OSD RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE
RDTE, Defense Wide BA 03	**0603000D8Z - Insensitive Munitions Advanced Technology**

COST ($ in Millions)	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P300 Insensitive Munitions AT		3.966	15.970	20.802	17.824	22.779	24.760

A. Mission Description and Budget Item Justification: (U) This program addresses advanced technology development associated with improving the lethality, reliability, safety and survivability of munitions and weapon systems. The goal is to develop and demonstrate joint enabling technologies that can be used by Program Managers as they develop their specific weapon programs. The program invests in and demonstrates technologies from a Joint Service perspective thus insuring the development of technology with the broadest applicability, while avoiding duplication of efforts.

(U) This effort will demonstrate enabling technologies needed to develop weapons in compliance with Insensitive Munitions (IM) requirements established in Title 10, United States Code and DoDI 5000.1. This effort will take promising technologies demonstrated at the laboratory scale and transition them into demonstration programs utilizing generic hardware based on priority munitions identified in the Program Executive Office (PEO) IM Strategic Plans. In this way, promising formulations, ingredients, case technologies, liners and coatings can be integrated into a munition configuration and its ability to improve the IM response can be validated. Program Managers can then transition mature demonstrated IM technology, decreasing their program costs and schedule risk, and facilitating their spin-off into other non-compliant munitions within their portfolios.

(U) Under the Joint IM Technology Program (JIMTP), investments are focused on specific munition areas that have been identified by the Science and Technology community and validated by the technology needs identified in the IM Strategic Plans submitted by the PEOs. These five munitions areas are: 1) high performance rocket propulsion, 2) minimum smoke rocket propulsion, 3) large caliber gun propulsion, 4) anti-armor warheads, and 5) blast and fragmentation warheads.

(U) Munition Area Technology Groups (MATGs) have been established for each area and are tasked with 1) coordinating, establishing, and maintaining five-year technology development plans and roadmaps, 2) coordinating biannual meetings to review technical and programmatic details of each funded and proposed efforts, 3) developing and submitting Technology Transition Agreements in coordination with appropriate PEOs for insertion in their IM Strategic Plans, and 4) interfacing with other MATGs and IM science and technology projects as appropriate. The JIMTP Technical Advisory Committee (TAC) (consisting of senior DoD and DOE laboratory representatives and senior Munitions PEO representatives) will provide program oversight, policy, direction and priorities during its annual meeting.

B. Program Change Summary	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2008)		6.000	16.000
Current BES/President's Budget (FY 2009)		3.966	15.970
Total Adjustments		-2.034	-0.030
Congressional Program Reductions		-2.000	
Congressional Rescissions			
Congressional Increases			

Reprogrammings			
SBIR/STTR Transfer			
Other		-0.034	-0.030

C. Other Program Funding Summary	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
0602000D8Z - BA 2 Joint Munitions Technology	10.323	12.433	15.254	15.371	15.250	15.453	15.671

Comment:

D. Acquisition Strategy Not applicable for this item.

E. Performance Metrics: Not Applicable.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDTE, Defense Wide BA 03	**0603000D8Z - Insensitive Munitions Advanced Technology**	**P300**

COST ($ in Millions)	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P300 Insensitive Munitions AT		3.966	15.970	20.802	17.824	22.779	24.760

A. Mission Description and Budget Item Justification: This RDT&E effort will demonstrate enabling technologies needed to develop weapons in compliance with Insensitive Munitions (IM) requirements established in Title 10, United States Code and DoDI 5000.1. This effort will take promising technologies demonstrated at the laboratory scale and transition them into demonstration programs utilizing generic hardware based on priority munitions identified in the Program Executive Officer (PEO) IM Strategic Plans. PEOs can then transition mature demonstrated IM technology, decreasing their program costs and schedule risk, and facilitating spin-offs to other non-compliant munitions within their portfolios.

Under the Joint Insensitive Munitions Program (JIMTP), investments are focused on five Munition Areas: High Performance Rocket Propulsion, Minimum Signature Rocket Propulsion, Blast and Fragmentation Warheads, Anti-Armor Warheads, and Large Caliber Gun Propulsion. Munition Area Technology Groups (MATGs) under tri-service leadership have developed technology roadmaps for each Munition Area which are used to guide investments based on goals consistent with the DoD IM Strategic Plan. These IM technologies, alone or in combination, will be incorporated in hardware, simulating real-world munitions, to demonstrate its utility and feasibility as part of Technology Transition Agreements with PEOs.

B. Accomplishments/Planned Program:

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Insensitive Munitions Advanced Technology Development		3.966	15.970

FY 2008 Plans: (U) Using DoD's IM Strategic Plan priority munitions configurations, technology demonstration hardware will be designed and manufactured. Current 6.2 Reactive Liner to support large general-purpose warheads will transition to 6.3. Assessments and studies based on mid-scale test results will be conducted to determine readiness for full-scale IM tests, and production capability will be verified with full-scale test assets. An indirect fire munition will be utilized to demonstrate the latest blast/fragment explosive technology. Demonstration programs will be conducted, which demonstrate the range of effectiveness of these new IM technologies against the IM threats of slow and fast heating, bullet and fragment impact, sympathetic reaction, and shaped charge jet impact.

FY 2009 Plans: (U) In addition to those efforts already underway, a generic small diameter rocket motor, called an analog, will be fabricated to demonstrate new vented case design concepts, which may include new propellant formulations. Conduct full-scale IM testing on the reactive liner concept implemented in a general purpose bomb configuration. Evaluate a first generation warhead to demonstrate anti-armor technology, which may include new energetic ingredients and binders, novel formulations, liners or case design concepts. Conduct coordinated IM demonstration programs, which demonstrate the range of effectiveness of these new IM technologies against the IM threats of slow and fast heating, bullet and fragment impact, sympathetic reaction, and shaped charge jet impact.

C. Other Program Funding Summary	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
0602000D8Z - BA 2 Joint Munitions Technology	10.323	12.433	15.254	15.371	15.250	15.453	15.671

Comment:

D. Acquisition Strategy Not applicable for this item.

E. Major Performers Not applicable for this item.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE
RDTE, Defense Wide BA 03	**0603121D8Z - SO/LIC Advanced Development**

	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	34.813	39.815	32.832	32.172	32.776	33.294	33.808
P206	Explosive Ordnance Disposal/Low-Intensity Conflict/P206	9.200	7.167	7.401	7.308	7.448	7.564	7.680
P207	Special Reconnaissance Capabilities/P207	21.862	27.472	20.168	19.668	20.033	20.351	20.666
P208	Information Dissemination Concepts/P208	3.264	3.106	3.125	3.085	3.145	3.194	3.243
P209	Irregular Warfare Support (IWS)/P209	0.487	2.070	2.138	2.111	2.150	2.185	2.219

A. Mission Description and Budget Item Justification: P206, Explosive Ordnance Disposal/Low-Intensity Conflict (EOD/LIC). The EOD/LIC Program develops and delivers advanced capabilities for military Explosive Ordnance Disposal (EOD) operators and Special Operations Forces (SOF) to meet the challenges of improvised explosive devices (IEDs), force protection, and the war on terrorism. EOD/LIC efforts focus in two areas: support to SOF to combat terrorism; and access, detection, identification, and neutralization of all types of conventional explosive ordnance and improvised explosive devices. Requirements submitted by the Joint Service EOD and Service Special Operations communities are prioritized and approved by OASD (SO/LIC).

P207, Special Reconnaissance Capabilities (SRC). The SRC Program exploits, leverages, and integrates DoDs service and agency efforts to improve surveillance and reconnaissance tools (unattended sensors, tagging devices, data infiltration/exfiltration, remote delivery, and mobility/delivery of sensors), while providing risk reduction for DoD and other agency technology and development programs. The SRC Program identifies, integrates, and operationalizes the technical tools for the collection of actionable information against a variety of targets and mission requirements, including Global War on Terrorism (GWOT), and maintains DoDs on-line catalog of tools in order to minimize crisis response time for special reconnaissance and surveillance.

P208, Information Dissemination Concepts (IDC). The IDC Program addresses technology capabilities necessary to enable sustained information dissemination campaigns in denied areas. The IDC program, working as necessary with DoD and the interagency, develops, modifies, and demonstrates concepts, mechanisms, platforms and payloads to propagate themes and messages that convince target audiences to take action favorable to the United States and its allies.

P209, Irregular Warfare Support (IWS). The IWS Program develops cross-domain blended capabilities necessary to enable sustained, counterterrorism operations. This program leverages ongoing research efforts of US Special Operations Command (USSOCOM), the military departments, Defense agencies, and other federal agencies to analyze, modify, design, prototype and demonstrate enduring technical and operational capabilities. Projects support efforts to: conduct counter organization warfare, develop counter motivation capabilities, coordinate infrastructure and sanctuary denial options, and provide counter enterprise and counter financing capability to the warfighter. The Program blends several disciplines including surveillance, operations, policy, information, training and technology.

B. Program Change Summary	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2008)	35.670	32.669	32.896

Current BES/President's Budget (FY 2009)	34.813	39.815	32.832
Total Adjustments	-0.857	7.146	-0.064
Congressional Program Reductions			
Congressional Rescissions			
Congressional Increases		7.146	
Reprogrammings			
SBIR/STTR Transfer			
Other	-0.857		-0.064

Remarks: The FY 2007 program value reflects rounding adjustments at the Department level. The FY 2008 increase is due to Congressional Adds.

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
08						
09						

Comment: Performance Metrics:
SO/LIC Advanced Development - PE 0603121D8Z; Explosive Ordnance Disposal & Low-Intensity Conflict/P206; Special Reconnaissance Capabilities/P207; Information Dissemination Concepts/P208; Irregular Warfare Support/P209

Long Term Strategies: Obtain adequate funding to support critical shortfalls; prioritize proposals that are deemed acceptable and allocate funding accordingly; and establish outreach to leverage institutional knowledge and expertise.

Performance Indicator and Rating:

FY 2008 Target:
70% of currently funded research projects are completed on time and within budget
5% increase in the number of research projects accepted
Transition scheduled projects to user communities

FY 2009 Target:
70% of currently funded research projects are completed on time and within budget
5% increase in the number of research projects accepted

Basis of FY 2007 to Date Performance Rating:
Currently the number of funded research projects are on track to be completed per the target.

Verification: The SO/LIC Advanced Development Program projects each track the status of their efforts. Reviews are conducted to assess project status. Oversight of the entire effort is undertaken by ASD SO/LIC.

Validation: Completed research products increase the capabilities of the DoD to effectively detect, deter and defend against terrorist attacks; defeat improvised explosive devices and unexploded ordinance; enable sustained information operations in denied areas; and contribute to resolution of hostile, unconventional conflicts.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDTE, Defense Wide BA 03	**0603121D8Z - SO/LIC Advanced Development**	**P206**

	COST ($ in Millions)	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P206	Explosive Ordnance Disposal/Low-Intensity Conflict/P206	9.200	7.167	7.401	7.308	7.448	7.564	7.680

A. Mission Description and Budget Item Justification: P206, Explosive Ordnance Disposal/Low-Intensity Conflict (EOD/LIC). The EOD/LIC program develops and delivers advanced capabilities for military EOD operators and Special Operations Forces (SOF) to meet the challenges of improvised explosive devices (IEDs), force protection, and the war on terrorism. EOD/LIC efforts focus in two areas: support to SOF to combat terrorism; and access, detection, identification, and neutralization of all types of conventional explosive ordnance and improvised explosive devices. Requirements submitted by the Joint Service EOD and Service Special Operations communities are prioritized and approved by Office of the Assistant Secretary of Defense (OASD) (SO/LIC).

B. Accomplishments/Planned Program:

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
2007 Accomplishments:	9.200		
Developed night vision capability for the bomb suit helmet. Designed a portable pen to sustain marine mammals in extreme environments. Assessed an unmanned aerial vehicle to support EOD combat operations. Conducted initial testing of a high power ordnance and IED standoff laser disruption system. Evaluated a roadside IED detection system. Designed a weapon-mounted robotic platform. Designed low cost, disposable robotic platforms for reconnaissance and tactical missions. Developed unmanned surface craft for reconnaissance of waterways and littoral regions.			

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
FY 2008 Plans:		7.167	
Improve portable unmanned aerial vehicle for EOD and combat missions. Evaluate sensors to detect threats through foliage and other obscurants. Develop an integrated dual modem interpreter to support underwater networking of sensors and vehicles. Evaluate a bladderless lift balloon to lift ordnance off the sea floor. Investigate wireless, non-radio frequency technologies for command and control of robotic platforms. Develop tools and technologies to enhance performance of robotic platforms in EOD and SOF missions. Improve unmanned surface vessels for reconnaissance of waterways and littoral regions. Develop tactical X-ray film for EOD and SOF missions. Evaluate an ordnance penalty simulator for objective performance evaluation of personnel undergoing EOD training at the Naval Explosive Ordnance Disposal School. Develop improved dive mask for combat and EOD divers.			

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
FY 2009 Plans:			7.401
Test and evaluate unmanned aerial vehicle with improved sensors for IED detection. Evaluate prototype undersea communications systems. Develop wireless, nonradio frequency technology for command and control of robotic platforms. Integrate sensors to detect threats through foliage and other obscurants. Evaluate tools that enhance capability of robotic platforms to support EOD and SOF missions. Evaluate performance of unmanned surface vehicles to reconnaissance of waterways and littoral regions. Evaluate improved dive mask for combat and EOD divers.			

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	**0603121D8Z - SO/LIC Advanced Development**	**P207**

COST ($ in Millions)		FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P207	Special Reconnaissance Capabilities/P207	21.862	27.472	20.168	19.668	20.033	20.351	20.666

A. Mission Description and Budget Item Justification: The SRC program primary goal is to seek out and identify technical tools for the collection of actionable data which will assist DoD in its execution of the Global War on Terrorism (GWOT). To accomplish this task, the program leverages emerging and existing developmental technologies from government and commercial ventures and operationalize them to meet near term reconnaissance and surveillance operational requirements. The operational tools transition unattended sensors, tagging devices, data transfer, remote delivery, and mobility/delivery of sensors into established Programs of Record throughout the DoD. The program evaluates new and existing technical surveillance technologies into a reference data base.

B. Accomplishments/Planned Program:

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
FY 2007 Accomplishments: The SRC Program	21.862		

FY 2007 Accomplishments: The Special Reconnaissance Capabilities (SRC) Program conducted end-to-end testing of a wide variety of small, power efficient beacons and sensors technologies to satisfy Global War on Terrorism (GWOT) requirements. The program conducted training for unattended ground sensors for maritime and ground persistence surveillance. These capabilities and equipment were inserted into operator training exercises to vet tactics, techniques and procedures for employment. The program office identified, evaluated, and directed enhancements to existing tagging, tracking, and locating (TTL) equipment in support of other government agencies to meet emerging requirements. In addition, the office provided enhancements, fielding and conducted operational assessment of an airborne interrogator-transponder prototype system. Delivered several prototypes of a sensor-less visible camera system and begin integrating night capabilities. Continued to improve data infiltration and exfiltration capabilities through the integration of advanced technology and new communications links. Continued to improve special reconnaissance (SR) optic capabilities through the integration of advanced optic technology and processing. Improved SR power capabilities through the integration of advanced power technologies and device redesign. Explored and exploited remote control capabilities by reducing form factors, improving power management, and integrating air droppable and maritime capabilities. Performed field evaluations of selected SR technologies and documented results in the on-line SRC knowledgebase. Supported cooperative projects and evaluated technology maturity for new capabilities with the DoD and OGA that accelerates the transition of advanced SR and TTL technology to the operational community.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
2007 Plans		27.472	

FY 2008 Plans: Provide technology support to DoD with emerging special reconnaissance (SR) precise location prototype technologies. Develop micro sensor controller for hand emplacement and air and maritime employment. Continue the following projects: provide technology support to the Global War on Terrorism to include, technology training and variants of tagging, tracking, and locating (TTL) and unattended ground sensor prototypes for maritime and ground persistence surveillance; engage the research and development community for technical solutions and candidate technologies to improve DoD SR mission capabilities; evaluate and operationalize sensor and TTL capabilities through insertion of maturing mini and micro technologies to enhance the technical performance of SR missions; insert operationally capable prototypes into operator training exercises to vet technologies and to develop tactics, techniques and procedures for employment; research, evaluate and integrate enhanced tagging and sensing capabilities to enable remote and standoff emplacement; research, evaluate and integrate emerging netted sensor technologies into remote capabilities; integrate improved SR data infiltration and exfiltration capabilities though the development and integration of advanced technology and new communications links; perform field

evaluations of selected SR technologies and document results in on-line SRC knowledgebase; and support cooperative projects with DoD and OGA to accelerate the transition of advanced SR technologies to the operational community.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
2009 Plans			20.168

FY 2009 Plans: Insert operationally capable prototypes into operator training exercises to vet technologies and new develop tactics, techniques and procedures for employment. Continue to: provide technology support to the Global War on Terrorism to include, technology training and variants of tagging, tracking and locating (TTL) and unattended ground sensor prototypes for persistence surveillance; engage the research and development community for technical solutions and candidate technologies to improve DoD special reconnaissance (SR) mission capabilities; evaluate and operationalize sensor and TTL capabilities through insertion of mini and micro maturing technologies; research, evaluate, and integrate enhanced tagging and sensing capabilities to extend mission life and standoff emplacement; integrate extended life mission sensors, micro optics, fingerprinting, emerging precise location technologies, and improved netted SR data infiltration and exfiltration capabilities; research, evaluate, and integrate emerging netted sensor technologies into remote capabilities; perform field evaluations of selected SR technologies and document results in on-line SRC knowledgebase; and support cooperative projects with the DoD and OGA Intelligence Agencies to accelerate the transition of advanced R&S technology to the operational community.

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	**0603121D8Z - SO/LIC Advanced Development**	**P208**

COST ($ in Millions)		FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P208	Information Dissemination Concepts/P208	3.264	3.106	3.125	3.085	3.145	3.194	3.243

A. Mission Description and Budget Item Justification: P208, Information Dissemination Concepts (IDC). The IDC Program addresses technology capabilities necessary to enable sustained information dissemination campaigns in denied areas. The IDC Program, working as necessary with DoD and the interagency, develops, modifies, and demonstrates concepts, mechanisms, platforms and payloads to propagate themes and messages that convince target audiences to take action favorable to the United States and its allies.

B. Accomplishments/Planned Program:

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
FY 2007 Accomplishments:	3.264		

USPACOM's Multimedia Alert Processing Systems (MAPS): Begin the process to transition MAPS to Services and COCOMS for procurement and support. Support counter-terrorism and combating terrorism operations by continuing development of information operations tools and technologies, and expanding translation capabilities and monitoring of local radio and Internet dissemination of foreign news services. Develop information dissemination requirements in support of instability and counter-narcotic operations. Start new projects defined through collaboration efforts to address technology shortfalls. USSOCOM's PSYOP Global Reach (PGR) Advanced Concept Technology Demonstration (ACTD): Continued management of the incremental design, engineering, and technical integration of multiple technologies as the variants become more robust. Planned events included continued development of advanced broadcast/rebroadcast payloads for Predator type UAS platforms, demonstrations of WSADS UAS FM and loudspeaker broadcast payloads, demonstrating the Compact Airborne Amplitude Modulated (AM) Transmitter, transitioning WSADS FM broadcast payload, demonstrating electronic leaflets and media display systems, and incremental fielding of POPAS. These efforts will culminate next FY in MUAs for scatterable media and the POPAS. Space and Naval Warfare Systems Center (SPAWAR), in FOUO text, started a new technology development to extend the state-of-the-art to understand cognitive processes used to disseminate and react to information. Defined techniques and minimized options for testing the interaction of cognitive decision making, cultural biases and technology effects. Designed experimental test sets. Started new capability to stand-off from target and deliver messages clandestinely. Started a new effort to investigate ability to receive messages using commercial low power electronics.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
FY 2008 Plans:		3.106	

USPACOM's Multimedia Alert Processing Systems (MAPS): Continue transitioning MAPS to Services. Support counter-terrorism and combating terrorism operations by improving upon existing tools and expanding technologies to enhance monitoring and translation capabilities across the full spectrum of communication media. Develop new projects to address technology shortfalls in building partnership capacity for distribution of themes and messages favorable to Coalition operations. USSOCOM's PSYOP Global Reach (PGR) Advanced Concept Technology Demonstration (ACTD): Continues development of advanced broadcast/rebroadcast payloads designed for Predator/Extended Range Multi Purpose (ERMP) type UAS platforms. Continues POPAS development and incremental fielding and transition software/hardware. Conduct MUAs and EUEs of scatterable media and the POPAS. Space and Naval Warfare Systems Center (SPAWAR), in FOUO text, continues development effort to track messages globally. Initiate transition to COCOM and Services. Initiate transition cognitive decision making to COCOMs. Continue effort to develop stand-off

technology for message delivery. Address limitations of deployment con-ops. Develop tool to deliver the message. Also, investigate potential for messages to be intentionally redirected by adversary. Continue effort to use commercial low power electronics for message reception. Begin size reduction effort.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
FY 2009 Plans:			3.125

USPACOM's Multimedia Alert Processing Systems (MAPS): Continue to provide technology support the Global War on Terrorism. Develop Information Operation tools and techniques that assist in the analysis and planning phase of Information Operations. Investigate additional mechanisms, platforms, and payloads to provide IO planners with multiple means of delivering themes and messages to targeted audience. USSOCOM's PSYOP Global Reach (PGR) Advanced Concept Technology Demonstration (ACTD): Execute further development, demonstrate and perform evaluations for the AM, FM, and TV broadcast payload pods to integrate and support Predator/Extended Range Multi Purpose (ERMP) type UAS platforms. Transition scatterable media to include scatterable loudspeaker broadcast systems and electronic leaflet systems. Demonstrate, evaluate, and transition Small Business Innovative Research (SBIR) Phase II FM/TV antenna, POPAS, and related software technologies. In addition, transition remaining software/hardware for POPAS. The transition of residuals with a focus on Milestone B will be completed by the ACTD as it conducts close-out procedures and fully integrates with the program of record by the end of the FY. Space and Naval Warfare Systems Center (SPAWAR), in FOUO text, transitions stand-off technology for message delivery to the COCOMs and Services. Develops capabilities to monitor and control delivery of messages by adversaries. Develops new projects that will allow the distribution of themes and messages from stand-off systems building upon collaboration across the Department and Agencies.

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	**0603121D8Z - SO/LIC Advanced Development**	**P209**

COST ($ in Millions)	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P209 Irregular Warfare Support (IWS)/P209	0.487	2.070	2.138	2.111	2.150	2.185	2.219

A. Mission Description and Budget Item Justification: P209, Irregular Warfare Support (IWS). The IWS Program develops cross-domain blended capabilities necessary to enable sustained, counterterrorism operations. This program leverages ongoing research efforts of US Special Operations Command (USSOCOM), the military departments, Defense agencies, and other federal agencies to analyze, modify, design, prototype and demonstrate enduring technical and operational capabilities. Projects support efforts to: conduct counter organization warfare, develop counter motivation capabilities, coordinate infrastructure and sanctuary denial options, and provide counter enterprise and counter financing capability to the warfighter. The Program blends several disciplines including surveillance, operations, policy, information, training and technology.

B. Accomplishments/Planned Program:

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
FY 2007 Accomplishments:	0.487		
Transitioned Clandestine Close Access Surveillance (CCAS) modular training support capability to Special Forces Command Program of Record; published video depicting research on terrorist prevention and disengagement strategies.			

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
FY 2008 Plans:		2.070	
Research and develop capabilities that support the Military and Interagency Irregular Warfare mission. This will include conducting operational analysis of requirements and capability design of surrogate network enhancement, counter-human network operations, and critical cooperation nodes between U.S. Government communications activities.			

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
FY 2009 Plans:			2.138
Research and develop capabilities that support the Military and Interagency Irregular Warfare mission. This will include further operational analysis of completed FY08 plans; assessment of effectiveness; solutions for systems integration, new operational analysis, and capability design for pilot Irregular Warfare (IW) training and education programs across the Interagency; enhanced counter-human network operations, and novel information age operational concepts.			

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 (R2 Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE
RDTE, Defense Wide BA 03	**0603122D8Z - Combating Terrorism Technology Support**

COST ($ in Millions)		FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P484	Combating Terrorism Technology Support (CTTS) P484	104.880	117.628	79.970	82.402	85.511	86.861	88.203

A. Mission Description and Budget Item Justification: The Combating Terrorism Technology Support (CTTS) program develops and delivers capabilities that address needs and requirements with direct operational application in the national effort to combat terrorism. Projects are distributed among 12 mission categories: Blast Effects and Mitigation; Chemical, Biological, Radiological, and Nuclear Countermeasures; Concept Development; Explosives Detection; Improvised Device Defeat; Infrastructure Protection; Investigative Support and Forensics; Physical Security; Surveillance, Collection, and Operations Support; Tactical Operations Support; Training Technology Development; and VIP Protection. This program is a non-system, advanced technology development effort that demonstrates the utility or cost reduction potential of technology when applied to combating terrorism requirements. It includes technology capability development, proof-of-principle demonstrations in field applications, and coordination to transition from development to operational use.

B. Program Change Summary	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2008)	114.728	76.276	80.125
Current BES/President's Budget (FY 2009)	104.880	117.628	79.970
Total Adjustments	-9.848	41.352	-0.155
Congressional Program Reductions			
Congressional Rescissions			
Congressional Increases		41.352	
Reprogrammings			
SBIR/STTR Transfer			
Other	-9.848		-0.155

Remarks: The FY 2007 program value reflects rounding adjustments at the Department level. The FY 2008 increase is due to Congressional Adds.

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
08						
09						

Comment: Combating Terrorism Technology Support - PE 0603122D8Z

Long Term Strategies: Obtain adequate funding to support critical shortfalls; prioritize proposals that are deemed acceptable and allocate funding accordingly; establish outreach programs with the interagency to leverage institutional knowledge and expertise; utilize cooperative research and development (R&D) agreements with the United Kingdom, Canada and Israel to leverage technology investments; and initiate full cooperative R&D programs with two new foreign partners.

Performance Indicator and Rating:

FY 2008 Target:
70% of currently funded research projects are completed on time
5% increase in the number of research projects accepted
Continue full R&D programs with existing and new foreign partners

Verification: The CTTS Program utilizes a database to track the status of the projects. Quarterly program reviews are conducted to assess project status. In addition, an annual report is produced that assesses the status of current projects and the ability to accept new projects.

Validation: Completed research products increase the capabilities of the DoD to effectively detect, deter, and defend against terrorist attacks; thus the Departments personnel and interests at home and abroad are safer from terrorism.

FY 2009 Target:
70% of currently funded research projects are completed on time
5% increase in the number of research projects accepted
Continue full R&D programs with five existing foreign partners

Verification: The CTTS Program utilizes a database to track the status of the projects. Quarterly program reviews are conducted to assess project status. In addition, an annual

report is produced that assesses the status of current projects and the ability to accept new projects.

Validation: Completed research products increase the capabilities of the DoD to effectively detect, deter, and defend against terrorist attacks; thus the Departments personnel and interests at home and abroad are safer from terrorism.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDTE, Defense Wide BA 03	**0603122D8Z - Combating Terrorism Technology Support**	**P484**

	COST ($ in Millions)	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P484	Combating Terrorism Technology Support (CTTS) P484	104.880	117.628	79.970	82.402	85.511	86.861	88.203

A. Mission Description and Budget Item Justification: The Combating Terrorism Technology Support (CTTS) program develops and delivers capabilities that address needs and requirements with direct operational application in the national effort to combat terrorism. Projects are distributed among 12 mission categories: Blast Effects and Mitigation; Chemical, Biological, Radiological, and Nuclear Countermeasures; Concept Development; Explosives Detection; Improvised Device Defeat; Infrastructure Protection; Investigative Support and Forensics; Physical Security; Surveillance, Collection, and Operations Support; Tactical Operations Support; Training Technology Development; and VIP Protection. This program is a non-system, advanced technology development effort that demonstrates the utility or cost reduction potential of technology when applied to combating terrorism requirements. It includes technology capability development, proof-of-principle demonstrations in field applications, and coordination to transition from development to operational use.

B. Accomplishments/Planned Program:

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
BLAST EFFECTS AND MITIGATION	8.537	6.470	5.291

FY 2007 Accomplishments: Applied blast simulator test data for walls, columns, and other structural elements of buildings for validation of computer models and full-scale field test data. Published a best practices blast mitigation guide to be used by tunnel owners. Designed and tested, advanced material blast shield walls for checkpoints, entry control facilities, and overhead protection. Designed construction of a configurable half-scale urban city used to develop simplified, yet high-fidelity modeling codes to predict effects of terrorist bombings in an urban environment. Developed an expeditionary structure that provides both blast and ballistic protection. Developed a polymer application apparatus that is lightweight and uses a polymer material comparable to current polymers used for blast mitigation. Validated the use of the Blast Simulator to test larger structural components to be used in U.S. Central Command (CENTCOM). Investigated homemade terrorist explosive mixtures and their effects on buildings and mass transit infrastructure.

Developed urban environment blast test models. Tested bridge tower structures using Blast Simulator.

FY 2008 Plans: Develop rapidly deployable entry control point equipment package for forward operating locations. Refine and provide critical blast information to military, industrial, and civil engineers by performing experiments in a configurable urban city test facility. Promulgate engineering guidance and designs incorporating commercial technologies to protect critical U.S. infrastructure including tunnels and train/subway stations. Enhance existing software used in calculation of air blast loads from detonation of explosive sources to take into account the complex effects of the close-in blast environment. Test and evaluate a lightweight polymer application apparatus that uses existing polymer materials for blast mitigation.

Develop an advanced head form for measurements involving the effects of blast injury and head trauma.

FY 2009 Plans: Develop entry control point design software that adapts to the current threat. Develop commercial off-the-shelf (COTS) technologies for blast mitigation. Examine blast mitigation strategies to protect critical U.S. infrastructure to include electrical power sub-stations, dams, and maritime facilities. Demonstrate integrated systems to protect facilities from vehicle borne

improvised explosive devices, suicide bombers on foot, and standoff weapons.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
CHEMICAL, BIOLOGICAL, RADIOLOGICAL AND NUCLEAR COUNTERMEASURES	9.491	10.169	6.204

FY 2007 Accomplishments: Tested a small portable radio repeater system to maintain voice communication for combat forces and first responders operating in underground environments. Initiated lab testing of color-based sensor array for chemical agent detection. Tested and evaluated a self-contained escape respirator for both chemical and smoke protection. Designed a pocketsize, low-profile escape respirator capable of meeting the National Institute for Occupational Safety and Health (NIOSH) standards. Analyzed gaps in existing risk-based permeation criteria for toxic industrial chemicals (TICs). Designed a vehicle retrofit kit for emergency mass evacuation. Designed prototype total organic carbon detector for water. Designed a portable test kit for collective protection filters. Developed an advanced alpha and beta radiation detector prototype for water. Analyzed data gaps in chemical instrumental libraries for detection of threat agents. Deployed personal hydration system water filters into theater for test and evaluation for operational use. Tested, evaluated, and deployed food detection kits in support of the Global War on Terror. Tested and evaluated next-generation fire fighter turnout gear with integrated chemical protection.

Successfully conducted DiCAST distributed chemical sensor field test installation in a mass transit station in a major metropolitan area. Conducted subject matter expert workshop on environmental sampling. Established testing center for bioterrorism operations and related public health preparedness.

FY 2008 Plans: Complete lab testing and initiate user field evaluation of color-based sensor array for chemical agent detection. Submit self-contained escape respirator for NIOSH certification. Finalize design for a pocketsize, low-profile escape respirator capable of meeting NIOSH standards. Initiate testing for risk-based permeation criteria for TICs. Evaluate vehicle retrofit kit for emergency mass evacuation. Build and evaluate prototype total organic carbon detector for water. Build and evaluate advanced alpha and beta radiation detector for water. Populate database for chemical instrumental libraries for detection of threat agents. Develop a guide to assist explosive ordnance disposal and bomb squad personnel in recognizing radiological dispersion devices. Initiate design and development of a handheld, standoff victim triage device. Develop a hydration status monitor to assess personnel. Field a transportable gasifier unit for destruction of contaminated biomass. Develop methodology for the emergency decontamination of N95 facemasks. Field a portable test kit for collective protection filters. Conduct a personal protective equipment conference to determine needs of the emergency response and military communities. Evaluate additional potential foodborne threats. Develop a desalination capability to enhance the personal hydration system water filter kit.

Develop and test optical fiber chemical indicators for two additional classes of chemicals with independent laboratory confirmation of performance. Conduct second subject matter expert workshop on environmental sampling. Initiate testing bio-terrorism operations and related public health preparedness.

FY 2009 Plans: Test and evaluate the hydration status monitor. Test and evaluate the prototype standoff patient triage device. Evaluate effectiveness of decontamination methodologies for N95 facemasks. Conduct expert and end-user evaluation of a guide to assist Explosive Ordnance Disposal (EOD) and bomb squad personnel in recognizing radiological dispersion devices. Test and evaluate performance of advanced alpha and beta radiation detector for water. Test and evaluate performance of total organic carbon detector for water. Complete database for chemical instrumental libraries for detection of threat agents.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
EXPLOSIVES DETECTION	5.944	7.656	7.664

FY 2007 Accomplishments: Conducted side-by-side evaluation of imaging and anomaly detection systems for personnel screening. Developed prototype systems for standoff detection of explosives worn on the body. Implemented optimization of trace explosives detection protocols for secondary screening of suspect individuals. Assessed technological feasibility of detecting explosives using laser photo-acoustic spectroscopy technique.

FY 2008 Plans: Assess the feasibility of an X-ray system for real time imaging of vehicles for vehicle-borne improvised explosive device detection. Evaluate prototype systems for standoff detection of explosives worn on the body. Evaluate training methods for canine detection of explosives on humans. Continue development of an X-ray system for real time imaging of vehicles for vehicle-borne improvised explosive device detection. Assess prototype systems for standoff detection of suicide bombers using an orthogonal approach to sensor fusion. Develop vapor standards for the validation of explosives trace detectors. Develop improved sampling systems for enhanced explosives trace detection. Develop a ruggedized prototype for entry control point screening of personnel.

FY 2009 Plans: Continue development of improved sampling systems for enhanced explosives trace detection. Evaluate prototype X-ray system for real time imaging of vehicles for vehicle-borne improvised explosive device detection. Develop prototype systems for standoff detection of suicide bombers using an orthogonal approach to sensor fusion. Continue development of a ruggedized prototype for entry control point screening of personnel.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
IMPROVISED DEVICE DEFEAT	7.562	9.592	7.174

FY 2007 Accomplishments: Developed and transitioned to commercial production an Improvised Explosive Device (IED) Diagnostics and Defeat Kit to assist bomb disposal technicians in the manual attack of wiring within an IED. Developed an initial prototype of the Multiple IED Disruption System for integration into existing robotic platforms. Characterized a select set of vehicle-borne IED (VBIED) disruption tools. Completed integration of the Power Hawk, a commercial-off-the-shelf (COTS) cutting system for robotic applications. Completed integration of a commercial drop camera with robotic platforms. Developed a prototype Body Bomb Tool Kit for integration with robotic applications. Designed a miniaturized Single Sided Imaging system for integration of suspect packages. Developed a multipurpose EOD cart to assist in the transportation of tools and VBIED disrupters. Developed a Joint Architecture for Unmanned Systems (JAUS) compliant interface for visual and X-ray targeting systems. Investigated the use of Caron nano-structures as a potential means to defeat IEDs.

FY 2008 Plans: Manufacture final prototypes and conduct field evaluation of the Multiple IED Disruption System. Build an initial prototype of the single Sided Imaging System. Design and build a utility cart with custom interface for the Single Sided Imaging System. Characterize additional sets of general disruption tools designed for use against IEDs and VBIEDs. Populate the electronic tool characterization decision-making database and guide. Demonstrate a plug-and-play capability for the integration of a JAUS compliant X-ray targeting system and components with JAUS compliant robotic platform. Develop new tools and end effectors for integration with current EOD robotic platforms. Develop a low cost user-friendly robotics package that allows integration with currently available all-terrain vehicles. Test, evaluate, and commercialize the EOD Tool Cart. Integrate a camera and Operator Control Unit with the New Explosive Ordnance Mover (NEOMOVER) prototype robotics platform, and deliver for evaluation. Demonstrate, test, and evaluate new classes of affordable mid-sized, two and four wheeled unmanned ground vehicles for military and homeland security applications.

FY 2009 Plans: Integrate a utility cart carried Single Sided Imaging System with a currently available robotics platform. Integrate JAUS compliant MIDS and X-ray Targeting with the NEOMOVER robotics platform and conduct a field demonstration. Define specifications and develop an initial design for a radio frequency (RF) receiver detection device. Design and develop a non-explosive IED defeat tool. Continue Tool Characterization of select IED/VBIED disruption charges, and populate the Tool Characterization Guide.

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

FY 2007 Plans: Moved to Physical Security.
FY 2008 Plans:
FY 2009 Plans:

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDTE, Defense Wide BA 03	**0603122D8Z - Combating Terrorism Technology Support**	**P484**

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
INVESTIGATIVE SUPPORT AND FORENSICS	4.178	4.174	4.178

FY 2007 Accomplishments: Fielded a two-way multifunctional encrypted radio. Delivered an IED component identification database. Fielded ten heated and cooled portable canine kennels. Fielded Statistical Verification of Camouflage Clothing System based on pattern matching. Deployed three Master Trainers to Special Operations Forces (SOF) Groups in order to retain and augment the current canine and handler abilities in theater.

FY 2008 Plans: Distribute a system for automatic analysis of text for author attribution. Improve the performance and scientific defensibility of dog teams by improving the absorption materials used for collecting human scent. Improve the protocol for adsorption of triacetone triperoxide (TATP) from the gas phase to assist in evidence collection from post-blast exhibits. Field an automated three-dimensional ear identification system. Field a distributive network attack system for decrypting steganography. Distribute a forensic audio spectral analysis tool. Field a laser Doppler vibrometry system for the remote measurement of physiological activity. Field a data stream profiling database. Field computer intrusion data collection software.

FY 2009 Plans: Produce a canine human scent identification working protocol. Improve the protocols for remote biometric assessment. Improve forensic capabilities for retrieving data from electronic equipment. Field an electronic fast capture fingerprint scanner. Enhance operational canine technology. Distribute new protocols for fingerprint recovery from improvised explosive devices.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
PHYSICAL SECURITY	11.776	19.967	12.050

FY 2007 Accomplishments: Developed an interoperable personnel identity management capability and conduct field tests. Developed and tested a paint that will reveal evidence of tampering when subjected to ultra-violet (UV) light. Concluded the operational assessment of an automated under vehicle inspection system. Conducted an interagency antiterrorism technology workshop. Developed crash tests of domestic and international vehicle security barriers. Evaluated the command and control station integrating multiple stand-alone optical systems designed to reduce labor and false alarms. Developed and published an updated vehicle inspection checklist to identify hidden explosives, contraband, and weapons in vehicles. Conducted field assessment of the integrated forward scatter and back scatter X-ray screening system to detect concealed explosives and metallic items in vehicles. Assessed technology to detect disassembled weapons and improvised explosives components in hand carried baggage. Developed a cyber security assessment tool. Developed a virtual cyber security testing capability. Updated the critical infrastructure database. Developed a transmission tower and line security monitor. Developed an evacuation simulation planning tool. Developed a secure software engineering guide. Developed a supervisory control and data acquisition cyber alert attack tool.

Developed remotely operated underwater screening to detect anomalies on submerged facilities and ship hulls. Developed and ruggedized high payoff commercial systems to enhance protection for coalition forces.

FY 2008 Plans: Evaluate next generation biometric identification technologies for inclusion with integrated access control systems. Conduct technology assessment of next generation weapons, explosives, and other contraband screening systems for facilities, public venues, and intermodal cargo terminals. Conduct crash tests of domestic and international vehicle security barriers and publish the results. Conduct field-tests of handheld devices to detect metallic and nonmetallic weapons on personnel. Develop a system to detect disassembled weapons and improvised explosives components. Develop an integrated personnel portal to detect concealed metallic threats. Conduct crash tests of nonstandard installation techniques of vehicle security barriers and update existing vehicle barrier guide. Conduct live-fire testing and intruder detection evaluations of a blast and ballistic protective system with integrated intrusion detection capabilities for remote substation protection. Conduct an international conference on Maritime Security Technologies. Complete an in-flight test of a secure means of data communications between military/commercial aircrafts and ground stations. Field a prototype early warning system for critical drinking water infrastructure. Develop an integrated cyber and physical assessment tool. Deploy and evaluate the performance of the evacuation simulation planning tool. Develop secure software engineering tools. Field an evacuation simulation planning tool. Convert the enhanced blast effects database into a web-based application. Identify critical infrastructure interdependency modeling technology gaps.

Test and field remotely operated underwater screening to detect anomalies on submerged facilities and ship hulls. Test and field ruggedized, and deploy high payoff commercial systems to enhance protection for coalition forces. Develop a comprehensive maritime domain awareness capability.

FY 2009 Plans: Develop an integrated personnel-screening system with remote capability to detect metallic, nonmetallic, and improvised explosive devices. Assess and demonstrate entry point screening and force protection technology. Assess a system to detect disassembled handguns and improvised explosives devices. Commercialize a blast and ballistic protective system with integrated intrusion detection capabilities for remote substation protection. Integrate novel sensors to extend perimeter/border capabilities to increase situational awareness and provide earlier warning of potential adversary attack. Develop integrated physical/cyber security systems. Develop curriculum and text for the secure software engineering course. Develop critical infrastructure dependency modeling standards and tools. Deploy a web-based blast effects database.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
CONCEPT DEVELOPMENT	4.326	2.748	

FY 2007 Accomplishments: Several subcomponent efforts were transitioned to a new Project within the Special Operations/Low Intensity Conflict (SO/LIC) Advanced Development Program (PE 0603121D8Z), Asymmetric Warfare Support, which leverages ongoing research efforts of US Special Operations Command (USSOCOM), the Military Services, Defense agencies, and other federal agencies to analyze, modify, design, and demonstrate enduring technical and operational capabilities for counterterrorism and counterinsurgency.

Conducted a Maritime Counter-Terrorism Exercise Asymmetric Warfare Initiative 2007 North.

FY 2008 Plans: Develop improved analytical tools for entity, relationship, and organizational structures resolution. Design and implement advanced automated activity and plan recognition capabilities.

FY 2009 Plans: Move to VIP Protection.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
SURVEILLANCE, COLLECTION AND OPERATIONS SUPPORT	13.884	26.598	9.287

FY 2007 Accomplishments: Integrated multiple tagging, tracking, and location technologies as a cue for other sensors or actions. Expanded existing geolocation and targeting capabilities. Evaluated and initiated biometric and other novel technologies to improve tagging, tracking, and locating effectiveness. Increased effectiveness of biometric technologies by studying and applying promising fusion techniques for the face, finger, and iris. Benchmarked and compared accuracy of machine and human face recognition. Developed automated tools and techniques to aid deployed forces in foreign language and cultural awareness.

Developed modular roll-on roll-off intelligence, surveillance, reconnaissance (ISR) capability for employment on nonspecialized aircrafts. Conducted a study on the available tools and equipment for information operations.

FY 2008 Plans: Improve access to open source media through new language processing technologies for multimedia information from degraded input sources. Continue to develop biometric and novel technology areas to improve tagging, tracking, and locating. Apply the gains in facial recognition technology to long-range video surveillance. Continue to investigate and improve biometric fusion techniques. Investigate methods and concepts for increasing the effectiveness of human identification at a distance when a person is aided by automated facial recognition algorithms. Continue to develop automated tools and techniques to aid deployed forces in foreign language and cultural awareness skills.

Develop simulation tools for deployable units_ operational efforts. Continue to improve technology for airborne threat detection. Investigate and improve tunnel detection technology. Field-testing of hand-emplaced and Unmanned Aerial Vehicle (UAV) delivered sensor systems configured for aero-bodies in jungle environment. Continue to develop ISR package in roll-on/roll-off platform. Establish prototype ISR testbed for sensor development and evaluation. Improve surveillance of borders in high risk through remote sensors.

FY 2009 Plans: Enhance open source media through new language processing technologies for degraded input sources. Improve biometric and novel technology areas for tagging, tracking, and locating. Increase performance of facial recognition technology for long-range video surveillance and human identification at a distance. Transition language processing techniques including increasing support for additional languages and domains to deployable systems for use. Enhance geolocation and targeting capabilities.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
TACTICAL OPERATIONS SUPPORT	16.015	11.053	9.338

FY 2007 Accomplishments: Delivered a High Performance In-Line Sniper Scope that will provide enhanced infrared images for sniper weapons for low rate initial production. Delivered the Eye Ball R-1 remote surveillance system for operational assessment. Developed an improved small laser target designator prototype for operational test and evaluation. Delivered a prototype weapon mounted video display for operational test and evaluation. Delivered a prototype lightweight, weapon-mounted, integrated laser rangefinder. Delivered a Dynamic Breaching Handbook for SWAT operations. Developed an integrated level IIIA Ballistic Helmet Prototype that supports modular tactical attachments and improves balance and wearer comfort. Delivered an enhanced tactical rope-ascending device for operational test and evaluation.

Conducted several scenario-based exercises and training events designed to increase the ability of local, State, and Federal agencies to respond to a terrorist event involving asymmetric threats. Developed and delivered tactical surveys for select high-risk facilities that will enable first responders to react to a crisis with enhanced safety, speed, and effectiveness.

FY 2008 Plans: Deliver a second generation Muzzle Flash Detection System for operational test and evaluation. Deliver initial integrated level IIIA Ballistic Helmets for operational test and evaluation. Develop an intrinsically safe distraction device for use by assault teams during shipboard operations. Develop low-profile fusion panoramic night vision goggles that provide enhanced situational awareness and ballistic eye protection. Finalize design for a portable countermeasure for remote controlled garage doors and conduct test and evaluation. Develop a remotely operated standoff vehicle stopping system that can be deployed from both a helicopter and vehicle. Finalize the design and deliver an improved small laser target designator prototype for operational test and evaluation. Deliver a deployable patient monitoring system for combat evacuations for operational test and evaluation. Deliver prototype of a portable, high bandwidth universal communications converter for initial testing. Deliver a prototype reusable non-pyrotechnic diversion device and conduct operational test and evaluation. Finalize the design and deliver a small tactical cutting torch for operational test and evaluation. Develop a high intensity tactical infrared headlight for military vehicles. Develop a next generation enhanced tactical rope-ascending device. Develop a compact amplifier and low-profile antenna to support use of the Multiband Inter/Intra Team Radio (MBITR) in military and civilian vehicles. Develop a projectile launched 40 mm listening system that can enhance situational awareness for SWAT teams. Develop next generation Front Line Viewing Units (FLVU) for local law enforcement agency operational test and assessment in their mobile command centers.

Analyze, design, and develop a program for tactical support surveys with civilian support teams.

FY 2009 Plans: Finalize the design, and deliver low-profile fusion panoramic night vision goggle for operational test and evaluation. Finalize, design, and deliver an intrinsically safe distraction device for operational test and evaluation. Finalize, design, and deliver a deployable patient monitoring system for operational test and evaluation. Finalize the design, and deliver a portable, high bandwidth universal communications converter for operational test and evaluation. Develop a portable system of wireless infrared illuminators with motion sensors to enhance site security for tactical forces. Finalize the design, and deliver a prototype standoff vehicle stopping system for initial operational test and evaluation. Finalize the design, and deliver high intensity tactical infrared headlights for military vehicles for operational test and evaluation. Finalize the design, and deliver next generation enhanced tactical rope-ascending device for operational test and evaluation. Deliver a low profile MBITR amplifier and antenna for operational testing and evaluation. Deliver a projectile launched 40 mm listening system for operational test and evaluation. Deliver next generation FLVU for local law enforcement agency operational tests and assessment. Develop a modular combat aiming system that provides a vertical continuously rectified target image in a near-

eye projection for use in close quarter battle operations.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
TRAINING TECHNOLOGY DEVELOPMENT	7.994	4.048	4.311

FY 2007 Accomplishments: Developed an Advanced Distributed Learning (ADL) authoring tool to enable integration of 3-D models with online training. Developed the next generation ADL registry for combating terrorism related content and assets. Produced a distributed language learning system that provides accurate translations for common operational phrases.

Analyzed, designed, and developed a program of training technologies focused on addressing port security. Designed and developed advanced distributed learning solutions to distribute focused training modules and innovative technological applications to counteract the effects of terrorist-employed CBRNE devices. Developed Training Support Packages (TSPs) on IED awareness for first responders, merchant vessel inspection, and on protecting the intermodal supply chain. Developed best practice guides on preparation for the suicide bomber, potential threats to bridges and on the retrieval of video evidence from digital closed circuit television (CCTV) systems.

FY 2008 Plans: Improve the knowledge, skills, and abilities of bomb squads through improved curriculum, practical exercises, and quarterly training. Enhance the creation of adaptable, agent-based, adversarial models in simulations that model human behavior and social interactions. Develop adaptive, artificial intelligent (AI) crowd models to train warfighters in handling crowd-related scenarios (e.g. riot control, disaster management, emergency evacuation, rescue operations, urbanized conflicts, etc.), formulate strategies, answer "what-if" scenarios, and evaluate contingency plans. Develop a program of instruction for next generation canine capability.

Implement a robust operations security (OPSEC) training program to develop an understanding of the OPSEC threat environment and of OPSEC techniques and practices. Design, develop, implement, and evaluate a model for an immersive cultural learning environment that provides warfighters, linguists, analysts, and language students with robust cultural awareness information and training.

FY 2009 Plans: Develop a virtual-live fire simulation housed in a container that can duplicate the conditions of a long, known distance (KD) range complex and an urban environment. Design and develop a data standard to identify, extract, and configure S1000D technical data modules and Shareable Content Object Reference Model (SCORM) enabled sharable content objects from a common source database (CSDB) for use as content on mobile job aids. Conduct an analysis of irregular warfare (IW) operations and activities within the educational domain in order to support an increased interagency and international capability.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
VIP PROTECTION	5.890	4.564	6.856

FY 2007 Accomplishments: Finalized prototype indirect laser detection system for early warning of laser targeting activity. Fielded the prototype vehicle tamper alerting system for evaluation. Integrated the VIP security kit components, conducted final testing, and deployed completed prototype systems. Characterized the ballistic performance of selected threats ammunition for inclusion in a previously developed projectile database. Developed modeling capabilities and performed testing to assess blunt trauma to the head and torso for selected ballistic helmets and body armor. Developed an IED blast/fragmentation test protocol to determine the effects on VIPs and protective detail armored vehicles. Constructed a field-installable inconspicuous vehicle armor system for a range of common civilian vehicles. Conducted state-of-the-art armor research for vehicle and body armors currently available to the Government. Compared commercially available wireless surveillance earpieces and assessed suitability for protective details.

Developed enhancements for the deployable armor system, verified ballistic and blast protection against multiple threats, and deployed additional prototype units for operational evaluation.

FY 2008 Plans: Deploy the updated projectile database with frangible and new threat ammunition information. Integrate an IED blast/fragmentation test protocol with the standards used by

purchasers of armored vehicles. Design and evaluate improved inconspicuous body armor for operations where the detection of body armor presents an increased danger to the wearer. Deploy field-installable inconspicuous vehicle armor kits for operational evaluation. Package and release a database of state-of-the-art armor research for vehicle and body armors currently available to the Government. Develop a ruggedized version of the VIP security kit for indoor/outdoor surveillance. Miniaturize a mobile video processing system and integrate with various camera systems to enhance situational awareness and incident response capabilities. Develop a portable pre-launch Man-Portable Air Defense System (MANPADS) threat detection capability.

FY 2009 Plans: Deploy the ruggedized VIP security kit for operational evaluation. Test and evaluate integrated cameras and miniature video processing system in multiple operational scenarios. Develop and launch a protective services portal system to standardize operation plans and enhance interoperability between agencies. Deploy a portable pre-launch MANPADS threat detection capability for operational evaluation. Develop advanced methodologies and analytical tools to support threat assessment and protective intelligence activities.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
PROGRAM MANAGEMENT	9.283	10.589	7.617

FY 2007 Accomplishments: Provided program management oversight and technical support for CTTS R&D projects. Augmented the CTTS program office with contract, financial, and security management personnel. Managed an additional $62 million in funds from other agencies. Managed international cooperative R&D programs including the United Kingdom, Canada, Israel, Australia, and Singapore. Established goals, objectives, and plans to reinforce interagency participation for the identification and prioritization of CTTS mission area requirements. Solicited proposals via BAA for new projects and tasks based on prioritized requirements. Directed the program, planning, and execution of projects and associated contracts, including the daily management and reporting for more than 525 separate contracts and tasks. Developed and implemented improvements for the BAA Information Delivery System (BIDS) solicitation process including enhanced outreach via training to potential submitters on BIDS use. Developed and implemented process improvement initiatives for the Business Information System processes.

FY 2008 Plans: Provide program management oversight and technical support for CTTS R&D projects including funds from other agencies and management of international cooperative R&D programs. Establish goals, objectives, and immediate revisions to plans that will reinforce interagency participation for the identification and prioritization of CTTS mission area requirements. Direct the program, planning, and execution for projects and associated contracts using direct and indirect budget allocations. Review and revise existing process and execution plans for CTTS mission area management and reporting responsibilities.

FY 2009 Plans: Provide program management oversight and technical support for CTTS R&D projects including funds from other agencies and management of international cooperative R&D programs. Establish goals, objectives, and immediate revisions to plans that will reinforce interagency participation for the identification and prioritization of CTTS mission area requirements. Direct the program, planning, and execution for projects and associated contracts using direct and indirect budget allocations. Review and revise existing process and execution plans for CTTS mission area management and reporting responsibilities.

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 (R2 Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE
RDTE, Defense Wide BA 03	**0603225D8Z - Joint DOD/DOE Munitions**

COST ($ in Millions)	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P225 Joint DOD/DOE Munitions	22.449	23.284	23.727	23.701	23.823	24.141	24.481

A. Mission Description and Budget Item Justification: (U) The mission of the Joint DoD/Department of Energy (DOE) Munitions Technology Development Program (JMP) is to develop advanced technologies needed to meet warfighting needs and bring about major improvements in non-nuclear munitions. A Memorandum of Understanding (MOU) between DoD and DOE provides the basis for the long-term commitment to this effort. Under the auspices of the JMP, the fusion of DOE technologies with Joint Services needs has provided major advances in warfighting capabilities for many years and continues to play a crucial role in the exploration, development, and transition of new technologies needed by the Services. The JMP is aligned with Department strategic plans such as the 2006 Quadrennial Defense Review (QDR) and is developing needed munitions capabilities and modeling tools for urban combat and counter-terrorism efforts. The JMP provides a proven and successful mechanism for the collaboration of DoD and DOE scientists and engineers so they can develop technologies of interest to both Departments, within a structured framework of technical reviews and scheduled milestones. The JMP has strong support from the Services through the leadership by DoD lab managers and technical experts of JMP technical activities and in collaborations on the transition of new capabilities to industry. This interdepartmental cooperation makes use of the substantial historic investment in scientific resources by the DOE, and the budgeted JMP funds represented in this justification are supplemented by matching DOE funds.

(U) A summary of recent JMP accomplishments and transitions is provided below; detailed technical plans, reports, and presentations are also available. Endorsements from DoD labs indicate a strong history of JMP accomplishments and significant Return On Investment (ROI). The Army's Picatinny Arsenal has stated that modeling and simulation (M&S) tools developed by the JMP are now routinely used to design all new warheads, and the use of these tools has reduced the number of validation tests required for each new warhead from about 5 to 1, resulting in substantial savings. The Army also estimated about a one-year reduction in design time for two warheads (Medium Range Munitions and Joint Common Missile), and cost savings of more than $3M. Compared to recent JMP investments in these M&S tools, an ROI of about 3 can be estimated for these warheads alone, and the tools continue to be used.

(U) Over the last several years, there has been increased emphasis on developing technologies of value to counter-terrorism efforts and Military Operations in Urban Terrain (MOUT). Initial successes have already emerged from this JMP focus, with some products already in the field. A new and rapidly emerging JMP technology which employs Multiphase Blast Explosives (MBX) will enable the use of precision lethality munitions in urban settings with minimal collateral damage. Based on modeling and technologies developed by the JMP, preliminary tests of MBX integrated in a composite case successfully destroyed Rocket Propelled Grenades (RPGs) in-flight with minimum collateral damage. In a related activity, the Air Force and the Navy are pursuing a Joint Capability demonstration Program (JCTD) to incorporate MBX technology into the Small Diameter Bomb.

(U) Other JMP transitions include four special-purpose shaped charge munition designs which are now deployed by the Special Operations Command (SOCOM) for Weapons of Mass Destruction (WMD)-defeat in Global War on Terror (GWOT) applications. Also, the Army's Multi-Role Armament & Ammunition System (MRAAS) compact multi-purpose shaped charge warhead was developed by the JMP and exceeds the performance of the Javelin warhead while being 24% smaller in diameter and 41% shorter in length. In addition, modeling and metallurgical technology for rhenium materials needed for the Standard Missle-3 (SM-3) Solid Divert and Attitude Control System (SDACS) was transitioned to the Naval Surface Warfare Center (NSWC)-Dahlgren to resolve a critical system problem. Cheetah, an advanced themochemical predictive code, developed with JMP funds, reached a milestone with the recent release of version four. This code is used by over 300 DoD and DOE scientific and engineering staff to study and select energetic materials for modern munitions. Further, all new fuze designs being developed by DoD and DOE utilize technologies such as highly compact capacitors, transformers, and

sensors developed by the JMP. In addition, state-of-the-art robotic and machine vision discrimination technologies are being successfully applied to munitions demilitarization programs and are being prototyped on several systems. Finally, a major accomplishment was achieved with JMP support in Synthetic Aperture Radar (SAR) technology for guidance and targeting applications. A new prototype "mini-SAR" was designed and built which is both five times lighter and less expensive than the baseline, with no degradation in image quality or resolution. This mini-SAR system was successfully flight-tested in an Unmanned Aerial Vehicle (UAV) and is now being transitioned to industry.

(U) Some technologies being developed by the JMP have been transitioned to other agencies such as NASA, which is using the Laser Dynamic Range Imager to inspect critical underwing areas of the space shuttle while in-flight. This technology was developed by the JMP for munitions guidance applications, but has now been deployed by NASA on all shuttle flights. Pictures from the imager resulted in an unprecedented space walk to repair critical damaged surfaces during the recent Space Transportation System (STS)-114 flight of the Discovery. The imager is considered to be critical equipment by NASA for the safety of the shuttle, and flights are not launched unless it is operational.

(U) The integrated DoD and DOE efforts within the JMP are speeding the realization of new technologies through the advanced development process. The highly challenging technical objectives of the approximately 50 JMP projects require multi-year efforts, and sustained, long-term investments are necessary to achieve success. The JMP is a focal point for collaborative work by over 200 DoD and DOE scientists and engineers, and has been called a model of how the Departments should cooperate, both within their respective organizations (intradepartmental) and with each other (interdepartmental). The JMP also works aggressively, through the Defense Ordnance Technology Consortium (DOTC), to inform industry of the technologies and tools being developed so that they can be transitioned equitably and efficiently for use by our warfighters as quickly as possible.

(U) Projects in the JMP are organized in five munitions technology focus areas. They are: Initiation, Fuzing, and Sensors; Energetic Materials; Computational Mechanics and Material Modeling; Warhead & Penetration Technology; and Munitions Lifecycle Technologies. These focus areas are described more fully in the accompanying R2a project exhibit.

B. Program Change Summary	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2008)	22.765	23.488	23.773
Current BES/President's Budget (FY 2009)	22.449	23.284	23.727
Total Adjustments	-0.316	-0.204	-0.046
Congressional Program Reductions		-0.204	
Congressional Rescissions			
Congressional Increases			
Reprogrammings			
SBIR/STTR Transfer	-0.460		
Other	0.144		-0.046

Change Summary Explanation: In FY 2007, GWOT supplemental funding ($0.144 million) has been displayed although it is actually for PE 0305125D8Z.

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

D. Acquisition Strategy Not applicable for this item.

E. Performance Metrics: Not Applicable.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDTE, Defense Wide BA 03	**0603225D8Z - Joint DOD/DOE Munitions**	**P225**

COST ($ in Millions)	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P225 Joint DOD/DOE Munitions	22.449	23.284	23.727	23.701	23.823	24.141	24.481

A. Mission Description and Budget Item Justification: (U) The Joint DoD/DOE Munitions Technology Development Program (JMP) is a collaborative, jointly-funded effort between DoD and Department of Energy (DOE), which has the mission to develop new and innovative warhead, explosive, initiation, and lifecycle technologies, as well as enabling tools, in order to bring about major improvements in non-nuclear munitions. The JMP supports the development and exploration of advanced munitions concepts and enabling technologies which precede system engineering. Through a Memorandum of Understanding (MOU) arrangement with DOE, DoD resources are evenly matched. More importantly, this relatively small DoD contribution effectively taps the annual multi-billion dollar DOE Research, Development, Test, and Evaluation (RDT&E) investments by accessing technical experts with highly specialized skills, advanced scientific equipment, unique facilities, and computational tools not available within DoD. These efforts take advantage of the extensive and highly developed technology base resident in the DOE national laboratories relevant to achieving the JMP goals of developing capable, cost-effective, conventional munitions.

(U) The JMP is further integrated with Service efforts through participation in the Defense Technology Area Plan (DTAP) for conventional weapons. The JMP has also been reviewed under the DoD's Technology Area Review and Assessment (TARA) process. After reviewing the JMP, a recent Weapons TARA panel assessed the JMP as follows: broad range of products transitioned to DoD as a result of JMP efforts; effectively leverages DOE expertise and funding; critical computational tools provided to DoD; well integrated into Service efforts; Technology Coordinating Groups (TCGs) provide an effective forum for technical collaborations.

(U) The JMP currently supports about 50 projects which can be summarized in five technical focus areas: Initiation, Fuzing, and Sensors; Energetic Materials; Computational Mechanics and Material Modeling; Warhead and Penetration Technology; and Munitions Lifecycle Technologies. The JMP is administered and monitored by the Office of the Secretary of Defense (OSD), and reviewed annually by the Technical Advisory Committee (TAC) composed of over 25 senior executives from the Army, Navy, Air Force, Special Operations Command, the Defense Threat Reduction Agency (DTRA), OSD, and DOE. Projects are organized in ten Technology Coordinating Groups (TCGs) in order to bring together the disciplines necessary to properly evaluate technical content and progress. DoD Service laboratory technical experts lead each of the Technology Coordinating Groups to ensure that the technologies under development address high priority DoD needs; they also coordinate the semi-annual technical peer-review process.

(U) Please see the corresponding R2 exhibit for additional JMP background information and accomplishments. More details about each of the technical focus areas are described below in the Accomplishments/Planned Program sections.

B. Accomplishments/Planned Program:

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Joint DOD/DOE Munitions / Initiators, Fuzes, and Sensors	4.368	4.443	4.138

Initiators, fuzes, and sensors are critical components in every munition system. These components must work together to ensure personnel safety by preventing unintended weapon detonation, allow

arming of a firing mechanism, detect the target through the use of sensors, and initiate detonation when required. With the increasing need for robust, hard-target-defeat capability, advanced fuze systems must be able to survive and function in increasingly higher-velocity and higher-G penetration environments. Methods for these sub-systems to survive high-G environments include the miniaturization, integration, and/or robust packaging of conventional fuze components such as detonators, switches, transformers, capacitors, sensors, and advanced batteries. In support of this technology area, the Joint DoD/DOE Munitions Program (JMP) continues to demonstrate advances in miniaturizing high-voltage Electronic Safe and Arm Devices (ESAD), through research and development of low-energy detonator/booster combinations, and with miniature Capacitive Discharge Units (CDUs). This focus builds on recent advances in micro-detonic/energetic materials research and MicroElectroMechanical Systems (MEMS) device development. Efforts in this portion of the JMP generally advance fuze technology and ultimately provide the DoD and DOE with next generation fuzing components for all weapons, particularly hard-target-defeat munitions (penetrators), and small, intelligent low-cost applications (artillery). Advanced initiation technology is an enabler for the next generation of warheads that can be aimed, are target adaptable, and extremely robust.

FY 2007 Accomplishments: Include advancement of inexpensive ink jet printing techniques to deposit energetic materials onto Micro-Electro-Mechanical System (MEMS) devices. Further, the first set of DoD detonators were fired utilizing High Speed Laser Schlieren Movie diagnostics. This new diagnostic allows extremely short exposure times (5 ns) and complete blockage of the explosive self-light to allow observation even during explosive breakout. In the field of multipoint initiation, advances were made to the FireMod initiation simulation code through inclusion of a physics-based resistivity model. The Miniature-Synthetic Aperture Radar (MiniSAR) technology was developed with reduced size and cost (both by a factor of 5), and a prototype was successfully tested. MiniSAR is being transitioned to the commercial sector. This technology transfer will provide the DoD an extremely robust, all-weather surveillance capability for small UAVs at an affordable price. Finally, the Laser Dynamic Range Imager was successfully transitioned to NASA for use on Space Shuttle flights.

FY 2008/2009 Plans: In this focus area include the further exploration of the effects of firing slappers at the low inductances associated with miniature firing systems, and this slapper and firing systems technology will feed into an integrated fireset demonstration. A "hard-science" question associated with miniature munitions is the transfer of detonation from a miniature detonator into the main charge explosive. This could dramatically affect the performance of a small munition. We will continue to study microdetonics, which refers to detonation initiation, acceleration (buildup), and curvature effects in small explosive systems. We plan to conduct numerous small-scale tests to determine the performance of insensitive high explosives of interest. The other portion of the microdetonics effort is to develop the diagnostics for characterizing detonator/booster explosive behaviors and a design code that will make effective use of the microdetonics data for miniature munitions design. We have multiple tasks associated with a sophisticated experiment to explore initiation sources. We will produce capacitors using the cluster tool (developed perviously by the JMP) baseline processes with enhancements for evaluation in weapons applications. For the mini-SAR development project, existing circuits will be migrated/converted to single Complementary Metal-Oxide Semiconductor (CMOS) Applicattion-Specific Integrated Circuits (ASIC). In addition, 10- and 20-W solid state power amplifiers using gallium nitride (GaN) monolithic integrated circuits will be designed and developed. Finally, the project focused on developing innovative technologies for advanced thermal batteries will proceed to full electrochemical cell fabrication and testing. Over the next five years, this portion of the JMP will work toward demonstrating emerging technologies that support robust, intelligent fuzing that can survive and function in environments exceeding 30,000 G's.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Joint DOD/DOE Munitions / Energetic Materials	5.533	5.703	5.823

The energetic materials (EM) focus area is aimed at developing the next-generation of EMs that have increased energy density over those in the current inventory, while attempting to provide enhanced insensitivity to extreme environments. There is a need to develop EMs that, when integrated into munitions, offer advantages of enhanced lethality against a variety of targets. Lighter and/or less bulky munitions significantly reduce the logistics burden of military actions and are also highly desirable. Similarly, a decrease in hazard classification brought about by the use of insensitive energetic materials and better designs will greatly decrease transportation and storage costs. Smarter munitions, capable of selectable, differential output, are another advantage to military agility. Hence, there is also a need for advanced EMs that can be used in small-scale devices such as distributed fuzing systems. In addition, as the operational environments have become more severe, EMs must survive setback forces in guns and severe impact forces in hard-target penetration applications. For enhanced lethality effects, the energy in EMs must be released either in the detonation reaction zone, or early enough in the gas expansion process so that it couples to impulse loading or sustains high temperatures. Increased lethality of EMs and munitions while simultaneously reducing collateral damage is of critical importance. Enhanced lethality requires that the energy be released in an appropriate time domain to allow optimized coupling to the target.

Material ingredients that contribute to later energy release offer no enhancement in lethality. For microdevices suitable for distributed fuzing systems, the requirement on energy release is very exacting in order to sustain reaction propagation in environments with extensive shock and heating losses. Like advanced initiation, advanced energetic materials are an enabling technology for the next generation of weapon systems that will be safer, smaller, and more lethal.

FY 2007 Accomplishments: Include the observation of detonation in a deposited microenergetic film of PETN. Also, a new thermo-mechanical model was implemented in the Adagio code, and the interaction effects between RDX and decomposition products of TAGzT were identified. This may explain TAGzT's effect on RDX burning rate. Further, imaging of convective burns by proton radiography in PBX 9501 was demonstrated for the first time. An optimized procedure for preparation of TAGzT, GUzT and BTATz was transitioned to the Navy. Additional major accomplishments include the identification of a previously unknown superionic state of water. Also, a novel molecular beam mass spectrometry apparatus was successfully calibrated for inert and energetic material samples. Further, an updated version (#5) of Cheetah, a thermochemical detonation simulation code widely used in the U.S, was released to the DoD for making enhanced performance predictions for an extended set of energetic materials. Finally, samples of lead-free iron (II) and copper (II) primary complexes were delivered to DoD, industry, and NASA for characterization.

FY 2008/2009 Plans: For EM work include continued development of nanoscale, microscale, and mesoscale energetic materials with enhanced performance which are less sensitive and more cost effective enablers for defense transformation. Specific activities will include the investigation of reaction mechanisms and kinetic parameters for the thermal decomposition of selected energetic materials such as HMX and RDX. Computer codes for modeling cook-off behavior with coupled thermal/mechanical response will also be developed. Specifically, numerical methodologies to deal with the flow of energetic materials within confined volumes are being addressed, and fracture and fragmentation models are being integrated with the multi-physics code ALE-3D to allow estimation of fragment sizes and velocities. Technology will be investigated for producing nanoenergetic explosives based on the formation of fine particles from supercritical solutions. Burn rates are being measured for pristine and damaged materials based on RDX, HMX, and TNT (alone or in combination with each other and other ingredients), and the basic thermal and mechanical properties of the explosives are being measured as needed if they are not available in the literature. The development and characterization of an LLM-105 booster composition will continue.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Joint DOD/DOE Munitions / Computational Mechanics and Material Modeling	6.678	6.831	7.013

In the area of Computational Mechanics and Material Modeling, the JMP is developing the ability to accurately predict the behavior of weapons in operating environments of extreme pressure, temperature, and velocity. This capability is essential to the development of lethal, accurate, and cost effective systems. To meet the needs of the DoD and DOE communities, there is a requirement for validated models using high-performance computing hardware and software that are capable of carrying out a broad class of continuum mechanics simulations where shock waves, nonlinear dynamics, and multi-materials gas dynamics are important. In particular, this aspect of the JMP focuses on numerical and algorithmic improvements to enhance our problem-solving capabilities for munitions development, advanced energetics, and target lethality predictions with significantly improved material models that accurately represent the materials of interest in dynamic states.

Three general classes of modeling codes offer solutions to the varied requirements posed by the defense community for the shock analysis regime. Eulerian shock physics tools are effective for a large number of conventional weapons and advanced energetics-related simulations. In situations where there is significant material deformation and turbulent mixing, Eulerian formulations are the most efficient. A second class of codes addresses the large, nonlinear dynamics that can be important for weapons design and development. Such Lagrangian calculations provide design information that complements information provided by the Eulerian shock physics codes. For example, many penetration problems involve detailed structural mechanics that are not appropriate for Eulerian codes but can be addressed by Lagrangian methods. A third class of tools combines these capabilities by using Arbitrary Lagrangian-Eulerian (ALE) algorithms to solve the conservation equations appropriate for shock analysis. This class of codes performs a range of simulations such as penetration mechanics, thermal cook-off, and fragment impact, where multi-physics phenomena descriptions are required across a wide range of time scales that cannot be addressed adequately with either Eulerian or Lagrangian codes. These ALE codes and associated validated material models represent the future in modeling complex dynamics encountered in a broad spectrum of applications across the defense community. To date, the Department's utilization of these capabilities has primarily been in the Science and Technology (S&T) community. It is desirable to extend the use of modeling and simulation tools into the engineering design community, and the JMP will pursue this objective and continue to provide and enhance these advanced modeling tools.

FY 2007 Accomplishments: Include new code releases (ALE3D and CTH-PRESTO) for Alpha Tests under the DoD's High Perforamnce Computing Modernization Office (HPCMO) Multiphase Flow, Target Response (MFT) Portfolio. The development of Eulerian, Lagrangian, and ALE codes relevant to the design and evaluation of munitions continued. CTH, a workhorse shock physics code developed by the JMP, is used everywhere from desktop PC's to massively parallel High Performance Computing (HPC) centers across the community. It is the number 1 "go-to" hydrocode for the weapons community, and has been instrumental in the development of a number of DoD weapon systems. CTH continues to be improved and made available to both Departments. Development also continued on the improvement and demonstration of ALE3D, a multi-physics code. Significant progress was made on modeling system level responses, blast loading of structures, and multiphase flow. ALE3D was shown to model slow cook-off experiments with high fidelity, and is now being used to model fast (laser) cookoff experiments. Progress was made in the development of a formalism for treating anisotropic plasticity. The implementation of this formalism in ALE3D has been extended to include dynamic evolution of the yield surface and rate-dependent hardening. The importance of anisotropy to various systems is being evaluated by inserting values of anisotropies in simulations and assessing the significance of the event. The JMP also provides a conduit into the DoD for the improved materials models emerging from the DOE Advanced Simulation and Computing Program (ASC), providing high resolution, accurate predictions of materials behavior and failure relevant to the analyses of weapon systems. The transition and support for these tools and models, along with user training, were provided to the DoD community.

FY 2008/2009 Plans: Includes the continued development, extension, and application of the hydrocodes and associated materials models to warhead and explosives design and evaluation. Ongoing code and material model development will focus on greater accuracy, improved physics, and extension to mixed phase flow problems. The JMP will continue to support the transition of these tools as well as the training of, and consulting for, the DoD user community. New material models will be migrated into CTH. A new task for non-shock initiation of energetic materials has been established to support the broader evaluation of hazards. This task is well aligned with, and supports a new project on, munitions impact response analysis. SIERRA, a new simulation concept for integrating individual physics codes together into a single application is under development and promises to reduce the time needed to apply models to new physical situations. A new emphasis has been placed on improving the multi-phase flow modeling capability in CTH. Numerical methods, e.g. meshless methods, are being developed to overcome deficiencies in hydrocodes to maintain numerical stability and predict damage softening, localization, and failure. These numerical methods will then be incorporated into hydrocodes across DOE and DoD.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Joint DOD/DOE Munitions / Warhead and Penetration Technology	3.768	3.943	4.088

In the warhead and penetration technology thrust, a major activity continues to be design and development of technologies and warheads for hard-target-defeat. As hard-target weapons evolve, several technical issues need to be addressed, including penetrators, fuzing, and simulation tools, along with associated validation data. Hardened military facilities are being buried in layered earth and concrete, "cut and cover" constructions, tunneled into mountainsides, or mined into rock far beneath the earth's surface. Buried structures accounted for a significant number of targets attacked by our forces during the Gulf, Afghanistan, and Iraq wars, and much of our military planning is being devoted to defeating them. Thus, a major thrust of the JMP continues to be hard-target-defeat. As hard-target weapons evolve, several technical issues need to be addressed. Specifically, penetrators striking targets with obliquity or at high angles of attack experience violent dynamic responses that can cause their cases to fail or interfere with the functionality of fuzes. Similarly, oblique, low velocity target impacts can result in ricochet, undesirable shallow trajectories, or bouncing out of the target. In general, new delivery vehicles tend to be smaller and faster, requiring smaller penetrators that carry less payload, and must survive more stressing impacts. Developing improved penetrating weapons depends on a solid understanding of the physics of penetration as well as affordable materials and processes to execute new designs that require more strength and durability from the penetrator. Although we can predict penetration depth with acceptable confidence, there are some targets for which we have insufficient data and experience; consequently, predicting the path a penetrator will take and whether it will survive is much less certain. The JMP provides a fundamental penetration technology base that addresses many of these issues and enables our future strike weapons. Additionally, warhead concepts which greatly extend the current range of capabilities in speed and tailored target effects are being explored. With increasing emphasis and interest in defeating targets of military interest in civilian areas, and of defeating and neutralizing Weapons of Mass Destruction (WMD) facilities, the application of energy to targets must be thoroughly controlled and understood. This requirement places increased demands on warhead output and is being pursued under the JMP.

FY 2007 Accomplishments: Include obtaining and analyzing calorimetry data which indicates that fast deflagration releases less than 10% of the detonation energy. Also, the shaped charge erosive initiator (SCEI) technology collaboration with ARDEC has resulted in successful demonstration against improvised explosive device (IED) surrogates. The technology was scaled up to a 66mm diameter and demonstrated to safely burn-out explosives and neutralize IEDs without explosive detonation. New multiphase blast liner materials used with fiber composite cases were shown to

provide desirable enhanced blast properties. Tailorable fragmentation technology studies are making progress, with down-selection of relevant microstructures based on practical processing criteria, and quasi-static tensile strength, fracture toughness and high-rate Hopkinson experiments being completed during FY07. The first direct numerical simulation (DNS), multi-field modeling of reactive, metal-bearing explosives was completed.

FY 2008/2009 Plans: Include continued low collateral damage weapon verification and validation testing in comparison with current best baseline munitions. The effort involves the advancement of the science of multi-phase blast explosives (MBX) integrated with composite case penetrators to yield discriminate lethality munitions. This work will include efforts to develop and integrate technology for a new generation of precision lethality munitions based on MBX technology. The goal is to develop the technology for future munitions with two key features: increased near field lethality (at the point of target engagement) and virtually zero, far field collateral damage (no fragmentation). Both of these features are critical for enabling discriminant lethality for military operations in urban terrain (MOUT) and close air support (CAS). The focus of the planned work is on understanding the science of MBX technology (material characterization, modeling and simulation, energetics, and target interaction effects), and integrating it with composite case technology for application to MBX munitions. This includes the ability to model and design warheads and munitions fracture, failure, and post-fracture behavior including fragmentation. High rate continuum modeling technology will be investigated, developed, and demonstrated to provide the capability to predict and therefore control fracture and post-fracture behavior. Studies will continue toward providing a fundamental understanding of the penetration process by conducting carefully designed experiments and analyses. Well-controlled, subscale penetration and perforation experiments are planned with clearly defined experimental variables. Penetrators will be instrumented with on-board accelerometers and data recorders to acquire high quality deceleration data for penetrator response. Data from these experiments not only provide a crucial database on the physical phenomena of the penetration process, but also provide researchers with valuable penetration data to benchmark codes and models.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Joint DOD/DOE Munitions / Munitions Lifecycle Technologies	2.102	2.364	2.665

Munitions lifecycle technologies, including stockpile aging, surveillance, demilitarization, and disposal, are developed under the auspices of the JMP. The Department has a large and growing inventory of conventional munitions in its demilitarization stockpile. Currently, the stockpile includes more than 400,000 tons and is expanding by about 70,000-100,000 tons per year. As the long-term focus for demilitarization and disposal within the DoD turns from open-burn (OB) and open-detonation (OD) to resource recycle and recovery, alternative technologies are required to turn waste materials into useful products. The technologies developed in this portion of the JMP enhance DoD capabilities to field safe, cost-effective processes for disposal, resource recovery, and reutilization of munitions and munitions components. For an aged weapon stockpile that has not reached end of useful life, reliability and surety may change with time because of age-related degradation of constituent materials. Existing stockpile assessment methods typically focus on addressing materials aging and reliability problems after they occur, rather than on anticipating and avoiding future problems or failure mechanisms. The predictive materials aging and reliability portion of the JMP is focused on improving our ability to understand, measure, predict, and mitigate safety and reliability problems caused by materials aging and possible degradation in weapons systems. Together with complementary demilitarization technologies, this focus provides a base of scientific knowledge and understanding that enhances the Department's ability to efficiently support the late phases of weapon lifecycle.

FY 2007 Accomplishments: Include the development of robotic technologies for disassembly of munitions which made significant progress using machine vision improvements. Two robotic demilitarization processes are being transitioned: one for Area Denial Artillery Munitions (ADAM) and Multiple Launch Rocket Systems (MLRS) grenades. Testing was completed and data complied for the elastic, plastic, and creep properties of lead-free solder, and a Unified Creep Plasticity (UCP) constitutive equation was derived to describe fatigue of soldered connections in defense electronics. Also, a detailed characterization of the MEMSCAP (company's name) Silicon on-Insulator (SOI) fabrication process was completed. Another accomplishment was development of a method to accurately and rapidly measure hydrolysis rates in ultra-thin silane films. Additional accomplishments include the completion of the comparison of the 2nd year of Long Term Dormant Storage (LTDS) data to models of critical electronic components, and electrical mounting of 18,000 LTDS electronic parts in text fixtures was accomplished. Further, the incorporation of methodology for adding alternate measures for aging data into the system models for RAM (Reliability, Assessment, and Maintainability) was implemented. Also completed was the first case-study to test a prototype of the methodology for weapons system, reliability assessment, resource allocation, as was the GROMIT software reliability assessment custom software package.

FY 2008/2009 Plans: For this thrust area include continued studies on predictive material aging of solders, including the investigation of tin wiskers, electronics corrosion, and aging of propellants and adhesives. Further development of the Bayesian approach to system reliability assessment will be conducted. The development of robotic disposal of munitions will be continued, and new

automation technologies for removing and safing sub-munitions that are automatically armed on exit from a projectile will be developed. Chemical kinetic models for combustion of TNT and RDX will be added to the extensive chemical database already existing for combustion processes. A project to develop a network of sensors for monitoring and quantifying the gaseous and particulate metallic species of environmental concern in OB/OD plumes will continue with field tests.

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 (R2 Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE
RDTE, Defense Wide BA 03	**0603618D8Z - Joint Electronic Advanced Technology**

COST ($ in Millions)	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P619 Joint Electronic Advanced Technology	10.692	12.311	9.320	9.529	9.851	9.982	10.122

A. Mission Description and Budget Item Justification: In the Global War on Terror, the United States (U.S.) must be ready to meet the widespread and growing threat of Man Portable Air Defense Systems (ManPADS) and sophisticated devices improvised from commercially available electronic sensors, computer modules, navigation and control components coupled with widely proliferated, man-portable explosives, mortars, rockets and small aircraft. Such devices provide terrorists and foreign military units the novel means to rapidly construct a wide range of weapons capable of disruptive actions against civilian and military forces alike. The U.S. must be ready to counter such weapons on short notice.

The asymmetric nature of such devices is already well understood by terrorists. Improvised explosive devices are in widespread use. ManPADS and mortars have been used to attack both air and ground forces, and pose a threat to any region due to their portability. Unmanned Aerial Vehicles (UAVs) capable of short range operations involving chemical, biological or explosive payloads can be found routinely available through commercial purchase and are easily adaptable to conduct precision attacks for terror purposes using commercial radio control systems. Global Positioning System civil navigation and autopilot devices capable of precisely controlling UAVs can be held in the palm of ones hand. Digital processors, analog-to-digital converters and digital optical sensors give terrorists the means to deploy unexpected threats on short notice. Because conventional kinetic defenses against these devices can be impractical in urban settings and because the speed of appearance of such devices can be short, such threats are disruptive and asymmetric in comparison with the typically long and costly development cycles associated with U.S. military defensive systems. Together these asymmetries highlight the need to rapidly evolve alternative Electronic Warfare, Information Operations and Counter Terrorism capabilities suitable for neutralizing such threats.

B. Program Change Summary	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2008)	10.341	9.219	9.338
Current BES/President's Budget (FY 2009)	10.692	12.311	9.320
Total Adjustments	0.351	3.092	-0.018
Congressional Program Reductions		-0.108	
Congressional Rescissions			
Congressional Increases		3.200	
Reprogrammings	-0.100		
SBIR/STTR Transfer	-0.031		
Other	0.482		-0.018

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

D. Acquisition Strategy Not applicable for this item.

E. Performance Metrics: Not Applicable.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDTE, Defense Wide BA 03	**0603618D8Z - Joint Electronic Advanced Technology**	**P619**

COST ($ in Millions)		FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P619	Joint Electronic Advanced Technology	10.692	12.311	9.320	9.529	9.851	9.982	10.122

A. Mission Description and Budget Item Justification: The widespread and growing availability of sophisticated, commercially available electronic sensors, computer modules, navigation and control components coupled with widely proliferated Man Portable Air Defense Systems (ManPADS), portable explosives, mortars, rockets and small aircraft provide terrorists and foreign military units with the novel means to rapidly construct a wide range of weapons capable of disruptive actions against military forces. In the Global War on Terror (GWOT), the United States (U.S.) must be ready to counter such weapons on short notice. The asymmetric nature of such devices is already well understood by terrorists. Improvised explosive devices are in widespread use. ManPADS and mortars have been used to attack both air and ground forces, and pose a threat to any region due to their portability. Unmanned Aerial Vehicles (UAVs) capable of short range operations involving chemical, biological or explosive payloads can be found routinely available through commercial purchase and are easily adaptable to conduct precision attacks for terror purposes using commercial radio control systems. Global Positioning System civil navigation and autopilot devices capable of precisely controlling UAVs can be held in the palm of ones hand. Digital processors, analog-to-digital converters and digital optical sensors give terrorists the means to deploy unexpected threats on short notice. Because conventional kinetic defenses against these devices can be impractical in urban settings and because the speed of appearance of such devices can be short, such threats are disruptive and asymmetric in comparison with the typically long and costly development cycles associated with U.S. military defensive systems. Together these asymmetries highlight the need to rapidly evolve alternative Electronic Warfare, Information Operations (EW/IO) and Counter Terrorism capabilities suitable for neutralizing such threats.

This program element seeks to identify low-cost, near-term solutions (outside of service programs of record) that can effectively mitigate asymmetric threats by rapidly integrating advanced commercial or military off-the-shelf technology in innovative ways. Laboratory and field testing will be used to evaluate the feasibility and military utility of resultant low cost, near term capabilities. FY 2009 efforts will investigate, integrate, test and demonstrate elements of the following technologies:

1. Ground based Counter ManPADS concepts and systems that provide area protection in the vicinity of military airports or other high value locations. A distributed ground based missile warning system will be refined, expanded and evaluated for its ability to increase probability of detection and decrease false alarms from the benchmark performance of aircraft based systems. This missile warning system will be initially integrated with aircraft based countermeasures systems. Several potentially viable ground based countermeasures concepts will be refined and tested to assess developmental risk. Subsequent efforts will assess integration of ground based missile warning/tracking systems, ManPADS countermeasures systems and other rapid means of engagement.
2. Low cost, near term technologies to allow Department of Defense aircraft to fly in medium to high ManPADS threat airspace in support of the GWOT. Emphasis is on aircraft and system approaches not covered by existing programs of record; including innovative fused-sensor missile warning, advanced decoys, and preemptive countermeasures systems.
3. Emerging commercially derived technologies; including rapid prototyping of those required to combat adaptive threats in the GWOT including, initially small UAV detection and engagement.

The objective of this effort is to assess and prototype low cost/near term EW/IO technologies that augment and/or reduce risk when inserted into service programs of record. Opportunities to provide breakthrough technologies and low cost upgrade opportunities are emphasized.

B. Accomplishments/Planned Program:

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Ground Based Counter-ManPADS:	5.517	3.685	1.300

FY 2007/2008/2009 Plans: This project integrates netted, ground-based, Infrared (IR) sensor technologies. By combining high-speed, high-resolution tracking mechanisms with either on-board decoys or on-/off-board directed-energy devices, it seeks to demonstrate the end-to-end capability to detect, track, and defeat shoulder-fired, Man Portable Air Defense Systems (ManPADS) known to be in the hands of terrorists in Iraq and elsewhere. Previously, thermal signature data was collected on a representative set of fixed-wing commercial aircraft suitable for Civil Reserve Air Fleet operations; IR sensors were evaluated for missile detection performance and suitability; ground-engagement concepts were modeled and evaluated; integration and tracking software was developed and refined; and detection and tracking performance were evaluated in more than 150 live fire events; and several ground-based directed energy engagement concepts, including the General Dynamics Counter-ManPADS Airspace Protection System (CMAPS), were jointly reviewed with other agencies/industry. The resultant products of these prior efforts have yielded a one-of-a-kind large, fixed-wing aircraft data base for shared use by Department of Defense and Department of Homeland Security that has subsequently been requested for use by United States (U.S.) allies and airline officials alike; a proven, three-element IR sensor array whose demonstrated performance in a three-pole configuration is capable of exceeding required detection and tracking parameters under constrained launch conditions for all threats tested. An initial live-fire demonstration of the unconstrained CMAPS system configuration combined with directed energy devices to defeat a live-fire missile was accomplished in FY 2007. FY 2008 efforts will complete the assessment of this system in combination with other, available ground-based ManPADS defeat devices and will document performance characteristics for consideration by force protection planners, integrated military base defense experts, and homeland defense officials. FY 2008-2009 will also test and measure this system for its ability to detect, warn and track other threats such as aircraft, cruise missiles, and Unmanned Aerial Vehicles (UAVs) whose signatures represent a difficult challenge for many conventional weapons systems.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Low Cost/Near Term Counter-ManPADS:	2.256	6.273	3.500

FY 2007/2008/2009 Plans: This project extends FY 2007 efforts to determine the feasibility of substantially improving the protection of air platforms by combining ground-based detection with airborne pyrophoric countermeasures. FY 2007 produced a proof of concept event which positively confirmed the ability of the system to defeat a ManPADS under live-fire conditions by automatically remotely triggering flares on drone aircraft. In FY 2008-2009, PE 0603618D8Z will leverage platform funding advance this ground-based sensor project to demonstrate a tactical data link on UH-1/AH-1 platforms of ManPADS detection, tracking, warning and engagement under all-aspect launch conditions and will complete the ground-based laboratory and flight demonstration of the integrated system and countermeasures called Aircraft ManPADS Protection System (AMPS).

Air platform protection can also be reducing false alarm events by combining existing active and passive sensors with advanced sensor fusion software. Current operations in the middle east have shown that missile detection and warning systems now used by U.S. and coalition forces are adversely affected by the large number of background events radiating in the ultraviolet spectrum and the average response recovery time of sensors exposed to high-intensity flares at short range. The technologies under examination use multiple spectrally independent sensors and fusion algorithms, since at least one sensor would always be free of interference, it is estimated that the fusion could reduce false alarms to near-zero levels while retaining exceptionally high threat detection rates. FY 2008 will complete the analysis of previous laboratory, anechoic chamber characterization, and live fire testing of selected components; will initiate collection and analysis urban false alarm testing of Doppler sensor system; will evaluate pyrophoric material effectiveness in a responsive scenario; will use measured data to update simulated performance objectives prior to attempting an on-aircraft integration and evaluation; FY 2008 will conclude testing to verify and validate performance and will document results for inclusion in future aircraft force protection programs. The management and sustainment of the IR signatures database and development of an IR countermeasures database will be funded from this project in FY 2008-2009.

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

Disruptive Technology Defeat:	2.919	2.353	4.520

FY 2007/2008/2009 Plans: Unconventional and disruptive technology defeat concepts. This effort recognizes the asymmetric nature of devices and tactics being developed by various nation-state and terror organizations on an adversarial footing with the United States (U.S.). In some circumstances such technologies are being adapted at rates faster than conventional defense systems can reasonably respond; in other cases, the cost of the response options are far in excess of the threat development costs, creating inefficiencies and incompatibilities in developing cost effective alternatives. This project recognizes the near-term nature of small Unmanned Aerial Vehicles (UAVs) quickly proliferating to terror organizations. Such UAVs can be used individually as terror weapons through the incorporation of small chemical, biological or explosive components, or can serve as detonation initiators in combination with larger explosive stockpiles. Because the small UAV is both inherently hard to detect and low in cost relative to conventional counter-air defense systems, it is a unique candidate for alternative, low-cost detection and defeat mechanisms. A recent United States Air Force Science Advisory Board study on UAV Detection and Defeat highlights the complexities and risks of this problem which spans traditional counter-military operations and spills over into homeland defense. Because of the lack of clear solutions to the detection and defeat problem, this project will join with exercise events planned in coordination with United States Northern Command (USNORTHCOM) and Defense Intelligence Agency (DIA). The events will document various UAV signatures, sensors and defeat mechanisms to assess the current range at which such UAVs can be reasonably detected and to determine state of the art, unconventional, near-term defeat options, including directed energy options. This project will fund targets for testing and will jointly with USNORTHCOM arrange for a variety of U.S. defense systems to be demonstrated and evaluated in the May 2008 timeframe. FY 2009 expenditures will be developed in coordination with the defense research community and DIA elements seeking ways to avoid technological surprise.

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 (R2 Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE
RDTE, Defense Wide BA 03	**0603648D8Z - Joint Capability Technology Demonstration (JCTD)**

	COST ($ in Millions)	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P648	Joint Capability Technology Demonstration (JCTD)	35.594	202.484	206.337	201.975	195.537	198.276	201.211

A. Mission Description and Budget Item Justification: In FY 2006, the Deputy Undersecretary of Defense for Advanced Systems and Concepts (DUSD(AS&C)) initiated a new business process, building on the successful ACTD program, to support the Department's transformational reform of addressing future threats from a capabilities focus versus the classical threat based viewpoint. The revised ACTD approach is called the Joint Capability Technology Demonstration (JCTD) program, and is based on proven, positive aspects of the ACTD program with new modifications. The JCTD model specifically addresses congressional concerns and recommendations made by the General Accountability Office (GAO) regarding rapid development and transitioning of Combatant Commander (CoCom) relevant capabilities to the joint warfighter in a more cost effective, timely and efficient model. Aligning closely with the thrust of with the Joint Staff's Joint Integration and Development System (JCIDS), JCTDs take a more balanced project candidate identification approach, shifting the overall program's focus to identifying specific warfighter capabilities needs up front (requirements pull), and then finding technology or concepts to address these needs, while maintaining the historical ACTD approach, where new technology is introduced to the warfighter to solve existing operational shortfalls (technology push). FY 2006 was the first year of a three to five year transition period from the current ACTD to the improved JCTD program. However, in FY08 all ACTD funding is being transferred to the JCTD program to complete this transition more quickly than originally anticipated. Beginning in FY07 all new starts will be JCTDs. This will implement a process that will more rapidly provide demonstrated solutions to joint warfighter needs, and unique transformational capabilities through the application of new operational concepts or technology from the Science and Technology (S&T) domain. The resources are aimed at carrying successful projects through the difficult transition stage ("S&T valley of death"). The remaining ongoing ACTDs that were started in previous years but not yet complete will be funded to completion in the JCTD program element and will complete in two to three years. It is anticipated that all ongoing ACTDs will be complete by FY09. In FY 2007, 10 JCTD new start projects were initiated and 20 projects were completed. To better support the rapid transition of joint, CoCom/coalition operational capabilities, the JCTD business model includes a JCTD Transition program element. While not all ACTDs and JCTDs require transition funding, these resources provide a "transition bridge" to enable sustainment for innovative, "joint-peculiar" and CoCom/coalition capabilities until traditional programming and budgeting can provide a permanent solution.

The appropriation, Program Element (PE) and Budget Activity (BA) structure for the new JCTD process includes the following:

- JCTD PE 0603648D8Z (RDT&E/DW BA-3)
- JCTD Transition Funding PE 0604648D8Z (RDT&E/DW BA-4)

In FY 2006, DUSD(AS&C) shifted an initial allocation of resources ($40 million) from the ACTD PE 0603750D8Z to populate three JCTD program element (PE)s. In FY08 all remaining ACTD resources will shift into the JCTD BA 3 PE 0603648D8Z. This will initially establish a funding stream to support approximately five to ten new JCTDs each year. The BA-3 JCTD PE will replace the current ACTD BA-3 PE in FY08; The JCTD and remaining ACTD projects used the combined resources of both the JCTD and ACTD PEs in FY07. In FY08 and out any remaining ACTDs will be supported with funding from the JCTD PE until completion in the next two or three years. JCTDs are initiated in Budget Activity three (BA-3) and are pre-acquisition demonstrations, characterized by Technology Readiness Levels 4, 5 or 6. Although not fully developed for production, the new JCTD model can provide a path for transition of Science and Technology to acquisition and are low-to-moderate risk vehicles for pursuing those objectives. The Defense Wide RDT&E funding managed by DUSD(AS&C) will support demonstration of military utility and deployment of interim capability including a transition period to a program of record, providing the Combatant Commanders, Services, Agencies, and operators with adequate time to address the transition issues of supportability, maintainability and training identified by the JCTD/ACTD. As described, the JCTD Program has established a new model that enhances successful demonstrations with the addition of a transition

arm through funding in the JCTD Transition BA4 program element (PE). The JCTD transition PE provides a path for rapid fielding of successful, transformational capabilities that may require additional transition resources to "bridge" to a program of record. To ensure successful capabilities transition to the CoCom this budget requests a shift of $10 million in FY09 from the JCTD BA3 PE into the JCTD Transition BA4 PE. This shift will better balance the JCTD model and enhance the ability to fully transition the most compelling capabilities to the CoComs.

FY 2008/2009 General Program Plan: DUSD (AS&C) will maintain oversight of the JCTD program. The FY 2008 candidate review and validation process began in March 2007, with JROC validation in June of 2007. Congressional notification of the FY 2008 new start selections occurred on November 28, 2007. There are eight "new start" JCTDs and five "rolling starts" proposed. Rolling start projects represent important warfighter concerns and potential capabilities that are not fully developed for initiation. However, to remain agile, because of the compelling capability a plan to start is derived if the development for starting is completed. Four of the five rolling starts were initiated in FY 2007. These projects address issues with emerging technologies that could be significant "game changers". While these projects have been successfully vetted through the JCTD selection process, some additional proposal development must be addressed with the stakeholders (i.e., Services, Agencies, Coalition and Inter-agency partners), prior to project initiation. This year, five candidates emerged that were particularly compelling; however, due to technology or resource related issues, they are still in a developmental stage. For FY 2009, the new start selection process will be repeated beginning in March 2008. Funding available for initiating new FY 2008 JCTDs is approximately $50 million. In FY09 all JCTD funding is anticipated to be approximately $50 million will be available for JCTD new start/rolling start initiatives. Due to the accelerated pace of JCTD development over ACTDs (JCTDs demonstrate in 2 to 3 years), the turnover rate is faster, thus funding for new starts each year has increased to approximately $50 million per year. However, because of the larger per project investment and faster completion it is estimated that the number of "ongoing" projects at any time will average between 40 and 50 projects, vice 60 in the ACTD program.

B. Program Change Summary	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2008)	36.468	194.352	207.740
Current BES/President's Budget (FY 2009)	35.594	202.484	206.337
Total Adjustments	-0.874	8.132	-1.403
Congressional Program Reductions			
Congressional Rescissions	-0.108	-1.768	
Congressional Increases		9.900	
Reprogrammings			-10.000
SBIR/STTR Transfer	-0.766		
Other			8.597

In FY07 congressional increases of $1.125 million for Computer Assisted Threat Exploitation Program (CATE) enabling technology. Congressional rescissions and other taxes such as Section 8023 for FFRDC and SBIR/STTR.

FY08 congressional increases of $9.9 million include the following enabling technologies: Distributed Network Switching Joint Capability Demonstration, Hardware Encryption

Tech Program, Louisiana Command and Control Interoperational Communications and Information, Simultaneous Field Radiation Technology (SFRT), and Spartan Advanced Composite Technology. In addition there were congressional recessions for Sections 8025 (FFRDC), 8097 and 8104 totaling $1.768 million.
In FY08 and FY09 all ACTD BA3 funding (Program Element (PE) 0603750D8Z) transfers into the JCTD BA3 PE 0603648D8Z.

In FY09 $10 million of JCTD BA3 funding (PE 0603648D8Z) transfers to the JCTD Transition BA4 PE (0604648D8Z) to support project transition. Additionally PDM II added $9 million in FY09 for the Large Data JCTD and $403K was shifted within DoD to cover certain economic assumptions with inflation and fuel.

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
08	Project Selection Focus					
	Spiral Technologies					
	Time to Final Demonstration					
	Adequately Shared Funding and Visibility					
	Independent Assessment Capability					
	Successful Military Utility Assessment (MUA)					

Comment: The majority of funding from this Program Element is forwarded to the Services/Defense Agencies that execute the individual JCTD projects. DUSD(AS&C) maintains and provides overall programmatic oversight for the JCTD program, to include the individual JCTD projects. The JCTD performance metrics center on how fast relevant joint and/or transformational technologies can be demonstrated and provided to the joint warfighter. These metrics are driven by the overall business process which includes six parts: (1) selection focus; (2) ability to spin-off spiral technologies; (3) time necessary to complete a final demonstration; (4) adequately resourced projects with appropriate oversight; (5) capability to complete an independent assessment of the technology; and (6) the number of successful capabilities that are actually transitioned to the

warfighter. The table below defines the metrics of the new JCTD business process model.

1) Project Selection Focus: Capability Based: Greater CoCom influence looking at nearer term joint/coalition needs.

2) Spiral Technologies: 25% of JCTDs will provide an operationally relevant product demonstration within 24 months of Implementation Directive (ID) signature.

3) Final Demonstration Completed: 75% of JCTD projects complete final demonstration within three years of ID signature.

4) Shared Funding and Viability of resources: OSD provides significantly more funding than the former ACTD program, greater than 30% in some cases a majority of projected funding, especially in the first two years.

5) Complete independent assessment.

6) Number of capabilities transitioned to the warfighter.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDTE, Defense Wide BA 03	**0603648D8Z - Joint Capability Technology Demonstration (JCTD)**	**P648**

	COST ($ in Millions)	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
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identified by the JCTD/ACTD. As described, the JCTD Program has established a new model that enhances successful demonstrations with the addition of a transition arm through funding in the JCTD Transition BA4 program element (PE). The JCTD transition PE provides a path for rapid fielding of successful, transformational capabilities that may require additional transition resources to "bridge" to a program of record. To ensure successful capabilities transition to the CoCom this budget requests a shift of $10 million in FY09 from the JCTD BA3 PE into the JCTD Transition BA4 PE. This shift will better balance the JCTD model and enhance the ability to fully transition the most compelling capabilities to the CoComs.

FY 2008/2009 General Program Plan: DUSD (AS&C) will maintain oversight of the JCTD program. The FY 2008 candidate review and validation process began in March 2007, with JROC validation in June of 2007. Congressional notification of the FY 2008 new start selections occurred on November 28, 2007. There are eight "new start" JCTDs and five potential "rolling starts" proposed. The FY08 new start projects will commence at the end of December 2008. Rolling start projects represent important warfighter concerns and potential capabilities that are not fully developed for initiation. However, to remain agile and the potential of the compelling capability, a plan to start is derived if the development for starting the project is completed. Four of the five rolling starts were initiated in FY 2007. These projects address issues with emerging technologies that could be significant "game changers". While these projects have been successfully vetted through the JCTD selection process, some additional proposal development must be addressed with the stakeholders (i.e., Services, Agencies, Coalition and Inter-agency partners), prior to project initiation. This year, five rolling start candidates emerged that were particularly compelling; however, due to technology or resource related issues, they are still in a developmental stage. For FY 2009, the new start selection process will be repeated beginning in March 2008. It is anticipated that new start initiatives will range from 5 to 7 JCTDs. Funding available for initiating new FY 2008 JCTDs is approximately $50 million. In FY09 all JCTD funding is anticipated to be approximately $50 million will be available for JCTD new start/rolling start initiatives. Due to the accelerated pace of JCTD development over ACTDs (JCTDs demonstrate in 2 to 3 years), the turnover rate is faster, thus funding for new starts each year has increased to approximately $50 million per year.

B. Accomplishments/Planned Program:

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Counter Intelligence - Human Intelligence Architecture Modernization Program, Intelligence Operations Now (CHAMPION)	1.200	1.200	

The Joint Requirements Oversight Council (JROC) validated the capability need for CHAMPION as a FY06 new start Joint Capability Technology Demonstration. The outcome will provide improved capabilities for the counter-intelligence, human-intelligence and special forces communities of interest. These improvements will provide an accessible and actionable information system for management of the CI/HUMINT/SOF collection, mission planning and asset management information. The capabilities include technologies for integration of biometrics and geospatial information. The primary outputs to be demonstrated to the users and evaluated in the Military Utility Assessment are: 1) joint data standard for human domain; 2) CHAMPION information collection tool and associated concept of operations (CONOPS), tactics, techniques and procedures (TTPs); 3) CI-HUMINT/SOF source management tools with federated search capability and data replication/access across multiple networks; and 4) integrated language translation collection, CIHUMINT source vetting tool and data access tools for multi-intelligence discipline fusion. The efficiencies to be gained are; 1) improved effectiveness of HUMINT operations; 2) elimination of Human domain data stovepipes; 3) joint human domain data standard; 4) improved web enabled data access across multiple networks and security levels; 5) Joint CONOPs/ TTPs; 6) Biometric and geo-spatially enabled mission and asst management tools. The transition strategy is to incorporate CHAMPION capabilities into the Distributed Common Ground Station program of record (POR). The sponsoring Combatant Command (CoCom) is the U. S. Central Command (CENTCOM). Other organizations involved as participants, users of capabilities, and/or observers include USSOCOM, USJFCOM, Counter-Intelligence Field Activity, Defense Intelligence Agency, National Geospatial Agency, and the National Security Agency. The lead service is the Army.
- FY 2007 Output - Complete Spiral 1 limited assessment report and Spiral 2 assessment plan. Execute the Spiral 2 demonstration and assessment of Spiral 2 deliverables. Prepare final assessment plan. Complete approval of transition plan. Secure funding for fielding of spiral deliverables and interim capabilities found to have military utility by operational sponsor.

- FY 2008 Planned Output - Execute final military utility assessment and finalize CONOPs and TTPs. Continue efforts to field spiral deliverables and interim capabilities found to have military utility by operational sponsor. The project will complete in FY2008. In FY2009 the project will transition to Program of Record.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Comprehensive Maritime Awareness (CMA)	1.100	5.600	

The Joint Requirements Oversight Council validated the capability need for CMA as an FY06 new start. The outcome of CMA is demonstration and transition of technologies and operations concepts showing the value of information sharing and effective information management for improving global Maritime Domain Awareness. CMA will demonstrate the value of both interagency and international (Republic of Singapore) information sharing. CMA will demonstrate data management techniques such as automated anomaly detection and threat evaluation, and application of the Department of Defense Net-Centric Data Strategy. CMA is a 4-year project sponsored by U.S. Pacific Command, U.S. Northern Command, and U.S. European Command. Initial capabilities will be demonstrated and operated in CY-06, with advanced capability spirals in FY07 and FY08, and transition support in FY09. The lead Service is U.S. Navy. The primary outputs and efficiencies to be demonstrated in CMA Military Utility Assessments are (1) percent increase in the number of maritime tracks and identified tracks in U.S. military, interagency, and coalition maritime operational pictures; (2) percent increase in numbers of maritime contacts with amplifying information (such as crew list, cargo manifest, port-of-call history, etc.); (3) percent increase in numbers of vessels of interest monitored by maritime intelligence analysts; (4) number of automated anomaly detections and threat alerts provided to maritime intelligence analysts; (5) increase in number of agencies (U.S. and international) engaged in information sharing across a common service oriented architecture.

- FY 2007 Output - Operated FY 2006 spiral capability. Integrated capabilities of the U.S. Coast Guard Vessel Tracking program, and automated anomaly and threat assessment, and regional maritime analysis nodes. Planned for initial military utility assessment.
- FY 2008 Planned Output - Integrate additional interagency data sources, and automated anomaly detection and threat assessment capabilities. Demonstrate net-centric services in accordance with DoD Net-Centric Data Strategy. Complete initial military utility assessment, plan final assessment. Project completion in FY2008.
- FY 2009 Planned Transition Output - Document final military utility assessment; complete transition documentation for U.S. Navy program of record; complete accreditation of software required for transition.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Joint Modular Intermodal Distribution System (JMIDS)	2.930		

The Joint Requirements Oversight Council (JROC) validated the capability need for JMIDS as an FY06 new start. The outcome of JMIDS is to demonstrate, analyze and transition joint service, all-mode containers and platforms that are equipped with Automatic Identification Technology (AIT). JMIDS will permit efficient, seamless, and visible movement of supplies through the distribution system from CONUS-based depots and vendor locations to tactical end users. This includes movement through the Seabase to support forward operating expeditionary and task force units. JMIDS technologies will enhance the ability to source load supplies that can move from origin to destination without the current intensive and inefficient handling and re-packing caused by: 1) incompatible air and ground cargo systems; and, 2) sorting, storing, and/or reconfiguring cargo. The goal of this JCTD is to improve the agility, flexibility, efficiency, effectiveness, responsiveness, and interoperability of the Joint Distribution System.

JMIDS is a three-year project under sponsorship of US Transportation Command, with JCTD completion by the end of FY 2008, and transition to selected Program Manager(s) / Program of Record(s) [Joint Modular Intermodal Platform (JMIP) and Joint Modular Intermodal Container (JMIC)] by FY 2009. The lead service is Army. The primary outputs and efficiencies to be demonstrated in the JCTD Limited and Capstone Military Utility Assessments are: (1) Timeliness of JMIDS technologies to deliver supplies to operating forces as compared to present distribution system; (2) Capability to support transportability across different modes by reducing re-handling/ packing time; (3) Improved supply flow through the available technologies- Tonnage processed per hour, Time per load-out of platform Wait times per load-out; and, (4) Capability to support Command Level Situational Awareness-Accuracy of AIT tracking technology (contents, position), percent of JMICs tracked correctly, overall improvement of situational awareness upon use of AIT.

- FY 2007 Accomplishments - Completed acquisition of JMIC, JMIP and AIT demonstration hardware. Conducted three MUAs. Completed multiple Capability Development Documents (CDD) spirals and Integrated Logistics Support planning drafts. Commenced CDD staffing through the Services. Delivered hardware and conducted engineering tests for a Coalition Warfare Demonstration of the JMIDS hardware with the United Kingdom. JCTD completion in FY2008.

- FY 2008 Refer to JCTD BA4 R-2a

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Epidemic Outbreak Surveillance (EOS)		2.500	2.500

The Joint Requirements Oversight Council (JROC) validated the capability need for EOS as an FY05 start. The outcome of EOS is to demonstrate and transition solutions that are transformational dual use for operational and clinical medicine as well as bio-defense. EOS will incorporate as series of technologies to rapidly detect and identify a wide range of respiratory pathogens that are frequently and easily confuse in clinical encounters. It is intended to overcome two diagnostic challenges: 1) discrimination between diverse pathogens that present similar (i.e. fever & flu-like) symptoms; and 2) screening rapidly, accurately and simultaneously across multiple (20 - 30+) candidate pathogens. Clinically, a practitioner, if faced with 100 cases of flu will assume you also have the flu if you exhibit the same symptoms. EOS will ensure a correct diagnosis more quickly while running a series of pathogen tests in the background to look for biological attack. The overall goal is to develop a business case that makes the technology affordable for and integrated into the command structure for both routine and wartime scenarios. EOS will leverage sophisticated, advanced molecular biology procedures, bio-informatics, micro array and/or RT-PCR - based technologies integrating into medical command channels to provide all leadership levels key information needed to make time-critical decisions. Ultimately this situational awareness provides a high likelihood that correct diagnostic decisions will be made, potentially even prior to the onset of symptoms in some scenarios. In detect-to-warn and detect-to-treat applications, the EOS diagnostic supports sustainment of warfighter capabilities in biologically active domains by promoting earlier and targeted diagnosis, intervention, minimizing casualty losses, and reducing mission degradation. The first spiral of EOS has begun with the initiation of an avian flu (H5N1) warning network to established at 22 USAF sites worldwide. This system should be operational by the Fall, CY-2006, in time for the next flu season. DUSD/AS&C, USJFCOM (warfighter), AF/SG (technical manager), and JPEO/CBD (transition manager) are the principals for this ACTD. The ACTD will end in FY2008. Outputs and Efficiencies: Viral/Bacterial Agents per Chip Assay - 100 vice 20; Total Cycle Time per Individual Assay - 2 hours vice 8; Approximate Cost per Assay - $40 vice $500; Portability of Fully Capable System - 40 pounds vice 500; Rapid ID of Bio Agents vs. Backgrounds - 2 hours vice 1 day; Forensic Attribution of Agent Strains - days vice months; contain Outbreak and Reconstitute Forces - 2 days vice weeks.

- FY 2007 Output - Refer to the ACTD R2a.

- FY 2008 Planned Output- Transition surveillance solutions found to have utility during the final military utility assessment. Complete CONOP'S and TTP's. Conduct operational exercises with US Navy. Continue to monitor for avian flu outbreaks and institute warning as necessary. Transition residual products to active duty locations for use. Begin spiral two assessment of follow-on technologies in FY 2008 and 2009. The ACTD completes in FY 2008.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Joint Coordinated Real-time Engagement (JCRE)		1.200	1.000

The Joint Requirements Oversight Council (JROC) validated the capability need for JCRE as an FY05 start. The outcome of JCRE will be to develop the CONOPS and the GIG-enabled software that enables Joint Real-Time Operations and Engagement across multi-Combatant Command (COCOM) Theaters and Echelons. JCRE will support Joint Operations by providing Net-Centric Command and Control Tools that greatly enhance Planning and Execution across multiple COCOMS. These tools will be provided as web services, so they can easily be extended to support Combined Operations as directed by the Operational Sponsor. The JCRE capability will be achieved by extending and integrating the following technologies: Joint Force Global Situational Awareness (SA) Tools; Joint Force Engagement Packages; and Joint Force Synchronization Tools. These JCRE technology components will be implemented using a Service Oriented Architecture (SOA) with distributed service orchestration. These JCRE technologies, tested on the Global Information Grid (GIG), will help validate whether the evolving GIG IP architecture and enterprise services can support the time sensitive performance requirements for global operations. Output and Efficiencies: % of relevant data that is properly synchronized; % of global operation centers that

have Synchronization awareness; % of synchronization problems that go undetected for > 10 minutes; Average time to detect a synchronization problem; Average time to determine impact of synchronization problems on effects; time to assemble and organize global effects; workload to assemble and organize global effects; time to synchronize global actions, capabilities, and resources; workload to synchronize global actions, capabilities, and resources; number of resynchronizations / number of original synchronizations (synchronization robustness); time to create a globally synchronized operational plan. The lead service is the Navy and the lead CoComs are U.S. Strategic Command and U.S. Special Operations Commands.

- FY 2007 Output - Refer to the ACTD R2a.

- FY 2008 Planned Output - Demonstration #3 (Fall 2007). Demonstration of Joint Force Global Situational Awareness Tools, Joint Force Engagement Packages, and Joint Force Synchronization Tools in a battle staff exercise. A Joint MUA will be performed in conjunction with the final demonstration. Demonstration goals may be changed based on Operational Manager's direction.

- FY 2009 Output: Prepare JCRE capability for primary transition to Net Enabled Command Capability (NECC). The EUE Package will consist of the JCRE System Prototype (all hardware and software required to host JCRE capabilities, in full or presentation server configuration), to be installed at USSTRATCOM, USSOCOM and DISA as necessary, and finalized CONOPS and TTP documents and training packages, to be delivered to US Joint Forces Command (USJFCOM). Secondary transition targets include USSTRATCOM and USSOCOM programs of record-Integrated Strategic Planning & Analysis Network (ISPAN) and Special Operations Mission Planning Environment (SOMPE), respectively. Navy PEO C4I and Space will transition relevant capabilities as web services into GCCS-M/NECC. The ACTD completes in FY2009.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Sea Eagle		0.800	

The Joint Requirements Oversight Council (JROC) validated the capability need for Sea Eagle as an FY 2005 start. The outcome of Sea Eagle will be to demonstrate and transition technologies to provide persistent, clandestine, and unattended monitoring of maritime areas in a Special Operations Forces (SOF) deliverable "system of systems". These sensors and systems will be deliverable by SOF and networked in a multi-media (sea, air, land) system-of-systems approach. Sea Eagle will greatly increase SOF's ability to clandestinely conduct persistent, intrusive Intelligence, Surveillance, and Reconnaissance (ISR) in maritime areas. The war fighter will tactically emplace Sea Eagle systems to provide targeted, tactical information that complements national and theater intelligence assets to enable a layered intelligence collection strategy. These funds will be used to support technical down-select, systems integration, and demonstrations of sensors and communication technologies. The funds will support: 1. Johns Hopkins University Applied Physics Lab (JHU APL) and Naval Surface Warfare Center Panama City (NSWC PC) as the technical integrators for Sea Eagle; 2. Operational Manager support and demonstration costs; and 3, Procurement and integration of components for the demonstrations. Outputs and Efficiencies: The overarching output for Sea Eagle is persistence. This output incorporates a variety of initiatives such as power management, intelligent triggering, and signal discrimination to optimize system performance and persistence. Measures of persistence will be relevant for individual component, subsystem, and overall system performance. Quantitative metrics are classified. USSOCOM is the COCOM/User Sponsor; Navy is the Lead Service.

FY 2007 Accomplishments: Sea Eagle Management Plan signed and Security Classification Guide approved. Incorporated underwater communications and sensors into a clandestine, close access, mesh network. Cross environment connectivity between Land and Maritime system components was demonstrated in June 2007 proving the "concept" of the ACTD.

FY 2008 Planned Output: Sea Eagle Transition Plan signed. Draft CDD finalized and Technology Transition Agreement socialized. Incorporate underwater communications and sensors into a clandestine, close access, ad-hoc, self-healing mesh network. Demonstrate the undersea network and sensors in Q2 FY08. Conduct final Military Utility Assessment of the entire Sea Eagle network Q3 FY08. Upgrade land network protocol and integrated additional land sensors. Transition capabilities with immediate military utility. Refine CONOPS and TTPs. The ACTD will complete in FY2008.
FY 2009 Planned Transition Output: The Transition/Residual Period will be conducted and the ACTD will complete with transition to the SOCOM Global Sensor Network (GSN) POR by the end of the FY.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Agile Rapid Global Combat Support (ARGCS)		0.900	

The Joint Requirements Oversight Council (JROC) validated the capability need for ARGCS as an FY-04 start which is using advanced technologies to demonstrate a family of testers for electronic components and provide unprecedented interoperability between weapon systems, Services, and levels of maintenance. This will reduce costs and the proliferation of testers while improving the availability and performance of weapon systems. In addition, ARGCS will demonstrate technologies to facilitate net-centric diagnostics by capturing historical logistics data and developing an expert support system that will further reduce repair times and costs, as well as future sparing requirements. Outputs and efficiencies will include increases in performance, test accuracy, interoperability, reduced logistics and weapon system support costs, and reduced proliferation of automatic test systems in the future. Technologies demonstrated will reduce the time to field new tester, a reduction in the time to diagnose and repair, a reduction in proliferation of test systems, and a reduction in the logistics footprint. The ARGCS technology will be transitioned to the Services through existing automated test programs of record. The user sponsor is U.S. Pacific Command and the lead service is the Navy.

- FY 2007 Output - Refer to the ACTD R2a. The ACTD will complete MUA in FY2007.

- FY 2008 Planned Transition Output: Complete project documentation and final report. Continue to evaluate ARGCS military utility through the EUE. Support transition of ARGCS technologies to include the development and approval of a Joint Capabilities Document (JCD) that will guide the future direction of automatic test systems. JCD will focus on net-centric diagnostics and interoperability within and between Services.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Joint Unmanned SyS Common Control (JUSC-2)		0.300	

The JROC validated the capability need for JUSC2 as an FY04 new start. The desired outcome of JUSC2 is to provide a reconfigurable and scaleable common control architecture, capable of concurrently managing large numbers of unmanned systems of all types, leveraging interoperability afforded by existing joint and coalition interfaces and message sets for unmanned systems. The primary outputs and efficiencies to be demonstrated by this project include more efficient management and improved overall operational effect through: (1) the ability to concurrently manage (in some cases, control) all unmanned systems deployed with Littoral Combat Ship (LCS) mission packages; (2) demonstration of NATO STANAG 4586 (UAV Control Standard) Level 3/4 control handoff of STANAG enabled unmanned aircraft between Army and Navy control stations; and (3) demonstrate the ability to hand-off control of unmanned surface vehicles (USVs) and unmanned ground vehicles (UGVs) to other services' Joint Architecture for Unmanned Systems (JAUS)-compliant control stations. Current transition plans include: JUSC2's Unmanned Vehicle Common Control (UVCC) software product - an integral component of the Navy's Littoral Combat Ship Flight 0. JUSC2 Common Unmanned Aerial Vehicle (UAV) Interface Segment (STANAG 4586 compliant ground station) - now a transition product that the Army's UAV Project Office will insert into the One System Acquisition Program. The user sponsor is U.S. Joint Forces Command and the lead service is the Navy.
- FY 2007 Output - Refer to the ACTD R2a.
- FY 2008 Planned Output - Complete residual final MUA activities. Complete reporting efforts; provide final engineering packages, software, and evaluation results to LCS program. Complete the ACTD.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Special Operations Forces (SOF) Long Endurance Demonstrator (SLED)		5.000	

The JROC validated the capability need for SLED as an FY05 new start. The outcome of SLED is to demonstrate an unmanned vertical take off and landing vehicle (the DARPA developed A160

Hummingbird VTOL UAV) capable of flying long range (2000+NM/24+ hours) and employing a wide variety of adaptable payloads, supporting combating terrorism (CT), counter proliferation (CP), special reconnaissance (SR), direct action (DA), psychological operations (PSYOP), and other mission areas. Efficiencies and outputs will be evaluate the A160 for its capability to perform designated functions. Platform performance must be compatible with payload and mission requirements in terms of altitude, endurance, range, weight (platform and payload), and payload power. The payloads must meet mission requirements and be compatible with A-160 capabilities and constraints. Planned Transition is to integrate with USSOCOM components.
U.S. Special Operations Command is the user sponsor and lead agency.
- FY 2007 Output - Refer to the ACTD R2a.
- FY 2008 Planned Output - Complete final MUA activities and reports. Update CONOPs. Perform Extended User Evaluation. Complete the ACTD.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Small UAV (SUAV)		3.700	1.700

The JROC approved the capability need for SUAS as an FY06 new start. The outcome of SUAS is to address Joint operational concerns noted during on-going operations through the integration of new technology across the entire class of Small UAVs. The outputs and efficiencies to be demonstrated are: technology insertions to provided measurably improved performance/logistical support in the following areas: Command, Control and Communications (C3); Payload Integration; Targeting; Platform Related Issues (power, propulsion, etc.); improved operator training though the use of integrated training programs with emphasis on simulation; improved and more efficient Tactics, Techniques, and Procedures (TTP) across the Services for small unit real-time reconnaissance and surveillance capabilities. New operational capabilities will be evaluated and no less than once per year. Transition strategy: FY2009/2010 is the transition period. The capabilities will be integrated into USSOCOM systems, and available for integration into all SUAS customers assets (spiraled out of the ACTD into the field as they become available). The User Sponsor and Lead agency is U.S. Special Operations Command (USSOCOM).
- FY 2007 Outcome - Refer to the ACTD R2a.
- FY 2008 Planned Outcome - Continue technology definition and cut in (spiral fielding). Continue TTP development and refinement. Continue CONOP refinement. Perform one limited assessment, one Interim Military Utility Assessment to support fielding of capabilities. Perform the final (culminating) assessment, capturing overall improvement to operational capabilities.
- FY 2009 Planned Output - MUA reporting, Extended Use (EU) and transition support of fielded technology and training packages will begin. The ACTD will complete in FY2009.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Counter Bomb/Counter Bomber (CB2)		0.500	

The Joint Requirements Oversight Council (JROC) validated the capability need for CB2 as a FY03 new start. The outcome is to provide improved capabilities for military installations against the threat posed by terrorist delivered bombs and improvised explosive devices (IEDs). The capabilities include technologies for detection, identification, mitigation, and command/ control/ communications (C3); along with tactics, techniques, and procedures, and concepts for operations. The sponsoring Combatant Commands (CoComs) are USSOUTHCOM and USEUCOM. Other organizations involved as participants, users of capabilities, and/or observers include USCENTCOM, Department of Homeland Security, and US Coast Guard. The lead service is the U. S. Navy. The primary outputs to be demonstrated to the users and evaluated in the Military Utility Assessment (MUA) are 1) ability to perform surveillance on the movements of people and vehicles near the installation as possible precursor to the threat, 2) detection and identification of the threat device prior to blast, 3) mitigation of the bomb, and 4) C3 to tie together the people, systems, and data critical to the accomplishment of the mission. The efficiencies to be gained are 1) the ability to perform an important and increasingly critical mission that had little priority until a few years ago, 2) the ability to perform that mission at little or no increase in manpower to military force protection organizations, 3) the ability to reduce the vulnerability and casualties of the force protection personnel while performing this dangerous mission. The transition strategy is to roll CB2 capabilities into existing programs of record (POR) and acquisition program elements of Service force protection projects, and also to utilize the J34 sponsored Combating Terrorism Readiness Initiative fund. User data packages for each of the systems will be developed, along with a users' guide on how to select and introduce new technology for force protection. Four critical products from this ACTD have already been deployed to Iraq: 1) van-mounted backscatter x-ray for vehicle inspection, 2) vehicle under carriage video inspection systems, 3) infra-red imaging system, and 4) off-leash trained canines for explosives detection. Transition plans will include program of records for Anti Terrorism/Force Protection acquisition agencies in each of the 3 services, GSA, and the J34 Combating Terrorism Readiness Initiative Fund. Due to initiation of a newer JCTD called Joint Force

Protection Advanced Security System (JFPASS) and efforts of Joint Improved Explosive Device Organization (JIEDDO), the CB2 ACTD will complete one year early in FY08 vice FY09.
- FY 2007 Outcome - Refer to the ACTD R2a.
- FY 2008 Planned Outcome - Continue with EUE and transition activities for all Spirals and publish CB2 ACTD results. Early completion date is in FY 2008.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
FLM Small Diameter Bomb	4.000	6.200	1.300

The Joint Requirements Oversight Council (JROC) validated the capability need for FLM as a new start in FY06. The outcome of FLM is to provide Combat Air Force aircraft the ability to prosecute high-value targets in a collateral damage sensitive environment. FLM integrates a carbon fiber warhead case and the multi-phase blast explosive (MBX) onto the existing Small Diameter Bomb (SDB) I airframe. The FLM is not intended to replace SDBI but to complement it. FLM's sub-four meter accuracy will result in pin-point focused lethality with minimal collateral damage concerns. FLM is a four-year project under sponsorship of United States Central Command (USCENTCOM), with completion of development and demonstration by the mid-CY 2008, and fielding of approximately fifty (50) residual FLMs with continued contractor sustainability provided through mid-CY 2010. The primary outputs and efficiencies to be demonstrated in the JCTD Military Utility Assessment are (1) successful integration of the carbon fiber warhead and MBX onto the existing SDB I airframe with a fully functioning weapon and kill mechanism, (2) safe carriage and separation from F-15E, (3) to demonstrate FLM's sub-four meter accuracy, (4) the elimination of fragmentation as kill mechanisms in the FLM weapon integration design,(5) a full and complete characterization of FLM's capability against defined target set for USCENTCOM. The planned transition strategy is: upon Military Utility demonstration, enter into formal acquisition process at Milestone C for Low Rate Initial Production (LRIP) buys; Extended User Evaluation (EUE) of residuals by USCENTCOM; follow-on system development and demonstration, production, and fielding through service Program Executive Office/Program Managers (PEOs/PMs); submit funding for LRIP in FY09 with the targeted Program of Record: Small Diameter Bomb Program. The User Sponsor is USCENTCOM and the Lead Service/Agency is the U.S. Air Force.
- FY 2007 Output - Completed integration of technologies onto FLM. Complete telemetry, structural, modal, and autopilot testing and design. Completed static live fire tests to demonstrate low collateral damage kill capability of FLM.
- FY 2008 Planned Output - Final operational demonstration of FLM. Deliver approximately 50 residual FLMs to CENTCOM. Initiate 2-years of operational logistical field support. Begin FLM insensitive munition and hazard classification certification. Initiate preparation for formal acquisition program transition. Transition manager is 918th Armament Systems Group.
- FY 2009 Planned Output - Continue FLM residual weapon fielding support. Complete FLM insensitive munition and hazard classification certification. FLM JCTD scheduled completion is second quarter CY 2010.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Night Vision Cave/Urban Assault (NVCUA)		0.600	

The Joint Requirements Oversight Council (JROC) validated the capability need for NVCUA as an FY03 new start. The outcome of NVCUA is to demonstrate a suite of lightweight, soldier-borne sensor technologies, together with new Concepts of Operation (CONOPs) and Tactics, Techniques and Procedures (TTPs), to enable decisive overmatch for dismounted assault in subterranean and urban environments. Five-year project under sponsorship of U.S. Special Operations Command (USSOCOM), with completion of development and final demonstration in FY05, and final completion date in FY08. The lead service is U.S. Army. The primary outputs and efficiencies to be demonstrated in the Night Vision ACTD Military Utility Assessment are: 1) Increased capability for Special Operations Forces (SOF) to identify detected targets during Special Reconnaissance (SR) missions; 2) Increased capability for SOF during Direct Action (DA) missions; 3) Enhanced SOF capabilities to move and identify targets in low/no-light environments; 4) Enhanced SOF capabilities to move and identify targets in urban/restrictive terrain. Current Efficiency Goals: SWIR Standoff Identification Range - 2k = IR Detection Range; UCIR Detection Range (Cave Assault) 150m, 200m, 250m; UCIR Detection Range (Urban UGS) - 15m, 25m; Pd (Approach Sensors) -- 90% - 95%; STTW Detection Range -- 10m, 20m. Transition status: Long Range Identification (LRID) system was successfully demonstrated and is currently undergoing an Extended User Evaluation in Iraq for consideration for transition to Army Programs of Record (POR). Additionally, the NVCUA ACTD developed and demonstrated a Fast Obscurant Grenade (FOG) which Transitioned to the U.S. Army Joint Program Manager NBC Program Of Record and recently was approved for Milestone C procurement status. In addition, efforts are underway to provide selected

items (e.g., Combat Periscope, ENV Goggles) for operational use on a rapid-equipping basis.
- FY 2007 Output - Refer to the ACTD R2a.
- FY 2008 Planned Output - Complete interim capability/residual support. Complete transition to designated Programs of Record. Complete the ACTD.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Extended Space Sensors Arch (ESSA)		1.600	1.700

The Joint Requirements Oversight Council (JROC) validated the capability need for ESSA as a FY06 new start. The ESSA ACTD is creating a joint, distributed, net-centric space surveillance framework. The expected outcome of the ESSA ACTD is a flexible, responsive and scalable command and control family of systems which enhance United States Strategic Command's (USSTRATCOM) Space Situational Awareness (SSA) capability. ESSA is a three-year ACTD sponsored by USSTRATCOM and Commander Joint Forces Component Command Space (CDR JFCC SPACE). The ESSA Operational Utility Assessment (OUA) is planned for mid FY 2009, and the capability will transition to Programs of Record (PORs) by the end of FY 2009. The lead service is the U.S. Air Force. The ESSA ACTD will develop and demonstrate a net-centric sensor architecture which provides more timely SSA information via the Secret Internet Protocol Router Network (SIPRNET) to decision makers. ESSA efficiencies will include: increased timeliness for delivering data products from sensor to command and control (C2) node; ability of netted sensors to perform more efficient strategies for searching, tracking, identifying and monitoring space object population; ability of C2 node to observe sensor operations in real-time and make rapid decisions in response to space events; and the ability of an architecture to support both theater and strategic users. While this ACTD does not answer all of the SSA gaps and shortfalls identified in USSTRATCOM's Space Control Joint Capability Document (JCD), it does address the number one priority identified in the JCD of synergistically exploiting all available SSA data.
- FY 2007 Output - The focus in FY07 was on the first of three demonstrations and supporting programmatic milestones. The management team wrote, coordinated, and signed the ESSA Management Plan. The transition team began developing a comprehensive transition plan. The operations team completed the Demonstration Execution Document (DED) and data gathering checklists and methodology for Demonstration 1. On 13 Dec 06, members of the ESSA management team, including the Massachusetts Institute of Technology, Lincoln Laboratory (MIT/LL), successfully completed the ESSA ACTD Demonstration 1. The objective of Demonstration 1 was to expose operationally relevant information and data from a radar imaging sensor via net-centric means. By using web-based applications, end users at Joint Space Operations Center (JSpOC) at Vandenberg Air Force Base (AFB), CA and the Space Situational Awareness Test Bed (SSATB) at Schriever AFB, CO were able to subscribe, retrieve and monitor wideband imagery and other products from the Haystack Auxiliary (HAX) radar imagery sensor. This demonstration was conducted over the Defense Research and Engineering Network (DREN). On 20 Apr 07, the ESSA SIPRNET risk reduction effort successfully validated the migration of the ESSA capabilities from the DREN to the SIPRNET. HAX radar tasking, imagery and associated metadata were transferred via the SIPRNET to multiple users simultaneously within similar timeliness as observed during Demonstration 1.
- FY 2008/2009 Planned Output - The focus for FY08 will center on two major topics: demonstration and transition. The Operations Integrated Products Team (Ops IPT), along with the 46th Test Squadron will draft the assessment objectives and sub-objectives that will validate the Critical Operating Issues (COIs). This information will then be incorporated into a comprehensive DED and data gathering checklists and questionnaires. Demonstration 2, which will include deep-space satellite monitoring, change detection and satellite conjunction analysis, is scheduled for 1 - 5 May 2008. The ESSA ACTD will culminate in March/April 2009 with a final demonstration. This demonstration will center on the characterization of a New Foreign Launch (NFL). The Ops IPT will lead the objective/sub-objective development, as well as the DED and associated assessment methodology. The ESSA transition manager, with the help of the entire ESSA management team, will finalize the transition plan for migrating ESSA ACTD capabilities into the hands of the warfighter. The transition plan will include two critical portions: the extended use of residuals and transition. The extended use of residuals, a two year period beginning April 2009, will increase the number of space surveillance network (SSN) sensors connected in a net-centric service orientated architecture and define an operationally focused concept of operations and tactics, techniques, and procedures. The transition period will begin after the extended use of residuals period has ended. During the transition period, additional SSN sensors will be added to the net-centric C2 network; however, detailed oversight and procedural development support will become the responsibility of the warfighter. The ACTD will complete in FY2009.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Actionable Situational Awareness Pull (ASAP)		0.600	

The JROC approved the capability need for ASAP as an FY05 new start. The ASAP output will develop, integrate, demonstrate and transition software that provides a "Smart Pull" capability to the tactical, operational and / or strategic user on the Global Information Grid (GIG) for accessing critical situation awareness information resident on distributed databases. Utilizing the Net-Centric Enterprise Services (NCES) core service architecture and the Net-Enabled Command Capability (NECC), a "Smart Pull" service will be operationally demonstrated and transitioned into NECC and the Integrated Broadcast System (IBS). ASAP's outputs and efficiencies include (1) increased percentage of useable data available to the user, (2) increased performance through decreased latency of data, (3) percentage of increase in data obtained via "pull" vice "push" procedures, and (4) increased interoperability with coalition forces by use of XML Common Message Format Standards. Expected efficiencies (to be measured and verified) will include response time performance on the return of data as a web service. Planned Transition: Software tools and documentation will transition to Net-Enabled Command Capability (NECC) and the Integrated Broadcast System (IBS) starting in FY 2007. The ASAP User Sponsor is the U. S. Pacific Command (PACOM) and the lead service/agency is the Defense Information Systems Agency (DISA).
- FY 2007 Output - Refer to the ACTD R2a.
- FY 2008 Planned Output - Finalize CONOPs / TTPs, training package and recommendations for DOTMLPF. Complete transition ASAP ACTD products to programs of record / programs pending results of JMUA. Complete the ACTD.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Regional Maritime Awareness Capability (RMAC)	2.234	2.200	

The JROC approved the capability need for RMAC as an FY06 new start. RMAC is a coordinated DoD and Department of State project. The outcome of RMAC will demonstrate and transition a regional maritime awareness solution set consisting of sensors and their indigenous processors, communications systems, and software. The initial application of the capability will enable friendly nations in the Gulf of Guinea region to develop maritime domain awareness in the regional waters, and share their data with each other and with the U.S. This solution set will be equally applicable to local sensor sites, national operations centers, regional coordination centers, and external users. The sensors and processors include Automated Information System (AIS), radar, video cameras, and night vision devices. Communications will be done through UHF/VHF Radios, W3C-compliant, commercially secure, IP-based networks and cell phones. RMAC's outputs and efficiencies include surveillance, tracking, fusion and analysis, vessel tracks, and multi national information sharing and collaboration capabilities. The current Transition Strategy will deliver: 1) Residuals: AIS, radar, video cameras, night vision devices, radios, cell phones; 2) Documentation: training package, software / hardware specifications, site surveys, frequency management plan and user maintenance manuals, CONOPS / TTPs; 3) Post-JCTD acquisition strategies for procurements of capability will be developed by host nations and U.S. Program Managers pending outcome of demonstrations and assessments. The User Sponsor is the U. S. European Command (EUCOM) and the lead service is the Navy.
- FY 2007 Output - Complete definition of requirements. Conduct additional site surveys in participation host nations, and develop coordinated installation plans with host nations. Finalize procurement of RMAC capability. Initiate development of training package. Continue development of CONOPS, Tactics, Techniques, and Procedures (TTP) and architecture. Conduct technical testing and demonstrations. Install baseline operational capability (BOC) equipment and software systems, and conduct initial checkout tests.
- FY 2008 Planned Output - Finalize requirements definition and architecture. Complete installation of RMAC capability. Continue development of CONOPS, TTP, and training package. Conduct operational demonstrations and Coalition Utility Assessment (CUA) of RMAC capability including local harbors / ports, National Operational Centers (NOC), Regional Coordination Center (RCC) and external users. Complete the JCTD in FY2008.
- FY 2009 Planned Transition Output: RMAC will sustain operational capabilities and complete transition planning.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Coalition Secure Management and Operations System (COSMOS)		1.900	1.900

The Joint Requirements Oversight Council (JROC) validated the capability need for COSMOS as a FY05 new start. The COSMOS ACTD output will be a pilot implementation of the Multilateral Interoperability Program (MIP) specifications for C2 data sharing (specifically the Command and Control Information Exchange Data Model (C2IEDM) and the Information Exchange Mechanism

(IEM)) in the Combined Enterprise Regional Information Exchange System (CENTRIXS) coalition network environment. COSMOS is planned for a final demonstration in the second quarter of FY08, with sustainment of the demonstrated capabilities by DISA through FY09. The expected output is identifying necessary and sufficient conditions for implementing the MIP specifications, leading to rapid, secure protected sharing of critical C2 information to and among coalition partners' organic command and control (C2) systems on a single and secure integrated coalition network. The expected efficiency is substantial reduction of textual message exchange required to establish and maintain situational awareness among coalition commanders, improved collaborative decision making, reduced confusion, uncertainty and delay in combat and crisis operations and effective bridging of coalition sourced information with US Global Information Grid (GIG) Network Centric Enterprise Services (NCES) for two-way information exchange, when approved cross domain solutions are available. Transition to programs of record is planned for FY09, targeted at the emerging Multinational Information Sharing (MNIS) initiative. A policy enforcement capability for discrete rapid information sharing will be implemented in enterprise and theater-level coalition networks (i.e., CENTRIXS migrating to an emerging program based on the Joint Requirements Oversight Council (JROC) approved Multinational Information Sharing (MNIS) Initial Capabilities Document (ICD)). The use of Open Source Code for software-based capabilities will enable improved capabilities to be inserted into programs of record for coalition information sharing, network services, and next generation command and control, including those of Allies and Coalition partners. COSMOS is a three year ACTD co-sponsored by U. S. Pacific Command (PACOM) and U. S. European Command (EUCOM). The Defense Information Systems Agency (DISA) is the lead agency.

- FY 2007 output - Refer to the ACTD R2a.
- FY 2008 Planned Output: The final demonstration for Military Utility Assessment (MUA) in a USEUCOM venue is planned for the fourth quarter of FY08. Use of the foundational MIP specification based C2 information exchange between coalition partners able to implement the necessary and sufficient conditions and security solutions in stabilization and recovery operations will provide increased political confidence, technical experience and collaborative abilities. The ACTD will complete in FY2008. Programmatic focus in FY08 is FY10 budget documentation to successfully transition sustainment of the demonstrated capability to programs of record. DISA will sustain the demonstrated militarily useful functionality until transitions to programs of record in FY09.
- FY 2009 Planned Output: The primary focus of activities in FY09 is final documentation and transition of functionality to programs of record. The ACTD completes in FY09.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Medical Situational Awareness in Theater (MSAT)		2.500	

The Joint Requirements Oversight Council (JROC) validated the capability need for MSAT as a FY05 new start. The outcome is to provide improved capabilities for medical situational awareness to commanders with integrated and timely health information fused with non-medical operational information incorporating a tailored decision support tool to make critical strategic and tactical decisions in a deployed environment. This capability will provide a fusion of medical data, personnel location information and health threat intelligence for situational awareness in theater. The capabilities include technologies for a web services environment fusing intelligence, chem.-bio threat, environmental health, unit location information; risk assessment; and decision support tools. The primary outputs to be demonstrated to the users and evaluated in the Military Utility Assessment (MUA) are 1) ability to perform surveillance of medical threats in deployed environments, 2) model threat dynamics, and 3) conduct risk assessment using decision support tools. The efficiencies to be gained are 1) the ability to provide commanders with a more complete medical situational awareness in an actionable time-frame, 2) the ability to make knowledge-based decisions with an automated decision-making tool tailored to medical operations. The transition strategy is to incorporate MSAT system tools and operational concepts, tactics, techniques and procedures into theater medical operations through GCSS (Global Combat Support System) and Theater Medical Information Program programs of record. The sponsoring Combatant Command (CoCom) is U. S. Pacific Command (PACOM). Other organizations involved as participants, users of capabilities, and/or observers include: Armed Forces Medical Intelligence Center; OSD Health Affairs; Joint Staff Surgeon and the Defense Information Systems Agency. The executive agent is the Joint Staff, Logistics Directorate, Health Services and OSD Health Affairs.

- FY 2007 Output - Refer to the ACTD R2a.
- FY 2008 Planned Output - Conduct final spiral demonstration and assessment with inclusion of medical unit readiness, adaptive planning capabilities and decision support tools, with integration of mapping tools into the GCSS and Theater Medical Information Program web services environment. In FY 2009 transition to the Theater Medical Information Program and GCSS programs of record and ACTD completion.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Node Mgt and Deployable Depot (NoMaDD)		1.900	

The Joint Requirements Oversight Council (JROC) validated the capability need for NoMaDD as a FY06 new start which is demonstrating technologies to address critical delays in getting needed supplies to the warfighter. Loss of visibility of items in the distribution pipeline and the inability to provide realistic delivery dates or effectively adjust the flow of commodities for delivery at the right place at the right time continue to impact the effectiveness of our forces. Node Management will provide distribution node managers the visibility needed to make logistics decisions to positively affect the distribution system. Deployable Depot will provide the ability to quickly establish a supply and distribution center in theater to control the physical flow of materiel moving into and through the theater. Together, these capabilities will provide the logistic responsiveness necessary to support our warfighters in any theater of operation. NoMaDD's effectiveness will be measured through its contribution to sustained logistics for major military deployments. Specific outputs and efficiencies will include: 1) increased accuracy in accounting for supplies resulting in reductions in customer wait time; 2) improvements in required airlift to support sustainment; 3) reductions in repeat requisitions. The planned transition for NoMaDD: Node Management will transition to the Army's Battle Command Sustainment Support System and U.S. Transportation Command's (TRANSCOM) Intelligent Road/Rail Information System (IRRIS) Program which will provide a web based version on Node Management. The Deployable Depot will become a program of record and be managed by DLA. The Combatant Command/User Sponsor is TRANSCOM and the lead service/agency is Defense Logistics Agency (DLA).

- FY 2007 Output - Refer to the ACTD R2a.
- FY 2008 Planned Output - Continue spiral development of BCS3 Node Management capabilities and development of the IRRIS web-based capability. Integrate BCS3 and IRRIS capabilities to ensure data and views are consistent. Perform the final Joint Military Utility Assessments of the Deployable Depot in March - April timeframe.
- FY 2009 Planned Output - Complete development and integration of BCS3 and IRRIS Node Management capabilities and conduct a final Joint Military Utility assessment. Complete the JCTD in FY2009.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Joint Enable Theater Access (JETA-SPOD)		3.700	0.600

The Joint Requirements Oversight Council (JROC) validated the need for JETA-SPOD capabilities as a FY06 new start. The outcome of JETA-SPOD is to develop and demonstrate: a Lightweight Modular Causeway System (LMCS) transportable by and employable from intra-theater sealift vessels such as the JHSV or other current Army/Navy watercraft; and an austere port Decision Support Tool for selection of optimal sites from multiple austere SPOD options. The capabilities proposed for development in this ACTD will optimize the use of the Joint High Speed Vessel (JHSV), current Army/Naval watercraft, and Lines of Communication (LOC) bridging requirements by providing increased and more rapid flow of combat power and sustainment through multiple theater austere seaport locations. This provides to Joint/Combined Force (J/CFC) commanders a means to mitigate threat anti-access activities and increases flexibility to conduct operational maneuver from strategic distances. JETA-SPOD ACTD is a three-year project under sponsorship of U.S. Pacific Command, with completion of development and demonstration by end of FY2008; and transition to U.S. logistics systems as early as FY2009. The lead service is Army. The primary outputs and efficiencies to be demonstrated in the ACTD Military Utility Assessment (MUA) are: 1) the LMCS will reduce weight, volume, and deployment time compared to existing military causeway and bridging systems; 2) the operational parameters for evaluating the military utility of the LMCS are based on a quantitative and qualitative comparison to the capability provided by the existing Modular Causeway System (MCS); 3) LMCS will result in a reduction in weight and volume by 50% over the MCS; a reduction in deployment time by 50% over the MCS; and elimination of in-water connections; 4) the Decision Support Tool capability equates to an increase in availability of throughput prediction information for 50-80% of worldwide small ports; and 5) the combination of LMCS and the Decision Support Tool includes a five-fold increase in the number of JHSV-compatible ports and doubling of the port throughput rate. LMCS Output includes incorporation of state-of-the-art connector and tensioning technology; innovative emplacement and recovery

system applicable to multiple military/civilian platforms; innovative self-locking and strap tensioning technologies; high strength fabrics for robust, lightweight floatation technology that quickly inflates/deflates for rapid LMCS emplacement and recovery; puncture/abrasion resistant floatation components; lightweight decking materials; and common 8x20 rapid transport footprint design. The efficiency is that the transport (land/sea) cost of moving causeway capabilities into austere SPODs will be significantly reduced; and causeway capabilities will arrive in theater more rapidly with a smaller logistics footprint. Austere Port Decision Support Tool Output includes query-able austere world port data; a port characterization model; rapid port enhancement tool; austere port throughput simulation; a comprehensive set of environmental and physical factors affecting ingress/egress throughput rates; and parametric algorithms for throughput rates in small ports and rates for planning and execution of vessel offload operations; developed with an open source tool; user friendly Graphical User Interfaces (GUI); and runs on a laptop computer. The efficiency is that the warfighter will possess flexibility and a broader range of options to establish austere seaports as strategic or operational maneuver entry points with a greater assurance of success. The transition strategy for LMCS and the Decision Support Tool is to establish Programs of Record under the guidance of two Transition Managers: Product Director, Army Watercraft Systems (PD AWS) and USTRANSCOM, respectively.

- FY 2007 Output - Refer to the ACTD R2a.

- FY 2008 Accomplishments _ Develop final LMCS and Decision Support Tool CONOPS; finalize extended user evaluation and Interim Transition Planning; conduct LMCS full-scale functional system demonstrations conduct CONUS LMCS testing; complete system integration and incorporate lessons learned; complete LMCS fabrication; conduct Decision Support Tool Limited User Evaluations (LUE); deliver final version of Decision Support Tool; complete Training Plan; conduct user training in preparation for MUA; complete MUA/Final Demonstration in Sep 2008; develop final MUA and ACTD report; and plan transition of LMCS and Decision Support Tool to Programs of Record in FY 2011.

- FY 2009 Planned Output - Deliver pre-transition and interim capability/residuals to the user (includes LMCS system and Decision Support Tool with Final Data Set); plan the use of LMCS and Decision Support Tool in exercises for continued refinement and continued socialization for transition; JETA-SPOD ACTD scheduled completion date is September 2009.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Coalition Joint Spectrum Management and Planning Tool (CJSMPT)	0.919	0.500	

The Joint Requirements Oversight Council (JROC) validated the capabilities needed from CJSMPT as an FY06 new start. The outcome of CJSMPT is a force structure driven database of basic friendly communications and counter-Improvised Explosive Devices jammers with an associated software based spectrum management tool to enable the Warfighters to coordinate electromagnetic spectrum resources usage in a timely way. CJSMPT is a three year project under the sponsorship of US European Command with direct engagement by US Central Command, with phased software deliveries and demonstrations in FY07 and FY08. The US Army is the technical lead Service for the JCTD and has agreed to sustain the delivered capability in the USEUCOM and USCENTCOM theaters until transition of the initial capabilities into the Defense Information Systems Agency (DISA) as the lead Agency for Global Electromagnetic Spectrum Information System program. The primary output and efficiencies to be demonstrated in the JCTD Military Utility Assessment are (1) interfaces to currently disparate and isolated data bases into a virtual knowledge repository, (2) interactive emitter, receiver and terrain models permitting user visualization of spectrum usage, and (3) spectrum use plans for operational coordination, scenario development and course of action evaluation.
- FY 2007 Output - Initial demonstration of basic counter-IED, friendly communications coordination and visualization tools applied to priority Warfighter scenarios. Establish and conduct operator training. Integrate CJSMPT software capability into USCENTCOM pre-deployment training for spectrum managers and electronic warfare officers.
- FY 2008 Planned Output - Refine phase one software capability and expand to additional friendly force spectrum usage. Expand mobile training, classroom instruction and doctrine for spectrum coordination with operational scenarios. Conduct Joint Military Utility Assessment of capabilities delivered. Coordinate sustainment activities within US Army and transition documentation with DISA. Complete the development of CJSMPT software capability and demonstrations by December 2008. Complete the JCTD.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Event Management Framework (EMF)		2.500	1.300

The Joint Requirements Oversight Council (JROC) validated the capability need for the EMF ACTD as a new start in FY06. The goal of EMF is to demonstrate the ground breaking capability of vertical and horizontal sharing of heretofore stove-piped information among organizations within and outside of DOD by emphasizing EMF policies; operational concepts; and tactics, techniques and procedures. In handling a terrorist event or incident, a horizontal information focus among Federal agencies is necessary during the interdiction phase of an incident. During response and recovery phases, a vertical information sharing focus among Federal, state, and local agencies is needed.

A coherent interoperable information sharing mechanism is needed to: (1) Discover and share information resources throughout the incident based coalition domain; (2) Recognize the changing value of temporal information; and (3) Analyze and synchronize the large amounts of data relative to an event. All COCOMs, as well as their non-DoD partners, have made large investments in command and control (C2) and collaboration coordination tools. But, to date, effective integration of those investments has been sub-optimal. The event management framework consists of policies, operational concepts and technologies to ensure decision makers can build a situational picture of an event with all relevant facts. The primary outputs and efficiencies to be demonstrated in the ACTD Military Utility Assessment (MUA) are: 1) Integrated EMF policies; operational concepts; and tactics, techniques and procedures; 2) Improved and more timely incident and information correlation to "connect the dots"; 3) Faster visualization of analytic results to aid decision makers in event assessment; 3) Addition of EMF databases and engine servers to cache data; 4) Capability to share information and analytical results across COCOMs, Coalitions, Services, and its interagency partners; 5) Reduced time required for event based decision making. EMF is a three-year project under the sponsorship of the United States Northern Command. The lead agency is the Defense Information Systems Agency (DISA).

- FY 2007 Output - Refer to the ACTD R2a.
- FY 2008 Planned Output - Spiral 3: Adapt ontology, data models, and smart agents for selected Communities of Interest. Increase partner base. Conduct JMUA. Harden software.
- FY 2009 Planned Output - Assuming a successful JMUA, transition is planned for FY09. Transition paths are to be determined. One possibility is transition to a DISA Program of Record such as NECC or NCES. The EMF ACTD is scheduled to complete in September 2009.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Theater Effects Based Operations (TEBO)		4.400	2.700

The Joint Requirements Oversight Council (JROC) validated the capability need for the TEBO ACTD as a new start in FY 04. The outcome of the TEBO ACTD is to provide Combatant Commanders with enhanced capabilities to analyze, plan, execute, and assess Effects-Based Operations (EBO) at the strategic and operational levels by integrating computer-aided decision support tools, Concept of Operations (CONOPS), and Tactics, Techniques and Procedures (TTPs) into the command's Mission Architectures. The TEBO ACTD is a six-year project under the sponsorship of Pacific Command and Combined Forces Command/U.S. Forces Korea (CFC/USFK) as the Operational User. Completion of development and demonstration is planned for by the end of CY 2009 with transition to the Net Enabled Command Capability (NECC) System of Record in 2010. The lead service is Army. The primary outputs and efficiencies to be demonstrated in the TEBO ACTD Military Utility Assessments are (1) Exploit existing knowledge base(s) of strategic, operational and tactical environments (e.g. Operational Net Assessments [ONA] - critical capabilities and vulnerabilities, centers gravity [COG] and nodal analysis, (2) Facilitate collaborative effects-based campaign planning within a combined/Joint environment, (3) Support execution with prioritization of strategic and operational levels of effort, synchronization of actions, and battle tracking, (4) Comprehensively assess and forecast progress toward the desired end state by analyzing observed direct and indirect effects.

- FY 2007 Output - Refer to the ACTD R2a.
- FY 2008 Planned Output - Conduct Operational Demonstration 5 (RSOI 08 and UFL 08) Final enhancement and integration of COA planning capabilities through the use of modeling and simulation; final military utilitary assessment; Begin transition of TEBO Knowledge Management Services into Army Battle Command Systems (ABCS) Program of Record.
- FY 2009 Planned Output - Begin transition to Net Enabled Command Capability (NECC) Program. Scheduled completion of the ACTD in September 2009.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Smart Threads Integrated Radiation Sensors (STIRS)	0.750	6.100	3.800

The Joint Requirements Oversight Council (JROC) validated the capability need for Smart Threads Integrated Radiological Sensors (STIRS) Joint Capabilities Technology Demonstration (JCTD) as an FY07 new start. The objective of the STIRS JCTD is to demonstrate and transition the capability to detect, identify, and disseminate radiological information on land, maritime, and airborne environments in order to enhance reconnaissance and surveillance operations. The STIRS JCTD suite will use a combination of proven and innovative radiation detection capabilities, networked through open-architectures, to aid in the combating of weapons of mass destruction. These capabilities have global applicability with forward-deployed Combatant Command (COCOM) ground forces (US Army), U.S. Naval Maritime Components, and US Coast Guard elements in the transient areas, and potentially, National Guard WMD Civil Support Teams (CST) within the homeland regions. In all mission areas, the systems will be networked and radiological information will then be provided through existing tactical and over-the-horizon command and control (C2) networks.

STIRS is a three-year JCTD sponsored by the US Northern Command (NORTHCOM); DTRA is Lead Agency and US Naval Sea Systems Command (NAVSEA O4LR) and the Joint Program Executive Office for Chemical and Biological Defense (JPEO CBD) are co-Transition Managers. The STIRS operational demonstration/exercise (ODX) phase will complete in FY 2009 and transition to the user community will begin in FY 2009 through FY 2010.

The STIRS JCTD capabilities and attributes below are the basis for the Joint Military Utility Assessment (JMUA) measures of effectiveness (MOEs) and measures of performance (MOPs), are:
a. Detect and identify concerning R/N material/threats.
- Attributes: precision, spectrum, quality, timeliness.
b. Correlate and fuse information to develop shared understanding.
- Attributes: quality, scalable, tailored to users.
c. Enable support of/execution across, spectrum of battlefield environments (land, sea and airborne).
- Attributes: robustness, persistence.
d. Collaborative, networked joint and interagency information sharing.
- Attributes: networked, interoperable, and fully integrated.

- FY 2007 Outcome - Requirements validation and refinement of STIRS capabilities into a man-portable detection system (MPDS) and vehicular- mounted detection system (VMDS) to confirm presence of R/N materials. Begin STIRS integration into line-of-site and over-the-horizon C2 networks to send STIRS data to required users in near real-time. Conducted initial technical testing and system characterization.
- FY 2008 Planned Outcome - Conduct Aerial Radiation Detection, Identification and Measurement System (ARDIMS) technical testing and system characterization. Continue MPDS and VMDS technical testing, followed by operational unit training. Plan and conduct operational demonstrations/exercises (ODX) with 20th Support Command (CBRNE) (with MPDS and VMDS capabilities), and US Navy SURFLANT Boarding Teams (MPDS capabilities).
- FY 2009 Planned Outcome - Conduct operational demonstrations/exercises (ODX) with ARDIMS capabilities (payload/pod) supporting interdiction missions, and post-event radiation mapping/detection capability utilizing either a manned and/or unmanned aerial platform. The JCTD will complete in FY2009.

The STIRS residuals will provide limited initial operational capability to units/joint Warfighters. The planned STIRS JCTD residuals include: 44 man-portable detection systems (MPDS); two vehicular mounted detection systems (VMDS); two Airborne Radiological Detection, Identification, and Measurement System (ARDIMS). Additionally, the STIRS JCTD will produce applicable CONOPS, TTPs, and DOTMLPF Change Recommendations.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Mapping the Human Terrain (MAP-HT)	0.500	2.700	2.600

(U) The Joint Requirements Oversight Council (JROC) validated the capability need for MAP-HT as a FY07 new start Joint Capability Technology Demonstration. The outcome will provide improved capabilities to effectively collect, consolidate, visualize and understand open source socio-cultural (green data) information to assist Commanders understanding of the human terrain in their Area of Responsibility (AOR). MAP-HT JCTD will develop and demonstrate an integrated, open-source, spatially/relationally/temporally referenced human terrain data collection and

visualization toolkit to support Brigade Combat Teams (BCT)/Regimental Combat Teams (RCT) in understanding the human terrain in which they operate. The overall project context for MAP-HT is development and deployment _by, through, and with_ deployed units in theaters of operations. The primary outputs to be demonstrated to the users and evaluated in the Military Utility Assessment are: (1) provide a stand-alone toolkit to collect/visualize socio-cultural information in geospatial and social network contexts at the unclassified level, (2) provide standard operating procedures (SOP) and concept of operations (CONOPS) , as well as tactics, techniques and procedures (TTP), (3) provide training on-line and manuals on the use of the system, (4) establishes direct cultural support to BCT/RCT commanders and interagency end-users which will minimize loss in continuity between unit relief in place/transfer of authority.
(U//FOUO) The MAP-HT Transition Sponsor is USA Distributed Common Ground Station Program of Record (DCGS-A POR). The sponsoring Combatant Command (CoCom) is U.S. Central Command (CENTCOM). Other involved organizations include the U. S. Marine Corps, U. S. Special Operations Command (USSOCOM), Defense Intelligence Agency (DIA), National Security Agency (NSA), etc. The U.S. Army is the lead Service.

- FY 2007 Output: First prototype-baseline, Module 0.0, of the MAP-HT toolkit is already being used by the 4th BDE, 82nd Airborne Division in OEF. Next prototype, Module 0.5, is scheduled to go into Iraq in August 2007 with five Human Terrain Teams. Results will be used to update the system for ultimate use and distribution between Services, Agencies and CoCOMs in theater. Prepare assessment plan with Operational Manager. Implementation Directive signed and approved by all stakeholders. Draft Management Plan and Transition plan.
- FY 2008 Planned output: Module 1 will include baseline plus knowledge discovery and advanced visualization/analysis tools with system hardening. Complete toolkit development, transition plan, and assessment plan for the final Joint Military Utility Assessment (JMUA).
- FY 2009 Planned Output: Transition to DCGS-A and PEO IIS/SOJICC. Complete the JCTD.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Joint Multi-Mission Electro-Optic Sys. (JMMES)	2.400	5.000	5.100

The Joint Requirements Oversight Council validated the capability need for JMMES as an FY-07 new start. The outcome of JMMES is demonstration and transition of airborne sensors and automated processing for automatic detection of items of interest for Joint Service, Coalition, and Interagency partners. The JMMES project will demonstrate use of advanced multi-spectral sensors in an aircraft turret compatible with existing turret mounts in US Navy, US Army, Drug Enforcement Agency, and British and Canadian aircraft. The project will develop and demonstrate automatic processing and automated operator cueing for targets such as submarines, mines, targets under trees, illicit crops, and search-and-rescue targets at sea. The primary outputs and efficiencies to be demonstrated in JMMES Military Utility Assessments are (1) ability of JMMES to recognize targets of interest, in terms of (a) percent of auto detections and auto cues that are relevant, (b) distance error of auto detect and auto cue reports, (c) timeliness of reports (seconds) to decision makers; and (2) ability of JMMES to defeat denial and deception efforts, in terms of (a) percent of denial and deception efforts defeated, (b) where and when JMMES applies (operating environments, seasons, time of day, range, etc.), (c) percent of time operable during missions, and (d) reliability and logistic support requirements. JMMES is a 3-year project sponsored by U.S. Pacific Command and U.S. Southern Command. Initial capabilities will be demonstrated and operated in FY07, with demonstrations against additional targets with additional aircraft types in FY08 and FY09. Transition activities began in FY07, leading to firm transition to programs of record in Program Objective Memorandum 2010. The lead Service is U.S. Navy.
- FY 2007 Output - Upgraded existing sensor suites to second generation for JMMES applications, integrated sensor and processing systems aboard selected aircraft. Conducted data collection and assessments for anti-submarine warfare missions, and begin algorithm development for other targets. Began Concept of Operations and system architecture documentation. Submitted POM documentation for transition to two Navy Programs of Record (POM 10).
- FY 2008 Planned Output _ Integrate third generation sensor suites. Flight test second generation systems, collect data for algorithm development and test. Execute JMMES integration into additional aircraft types for mine detection missions, search and rescue missions, counter concealment and deception (land targets) missions, illicit crop detection, and other missions. Complete initial algorithm development for the additional missions and conduct data collection and assessment trials, including interagency and coalition partner participation. Follow-up POM-10 submissions as needed.
- FY 2009 Planned Output - Complete multi-aircraft/multi-mission assessment trials and draft Military Utility Assessment. Complete Concept of Operations, Tactics/Techniques/Procedures, and System Architecture documentation. Support ongoing transition activities into programs of record. Complete the JCTD.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Maritime Auto Super Track enhance Reporting (MASTER)	2.000	5.600	3.100

The Joint Requirements Oversight Council (JROC) validated the capability need for MASTER (Maritime Automated Super Track Enhanced) as an FY07 new start. The initial goal of MASTER is to demonstrate a set of technologies with associated CONOPS, which provide automatic tracking of ship traffic using both unclassified and classified methods and which will provide a tangible improvement of United States maritime domain awareness on a global-basis. The MASTER JCTD will also provide a common set of Tactics, Techniques and Procedures (TTPs) to the Intelligence Community (IC) that will allow adoption of this new capability across the IC. The primary outputs and efficiencies to be demonstrated in the Military Utility Assessment (MUA) are to develop and deploy a persistent maritime awareness capability for the analyst, warfighter and decision maker that enables: (1) significant increase in worldwide, multi-INT vessel tracks using information sources from SCI/Secret/Unclassified-levels and dissemination of these "Super Tracks", to operational users at the JWICS and Secret security levels; (2) percent decrease in the time required for an intelligence analyst to assemble the maritime awareness picture of ships using track , cargo and people information ; (3) percent increase in the ability of an analyst to determine ship threat profile (friend or foe) based on ship track, cargo and people information at the JWICS level; (5) percent increase in number of maritime awareness entities (ship, people, cargo, infrastructure) and the ability to manually and automatically fuse the data. The JCTD Residuals include: 1) Multi-INT fusion for worldwide MDA tracks with associated metadata; 2) web portal at the JWICS level; 3) SOA at JWICS level; 4) Alarms/alerts notification methodology; 5) Operationally tested CONOP for a 24/7 worldwide capability. MASTER is a three-year JCTD under the sponsorship of US Northern Command (NORTHCOM) and U.S. Navy, with completion of development and demonstration by the end of FY 2009 and transition to the IC through ONI beginning in FY 2009. The lead Service is Navy.

- FY 2007 Output - Worldwide tracking, user access via a JWICS web portal and an initial set of user definable alarms focused on ship tracking.
- FY 2008 Planned Output - Worldwide multi-INT tracking, enhanced web portal, cargo information at the JWICS level, initial JWICS level SOA, linkage of vessel and cargo alerts; Conduct Technical Demonstration One & Two; Conduct Operational Demonstration One
- FY 2009 Planned Output - Conduct Technical Demonstration Two; Conduct Final Operational Demonstration of MASTER with enhanced techniques for analytical user, and transition and operational users; publish Joint Military Utility Assessment (JMUA). Complete the JCTD.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Internet Protocol Router in Space (IRIS)	2.000	5.000	5.100

The Joint Requirements Oversight Council (JROC) validated the need for capability from IRIS as a FY07 new start. IRIS leverages a planned launch of a commercial communications satellite to introduce Internet Protocol (IP) routing and cross-banding between C-band and Ku-band transponders. The IRIS outputs and efficiencies include (1) demonstrate the capability to collaborate with industry in leveraging the commercial acquisition processes to provide near-term, space-based, IP routing network capability, (2) demonstrate the capability via a commercial payload to conduct on-board IP packet routing communications from a geostationary orbit, (3) explore and incorporate a decision process to determine which commercial SATCOM users should leverage the IRIS capability. USSTRATCOM is assigned responsibility for global network operations, and as the operational user sponsor seeks to improve network reliability and endurability through dynamic topology updates (multiple transport paths) and improved collaboration and interoperability among info sources and users (e.g., sensors, soldiers, command centers at Joint, Allied and Coalition levels). The Defense Information System Agency (DISA) is the lead Service and will transition the demonstrated commercial capability into contracting language for future services subscription in support of operations, including integration of IRIS services into existing network architectures beyond the IRIS JCTD.

- FY 2007 Output - Develop the draft CONOP and conduct a scenario-based limited military utility assessment that will simulate the use of the IRIS capability.
- FY 2008 Planned Output - Validate and verify draft CONOP and demonstration architectures to enable a limited military utility assessment of an emulated IRIS capability. Participate in the industry led end-to-end IRIS technical capabilities demonstration with representative hardware prior to IS 14 launch.
- FY 2009 Planned Output - Launch of the IS 14 spacecraft is projected for the 1st quarter FY2009. Conduct a live scenario and capability based demonstrations culminating in a final military utility assessment of the IRIS JCTD. The IRIS JCTD will leave behind the IRIS capability on a fee for service basis to provide a space based routing enterprise solution that enables video, voice and data

network services. Complete the JCTD.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Coalition Mobility System (CMS)		2.000	

The Joint Requirements Oversight Council validated the capability need for CMS as an FY07 new start. The outcome of CMS is to develop the capability for rapid coordination of coalition movement execution. CMS will integrate selected, operationally relevant data from US systems with data sources used by coalition partners to establish a working coalition environment, which meets the needs of US and CTF decision makers. The primary outputs and efficiencies to be demonstrated in the JCTD are: 1) US operators gain access to coalition movement data (military and commercial) using familiar US national systems (Single Mobility System, Global Transportation Network, etc.), 2) Supports the Common Operating Picture for Deployment & Distribution (COP D2), 3) Coalition partners and CTF staff gain access to selected, operationally relevant information on US and coalition airlift and sealift (military & commercial) supporting coalition activities. CMS is a 4-year project sponsored by US Pacific Command. Key participants include the Quadrilateral Logistics Forum consisting of Australia, Canada, United Kingdom, and the United States. Initial capabilities will be demonstrated and operated in FY07, demonstrations and assessment on coalition networks in FY08 and FY09. USTRANSCOM is the Transition Manager and transition activities will begin in FY07, leading to firm transition to multiple coalition networks by 2010.

- FY 2007 Accomplishments - Refer to the ACTD R-2a

- FY 2008 Accomplishments - Operationally harden and enhance the Phase I prototype; operationally test the ability of CMS to provide coalition data to SMS or a suitable US feeder system; Operationally test the ability of CMS to export data for coalition partners (to include commercial partners); Integrate CMS into the Coalition Theater Logistics (CTL) portal; Conduct an appropriate Limited Operational Utility Assessment (LOUA) utilizing an agency not affiliated with product development; Complete an LOUA employing a coalition network in an operational or exercise setting.

- FY 2009 Planned Output - The following activities will occur: Finalize CONOPS documentation and complete DOTMLPF Change Recommendation; Transition is planned to multiple coalition networks; implement a cross domain solution and complete the accreditation and certification process. Conduct final OUA. Complete the JCTD remaining Program Management actions.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Multi-Sensor Aerospace-ground Joint ISR IC (MAJIIC)		3.100	

The JROC approved the capability need for MAJIIC as an FY04 new start. The outcome of MAJIIC is to develop, test and transition a set of standards, eXtensible Markup Language (XML) formats, and information services to promote intelligence, surveillance and reconnaissance (ISR) interoperability between U.S. and Coalition ground stations and systems. MAJIIC will demonstrate near-real-time interoperability of data from electro-optical, infrared, motion video, moving target indicators, synthetic aperture radar, and other sensors; enhance collaborative targeting operations; improve ISR data accessibility and sense making to support U.S. Joint ISR operations. Outputs and efficiencies include: 1) Near real-time MAJIIC ISR mission and sensor data is available for discovery and smart pull within the Collateral Space in near real time (i.e. Post in Parallel); 2) MAJIIC services and data are readily discoverable via portals, C2 Visualization and other applications, and other Global Information Grid (GIG) service providers; 3) MAJIIC data pedigree is trustable by users; 4) MAJIIC service access is assured for authorized users and denied for unauthorized users; 5) MAJIIC data access is provided based on user clearance, country affiliation, and role and protected from those not meeting the minimum policy requirements. Transition is planned for FY 2008 by the U.S. Army Training and Doctrine Command (TRADOC) System Manager to the Service Distributed Command Ground Station (DCGS) programs, to satisfy their requirements for coalition ISR interoperability and Network Centric Enterprise Services compatibility. Transition already Accomplished: The MAJIIC Full-Motion Video ISR Information Services (ISRIS) capability deployed as part of JIOC-I to OIF, and is transitioning to the Army Distributed Common Ground System (DCGS-A). NATO is deploying the MAJIIC coalition shared database (CSD) as part of the NATO Intelligence Management and Reporting Tool (IMART) to OEF. Remaining transition: NATO, Supreme Headquarters Allied PowerEurope (SHAPE), and the U.S. will adopt demonstrated capabilities and concepts of operation into existing national and coalition systems. MAJIIC technology and lessons learned will transition to the Service DCGS programs to satisfy their requirements

for Coalition ISR interoperability and Network Centric Enterprise Services compatibility. U.S. Joint Forces Command is the operational sponsor and the Air Force is lead service.
- FY 2007 Output - Refer to the ACTD R2a.
- FY 2008 Planned Output - Participate in the annual MAJIIC coalition exercise with possible NATO Allied Command transformation with NATO Air Group IV ISR capability. Validate CONOPs and conduct MUA. Transition capability into the DCGS Integration Backbone spiral baseline. Complete the ACTD.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
MASINT Tactical Intelligence Fusion (MASTIF)		3.700	2.500

The Joint Requirements Oversight Council (JROC) validated the capability need for MASCOT, renamed MASTIF, as an FY06 new start. The outcome of MASTIF is to provide the warfighter with a set of Network Centric Intelligence, Surveillance and Reconnaissance (ISR) collection systems and management applications to employ traditional and non-traditional, distributed sensing against concealed/obscured targets, with the goal of enhancing detection, classification, characterization, and tracking of these targets. This five-year project is under the sponsorship of the United States Special Operations Command (USSOCOM) and United States Southern Command (USSOUTHCOM). The lead DOD agency is the Defense Intelligence Agency (DIA). The primary outputs and efficiencies to be demonstrated are: 1) exploit Measurement and Signatures Intelligence (MASINT) technologies and develop new sources and methods to counter adversary concealment and deception techniques, 2) develop new methodologies for sensor-to-sensor communications to enable tipping and cueing, and 3) seek new fusion processing systems to make maximum use of the data to solve the difficult problem of concealed/obscured targets.
- FY 2007 Output - Refer to the ACTD R2a.
- FY 2008 Planned Output - Mature fusion capability. Complete Demo 1 with sensor integration in a laboratory environment. Conduct final demonstration on airborne test platform and complete JMUA. Plan for spiral capabilities to field during transition and identify opportunities for integration of other on or off board sensor information.
- FY 2009 Planned Output - Begin EUE. Spiral initial ACTD capability for COCOM field application. Support required documentation modification needs, and supply required documentation as appropriate for transition. Continue development of CONOPs and TTPs, based on user feedback. Support technology transition. In FY 2010 Complete EUE and ACTD. The ACTD will complete in FY2009.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Computer Assisted Threat Exploitation Program (CATE)	1.125		

The Computer Assisted Threat Exploitation Program (CATE) will increase maritime domain awareness in a selected AOR by applying a maritime threat evaluation software program, fully compatible and interfaced with maritime detection data inputted from deployed equipment, tools, instrument, or other data sources, and authorized to operate in a military coalition network environment. The maritime threat evaluation program must enable the Navy to detect, identify and analyze the threat of vessels traveling within and through the observed area/sea lanes.

- FY 2007 Output: Funding will be used solely for the purposes of exploiting the capability of the CATE System for use with coalition partners. Working with staff of Commander, U.S. Naval Forces Europe, and staff of the North Atlantic Treaty Organization Component Commander Maritime, this funding will embed CATE capability into existing NATO CCMAR maritime awareness systems, and provide associated support for integrating the capability into ongoing NATO CCMAR operations.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Distributed Network Switching (DNS) Joint Capability Demonstration		1.600	

Congress appropriated funds to integrate a maturing high-speed (40+ GBps) optical switching capability combined with a networking appliance that enables to masking of network media access control addresses. The outcome of DNS is to develop and demonstrate a stealth core backbone network for interoperable IP-based, high-capacity data transfer through secure networking functionality more immune to cyber-attack. The capabilities proposed for development in this capability demonstration will improve network defenses while enabling high-speed data transfer

between authorized nodes. Navy will participate in developing and demonstrating the functionality. The primary outputs and efficiencies to be demonstrated are: 1) improved core networks capacity and redundancy, (2) improved cyber-attack immunity, and (3) users able to seamlessly use network services. DNS output is demonstrated stealth core functionality. The efficiency is that Warfighters will be able to interoperate in a over a new networking framework that provides increased immunity from cyber-attack. DNS may transition to Global Information Grid (GIG) core services.

- FY 2008 Planned Output - Initial stealth core prototype.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Hardware Encryption Tech Program		1.600	

Congress appropriated funds to mature hardware-based hard disk encryption technology to counter the recurring issue of lost computers and resultant compromise of sensitive but unclassified information (such as social security numbers, personal identifying data, or agency information.) The outcome of Hardware Encryption Tech Program is to develop and obtain certification of _data-at-rest_ protection. The capabilities proposed for development in this technology program will enable mobile computing users, data-at-rest defenses. Navy will participate in developing and demonstrating the functionality. The primary outputs and efficiencies to be demonstrated are improved mobile computing protection of data-at-rest. Hardware Encryption Tech Program output is certified data-at-rest protection for sensitive but unclassified data. The efficiency is that mobile users will have protection of their data in the event computer assets are lost or stolen. Hardware Encryption Tech Program will transition to a commercially available product line for use by any executive department agency requiring protection of data at rest.

- FY 2008 Planned Output - Productization of the FIPS 140-2 certified capability developed under previous related efforts.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Simultaneous Field Radiation Tech (SFRT)		3.100	

Congress appropriated funds to develop a new type of antenna for use on radio-frequency (RF) communications devices. The emergent research proposed use of cylindrical RF antenna forms to reduce antenna profile and length while improving antenna gain. The outcome of Simultaneous Field Radiation Tech (SFRT) is to develop and demonstrate improved antennas for tactical radios in the High Frequency, Very high Frequency and Ultra High Frequency radio bands. The capabilities proposed for development in this technology program will improve communications capabilities while reducing antenna visibility. Navy is participating in developing and demonstrating the new antenna functionality. The primary outputs and efficiencies to be demonstrated are improved tactical communications. SFRT output is certified antennas for at least two classes of tactical radios. The efficiency is that mobile users will have improved communications while enjoying more covert antenna profiles. Simultaneous Field Radiation Tech (SFRT) will transition to a commercially available product line for use by any executive department agency requiring tactical communications.

- FY 2008 Planned Output - Development, demonstration and initial productization of new antenna technology.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
SPARTAN Advanced Composite Technology		1.600	

The Joint Requirements Oversight Council (JROC) validated the capability need for SPARTAN as a FY02 start. The outcome is to provide a modular, multi-mission, unmanned surface vehicle (USV) used to deploy sensors and weapons as low-cost force multipliers with integrated expeditionary sensor and weapon systems for use against asymmetric threats. The expanded range provides a

layered defense, early warning/intercept capability for incoming threats, thereby improving protection of surface combatants, noncombatants, and other national and strategic assets. The user sponsor is U.S. Pacific Command whose Operational Manager is the U.S. Third Fleet, lead service is the U. S. Navy. The primary outputs to be demonstrated to the users and evaluated in the Military Utility Assessment (MUA) are 1) Conduct critical missions Antisubmarine Warfare (ASW); Mine Warfare (MIW); Intelligence, Surveillance, and Reconnaissance/Force Protection/precision Engagement (ISR/FP/PE); 2) Prepare the waterspace for Amphibious and Sealift Ops; and 3) Provide port-protection when launched/operated from shore. The efficiencies to be gained are 1) force multiplication using low-cost deployable sensors and weapons; 2) provide a symmetric response to asymmetric threats; 3) expanded range to provide for a reduced risk to personnel and capital assets during the conduct of dangerous missions. The Transition Strategy: The SPARTAN USV Command and Control system and Concept of Operation (CONOPS) will transition to the U.S. Navy Littoral Combat Ship (LCS) (PEO-LMW, PMW 420) Program of Record (POR) for the LCS USV. Transition is scheduled to begin with LCS Flight Zero, Ship number One production in January 2007.

- FY 2007 Output - The ACTD officially completed in FY 2006, however a $1.3M congressional add was provided in the ACTD PE in FY 2007 for composite technology research to support Navy transition efforts into the LCS program of record.
- FY 2008 Planned Output - Congressional funding was added to continue composite technology development for Spartan. The effort will encompass three phases in the evaluation and characterization of advanced composite materials for Spartan and future USV applications. Phase 1: USV Payload/Sensor Performance Improvement - payload/sensor improvement efforts will include an FEM analysis that will be conducted with known properties of structural components. Early and later full-scale testing will be conduct on prototype and full-scale payload/sensor hardware and the supporting platform interface foundations. Material Characterization will be conducted to evaluate performance of the materials. Static and dynamic material response will be characterized to validate the FEM analysis. Specimen fatigue and creep may also be studied, as well as temperature variation. Volume fraction optimization and material processing/fabrication techniques will also be investigated as necessary. A Final Design and FEM analysis will be conducted using new material properties. "Build-to" drawings will be developed after the design is finalized. At-sea testing will be conducted with packages installed on a SPARTAN USV (or next-generation SPARTAN platform) under operationally representative conditions. Test instrumentation will be used to record load conditions.
Phase 2: Electronic Sensors/Payload - following successful completion of Phase 1 in it intended to assess, design, fabricate and test additional mission/payload components (structural and non-structural) of more complex shapes and configurations used in SPARTAN including electronics and sensor enclosures. Also in this phase is the potential to explore the need to meet low-smoke requirements.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Louisiana Command and Control Interope Communications and Information		2.000	

An operational model for high speed reliable wireless communications in Louisiana that is standards-based and is accessible to the Department of Defense when required during military support operations. The venue was selected in part due to the convergence of elements of the national critical infrastructure and defense industrial base. By adhering to open networking standards the functional advantage of this high capacity digital network is to provide new and innovative ways to fuse sensor and C2 functions which advances the daily operations of the practitioners and has scalability in times of crisis regardless of origin, man-made or natural disaster. Operating with a hybrid 5.8 GHz and 4.9 GHz implementation, the project provides the advantage of using uncluttered public safety radio licenses for reliable communications and higher performance equipment to support non-public safety participants and backup communications pathways. Congressional funding was provided in 2006 to finish the build-out and testing of the network. FY 2008 Congressional funding will expand those Command and Control capabilities in Louisiana.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
CoCom Direct Support, Pre-Transition and Classified Programs		21.685	22.672

The JCTD Direct Program Support is comprised of four programs broken-out separately from the specific JCTDs projects. The direct funding line is used to provide support for the entire JCTD program (versus individual JCTDs). These four programs include (1) Unified Combatant Commander (CoComs); (2) JCTD Pre-Transition Support; (3) Interagency Classified Projects, and (4) Joint

enabling technologies that are either directed by congress or initiated by DUSD (AS&C).
1) Unified Combatant Commander (UCC) Direct Support: The CoCom's play an essential role in the selection, validation, demonstration, and transition of JCTDs. The focus of JCTDs is to directly fill joint CoCom/coalition capability gaps. Many JCTDs have funding allocated for the CoComs from within their specific program funding lines. Additionally, in previous years DUSD (AS&C) would attempt to provide direct ACTD support from OSD if resources became available. This direct support allows for a timely allocation of resources to the CoComs, based on the number of JCTD projects being sponsored and the intensity of effort required. The Department also envisions that the CoComs will play a greater role in the development, support and coordination of JCTDs that are coalition oriented (within their specific AOR). CoCom direct program funding is estimated at $5.0 million per year.
2) JCTD Pre-Transition Support: The JCTD program has been highly successful in rapidly developing and demonstrating new technologies and complementary concepts of operations for the warfighter. In order to successfully transition more JCTDs to the warfighter, the SECDEF established the goal of increasing the number of JCTDs evolving into formal acquisition programs. In order to enhance this transition effort and to respond to GAO recommendations in earlier years, the JCTD program continues to support a pre-transition line in the JCTD budget submission. Funding for pre-transition initiatives will be approximately $3.0 million per year.
3) Special Capabilities Office (SCO)/Interagency Classified Support for JCTDs: JCTDs also support a limited number of classified efforts which are coordinated with other agencies and detailed in separate DoD budget exhibits. Funding for this direct program support is estimated at $12.0 million each year.
4) Joint Enabling Technologies: Over the past several years, congressional committees have highlighted the potential of mature, joint technologies and provided resources to the JCTD program to investigate the military utility of these technologies. DUSD (AS&C) also becomes aware of promising technologies which may have transformational application to JCTDs. The need for these technologies may be realized until an JCTD is mid-way through its development or after a final demonstration. In most cases, these enabling technologies have broader application across several functional capabilities addressed by various JCTDs.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
FY 2008 Rolling Starts		19.152	24.080

In FY 2008 JCTD selection process five JCTDs were identified by the Department as potential rolling starts. These projects were selected because they represent important warfighter concerns and capabilities. Three of the proposals, address issues with emerging technologies that could be significant game changers. While these projects have been successfully vetted through the JCTD selection process, some additional proposal development must be addressed with the stakeholders (i.e., Services, Agencies, Coalition and Inter-agency partners), prior to project initiation. In FY 2008, five candidates emerged that were particularly compelling; however, due to technology or resource related issues, they are still in a developmental stage. These projects show such great potential capability that they were included as part of the official congressional notification requirement anticipating initiation as they become ready. This helps meet the new JCTD goal of being a more agile process to meet urgent warfighter needs faster. The five projects are: 1)Cross Domain Collaborative Information Environment (CD-CIE)- Provides whiteboard & chat with language translation for Coalition and Interagency Cross domain environments; 2) Medusa - Provide low cost Fire and Forget weapon for UAV or Helo applications; 3) NVW/ADAS - Provide SOF Aviation Next Generation full Spectrum Night Sensing & Missile Warning; 4) NET Zero Plus - Alternative energy production for deployed forces; 5)Transnational Information Sharing for Coalitions (TISC)- A C2 capability to Share Information among Partner Nation, Peace Keeping, Humanitarian Relief with Africa Missions. In FY 2007, four of the five rolling starts were initiated.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
FY 2009 JCTD New Starts			58.300

Funding for FY 2009 JCTD new starts that will result from the JCTD selection process that will begin in March 2008. New start selections will be finalized in August/September of 2008, just prior to the year of execution. These funds will start six to ten new starts in FY09. Although the specific projects are unknown at this time, the 2008 selection process provides a more rapid delivery of capabilities than the traditional, incremental programming and budgeting methods that are supported by the deliberative Planning, Programming, Budgeting and Execution (PPBE) process. The JCTD process is adaptive and provides an agile technology development and demonstration program to better address a quickly changing threat. The JCTD model is an agile process spanning of two to four years. The concept falls between the Joint Rapid Action Cell (JRAC) urgent needs process of less than two years with little or no development, and the traditional, more deliberate, formal acquisition process that can stretch five to ten years. Final selection of projects just prior to the fiscal year allows for the program to be as agile as possible.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Tactical Service Provider (TSP)	1.200	3.700	3.800

The Joint Requirements Oversight Council (JROC) validated the capability need for TSP as a FY07 new start. The TSP ACTD focuses on taking full advantage of emerging commercial technologies to significantly enhance and improve C2 and Net-Centric capabilities to meet critical present and near-term requirements until DoD's next generation communication systems (JTRS, TSAT, GBS, IP SATCOM) are at Full Operational Capability (FOC). TSP is planned for a final demonstration in the fourth quarter of FY08, with sustainment of the demonstrated capabilities by DISA through FY09 until transition to programs of record in FY10. TSP outcome will enable broadband communications between strategic information sources and tactical users as well as between tactical users. The expected output is wideband communications supporting two-way, high-bandwidth services for tactical users using a hybrid architecture of emerging, standards-based SATCOM and wireless technologies by delivering robust lightweight commercially available applications, DoD tactical applications, and emerging Net Centric Enterprise Services (NCES) applications through demonstration and testing in a simulated, mobile tactical environment. The expected efficiency is substantial increase in delivery of tactically relevant command and control and intelligence-related information products to land mobile troops, and the near real time delivery of tactically generated information to operational and strategic echelons. TSP is a two year ACTD co-sponsored by USCENTCOM and USJFCOM. The Defense Information Systems Agency (DISA) is the lead agency.

- FY 2007 Output: The technical focus for TSP was on implementing emerging digital broadcast protocol standards for forward SATCOM link, using emerging Joint Internet Protocol (IP) Modem standard and a new satellite protocol standard for return SATCOM link, achieving two-way Bandwidth on Demand, and the addition of a Global Broadcast Service (GBS) terminal appliqué using IEEE standard 802.16 for two-way wireless communications extension. TSP expected efficiencies include a 38% improved bandwidth efficiency over existing digital broadcast standard in use today, decreased size and weight of equipment required by mobile tactical sources to send and receive relevant information, and measurable real- or near-real-time transmission of intelligence collection products from deployed forces back to operational and strategic users. Two demonstrations are planned for the fourth quarter of FY07: the first two-way IP SATCOM communications over the improved GBS terminal prototype; the second a "WiMax" (802.16) wireless extension of communications connectivity from the improved GBS terminal. From an operational viewpoint, these demonstrations will establish the new baseline for bi-directional high bandwidth satellite communications, and provide early limited military utility assessment of the technologies. Programmatically, the operational and technical teams will be obtaining approval of the Implementation Directive and developing the Concept of Operations (CONOPS) and the integrated assessment plan.
- FY 2008 Planned Output: There are two additional demonstrations are planned for FY08: the first showing the use of "lightweight" commercial applications of tactical utility over the SATCOM-wireless extension; the second and final demonstration will show Defense Information System Network (DISN) tactical Net Centric Enterprise Services (NCES) over the SATCOM-wireless extension. Operationally, TSP will ratify the planned migration to services architecture in tactical implementation by providing wirelessly extended broadband communications to the mobile, dismounted Warfighter. The efficiencies expected include enhanced situational awareness, real- or near-real-time intelligence sharing, a more agile and effective combat force with collaborative capabilities at the "tactical edge" to and from mobile troops.
- FY 2009 Planned Output: DISA will sustain the demonstrated and militarily useful capabilities while finalizing the documentation and transition of functionality to programs of record. The ACTD will complete in FY2009.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Large Data	1.745	9.100	9.000

The Joint Requirements Oversight Council (JROC) validated the capability need for the Large Data (LD) Joint Capability Technology Demonstration (JCTD) as an FY06 new start. The outcome of Large Data is to demonstrate the military utility of a highly scalable, rapid, and secure integrated capability to retrieve, store and share massive amounts of information effectively between global users. It will provide increased situational awareness by displaying large, fused sets of geospatially-referenced data in a Joint Warfighting context using intuitive navigation techniques. Large Data is a three-year project under the sponsorship of the United States Strategic Command. The primary outputs and efficiencies to be demonstrated in the JCTD Military Utility Assessment are: 1) Synchronized databases across all major operational storage nodes, i.e. cache coherency; 2) Timely delivery and sharing of data - instant real time access and collaboration; 3) Intuitive way for users to navigate large data sets (petabytes to exabytes); 4) Ability to easily visualize huge amounts of data that is being generated; 5) Capability to perform "trackback" or change analysis on an unprecedented scale.
The user sponsor is the U. S. Strategic Command and the lead agencies are the National Geospatial Agency (NGA) and Defense Systems Agency (DISA). Transition is planned for FY 09 after

successful JMUA to National Geospatial Agency (NGA) and Defense Systems Agency (DISA). Both agencies are participating in the JCTD as Co-Transition Managers. The Large Data JCTD is scheduled to complete in December 2008.
- FY 2007 Output - Spiral 2: Develop holistic target characterization prototypes and deploy to USFK mini node. Add 4th CONUS node. Install Trans-PAC link. Develop capability for geo-temporally indexed multi-agency data, with security, identity management, and Continuity of Operations features. Perform multi-node testing on classified and unclassified networks. Provide large geospatial visualization displays and advanced data integration. Refine CONOPs and TTPs. Plan JMUA. Conduct demonstration in USFK and JEFX.
- FY 2008 Planned Output - Spiral 3: Provide capability to the edge -- from COCOMs to low bandwidth users. Refine software with advanced geospatial and temporal search capabilities. Add a Zoomable User interface. Apply for JWICS accreditation. Add metadata tagging enhancements. Provide large data capacity to xESSA, JCRE ACTD and other net-centric capabilities. Conduct JMUA.
- FY 2009 Planned Output - JMUA reporting and Extended Use in preparation for integration and transition into program of record. Complete the JCTD.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Joint Precision Air Drop System (JPADS)		1.200	

The Joint Requirements Oversight Council (JROC) validated the capability need for JPADS as an FY04 new start. The outcome of JPADS is to demonstrate a fast, flexible, direct projection-based distribution system to sustain rapidly deployed forces at any global destination - strategically, operationally, and tactically. The primary output and efficiencies are to demonstrate a high-altitude (25,000 ft. Mean Sea Level (MSL)) autonomous offset airdrop capability (goal 8-25 miles offset) with the option to deliver separate and distinct payloads (up to 10,000 lb total, full rigged weight, minimum of 8.5Klbs of usable payload) to multiple locations from one release point to within a 250 meter (threshold) Circular Error Probable (CEP) (50 meter CEP objective). This effort focuses Army and Air Force programs and initiatives on meeting joint airdrop requirements. JPADS will provide a seamless and flexible system of systems approach, providing materiel resupply capabilities to meet dynamic in theater operational requirements and the strategic requirement of the CoComs worldwide no later than 24 hours from the request. JPADS is a four-year project with completion of the Advanced Concept Technology Demonstration (ACTD) development and demonstration by end of FY 2008 transitioning to United States Army (USA) Program Manager Force Sustainment Systems (PM FSS), U.S. Air Force (USAF) Mobility Systems Wing systems (Mission Planner (MP) hardware) and the USAF Electronic Systems Command (MP Software) by FY 2008. Transition accomplished to date: USAF Mission planner to both Afghanistan and Iraq, ongoing integration of MP into the Marine Corps C130J and into USSOCOM/USMC navigational aid for Military Free Fall (MFF) systems.

Planned Transition: Transition high-altitude, aircraft deployable, autonomous, airdrop systems, and in-flight mission planning with wireless communication to guidance, navigation, and control systems to USA PM-FSS and USAF PMs. Plan for and execute a potential rapid combat fielding of the residual 10K JPADS decelerator systems to Afghanistan and/or Iraq.

- FY 2007 Output - Refer to the ACTD R2a.

- FY 2008 Planned Output. Transition residual systems to USA or USAF units in CONUS and deliver to those services in the AOR requesting the residual systems by an approved ONS/MNS. Continue to execute interim transition with users in conjunction with PORs to include training and numerous weeks of airdrops with remaining systems available. Execute the first of three planned extended user evaluation (EUE) during DoD and NATO sponsored Precision Airdrop Technology Conference and Demonstration (PATCAD) 22-26 Oct 07. JPADS scheduled completion date is September 2008.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Chemical Unmanned Ground Reconnaissance (CUGR)		1.700	

The Joint Requirements Oversight Council (JROC) validated the capability need for CUGR as an FY05 new start. The outcome of CUGR is to provide manned nuclear, biological and chemical

(NBC) reconnaissance units with two new technology applications to be demonstrated in the Joint Service Light NBC Reconnaissance System's (JSLNBCRS) High Mobility Multipurpose Wheeled Vehicle (HMMWV) variant providing an unmanned capability. The first of these new systems (Thrust One) will replace the Double Wheel Sampling System (DWSS), currently in use, with a mobile Mass Spectrometer, using RAMAN technology. Since the DWSS can only be used when the vehicle is moving at a fast walk, replacing it with the RAMAN detector, which is producing reliable results at maximum vehicle speed, greatly increases mobility and flexibility for these units. The second technology (Thrust Two) is the incorporation of a small, remote controlled, sensor-equipped robot to be the recon crew's "point man" in high risk contamination reconnaissance. The efficiency of CUGR will be to utilize a machine rather than put a soldier at risk. CUGR addresses the capability gaps identified in the CBRN Baseline Capability Assessment, the JRO-CBRN Defense Mobilization Plan, and the supporting JCIDS Functional Area Analysis. Thrust One will transition as part of the Reconnaissance and Platform integration sensor block upgrade program and replace DWSS on Stryker, HMMWV and LAV vehicles. Thrust Two will become part of the Joint CBRN Dismountable Reconnaissance System (JCDRS). DTRA provides overarching program management. The Technical Manager is the U.S. Army Research, Development and Engineering Command's Edgewood Chemical and Biological Center. The Joint Program Executive Office for CBD assigned the Joint Product Manager for NBC Reconnaissance as the Transition Manager. The U.S. Pacific Command is the ACTD sponsor with Operational Manager responsibility with the U.S. Army Pacific who is providing the 95th Chemical Company as the ACTD demonstration unit. ACTD will complete in FY 07. Outputs will be: to increase maneuver speed to 45 kph vice 11-22 kph: allow detection/identification of various classes of substances simultaneously vice one at a time; reduce mission consumables; enable reconnaissance into areas that otherwise would be inaccessible by manned vehicles; can be deployed into hazardous environments; offer a point detection capability; and provide the ability to collect liquid, solid and aerosol samples.
- FY 2007 Output - Refer to the ACTD R2a.
- FY 2008 Planned Output - Provide two JCSD equipped CBRN Reconnaissance platforms and 2 CUGR's for residual phase support to the 95th Chemical Company (CMLCO) and initiate Extended User Evaluation. Complete mounted CUGV system design and integration on the third JSLNBCRS. Conduct mounted CUGV early user assessment. Complete CUGV test methodology development as well as the technical manual and user training plan. Conduct mounted CUGV technical and operational demonstrations. Receive integrated system and complete the ACTD. Develop documentation and planning for Thrust One installation and transition to Stryker vehicle (new request from U.S. Army). The ACTD will complete in FY2008.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Airborne Weapons Surveillance System (AWSS)	2.800	0.800	3.100

The Joint Requirements Oversight Council (JROC) validated the capability need for AWSS as an FY07 new start. The output of AWSS will be to demonstrate a capability to immediately detect enemy artillery, rocket, and mortar fires, and relay locations of enemy firing units to coalition counter-fire systems. The JCTD will use advanced staring non-imaging infra-red wide field-of-view detectors, together with electro-optic video, aboard unmanned air vehicles. The efficiencies of the AWSS system will be to detect artillery fires at ranges of 20 km or greater, locate the artillery within 100m, classify artillery type (152mm, 170mm, 240mm), and immediately transmit location and classification data. The capability will be demonstrated and assessed in forward areas using a Republic of Korea (ROK) unmanned air vehicle, and technical tests will be conducted in Continental U.S. using U.S. Army manned and unmanned air vehicles.

FY 2007 and 2008 Output: Concept operations, demonstration program definition, integration program coordination, component build.test, and system integration.
FY 2009 Planned Output: Operational testing and demonstration. The final demonstration and project completion will be in FY 2009.

Transition Strategy: U.S. Army intends to transition AWSS capabilities for U.S. Army unmanned air vehicle applications, pending successful military utility assessment. ROK will assess development of ROK version of AWSS, based on results and lessons of AWSS demonstrations in Korea.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Joint Surface Warfare (JSuW)	1.300	5.000	5.000

The Joint Requirements Oversight Council (JROC) validated the capability need for JSuW as an FY07 new start. The output of the JSuW JCTD will be to allow multiple existing Intelligence,

Surveillance, and Reconnaissance (ISR) assets, launch platforms, and standoff weapons to communicate via maturing weapons data link network technologies. The efficiency will be that Joint ISR platforms may provide initial targeting data and in-flight targeting updates to standoff weapons while the launch platform either remains beyond or decreases time inside the threat envelope. As a result of this interaction via the weapons data link network, the Combatant Commander will be provided multiple options for joint kill chains to increase operational agility, and have significantly extended space in which surface targets may be successfully prosecuted.

FY 2007 and 2008 Output: Deliverables will include documented Concept(s) of Operation (CONOPS), Tactics, Techniques, and Procedures (TTP), and software changes to operational flight programs aboard demonstration ISR platforms. The final demonstration will be in FY 2009 and JCTD Completion will be in FY 2010.

Transition Strategy: Following the demonstration, validated software will be readily available to incorporate into additional assets via each individual acquisition program's mode of software push. CONOPS and TTP will be disseminated to the Services through their respective training commands to capitalize on enhanced capabilities. All platforms and weapons involved are currently Programs of Record, and no substantive hardware changes will be made to these assets in the course of the JCTD.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Global Observer (GO)	7.391	7.348	10.000

The Joint Requirements Oversight Council (JROC) validated the capability need for Global Observer as an FY07 new start. The Global Observer JCTD is a transformational technology program that proposes to demonstrate a liquid hydrogen powered unmanned aerial vehicle, using a modified, off-the-shelf internal combustion engine, capable of flying extremely long endurance (objective of 7 days on station) with a moderately sized payload capacity (380 lbs) at an altitude of 55-65,000 ft. mean sea level. The output of Global Observer will be to provide low-cost persistent surveillance (ISR). The efficiencies of Global Observe will be a long endurance capability that would support placing system into theater from garrisoned locations, reducing the number of forward bases required for world-wide operations and relieving the optempo from other overstressed assets.

FY 2007 and 2008 Output: The design, development, fabrication, integration, and testing of 1 GO UAS, to include 1 air vehicle and 1 launch and recovery element (LRE). The final demonstration and JCTD completion will be in FY 2010.

Transition Strategy: The residual package will be transitioned to Air Force Special Operations Command for extended use starting in FY 2011 to support its core mission of intelligence, surveillance, and reconnaissance with the persistent operations using the Electro-Optics/Infrared and communications relay payloads. Pending Joint Requirements Oversight Council validation of the capability requirement, the Air Force Air Combat Command will program funding in the FY 2012 POM to transition Global Observer to the Combined Air Force.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Zephyr		6.100	

The Joint Requirements Oversight Council (JROC) validated the capability need for Zephyr as an FY07 new start. The Zephyr JCTD is a transformational technology program that proposes to demonstrate and transition into service a solar-powered unmanned aerial vehicle to meet urgent operational requirements for USCENTCOM and USEUCOM. The output of Zephyr will be to provide low-cost persistent surveillance and communications relay, flying continuous operations for periods of months at a time using solar power plus batteries for continual day/night operations. The efficiencies of Zephyr's sensors will provide ground radio communications links over hundreds of square miles and surveillance of logistics routes and ground threats. Zephyr is hand launched and requires no formal infrastructure and little manpower to operate. Zephyr solution provides cross-theatre benefits to all U.S. Forces.

FY 2007 and 2008 Output: The development of the JCTD Integrated Assessment Plan (IAP) to include: (1) providing day to day operational management through close coordination with the JCTD

Technical and Transition Managers; (2) development and validate Concept of Operations (CONOPS); Concept of Employment (COE); Tactics, Techniques, and Procedures (TTPs), and associate Training Support Packets (TSPs) as needed; (3) management of the assessment activities in support of a military utility decision. Funding also includes support provided by the Operational Test Agency (OTA) to conduct assessments, the Assessment Execution Document (AED). The final demonstration is FY 2008. JCTD Completion: FY 2008

Transition Strategy: Aggressive transition to production is demanded by a USCENTCOM urgent operational requirement in theatre. The Zephyr team is working with QinetiQ North America to transition Zephyr to a U.S. production partner.
Suppliers: U.S. and U.K. managers will implement post-JCTD acquisition strategies for all procurements (notably two cutting-edge U.S. technologies/solar array and battery). Residuals: 2 x Zephyr high-altitude, long-endurance unmanned aircraft systems complete with payloads and ground stations. Training package will include deployment procedures and techniques, user maintenance manuals, and concept of operations/tactics.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Communications Air-Borne Layer Expansion (Cable)		4.500	4.500

The Joint Requirements Oversight Council (JROC) validated the need for CABLE capabilities as a FY08 new start. The outcome of CABLE is to develop and demonstrate: an airborne backbone network for interoperable IP-based, high-capacity data transfer through secure gateways between Services_ networks. The capabilities proposed for development in this ACTD will improve _tactical edge_ networks capacity and redundancy, provide bandwidth for mobile or stationary wireless users, and enable users at the tactical edge to connect with one another. CABLE JTD is a three-year project under sponsorship of U.S. Strategic Command, with completion of development and demonstration by end of FY2010; and transition to U.S. networking systems as early as FY2011. The lead services are Navy and Air Force. The primary outputs and efficiencies to be demonstrated in the ACTD Military Utility Assessment (MUA) are: 1) improved "tactical edge" networks capacity and redundancy, (2) increased bandwidth support to mobile or stationary radio-frequency connected users, services and applications, and (3) users at the tactical edge able to connect seamlessly to network services. CABLE output is interoperability of emergent Service networking architectures with users at the tactical edge from one Service able to take advantage of other-Service provided ground entry points. The efficiency is that Warfighters will be able to interoperate in a complex or austere operational environment, using emergent joint data standards. Combatant Commanders will be able to extend modern mission applications for collaboration and situational awareness to airborne Warfighters, leading to improved situational awareness and shorter operational timelines. The efficiency is that the Warfighter will possess flexibility and a broader range of options with a greater assurance of success. CABLE is targeted for transition to the Air Force Battlefield Airborne Communications Node (BACN), Navy Automated Digital Network System (ADNS), Army Warfighter Information Network-Tactical (WIN-T) Aerial Layer, the Multi-Role Tactical-Common Data Link (MR-TCDL) standard, and common Tier 3 Enterprise Services. Transition Managers: USAF Objective Gateway and USN Automated Digital Networking System.

- FY 2008 and 2009 Planned Output - Interim initial gateway prototype connecting data links and voice systems.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Multi-Function Threat Detector (MFTD)		2.500	2.500

The Joint Requirements Oversight Council (JROC) validated the need for MFTD capabilities as a FY08 new start. The output of MFTD will be to provide indication, warning, or situational awareness to the pilot or aircrew of non-guided threats such as small arms fire, tracer fire, anti-aircraft artillery fire, and rockets/rocket propelled grenades (RPGs). The efficiencies of MFTD will be to reduce significant and unacceptable vulnerabilities to highly proliferated battlefield threats to include MANPADs, RPGs and Unguided Rockets (UR). MFTD JCTD expands aircraft MWS to include Hostile Fire Warning (HFW) from MANPADS, RPGS, URs and incoming Surface-to-Air Fire from small arms to Anti-Aircraft Artillery. MFTD will develop software algorithms to detect, characterize, and display unguided threats to the aircrew. MFTD plans to develop an infrared micro-lens optics package that provides simultaneous spatial and temporal co-registration of spectral images. The HFW algorithm will not degrade the current operational performance of the Missile Warning (MW) or LW Sensors.

FY 2008 Output: Will conduct the MFTD module demonstration: MFTD module mounted on tripod and tested against HFI threats. Test data acquired and analyzed.
FY 2009 Planned output: MFTD will be integrated into AAR-47 sensor head as HFI detector demo with the planned demonstration venue at China Lake. It will test the HFI system installed in a remotely controlled helicopter in self-powered hover under realistic flight loads and against actual threats at and around the helicopter in-hover to assess accurate HFI. Record measured data to determine project operational utility, provide for system integration, and expedite flight qualification. The MUA plan currently being drafted in coordination with COMOPTEVFOR. The final demonstration will be in FY 2009. JCTD Completion: FY 2010

Acquisition/Transition Strategy: MFTD JCTD will transition into both Navy and Army Programs of Record. First, the MFTD module will be integrated into the AAR-47B(V)2 sensor, and fielded to those aircraft that currently are outfitted with the AAR-47. Also, it will be transitioned into the Joint and Allied Threat Awareness System (JATAS) program. JATAS will be the Army's primary MW, LW, HFW system for cuing counter measures dispensing systems as well as Directed Infrared Countermeasures systems. Army's funding will integrate the MFTD module into the AAR-57 MWS.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
CORPORAL		5.000	5.000

The Joint Requirements Oversight Council (JROC) validated the need for CORPORAL capabilities as a FY08 new start. The output of CORPORAL will be to provide ground-based, deployed Marines and Soldiers with the capability to take full advantage of tactically relevant sensor data, Command & Control (C2), and Electronic Attack (EA) in near real time.
Specifically, Non-Traditional ISR (NTISR) "on-demand" to the ground unit; beyond Line of Sight connectivity maximizing opportunity for collaboration or synchronization; distributed operations demand faster responses and necessitate providing greater capability to existing aircraft rather than introducing new aircraft; greater joint service capacity from existing and planned EA assets and platforms. The efficiencies of the CORPORAL JCTD will be to decentralize the data to share openly across systems allowing airborne and ground-based tactical systems to be connected. The result is a greatly improved/expanded communications range and availability so that critical data/information can be shared with other warfighters allowing collaboration and visibility to higher authorities. This will provide the ground forces with a beyond-line-of-sight (BLOS) connectivity to ISR resources (traditional and non-traditional) that they do not have today. This JCTD will provide a collaborative distributed data and information exchange framework based on existing and planned warfighters' communication waveforms.

FY 2008 Output: Litning pod hardware and network pods. Payload integration and field testing.
FY 2009 Planned Output: Operational Assessment, Concepts of Operations and Joint Military Utility Assessment. The JMUA will be in FY 2009. JCTD Completion: FY 2010.

Acquisition/Transition Strategy: Will transition to USN NAVAIR -234 and PMA 272 (USMC Aircraft); Program of Record (POR): Lightning Pod, Shadow 200, Tier II UAS, MV-22 and USMC Aircraft (PMA-272).

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Shadow Harvest		5.000	5.000

The Joint Requirements Oversight Council (JROC) validated the capability need for SHADOW HARVEST as an FY08 new start. The outcome of the SHADOW HARVEST JCTD is to provide Combatant Commands an integrated, joint airborne capability to provide persistent surveillance to consistently, accurately and efficiently find, fix, track and target enemy assets obscured by weather, vegetation, camouflage, concealment and/or deception (CC&D). The program leverages the Defense Intelligence Agency's (DIA) SHADOW HARVEST C-130-based program along with several maturing sensors and relevant networking/data fusion/recognition technologies. SHADOW HARVEST will provide a timely and low cost C-130-based approach to integrate, operationally deploy, and demonstrate new sensor processing, exploitation, and dissemination (PED) capabilities into the intelligence production cycle and will require fewer personnel, reduce or eliminate dependence on specialized collection platforms, mitigate the problems associated with equipment standardization and minimize the impact on the maintenance infrastructure. The goal of this JCTD is to transition a

mature system, architectures, flexible adaptive CONOPS and platform which will allow for flexible airborne remote sensing in a tactical or irregular warfare environment. SHADOW HARVEST will be compatible with intelligence community, DoD and COCOM requirements and will provide a rapid to-the-field development capability for future sensor systems.

SHADOW HARVEST is a two-year project sponsored by USSOUTHCOM, and the JCTD is scheduled to be complete by the end of FY 2009. It will transition to selected Program Manager(s) / Program of Record(s) by FY 2012. The lead service is the US Air Force. The DIA is the lead agency responsible for organizing a multi-agency, multi-service team for the JCTD. The primary outputs and efficiencies of the JCTD Joint Military Utility Assessments are: (1) Conduct multiple airborne mission demonstrations against challenging CC&D/OTs using a tailorable C-130 multi-sensor system complete with on-board multi-phenomenology data fusion and ground PED, (2) Demonstrate and assess sensor cross-cueing/collaboration techniques for both baseline/new electro-optical/radar sensors and maturing MASINT sensors (to include low frequency/Multi-Band Synthetic Aperture Radar (MB-SAR), and hyperspectral imaging (i.e., Spectral Infrared Remote Imaging Transition Testbed (SPIRITT)), (3) Demonstrate dynamic in-flight mission tasking against emerging/evolving target sets, (4) Publish an OUA of the capabilities demonstrated and develop joint CONOPS and TTPs for COCOM target sets that will help the MAJCOM to develop sensor-mix strategies for COMCOM Target sets/missions and develop theater specific CONOPS to enable new collection capabilities to be integrated into the COCOM intelligence production cycle, (5)Maintain operation readiness, in flight status, for Extended Use of Residuals (EUR) assets to include a DIA SHADOW HARVEST system available for USAF and DIA tasking until transition to POR.

- 1Q FY 2008 Accomplishments _ Successfully completed second test flight series in December 2007. Conducted flight support to US NORTHCOM by conducting flights over burned areas from October 2007 California wildfires. Conducted demonstration of concept of support to USNORTHCOM_s Operation CLEAR VIEW requirements and DoD Support to Civilian Authorities (DSCA).

- FY 2008/2009 Planned Activities - Coordinate Implementation Directive and Management Plan (to include initial transition plan) and begin final system integration activities. Coordinate and plan demonstration activities to USSOUTHCOM AOR. Complete the JCTD in FY2010.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Joint Web-enabled Training & Rehearsal System (JWTRS)		2.689	3.000

The Joint Requirements Oversight Council (JROC) validated the need for JWTRS capabilities as a FY08 new start. The output of JWTRS will be to provide capability to conduct rapid mission planning, rehearsal and training in a virtual, geo-specific, 3D "Real World" environment to prepare the warfighter to operate effectively in a complex, joint, combined and inter-agency combat environment. JWTRS efficiencies include: Language & Cultural Training for training the warfighter; Ability to deploy in unfamiliar regions/areas, with a better language and cultural understanding; Core Enterprise System - The ability to build a flexible and scalable core with ability to add interoperable modules will dramatically reduce cost future development costs; Rapid Mission Rehearsal software that will ingest various national intelligence terrain data sets to allow for the rapid creation of accurate geo-specific locations (These data sets include LIDAR, photographs, satellite imagery, DTED etc); Tools that allow operators to create their own mission rehearsal and training scenarios; Language & Culture Training - Cultural/Religious exposure with user defined scenarios, varying levels of difficulty and specific cultural objectives. Obtain and maintain proficiency in language skills and knowledge in real countries and cities; and Advanced Training Capability - A federation of systems that can be used in any combination on demand, at home, en-route, or deployed, to support Special Operations Forces.

FY 2008 Output: Begin Implementation Directive, Management Plan, Transition Plan and CONOPS development. Spiral 1 Limited Utility Assessment (LUA) - Demonstrate RealWorld gaming engine with limited operator stations.
FY 2009 Planned Output: Spiral 2 LUA Demonstrate gaming engine with SOF CDB, multiple operator stations and Govt CGF. In FY 2010 final demonstration of full capability of mission rehearsal generation from mission planning tools. Final MUA & Transition. JCTD Completion: FY 2010.

Transition: Spiral transitions are planned. FY08: SEAL Deliver Vehicle and Predator Desktop Trainer (DTT); FY09: Spiral 1 RealWorld Platform, C-130, MH-60 Blackhawk, Signals Intelligence DTT, Language & Culture Trainer; FY10: Deception and Littlebird DTT, Spiral 2 RealWorld Platform/Tools.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Joint Force Protection Advanced Security System (JFPASS)		4.000	4.000

The Joint Requirements Oversight Council validated the capability need for JFPASS as an FY08 new start. JFPASS addresses the validated problem that current force protection technologies and concepts of operation do not provide a comprehensive, effective, and sustainable Joint force protection capability. Fielded systems do not provide comprehensive situation awareness, absorb too much manpower, and are too costly with many variants and redundancies. The outcome of JFPASS is to demonstrate and transition an integrated joint force protection Command and Control architecture, providing rapid situation awareness where needed, decision support, and more effective force protection with reduced workload through systems integration. The primary outputs and efficiencies to be demonstrated in the JCTD are: 1) numbers of currently distinct force protection systems that are integrated for common situation awareness; 2) decreased time required to provide situation awareness to all in chain of command with force protection response missions; 3) decrease in operations center manning and workload required to maintain force protection situation awareness and manage situation responses. JFPASS is a 3-year project sponsored by US European Command. The project will conduct an initial demonstration and limited assessment after one year, to be followed by in-theater installations and operational utility assessment in the second year. Army, Navy, and Air Force force protection experts are participating and contributing funding and expertise to the demonstration of this Joint force protection capability. The US Navy is providing the Technical Manager, US Air Force provides the deputy Technical Manager, and US Army provides the Transition Manager. This project is aligned with the Joint Staff Installation Unit Base Integrated Protection Capabilities Based Assessment process.

- FY 2008 Planned Output - Conduct experiments to assess situation awareness and systems integration concepts for access control, vehicle inspection, intrusion detection, unmanned sensor, waterside security, and CBRN systems. Integrate selected technologies and conduct CONUS-based limited assessment.

- FY 2009 Planned Output - Refine situation awareness and systems integration architecture. Install integrated capability at high priority EUCOM-selected base. Conduct technical demonstrations and operational demonstration for operational utility assessment. Complete the JCTD in FY2010.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Hard Target Void Sensing (HTVS) Fuse		5.000	5.000

The Joint Requirements Oversight Council (JROC) validated the capability need for HTVS as a FY08 new start. The HTVS Fuze JCTD incorporates two significant features: (1) Capability to count voids and detonate at the optimal point, (2) Capability to survive and function in today's harder target environments. The HTVS business model provides a fuze approach that is applicable to the BLU-109, BLU-113, and BLU-122 legacy warheads. The JCTD will provide warfighting commands a proven capability with a number of residual mission ready fuzes in 31 months. The acquisition strategy allows a smooth transition from the JCTD to Systems Development and Demonstration (SDD) in FY10 followed by production. The U.S. Navy also has a requirement for this capability and has agreed to fund part of the JCTD in FY09. To date, the HTVS Fuze JCTD has accomplished the following: Management transferred from AAC/XRS to 708 ARSG; Sufficiency review for FY09 APOM initiative to fund JCTD complete; Sufficiency review for FY10 POM for SDD, Production and Sustainment completed; Acquisition Strategy for entire HTVSF Program Approved.

FY 2008/2009 Planned Output: The focus of the government team will be on completing the source selection in late February 2008 and awarding two contracts in March (08) for a 27 month rolling down-select to one contractor for SDD and Production. The formation of HTVSF team to include roles and responsibilities of all stakeholders will be paramount as will completing the required documentation for the JCTD. The focus will initially be on Modeling and Simulations (M&S) in the appropriate target environments for the BLU-109 and BLU-113 warheads. The contractors will be refining void sensing modules to ensure effective operation. Initial sub-scale testing and possibly sled testing will be conducted in an effort to refine M&S models. Additional tests will include ground testing, cannon tests; and flight tests.

- FY 2010 Planned Output: As the down-select to one contractor approaches the contractors will be required to meet the governments' exit criteria for the HTVSF JCTD. The fuze must (1) Survive and function during a fuze demo while penetrating 10K+PSI targets, (2) Demonstrate successful capability for detecting and counting more than one void during target penetration (3) Demonstrate time-delay capabilities, (4) Demonstrate cockpit programmability (5) Demonstrate trend toward affordability goal. In the 3rd qtr. 2010 will award a 33 month SDD and production contract for 5000 units. Complete the JCTD.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Combat Autonomous Mobility System (CAMS)		4.610	4.485

The Joint Requirements Oversight Council (JROC) validated the capability need for CAMS as a FY08 new start. Special Operations Forces (SOF) are operating for extended periods in wide ranging, austere, non-permissive areas against larger forces; all with resource constrained manpower. The CAMS JCTD output will provide robust organic capability to conduct: Timely Intelligence, Surveillance, and Reconnaissance (ISR); Command and Control of multiple assets over extended distances; Automated mobility in support of SOF mission profiles. In short, CAMS will provide the technology to force multiply the available manpower.

The CAMS JCTD efficiencies will integrate ground-based autonomous technology to leverage current SOF manpower. The system will employ mature sub-components to extend ISR range and targeting coverage, improve Joint fires support, C2 multiple unmanned ground and air systems, and provide automated support for multiple SOF mission profiles.

FY 2008 Planned Output: Develop the Implementation Directive, Management Plan, CONOPs, Transition Initiation, Build & Deliver Platforms, IAP, TLOE #1, Demonstration #1.
FY 2009 Planned Output: TLOE #2, Demonstration #2 - Military Utility Assessment - final demonstration: 4th Qtr FY 2009. JCTD Completion: FY 2010.

Transition Strategy: CAMS technology will transition to Program Executive Office - SOF Warrior. Robotic Systems _ Joint Program Office is postured to manage the USSOCOM Program of Record.

C. Other Program Funding Summary	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
ACTD PE 0603750D8Z (RDT&E/DW BA-3/Line #44)	158.313	1.589					
JCTD Transition PE 0604648D8Z (RDT&E/DW BA-4/Line #83)	3.029	2.934	14.962	18.911	18.886	19.917	19.959

Comment: In FY08 all ACTD funding transferred to the JCTD program. This action completes the transition to the JCTD model that began in the FY06 President's Budget. The new JCTD Program provides a "cradle to grave" path for transformational joint capabilities. The initial funding lines (program elements (PE)) are outlined in the table below. The PEs in the table (with the exception of the ACTD BA3 PE which will fully transfer to the JCTD BA3 PE in FY08) represent the JCTD model. The model contains a BA3 development arm as well as BA4 transition arm. Under the new JCTD process, the pace of development will be accelerated to two to three years. Only the ACTD/JCTDs that demonstrate the highest military utility will be considered for the transition funding in the JCTD BA4 Transition PE. Not all JCTDs require transition funding, many projects have a very clear transition path, however, some projects that demonstrate significant military utility require transition funds to "bridge" them to a program of record. Promising ACTDs may receive transition funding during the transition period to the JCTD program. Beginning in FY07 all new starts will be JCTD only. Refer to the specific Budget Exhibit for more details on each funding line.

D. Acquisition Strategy The strategy for ACTDs and now JCTDs has always been to focus on developing a transition path into a program of record or to establish a new program for those projects that show significant military utility in the demonstration phase. The following questions are used for the selection of compelling JCTD capability projects:
- Does the action address COCOMs needs?
- Is a Joint capability or military advantage gained?
- Do we have a clearly stated and attainable goal?
- Have risks and costs been fully and frankly analyzed?
- Have all other DOTMLPF means been fully explored?
- Is there an exit strategy to avoid endless development?
- Have consequences of inaction been fully considered?
- Can genuine support be garnered from interested partners?
- Are experienced people available to execute the effort?
- Can results be demonstrated to the project champion?

Under the new JCTD program, only the ACTD/JCTDs that demonstrate the highest military utility will be considered for the transition funding in the JCTD BA4 Transition PE. Many JCTDs will transition smoothly into a well identified program of record and not require funding from the transition PE (the transition arm of the JCTD model). Promising ongoing ACTDs may also receive transition funding from the JCTD Transition arm as the ACTD program completes. All ACTD funding will transfer to the JCTD program element in FY08. Beginning in FY07 all new starts will be JCTD only. Some initiatives that are successful but are having smaller problems transitioning to an identified program of record may receive "pre-transition" funding from the JCTD BA3 PE. JCTD metrics and guidelines are:
- Capability Based: Greater CoCom influence looking at nearer term joint/coalition needs
- Provide Spiral Technologies - 25% will provide an operationally relevant product demonstration within 24 months of ID signature.
- Agile Demonstration - 75% complete final demonstration within three years of ID signature.
- OSD provide significantly more funding (often greater than 30%). In some exceptional cases a majority of project funding, especially during the first two years
- JCTDs not necessarily tied to an exercise. Greater flexibility to establish military utility via operational "real-world" demonstration or specifically designed test/venue
- 80% of JCTDs transition at least 50% of their products to sustainment.

E. Major Performers Not applicable for this item.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE
RDTE, Defense Wide BA 03	**0603662D8Z - Networked Communications Capability**

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		14.871	39.923	28.727	26.302	26.697	27.266
P662	Airborne Network Gateway		7.435	19.962	8.915			
P663	Network Communications Analysis		7.436	19.961	19.812	26.302	26.697	27.266

A. Mission Description and Budget Item Justification: (U) War-fighters today rely more and more on communications networks to support and enable actions from targeting and shooting weapons to video-conferencing back home. Though military basic infrastructure capabilities follow the mainstream commercial internet, for many reasons (security, mobility, robustness), commercial telecommunications especially commercial wireless (tactical edge) communications are not well-matched with the requirements of today's war-fighter. These trends will continue as the military data load becomes more diverse and heavy. The National Research Councils Network Science Report (2005) and Army Mobile Ad-hoc Network (MANET) Jason Report (January 2006) state that the type of networking projected to meet military tactical requirements are not supported by network theory, network design nor analysis tools. These tactical edge technology challenges cut across all warfare domains (space, air, ground, sea). In response to recognized technical problems today, as well as anticipated problems in the future, this research will focus on two key problems in networked technologies: the need for expanded wireless reach where no communications infrastructure exists, and the need to create ways to manage diverse wireless communications load and heterogeneous network types. Airborne Network Gateway will expand the wireless communications and networking reach for the tactical force in the form of an airborne network gateway capability. Network Communications Analysis will establish the scientific foundations for military tactical mobile networking with a specific emphasis on the integrated network management of tactical networks. This research will provide the technical basis to standardize the implementation of military network communications capabilities in the areas of airborne network gateways and network communications analysis across the military services, joint staff, OSD, and defense agencies.

B. Program Change Summary	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2008)		40.000	40.000
Current BES/President's Budget (FY 2009)		14.871	39.923
Total Adjustments		-25.129	-0.077
Congressional Program Reductions		-25.129	
Congressional Rescissions			
Congressional Increases			
Reprogrammings			
SBIR/STTR Transfer			
Other			-0.077

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
08	Net-Centric Warfare/Joint Interoperable Communicat	Experimental relays and gateways; Non-federated, modest laboratory test beds; no joint network man	Prototype relays and gateways; Completion of init	TBD (new start)	Completion of initial federated test beds; demonst	TBD (new start)

Comment: Network Communications Analysis comprises multiple research efforts which are just under development as of this writing. Metrics for success for the overall effort will be in the modes of infrastructure development and knowledge generation, and be measured according to the quality and relevance to the topic. Metrics for individual research initiatives will vary according to the mode, but will include performance, quality, relevance and the generation of human capital at a minimum. Lastly, technology selection and transition will be assessed according to success or failure for each of the sub-project areas.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDTE, Defense Wide BA 03	**0603662D8Z - Networked Communications Capability**	**P662**

COST ($ in Millions)	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P662 Airborne Network Gateway		7.435	19.962	8.915			

A. Mission Description and Budget Item Justification: Airborne Tactical Relay - (U) An airborne tactical relay capability enables Beyond Line of Sight (BLOS) range extension for tactical mobile communications. Within the current deployed forces there is no airborne network tier to support locally distributed ground and naval forces at lower tactical levels. The need to increase the capability to support tactical forces at lower levels is highlighted in the 2006 Naval Research Advisory Committee (NRAC) Distributed Operations Study. The current lack of an airborne tactical relay limits BLOS tactical communications to available satellite communications. This research will develop, integrate and demonstrate airborne tactical relay technology to support locally distributed tactical forces and achieve improved near-term networked communications capability. Focus will be placed on the transition from research to acquisition for accelerated fielding. Several candidate payloads and platforms will be investigated to meet the needs of the tactical military user at the lower tactical network tiers, for example, small unit relay. Upon the selection of candidates, the technologies will be integrated, matured and demonstrated to support transition. Research and development will include the development and integration of the payload to include Single Channel Ground and Airborne Radio System (SINCGARS), Enhanced Position Location and Reporting (EPLRS), and Soldier Radio Waveform (SRW) for example; the payload to platform integration to support demonstration; and the development of a small unit Concept of Operations (CONOPS) to demonstrate operations supported by the range extension for tactical units. Demonstrations will be used to support technology maturation and verify technology transition criteria.

Airborne Network Gateway - (U) An airborne network gateway interconnects dissimilar networks among tactical forces and also interconnects tactical forces with higher headquarters and command centers. In general, gateways interconnect networks with different, incompatible communications protocols. Gateways are commonly used commercially in the wired internet world to bridge between different networks. The Department of Defense (US Air Force) has initiated a program, Objective Gateway, to develop a family of modular, scalable airborne and ground-based gateways based on the reduction/demonstration efforts, Battlefield Airborne Communications Node (BACN) and Rapid Attack Information Dissemination Execution Relay (RAIDER). As an airborne network gateway, the Objective Gateway program will bridge between disparate data links and voice networks, integrate sensors into the network and provide Internet Protocol (IP) connectivity to the tactical edge. The Airborne Network Gateway research will develop, integrate and demonstrate airborne network gateway technology to facilitate near term networked communications capability that will be transitioned to the Objective Gateway program. Specifically, this research will investigate the data links (eg. Link-16), networks (eg. Tactical Targeting Network Technology (TTNT)), and voice (eg. cellular) candidates for an airborne network gateway, assess technology issues and maturity, and develop enhancements that will overcome shortfalls that preclude the ability to more broadly network the force through an airborne network gateway. One specific area of emphasis will be the analysis of the airborne network gateway effectiveness across sensor to weapon scenarios. Demonstrations will be used to support technology maturation and verify technology transition criteria.

Gateway Interoperability - (U) As discussed above, the Objective Gateway program will develop a family of modular, scalable airborne and ground-based gateways. Additionally, there will be gateway functions performed by other components within the network. Gateways as a general term include relays (range extension), bridges (connect across networks), message translation (connect across data links), and guards/cross domain security (connect across security domains). This research will define, develop, integrate, demonstrate, and assess technology that provides standards to perform gateway functions from the tactical edge to the core Global Information Grid network. Many technologies and components exist to perform the variety of gateway functions discussed. These would be assessed to identify desirable aspects to be leveraged as the foundation for providing improved interoperability. Emphasis will be placed on demonstrating capabilities to support airborne tactical relays and airborne network gateways. The research will be expanded to provide the technical basis for standards and policies that can be applied across DoD, specifically in support of the Global Information Grid.

B. Accomplishments/Planned Program:

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Airborne Tactical Relay		4.159	9.780

Current program plan calls for the development and maturation of an airborne communications relay suitable for flight on a UAV. The relay will be demonstrated in an operational environment by the end of 2009 and transitioned in 2010. The first year's effort will be executed by the Marine Corps (Office of Naval Research) and the second year's effort will be executed by the Marine Corps (Office of Naval Research) and Army (Communications-Electronics Research, Development, and Engineering Center). Plans call for a common, joint airborne relay supporting tactical small units developed jointly by the Marine Corps and Army, to include development of the payloads and concepts of operation and transition directly to the Services. I

Overall goal: Increase the understanding of airborne tactical relays. Demonstrate the network communication technology required to support small unit distributed operations. Establish the concept of operations for how these technologies will be operationally used and supported.

FY 2008 Plan/Accomplishments (U) Platforms selected; payload selection under way. Plans call for the development, integration and test of the payloads; procure (lease) platforms (UAV, ground terminals and portable equipment); and initiation of payload to platform integration for operational demonstration. Establish the concept of operations and operational scenario to be evaluated at the military utility assessment. Initiate technology transition criteria.

FY 2009 Plan (U) Procure (buy) platforms; Complete integration for operational demonstrations. Develop concepts of operation and conduct military utility assessment. Assess technology maturity and validate technology transition criteria. Continue the development for follow on assessment and technology maturation.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Airborne Network Gateway		3.181	4.890

Current program plan calls for the development and demonstration of Concurrent Multinetting to enhance Link 16 and enable multiple networks to operate concurrently and interoperate on a single platform. In addition, other enhancements will be evaluated for enhancing Link 16 and enabling interoperation between IP-type networks and Link 16. These enhancements will be developed during 2008-2010 by the Navy (SPAWAR Systems Center) in collaboration with the Air Force (Langley), with a target transition to the Navy (MIDS-LVT and JTIDs program offices) and Air Force (Langley) in 2011. These enhancements will be offered to international partners to enable interoperation with joint and coalition communications networks. Current plan also calls for the development of further enhanced gateway capability with additional tactical networks in 2009 to be executed by the Navy, Air Force and Army to develop and build the technologies necessary for a joint gateway that will interconnect diverse tactical networks.

Overall goal: Evaluation of the technology maturity of the data link, networks, and voice capabilities to be integrated into a form factor with size, weight, and power design constraints. Development of enhancements to improve networking across the battlespace. Incorporation of standards that will lead to improved interoperability. Increased understanding of the operational concepts that will use this integrated capability.

FY 2008 Plan/Accomplishments - (U) Link 16 gateway enhancements to be evaluated selected. Evaluation under way. Plans call for the assessment of technology maturity of data link, network and voice communications capability to be used for airborne network gateway candidates. Initiate the development of enhancements to support shortfalls discovered. Initiate the development of technology transition criteria.

FY 2009 Plan - (U) Conduct operational demonstration of enhancements developed for the airborne network gateway capability. Select new candidates for gateway development and integration. Initiate research to support airborne gateway for specific existing tactical communications networks. Assess technology maturity of candidates. Conduct military utility assessment. Continue development for follow on assessment and technology maturation.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Gateway Interoperability			4.852

Current plan calls for initiation of this project in 2009 as a joint Navy-Marine Corps-Army-Air Force effort. Increase understanding of gateways, a complex area of networking within DoD. Establish the technical basis for DoD policy and standards for the Global Information Grid, specifically in the area of the tactical edge attachment to the Global Information Grid core networks.

FY 2008 Plan - (U). N/A _ Initiation in 2009.

FY 2009 Plan - (U) Evaluate gateway technologies and program candidates. Define the criteria for acceptable gateway technical and operational performance criteria. Initiate the integration of gateway candidates for testing and assessment. Produce initial technical report for gateway standardization and interoperability. Initiate the development of technology to fill shortfalls for airborne tactical relay and airborne network gateway. Complete gateway testing and assessment.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Administration and Studies		0.095	0.440

Funding retained at OSD annually for contractual and SETA/Studies support

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

D. Acquisition Strategy Not applicable for this item.

E. Major Performers

Category	Name	Location	Type of Work and Description	Award Date
Labs/Centers				
	SPAWAR Systems Center	San Diego, CA	Conduct research and engineering for Link 16 improvements and gateway capability; Expected January 2008	

	Office of Naval Research	Arlington, VA	Administers (unpaid) and awards contracts to commercial research and development organizations to develop and deliver airborne network relay and gateway capability. Expected January 2008 (to ONR); Expected February 2008 (to contractor)	
Universities				
	MIT/Lincoln Labs	Lexington, MA	Host data warehouse for program data and research paper products from project 662 and 663; Expected January 2008	

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDTE, Defense Wide BA 03	**0603662D8Z - Networked Communications Capability**	**P663**

COST ($ in Millions)		FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P663	Network Communications Analysis		7.436	19.961	19.812	26.302	26.697	27.266

A. Mission Description and Budget Item Justification: Tactical Mobile Networking (U) As studies have suggested, for instance, the National Research Councils Network Science Report (2005) and Army Mobile Ad-hoc Network (MANET) Jason Report (January 2006), the type of networking projected to meet military tactical requirements are not supported by network theory, network design and analysis tools. This research will define those technical parameters important to military tactical mobile networking environments, investigate the status of network design and analysis tools, and evaluate how modeling and simulation is conducted to support tactical mobile networking environments. The role of network experimentation with respect to network modeling will be explored. Further development and analysis will be conducted to improve the awareness of the condition of tactical mobile networking technologies. Design tools, architectures and technical approaches will be recommended to acquisition programs as a result of this research.

Network Management Tools and Analysis - (U) Network management in the commercial world is a highly organized, synchronized activity that has excellent tools to monitor activity and repair disrupted networks as needed. These same tools are ill-matched for management in the wireless world, and specifically for military tactical mobile networking. In addition, the military tactical mobile networking environment lacks the infrastructure (connectivity) and support (helpdesk) because resources (spectrum, people, and equipment) are scarce (not in harms way). As the complexity of networking grows and as network capabilities are introduced, improved network management is required. For military operations, assured delivery may be needed for specific information and operations. This requires management tools to be in place to ensure continued secure and robust operations, which is not achieved with commercial wireless technologies. This research will assess network management tools in place for the military tactical mobile networking environment, develop technology and tools to address shortfalls with the goal to transition technology to operational systems.

Spectrum Management Tools and Analysis - (U) For wireless, tactical mobile networking, the management of the use of spectrum effects network operations. The demand for spectrum is increasing due to the expanded use of sensors, imagery and voice. This demand increases the pressure on the limited shared radio frequency (RF) spectrum for military tactical networking. The current DoD frequency planning and management infrastructure will have a limited ability to cope with this demand through operational planning, Coalition Joint Spectrum Management Planning Tool (CJSMPT) Joint Capability Technology Demonstration (JCTD) and the Global Electromagnetic Spectrum Information System (GEMSIS). Advanced spectrum management concepts such as sense and adapt, spectrum sharing, and dynamic reallocation are under investigation but not yet mature support operations. This research will evaluate opportunities for more efficient and effective use of the frequency spectrum within DoD. Technology advances are expected to advance the concept of cognitive radio devices to sense and adapt operations based on spectrum policy and usage, the management of multiband and multifunction apertures, and the use of spectrum efficient waveforms for use in military environments. This research will develop the models and tools to demonstrate capabilities for operational planning and monitoring of spectrum as these technologies are introduced.

Integrated Network Management Capability - (U) Network management becomes more complex as more and different types of networking capability becomes available. Integrated network management across heterogeneous systems, especially wireless systems, requires definition, design and development. Operationally, network management assumes all functions required to share networking resources and ensure proper operation for participants. This research will define integrated network operations tools for all aspects of network resource management and to prioritize across operational spectrum management, security management, network management, and information management. This research will also develop testbeds specially to validate models and simulations used to develop and test network management tools, and conduct experimentation on

approaches developed.

B. Accomplishments/Planned Program:

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Tactical Mobile Networking		0.761	4.851

Current plan calls for the development of new applications and standards that can be used on existing tactical networks to improve data retrieval and discovery by the tactical warfighter. In addition, research is being conducted into tactical communications architectures to develop models useful for optimizing and exploiting tactical networks. New applications and architectures will be tested in a joint federated experimental emulation test bed being developed within this program. Project collaboratively executed by the Navy and Air Force. Results planned for transition to programs of record as maturity of models allow.

Overall goal: Increased understanding of the condition of tactical mobile networking technologies. Improved specification of technical standards and policy for tactical mobile networking. Finer fidelity modeling and simulation to support operations analysis and the articulation of operational requirements and performance parameters.

FY 2008 Plan/Accomplishments (U) Work under way presently executed by the Navy and Air Force. Define the technical parameters to be met for tactical mobile networking. Evaluate modeling and simulation along with design and analysis tools to support tactical mobile networking. Initiate the development of an improved set of tools to support tactical mobile networking. Initiate experimentation to evaluate tools

FY 2009 Plan (U) Initiative research into other areas applicable to the joint tactical environment such as cognitive networking. Continue the development of an improved set of tools. Develop testbeds and demonstrate tools in a laboratory testbed environment.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Network Management Tools and Analysis		1.666	5.291

Current plan calls for the development of joint standards and tools for policy-based and measurement-based tactical network management. New standards and applications will be tested in a joint federated experimental emulation test bed being developed within this program. Project jointly executed by the Navy, Air Force and Army, with technology transition agreements being pursued with programs of record.

Overall goal: Increased understanding of the complexity of the tactical network management. Determination of the support required for tactical network operations. Evaluation of technology to support transition and fielding to operational capability.

FY 2008 Plan/Accomplishments (U) Initial policy-based Network Management tools selected jointly by the Air Force and Army and evaluation underway. Measurement-based tactical network management tools under development by the Navy. Plans to share results and tools in a collaborative environment (called the Joint NETOPS Integrated Collaborative Working Group) established. Plan for this year calls for the assessment of network management tools for the military tactical mobile networking environment in operational and laboratory testbed environments. Develop technology and tools to address shortfalls.

FY 2009 Plan (U) Further develop and demonstrate management tools to evaluate technical maturity and military utility. Initiate technology transition planning.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Spectrum Management Tools and Analysis		0.543	3.780

Current plan calls for the development of measurement-based spectrum management tools. Applications will be developed and tested in a laboratory environment. Project executed by the Army with results available to the Navy and Air Force through the Joint NETOPS Integrated Collaborative Working Group. Transition planned for the GEMSIS program in 2010-2011 as maturity allows, and to other existing tactical network programs as appropriate.

Overall goal: Technical basis to support changes regarding the operational use of spectrum both within the military and among spectrum regulatory bodies.

FY 2008 Plan/Accomplishments (U) Work underway. Develop the spectrum technology strategy for the introduction of advanced capability beyond operational mission planning. Demonstrate technologies to support monitoring and plan adjustments as spectrum conditions allow. Assess emerging spectrum technologies for inclusion to support military operations.

FY 2009 Plan (U) Expand program into spectrum-aware, cognitive networking for existing tactical networks. Demonstrate concepts and technologies to support a more efficient and effective use of spectrum. Initiate collaborative research among the Services.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Integrated Network Management Capability		4.231	5.159

Current plan calls for the development of joint integrated network management tools, and three federated experimental test beds for the development and evaluation of integrated tactical network management and spectrum management. Project executed jointly by the Navy, Army and Air Force. Plans also establish a Joint NETOPS Integrated Collaborative Working Group for the establishments of standards and joint development in support of all projects in this program. Membership includes the research community from the Navy, Marine Corps, Army and Air Force as well as developers from acquisition programs such as FCS, WIN-T and JTRS. Future plans call for further joint infrastructure test bed development to include DoD PlanetLab as well as joint networking tools in support of NETOPS. The results of this research will transition to future increments of JTRS and WINT, and if successful, to the field through a joint integrated tactical NETOPS program.

Overall goal: Common integrating framework to support interoperability among various aspect of developmental network operations and management to include: spectrum management, network management, security management and information management. Reduce the cost to develop, procure and support networks through the integration across networks and functions within networks.

FY 2008 Plan/Accomplishments (U) Work underway. Working Group established. Establish federated testbeds at Army, Navy and Air Force research facilities to explore how individual network management tools work together in diverse tactical networks. Establish the integrating framework for network management. Demonstrate network managers to assess technical shortfalls. Initiate development of integrated management tools.

FY 2009 Plan (U) Complete joint federated test beds and transition test beds to Services, initiate DoD PlanetLab test and development facility. Continue the definition of an integrated network management framework. Demonstrate tools that provide integrated network management.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Administration and Studies		0.235	0.880

Funding retained at OSD annually for contractual and SETA/Studies support.

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

D. Acquisition Strategy Not applicable for this item.

E. Major Performers

Category	Name	Location	Type of Work and Description	Award Date
Labs/Centers				
	Electronic Systems Center	Hanscom AFB, MA	Research into Network Management; Serves as government technical POC for AF wireless testbed; Expected January 2008	
	Air Force Research Labs/Rome Labs	Rome, NY	Research into tactical mobile wireless networking; Expected January 2008	
	Communications-Electronics Research, Development,	Ft. Monmouth, NJ	Lead agent for federation of government wireless testbeds; build and host Army wireless test bed; conduct research in network management and spectrum management; Expected January 2008	
	Naval Research Laboratory	Washington, DC	Build and host Navy wireless test bed; conduct research into network management and mobile wireless networking; Expected January 2008	
Universities				
	MIT/Lincoln Labs	Lexington, MA	Build and host Air Force wireless testbed; conduct research into network management; Host data warehouse for program data and research paper products for projects 662 and 663; Expected January 2008	

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE
RDTE, Defense Wide BA 03	**0603665D8Z - Biometrics Science and Technology**

COST ($ in Millions)	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P665 Biometrics Science and Technology		10.113	10.579	11.194	11.981	12.182	15.054

A. Mission Description and Budget Item Justification: (U) In Oct 2006, the Deputy Secretary of Defense designated the Director for Defense Research and Engineering (DDR&E) as Principal Staff Assistant (PSA) for biometrics with the responsibility to fully address and exercise control over all facets of the Department's biometrics programs, initiatives, and technologies. Biometrics technologies have the unique potential to provide the Department with the capability to take away an adversary's anonymity; this program provides focused investment to fill current technology gaps.

(U) Biometrics technologies can be used to both verify an individual's claimed identity and, when combined with additional intelligence and/or forensic information, biometrics technologies can establish an unknown individual's identity, thus stripping away his anonymity. The biometrics science and technology program addresses the technology gaps that preclude our ability to quickly and accurately identify anonymous individuals who threaten our interests, in whatever domain they operate.

(U) This program develops a comprehensive biometrics science and technology plan and implements multiple projects to advance capability to identify anonymous individuals using individual biometrics.

B. Program Change Summary	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2008)		8.000	10.600
Current BES/President's Budget (FY 2009)		10.113	10.579
Total Adjustments		2.113	-0.021
Congressional Program Reductions		-0.087	
Congressional Rescissions			
Congressional Increases		2.200	
Reprogrammings			
SBIR/STTR Transfer			
Other			-0.021

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

D. Acquisition Strategy Not applicable for this item.

E. Performance Metrics: Not Applicable.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDTE, Defense Wide BA 03	**0603665D8Z - Biometrics Science and Technology**	**P665**

COST ($ in Millions)	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P665 Biometrics Science and Technology		10.113	10.579	11.194	11.981	12.182	15.054

A. Mission Description and Budget Item Justification: (U) This program will develop the technology that will improve the quality of biometrics derived information provided to the operational forces for the purpose of identifying and classifying anonymous individuals. It will enable execution of a DoD and interagency coordinated biometrics science and technology plan that supports technology transition to acquisition programs in FY 2010 and out-years.

(U) Elements of the program include: develop a comprehensive science and technology plan to include a corresponding road-map that supports future capabilities as required by an on-going biometrics capability based assessment; improve the quality of biometrics information collected through the development of higher quality, more secure and stand-off multi-modal sensors; develop next generation, non-proprietary algorithms for rapid and accurate multi-modal matching; improve government/industry/international standards to facilitate biometric data sharing; develop and improve biometrics enterprise architecture to enable seamless collection, transmission, storage, matching and analysis of biometric information; and develop biometrics forensic collection, processing and exploitation systems capable of operating in all tactical environments.

B. Accomplishments/Planned Program:

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Develop a Comprehensive Science and Technology Plan		0.500	

Develop comprehensive science and technology (S&T) plan to include corresponding road-map that supports future capabilities as required by on-going biometrics capability based assessment.

FY 2008 Plan: Establish baseline of technology and develop near term S&T objectives. Draft Broad Agency Announcement soliciting proposals, convene review and selection panels. Draft comprehensive S&T plan and roadmap.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Improve Quality of Biometrics Information Collected		2.000	2.200

Improve quality of biometrics information collected through development of higher quality, more secure and stand-off multi-modal sensors.

FY 2008/2009 Plans: Develop innovative means to capture fingerprint, face and iris images in all conditions. Investigate ultrasonic and holographic technologies for fingerprint capture and technologies such as infrared laser and inverse SAR/LIDAR to enhance video/camera images to enable stand-off, covert and overt detection and identification or iris and facial images.

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

Develop Algorithms		2.000	2.200

Develop next generation, non-proprietary algorithms for rapid and accurate multi-modal matching.

FY 2008/2009 Plans: Currently available biometric matching algorithms were developed primarily for commercial purposes and lack the scalability and multimodal capabilities required for growing DOD applications. Additionally, the available algorithms are propriety, limiting DOD options for fielding the most effective hardware and software combinations. Efforts will focus on non-proprietary matching algorithms for iris and facial images.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Improve Standards		2.000	2.200

Improve government/industry/international standards to facilitate biometric data sharing.

FY 2008/2009 Plans: Standards development for biometric use in support of identity management is still in early stages. Project will focus on standards for those modalities not adequately covered and to ensure DOD acceptable standards are accepted by commercial, DOD, interagency and international bodies.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Develop and Improve Biometrics Enterprise Architecture		2.000	2.118

Develop and improve biometrics enterprise architecture to enable seamless collection, transmission, storage, matching and analysis of biometric information.

FY 2008/2009 Plans: Investigate scalable biometric data and network architectures to ensure biometrics compatibility with the target Global information Grid (GIG)

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Develop Biometrics Forensic Systems		1.613	1.861

Develop biometrics forensic collection, processing and exploitation systems capable of operating in all tactical environments.

FY 2008/2009 Plans: Investigate technologies such as mass spectrometry to improve latent fingerprint collection, miniaturize and harden for field use DNA collection, processing and sequencing capabilities, and establish capabilities to exploit forensic information derived from weapons, evidence and human identifiers. Develop interoperable and modular forensics databases and associate training for biometrics users.

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 (R2 Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE
RDTE, Defense Wide BA 03	**0603670D8Z - Human, Social and Culture Behavior Modeling (HSCB) Advanced Development**

COST ($ in Millions)		FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P370	Human, Social and Culture Behavior Modeling (HSCB) Advanced Development		2.974	9.381	11.689	12.080	20.204	22.978

A. Mission Description and Budget Item Justification: (U) Current military operations need and future operations will demand the capability to understand the social and cultural terrain and the various dimensions of human behavior within these terrains. Behaviors in the social and cultural terrain context extend across the spectrum from adversaries to our Joint U.S. forces, with our coalition partners, and with government and non-government organizations. USG and DoD capstone policy and guidance are driving this need -- as articulated in NSPD-44, QDR 2006, and DoDD 3000.05 (Stability, Security, Transition and Reconstruction (SSTR)). Science and resulting technologies form a resource and enabler for success in this area. Advanced Development in Human Social Culture Behavior Modeling (HSCB) and its counterparts in BA2 and BA4, will demonstrate technologies that enhance existing toolsets and create new toolsets for human terrain understanding and forecasting in four application pillars: intelligence analysis; operations analysis/planning; training; and joint experimentation. Early priorities will include an emphasis on demonstration in relevant operational systems (e.g. Mapping of the Human Terrain JCTD). The program will demonstrate visualization toolsets, modeling systems, and training systems capable of mapping the complex human terrain that will be encountered in both current and future military and stability operations.

B. Program Change Summary	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2008)		9.000	9.400
Current BES/President's Budget (FY 2009)		2.974	9.381
Total Adjustments		-6.026	-0.019
Congressional Program Reductions		-6.026	
Congressional Rescissions			
Congressional Increases			
Reprogrammings			
SBIR/STTR Transfer			
Other			-0.019

C. Other Program Funding Summary	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
PE 0602670D8Z BA 2 HSCB Applied Research		6.246	7.685	9.609	9.902	16.539	18.818

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)								February 2008
APPROPRIATION/ BUDGET ACTIVITY **RDTE, Defense Wide BA 03**		PE NUMBER AND TITLE **0603670D8Z - Human, Social and Culture Behavior Modeling (HSCB) Advanced Development**						
PE 0604670D8Z BA 4 HSCB Research & Engineering		0.991	5.991	7.132	7.823	12.875	15.621	

Comment:

D. Acquisition Strategy Not applicable for this item.

E. Performance Metrics: Not Applicable.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDTE, Defense Wide BA 03	**0603670D8Z - Human, Social and Culture Behavior Modeling (HSCB) Advanced Development**	**P370**

COST ($ in Millions)		FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P370	Human, Social and Culture Behavior Modeling (HSCB) Advanced Development		2.974	9.381	11.689	12.080	20.204	22.978

A. Mission Description and Budget Item Justification: (U) This project is focused on demonstrating general-use , cross-domain capabilities/tools to support all HSCB applications. The project will develop: Computational modeling capabilities; Visualization software toolsets; and Training/mission rehearsal systems that provide forecasting capabilities for socio-cultural (human terrain) responses at the strategic, operational and tactical levels. This project will develop, integrate and demonstrate technologies that provide cultural understanding/overlays in existing intelligent, influence operations, and operations planning systems. This project will develop, integrate and demonstrate training and mission rehearsal capabilities that go beyond strategic level planning tools (to the operational and tactical level), providing broader, more in depth training/retention capability.

Modeling Capabilities that will generate and demonstrate validation of synthetic adversaries to populate what if analyses for forecasting reactions to a defined class of adversaries to U.S./coalition mission Strategic decision making tools that account for political, religious, cultural, and other factors. Integration of a common architecture visualization tool that vertically integrates cultural information into a military operational environment.

Visualization software toolsets that will be used as a strategic decision making tool that will account for political, religious, cultural, and other factors. Integration of a common architecture visualization tool that vertically integrates cultural information into a military operational environment.

Training/Mission rehearsal systems capable of using flexible underlying cultural models to train at the operational/tactical level. Integration and demonstrations of social, cultural and human behavior/cognition skills training systems for operational and strategic planning personnel in a coalition force context.

B. Accomplishments/Planned Program:

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Modeling Capabilities		1.500	3.000

Generation and demonstration of validated synthetic adversaries to populate what if analyses for forecasting reactions to a defined class of adversaries to U.S./coalition military, economic, or political actions. Integration and demonstration of decision making support tools within Battle Command Planning/Execution/Re-Planning systems for political, religious, cultural and other factors. Development of tools and software products to integrate socio-cultural models and information into existing intelligence, and Command and Control systems.

FY 2008 Plan: Integration and demonstration of a validated, human terrain forecasting modeling approach that enables the examination of second, third, and higher order effects of kinetic and non-kinetic actions within a theater in support of Effects Based Operations. Current integrated software for human social, cultural and behavior modeling (HSCB) is focused on intelligence applications using existing social network modeling tools and relatively data poor/outdated theory based models. This work will begin to provide an initial set of DoD centric models and tools to support decision

aids and toolsets for command and control, intelligence, influence operations and operational planning. FY08 efforts will focus on developing models within a specified operational domain/scenario.

FY 2009 Plan: Expansion and validation of HSCB related modeling approaches and development of more generalizable solutions for multiple military, kinetic and non-kinetic domains. This work will address both horizontal (across user community) and vertical (tactical to strategic) generalization of HSCB models.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Visualization Software Toolsets		0.500	4.000

Visualization software toolsets that will be used as a strategic decision making tool that will account for political, religious, cultural, and other factors. Integration of a common architecture visualization tool that vertically integrates cultural information into a military operational environment.

FY 2008 Plan: Demonstration of the feasibility of integrating HSCB process and software into strategic level conflict resolution and regional stability planning tools. DoD strategic planning requires accurate representation of the full range of national power, including multi-agency and non-military actions. It also requires the ability to accurately represent the outcomes of those actions in the target region/population. This project will demonstrate improved decision-making toolsets that includes HSCB factors.

FY 2009 Plan: Common, generalizable (strategic to tactical) tools for visualization of DIME-PMESII or HSCB factors on the battlefield, or during Security, Stability, Transition and Reconstruction phases do not exist. This project will do an initial demonstration of a common architecture for visualization of these effects, with the ability for commanders to drill down from regional to local views, and vice versa.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Training/Mission Rehearsal Systems		0.974	2.381

Training systems capable of using flexible underlying cultural models to train at the operational/tactical level. Integration and demonstrations of social, cultural and human behavior/cognition skills training systems for operational and strategic planning personnel in a coalition force context.

FY 2008 Plan: Current methods and procedures for integrating cultural information into military operations do not satisfy the requirements for ongoing operations and are not flexible enough to rapidly deliver Just In Time training for complex new regions of interest, and relatively new mission areas (e.g. transition and reconstruction). This project will integrate and demonstrate training technologies to deliver socio-cultural understanding and skills needed for individuals and small units in current and future military operations.

FY 2009 Plan: Socio-cultural factors impact not only U.S.-adversary actions and reactions, but also impact the capability of U.S forces to work effectively with coalition/multi-national forces in the global war on terror. Virtual training and mission rehearsal/exercises provides leaders with some opportunity to develop teamwork with coalition forces who are physically separated from U.S. forces. However, the events do not provide the opportunity to develop teamwork with forces who are culturally, or socially separate from our own forces. Cultural and language barriers can create problems with understanding operational orders. This project will demonstrate distributed training technologies to speed the development of socio-cultural skills in coalitions in current military operations.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDTE, Defense Wide BA 03	**0603670D8Z - Human, Social and Culture Behavior Modeling (HSCB) Advanced Development**	**P370**

C. Other Program Funding Summary	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
R&D 0602670D8Z HSCB Applied Research BA 2		6.246	7.685	9.609	9.902	16.539	18.818
R&D 0604670D8Z HSCB Research and Engineering BA 4		0.991	5.991	7.132	7.823	12.875	15.621

Comment:

D. Acquisition Strategy Not applicable for this item.

E. Major Performers Not applicable for this item.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE
RDTE, Defense Wide BA 03	**0603680D8Z - Defense Wide Manufacturing Science and Technology Program**

COST ($ in Millions)		FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P680	Manufacturing Science and Technology Program		23.594	11.981	14.906	19.853	19.856	24.808

A. Mission Description and Budget Item Justification: The Manufacturing Science and Technology (S&T) Program was mandated by Congress in Section 241 of the National Defense Authorization Act of 2006, under the authority of Section 2521 of Title 10, to identify and transition advanced manufacturing processes and technologies that would achieve significant productivity and efficiency gains in the defense manufacturing base. A March 2005 GAO study cites immature technology and unstable manufacturing processes and readiness as major drivers in cost, schedule, and technical overruns of acquisition program. The challenge of designing and producing affordable weapon systems is long-standing. A robust manufacturing technology (ManTech) program is critical to developing and delivering affordable capabilities. The Manufacturing S&T Program budget provides DoD with the ability to invest and advance pervasive joint manufacturing issues that are currently driving the high cost of advanced weapon systems.

The Manufacturing S&T program provides investments that focus on cross-cutting military manufacturing needs for critical enabling technologies in the areas of specialty materials, electronics, and manufacturing processes that require maturation to expedite transition across multiple platforms, are deployable in 3-10 years, and can provide game-changing capability or faster and affordable production of DoD weapon systems. This program compliments the Service ManTech programs, which are generally focused on more near term (1-3 year) technology maturation for service specific requirements. Investment opportunities identified through roadmapping activities, conducted in concert with industry, data calls, and service/agency technologies that can be transferred across multiple platforms with additional ManTech assistance, are considered for investment.

In anticipation of the establishment of the ManTech S&T Program, the Joint Defense Manufacturing Technology Panel (JDMTP), using seed funds provided by the Component ManTech programs, launched and funded road-mapping activities for power and energy and Radio Frequency (RF) modules, and initiated a data call through the sub-panels for candidate technology initiatives and projects. The JDMTP received more than 60 proposals in response to the call that will be used as the initial candidate pool for selection and funding execution. Areas of interest included a low observable initiative, a propulsion initiative for advanced turbine engines to include advanced machining and advanced material development, an RF module initiative, system-on-chip electronic investments, composite investments for prosthetics, and directed energy technology.

B. Program Change Summary	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2008)		10.000	10.000
Current BES/President's Budget (FY 2009)		23.594	11.981
Total Adjustments		13.594	1.981
Congressional Program Reductions		-5.000	
Congressional Rescissions		-0.206	
Congressional Increases		18.800	
Reprogrammings			
SBIR/STTR Transfer			

Other			1.981

The Department aligned $2 million in resources in FY 2009 and $5 million per year there after into OSD Defense-wide ManTech program. These resources support a Manufacturing Readiness Assessment Capability. This is intended to address the large and continuing unfavorable deviations in cost and schedule performance in major acquisition programs which have been attributed in part to insufficient knowledge of manufacturing readiness of technologies as well as insufficient knowledge of the manufacturing readiness of the industrial capabilities (production processes, equipment, systems, tooling, materials and supplier base) that produce the systems. The MRA capability will provide for the following: input to the development of related Defense Acquisition University curriculums; provide competent technical advice to Defense Acquisition Board (DAB) principals on manufacturing readiness issues and policies; review and analyze the results of field-conducted MRAs; participate, as appropriate, in Manufacturing Readiness Assessments conducted by field organizations to support DAB milestone decisions; conduct independent MRAs; and provide advice to field organizations on manufacturing readiness matters.

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

D. Acquisition Strategy Not applicable for this item.

E. Performance Metrics: Not Applicable.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDTE, Defense Wide BA 03	**0603680D8Z - Defense Wide Manufacturing Science and Technology Program**	**P680**

COST ($ in Millions)		FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P680	Manufacturing Science and Technology Program		23.594	11.981	14.906	19.853	19.856	24.808

A. Mission Description and Budget Item Justification: The ManTech S&T program has a two-pronged approach: 1) technology initiatives and 2) single specific projects. Technology initiatives, in collaboration with industry, identify and develop investment strategies, to advance the manufacturing processes and technologies needed to support the technology development in the area identified. Single specific projects address investment opportunities not associated with selected technology initiatives. Single projects enable the program to respond to urgent, compelling manufacturing needs and provide seed funding to more high risk-high payoff technologies.

Data calls will be launched annually by the Joint Defense Manufacturing Technology Panel (JDMTP) to identify technology initiatives and single specific issues requiring investment. The JDMTP is comprised of the ManTech Directors from the Services, Defense Logistics Agency, Missile Defense Agency (MDA) and Office of Secretary of Defense (OSD). The call will be distributed through the JDMTP sub panels and Broad Agency Announcements (BAAs) as required. Potential candidates will be evaluated by the JDMTP based on criteria set forth in the call and announcements and down-selected for further development prior to final selection. Priority will be given to those initiatives and single projects that support affordability and producibility of critical enabling manufacturing technologies that cut across multiple platforms. Investments will also balance defense priorities in specialty materials, electronics, propulsion and power, and manufacturing processes including "above the shop floor" (lean and business technologies facilitating interoperable manufacturing). Final projects are selected by the OSD ManTech Director in collaboration with the JDMTP and in consultation with the Director, Defense Research & Engineering. Technology initiatives and projects will be executed at the Component level.

Ceramic Matrix Composite (CMC) Manufacturing Initiative - Turbine engines are the main propulsion system for virtually all DoD aircraft and helicopters and also power an array of ships and tanks. Improvements in manufacturing process technology must be achieved with each new generation of engines for these challenging new designs to be manufactured with acceptable quality, cost, and delivery rate to meet the warfighter needs. This initiative seeks to advance and establish the manufacturing technologies and US industrial base capabilities needed to support the development, production and sustainment of advanced gas turbine engines. $5-7 billion projected life cycle cost avoidance could be realized with successful maturation.

Manufacturing Readiness Level (MRL) Assist: Tool Development - A March 2005 GAO report cited immature manufacturing processes and the lack of knowledge regarding the maturity of those processes as major drives in cost and schedule overruns. "MRL Assist" is a web based knowledge management tool that can be used from the shop floor to executive level leadership to understand manufacturing readiness and risk within a program This project will complete the development of "MRL Assist", a knowledge-based manufacturing risk assessment tool for use by industry and government programs. "MRL Assist" provides a rigorous set of questions within the ten major cross threads for each MRL. A composite overview of the responses provides a quick visual feedback as to where risks are located within the process.

System-on-Chip (SOC) - ManTech investments will provide leap ahead communication and sensor capability by maturing technologies that move heavy, high volume/power demand systems to small, power efficient SOC packaging technology.

Custom Composite Orthotics and Prosthetics Manufacturing Initiative - New manufacturing technologies are required for the development of custom composite orthotics and prosthetics for injured men and women of the armed services. Orthotics and prosthetics present a two-fold challenge in that they contain a high degree of customization in design and a labor intensive means of manufacturing. Recent advances in solid modeling, reconfigurable tooling, room temperature resin chemistry, automated fabrication of custom fiber architectures, and novel resin infusion methods have created the potential to develop a highly integrated, low cost, custom orthotic and prosthetic technology to address the unique requirements and needs of the armed services. Rapid prototyping technologies and new composite manufacturing solutions have shown the potential to provide a 24-hour turn around time for component fabrication. The current state of the art for orthotics is to thermoform plastic materials such as polypropylene to create a custom fit orthotic. New manufacturing techniques integrated with advanced polymer composite technologies have allowed for initial prototyping work using woven glass reinforced Adiprene. These new materials are compliant, but sufficiently rigid for use with prosthetics. The integration of composite materials could provide up to a 20% weight savings and an approximate 40% reduction in skin contact over current thermoform plastic solutions.

Manufacturing Readiness Assessments (MRA) Capability - OSD is establishing a MRA capability which will include a requirement for major acquisition programs to perform an MRA prior to major milestone reviews. This is intended to address the large and continuing unfavorable deviations in cost and schedule performance in major acquisition programs which have been attributed in part to insufficient knowledge of manufacturing readiness of technologies as well as insufficient knowledge of the manufacturing readiness of the industrial capabilities (production processes, equipment, systems, tooling, materials and supplier base) that produce the systems. The MRA capability will provide for the following: input to the development of related Defense Acquisition University curriculums; provide competent technical advice to Defense Acquisition Board (DAB) principals on manufacturing readiness issues and policies; review and analyze the results of field-conducted MRAs; participate, as appropriate, in Manufacturing Readiness Assessments conducted by field organizations to support DAB milestone decisions; conduct independent MRAs; and provide advice to field organizations on manufacturing readiness matters.

Disruptive Manufacturing Technology - This is an FY2008 Congressionally added effort to mature manufacturing processes needed to transition emerging, disruptive technologies which offer leap ahead capability for future warfighting within the next decade.

High Performance Manufacturing - This is an FY2008 Congressional add to fund efforts to identify, advance, and accelerate manufacturing processes and technologies that will achieve productivity and efficiency gains in the defense manufacturing base. Activities include maturing manufacturing process development, strategic planning and roadmapping, development of prototypes and testbeds, workshops, incentives, and outreach.

B. Accomplishments/Planned Program:

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Ceramic Matrix Composite (CMC) Manufacturing Initiative		1.000	4.981

This project was previously titled "Industry Wide Propulsion Initiative" in the FY 2008 President's Budget.

Outcome: Demonstrate the advancement of manufacturing technologies for advanced turbine engines that result in: 1) percentage increase in reduced weight, 2) percentage increase in engine performance, 3) percentage decrease in maintenance, 4) increasing production flow through, 5) increased non destructive evaluation (NDE) techniques, and 6) increased safety. Advanced manufacturing processes materials will reduce re-work, increase production capacity, and enable production rate requirements for engine components. Projected LCC avoidance for this initiative is

projected between $5-12 billion, with technology maturity within 3-5 years.

FY 2008 Plan: Initiate Phase 1 for optimizing and validating manufacturing, machining, and non-destructive inspection techniques for Organic Matrix Composites (OMC) and Ceramic Metal Matrix Composites (CMC). Initiate Phase 1 for processing and Non-Destructive Evaluation (NDE) of Ceramic Hybrid Bearing to mature reliability and repeatability of manufacturing processes.

FY 2009 Plan: Continue Phase 1 for CMC activity. Advance technologies to increase production rate for CMC by 50% of end-point goals. Advance Phase Ceramic Hybrid Bearing manufacturing processes by 25% of end-point goals.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Manufacturing Readiness Level (MRL) Assist: Tool Development		0.850	0.250

Outcome: Three key areas: 1) increased knowledge of manufacturing risks related to acquisition programs and technology transition, 2) disciplined process for determining risk, and 3) program that will be made available to public and private industry.

FY 2008 Plan: Complete beta testing. Launch final Version 1.0 of tool on website and maintained by BMPCOE

FY 2009 Plan: Complete field testing of Version 1.0 and make final improvements

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Low Observable Material Manufacturing Initiative		1.000	1.500

This project was previously titled "Manufacturing Scale-up for Low Observable Materials and Platforms" in the FY 2008 President's Budget.

Outcome: Three key areas: 1) precision component fabrication (no gaps and seams), 2) multi-spectral LO integration, and 3) minimize sustainment cost and cycle time drivers. Investment in the three key areas are projected to have a payback of $90 million within the FYDP and billions over 2-3 FYDPs. Technology is expected to mature beginning in FY10.

FY 2008 Plan: Conduct and complete BAA and proposal solicitation. Establish technology teams and associated technology metrics for new-start Low Observable (LO) projects. Initiate selected material projects for advancement of precision component fabrication. Measured increase in component fabrication for scale up processes.

FY 2009 Plan: Measured increase in component fabrication processes approaching 50% of target end point

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
System-On-Chip (SOC)		1.000	1.500

Outcome: ManTech will move the basic packaging technology from Technology Readiness Level (TRL) 3 to qualification for application in on-board SATCOM capable platforms. ManTech investments will refine the fabrication process, develop design rules for complex integration of non optimized mixed devices on same silicon, and accelerate the development and integration of the transmit and receive module.

FY 2008 Plan: Baseline technical milestones. Advance manufacturing processes for fabrication processes by 15% of technical goals. Conduct Phase 0 study on the requirements integration of

mixed, non-optimized components

FY 2009 Plan: Advance manufacturing fabrication processes by 30% of technical goals.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Custom Composite Orthotics and Prosthetics Manufacturing Initiative		1.150	1.750

This project was previously titled "Affordable Manufacturing and Rapid Prototyping for Custom Composite Orthotics and Prosthetics" in the FY 2008 President's Budget.

Outcome: New rapid prototyping and affordable manufacturing processes resulting in 20% weight savings and 40% reduction in skin contact. Improved reliability of new composite prosthetics.

FY 2008 Plan: Coordinate with the National Naval Medical Center (NNMC) and Walter Reed Hospital (WRH) to establish a team to develop manufacturing technologies. Conduct Phase 1 - Integration of fiber performs with new fabrication prototyping of prosthetics and orthotics and conduct proof-of-concept of rapid custom composite prosthetics.

FY 2009 Plan: Full-scale manufacturing capability for custom composite orthotics and prosthetics. Train NNMC and WRH on prototyping technology.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Disruptive Manufacturing Technology Initiative		7.909	

This is an FY2008 Congressionally added effort ($8000, adjusted to $7909 for Sec 8025(f), 8097, and 8094 provisions) to mature manufacturing processes needed to transition emerging, disruptive technologies which offer leap ahead capability for future warfighting within the next decade.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
High Performance Manufacturing Technology Initiative		7.909	

This is an FY2008 Congressional add ($8000, adjusted to $7909 for Sec 8025(f), 8097 and 8094 provisions) to fund efforts to identify, advance, and accelerate manufacturing processes and technologies that will achieve productivity and efficiency gains in the defense manufacturing base. Activities include maturing manufacturing process development, strategic planning and roadmapping, development of prototypes and testbeds, workshops, incentives, and outreach.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Lightweight Composite Brakes for Armored Wheeled Vehicles		0.793	

Light Weight Composite Brakes for Armored Wheeled Vehicles is an FY 2008 Congressionally added effort ($800, adjusted to $793 for Sec 8025(f), 8097, and 8094 provisions) that is misplaced in the ManTech S&T Program Element and should be reprogrammed into the Army's Combat Vehicle and Automotive Technology Program (PE 0602601A) Subelement - 622601 Project Code - T-31, POC Thomas Altobelli 586-574-8708 at TARDEC.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Claflin University Detection and Remediation Response to Biological and Chemical Weapons Project		1.983	

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDTE, Defense Wide BA 03	**0603680D8Z - Defense Wide Manufacturing Science and Technology Program**	**P680**

Claflin University Detection and Remediation Response to Biological and Chemical Weapons Project is a Congressionally added effort ($2000, adjusted to $1983 for Sec 8025(f), 8097, and 8094 provisions) that is currently believed to be misplaced in the ManTech S&T PE. OSD AT&L coordination with HAC/SAC staff is required to determine the purpose of this add in order to accomplish reprogramming to the correct Program Element.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Manufacturing Readiness Assessment (MRA) Capability			2.000

Outcome: Manufacturing Readiness Assessments (MRA) Capability - an MRA capability which will include a requirement for major acquisition programs to perform an MRA prior to major milestone reviews. This is intended to address the large and continuing unfavorable deviations in cost and schedule performance in major acquisition programs which have been attributed in part to insufficient knowledge of manufacturing readiness of technologies as well as insufficient knowledge of the manufacturing readiness of the industrial capabilities (production processes, equipment, systems, tooling, materials and supplier base) that produce the systems.

FY 2009 Plan: Implement MRA requirements across the Department; develop Defense Acquisition University (DAU) curriculum and establish training requirements; assist in initial MRA performed at field activities to develop a most efficient process and appropriate guidance.

C. Other Program Funding Summary	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Air Force ManTech (BA7) 0708011F	66.122	39.906					
Air Force ManTech (BA3) 0603680F			36.156	36.884	37.246	37.965	38.738
Army ManTech (BA7) 0708045A	112.223	66.869	69.495	70.081	70.635	72.189	73.777
Navy ManTech (BA7) 0708011N	59.450	56.445	56.705	58.929	59.823	60.326	60.833
DLA ManTech (BA7) 0708011S	34.142	20.114	20.627	20.978	21.475	21.880	22.207

Comment:

D. Acquisition Strategy Not applicable for this item.

E. Major Performers Not applicable for this item.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE
RDTE, Defense Wide BA 03	**0603711D8Z - Joint Robotics Program/Autonomous Systems**

COST ($ in Millions)		FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P710	Joint Robotics Program/Autonomous Systems	8.765	19.585	8.449	9.276	10.435	11.634	11.974

A. Mission Description and Budget Item Justification: (U) This program element (PE) supports the advanced technology development activities of the Joint Ground Robotics Enterprise (JGRE) with a focus on the development of subsystems and components and efforts to integrate subsystems and components into system prototypes for field experiments and/or tests in simulated environments. Projects deliver advanced technology with direct relevance to enhancing warfighters' capabilities that have been identified during operational assessments and field feedback of current unmanned systems. The PE enables Joint Service coordination and provides for interoperability and commonality among unmanned systems. The primary purpose of this PE is to support efforts to overcome technology barriers in the thrust areas of unmanned ground system technologies to include Autonomous & Tactical Behaviors, Manipulation Technologies, Collaborative Operations, Interoperability, Man-portable Unmanned Ground Systems, and Technology Transition/Transformation. The technologies in the PE are generally at Technology Readiness Levels (TRL) of 4, 5, or 6 making transition and transformation activities critical to closing the requirement to capability gap.

All actions under this PE are within BA 3 and are identified with one project number.

B. Program Change Summary	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2008)	8.775	11.256	14.202
Current BES/President's Budget (FY 2009)	8.765	19.585	8.449
Total Adjustments	-0.010	8.329	-5.753
Congressional Program Reductions		-0.171	
Congressional Rescissions			
Congressional Increases			
Reprogrammings		8.500	
SBIR/STTR Transfer	-0.010		
Other			-5.753

C. Other Program Funding Summary	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
PE 0603709D8Z (BA4) Joint Robotics Program	22.975	23.654	11.847	12.005	12.268	12.589	12.916
PE 0604709D8Z (BA5) Joint Robotics Program	9.721	6.851	5.725	5.212	4.245	3.242	3.111

Comment:

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: Metrics for the Joint Ground Robotics Enterprise (JGRE) funded RDT&E are articulated in individual project plans and overview quad charts used to form the basis of funding justification and program assessment. These decisions are supported by the JGRE Technology Advisory Board (TAB). The TAB provides technology to capability matrix assessments to inform funding decisions, provide inputs to unmanned system (UMS) roadmaps and ensure technology transitions. In all document sets, project descriptions include task schedules with associated milestones, against which progress toward end goals can be measured. At the level of the performer, efforts are tracked using project technical and management milestones that have been appropriately defined and agreed upon in the project plans. At the enterprise level, the JGRE management structure and process tracks deliverables and examines the transition of technologies and ideas from the performer to DoD programs. The JGRE management structure and process includes a mid-year in progress review (IPR), annual funding justification and prioritization, technology assessments, an O-6 Council and a Senior Steering Group (SSG) overview. These DoD participant reviews include cost, schedule and technical progress assessment against the project milestones. Metric evaluations for the funded actions include, where appropriate, controlled trials, demonstrations, quasi-experimental evaluations, and direct/indirect analysis.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDTE, Defense Wide BA 03	**0603711D8Z - Joint Robotics Program/Autonomous Systems**	**P710**

COST ($ in Millions)		FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P710	Joint Robotics Program/Autonomous Systems	8.765	19.585	8.449	9.276	10.435	11.634	11.974

A. Mission Description and Budget Item Justification: (U) This program element (PE) supports the advanced technology development activities of the Joint Ground Robotics Enterprise (JGRE) with a focus on the development of subsystems and components and efforts to integrate subsystems and components into system prototypes for field experiments and/or tests in simulated environments. Projects deliver advanced technology with direct relevance to enhancing warfighters' capabilities that have been identified during operational assessments and field feedback of current unmanned systems. The PE enables Joint Service coordination and provides for interoperability and commonality among unmanned systems. The primary purpose of this PE is to support efforts to overcome technology barriers in the thrust areas of unmanned ground system technologies to include Autonomous & Tactical Behaviors, Manipulation Technologies, Collaborative Operations, Interoperability, Man-portable Unmanned Ground Systems, and Technology Transition/Transformation. The technologies in the PE are generally at Technology Readiness Levels (TRL) of 4, 5, or 6 making transition and transformation activities critical to closing the requirement to capability gap.

All actions under this PE are within BA 3 and are identified with one project number.

B. Accomplishments/Planned Program:

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
(U) Autonomous & Tactical Behaviors	1.268	5.470	1.200

FY2007 Accomplishments:

* Virtual Autonomous Navigation Environment (VANE) - Identified the necessary tasks, best modeling architecture and architecture development process for the VANE vehicle dynamic's and graphic's software and Joint Architecture for Unmanned Systems (JAUS) compliant VANE vehicle dynamics software.
* Developed and implemented 70% of the research plan for best modeling architecture and architecture development process for the VANE vehicle dynamic's and (JAUS) compliant VANE vehicle dynamics software.
* Initiated evaluation of Software Integration Lab (SIL) connection to the VANE.
* Demonstrated deliberative and obstacle avoidance for unmanned surface vehicles used digital nautical charts, marine radar and AIS sensor fusion
* Tested stereovision sensor system for on-the-water obstacle detection
* Developed detection and exploration behavior for enhanced autonomous navigation and more efficient search patterns in urban environments
* Demonstrated human presence detection based on fused thermal and color cameras, and investigated performance when integrated with navigation and change-detection behaviors
* Developed generic framework for evaluation of varying classifiers for object detection/recognition of tactical objects
* Demonstrated autonomous mobility, manipulation, and novel human/robot interfaces to the EOD user community.
* Transitioned unmanned vehicle technologies from unmanned ground vehicles to unmanned surface vehicles to rapidly increase USV autonomous navigation software development.

FY 2008/2009 Plans: Support the development of vehicle onboard intelligence and tactical behaviors to allow the fielding of advanced autonomous unmanned systems. Baseline user identified

mission scenarios to develop operational behaviors enabling unmanned operations within the conduct of mission tasks. Increase the warfighter's capability by transferring and developing technologies that will have an immediate impact on the autonomy and functional capabilities of current and future robotic systems. Enable transitioning of technologies appropriate for small robots from the technology transfer program to fielded systems. Plans include:

* Autonomous Navigation for Small UGVs - Develop, test, and prototype navigation sensors and software designed specifically for small UGVs to enable autonomous navigation.
* Computer Assisted Robotic Manipulation (CARMAN)
* Urban Environment Exploration and Modeling - Enable robotic platforms to more effectively operate within the challenging conditions of dynamic urban environments; demonstrate autonomous generation of a 3-D model of urban structures; UGV mission planning and coordination.
* Autonomous Control Development - Mission planning and execution capabilities.
* Computer Assisted Tele-Operation (CATO)
* Explosive Ordnance Disposal (EOD) Cooperative Robotics
* Advanced EOD Robot System Technology Development - Mature and reduce risk (to TRL 6) of specific autonomous navigation, autonomous manipulation, dexterous manipulation, and scalable mobility technologies
* Autonomous & Semi-Autonomous Manipulation for Ground Robotics
* Warrior Unmanned Ground Vehicle

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
(U) Collaborative Operations	1.305	3.257	2.255

FY2007 Accomplishments:

* Optimized a 3-D augmented virtuality interface for multiple robot control
* Evaluated various speech recognition engines for multi-modal robot control interfaces
* Implementation of demonstrations of realistic autonomous capabilities to EOD users

FY 2008/2009 Plans: Integrate communication, mission planning, interface technologies, and advanced intelligence capabilities to support collaborative operations between manned and unmanned systems. Develop and assess several strategies to enhance tele-operation of current UGVs and collaborative UAV teams. Collaborative and tactical behaviors include system convoying, teamed obstacle avoidance, area perception and relative position information sharing. Plans include:

* Man-Portable Robotic Systems (MPRS)
* Computer Assisted Tele-Operation (CATO)- Improve Tele-Operated Mobility , Performance and Assess Operational Effectiveness
* Collaborative Engagement Experimentation
* Convoy Active Safety Technologies (CAST)
* EOD Cooperative Robotics - Develop a plan to transition Cooperative Robotics technologies to other EOD Robotics projects or acquisition programs.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
(U) Interoperability	1.072	1.992	0.852

FY 2007 Accomplishments:

* Under Man-Portable Robotic Systems (MPRS) projects, completed transition to fully Joint Architecture for Unmanned Systems (JAUS) Level 2 software architecture for small UGV semi-autonomous navigation.
* Developed new JAUS components to enable USV path planning and reactive obstacle avoidance within the JAUS architecture
* Expanded generic behavior architecture from Idaho National Laboratory (Autonomous UAV Mission System [AUMS]) to include generic classes of perceptions, mission payloads, behaviors, and communication protocols (JAUS included)
* Optimized a navigation package consisting of obstacle avoidance, mapping and path planning, GPS waypoint following, adaptive localization, and seamless indoor/outdoor navigation and enhanced dead reckoning.

FY 2008/2009 Plans: Promote and guide technology development to meet joint requirements and promote ground as well as air unmanned systems interoperability. Support the bridging of currently incompatible robots and controllers from various manufacturers, using different communications channels and hardware. Optimize best features of prior/ongoing research efforts into a maturing, standardized system that can be easily ported to robotic platforms used DoD-wide. Plans include:

* Rapid Prototyping & Integration of Robotic Systems - A systems engineering approach to the design and implementation of software for prototyping robotic systems.
* Robotic Systems Technical & Operational Metrics Correlation
* Joint Collaborative Technologies Experiment (JCTE)

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
(U) Man-Portable Unmanned Ground System Technologies	1.448	1.661	1.352

FY 2007 Accomplishments:

* Virtual Autonomous Navigation Environment (VANE) - Identified the necessary tasks, best modeling architecture and architecture development process for the VANE vehicle dynamic's and graphic's software and Joint Architecture for Unmanned Systems (JAUS) compliant VANE vehicle dynamics software.
* Under VANE, initiated evaluation of Software Integration Lab (SIL) connection to the VANE.
* Demonstrated stereovision based obstacle avoidance and guarded teleoperation under Man-Portable Robotic Systems (MPRS) projects.
* Initiated improvement program for integration of UGV in combat.
* Completed transition to fully JAUS Level 2 software architecture for small UGV semi-autonomous navigation.

FY 2008/2009 Plans: Increase the warfighter's capability by transferring and developing technologies that will have an immediate impact on the functional capabilities of man-portable robotic systems. Enable transitioning of technologies appropriate for small robots from the technology transfer program to fielded systems. Included: Support to the identification of a M & S architecture and specifications with EOD robot specific mission-application. Specific technologies include obstacle detection/obstacle avoidance (ODOA) and collaborative behaviors for small vehicles. Plans include:

* Low-Cost UGV for IED Neutralization
* Man-Portable Robotic Systems (MPRS)
* EOD Cooperative Robotics
* Urban Environment Exploration and Modeling - Demonstrate and establish metrics for dynamic localization techniques, large-scale, complex terrain and obstacle avoidance, and reactive, real-time path planning in the presence of moving obstacles.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
(U) Technology Transition/Transformation	2.082	3.974	1.085

FY2007 Accomplishments:

* Transitioned unmanned vehicle technologies from unmanned ground vehicles to unmanned surface vehicles to rapidly increase USV autonomous navigation software development.
* Demonstrated deliberative and obstacle avoidance for unmanned surface vehicles used digital nautical charts, marine radar and AIS sensor fusion.
* Demonstrated robotic search behaviors with a radiological sensor.
* Tested stereovision sensor system for on-the-water obstacle detection.
* Demonstrated stereovision based obstacle avoidance and guarded teleoperation.
* Ported integration navigation package consisting of obstacle avoidance, mapping and path planning, GPS waypoint following, adaptive localization, and seamless indoor/outdoor navigation, enhanced dead reckoning, and 3-D visualization tools to a ruggedized payload on an iRobot PackBot for user evaluation in a relevant environment.
* Evaluated and integrated robotic search behavior with radiological sensor from industry, SpaceMicro.
* From industry evaluated an acoustic sensor into a detection system, AETC; a video contrast enhancement module, DigiVision, on iRobot PackBot; leave behind sensors, CornerTurn.
* Optimized a navigation package consisting of obstacle avoidance, mapping and path planning, GPS waypoint following, adaptive localization, and seamless indoor/outdoor navigation and enhanced dead reckoning.

FY 2008/2009 Plans: Facilitate integration of and ensure the ultimate transfer or transformation of technologies to ongoing programs. Exploit the best features of past and on-going efforts while supporting the development of technologies that have low risk to transition. Technologies of interest include: Interface Technologies (Human Robot Interaction), Autonomous Operations (Information Fusion, Perception, and Navigation), Autonomous Technologies (Positioning), and Platform Technologies. Plans include:

* Pursuing noise suppression technologies for robotic stealth operations & survivability.
* Modeling and Simulation for EOD Robot Tactics Development
* Identifying a M&S architecture for the development of EOD robot specific mission-application.
* Developing and employing of a medium fidelity analytic modeling and simulation (M&S) capability for EOD Robot Tactics Development.
* EOD Cooperative Robotics - transition Cooperative Robotics technologies to other EOD Robotics projects or acquisition programs.
* Autonomous & Semi-Autonomous Manipulation for Ground Robotics
* Legged Robotics
* Warrior Unmanned Ground Vehicle

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
(U) Manipulation Technologies	1.590	3.231	1.705

FY2007 Accomplishments:

* Initiated improvement program for integration of UGV in combat.
* Initiated engineering change proposals (ECP)for manipulator technologies.
* MTRS manipulator strengthening.

FY 2008/2009 Plans: Incorporate existing technologies into systems representative to those in use, demonstrate ease of robotic manipulation, support the development of mobile manipulation, expedite the transition and integration of corresponding robotic technologies to enhance the current fielded systems with more functionalities, autonomy and state-of-the-art behavior with interface methods from the RTD&E environment. Plans include:

* Advanced EOD Robot System Technology Development - Mature and reduce risk (to TRL 6) of specific autonomous navigation, autonomous manipulation, dexterous manipulation, and scalable mobility technologies
* Pursue noise suppression technologies for robotic stealth operations & survivability.
* Urban Environment Modeling - autonomous generation of a 3-D model of urban structures and use of 3-D models for UGV mission planning and coordination.
* Autonomous & Semi-Autonomous Manipulation for Ground Robotics
* Autonomous Control Development
* Legged Robotics
* Warrior Unmanned Ground Vehicle

C. Other Program Funding Summary	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
PE 0603709D8Z Joint Robotics Program (BA4)	22.975	23.654	11.847	12.005	12.268	12.589	12.916
PE 0604709D8Z Joint Robotics Program (BA5)	9.721	6.851	5.725	5.212	4.245	3.242	3.111

Comment:

D. Acquisition Strategy The Joint Ground Robotics Enterprise (JGRE) utilizes several contracting and management strategies to achieve its objectives. JGR has established relationships with the several agencies to include the National Center for Defense Robotics (NCDR) and the Army s Rapid Equipping Force (REF) to support the rapid acquisition and evaluation of promising unmanned system technologies.

Funding is provided to Service lab partners and other developers to promote common technology solutions across platforms and Services.

Beginning in FY08, JGRE will encourage the establishment of a robotics consortium to broaden the research and development of robotics technologies.

E. Major Performers Not applicable for this item.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE
RDTE, Defense Wide BA 03	**0603716D8Z - Strategic Environmental Research and Development Program (SERDP)**

COST ($ in Millions)		FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P470	Strategic Environmental Research and Development Program (SERDP)	62.156	69.071	69.038	70.438	71.388	72.338	73.358

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

B. Program Change Summary	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2008)	63.682	68.874	69.173
Current BES/President's Budget (FY 2009)	62.156	69.071	69.038
Total Adjustments	-1.526	0.197	-0.135
Congressional Program Reductions		-0.603	
Congressional Rescissions			
Congressional Increases		0.800	
Reprogrammings			
SBIR/STTR Transfer	-0.945		
Other	-0.581		-0.135

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
08	DoD Environmental Requirements					

Comment: Performance in this program is monitored at two levels. At the lowest level, each of the more than 160 individual projects is measured against both technical and financial milestones on a quarterly and annual basis. At a program-wide level, progress is measured against DoD's environmental requirements and the development of technologies that address these requirements as well as the transition of these technologies to either to demonstration and validation programs or to direct use in the field.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDTE, Defense Wide BA 03	**0603716D8Z - Strategic Environmental Research and Development Program (SERDP)**	**P470**

	COST ($ in Millions)	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P470	Strategic Environmental Research and Development Program (SERDP)	62.156	69.071	69.038	70.438	71.388	72.338	73.358

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

B. Accomplishments/Planned Program:

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Munitions Management (MM):	13.360	15.152	15.910

(U) FY 2007 Accomplishments: Munitions Management (MM):
Investment in munitions management yielded advanced technology to address the most difficult and persistent issues facing our military testing and training lands, ranging from advanced signal processing approaches for improved detection and discrimination to next generation sensors to unexploded ordnance (UXO) filler material identification methods to underwater characterization technologies. Investigators continued to use the two standardized test sites for the demonstration and evaluation of UXO technologies and continued efforts to improve sensor designs and improving detection and discrimination methods. New efforts were initiated in the following areas: technologies to eliminate or mitigate future UXO munitions contamination; advanced electromagnetic and magnetic sensor development; advanced technologies for detection, discrimination, and remediation of munitions and explosives of concern (MEC); and wide area assessment for UXO management on active ranges

(U) FY 2008 Plans: Munitions Management: New initiatives will continue to focus on wide area assessment technologies, advanced sensors, signal processing, supporting technologies and protocols. Notably is the development of more capable sensors and systems for the detection and discrimination of underwater munitions. In addition, projects will be funded in the following areas: advanced discrimination of military munitions exploiting data from the ESTCP discrimination pilot study; improved technologies for wide area assessment of potential munitions response sites; and advanced technologies for detection, discrimination and remediation of military munitions. Continuing efforts include a project to develop model-based, robust methods for UXO discrimination from

time and frequency domain Electromagnetic Induction.

(U) FY 2009 Plans: Munitions Management:
Research initiatives will focus on advancements in underwater UXO detection and discrimination, wide area assessment technologies, advanced sensors, signal processing, supporting technologies and protocols to reduce the costs associated with detecting UXO. New start initiatives will center on cost effective remediation technologies.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Environmental Restoration:	19.761	19.973	19.369

(U) FY 2007 Accomplishments: Environmental Restoration:
In FY 2007 SERDP-funded research continued to address two major contaminants of concern at DoD facilities: munitions constituents (explosives, propellants and pyrotechnics) found on ranges; and chlorinated solvents (TCE, PCE) found at over half of DoD remediation sites. Significant progress was made in the munitions constituents on ranges and chlorinated solvents areas. Projects were funded with the following objectives: 1) investigate cost-effective in-situ remediation strategies for sediments; 2) improved understanding of the delivery and distribution of remedial materials in the subsurface; 3) develop technologies to assessment the impact of processes on fate and transport of contaminants in sediments; 4) develop new technologies for containment and/or treatment of energetic materials on ranges. The Congressional appropriation included $1,300,000 for at Central Michigan University Research Corporation on Perchlorate Remediation using New Nanoscale Dendritic Polymer Technology.

(U) FY 2008 Plans: Environmental Restoration:
SERDP will improve scientific understanding and develop innovative cost effective methods for the bioremediation of munitions constituents, specifically energetics and nitroaromatic compounds. Additional initiatives will continue work in the areas of source-zone treatment of dense non-aqueous phase liquids, and the phytoremediation of energetic contaminants. Future initiatives that will be funded to ensure the continued use and sustainability of our training ranges include exposure assessments of the fate and transport of energetic materials, and screening level and modeling tools. The knowledge of the potential sources, the movement of residual energetic materials and/or their breakdown products, and the assessment of environmental exposure will assist in total assessment of potential environmental impacts stemming from the use of test and training ranges.

(U) FY 2009 Plans: Environmental Restoration: New initiatives will focus on the remediation of energetics and other contaminants found on testing/training ranges, management of contaminated sediments, and the identification and characterization of new emerging contaminants.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Sustainable Infrastructure:	16.560	17.907	17.293

(U) FY 2007 Accomplishments: Sustainable Infrastructure:
Sustaining use of military ranges requires SERDP to continue efforts on developing cost effective quantification of impact of military operations on Threatened and Endangered Species and marine mammals, and cost effective control of invasive species on ranges. A highlight of this year's program is the first controlled exposure of marine mammals to underwater sound to determine what, if any, impact military sound sources may have on whales. In FY2007 SERDP continued efforts to: develop methods to identify and control the spread of non-native invasive species (NIS) that may be inadvertently transported by DoD vehicles and/or personnel; determine the fundamental relationships that define migratory land bird habitat and routing; and to understand how these elements can lead to improved monitoring strategies; develop models for biogeochemical cycles that can assist land managers in determining appropriate land uses and land management approaches for

ecosystems; and develop new remote sensing technologies to detect high priority threatened and endangered species (TES) and their habitat(s) on DoD lands. Continued efforts to understand and manage invasive plant species that negatively affect training activities; predicting marine mammal population densities; and developing remote sensing technologies to identify threatened/endangered species habitats to meet requirements of the Endangered Species Act and Migratory Bird Treaty Act. New initiatives included the establishment of the Defense Coastal and Estuarine Research Program at Marine Corps Base Camp LeJeune, developing new techniques for selecting the most effective acquisition of land as buffers for active ranges, understanding the mechanisms of forest decline on installations in the Southeastern US and the impact on habitat, and developing new methods for establishing scientifically defensible population recovery goals for threatened and endangered species.

(U) FY 2008 Plans: Sustainable Infrastructure:
SERDP will continue and initiate new efforts to address persistent issues that severely impact installation readiness and their ability to support force training and testing. SERDP will expand the long-term research efforts at the Defense Coastal and Estuarine Research Program at Camp LeJeune into full scale operation. Research topics include an assessment of the stressors on military lands caused by future larger/centralized force structures, development of new technologies to reduce and/or treat solid waste and develop technologies to safely and effectively dispose of composite materials that come about as a result of manufacturing and repair processes at military depots. New research efforts will begin in the following areas: scalable power grids that facilitate the use of renewable energy technologies; innovative technologies for electricity production from waste heat for deployed forces; managing and restoring the dry forest ecological system in the Pacific islands; impacts of military activities and invasive species on pacific island freshwater and near-shore marine ecosystems; characterization of air emissions from prescribed burning; and innovative approaches for non-destructive sensing and analysis of the integrity of historic buildings and structures

(U) FY 2009 Plans: Sustainable Infrastructure:
Continue efforts to assess stressors on military lands caused by future force structures; developing scientific, defensible threatened and endangered species population goals for installations and surrounding areas; and develop tools to manage biodiversity fragmentation caused by encroachment around military installations. Research initiatives will continue to focus on the sustainability of our training ranges including screening level tools and detailed range management models that minimize impacts to the environment while maximizing training capabilities as well as assessing the impacts of potential sea level rise on military infrastructure.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Weapons Systems and Platforms:	12.475	16.039	16.466

(U) FY 2007 Accomplishments: Weapons Systems and Platforms:
Continuing efforts focused on eliminating hazardous _red water_ from explosives (TNT) manufacturing, cadmium plating on high-strength steels, and solvents containing Class II ozone depleting substances. SERDP continued work on development of a chromium and VOC free paint systems for platforms, reduction of packaging waste for military items, and environmentally benign synthesis of energetic materials and their precursors. New start efforts were initiated in combustion science to reduce PM emissions for military platforms; environmentally benign approaches for the repair of composites for military applications; biosynthesis of energetic compounds; and advanced military aircraft noise reduction

(U) FY 2008 Plans: Weapons Systems and Platforms:
The Weapons Systems and Platforms program will focus on new efforts will begin in the following areas: Environmentally Benign, High-Strength Fasteners for Weapons Systems; Scientific Understanding of Non-Chromated Corrosion Inhibitors Function; Environmentally Benign Pyrotechnics Assemblies; Self-Remediating Munitions; and Understanding Volatile Particle Emissions from Military Aircraft.

(U) FY 2009 Plans: Weapons Systems and Platforms:

The Weapons Systems and Platforms program will continue to focus on development of _green_ energetics, munitions and weapons systems components as well as innovative life-cycle-based coating systems for military aircraft and land based platforms that eliminates volatile organic compounds, heavy metal constituents, and associated hazardous air pollutants. New initiatives will reduce or eliminate compounds on the Toxic Release Inventory top ten list.

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

D. Acquisition Strategy Not applicable for this item.

E. Major Performers

Category	Name	Location	Type of Work and Description	Award Date
Labs/Centers				
	Army Corps of Engineers	Washington, DC	Funds are provided for U.S. Army staff support to the SERDP Executive Director, Scientific Advisory Board and the SERDP Council; the U.S. Army, U.S. Navy, the U.S. Environmental Protection Agency, the U.S. Department of Energy, the U.S. Department of Agriculture (USDA), and the National Institute of Standards and Technology (NIST) for approved FY 2006 SERDP projects in Munitions Management, Environmental Restoration, Sustainable Infrastructure, and Weapons Systems and Platforms.	Oct 04

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE
RDTE, Defense Wide BA 03	**0603727D8Z - Joint Warfighting**

COST ($ in Millions)	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P727 Joint Warfighting	10.328	10.964	11.098	11.339	11.509	11.662	11.826

A. Mission Description and Budget Item Justification: Centralized funding for Defense Joint Experiment (JE) was established in FY 2000 in Navy PE 060372N. US Joint Forces Command (USJFCOM) was designated as executive agent for this funding. A smaller residual analysis and experimentation support account for was deliberately maintained under the aegis of the Office of the Director, Defense Research & Engineering (DDR&E) to provide leverage over the larger USJFCOM account, and to establish an independent capability for joint warfare analysis. This OSD Joint Warfighting Program (JWP) account supports the Joint Advanced Warfighting Program (JAWP) and directly empowers joint commanders' ability to conduct analysis and experimental concept development.

The Joint Advanced Warfighting Program (JAWP) is strongly supported by the Office of the Secretary of Defense (OSD) Policy and AT&L, with the continuing concurrence of the Joint Staff (J7) to serve as a catalyst for critical analysis and development of innovative concepts on an accelerated basis. This program fuses a team of civilian operational analysis experts with mid-grade and senior military officers to provide first-hand research into topics of pivotal importance to current and future joint campaigns. These analyses serve as a basis for formulation and assessment of advanced concepts and capabilities, identifying enabling technologies and operational integration options for the Department. Resultant concepts drive changes in the doctrine, organization, training, materiel, leadership, personnel, and facilities (DOTMLPF) of the Services. The JAWP serves an essential, expert, and independent feedback role in identifying, exploring and evaluating breakthrough war fighting capabilities. It captures and builds on lessons learned from joint contingency operations and earlier joint and Service experimentation. From that foundation, it identifies and helps formulate advanced joint concepts, explores their effectiveness by recommending design and conduct of joint experiments, and helps streamline implementation processes. Its work complements and supports the activities of Joint Forces Command, the Joint Staff, Combatant Commanders (CoComs), and the office of the Secretary of Defense (OSD).

An invigorated Defense enterprise for joint experimentation is a fundamental element of joint capability development. Elements of the JWP assist COCOMs to specify operational needs and examine capability gap alternatives. The JWP also directly funds COCOMs specific operational needs and examine capability gap alternatives. The processes assess military contingency operations and formulate advanced joint concepts to be tested and refined via experiments, doctrine development, and demonstrations. The JWP directly enfranchises the Combatant Commanders (COCOMS) to employ capabilities for mission needs analysis and joint experimentation. This JWP investment strategy expands earlier practice of offsetting costs for Defense Adaptive Red Team/DART services to the COCOMS. It aims to reinvigorate COCOM staff capabilities to employ rigorous analysis and experimentation methodologies in support of their specific mission assignments. By empowering COCOM staffs to critically assess their own needs and examine viable capability gap solutions, the JWP aims to focus larger research and development investments, like Joint Experimentation and Joint Capability Technology Demonstrations to specific warfighter requirements. The JWP enables joint commanders to conduct limited objective experiments in theater that explore capability gaps and potential capability solutions unique to their mission set. The JWP is intended to be seed funding encouraging leveraged employment of existing Defense analysis and experimentation infrastructure such as networked access to the centralized Joint Futures Laboratory facilities at U.S. Joint Forces Command in Virginia. This approach minimizes redundant investment, strengthens the relevance of Defense analysis and experimentation projects, and diversifies the range of solutions considered for pursuit by the Department.

The Defense Adaptive Red Team/DART effort evolved into an expanded effort to assist COCOMs with analysis and experimentation services tuned to their respective mission needs. DART met its objectives as a springboard to enfranchise COCOMs with a voice in Defense analysis and experimentation. Likewise, Technology Feeder Support (TFS) was a separate fund segment supporting COCOM internal analysis and experimentation technology needs. Both DART and TFS are now incorporated into the larger Joint Warfighting Program.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE
RDTE, Defense Wide BA 03	**0603727D8Z - Joint Warfighting**

B. Program Change Summary	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2008)	10.580	11.060	11.120
Current BES/President's Budget (FY 2009)	10.328	10.964	11.098
Total Adjustments	-0.252	-0.096	-0.022
Congressional Program Reductions		-0.096	
Congressional Rescissions			
Congressional Increases			
Reprogrammings	-0.250		
SBIR/STTR Transfer	-0.296		
Other	0.294		-0.022

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
08						

Comment: Performance of Joint Experimentation systems is measured through metrics including (1) objective validation of enhanced CoCom capabilities to perform joint missions in their assigned theaters and areas of responsibility, (2) documented delivery effective joint operational concepts, (3) confirmed production of refined and validated capability descriptions.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDTE, Defense Wide BA 03	**0603727D8Z - Joint Warfighting**	**P727**

COST ($ in Millions)	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P727 Joint Warfighting	10.328	10.964	11.098	11.339	11.509	11.662	11.826

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The Joint Advanced Warfighting Program (JAWP) is strongly supported by the Office of the Secretary of Defense (OSD) Policy and AT&L, with the continuing concurrence of the Joint Staff (J7) to serve as a catalyst for critical analysis and development of innovative concepts on an accelerated basis. This program fuses a team of civilian operational analysis experts with mid-grade and senior military officers to provide first-hand research into topics of pivotal importance to current and future joint campaigns. These analyses serve as a basis for formulation and assessment of advanced concepts and capabilities, identifying enabling technologies and operational integration options for the Department. Resultant concepts drive changes in the doctrine, organization, training, materiel, leadership, personnel, and facilities (DOTMLPF) of the Services. The JAWP serves an essential, expert, and independent feedback role in identifying, exploring and evaluating breakthrough war fighting capabilities. It captures and builds on lessons learned from joint contingency operations and earlier joint and Service experimentation. From that foundation, it identifies and helps formulate advanced joint concepts, explores their effectiveness by recommending design and conduct of joint experiments, and helps streamline implementation processes. Its work complements and supports the activities of Joint Forces Command, the Joint Staff, Combatant Commanders (CoComs), and the office of the Secretary of Defense (OSD).

An invigorated Defense enterprise for joint experimentation is a fundamental element of joint capability development. Elements of the JWP assist COCOMs to specify operational needs and examine capability gap alternatives. The JWP also directly funds COCOMs specific operational needs and examine capability gap alternatives. The processes assess military contingency operations and formulate advanced joint concepts to be tested and refined via experiments, doctrine development, and demonstrations. The JWP directly enfranchises the Combatant Commanders (COCOMS) to employ capabilities for mission needs analysis and joint experimentation. This JWP investment strategy expands earlier practice of offsetting costs for Defense Adaptive Red Team/DART services to the COCOMS. It aims to reinvigorate COCOM staff capabilities to employ rigorous analysis and experimentation methodologies in support of their specific mission assignments. By empowering COCOM staffs to critically assess their own needs and examine viable capability gap solutions, the JWP aims to focus larger research and development investments, like Joint Experimentation and Joint Capability Technology Demonstrations to specific warfighter requirements. The JWP enables joint commanders to conduct limited objective experiments in theater that explore capability gaps and potential capability solutions unique to their mission set. The JWP is intended to be seed funding encouraging leveraged employment of existing Defense analysis and experimentation infrastructure such as networked access to the centralized Joint Futures Laboratory facilities at U.S. Joint Forces Command in Virginia. This approach minimizes redundant investment, strengthens the relevance of Defense analysis and experimentation projects, and diversifies the range of solutions considered for pursuit by the Department.

The Defense Adaptive Red Team/DART effort evolved into an expanded effort to assist COCOMs with analysis and experimentation services tuned to their respective mission needs. DART met its objectives as a springboard to enfranchise COCOMs with a voice in Defense analysis and experimentation. Likewise, Technology Feeder Support (TFS) was a separate fund segment supporting COCOM internal analysis and experimentation technology needs. Both DART and TFS are now incorporated into the larger Joint Warfighting Program.

B. Accomplishments/Planned Program:

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Joint Advanced Warfighting Program (JAWP):	5.850	5.500	5.707

JAWP serves as a catalyst for innovation and change. This effort focuses on formulation and assessment of advanced concepts and capabilities, plus identifying enabling technologies and integration options for the Department. Annual JAWP activities are reviewed and approved by a Board of Directors chaired by USJFCOM, including Joint Staff (J7), and OUSD(Policy).

FY 2007 Accomplishments - The JAWP continued support of full spectrum transformation objectives addressing irregular, catastrophic, and disruptive challenges. It will design, conduct, and support joint experimentation, joint concept development, and analysis of joint operations, with the intent to inform and effect resource allocation and acquisition. It will continue efforts to align Department processes in ways that make them more responsive to the needs of CoComs and their subordinate forces. Topics analyzed in FY07 include:

- Iraqi Perspectives (Customer: US Joint Forces Command Joint Center for Operations Analyses Lessons Learned (USJFCOM JCOA-LL) continuing effort. Exploited Harmony database to identify what Sadaam's regime knew about neighboring countries' activities and capabilities, how he evaded sanctions, etc.
- Global War on Terrorism Africa (Customers: USJFCOM JCOA-LL). Building on previous work on interagency interplay in the Global War on Terror and its effect in the Horn of Africa, visit US embassies in Central Africa to identify opportunities and weaknesses in how the interagency works in areas where there are no US forces or military infrastructure. Use the effort to help inform the mission and organization of AFRICOM.
- Terrorist Perspectives Customers: USJFCOM JCOA-LL) continuing effort. Building on FY06 work on identifying schisms in Salafist jihadist discourse, formulate a draft strategy for exploiting enemy cleavages.
- Support to Multinational Force Iraq (Customer: Multi-National Force Iraq) continuing effort. Organize, conduct and report the results of expert panels, exploring issues identified by MNF-I.
- Improving Capabilities for Irregular Warfare (Customer: OSD, USJFCOM). Building on related FY06 work, identify capabilities needed to conduct an effective Irregular Warfare campaign, with particular emphasis on technologies. Include metrics for measuring effectiveness of DOTMLP alternatives.
- Urban Resolve Experimentation (Customer: USJFCOM) continuing effort. Provide subject matter experts and mentorship support to USJFCOM leaders of Urban Resolve-Future, Current Operations, and Homeland Defense experiments.
- Adaptive Planning (Customer: OSD, USJFCOM). Building on DoD's Adaptive Planning Roadmap and leveraging IDA experience with COCOM support and Linking Plans to Resources, identify opportunities for accelerating joint planning, making Joint planning more adaptive, and ensuring planning processes are mutually support.
- Joint Command and Control Management (Customer: Joint Staff, USJFCOM). Assist JFCOM in managing its new JC2 Portfolio Manager role by identifying the authorities, responsibilities, and inter-relationships of DoD's JC2 governance structure and recommending an approach for aligning JFCOM activities with that structure.
- Joint Command and Control Combat Development (Customer: USJFCOM). Assist JFCOM in addressing emerging JC2 combat development opportunities and challenges by identifying ways to de-conflict JC2-specific doctrine, strengthen operations-intelligence interface, target promising JC2 enablers for quick fielding, and developing a process for forming CJTFs with coalition partners.
- Fallujah Battle Reconstruction (MNF-I, JFCOM). Continuation of the battle's reconstruction, complying with GEN Casey's guidance to turn the endeavor into an interactive training tool, exploiting gaming technology.

FY 2008 Planned Output - The JAWP will continue support of full spectrum transformation objectives addressing irregular, catastrophic, and disruptive challenges. It will design, conduct, and support joint experimentation, joint concept development, and analysis of joint operations, with the intent to inform and effect resource allocation and acquisition. It will continue efforts to align Department processes in ways that make them more responsive to the needs of CoComs and their subordinate forces.

FY 2009 Planned Output - The JAWP will continue support of full spectrum transformation objectives addressing irregular, catastrophic, and disruptive challenges. It will design, conduct, and support joint experimentation, joint concept development, and analysis of joint operations, with the intent to inform and effect resource allocation and acquisition. It will continue efforts to align Department processes in ways that make them more responsive to the needs of CoComs and their subordinate forces and coalition partners.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Technology Feeder Support (TFS):	3.061		

TFS activities support Combatant Commanders (CoComs) by promoting the use of joint experimentation to address challenges specific to their theater or functional missions. TFS provides a "trial and error" experiment to understand a concept or technology that addresses a specific CoCom challenge." TFS activities are selected through an annual candidate nomination review and selection process.

FY 2007 Accomplishments: TFS continued to provide resources to CoComs for joint experimentation that addresses regional capability gaps and improves understanding of new technologies and concepts. Develop concepts for Joint Capabilities Technology Demonstration projects. A special request from US Pacific Command to re-establish a regional joint experimentation capability received early funding from FY07 program resources. Program objectives were achieved.

FY 2008 and beyond Planned Output - Program segment purposes achieved; funding transitioned into COCOM Analysis and Defense Experimentation Support, building on the success of the DART effort.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
DoD Adaptive Red Team (DART):	1.417		

DART supports four activities: (1) planning implementation of JFCOM and Joint Staff Concept Development and Experimentation (CD&E); (2) Support to other CoCOMs; (3) Support development of technologies and operational concepts underpinning joint and coalition capabilities; and (4) development and refinement of red teaming best practices. DART activities are selected through an annual candidate nomination review and selection process.

FY 2007 Accomplishments: The DART staff completed the multi-year efforts in FY07. DART continued to support the CoComs, JAWP and the Joint Staff concept development and experimentation efforts. Best practices and Senior Advisory Group activities were completed. Specific projects executed include:
- Unmanned Air Vehicle Precision View assessment of alternative concepts for pixel registration and operational impact (Customer: US Strategic Command).
- Crisis Management in Peace Keeping Operations exercise development and execution red cell (Customer: US Southern Command).
- Joint Operations Concept red teaming (Customer: Joint Staff) continuing effort.

Program objectives were achieved.

FY 2008 and Outyears Planned Output - Program segment purposes achieved; funding transitioned into COCOM Analysis and Defense Experimentation Support, building on the success of the DART effort.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Combatant Commander Analysis and Defense Experimentation Support		5.464	5.391

FY08 Planned Output: Support Combatant Commanders (COCOMs) by promoting the use of joint experimentation to address challenges specific to their theater or functional missions. Funds will be used to assess regional capability gaps and improves understanding of new technologies and concepts. Develop concepts for Joint Capabilities Technology Demonstration projects.

FY 2009 Planned Output - Continue to provide resources to CoComs for joint experimentation that addresses regional capability gaps and improves understanding of new technologies and concepts. Develop concepts for Joint Capabilities Technology Demonstration projects.

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 (R2 Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE
RDTE, Defense Wide BA 03	**0603745D8Z - Synthetic Aperture Radar (SAR) Coherent Change Detection (CDD)**

COST ($ in Millions)		FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P745	Synthetic Aperture Radar (SAR) Coherent Change Detection (CDD)		3.469	7.984	4.953			

A. Mission Description and Budget Item Justification: The Synthetic Aperture Radar (SAR) Coherent Change Detection (CCD) Initiative encompasses four phases to develop deployable systems capable of achieving SAR with real-time Coherent Change Detection for tactical intelligence. Phase I will validate the utility of existing small SAR sensors for use as a CCD platform. CCD post processing will be used to establish current SAR capabilities for change detection thresholds. Phase II will demonstrate real-time CCD on a manned, SAR-equipped, platform. This real-time enhancement will be capable of being retro fitted on existing manned SAR platforms. Phase III will develop the engineering enhancements necessary to integrate a real-time SAR CCD capability on a small UAV. All necessary software will be developed during this phase. Phase IV will extend the capability to an affordable small unmanned aircraft with a miniaturized SAR system. The goal is to develop a deployable system with a SAR sensor capable of achieving real time CCD on a small UAV to be tested by the tactical commander and at a cost of $500 thousand per SAR CCD sensor package.

B. Program Change Summary	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2008)		6.500	8.000
Current BES/President's Budget (FY 2009)		3.469	7.984
Total Adjustments		-3.031	-0.016
Congressional Program Reductions		-3.031	
Congressional Rescissions			
Congressional Increases			
Reprogrammings			
SBIR/STTR Transfer			
Other			-0.016

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

D. Acquisition Strategy Not applicable for this item.

E. Performance Metrics: Not Applicable.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDTE, Defense Wide BA 03	**0603745D8Z - Synthetic Aperture Radar (SAR) Coherent Change Detection (CDD)**	**P745**

COST ($ in Millions)		FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P745	Synthetic Aperture Radar (SAR) Coherent Change Detection (CDD)		3.469	7.984	4.953			

A. Mission Description and Budget Item Justification: The Synthetic Aperture Radar (SAR) Coherent Change Detection (CCD) Initiative encompasses four phases to develop deployable systems capable of SAR with real-time Coherent Change Detection processing to provide over the horizon alerts for terrain changes above a given threshold.

Phase I will validate the utility of current small SAR systems for use with CCD processing. CCD post processing will be used to establish current SAR capabilities for change detection thresholds.

Phase II will demonstrate real-time CCD on a manned SAR-equipped platform. This real-time enhancement will be capable of being retrofitted on existing manned SAR platforms.

Phase III will develop the engineering enhancements necessary to integrate a real-time SAR CCD capability on a small UAV. All necessary software will be developed during this phase.

Phase IV will extend the capability to an affordable small unmanned aircraft with a miniaturized SAR system. Phase IV will also decrease procurement costs of a small SAR with a real time CCD capability to $500 thousand per sensor package. This compares to a current cost of approximately $1.2 million for a spot SAR system.

B. Accomplishments/Planned Program:

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Validate the Utility of SAR CCD		0.750	

SAR with real-time CCD will have the ability to detect the following activities with actual detection metrics to be determined and tested during Phase I:
- Vehicle tracks due to a vehicle recently driving off-road, such as across a median strip, or adjacent to a paved road.
- Human(s) having recently traversed a path on soft soil, underbrush or vegetation.
- Detection of linear structures newly-emplaced, such as a small diameter pipe.
- Ground displacement due to trenching or the movement of dirt along a path.
- The addition or subtraction of a significant object visible to the sensor, covering a half square meter, or providing a significant change in radar cross section (reflectivity).
- Ground displacement due to digging operations, or digging and soil replacement, or repaving operations, where the ground area of the displaced earth covers a square meter or more.
- The displacement of guard barriers, or other objects, due to manual manipulation, or vehicle crashes.
- Ground level subsidence due to underground excavation activities when the surface subsidence amounts to a few millimeters.

The first phase will validate the utility of small SAR sensors for use in CCD processing. Phase I will also determine the current actual capabilities of CCD in tactical change detection.

FY 2008 Plan: Validate the utility of small SAR systems with CCD post processing for intelligence gathering. The goal is to develop deployable systems, capable of achieving real-time CCD for tactical intelligence with the objective of deployment in a small UAV to be utilized by the tactical commander.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Demonstration of a manned platform system		2.719	2.146

Phase II will demonstrate real-time CCD on a manned platform. The objective is to create a real-time CCD solution that may be retrofitted on to current manned SAR platforms.

FY 2008/FY 2009 Plans: This phase will continue with first phase efforts, in addition, will demonstrate a real-time CCD capability on a manned SAR platform system with a radar and processing capability that can produce real-time SAR CCD, together with a design for a deployable objective system.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Develop the engineering enhancements			5.838

Phase III will develop the engineering enhancements necessary to integrate a miniature SAR with a real-time CCD capability on a small unmanned aircraft.

FY 2009 Plan: This phase will develop the necessary reduction in SAR component size necessary to facilitate integration of real-time CCD systems into a small UAV.

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

The fourth phase will extend a real-time CCD capability to a small unmanned aircraft with a small SAR system for $500 thousand per sensor package.

FY 2010 Plan: This phase of the program will integrate a SAR with real time CCD capability to a small UAV for $500 thousand per sensor package.

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 (R2 Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE
RDTE, Defense Wide BA 03	**0603750D8Z - Advanced Concept Technology Demonstration (ACTD)**

COST ($ in Millions)		FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P523	Advanced Concept Technology Demonstration (ACTD)	158.313	1.589					

A. Mission Description and Budget Item Justification: The Department of Defense (DoD) initiated the Advanced Concept Technology Demonstration (ACTD) program in 1995 with the purpose of demonstrating new, mature technologies in an operational environment and the goal of getting new technology into the hands of the warfighter as quickly as possible. Early successes included the Predator and Global Hawk unmanned aerial vehicles (UAVs). As of year end FY06, DoD has started 150 ACTDs, a total of 70 ACTDs were in process, and 22 had been returned to the technology base or terminated. The program continues to demonstrate success in meeting urgent warfighter needs with 65 ACTDs contributing products that are/were employed in Operation Iraqi Freedom (OIF) and/or Operation Enduring Freedom (OEF). Some of these ACTDs are completing their operational demonstrations in a wartime environment. A non-exhaustive list of ACTDs deploying products to either OIF or OEF includes: Language and Speech Exploitation Resources (LASER), Expendable Unmanned Aerial Vehicle (XUAV), and the Joint Explosive Ordnance Disposal (JEOD) projects. The streamlined approach to ACTDs brings together technologists and military operators, who together insert advanced technologies into live demonstrations, evaluating their military utility in the field, while tailoring operational concepts and tactics, techniques, and procedures (TTPs) for warfighter employment.

In FY 2006, the Deputy Undersecretary of Defense for Advanced Systems and Concepts (DUSD(AS&C)) initiated a new business process, building on the successful ACTD program, to support the Department's transformational reform of addressing future threats from a capabilities focus versus the classical threat based viewpoint. The revised ACTD approach is called the Joint Capability Technology Demonstration (JCTD) program, and is based on proven, positive aspects of the ACTD program with new modifications. The JCTD model specifically addresses congressional concerns and recommendations made by the General Accountability Office (GAO) regarding rapid development and transitioning of Combatant Commander (CoCom) relevant capabilities to the joint warfighter in a more cost effective, timely and efficient model. Aligning closely with the thrust of with the Joint Staff's Joint Integration and Development System (JCIDS), JCTDs take a more balanced project candidate identification approach, shifting the overall program's focus to identifying specific warfighter capabilities needs up front (requirements pull), and then finding technology or concepts to address these needs, while maintaining the historical ACTD approach, where new technology is introduced to the warfighter to solve existing operational shortfalls (technology push). FY 2006 was the first year of a three to five year transition period from the current ACTD to the improved JCTD program. However, in FY08 all ACTD funding is being transferred to the JCTD program to complete this transition more quickly than originally anticipated. Beginning in FY07 all new starts will be JCTDs. This will implement a process that will more rapidly provide demonstrated solutions to joint warfighter needs, and unique transformational capabilities through the application of new operational concepts or technology from the Science and Technology (S&T) domain. The resources are aimed at carrying successful projects through the difficult transition stage ("S&T valley of death"). The remaining ongoing ACTDs that were started in previous years but not yet complete will be funded to completion in the JCTD program element and will complete in two to three years. It is anticipated that all ongoing ACTDs will be complete by FY09. In FY 2007, 11 JCTD new start projects were initiated. To better support the rapid transition of joint, CoCom/coalition operational capabilities, the JCTD business model includes a JCTD Transition program element. While not all ACTDs and JCTDs require transition funding, these resources provide a _transition bridge" to enable sustainment for innovative, "joint-peculiar" and CoCom/coalition capabilities until traditional programming and budgeting can provide a permanent solution.

The appropriation, Program Element (PE) and Budget Activity (BA) structure for the new JCTD process includes the following:

- JCTD PE 0603648D8Z (RDT&E/DW BA-3)
- JCTD Transition Funding PE 0604648D8Z (RDT&E/DW BA-4)

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE
RDTE, Defense Wide BA 03	**0603750D8Z - Advanced Concept Technology Demonstration (ACTD)**

In FY 2006, DUSD(AS&C) shifted an initial allocation of resources ($40 million) from the ACTD PE 0603750D8Z to populate three JCTD program element (PE)s. In FY08 all remaining ACTD resources have shifted into the JCTD BA 3 PE 0603648D8Z. This will initially establish a funding stream to support approximately five to ten new JCTDs each year. The BA-3 JCTD PE will replace the current ACTD BA-3 PE in FY08; The JCTD and remaining ACTD projects used the combined resources of both the JCTD and ACTD PEs in FY07. In FY08 and out any remaining ACTDs will be supported with funding from the JCTD PE until completion in the next two or three years. JCTDs are initiated in Budget Activity three (BA-3) and are pre-acquisition demonstrations, characterized by Technology Readiness Levels 4, 5 or 6. Although not fully developed for production, the new JCTD model can provide a path for transition of Science and Technology to acquisition and are low-to-moderate risk vehicles for pursuing those objectives. The Defense Wide RDT&E funding managed by DUSD(AS&C) will support demonstration of military utility and deployment of interim capability including a transition period to a program of record, providing the Combatant Commanders, Services, Agencies, and operators with adequate time to address the transition issues of supportability, maintainability and training identified by the JCTD/ACTD. As described, the JCTD Program has established a new model that enhances successful demonstrations with the addition of a transition arm through funding in the JCTD Transition BA4 program element (PE). The JCTD transition PE provides a path for rapid fielding of successful, transformational capabilities that may require additional transition resources to "bridge" to a program of record. To ensure successful capabilities transition to the CoCom this budget requests a shift of $10 million in FY09 from the JCTD BA3 PE into the JCTD Transition BA4 PE. This shift will better balance the JCTD model and enhance the ability to fully transition the most compelling capabilities to the CoComs.

FY 2008/2009 General Program Plan: DUSD (AS&C) will maintain oversight of the JCTD program. No projects will be funded in the ACTD PE 0603750D8Z in FY 2008. The FY 2008 new start review and validation process began in March 2007, with JROC validation in June of 2007. Congressional notification of the FY 2008 new starts occurred in November 2007. There were eight "new start" JCTDs and five "rolling starts" proposed. Rolling start projects represent important warfighter concerns and potential capabilities that are not fully developed for initiation. However, to remain agile, because of the compelling capability a plan to start is derived if the development for starting is completed.

B. Program Change Summary	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2008)	162.201		
Current BES/President's Budget (FY 2009)	158.313	1.589	
Total Adjustments	-3.888	1.589	
Congressional Program Reductions			
Congressional Rescissions	-0.586	-0.011	
Congressional Increases		1.600	
Reprogrammings			
SBIR/STTR Transfer	-3.302		
Other			

In FY07 the ACTD program had congressional increases of $9.8 million and a congressional decrease of $5.0 million. The congressional increases funded the following enabling technologies: Processing Fuel Cell Components for Lightweight, Low Cost Transportation System; Special Operations Command Target Tracking and Knowledge Discovery

System; Crossed-Field Radiation Technology (CFRT); Masking Shunt; and Spartan Advanced Composite Technology. There was a congressional reduction of $5.0 million for "Reduction to New Start Projects". There were congressional recissions of $937 thousand for Section 8106 (1% reduction) and Section 8023 (FFRDC).

In FY08 the ACTD program had a congressional increase of $1.6 million for operational/integration evaluation of the Power Dozer Side-Casting Technology. There were congressional recissions of $3K and $8K for sections 8097 and 8104 respectively.

In FY08 and FY09 all ACTD funding is transferred to the JCTD Program (PE 0603648D8Z).

C. Other Program Funding Summary	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Joint Capability Technology Demonstration (JCTD) PE 0603648D8Z	35.594	202.484	206.337	201.975	195.537	198.276	201.211
Joint Capability Technology Demonstration (JCTD) Transition PE 0604648D8Z	3.029	2.934	14.962	18.911	18.886	19.917	19.959

Comment: In FY08 all ACTD funding transfers to the JCTD program. This will complete the transition to the JCTD model that began in the FY06 President's Budget. The new JCTD Program provides a "cradle to grave" path for transformational joint capabilities. The initial funding lines (program elements (PE)) are outlined in the table below. The PEs in the table (with the exception of the ACTD BA3 PE which will fully transfer to the JCTD BA3 PE in FY08) represents the JCTD model. The model contains a BA3 development arm as well as BA4 transition arm. Under the new JCTD process, the pace of development will be accelerated to two to three years. Only the JCTDs that demonstrate the highest military utility will be considered for the transition funding in the JCTD BA4 Transition PE. Not all JCTDs require transition funding, many projects have a very clear transition path, however, some projects that demonstrate significant military utility require transition funds to "bridge" them to a program of record. Any promising remaining ACTDs may receive transition funding during the transition period to the JCTD program. Beginning in FY07 all new starts will be JCTD only. Refer to the specific Budget Exhibit for more details on each funding line.

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	Selection focus					
07	Ability to spiral					

	technologies					
07	Independent assessment of the technology					
07	Adequately resourced projects					
07	Complete a final demonstration					
07	Number of successful capabilities transitioned					

Comment: The majority of funding from this Program Element is forwarded to the Services/Defense Agencies that execute the individual ACTD projects. DUSD(AS&C) maintains and provides overall programmatic oversight for the ACTD program, to include the individual ACTD projects. The JCTD/ACTD performance metrics center on how fast relevant joint and/or transformational technologies can be demonstrated and provided to the joint warfighter. These metrics are driven by the overall business process which includes six parts: (1) selection focus; (2) ability to spin-off spiral technologies; (3) time necessary to complete a final demonstration; (4) adequately resourced projects with appropriate oversight; (5) capability to complete an independent assessment of the technology; and (6) the number of successful capabilities that are actually transitioned to the warfighter. The table below defines these metrics and helps compare/contrast the current ACTD program with the new JCTD business process model.
A comparison of ACTD and JCTD metrics are:
1) Project Selection Focus:
a. ACTD - Threat based: shared military service and CoCom influence.
b. JCTD - Capability Based: Greater CoCom influence looking at nearer term joint/coalition needs.
2) Sprial Technologies:
a. ACTD - No metric
b. JCTD - 25% will provide an operationally relevant product demonstration within 24 months of ID signature.
3) Final Demonstation Completed
a. ACTD - 3 to 4 years after initiation
b. JCTD - 75% of projects complete final demonstration within three years of ID signature.
4) Shared Funding and Viability of resources:
a. ACTD - OSD provides no more than 30% of the budgeted resources. Funding provided form many different program elements.
b. JCTD - OSD provides significantly more funding, greater than 30% in some cases a majority of projected funding, especially in the first two years.
5) Military Utility Assessment (MUA)
a. ACTD - MUA traditionally tied to a specific planned execise for evaluation.
b. JCTD - JCTDs not necessarily tied to an exercise. Greater flexibility to establish military untility via operational "real-world" demonstation or specifically designed test/venue.
6) Transition of Technology
a. ACTD - 70% of ACTDs transition at lease one product to sustainment.
b. JCTD - 80% of JCTDs transition at least 50% of their products to sustainment.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDTE, Defense Wide BA 03	**0603750D8Z - Advanced Concept Technology Demonstration (ACTD)**	**P523**

COST ($ in Millions)		FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P523	Advanced Concept Technology Demonstration (ACTD)	158.313	1.589					

A. Mission Description and Budget Item Justification: The Department of Defense (DoD) initiated the Advanced Concept Technology Demonstration (ACTD) program in 1995 with the purpose of demonstrating new, mature technologies in an operational environment and the goal of getting new technology into the hands of the warfighter as quickly as possible. Early successes included the Predator and Global Hawk unmanned aerial vehicles (UAVs). As of year end FY07, DoD has started 160 ACTDs, a total of 57 ACTD/JCTDs were in process, and 22 had been returned to the technology base or terminated. The program continues to demonstrate success in meeting urgent warfighter needs with 65 ACTDs contributing products that are/were employed in Operation Iraqi Freedom (OIF) and/or Operation Enduring Freedom (OEF). Some of these ACTDs are completing their operational demonstrations in a wartime environment. A non-exhaustive list of ACTDs deploying products to either OIF or OEF includes: Language and Speech Exploitation Resources (LASER), Expendable Unmanned Aerial Vehicle (XUAV), and the Joint Explosive Ordnance Disposal (JEOD) projects. The streamlined approach to ACTDs brings together technologists and military operators, who together insert advanced technologies into live demonstrations, evaluating their military utility in the field, while tailoring operational concepts and tactics, techniques, and procedures (TTPs) for warfighter employment.

In FY 2006, the Deputy Undersecretary of Defense for Advanced Systems and Concepts (DUSD(AS&C)) initiated a new business process, building on the successful ACTD program, to support the Department's transformational reform of addressing future threats from a capabilities focus versus the classical threat based viewpoint. The revised ACTD approach is called the Joint Capability Technology Demonstration (JCTD) program, and is based on proven, positive aspects of the ACTD program with new modifications. The JCTD model specifically addresses congressional concerns and recommendations made by the General Accountability Office (GAO) regarding rapid development and transitioning of Combatant Commander (CoCom) relevant capabilities to the joint warfighter in a more cost effective, timely and efficient model. Aligning closely with the thrust of with the Joint Staff's Joint Integration and Development System (JCIDS), JCTDs take a more balanced project candidate identification approach, shifting the overall program's focus to identifying specific warfighter capabilities needs up front (requirements pull), and then finding technology or concepts to address these needs, while maintaining the historical ACTD approach, where new technology is introduced to the warfighter to solve existing operational shortfalls (technology push). FY 2006 was the first year of a three to five year transition period from the current ACTD to the improved JCTD program. However, in FY08 all ACTD funding has transferred to the JCTD program to complete the transition more quickly than originally anticipated. Beginning in FY07 all new starts will be JCTDs. This will implement a process that will more rapidly provide demonstrated solutions to joint warfighter needs, and unique transformational capabilities through the application of new operational concepts or technology from the Science and Technology (S&T) domain. The resources are aimed at carrying successful projects through the difficult transition stage ("S&T valley of death"). The remaining ongoing ACTDs that were started in previous years but not yet complete will be funded to completion in the JCTD program element and will complete in two to three years. It is anticipated that all ongoing ACTDs will be complete by FY09. In FY 2007, 10 JCTD new start projects were initiated and 20 completed. To better support the rapid transition of joint, CoCom/coalition operational capabilities, the JCTD business model includes a JCTD Transition program element. While not all ACTDs and JCTDs require transition funding, these resources provide a "transition bridge" to enable sustainment for innovative, "joint-peculiar" and CoCom/coalition capabilities until traditional programming and budgeting can provide a permanent solution.

The appropriation, Program Element (PE) and Budget Activity (BA) structure for the new JCTD process includes the following:

- JCTD PE 0603648D8Z (RDT&E/DW BA-3)
- JCTD Transition Funding PE 0604648D8Z (RDT&E/DW BA-4)

In FY 2006, DUSD(AS&C) shifted an initial allocation of resources ($40 million) from the ACTD PE 0603750D8Z to populate three JCTD program element (PE)s. In FY08 all remaining ACTD resources will shift into the JCTD BA 3 PE 0603648D8Z. This will initially establish a funding stream to support approximately five to ten new JCTDs each year. The BA-3 JCTD PE will replace the current ACTD BA-3 PE in FY08; The JCTD and remaining ACTD projects used the combined resources of both the JCTD and ACTD PEs in FY07. In FY08 and out any remaining ACTDs will be supported with funding from the JCTD PE until completion in the next two or three years. JCTDs are initiated in Budget Activity three (BA-3) and are pre-acquisition demonstrations, characterized by Technology Readiness Levels 4, 5 or 6. Although not fully developed for production, the new JCTD model can provide a path for transition of Science and Technology to acquisition and are low-to-moderate risk vehicles for pursuing those objectives. The Defense Wide RDT&E funding managed by DUSD(AS&C) will support demonstration of military utility and deployment of interim capability including a transition period to a program of record, providing the Combatant Commanders, Services, Agencies, and operators with adequate time to address the transition issues of supportability, maintainability and training identified by the JCTD/ACTD. As described, the JCTD Program has established a new model that enhances successful demonstrations with the addition of a transition arm through funding in the JCTD Transition BA4 program element (PE). The JCTD transition PE provides a path for rapid fielding of successful, transformational capabilities that may require additional transition resources to "bridge" to a program of record. To ensure successful capabilities transition to the CoCom this budget requests a shift of $10 million in FY09 from the JCTD BA3 PE into the JCTD Transition BA4 PE. This shift will better balance the JCTD model and enhance the ability to fully transition the most compelling capabilities to the CoComs.

B. Accomplishments/Planned Program:

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Crossed Field Radiation Technology	3.200		

Since 2006 Congress has provided additional resources for the Cross Field Radiation Technology (CFRT) project to explore antenna design concepts which may prove revolutionary in reducing antenna size and weight for possible application in manned and unmanned communications systems. The 2007 Congress had provided resources for CFRT in 2007. The expected outcome of CFRT is verification of antenna design concepts and limitations with respect to frequency band use, power versus range as a function of antenna pattern, and radio equipment interface characterization. CFRT efficiencies include performance measurements for comparison to existing antenna designs, manufacturability constraints for life cycle cost analysis, and power requirements and potential savings. While this enabling technology project is not yet directed at a specific Joint Capability Technology Demonstration, there are a number of low profile sensor and unmanned systems for which the technology may make a direct contribution if successful.

- FY 2007 Output: CRFT technical focus will be on performance measurements in field conditions for refined characterization of directivity and polarization; frequency response; linearity and harmonic distortion; and omni-directional radiation pattern analysis. Goals include further refinements to the prototype antenna design of a tunable antenna for application across a wider range of base radios. The design of the CFR antenna will continue to evolve in FY07 to designs for autonomous multi-sensor platform integration. Efficiencies will be measured in power required for given communications ranges or achievable bandwidth or throughput for digital communications. Programmatically, the technical team will use the results of the tests and field trials to identify potential projects or programs that may use the CRFT in future development spirals.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Platform Test bed for Advanced Sensors (PTAS)	3.000		

The JCTD program has a critical need for a medium-high altitude airborne platform test bed to support worldwide projects and demonstrations of various technologies ranging from scientific/experimental to operational/intelligence missions. NASA currently operates the sole remaining operational long-wing WB-57 aircraft. These aircraft have been determined useful to support the JCTD program as a demonstration platform of new technologies. The JCTD program will provide resources to NASA via the USAF using an Interagency Agreement. DUSD (AS&C) will help establish mission requirements & priorities, defining payload configurations, and the demonstration/testing schedule. NASA will provide maintenance support for the aircraft and engineering support for payload integration. The JCTD program estimates 200 flight hours will be required annually beginning in FY 2006. Support also includes use of hangar and office space for experiment planning/data processing.
- FY 2007 Output - Approximately 200 planned flight hours for technology demonstrations and testing

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Processing Fuel Cell Components	3.000		

These Congressionally added funds are being used to execute low cost integrated manufacturing processes being developed for the continuous processing of advanced components for fuel cells and fuel cell vehicles for military and civilian applications. Ongoing research has produced a manufacturing process for the significant reduction of mass production costs for fuel cell components, and for high performance light weight metal matrix composites for structural components for vehicle production. This initiative has the support of the US Army National Automotive Center, as well as commercial interests in the automotive and heavy trucking industries.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Special Operations Command Target Tracking	1.000		

USSOCOM intelligence analysts face unique challenges in the prosecution and support of the Global War on Terror. Critical needs include the capability to positively identify and track leadership and key individual targets, pinpointing specific individuals that pose a threat. The global nature of the terrorist threat overwhelms current internal resources; improved capabilities to access key intelligence data at the operational level are needed; getting digital actionable data to operators on the ground.

The US Special Operations Command (SOCOM) will demonstrate an advanced technology integration proof of concept under the Research and Development Experimental Collaboration (RDEC) program in support of SOCOM Special Operations Acquisition and Logistics Center (SOAL) Program Executive Office (PEO) _ Intelligence and Information Systems (SOAL-II), Program Manager (PM) for Reconnaissance and Surveillance (SOAL-II-RS). USSOCOM will integrate tag data from at least three tagging, tracking and locating (TT&L) sources and two security classifications with additional data sources and when available and appropriate the Global Counter Terrorism Network (GCTN) and Global Sensor Network (GSN) Databases. This integration effort should result in the display of geo-located tracks linked between the TT&L data. The tag data will be processed to combine attributes from the multiple sources into a superset of information with duplicate tag information correlated into one entity.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Masking Shunt	1.300		

Masking Shunt provides a capability to hide Media Access Control (MAC) addresses. In computer networking a Media Access Control address (MAC address) is a unique identifier attached to most network adapters (NICs). It is a number that acts like a name for a particular network adapter, so, for example, the network cards (or built-in network adapters) in two different computers will have

different names, or MAC addresses, as would an Ethernet adapter and a wireless adapter in the same computer, and as would multiple network cards in a router. SPAWARSYSCEN Charleston, SC, Critical Infrastructure Protection Center, will use the funding provided to integrate the Masking Shunt into first responder and other networking environments to develop the concepts, procedures and protection profiles to use the Masking Shunt to increase security for wireless and other highly vulnerable networks. The expected integration, trial and implementation approach will be complete in FY 2007.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Power Dozer Side-Casting Technology Operational/Integration Evaluation		1.589	

The Power Dozer Side Casting Blade Technology is a mechanized earth moving system and is that of continuous loading and unloading of material. The Power Dozer Side Casting Blade Technology will be integrated on armored U.S. Military D8N and D7G dozers.

The Power Dozer Side Casting Blade Technology has successfully demonstrated the ability to breach/clear assault lanes and wide area operations consisting of mines and heavy obstacles (tetrahedrons, hedgehogs, concrete jersey barriers, concrete cubes, concertina wire) on beach and inland approaches in a majority of soil types (from sand to extreme hardpack). The Power Dozer Side Casting Blade system consists of a standard cutting edge with teeth, a steel track laid on edge to form a belt around two vertical axis, two hydraulic motors directly driving two sprocket drives to propel the belt, powered by an auxiliary power unit (APU) mounted on the rear of the dozer.

The Power Dozer Side Casting Blade Technology provides power directly to the steel belt actively removing soil from the blade before it accumulates to the point the platform stops its forward motion. The steel belt rotates around two vertical axis that brings soil from the cutting edge to the belt, removing and casting it to the side of the vehicle's (platform) path. (Mines and obstacles are swept aside with the soil.) The speed at which the belt side-casts the material is matched to the host platform's forward speed so material is continuously unloaded. The belt is also reversible. The Power Dozer Side Casting Blade Technology has produced results not previously attained within the mechanical mine clearance arena.

In addition to mine and heavy obstacle clearance, the Power Dozer is capable of a 50% or greater enhanced productivity in earth moving tasks, protective berms, back filling, road building, side hill cuts, and general windrowing. The Power Dozer has the unique capability, as determined by mission requirements, of being able to be downsized or upsized to match various platforms

FY 2008 Planned Output: Perform and operational and integration evaluation on this recently demonstrated technology.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Coalition Combat Identification (CCID)	7.200		

The JROC approved the capability need for CCID as an FY01 new start. The outcome of CCID will demonstrate and transition CCID solutions that significantly reduce fratricide and enhance combat effectiveness of allied and coalition forces operating in both traditional and ad-hoc coalitions through the core ACTD, FY01-06 and Extension FY06-08. CCID addresses both Cooperative Target Identification (CTI) and Non-Cooperative (NCTI) technologies and systems focused on ground to ground and air to ground mission areas. The core ACTD culminated with the successful 2005 Operational Demonstration of CTI technologies / systems at Salisbury Plain Training Area, U.K. The objective of the Extension is to assess the coalition military utility (CMU) of the designated non-cooperative target identification (NCTI) technologies for coalition operations, and further inform U.S. and allied investment in the optimal CTI and NCTI combat identification

capability. The CMU Assessment (CMUA) of technologies / systems will consider, as required, other relevant fielded or emerging devices in the Combat Identification-Blue Force Tracking/Joint Blue Force Situational Awareness (CID-BFT/JBFSA) family of systems. The Extension Coalition Military Utility Assessment (CMUA) will focus on the NCTI technologies rather than systems that have been previously assessed or fielded in the core. The ACTDs output and efficiencies will be correctness of ID, time to ID, range to ID, enemy targets engaged, fratricide minimized and the impact on the tempo of operations, specifically, demonstrate interoperability of U.S., U.K., and French vehicle-to-vehicle time to ID of 3 seconds (threshold)/ 1 second (objective), and range to identification (ID) of 3 kilometer (km) (threshold)/5 km (objective); demonstrate rotary-wing-to-ground beyond-line-of-sight (BLOS) and forward observer/forward air Controller time to ID of 10 seconds (threshold)/3 seconds (objective) and range of 5 km (threshold) (15 km for BLOS) / 10 km (objective) (25 km for BLOS). The User Sponsor is the U. S. Joint Forces Command (JFCOM) and the lead service is the Air Force. The Transition Strategy will be via a two-pronged approach consisting of an Extended User Evaluation (EUE), and Follow-On Development, Production and Sustainment through the JSTARS and select fixed wing aircraft programs. The strategy builds on the currently approved CCID ACTD Transition Plan and Strategy.
- FY 2007 Output - Continue development of CONOP/TTP and training package. Complete technical tests and demonstrations. Conduct operational demonstration of optimal mix of CTI and NCTI technologies and systems. Planned NCTI technologies will be assessed at Exercise Bold Quest in September 2007. In FY08 the CCID ACTD will complete as it implements its transition plan including Extended Use of the residual package. The program will finalize CONOPs, TTPs and training package during this period.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Active Denial System (ADS)	0.300		

The Joint Requirements Oversight Council (JROC) validated the capability need for ADS as an FY02 start. The outcome was to demonstrate a non-lethal, counter-personnel directed energy standoff weapon capable of producing non-lethal effects at ranges beyond effective small arms range. ADS functions by projecting a focused, speed-of-light millimeter-wave energy beam that induces an intolerable heating sensation on an adversary's skin, causing him to cease any military actions and be repelled without injury. The sensation immediately ceases when the individual moves out of the beam or when the system operator turns it off. Despite this sensation, the beam does not cause injury because of the shallow penetration depth of energy at this wavelength and the low energy levels applied. Thousands of shots involving hundreds of subjects resulted in no more than minor, transitory effects which never required long-term medical attention. The bio-effects of ADS were validated by the USAF Surgeon General and also by independent assessments by experts outside DOD. Operationally, ADS will enable our forces to stop, deter and turn back an advancing adversary without applying lethal force. The ADS ACTD produced a High Mobility Multi-purpose Wheeled Vehicle (HMMWV)-mounted field prototype and provided it to operational forces in all Services. The Services developed concepts of operations, and tactics, techniques and procedures for employing the ADS system, and they also evaluated its utility in representative military environments which included open terrain, urban environments and over water operations. In addition to rigorous bio-effects testing, the ADS HMMWV residual system successfully underwent weapons legal and treaty compliance reviews, and none identified any prohibitions to the employment. Outputs and efficiencies include: demonstrated adequate reliability and discrete support requirements over multiple 2-3 day periods; over a 12-16 month period, the system remained available over 25% of time and demonstrated the ability to be used effectively and safely; provided operators with a non-lethal counter personnel capability that out-ranges effective small-arms fire using directed energy from a mobile platform; extended the range of non-lethal capability over conventional non-lethal munitions greater than a factor of 10; lowered the probability of damage when compared to kinetic non-lethal munitions; performed line-of-sight targeting, and engaged targets at light speed, enabling high probability of hit. The Technical Manager for ADS is the USAF Research Laboratory at Kirtland, AFB, NM. The sponsoring Combatant Command is USJFCOM and the lead Service is the US Air Force. The Transition Manager is Electronic Systems Center (ESC), Hanscom AFB, MA (USAF).
- FY 2007 Output _ The ADS ACTD was extended one year to continue the integration and testing of a second containerized, desert-hardened and armored ADS system. This truck-mounted, containerized, crew-armored and desert-hardened ADS System (System 2) is in development and scheduled for delivery in January, 2008. Additionally, the ACTD investigated the feasibility testing of a smaller, prototype 30 KW system. The ADS ACTD concluded on 30 Sep 07, and the System 1 residual was delivered to USAF 820th Security Forces Group for continuing field evaluation.
- FY 2008/2009 Planned Output _ A transition effort will continue in FY2008 and FY2009 under an ADS _bridge effort_ funded by the Joint Non-Lethal Weapons Directorate (JNLWD). The primary focus is to promulgate ADS capability and to secure approved FY POM budgets in one or more Services in order to enter the formal acquisition process. As part of the transition effort, Air Combat Command is coordinating the AFROC approved ADS Capabilities Development Document with the other services and the Joint Staff.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
SPARTAN	2.100		

The Joint Requirements Oversight Council (JROC) validated the capability need for SPARTAN as a FY02 start. The outcome is to provide a modular, multi-mission, unmanned surface vehicle (USV) used to deploy sensors and weapons as low-cost force multipliers with integrated expeditionary sensor and weapon systems for use against asymmetric threats. The expanded range provides a layered defense, early warning/intercept capability for incoming threats, thereby improving protection of surface combatants, noncombatants, and other national and strategic assets. The user sponsor is U.S. Pacific Command whose Operational Manager is the U.S. Third Fleet, lead service is the U. S. Navy. The primary outputs to be demonstrated to the users and evaluated in the Military Utility Assessment (MUA) are 1) Conduct critical missions Antisubmarine Warfare (ASW); Mine Warfare (MIW); Intelligence, Surveillance, and Reconnaissance/Force Protection/precision Engagement (ISR/FP/PE); 2) Prepare the waterspace for Amphibious and Sealift Ops; and 3) Provide port-protection when launched/operated from shore. The efficiencies to be gained are 1) force multiplication using low-cost deployable sensors and weapons; 2) provide a symmetric response to asymmetric threats; 3) expanded range to provide for a reduced risk to personnel and capital assets during the conduct of dangerous missions. The Transition Strategy: The SPARTAN USV Command and Control system and Concept of Operation (CONOPS) will transition to the U.S. Navy Littoral Combat Ship (LCS) (PEO-LMW, PMW 420) Program of Record (POR) for the LCS USV. Transition is scheduled to begin with LCS Flight Zero, Ship number One production in January 2007.

- FY 2007 Output - The ACTD continues Transition activity to U.S. Navy Littoral Combat Ship (LCS) (PEO-LMW, PMW 420) Program of Record (POR). The ACTD also completes a Residual support phase for the Singapore and French SPARTAN participants to include delivering the Singapore SPARTAN USV to Singapore. Additionally a $1.3M congressional add was provided in FY 2007 through September 2008 to support the U.S. Navy in the application of advanced composite materials to improve performance and increase capability of mission payloads for SPARTAN and next generation Unmanned Surface Vessels.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Adaptive Joint C4ISR Node (AJCN)	0.800		

The JROC approved the capability need for AJCN as an FY03 new start. The outcome of the AJCN ACTD is to develop, integrate, demonstrate and transition a multi-mission radio frequency system that provides seamless interoperable communications, simultaneously with signal intelligence (SIGINT), electronic warfare (EW), and information operations (IO) capabilities. Outputs and efficiencies include number of simultaneous missions and reconfigurable levels of security, mission reconfigurable timelines, and number of scalable architectures and compliant radio transmissions. Transition accomplishments to date are two AJCN ACTD multi-function test stations transitioned to the Joint Tactical Radio System Joint Program Office. The U. S. Joint Forces Command (JFCOM) is the User Sponsor and the lead service is US Army.
- FY 2007 Output - Complete EUE of AJCN ACTD residual package. Finalize CONOPS/TTPs, training package and recommendations for Doctrine, Organization, Training, Materiel, Leadership, Personnel and Facilities (DOTMLPF). Transition AJCN ACTD products to programs of record / programs. Complete AJCN ACTD.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Agile Rapid Global Combat Support (ARGCS)	0.800		

The Joint Requirements Oversight Council (JROC) validated the capability need for ARGCS as an FY-04 start which is using advanced technologies to demonstrate a family of testers for electronic components and provide unprecedented interoperability between weapon systems, Services, and levels of maintenance. This will reduce costs and the proliferation of testers while improving the availability and performance of weapon systems. In addition, ARGCS will demonstrate technologies to facilitate net-centric diagnostics by capturing historical logistics data and developing an expert support system that will further reduce repair times and costs, as well as future sparing requirements. Outputs and efficiencies will include increases in performance, test accuracy,

interoperability, reduced logistics and weapon system support costs, and reduced proliferation of automatic test systems in the future. Technologies demonstrated will reduce the time to field new tester, a reduction in the time to diagnose and repair, a reduction in proliferation of test systems, and a reduction in the logistics footprint. The ARGCS technology will be transitioned to the Services through existing automated test programs of record. The user sponsor is U.S. Pacific Command and the lead service is the Navy.

FY 2007 Output - Completed systems integration and testing, and conducted a Limited Military Utility Assessment at the contractor_s facility. Completed the Joint Military Utility Assessment in the summer of 2007 Finalized the Concept of Operations and transition planning

FY 2008 Planned Output: Refer to the JCTD R-2a

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Counter Bomb/ Counter Bomber (CB2)	0.500		

The Joint Requirements Oversight Council (JROC) validated the capability need for CB2 as a FY03 new start. The outcome is to provide improved capabilities for military installations against the threat posed by terrorist delivered bombs and improvised explosive devices (IEDs). The capabilities include technologies for detection, identification, mitigation, and command/ control/ communications (C3); along with tactics, techniques, and procedures, and concepts for operations. The sponsoring CoComs are USSOUTHCOM and USEUCOM. Other organizations involved as participants, users of capabilities, and/or observers include USCENTCOM, Department of Homeland Security, and US Coast Guard. The lead service is the U. S. Navy. The primary outputs to be demonstrated to the users and evaluated in the Military Utility Assessment (MUA) are 1) ability to perform surveillance on the movements of people and vehicles near the installation as possible precursor to the threat, 2) detection and identification of the threat device prior to blast, 3) mitigation of the bomb, and 4) C3 to tie together the people, systems, and data critical to the accomplishment of the mission. The efficiencies to be gained are 1) the ability to perform an important and increasingly critical mission that had little priority until a few years ago, 2) the ability to perform that mission at little or no increase in manpower to military force protection organizations, 3) the ability to reduce the vulnerability and casualties of the force protection personnel while performing this dangerous mission. The transition strategy is to roll CB2 capabilities into existing programs of record (POR) and acquisition program elements of Service force protection projects, and also to utilize the J34 sponsored Combating Terrorism Readiness Initiative fund. User data packages for each of the systems will be developed, along with a users' guide on how to select and introduce new technology for force protection. Four critical products from this ACTD have already been deployed to Iraq: 1) van-mounted backscatter x-ray for vehicle inspection, 2) vehicle under carriage video inspection systems, 3) infra-red imaging system, and 4) off-leash trained canines for explosives detection. Transition plans will include program of records for Anti Terrorism/Force Protection acquisition agencies in each of the 3 services, GSA, and the J34 Combating Terrorism Readiness Initiative Fund.

- FY 2007 Output - Execute the final CB2 ACTD Spiral 3 demonstration at the Soto Cano HN, forward operating base. Initiate the Spiral 2 EUE at Naval Station Rota, Spain. Prepare Limited MUA reports and initiate EUE activities for Spiral 3 which will include a SOUTHCOM element and a EUCOM element. Initiate CMIED demonstration EUE activities. Initiate an analysis by the Defense Threat Reduction Agency (DTRA) of the quantitative improvement of introduction.

- FY 2008 Planned Outcome - Continue EUE and transition activities for all Spirals. Planned completion date is in FY 2009.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Foliage Penetration Synthetic Aperture Radar (FOPEN)(FOPEN/SAR)	1.100		

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDTE, Defense Wide BA 03	**0603750D8Z - Advanced Concept Technology Demonstration (ACTD)**	**P523**

The Joint Requirements Oversight Council (JROC) validated the capability need for the Foliage Penetrating Radar (FOPEN) ACTD as an FY03 new start. The outcome of FOPEN is to provide real-time detection and cueing of stationary targets obscured by foliage and under camouflage using tactical sensors, and to document technical requirements to better describe the characteristics and technology needed to develop a fully operational sensor system. The primary outputs and efficiencies for this project are products that locate and help in the generation of actionable information for targets under foliage or camouflage, with significant reduction in the number of sorties or manned patrols currently required. Such output goals are: to provide actionable intelligence within 1 hour of mission completion, and complete analysis of an entire mission within 12 hours; to detect 50% of relocated vehicle-sized targets under double canopy; to geolocate points of interest and targets to within 10 meters; to map concealed terrain and lines-of-communications at rates of 150 km²/hr. Generate bald-earth digital elevation models to accuracies equivalent to NGA DTED Level-II or greater; to measure ability to map man-made infrastructure (roads, paths, etc.) and relevant geographic features (rivers, streams, etc.) through average Central/South American foliage with sufficient fidelity to support military operations; to measure ability to detect and locate relevant narco-terrorist related targets of interest with sufficient fidelity and timeliness to support military operations. The user sponsor is U.S. Southern Command and the lead service is the Army. Due to the immaturity of critical technological components, the start of the ACTD was delayed until FY 2005, when DARPA delivered the necessary advanced software products. The current transition strategy for FOPEN includes: funding to transition in limited quantities (estimated 2) to an unmanned aircraft system is in the Army FY2007 President's Budget. Currently, Predator B is being considered as the primary host. The existing FOPEN-equipped RC-12D will be retained by the Army's Research and Development Command for continued development and operational applications (as needed on a fee-for-service basis).

- FY 2007 Output - Deployed to theater in support of MUA. Provide refined technical characteristics of an operational FOPEN radar system to the Army for transition to an Unmanned Aircraft System (FY 2007 Army New Start). Complete the FOPEN ACTD.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Urban Recon (UR)	0.300		

The Joint Requirements Oversight Council validated the capability need for Urban Recon (UR) as an FY03 new start. The outcome of Urban Recon is to provide advanced airborne and terrestrial 3-D reconnaissance capability to US Army Special Operations Command (USASOC) (Operational Manager) using LIDAR sensor with rapid processing software and decision aid software. Urban Recon will provide enhanced urban warfare survivability to early-entry forces by collecting revolutionary 3D urban databases supporting advanced mission planning and rehearsal, vulnerability assessment, high-fidelity route analysis, field of view, and line of sight. Rapid collection, processing, and visualization of complex urban environments. Outputs and efficiencies include: extent to which the Urban Recon ACTD sensors and software provide the high-resolution, 3-D data needed to support urban warfare operations; extent to which the equipment and software provided are easy to use and supportable by military personnel; and extent to which the Urban Recon Tactics, Techniques and Procedures (TTPs) can be effectively executed in meeting urban reconnaissance objectives. Urban Recon completed the objective laser systems development supporting vehicle-deployed, soldier-deployed, and UAV-deployed (surrogate vehicle) configurations. Finalized the CONOPS for each objective system configuration. Drafted and finalized a Capability Development Document for LIDAR Sensors. Completed the Military Utility Assessment (MUA). MUA results indicated that the data was very useful and beneficial, some additional modifications to vehicle hardware and software were required prior to fielding. Developed transition strategy supporting follow-on development, acquisition and fielding based on MUA results. Urban Recon will transfer to SOCOM. The user sponsor is U.S. Special Operations Command (SOCOM) through USASOC. The lead service is the National Geospatial-Intelligence Agency (NGA).

FY 2007 Output - Completed required capabilities documents (Capabilities Development Document, CDD, and/or Capabilities Production Document, CPD) for high-resolution terrain data acquisition and dissemination system to support programming activities. Complete required program upgrades to satisfy MUA and conclude EUE OCONUS activity.

FY 2008 Planned Output: Complete the ACTD and complete transition of capabilities .

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Coalition Shared Intelligence Network Environment (COSINE)	0.100		

The Joint Requirements Oversight Council (JROC) validated the capability need for COSINE as a FY04 new start ACTD. The outcome will provide improved capabilities for coalition operations to share information across Community of Interests (COIs) in an ad hoc coalition member environment. COSINE enforces Need to Know or Need to Share rules by only publishing information to selected communities and preventing access to sensitive documents to members who are not authorized. The primary outputs to be demonstrated to the users and evaluated in the Military Utility Assessment (MUA) are: 1) ability to establish standards, concept of operations and associated tactics, techniques and procedures for sharing information products in NATO and non-NATO environments, while maintaining secure operations; 2) ability to quickly implement the connection of a secure coalition command, control and intelligence system; 3) ability to share intelligence information and coordinate with both allied and coalition partners in a timely secure manner, and 4) ability to rapidly alter the sharing environment when the operational situation changes, coalition membership changes or information release policies change. The efficiencies to be gained are 1) the ability to perform dynamic information security and management for sharing intelligence information in a dynamic coalition environment. The transition strategy is to implement the COSINE system design and standards into the ISAF (International Security Assistance Force) secret network for coalition operations in Afghanistan. COSINE is also a component of the NATO Intelligence Functional Area Service Capability Package as a broader NATO standard capability. The sponsoring Combatant Command (CoCom) is NATO Supreme Headquarters Allied Powers Europe (SHAPE). The lead agency is the NATO Command & Control Consultation Agency. Other participants include Allied Command Operations and Allied Command Transformation.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Coalition Reception Staging & Onward Movement (CORSOM)	0.100		

The Joint Requirements Oversight Council (JROC) validated the capability need for CORSOM as an FY04 new start. The outcome of CORSOM is to demonstrate a set of technologies, provide modeling and simulation support, and establish procedures to provide Joint Force Commanders with an enhanced Reception, Staging and Onward-Movement (RSOM) Planning and Execution Monitoring capability for coalition deployment operations. The primary outputs and efficiencies to be realized by CORSOM ACTD deliverables are: 1) 10% percent decrease in delays of convoy movements caused by congestion, and as a result decreases in number of units that do not meet Required Delivery Dates 2)5% percent decrease in numbers of movement control personnel needed to manage RSOI efficiently; 3) 5% decrease in average time to offload strategic movement assets, move assets through marshalling areas, and on to staging areas; 4) comparison of total cost of RSOI when using CORSOM deliverables compared to current costs; 5) identification of reductions in logistics response times, i.e., reduced sustainability requirements, and reductions in losses in supply chain.

Planned Transition: CORSOM products will transition into NATO's Logistics Functional Area Services (LOGFAS) with NATO Communications and Systems Operating and Support Agency providing operations and maintenance. Additional transition into Global Combat Control Systems (GCCS) through Defense Information Systems Agency (DISA) support is also planned. This is a four-year project under the sponsorship of six NATO nations, NATO Strategic Commands and Supreme Headquarters Allied Powers, Europe, are User Sponsors and the lead agency is the NATO C3 Agency.

- FY 2007 Output - Completed transition to NATO Logistics Functional Area Services to include provision of required system documentation such as Data Dictionaries, Architecture Descriptions, User Documentation and Training Packages. CORSOM was used successfully in Exercises STEADFAST MOVE 07 and STEADFAST JACKPOT 07 to plan the RSOM portion of a NATO Response Force Deployment. CORSOM ACTD scheduled completion date is December 2007.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDTE, Defense Wide BA 03	**0603750D8Z - Advanced Concept Technology Demonstration (ACTD)**	**P523**

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Future Tactical Truck System (FTTS)	0.600		

The Joint Requirements Oversight Council (JROC) validated the capability need for FTTS as an FY04 new start. The outcome of FTTS is to demonstrate new and emerging system capabilities for the Maneuver Sustainment Variant (MSV) and for the Utility Variant (UV) derived from Unit of Action concept drivers. The FTTS ACTD demonstrations will have the MSVs replacing two Heavy Expanded Mobility Tactical Truck Load Handling Systems in an Engineering Battalion and two UVs replacing High Mobility Multipurpose Wheeled Vehicles (HMMWV) in a Military Police (MP) Brigade. The demonstration aims to identify key elements of a seamless distribution system that has a reduced logistics footprint and reduced fuel dependency and supports both the current and future force. The primary outputs and efficiencies to be demonstrated in the ACTD Military Utility Assessment (MUA) are: 1) percent increase in fuel efficiency, and as a result increased operational range of up to 600 miles; 2) reduce Materiel Handling Equipment (MHE) from four to one and capable of transloading 463L pallets, flatracks, tankracks, other payloads (e.g. Non Line Of Sight-Container Launch Unit), and containers to/from the MSV, to another MSV, a MSV trailer, an aircraft, Theater Support Vehicle, and other Army and Navy watercraft, a flatdeck railcar, a semi-trailer, or the ground; 3) demonstrate on board exportable power of up to 75 kW; 4) demonstrate integral armor approach with capability to add up armor kit utilizing onboard MHE. Planned Transition Status: The FTTS ACTD is a critical piece of the Army's Tactical Wheeled Vehicle Transformation Strategy. Advanced technologies demonstrated in the ACTD may be incorporated into current and future tactical wheeled vehicles. In addition, PM Future Tactical Systems (FTS) (Provisional) is leveraging the FTTS ACTD to feed the requirements development process for the Joint Light Tactical Vehicle (JLTV). This is a four-year project under sponsorship of US Pacific Command (USPACOM), with completion of development and demonstration by end of FY 2007. The lead service is Army.

- FY 2007 Output - Completed hardware build and delivered 2 UVs with trailer and 1 MSV and Companion Trailer (CT) in November 2006. Completed safety assessment and operator training for theUVs and MSV. Final operational demonstrations of FTTS MSV and FTTS UV completed in 2nd Qtr FY07. Initiated transition strategy and preparation for extended user evaluation. Spiral Output Planned - Leverage results from FTTS MSV for potential upgrade to current medium/heavy tactical fleet. Provided operational assessment results from FTTS UV to PM Future Tactical Systems (FTS) which will feed the Joint Light Tactical Vehicle (JLTV) requirements document. MS B decision for JLTV is Nov 2007. Transition manager is PM FTS. FTTS ACTD scheduled completion date is September 2007.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Joint Unmanned Systems Common Control (JUSC2)	0.300		

The JROC validated the capability need for JUSC2 as an FY04 new start. The desired outcome of JUSC2 is to provide a reconfigurable and scaleable common control architecture, capable of concurrently managing large numbers of unmanned systems of all types, leveraging interoperability afforded by existing joint and coalition interfaces and message sets for unmanned systems. The primary outputs and efficiencies to be demonstrated by this project include more efficient management and improved overall operational effect through: (1) the ability to concurrently manage (in some cases, control) all unmanned systems deployed with Littoral Combat Ship (LCS) mission packages; (2) demonstration of NATO STANAG 4586 (UAV Control Standard) Level 3/4 control handoff of STANAG enabled unmanned aircraft between Army and Navy control stations; and (3) demonstrate the ability to hand-off control of unmanned surface vehicles (USVs) and unmanned ground vehicles (UGVs) to other services' Joint Architecture for Unmanned Systems (JAUS)-compliant control stations. Current transition plans include: JUSC2's Unmanned Vehicle Common Control (UVCC) software product - an integral component of the Navy's Littoral Combat Ship Flight 0. JUSC2 Common Unmanned Aerial Vehicle (UAV) Interface Segment (STANAG 4586 compliant ground station) - now a transition product that the Army's UAV Project Office will insert into the One System Acquisition Program. The user sponsor is U.S. Joint Forces Command and the lead service is the Navy.
- FY 2007 Output - Due to now resolved funding delays, plan for and execute JMUA 2 (Border Patrol scenario - primarily unmanned aircraft based) in Feb-Mar 07. Plan for warfighting utility assessment with full at-sea test of LCS Flight 0 residual Sept-Oct 07.
- FY 2008 Planned Outcome - Complete residual final MUA activities. Complete reporting efforts; provide final engineering packages, software, and evaluation results to LCS program. Complete

the ACTD.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Joint Precision Airdrop System (JPADS)	1.400		

The Joint Requirements Oversight Council (JROC) validated the capability need for JPADS as an FY04 new start. The outcome of JPADS is to demonstrate a fast, flexible, direct projection-based distribution system to sustain rapidly deployed forces at any global destination - strategically, operationally, and tactically. The primary output and efficiencies are to demonstrate a high-altitude (25,000 ft. Mean Sea Level (MSL)) autonomous offset airdrop capability (goal 8-25 miles offset) with the option to deliver separate and distinct payloads (up to 10,000 lb total, full rigged weight, minimum of 8.5Klbs of usable payload) to multiple locations from one release point to within a 250 meter (threshold) Circular Error Probable (CEP) (50 meter CEP objective). This effort focuses Army and Air Force programs and initiatives on meeting joint airdrop requirements. JPADS will provide a seamless and flexible system of systems approach, providing materiel resupply capabilities to meet dynamic in theater operational requirements and the strategic requirement of the CoComs worldwide no later than 24 hours from the request. JPADS is a four-year project with completion of the Advanced Concept Technology Demonstration (ACTD) development and demonstration by end of FY 2008 transitioning to United States Army (USA) Program Manager Force Sustainment Systems (PM FSS), U.S. Air Force (USAF) Mobility Systems Wing systems (Mission Planner (MP) hardware) and the USAF Electronic Systems Command (MP Software) by FY 2008. Transition accomplished to date: USAF Mission planner to both Afghanistan and Iraq, ongoing integration of MP into the Marine Corps C130J and into USSOCOM/USMC navigational aid for Military Free Fall (MFF) systems.

Planned Transition: Transition high-altitude, aircraft deployable, autonomous, airdrop systems, and in-flight mission planning with wireless communication to guidance, navigation, and control systems to USA PM-FSS and USAF PMs. Plan for and execute a potential rapid combat fielding of the residual 10K JPADS decelerator systems to Afghanistan and/or Iraq.

- FY 2007 Output - Executed JMUA #2 rehearsal in December 2006, JMUA #2 in January 2007, JMUA #3 rehearsal in April 2007 and final operational demonstration, JMUA #3 in May 2007 based on US Joint Forces Command and user based scenarios. Continued to support and monitor residual system performance and user feedback during spiral technical development. Finalized USA and prepared USAF (Hardware) programs for Milestone B and planned System Development and Demonstration (SDD) programs. Finalized and executed interim transition plan in conjunction with formal JPADS 10Klb PORs. Conducted an interoperability test using Australian aircraft and forces.

- FY 2008 Planned Output - Refer to the JCTD R2a.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Multi-Sensor Aerospace/Ground Joint ISR Interoperability Coalition (MAJIIC)	2.200		

The JROC approved the capability need for MAJIIC as an FY04 new start. The outcome of MAJIIC is to develop, test and transition a set of standards, eXtensible Markup Language (XML) formats, and information services to promote intelligence, surveillance and reconnaissance (ISR) interoperability between U.S. and Coalition ground stations and systems. MAJIIC will demonstrate near-real-time interoperability of data from electro-optical, infrared, motion video, moving target indicators, synthetic aperture radar, and other sensors; enhance collaborative targeting operations; improve ISR data accessibility and sense making to support U.S. Joint ISR operations. Outputs and efficiencies include: 1) Near real-time MAJIIC ISR mission and sensor data is available for discovery and smart pull within the Collateral Space in near real time (i.e. Post in Parallel); 2) MAJIIC services and data are readily discoverable via portals, C2 Visualization and other applications, and other Global Information Grid (GIG) service providers; 3) MAJIIC data pedigree is trustable by users; 4) MAJIIC service access is assured for authorized users and denied for unauthorized users; 5) MAJIIC data access is provided based on user clearance, country affiliation, and role and protected from those not meeting the minimum policy requirements. Transition is planned for FY 2008 by

the U.S. Army Training and Doctrine Command (TRADOC) System Manager to the Service Distributed Command Ground Station (DCGS) programs, to satisfy their requirements for coalition ISR interoperability and Network Centric Enterprise Services compatibility. Transition already Accomplished: The MAJIIC Full-Motion Video ISR Information Services (ISRIS) capability deployed as part of JIOC-I to OIF, and is transitioning to the Army Distributed Common Ground System (DCGS-A). NATO is deploying the MAJIIC coalition shared database (CSD) as part of the NATO Intelligence Management and Reporting Tool (IMART) to OEF. Remaining transition: NATO, Supreme Headquarters Allied PowerEurope (SHAPE), and the U.S. will adopt demonstrated capabilities and concepts of operation into existing national and coalition systems. MAJIIC technology and lessons learned will transition to the Service DCGS programs to satisfy their requirements for Coalition ISR interoperability and Network Centric Enterprise Services compatibility. U.S. Joint Forces Command is the operational sponsor and the Air Force is lead service.

- FY 2007 Output - Participate in the annual MAJIIC coalition exercise with possible NATO Allied Command transformation with NATO Air Group IV ISR capability. Validate CONOPs and conduct MUA. Transition capability into the DCGS Integration Backbone spiral baseline.

- FY 2008 Planned Output - Refer to the JCTD R-2a.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Psychological Operations Global Reach (PSYOP)	2.600		

The USSOCOM led and sponsored PSYOP Global Reach Advanced Concept Technology Demonstration was funded and established to demonstrate and transition critical PSYOP technologies to programs of record in response to 2002 Defense Planning Guidance. The PGR ACTD will transform current PSYOP capabilities through the achievement of two major objectives: 1) extension of PSYOP product dissemination to reach target audiences in denied areas at a range up to 800 nautical miles, and 2) automation (software and hardware) of the PSYOP planning and analysis process. This ACTD will identify and assess fieldable solutions to enable the transformation of joint PSYOP by improving capabilities to disseminate information multi-dimensionally across extended ranges into denied areas, and improving PSYOP planning and analytical capability through technologies that are integrated into SOF planning systems. The PSYOP planning and assessment tools will include populace analysis, audience targeting, theme development, media and product selection, distribution and dissemination, and results analysis. Overarching outputs include: long-range PSYOP product dissemination; a digitally automated systems of systems for PSYOP planning and analysis; and the development of PSYOP scatterable media capabilities that are currently unavailable to the war fighters. These activities incorporate a variety of initiatives such as generic pod development for integration of AM, FM, and TV transmitters on-board Predator-type Unmanned Aircraft Systems, and digitizing of PSYOP planning and analytical capabilities through technologies that are integrated into the SOF net centric environment. Measures of performance/success for long-range dissemination include: distances (CONUS to OCONUS and/or transnational), ability to penetrate denied areas, ability to continuously operate/disseminate in denied areas, and dispersion area of a message in urban and rural areas. Planning and analysis collaborative tools may be measured by: rapid identification of the proper target audience and cultural message, measurement of message dispersion via various media, measurement of message reception by the target audience, measurement of effectiveness and speed of planning through approval, production, and dissemination collaborative tools, and ability to leverage other pertinent data sources. Quantitative metrics will be validated by the Joint Integration Test Command. Joint Service interoperability will be applied across all technologies.

FY 2007 Output: Continued management of the incremental design, engineering, and technical integration of multiple technologies as the variants became more robust. Planned and conducted events included: developing scatterable media and advanced broadcast payloads to support deployment on Predator type UAS platforms; conducting a Technical Demonstration (TD) of a ground launched tethered balloon FM broadcast payload, an AM broadcast payload, Wind Supported Aerial Delivery System (WSADS) UAV FM broadcast payload, and WSADS UAS loudspeaker broadcast payload; transition of the WSADS FM broadcast payload; performing a TD on R-22 Maverick UAS loudspeaker broadcast payload and Air Deployable Media Device; executing technical and operational demonstrations of the POPAS and PSYOP Situational Awareness System (PSAS); and continuing SBIR projects for antenna development and POPAS related software. These efforts will culminate in further technical demonstrations, operational demonstrations, military utility assessments, and extended user evaluations.

FY 2008 Planned Output: Continue the development and demonstration of advanced broadcast payloads for deployment on Predator/Extended Range Multi-Purpose (ERMP) and other Unmanned Aircraft Systems (UASs), to include AM, FM, and TV broadcast systems. Transition aerial loudspeaker broadcast payloads for deployment on UAS. Transition tethered balloon FM broadcast

payload_s residual. Continue the development and demonstration of scatterable loudspeaker systems and Air Deployable Media Device to support transition. Further execute SBIR projects for FM/TV antenna and the POPAS related Cultural Intelligence Wiki-berry System. Continue POPAS and PSAS development, demonstration, evaluation, incremental fielding, and transition of residual software/hardware. Conduct a consolidated Military Utility Assessment for the SLS, ADMD, POPAS, and PSAS at Ft. Bragg, NC. Transition capabilities with immediate military utility. Refine Concept of Operations and Tactics, Techniques, and Procedures.

FY 2009 Planned Output: Execute further development, demonstration, and perform evaluations for the AM, FM, and TV broadcast payloads to support deployment on Predator/ Extended Range Multi-Purpose (ERMP) type Unmanned Aircraft System (UAS) platforms. Transition scatterable media to include: scatterable loudspeaker broadcast systems and electronic leaflet systems (ADMD). Perform further development, demonstration, and evaluations of SBIR FM/TV antenna and POPAS related software technologies. Transition remaining software/hardware for POPAS and PSAS systems. The transition of residuals with a focus on Milestone B will be completed by the ACTD as it conducts close-out procedures and fully integrates with USSOCOM Special Operations Acquisition and Logistics-Intelligence and Information/Program Manager Psychological Operations (SOAL-PEO-II/PMP).

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Theater Effects-Based Operations (TEBO)	5.100		

The Joint Requirements Oversight Council (JROC) validated the capability need for the TEBO ACTD as a new start in FY 04. The outcome of the TEBO ACTD is to provide Combatant Commanders with enhanced capabilities to analyze, plan, execute, and assess Effects-Based Operations (EBO) at the strategic and operational levels by integrating computer-aided decision support tools, Concept of Operations (CONOPS), and Tactics, Techniques and Procedures (TTPs) into the command's Mission Architectures. The TEBO ACTD is a six-year project under the sponsorship of Pacific Command and Combined Forces Command/U.S. Forces Korea (CFC/USFK) as the Operational User. Completion of development and demonstration is planned for by the end of CY 2009 with transition to the Net Enabled Command Capability (NECC) System of Record in 2010. The lead service is Army. The primary outputs and efficiencies to be demonstrated in the TEBO ACTD Military Utility Assessments are (1) Exploit existing knowledge base(s) of strategic, operational and tactical environments (e.g. Operational Net Assessments [ONA] - critical capabilities and vulnerabilities, centers gravity [COG] and nodal analysis, (2) Facilitate collaborative effects-based campaign planning within a combined/Joint environment, (3) Support execution with prioritization of strategic and operational levels of effort, synchronization of actions, and battle tracking, (4) Comprehensively assess and forecast progress toward the desired end state by analyzing observed direct and indirect effects.

- FY 2007 Output - Conduct Operational Demonstration 4 (Reception, Staging, Onward Movement and Integration (RSOI) 07 and Ulchi Focus Lens (UFL) 07) Enhance and integrate COA planning capabilities and EBO execution enabling capabilities into CFC architectures ; enhance and transition ONA capabilities into other COCOMs for use; enhance and integrate DA capabilities into CFC architectures.

FY 2008/2009 Planned Output - Refer to the JCTD R-2a.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Actionable Situational Awareness Pull (ASAP)	0.600		

The JROC approved the capability need for ASAP as an FY05 new start. The ASAP output will develop, integrate, demonstrate and transition software that provides a "Smart Pull" capability to the tactical, operational and / or strategic user on the Global Information Grid (GIG) for accessing critical situation awareness information resident on distributed databases. Utilizing the Net-Centric Enterprise Services (NCES) core service architecture and the Net-Enabled Command Capability (NECC), a "Smart Pull" service will be operationally demonstrated and transitioned into NECC and

the Integrated Broadcast System (IBS). ASAP's outputs and efficiencies include (1) increased percentage of useable data available to the user, (2) increased performance through decreased latency of data, (3) percentage of increase in data obtained via "pull" vice "push" procedures, and (4) increased interoperability with coalition forces by use of XML Common Message Format Standards. Expected efficiencies (to be measured and verified) will include response time performance on the return of data as a web service. Planned Transition: Software tools and documentation will transition to Net-Enabled Command Capability (NECC) and the Integrated Broadcast System (IBS) starting in FY 2007. The ASAP User Sponsor is the U. S. Pacific Command (PACOM) and the lead service/agency is the Defense Information Systems Agency (DISA).
- FY 2007 Output - Complete Operational Demonstrations and JMUA. Initiate Extended User Evaluation of ASAP ACTD residual package. Initiate finalization of CONOPs / TTPs, training package and recommendations for Doctrine, Organization, Training, Materiel, Leadership, Personnel and Facilities (DOTMLPF). Transition ASAP ACTD products to programs of record / programs pending results of JMUA.
- FY 2008 Planned Output - Refer to the JCTD R-2a.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Coalition Secure Management and Operations System (COSMOS)	5.300		

The Joint Requirements Oversight Council (JROC) validated the capability need for COSMOS as a FY05 new start. The COSMOS ACTD output will be a pilot implementation of the Multilateral Interoperability Program (MIP) specifications for C2 data sharing (specifically the Command and Control Information Exchange Data Model (C2IEDM) and the Information Exchange Mechanism (IEM)) in the Combined Enterprise Regional Information Exchange System (CENTRIXS) coalition network environment. COSMOS is planned for a final demonstration in the second quarter of FY08, with sustainment of the demonstrated capabilities by DISA through FY09. The expected output is identifying necessary and sufficient conditions for implementing the MIP specifications, leading to rapid, secure protected sharing of critical C2 information to and among coalition partners' organic command and control (C2) systems on a single and secure integrated coalition network. The expected efficiency is substantial reduction of textual message exchange required to establish and maintain situational awareness among coalition commanders, improved collaborative decision making, reduced confusion, uncertainty and delay in combat and crisis operations and effective bridging of coalition sourced information with US Global Information Grid (GIG) Network Centric Enterprise Services (NCES) for two-way information exchange, when approved cross domain solutions are available. Transition to programs of record is planned for FY09, targeted at the emerging Multinational Information Sharing (MNIS) initiative. A policy enforcement capability for discrete rapid information sharing will be implemented in enterprise and theater-level coalition networks (i.e., CENTRIXS migrating to an emerging program based on the Joint Requirements Oversight Council (JROC) approved Multinational Information Sharing (MNIS) Initial Capabilities Document (ICD)). The use of Open Source Code for software-based capabilities will enable improved capabilities to be inserted into programs of record for coalition information sharing, network services, and next generation command and control, including those of Allies and Coalition partners. COSMOS is a three year ACTD co-sponsored by U. S. Pacific Command (PACOM) and U. S. European Command (EUCOM). The Defense Information Systems Agency (DISA) is the lead agency.
- FY 2007 Output: The technical focus for COSMOS in FY07 will be on establishing a stable and sustainable MIP specification based information exchange and demonstration of fundamental role and policy-based sharing among coalition partners. US Army planned fielding of Army Battle Command.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
CBRN Unmanned Ground Reconnaissance (CUGR)	1.800		

The Joint Requirements Oversight Council (JROC) validated the capability need for CUGR as an FY05 new start. The outcome of CUGR is to provide manned nuclear, biological and chemical (NBC) reconnaissance units with two new technology applications to be demonstrated in the Joint Service Light NBC Reconnaissance System's (JSLNBCRS) High Mobility Multipurpose Wheeled Vehicle (HMMWV) variant providing an unmanned capability. The first of these new systems (Thrust One) will replace the Double Wheel Sampling System (DWSS), currently in use, with a mobile Mass Spectrometer, using RAMAN technology. Since the DWSS can only be used when the vehicle is moving at a fast walk, replacing it with the RAMAN detector, which is producing reliable results at maximum vehicle speed, greatly increases mobility and flexibility for these units. The second technology (Thrust Two) is the incorporation of a small, remote controlled, sensor-equipped robot to be the recon crew's "point man" in high risk contamination reconnaissance. The efficiency of CUGR will be to utilize a machine rather than put a soldier at risk. CUGR addresses

the capability gaps identified in the CBRN Baseline Capability Assessment, the JRO-CBRN Defense Mobilization Plan, and the supporting JCIDS Functional Area Analysis. Thrust One will transition as part of the Reconnaissance and Platform integration sensor block upgrade program and replace DWSS on Stryker, HMMWV and LAV vehicles. Thrust Two will become part of the Joint CBRN Dismountable Reconnaissance System (JCDRS). DTRA provides overarching program management. The Technical Manager is the U.S. Army Research, Development and Engineering Command's Edgewood Chemical and Biological Center. The Joint Program Executive Office for CBD assigned the Joint Product Manager for NBC Reconnaissance as the Transition Manager. The U.S. Pacific Command is the ACTD sponsor with Operational Manager responsibility with the U.S. Army Pacific who is providing the 95th Chemical Company as the ACTD demonstration unit. ACTD will complete in FY 07. Outputs will be: to increase maneuver speed to 45 kph vice 11-22 kph: allow detection/identification of various classes of substances simultaneously vice one at a time; reduce mission consumables; enable reconnaissance into areas that otherwise would be inaccessible by manned vehicles; can be deployed into hazardous environments; offer a point detection capability; and provide the ability to collect liquid, solid and aerosol samples.

- FY 2007 Output - Refer to the ACTD R2a.
- FY 2008 Planned Output - Provide two JCSD equipped CBRN Reconnaissance platforms and 2 CUGR's for residual phase support to the 95th Chemical Company (CMLCO) and initiate Extended User Evaluation. Complete mounted CUGV system design and integration on the third JSLNBCRS. Conduct mounted CUGV early user assessment. Complete CUGV test methodology development as well as the technical manual and user training plan. Conduct mounted CUGV technical and operational demonstrations. Receive integrated system and complete the ACTD. Develop documentation and planning for Thrust One installation and transition to Stryker vehicle (new request from U.S. Army).

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Gunship Standoff Precision Munition (Danger Close CAS - Viper Strike)	6.400		

The Joint Requirements Oversight Council (JROC) validated the need for Standoff Precision Guided Munitions (SOPGM) capabilities as a FY05 new start. The outcome of the SOPGM ACTD is to evaluate the military utility of adding precision guided munitions capability to the AC-130 gunship armament suite. The assessment will be based on ground and flight demonstrations of a SOPGM weapon system employed from an AC-130 against representative gunship targets. Outputs for this project include: Initial Proof-of-Concept (IPOC) of the SOPGM weapon system and an interim Military Utility Assessment (MUA). The SOPGM IPOC weapon system will include a variant of the Viper Strike munition demonstrated on the Hunter Unmanned Aerial Vehicle, a battle management system (BMS) being developed as part of the ACTD, and physical, functional, and communications interfaces to integrate the munition and BMS to safely and effectively employ the munition. The Viper Strike munition will be modified to incorporate GPS aiding of its inertial navigation system to maintain accuracy over longer flight times. The BMS development will leverage technology developed for the Navy's Naval Fire Control system to provide operators with engagement zones and fire control for employing the munition in top attack scenarios. The IPOC SOPGM weapon system will be demonstrated through ground and flight test and deployed OCONUS in an extended user evaluation to demonstrate the potential military utility of providing the gunship with a precision guided munition capability. Outputs and efficiencies: Modify the Viper Strike munition to integrate GPS and improved warhead lethality to enhance target effects and facilitate man-in-the-loop control throughout the kill chain. Demonstrate sub-meter Circular Error Probable from 10-50 kilometer standoff ranges against moving and stationary targets within the Gunship target set with terminal guidance provided by the launch aircraft, ground teams and/or Unmanned Aerial Vehicles (UAVs). Demonstrate ability to accept and act on digital fire commands against multiple targets nearly simultaneously. Demonstrate ability to conduct attack profiles with varied avenues of approach suitable for targets in all terrain including urban environments. The Combatant Command/User Sponsor is U.S. Special Operations Command (SOCOM) and the lead service/agency is also SOCOM.

- FY 2007 Output - Planned transition: Software and hardware configurations were finalized for first ship installation and initial flight tests, but GWOT OPTEMPO for the AC-130 prevented further work on that Mission Design Series host platform. Hardware and software were rehosted on a surrogate aircraft and flight test commenced late in FY 2007.

- FY 2008 Output - Successfully completed weapon and battle management system flight tests on the surrogate host platform. Residual capabilities transitioning to SOCOM SOAL PEO Fixed Wing.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDTE, Defense Wide BA 03	**0603750D8Z - Advanced Concept Technology Demonstration (ACTD)**	**P523**

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Epidemic Outbreak Surveillance (EOS)	8.900		

The Joint Requirements Oversight Council (JROC) validated the capability need for EOS as an FY 2005 start. The outcome of EOS is to demonstrate and transition solutions that are transformational dual use for operational and clinical medicine as well as bio-defense. EOS will incorporate as series of technologies to rapidly detect and identify a wide range of respiratory pathogens that are frequently and easily confuse in clinical encounters. It is intended to overcome two diagnostic challenges: 1) discrimination between diverse pathogens that present similar (i.e. fever & flu-like) symptoms; and 2) screening rapidly, accurately and simultaneously across multiple (20 - 30+) candidate pathogens. Clinically, a practitioner, if faced with 100 cases of flu will assume you also have the flu if you exhibit the same symptoms. EOS will ensure a correct diagnosis more quickly while running a series of pathogen tests in the background to look for biological attack. The overall goal is to develop a business case that makes the technology affordable for and integrated into the command structure for both routine and wartime scenarios. EOS will leverage sophisticated, advanced molecular biology procedures, bio-informatics, micro array and/or RT-PCR - based technologies integrating into medical command channels to provide all leadership levels key information needed to make time-critical decisions. Ultimately this situational awareness provides a high likelihood that correct diagnostic decisions will be made, potentially even prior to the onset of symptoms in some scenarios. In detect-to-warn and detect-to-treat applications, the EOS diagnostic supports sustainment of warfighter capabilities in biologically active domains by promoting earlier and targeted diagnosis, intervention, minimizing casualty losses, and reducing mission degradation. The first spiral of EOS has begun with the initiation of an avian flu (H5N1) warning network to established at 22 USAF sites worldwide. This system should be operational by the Fall, CY-2006, in time for the next flu season. DUSD/AS&C, USJFCOM (warfighter), AF/SG (technical manager), and JPEO/CBD (transition manager) are the principals for this ACTD. The ACTD will end in FY2008. Outputs and Efficiencies: Viral/Bacterial Agents per Chip Assay - 100 vice 20; Total Cycle Time per Individual Assay - 2 hours vice 8; Approximate Cost per Assay - $40 vice $500; Portability of Fully Capable System - 40 pounds vice 500; Rapid ID of Bio Agents vs. Backgrounds - 2 hours vice 1 day; Forensic Attribution of Agent Strains - days vice months; contain Outbreak and Reconstitute Forces - 2 days vice weeks.

- FY 2007 Output - Completed analysis of alternatives for technical solution; completed assessment of Avian Influenza demonstration; established avian influenza Silent Guardian kiosks at multiple military bases.
- FY 2008 Planned Output- Refer to the JCTD R2a.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Joint Coordinated Real-Time Engagement (JCRE)	2.600		

The Joint Requirements Oversight Council (JROC) validated the capability need for JCRE as an FY 2005 start. The outcome of JCRE will be to develop the CONOPS and the GIG-enabled software that enables Joint Real-Time Operations and Engagement across multi-Combatant Command (COCOM) Theaters and Echelons. JCRE will support Joint Operations by providing Net-Centric Command and Control Tools that greatly enhance Planning and Execution across multiple COCOMS. These tools will be provided as web services, so they can easily be extended to support Combined Operations as directed by the Operational Sponsor. The JCRE capability will be achieved by extending and integrating the following technologies: Joint Force Global Situational Awareness (SA) Tools; Joint Force Engagement Packages; and Joint Force Synchronization Tools. These JCRE technology components will be implemented using a Service Oriented Architecture (SOA) with distributed service orchestration. These JCRE technologies, tested on the Global Information Grid (GIG), will help validate whether the evolving GIG IP architecture and enterprise services can support the time sensitive performance requirements for global operations. Output and Efficiencies: % of relevant data that is properly synchronized; % of global operation centers that have Synchronization awareness; % of synchronization problems that go undetected for > 10 minutes; Average time to detect a synchronization problem; Average time to determine impact of synchronization problems on effects; time to assemble and organize global effects; workload to assemble and organize global effects; time to synchronize global actions, capabilities, and resources; workload to synchronize global actions, capabilities, and resources; number of resynchronizations / number of original synchronizations (synchronization robustness); time to create a globally synchronized operational plan. The lead service is the Navy and the lead CoComs are U.S. Strategic Command and U.S. Special Operations Commands.

- FY 2007 Output - Demonstration #3. (Fall 2007) Demonstration of Joint Force Global Situational Awareness Tools, Joint Force Engagement Packages, and Joint Force Synchronization Tools in a battle staff exercise. A Joint MUA will be performed in conjunction with the final demonstration. Demonstration goals may be changed based on Operational Manager's direction.

FY 2008 Planned Output - Refer to the JCTD R-2a.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Joint Force Projection (JFP)	3.900		

The Joint Requirements Oversight Council (JROC) validated the capability need for Joint Force Projection (JFP) as a Fiscal Year (FY) 2005 new start. The outcome of JFP is to provide the joint warfighter the capability to identify, source, schedule, move, maintain visibility of, and close force capabilities across the entire Force Projection process. This capability will support joint deployment planning and execution, and provide emerging adaptive planning and Net-Enabled Command Capability (NECC) capabilities. The primary outputs and efficiencies to be demonstrated are (1) 100% net-centric access to core deployment planning and execution systems; (2) develop, test, and demonstrate model-based decision support tools to give the Joint Force Commander the ability to be able to conduct rapid, dynamic course of action analysis and predictive assessment of the deployment flow on current operations; (3) develop, test, and demonstrate a common, joint toolset for Joint Reception, Staging, Onward Movement, and Integration (JRSOI) activities to coordinate the flow of forces and sustainment into a theater during execution; (4) ability to create, manage, and track capability-based force packages and link them to an operational plan (100%); (5) Crisis Action Planning and Execution (after release of deployment order) support development and maintenance cycle for Operations Order (OPORD) and associated products. Cycle time reduction from 2 weeks to less than 96 hours. (6) Go from less than 5% of a capability in the current systems to 80% ability with the Joint Capabilities Requirements Tool and JFP to create, manage, and track capability-based force packages and link them to an operational plan. (7) Increase the end-to-end visibility of forces as capabilities from zero in the current process to 80% with JFP. (8) Potential of reducing the primary thread of deployment systems from 193 to 34, with an industry standard Return on Investment of 30%.

Planned JFP transition: Improved capabilities will be provided to programs of record for the next generation of command and control and network services. JFP is planning a two- phase transition. Phase 1 will be to the Global Combat Support System followed by Phase 2 transition to the Net-Enabled Command Capability when it achieves Milestone B. The user sponsor is US Joint Forces Command (USJFCOM), and the lead Service/Agency is Defense Information Systems Agency (DISA).

- FY 2007 Output - Finalized demonstration activities to complete the end-to-end Force Projection visibility capability; conducted two Joint Military Utility Assessments (JMUA) and an Extended User Evaluation; and began to transition to deliver the new Force Projection capability into program of record Net-Enabled Command and Control (NECC). Conducted final JMUA in March 2007. Completed the last two spirals of JFP ACTD deployment to include capabilities tracking throughout the deployment process and Joint Reception, Staging, Onward Movement, and Integration activities. Installed JFP in the Joint Staff Support Center (JSSC) as an application until Net-Enabled Command Capability achieves its Milestone B.

- FY 2008 Planned Output: Refer to the JCTD R2a.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Medical Situational Awareness in Theater (MSAT)	1.900		

The Joint Requirements Oversight Council (JROC) validated the capability need for MSAT as a FY05 new start. The outcome is to provide improved capabilities for medical situational awareness to commanders with integrated and timely health information fused with non-medical operational information incorporating a tailored decision support tool to make critical strategic and tactical decisions in a deployed environment. This capability will provide a fusion of medical data, personnel location information and health threat intelligence for situational awareness in theater. The capabilities include technologies for a web services environment fusing intelligence, chem.-bio threat, environmental health, unit location information; risk assessment; and decision support tools.

The primary outputs to be demonstrated to the users and evaluated in the Military Utility Assessment (MUA) are 1) ability to perform surveillance of medical threats in deployed environments, 2) model threat dynamics, and 3) conduct risk assessment using decision support tools. The efficiencies to be gained are 1) the ability to provide commanders with a more complete medical situational awareness in an actionable time-frame, 2) the ability to make knowledge-based decisions with an automated decision-making tool tailored to medical operations. The transition strategy is to incorporate MSAT system tools and operational concepts, tactics, techniques and procedures into theater medical operations through GCSS (Global Combat Support System) and Theater Medical Information Program programs of record. The sponsoring Combatant Command (CoCom) is U. S. Pacific Command (PACOM). Other organizations involved as participants, users of capabilities, and/or observers include: Armed Forces Medical Intelligence Center; OSD Health Affairs; Joint Staff Surgeon and the Defense Information Systems Agency. The executive agent is the Joint Staff, Logistics Directorate, Health Services and OSD Health Affairs.
- FY 2007 Output - Project restructured to accommodate alternative solution set, new partners and funding sources. Approved amendment to implementation directive. Revised requirements plan and began new development contract. Prepared new assessment plan.
FY 2008 Planned Output - Refer to the JCTD R2a.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Rapid Airborne Reporting & Exploitation (RARE)	0.400		

The Joint Requirements Oversight Council (JROC) validated the capability need for RARE as an FY05 ACTD new start. The outcome of RARE is a time-sensitive, thermal IR, advanced geospatial intelligence (AGI) airborne capability for theater commanders. The outcome will include documented capabilities to produce special measurements from the U-2 SYERS-2 and the Global Hawk ISS platforms / sensors. The RARE ACTDJMUA was completed in FY07 and is planned for transition into the U-2, Global Hawk and AF DCGS Programs of Record. The primary efficiency and output to be demonstrated is an increased number and value of EEI's that can be provided to the users / data exploiters with negligible additional cost in the acquisition, operation and maintenance of the collection systems. In FY 2008, the RARE capability will begin transition to AF DCGS, U-2 and Global Hawk programs. The RARE capability will transition to the REAPIR/SOCET software packages and be incorporated into the concept of operations of the Senior Year Electro-Optical Reconnaissance System-2 and Global Hawk sensor systems. The ACTD will also deliver documentation/lessons learned to enable capability for other airborne platforms. The lead service is the U.S. Air Force, and the ACTD user sponsor is U. S. Central Command (CENTCOM). The Transition Manager is ACC/A2.
- FY 2007 Output - Completed system performance characterization and formal exploitation software package. Identified and coordinated requirements and requested funding to support transition of capabilities to Programs of Record. Continued beta operational support at NASIC, including identification and solution of data format and transmission problems not previously expected. Successfully conducted the concluding Joint Military Utility Assessment with participation from CENTCOM and AF DCGS.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Sea Eagle	1.000		

The Joint Requirements Oversight Council (JROC) validated the capability need for Sea Eagle as an FY 2005 start. The outcome of Sea Eagle will be to demonstrate and transition technologies to provide persistent, clandestine, and unattended monitoring of maritime areas in a Special Operations Forces (SOF) deliverable "system of systems". These sensors and systems will be deliverable by SOF and networked in a multi-media (sea, air, land) system-of-systems approach. Sea Eagle will greatly increase SOF's ability to clandestinely conduct persistent, intrusive Intelligence, Surveillance, and Reconnaissance (ISR) in maritime areas. The war fighter will tactically emplace Sea Eagle systems to provide targeted, tactical information that complements national and theater intelligence assets to enable a layered intelligence collection strategy. These funds will be used to support technical down-select, systems integration, and demonstrations of sensors and communication technologies. The funds will support: 1. Johns Hopkins University Applied Physics Lab (JHU APL) and Naval Surface Warfare Center Panama City (NSWC PC) as the technical integrators for Sea Eagle; 2. Operational Manager support and demonstration costs; and 3, Procurement and integration of components for the demonstrations. Outputs and Efficiencies: The

overarching output for Sea Eagle is persistence. This output incorporates a variety of initiatives such as power management, intelligent triggering, and signal discrimination to optimize system performance and persistence. Measures of persistence will be relevant for individual component, subsystem, and overall system performance. Quantitative metrics are classified. USSOCOM is the COCOM/User Sponsor; Navy is the Lead Service.

FY 2007 Accomplishments: Sea Eagle Management Plan signed and Security Classification Guide approved. Incorporated underwater communications and sensors into a clandestine, close access, mesh network. Cross environment connectivity between Land and Maritime system components was demonstrated in June 2007 proving the "concept" of the ACTD.

FY 2008 Planned Output: Sea Eagle Transition Plan signed. Draft CDD finalized and Technology Transition Agreement socialized. Incorporate underwater communications and sensors into a clandestine, close access, ad-hoc, self-healing mesh network. Demonstrate the undersea network and sensors in Q2 FY08. Conduct final Military Utility Assessment of the entire Sea Eagle network Q3 FY08. Upgrade land network protocol and integrated additional land sensors. Transition capabilities with immediate military utility. Refine CONOPS and TTPs.
FY 2009 Planned Output: The Transition/Residual Period will be conducted and the ACTD will complete with transition to the SOCOM Global Sensor Network (GSN) POR by the end of the FY.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
SOF Long Endurance Demonstrator (SLED)	5.100		

The JROC validated the capability need for SLED as an FY05 new start. The outcome of SLED is to demonstrate an unmanned vertical take off and landing vehicle (the DARPA developed A160 Hummingbird VTOL UAV) capable of flying long range (2000+NM/24+ hours) and employing a wide variety of adaptable payloads, supporting combating terrorism (CT), counter proliferation (CP), special reconnaissance (SR), direct action (DA), psychological operations (PSYOP), and other mission areas. Efficiencies and outputs will evaluate the A160 for its capability to perform designated functions. Platform performance must be compatible with payload and mission requirements in terms of altitude, endurance, range, weight (platform and payload), and payload power. The payloads must meet mission requirements and be compatible with A-160 capabilities and constraints. Planned Transition is to integrate with USSOCOM components.
U.S. Special Operations Command is the user sponsor and lead agency.
- FY 2007 Output - Completed CONOPs development. Selected and demonstrated representative support payloads, such as SAR/GMTI, SIGINT, Comm Relay, and EPR. Demonstrated Hellfire on A-160. Developed slide on/slide off payload capability. Plan and perform final MUA. Final MUA activities may slip to first quarter FY 08 as a result of DARPA FY06 grounding and re-certification activity for A160.
FY 2008 Planned Outputs Refer to the JCTD R-2a.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Tactical Satellite (TacSat)-2 (Road-Runner)	1.500		

The Joint Requirements Oversight Council (JROC) validated the capability need for Tactical Satellite (TacSat)-2 as an FY05 start. The outcome of TacSat-2 is to demonstrate use of responsive, flexible and affordable tactical satellites to retain a space capabilities advantage in high threat environments and the concepts for dynamic theater tasking, high-rate theater downlinks and horizontal integration of space derived information via SIPRNET. It will demonstrate on-demand, cost-effective augmentation of space forces. Capabilities will be tailored to specific and emerging crises and use the latest, high-payoff technologies to avoid surprise and counter terrestrial and space threats. These attributes help rapidly reconstitute destroyed or degraded space capabilities to continue military action. TacSat-2 will be Internet Protocol addressable and function as a node within a network-centric architecture. Warfighters with Secret Internet Protocol Router Network access can task the satellite's sensors for geo-rectified signals information and one-meter resolution visible imagery on areas of interest. Outputs and efficiencies are: Spacecraft launch site arrival to launch - objective: 7 days, threshold: 14 days. Autonomous rapid on-orbit spacecraft and payload checkout and initialization - objective: 24 hours, threshold: 72 hours. Payload downlink data rate - objective: 274 Mbps, threshold: 1.15 Mbps. Planned transition: The Services will use the ACTD results to update their future operational concepts and to refine National Security Space Office's Responsive

Space Operations Architecture. Proven technologies, such as the Common Data Link, will be integrated to increase data transmission rates from space to the warfighter and autonomous state of health processes to reduce satellite operations and maintenance costs. The lead Combatant Commander (CoCom) is the U. S. Strategic Command. The lead service is the Air Force.

- FY 2007 Output - The TacSat-2 ACTD successfully launched in December 2006. Following on-orbit checkout, the sensor systems will undergo testing and calibration leading into its participation in the Talisman Saber 07 exercise in the PACOM AOR. TacSat-2 also plans participation in Valiant Shield, Empire Challenge, and Ulchi Focus Lens. After each exercise a quick-look report will be produced to understand the utility of the satellite, refine concepts of operation and understand lessons learned. Following the final exercise a formal Military Utility Assessment report will be produced ultimately affecting the future Operationally Responsive Space construct.

FY 2008 Planned Output - Refer to the JCTD R-2a.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Counter Intelligence - Human Intelligence Architecture Modernization Program, Intelligence Operations Now (CHAMPION)	6.400		

The Joint Requirements Oversight Council (JROC) validated the capability need for CHAMPION as a FY06 new start Joint Capability Technology Demonstration. The outcome will provide improved capabilities for the counter-intelligence, human-intelligence and special forces communities of interest. These improvements will provide an accessible and actionable information system for management of the CI/HUMINT/SOF collection, mission planning and management information. The capabilities include technologies for integration of biometrics and geospatial information. The primary outputs to be demonstrated to the users and evaluated in the Military Utility Assessment are: 1) joint data standard for human domain; 2) CHAMPION information collection tool and associated concept of operations (CONOPS), tactics, techniques and procedures (TTPs); 3) CI-HUMINT/SOF source management tools with federated search capability and data replication/access across multiple networks; and 4) integrated language translation collection, CIHUMINT source vetting tool and data access tools for multi-intelligence discipline fusion. The efficiencies to be gained are; 1) improved effectiveness of HUMINT operations; 2) elimination of Human domain data stovepipes; 3) joint human domain data standard; 4) improved web enabled data access across multiple networks; 5) Joint CONOPs/ TTPs; 6) Biometric and geo-spatially enabled mission and asset management tools. The transition strategy is to incorporate CHAMPION capabilities into the Distributed Common Ground Station program of record (POR) and the CHARCS (CI HUMINT Automated Reporting Collection Systems). The sponsoring Combatant Command (CoCom) is the U. S. Central Command (CENTCOM). Other organizations involved as participants, users of capabilities, and/or observers include USSOCOM, USJFCOM, Counter-Intelligence Field Activity, Defense Intelligence Agency, National Geospatial Agency, and the National Security Agency. The lead service is the Army.
- FY 2007 Output - Completed Spiral 1 limited assessment report and Spiral 2 assessment plan. Executed the Spiral 2 development. Secured funding for fielding of spiral deliverables and interim capabilities found to have military utility by operational sponsor.
FY 2008/2009 Planned Output - Refer to the JCTD R2a.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Comprehensive Maritime Awareness (CMA)	6.400		

The Joint Requirements Oversight Council validated the capability need for CMA as an FY06 new start. The outcome of CMA is demonstration and transition of technologies and operations concepts showing the value of information sharing and effective information management for improving global Maritime Domain Awareness. CMA will demonstrate the value of both interagency and international (Republic of Singapore) information sharing. CMA will demonstrate data management techniques such as automated anomaly detection and threat evaluation, and application of the Department of Defense Net-Centric Data Strategy. CMA is a 4-year project sponsored by U.S. Pacific Command, U.S. Northern Command, and U.S. European Command. Initial capabilities will be demonstrated and operated in CY-06, with advanced capability spirals in FY07 and FY08, and transition support in FY09. The lead Service is U.S. Navy. The primary outputs and

efficiencies to be demonstrated in CMA Military Utility Assessments are (1) percent increase in the number of maritime tracks and identified tracks in U.S. military, interagency, and coalition maritime operational pictures; (2) percent increase in numbers of maritime contacts with amplifying information (such as crew list, cargo manifest, port-of-call history, etc.); (3) percent increase in numbers of vessels of interest monitored by maritime intelligence analysts; (4) number of automated anomaly detections and threat alerts provided to maritime intelligence analysts; (5) increase in number of agencies (U.S. and international) engaged in information sharing across a common service oriented architecture.
- FY 2007 Output - Continue operating FY 2006 spiral capability. Integrate capabilities of the U.S. Coast Guard Vessel Tracking Program, and automated anomaly and threat assessment, at key regional sites determined by architecture decisions. Conduct interim military utility assessment. Complete planning for network services and architecture implementation for FY 2008 for interagency sharing.
FY 2008 Planned Output - Refer to the JCTD R-2a.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Event Management Framework (EMF)	3.000		

The Joint Requirements Oversight Council validated the capability need for EMF as an FY06 new start. The goal of EMF is to demonstrate the ground breaking capability of vertical and horizontal sharing of heretofore stove-piped information among organizations within and outside of DOD by emphasizing EMF policies; operational concepts; and tactics, techniques and procedures. In handling a terrorist event or incident, a horizontal information focus among Federal agencies is necessary during the interdiction phase of an incident. During response and recovery phases, a vertical information sharing focus among Federal, state, and local agencies is needed.
A coherent interoperable information sharing mechanism is needed to: (1) Discover and share information resources throughout the incident based coalition domain; (2) Recognize the changing value of temporal information; and (3) Analyze and synchronize the large amounts of data relative to an event. All COCOMs, as well as their non-DoD partners, have made large investments in command and control (C2) and collaboration coordination tools. But, to date, effective integration of those investments has been sub-optimal. The event management framework consists of policies, operational concepts and technologies to ensure decision makers can build a situational picture of an event with all relevant facts. The primary outputs and efficiencies to be demonstrated in the ACTD Military Utility Assessment (MUA) are: 1) Integrated EMF policies; operational concepts; and tactics, techniques and procedures; 2) Improved and more timely incident and information correlation to "connect the dots"; 3) Faster visualization of analytic results to aid decision makers in event assessment; 3) Addition of EMF databases and engine servers to cache data; 4) Capability to share information and analytical results across COCOMs, Coalitions, Services, and its interagency partners; 5) Reduced time required for event based decision making. EMF is a three-year project under the sponsorship of the United States Northern Command. The lead agency is the Defense Information Systems Agency (DISA).

- FY 2007 Output - Developed Spiral 2 capabilities - incident and event reasoning prototype, ontology and data models. Developed portal interfaces. Add regional partners. Provide advanced cryptographic devices. Refine smart agents. Refine CONOPs and TTPs. Plan Joint Military Utility Assessment (JMUA). Conduct command post exercise 2.

- FY 2008/09 Output - Refer to the JCTD R-2a.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Extended Space Sensors Architecture (ESSA)	2.800		

The Joint Requirements Oversight Council (JROC) validated the capability need for ESSA as a FY06 new start. The ESSA ACTD is creating a joint, distributed, net-centric space surveillance framework. The expected outcome of the ESSA ACTD is a flexible, responsive and scalable command and control family of systems which enhance United States Strategic Command's (USSTRATCOM) Space Situational Awareness (SSA) capability. ESSA is a three-year ACTD sponsored by USSTRATCOM and Commander Joint Forces Component Command Space (CDR JFCC SPACE). The ESSA Operational Utility Assessment (OUA) is planned for mid FY 2009, and the capability will transition to Programs of Record (PORs) by the end of FY 2009. The lead service is the U.S. Air Force. The ESSA ACTD will develop and demonstrate a net-centric sensor architecture which provides more timely SSA information via the Secret Internet Protocol Router

Network (SIPRNET) to decision makers. ESSA efficiencies will include: increased timeliness for delivering data products from sensor to command and control (C2) node; ability of netted sensors to perform more efficient strategies for searching, tracking, identifying and monitoring space object population; ability of C2 node to observe sensor operations in real-time and make rapid decisions in response to space events; and the ability of an architecture to support both theater and strategic users. While this ACTD does not answer all of the SSA gaps and shortfalls identified in USSTRATCOM's Space Control Joint Capability Document (JCD), it does address the number one priority identified in the JCD of synergistically exploiting all available SSA data.

- FY 2007 Output - The focus in FY07 was on the first of three demonstrations and supporting programmatic milestones. The management team wrote, coordinated, and signed the ESSA Management Plan. The transition team began developing a comprehensive transition plan. The operations team completed the Demonstration Execution Document (DED) and data gathering checklists and methodology for Demonstration 1. On 13 Dec 06, members of the ESSA management team, including the Massachusetts Institute of Technology, Lincoln Laboratory (MIT/LL), successfully completed the ESSA ACTD Demonstration 1. The objective of Demonstration 1 was to expose operationally relevant information and data from a radar imaging sensor via net-centric means. By using web-based applications, end users at Joint Space Operations Center (JSpOC) at Vandenberg Air Force Base (AFB), CA and the Space Situational Awareness Test Bed (SSATB) at Schriever AFB, CO were able to subscribe, retrieve and monitor wideband imagery and other products from the Haystack Auxiliary (HAX) radar imagery sensor. This demonstration was conducted over the Defense Research and Engineering Network (DREN). On 20 Apr 07, the ESSA SIPRNET risk reduction effort successfully validated the migration of the ESSA capabilities from the DREN to the SIPRNET. HAX radar tasking, imagery and associated metadata were transferred via the SIPRNET to multiple users simultaneously within similar timeliness as observed during Demonstration 1.

- FY 2008/2009 Planned Output _ The focus for FY08 will center on two major topics: demonstration and transition. The Operations Integrated Products Team (Ops IPT), along with the 46th Test Squadron will draft the assessment objectives and sub-objectives that will validate the Critical Operating Issues (COIs). This information will then be incorporated into a comprehensive DED and data gathering checklists and questionnaires. Demonstration 2, which will include deep-space satellite monitoring, change detection and satellite conjunction analysis, is scheduled for 1 _ 5 May 2008. The ESSA ACTD will culminate in March/April 2009 with a final demonstration. This demonstration will center on the characterization of a New Foreign Launch (NFL). The Ops IPT will lead the objective/sub-objective development, as well as the DED and associated assessment methodology. The ESSA transition manager, with the help of the entire ESSA management team, will finalize the transition plan for migrating ESSA ACTD capabilities into the hands of the warfighter. The transition plan will include two critical portions: the extended use of residuals and transition. The extended use of residuals, a two year period beginning April 2009, will increase the number of space surveillance network (SSN) sensors connected in a net-centric service orientated architecture and define an operationally focused concept of operations and tactics, techniques, and procedures. The transition period will begin after the extended use of residuals period has ended. During the transition period, additional SSN sensors will be added to the net-centric C2 network; however, detailed oversight and procedural development support will become the responsibility of the warfighter.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Joint Enable Theater Access - Sea Ports of Debarkation (JETA-SPOD)	4.000		

The Joint Requirements Oversight Council (JROC) validated the need for JETA-SPOD capabilities as a FY06 new start. The outcome of JETA-SPOD is to develop and demonstrate: a Lightweight Modular Causeway System (LMCS) transportable by and employable from intra-theater sealift vessels such as the JHSV or other current Army/Navy watercraft; and an austere port Decision Support Tool for selection of optimal sites from multiple austere SPOD options. The capabilities proposed for development in this ACTD will optimize the use of the Joint High Speed Vessel (JHSV), current Army/Naval watercraft, and Lines of Communication (LOC) bridging requirements by providing increased and more rapid flow of combat power and sustainment through multiple theater austere seaport locations. This provides to Joint/Combined Force (J/CFC) commanders a means to mitigate threat anti-access activities and increases flexibility to conduct operational maneuver from strategic distances. JETA-SPOD ACTD is a three-year project under sponsorship of U.S. Pacific Command, with completion of development and demonstration by end of FY2008; and transition to U.S. logistics systems as early as FY2009. The lead service is Army. The primary outputs and efficiencies to be demonstrated in the ACTD Military Utility Assessment (MUA) are: 1) the LMCS will reduce weight, volume, and deployment time compared to existing military causeway and bridging systems; 2) the operational parameters for evaluating the military utility of the LMCS are based on a quantitative and qualitative comparison to the capability provided by the existing Modular Causeway System (MCS); 3) LMCS will result in a reduction in weight and volume by 50% over the MCS; a reduction in deployment time by 50% over the MCS; and elimination of in-water connections; 4) the Decision Support Tool capability equates to an increase in availability of throughput prediction information for 50-80% of worldwide small ports; and 5) the combination of LMCS and the Decision Support Tool includes a five-fold increase in the number of JHSV-

compatible ports and doubling of the port throughput rate. LMCS Output includes incorporation of state-of-the-art connector and tensioning technology; innovative emplacement and recovery system applicable to multiple military/civilian platforms; innovative self-locking and strap tensioning technologies; high strength fabrics for robust, lightweight floatation technology that quickly inflates/deflates for rapid LMCS emplacement and recovery; puncture/abrasion resistant floatation components; lightweight decking materials; and common 8x20 rapid transport footprint design. The efficiency is that the transport (land/sea) cost of moving causeway capabilities into austere SPODs will be significantly reduced; and causeway capabilities will arrive in theater more rapidly with a smaller logistics footprint. Austere Port Decision Support Tool Output includes query-able austere world port data; a port characterization model; rapid port enhancement tool; austere port throughput simulation; a comprehensive set of environmental and physical factors affecting ingress/egress throughput rates; and parametric algorithms for throughput rates in small ports and rates for planning and execution of vessel offload operations; developed with an open source tool; user friendly Graphical User Interfaces (GUI); and runs on a laptop computer. The efficiency is that the warfighter will possess flexibility and a broader range of options to establish austere seaports as strategic or operational maneuver entry points with a greater assurance of success. The transition strategy for LMCS and the Decision Support Tool is to establish Programs of Record under the guidance of two Transition Managers: Product Director, Army Watercraft Systems (PD AWS) and USTRANSCOM, respectively.

- FY 2007 Accomplishments - Conducted early user evaluation and incorporated changes prior to testing; developed Training Strategy and began limited user training; completed LMCS full-scale component demonstration and testing; began LMCS fabrication; planned residuals and technical support; received an approved/signed Management Plan; completed draft JSAT and LMCS CONOPS; refined DAMP; locked Decision Support Tool data requirements; developed Decision Support Tool Beta Version as Spiral Output to the field; conducted a Decision Support Tool Limited MUA; and continued Interim Transition Planning (ITP).

- FY 2008 Accomplishments - Refer to the JCTD R-2a

- FY 2009 Planned Output - Refer to the JCTD R-2a

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Joint Modular Intermodal Distribution System (JMIDS)	8.900		

The Joint Requirements Oversight Council (JROC) validated the capability need for JMIDS as an FY06 new start. The outcome of JMIDS is to demonstrate, analyze and transition joint service, all-mode containers and platforms that are equipped with Automatic Identification Technology (AIT). JMIDS will permit efficient, seamless, and visible movement of supplies through the distribution system from CONUS-based depots and vendor locations to tactical end users. This includes movement through the Seabase to support forward operating expeditionary and task force units. JMIDS technologies will enhance the ability to source load supplies that can move from origin to destination without the current intensive and inefficient handling and re-packing caused by: 1) incompatible air and ground cargo systems; and, 2) sorting, storing, and/or reconfiguring cargo. The goal of this JCTD is to improve the agility, flexibility, efficiency, effectiveness, responsiveness, and interoperability of the Joint Distribution System.

JMIDS is a three-year project under sponsorship of US Transportation Command, with JCTD completion by the end of FY 2008, and transition to selected Program Manager(s) / Program of Record(s) [Joint Modular Intermodal Platform (JMIP) and Joint Modular Intermodal Container (JMIC)] by FY 2009. The lead service is Army. The primary outputs and efficiencies to be demonstrated in the JCTD Limited and Capstone Military Utility Assessments are: (1) Timeliness of JMIDS technologies to deliver supplies to operating forces as compared to present distribution system; (2) Capability to support transportability across different modes by reducing re-handling/ packing time; (3) Improved supply flow through the available technologies- Tonnage processed per hour, Time per load-out of platform Wait times per load-out; and, (4) Capability to support Command Level Situational Awareness-Accuracy of AIT tracking technology (contents, position), percent of JMICs tracked correctly, overall improvement of situational awareness upon use of AIT.

- FY 2007 Accomplishments - Completed acquisition of JMIC, JMIP and AIT demonstration hardware. Conducted three MUAs. Completed multiple Capability Development Documents (CDD)

spirals and Integrated Logistics Support planning drafts. Commenced CDD staffing through the Services. Delivered hardware and conducted engineering tests for a Coalition Warfare Demonstration of the JMIDS hardware with the United Kingdom.

- FY 2008 Refer to JCTD BA4 R-2a

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Large Data	6.400		

The Joint Requirements Oversight Council (JROC) validated the capability need for the Large Data (LD) Joint Capability Technology Demonstration (JCTD) as an FY06 new start. The outcome of Large Data is to demonstrate the military utility of a highly scalable, rapid, and secure integrated capability to retrieve, store and share massive amounts of information effectively between global users. It will provide increased situational awareness by displaying large, fused sets of geospatially-referenced data in a Joint Warfighting context using intuitive navigation techniques. Large Data is a three-year project under the sponsorship of the United States Strategic Command. The primary outputs and efficiencies to be demonstrated in the JCTD Military Utility Assessment are: 1) Synchronized databases across all major operational storage nodes, i.e. cache coherency; 2) Timely delivery and sharing of data - instant real time access and collaboration; 3) Intuitive way for users to navigate large data sets (petabytes to exabytes); 4) Ability to easily visualize huge amounts of data that is being generated; 5) Capability to perform "trackback" or change analysis on an unprecedented scale.
The user sponsor is the U. S. Strategic Command and the lead agencies are the National Geospatial Agency (NGA) and Defense Systems Agency (DISA). Transition is planned for FY 09 after successful JMUA to National Geospatial Agency (NGA) and Defense Systems Agency (DISA). Both agencies are participating in the JCTD as Co-Transition Managers. The Large Data JCTD is scheduled to complete in December 2008.

-FY 2007 Output - Spiral 2: Develop holistic target characterization prototypes and deploy to USFK mini node. Add 4th CONUS node. Install Trans-PAC link. Develop capability for geo-temporally indexed multi-agency data, with security, identity management, and Continuity of Operations features. Perform multi-node testing on classified and unclassified networks. Provide large geospatial visualization displays and advanced data integration. Refine CONOPs and TTPs. Plan JMUA. Conduct demonstration in USFK and JEFX.

- FY 2008 Planned Output - Refer to the JCTD R-2a.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
MASINT Tactical Intelligence Fusion (MASTIF)	6.400		

The Joint Requirements Oversight Council (JROC) validated the capability need for MASCOT, renamed MASTIF, as an FY06 new start. The outcome of MASTIF is to provide the warfighter with a set of Network Centric Intelligence, Surveillance and Reconnaissance (ISR) collection systems and management applications to employ traditional and non-traditional, distributed sensing against concealed/obscured targets, with the goal of enhancing detection, classification, characterization, and tracking of these targets. This five-year project is under the sponsorship of the United States Special Operations Command (USSOCOM) and United States Southern Command (USSOUTHCOM). The lead DOD agency is the Defense Intelligence Agency (DIA). The primary outputs and efficiencies to be demonstrated are: 1) exploit Measurement and Signatures Intelligence (MASINT) technologies and develop new sources and methods to counter adversary concealment and deception techniques, 2) develop new methodologies for sensor-to-sensor communications to enable tipping and cueing, and 3) seek new fusion processing systems to make maximum use of the data to solve the difficult problem of concealed/obscured targets.
FY 2007 Output - MASTIF Management Plan Signed. Established required support for Technical and other IPTs. Awarded contract to start development of fusion engine and system integration. Finalized system design. Initiated development of MOPs and MOEs as part of initial MUA planning. Established and establishing coordinating MOAs for participation by other organizations,

including sensor loaning agreements. Began transition planning.
- FY 2008 Output/ Planned Output _ Securing necessary airborne test platform and sensor systems. Tailoring system and system flexibility with input from mission partners and operators. System integration; lab and ground testing and demonstrations; and initial flights for system training, system refinement, and developmental testing. Continuing detailed planning for Operational Testing and Military Utility Assessment (MUA). Conducting initial operator training for the MUA. Developing detailed CONOP. Continuing to partner with other organizations to enhance capability and interoperability with other systems, user groups, and data exploitation centers, in order to involve users early and maximize opportunities for transition. Continue transition planning and development.
- 2009 Planned Output - Conduct Final Demonstration and Military Utility Assessment. Begin Residual Transition. Spiral initial ACTD capability for COCOM field application. Support required documentation
modification needs, and supply required documentation as appropriate for transition. Continue development of CONOPs and TTPs, based on user feedback. Support technology transition.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Node Management and Deployable Depot (NoMaDD)	2.600		

The Joint Requirements Oversight Council (JROC) validated the capability need for NoMaDD as a FY06 new start which is demonstrating technologies to address critical delays in getting needed supplies to the warfighter. Loss of visibility of items in the distribution pipeline and the inability to provide realistic delivery dates or effectively adjust the flow of commodities for delivery at the right place at the right time continue to impact the effectiveness of our forces. Node Management will provide distribution node managers the visibility needed to make logistics decisions to positively affect the distribution system. Deployable Depot will provide the ability to quickly establish a supply and distribution center in theater to control the physical flow of materiel moving into and through the theater. Together, these capabilities will provide the logistic responsiveness necessary to support our warfighters in any theater of operation. NoMaDD's effectiveness will be measured through its contribution to sustained logistics for major military deployments. Specific outputs and efficiencies will include: 1) increased accuracy in accounting for supplies resulting in reductions in customer wait time; 2) improvements in required airlift to support sustainment; 3) reductions in repeat requisitions. The planned transition for NoMaDD: Node Management will transition to the Army's Battle Command Sustainment Support System and U.S. Transportation Command_s (TRANSCOM) Intelligent Road/Rail Information System (IRRIS) Program which will provide a web based version on Node Management. The Deployable Depot will become a program of record and be managed by DLA. The Combatant Command/User Sponsor is TRANSCOM and the lead service/agency is Defense Logistics Agency (DLA).

- FY 2007 Output - Continued spiral development and demonstration of Node Management capabilities, including node capacity and improved data integrity. Completed procurement and integration of equipment for the Deployable Depot. Preliminary transition plans for both Node Management and Deployable Depot were developed. A successful Limited Utility Assessment of the Theater Consolidation and Shipping Point component of Deployable Depot was held in April 2007. The IRRIS Program joined the NoMaDD ACTD team to provide a web-based version of node management. Development of IRRIS capabilities and integration with BCS3 was initiated.

- FY 2008/2009 Planned Output - Refer to the JCTD R-2a.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Small UAV (SUAV)	3.200		

The JROC approved the capability need for SUAS as an FY06 new start. The outcome of SUAS is to address Joint operational concerns noted during on-going operations through the integration of new technology across the entire class of Small UAVs. The outputs and efficiencies to be demonstrated are: technology insertions to provided measurably improved performance/logistical support in

the following areas: Command, Control and Communications (C3); Payload Integration; Targeting; Platform Related Issues (power, propulsion, etc.); improved operator training though the use of integrated training programs with emphasis on simulation; improved and more efficient Tactics, Techniques, and Procedures (TTP) across the Services for small unit real-time reconnaissance and surveillance capabilities. New operational capabilities will be evaluated and no less than once per year. Transition strategy: FY2009/2010 is the transition period. The capabilities will be integrated into USSOCOM systems, and available for integration into all SUAS customers assets (spiraled out of the ACTD into the field as they become available). The User Sponsor and Lead agency is U.S. Special Operations Command (USSOCOM).

- FY 2007 Outcome - Continue technology definition and cut in (spiral fielding). Begin TTP development. Continue CONOP refinement. Perform two limited assessments and one Interim Military Utility Assessment to support fielding of capabilities.

FY 2008/2009 Planned Outcome - Refer to the JCTD R-2a.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Tactical Service Provider (TSP)	2.400		

The Joint Requirements Oversight Council (JROC) validated the capability need for TSP as a FY07 new start. The TSP ACTD focuses on taking full advantage of emerging commercial technologies to significantly enhance and improve C2 and Net-Centric capabilities to meet critical present and near-term requirements until DoDs next generation communication systems (JTRS, TSAT, GBS, IP SATCOM) are at Full Operational Capability (FOC). TSP is planned for a final demonstration in the fourth quarter of FY08, with sustainment of the demonstrated capabilities by DISA through FY09 until transition to programs of record in FY10. TSP outcome will enable broadband communications between strategic information sources and tactical users as well as between tactical users. The expected output is wideband communications supporting two-way, high-bandwidth services for tactical users using a hybrid architecture of emerging, standards-based SATCOM and wireless technologies by delivering robust lightweight commercially available applications, DoD tactical applications, and emerging Net Centric Enterprise Services (NCES) applications through demonstration and testing in a simulated, mobile tactical environment. The expected efficiency is substantial increase in delivery of tactically relevant command and control and intelligencerelated information products to land mobile troops, and the near real time delivery of tactically generated information to operational and strategic echelons. TSP is a two year ACTD co-sponsored by USCENTCOM and USJFCOM. The Defense Information Systems Agency (DISA) is the lead agency.
- FY 2007 Output: The technical focus for TSP in FY07 will be on implementing emerging digital broadcast protocol standards for forward SATCOM link, using emerging Joint Internet Protocol (IP) Modem standard and a new satellite protocol standard for return SATCOM link, achieving two-way Bandwidth on Demand, and the addition of a Global Broadcast Service (GBS) terminal appliqué using IEEE standard 802.16 for two-way wireless communications extension. TSP expected efficiencies include a 38% improved bandwidth efficiency over existing digital broadcast standard in use today, decreased size and weight of equipment required by mobile tactical sources to send and receive relevant information, and measurable real- or near-real-time transmission of intelligence collection products from deployed forces back to operational and strategic users. Two demonstrations are planned for the fourth quarter of FY07: the first two-way IP SATCOM communications over the improved GBS terminal prototype; the second a WiMax (802.16) wireless extension of communications connectivity from the improved GBS terminal. From an operational viewpoint, these demonstrations will establish the new baseline for bi-directional high bandwidth satellite communications, and provide early limited military utility assessment of the technologies. Programmatically, the operational and technical teams will be obtaining approval of the Implementation Directive and developing the Concept of Operations (CONOPS) and the integrated assessment plan.

FY 2008/09 Planned Output: Refer to the JCTD R-2a.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Joint Multi-Mission Electro-Optic Sys (JMMES)	2.000		

The Joint Requirements Oversight Council validated the capability need for JMMES as an FY-07 new start. The outcome of JMMES is demonstration and transition of airborne sensors and automated processing for automatic detection of items of interest for Joint Service, Coalition, and Interagency partners. The JMMES project will demonstrate use of advanced multi-spectral sensors in an aircraft turret compatible with existing turret mounts in US Navy, US Army, Drug Enforcement Agency, and British and Canadian aircraft. The project will develop and demonstrate automatic processing and automated operator cueing for targets such as submarines, mines, targets under trees, illicit crops, and search-and-rescue targets at sea. The primary outputs and efficiencies to be demonstrated in JMMES Military Utility Assessments are (1) ability of JMMES to recognize targets of interest, in terms of (a) percent of auto detections and auto cues that are relevant, (b) distance error of auto detect and auto cue reports, (c) timeliness of reports (seconds) to decision makers; and (2) ability of JMMES to defeat denial and deception efforts, in terms of (a) percent of denial and deception efforts defeated, (b) where and when JMMES applies (operating environments, seasons, time of day, range, etc.), (c) percent of time operable during missions, and (d) reliability and logistic support requirements. JMMES is a 3-year project sponsored by U.S. Pacific Command and U.S. Southern Command. Initial capabilities will be demonstrated and operated in FY07, with demonstrations against additional targets with additional aircraft types in FY08 and FY09. Transition activities began in FY07, leading to firm transition to programs of record in Program Objective Memorandum 2010. The lead Service is U.S. Navy.

- FY 2007 Output - Upgraded existing sensor suites to second generation for JMMES applications, integrated sensor and processing systems aboard selected aircraft. Conducted data collection and assessments for anti-submarine warfare missions, and begin algorithm development for other targets. Began Concept of Operations and system architecture documentation. Submitted POM documentation for transition to two Navy Programs of Record (POM 10).
- FY 2008 Planned Output _ Integrate third generation sensor suites. Flight test second generation systems, collect data for algorithm development and test. Execute JMMES integration into additional aircraft types for mine detection missions, search and rescue missions, counter concealment and deception (land targets) missions, illicit crop detection, and other missions. Complete initial algorithm development for the additional missions and conduct data collection and assessment trials, including interagency and coalition parter participation. Follow-up POM-10 submissions as needed.
- FY 2009 Planned Output - Complete multi-aircraft/multi-mission assessment trials and draft Military Utility Assessment. Complete Concept of Operations, Tactics/Techniques/Procedures, and System Architecture documentation. Support ongoing transition activities into programs of record. Complete the JCTD.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Maritime Auto Super Track Enhance Reporting (MASTER)	2.500		

The Joint Requirements Oversight Council (JROC) validated the capability need for MASTER (Maritime Automated Super Track Enhanced) as an FY07 new start. The initial goal of MASTER is to demonstrate a set of technologies with associated CONOPS, which provide automatic tracking of ship traffic using both unclassified and classified methods and which will provide a tangible improvement of United States maritime domain awareness on a global-basis. The MASTER JCTD will also provide a common set of Tactics, Techniques and Procedures (TTPs) to the Intelligence Community (IC) that will allow adoption of this new capability across the IC. The primary outputs and efficiencies to be demonstrated in the Military Utility Assessment (MUA) are to develop and deploy a persistent maritime awareness capability for the analyst, warfighter and decision maker that enables: (1) significant increase in worldwide, multi-INT vessel tracks using information sources from SCI/Secret/Unclassified-levels and dissemination of these "Super Tracks", to operational users at the JWICS and Secret security levels; (2) percent decrease in the time required for an intelligence analyst to assemble the maritime awareness picture of ships using track , cargo and people information ; (3) percent increase in the ability of an analyst to determine ship threat profile (friend or foe) based on ship track, cargo and people information at the JWICS level; (5) percent increase in number of maritime awareness entities (ship, people, cargo, infrastructure) and the ability to manually and automatically fuse the data. The JCTD Residuals include: 1) Multi-INT fusion for worldwide MDA tracks with associated metadata; 2) web portal at the JWICS level; 3) SOA at JWICS level; 4) Alarms/alerts notification methodology; 5) Operationally tested CONOP for a 24/7 worldwide capability. MASTER is a three-year JCTD under the sponsorship of US Northern Command (NORTHCOM) and US Navy, with completion of development and demonstration by the end of FY 2009 and transition to the IC through ONI beginning in FY 2009. The lead service is Navy.

- FY 2007 Output - Worldwide tracking, user access via a JWICS web portal and an initial set of user definable alarms focused on ship tracking.
- FY 2008/2009 Planned Output - Refer to the JCTD R2a.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Coalition Mobility System (CMS)	2.500		

The Joint Requirements Oversight Council validated the capability need for CMS as an FY07 new start. The outcome of CMS is to develop the capability for rapid coordination of coalition movement execution. CMS will integrate selected, operationally relevant data from US systems with data sources used by coalition partners to establish a working coalition environment, which meets the needs of US and CTF decision makers. The primary outputs and efficiencies to be demonstrated in the JCTD are: 1) US operators gain access to coalition movement data (military and commercial) using familiar US national systems (Single Mobility System, Global Transportation Network, etc.), 2) Supports the Common Operating Picture for Deployment & Distribution (COP D2), 3) Coalition partners and CTF staff gain access to selected, operationally relevant information on US and coalition airlift and sealift (military & commercial) supporting coalition activities. CMS is a 4-year project sponsored by US Pacific Command. Key participants include the Quadrilateral Logistics Forum consisting of Australia, Canada, United Kingdom, and the United States. Initial capabilities will be demonstrated and operated in FY07, demonstrations and assessment on coalition networks in FY08 and FY09. USTRANSCOM is the Transition Manager and transition activities will begin in FY07, leading to firm transition to multiple coalition networks by 2010.

- FY 2007 Accomplishments - Identified the US data elements to be made available in CMS; identified queries for use by CMS users; Addressed the issue of releasing selected SMS data elements in CMS; defined report formats for CMS users and identified existing SMS functionalities to be made available in the CMS tool. Delivered network integration; designed and implemented an electronic data interface (EDI) which allows for the acceptance of properly formatted coalition partner information into the CMS database

- FY 2008 Accomplishments - Refer to the JCTD R-2a

- FY 2009 Planned Output - Refer to the JCTD R-2a

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Joint Surface Warfare (JSuW)	1.500		

The Joint Requirements Oversight Council validated the capability need for JSuW as an FY07 new start. The United States Pacific Command submitted and validated the need for a Joint Surface Warfare capability utilizing the net enabled weapon message set. The intent of the JSuW JCTD is to demonstrate that capability and show the military utility of having multiple, Joint Intelligence, Surveillance and Reconnaissance (ISR) aircraft control a variety of anti-ship weapons against surface combatants at stand-off ranges in all weather conditions. The prime objectives of the JSuW JCTD are to demonstrate the capability and deliver the associated concept of operations (CONOPS) with associated training, tactics and procedures (TTPs) requisite to executing this capability.

ISR Platforms: E-8 Joint Surveillance Targeting Attack Radar System (JSTARS) and the P-3 Littoral Surveillance Radar System (LSRS)
Launch platform: F/A-18 Hornet
Weapons: AGM-154C Joint Stand-off Weapon (JSOW-C-1), AGM-84D Harpoon Block III, and the AGM-84K Stand-off Land Attack Missile-Expanded Response (SLAM-ER)

FY07 Output: Approved Implementation Directive and Management Plan formed, Integrated Product Team established, spend plan developed, initial Link 16 net enabled weapon network modeling and analysis, first simulation exercise for development of draft concept of operations executed, draft of test plan produced.
FY08 Planned Output: Funded in JCTD PE 0603648D8Z. Laboratory tests for development and integration, secondary level of modeling and simulation analysis, produce first draft of information exchange requirements between participating systems, continued refinement of test plan, second simulation exercise based upon further-developed concept of operations, training table tops for process flow and training, tactics and techniques development, limited single platform and single weapon ground tests.
FY09 Planned Output: Funded in the JCTD PE 0603648D8Z. Completed ground tests for individual and multiple platforms and weapons, test plan finalized, limited initial flight test, all associated

requisite systems and processes defined and finalized including network, cryptology and mission planning, initial architectures developed per CJCSI 6212.01D.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Internet Protocol Router in Space (IRIS)	1.000		

The Joint Requirements Oversight Council (JROC) validated the need for capability from IRIS as a FY07 new start. IRIS leverages a planned launch of a commercial communications satellite to introduce Internet Protocol (IP) routing and cross-banding between C-band and Ku-band transponders. The IRIS outputs and efficiencies include (1) demonstrate the capability to collaborate with industry in leveraging the commercial acquisition processes to provide near-term, space-based, IP routing network capability, (2) demonstrate the capability via a commercial payload to conduct on-board IP packet routing communications from a geostationary orbit, (3) explore and incorporate a decision process to determine which commercial SATCOM users should leverage the IRIS capability. USSTRATCOM is assigned responsibility for global network operations, and as the operational user sponsor seeks to improve network reliability and endurability through dynamic topology updates (multiple transport paths) and improved collaboration and interoperability among info sources and users (e.g., sensors, soldiers, command centers at Joint, Allied and Coalition levels). The Defense Information System Agency (DISA) is the lead Service and will transition the demonstrated commercial capability into contracting language for future services subscription in support of operations, including integration of IRIS services into existing network architectures beyond the IRIS JCTD.

" FY 2007 Planned Output - Develop the draft CONOP and conduct a scenario-based limited military utility assessment that will simulate the use of the IRIS capability.

" FY 2008 Planned Output - Validate and verify draft CONOP and demonstration architectures to enable a limited military utility assessment of an emulated IRIS capability. Participate in the industry led end-to-end IRIS technical capabilities demonstration with representative hardware prior to IS 14 launch.

" FY 2009 Planned Output - Launch of the IS 14 spacecraft is projected for the 1st quarter FY2009. Conduct a live scenario and capability based demonstrations culminating in a final military utility assessment of the IRIS JCTD. The IRIS JCTD will leave behind the IRIS capability on a fee for service basis to provide a space based routing enterprise solution that enables video, voice and data network services. Complete the JCTD.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Global Observer (GO)	2.100		

The Joint Requirements Oversight Council validated the capability need for Global Observer (GO) as an FY-07 new start. The outcome of the Global Observer project seeks to develop an unconventionally fueled (liquid hydrogen) long range, long duration (7 days), high altitude (50k ft+) unmanned aircraft system, to meet COCOMs' need for persistence on station with a reduced, perhaps negligible, logistical footprint in theater. The JCTD will use existing proven systems to field a UAS as a stratospheric satellite to provide affordable, persistent presence over an area of interest for surveillance and communications relay missions. The outputs and efficiencies created by GLOBAL OBSERVER would be in the increased capability to carry ISR and communications relay payloads, among others (payloads are government provided). Output demonstrated would be greater than 7 days endurance at altitudes of 65,000 feet or greater with high mission utilization rates. Greater persistent ISR. Increased communications/data relay bandwidth availability; Enables critical forensic and communications relay missions; Affordable persistence: less flights, fuel, & ops cost; New fuel option permits much greater persistence. Anticipate completing JCTD and enter transition in 2 years. The U. S. Lead Service will be the US Army or USAF (P) and the Sponsoring CoCOM will be USSOCOM (P) and/or USSTRATCOM (P).

- FY 2007 Output - Began the manufacture of prototype aircraft and production representative vehicles. Begin payload integration. Began manufacture of ground systems.

- FY 2008 Planned Output - Take delivery of air vehicles and ground stations. Begin flight test program. Initiate planning for operational demonstrations. Planned JCTD completion is FY2009

(includes 1 year Transition Period).

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Regional Maritime Awareness Capability (RMAC)	0.500		

The JROC validated the capability need for RMAC as an FY06 new start. RMAC is a coordinated DoD and Department of State project. The outcome of RMAC will demonstrate and transition a regional maritime awareness solution set consisting of sensors and their indigenous processors, communications systems, and software. The initial application of the capability will enable friendly nations in the Gulf of Guinea region to develop maritime domain awareness in the regional waters, and share their data with each other and with the U.S. This solution set will be equally applicable to local sensor sites, national operations centers, regional coordination centers, and external users. The sensors and processors include Automated Information System (AIS), radar, video cameras, and night vision devices. Communications will be done through UHF/VHF Radios, W3C-compliant, commercially secure, IP-based networks and cell phones. RMAC's outputs and efficiencies include surveillance, tracking, fusion and analysis, vessel tracks, and multi national information sharing and collaboration capabilities. The current Transition Strategy will deliver: 1) Residuals: AIS, radar, video cameras, night vision devices, radios, cell phones; 2) Documentation: training package, software / hardware specifications, site surveys, frequency management plan and user maintenance manuals, CONOPS / TTPs; 3) Post-JCTD acquisition strategies for procurements of capability will be developed by host nations and U.S. Program Managers pending outcome of demonstrations and assessments. The User Sponsor is the U. S. European Command (EUCOM) and the lead service is the Navy.

- FY 2007 Output - Conducted additional site surveys in participation host nations, and developed coordinated installation plans with one host nation. Conducted series of high level discussions with officials of a second strategic host nation, leading to enthusiastic agreement to participate from that country. Finalized procurement of RMAC components. Initiated development of training package. Continued development of CONOPS, Tactics, Techniques, and Procedures (TTP) and architecture. Conducted technical testing and demonstrations. Installed baseline operational capability (BOC) equipment and software systems, and conduct initial checkout tests and operations with host nation personnel
- FY 2008 Planned Output - Finalize requirements definition and architecture. Complete installation of RMAC capability in both participating nations. Continue development of CONOPS, TTP, and training package. Conduct operational demonstrations and Coalition Utility Assessment (CUA) of RMAC capability including local harbors / ports, National Operational Centers (NOC), and external users.
- FY 2009 Planned Output - Sustain operational capabilities in host nations, complete transition planning and complete the JCTD.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Joint Enabling Technolgies	7.105		

Over the past several years congressional committees have highlighted the potential of mature, joint technologies and provided resources to the JCTD program to investigate the military utility of these technologies. DUSD (AS&C) also becomes aware of promising technologies which may have transformational application to JCTDs. The need for these technologies may be realized until an JCTD is mid-way through its development or after a final demonstration. In most cases, these enabling technologies have broader application across several functional capabilities addressed by various ACTDs. Two enabling technologies were funded in FY 2007.

1. Iridium Global Positioning System (iGPS) - Development for accelerating anti-jamming enhancement capabilities of Global Position, Navigation, and Time (PNT). The Objective and Payoff: Development and demonstration of using low earth orbit space systems to improve the vulnerability and precision of the existing GPS navigation capability. The effort leverages existing space resources that will provide an interim capability until the future robust GPS architecture becomes operational. The concept that leverages the existing Low Earth Orbit satellite constellation Iridium to provide a global enhancement to the current GPS navigation capability. A team of experts has been assembled to determine key components of the technology required to demonstrate the concept. The elements under this effort include: 1) quantifying anti-jam performance in moving vehicle tests using brassboard hardware, 2) measuring precision location capabilities in jamming environment,

3) demonstrating long base-line time transfer, 4) demonstrating ephemeris store & broadcast, and 5) demonstrating sub-decimeter position accuracy.

2. The ARGUS Study Team - Objective: Provide national-level systems architecture and systems analysis personnel to participate in the Argus Study Team. Provides DDR&E with engineering and technical analysis support to effectively guide and direct the SNL Argus Study task and develop a low-risk plan for an early end-to-end Overhead Non-imaging Infrared (ONIR) flight demonstration with growth to an operational ONIR constellation. This task delivers a Demonstration Requirements Document which shall be the basis for assessing the SNL design and development plans. This task also provides an independent risk assessment & mitigation plan for the Argus demonstration and an independent Transition Plan for the government.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
CoCom Direct Support, Pre-Transition, and Classified programs	10.208		

Direct support costs for the ACTD program averages between $11-$20 million annually. ACTD Direct Program Support is comprised of four programs broken-out separately from the specific ACTDs projects. The direct funding line is used to provide support for the entire ACTD program (versus individual ACTDs). These four programs include (1) Unified Combatant Commander; (2) ACTD Pre-Transition Support; (3) Interagency Classified Projects, and (4) Joint enabling technologies that are either directed by congress or initiated by DUSD (AS&C).

1) Unified Combatant Commander (UCC) Direct Support: The UCC's play an essential role in the selection, validation, demonstration, and transition of ACTDs. Many ACTDs have funding allocated for the UCCs from within their specific program funding lines. Additionally, in previous years DUSD (AS&C) would attempt to provide direct ACTD support from OSD if resources became available. This direct support allows for a timely allocation of resources to the UCCs, based on the number of ACTD projects being sponsored and the intensity of effort required. The Department also envisions that the UCCs will play a greater role in the development, support and coordination of JCTD/ACTDs that are coalition oriented (within their specific AOR). UCC direct program funding is estimated at $5.0 million per year.

2) ACTD Pre-Transition Support: The ACTD program has been highly successful in rapidly developing and demonstrating new technologies and complementary concepts of operations for the warfighter. In order to successfully transition more ACTDs to the warfighter, the SECDEF established the goal of increasing the number of ACTDs evolving into formal acquisition programs. In order to enhance this transition effort and to respond to GAO recommendations in earlier years, the ACTD program continues to support a pre-transition line in the ACTD budget submission. Funding for pre-transition initiatives will be in the approximately $3.0 million per year.

3) Special Capabilities Office (SCO)/Interagency Classified Support for ACTDs: ACTDs also support a limited number of classified efforts which are coordinated with other agencies and detailed in separate DoD budget exhibits. Funding for this direct program support is estimated $11.0 million each year.

4) Joint Enabling Technologies: Over the past several years congressional committees have highlighted the potential of mature, joint technologies and provided resources to the ACTD program to investigate the military utility of these technologies. DUSD (AS&C) also becomes aware of promising technologies which may have transformational application to ACTDs. The need for these technologies may be realized until an ACTD is mid-way through its development or after a final demonstration. In most cases, these enabling technologies have broader application across several functional capabilities addressed by various ACTDs. Five enabling technologies were funded in FY 2005. Funding for the Enableling technologies is listed above and not included here.

C. Other Program Funding Summary	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Joint Capability Technology Demonstration (JCTD): PE 0603648D8Z, BA3	35.594	202.484	206.337	201.975	195.537	198.276	201.211
JCTD Transition: PE 0604648D8Z, BA4	3.029	2.934	14.962	18.911	18.886	19.917	19.959

Comment: In FY08 all ACTD funding transfers to the JCTD program. This will complete the transtion to the JCTD model that began in the FY06 President's Budget. The new JCTD Program provides a "cradle to grave" path for transformational joint capabilities. The initial funding lines (program elements (PE)) are outlined in the table below. The PEs in the table (with the exception of the ACTD BA3 PE which will fully transfer to the JCTD BA3 PE in FY08) represent the JCTD model. The model contains a BA3 development arm as well as BA4 transition arm. Under the new JCTD process, only the ACTD/JCTDs that demonstrate the highest military utility will be considered for the transition funding in the JCTD BA4 Transition PE. Promising ACTDs may receive transition funding during the transition period to the JCTD program. Beginning in FY07 all new starts will be JCTD only. Refer to the specific Budget Exhibit for more details on each funding line.

D. Acquisition Strategy The strategy for ACTDs has always been to focus on developing a transition path into a program of record or to establish a new program for those projects that show significant military utility in the demonstration phase. Under the new JCTD program, only the ACTD/JCTDs that demonstrate the highest military utility will be considered for the transition funding in the JCTD BA4 Transition PE. Many JCTDs will transition smoothly into a well identified program of record and not require funding from the transition PE (the transition arm of the JCTD model). Promising ongoing ACTDs may also receive transition funding from the JCTD Transition arm as the ACTD program completes. All ACTD funding will transfer to the JCTD program element in FY08. Beginning in FY07 all new starts will be JCTD only. Some initiatives that are successful but are having smaller problems transitioning to an identified program of record may receive "pre-transition" funding from the JCTD BA3 PE.

- Capability Based: Greater CoCom influence looking at nearer term joint/coalition needs
- Provide Spiral Technologies - 25% will provide an operationally relevant product demonstration within 24 months of ID signature.
- Agile Demonstration - 75% complete final demonstration within three years of ID signature.
- OSD provide significantly more funding (often greater than 30%). In some exceptional cases a majority of project funding, especially during the first two years.
- JCTDs not necessarily tied to an exercise. Greater flexibility to establish military utility via operational "real-world" demonstration or specifically designed test/venue.
- 80% of JCTDs transition at least 50% of their products to sustainment.

E. Major Performers Not applicable for this item.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE
RDTE, Defense Wide BA 03	**0603755D8Z - High Performance Computing Modernization Program**

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	198.367	205.017	208.079	215.278	200.933	211.363	218.506
P507 High Performance Computing Modernization Program (HPCMP)	198.367	205.017	208.079	215.278	200.933	211.363	218.506

A. Mission Description and Budget Item Justification: The Department of Defense (DoD) High Performance Computing (HPC) Modernization Program (HPCMP) supports warfighter needs for technological superiority and military dominance on the battlefield by providing advanced computational services to U.S. weapons system scientists and engineers. Exploiting continuous HPC technology advances, the DoD research, development, test and evaluation (RDT&E) community is able to resolve critical scientific and engineering problems more quickly and with more precision. This feeds directly into the acquisition process by improving weapons system designs through an increased fundamental understanding of materials, aerodynamics, chemistry, fuels, acoustics, signal image recognition, electromagnetics, and other areas of basic and applied research as well as enabling advanced test and evaluation (T&E) environments that allow synthetic scene generation, automatic control systems and virtual test environments. HPC has been identified as a key enabling technology essential to achieving the DoD's science and technology (S&T) and T&E objectives.

The HPCMP supports four major shared resource supercomputing centers (MSRCs) and two allocated distributed centers (ADCs) established by congressional direction are also partially supported (Arctic Region Supercomputing Center, Fairbanks, AK; Maui High Performance Computing Center, Maui, HI). Two other congressionally established ADCs that provide supercomputing services to the DoD do not receive HPCMP support; the Army High Performance Computing Research Center, Minneapolis, MN and the Space and Missile Defense Command, Huntsville, AL receive Army operational support. Prior to FY 2008, smaller, special-purpose dedicated distributed centers were annually established or upgraded through a competitive selection process. These centers are retired as their systems become obsolete and funding for specialized programs is now provided through dedicated HPC project investments (DHPCPIs). DHPCPIs support a one-time need with no legacy in the HPCMP. Centers and DHPCPIs directly support the DoD S&T and T&E laboratories and test centers and are accessible to local and remote scientists and engineers via high-speed network access. In FY 2009 and continuing into FY 2010, the significant investments will be made in mass data storage systems to replace systems reaching the end of their useful life. An integral part of the program is providing for the adaptation of broadband, widely used applications and algorithms to address S&T and T&E requirements, along with continued training of users in new system designs and concepts. The HPCMP pursues continuous interaction with the national HPC infrastructure, including academia, industry, and other government agencies to facilitate sharing of knowledge, tools, and expertise.

HPCMP users average more than 5,000 scientists and engineers at approximately 180 locations (DoD Laboratories, Test Centers, academic institutions and commercial businesses). The integrated HPCMP consists of Shared Resource Centers; the Defense Research and Engineering Network; and Software Application Support. MSRCs are responsible for as large a part of DoD`s S&T and T&E computational workload as feasible providing extensive capabilities to address user requirements for hardware, software, and programming environments. ADCs and DHPCPIs augment the MSRCs to form total HPCMP computational capability. DHPCPIs address critical HPC requirements that cannot be met at MSRCs, such as real-time, and near real-time computing requirements, and leverage significant HPC and mission expertise located at these remote sites. All elements of the HPCMP are interconnected with all S&T and T&E user sites via the Defense Research and Engineering Network. The Software Application Support component develops critical common DoD applications programs that run efficiently on advanced HPC systems, supports technology transition activities with academic and commercial institutions, trains users, builds collaborative programming environments, and develops mechanisms to protect high value HPC application codes. Additional funding for Computational Research and Engineering Acquisition Tools and Environments (CREATE) has been provided by the DoD, beginning in FY 2008. CREATE will produce supercomputer-based engineering design and test tools improving the acquisition process for major weapons systems across the DoD.

Modernization of DoD HPC capability and fulfillment of the program's vision and goals requires an on-going strategy that addresses all HPC aspects. While advancing the level of hardware performance is critical to success, the higher objective is enabling better scientific research, test and evaluation environments, and technology development for superior weapons, warfighting, and related support systems. Program goals are to acquire, deploy, operate and maintain best-value supercomputers; acquire, develop, deploy and support software applications and computational work environments that enable critical DoD research, development and test challenges to be analyzed and solved; acquire, deploy, operate and maintain a communications network that enables effective access to supercomputers and to distributed S&T/T&E computing environments; continuously educate the RDT&E workforce with the knowledge needed to employ computational modeling effectively and efficiently; and promote collaborative relationships among the DoD and the national computational science communities, and minority serving institutes.

B. Program Change Summary	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2008)	208.463	187.587	208.488
Current BES/President's Budget (FY 2009)	198.367	205.017	208.079
Total Adjustments	-10.096	17.430	-0.409
Congressional Program Reductions		-1.790	
Congressional Rescissions			
Congressional Increases		19.220	
Reprogrammings	-5.603		
SBIR/STTR Transfer	-4.436		
Other	-0.057		-0.409

C. Other Program Funding Summary	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
0902198DZ Major Equipment OSD	50.089	50.784	52.565	53.959	56.290	57.029	57.831

Comment: FY 2007 funds provided upgrades to the following DHPCPIs through the annual competitive process mentioned earlier: Joint Air Force Weather Agency, Offutt AFB, NE / Fleet Numerical Meteorology & Oceanography Center, Monterey, CA; U.S. Joint Forces Command, Norfolk, VA; and the Naval research Laboratory, Washington, DC. Funding exists in the 2008 Procurement budget to provide for approximately four Dedicated High Performance Computing Project Investments.

In FY 2007 two MSRCs were upgraded and funding exists in the FY 2008 Procurement budget to upgrade 2 centers. The four MSRCs are: Army Research Laboratory (ARL),

Aberdeen Proving Grounds, MD; Aeronautical Systems Center (ASC), Wright-Patterson AFB, OH; US Army Engineer Research and Development Center, Vicksburg, MS; and Naval Research Laboratory, Washington, DC.

D. Acquisition Strategy Not applicable for this item.

E. Performance Metrics: Not Applicable.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDTE, Defense Wide BA 03	**0603755D8Z - High Performance Computing Modernization Program**	**P507**

	COST ($ in Millions)	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P507	High Performance Computing Modernization Program	198.367	205.017	208.079	215.278	200.933	211.363	218.506

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

The HPC Modernization Program supports four major shared resource supercomputing centers (MSRCs). The program also partially supports operations at two allocated distributed centers (ADCs) established by congressional direction. These centers are the Arctic Region Supercomputing Center (ARSC), Fairbanks, AK and the Maui High Performance Computing Center, Maui, HI. Two other ADCs, also congressionally established, do not receive programmed support through HPC Modernization Program funding, but provide supercomputing services to the DoD. The Army High Performance Computing Research Center (AHPCRC), Minneapolis, MN and the Space and Missile Defense Command, Huntsville, AL, receive their support for operations through the Army. During FY2006 and prior years, there were also several smaller, special-purpose dedicated distributed centers (DDCs) that were annually established or upgraded based through a competitive selection process. However, these other centers were retired as their systems became obsolete and funding for specialized programs is currently provided through dedicated HPC project investments (DHPCPIs). DHPCPIs support a one-time need and have no legacy within the HPC Modernization Program. Centers and DHPCPIs directly support the DoD S&T and T&E laboratories and test centers and are accessible to local and remote scientists and engineers via high-speed network access. An integral part of the program is providing for the adaptation of broadband, widely used applications and algorithms to address S&T and T&E requirements, along with continued training of users as new system designs and concepts evolve. The program pursues continuous interaction with the national HPC infrastructure, including academia, industry, and other government agencies to facilitate the sharing of knowledge, tools, and expertise.

The HPC Modernization Program user base includes an average of more than 5,000 scientists and engineers at approximately 180 locations (DoD Laboratories and Test Centers, academic institutions and commercial businesses). The integrated HPC program consists of Shared Resource Centers; the Defense Research and Engineering Network; and Software Application Support. MSRCs are responsible for as large a fraction of DoD`s S&T and T&E computational workload as feasible. MSRCs provide extensive capabilities to address user requirements for hardware, software, and programming environments. ADCs, and DHPCPIs augment the MSRCs to form the total HPC Modernization Program computational capability. DHPCPIs address critical HPC requirements that cannot be met at MSRCs, such as real-time, and near real-time computing requirements, and leverage significant HPC and mission expertise located at these remote sites. All elements of the HPC Modernization Program are interconnected with all S&T and T&E user sites via the Defense Research and Engineering Network (DREN). Additionally, the Software Application Support component develops critical common DoD applications programs that run efficiently on advanced HPC systems, supports technology transition activities with academic and commercial institutions, trains users, builds collaborative programming

environments, and develops mechanisms to protect high value HPC application codes.
True modernization of DoD`s HPC capability and fulfillment of the program's vision and goals requires an on-going program strategy that addresses all aspects of HPC. While advancing the level of hardware performance is critical to success, the higher objective is to enable better scientific research, test and evaluation environments, and technology development for superior weapons, warfighting, and related support systems. The Program goals are to (1) Acquire, deploy, operate and maintain best-value supercomputers; (2) Acquire, develop, deploy and support software applications and computational work environments that enable critical DoD research, development and test challenges to be analyzed and solved; (3) Acquire, deploy, operate and maintain a communications network that enables effective access to supercomputers and to distributed S&T/T&E computing environments; (4) Continuously educate the RDT&E workforce with the knowledge needed to employ computational modeling effectively and efficiently; and (5) Promote collaborative relationships among the DoD computational science community, the national computational science community and minority serving institutes.

The DREN provides wide area network (WAN) connectivity among the Department's S&T and T&E communities. The DREN is implemented through an Intersite Services Contract awarded to MCI (WORLDCOM) during FY 2002. DREN currently provides services to sites throughout the continental United States, Alaska, Hawaii, and can be extended overseas where necessary. Minimal access is DS-3 (45 Mbps) with potential high-end access of OC-768 (40 Gbps) over the next 7 years. Current site connectivity ranges from DS-3 to OC-48 (2 Gbps). A Secret DREN using common Secret systems high key with NSA certified Type-1 encryptors that can transport classified traffic at OC-3 (155 Mbps) has also been deployed. The HPC Modernization Program employs state-of-the-art WAN security and strong host and user security creating a defense-in-depth security architecture.

B. Accomplishments/Planned Program:

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Selected Resource Centers:	102.371	110.935	102.373

FY2007 Accomplishments: The program sustained and supported the integration, operation and use of HPC computational resources at four Major Shared Resource Centers. The program also partially sustained and supported the integration, operation and use of HPC computational resources at two Allocated Distributed Centers.

FY 2008/2009 Plans: Since 1994, the program has sustained and regularly modernized HPC systems, storage, and scientific data analysis and visualization capabilities to fulfill a significant portion of the science and technology (S&T) and test and evaluation (T&E) community HPC requirements. For several years two other Allocated Distributed Centers, sustained and supported by the Army have received modernization funding through congressional adjustments to the program's annual budget request. These efforts are planned to continue into future years with no set completion date. Beginning in FY 2009 and continuing into FY 2010, the program will make significant investments in mass data storage systems to replace systems that will reach the end of their life cycle.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Networking:	32.739	28.157	29.682

FY2007 Accomplishments: The DREN provided high speed wide area network services to over 130 locations throughout the United States. Also, the DREN expanded internet protocol version 6 (IPv-6) testing for the Department of Defense and upgraded full point-to-point encryption of the network. DREN continued collaborative work with the federal networking community and standards associations.

FY 2008/2009 Plans: Network services to link all elements of the program will be provided by the Defense Research and Engineering Network (DREN) as well as operation of security systems and enhancements. Collaborative work with the federal networking community and standards associations will continue to assure that the DREN will remain compatible with future technology change. These efforts are planned to continue into future years with no set completion date.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Software Applications:	57.244	65.925	76.024

FY2007 Accomplishments: Development efforts in software programs continued to mature as other projects were completed, and others begun. Software Institutes and portfolios developed shared scalable applications to exploit scalable HPC assets. An Academic Outreach Program was supported to encourage and support computational science in universities across the United States. The User Productivity Enhancement and Technology Transfer (PET) effort provided computational and computer science support to the DoD HPC user community through interaction and collaborative projects with academic and industrial partners. Efforts were maintained in to develop technologies and methodologies to protect and limit end-use of high performance computing applications software while minimizing the burden on authorized end-users.

FY 2008/2009 Plans: Additional program funding for Computational Research and Engineering Acquisition Tools and Environments (CREATE) has been provided by the DoD, beginning in FY2008. CREATE will produce supercomputer-based engineering design and test tools to improve the acquisition process for major weapons systems across the Department. Development efforts in software programs will continue to mature as other projects are completed, and others begun with a greater emphasis on engineering applications. Software Institutes and portfolios will continue to develop shared scalable applications to exploit scalable HPC assets. An Academic Outreach Program will continue be supported to encourage and support computational science in universities across the United States. The Programming Environments and Training effort will provide computational and computer science support to the DoD HPC user community through interaction and collaborative projects with academic and industrial partners. On-going efforts will be maintained to develop technologies and methodologies to protect and limit end-use of high performance computing applications software while minimizing the burden on authorized end-users. These efforts are planned to continue into future years with no set completion date.

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

C. Other Program Funding Summary	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
0902198DZ Major Equipment OSD	50.089	50.784	52.565	53.959	56.290	57.029	57.831

Comment: Comment: The following DHPCPIs were also provided upgrades with FY2007 procurement funding through the annual competitive process mentioned earlier: Joint Air Force Weather Agency, Offutt AFB, NE / Fleet Numerical Meteorology & Oceanography Center, Monterey, CA; U.S. Joint Forces Command, Norfolk, VA; and the Naval Research Laboratory, Washington, DC. Funding exists in the FY2008 procurement budget to provide for approximately four DHPCPIs.

In FY 2007 two MSRCs were upgraded and funding exists in the FY 2008 Procurement budget to upgrade 2 centers. The four MSRCs are: Army Research Laboratory (ARL), Aberdeen Proving Grounds, MD; Aeronautical Systems Center (ASC), Wright-Patterson AFB, OH; US Army Engineer Research and Development Center, Vicksburg, MS; and Naval Oceanographic Office, Stennis Space Center, MS.

D. Acquisition Strategy Not applicable for this item.

E. Major Performers Not applicable for this item.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE
RDTE, Defense Wide BA 03	**0603781D8Z - Software Engineering Institute (SEI)**

	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	27.700	25.726	31.244	31.870	32.441	32.909	33.403
P781	Software Engineering Institute (SEI)	23.084	22.613	28.212	28.852	29.447	29.875	30.326
P782	Software Intensive Systems	2.602						
P783	Software Producibility Initiative	2.014	3.113	3.032	3.018	2.994	3.034	3.077

A. Mission Description and Budget Item Justification: Software is key to meeting DoD's increasing demand for high-quality, affordable, and timely national defense systems. There is a critical need to rapidly transition state-of-the-art technology and best practices to improve the acquisition, engineering, fielding, and evolution of software-intensive DoD systems.

Project 781 funds the technology development and transition activities of the Software Engineering Institute (SEI) at Carnegie Mellon University. The SEI is an R&D Laboratory Federally Funded Research and Development Center (FFRDC) sponsored by the Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics. It was established in 1984 as an integral part of the DoD's software initiative to identify, evaluate, and transition high-leverage software engineering technologies and practices. The SEI fosters disciplined software engineering practices by DoD acquisition and life-cycle support programs and by the industrial base where the bulk of defense software is produced. The Institute works across government, industry, and academia to: (1) improve current software engineering activities from acquisition, technical, and management perspectives; (2) facilitate rapid, value-added transition of software engineering technology into practice; and (3) evaluate and calibrate emerging software engineering technologies to determine their potential for improving the evolution of software-intensive DoD systems.
The SEI enables the exploitation of emerging software technology by bringing engineering discipline to software acquisition, development, and evolution. The SEI focuses on software technology areas judged to be of the highest payoff in meeting defense needs. FY 2005 focus areas are: Acquisition Practices for DoD Software-Intensive Systems (including pilot demonstrations of new technologies, dissemination of lessons learned, and provision of selected important services to the DoD acquisition community); Software Engineering Technical Practices (including survivable systems practices, software architecture technology, software component technology, performance-critical systems, and integration of software-intensive systems); and Software Engineering Management Practices [including personal and team software development processes, software engineering measurement and analysis, and Capability Maturity Model Integration (CMMI)].

This funding line includes the Software Intensive Systems (SIS) effort under project 782 for 2007 only. In FY 2008, the Software Intensive Systems funding line will be transferred from PE0603782D8Z to the Developmental Test and Evaluation line in Acquisition in Technology and will be renamed Software Engineering and System Assurance.

This funding line also includes the Software Produceability Initiative starting in FY 2006 as project 783. The role of software in major Defense acquisition programs has been steadily increasing. Much of the mission functionality demanded from programs such as F/A-22, JSF, Future Combat System, and many others is embodied in large, complex software systems. Shortcomings in software development often lead to schedule slippage, cost growth, and mission compromises. These shortcomings can frequently be traced to underpowered software development technologies not up to the task of developing the scale and complexity of software needed. Despite the large role of the commercial sector in advancing software technology, there are many key aspects of complex, distributed, robust systems crucial to DoD that are not being addressed directly by commercial technology efforts, as our experience over the past decade shows. The Software Produceability Initiative will focus on developing and transitioning more powerful and effective software development science, techniques, tools, and technologies to improve our ability to design, build, test and sustain software and software intensive systems.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE
RDTE, Defense Wide BA 03	**0603781D8Z - Software Engineering Institute (SEI)**

B. Program Change Summary	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2008)	28.380	29.851	31.305
Current BES/President's Budget (FY 2009)	27.700	25.726	31.244
Total Adjustments	-0.680	-4.125	-0.061
Congressional Program Reductions		-4.125	
Congressional Rescissions			
Congressional Increases			
Reprogrammings	-1.882		
SBIR/STTR Transfer	-0.771		
Other	1.973		-0.061

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
08	Improve ability to acquire systems	Value to Customer	Average rating of 4 or higher		Customer Survey	
	Value to taxpayer	Contract Billings	All costs are allowable and allocable		Assessment by Admin Agent	
	Value to taxpayer	Performance and Cost review	Less than 5% of programs unsatisfied		DCAA conduct periodic review	

Comment: A&S Performance Measures for Products
Customer Supported
Activity
Performance Requirement
Performance Measure
Method of Measurement
SEI Admin Agent
Ensure value to PWS Customers
Average rating of 4 or higher
Level of overall performance
Paper or electronic survey of customers
SEI Admin Agent
Contract Billings
All costs are allowable and allocable
Contract costs
Approval by ACO
SEI Admin Agent
Performance and Cost Review
Less than 5% of solicited programs
Number of unsatisfactory ratings
DCAA conducts periodic review
For SIS: PM
Ensure valuable assistance to programs' success
Provide actionable and effective recommendations to PMs
Percentage of recommendations implemented
Customer Satisfaction Survey to PMs
Cost avoidance realized as result of implementing recommendations
Interview w/PM as follow-up to Survey

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDTE, Defense Wide BA 03	**0603781D8Z - Software Engineering Institute (SEI)**	**P781**

COST ($ in Millions)		FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P781	Software Engineering Institute (SEI)	23.084	22.613	28.212	28.852	29.447	29.875	30.326

A. Mission Description and Budget Item Justification: Software Engineering Institute is key to meeting DoD's increasing demand for high-quality, affordable, and timely national defense systems. There is a critical need to rapidly transition state-of-the-art technology and best practices to improve the acquisition, engineering, fielding, and evolution of software-intensive DoD systems.

The SEI enables the exploitation of emerging software technology by bringing engineering discipline to software acquisition, development, and evolution. The SEI focuses on software technology areas judged to be of the highest payoff in meeting defense needs.

B. Accomplishments/Planned Program:

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Acquisition Practices for DoD Software Intensive Systems:	2.060	2.239	2.310

FY 2007 Accomplishments:
- Helped more than 50 key acquisition programs achieve their objectives by working directly with them to apply new technologies and conduct experiments with maturing SEI products and services in real-world acquirer contexts.
- Completed the Systems Engineering Effectiveness Study, in response to a request from OSD and in conjunction with the NDIA Systems Engineering Effectiveness Committee, which reveals how the use of effective performance of systems engineering best practices on a development program yields quantifiable improvements in the program execution (e.g., improved cost performance, schedule performance, technical performance).
- Established on-site presence in Los Angeles, CA to provide direct support to the USAF Space and Missile Systems Center.
- Established a delivery capability to meet the needs of strategic impact programs that are sponsored by service acquisition executives. Provided an on-site presence as needed to assist acquisition officials in the improvement of their software-intensive system-acquisition activities.
- Continued to provide liaison activity with external organizations and provided leadership roles within National Defense Industrial Association (NDIA), the International Council on Systems Engineering (INCOSE), the Program Managers Institute (PMI), Practical Systems and Software Measurement (PSSM), and the Office of the Secretary of Defense (OSD).
- Captured knowledge from engagements with acquisition organizations, integrated it with lessons learned from similar work, and helped to impart that knowledge to the acquisition community. Accomplished this through means such as conferences, workshops, courses, briefings, technical reports, articles, advocacy, and participation in acquisition communities of practice.

FY 2008 Plans:
- Continue to provide direct support to key acquisition programs.
- Pursue a balanced portfolio of program support and organizational support to aid in persistent organizational learning across multiple programs.
- Establish additional on-site presence in response to needs and requests from key acquisition programs and organizations.
- Explore the areas of mission assurance establishing a reasonable degree of confidence in mission success and enterprise information systems.

FY 2009 Plans:

- Continue to help Department of Defense and other government acquirers improve their ability to acquire, deploy, and sustain systems and capabilities.
- Partner with the acquisition community to identify common areas of concern across multiple programs.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Software Engineering Technical Practices	15.040	15.410	20.776

FY 2007 Accomplishments:

- Identified and established techniques and approaches needed to embed software and system assurance in all aspects of the system development life cycle. Created and matured a disciplined research and development process that produces theoretical foundations, engineering methods, and early prototype automation for solving security and software assurance challenge problems through Computational Engineering for Software and System Assurance and Software and System Assurance Technology and Knowledge Transfer.
- Worked to establish the routine use of disciplined approaches to improve the survivability and resiliency of the Department of Defense, federal civilian agencies, private sector organizations, and their networked systems by identifying and developing security management frameworks, evaluations, models, practices, and policy guidance that allow organizations to effectively and efficiently protect their mission-critical assets and systems; and focusing on the identification, analysis, and management of organizational, operational, and technical risks throughout the system development life cycle.
- Provided security practices and information assurance training and education to equip personnel in the Department of Defense, federal civilian agencies, and the private sector with the knowledge, skills, and abilities required to improve the survivability of networked systems and computer network defense.
- Improved the national cyber response and readiness capability and built international computer security information exchange and collaborative analysis capabilities. Developed and deployed tools to improve the effectiveness of response teams and investigator communities, such as malicious code cataloging and analysis tools
- Provided analysis and capabilities to the DoD, DHS, and the broad Internet community to enable situational awareness of Internet threats through novel engineering- and research-based approaches.
- Published the CERT Resiliency Engineering Framework, the first step in the development of a process improvement approach to operational resiliency management.
- Upgraded the SEI's security VTE (Virtual Training Environment), which has been viewed more than 9.9 million times since its launch in 1QFY07; 8,523 DoD personnel had accounts for VTE courses in FY07.
- Built CERT's Clustered Computing Analysis Platform, which is used by the US Secret Service.
- Transitioned CERT's forensic tool suite to all DoD computer forensic labs as part of the standard analysis platform.
- Addressed detection and analysis of malware using function extraction technology for computing software behavior.
- Built-out the DHS Build-Security-In Web site, with special emphasis on supporting the DHS Software Assurance Working Groups
- The Survivability in Information Assurance curriculum, available on the CERT web site for academic institutions and faculty, was downloaded 1,758 times worldwide, in 112 countries.
- Addressed method and tool support for improving deficient architectures by developing the second version of the architecture design expert (ArchE).
- Held an Army Software Architecture Workshop sponsored by the Army_s Strategic Software Improvement Program (ASSIP) in which all 10 Army programs at the workshop agreed that ATAM architecture evaluations had significant positive effects resulting in reduced risk in schedule and cost, and a higher quality product for the warfighter.
- Published _System of Systems Governance: New Patterns of Thought,_ a report that addresses governance issues that result from working in a system of systems environment, particularly within one that is centered on a Service-Oriented Architecture approach.
- Transitioned AADL to the AVSI (Aerospace Vehicle Systems Institute), a consortium of American avionics companies (including Boeing, Lockheed Martin, Rockwell-Collins, and Smiths Industries), which has agreed to use AADL as their language for modeling and analyzing avionics systems designs.
- Developed Mission Success in Critical Environments (MSCE) methods which are based on a modular design, or toolkit approach, which allows for flexibility and tailoring when working with customers. Completed a prototype web-based toolkit interface and method repository.
- Updated SoS Navigator for systems of systems; the beta version is being employed in an engagement with Department of Interior (DOI).

FY2008 Plans:
- Develop a capability to support network and distributed systems forensics for the Department of Defense, federal agencies, law enforcement, and critical infrastructure operators.
- Encourage broad adoption of tools, techniques, and lessons learned from earlier work in vulnerability and malicious code analysis; situational awareness; process improvement for security management; insider threat studies; and computer network defense service provider metrics.
- Emphasize architecture-centric system evolution by developing theories and methods for determining inconsistencies between a system and its associated business goals, and strategies for evolving architectures to enable systems to continuously meet changing business and mission goals while minimizing risk.
- Develop methods, guidelines, and problem-specific interventions to improve individual and organization competence in using architecture-centric development approaches
- Expanded efforts to form a community that uses SEI architecture-centric methods by creating a partner network, accelerating the licensing of courses in the SEI Software Architecture Curriculum, and exploring other course delivery mechanisms
- Apply and mature research results with customers and emphasize integrating software and system architecture practices.
- Emphasize application of predictable assembly from certifiable components tools and techniques in real-world settings and facilitate adoption of predictable assembly in the Department of Defense, industry, and undergraduate and graduate academic.
- Mature and transition two emerging technologies for use in net-centric operations and systems of systems, and address the evolving research agenda in collaboration with a set of partners in the international research community.
- Formulate a comprehensive body of model-based engineering guidance, and the beginnings of dissemination to a wider community.
- Apply an assurance case approach to large-scale system development and in applications ranging from system-of-systems information assurance to the safety of plug-and-play medical devices.

FY 2009 Plans:
- Develop function-extraction tools for correctness verification and component composition.
- Develop training courses and workshops for the SEI Resiliency Engineering Framework and for software assurance.
- Develop a comprehensive architecture competence model.
- Write case studies, course materials, and book draft about architecture evolution.
- Demonstrate predictable assembly from certifiable components (PACC) in practice using test bed and case studies.
- Develop PACC workshops and course materials for academics and practitioners.
- Develop system-of-systems analytical framework and tools based on it.
- Mature practices and tools for engineering in a system-of-systems context.
- Develop training standards, curriculum material, and courses in model-based engineering
- Develop assurance case patterns for information assurance, safety, and large-scale system dependability

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Software Engineering Management Practices	4.389	4.512	4.655

FY 2007 Accomplishments:
- Maintained the CMMI Product Suite by creating, maintaining, and appropriately updating or enhancing products, including guidance for small organizations and appraisal and process improvement courseware.
- Launched CMMI for Acquisition (CMMI-ACQ).
- Administered a certification program for High Maturity Lead Appraisers.
- Continued the transition of CMMI into practice, training (to date) 75,279 students in the Introduction to CMMI course; training 2,612 in the Intermediate CMMI course; authorizing 428

Intro to CMMI V1.2 instructors; authorizing 452 SCAMPI V1.2 Lead Appraisers; and conducting more than 2,700 SCAMPI A appraisals

- Expanded the transition of the Personal Software Process by translating the developer exam into Japanese. Web pages related to CMMI v1.2 are also being translated.
- Published a book titled CMMI and Six Sigma: Partners in Process Improvement.
- Co-developed a special report titled _A Survey of Systems Engineering Effectiveness,_ which was presented to the National Defense Industrial Association subcommittee.
- Replaced the system used to report SCAMPI appraisal results with a new system that allows more automated checking of appraisal reports as they are submitted. As a consequence, some quality audits will become automated, allowing SEI to more rapidly identify lead appraisers whose conduct should be carefully reviewed.
- Completed a technical report describing the results of our 2006 State of Measurement Practice Survey.
- Continued to provide support to OSD PA&E on systems of systems cost estimation and risk identification.
- Continued to deliver process improvement consulting services to a variety of U.S. government departments and agencies.
- Led the development and authoring of ISO/IEC 2520, which has now been approved for publication. This standard is part of a series that addresses the measurement of software product quality attributes.
- Conducted tutorial at Warner Robins Air Logistics Center (WRALC) to teach participants how to use the statistical visualization software SAS JMP. WRALC will use the software to keep the squadrons populated with statistical experts.
- Managed and administered transition programs (appraisal, training, SEI Partner Network, and communication programs) and services (delivering technical services and providing materials) to support the widespread, high-quality use of the CMMI Product Suite in government and industry.
- Extended and operated the Software Engineering Information Repository (SEIR) to provide data and information that software organizations use to learn about (a) the experiences of other organizations attempting to improve their software engineering processes and technology, (b) new software engineering technology that may improve their performance, and (c) issues, challenges, and policies related to the Department of Defense and its suppliers of software-intensive systems.
- Provided expertise and specific techniques for software and acquisition organizations to use for measuring and analyzing their performance and managing their projects and processes, and research new areas with promise for improving organizational measurement and analysis capability.

FY 2008 Plans:

- Transition CMMI for Acquisition, launched in FY 2007, to increase critical government adoption.
- Pursue development of CMMI for Services (sponsored by Northrop Grumman).
- Maximize the interoperability of multiple CMMI constellations CMMI for Development and CMMI for Acquisition.
- Support a series of user workshops to define the requirements for a CMMI Version 2.0.
- Bring together industry and vendors with sizable repositories of performance data together to address the need for high-quality project-performance benchmarks.
- Merge techniques from CMMI appraisals, measurement system evaluation, and customer satisfaction analysis to improve data and information quality for managing projects.

FY 2009 Plans:

- Manage a joint industry, government, and SEI effort to extend coverage of the CMMI Framework to the acquisition of products and services.
- Explore whether and how to add Information Security to CMMI.
- Provide empirical analyses of CMMI costs and benefits.
- Continue stewardship functions for CMMI
- Create specific _how to_ methodology or implementation guidance for Six Sigma tools, business case analyses, various computations of expected benefits or returns (e.g., ROI), and other techniques and tools.
- Adapt statistical and quantitative analysis techniques for acquisition, systems engineering, and software engineering practitioners.

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

Administrative Agent	0.322	0.452	0.471
Funding send to Electronic Systems Command annually for contractual and financial administration of the SEI			
Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Other	1.273		
TBD			

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	**0603781D8Z - Software Engineering Institute (SEI)**	**P782**

COST ($ in Millions)	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P782 Software Intensive Systems	2.602						

A. Mission Description and Budget Item Justification: The Systems and Software Engineering (SSE) Directorate manages the Software Intensive Systems (SIS) mission to improve DoD SIS acquisition and sustainment. The SSE Directorate is the focal point for DoD initiatives that reduce software risk. The SSE Directorate is organized into elements that ensure coverage of the breadth of responsibilities necessary to achieve the mission of improving SIS acquisition performance, and to act as the DoD software community focal point. These elements focus on Policy and Guidance, Education, Best Practices, Software Engineering Technology, and Collaboration. The SSE Directorate conducts its SIS efforts by understanding DoD needs, issues and solutions; and acting on/transitioning improvements to DoD enterprise, program and practitioner levels.

In FY 2008, the Software Intensive Systems funding line will be transferred from PE0603782D8Z to the Developmental Test and Evaluation line in Acquisition in Technology and will be renamed Software Engineering and System Assurance.

B. Accomplishments/Planned Program:

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Software Intensive Systems:	2.602		

FY 2007 Accomplishments: Conducted assessments on acquisition programs as part of formal acquisition oversight reviews and in support of Nunn-McCurdy certification requirements for acquisition programs exceeding legally established thresholds for cost and schedule growth.

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# 3	**0603781D8Z - Software Engineering Institute (SEI)**	**P783**

COST ($ in Millions)		FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P783	Software Producibility Initiative	2.014	3.113	3.032	3.018	2.994	3.034	3.077

A. Mission Description and Budget Item Justification: The role of the Software Producibility in major Defense acquisition programs has been steadily increasing. Much of the mission functionality demanded from programs such as F/A-22, JSF, Future Combat System, and many others is embodied in large, complex software systems. Shortcomings in software development often lead to schedule slippage, cost growth, and mission compromises. These shortcomings can frequently be traced to underpowered software development technologies not up to the task of developing the scale and complexity of software needed. Despite the large role of the commercial sector in advancing software technology, there are many key aspects of complex, distributed, robust systems crucial to DoD that are not being addressed directly by commercial technology efforts, as our experience over the past decade shows.

This initiative will conduct integrated program of research from basic through dem-val that advances the state-of-the art in producibility of software for DoD systems, particularly those systems characterized by high complexity, need for robustness, information assurance, real-time performance, and physical distribution. Research and transition efforts will pursue technical goals to (1) meet and ensure mission-critical requirements; (2) control complexities; (3) enable system evolution; (4) ensure seamless interoperability; and (5) model behavior and performance.

Invest in promising software technologies involving (1) specification of complex requirements; (2) correct-by-construction software development; (3) composable and customizable frameworks; (4) high-confidence system software and middleware; (5) system architectures for network-centric environments; (6) technologies for testing, verification, and validation, and (7) modeling and metrics. Establish cost avoidance goals of 10% - requirements phase, 60% - design phase, 80% - code/unit test phase and 40% - integration and test phase in the software development lifecycle. Based on these goals, annuals cost avoidance is estimated at $10.6 billion. Additionally, these software experts would directly advise ongoing acquisition programs.

B. Accomplishments/Planned Program:

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Software Producibility	2.014	3.113	3.032

FY 2007 Accomplishments: Completed competition to host the Software and Systems Test Track. Awarded three contracts to provide software development tools for promoting systems of systems interoperability. Initiated development of a business plan for options to foster government and industry co-investment in focused research centers for improving software producibility. Engaged with industry and government to mature options. Initiated development of a SIS Producibility Technology Roadmap to prioritize research investments and identify measures that allow the development community to judge progress. Continued progress on National Academy of Sciences study on Advancing Software-Intensive Systems Producibility

FY 2008 Plan: Award the Software and Systems Test Track implementation contract in Jan 2008 per the completed competition. Continue research efforts in developing technologies for interoperable systems of systems. Mature business plan for gov/industry co-investment in research, select an implementation approach, initiate the necessary agreements. Mature the SIS Producibility Technology Roadmap, get community consensus on priorities and measures. Start initial effort in using the Systems and Software Test Track to provide a place (possibly virtual and

not a single physical location) for experimental verification of Software-Intensive Systems Producibility technologies due to their novelty and the potential complexity of the underlying theories. The experimental platforms will incorporate software technology to instrument, monitor and test large-scale applications. The experimental platform research included subtasks to conduct large-scale coordination experiments, and developed methods and tools for evaluating aggregate performance of applications. This environment provided a full range of collaborative technology challenges, run-time platforms and applications, experiments, evaluations, and demonstrations. A Common infrastructure will enable control and data flow between both kinds of application components for a distributed environment. The open experimentation environment provided the fundamental reference architecture and underpinnings helping researchers to develop and test their designs as well as facilitates transition of promising technologies into production use. Initiated a research topic in interoperability to address software techniques to improve system of system interoperability. Review previously awarded contracts to develop and transition new methodologies, tools, technologies and techniques that improve DoDs ability to acquire software for large, net-centric warfighting systems of systems. Release a BAA with subsequent award for community based technology efforts such as reuseable SW library or populating existing toolsets with domain-specific knowledge for application to a DoD-specific need such as military avionics, communications, or platform control.

FY 2009 Plan: Complete efforts in SW Technologies for Interoperable SoS, initiate new topic based on mature technology roadmap. Sustain experimentation on the Software and Systems Test Track. Continue DoD-specific community based technology effort awarded in 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 (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.

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)**

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.			

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 **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
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 cryropackage 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

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**

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.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE
RDTE, Defense Wide BA 03	**0603828D8Z - Joint Experimentation**

COST ($ in Millions)	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P808 Joint Experimentation	102.222	107.240	114.947	117.571	118.813	120.396	122.092

A. Mission Description and Budget Item Justification: The Joint Experimentation (JE) Program is the centerpiece to the broader Defense Experimentation Enterprise inclusive of investments by the Military Services and Defense Agencies. The JE Program underwrites Department of Defense (DoD) efforts to identify future joint and coalition force capabilities, to ascertain shortfalls in current joint force capabilities, and to examine key attributes of potential solutions for near-term joint shortfalls through effective Doctrine, Organization, Training, Materiel, Leadership and Facilities (DOTMLPF) improvements. Deliverables from Joint Experimentation (JE) Program investments should, then, fall into three categories: specific long-term force composition and mission descriptions that can be expressed as force development policy inputs, joint operational concepts, and DOTMLPF recommendations for force tailoring and improvement. The primary customer for JE is the joint warfighter including major joint Combatant Commanders and joint task force commanders. This customer focus necessarily involves inter-agency, inter-government/coalition, and non-government agency entities with whom the joint commanders must interact in the performance of their assigned missions. Inherent in performance of JE is close alignment and synchronization of experimentation efforts by Services and Agencies vested with responsibility under U.S. Title 10 for the training, equipping, and organizing of military forces assigned to joint commanders in the field.

Conceptually, JE is a critical element in a chain of processes yielding military capabilities. This chain normally begins with assessment and analyses of current military capabilities that frequently takes the form of "lessons learned" or exploratory force design. JE contributes to this process by providing rigorous environments for developing and testing conclusions development through the analysis phase. Ideally, JE progressively narrows the scope of inquiry through iterative examination and analysis leading to recommendations that can confidently serve as proposals for effective future force design, and current force modifications and improvements. Typically, JE deliverables provide the basis for future force development and employment guidance, for operational concept and plan development, and for the DOTMLPF investments that shape the forces fielded for military missions. In essence, JE is a risk reduction investment aiming to explore innovative alternatives for force development and to provide rigorous analyses of variables affecting joint force operational concepts and capability enhancements.

The challenges for joint experimentation include establishing valid hypotheses for examination, determination of effective processes for experimentation, disciplined execution to obtain actionable results, and transition into tangible and meaningful improvements - these all represent critical elements necessary for JE to be relevant to joint warfighting capabilities. In terms of program alignment, programs such as the Joint Warfighting Program (JWP) fund analyses providing the entering argument for experimentation by highlighting areas for improvement and proposing innovative avenues for future force development. JE then provides operationally relevant environments for solution exploration and iterative refinement. Outcomes from JE can take the form of joint operational concepts or joint capability prototypes for DOTMLPF tailoring via demonstrations before investment decisions for transition into force-wide implementation. Programs such as the Joint Capability Technology Demonstration (JCTD) Program and Joint Training (JT) Program should directly benefit from JE in progressing concepts to fielded joint capabilities.

The latest Unified Command Plan (UCP), dated May, 2006, specifies that Commander, US Joint Forces Command (USJFCOM) is functionally responsible to the Chairman of the Joint Chiefs of Staff] for "Leading joint concept development and experimentation (CDE)", for "Coordinating the CDE efforts of the Services, combatant command, and defense agencies to support joint interoperability and future joint warfighting capabilities", for "Leading the development, exploration, and integration of new joint warfighting concepts", for "Serving as the DOD executive agent for Joint Warfighting Experimentation, including planning, designing, preparing, and assessing a program of joint warfighting experimentation in coordination with the Services, other combatant commands, and defense agencies, as appropriate", and for "Developing combined operational warfighting transformation efforts with joint CDE in coordination with the other combatant commands."

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE
RDTE, Defense Wide BA 03	**0603828D8Z - Joint Experimentation**

Beginning with FY 2007, Director, Defense Research and Engineering (DDR&E) exerted executive oversight of Defense Experimentation including the JE Program. In policy guidance for the conduct of RDT&E-funded Joint Experimentation, DDR&E emphasized joint warfighter Combatant Command customer focus, discrete deliverables and project level fiscal accountability. During FY 2007, USJFCOM implemented management initiatives that are under evaluation by OSD. For purposes of broader oversight such as coordination of Defense experimentation and training investments, and integration of Defense experimentation with the Joint Concept Development and Integration System (JCIDS), OSD/AT&L teams with OSD(Policy/Personnel & Readiness), and the Joint Staff.

In FY 2008 and beyond, OSD policy for joint experimentation execution will be decentralization of joint experimentation execution in an effort to make the process more relevant and productive for individual joint combatant commanders. Part of this effort will be reinvigoration of experimental expertise funded through the Joint Warfare Program; part will be a new emphasis on decentralized execution where US Joint Forces command provides experimentation support to events hosted by combatant commander headquarters in balance with USJFCOM acting as a surrogate joint host for large-scale consolidated events. While ample opportunities will be preserved for discovery and innovation, projects under development without acceptable provisions for discrete deliverables and measurable performance metrics will have funding withheld or cancelled by DoD oversight authorities, with funding redirected to other joint experimentation priorities. OSD will also seek opportunities to integrate modeling & simulation and networked distribution technologies across Experimentation and Training Transformation domains for improved return on investment and benefits of cross-fertilization.

JE will benefit from a greater focus discrete deliverables in the areas of development and validation of new operational concepts and definition of joint capability gaps. To this end, and in balance with issues referred directly from CoComs and Services, Joint Experimentation will address those Most Pressing Military Issues (MPMI) and Integrated Priority List (IPL) shortfalls compiled by the Joint Staff through the Joint Capabilities Integration and Development System (JCIDS).

B. Program Change Summary	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2008)	103.489	112.017	115.170
Current BES/President's Budget (FY 2009)	102.222	107.240	114.947
Total Adjustments	-1.267	-4.777	-0.223
Congressional Program Reductions		-3.840	
Congressional Rescissions			
Congressional Increases			
Reprogrammings	1.295		
SBIR/STTR Transfer	-2.434		
Other	-0.128	-0.937	-0.223

FY 2007 Congressional adjustments: Reduction (-$15.9M) for "duplicative efforts"; increase (+$3.8M) for Modeling and Simulation (M&S).

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
08						

Comment: Performance of Joint Experimentation systems is measured by successful development of:
(1) objective validation of enhanced CoCom capabilities to perform joint missions in their assigned theaters and areas of responsibility,
(2) documented delivery effective joint operational concepts,
(3) confirmed production of refined and validated capability descriptions for joint materiel solutions for implementation by Service and Agency force developers and acquisition authorities,
(4) identification of innovative integrated solutions and joint interoperability standards for Service-developed military capabilities, and
(5) resolution of specific joint capability shortfalls delineated through the Joint Forces Command Combatant Commander Engagement process and through the Concept Joint Capabilities Integration and Development System (JCIDS), specifically in Most Pressing Military Issues (MPMI) and Integrated Priority List (IPL) shortfall compilations.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDTE, Defense Wide BA 03	**0603828D8Z - Joint Experimentation**	**P808**

COST ($ in Millions)	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P808 Joint Experimentation	102.222	107.240	114.947	117.571	118.813	120.396	122.092

A. Mission Description and Budget Item Justification: Beginning with FY 2007, Director, Defense Research and Engineering (DDR&E) exerted executive oversight of Defense Experimentation including the JE Program. In policy guidance for the conduct of RDT&E-funded Joint Experimentation, DDR&E emphasized joint warfighter Combatant Command customer focus, discrete deliverables and project level fiscal accountability. During FY 2007, USJFCOM implemented management initiatives that are under evaluation by OSD. For purposes of broader oversight such as coordination of Defense experimentation and training investments, and integration of Defense experimentation with the Joint Concept Development and Integration System (JCIDS), OSD/AT&L teams with OSD(Policy/Personnel & Readiness), and the Joint Staff.

In FY 2008 and beyond, OSD policy for joint experimentation execution will be decentralization of joint experimentation execution in an effort to make the process more relevant and productive for individual joint combatant commanders. Part of this effort will be reinvigoration of experimental expertise funded through the Joint Warfare Program; part will be a new emphasis on decentralized execution where US Joint Forces command provides experimentation support to events hosted by combatant commander headquarters in balance with USJFCOM acting as a surrogate joint host for large-scale consolidated events. While ample opportunities will be preserved for discovery and innovation, projects under development without acceptable provisions for discrete deliverables and measurable performance metrics will have funding withheld or cancelled by DoD oversight authorities, with funding redirected to other joint experimentation priorities. OSD will also seek opportunities to integrate modeling & simulation and networked distribution technologies across Experimentation and Training Transformation domains for improved return on investment and benefits of cross-fertilization. With issues referred directly from CoComs and Services, Joint Experimentation will address those Most Pressing Military Issues (MPMI) and Integrated Priority List (IPL) shortfalls compiled by the Joint Staff through the Joint Capabilities Integration and Development System (JCIDS).

Project Justification: To enable better and more enduring focus over time, and to conform to the Joint Concept Development and Experimentation (JCDE) Enterprise standard, USJFCOM has adopted the use of Lines of Joint Experimentation (LOJX) to organize and track products and outcomes. These align very closely to the Tier I Joint Capability Areas. In any given year, work may be focused on those lines corresponding to solutions to the highest priority warfighter challenges, and so the portfolio of USJFCOM's JCDE may not cover every LOJX. Currently LOJX consist of: Battlespace Awareness, Command and Control, Comprehensive Approach, Force Application, Force Protection, Irregular Warfare, Logistics, Net-Centric Warfare, Shaping, and Stability. One additional category used by USJFCOM is Corporate Management and Support, which captures those projects supporting the Unified Command Plan (UCP)-directed Lead and Coordinate role.

Battlespace Awareness (BA) JCDE:
Joint Concept Development and Experimentation in the BA LOJX includes further development of Maritime Domain Awareness (MDA) and the Joint Intelligence Operations Center _ Transformational (JIOC-X). It also includes several initiatives by the Joint Urban Operations Office to improve BA in the urban environment. Finally, USJFCOM has begun investigation into ways and means to achieve persistent surveillance, and to analyze and display effects of military operations across the spectrum of Political, Military, Economic, Social, Information, Infrastructure (PMESII).

Command and Control (C2) JCDE:

USJFCOM conducts JCDE in support of the C2 LOJX in several areas, including Homeland Defense and Civil Support (HLD/CS) concept development, interagency coordination, and Joint Urban Operations (JUO). Additionally, advanced technology solutions such as Conflict Modeling, Planning and Outcomes Experimentation (COMPOEX), Theater Effects Based Operations (TEBO) Advanced Concept Technology Demonstration (ACTD), and Cross-Domain Collaborative Information Environment (CDCIE) JCTD are being assessed through joint experimentation.

Comprehensive Approach (CA) JCDE:
The Comprehensive Approach LOJX seeks whole-of-government solutions to warfighter challenges in both a U.S. interagency environment and a multinational environment that involves military forces, other governmental agencies, and non-profit organizations. USJFCOM is a lead organization for the fifth in a series of multinational experiments (MNE5), and supports U.S. interagency experimentation in its Unified Action series and as it supports the stand-up of US Africa Command (AFRICOM). In addition, USJFCOM is conducting Unified Action (UA08) in support of Dept of State Coordinator for Reconstruction and Stability (S/CRS).

Force Application (FA) JCDE:
USJFCOM maintains interest in the Force Application LOJX, experimenting with automated close air support and urban warfare applications. Additionally, USJFCOM is responding to specific request for support from Commander, Multinational Force Iraq (MNF-I) through a tailored program of field experimentation.

Force Protection (FP) JCDE:
The FP LOJX is supported by experimentation in Combating Weapons of Mass Destruction (CWMD).

Irregular Warfare (IW) JCDE:
USJFCOM is beginning exploration in the IW LOJX in FY 2008. Specifically, the augmentation of Special Technical Operations (STO) to mainstream experimentation and work with USSTRATCOM in cyberspace warfare will comprise USJFCOM's initial work in IW.

Logistics JCDE:
USJFCOM plays a large role in the Logistics LOJX. Scalable, tailorable theater logistics concepts and implementation, a concept for a Joint Logistics Command, and multinational logistics comprise three significant efforts that will be undertaken in FY 2008 and FY 2009.

Shaping JCDE:
Beginning in FY 2007 and continuing through FY 2009, USJFCOM is working closely with other COCOMs to develop Joint Operating Concept (JOC) for Shaping that describes the Military Contribution to Cooperative Security Engagement in all global environments. In addition to developing the concept, experimentation activities are being conducted that support both concept development and capability requirements and gaps. As recognized in the 2006 Quadrennial Defense Review (QUADRENNIAL DEFENSE REVIEW), Strategic Communication is an integral part of shaping, and USJFCOM is aggressively developing a Joint Integrating Concept (JIC) to aid military commanders in supporting a unified national message in all operations.

JCDE Community Management and Support:
As directed in the Unified Command Plan 2006, USJFCOM is functionally responsible to the Chairman for leading transformation of the Armed Forces, for coordinating the development of joint concepts, and for coordinating joint warfighting experimentation. These roles are carried out through exercise of four core competencies developed at

USJFCOM: developing joint concepts, developing joint capabilities, conducting joint experimentation, and managing Concept Development and Experimentation (CDE) through an Enterprise approach.

B. Accomplishments/Planned Program:

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Battlespace Awareness (BA)	11.142	10.476	11.154

FY 2007 Accomplishments
- Operational Net Assessment (ONA)/Synthetic Environment for Analysis Support (SEAS) Field Experiment. Conducted field experiment with NATO Interim Security Assistance Force (ISAF), testing both ONA and SEAS tools and concepts for global reachback capability. Engaged Joint Intelligence Operations Center _ Transformational (JIOC-X) in experiment, providing intelligence and planning support to ISAF.
- Sensor Placement Support. Developed and delivered Geospatial Analysis and Planning Support (GAPS) tool to operational forces, enabling them to more accurately assess coverage and optimize sensor placement to monitor tactical environment.
- UAV-Based Forensic Tracking. Working with an existing AFRL/USMC consortium, USJFCOM supported initial deployment of and CONOPS for the Commercial-Off-The-Shelf sensor package, a persistent tactical-level Intelligence, Surveillance and Reconnaissance (ISR) capability, as well as a powerful near-real-time analytical tool. Initial deployment conducted as operational assessment.

FY 2008 Planned Output:
- The Joint Intelligence Operations Center _ Transformational (JIOC-X) provides continuous development and refinement of COCOM JIOC processes, tactics, techniques and procedures (TTP), architectures, and standards in support of intelligence, operations, and plans integration (IOP-I) through JCDE. Intelligence support to information operations and IOP-I will be examined in a series of limited objective experiments, focused on rapid integration of information operations capabilities, providing input to real world operational planning, and informing Strategic Communication concept development. Activity will focus on supporting the stand up of USAFRICOM JIOC capabilities.
- Maritime Domain Awareness (MDA) joint concepts will improve the maritime awareness functional and cognitive processes to enhance decision making, improve the global sharing of maritime domain information at all levels, and facilitate the networking of global maritime operation centers. Contributions from Singapore, Finland and NATO will characterize the productive partnerships in the development of Maritime Domain Awareness concepts. Deliverables include: SenseMaking Limited Objective Experiments Final Report, MDA Information Flow Analysis, Multinational Maritime Situational Awareness Concept and CONOPS, MNE MSA/JEFX TAC 08 Final Report, and MDA National CONOPS Limited Objective Experiments (LOE) Final Report.

FY 2009 Planned Output:
- Lessons learned from MDA will be applied to other warfighting environments to increase the effectiveness of aggregation of information from diverse sources, enhancing physical domain awareness.
- Completion of Phase 4 of JIOC-X, and delivery of Phase 4 products.
- Potential for JCTD work on Joint Persistent Surveillance Sensor Integration (JPSSI).
- Continue transition and improvement of JUO ISR capability definition.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Command and Control (C2)	18.312	17.863	19.124

FY 2007 Accomplishments

- Cross-Domain Collaborative Information Environment. Developed standards-based, cross-domain whiteboard/web-based chat tool. Used in USPACOM and USSOUTHCOM exercise environments; requested by USNORTHCOM.
- Noble Resolve Homeland Defense Experimentation. USJFCOM began a groundbreaking effort supporting USNORTHCOM and actively partnering with USSTRATCOM, USPACOM, National Guard Bureau, Department of Homeland Security, state & local governments, and non-governmental organizations. Noble Resolve integrated and synchronized joint experimentation in the areas of homeland defense and defense support to civilian authorities and provided information sharing and synchronization solutions.

FY 2008 Planned Output :
- The Joint Urban Operations (JUO) Capability Based Assessment (CBA) will identify unique urban capability requirements, capability gaps, and potential Doctrine, Organization, Training & Education, Material, Leader Development, Personnel, and Facilities (DOTMLPF) solutions required to improve Joint Force abilities to conduct Joint Urban Operations in the 2015-2027 timeframe
- Noble Resolve experimentation will continue, in collaboration with USNORTHCOM, Department of Homeland Security, the National Guard Bureau, and state and local governments. Deliverables include: improved interagency command and control for disaster response; a shared information environment that supports Federal, State, Local Strategic/Operational information sharing, a harmonized policy for Homeland Defense, an ongoing Homeland Defense/Security experimentation venue, and Combat WMD/CBRN Battlespace Awareness Environment for the Joint Force Commander.

FY 2009 Planned Output:
- USJFCOM will continue supporting a robust environment for collaborative development of joint and interagency experimentation.
- In coordination with other COCOMs and interagency partners, deliver appropriate tools and solutions that address critical information sharing capability gaps, support border security, and Chemical, Biological, Radiological, Nuclear and Enhanced Conventional Weapons (CBRNE) response.
- Complete cooperative development with USNORTHCOM of the Homeland Defense & Civil Support Joint Operating Concept.
- Transition tool from Conflict Modeling, Planning and Outcomes Experimentation (COMPOEX) to a program of record.
- Deliver modules that will complete the Cross-Domain Collaborative Information Environment, in partnership with Defense Information Systems Agency (DISA) and National Security Agency (NSA).
- Complete testing and delivery of complete version of Theater Effects Based Operations (TEBO) ACTD, ensure transition to program of record.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Comprehensive Approach (CA)	22.038	22.803	24.945

FY 2007 Accomplishments
- Completed transition of Joint Interagency Coordination Group (JIACG). Providing doctrinal handbook, DoD Instruction, and Concept of Operations (CONOPS) for staffing.
- Support to USEUCOM/USAFRICOM. Provided assistance to USEUCOM in the development and transition of USAFRICOM, integrating U.S. interagency personnel throughout its structure, and focusing primarily on security and stability operations.
- Conducted Rule of Law prototyping in support of USSOUTHCOM and Joint Task Force-Horn of Africa (JTF-HOA). Developed Justice Sector Assessment Tool, Rule of Law (ROL) Handbook, Draft CONOP for Comprehensive Approach to Security, Stability, Reconstruction (SSR) including assessment process and metrics, Draft CONOP for integration of Stability Police Units (SPUs) into US military operations, Draft CONOP for integration of a civilian/military justice planning cell, and illicit power structures taxonomy.
- Conducted initial planning and shaping Multinational Experiment 5 (MNE5), collaboratively developing and implementing mutually acceptable process for screening international expansion to requesting nations.

FY 2008 Planned Output:
- Support to USEUCOM in the stand-up and operationalizing of U.S. Africa Command (USAFRICOM). Specifically, support will consist of initial mission analysis and experimentation necessary to help determine the necessary structure, roles, mission and partnerships.

- Unified Action 08 is a highly collaborative experimentation program designed to deliver whole-of-government applications and products. Purpose is to support implementation of National Security Presidential Directive 44 (NSPD-44) by transforming the joint force's capability to conduct integrated planning and execution of complex emergencies at home and abroad with USG departments and agencies, to collaborate with intergovernmental organizations (IGOs), non governmental organizations (NGOs), and the private sector, and to conduct activities in support of broader National Security Reform. Deliverables include USG Planning Framework (S/CRS lead), Interagency Management System (S/CRS lead), Interagency Logistics Capability (JFCOM lead), Metrics and Assessment Tools and Frameworks (Multiple leads including United States Army Corps of Engineering (USACE), United States Institute of Peace (USIP), Regional Security Organization Architecture (COCOM-after-next) (AFRICOM / SOUTHCOM lead), Federal Foreign Disaster Response Plan (USAID lead), Information-Sharing Procedures (JFCOM lead), Ungoverned Areas and Threats from Safe Havens Paper (JFCOM lead with USAID), Haiti Stabilization Initiative Plan Report (HSI lead), Draft CONOP for Formed Police Unit (FPU) Integration (JFCOM lead), Draft CONOP for Civilian/Military Justice Coordination Cell (JFCOM lead), Interagency C2 and Common Operational Picture (COP) Solutions (JFCOM lead), Military Support to Governance Handbook; Interagency (IA) Chapter in Certification and Accreditation (CA) Manual (JFCOM lead), Military Support to Economics Handbook (JFCOM lead), Integrated National Planning and Execution System _Adaptive Planning and Execution/Global Force management (NPES-APEX/GFM) Capability (JFCOM and DHS lead), National Homeland Security Plan (NORTHCOM lead), Pre-Doctrinal Rule of Law Handbook for Joint Operations (JFCOM / US Army Center for Law and Military Operations (CLAMO) lead, and Pre-Doctrinal CONOP Comprehensive Approach to Security, Stability, Reconstruction (SSR) (JFCOM, USAID, OECD lead).
- Multinational Experiment 5 (MNE5), a multi-year effort, will conduct narrowly focused events in FY 08 and a capstone major integrating event in spring 09. Using a disciplined experimentation campaign plan, experiment issues and expected deliverables drive individual workshops and limited objective experiments. The MNE 5 community of interest membership currently includes 17 nations, NATO and the European Union. Partner nations will lead development of many of the deliverables. Deliverables include:
-- Coalition Handbook, a guidebook that provides operational-level guidance in discrete areas of operations, is capable of being used in entirety or in parts, and is easily adaptable to partial, intermittent revisions over time.
-- Comprehensive Approach White Paper (US): White Paper that frames the overarching approach harmonizing all elements of power.
-- Strategic Planning Guide (FR): Multinational Strategic Planning Guide used to establish coalition guidance at the strategic level.
-- Implementation Planning, Management, and Evaluation Guide (UK& US): Cooperative Implementation Planning (CIP) Guide; CIP Course Syllabus & Course Handbook
-- Multinational Effects-based Approach (MN-EBAO) CONOPS (NATO): EBAO CONOPS for military planning, execution and assessment in a civilian-compatible format; EBAO Handbook for either military or non-military players; Joint Planning and Engagement Tool for System Analysis, Planning and Assessment
-- Best Practices for Assessment, Planning (NATO): Code of Best Practice (CoBP) for Assessment within the EBAO framework and compatible with civilian planning; EBAO CONOPS (Ch 7 EB Assessment) refined; Joint Planning and Engagement Tool for System Analysis, Planning and Assessment
-- Knowledge Development (KD) framework concept (GE): Generic Framework for KD support of a Comprehensive Approach; Comprehensive Knowledge Base for MNE 5
-- Knowledge Base (KB) - MNE 5 Crisis Area and Kosovo Field Study (GE): Fully built KB that supports real-world operations in Kosovo; CONOPS Limited Field Experiment (LFE) HQ Kosovo Peacekeeping Forces (KFOR)
-- Technical Architecture and Design document (SE): Documentation of supporting CONOPS using NATO Architecture Framework version 3 concepts, providing a common architecture definition and design thru use of Design Rules, a Service Oriented integration environment for Service Oriented Architecture (SOA)-based applications, compatible with US and Finnish technical platforms.
-- Shared Information Framework and Technology structure/processes (FI): Framework for sharing information across agency and national boundaries; Compendium of Best Practices - Theoretical Model of Information Flows; Package of tools for the Secure Hosted Interface For File Transfer (Shift) community utilizing service oriented architecture (SOA) and commercial off the shelf technology (COTS)
-- Coalition Info Strategy CONOPS and White Paper (GE): White Paper _Information Activities in Future Coalition Operations _ A Comprehensive Approach_ ; CONOPS _Coordination of Information Activities in Support of Coalition Information Strategy.
-- Multinational Logistics CONOPS (US): CONOPS describing logistics organizational structure, processes, tools and information sharing requirements necessary to support a Comprehensive Approach in a coalition environment.

FY 2009 Planned Output:
- Work will continue supporting USAFRICOM, with deliverables including a USG Deployment & Sustainment Handbook, a USG Strategic Framework for Africa, and recommended appropriate decision support tools.

- MNE5 major integrating event and culminating Senior Leader Review will validate and accelerate implementation of MNE5 deliverables.
- Complete experimentation and begin delivery of capabilities developed through the Unified Action experimentation and begin delivery of capabilities developed through the Unified Action experimentation series.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Force Application (FA)	8.284	8.886	9.461

FY 2007 Accomplishments:
- Joint Urban Fires Prototype. Hand-held tactical level imagery mensuration capability developed and has entered systems integration phase with existing Service fires systems (Precision Strike Suite for Special Operations Forces, Army Field Artillery Tactical Data System, Joint Automated Deep Operations Coordination System).

FY 2008 Planned Output:
- The Joint Urban Operations Office (JUOO) serves as the DOD-wide single point of contact and proponent for joint urban operations doctrine, training and equipment over the full spectrum of urban contingencies that the Joint Force could confront. The JUOO will ensure USJFCOM is able to provide trained/capable/interoperable Joint Forces for urban operations. It will enhance Joint Command and Control through the development of concepts and capabilities that enable Joint Force Commander to observe, orient, decide and act inside the adversary's decision cycle. The JUOO will serve as the communication conduit of Urban Operations focus throughout DOD and the Joint Force.
- Further enhancement of the Joint Urban Fires Prototype will provide joint warfighters the ability to apply precision fires from any source in an urban environment with improved precision, discrimination and response.
- Joint Urban Fires Project (JUFP) capabilities, with associated tactics, techniques and procedures (TTP) will transition in FY 2008. Funds will provide contractor personnel support, and creation of JUFP capabilities performed under an experimental support agreement (ESA) between USJFCOM and the Weapons Engagement Office (WEO) at Naval Weapons Center (NWC) China Lake.

FY 2009 Planned Output:
- The JUOO will continue to support advances in joint integrated fires applications in joint urban operations; complete final capability demonstration of JUFP integration with unmanned aerial systems (UAS) scene matching.
- Complete Spiral 3 of Joint Automated Close Air Support Suite (JACS), with aircraft Precision Fires Image Generator.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Force Protection (FP)	0.849	0.911	0.970

FY 2007 Accomplishments:
- Senior Leader Review for Combating Weapons of Mass Destruction (SLR-CWMD). Partnered with USSTRATCOM and Defense Threat Reduction Agency (DTRA) to execute SLR-CWMD and initiated follow-on actions to implement recommendations.

FY 2008 Planned Output:
- Complete detailed plan capturing potential solutions for CWMD warfighter challenges.

FY 2009 Planned Output:

- Execute CWMD plan of experimentation.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Irregular Warfare (IW)		1.680	1.788

FY 2007 Accomplishments:
- None new start in FY 2008

FY 2008 Planned Output:
- The Integrated Joint Special Technical Operations (IJSTO) program will provide support to COCOMs, Services, and other organizations through the analysis and experimentation of special access program capabilities and processes. This program will examine potential solutions to real-time collaborative planning at the strategic through tactical levels within the Special Access Program (SAP) environment, participating as a distributed location in joint experimentation technical spirals, experiments, and exercises as required.

FY 2009 Planned Output:
- Provide experimentation support for USMC and SOCOM development of Irregular Warfare (IW) Joint Operating Concept.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Logistics (Log)	17.086	18.328	19.513

FY 2007 Accomplishments:
- Joint Deployment & Distribution Enterprise. Assisted USTRANSCOM in support for the Joint Deployment and Distribution Enterprise and development of the Joint Capabilities Requirements tool.
- Joint Experimental Deployment and Support (JxDS). Provided direct support to U.S. Forces Korea in developing organization, architectures and CONOPS for integrated Joint Force Support Component Command. Full Operational Capability to be achieved by end of FY 2007. Provided direct support to USPACOM, developing CONOPS for Enhanced Joint integrated joint logistics directorate), demonstrating scalability of JxDS solution set.
- Multinational Logistics (MN-Log) Handbook. In support of MNE5, developed the MN-Log handbook for evaluation in robust multinational experimentation environment.
- Joint Force Projection Advanced Concept Technology Demonstration (JFP ACTD). Continued development of JFP ACTD, developing the Reception Staging Onward Movement and Integration (JRSO&I) planning and execution suite, building a Service Oriented Architecture/Web Services technical environment, and documenting business rules for operational planning and execution using an operational capabilities-based construct.
- Adaptive Planning (AP). Conducted initial baseline assessment to support Joint / OSD effort to develop an AP capability for the Department.

FY 2008 Planned Output:
- The Joint Experimental Deployment & Support (JxDS) initiative, a family of scalable joint and combined logistics capabilities, will be continued. Following FY07 declaration of full operational capability of the Joint Force Support Component Command (JFSCC) at U.S. Forces Korea (USFK), support will transition to a developing and implementing a Joint Logistics Command under the new Korea Command transformation construct. USPACOM and USJFCOM will jointly develop and implement the Enabled J4 concept, and USJFCOM will work with USSOUTHCOM and USCENTCOM to prepare a follow-on program of work to deliver tailored joint logistics capabilities in those respective theaters. Additionally, USJFCOM and USSOCOM will jointly develop the Special Forces _plug_ for each of these theaters of operation.
- USTRANSCOM Partnering Activities will be continued. Two deliverables anticipated in FY 2008 are a Theater Enterprise Deployment Distribution CBA and an assessment of the concept of a Director for Mobility-Surface.
- USJFCOM will partner with Joint Staff J4 in rewriting Joint Publication 4-0, (JP 4-0 Rewrite; Joint Logistics Education; Joint Logistics Training)

- USJFCOM will assess the ability of current and future technology to comprehensively support an Adaptive Planning and Execution (APEX) system encompassing both contingency (formerly deliberate) and crisis planning. APEX is a candidate to be a three-spiral/two-year JCTD that carries out DoD AP Roadmap Recommendation 9.
- Joint Force Projection (JFP) Automated Workflow _ Adaptive Response & Execution (JFP AW-ARE) is follow-on work associated with the JFP ACTD. Using service oriented architecture/web portal available in JFP ACTD, the project will: automate Joint Deployment & Distribution Architecture (JDDA) primary thread activities/ information exchanges in web-based electronic forms (e-forms); provide notification/acknowledgement service to trigger actions/guide progression of JFP workflow; develop role-based _write-back_ capability to key authoritative data sources in the primary thread; and provide crisis response _watchboards_ for primary stakeholders to monitor process status/execution.

FY 2009 Planned Output:
- Collaborative development will continue with USFK on implementing a Joint Logistics Command as part of USFK's transformation to U.S. Korea Command (KORCOM).
- Joint Force Projection ACTD will provide enterprise-wide visibility of force capabilities from requirements generation through integration in the battlespace, transitioning an end-to-end force projection capability to the Network Enabled Command and Control (NECC) that utilizes operations capabilities-based construct of force management, deployment, and employment.
- USJFCOM will provide expertise to other joint experimentation efforts, merging joint logistics concepts with other joint warfighting concepts to ensure currency and interoperability.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Shaping	7.046	7.558	8.046

FY 2007 Accomplishments:
- Initial version of Shaping Joint Operating Concept (JOC) was completed in FY 2007, in collaboration with USEUCOM.
- Preliminary work completed on Strategic Communications Joint Integrating Concept (JIC).

FY 2008 Planned Output:
- As tasked by the 2006 Quadrennial Defense Review (QDR) Strategic Communications Roadmap, USJFCOM will develop a Strategic Communication JIC to describe how a Joint Force Commander (JFC) could plan and perform strategic communication circa 2015-2027 at the theater-strategic and operational levels within the context of broader national-level strategic communications.
- The Shaping Joint Operating Concept (JOC) describes how future JFCs will conduct cooperative security and engagement activities in combination with other available instruments of national power and in concert with partners to achieve strategic objectives notionally in the 2015 to 2027 timeframe. The Defense Contribution to Cooperative Security and Engagement JOC posits an operational-level solution for the following military problem: _How does a JFC contribute to fostering a security environment favorable to U.S. interests as well as establish a solid base for effective crisis response when it is often difficult to anticipate where and in what types of situations he will be involved, the willingness and ability of others to cooperate, and what will constitute success in a given situation?_ The concept identifies operational-level effects considered essential for achieving the end states envisioned. It focuses on the associated broad military capabilities necessary to create those effects.

FY 2009 Planned Output:
- Delivery of Doctrine, Operations, Training, Materiel, Leadership & Education, Personnel and Facilities (DOTMLPF) recommendations to provide solutions to capability gaps identified through COCOM experimentation with the Shaping JOC and Strategic Communications JIC.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDTE, Defense Wide BA 03	**0603828D8Z - Joint Experimentation**	**P808**

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Community Management and Support (CM&S)	17.465	18.735	19.946

FY 2007 Accomplishments:
- Concept Development and Experimentation (CDE) Enterprise. To fulfill its lead and coordinate role within the Joint Concept Development and Experimentation (CDE) Enterprise, USJFCOM developed and delivered an organizational framework by which the enterprise is now able to maintain situational awareness on enterprise activity, enable the enterprise leadership to make informed decisions, and based on those decisions develop a comprehensive, coordinated plan to more efficiently utilize experimentation resources.
- Provided direct support to combatant commands. Delivered innovations to USCENTCOM, Commander Joint Task Force- Horn of Africa (HOA), USEUCOM, USNORTHCOM, USSTRATCOM, USPACOM, USSOUTHCOM, and USTRANSCOM.
- The Joint Operational Environment (JOE) provides a framework for considering the future and determining the impact of the operational environment on joint force operations. It anticipates a range of potential future operational environments and discusses those critical variables that help describe the JOE, the trends that will influence those variables, the range of possible conditions shaped by those trends, and those threats that may arise in such future operational environments. Finally, the JOE considers the implications of these alternative futures on the way we will train, equip, and employ the future Joint Force. As the military seeks to anticipate and shape the future, the JOE forms the basis for that debate and argument essential to innovative and creative thinking.
- Joint Context. Examined and evaluated joint concepts while supporting execution of FY07 Title X Service, COCOM, and other agency experimentation (Unified Quest, Noble Resolve, Unified Engagement, Joint Urban Warrior, and Crisis Management II).
- Joint Operations Concepts (JOpsC) development. Partnered with USEUCOM to deliver version 1.0 of Military Support to Shaping Operations (MSSO) Joint Operating Concept (JOC) to Joint Requirements Oversight Council (JROC). Completed and submitted version 2.0 of Major Combat Operations (MCO) and Security, Stability, Transition and Reconstruction Operations (SSTRO) JOC.

FY 2008 Planned Output:
- DoD Joint Concept Development & Experimentation (JCDE) enterprise campaign plan, process guide, and Virtual Operations Center that increases availability and transparency of experimentation planning information across the Enterprise.
- Deep Futures program will: update the Global Joint Operational Environment document; provide executive summaries of major future trends and variables; assist in developing Alternative Future experiment scenarios; and identify potential future solutions to enduring Warfighter Challenges.
- The COCOM/Service Support project will provide support to Army Unified Quest Title 10 war game, experimentation support to USSOUTHCOM and USCENTCOM (Multi National Forces-Iraq), and support development of CONOPS for conducting forcible entry from strategic distances and building partnership capacity support to Expeditionary Warrior and Joint Urban Warrior.
- Coalition Warrior Interoperability Demonstration (CWID) support includes participation in seven FY08 shadow events with deliverables in the form of after-action reports/briefs.
- Enhancements to the Joint Technology Exploration Center (JTEC) will provide additional lab and office space supporting both virtual and live experiments, while at the same time reducing the size and cost of the USJFCOM physical footprint in the Suffolk area.
- Capabilities already developed for Cross-Domain Collaborative Information Environment (CDCIE) will be transitioned at their present level.
- Experimentation Environment Development will focus primarily on building the knowledge products for West Africa and instantiation into a robust model and simulation environment to enable analysis of experimentation objectives.
- Continued management and oversight of the JFCOM Advanced Concept Technology Demonstration/ Joint Concept Technology Demonstration (ACTD/JCTD) program.

FY 2009 Planned Output:
- Continuation of an experimentation campaign that provides a succession of Limited Objective Experiment (LOE) events for execution in COCOM theaters, allowing more robust participation while decreasing associated Operational Tempo/Personnel Tempo (OPTEMPO/PERSTEMPO).
- Continuation of Deep Futures exploration of plausible alternative futures, captured in a continuously updated Global Joint Operational Environment document.
- Expansion of the experimentation environment to globally distributed sites, providing a consistent joint context for all participants while allowing geographic flexibility for participation.
- Continuation of JFCOM-directed CWID efforts, to include two CWID 09 execution events (U.S. Combat Development Command (CDC) and Coalition CDC) that will begin the execution cycle.

- Support to Joint Staff in the integration of all warfighter requirement input channels into a revised and more efficient Joint Strategic Planning Process.
- Enhanced and expanded interagency and international participation in JI&E Enterprise campaign planning, execution, analysis, and assessment.
- Continued management and oversight of the JFCOM ACTD/JCTD program.

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 (R2 Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE
RDTE, Defense Wide BA 03	**0603832D8Z - Joint Wargaming Simulation Management Office**

COST ($ in Millions)		FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P476	Joint Wargaming Simulation Management Office	34.110	22.639	38.147	39.208	40.027	40.559	41.130

A. Mission Description and Budget Item Justification: A. Mission Description and Budget Item Justification: (U) Modeling and Simulation (M&S) is a key enabler of DoD activities in Communities such as acquisition, analysis, experimentation, planning, test & evaluation, and training; across the Services; and within most of the other DoD components. The strategic objective of this program is to develop a robust M&S capability which enables the Department to more effectively meet its operational and support objectives across the diverse activities of the services, combatant commands, and agencies. This includes a defense-wide M&S management process which encourages collaboration and facilitates the sharing of data across DoD components, while promoting interactions between DoD and other government agencies, international partners, industry, and academia. This Joint Wargaming Simulation Management Office Program Element is executed by the Modeling and Simulation Coordination Office (M&S CO) in accordance with DoD Directive 5000.59, Management of Modeling and Simulation, DoD Directive 5134.1 Under Secretary of Defense for Acquisition, Technology, and Logistics (USD(AT&L)), DoD 4120.24-M, DoD Standardization Program (DSP) Policies and Procedures, and DoD Instruction 3200.14, Principles and Operational Parameters of the DoD Scientific and Technical Information Program.

B. Program Change Summary	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2008)	35.972	37.837	38.273
Current BES/President's Budget (FY 2009)	34.110	22.639	38.147
Total Adjustments	-1.862	-15.198	-0.126
Congressional Program Reductions		-15.198	
Congressional Rescissions			
Congressional Increases			
Reprogrammings	-1.800		
SBIR/STTR Transfer	-0.957		
Other	0.895		-0.126

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
08						

Comment: (U) Comment: Performance in this program is monitored in the following ways:

(U) 1. Continuous oversight on behalf of the USD(AT&L) by the DoD Modeling and Simulation Steering Committee comprised of Communities enabled by M&S, the four Military Departments, and the Joint Staff.
(U) 2. Community M&S Business Plans implemented.
(U) 3. Common and Cross-Cutting M&S Business Plan implemented.
(U) 4. Standards Implemented.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDTE, Defense Wide BA 03	**0603832D8Z - Joint Wargaming Simulation Management Office**	**P476**

COST ($ in Millions)		FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P476	Joint Wargaming Simulation Management Office	34.110	22.639	38.147	39.208	40.027	40.559	41.130

A. Mission Description and Budget Item Justification: (U) Modeling and Simulation (M&S) is a key enabler of DoD activities such as analysis, acquisition, training, test and evaluation, experimentation, and planning across the Services as well as most of the other major DoD components. The development and use of most M&S within DoD is generally double stovepiped - first, within separate activities such as those above, and second, within each of the DoD components. The strategic objective of this program is to maximize M&S commonality, reuse, interoperability, efficiencies, and effectiveness via common and cross-cutting M&S. This Joint Wargaming Simulation Management Office Program Element is executed by the Modeling and Simulation Coordination Office (M&S CO) in accordance with DoD Directive 5000.59, Management of Modeling and Simulation, DoD Directive 5134.1 Under Secretary of Defense for Acquisition, Technology, and Logistics (USD(AT&L)), DoD 4120.24-M, DoD Standardization Program (DSP) Policies and Procedures, and DoD Instruction 3200.14, Principles and Operational Parameters of the DoD Scientific and Technical Information Program.

U) The M&S CO has five responsibility areas:
(U) (1) Coordinate the development of DoD's M&S vision to guide the M&S activities of the DoD Components and DoD Communities.
(U) (2) Coordinate oversight and strategic governance of DoD M&S capabilities and resources.
(U) (3) Coordinate the development and implementation of Community M&S Business Plans and the Common and Crosscutting M&S Business Plan.
(U) (4) Facilitate the development and implementation of policies, plans, procedures, and DoD issuances to manage M&S, and the implementation of best practices for M&S acquisition, development, management, and use by DoD Components and Communities.
(U) (5) Initiate the development of M&S Technologies to meet capability gaps identified by the M&S communities in their business plans.

(U) The M&S CO strategic objectives:
(U) M&S Commonality Maximize the use of common M&S Tools, Data, and Services via projects creating or making visible and accessible common and cross-cutting M&S Tools, Data, and Services.
(U) M&S Reuse Maximize the reuse of existing M&S Tools, Data, and Service components to create new M&S Tools, Data, and Services via projects that foster visibility, accessibility, and usability of such components.
(U) M&S Interoperability Maximize interoperability among the real operations environment, the simulated operations environment, and the range operations environment via projects to create and maintain standards.
(U) M&S Efficiencies Implement M&S management provisions to organize DoD M&S activities to cost efficiently satisfy DoD M&S requirements. This includes, but is not limited to: M&S Tools, M&S Data and M&S Services; standards and best practices for the use of M&S; DoD M&S Coordination Agents; a DoD M&S Information Analysis Center, and M&S Professional Development.
(U) M&S Effectiveness Maximize the effectiveness and effective use of M&S Tools, Data, and Services via projects that enable the rapid sharing of readily understandable verification, validation, and accreditation information.

B. Accomplishments/Planned Program:

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Joint Wargaming Simulation Management Office	34.110		

FY 2007 Accomplishments: Rewrote DoD Directive 5000.59, Management of Modeling and Simulation and published the Strategic Vision for DoD Modeling and Simulation. Developed an initial draft of the M&S Common and Crosscutting Business Plan and continued the evolution of the Community Business Plans, identifying major capabilities which limit the DoD's effective use of M&S. Continued acting as the USD(AT&L) action agent in developing M&S policies, plans and programs that support the effective and efficient management of the Department's M&S resources. Began a two year effort to provide authoritative natural environment representations (initially focused on space and weather) to the DoD M&S community for the use in live, virtual, and constructive simulation-based activities. Initiated a two year effort to develop recommended changes to policy and guidance for the verification, validation, and accreditation (VV&A) of models and simulations while standardizing VV&A planning and reporting. In the area of representing of political, societal, diplomatic, information, and economic non-kinetics of warfare: consolidated the basic research, began improving existing models and simulations to reflect these effects, and initiated an effort to develop a DoD-owned simulation to represent these effects. Improved the capabilities of existing simulations to address homeland defense analysis. Improved the ability to rapidly generate and analyze multi-option operational plans. Completed the foundational research necessary to educate the DoD workforce to more effectively employ M&S.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Joint Wargaming Simulation Management Office		22.639	38.147

FY 2008/2009 Plans: Write a DoD Instruction for M&S Management Implementation. It will include the role and function of DoD M&S Coordination Agents. Improve and implement Community and Common and Crosscutting M&S Business Plans. Continue previous efforts to provide realistic natural environment representations to the DoD M&S community for the use in live, virtual, and constructive simulation-based activities. Develop a DoD wide business model for the reuse of M&S resources (e.g. information, models, simulations, services). Complete efforts to develop recommended changes to VV&A policy and guidance. Continue to improve the ability of models and simulations to address the non-kinetic political, societal, diplomatic, information, and economic effects. Develop a core curriculum for educating the DoD workforce in the effective employment of M&S. Complete a studies that identify the way forward for quantifying the return on investment for M&S and establish a baseline compilation of M&S standards. Consolidate efforts into a consistent DoD-wide strategy for the integration of LVC environments. Improve the ability and processes to share data among activities that employ M&S. Develop and provide tools for the mediation of M&S data to support new and legacy M&S applications and federations. Convert M&S requirements/identification process to be compatible with the JCIDS process.

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.

Exhibit R-2, RDT&E Budget Item Justification						February 2008	
Appropriation/Budget Activity RDT&E, Defense-Wide, BA 03			R-1 Item Nomenclature: Test and Evaluation/Science and Technology (T&E/S&T), PE 0603941D8Z				
Cost ($ in millions)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Total PE Cost	38.759	62.344	94.672	96.358	97.883	99.428	100.964
High Speed/Hypersonic Test	9.063	16.647	17.714	18.853	19.060	19.038	19.183
Spectrum Efficient Technology	3.303	0.446	6.124	6.108	11.054	10.810	10.458
Multi-Spectral Test	5.496	9.256	11.294	12.659	12.648	12.549	12.600
Non-Intrusive Instrumentation	4.856	6.941	6.538	4.831	6.607	8.522	9.685
Directed Energy Test	8.944	15.585	17.713	18.852	19.061	19.037	19.183
Netcentric Systems Test	5.093	9.304	12.884	16.035	17.893	17.852	17.940
Unmanned and Autonomous System Test	2.004	4.165	5.056	5.801	6.118	6.087	6.130
Common Range Integrated Instrumentation System	0.000	0.000	15.000	10.250	0.000	0.000	0.000
Multi-Level Security	0.000	0.000	2.349	2.969	5.442	5.533	5.785

Exhibit R-2, RDT&E Budget Item Justification	February 2008
Appropriation/Budget Activity RDT&E, Defense Wide, BA 03	R-1 Item Nomenclature Test and Evaluation/Science and Technology (T&E/S&T), PE 0603941D8Z

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

The Test and Evaluation /Science and Technology (T&E/S&T) program seeks out and develops test technologies to pace evolving weapons technology. The program is critical to ensuring that the Department of Defense (DoD) has the capability to adequately test the advanced systems that will be fielded in the future. To meet this objective, the T&E/S&T program:

- Exploits new technologies and processes to meet important Test and Evaluation (T&E) requirements.
- Expedites the transition of new technologies from the laboratory environment to the T&E community.
- Leverages commercial equipment, modeling and simulation, and networking innovations to support T&E.

Additionally, the T&E/S&T program examines emerging T&E requirements derived from joint service initiatives to identify needed technology areas and develop a long-range roadmap for technology insertion. The program leverages and employs applicable 6.2 applied researches from the highly developed technology base in the DoD laboratories and test centers, other government agencies, industry, and academia to accelerate the development of new test capabilities. This PE also provides travel funds for T&E/S&T program oversight, special studies, analyses, and strategic planning related to test capabilities and infrastructure.

The T&E/S&T program is funded within the Advanced Technology Development Budget Activity because it develops and demonstrates high payoff technologies for current and future DoD test capabilities.

Exhibit R-2, RDT&E Budget Item Justification	February 2008
Appropriation/Budget Activity RDT&E, Defense Wide, BA 03	R-1 Item Nomenclature Test and Evaluation/Science and Technology (T&E/S&T), PE 0603941D8Z

B. (U) PROGRAM CHANGE SUMMARY

	FY 2007	FY 2008	FY 2009
Previous President's Budget:	39.710	62.889	94.855
Current President's Budget:	38.759	62.344	94.672
Total Adjustments:			
Congressional Program Reductions:		(0.545)	
Congressional Rescissions:			
Congressional Increases:			
Other Program Adjustments:	(0.951)		(0.183)

C. (U) OTHER PROGRAM FUNDING SUMMARY: NA

D. (U) ACQUISITION STRATEGY: NA

E. (U) PERFORMANCE METRICS:

Percentage of T&E/S&T projects progressing satisfactorily toward technical, financial, schedule, and risk mitigation goals.

Exhibit R-2a, RDT&E Project Justification						February 2008	
Appropriation/Budget Activity RDT&E, Defense Wide, BA 03, PE 0603941D8Z			High Speed/Hypersonic Test				
Cost ($ in millions)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
High Speed/Hypersonic Test	9.063	16.647	17.714	18.853	19.060	19.038	19.183

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

DoD is developing air-breathing weapons, advanced aircraft and access to space platforms to operate in the high speed (Mach 3-5) and hypersonic speed (Mach 5 and above) regimes. High speed/hypersonic systems to be developed by DoD will require T&E capabilities in numerous areas ranging from ground testing [e.g. wind tunnels, sled tracks, installed-system test facilities, and modeling and simulation (including computational fluid dynamics)] to flight testing. At high and hypersonic speeds, flight testing will challenge existing ground instrumentation systems (e.g., tracking system slew rate limitations, telemetry dropouts due to ionization, etc.) and range safety decision making. High speed/hypersonic weapon systems will depend on several new technological thrusts in areas such as propulsion and engines, structures and materials, guidance and control, seekers and sensors, warheads and payloads, and weapons delivery techniques and end-game dynamics each of which requires supporting T&E capabilities to determine performance, effectiveness, suitability, survivability, and responsiveness to Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance systems. Service improvement and modernization programs are addressing some basic test facility upgrades using off-the-shelf technologies; however, T&E of high speed/hypersonic systems will require technologies as yet undeveloped or unavailable for T&E purposes. DoD must have adequate T&E capabilities in place in time to meet current development and, ultimately, acquisition program schedules. The purpose of the T&E/S&T High Speed/Hypersonic Test focus area is to address these T&E technology issues.

B. (U) ACCOMPLISHMENTS/PLANNED PROGRAM

	FY 2007	FY 2008	FY 2009
High Speed/Hypersonic Test	9.063	16.647	17.714

Exhibit R-2a, RDT&E Project Justification		February 2008
Appropriation/Budget Activity RDT&E, Defense Wide, BA 03, PE 0603941D8Z	High Speed/Hypersonic Test	

FY 2007 Accomplishments:

Continued the efforts initiated in prior years.

- Completed Pulsed Electron Beam Spectroscopy efforts to develop and demonstrate a non-intrusive sensor technology for temperature and gas concentration measurements in the flow field of hypersonic ground test facilities. The technology will provide the ability to determine temperature, gas species, and concentration of combustion products in the flow field.
- Completed High Heat Flux Sensor efforts to develop and demonstrate sensors that can provide accurate heat flux measurements in the extreme temperature environment of hypersonic aeropropulsion test facilities. The High Heat Flux Sensor project extended the developments of the Heat Flux Sensor project to enable the sensors to survive at higher temperatures (1500 degrees Fahrenheit vs. 700 degrees Fahrenheit). The high heat flux sensors will allow sensor measurements both in hypersonic propulsion systems and in vitiated test environments.
- Completed Microelectromechanical System Shear Stress Sensor efforts to develop and demonstrate a Silicon Carbide-based Microelectromechanical System sensor capable of measuring two-dimensional shear stress of hypersonic vehicle surfaces.
- Completed Plug Nozzle Study efforts to assess the feasibility of using an axisymmetric plug nozzle to create variable Mach number test conditions in the Arnold Engineering Development Center (AEDC) Aeropropulsion Test Unit facility to determine uniformity of flow conditions downstream of the plug center body in the nozzle to support variable Mach number high speed/hypersonic testing.
- Completed In-Situ Pressure Measurement efforts to develop a proven pressure-sensing approach for evaluating hypersonic engine performance.
- Continued In-Flight Combustion Gas Analysis efforts to fabricate and ground-test a non-intrusive laser spectroscopy diagnostic sensor suitable for in-flight T&E of hypersonic propulsion systems. The sensor will provide improved capability to evaluate the performance of hypersonic combustors in true flight conditions and will support the validation of computational modeling codes.
- Continued Hypersonic Clean Air Heater Test Technology efforts to fabricate and test a sub-scale clean air heater system. The technology will provide the basis for development of a full-scale heater system for use in hypersonic aeropropulsion testing.
- Continued the Test Media Effects efforts modeling effects of vitiates on hypersonic combustion engines to allow prediction of engine performance in clean air flight conditions.

- Continued Regenerative Storage Heater efforts to conduct comprehensive material testing for selecting core brick

Exhibit R-2a, RDT&E Project Justification		February 2008
Appropriation/Budget Activity RDT&E, Defense Wide, BA 03, PE 0603941D8Z	High Speed/Hypersonic Test	

structural material for storage heater.

- Continued with Hypersonic Engine-Facility Interaction efforts to test a scramjet engine in test facilities and to conduct scramjet engine computational modeling in air, hydrogen, and hydrocarbon vitiation conditions.
- Continued Modeling and Simulation (M&S) for Hypersonic T&E efforts to improve and demonstrate accuracy of US Wind Code for scramjet and ramjet engine test. Efforts continued to improve combustion modeling to include capabilities such as liquid phase chemical kinetics for hydrocarbon-air combustion model, and multiphase spray models for liquid injection model and turbulent heat and mass transfer model.
- Continued High Pressure Arc Heater efforts to develop an arc heater characteristics monitoring system that will determine heater configuration effects on arc behavior in order to develop an analysis tool for determining the propensity of arcing to or between segments. The efforts will provide knowledge to reduce the arcing events, which cause severe damage to facilities.

Initiated new research efforts to address T&E technology challenges in this focus area:

- Variable Mach Number Nozzle.
- Variable Mach Number Test capability using energy addition downstream of the plenum.
- Arc Heater Aerothermal T&E.
- Micro Fiber Optical Sensors.

Initiated Broad Agency Announcement (BAA) in FY 2007 to select efforts for FY 2008 award.

FY 2008 Plans:

Continue efforts initiated in prior years.

- Complete Test Media Effects efforts, incorporating the effects of vitiates into computational fluid dynamics codes to predict flame holding within hypersonic vehicle combustors used in hypersonic combustion engine testing.
  The effort will result in the ability to characterize the performance of a hypersonic vehicle in a wind tunnel using vitiated air, and use the results to predict the vehicle's flight performance. The effort will also advance state-of-the-art in-ground test instrumentation to characterize the test environment.
- Complete High Pressure Arc Heater efforts to extend the operating regime for arc heater facilities to the Mach 8–12 regimes. Efforts will provide true air operating conditions to support testing of thermal protection systems and hypersonic combustion systems.
- Complete Pulsed Electron Beam Spectroscopy efforts to develop and demonstrate a non-intrusive sensor technology for temperature and gas concentration measurements in the flow field of hypersonic ground test facilities.

Exhibit R-2a, RDT&E Project Justification	February 2008
Appropriation/Budget Activity RDT&E, Defense Wide, BA 03, PE 0603941D8Z	High Speed/Hypersonic Test

- Complete Combustion Gas Analysis efforts to fabricate and ground-test a non-intrusive laser spectroscopy diagnostic sensor suitable for in-flight T&E of hypersonic propulsion systems.
- Continue Arc Heater Aerothermal efforts to improve aerothermal test capabilities for ground testing of ballistic reentry vehicles.
- Continue Hypersonic Engine-Facility Interaction effort to resolve ground-test issues related to vitiate effects at various test facilities using different combustion heater fuels. Efforts will provide an empirical understanding of the effects of vitiated air on hypersonic scramjet engines and support analysis of ground-test performance at different test facilities.
- Continue Regenerative Storage Heater efforts to finalize pilot heater system design.
- Continue M&S for Hypersonic T&E effort to improve mode transition modeling, including capabilities to conduct numerical simulation of time independent mode transition and simulation of ram to scram mode transition.
- Continue Clean Air Heater Test Technology efforts to design and fabricate a high-pressure elevated temperature air flow system and heater control elements required for testing of heater elements in a flow field.
- Continue Micro Fiber Optical Sensor efforts to develop advanced instrumentation for hypersonic flight test of hot structures, using micro heat transfer sensor for leading edges and pressure sensors for laminar-turbulent transition detection.
- Continue Variable Mach Number Nozzle efforts to develop a high Mach number capability – including variable Mach numbers – for propulsion ground testing.
- Continue Variable Mach Number Test Capability efforts to develop variable Mach 5 to Mach 7 test capability using energy addition downstream of the plenum.

Initiate new research efforts to address T&E technology challenges in this focus area.

- Hypersonic Impulse Facility Analysis to compare the hypersonic propulsion data at Mach 5 and 8 generated by impulse and short duration facilities, and analyze related runtime and vitiation affects.
- Improved Endothermic Fuel System to develop modular hypersonic fuel conditioning system for hypersonic test needs.
- Hypersonic Nozzle Cooling to design tools for wind tunnel nozzles that take condensation, combustion and real gas effects into account.
- Wavelength Multiplexed Tunable Diode Laser Spectroscopy for in-flight, non-intrusive measurement of scramjet thrust using velocity, density and combustion species.

Initiate BAA in FY 2008 to select efforts for FY 2009 award.

FY 2009 Plans:

Continue efforts initiated in prior years.

Exhibit R-2a, RDT&E Project Justification	February 2008
Appropriation/Budget Activity RDT&E, Defense Wide, BA 03, PE 0603941D8Z	High Speed/Hypersonic Test

- Complete Arc Heater Aerothermal effort to improve aerothermal test capabilities for ground testing of ballistic reentry vehicles.
- Complete Regenerative Storage Heater efforts to develop a brick storage heater based on novel cored brick materials. Efforts will provide a technique to produce non-vitiated air for ground testing hypersonic propulsion systems in a true flight environment.
- Complete M&S for high speed/hypersonic T&E efforts to develop enhanced M&S tools in support of integrated test article and facility effects modeling. The tools will allow detailed analysis of hypersonic system testing prior to physical testing in order to reduce risk and cost of ground test events.
- Complete Clean Air Heater efforts to develop and demonstrate a sub-scale resistive element clean air heater system. The technology will support development of a full-scale wind-tunnel heater system that can provide continuous clean air flow for use in hypersonic aeropropulsion testing.
- Complete Variable Mach Number Nozzle efforts to develop a high Mach number capability – including variable Mach numbers – for propulsion ground testing.
- Complete Variable Mach Number Test Capability efforts to develop variable Mach 5 to Mach 7 test capability using energy addition downstream of the plenum.
- Continue Hypersonic Engine-Facility Interaction efforts that will permit comparison predictions between research and operational engine, and between test facilities as well as the influence of vitiate species on overall system performance.
- Continue Hypersonic Impulse Facility Analysis efforts to compare the hypersonic propulsion data at Mach 5 and 8 generated by impulse and short duration facilities, and analyze related runtime and vitiation affects.
- Continue Improved Endothermic Fuel System efforts to develop modular hypersonic fuel conditioning system for hypersonic test needs.
- Continue Hypersonic Nozzle Cooling efforts to design tools for wind tunnel nozzles that take condensation, combustion or real gas effects into account.
- Continue Wavelength Multiplexed Tunable Diode Laser Spectroscopy efforts for in-flight, non-intrusive measurement of scramjet thrust using velocity, density and combustion species.
- Initiate future investigations to address T&E technology challenges in this focus area.
- Flight vehicle static structural testing to support ground testing of integrated hypersonic vehicles prior to flight testing
- Jet interaction and flow separation control methodologies to ensure high Mach number testing accurately represents in-flight test conditions.
- Methods for electron-beam energy addition to create high temperature flows required to emulate flight conditions of

Exhibit R-2a, RDT&E Project Justification		February 2008
Appropriation/Budget Activity RDT&E, Defense Wide, BA 03, PE 0603941D8Z	High Speed/Hypersonic Test	

Mach 8 and higher.

- Transient modeling techniques to simulate in-flight transients (e.g. boundary layer effects) in support of "fly the mission" ground tests.

Initiate BAA in FY 2009 to select efforts for FY 2010 award.

C. (U) OTHER PROGRAM FUNDING SUMMARY NA

D. (U) ACQUISITION STRATEGY NA

Exhibit R-2a, RDT&E Project Justification						February 2008	
Appropriation/Budget Activity RDT&E, Defense Wide, BA 03, PE 0603941D8Z			Spectrum Efficient Technology				
Cost ($ in millions)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Spectrum Efficient Technology	3.303	0.446	6.124	6.108	11.054	10.810	10.458

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION

The Spectrum Efficient Technology (SET) program enables T&E of technologies for more efficient use of legacy telemetry bands and expansion into non-traditional areas of the radio frequency spectrum and the optical spectrum. The Test Resource Management Center has realigned the SET program to perform risk reduction and advanced technology development for Central Test and Evaluation Investment Program (CTEIP) projects. Accordingly, the SET Focus Area is structured to provide advanced technology developments needed by the CTEIP integrated Network Enhanced Telemetry (iNET) project. The iNET project has developed an architectural concept for a Telemetry Network System (TmNS) that addresses the needs of the T&E and training communities. However, as the iNET architecture is not sufficiently defined yet to guide the selection and funding of SET projects, SET will not fund any FY 2008 projects. It will stand up again in FY 2009 when iNET is better defined. SET completed nine of its current, ongoing projects in FY 2007, and will complete the remaining six in FY 2008.

B. (U) ACCOMPLISHMENTS/PLANNED PROGRAM

	FY 2007	FY 2008	FY 2009
Spectrum Efficient Technology	3.303	0.446	6.124

FY 2007 Accomplishments:

Continued efforts initiated in prior fiscal years.

- Completed Super High Frequency Channel Modeling flight test data reduction.
- Completed Spectrally Efficient High Data Rate Telemetry System for super-high frequency flight-testing of real-time capability.
- Completed Laser Telemetry effort to demonstrate a Free Space Optical telemetry system during flight test.

Exhibit R-2a, RDT&E Project Justification		February 2008
Appropriation/Budget Activity RDT&E, Defense Wide, BA 03, PE 0603941D8Z	Spectrum Efficient Technology	

- Completed Smart Modulating Retroreflector modulator fabrication and systems analysis, characterized link stability and throughput, performed dynamic testing, and data reduction.
- Completed Optical Communications and Advanced Telemetry Study and delivered results of analysis.
- Completed Steerable Beam Directional Antenna Concept effort to develop a flight-qualified phase shift controlling device to steer the pattern of combined antennas in real-time.
- Completed Radio Frequency Microelectromechanical Systems effort to develop a phased array antenna package that will allow better usage of spectrum resources without interference.
- Completed Beamformer Antenna effort to develop antennas that are low cost and can support over-the-horizon testing.
- Completed Phased Array Antenna dynamic pointing test, flight test planning, and analysis.
- Continued Broadband Telemetry Antenna fabrication, integration, testing, and delivery of antennas 1 and 2.
- Continued Aeronautical Network Telemetry, coordinated layer-2 & layer-3 Quality of Service approach, confirmed transport layer interoperability, completed final architecture refinement.
- Continued Improved Linear Power Amplifier effort to reduce linear transmitter power supply, heat sink requirements, weight, size, and cost by 30 percent.
- Continued Medium Access Control planning, scripting, and analysis; optimized and upgraded model, repeated simulation, and delivered initial report; developed high-fidelity model; and conducted high-fidelity simulation.
- Continued Enhanced Forward Error Correction (EFEC) by extending results from phase 1 to characterize the performance of the test suite of EFEC codes on the second and third of the three common telemetry modulation schemes. Developed simplified coherent and non-coherent decoders for pulse code modulation/frequency modulation and advanced range telemetry continuous phase modulation schemes.
- Continued Space-Time Coding effort to develop a verified space-time code data encoding and processing technique and prototype receiver designed to improve link reliability.

FY 2008 Plans:

Continue efforts initiated in prior fiscal years. Efforts will provide risk mitigation and advanced technologies to support the CTEIP iNET project.

- Complete Broadband Telemetry Antenna fabrication, integration, testing, and delivery of antennas 1 and 2.
- Complete Aeronautical Network Telemetry, coordinated layer-2 & layer-3 Quality of Service approach, confirmed transport layer interoperability, completed final architecture refinement.
- Complete Medium Access Control high fidelity simulations.

Exhibit R-2a, RDT&E Project Justification	February 2008
Appropriation/Budget Activity RDT&E, Defense Wide, BA 03, PE 0603941D8Z	Spectrum Efficient Technology

- Complete Enhanced Forward Error Correction (EFEC) effort to finalize the coherent and non-coherent decoders and deliver detailed design of decoders with performance table identifying the best combinations of EFEC codes and decoders.
- Complete Improved Linear Power Amplifier effort to reduce linear transmitter power supply, heat sink requirements, weight, size, and cost by 30 percent.
- Complete Space-Time Code effort to develop a verified space-time code data encoding and processing technique and prototype receiver designed to improve link reliability.

Determine future investigations to address T&E technology challenges in this focus area by developing a roadmap in conjunction with the iNET effort.
Initiate BAA in FY 2008 to select efforts for FY 2009 award.

FY 2009 Plans:

Reactivate the SET focus area to provide risk mitigation and advanced technologies to support the CTEIP iNET project.
Initiate BAA in FY 2009 to select efforts for FY 2010 award. Begin development of an advanced waveform to work in the SHF band.

C. (U) OTHER PROGRAM FUNDING SUMMARY NA

D. (U) ACQUISITION STRATEGY NA

Exhibit R-2a, RDT&E Project Justification						February 2008	
Appropriation/Budget Activity RDT&E, Defense Wide, BA 03, PE 0603941D8Z		Multi-Spectral Test					
Cost ($ in millions)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Multi-Spectral Test	5.496	9.256	11.294	12.659	12.648	12.549	12.600

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION

The Multi-Spectral Test (MST) focus area develops technologies to test multi-spectral (MS) and hyper-spectral (HS) sensors, seekers, and detectors for weapon systems and intelligence, surveillance, and reconnaissance systems. T&E of new MS and HS sensors to be used in these future weapon systems will require new T&E technologies. Current methods for testing MS and HS sensors rely heavily on expensive field test programs. While these field tests provide realistic data for sensor testing, they leave several critical gaps. For example, test conditions are not repeatable because environments observed one day will be different the next day. Imagery can be collected and stored to partially mitigate this deficiency, but this process is expensive and cannot cover the full spectrum of environments required for complete test article evaluation and performance analysis. The T&E community needs the ability to test these advanced seekers and sensors in a repeatable, objective fashion before and after integrating them into warfighting systems. Without these new T&E technologies, DoD will not be able to adequately test and evaluate the MS and HS weapon systems of the future.

B. (U) ACCOMPLISHMENTS/PLANNED PROGRAM

	FY 2007	FY 2008	FY 2009
Multi-Spectral Test	5.496	9.256	11.294

FY 2007 Accomplishments:

Continued efforts initiated in prior fiscal years.

- Completed Dynamic HS Thermal Signature Model efforts including scene builder, graphical user interface, and scenario editor. Provided software, run-time analysis, and final report along with user manuals and support documentation.
- Completed Multi-Spectral Stimulator Injection Test Method efforts by providing results of hardware-in-the-loop demonstration and engineering drawings; delivered user manuals, final report, and prototype system.

Exhibit R-2a, RDT&E Project Justification		February 2008
Appropriation/Budget Activity RDT&E, Defense Wide, BA 03, PE 0603941D8Z	Multi-Spectral Test	

- Completed HS Testbed demonstration, completed and provided software, and delivered user manuals and final report.
- Continued Super-lattice Light-Emitting Diode test and delivered Mid-Wave Infrared (MWIR) array; began design, fabrication, and testing of Long-Wave Infrared (LWIR) array; and began development of MS processing protocols.

Initiated new research efforts to address T&E technology challenges in this focus area.

- Multi-Spectral Passive long-wave infrared Polarization Signature Model.
- Ultraviolet (UV)-MWIR Micro-Plasma Projector.
- MS & HS Polarized Scene Projector with Bandwidth Control.
- Next Generation Read-in Integrated Circuits for IR Scene Projection.

Initiated a BAA to select efforts for FY 2008 award.

FY 2008 Plans:

Continue efforts initiated in prior fiscal years.

- Continue Super-lattice Light-Emitting Diode (SLED) efforts by delivering 64x64 MWIR and LWIR arrays, and optimize 512x512 MWIR and LWIR SLEDs and couple the two to form a monolithic, two-color infrared emitter for delivery; and deliver scalability study for 1024x1024 or larger arrays. Deliver final report.
- Continue Multi-Spectral Passive long-wave infrared Polarization effort to provide capability for a spatial/spectral resolution radiometric predictive VIS/SWIR background model. Technology also incorporates validated threat signatures for sensor/seeker T&E.
- Continue Micro-Plasma Projector effort to provide capability to accurately represent high temperature and flexible spectral emitters for representing threat weapon signatures in hardware in the loop multi -wavelength sensors & seekers T&E systems.
- Continue Multi-spectral Polarized Scene Projector effort to provide capability to precisely control parameters required to test and evaluate polarized sensors. Develop ability to generate polarized returns for T&E of illuminated scenes projected to polarized sensors.
- Continue Read-In Integrated Circuit effort to provide capability to provide a high drive current source for development of missile defense end-game scenarios that include high-intensity target signatures in cold backgrounds for scene projectors used in seeker and sensor T&E.

Initiate new research efforts to address T&E technology challenges in this focus area.

- Hyperspectral Test Suite efforts to fabricate, integrate and demonstrate integrated and real-time Mid-Wave Infrared and Long-Wave Infrared scene projection.

Exhibit R-2a, RDT&E Project Justification		February 2008
Appropriation/Budget Activity RDT&E, Defense Wide, BA 03, PE 0603941D8Z	Multi-Spectral Test	

- Hyperspectral Imaging Projector (HIP) efforts to fabricate chalcogenide fiber optics and HIP prototype unit with Multi-Spectrum/Hyper-Spectral sensors.
- Cell-based Hyperspectral Atmospheric Radiation Model (CHARM) efforts to develop and demonstrate the CHARM engine performance with large complex scenes and real-time scene generators.

Initiate a BAA in FY 2008 to select efforts for FY 2009 award.

FY 2009 Plans:

Continue efforts initiated in prior fiscal years.

- Complete Super-lattice Light-Emitting Diode (SLED) by delivering 64x64 MWIR and LWIR arrays, and optimize 512x512 MWIR and LWIR SLEDs and couple the two to form a monolithic, two-color infrared emitter for delivery; and deliver scalability study for 1024x1024 or larger arrays. Deliver final report.
- Continue Multi-Spectral Passive long-wave infrared Polarization effort to provide capability for a spatial/spectral resolution radiometric predictive VIS/SWIR background model. This technology also incorporates validated threat signatures for sensor/seeker T&E.
- Continue Micro-Plasma Projector effort to provide capability to accurately represent high temperature and flexible spectral emitters for representing threat weapon signatures in hardware in the loop T&E.
- Continue Multi-spectral Polarized Scene Projector effort to provide capability to precisely control parameters required to test and evaluate polarized sensors.
- Continue Read-In Integrated Circuit effort to provide capability to provide a high drive current source for development of missile defense end-game scenarios that include high-intensity target signatures in cold environments.

Initiate future investigations to address T&E technology challenges in this focus area.

- VIS/Near Infrared (NIR) HS Polarized Signature Model.
- HS NIR/SWIR Projector.
- MS/HS Ground Targets.
- MS/HS Field Characterization System.
- MS/HS Data Fusion T&E.
- HS MWIR Background Signature Model.
- MS Whole Sky Imager T&E.

Initiate a BAA in FY 2009 to select efforts for FY 2010 award.

Exhibit R-2a, RDT&E Project Justification		February 2008
Appropriation/Budget Activity RDT&E, Defense Wide, BA 03, PE 0603941D8Z	Multi-Spectral Test	

C. (U) OTHER PROGRAM FUNDING SUMMARY NA

D. (U) ACQUISITION STRATEGY NA

Exhibit R-2a, RDT&E Project Justification						February 2008	
Appropriation/Budget Activity RDT&E, Defense Wide, BA 03, PE 0603941D8Z			Non-Intrusive Instrumentation				
Cost ($ in millions)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Non-Intrusive Instrumentation	4.856	6.941	6.538	4.831	6.607	8.522	9.685

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION

This focus area was established to address the T&E challenges discussed below; however, the TRMC has determined that requirements and transition partners must be better understood. Accordingly, this focus area will not initiate any FY 2008 new starts, but will develop a Non-intrusive Instrumentation (NII) T&E technology road map to determine the way forward. Ongoing projects will continue to completion. Based on road mapping efforts, this focus area will fund new starts in FY 2010.

Instrumentation requirements for systems-under-test, hardware-in-the-loop testing, and training are increasing exponentially for new weapon systems. Onboard or personnel-borne instrumentation and equipment are required for sensing and collecting critical performance data; determining accurate time, space, position, and attitude information; interfacing with command and control data links; monitoring and reporting system-wide communications; reporting human operator performance; and storing and transmitting data. These requirements drive the need for enabling technologies for miniaturized, NII suites with increased survivability in harsh environments, which the NII Focus Area addresses.

Minimal space is available for adding instrumentation to new weapon systems subsequent to their development. Moreover, additional weight and power draw can adversely affect the weapon system's signature and performance. Instrumentation for humans-in-the-loop, such as a dismounted soldier, should not detrimentally affect the soldier's performance or operational burden. New technologies can be exploited to integrate small NII into new platforms during design and development, and, in some cases, into existing platforms. NII can provide the required data for T&E, training, and logistics throughout the system's lifecycle, and provide the ability to collect critical system performance data during combat missions.

The use of NII for T&E, training, and logistics has the potential for significantly reducing the total ownership costs of new weapon systems while enhancing force readiness. Accordingly, the Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 3170.01D states that acquisition programs should include embedded instrumentation as part of system trade-off studies and design analyses. The NII focus area will also advance T&E technologies needed to facilitate compliance with CJCSI 3170.01D.

B. (U) ACCOMPLISHMENTS/PLANNED PROGRAM

Exhibit R-2a, RDT&E Project Justification	February 2008
Appropriation/Budget Activity RDT&E, Defense Wide, BA 03, PE 0603941D8Z	Non-Intrusive Instrumentation

	FY 2007	FY 2008	FY 2009
Non-Intrusive Instrumentation	4.856	6.941	6.538

FY 2007 Accomplishments:

Continued efforts initiated in prior fiscal years:

- Completed On-Board Wireless Data Communications efforts to develop and demonstrate a prototype wireless data bus for use with smart sensors on a system under test. This will enable integration of NII into test articles with minimal impact to the SUT. A demonstration was conducted at Aberdeen Test Center.
- Continued Holographic Memory Cube Upgrade for terabyte data storage and retrieval.
- Continued Advanced Munitions Flight Test Instrumentation efforts to develop, fabricate, and flight test a Microelectromechanical System (MEMS)-based instrumentation module in an artillery shell. This embedded instrumentation package will improve weapon evaluation without adversely impacting the weapon design or function.
- Continued High Speed and Temperature Diagnostics efforts to develop and demonstrate a series of probes that can withstand continuous exposure to hypersonic test environments. The effort is developing an optical species probe, total pressure probe, total temperature probe, and a Mach/flow angularity probe. The probes will support both ground and flight-testing of hypersonic vehicles.
- Continued MEMS Fiber Optic Sensors efforts to design, fabricate, and demonstrate optical pressure, temperature, and shear stress sensors integrated into a single sensor head. The sensors will be embedded into a test article to demonstrate practical application in an operationally relevant environment.
- Continued Digital Communications Test Data Bus efforts to develop and demonstrate a prototype miniaturized, self-calibrating embedded instrumentation system that consists of smart sensors, a subsystem controller, and a processor. The instrumentation system will be capable of operating on missile system power in the operational environment and will be able to support continuous life cycle T&E.
- Continued Open Modular Embedded Instrumentation Architecture efforts to design and develop an embedded system architecture that is open, modular, and scalable. The architecture has been demonstrated in tests of the Multi-Megawatt Electric Power System being developed for directed energy weapons applications.

Exhibit R-2a, RDT&E Project Justification	February 2008
Appropriation/Budget Activity RDT&E, Defense Wide, BA 03, PE 0603941D8Z	Non-Intrusive Instrumentation

- Continued Self Powered Chip efforts to design power mixer-supply system integrated circuit, sensor system integrated circuit, and fuel cell-lithium ion brassboard. Efforts continue to test, evaluate, and optimize wireless telemetry and common, off-the-shelf sensor technologies.
- Continued Wide Band Location Positioning System efforts to develop acquisition waveform and algorithm to test acquisition and tracking software and to design and test receiver and transmitter reference frequency. Efforts will provide Time Space Positioning Information (TSPI) in Global Positioning Systems (GPS)-denied environments such as buildings.
- Continued Harsh Environment D-Fiber Sensors efforts to enhance D-Fiber sensor in ways such as improving spectral response, reducing fiber brittleness, and improving sensor packaging. Efforts continue to enhance the fiber sensor integrated monitoring to develop high speed monitoring and wavelength sweeping source, which are survivable in extreme environments.

Initiated new research efforts to address T&E technology challenges in this focus area.

- Multi-Species Gas Sensor Arrays
- MEMS Optical Pressure Sensors
- Ultra High Dynamics GPS.

FY 2008 Plans:

Continue efforts initiated in prior fiscal years:

- Complete Holographic Memory Cube Upgrade system for terabyte data storage and retrieval.
- Complete Advanced Munitions Flight Test Instrumentation efforts to develop, fabricate, and flight test a Microelectromechanical System (MEMS)-based instrumentation module on an artillery shell. This embedded instrumentation package will improve weapon evaluation without adversely impacting the weapon design or function.
- Complete High Speed and Temperature Diagnostics efforts to develop and demonstrate a series of probes that can withstand continuous exposure to hypersonic test environments. The effort is developing an optical species probe, total pressure probe, total temperature probe, and a Mach/flow angularity probe. The probes will support both ground and flight testing of hypersonic vehicles.
- Complete MEMS Fiber Optic Sensors efforts to design, fabricate, and demonstrate optical pressure, temperature, and shear stress sensors integrated into a single sensor head. The sensors will be embedded into a test article to demonstrate practical application in an operationally relevant environment.

Exhibit R-2a, RDT&E Project Justification	February 2008
Appropriation/Budget Activity RDT&E, Defense Wide, BA 03, PE 0603941D8Z	Non-Intrusive Instrumentation

- Complete Digital Communications Test Data Bus efforts to develop and demonstrate a prototype miniaturized, self-calibrating embedded instrumentation system that consists of smart sensors, a subsystem controller, and a processor. The instrumentation system will be capable of operating on missile system power in the operational environment and will be able to support continuous life cycle T&E.
- Complete Open Modular Embedded Architecture efforts to demonstrate an NII architecture that can be configured for incorporation into any system under test. The architecture will support incorporation of smart sensors and synthetic instruments, and provide a standardized interface protocol for development of advanced, non-intrusive sensors.
- Complete Harsh Environment D-Fiber Sensors efforts to integrate robust D-fiber sensors with an integrated monitoring system to create a fiber optic sensor suite. The NII package will be usable as either embedded instrumentation or as NII for integration into existing platforms.
- Continue Self Powered Chip efforts to fabricate and test mixer-supply system integrated circuit, sensor system integrated circuit, and fuel cell-lithium ion brass board. Efforts continue to design an integration package for the system.
- Continue Wideband Location Positioning System to design and test miniature receiver prototype and to design and fabricate four portable transmitter prototypes.
- Continue Multi-Species Gas Sensor Array efforts to design improvements in sensor sensitivity and survivability in the presence of interfering gas species. Efforts continue to quantify composition of critical constituents in turbine engine exhaust products and to improve accuracy in measuring exhaust products to help develop better engine fuel mixtures and engine components.
- Continue MEMS Optical Pressure Sensor efforts to miniaturize data acquisition and analysis test hardware with very small MEMS sensors and wireless transmitters to describe flow patterns and behavior in machinery.
- Continue Ultra High Dynamic GPS efforts to improve accuracy associated with TSPI of warfighting assets.

Develop an NII roadmap to guide future efforts.

FY 2009 Plans:

Continue efforts initiated in prior fiscal years.

- Complete Self Powered Chip efforts to design, integrate, and demonstrate a self contained MEMS sensor package that integrates a sensor and power supply into a package that is a few cubic centimeters in size. The integrated sensor design will support the incorporation of different sensors into non-intrusive sensor packages.
- Complete Wideband Location Positioning System efforts to develop and demonstrate a location positioning system using

Exhibit R-2a, RDT&E Project Justification	February 2008
Appropriation/Budget Activity RDT&E, Defense Wide, BA 03, PE 0603941D8Z	Non-Intrusive Instrumentation

wide band radio frequency transmissions to provide position information in GPS-denied environments. Efforts will support T&E of systems in urban environments.

- Complete Multi-Species Gas Sensor Array efforts to design, integrate, and demonstrate long-life high-sensitivity sensors to quantify composition of critical constituents in turbine engine exhaust products. The sensor will improve accuracy in measuring exhaust products to produce better engine fuel mixtures and engine components.
- Complete MEMS Optical Pressure Sensor efforts to produce and demonstrate an integrated optical pressure sensor package with plug-and-play capability for on-blade acoustic measurement to describe flow patterns and behavior around rotor blades and difficult locations in turbo machinery.
- Complete Ultra High Dynamic GPS efforts design, and integrate and demonstrate a system that improves accuracy associated with TSPI.

Initiate a BAA in FY 2009 to select efforts for FY 2010 award.

C. (U) OTHER PROGRAM FUNDING SUMMARY NA

D. (U) ACQUISITION STRATEGY NA

Exhibit R-2a, RDT&E Project Justification						February 2008	
Appropriation/Budget Activity RDT&E, Defense Wide, BA 03, PE 0603941D8Z		Directed Energy Test					
Cost ($ in millions)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Directed Energy Test	8.944	15.585	17.713	18.852	19.061	19.037	19.183

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION

Directed Energy (DE) test technologies are rapidly transitioning into acquisition programs and Advanced Concept Technology Demonstrations. These weapon technologies, primarily consisting of High Energy Lasers (HEL) and High Power Microwaves (HPM), are outpacing their supporting test technologies. Advancements in HEL and HPM have created a new class of weapon systems in which energy is placed on a target instantaneously; traditional test techniques for evaluating conventional munitions (with flight times ranging from seconds to minutes) are not applicable to DE systems T&E. As a result, new technology solutions are needed to ensure adequate developmental, live fire, and operational test capabilities are available when DE acquisition programs are ready to test.

DE system and component testing requires two principal assessments: how well the weapon is performing, and the specific interaction of energy and target. The current ability to assess DE systems performance and interactions is based on effects testing, i.e., determining if and when a target was destroyed. Current capabilities do not provide the detailed test data required to understand DE system performance. Military utility of these weapons will be dependent upon the knowledge acquired through T&E to know how much to trust the technologies under development and how best to use them. The T&E/S&T Directed Energy Test focus area is developing the needed technologies to quantitatively assess both HEL and HPM performance and target interaction to support thorough testing of DE systems.

B. (U) ACCOMPLISHMENTS/PLANNED PROGRAM

	FY 2007	FY 2008	FY 2009
Directed Energy Test	8.944	15.585	17.713

Exhibit R-2a, RDT&E Project Justification		February 2008
Appropriation/Budget Activity RDT&E, Defense Wide, BA 03, PE 0603941D8Z	Directed Energy Test	

FY 2007 Accomplishments:

Continued projects initiated in prior years. Efforts provide risk mitigation and advanced technologies to support the Central Test and Evaluation Investment Program (CTEIP) Directed Energy Test and Evaluation Capability (DETEC) program.

- Completed Dielectric Electromagnetic Field Probes efforts to develop and demonstrate dielectric-based field probes based on planar waveguide technology that can measure electric and magnetic fields during HPM T&E events. The dielectric field probes will cause little or no perturbation of the electromagnetic environment during the event.
- Completed Delivered Irradiance Assessment Tool efforts to assess approaches for determining HEL irradiance delivered to the target. The tool will combine data from multi-spectral imagery sensors and sensor-atmospheric propagation models to determine HEL irradiance to the target.
- Completed Laser Irradiance T&E Tool efforts to develop algorithm for in-band and thermal imagery to determine incident irradiance from temperature distributions.
- Continued T&E Adaptive Optics System efforts to integrate and test an adaptive optics system in support of remote measurement of HEL temperature with high spatial and temporal accuracy. The adaptive optics system will be integrated into the Advanced Pointer Tracker at the HEL System Test Facility.
- Continued Quantum Well Infrared Photodetector (QWIP) efforts to test an integrated QWIP, Near Infrared (NIR) Focal Plane Array, and Computed Tomographic Imaging Spectrometer (CTIS). The prototype camera system will be demonstrated in both lab and field environments. The QWIP/NIR/CTIS camera system will allow off-board analysis of HEL beam interaction with a target to characterize the laser weapon performance.
- Continued Reflectance and Data Fusion Model efforts to develop and demonstrate improved bidirectional reflection distribution function models to predict the laser irradiance based on reflected energy measurements from various target material compositions. The effort will develop a dynamic data fusion model that will support projecting two-dimensional HEL imagery onto three-dimensional target representations, allowing more detailed analysis of HEL-target interaction during T&E.
- Continued Holographic Target Board efforts to design, fabricate, and test a small-scale holographic HEL target board using photo-thermo-refractive glass to measure HEL irradiance of an incident laser beam.
- Continued Multiple Wave Temperature Sensor efforts to design a multi-band camera system for target surface temperature measurement.
- Continued Bi-static Optical Imaging Sensor efforts to design and fabricate a prototype ground-based HEL diagnostics sensor and to install and characterize the prototype sensor.
- Continued Dielectric Antenna Electro-Optical Sensor efforts to design and fabricate a prototype device consisting of a

Exhibit R-2a, RDT&E Project Justification	February 2008
Appropriation/Budget Activity RDT&E, Defense Wide, BA 03, PE 0603941D8Z	Directed Energy Test

Dielectric resonance antenna and Electro-Optical (E-O) resonator.

Initiated new research efforts to address T&E technology challenges in this focus area.

- Compact Three Axis Sensor efforts to develop a compact, electro-optical sensor that detects three-axis electric field measurements during HPM irradiation.
- Scanning Target Board efforts to develop an HPM target board that uses an array of compact, multi-layered patch antennas to map the HPM source power spectrum.
- Laser Protected Antenna efforts to develop shielding techniques to protect flight termination system antenna from errant HEL irradiation.
- Probe-based Irradiance Profiler efforts to develop a prototype system using a probe and beam camera to determine irradiance on an HEL target.
- Temperature & Irradiance Sensor Matrix efforts to develop a matrix of conformal, onboard photoconductive detectors to determine target irradiance and temperature profiles.
- Magneto-Optical Field Sensor efforts to develop fiber-coupled optical sensors using the Faraday effect to non-intrusively capture magnetic fields during HPM irradiation.

Initiated a BAA in FY 2007 to select efforts for FY 2008 award.

FY 2008 Plans:

Continue efforts initiated in prior years. Efforts will provide risk mitigation and advanced technologies to support the CTEIP DETEC project.

- Complete Bi-static Optical Imaging Sensor efforts to develop, fabricate, and demonstrate a brass board hyper-spectral imager by utilizing a fiber-based field sensor. This effort will develop the technology to use a bi-static hyper-spectral imager to remotely characterize multiple HEL beam wavelengths and power level signatures to support HEL test events.
- Complete T&E Adaptive Optics System efforts to integrate and test an adaptive optics system in support of remote measurement of HEL temperature with high spatial and temporal accuracy. The adaptive optics system will be integrated into the Advanced Pointer Tracker at the HEL System Test Facility.
- Complete Quantum Well Infrared Photodetector (QWIP) efforts to test an integrated QWIP, Near Infrared (NIR) Focal Plane Array, and Computed Tomographic Imaging Spectrometer (CTIS). The prototype camera system will be

Exhibit R-2a, RDT&E Project Justification	February 2008
Appropriation/Budget Activity RDT&E, Defense Wide, BA 03, PE 0603941D8Z	Directed Energy Test

demonstrated in both lab and field environments. The QWIP/NIR/CTIS camera system will allow off-board analysis of HEL beam interaction with a target to characterize the laser weapon performance.

- Complete Reflectance and Data Fusion Model efforts to develop and demonstrate improved bidirectional reflection distribution function models to predict the laser irradiance based on reflected energy measurements from various target material compositions. The effort will develop a dynamic data fusion model that will support projecting two-dimensional HEL imagery onto three-dimensional target representations, allowing more detailed analysis of HEL-target interaction during T&E.
- Complete Dielectric Antenna E-O Sensor efforts to fabricate and test a dielectric antenna with an embedded E-O crystal to measure changes in the electric field during an HPM engagement. The sensor will allow non-intrusive measurement of HPM environments with minimal impact on the fields measured.
- Continue Holographic Target Board efforts to design, fabricate, and test large scale holographics HEL target boards using photo-thermo-refractive glass to measure HEL irradiance of the an incident laser beam.
- Continue Multiple Wave Temperature Sensor efforts to integrate multi-band focal plane array, electronics, and operating software, and to characterize the multiple wave temperature sensor performance.
- Continue Compact Three-Axis Sensor efforts to develop a sensor that measures short, pulsed HPM fields in real-time. Efforts will include design and integrate ultra-wideband capable, fast rise-time, high sensitivity, compact sensors for minimal perturbation of the measured field and three-axis polarizations.
- Continue Scanning Target Board efforts to develop a system with sufficient resolution to derive energy distribution for direct measurement of primary beam shape of HPM systems and sources in complex environments.
- Continue Laser Protected Antenna efforts to develop laser-hard shielding that does not interfere with antenna performance during HEL testing. Assess flight termination system antenna and component vulnerability in relation to laser irradiation and thermal damage, conduct design trades for protection concepts, and conduct radio frequency (RF) verification tests.
- Continue Probe-based Irradiance Profiler efforts to develop non-intrusive methods for measuring HEL irradiance profile remotely using utilizing information from HEL/probe lasers and cameras for ground targets.
- Continue Temperature & Irradiance Sensor Matrix efforts to develop conformal, externally-mounted micro-sensors to resolve location and intensity of airborne HEL laser spots with minimal aerodynamic & thermal signature effects.
- Continue Magneto-Optical Field Sensor efforts to apply the Faraday Effect at microwave bandwidths at remote locations from light source & detector to measure magnetic fields in order to better understand HPM.

Initiate new research efforts to address T&E technology challenges in this focus area:

Exhibit R-2a, RDT&E Project Justification		February 2008
Appropriation/Budget Activity RDT&E, Defense Wide, BA 03, PE 0603941D8Z	Directed Energy Test	

- Atmospheric Transmission Measurement effort to develop stationary, ground-based measurement of slant path transmission for ranges of ~ 10km.
- Integrated Sensor and Software Model effort to integrate low-cost, high-resolution temperature sensor with an Inverse Heat Conduction model in an instrument that can be used determine heat put on target by an HEL system.
- Initiate Sensor Inverse Temperature Determination effort to determine laser energy deposition onto a composite target.
- Remote Target & Laser Imagery Determination effort to develop "inverse problem" retrieval solution under HEL engagement based on in-band and out-of-band radiance imagery.
- High Power Microwave Attenuator efforts.
- Cine Radiography of Explosive HPM Munitions efforts to develop a compact flash X-ray source.
- Non-intrusive, Internal Target Sensor efforts to develop a non-intrusive, large dynamic range and high bandwidth sensor to measure incident HPM magnetic field amplitude, internal cavity fields and circuit board currents.
- Dual Oscillator Microwave Generation efforts to extend center frequency of spark gap oscillators up from 500MHz to 2.5GHz.

Initiate a BAA in FY 2008 to select efforts for FY 2009 award.

FY 2009 Plans:

Continue projects initiated in prior years.

- Complete Holographic Target Board efforts to fabricate and demonstrate large-scale holographic HEL target board that uses photo-thermo-refractive glass to measure HEL irradiance of an incident laser beam. The reusable system will deliver test data that is both spatially and temporally resolved.
- Complete Multiple Waveband Temperature Sensor efforts to fabricate and demonstrate a remote four-waveband infrared temperature sensor that allows measurement of target surface temperature during HEL field tests.
- Complete Compact Three-Axis Sensor efforts develop a sensor to measure short-pulsed HPM field in real-time, including calibration and demonstration of three-axis E-O sensor. Efforts will allow understanding of HPM effects on fielded systems internal electronics and aid in countermeasure development.
- Complete Probe-based Irradiance Profiler to understand properties of target during irradiation in the presence of HEL beam fluctuations. The effort will produce robust, high-fidelity diagnostics for HEL weapon systems to ensure proper, effective operation in support of warfighters.
- Complete Temperature & Irradiance Sensor Matrix effort to scale-up sensor matrix fabrication to withstand airborne

Exhibit R-2a, RDT&E Project Justification		February 2008
Appropriation/Budget Activity RDT&E, Defense Wide, BA 03, PE 0603941D8Z	Directed Energy Test	

HEL environment with large peak irradiances, high target surface temperatures, and aerodynamic sheer forces. Demonstrate this technology.

- Complete Magneto-Optical Field Sensor effort to develop microwave photonic system using fiber-optic connections, Magneto-Optical sensor, and opto-electronic circuitry to non-intrusively detect magnetic fields and demonstrate technology. Efforts will allow accurate assessment of narrowband HPM threats and provide better opportunity for response and countermeasures.
- Continue Scanning Target Board efforts to develop target board base element, perform base element M&S and optimize sensor designs, and fabricate and test target board. The effort will support development of HPM weapons for the battlefield to allow warfighter understanding of HPM irradiation on targets.
- Continue Laser Protected Antenna efforts to produce laser-resistant Flight Termination components using refractory material while simultaneously maintaining RF reliability during HEL irradiation. Integrate components and demonstrate performance.
- Continue Atmospheric Transmission Measurement effort to develop stationary, ground-based measurement of slant path transmission for ranges of ~ 10km.
- Continue Integrated Sensor and Software Model effort to integrate low-cost, high resolution temperature sensor with Inverse Heat Conduction model in an instrument that can be used determine heat put on target by an HEL system.
- Continue Sensor Inverse Temperature Determination effort to determine laser energy deposition into a composite target.
- Continue Remote Target & Laser Imagery Determination effort to develop “inverse problem” retrieval solution under HEL engagement based on in-band and out-of-band radiance imagery.
- Continue High Power Microwave Attenuator efforts.
- Continue Cine Radiography of Explosive HPM Munitions efforts to develop compact flash X-ray source.
- Continue Non-intrusive, Internal Target Sensor efforts to develop non-intrusive, large dynamic range and high bandwidth sensor to measure incident HPM magnetic field amplitude, internal cavity fields and circuit board currents.
- Continue Dual Oscillator Microwave Generation non-intrusive instrumentation (NII) efforts to extend center frequency of spark gap oscillators up from 500MHz to 2.5GHz.

Initiate future investigations to address T&E technology challenges in this focus area.

- Advanced physics based M&S tools to predict HEL-target interactions in real time.
- Advanced HEL measurement techniques that do not affect target dynamics or response to laser irradiation.
- Advanced HPM measurement techniques that do not perturb the RF environment and that provide a reliable measurement of field strength in an HPM engagement.

Exhibit R-2a, RDT&E Project Justification		February 2008
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Initiate a BAA in FY 2009 to select efforts for FY 2010 award.

C. (U) OTHER PROGRAM FUNDING SUMMARY NA

D. (U) ACQUISITION STRATEGY NA

Exhibit R-2a, RDT&E Project Justification		February 2008
Appropriation/Budget Activity RDT&E, Defense Wide, BA 03, PE 0603941D8Z	Netcentric Systems Test	

Exhibit R-2a, RDT&E Project Justification						February 2008	
Appropriation/Budget Activity RDT&E, Defense Wide, BA 03, PE 0603941D8Z			Netcentric Systems Test				
Cost ($ in millions)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Netcentric Systems Test	5.093	9.304	12.884	16.035	17.893	17.852	17.940

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION

The Netcentric Systems Test (NST) focus area measures and assesses the performance of the physical, information and cognitive domains of joint integrated architectures. Advancements in Netcentric Systems will provide commanders and staff with an adaptive, network-centric, configurable, operational information visualization environment, which will improve the speed and quality of command and control decisions. Information assurance is central to achieving these advancements. Advances will enable a spectrum of operational capabilities ranging from enhanced management and exploitation of intelligence, surveillance, and reconnaissance assets to next-generation tactical radio systems. Successful implementation of these transformational capabilities will necessitate a corresponding transformation in the ability of DoD to test and evaluate Netcentric Systems. The NST focus area addresses the T&E scenarios, technologies, and analysis tools required to ensure that operational networked systems delivered to the warfighter provide an assured capability to acquire, verify, protect, and assimilate information necessary for battlefield dominance within a complex netcentric environment.

B. (U) ACCOMPLISHMENTS/PLANNED PROGRAM

	FY 2007	FY 2008	FY 2009
Netcentric Systems Test	5.093	9.304	12.884

FY 2007 Accomplishments:

The NST Focus Area provided numerous briefs throughout the year to socialize and receive critical input from various subject matter experts in the T&E/S&T field.

The input received has facilitated further tailoring of the NST focus area to better provide risk mitigation and advanced

Exhibit R-2a, RDT&E Project Justification		February 2008
Appropriation/Budget Activity RDT&E, Defense Wide, BA 03, PE 0603941D8Z	Netcentric Systems Test	

technologies in support of the Central Test & Evaluation Investment Program (CTEIP) Joint Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) Interoperability T&E Capability (InterTEC) project, as well as numerous other potential transition partners.

Continued projects initiated in prior fiscal years to include the projects listed below.

- Completed Tactical-Report Generation Test Bed for C4ISR Systems to develop a scenario/message generator that records, infuses and seamlessly interleaves multiple information feeds to generate choreographed mission thread sensor data and formatted message data streams to simulate netcentric scenarios.
- Completed Validation for Netcentric Simulations effort to develop a quantitative verification methodology for netcentric simulations based on metrics that adequately characterize system performance and effectiveness.
- Continued Executable Architecture Analysis Modeling effort to develop test technologies to create executable models of netcentric architectures comprised of integrated combat, communications, and process models.
- Continued Middleware Enhancements for Netcentric Simulation Architecture efforts to develop and demonstrate a network coding technology that will enable a gain by a factor of two or more in testing middleware communication throughput over test networks.
- Continued Joint Virtual Network Centric Warfare effort to develop the capability to build, test, evaluate, and optimize large-scale, real-time communication networks integrated with hardware, software, external systems, test ranges, and warfighters.
- Continued Technology and Tools for Joint Testing effort to prototype T&E tools for developing test architectures, assigning test measures, and visualizing and testing Joint command and control systems in a service oriented architecture environment.

Initiated new research efforts in:

- Analyzer for Netcentric Systems Test Confederations.
- Configurable Situational Awareness Displays.
- Dynamic Distributed Networking for Test and Evaluation.
- Flexible Analysis Services.
- Netcentric Systems Test Architecture and Technology Insertion Environment.
- Service Oriented Architecture Toolset.
- Technologies for Tactical Video.
- Validation for Netcentric Simulations.

Initiated a BAA in FY2007 to select efforts for FY 2008 award.

Exhibit R-2a, RDT&E Project Justification		February 2008
Appropriation/Budget Activity RDT&E, Defense Wide, BA 03, PE 0603941D8Z	Netcentric Systems Test	

FY 2008 Plans:

Continue projects initiated in prior years. Efforts will provide risk mitigation and advanced technologies to support the CTEIP InterTEC and Joint Information Assurance Test Suite-Web Enabled Test (JIATS-WET) projects and will include the following:

- Complete Dynamic Distributed Networking for Test and Evaluation effort to develop tools to dynamically configure Netcentric Systems Test infrastructure communications networks.
- Complete Flexible Analysis Services effort to develop and demonstrate generic message protocol translation prototypes (initial Link 16 capability) with a parser rule and profile creation user interface and a generic message parser.
- Complete Netcentric Systems Test Architecture and Technology Insertion Environment effort to develop an architecture, tools, and a laboratory to integrate, demonstrate and validate NST technology projects.
- Complete Middleware Enhancements for Netcentric Simulation Architecture efforts to develop and demonstrate a network coding technology that will enable a gain by a factor of two or more in test middleware communication throughput over test networks.
- Complete Configurable Situational Awareness Displays effort; demonstrate and deliver final 3D visualization tool and final report.
- Complete Executable Architecture Analysis Modeling, perform testing, and deliver final technical report and software development plan.
- Continue Analyzer for Netcentric Systems Test Confederations effort to develop and demonstrate web-based technologies to automate Netcentric test planning and scenario development.
- Continue Joint Virtual Network Centric Warfare effort by demonstrating virtual communication link technology enabling visualization of transmit events, link connectivity, terrain cross sections, and line-of-sight visibilities.
- Continue Service-Oriented Architecture T&E Toolset efforts that will provide a web-enabled display and manipulation of test architectures.
- Continue Technology and Tools for Joint Testing effort to develop agile command and control data-mining algorithm prototype and data mining visualization.
- Continue Technologies for Tactical Video and demonstrate a battlespace awareness tool that integrates sensor imagery data with other Joint Mission Effectiveness (JMe) test data projected into the battlespace.

Initiate future investigations to address T&E technology challenges in this focus area.

- Cognitive Command & Control (C2) Capabilities for Agent Based Model-Enabled Data Farming to develop models capturing the C2 structures and develop bio-inspired and natural algorithms to automatically generate adversarial

Exhibit R-2a, RDT&E Project Justification		February 2008
Appropriation/Budget Activity RDT&E, Defense Wide, BA 03, PE 0603941D8Z	Netcentric Systems Test	

behavioral.

- Cognitive Performance Assessment Test Technologies to develop objective models for real-time measure and analysis of warfighter cognitive performance and situational awareness, and to develop advanced algorithms to fuse multivariate performance data to determine task specific cognitive states.
- Net-Centric Command & Control Test Analysis Algorithms to develop technologies for real-time analysis of joint mission effectiveness in a C2 environment.
- Flexible Analysis Services to develop architecture compatible to the NST infrastructure deciphering dynamically defined communications and intelligent algorithms for NST analysis, visualization, and reporting.
- Effects Based Approach to Operations Support to develop modeling technologies for conventional and unconventional effects of Information Operations actions.
- Multi-Level Security Cross Layer Scheme for Mobile Ad Hoc Network to build multi-level security features into distributed, decentralized, quality of service medium access control while preserving power and bandwidth.
- Rapid Live-Virtual-Constructive (LVC) Reconfiguration to develop advanced artificial intelligence algorithms that enable rapid and automated configuration or reconfiguration of distributed LVC resources.
- Policy-Based Adaptive Network and Security Management to develop a policy based management system for controlling cross-domain multi-level security and automated network Quality of Service controls through recognition of TENA based applications.
- Waveform and Link Manager Risk Mitigation to develop technologies that facilitate protocol implementation handling uncertain radio frequency communication links.

Initiate BAA in FY 2008 to select efforts for FY 2009 award.

FY 2009 Plans:

Continue projects initiated in prior years. Efforts will provide risk mitigation and advanced technologies to support the CTEIP InterTEC and JIATS-WET projects.

- Complete Configurable Situational Awareness Displays efforts; demonstrate and deliver final 3D visualization tool and final report.
- Complete Executable Architecture Analysis Modeling, perform testing, and deliver final technical report and software development plan.
- Complete Joint Virtual Network Centric Warfare efforts by demonstrating virtual communication link technology enabling visualization of transmit events, link connectivity, terrain cross sections, and line-of-sight visibilities.

Exhibit R-2a, RDT&E Project Justification		February 2008
Appropriation/Budget Activity RDT&E, Defense Wide, BA 03, PE 0603941D8Z	Netcentric Systems Test	

- Complete Technologies for Tactical Video efforts to demonstrate a battlespace awareness tool that integrates sensor imagery data with other Joint Mission Effectiveness (JMe) test data projected into the battlespace.
- Continue Technology and Tools for Joint Testing efforts to develop agile C2 data-mining algorithm prototype; and conduct data mining advanced visualization.
- Continue Cognitive Command & Control (C2) Capabilities for Agent Based Model-Enabled Data Farming efforts to develop models capturing the C2 structures and develop bio-inspired and natural algorithms to automatically generate adversarial behavioral.
- Continue Cognitive Performance Assessment Test Technologies efforts to develop objective models for real-time measure and analysis of warfighter cognitive performance and situational awareness, and to develop advanced algorithms to fuse multivariate performance data to determine task specific cognitive states.
- Continue Net-Centric Command & Control Test Analysis Algorithms efforts to develop technologies for real-time analysis of joint mission effectiveness in a C2 environment.
- Continue Flexible Analysis Services efforts to develop architecture compatible to the NST infrastructure; deciphering dynamically defined communications and intelligent algorithms for NST analysis, visualization, and reporting.
- Continue Effects Based Approach to Operations Support efforts to develop modeling technologies for conventional and unconventional effects of Information Operations actions, Stability & Security Operations actions, Diplomatic, Information, Military, and Economic actions; and Political, Military, Economical, Social, Information, & Infrastructure.
- Continue Multi-Level Security Cross Layer Scheme for Mobile Ad Hoc Network efforts to build multi-level security features into Distributed, Decentralized, Quality of Service Medium Access Control while preserving power and bandwidth.
- Continue Rapid Live-Virtual-Constructive (LVC) Reconfiguration efforts to develop advanced artificial intelligence algorithms that enable rapid and automated configuration or reconfiguration of distributed LVC resources.
- Continue Policy-Based Adaptive Network & Security Management efforts to develop a policy based management system for controlling cross-domain multi-level security, and develop automated network Quality of Service controls.

- Continue Waveform and Link Manager Risk Mitigation efforts to develop technologies that facilitate protocol implementation handling uncertain radio frequency communication links.

Initiate future investigations to address T&E technology challenges in this focus area.

- Capabilities to evaluate advances from a “human-out” perspective (i.e., determine what information actually enhances a warfighter’s performance).

Exhibit R-2a, RDT&E Project Justification		February 2008
Appropriation/Budget Activity RDT&E, Defense Wide, BA 03, PE 0603941D8Z	Netcentric Systems Test	

- Technologies to non-intrusively assess low probability of detection and low probability of communications and data link interception.
- Methods to assess the contribution of netcentricity to decision superiority in operational scenarios.

Initiate BAA in FY 2009 to select efforts for FY 2010 award.

C. (U) OTHER PROGRAM FUNDING SUMMARY NA

D. (U) ACQUISITION STRATEGY NA

Exhibit R-2a, RDT&E Project Justification						February 2008	
Appropriation/Budget Activity RDT&E, Defense Wide, BA 03, PE 0603941D8Z			Unmanned and Autonomous Systems Test				
Cost ($ in millions)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013

Exhibit R-2a, RDT&E Project Justification						February 2008	
Appropriation/Budget Activity RDT&E, Defense Wide, BA 03, PE 0603941D8Z		Unmanned and Autonomous Systems Test					
Unmanned and Autonomous Systems Test Systems Test	2.004	4.165	5.056	5.801	6.118	6.087	6.130

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION

The next generation of unmanned warfighting support systems is in development and will rapidly transition from research efforts into acquisition programs. In addition, on-going research into autonomous and semi-autonomous systems indicates such systems will soon emerge as a new test challenge. The Unmanned and Autonomous Systems Test (UAST) Focus Area is addressing the current and emerging challenges associated with T&E of these important warfighting assets. As the complexity of Unmanned and Autonomous Systems (UAS) increases, the capability to test these systems must also be developed. UAS T&E technology advancements are required to enable testing of the behavior of learning unmanned and autonomous systems. Ranges and installed system test facilities must be able to characterize UAS responses to mission priorities in densely-packed battle spaces and predict from the data how these systems will respond in the future. The Department of Defense must have the capability to test the ability of these systems to interact safely and effectively with large groups of humans and to determine how these systems respond to unscripted scenarios. This capability requires the development of technology to accurately collect and compare situational awareness of autonomous systems to the ground truth situation; test unmanned systems in a net-centric environment; maintain non-line-of-sight tracking; and execute controlled, repetitive, and realistic stimulation of systems under test.

B. (U) ACCOMPLISHMENTS/PLANNED PROGRAM

	FY 2007	FY 2008	FY 2009
Unmanned and Autonomous Systems Test	2.004	4.165	5.056

FY 2007 Accomplishments:

Completed process using BAA to select efforts for FY 2007 award.

Initiated research efforts to address T&E technology challenges in this focus area:

- Remote Embedded Test Systems effort.
- Flexible Command and Control.
- Reconfigurable Wireless Measurement System.

Exhibit R-2a, RDT&E Project Justification		February 2008
Appropriation/Budget Activity RDT&E, Defense Wide, BA 03, PE 0603941D8Z	Unmanned and Autonomous Systems Test	

- Microbeacon tracking of autonomous Systems.
- Integrated Agent Based Framework.
- High Fidelity Communication Modeling and Analysis.

Initiated BAA in FY 2007 to select efforts for FY 2008 award.

FY 2008 Plans:

Continue efforts initiated in prior fiscal years.

- Complete Flexible Command and Control efforts to develop technology that allows operation of multiple UAS platforms within a precisely prescribed environment that can be monitored and controlled locally, or widely distributed, over all battlespaces/test infrastructures.
- Complete Intelligent Agent Based Framework efforts to develop preplanning techniques which properly characterize communications links to support UAS operations in complex environments.
- Continue Remote Embedded Test Systems efforts to develop long duration, lightweight hybrid power/energy system for reliable UAS operation of onboard sensors and data transmission devices.
- Continue Reconfigurable Wireless Measurement System efforts to develop non-intrusive test instrumentation for real time measures at the system and sub-system levels for both truth and perceived truth data.
- Continue Microbeacon tracking efforts to develop non obtrusive instrumentation for time, space, position information.
- Continue High Fidelity Communication Modeling and Analysis efforts to develop modeling and simulation tools to provide controlled, repetitive, and realistic stimulation of systems under test.

Initiate new research efforts to address T&E technology challenges in the focus area.

- Development of a common architecture allowing integration of diverse systems from across the services and enabling distributed live, virtual, and constructive testing of UAS.
- Command and control techniques to safely control multiple lethal unmanned systems in densely packed battlespaces (air, land, and sea, and combinations thereof).
- Techniques to test and control UAS in an unscripted scenario.
- Technologies to conduct Non-Line-of-Sight (NLOS) tracking of UAS during T&E events.
- Creation, manipulation, and reproduction of the full battlespace environment for test of UAS learning algorithms.

Initiate BAA in FY 2008 to select efforts for FY 2009 award.

FY 2009 Plans:

Exhibit R-2a, RDT&E Project Justification	February 2008
Appropriation/Budget Activity RDT&E, Defense Wide, BA 03, PE 0603941D8Z	Unmanned and Autonomous Systems Test

Continue efforts initiated in prior fiscal years.

- Complete Remote Embedded Test Systems efforts to develop long duration, lightweight hybrid power/energy system for reliable UAS operation of onboard sensors and data transmission devices.
- Complete Reconfigurable Wireless Measurement System efforts to develop non-intrusive test instrumentation for real time measures at the system and sub-system levels for both truth and perceived truth data.
- Complete Microbeacon tracking efforts to develop non obtrusive instrumentation for time, space, position information.
- Complete High Fidelity Communication Modeling and Analysis efforts to develop modeling and simulation tools to provide controlled, repetitive, and realistic stimulation of systems under test.

Initiate new research efforts to address T&E technology challenges in the focus area.

- Modeling of semi-autonomous and autonomous systems to facilitate prediction of UAS performance in scenarios to supplement development and operational T&E events.
- Techniques to conduct T&E in deep sea operations (e.g. data rates, telemetry, way points, off-board sensors, etc.) for unmanned undersea vehicles.
- Methods for testing autonomous space systems (e.g. accessibility, latency, safety/health hazards, etc.) in an operationally relevant environment.
- Tools to evaluate the cognitive behavior and predict future performance of learning algorithms in semi-autonomous and autonomous systems.

Initiate a BAA in FY 2009 to select efforts for FY 2010 award.

C. (U) OTHER PROGRAM FUNDING SUMMARY NA

D. (U) ACQUISITION STRATEGY NA

Exhibit R-2a, RDT&E Project Justification						February 2008	
Appropriation/Budget Activity RDT&E, Defense Wide, BA 03, PE 0603941D8Z			Common Range Integrated Instrumentation System				
Cost ($ in millions)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Common Range Integrated Instrumentation System	0.000	0.000	15.000	10.250	0.000	0.000	0.000

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION

The Department of Defense has a critical need for enhanced T&E instrumentation to support advanced aircraft, avionics, and weapons system testing. The Common Range Integrated Instrumentation System (CRIIS) is a tri-service project that provides a family of capabilities to improve time-space-position information (TSPI) accuracy in low- to high-dynamic test environments and data link throughput capabilities using spectrally efficient data links. CRIIS participant packages will be highly miniaturized in both pod-mounted and internally mounted configurations. CRIIS is highly dependent upon advanced technology development in the areas of high-accuracy TSPI and spectrally efficient, high throughput data transmission.

B. (U) ACCOMPLISHMENTS/PLANNED PROGRAM

	FY 2007	FY 2008	FY 2009
Common Range Integrated Instrumentation System	0.000	0.000	15.000

FY 2009 Plans:

- Initiate risk reduction activities leading to development of an improved data link.
- Initiate technology maturation activities to attain improved TSPI accuracy and increased update rates.

Exhibit R-2a, RDT&E Project Justification	February 2008
Appropriation/Budget Activity RDT&E, Defense Wide, BA 03, PE 0603941D8Z	Common Range Integrated Instrumentation System

C. (U) OTHER PROGRAM FUNDING SUMMARY NA

D. (U) ACQUISITION STRATEGY N/A

Exhibit R-2a, RDT&E Project Justification						February 2008	
Appropriation/Budget Activity RDT&E, Defense Wide, BA 03, PE 0603941D8Z		Multi-Level Security					
Cost ($ in millions)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Multi-Level Security	0.000	0.000	2.349	2.969	5.442	5.533	5.785

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION

Multi-level Security (MLS), a new start project for FY 2009, is essential in future telemetry systems where multiple test articles transmit data at various security levels to testers cleared to different levels in disparate facilities. The MLS effort will provide technology to eliminate the need to run systems with different security levels of data, avoid running the entire computer network at System-High, and allow individuals not cleared to the System-High level to participate in the test. Security requirements extend to include coalition partners participating in cutting edge systems with closely held US components. Moreover, security levels include protection of proprietary information, thereby enabling different contractors to actively participate in testing. The MLS system will have all the essential functions required by security (logging, segregation, etc.) but provide almost transparent operation with minimal latency.

B. (U) ACCOMPLISHMENTS/PLANNED PROGRAM

	FY 2007	FY 2008	FY 2009
Multi-Level Security	0.000	0.000	2.349

FY 2009 Plans:

Initiate risk reduction efforts to accomplish MLS through a common data link.

- Permit access to approved users.
- Prohibit access to unapproved users.
- Identify attempts to intercept and change data.
- Segregate information by security level.
- Permit users at higher levels to view information at lower levels.
- Prohibit applications at lower levels from writing or viewing information at higher levels.
- Maintain minimal latency.

Exhibit R-2a, RDT&E Project Justification		February 2008
Appropriation/Budget Activity RDT&E, Defense Wide, BA 03, PE 0603941D8Z	Multi-Level Security	

C. (U) OTHER PROGRAM FUNDING SUMMARY NA

D. (U) ACQUISITION STRATEGY NA

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE
RDTE, Defense Wide BA 03	**0603942D8Z - Technology Transfer**

	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	11.910	5.784	2.170	2.259	2.259	2.276	2.304
P343	Homeland Defense First Responders Technology Transfer	1.156						
P942	Technology Link	10.754	5.784	2.170	2.259	2.259	2.276	2.303

A. Mission Description and Budget Item Justification: Defense Technology Transfer was referred to in previous budgets as Defense Technology Link (TechLink). This program title change serves to distinguish the Technology Transfer program from one of the program's successful contractors, TechLink of Montana State University.

Defense Technology Transfer is an element in the Department's technology transfer, transition, and acquisition activities. Its three-fold mission is (1) integration of advanced commercial-sector technologies into DoD systems, particularly from nontraditional defense contractors; (2) spin-off of DoD-developed technologies to the commercial sector to make these technologies more affordable for military acquisition; and (3) establishment of collaborative R&D projects with the private sector for cost-sharing of new dual-use technology development.

Defense Technology Transfer has been highly successful at helping the Department transfer its technologies to U.S. companies, making these technologies available for both military and commercial applications.

Technology Transfer is highly cost-effective and has provided a return on the investment to DoD of 4:1 on funds expended to date. This efficiently run organization currently accounts for 30 percent of all DoD patent license agreements (PLAs) and has brokered over 350 Cooperative Research and Development Agreements (CRADAs) and other R&D partnerships involving innovative companies new to DoD. The Congressional Record for November 18, 2003, page S15056, has a statement from Senator Burns (R-MT) commending Technology Link for its outstanding achievements.

In FY 2006, the Defense Technology Transfer Program began assisting DOD's Homeland Defense Office on first responder initiatives. The Homeland Defense First Responder Technology Transfer Project enhances efficiency and cost effectiveness by leveraging off existing TechLink efforts to manage equipment and technology transfers to civilian communities and eliminate duplication of effort between Department of Defense parties involved in technology and equipment transfers to first responders. In FY 2008, the Homeland Defense First Responders Technology Transfer project has been transferred to PE 0305186D9Z under the auspices of the Assistant Secretary of Defense (Homeland Defense).

B. Program Change Summary	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2008)	12.202	2.234	2.173
Current BES/President's Budget (FY 2009)	11.910	5.784	2.170
Total Adjustments	-0.292	3.550	-0.003

Congressional Program Reductions			
Congressional Rescissions		-0.050	
Congressional Increases		3.600	
Reprogrammings			
SBIR/STTR Transfer			
Other	-0.292		-0.003

Congressional increases provided: $1600 for FirstLink; $2000 for Springboard.

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
08						

Comment: For FY 2007, establish patent license agreements (PLAs) totaling 30% of all DOD PLAs and assist in the brokering of over 30 Cooperative Research and Development Agreements (CRADAs)
For FY 2008, establish patent license agreements (PLAs) totaling 30% of all DOD PLAs and assist in the brokering of over 30 Cooperative Research and Development Agreements (CRADAs)
For FY 2009, establish patent license agreements (PLAs) totaling 30% of all DOD PLAs and assist in the brokering of over 30 Cooperative Research and Development Agreements (CRADAs)

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDTE, Defense Wide BA 03	**0603942D8Z - Technology Transfer**	**P343**

COST ($ in Millions)		FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P343	Homeland Defense First Responders Technology Transfer	1.156						

A. Mission Description and Budget Item Justification: Leverages off existing technology transfer programs to meet the requirements of the FY 2003 National Defense Authorization Act, Section 1401. Meets the requirement to identify DoD technology items and equipment developed or being developed with the potential to enhance public safety and improve homeland defense. Evaluates technology items and procured equipment useful to first responders and facilitates technology items and equipment to Federal, State, and local first responders. Identifies and eliminates redundant and unnecessary research efforts while advancing high priority projects. Through participation in outreach programs, communicates with first responders and facilitates awareness of available technology items and equipment to support crisis responses. Monitors all DoD research and development activities to identify potential first responder applications; coordinates with other Federal Departments and Agencies to facilitate the transfer of technology from DoD to first responders; and assists in the transfer of technology and equipment for first responders.

Starting in FY08, this program has been transferred to PE 0305186D9Z under the auspices of the Assistant Secretary of Defense (Homeland Defense).

B. Accomplishments/Planned Program:

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Homeland Defense First Responders Technology Transfer:	1.156		

FY 2007 Accomplishment: Actively worked with Federal, State, and local officials to identify and participate in outreach events and activities to communicate with first responders and facilitate awareness of available technology items and equipment to support homeland security and enhance public safety.

Meets the Congressional intent of the FY 2003 National Defense Authorization Act, Section 1401. Eliminates duplication of effort between DoD organizations involved in the transfer of equipment and technology to first responders. Identifies equipment with the potential to enhance public safety. Establishes an overarching government program to assure the efficient and effective transfer of technology equipment useful to first responders. Eliminates redundant and unnecessary efforts concerning equipment and technology transfer to first responders. Facilitates the transitions of high priority DoD projects from research through implementation of initial manufacturing. Communicates to first responders the availability of equipment and technology items to support homeland security.

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	**0603942D8Z - Technology Transfer**	**P942**

COST ($ in Millions)	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P942 Technology Link	10.754	5.784	2.170	2.259	2.259	2.276	2.304

A. Mission Description and Budget Item Justification: Defense Technology Transfer was referred to in previous budgets as Defense Technology Link (TechLink). This change serves to distinguish the Technology Transfer program from one of the program's successful contractors, TechLink of Montana State University.

Defense Technology Transfer is an element in the Department's technology transfer, transition, and acquisition activities. Its three-fold mission is (1) integration of advanced commercial-sector technologies into DoD systems, particularly from nontraditional defense contractors; (2) spin-off of DoD-developed technologies to the commercial sector to make these technologies more affordable for military acquisition; and (3) establishment of collaborative R&D projects with the private sector for cost-sharing of new dual-use technology development.

Defense Technology Transfer has been highly successful at helping the Department transfer its technologies to U.S. companies, making these technologies available for both military and commercial applications.

Technology Transfer is highly cost-effective with elements of T2 achieving Return on Investment (ROI) to DoD. For example, TechLink and has provided a ROI to DoD of 4:1 on funds expended to date. This efficiently run organization currently accounts for 30 percent of all DoD patent license agreements (PLAs) and has brokered over 350 Cooperative Research and Development Agreements (CRADAs) and other R&D partnerships involving innovative companies new to DoD. The Congressional Record for November 18, 2003, page S15056, has a statement from Senator Burns (R-MT) commending Technology Transfer for its outstanding achievements.

B. Accomplishments/Planned Program:

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Marketing of DoD Technologies	1.415	1.340	1.310

FY 2007 Accomplishments: Actively marketed DoD-developed technologies to US companies to establish Patent License Agreements to commercialize these technologies for both civilian and military applications. The multiple objectives of this technology marketing activity are to (1) accelerate the transition of DoD-developed technologies to the warfighter; (2) lower the cost of DoD technology acquisition by developing a larger commercial market for dual-use technologies; (3) provide a return of revenue to DoD labs from commercial spin-off of defense technologies; and (4) fulfill DoD's Congressionally mandated technology transfer directives.

As an example, TechLink (Montana State University) facilitated a patent license agreement of a perimeter security and surveillance system developed by the Naval Undersea Warfare Center, Newport, Rhode Island. The Navy and their commercial partner are working to incorporate the Navy technology with the commercial partner's geographic information system software to pinpoint the location and interpretation of a remotely located acoustic event such as a human or animal footstep or movement of airborne or ground-based vehicles. The technology offers great promise for activities such as remote border security or perimeter protection of critical infrastructure.

FY 2008/2009 Plan: Continue active marketing of DoD-developed technologies to US companies to establish Patent License Agreements to commercialize these technologies for both civilian and military applications. The multiple objectives of this technology marketing activity are to (1) accelerate the transition of DoD-developed technologies to the warfighter; (2) lower the cost of DoD technology acquisition by developing a larger commercial market for dual-use technologies; (3) provide a return of revenue to DoD labs from commercial spin-off of defense technologies; and (4) fulfill DoD's Congressionally mandated technology transfer directives.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Dual Use Technology Deployment	0.560	0.582	0.560

FY 2007 Accomplishments: Actively promoted and brokered Cooperative Research and Development Agreements (CRADAs) between DoD labs and industry for development of technology with both commercial and military applications. This activity will particularly focus on nontraditional defense contractors and is intended (1) to help lower the expense of new defense-related technology development through cost-sharing with industry, and (2) to help DoD benefit from private-sector technology investments and innovations. Continued to provide critical support to DoD labs by facilitating 30% of all of DoD's Patent License Agreements (PLAs) for the fiscal year. Also brokered over 35 new CRADAs between DoD labs and industry, thereby enabling DoD and industry to leverage technology development efforts by both parties.

FY 2008/2009 Plan: Continue to actively promote and broker Cooperative Research and Development Agreements (CRADAs) between DoD labs and industry for development of technology with both commercial and military applications. This activity will particularly focus on nontraditional defense contractors and is intended (1) to help lower the expense of new defense-related technology development through cost-sharing with industry, and (2) to help DoD benefit from private-sector technology investments and innovations.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Spin-On of Advanced Commercial-Sector Technologies	0.300	0.312	0.300

FY 2007 Accomplishments: Actively promoted the DoD Small Business Innovation Research (SBIR) (focus on Phase III contracts) and Independent Research and Development (IR&D) programs to companies in the Northwestern United States in order to help DoD identify, fund, acquire, and integrate private-sector innovations and advanced commercial technologies into DoD systems.

FY 2008/2009 Plan: Continue to actively promote the DoD Small Business Innovation Research (SBIR) (focus on Phase III contracts) and Independent Research and Development (IR&D) programs to companies in the Northwestern United States in order to help DoD identify, fund, acquire, and integrate private-sector innovations and advanced commercial technologies into DoD systems.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
TechLink Southeast (T2 Bridge) (Congressional Add)	1.000		

T2 Bridge is a congressionally added effort to facilitate technology transfer from the DoD laboratories to the commercial sector in the southeast U.S. The goal is to ensure commercial production of technology developed in DoD so it can be inserted into DoD items through the normal acquisition process. The partnership intermediary agreement was signed October 31, 2006.

FY 2007 Accomplishments: There are two key objectives: 1) foster collaboration activities between DoD, academia, and industry with emphasis on small business, and 2) facilitate a minimum of 10 partnerships between DoD laboratories and academia/private sector using technology transfer mechanisms such as, but not limited to, CRADAs, SBIRs, PLAs, educational partnership agreements, and contracts.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
FirstLink (Congressional Add)	1.450	1.600	

FirstLink - a congressionally added effort - is officially called the Department of Defense's National Center of Excellence for Commercialization and Technology Transfer for First Responder Technologies. The Congressional add in FY 2007 for this same effort was called "Technology Transfer IEE."

FY 2007 Accomplishments: FirstLink assessed user needs and priorities, collected and evaluated potential DoD technologies for first responder use, identified non-DoD technologies that address DoD and first responder needs, and created and executed a marketing plan for these technologies. Measures of success include technologies made available for first responder use.

FY 2008 Plan: Continue to actively assess user needs and priorities, collect and evaluate potential DoD technologies for first responder use, identify non-DoD technologies that address DoD and first responder needs, and create and execute a marketing plan for these technologies. Measures of success include technologies made available for first responder use.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Springboard (Congressional Add)	6.029	1.950	

Spring Board is a congressionally added effort to facilitate technology transfer from the DoD laboratories to the commercial sector in Alaska. The goal is to ensure commercial production of technology developed in DoD so it can be inserted into DoD items through the normal acquisition process. (FY07 and FY08 Congressional add amounts are modified for appropriation general provisions, including FY08 Sec 8025(f), 8097, and 8104.)

There are two key objectives to meet this goal: 1) Foster collaboration activities between DoD, academia, and industry with emphasis on small business, and 2) Facilitate a minimum of seven partnerships between DoD laboratories and academia/private sector using technology transfer mechanisms such as, but not limited to, CRADAs, SBIRs, PLAs, educational partnership agreements, and contracts. The focus is on Alaska's emerging technology sectors.

FY 2007 Accomplishments: 1) fostered collaboration activities between DoD, academia, and industry with emphasis on small business, and 2) facilitated a minimum of seven partnerships between DoD laboratories and academia/private sector using technology transfer mechanisms such as, but not limited to, CRADAs, SBIRs, PLAs, educational partnership agreements, and contracts. Increased capability for all partnership intermediaries to share information and facilitate communication among/between DoD technology transfer activities.

FY 2008 Plan: continue to actively 1)foster collaboration activities between DoD, academia, and industry with emphasis on small business, and 2) facilitate a minimum of seven partnerships between DoD laboratories and academia/private sector using technology transfer mechanisms such as, but not limited to, CRADAs, SBIRs, PLAs, educational partnership agreements, and contracts. Increase capability for all partnership intermediaries to share information and facilitate communication among/between DoD technology transfer activities.

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.