

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2007

BUDGET ACTIVITY	PE NUMBER AND TITLE							
3 - Advanced technology development	0603008A - Electronic Warfare Advanced Technology							
COST (In Thousands)	FY 2006 Actual	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	52236	53129	49199	51213	52230	55304	56521	57764
TR1 TAC C4 TECHNOLOGY INT	18028	22073	35983	37713	39206	41175	42081	43007
TR2 DIGITAL BATTLEFLD COMM	25487	21463	13216	13500	13024	14129	14440	14757
TR8 C3 DEMONSTRATIONS (CA)	8721	9593						

A. Mission Description and Budget Item Justification: The goal of this program element(PE) is to provide enabling technologies for a secure, mobile, wireless network that will operate reliably in diverse and complex terrain, in all environments for the Army's Future Force and, where feasible, exploit opportunities to enhance Current Force capabilities. Technologies will be matured and demonstrated to address this challenge with distributed, mobile, secure, self-organizing communications networks. A key objective is to demonstrate seamlessly integrated communications technologies across all network tiers, ranging from unattended networks and sensors through maneuver elements and airborne/space assets. To accomplish the goal this PE will investigate and leverage external communication technologies and combine technology options in a series of Command, Control, Communications, and Computers Intelligence, Surveillance, and Reconnaissance (C4ISR) On-The-Move (OTM) experiments to measure the battlefield effectiveness for the Future Force. This PE also provides: protection technologies for tactical wireless networks against modern network attacks; smart communication technologies to network and control unmanned systems anywhere on the battlefield enabling timely sensor-decider-engagement linkage to defeat critical targets; advanced antenna technologies for greater communications mobility, range, and throughput; and automated network management aids. Several tasks are conducted in conjunction with the Defense Advanced Research Projects Agency (DARPA) and the other Services. Project TR8 funds congressional special interest efforts.

Since the current program element 0603008A project TR2 efforts are complementary to those funded from 0603008A project TR1, all efforts funded and executed from project TR2 are being transferred to project TR1 in FY08 and beyond, to reduce administrative burden. In FY08 and beyond, TR2 will contain only those efforts transferred from 0603238 (Global Surveillance/Air/Precision Strike) project 177 (JT ALS PS DEMO) to support the advanced technology demonstration for PEO IEW&S and will be executed by the Communications-Electronics Research, Development, and Engineering Center, Fort Monmouth, NJ. In FY08, the Joint Programs Sustainment and Development (JPSD) Project Office, an element of the Program Executive Office, Intelligence, Electronic Warfare, and Sensors (PEO IEW&S) will be disbanded.

The cited work is consistent with Strategic Planning Guidance, the Army Science and Technology Master Plan (ASTMP), the Army Modernization Plan, and the Defense Technology Area Plan (DTAP). Work in this PE contains no duplication with any effort within the Military Departments and is fully coordinated with PE 0602782A (Command, Control, Communications Technology), and PE 0603772A (Advanced Tactical Computer Science and Sensor Technology). Work is performed by the Army Research, Development, and Engineering Command, Communications-Electronics Research, Development, and Engineering Center, Fort Monmouth, NJ.

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<u>B. Program Change Summary</u>	FY 2006	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2007)	60515	44022	37663	37780
Current BES/President's Budget (FY 2008/2009)	52236	53129	49199	51213
Total Adjustments	-8279	9107	11536	13433
Congressional Program Reductions		-203		
Congressional Rescissions				
Congressional Increases		9700		
Reprogrammings	-8279	-390		
SBIR/STTR Transfer				
Adjustments to Budget Years			11536	13433

In FY08 and beyond funding was transferred to PE/project 0603008/TR2 from PE/project 0603238/177 to support advanced technology demonstration (Theater Effects Based Operations).

Five FY07 congressional adds totaling \$9297 (after adjustment for Congressional Undistributed Reductions) were added to this PE.

- (\$3115) Portable & Mobile Emergency Broadband Systems
- (\$1390) JT Unified Maritime Protection System (JUMPS)
- (\$958) Advanced Wireless Technologies
- (\$2588) Applied Comms & Information Networking (ACIN) Prog
- (\$1246) JEM Radio Communications Range Extension

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BUDGET ACTIVITY 3 - Advanced technology development		PE NUMBER AND TITLE 0603008A - Electronic Warfare Advanced Technology					PROJECT TR1		
COST (In Thousands)	FY 2006 Actual	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	
TR1 TAC C4 TECHNOLOGY INT	18028	22073	35983	37713	39206	41175	42081	43007	

A. Mission Description and Budget Item Justification: This project matures and demonstrates key communications, mobile networking, and information assurance technologies for the dismounted Soldier, embedded network communications, and the Future Force. These technologies will enable commanders and individual Soldiers to survive and fight by providing secure, reliable, mobile communications network solutions that function in complex and diverse terrain. The Joint Tactical Radio System (JTRS) Squad-Level Integrated Communications (SLICE) effort matures and demonstrates communications technology to provide a JTRS Software Communications Architecture (SCA) Soldier Radio Waveform (SRW). This effort addresses communications connectivity and network interoperability between dismounted Soldiers and the Future Combat System (FCS) brigade combat team (BCT) manned and unmanned systems within the size, weight, power consumption, and safety constraints of embedded JTRS Handheld, Manpack, and Small Form Fit (HMS) platform environments. Antenna Technologies will mature a family of mission tailored antennas to provide higher gains to sustain Wideband Network Waveform (WNW) link connectivities, reduce visual signature on ground platforms, increase resistance to damage from ballistic debris strikes, reduce the number of platform antennas while increasing their ability to support multiple waveforms, and integrate conformal, lightweight antennas within the Soldiers' protective combat wear for suppressed equipment visual signatures, improved mobility, survivability, and fightability. The Tactical Wireless Network Assurance (TWNA) effort provides network protection for mobile wireless ad hoc networks and provides safeguards against modern network attacks. It provides network assurance through enhanced net access controls. It also focuses on wireless intrusion detection to detect unauthorized access attempts. The effort matures and demonstrates mobile data security solutions and protection of secure database elements. The Proactive Integrated Link Selection for Network Robustness effort matures and integrates technologies to provide automatic network communications link selections that address the challenge of limited network connectivity due to an inability to optimally use all available communication types. The Communications Planner for Operational and Simulation Effects with Realism (COMPOSER) effort will mature software tools that enable the Warfighter to dynamically plan, predict, and visualize network communications performance due to maneuver and environmental effects faster than real time (virtual). COMPOSER is the Army component to the Coalition Joint Spectrum Management and Planning Tool (CJSMP) Joint Capability Technology Demonstration (JCTD).

Since the current program element 0603008 project TR2 efforts are complementary to those funded from 0603008 project TR1, all efforts funded and executed from project TR2 are being transferred to project TR1 in FY08 and beyond, to reduce administrative burden.

The cited work is consistent with Strategic Planning Guidance, the Army Science and Technology Master Plan (ASTMP), the Army Modernization Plan, and the Defense Technology Area Plan (DTAP). Work in this project is performed by the Army Research, Development, and Engineering Command, Communications-Electronics Research, Development, and Engineering Center (CERDEC), Fort Monmouth, NJ.

<u>Accomplishments/Planned Program:</u>	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
JTRS Squad-Level Communications: In FY06, delivered initial release of the SRW 1.0 to JTRS JPEO for porting to JTRS Ground Mobile Radio (GMR) and HMS target operating environments to support FCS BCT Spin Out #1 system integration; completed SRW Increment 2.1 development with enhanced voice and data communications services for dismounted Soldier and unmanned ground sensors/intelligent munition systems network applications up to 25 networking nodes in high fidelity laboratory and operationally relevant	9913	9700		

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field test environments; validated interoperability between manned and unmanned systems; and conducted operational experimentation in the C4ISR OTM experiment and Air Assault Expeditionary Force with Future Force Warrior (FFW) ATD, and actual troops operating up to 85 networking nodes. In FY07, complete SRW voice and data communications services for dismounted Soldier applications; extend application for unmanned aerial vehicle; and unmanned ground vehicle to support teleoperations/navigation, ISR data transport, and communications range extension services; complete validation of SRW network performance in technical test in laboratory and field environments; conduct follow-on operational experiments with FFW ATD and FCS BCT Spin Out #1; and deliver final release of SLICE SRW 2.1 software application to JTRS JPEO for porting to JTRS GMR and HMS for JTRS SCA and NSA security certifications.				
Antenna Technologies: In FY06, completed, tested, and validated breadboard WNW high gain antenna; evaluated triband antennas with improved gains and reduced form factors, developed a diplexer to couple a fourth waveform into the triband antenna; completed live fire evaluation of ballistic radome, and improved gain of survivable low profile antenna. In FY07, improve gain performance of triband antenna with diplexer; demonstrate prototype triband antennas; improve gain performance of survivable low profile antennas with the ballistic radome; demonstrate dual band antenna system in an OTM environment; develop high efficiency Ku power amplifier module; mature Ka power amplifier module; and complete development of X-band OTM antenna system. In FY08, will initiate development of affordable terrestrial directional antenna; will complete development of 2 port low profile prototypes; will complete ruggedization of triband and low profile antennas; integrate body wearable antennas with JTRS HMS; will develop and test low cost low profile directional antenna prototypes; will integrate and test dual band SATCOM antenna on a Warfighter Information Network-Tactical (WIN-T) vehicle; will complete development of power amplifiers and integrate into antenna assemblies; develop a low profile single beam SATCOM antenna; will demonstrate vehicle X-band OTM antenna system. In FY09, will mature and demonstrate a low profile single beam, single frequency SATCOM antenna to improve OTM satellite tracking performance and throughput; will begin to mature a single beam, two frequency low profile SATCOM antenna. Complimentary work was also accomplished under 63008 TR2 in FY06 and FY07. In FY08 and FY09, this work will be consolidated in this project.	4882	3077	7720	4088
Tactical Wireless Network Assurance (TWNA): In FY06, matured intrusion detection algorithms for FCS BCT to deter intruders and to recognize attempts to attack/exploit Mobile Ad-hoc Networks (MANETs); matured and tested Tactical Public Key (TPK) enabling capabilities in a simulated MANET environment. In FY07, mature intrusion detection system framework and integrate with FCS security management capability; mature certificate revocation capability within TPK framework to reduce impact of security overhead on MANETs; provide demonstration encapsulating matured wireless security capabilities; provide TPK enabling technologies to FCS/WIN-T.	2264	4907		
Wireless Information Assurance (IA): In FY09 will mature and demonstrate biometric software token technology in the TPK infrastructure framework for the tactical network environment; will provide updated TPK enabling technologies to WIN-T.				3350
Proactive Integrated Link Selection for Network Robustness: In FY06, performed initial implementation of network link selection algorithms that will be utilized during the planning and analysis of a network before deployment (planning mode link selection algorithms); performed modeling and simulation (M&S) and provided initial performance results. In FY07, mature design of planning mode components based on M&S results; mature system architecture to include design of deployed mode link selection technologies; begin M&S of deployed mode link selection algorithms. In FY08, will continue M&S and design of enhanced implementation of deployed mode link selection algorithms; will implement first level integration among link selection algorithms; will conduct performance characterization and scalability testing of mature link selection algorithms. In FY09, will complete implementation of deployed mode link selection algorithms; will conduct final architecture, design maturation, and integration of planning and deployed mode link selection algorithms; will conduct performance testing in a relevant field environment of all planning and deployed mode link selection technologies after integration of WIN-T hardware. Complimentary work was also accomplished under 63008 TR2 in FY06 and FY07. In	969	3059	7852	9069

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FY08 and FY09, this work will be consolidated in this project.		
Communications Planner for Operational and Simulation Effects with Realism (COMPOSER): In FY07, integrate and test the communications effects simulator, network visualizer, and spectrum management software modules to support the baseline architecture for Coalition Joint Spectrum Management Planning Tool (CJSMPPT) applications. In FY08, will further integrate and test enhanced COMPOSER technologies in support of the CJSMPPT effort.	800	2744
Dismounted Communications in Urban Terrain: In FY09, will mature communications capabilities for dismounted Soldier operating in highly complex terrain (e.g. urban environments) through the use of space-time adaptive processing, cross layer networking algorithms, and network security features such as employing random noise waveforms and other low probability of intercept, low probability of detection technologies to reduce communications systems vulnerability.		2500
Applied Communications and Information Networking (ACIN): In FY09, ACIN will mature and demonstrate commercial networking and communications technology in intelligent agents and mobile networking; will provide rapid adaptation of commercial communications equipment for military use through the development of new architectures combining commercial and military unique technologies; and will provide modeling and simulation for communications/network planning.		1957
C4ISR On-The-Move (OTM) Experiment: In FY08, will assess the capability, functionality, and performance of JTRS SRW version 2.2 and 3.0 on JTRS HMS and GMR representative hardware; will conduct the final experiment of the FCS Experiment Phase 2 Campaign to assess the capability, functionality and performance of FCS Battle Command, System of Systems Common Operating Environment (SoSCOE) and Spin Out 1 and 2 hardware and software; will assess the technology readiness level of Army science and technology efforts maturing in the FY08 timeframe in an operationally relevant field environment; will assess the performance of the baseline and alternative C4ISR on-the-move architectures and various network configurations to inform the current and future forces. In FY09, will assess the capability, functionality, and performance of the FY09 programmed increments of JTRS HMS for dismount Soldiers, unmanned ground sensors, non-line of site launch system and intelligent munitions systems; will assess WIN-T technology insertions to JNN such as an enhanced quality of service architecture, information assurance solutions to enable black core, and selected network operations management functions; will assess the technology readiness level of Army science and technology efforts maturing in the FY09 timeframe in an operationally relevant field environment; will develop or evaluate M&S capabilities and warfighting analyses techniques that enhance the ability to view systems and immerse humans in the virtual world to facilitate early assessment of new C4ISR technologies. In FY08 and FY09, this work will be consolidated in this project from TR2.	13007	11249
C4ISR Network Mining: Large-scale information technology has been evolving separate transaction and analytical systems, data mining provides the link between the two. Data mining consists of five major elements: extracting, transform, and load transaction data onto the data warehouse system, storing, and managing the data in a multidimensional database system; providing data access; analyzing the data by application software; and presenting the data in a useful format. In FY08, will mature network data mining software analysis to understand the relationships and patterns in stored transaction data based on open-ended user queries; will mature analytical software for use in battle command systems including statistical and machine learning. In FY09, will mature network data mining analytical software particularly neural networks for applicability to next generation battle command systems; will conduct demonstrations focused on four types of relationships. 1) Classes: stored data is used to locate data in predetermined groups. 2) Clusters: data items are grouped according to logical relationships or consumer preferences. 3) Associations: data can be mined to identify associations. 4) Sequential patterns: data is mined to anticipate behavior patterns and trends. Complimentary work was also accomplished under 63008 TR2 in FY06 and FY07. In FY08 and FY09, this work will be consolidated in this project.	4660	5500
Small Business Innovative Research/Small Business Technology Transfer Programs	530	

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Total

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BUDGET ACTIVITY 3 - Advanced technology development	PE NUMBER AND TITLE 0603008A - Electronic Warfare Advanced Technology						PROJECT TR2	
COST (In Thousands)	FY 2006 Actual	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
TR2 DIGITAL BATTLEFLD COMM	25487	21463	13216	13500	13024	14129	14440	14757

A. Mission Description and Budget Item Justification: In FY06 and FY07, This project matures and demonstrates an integrated Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) On-The-Move (OTM) (sensor to shooter) capability for the Future Force, and where feasible, exploits opportunities to enhance Current Force capabilities. It seeks to provide the ability to move large amounts of data over extended ranges with minimal infrastructure, tying in networks of unattended sensor fields. The efforts here concentrate on three major goals: provide a series of technology demonstrations of C4ISR capabilities to significantly reduce the risk associated with the networks of networks approach to the Future Combat System (FCS) brigade combat team (BCT) integrated on-the-move lethal force structure; provide critical links in the ability to communicate and move large amounts of information across the force structure in a seamless, integrated manner conducive to a highly mobile manned and unmanned force structure; and assess the Technology Readiness Level of emerging network technologies in an operationally relevant environment. C4ISR OTM provides an operationally relevant field experimentation venue complemented by constructive and virtual M&S for the assessment of emerging individual C4ISR technologies, system of systems, and architectures that will increase the survivability and lethality of Future Force platforms. Several key programs support these goals. The experiments will expand both the functionality and complexity of the integrated C4ISR system-of-systems, including the participation of Joint, Current, and dismounted elements experiments, align with Army Transformation critical objectives for C4ISR, and exploit opportunities to enhance Current Force (e.g. Stryker BCT) modernization. Adaptive Joint C4ISR Node (AJCN) Advanced Concept Technology Demonstration (ACTD) for mobile airborne communication nodes seeks to provide assured communications and also has the capability to perform signals intelligence, information warfare and electronic attack missions simultaneously. The Proactive Integrated Link Selection for Network Robustness effort will integrate automatic link selection technologies for Future Force networks. The Command, Control, and Communications (C3) OTM Network Mining matures and demonstrates network technologies that exploit and fuse existing data on the network to enable critical combat functions such as counterintelligence, rapid Battle Damage Assessment (BDA), targeting/retargeting, and Combat Identification (CID). Radio Enabling Technologies and Nextgen Applications (RETNA) matures and demonstrates affordable radio components and enabling technologies to reduce Joint Tactical Radio System (JTRS) programmatic risk and improve performance reliability. Antenna technologies will develop a family of mission tailored antennas for ground vehicles and the Soldier. The ground vehicle antennas efforts will focus on high gain antennas to sustain Wideband Network Waveform (WNW) link connectivity; affordable OTM directional SATCOM antenna technologies will provide low cost, low profile ground-to-ground and ground-to-air links; and multi-band antennas that consolidate multiple waveforms using a single antenna to reduce the number of platform antennas. Soldier antenna efforts mature and integrate conformal, rugged, lightweight antennas within the soldiers protective combat wear for visual camouflage, improved mobility, and increased survivability.

In FY08 and beyond, Theater Effects Based Operations (TEBO) will provide United States Forces Korea (USFK) with enhanced capabilities to analyze, plan, execute, and assess operations, at strategic and operational levels, using an effects based approach. TEBO will integrate computer-aided decision support tools, concepts, and procedures to provide a more comprehensive understanding of a given adversary and the environment. TEBO will help to identify those actions that can be taken to influence behavior and facilitate the harmonization of all elements of national power to support national objectives. It will provide greater responsiveness and adaptability to better manage the rapidly changing situations of today's environment. TEBO will conduct a limited military utility assessment to determine the extent to which the TEBO concept has been adopted and incorporated into their staff organization processes. TEBO assessment tools will be incorporated into USFK Theater Architecture.

Since the current program element 0603008A project TR2 efforts are complementary to those funded from 0603008A project TR1, all efforts funded and executed from project TR2 are being transferred to project TR1 in FY08 and beyond, to reduce administrative burden. In FY08 and beyond, TR2 will contain only those efforts transferred from

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0603238 (Global Surveillance/Air/Precision Strike) project 177 (JT ALS PS DEMO) to support the advanced technology demonstration for PEO IEW&S and will be executed by the Communications-Electronics Research, Development, and Engineering Center, Fort Monmouth, NJ. In FY08, the Joint Programs Sustainment and Development (JPSD) Project Office, an element of the Program Executive Office, Intelligence, Electronic Warfare, and Sensors (PEO IEW&S) will be disbanded.

The cited work is consistent with Strategic Planning Guidance, the Army Science, and Technology Master Plan (ASTMP), the Army Modernization Plan, and the Defense Technology Area Plan (DTAP). Work in this project is performed by the Army Research, Development, and Engineering Command, Communications-Electronics Research Development and Engineering Center (CERDEC), Fort Monmouth, NJ, and the Army Research Laboratory, Adelphi, MD.

Accomplishments/Planned Program:

FY 2006

FY 2007

FY 2008

FY 2009

C4ISR On-The-Move (OTM) Experiment: In FY06, conducted experiments to inform Program Managers the impact and effectiveness of C4ISR concepts; evaluated the technical performance of component C4ISR systems; reduced risk associated with system of systems integration; assessed the human factors of component systems; evaluated the end-to-end performance of complete operational mission threads; quantified the performance of varying system of systems configurations; conducted C4ISR system of systems operational assessments employing Soldiers in unscripted missions to determine C4ISR equipment effectiveness including dismounted and mounted JTRS Soldier Radio Waveform (SRW) nodes, WIN-T/Network Centric Waveform (NCW) Points of Presence, multiple unattended ground sensor fields, and multiple unmanned air and ground vehicles. In FY07, assess the capability, functionality, and performance of the programmed increments of: JTRS SRW 2.1 running on JTRS Handheld, Manpack, and Small Form Fit (HMS) hardware; WIN-T NCW waveform development; and JNN technology insertion; demonstrate commercial SATCOM, commercial wireless technologies, and protocols, Information Assurance and ISR sensor and sensor fusion in an operationally relevant field environment complimented with virtual and constructive modeling and simulation; conduct the initial experimentation under of the FCS Experiment Phase 2 Campaign to assess the capability, functionality, and performance of FCS Battle Command (1.0), SoSCOE (1.8) and Spin Out 1 and 2 hardware and software. In FY08 and beyond, funding for this effort was transferred to PE/project 0603008/TR1.

12423

11428

Adaptive Joint C4ISR Node (AJCN) ACTD: In FY06, conducted Extended User Evaluation (EUE) efforts and provided sustainment support for leave behind equipment and supported transition initiatives. In FY07, complete EUE and sustainment for leave behind equipment.

1957

1060

Proactive Integrated Link Selection for Network Robustness: In FY06, conducted controlled environment testing/demonstration of stand-alone link selection algorithms; transitioned the Agent Architecture module to WIN-T baseline. In FY07, mature planning mode link selection algorithms; begin implementation of deployed mode link selection algorithms; mature software operations to manage interactions and interfaces among link selection algorithms. Work on this effort is also being accomplished under PE/project: 0603008A/TR1. In FY08 and beyond, funding for this effort was transferred to PE/project 0603008/TR1.

1922

1968

C4ISR Network Mining: Large-scale information technology has been evolving separate transaction and analytical systems, data mining provides the link between the two. Data mining consists of five major elements: extracting, transform, and load transaction data onto the data warehouse system; storing and managing the data in a multidimensional database system; providing data access; analyzing the data by application software; and presenting the data in a useful format. In FY06, conducted systems engineering efforts in Joint Architecture Analysis; analyzed performance of Command Post of the Future over tactical communications systems; tactical network data collection; and various other network and battle command application system engineering efforts; demonstrated, transitioned, and fielded data collection tools to the 101st infantry division during their MRX. In FY07, assess the three services network centric warfare program

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architectures and identify interoperability issues; provide the Training and Doctrine Command (TRADOC) the results of the analysis to influence requirements updates and support TRADOC campaign of experimentation effort; demonstrate, and transition updated data collection tools to the 25th Infantry Division. In FY08 and beyond, funding for this effort was transferred to PE/project 0603008/TR1.				
Radio Enabling Technologies and Nextgen Applications (RETNA): In FY06, identified, evaluated, and adapted emerging commercial technologies for military application to HMS and embedded Wideband Power Amplifiers (WBPA)s; investigated thermal management techniques to efficiently transfer unwanted heat from targeted hot spots in Joint Tactical Radio Systems (JTRS) radios. In FY07, evaluate functional, integrateable (JTRS Software Communication Architecture (SCA) compliance) and operationally suitable products; validate performance of thermal management techniques via testing and analysis of HMS WBPAs' environmental performance.	507	1336		
Antenna Technologies: In FY06, evaluated conformal vest antenna prototypes and down-selected to best designs for integration into Future Force Warrior (FFW) Soldier ensemble; matured body wearable antennas to meet JTRS HMS requirements; conducted M&S of body wearable antenna designs and specific absorption rates for safety assessment. In FY07, complete antenna development and conduct test/demonstration of body wearable antenna prototypes for HMS. Work on this effort is also being accomplished under PE/project: 0603008A/TR1. In FY08 and beyond, funding for this effort was transferred to PE/project 0603008/TR1.	1450	965		
Theater Based Effects Operations (TEBO) ACTD: The TEBO ACTD will demonstrate an Effects-based Operations (EBO) process and will provide United States Forces Korea with enhanced capabilities to analyze, plan, execute, and assess effects-based operations at the strategic-theater and operational levels by integrating a framework of processes, tools, and tactics, techniques and procedures. In FY07, TEBO is funded and executed under PE/project 0603238/177. In FY08, mature TEBO software to Spiral V configuration; will mature and harden capabilities demonstrated in spirals I-IV to provide full spectrum support for effects-based operations including semi-automated knowledge acquisition and operational modeling and simulations; will mature human interfaces and scalability of the TEBO toolset demonstrate TEBO capabilities in Joint Forces Command (JFCOM) exercises in coordination with United States Forces Korea. In FY09, will initiate the sixth and final developmental spiral; will conduct the final military utility assessment of the TEBO capabilities; will transition activities for the TEBO toolset to Defense Information Systems Agency and Net-Centric Enterprise Services. Work on TEBO prior to FY08 was executed under PE/project 0603238/177.			13216	13500
Applied Communications and Information Networking (ACIN): In FY06, this one year congressional add matured and demonstrated commercial networking and communications technologies in the C4ISR areas of satellite receivers to assist first responders during Hurricane Katrina; handheld PDA communication terminal, target detection capabilities, web based software for call for fire; and vessel tracking system for Port Security. No additional funds are required to complete this effort.	6228			
Small Business Innovative Research/Small Business Technology Transfer Programs		493		
Total	25487	21463	13216	13500