ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2006

BUDGET ACTIVITY	PE NUMBER AND TITLE
3 - Advanced technology development	**0603001A - Warfighter Advanced Technology**

	COST (In Thousands)	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate
	Total Program Element (PE) Cost	78821	77434	45666	48280	47989	43706	45554
242	AIRDROP EQUIPMENT	7006	3786	4096	4186	3827	3860	3890
543	AMMUNITION LOGISTICS	1487	1429	1310	1338	1283	1369	1378
C07	JOINT SERVICE COMBAT FEEDING TECH DEMO	2365	2395	2010	1805	2268	2289	2305
J50	FUTURE WARRIOR TECHNOLOGY INTEGRATION	49121	49321	38250	40951	40611	36188	37981
J52	WARFIGHTER ADVANCED TECHNOLOGY INITIATIVES (CA)	18842	20503	0	0	0	0	0

A. Mission Description and Budget Item Justification: This Program Element (PE) matures and demonstrates technologies to enhance dismounted Soldier system capabilities while reducing the logistics burden on the battlefield; decreasing operation and sustainment costs; and improving ammunition logistics system performance. This PE contains projects that address technologies for use in the Future Force and, where feasible, exploit opportunities to enhance Current Force capabilities. The major effort in the Future Warrior Technology Integration project (J50) is the Future Force Warrior (FFW) program that utilizes technology integration and multi-functionality to provide combat overmatch capabilities for the individual Soldier and small combat unit while reducing Soldier load. Per FY05 congressional direction, the FFW program has been consolidated with the Land Warrior (LW) program (managed by Program Executive Office (PEO) Soldier) to focus on Future Combat Systems (FCS) compatibility and realize benefits from the combined effort. The FFW Science and Technology program will demonstrate technologies to provide a lightweight, full spectrum protective combat ensemble, modularly integrated with multi-functional sensors, weapons and medical monitoring capabilities. The program will also mature and integrate technologies for connectivity to other dismounted personnel, FCS, and robotic air/ground platforms for improved situational understanding and effects. The Joint Service Combat Feeding Technology project (C07) demonstrates technologies for military combat feeding systems and combat rations to include processing, preservation, packaging and equipment and energy technologies to reduce the logistics footprint while enhancing warrior mental and physical agility. The DoD Combat Feeding Research and Engineering Board and Nutrition Committee provides oversight for this project. The Ammunition Logistics project (543) demonstrates technology that optimizes weapon system rearm, ammunition packaging/palletization, explosives safety, material handling equipment, and ammunition throughput/management for improved munitions availability and survivability. The Airdrop Equipment project (242) provides enhancements to rapid deployment and force projection capabilities by maturing and demonstrating technology required for dropping increasingly heavier cargo to precise locations from high altitudes and greater offset distances. The objective is to increase both the survivability of aircraft and crews, and the probability that payloads delivered will land in a usable condition. The Joint Precision Airdrop System, an Advanced Concept Technology Demonstration (ACTD) begun in FY04 in partnership with the US Air Force, will demonstrate a 5-ton payload, high altitude precision airdrop system with an on-board mission planning capability. Another major effect within this project is to demonstrate a 15-ton precision airdrop capability that interfaces with the Joint-Modular Intermodal Platform (J-MIP) Joint Capability Technology Demonstration. The cited work is consistent with Strategic Planning Guidance, the Army Science and Technology Master Plan, the Army Modernization Plan, and the Defense Technology Area Plan. The projects in this PE adhere to Tri-Service Reliance Agreements on clothing, textiles, and food with oversight and coordination provided by the directors of Service laboratories through the Warrior Systems Technology Base Executive Steering Committee. Work in this PE is related to and fully coordinated with efforts in PE 0602786A (Warfighter Technology), PE 0602105A (Materials Technology), PE 0602618A (Ballistics Technology), PE0602624A (Weapons and Munitions Technology); PE 0602705A (Electronics and Electronic Devices), PE0603004 (Weapons and Munitions Advanced Technology); PE 0603008A (Command, Control, Communications Advanced Technology), and PEs 0602623A and 0603607A (Joint Service Small Arms Program). Work is performed by the Natick Soldier Center, Natick, MA; the Armament Research, Development, and

Engineering Center, Picatinny, NJ; and the Research, Development, and Engineering Command, Edgewood MD.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2006

BUDGET ACTIVITY	PE NUMBER AND TITLE
3 - Advanced technology development	**0603001A - Warfighter Advanced Technology**

B. Program Change Summary	FY 2005	FY 2006	FY 2007
Previous President's Budget (FY 2006)	77022	63754	48143
Current BES/President's Budget (FY 2007)	78821	77434	45666
Total Adjustments	1799	13680	-2477
Congressional Program Reductions		-6340	
Congressional Rescissions		-780	
Congressional Increases		20800	
Reprogrammings	1799		
SBIR/STTR Transfer			
Adjustments to Budget Years			-2477

Nine FY06 Congressional adds totaling $20800 were added to this PE.

FY06 Congressional adds with no R-2A (appropriated amount is shown):
($1500) Antimicrobial/Medical Base Layer Garment Technology
($1300) Joint Precision Airdrop Systems (JPADS) - 2k lb Resupply Requirement & Support
($2600) Multifunctional Protective Packaging Technology
($3000) Multi-Layer Coextrusion for High Performance Packaging Film
($2800) Precision Airdrop System for Special Operations Forces
($4700) Ration Packaging Materials and Systems for Meals-Ready-To-Eat
($1400) Self-Decontaminating Selectively Permeable Membranes for Chem-Bio Protection
($200) Small Business Development and Transition
($1500) Technology and Human Systems Integration Testing

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2006

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
3 - Advanced technology development	**0603001A - Warfighter Advanced Technology**	**242**

COST (In Thousands)	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate
242 AIRDROP EQUIPMENT	7006	3786	4096	4186	3827	3860	3890

A. Mission Description and Budget Item Justification: This project focuses on the maturation and demonstration of equipment and innovative techniques for aerial delivery of cargo and personnel. This is a key capability for rapid force projection and global precision delivery envisioned for the Future Force. Precision airdrop can provide a long-range, autonomous airdrop capability, with the option to deliver separate and distinctive payloads to multiple locations. Capitalizing on advances in decelerators, guidance and sensing (e.g., Global Positioning System), and wind sensing technologies, precision airdrop systems have the ability to be deployed from high altitudes (up to 25,000 ft) with large offset distances and to deliver payloads with improved accuracy, which enhances cargo, crew, and aircraft survivability. This project provides technology development for the Joint Precision Airdrop System Advanced Concept Technology Demonstration (ACTD) which will demonstrate a 10,000 lb precision delivery capability from up to 20 miles offset with 100 meter Circular Error Probable (CEP) accuracy. A second major effort to increase the payload weight to 30,000 lb began in FY04. The efforts in this project support the Army Transformation goals in the area of rapid deployment. The cited work is consistent with Strategic Planning Guidance, the Army Science and Technology Master Plan, the Army Modernization Plan, and the Defense Technology Area Plan. Work in this project is performed and managed by the Natick Soldier Center, Natick, MA.

Accomplishments/Planned Program	FY 2005	FY 2006	FY 2007
Aerial Delivery of Cargo - In FY05, completed system integration; conducted technical testing and user training; and demonstrated a high altitude (25,000 ft. Mean Sea Level) deployable, autonomous, offset airdrop capability with the option to deliver separate and distinct payloads (up to 10,000 lbs total) to multiple locations. Matured sensing technology for a parachute cargo release to replace legacy releases.	2355	0	0
Medium Precision Airdrop (capability for payloads up to 30,000 lb) - In FY05, conducted full-scale component prototyping; continued scale-model evaluations of two concepts; completed Guidance, Navigation & Control (GN&C) systems design integration and bench testing; began component level modeling; and evaluated advanced textile materials to improve performance and reduce cost. In FY06, perform component and GN&C evaluations; begin full-scale system design; complete component level modeling and begin system modeling; complete evaluation of advanced textile materials; and integrate intermodal platform. In FY07, will complete all component-level evaluations, system design, and system modeling; will integrate components into airdrop system; and will begin system evaluation and system control logic validation.	4651	3786	4096
Total	7006	3786	4096

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2006

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
3 - Advanced technology development	**0603001A - Warfighter Advanced Technology**	**543**

COST (In Thousands)	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate
543 AMMUNITION LOGISTICS	1487	1429	1310	1338	1283	1369	1378

A. Mission Description and Budget Item Justification: This project develops technology that provides rapid munitions deployability, resupply, and return from deployment for the Army's Future Force. It enhances force readiness and reduces the logistics footprint through improvements in explosive safety, Materials Handling Equipment (MHE), ammunition and missile packaging/palletization, and asset throughput/management. It also improves weapon system rearm for artillery, armor, air defense, aviation, and infantry. A major effort is a lightweight, high strength cargo platform system, the Joint Modular Intermodal Platform (JMIP), which is a key component of the JMIP Joint Capability Technology Demonstration (JCTD) and leverages work funded in Defense-wide PE 0603750D. The effort facilitates logistics through its compatibility with the Theatre Support Vessel; C-17 and C-130 aircraft; current and future trucks; and aerial delivery systems. The JMIP's modularity and compatibility will reduce aircraft load/unload time by up to 75%, and allow more efficient loading of aircraft (reducing number of aircraft missions required). Technology will transition to weapons and munitions development programs for weapons, munitions, MHE, and tactical vehicles. The cited work is consistent with Strategic Planning Guidance, the Army Science and Technology Master Plan, the Army Modernization Plan, and the Defense Technology Area Plan. This project is managed by the U.S. Army Armament Research, Development and Engineering Center, Picatinny Arsenal, NJ.

Accomplishments/Planned Program	FY 2005	FY 2006	FY 2007
Smart Distribution - Modular Inter-modal Platform (MIP) - In FY05, fabricated components and conducted hardware and interface evaluations on component subsystems.	1487	0	0
Component of the Joint Modular Intermodal Distribution System (JMIDS) Joint Capability Technology Demonstration (JCTD) - In FY06, complete design, fabricate prototypes and conduct engineering testing of a Joint Modular Intermodal Platform (JMIP) as part of an integrated set of technologies (JMIP, the Joint Modular Intermodal Container (JMIC), and an Automatic Identification Technology (AIT) tag) that will facilitate the efficient, rapid, and continuously visible movement and handling of supplies across all transportation modes through the Defense Transportation System and on to forward combat forces. In FY07, modify design and test demonstration quantities of JMIPs with integrated AIT. Will conduct Limited Military Utility Assessments (LMUA) and a full-scale MUA as part of the JCTD.	0	1429	1310
Total	1487	1429	1310

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2006

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
3 - Advanced technology development	**0603001A - Warfighter Advanced Technology**	**C07**

COST (In Thousands)		FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate
C07	JOINT SERVICE COMBAT FEEDING TECH DEMO	2365	2395	2010	1805	2268	2289	2305

A. Mission Description and Budget Item Justification: This project matures and demonstrates nutritionally advanced rations; biosensor technologies for ration contamination/ wholesomeness assessment; and logistically streamlined combat feeding systems with enhanced fuel efficiencies to decrease the combat feeding logistics tail. The project is a Department of Defense (DoD) program for which the Army has Executive Agent responsibility. The project demonstrates advances in combat ration technology, materials, energy utilization, and heating technologies to provide efficient and effective field feeding with reduced resupply burden. It exploits advances in ration formulation and quality, packaging, preservation, and nutritional content to improve morale, extend endurance, and sharpen mental acuity. It also demonstrates predictive modeling and simulation to assist in ration design, mission planning, and Class I (subsistence) distribution and tracking. This project supports the Army Transformation with a goal to demonstrate combat feeding technology with potential to reduce logistics (in component parts, weight, cube, fuel and water) and labor requirements, while improving the quality of food service. The work in this project is performed and managed by the U.S. Army Natick Soldier Center, Natick, MA with oversight from the DoD Combat Feeding Research and Engineering Board. This project has collaborative efforts with the U.S. Army Research Institute for Environmental Medicine. The cited work is consistent with Strategic Planning Guidance, the Army Science and Technology Master Plan, the Army Modernization Plan, and the Defense Technology Area Plan.

Accomplishments/Planned Program	FY 2005	FY 2006	FY 2007
Equipment and Energy Technologies - In FY05, completed design and fabrication of a thermoelectric water heater chiller for Future Combat Systems (FCS) crew sustainment that weighs less than half of the current Mounted Water Ration Heater and provides hot (140F) and chilled (72F) water in 20 minutes. In FY06, demonstrate and transition thermoelectric water heater chiller to Program Manager Force Sustainment Systems. Demonstrate Capillary Force Vaporizer (vaporizer with no moving parts and constructed of layered ceramics) stove and associated equipment, and transition through Army and Marine Rapid Fielding Initiatives. Demonstrate and transition improved cookware with an applied high hardness, nonstick coating. Conduct proof-of-principle demonstrations of waste to energy conversion technologies. In FY07, will demonstrate and transition thermoelectric self-powered tray ration heater for Army, US Marine Corps and Air Force kitchens; will integrate and demonstrate a prototype beverage chiller with a standard hydration bladder.	613	614	250
Ration Stabilization, Packaging, and Novel Nutrient Delivery Technologies - In FY05, validated and optimized diagnostic techniques to detect chemical/biological agents and/or naturally occurring food pathogens in food matrices and incorporated into biosensor detection systems. Demonstrated and transitioned a surface scanning biosensor. Evaluated advanced prototype film produced using nanocomposites and enhanced barrier coating in ration packaging. Determined stability of encapsulated proteins appropriate for thermally processed components. Developed tests for supplements and conducted limited field evaluation. Finalized and transitioned First Strike Ration (FSR) component/menu/ packaging. In FY06, obtain commercial or prototype array diagnostic systems and validate for four food pathogens from different complex food matrices. Investigate technologies and optimize tamper evident devices to ensure DoD and commercial interoperability, and transition pending Defense Logistics Agency concurrence. Develop model for designing rations to contain optimal levels of macronutrients. In FY07, will demonstrate effectiveness of protein encapsulation in thermally and non-thermally processed FSR components; will complete optimization and final product evaluation of FSR supplements.	1752	1781	1760
Total	2365	2395	2010

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2006

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
3 - Advanced technology development	**0603001A - Warfighter Advanced Technology**	**J50**

COST (In Thousands)		FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate
J50	FUTURE WARRIOR TECHNOLOGY INTEGRATION	49121	49321	38250	40951	40611	36188	37981

A. Mission Description and Budget Item Justification: This project matures and integrates high-payoff technologies and systems for the Future Force Soldier, and develops the basic Soldier System of Systems(SoS) architecture that directly supports the Army Training and Doctrine Command's Soldier as a System (SaaS) concept. Near term focus (through FY07) emphasizes Ground Soldier and Small Combat Unit (SCU) variants, and develops and integrates high payoff technologies in Soldier system areas that will transition to Program Executive Office (PEO) Soldier for fielding to the Future Force. The longer-term goal (FY08 and beyond) is continued technology development and integration that will exploit the SaaS concept for the Mounted Soldier, Air Soldier, and improved Ground Soldier variants. Longer term technology maturation and integration will focus on Soldier borne computing, communications, and networking; Soldier protection and mobility; enhanced situational awareness; and Soldier power. The major effort in FY06 and FY07 is the Future Force Warrior (FFW) System of Systems (SoS). The FFW program utilizes technology integration and multi-functionality to enhance warfighting capability for the individual Soldier and Small Combat Unit (SCU) while reducing Soldier load and power demand. The FFW program develops technology to provide dismounted warfighters in the SCU with enhanced capability in the areas of survivability, networked communications/collaborative situational awareness, individual Soldier and small team lethality/cooperative engagement, and agility while enabling them to operate for extended periods under arduous combat conditions, with reduced loss in physical capabilities from fatigue, stress, and hardship. Per FY05 congressional direction, the FFW program has been consolidated with the Land Warrior (LW) program (managed by PEO Soldier) to focus on Future Combat Systems (FCS) compatibility and realize benefits from the combined effort. Consolidation activities with PEO Soldier included migration of FFW technology development to the same contractor as LW and the establishment of a combined organizational structure. As part of the consolidated Soldier modernization strategy, the FFW program is providing technology with potential to result in the initial fielding of an integrated modular Ground Soldier System (GSS) that is fully compatible with FCS. The FFW SoS utilizes open system architectures and integrated technologies to provide a lightweight system-engineered protective combat ensemble, employing modular plug and play components such as multi-function sensors, networked communications, enhanced positioning navigation, networked fire control, embedded training, medical status monitoring capabilities, and links with man-portable air and ground sensor platforms. This FFW SoS will have connectivity to other dismounted personnel and Current/Future Force platforms including FCS to form adaptive, distributed sensor networks for better situational understanding of local environments and threats. Demonstrations and experimentation will include FY06 participation in the C4ISR On The Move (OTM) experiment, and FY07 participation in the C4ISR OTM and Air Assault Expeditionary Force (AAEF) Spiral D experimentation venues. Key performance goals are to demonstrate a Soldier borne system with fighting load of no more than 70 lbs for the rifleman ; the ability to operate for 24 hrs autonomously at the individual level and 72 hrs at the Brigade Combat Team level; integration of the Soldier Radio Waveform (SRW); and compatibility with FCS. The FFW program works closely with the Army's FCS and Squad Level Integrated Communications Environment (SLICE (developing SRW)) programs, as well as other Army Science & Technology (S&T) and DoD programs, in order to ensure interoperability, prevent possible duplication of efforts, and maximize return on investment to the Army. As part of the FFW/LW consolidation effort, FFW is working directly with PEO Soldier to identify and transition early maturing technologies into ongoing PEO Soldier acquisition programs. The cited work in this project is consistent with Strategic Planning Guidance, the Army Science and Technology Master Plan, the Army Modernization Plan, and the Defense Technology Area Plan. The project matures and integrates Soldier technologies transitioned from Program Elements (PEs) 0602786A, 0602105A, 0602308A, 0602623A, 0602705A, 0602782A, 0602785A, 0602787A, 0603002A, 0603008A, and 0603607A. The Natick Soldier Center, Natick, MA manages this project.

Accomplishments/Planned Program	FY 2005	FY 2006	FY 2007

FFW/LW Consolidation - In FY05, executed the consolidation of the FFW and LW programs per Congressional direction. Transitioned FFW Lead Technology Integrator (LTI) role from General Dynamics Robotics Systems to LW prime contractor (General Dynamics C4 Systems (GDC4S)). With PEO Soldier, GDC4S and TRADOC System Manager Soldier, developed a Ground Soldier System (GSS) modernization roadmap to achieve GSS requirements that is aligned with ongoing PEO-Soldier and FCS acquisition programs. Redefined FFW government/LTI team structures, and matrixed PEO Soldier personnel into FFW team structure. Re-established program technical baseline based upon consolidated effort and initiated FFW Systems Engineering Synchronization Phase. Reassessed technical performance metrics for GSS and Small Combat Unit (SCU) to meet size/weight/power requirements. Completed prioritization of capability requirements.	3086	0	0
FFW Technology Development - In FY05, continued Soldier SoS M&S, concept and subsystem development including: Headgear - fabricated breadboard sensors (fused visual/infrared) and assessed lightweight ballistic materials; Communications - conducted lab and limited field tests with prototype hardware to evaluate Soldier Radio Waveform for dismounted voice/data comms and modeled FFW network; Soldier Borne System (SBS) - fabricated six prototypes and performed technical evaluations and field assessments with soldiers to obtain feedback; Lethality - defined interfaces between SBS and weapon fire control; modified XM104 fire control to add Non Line of Sight capability; Processing and Power - developed proof-of-concept Soldier borne computer system, developed mission profiles and power duty cycles, and received prototype battery cells for lab evaluation; Personal Area Network (PAN) - defined body borne antennae interfaces and initiated integration of Warfighter Physiological Status Monitoring (WPSM) components into PAN; Software - initiated algorithm development for weapon target pairing, power management and graphical user interface; Soldier/platform interfaces - conducted demonstration of Soldier control of robotic platform; developed initial interface specifications for unmanned and manned vehicles. Augmented Cognition- assessed the capability of real-time assessment of cognitive state of Soldiers in the field, including data collection of WPSM. Systems Engineering - as part of LW/FFW consolidation, stabilized FFW architecture after assessing both LW and initial FFW systems; refined comms, lethality, security, software and physical architectures; validated trade studies and conducted new trades; analyzed distribution and resulting effectiveness of capabilities across the SCU; initiated Interface Control Documents and DOD compliant architecture documentation; initiated analysis of FCS SoS Common Operating Environment products for FFW re-use.	46035	0	0
Body Borne System: Activities are focused on integrating technology in a lightweight, low power, ergonomically designed, integrated modular package to meet overall 70 lb weight threshold (rifleman) and 24 hr autonomous mission. Included are systems engineering tasks to include development of architecture, metrics, requirements allocation, interoperability and supportability. In FY06, complete design and development of Soldier-borne hardware architecture for all Military Operational Specialty (MOS) specific configurations within the SCU. Integrate hardware subsystems into the FFW Soldier Protection and Individual Equipment System. These subsystems include: stand off ballistic protection and load carriage chassis, signature management, semi-permeable membrane (chemical-biological protective) over-garment, laser detectors for Tactical Engagement Sensor (TES), antennas, power sources, communications, computer, position/navigation, fire control, Warfighter Physiological Status Monitoring-Initial Capability, and PAN. Explore requirements for future integration of flexible panel display technology. Develop FCS-compatible interface(s) in areas of power and data (to share Situational Awareness/Common Operating Picture from higher echelons), as well as size/cube compatibility for Ground Soldier vehicle compartments. Fabricate and test 12 integrated body borne systems. Develop engineering projections for fielded GSS and build 1 leader and 1 Soldier mockup. In FY07, will complete final system development and integration, including addition of chem/bio protection using semi-permeable membrane and integration of PAN enhancements. Will retrofit existing 12 systems and fabricate and test 10 additional integrated body borne systems to support up to platoon level size field experiments and demonstrations.	0	6540	4526
Headgear: In FY06, complete design and development of basic helmet configuration integrating leveraged lightweight ballistic shell and liner materials. Complete development of modular add-on hardware for leader/MOS specific capabilities, including initial implementation of TES/laser sensors, microphone, visual and infrared dual aperture sensor fusion and integrated high resolution color helmet mounted	0	11490	7191

display. Perform systems engineering tasks to refine architecture, metrics, and requirements allocation. Develop backwards-compatible interfaces for Advanced Combat Helmet. Continue exploration/development and integration of active noise reduction. Fabricate, integrate and test 12 headgear systems. In FY07, will complete integration into FFW electronic components of vision enhancement, sensor fusion, and TES functionality, and XM50 chem/bio mask interface. Will modify existing 12 systems and fabricate, integrate and test 10 additional headgear systems to support field experiments and demonstrations. Will perform systems engineering tasks to support integration, interoperability and supportability.			
Soldier Computer and Software: In FY06, execute incremental development of Soldier computer system and employing System on a Chip (SoC) technology, leveraging the LW computer system. Continue service based software development and testing of Operating System and information management, power management, WPSM interface, netted fires/cooperative engagement, memory joggers, embedded training and TES, situational awareness, mapping image capture and transmittal, user interfaces and System Voice Control, and Unmanned Aerial Vehicle (UAV) data feed. UAV and UAV controller will be leveraged. Develop basic system processor to support increased functionality for distributed capabilities for Soldier MOSs that don't require a full-up computer. Develop a Soldier Radio Waveform (SRW)-based Application Programming Interface compatible with future radios to result in effective integration of the Soldier in the FCS network. Develop basic compatibility with FCS (SoS Common Operating Environment, Battle Command/Network Management Services) and Army Battle Command System. Explore development of enhancements to handheld planning device/tool. Conduct testing of FFW systems with leveraged LW computers and initial software applications described above. Evaluate Army and FCS information assurance/cross domain security developments for future incorporation into GSS. Conduct modifications to WPSM data processing algorithms to reduce signal artifacts and improve data quality for augmented cognition In FY07, will complete software functionality development to include applications described above and after action review, limited built in test, and code optimization for a power constrained computing environment. Will conduct field experiments and demonstrations with FFW Soldier computer hardware and software. Will develop plan for information assurance/cross domain security for GSS. Will perform systems engineering to support integration, interoperability and supportability.	0	11850	6713
Personal Area Network (PAN): In FY06, develop PAN components for distribution of power and data across the FFW electronic components, leveraging LW cables/connectors and novel electronic textile cables. Perform systems engineering to refine architecture, metrics, requirements allocation, and interface controls. In FY07, will refine PAN, and fabricate, integrate and test PAN to support field experiments and demonstrations. Will perform systems engineering tasks to support integration, interoperability and supportability.	0	1019	705
Power Sources: In FY06, continue development of advanced novel Lithium Polymer (24 hr, rechargeable and conformal for ergonomics/comfort) and Zinc Air (mission extender for missions beyond 24 hrs) power sources. In FY07, will fabricate power sources to support field experiments and demos. Will demonstrate power and energy technologies developed in PE 0602705 and integrate into Soldier systems, with particular emphasis on the GSS. Will evaluate prototype hybrid fuel cell power systems for technical performance and mission capability in Soldier tactical environments for 72 hr mission. Will demonstrate prototype modular quiet man-portable (<10 kg without fuel) battery chargers to support off-vehicle battery recharging.	0	1005	4813
Network/Communications/ Antennas: In FY06, develop communications and network interface Hardware/Software (HW/SW) functionality leveraging Soldier Radio Waveform (SRW) and develop backwards compatibility to Current Force. Implement FFW communications architecture for the SCU and integrate it with the Squad Level Integrated Communications Environment SRW-based network. Conduct network modeling and simulation. Develop network gateway for Soldier connectivity to unmanned ground systems, UAVs and legacy systems. Optimize communications architecture for compatibility with FCS while ensuring robust peer-to-peer communications, situational awareness and synchronization of fires while away from supporting platforms. Develop hardware interface for leveraged handheld radios. Integrate advanced body mounted antennae concepts to support robust communications in restricted	0	4495	3871

positions and environments. Fabricate and integrate components for 12 systems to support FY06 experimentation. In FY07, will refine network based on FY06 experimentation and M&S. Will fabricate 10 additional communication subsystems to support field experiments and demonstrations. Will perform systems engineering tasks to support integration, interoperability and supportability.			
Small Combat Unit Lethality and Fire Control: In FY06, develop distribution of lethality capabilities across the SCU. Complete modification of two XM104 prototype fire control systems for day/night non-line-of-sight cooperative engagement and integrate with LW weapon user interface and FFW body borne system. Develop XM104 hardware interfaces including black box, Weapon User Interface (WUI) and interfaces to Soldier Computer and integrate visible aiming laser and pointer/illuminator. Conduct laboratory demos and live fire assessments of modified XM104. Integrate FFW system with Multi-function Laser/ Small Tactical Optical Rifle Mounted Micro-Laser Range Finding System, Medium Thermal Weapon Sight and Daylight Video Sight for long range target acquisition . Procure lethality components to support FY06 experimentation. In FY07, will complete development and integration of wireless WUI. Will fabricate 6 wireless WUIs and other distributed lethality components to support field experiments and demonstrations. Will perform systems engineering tasks to support integration, interoperability and supportability.	0	2166	1499
Precision Position System (PPS): In FY06, develop a high fidelity personal navigation system utilizing Micro Electro-Mechanical System Inertial Measurement Unit technology. This effort will provide improved accuracy (3 m vs. 10+ m) necessary to enable precision netted lethality/fire control capabilities and 3-D position location in Global Positioning System denied areas (e.g. inside buildings), while reducing system size, weight and power. Integrate precision position/navigation system into overall FFW architecture. Initiate fabrication of 5 PPS systems. In FY07, will complete development of PPS systems and conduct integration into FFW HW/SW architecture to support field experiments and demonstrations. Will perform systems engineering tasks to include metrics, requirements allocation, interoperability and supportability.	0	3418	2365
Technical Evaluations, Analysis, Assessments and Demonstrations: In FY06, conduct technical evaluations in a Soldier Integration Lab environment, and conduct modeling and simulation evaluations/assessments to validate component/subsystem performance, integration, and "what if" analyses to explore system robustness. Conduct reduced-scope Map Exercise analysis. Conduct FFW system level evaluation through participation in C4ISR On the Move (OTM) experiment to validate system performance progress and network interoperability. Conduct SCU combat effectiveness and cost benefit analyses to compare FFW capability enhancements against currently fielded soldier equipment and LW baseline capability sets to show extent of performance improvements. Initiate planning for demonstration(s) to be conducted in FY07, including early development of Experimental Force (EXFOR) training and test plans. Develop Tactics, Techniques and Procedures for SCU tactical employment of FFW capabilities and associated training program. In FY07, will conduct EXFOR training and execute FFW System level demonstrations through participation in C4ISR OTM and Air Assault Expeditionary Force Spiral D experiments employing an FFW equipped squad, adjacent squad leaders, and platoon headquarters element, (minimal required configuration needed to demonstrate platoon level communications network) to validate system performance at Technical Readiness Level 6. Will complete final analyses regarding SCU combat effectiveness.	0	7338	6567
Total	49121	49321	38250