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| Exhibit R-2, PB 2011 Army RDT&E Budget Item Justification | | | | | | | | | DATE: February 2010 | | |
| APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 2: Applied Research | | | | R-1 ITEM NOMENCLATURE PE 0602270A: Electronic Warfare Technology | | | | | | | |
| COST (\$ in Millions) | FY 2009 Actual | FY 2010 Estimate | Base FY 2011 Estimate | OCO FY 2011 Estimate | Total FY 2011 Estimate | FY 2012 Estimate | FY 2013 Estimate | FY 2014 Estimate | FY 2015 Estimate | Cost To Complete | Total Cost |
| Total Program Element | 20.058 | 22.303 | 17.330 | 0.000 | 17.330 | 17.806 | 18.175 | 18.518 | 21.855 | 0 | 153.375 |
| 442: TACTICAL EW TECHNOLOGY | 9.389 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | Continuing | Continuing |
| 475: ELECTRONIC WARFARE COMPONENT TECHNOLOGIES (CA) | 3.587 | 6.268 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | Continuing | Continuing |
| 906: Tactical Electronic Warfare Applied Research | 7.082 | 16.035 | 17.330 | 0.000 | 17.330 | 17.806 | 18.175 | 18.518 | 21.855 | Continuing | Continuing |

A. Mission Description and Budget Item Justification

This program element (PE) designs and develops electronic warfare (EW) component technologies that deny, disrupt, or degrade the enemy's use of the electromagnetic spectrum for offensive or defensive operations. This is accomplished through the investigation of electronic support measures (ESM), countermeasures against communications systems and networks; the development of sensors used to identify and locate threat forces in an asymmetric environment; and threat warning and electronic countermeasures (ECM) against: munitions sensors and targeting capabilities, missile guidance and targeting systems, and booby traps. This PE protects high-value ground platforms, aircraft, and the Soldier from threat surveillance and tracking systems; imaging systems; and advanced radio frequency (RF)/electro-optical (EO)/infrared (IR) missiles, artillery, and smart munitions. Information fusion research addresses sensor correlation, relationship discovery, and management services through use of automated processing, as well as higher level reasoning techniques that support automated combat assessment. This PE also supports efforts related to research and application of key EW technologies to intercept, locate, and disrupt, current and emerging threat communications and non-communications emitters, to provide vital, quality combat information directly to users in a timely actionable manner. Specifically, its technologies focus on detecting threat sensors and emitters associated with weapon systems, targeting systems and command, control, communications, computers, and intelligence systems and networks. Project 475 funds congressional special interest items. Since the current PE 0602270A, project 442 efforts are complementary to those funded from PE 0602270A, project 906, all efforts funded and executed from project 442 are being transferred to project 906 in FY10 and beyond, to reduce administrative burden. Work in this PE is related to and fully coordinated with PE 0603270A (EW Technology), PE 0602120A (Sensors and Electronic Survivability), and PE 0603772A (Advanced Tactical Computer Science and Sensor Technology). The cited work is consistent with the Director, Defense Research and Engineering Strategic Plan, the Army Modernization Strategy, and the Army Science and Technology Master Plan. Work is performed by the Army Research, Development and Engineering Command, Communications-Electronics Research, Development, and Engineering Center (CERDEC), Fort Monmouth, NJ and Aberdeen Proving Ground, MD.

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| Exhibit R-2, PB 2011 Army RDT&E Budget Item Justification | | | | DATE: February 2010 | |
| APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 2: Applied Research | | R-1 ITEM NOMENCLATURE PE 0602270A: Electronic Warfare Technology | | | |
| B. Program Change Summary (\$ in Millions) | | | | | |
| | FY 2009 | FY 2010 | FY 2011 Base | FY 2011 OCO | FY 2011 Total |
| Previous President's Budget | 21.739 | 16.119 | 17.292 | 0.000 | 17.292 |
| Current President's Budget | 20.058 | 22.303 | 17.330 | 0.000 | 17.330 |
| Total Adjustments | -1.681 | 6.184 | 0.038 | 0.000 | 0.038 |
| • Congressional General Reductions | | -0.116 | | | |
| • Congressional Directed Reductions | | | | | |
| • Congressional Rescissions | | 0.000 | | | |
| • Congressional Adds | | 6.300 | | | |
| • Congressional Directed Transfers | | | | | |
| • Reprogrammings | -1.449 | 0.000 | | | |
| • SBIR/STTR Transfer | -0.232 | 0.000 | | | |
| • Adjustments to Budget Years | 0.000 | 0.000 | 0.038 | 0.000 | 0.038 |
| Change Summary Explanation | | | | | |
| FY10 Congressionally directed increases. | | | | | |

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| Exhibit R-2A, PB 2011 Army RDT&E Project Justification | | | | | | | | DATE: February 2010 | | | |
| APPROPRIATION/BUDGET ACTIVITY 2040: <i>Research, Development, Test & Evaluation, Army</i> BA 2: <i>Applied Research</i> | | | | R-1 ITEM NOMENCLATURE PE 0602270A: <i>Electronic Warfare Technology</i> | | | | PROJECT 442: <i>TACTICAL EW TECHNOLOGY</i> | | | |
| COST (\$ in Millions) | FY 2009 Actual | FY 2010 Estimate | Base FY 2011 Estimate | OCO FY 2011 Estimate | Total FY 2011 Estimate | FY 2012 Estimate | FY 2013 Estimate | FY 2014 Estimate | FY 2015 Estimate | Cost To Complete | Total Cost |
| 442: <i>TACTICAL EW TECHNOLOGY</i> | 9.389 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | Continuing | Continuing |

A. Mission Description and Budget Item Justification

This objective of this project is to design, develop, and apply electronic warfare technologies to enhance the survivability capabilities of ground combat vehicles, aircraft, and the dismounted Soldier. The survivability approach provides detection avoidance through signature management and hit avoidance using warning receivers and electronic countermeasures. This project applies recent advances in radio frequency (RF), infrared (IR), and electro-optical (EO) sensor and jamming sources to detect, locate, deceive, and jam threats, radar directed target acquisition systems, target-tracking sensors, Surface-to-Air Missiles (SAMs), Air-To-Air Missiles (AAMs), top attack weapons, and electronically fuzed munitions. The ability to neutralize booby traps is pursued, and this project will investigate Electronic Support (ES) technologies used against non-communications signals for targeting and tactical situational awareness. Since the current PE 0602270A, project 442 efforts are complementary to those funded from PE 0602270A, project 906, all efforts funded and executed from project 442 have transferred to project 906 in FY10 and beyond, to reduce administrative burden. The cited work is consistent with the Director, Defense Research and Engineering Strategic Plan, the Army Modernization Strategy, and the Army Science and Technology Master Plan. Work is performed by the Army Research, Development, and Engineering Command, Communications-Electronics Research, Development, and Engineering Center (CERDEC), Fort Monmouth, NJ and Aberdeen Proving Ground, MD.

B. Accomplishments/Planned Program (\$ in Millions)

| | FY 2009 | FY 2010 | Base FY 2011 | OCO FY 2011 | Total FY 2011 |
|--|----------------|----------------|-------------------------|------------------------|--------------------------|
| Program #1 Networked Electronic Warfare: This effort provides autonomous detection, classification, correlation, and geo-location capability against modern wireless emitters and other threats in battlefield and urban environments. In FY09, integrated digital wideband receiver capabilities into a net-centric solution that combines detection and jamming, location, and neutralization capabilities; completed fabrication of adaptive processing arrays; completed algorithm development and validation testing; transitioned advanced RF detection capabilities to existing electronic countermeasure systems. Related work is also being accomplished under PE 0602270A/project 906, PE 0603270A/project K15, and PE 0603270A/project K16. <i>FY 2009 Accomplishments:</i> FY 2009 | 1.956 | 0.000 | 0.000 | 0.000 | 0.000 |

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| Exhibit R-2A, PB 2011 Army RDT&E Project Justification | | | | DATE: February 2010 | | |
| APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 2: Applied Research | | R-1 ITEM NOMENCLATURE PE 0602270A: Electronic Warfare Technology | | PROJECT 442: TACTICAL EW TECHNOLOGY | | |
| B. Accomplishments/Planned Program (\$ in Millions) | | | | | | |
| | | FY 2009 | FY 2010 | Base FY 2011 | OCO FY 2011 | Total FY 2011 |
| FY 2010 Plans: FY 2010 | | | | | | |
| Base FY 2011 Plans: FY 2011 Base | | | | | | |
| OCO FY 2011 Plans: FY 2011 OCO | | | | | | |
| Program #2 Cueing Sensor: This effort develops low cost infrared sensors that detect rocket propelled grenades, anti-tank guided missiles, and tank fired kinetic energy and high energy anti-tank rounds and then cue active protection system for Army vehicles. In FY09, completed focal plane array design; evaluated software algorithms for on the move detection capability. Related work effort is also being accomplished under PE 0603270A/project K16. | | 0.099 | 0.000 | 0.000 | 0.000 | 0.000 |
| FY 2009 Accomplishments: FY 2009 | | | | | | |
| FY 2010 Plans: FY 2010 | | | | | | |
| Base FY 2011 Plans: FY 2011 Base | | | | | | |
| OCO FY 2011 Plans: FY 2011 OCO | | | | | | |
| Program #3 | | 2.963 | 0.000 | 0.000 | 0.000 | 0.000 |
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| Exhibit R-2A, PB 2011 Army RDT&E Project Justification | | | | DATE: February 2010 | | |
| APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 2: Applied Research | | R-1 ITEM NOMENCLATURE PE 0602270A: Electronic Warfare Technology | | PROJECT 442: TACTICAL EW TECHNOLOGY | | |
| B. Accomplishments/Planned Program (\$ in Millions) | | | | | | |
| | | FY 2009 | FY 2010 | Base FY 2011 | OCO FY 2011 | Total FY 2011 |
| Multispectral Threat Warning: This effort develops affordable electro-optic/infrared (EO/IR) countermeasure system concepts with multispectral detectors, multiband laser, and advanced countermeasure architectures. It develops advanced EO/IR countermeasure techniques to exploit signals in background clutter to increase detection, identification, and threat classification capabilities against laser guided munitions, surface-to-air, air-to-air, and anti-tank threats. In FY09, developed and evaluated new algorithm techniques to exploit signals in background clutter to increase detection, identification, and threat classification capabilities. In FY10 and beyond funding for this effort was transferred to PE 0602270A/project 906 under same title. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO | | | | | | |
| Program #4 Advanced Tactical Electronic Support Measures: This effort investigates passive and active techniques and software algorithm development for three dimensional (3D) detection, identification, and precision geolocation of next-generation wireless communication threats and improved situational awareness (SA) under the constraint of operating in the presence of Force Protection jamming systems. Development will also address operational conditions such as dense, co-channel, and multipath radio frequency (RF) environments. In FY09, developed an integrated suite of optimal detection, de-interleaving (arranging received signal components in the appropriate order) and tracking techniques with a goal of full spectrum coverage for all waveform classes in a dense signal | | 2.963 | 0.000 | 0.000 | 0.000 | 0.000 |

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| Exhibit R-2A, PB 2011 Army RDT&E Project Justification | | | | DATE: February 2010 | | |
| APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 2: Applied Research | | R-1 ITEM NOMENCLATURE PE 0602270A: Electronic Warfare Technology | | PROJECT 442: TACTICAL EW TECHNOLOGY | | |
| B. Accomplishments/Planned Program (\$ in Millions) | | | | | | |
| | | FY 2009 | FY 2010 | Base FY 2011 | OCO FY 2011 | Total FY 2011 |
| environment. In FY10 and beyond funding for this effort was transferred to PE 0602270A/project 906 under the title Passive and Active Targeting Techniques. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO | | | | | | |
| Program #5 Low Cost RF Situational Awareness and Countermeasures: This effort provides the electronic countermeasures, signal coherency, power, spectral energy efficiency, and jamming capability to protect friendly airborne and surface platforms from wideband threat weapon systems that use advanced radar processing techniques. In FY09, developed new hardware and software modules with the capability to neutralize the enemy's ability to locate, classify, and engage our forces with radar-based air defense and targeting radars common to both air and ground platforms. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 | | 1.408 | 0.000 | 0.000 | 0.000 | 0.000 |

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| Exhibit R-2A, PB 2011 Army RDT&E Project Justification | | | | DATE: February 2010 | |
| APPROPRIATION/BUDGET ACTIVITY 2040: <i>Research, Development, Test & Evaluation, Army</i> BA 2: <i>Applied Research</i> | R-1 ITEM NOMENCLATURE PE 0602270A: <i>Electronic Warfare Technology</i> | PROJECT 442: <i>TACTICAL EW TECHNOLOGY</i> | | | |
| <u>B. Accomplishments/Planned Program (\$ in Millions)</u> | | | | | |
| | FY 2009 | FY 2010 | Base FY 2011 | OCO FY 2011 | Total FY 2011 |
| <i>Base FY 2011 Plans:</i> FY 2011 Base <i>OCO FY 2011 Plans:</i> FY 2011 OCO | | | | | |
| Accomplishments/Planned Programs Subtotals | 9.389 | 0.000 | 0.000 | 0.000 | 0.000 |
| <u>C. Other Program Funding Summary (\$ in Millions)</u> | | | | | |
| N/A | | | | | |
| <u>D. Acquisition Strategy</u> | | | | | |
| N/A | | | | | |
| <u>E. Performance Metrics</u> | | | | | |
| Performance metrics used in the preparation of this justification material may be found in the FY 2010 Army Performance Budget Justification Book, dated May 2010. | | | | | |

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| Exhibit R-2A, PB 2011 Army RDT&E Project Justification | | | | | | | | | DATE: February 2010 | | |
|---|----------------|------------------|-----------------------|--|------------------------|------------------|------------------|---|---------------------|------------------|---------------|
| APPROPRIATION/BUDGET ACTIVITY | | | | R-1 ITEM NOMENCLATURE | | | | PROJECT | | | |
| 2040: Research, Development, Test & Evaluation, Army BA 2: Applied Research | | | | PE 0602270A: Electronic Warfare Technology | | | | 475: ELECTRONIC WARFARE COMPONENT TECHNOLOGIES (CA) | | | |
| COST (\$ in Millions) | FY 2009 Actual | FY 2010 Estimate | Base FY 2011 Estimate | OCO FY 2011 Estimate | Total FY 2011 Estimate | FY 2012 Estimate | FY 2013 Estimate | FY 2014 Estimate | FY 2015 Estimate | Cost To Complete | Total Cost |
| 475: ELECTRONIC WARFARE COMPONENT TECHNOLOGIES (CA) | 3.587 | 6.268 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | Continuing | Continuing |
| A. Mission Description and Budget Item Justification | | | | | | | | | | | |
| Congressional Interest Item funding for Electronic Warfare technology applied research. | | | | | | | | | | | |
| B. Accomplishments/Planned Program (\$ in Millions) | | | | | | | | | | | |
| | | | | | | | FY 2009 | FY 2010 | Base FY 2011 | OCO FY 2011 | Total FY 2011 |
| Program #1 | | | | | | | 1.594 | 0.000 | 0.000 | 0.000 | 0.000 |
| Battlefield Connectivity, Multi-Level Secure Network: In FY09 this Congressional Interest Item supported the Cross Domain Intelligence release (CDIR) program which is a consolidated, multi-level/domain management secure information system. | | | | | | | | | | | |
| FY 2009 Accomplishments: FY 2009 | | | | | | | | | | | |
| FY 2010 Plans: FY 2010 | | | | | | | | | | | |
| Base FY 2011 Plans: FY 2011 Base | | | | | | | | | | | |
| OCO FY 2011 Plans: FY 2011 OCO | | | | | | | | | | | |
| Program #2 | | | | | | | 1.993 | 0.000 | 0.000 | 0.000 | 0.000 |

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| Exhibit R-2A, PB 2011 Army RDT&E Project Justification | | | DATE: February 2010 | | |
| APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 2: Applied Research | R-1 ITEM NOMENCLATURE PE 0602270A: Electronic Warfare Technology | PROJECT 475: ELECTRONIC WARFARE COMPONENT TECHNOLOGIES (CA) | | | |
| B. Accomplishments/Planned Program (\$ in Millions) | | | | | |
| | FY 2009 | FY 2010 | Base FY 2011 | OCO FY 2011 | Total FY 2011 |
| Counter-IED Force Protection Program: In FY09 this Congressional Interest Item developed and optimized antennas, signal detection and processing hardware/software and algorithms suitable for employment in tactical environments. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO | | | | | |
| Program #3 Hostile Fire Indicator for Aircraft. This is a Congressional Interest Item. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base | 0.000 | 1.492 | 0.000 | 0.000 | 0.000 |
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| Exhibit R-2A, PB 2011 Army RDT&E Project Justification | | | DATE: February 2010 | | | |
| APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 2: Applied Research | R-1 ITEM NOMENCLATURE PE 0602270A: Electronic Warfare Technology | PROJECT 475: ELECTRONIC WARFARE COMPONENT TECHNOLOGIES (CA) | | | | |
| B. Accomplishments/Planned Program (\$ in Millions) | | | | | | |
| | | FY 2009 | FY 2010 | Base FY 2011 | OCO FY 2011 | Total FY 2011 |
| OCO FY 2011 Plans: FY 2011 OCO | | | | | | |
| Program #4 Silver Fox Unmanned Aerial Vehicle - Army. This is a Congressional Interest Item. | | 0.000 | 1.592 | 0.000 | 0.000 | 0.000 |
| FY 2009 Accomplishments: FY 2009 | | | | | | |
| FY 2010 Plans: FY 2010 | | | | | | |
| Base FY 2011 Plans: FY 2011 Base | | | | | | |
| OCO FY 2011 Plans: FY 2011 OCO | | | | | | |
| Program #5 Integrated Information Technology Policy Analyses Research. This is a Congressional Interest Item. | | 0.000 | 3.184 | 0.000 | 0.000 | 0.000 |
| FY 2009 Accomplishments: FY 2009 | | | | | | |
| FY 2010 Plans: FY 2010 | | | | | | |
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| Exhibit R-2A, PB 2011 Army RDT&E Project Justification | | | | DATE: February 2010 | | |
| APPROPRIATION/BUDGET ACTIVITY 2040: <i>Research, Development, Test & Evaluation, Army</i> BA 2: <i>Applied Research</i> | | R-1 ITEM NOMENCLATURE PE 0602270A: <i>Electronic Warfare Technology</i> | | PROJECT 475: <i>ELECTRONIC WARFARE COMPONENT TECHNOLOGIES (CA)</i> | | |
| <u>B. Accomplishments/Planned Program (\$ in Millions)</u> | | | | | | |
| | | FY 2009 | FY 2010 | Base FY 2011 | OCO FY 2011 | Total FY 2011 |
| <i>Base FY 2011 Plans:</i> FY 2011 Base | | | | | | |
| <i>OCO FY 2011 Plans:</i> FY 2011 OCO | | | | | | |
| Accomplishments/Planned Programs Subtotals | | 3.587 | 6.268 | 0.000 | 0.000 | 0.000 |
| <u>C. Other Program Funding Summary (\$ in Millions)</u> | | | | | | |
| N/A | | | | | | |
| <u>D. Acquisition Strategy</u> | | | | | | |
| N/A | | | | | | |
| <u>E. Performance Metrics</u> | | | | | | |
| Performance metrics used in the preparation of this justification material may be found in the FY 2010 Army Performance Budget Justification Book, dated May 2010. | | | | | | |

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| Exhibit R-2A, PB 2011 Army RDT&E Project Justification | | | | | | | | DATE: February 2010 | | | |
| APPROPRIATION/BUDGET ACTIVITY 2040: <i>Research, Development, Test & Evaluation, Army</i> BA 2: <i>Applied Research</i> | | | | R-1 ITEM NOMENCLATURE PE 0602270A: <i>Electronic Warfare Technology</i> | | | | PROJECT 906: <i>Tactical Electronic Warfare Applied Research</i> | | | |
| COST (\$ in Millions) | FY 2009 Actual | FY 2010 Estimate | Base FY 2011 Estimate | OCO FY 2011 Estimate | Total FY 2011 Estimate | FY 2012 Estimate | FY 2013 Estimate | FY 2014 Estimate | FY 2015 Estimate | Cost To Complete | Total Cost |
| 906: <i>Tactical Electronic Warfare Applied Research</i> | 7.082 | 16.035 | 17.330 | 0.000 | 17.330 | 17.806 | 18.175 | 18.518 | 21.855 | Continuing | Continuing |

A. Mission Description and Budget Item Justification

Efforts in this project design, develop, and apply key electronic warfare (EW)/Information Operations technologies to enhance platform survivability (to include ground combat vehicles, aircraft, and the dismounted Soldier) and to intercept and locate current and emerging threat communications and non-communications emitters. This project applies recent advances in radio frequency (RF), infrared (IR), and electro-optical (EO) sensor and jamming sources to detect, locate, deceive, and jam threats, radar directed target acquisition systems, target-tracking sensors, Surface-to-Air Missiles (SAMs), Air-To-Air Missiles (AAMs), top attack weapons, and electronically fuzed munitions, the ability to neutralize booby traps is also pursued. This project develops information systems to provide vital, quality combat information directly to users in a timely actionable manner in accordance with concepts for future force intelligence operations. This project investigates RF collection and mapping technologies to offer real time emitter detection, location, and identification. In addition, this project enables a remote capability to disrupt, deny, or destroy threat communication signals, other research areas include fusion (automated assimilation and synthesis) of battlefield intelligence data to enable interpretation of current and future enemy activities and allowing development of courses of action in time to act decisively and in a pre-emptive manner.

Since the current PE 0602270A, project 442 efforts are complementary to those funded from PE 0602270A, project 906, all efforts funded and executed from project 442 are being transferred to project 906 in FY10 and beyond, to reduce administrative burden. The cited work is consistent with the Director, Defense Research and Engineering Strategic Plan, the Army Modernization Strategy, and the Army Science and Technology Master Plan. Work in this project is performed by the Army Research, Development, and Engineering Command, Communications-Electronics Research, Development, and Engineering Center (CERDEC), Ft. Monmouth, NJ and Aberdeen Proving Ground, MD.

B. Accomplishments/Planned Program (\$ in Millions)

| | FY 2009 | FY 2010 | Base FY 2011 | OCO FY 2011 | Total FY 2011 |
|---|----------------|----------------|-------------------------|------------------------|--------------------------|
| Program #1 Multi-Intelligence Data Fusion and Targeting: This effort investigates and develops software technologies for advanced Intelligence/Battle Command enterprise collaboration that enable the enterprise to identify, fuse, trace/track specific human targets in an asymmetric environment. In FY10, develop advanced data ingestion (throughput of high volume and non-traditional data types), data alignment/conversion (normalization), and correlation and data engineering management techniques. In FY11, will integrate additional fusion algorithms, data, sensor and message types, temporal enhancements, as well as integrated extraction, visualization, and | 0.000 | 5.484 | 6.915 | 0.000 | 6.915 |

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| APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 2: Applied Research | | R-1 ITEM NOMENCLATURE PE 0602270A: Electronic Warfare Technology | | PROJECT 906: Tactical Electronic Warfare Applied Research | | |
| B. Accomplishments/Planned Program (\$ in Millions) | | | | | | |
| | | FY 2009 | FY 2010 | Base FY 2011 | OCO FY 2011 | Total FY 2011 |
| conceptualization tools into a fusion & exploitation framework for improved target tracking and identification; investigate biometric data matching and fusion algorithms for use in non-cooperative intelligence collection environment. Related work is also being accomplished under PE 0602120A/project H15. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO | | | | | | |
| Program #2 Offensive Information Operations Technologies: This effort investigates and develops techniques that identify and capture data traversing targeted networks for the purpose of Information Operations or otherwise countering adversary communications. In FY10, define distributed communications to allow the technologies to communicate and migrate between nodes; begin development of interception and countermeasure capabilities against network traffic flows of interest; develop Network Operations techniques against relevant high priority protocols; research methods to link this Computer Network Operations (CNO) framework to previously developed Electronic Warfare (EW) frameworks. In FY11, will develop capability for identification and capture of protocols of interest; will implement algorithms to allow for surgical and coordinated exploitation amongst nodes; will develop traffic analysis techniques to discriminate amongst individual data sessions; will prototype communication and coordination capabilities between CNO and EW systems. | | 0.000 | 3.692 | 3.770 | 0.000 | 3.770 |

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| Exhibit R-2A, PB 2011 Army RDT&E Project Justification | | | | DATE: February 2010 | | |
| APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 2: Applied Research | | R-1 ITEM NOMENCLATURE PE 0602270A: Electronic Warfare Technology | | PROJECT 906: Tactical Electronic Warfare Applied Research | | |
| B. Accomplishments/Planned Program (\$ in Millions) | | | | | | |
| | | FY 2009 | FY 2010 | Base FY 2011 | OCO FY 2011 | Total FY 2011 |
| FY 2009 Accomplishments: FY 2009 | | | | | | |
| FY 2010 Plans: FY 2010 | | | | | | |
| Base FY 2011 Plans: FY 2011 Base | | | | | | |
| OCO FY 2011 Plans: FY 2011 OCO | | | | | | |
| Program #3 | | 0.000 | 3.191 | 3.068 | 0.000 | 3.068 |
| Multispectral Threat Warning: This effort investigates the benefits of augmenting the currently fielded Ultra-Violet (UV)-based Common Missile Warning System (CMWS) threat detection capability with infrared (IR) and acoustic sensors to: improve the probability of detection of Man-Portable Air Defense System (MANPADS)-like threats; reduce atmospheric clutter and, thereby, the false alarm rate, and add detection of ball ammunition to the current CMWS tracer-only capability. In FY10, investigate integration of acoustic signals into UV-based hostile fire indication (HFI) algorithms; evaluate acoustic array hardware concepts with regard to algorithm design and begin correlation of acoustic and UV based HFI data based on hardware integration concepts. In FY11, will finalize IR and UV sensor integration algorithms; will demonstrate integration concept of these multispectral sensors and their affect on detection and false alarm in a laboratory environment; will demonstrate effectiveness of acoustic sensor in enhancing HFI algorithms. | | | | | | |
| FY 2009 Accomplishments: FY 2009 | | | | | | |

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| Exhibit R-2A, PB 2011 Army RDT&E Project Justification | | | | DATE: February 2010 | | |
| APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 2: Applied Research | | R-1 ITEM NOMENCLATURE PE 0602270A: Electronic Warfare Technology | | PROJECT 906: Tactical Electronic Warfare Applied Research | | |
| B. Accomplishments/Planned Program (\$ in Millions) | | | | | | |
| | | FY 2009 | FY 2010 | Base FY 2011 | OCO FY 2011 | Total FY 2011 |
| FY 2010 Plans: FY 2010 | | | | | | |
| Base FY 2011 Plans: FY 2011 Base | | | | | | |
| OCO FY 2011 Plans: FY 2011 OCO | | | | | | |
| Program #4 | | 0.000 | 3.411 | 3.577 | 0.000 | 3.577 |
| Passive and Active Targeting Techniques: This effort investigates passive and active techniques and software algorithm development for three dimensional (3D) detection, identification, and precision geolocation of next-generation wireless communication threats and improved situational awareness (SA). Development will also address operational conditions such as dense, co-channel, and multipath radio frequency (RF) environments. In FY10, evaluate and select precision geolocation techniques and analyze performance results in the presence of jamming and under varying environmental conditions; design software to implement selected techniques on commercial based software defined radio representative hardware; evaluate techniques for feasibility of implementation on representative hardware. In FY11, will enhance geolocation techniques based on results of representative hardware testing; will perform additional simulation and laboratory validation testing of these enhancements utilizing synthesized and outdoor wireless RF data collected in relevant field environments; will transition executable software package, software model and associated engineering analysis quantifying technique performance and effectiveness to applicable follow-on technology demonstration, program of record or quick reaction capability. | | | | | | |
| FY 2009 Accomplishments: FY 2009 | | | | | | |

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| B. Accomplishments/Planned Program (\$ in Millions) | | | | | | |
| | | FY 2009 | FY 2010 | Base FY 2011 | OCO FY 2011 | Total FY 2011 |
| FY 2010 Plans: FY 2010 | | | | | | |
| Base FY 2011 Plans: FY 2011 Base | | | | | | |
| OCO FY 2011 Plans: FY 2011 OCO | | | | | | |
| Program #5 Networked Electronic Warfare: This effort provides autonomous detection, classification, correlation, and geo-location capability against modern wireless emitters and other threats in battlefield and urban environments. In FY09, investigated and developed techniques to engage emergent communications technologies for inclusion into Information Operations (IO) techniques database; refined IO techniques database for access and use by other users including Joint Service and other members of intelligence community. Related work is also being accomplished under PE 0602270A/project 442; PE 0603270A/project K15, and PE 0603270A/project K16. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO | | 4.091 | 0.000 | 0.000 | 0.000 | 0.000 |

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| APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 2: Applied Research | R-1 ITEM NOMENCLATURE PE 0602270A: Electronic Warfare Technology | PROJECT 906: Tactical Electronic Warfare Applied Research | | | |
| B. Accomplishments/Planned Program (\$ in Millions) | | | | | |
| | FY 2009 | FY 2010 | Base FY 2011 | OCO FY 2011 | Total FY 2011 |
| Program #6 Fusion Based Technologies: This effort develops an advanced knowledge generation capability to answer warfighting commanders' priority intelligence requirements (PIR) for the future force. These answers provide actionable intelligence enabling timely decision-making by commanders and timely action by Soldiers in the execution of operations. In FY09, developed final set of representations for different types of enemy tactics to handle more complex and asymmetric behaviors such as ambushes, vehicle-borne explosive devices, and sniper attacks; demonstrated capabilities to automatically identify and link human-specified critical entities and activities to PIRs and reveal emerging actionable intelligence; developed and demonstrated an intelligence, surveillance, and reconnaissance planning/re-planning toolset with capabilities for evaluating and selecting the most capable and relevant collection assets given PIRs and contextual information. Related work is also being accomplished under PE 0602270A/project 442 and PE 0603772A/project 243. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO | 2.991 | 0.000 | 0.000 | 0.000 | 0.000 |
| Program #7 Small Business Innovative Research/Small Business Technology Transfer Programs | 0.000 | 0.257 | 0.000 | 0.000 | 0.000 |

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| APPROPRIATION/BUDGET ACTIVITY 2040: <i>Research, Development, Test & Evaluation, Army</i> BA 2: <i>Applied Research</i> | | R-1 ITEM NOMENCLATURE PE 0602270A: <i>Electronic Warfare Technology</i> | | PROJECT 906: <i>Tactical Electronic Warfare Applied Research</i> | | |
| B. Accomplishments/Planned Program (\$ in Millions) | | | | | | |
| | | FY 2009 | FY 2010 | Base FY 2011 | OCO FY 2011 | Total FY 2011 |
| <i>FY 2009 Accomplishments:</i> FY 2009 <i>FY 2010 Plans:</i> FY 2010 <i>Base FY 2011 Plans:</i> FY 2011 Base <i>OCO FY 2011 Plans:</i> FY 2011 OCO | | | | | | |
| Accomplishments/Planned Programs Subtotals | | 7.082 | 16.035 | 17.330 | 0.000 | 17.330 |
| C. Other Program Funding Summary (\$ in Millions) N/A | | | | | | |
| D. Acquisition Strategy N/A | | | | | | |
| E. Performance Metrics Performance metrics used in the preparation of this justification material may be found in the FY 2010 Army Performance Budget Justification Book, dated May 2010. | | | | | | |

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