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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 3: Advanced Technology Development (ATD)				R-1 ITEM NOMENCLATURE PE 0603270A: 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	32.544	21.877	18.350	0.000	18.350	18.654	18.977	22.793	28.551	0	180.096
K12: EW Demonstrations (CA)	9.170	2.785	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
K15: ADVANCED COMM ECM DEMO	14.155	9.342	9.393	0.000	9.393	9.548	9.724	11.391	14.034	Continuing	Continuing
K16: NON-COMMO ECM TECH DEM	9.219	9.750	8.957	0.000	8.957	9.106	9.253	11.402	14.517	Continuing	Continuing

A. Mission Description and Budget Item Justification

Efforts in this program element (PE) mature and demonstrate electronic warfare (EW) technologies intended to deny, disrupt, locate, or destroy the enemy's Command, Control, and Communications (C3) systems and intelligence, surveillance and reconnaissance assets. This PE matures both countermeasures (CM) and counter-countermeasures (CCM) to deny the enemy the use of their systems while protecting US assets from enemy deception and jamming. This PE supports the maturation and demonstration of technologies to locate and exploit enemy communication systems including computer networks (project K15) and multifunctional EW capability to enhance platform survivability (jamming) and the detection, identification and geo-location of emitters of interest to provide near real-time situational awareness to the commander (project K16). Project K12 funds congressional special interest items. Work in this PE is coordinated with PE 0603313A (Missile and Rocket Advanced Technology), PE 0603003A (Aviation Advanced Technology), PE 0602270A (EW Techniques), PE 0602120A (Sensors and Electronic Survivability), and PE 0603772A (Advanced Tactical Computer Science). 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 PE is performed by the Army Research, Development, and Engineering Command (RDECOM), Communications-Electronics Research, Development, and Engineering Center (CERDEC), Fort Monmouth, NJ and Aberdeen Proving Ground, MD.

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APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603270A: 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	33.086	19.192	18.513	0.000	18.513
Current President's Budget	32.544	21.877	18.350	0.000	18.350
Total Adjustments	-0.542	2.685	-0.163	0.000	-0.163
• Congressional General Reductions		-0.115			
• Congressional Directed Reductions					
• Congressional Rescissions		0.000			
• Congressional Adds		2.800			
• Congressional Directed Transfers					
• Reprogrammings	0.257	0.000			
• SBIR/STTR Transfer	-0.799	0.000			
• Adjustments to Budget Years	0.000	0.000	-0.163	0.000	-0.163
Change Summary Explanation					
FY10 - Congressional directed increases.					

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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				PE 0603270A: Electronic Warfare Technology				K12: EW Demonstrations (CA)			
BA 3: Advanced Technology Development (ATD)											
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
K12: EW Demonstrations (CA)	9.170	2.785	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 Demonstrations.											
B. Accomplishments/Planned Program (\$ in Millions)											
							FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Program #1							1.994	0.000	0.000	0.000	0.000
Aerial Canopy MASINT System (ACMS): In FY09, this Congressional Interest Item developed an auto-rotating package to provide a slow decent speed capable for the sensor system to deposit in the tree tops; integrated photovoltaic cells provided a recharge capability for long endurance missions.											
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							1.994	0.000	0.000	0.000	0.000

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B. Accomplishments/Planned Program (\$ in Millions)					
	FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Advanced IED Jammer Research and Development Program: In FY09, this Congressional Interest Item supported quick reaction initiatives to provide advanced ground electronic warfare systems and technologies for DoD; researched neutralizing techniques against future/anticipated IED threats. 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 Advanced Communications ECM Demonstration: In FY09, this Congressional Interest Item integrated Intelligence Surveillance and Reconnaissance (ISR) , Electronic Support Measure (ESM), Electronic Attack (EA), and Tactical Command Data Link (TCDL) payloads on Class III/IV UAV surrogate platforms (UH-60); integrated airborne ISR/ESM/EA/TCDL capability with ground stations, a network, DCGS-A V3 workstation, and PM C4ISR OTM facility; tested this demonstrable prototype package against live and virtual mounted and dismounted adversaries for persistent surveillance and attack operations. FY 2009 Accomplishments: FY 2009	1.595	0.000	0.000	0.000	0.000

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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 #4		1.195	0.000	0.000	0.000	0.000
Non-communications ECM Technology Demonstration: In FY09, this Congressional Interest Item upgraded current C-IED collection, examination and characterization facilities; augmented the integration of Hostile Fire Indicator (HFI), Special Purpose Electronic Attack (SPEA), and Tactical Common Data Link (TCDL) payloads on Class III/IV surrogate platforms (UH-60); integrated airborne Air Survivability Equipment (ASE)/SPEA/TCDL capability with ground stations, a network, DCGS-A workstation, and PM C4ISR OTM facility; tested this demonstrable prototype against live and virtual mounted and dismounted adversaries for persistent surveillance, protection, and attack operations.						
FY 2009 Accomplishments: FY 2009						
FY 2010 Plans: FY 2010						
Base FY 2011 Plans: FY 2011 Base						

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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 #5 Highly Mobile Remote Controlled IED Countermeasure: In FY09, this Congressional Interest Item continued development and demonstration of lightweight, high performance Improvised Explosive Device Countermeasures (IED) system for the dismounted warfighter; completed Band C backpack and size reduction of Band A&B backpacks. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO	0.797	0.000	0.000	0.000	0.000
Program #6 ALQ-211 Networked EW Controller: In FY09, this Congressional Interest Item completed software and hardware requirements; completed lab demo. FY 2009 Accomplishments: FY 2009	1.595	0.796	0.000	0.000	0.000

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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 #7 Advanced Ground Electronic Warfare & Signals Intelligence System. This is a Congressional Interest Item.	0.000	1.989	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					
Accomplishments/Planned Programs Subtotals	9.170	2.785	0.000	0.000	0.000

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<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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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
K15: <i>ADVANCED COMM ECM DEMO</i>	14.155	9.342	9.393	0.000	9.393	9.548	9.724	11.391	14.034	Continuing	Continuing

A. Mission Description and Budget Item Justification

Efforts in this project mature and demonstrate the ability to locate and identify modern tactical battlefield enemy and blue force radio frequency (RF) communications, radars, and computer networks and nodes to enable uninterrupted air and ground based intelligence collection and long range targeting operations in a hostile electromagnetic and cyber environment. This project matures and demonstrates communications countermeasures (CM) and counter-countermeasures (CCM) technologies to first intercept, then identify, and locate tactical communications and degrade threat computer networks and their components. 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 (RDECOM), 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 Offensive Operations: This effort matures and demonstrates integrated Electronic Attack (EA)/Computer Network Operations (CNO) capability to execute Force Protection (FP), Electronic Attack (EA), Electronic Surveillance (ES), and Signals Intelligence (SIGINT) missions in a dynamic, distributed and coordinated fashion. The result will be the capability to engage a multitude of diverse multi-node, multi-waveform, multi-platform and cyber (internetworked computer) targets while maximizing overall network efficiency and effectiveness while preserving blue force/non-combatant communications. In FY10, develop and mature algorithms for distributed scheduling and predicted impact; will mature high-fidelity models of next generation techniques to include lethal effects and threat/node characterization. In FY11, will enhance system baseline for distributed operation; will focus techniques development on threat priorities; will identify and implement system and network load balancing techniques to ensure effective and efficient operation; will develop techniques to ensure coordination and interoperability with Counter RCIED (Remote Control Improvised Explosive Device) Electronic Warfare (CREW) systems. Work related to this effort is also being accomplished under PE 0603270A/project K16.	0.000	4.578	4.696	0.000	4.696

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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 #2 Stand-off Non-Cooperative Multi-Intelligence Technologies: This effort matures and demonstrates technologies to detect, identify, map, and display structural layouts, identify and locate personnel, RF devices and anomalies located within structures and complex terrain to provide dismounted and remote users with the capability to conduct standoff ISR in a three dimensional urban battlespace. In FY10, analyze and design optimum sensor mix; develop and mature software algorithms and hardware; mature modeling and simulation for sensor mix. In FY11, improve and implement new algorithms and techniques for detection of slow-moving and stationary personnel inside structures and reduce false positives due to multipath in urban environments; leverage data from Improvised Electronic Device (IED) efforts to develop algorithms that would allow through-wall detection of personnel carrying weapons and explosive devices; assess/leverage recent developments in 3-D visualization and mapping efforts and apply radio frequency detection techniques as necessary to selected ground radars and/or their ground stations. FY 2009 Accomplishments: FY 2009		0.000	4.577	4.697	0.000	4.697

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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 #3 Networked Electronic Warfare (EW): This effort provides the capability to autonomously detect, classify, correlate, and geo-locate modern wireless communication emitters on the battle field and in urban terrain. In FY09, integrated commercial off-the-shelf 3-D visualization and mapping tools with geo-location solution set for optimal urban situational awareness and emitter representation; integrated capabilities into net-centric solution that combines jamming and detection/location/neutralization capabilities; completed algorithm development and validation and fabrication of adaptive processing arrays. Related work is also accomplished under PE 0602270A/project 442, PE 0602270A/project 906, and PE 0603270A/project K16. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base	9.067	0.000	0.000	0.000	0.000

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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 Combat Identification (CID) Technology Demonstration: This effort matures and demonstrates real time CID technologies for light weight tactical vehicles and Soldiers. In FY09, matured and demonstrated the Soldier Radio Waveform (SRW) as a radio-based application that would provide both a target identification (TI) and situational awareness (SA) capability for light vehicle applications as well as urban and open terrain operation for Soldier level applications; matured TI interrogation approaches utilizing either laser or radio frequency components; enhanced the SRW software to allow it to respond to directed interrogations for TI capability as well as to provide SA capability even in Global Positioning System denied environments; integrated and demonstrated the processor, transceiver, and antenna for the miniaturized Battlefield Target Identification Device (BTID) CID system on light weight tactical vehicles. Work related to this effort 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	5.088	0.000	0.000	0.000	0.000
Program #5 Small Business Innovative Research/Small Business Technology Transfer Programs	0.000	0.187	0.000	0.000	0.000

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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	14.155	9.342	9.393	0.000	9.393
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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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
K16: <i>NON-COMMO ECM TECH DEM</i>	9.219	9.750	8.957	0.000	8.957	9.106	9.253	11.402	14.517	Continuing	Continuing

A. Mission Description and Budget Item Justification

Efforts in this project mature and demonstrate non-communication, multi-functional electronic warfare capabilities that enhance the survivability of Army air and ground platforms and dismounted forces. This project matures and demonstrates radio frequency (RF), infrared (IR) and electro-optical (EO) sensor and jamming source technologies to detect, locate, deceive, and neutralize (jam) booby traps, radar directed target acquisition systems, target-tracking sensors, surface-to-air missiles (SAMs), air-to-air missiles (AAMs), top attack and electronically fuzed munitions. This project also matures and demonstrates Electronic Support (ES) technologies to detect, identify, and geolocate emitters of interest from an effective standoff distance and provide near real-time situational awareness. 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 (RDECOM), Communications-Electronic Research, Development, and Engineering Center (CERDEC), Ft. Monmouth NJ and Aberdeen Proving Ground, MD, and the Army Research Lab, Adelphi MD.

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

	FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Program #1 Distributed Aperture Infrared Countermeasures (DAIRCM) Technologies: This effort matures and demonstrates an integrated laser source, distribution system, and beam director that support multi-function helicopter protection with an integrated cueing capability. In FY10, investigate and mature a laser pointer tracker (LPT) to be aligned bore-sited with the UV-based CMWS sensors. The LPT will scan areas of interest cued by the missile warning system (MWS) and receive laser return for the incoming threat. In FY11, will complete design of integrated missile warning and multi-band laser demonstration system; will integrate advanced two color IR missile warning system to improve overall system performance with high probability of detection/low false alarm, while the pointer-tracker will expand the mission profile by increasing pointer-tracker reliability and permit simultaneous multiple threat engagement; will develop target identification database for mission post analysis; will finalize digital threat-warning hardware design; will perform testing on correlation algorithms and architecture.	0.000	4.665	4.405	0.000	4.405

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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 #2 Advanced Tactical Radio Frequency Countermeasures (ATRFCM) Technologies: This effort matures and demonstrates an integrated Electronic Warfare/Direction Finding system for the protection of platforms from emerging RF threats. In FY10, mature and demonstrate improved wideband frequency waveform generators for higher spectral purity and modulation flexibility; wideband receivers capable of high speed, dynamic signal demodulation and data collection; and high power, efficient, RF amplifiers, for improved Electronic Warfare (EW)/communications compatibility; begin integration into a working brassboard for lab and field testing; develop and mature integrated and distributed packaging for improved vehicle integration and thermal performance. In FY11, will optimize platform protection capabilities through the coordination of real-time dynamic antenna selection; will demonstrate real time on-the-move direction finding and geolocation capabilities that will complement targeting and cueing activities of overarching force protection and Comms EW missions to support a common operating picture. FY 2009 Accomplishments: FY 2009		0.000	4.864	4.552	0.000	4.552

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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 #3		2.175	0.000	0.000	0.000	0.000
Networked Electronic Warfare: This effort provides autonomous detection, classification, correlation, and geolocation capability against modern wireless emitters and other threats supporting force protection technology. In FY09, completed algorithm development and validation of adaptive processing arrays; integrated visualization and mapping tools with geolocation solution sets; demonstrated capability in the lab. Work related to this effort is also being accomplished under PE 0602270A/project 442; PE 0602270A/project 906, and PE 0603270A/project K15.						
FY 2009 Accomplishments: FY 2009						
FY 2010 Plans: FY 2010						
Base FY 2011 Plans: FY 2011 Base						
OCO FY 2011 Plans: FY 2011 OCO						

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B. Accomplishments/Planned Program (\$ in Millions)					
	FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Program #4 Cueing Sensor: This effort matures and demonstrates low cost infrared sensors that detect rocket propelled grenades, anti-tank guided missiles, tank fired and high energy anti-tank rounds and then cues active protection systems for Army vehicles. In FY09, demonstrated the cueing sensor software and hardware against different types of live fire munitions (threats to ground vehicle); demonstrated the capability to detect, declare, and classify the live fire threats; transitioned the cueing sensor hardware and software to the active protection system (APS) effort for integration into the kinetic energy APS vehicle survivability system. Work related to this effort is also being accomplished under PE 0602270A/project 442. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO	7.044	0.000	0.000	0.000	0.000
Program #5 Small Business Innovative Research/Small Business Technology Transfer Programs FY 2009 Accomplishments: FY 2009	0.000	0.221	0.000	0.000	0.000

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<u>B. Accomplishments/Planned Program (\$ in Millions)</u>						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
<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		9.219	9.750	8.957	0.000	8.957
<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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