Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Army										DATE: February 2011	
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*				R-1 ITEM NOMENCLATURE PE 0602712A: *Countermine Systems*							
COST ($ in Millions)	**FY 2010**	**FY 2011**	**FY 2012 Base**	**FY 2012 OCO**	**FY 2012 Total**	**FY 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**Cost To Complete**	**Total Cost**
Total Program Element	27.892	19.118	20.280	-	20.280	20.878	21.257	21.446	21.756	Continuing	Continuing
H24: *COUNTERMINE TECH*	15.575	16.242	17.348	-	17.348	17.888	18.213	18.351	18.608	Continuing	Continuing
H35: *CAMOUFLAGE & COUNTER-RECON TECH*	2.767	2.876	2.932	-	2.932	2.990	3.044	3.095	3.148	Continuing	Continuing
HB2: *COUNTERMINE COMPONENT TECHNOLOGY (CA)*	9.550	-	-	-	-	-	-	-	-	Continuing	Continuing

Note

FY10 funding increase is for congressional special interest items.

A. Mission Description and Budget Item Justification

This program element (PE) investigates and develops applied technologies to improve countermine, signature management, and counter-sensors capabilities. The focus is on sensor technologies to improve detection of mines, explosive threats and directed energy; ballistic methods to defeat mines and explosive threats; and signature management technologies to reduce reconnaissance capabilities of the enemies. This PE also supports DoD's Center of Excellence for Unexploded Ordnance which coordinates and standardizes land mine signature models; maintains a catalogue of mine signatures; supports the evaluation of mine detection sensors and algorithms; and working in conjunction with the US Army Engineering, Research and Development Center (ERDC), examines countermine phenomenology of surface and buried mines, and explosive threats. This PE advances the state of the art in Countermine Technologies (project H24) and Camouflage and Counter Reconnaissance Technologies (project H35). Countermine Component Technology (project HB2) funds congressional special interest items.

Work in this PE is related to and is fully coordinated with PE 0602120A, (Sensors and Electronic Survivability), PE 0602624A, (Weapons and Munitions Technology), PE 0602709A, (Night Vision Technology), PE 0602622A , (Chemical, Smoke and Equipment Defeating Technology), PE 0602784A (Military Engineering Technology), PE 0603606A, (Landmine Warfare and Barrier Advanced Technology), PE 0603710A (Night Vision Advanced 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 in this PE is performed by the Army Research, Development, and Engineering Command (RDECOM), Communications-Electronics Research, Development, and Engineering Center (CERDEC), Fort Belvoir, VA.

Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602712A: *Countermine Systems*	

B. Program Change Summary ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Previous President's Budget	23.621	19.118	20.480	-	20.480
Current President's Budget	27.892	19.118	20.280	-	20.280
Total Adjustments	4.271	-	-0.200	-	-0.200
• Congressional General Reductions		-			
• Congressional Directed Reductions		-			
• Congressional Rescissions	-	-			
• Congressional Adds		-			
• Congressional Directed Transfers		-			
• Reprogrammings	4.775	-			
• SBIR/STTR Transfer	-0.504	-			
• Adjustments to Budget Years	-	-	-0.200	-	-0.200

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602712A: *Countermine Systems*	PROJECT H24: *COUNTERMINE TECH*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
H24: *COUNTERMINE TECH*	15.575	16.242	17.348	-	17.348	17.888	18.213	18.351	18.608	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project investigates and develops new countermine technologies that use man-portable, ground-vehicular, and airborne platforms for detection, discrimination, and neutralization of individual mines, minefields, and other explosive threats. The goal of this project is to accurately detect threats with a high probability, reduce false alarms, and enable an increased operational tempo.

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), Fort Belvoir, VA.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Title: Department of Defense Unexploded Ordnance (UXO) Center of Excellence (UXOCOE)	0.479	0.495	0.493
Description: The Army serves as executive agent of the UXOCOE, which provides for the coordination of UXO across the Department of Defense (DoD) and serves as the focal point for research, development, testing and evaluation (RDT&E) for UXO detection and clearance technologies. ***FY 2010 Accomplishments:*** Analyzed catalogued detection and clearance requirements, and technologies to determine RDT&E shortfalls and leveraging opportunities. ***FY 2011 Plans:*** Continue the coordination, with the Joint services, for the UXO detection and clearance research, demonstration, test and evaluation program. ***FY 2012 Plans:*** Will research and evaluate the UXO RDT&E detection and clearance information and coordinate across the DoD.			
Title: Standoff Mine/Defeat Neutralization Technology	7.426	7.612	3.562
Description: This effort investigates and evaluates the ability to pre-detonate and neutralize mines, and emerging threats at tactically relevant standoff ranges.			

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602712A: *Countermine Systems*	PROJECT H24: *COUNTERMINE TECH*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
FY 2010 Accomplishments: Developed and evaluated two neutralization technologies: a brassboard for laser drilling technologies and a brassboard for munitions against buried and obscured threats. ***FY 2011 Plans:*** Conduct laboratory tests with the brassboards for laser drilling and for munitions in an environment that simulates theater operations (e.g. threat, weather, and environmental conditions) to assess the relative performance against a spectrum of buried and obscured threats. ***FY 2012 Plans:*** Will investigate and integrate diode based laser pump technology into a neutralization brassboard; will evaluate the power and energy output with regards to requirements to defeat mine and threat explosives.			
Title: Standoff Explosive Compound Detection Technology ***Description:*** This effort investigates ground based detection and confirmation technologies of explosives compounds from tactically relevant standoff distances. The effort is complimentary to the work being accomplished under PE 0602622A/project 552. ***FY 2010 Accomplishments:*** Performed an explosive compound behavioral study on different surfaces under various environmental conditions; and determined performance of ground based detection systems for a spectrum of threats. ***FY 2011 Plans:*** Perform a comprehensive evaluation of the candidate brassboard (such as laser induced breakdown spectroscopy and ultra-violet spectroscopy) for standoff performance validation (standoff range) and continue to refine the performance of the ground based and airborne detection systems. Conduct field evaluations of selected technologies. ***FY 2012 Plans:*** Will conduct data collection of domestic and foreign explosive compounds in order to populate and categorize signatures and will utilize the data in conjunction with algorithm development; will research potential to increase detection sensitivity with newly designed algorithms versus the sensitivity of current technology; will investigate explosive detection sensors that have potential to reduce false alarms in high clutter areas.	3.022	3.307	3.762
Title: Advanced Electro-Magnetic (EM) and Electro Optic (EO) Sensors for Detection Emerging Threats Devices ***Description:*** This effort investigates all-terrain standoff detection using multiple modalities in order to locate mine and emerging threats with minimal false alarms.	-	4.828	4.701

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602712A: *Countermine Systems*	PROJECT H24: *COUNTERMINE TECH*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
FY 2011 Plans: Begin efforts to investigate advanced electromagnetic induction technologies and EO sensors; incorporate the advances made in forward looking ground penetrating radar and electromagnetic induction and EO sensors for detection of metallic mines and explosive threats buried in-road and in urban areas. ***FY 2012 Plans:*** Will design and develop a brassboard with data collection capabilities incorporating EM, Electromagnetic Interference (EMI), and EO advancements; will evaluate EO sensing and EM detection concepts for detection of emerging threats; will integrate and combine emerging Defense Advanced Research Projects Agency standoff vibration detection technology with the EM, EMI, and EO based sensors and with a downward looking active EO laser and/or Laser Detection & Ranging (for ground surface profiling) technology			
Title: Detection of Home Made Explosive (HME) Production Facilities and Threats ***Description:*** This effort investigates and develops emerging homemade explosive (HME) detection technologies to address Warfighter needs for standoff detection and confirmation of HME production facilities and threats. Work related to this effort is also being accomplished under PE 0602622A/project 552. ***FY 2012 Plans:*** Will investigate short wave infrared and long wave infrared hyperspectral imaging techniques for detecting homemade explosive threats; will determine and analyze concentrations of HME required for reliable detection in different air and ground scenarios (e.g., production and drying facilities, spill sights, residue on vehicles and other objects); will research algorithm techniques for separation of HME signatures from background clutter leading to algorithms for automated HME detection.	-	-	4.830
Title: Anti-personnel/Anti-Tank Mine False Alarm Reduction ***Description:*** This effort investigates new sensor and signal processing component technology for ground based and airborne systems that provide the Warfighter solutions to standoff mine/emerging threat detection while reducing false alarm rates. ***FY 2010 Accomplishments:*** Performed a comprehensive evaluation of candidate sensors to assess threat detection performance using the processor in a variety of operational conditions; completed the phenomenology study and signal processing algorithm development.	4.648	-	-
Accomplishments/Planned Programs Subtotals	15.575	16.242	17.348

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602712A: *Countermine Systems*	PROJECT H24: *COUNTERMINE TECH*

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.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602712A: *Countermine Systems*	PROJECT H35: *CAMOUFLAGE & COUNTER-RECON TECH*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
H35: *CAMOUFLAGE & COUNTER-RECON TECH*	2.767	2.876	2.932	-	2.932	2.990	3.044	3.095	3.148	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project evaluates and develops advanced signature management and deception technologies for masking friendly force capabilities and intentions. Technologies pursued under this effort reduce the cross section of sensor systems. Technologies investigated include the decentered field lens, wavefront coding, and spectral filtering and threat sensing algorithms.

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), Fort Belvoir, VA.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Title: Camouflage and Counter-Reconnaissance Technology for Advanced Spectral Sensors:	2.767	2.876	2.932
Description: This effort investigates and advances new technologies to reduce susceptibility of sensors and extends camouflage technology. ***FY 2010 Accomplishments:*** Investigated advanced signature reduction approaches for uncooled and dual band staring sensors, and other staring sensors; investigated the susceptibility of foreign and friendly systems to hyperspectral detection methods; developed near-term improvements to camouflage paints, coatings, and systems in both the visible and non-visible wavelength regions. ***FY 2011 Plans:*** Continue to develop the optical signature reduction effort; widen the key sensor waveband coverage and future staring sensors, such as day television and shortwave infrared; investigate camouflage paints or other systems for hyperspectral signature reduction; and validate for effectiveness and potential for implementation in operational systems. ***FY 2012 Plans:*** Will continue investigation of the susceptibility of foreign and friendly systems to hyperspectral detection methods; will conduct experiments and evaluate multiple technologies to ensure signature reduction is achieved and incorporate results into sensor			

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602712A: *Countermine Systems*	PROJECT H35: *CAMOUFLAGE & COUNTER-RECON TECH*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
models for advanced characterization; will collaborate with industry to develop near-term improvements to camouflage paints, coatings, and systems in both the visible and other wavelength regions.			
Accomplishments/Planned Programs Subtotals	2.767	2.876	2.932

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.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602712A: *Countermine Systems*	PROJECT HB2: *COUNTERMINE COMPONENT TECHNOLOGY (CA)*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
HB2: *COUNTERMINE COMPONENT TECHNOLOGY (CA)*	9.550	-	-	-	-	-	-	-	-	Continuing	Continuing

A. Mission Description and Budget Item Justification

Congressional Interest Item funding for Countermine Systems applied research.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Title: Spectroscopic Materials Identification Center ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** This Congressional Interest Item developed spectroscopic signatures libraries for the identification of explosives and explosive-related compounds (ERCs)	1.592	-	-
Title: Standoff Detection of Explosives and Explosive Devices ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** This Congressional Interest Item researched the detection of explosive residues for force protection and route clearance missions and the detection of explosives-related cues indicative of homemade explosive weaponization.	3.183	-	-
Title: Standoff Improvised Explosive Device Detection Program ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** This Congressional Interest Item, investigated standoff explosives-based detection technology optical signatures (laser induced breakdown spectroscopy (LIBS) and photo-dissociation laser induced fluorescence (PD-LIF)); long wave-hyperspectral imaging (LW-HSI); Raman; and point vapor detection techniques).	4.775	-	-
Accomplishments/Planned Programs Subtotals	9.550	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602712A: *Countermine Systems*	PROJECT HB2: *COUNTERMINE COMPONENT TECHNOLOGY (CA)*

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.