Exhibit R-2, RDT&E Budget Item Justification: PB 2013 Army										DATE: February 2012	
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 3: *Advanced Technology Development (ATD)*				R-1 ITEM NOMENCLATURE PE 0603313A: *Missile and Rocket Advanced Technology*							
COST ($ in Millions)	**FY 2011**	**FY 2012**	**FY 2013 Base**	**FY 2013 OCO**	**FY 2013 Total**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**Cost To Complete**	**Total Cost**
Total Program Element	76.272	90.458	71.111	-	71.111	68.230	53.353	54.737	57.074	Continuing	Continuing
206: *MISSILE SIMULATION*	3.379	3.548	2.271	-	2.271	2.299	2.265	2.143	2.202	Continuing	Continuing
263: *FUTURE MSL TECH INTEGR(FMTI)*	40.526	60.620	58.907	-	58.907	59.166	38.527	35.194	35.785	Continuing	Continuing
550: *COUNTER ACTIVE PROTECTION*	8.255	7.510	-	-	-	-	-	-	-	Continuing	Continuing
704: *Advanced Missile Demo*	12.458	8.796	4.879	-	4.879	6.765	12.561	17.400	19.087	Continuing	Continuing
G03: *Area Defense Advanced Technology*	11.654	9.984	5.054	-	5.054	-	-	-	-	Continuing	Continuing

Note

Not applicable for this item.

A. Mission Description and Budget Item Justification

This program element (PE) matures, fabricates, and demonstrates advanced rocket, missile, interceptor, and guided munition technologies to enhance weapon system lethality, survivability, agility, deployability, and affordability. Project 206 develops high fidelity simulations for advanced tactical missiles and interceptors. Project 263 demonstrates missile and interceptor systems with capabilities to provide protection against rockets, artillery, and mortars; provide precision weapons for small units in close combat; and provide minimum smoke propulsion for aviation missiles. Project 550 demonstrates guided interceptors for ground combat vehicle active protection systems and evaluates the countering of threat active protection systems ensuring missile lethality. Project 704 demonstrates the capability to detect and track rocket, artillery, mortar, and unmanned air vehicles threats. Project G03 demonstrates missile-based deployable force protection and fire control systems as well as defense against unmanned aerial vehicles and rotary wing aircraft.

Work in this PE is complimentary to PE 0602303A (Missile Technology), and is fully coordinated with PE 0602618 (Ballistics Technology), PE 0602624A (Weapons and Munitions Technology), PE 0603003A (Aviation Advanced Technology), PE 0603004A (Weapons and Munitions Advanced Technology), PE 0603005A (Combat Vehicle and Automotive Advanced Technology), PE 0603125 (Combating Terrorism ? Technology Development), PE 0603270A (Electronic Warfare Technology), PE 0603734A (Combat Engineering Systems), and PE 0708045A (Manufacturing Technology).

The cited work is consistent with the Assistant Secretary of Defense for Research and Engineering science and technology priority focus areas and the Army Modernization Strategy.

Work in this PE is performed by the Aviation and Missile Research, Development, and Engineering Center (AMRDEC) located at Huntsville, AL.

Exhibit R-2, RDT&E Budget Item Justification: PB 2013 Army					DATE: February 2012
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 3: *Advanced Technology Development (ATD)*		R-1 ITEM NOMENCLATURE PE 0603313A: *Missile and Rocket Advanced Technology*			
B. Program Change Summary ($ in Millions)	**FY 2011**	**FY 2012**	**FY 2013 Base**	**FY 2013 OCO**	**FY 2013 Total**
Previous President's Budget	84.553	90.602	77.540	-	77.540
Current President's Budget	76.272	90.458	71.111	-	71.111
Total Adjustments	-8.281	-0.144	-6.429	-	-6.429
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-2.294	-			
• Adjustments to Budget Years	-	-	-6.429	-	-6.429
• Other Adjustments 1	-5.500	-	-	-	-
• Other Adjustments 2	-0.487	-0.144	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2013 Army			DATE: February 2012
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603313A: *Missile and Rocket Advanced Technology*	PROJECT 206: *MISSILE SIMULATION*	

COST ($ in Millions)	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total	FY 2014	FY 2015	FY 2016	FY 2017	Cost To Complete	Total Cost
206: *MISSILE SIMULATION*	3.379	3.548	2.271	-	2.271	2.299	2.265	2.143	2.202	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project matures and demonstrates advanced modeling and simulation technologies for missile design and analysis. Evaluation of missile technology by means of modeling and simulation provides a cost-effective method that supports missile maturation throughout the weapon system life cycle. This effort permits a reduction in the number of flight tests required for programs of record as well as improves the confidence of flight test readiness and probability of flight test success.

This project support efforts in the Army science and technology Ground portfolio.

The cited work is consistent with the Assistant Secretary of Defense for Research and Engineering science and technology priority focus areas and the Army Modernization Strategy.

Work in this project is performed by the Aviation and Missile Research, Development, and Engineering Center, (AMRDEC) Huntsville, AL.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
Title: Missile Simulation	3.379	3.548	2.271
Description: This effort designs, matures, and demonstrates advanced simulation technologies to support missile design, analysis, and evaluation including Hardware-in-the-Loop (HWIL) simulation, missile component and system simulations.			
FY 2011 Accomplishments: Enhanced the common HWIL computing capability to support data-intensive laser radar (LADAR) and radar projection seeker simulations; continued maturation of seeker signal injection for active radar and LADAR seekers; continued improvements to the solar simulator; continued design of a visualization environment capability to parametrically evaluate missile system performance.			
FY 2012 Plans: Continue simulation maturation to improve run-time performance of scene generators; improve HWIL multi-mode scene generation capabilities; increase standardization of HWIL interfaces to reduce integration time of different guidance systems; increase fidelity of real-time technical and programmatic modeling and simulation tools (visualization and fast-running models); and leverage advancements in computer processing capabilities to improve fidelity and runtime of simulations.			
FY 2013 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2013 Army		DATE: February 2012
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603313A: *Missile and Rocket Advanced Technology*	PROJECT 206: *MISSILE SIMULATION*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
Will improve simulation fidelity, run-time, integration time, and visualization capabilities including: reuse and validate of HWIL simulation modules to reduce integration time and cost; design reduce the run-time required for higher fidelity scene generation, and complete HWIL modifications to allow for varying radio frequency waveforms.			
Accomplishments/Planned Programs Subtotals	3.379	3.548	2.271

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 2013 Army			DATE: February 2012
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603313A: *Missile and Rocket Advanced Technology*	PROJECT 263: *FUTURE MSL TECH INTEGR(FMTI)*	

COST ($ in Millions)	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total	FY 2014	FY 2015	FY 2016	FY 2017	Cost To Complete	Total Cost
263: *FUTURE MSL TECH INTEGR(FMTI)*	40.526	60.620	58.907	-	58.907	59.166	38.527	35.194	35.785	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project matures, fabricates, and demonstrates advanced missile and interceptor technologies, such as seekers, guidance and controls, propulsion, and airframes. The project goal is to reduce the life-cycle cost per kill of precision guided missiles and interceptors.

This project support efforts in the Army science and technology Ground portfolio.

This project matures technologies from PE 0602303A and directly supports systems managed by the Program Executive Officer for Missiles and Space. Work in this project is in collaboration with PE 0602618 (Ballistics Technology), PE 0602624A (Weapons and Munitions Technologies), PE 0603004A (Weapons and Munitions Advanced Technology), PE 0603005A (Combat Vehicle and Automotive Advanced Technology) and PE 0708045A (Manufacturing Technology)..

The cited work is consistent with the Assistant Secretary of Defense for Research and Engineering science and technology priority focus areas and the Army Modernization Strategy.

Work in this project is performed by the Aviation and Missile Research, Development, and Engineering Center (AMRDEC), Huntsville, AL.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
Title: Technology for Guided Missiles and Interceptors	6.965	5.665	-
Description: This effort designs technologies for highly responsive missiles and interceptors. This effort matures and demonstrates guidance and control, seeker, propulsion, and airframe technologies. This effort compliments the: Enhanced Precision Interceptor Technology, Guided Interceptor Technology for Defense against RAM, Hit-to-Kill Interceptor Technology for Defense against RAM (PE 0603313, Project 263) and Kinetic Energy Active Protection System Guided Interceptor (PE 0603313, Project 550).			
FY 2011 Accomplishments: Designed and demonstrated guidance, control, seeker, propulsion, and aerodynamic technologies in support of missile-based interceptor designs for force protection systems; designed technologies to support highly responsive guidance of tactical interceptors to defeat high velocity threats.			
FY 2012 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2013 Army		DATE: February 2012
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603313A: *Missile and Rocket Advanced Technology*	PROJECT 263: *FUTURE MSL TECH INTEGR(FMTI)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
Continue efforts to design and demonstrate guidance, control, propulsion, and airframe technologies to enable a highly responsive interceptor to defeat incoming RAM threats; design small radar frequency seeker technologies capable of guiding an interceptor to incoming RAM threats; integrate these technologies with guided interceptor designs for flight demonstration; and update designs based on flight demonstration results.			
Title: Applied Smaller, Lighter, and Cheaper (SLC) Munition Components ***Description:*** This effort designs, fabricates, and demonstrates technology for increasingly smaller, lighter, and cheaper munition components to enhance current system capabilities against asymmetric threats. These technologies will transition to current and next generation small precision munitions. This effort matures and transitions technologies developed in PE602303A. ***FY 2011 Accomplishments:*** Demonstrated image-based stabilization/tracking algorithms using captive flight; conducted static and dynamic evaluations of high performance insensitive munition propulsion systems; performed functional and environmental evaluation of composite JAGM sample GEU housing; demonstrated advanced interconnections in a representative small precision munition processor; and fabricated and field demonstrated form factored small semi-active laser seeker for small precision munitions. ***FY 2012 Plans:*** Complete design of composite missile propulsion casing and perform static performance evaluation; complete design of common ESAD in Javelin configuration; and design uncooled state-of-the-art infrared seeker design and conduct captive flight demonstration in support of Javelin upgrades.	11.246	7.987	-
Title: Small Organic Precision Munition Integrated Technology ***Description:*** This effort designs, fabricates, integrates, and flight demonstrates critical components to enhance system-level performance of a small precision munition organic to the Battalion. The effort provides a soldier portable, 5.5 pound, precision guided munition to enable small units to organically dominate asymmetric threats in complex terrain. The goals include improved: target tracking, effects against soft targets, communication with munition in flight, and power sources for increased flight and storage time. This effort matures and demonstrates technology from PE 0602303A, PE 0602624 Project H28, and the Applied Smaller, Lighter, and Cheaper Munition Components effort. ***FY 2012 Plans:*** Integrate and flight demonstrate image stabilization and people tracking on a surrogate munition platform; complete the design, fabricate, and conduct dynamic evaluations of a small height of burst sensor package to provide warhead effects against soft targets; fabricate, integrate, and demonstrate a small warhead with improved effects against asymmetric threats; and characterize	-	10.983	10.107

Exhibit R-2A, RDT&E Project Justification: PB 2013 Army		DATE: February 2012
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
the performance of the state-of-the-art in small seekers for guidance to targets in high clutter environments, digital data-links to enable the Warfighter to communicate with the munition while in flight, and power sources to enable longer operation. ***FY 2013 Plans:*** Will continue to integrate image stabilization and people tracking algorithms with small seeker, conduct flight demonstration in surrogate munition to demonstrate improved tracking performance, then complete algorithm optimization based on demonstration results; integrate small form-factored laser ranging height of burst sensor, less sensitive omni-directional warhead, and fuze optimized for lethal effects against personnel and soft targets, then evaluate effectiveness in obscured environments; integrate secure digital data link in surrogate munition and conduct hardware-in-the-loop evaluation and flight demonstrations; evaluate form-factored power source over operating temperature range to demonstrate increased shelf-life.			
Title: Multi-Mission/Multi-Purpose Single Missile Propulsion ***Description:*** This effort matures and demonstrates advanced missile propulsion technology that provides longer ranges, increased mission flexibility, and shorter flight times while increasing system insensitive munitions capability in air-to-ground, ground-to-ground, and ground-to-air roles for transition to PEO Missiles & Space. ***FY 2011 Accomplishments:*** Completed static demonstrations of missile motors over operational temperature range; began fabrication of flight-weight hardware assets for the best technical approach in order to conduct flight demonstrations. ***FY 2012 Plans:*** Complete fabrication of best technical approach for demonstration; and integrate the propulsion system in a controlled flight vehicle for demonstration of improved insensitive munition capabilities.	3.264	4.356	-
Title: Defense against Rockets, Artillery, and Mortars (RAM) ***Description:*** This effort demonstrates an integrated launch system capable of 360 degree hemispherical protection from RAM threats. This effort is complementary to Enhanced Precision Interceptor Technology and Technical Fire Control Technology. Beginning in FY12, this effort will be captured in the Guided Interceptor Technology for Defense against RAM and Hit-to-Kill Interceptor Technology for Defense against RAM efforts. ***FY 2011 Accomplishments:*** Continued system-level HWIL evaluation to verify required performance; fabricated components and integrated for guided flight demonstrations against single RAM targets; updated the vertical launch and pitch over designs and system simulation based on evaluation results.	4.719	-	-
Title: Enhanced Precision Interceptor Technology	7.644	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2013 Army		DATE: February 2012
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603313A: *Missile and Rocket Advanced Technology*	PROJECT 263: *FUTURE MSL TECH INTEGR(FMTI)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
Description: This effort demonstrates two technically different missile-based interceptor concepts with the required accuracy and lethality to defeat rocket, artillery, and mortar (RAM) threats. This effort conducts flight demonstrations of a guided missile-based interceptor with a high explosive warhead and a hit-to-kill guided missile-based interceptor against single and multiple simultaneous RAM threats in the required timeline to protect ground forces. This effort is complementary to the Defense against RAM effort and integrates technology developed in the Technology for Guided Missiles and Interceptors. Beginning in FY12, this effort will be captured in the Guided Interceptor Technology for Defense against RAM and Hit-to-Kill Interceptor Technology for Defense against RAM efforts. ***FY 2011 Accomplishments:*** Fabricated interceptors for guided flight demonstrations against single RAM targets and performed pre-flight HWIL evaluation on each interceptor; continued system-level HWIL evaluation and prepared interceptors for guided flight demonstrations; and updated the interceptor design and system simulation based HWIL evaluation results.			
Title: Technical Fire Control Technology ***Description:*** This effort demonstrates Technical Fire Control technology necessary to generate and execute a firing solution for defeat of rocket, artillery, and mortar (RAM) threats in the required timeline to protect ground forces. This effort develops Technical Fire Control technology to compliment the interceptor development performed in the Guided Interceptor Technology for Defense against RAM, Hit-to-Kill Interceptor Technology for Defense against RAM, and Counter RAM Tracking and Fire Control (PE 0603313 Project 704) efforts. These combined efforts will conduct 4-8 interceptor flight demonstrations each year beginning in FY12. The technologies demonstrated will be applicable to the Indirect Fire Protection Capability (IFPC), which began the Material Solution Analysis Phase in 4QFY11. ***FY 2011 Accomplishments:*** Fabricated one technical fire control node for guided flight demonstration against single RAM targets; matured technical fire control software and integrated technical fire control node with the interceptor components to support system-level hardware-in-the-loop (HWIL) evaluation to verify correct fire control solution and launch command are generated; and updated the technical fire control design and system simulation based on HWIL evaluation results. ***FY 2012 Plans:*** Complete fabrication of a technical fire control node for each interceptor flight demonstration; integrate technical fire control components with interceptor guidance section and tracking and fire control system components for pre-flight evaluation in HWIL; fully integrate technical fire control hardware and software with the tracking and fire control sensor to obtain incoming RAM threat state information; integrate technical fire control with interceptors to provide interceptor control for guided flight demonstrations; conduct guided flight demonstrations using technical fire control nodes to control each counter RAM interceptor through live-fire	6.688	6.824	7.882

Exhibit R-2A, RDT&E Project Justification: PB 2013 Army		DATE: February 2012
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
shoot down of single RAM threats; and update technical fire control design and system simulation based on HWIL evaluation and flight demonstration results. ***FY 2013 Plans:*** Will increase the software capability and update the Technical Fire Control nodes based on analysis from the guided flight demonstrations of single RAM threats and support multiple flight demonstrations for both interceptor concepts; integrate updated Technical Fire Control components with interceptor guidance sections and Tracking and Fire Control system components for pre-flight evaluation in HWIL; conduct additional guided flight demonstrations using Technical Fire Control nodes to control each of the counter RAM interceptors through live-fire shoot down of single and dual RAM threats; and update system simulation based on HWIL evaluation and flight demonstration results.			
Title: Guided Interceptor Concept Technology for defense against Rockets, Artillery, and Mortars (RAM) ***Description:*** This effort demonstrates a Guided missile-based Interceptor concept with a high explosive warhead initially focused to defeat RAM threats with the potential for precision ground-to-ground applications. This effort designs, fabricates, evaluates, and flight demonstrates a guided missile-based interceptor and launch system. Complementary efforts include: Technical Fire Control Technology provides the interceptor with a firing solution and launch command and Counter RAM Tracking and Fire Control, in PE 0603313A Project 704, tracks the RAM threat. This effort will support the design, fabrication, integration, and flight demonstration of 2-4 guided interceptors each year beginning in FY 2012. Beginning in FY12, this effort combines the Defense against RAM and Enhanced Precision Interceptor Technology efforts to provide more detail on the two technically different missile-based counter-RAM systems that are being flight demonstrated. The technologies demonstrated will be applicable to the Indirect Fire Protection Capability (IFPC), which began the Material Solution Analysis Phase in 4QFY11. ***FY 2012 Plans:*** Update Guided Interceptor and launch system designs based on hardware-in-the-loop (HWIL) evaluation; integrate components and fabricate interceptors and a launch system for flight demonstration against single RAM threat; conduct pre-flight HWIL evaluation of each Guided Interceptor to ensure successful flight demonstration; integrate the interceptor and launch system with the technical fire control node and tracking and fire control system; flight demonstrate integrated interceptors, launch system, technical fire control node, and tracking and fire control system capability to defeat single RAM threats in flight within the required timeline; update designs and system simulation based on flight demonstration results. ***FY 2013 Plans:*** Will continue the fabrication and integration of command Guided Interceptors for flight demonstration; integrate with the Technical Fire Control node and Tracking and Fire Control System; perform pre-flight HWIL evaluation on each interceptor to ensure	-	11.957	20.810

Exhibit R-2A, RDT&E Project Justification: PB 2013 Army		DATE: February 2012
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603313A: *Missile and Rocket Advanced Technology*	PROJECT 263: *FUTURE MSL TECH INTEGR(FMTI)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
successful flight demonstration and prepare for controlled and guided flight demonstrations of live-fire shoot down of single RAM threat targets; and update the interceptor design and system simulation based on HWIL evaluation and flight test results.			
Title: Hit-to-Kill Interceptor Concept Technology for Defense against Rockets, Artillery, and Mortars (RAM) ***Description:*** This effort demonstrates a compact, very light weight, radar frequency guided Hit-to-Kill missile-based Interceptor concept initially focused to defeat RAM threats in flight with the potential for use on air launched platforms, small weapons platforms, and ground-to-ground applications. This effort designs, fabricates, evaluates, and flight demonstrates a Hit-to-Kill counter RAM system consisting of interceptors and a launch system. Complementary efforts include: Technical Fire Control Technology provides the firing solution and launch command and Counter RAM Tracking and Fire Control, PE 0603313A Project 704, provides tracking of the RAM threat for intercept. This effort will support the design, fabrication, integration, and flight demonstration of 2-4 hit-to-kill interceptors each year beginning in FY12. Beginning in FY12, this effort combines the Defense against RAM and Enhanced Precision Interceptor Technology efforts to provide more detail on the two technically different missile-based counter-RAM systems that are being flight demonstrated. The technologies demonstrated will be applicable to the Indirect Fire Protection Capability (IFPC), which began the Material Solution Analysis Phase in 4QFY11. ***FY 2012 Plans:*** Update the Hit-to-Kill interceptor and launch system designs based on hardware-in-the-loop (HWIL) evaluation; integrate components and fabricate interceptors and launch system for flight demonstration; conduct pre-flight HWIL evaluation of each Hit-to-Kill interceptor to ensure successful flight demonstration; integrate the interceptor and launch system with the Technical Fire Control node and Tracking and Fire Control system; flight demonstrate the ability of the integrated interceptors, launch system, Technical Fire Control node, and Tracking and Fire Control system to defeat single RAM threats in flight within the required timeline; update designs and system simulation based on flight demonstration results. ***FY 2013 Plans:*** Will continue fabrication and integration of Hit-to-Kill Interceptors and launch systems; integrate with the Technical Fire Control and Tracking and Fire Control system; conduct pre-flight HWIL evaluation of each Hit-to-Kill interceptor to ensure successful flight demonstration; perform 2-4 guided flight demonstrations of live-fire shoot down of single and dual RAM threat targets; and update the system simulation based on HWIL evaluation and flight demonstration results.	-	12.848	20.108
Accomplishments/Planned Programs Subtotals	40.526	60.620	58.907

C. Other Program Funding Summary ($ in Millions)

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2013 Army		DATE: February 2012
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603313A: *Missile and Rocket Advanced Technology*	PROJECT 263: *FUTURE MSL TECH INTEGR(FMTI)*

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 2013 Army			DATE: February 2012
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603313A: *Missile and Rocket Advanced Technology*	PROJECT 550: *COUNTER ACTIVE PROTECTION*	

COST ($ in Millions)	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total	FY 2014	FY 2015	FY 2016	FY 2017	Cost To Complete	Total Cost
550: *COUNTER ACTIVE PROTECTION*	8.255	7.510	-	-	-	-	-	-	-	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project matures and demonstrates integrated survivability technologies and techniques for lightweight combat platforms including light armored vehicles, tactical wheeled vehicles, and helicopters. Focus is on guided interceptors for active protection systems capable of defeating tank-fired large caliber anti-armor threats, anti-tank guided missiles and long range rocket propelled grenades. This project also matures and demonstrates technologies for countering threat active protection systems to maintain missile lethality against vehicles.

This project support efforts in the Army science and technology Ground portfolio.

Work in this project is in collaboration with PE 0602624A (Weapons and Munitions Technologies) Project H28, PE 0603004 (Advanced Munitions Demonstration), and PE 0603005A (Combat Vehicle and Automotive Advanced Technology) Project 221, as well as complements work done on adaptive infrared suppressor and acoustic signature technologies matured in the PE 0603003A (Aviation Advanced Technology) Project 313.

The cited work is consistent with the Assistant Secretary of Defense for Research and Engineering science and technology priority focus areas and the Army Modernization Strategy.

Work in this project is performed by the Aviation and Missile Research, Development, and Engineering Center (AMRDEC), Huntsville, AL.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
Title: Kinetic Energy Active Protection System (KEAPS) Guided Interceptor	8.255	7.510	-
Description: This effort designs, fabricates, and flight demonstrates an interceptor to defeat threats to combat vehicle survivability focusing on tank fired kinetic energy threats. This effort demonstrates interceptor performance against kinetic energy tank rounds through a series of guided flight demonstrations incrementally integrating key components as their designs mature.			
FY 2011 Accomplishments: Conducted guided flight demonstrations against live threats to evaluate TDD performance limits; integrated interceptor and conducted guided flight demonstrations to verify the interceptor can navigate to the intercept point; and integrated warhead into interceptor.			
FY 2012 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2013 Army		DATE: February 2012
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
Continue flight demonstration of interceptors with the TDD integrated; fabricate interceptors with seeker, ESAD, TDD, and warhead integrated to demonstrate the capability to defeat tank fired kinetic energy rounds in flight; and complete full horizontal launch end-to-end flight demonstrations with an integrated warhead demonstrating guidance to the intercept point of tank fired kinetic energy round.			
Accomplishments/Planned Programs Subtotals	8.255	7.510	-

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 2013 Army			DATE: February 2012
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603313A: *Missile and Rocket Advanced Technology*	PROJECT 704: *Advanced Missile Demo*	

COST ($ in Millions)	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total	FY 2014	FY 2015	FY 2016	FY 2017	Cost To Complete	Total Cost
704: *Advanced Missile Demo*	12.458	8.796	4.879	-	4.879	6.765	12.561	17.400	19.087	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project matures advanced missile system concepts and related hardware to enhance weapon system lethality, survivability, agility, versatility, deployability, and affordability for defense against the future air and ground, armored and non-armored threats.

This project support efforts in the Army science and technology Ground portfolio.

Work in this project is in collaboration with PE 0602624A (Weapons and Munitions Technologies).

The cited work is consistent with the Assistant Secretary of Defense for Research and Engineering science and technology priority focus areas and the Army Modernization Strategy.

Work in this project is performed by the Aviation and Missile Research, Development, and Engineering Center (AMRDEC), Huntsville, AL.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
Title: Counter Rockets, Artillery, Mortars (RAM) Tracking and Fire Control	11.956	8.796	4.879
Description: This effort matures and demonstrates system technology to provide 360 degree, near hemispherical coverage for tracking and intercept of RAM threats. This effort determines the trajectory and location of the incoming RAM threat and feeds that information to the technical fire control node to generate a firing solution provided to the guidance section of each of the missile interceptors. Complementary work is conducted in the Technical Fire Control Technology, Guided Interceptor Technology for defense against Rockets, Artillery, and Mortars, and Hit-to-Kill Interceptor Technology for Defense against Rockets, Artillery, and Mortars efforts in PE 0603313A Project 263. These combined efforts will perform 4-8 interceptor flight demonstrations each year beginning in FY12. The technologies demonstrated will be applicable to the Indirect Fire Protection Capability (IFPC), which began the Material Solution Analysis Phase in 4QFY11.			
FY 2011 Accomplishments: Completed fabrication of the fire control system hardware and software for guided flight demonstrations of interceptors; evaluated tracking and fire control system accuracy through modeling and simulation to verify it meets the required performance; and updated the tracking and fire control system designs and system simulations based on evaluation results.			
FY 2012 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2013 Army		DATE: February 2012
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603313A: *Missile and Rocket Advanced Technology*	PROJECT 704: *Advanced Missile Demo*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
Update tracking and fire control system hardware and software designs; integrate tracking and fire control systems with technical fire control nodes to provide RAM threat state information to support live-fire guided flight demonstrations of interceptors to shoot down a single RAM threat; conduct demonstrations to verify the tracking and fire control system can detect incoming RAM threats and provide the technical fire control node with a firing solution; and update the system simulation based on flight demonstration results. ***FY 2013 Plans:*** Will finalize tracking and fire control system designs based on initial tracking testing and flight demonstrations; modify component hardware to optimize integrated performance against full range of target types; integrate updated tracking and fire control systems with technical fire control nodes to provide RAM threat state information; support multiple flight demonstrations of live-fire shoot down of single and dual RAM threat targets; and verify the system simulation based on HWIL evaluation and flight demonstration results.			
Title: Counter Rocket, Artillery, and Mortar (RAM) Interceptor Integration ***Description:*** This effort integrates technologies from Defense against RAM, PE 0603313A Project 263 and performs system-level Hardware-in-the-Loop (HWIL) evaluation to verify system performance. ***FY 2011 Accomplishments:*** Supported system-level HWIL evaluation. Integrated technologies for two missile concept designs to perform guided flight demonstrations against single RAM threats.	0.502	-	-
Accomplishments/Planned Programs Subtotals	12.458	8.796	4.879

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 2013 Army			DATE: February 2012
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603313A: *Missile and Rocket Advanced Technology*	PROJECT G03: *Area Defense Advanced Technology*	

COST ($ in Millions)	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total	FY 2014	FY 2015	FY 2016	FY 2017	Cost To Complete	Total Cost
G03: *Area Defense Advanced Technology*	11.654	9.984	5.054	-	5.054	-	-	-	-	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project matures and demonstrates Deployable Force Protection missile technology for small command outposts and air defense missile technology to protect against: unmanned aerial vehicles, rotary wing aircraft large caliber rockets, and cruise missiles as well as expands the protection envelope to a division/corps area.

This project support efforts in the Army science and technology Ground portfolio.

Work in this project is in collaboration with PE 0603734A (Combat Engineering Systems) and PE 0603125 (Combating Terrorism - Technology Development).

The cited work is consistent with the Assistant Secretary of Defense for Research and Engineering science and technology priority focus areas and the Army Modernization Strategy.

Work in this project is performed by the Aviation and Missile Research, Development, and Engineering Center (AMRDEC), Huntsville, AL.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
Title: Air Defense Advanced Technology	2.010	-	-
Description: This effort matures and demonstrates missile technology to provide capability for Warfighter force protection against low and slow flying air vehicle threats in all environments without increasing the force structure. This effort leverages activities from PE 0602303A, project 214. ***FY 2011 Accomplishments:*** Continued design and demonstration of critical components; and integrated and demonstrated an air defense system capability in a relevant environment.			
Title: Deployable Force Protection Missile Technology	9.644	9.984	5.054
Description: This effort demonstrates affordable missile technology to provide force protection for smaller forward operating bases (FOBs). This effort will integrate existing and developmental missile technology and design novel fire control, guidance, and control systems to use missiles in a force protection role. ***FY 2011 Accomplishments:***			

Exhibit R-2A, RDT&E Project Justification: PB 2013 Army		DATE: February 2012
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603313A: *Missile and Rocket Advanced Technology*	PROJECT G03: *Area Defense Advanced Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
Demonstrated missile system technologies for affordable effects to provide area protection for smaller FOBs; designed guidance, control, actuation, and propulsion technology to enable 360 degree protection; and designed fire control systems to provide 360 degree protection to a re-configurable protected area using multiple missiles and launchers. ***FY 2012 Plans:*** Integrate missile component technologies into missile systems; integrate missile system with the fire control systems; demonstrate missile and fire control systems individually and evaluate performance of the combined systems. ***FY 2013 Plans:*** Will complete integration of missile systems with fire control technologies to demonstrate an integrated base protection system; and conduct demonstration of integrated fire control, missile systems, sensor systems, and other systems in a base protection role.			
Accomplishments/Planned Programs Subtotals	11.654	9.984	5.054

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.