Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Army										DATE: February 2011	
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 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	83.649	84.553	90.602	-	90.602	77.540	72.921	54.201	59.679	Continuing	Continuing
206: *MISSILE SIMULATION*	3.384	3.502	3.554	-	3.554	3.612	3.677	3.644	3.524	Continuing	Continuing
263: *FUTURE MSL TECH INTEGR(FMTI)*	40.861	42.002	60.716	-	60.716	61.086	62.528	38.110	34.829	Continuing	Continuing
550: *COUNTER ACTIVE PROTECTION*	7.831	8.547	7.522	-	7.522	0.008	0.009	0.009	4.100	Continuing	Continuing
704: *Advanced Missile Demo*	7.509	18.418	8.810	-	8.810	4.834	6.707	12.438	17.226	Continuing	Continuing
G03: *Area Defense Advanced Technology*	1.920	12.084	10.000	-	10.000	8.000	-	-	-	Continuing	Continuing
NA6: *Missile and Rocket Initiatives (CA)*	22.144	-	-	-	-	-	-	-	-	Continuing	Continuing

Note

FY12 funding increase for Indirect Fire Protection Capability (IFPC) Technology Development.

A. Mission Description and Budget Item Justification

This program element (PE) matures and demonstrates advanced missile technologies to enhance weapon system lethality, survivability, agility, deployability, and affordability. This PE focuses on smaller, lighter weight, more affordable missiles. This PE supports high fidelity simulations for advanced tactical missiles and interceptors (project 206); missile and interceptor components with capabilities for locating targets in clutter, precision guidance, high speed missile flight, and missile communications, command, and control (project 263); guided interceptors to work with ground combat vehicle active protection systems (project 550); technologies to detect and track rocket, artillery, and mortar threats (project 704); and technologies required for missile-based deployable force protection as well as defense against unmanned aerial vehicles and rotary wing aircraft (project G03). Project NA6 funds congressional special interest items.

Work in this PE is complimentary to PE 0602303A (Missile Technology), and is fully coordinated with PE 0603003A (Aviation Advanced Technology), PE 0603270A (Electronic Warfare Technology), PE 0602624A (Weapons and Munitions Technology), PE 0603004A (Weapons and Munitions Advanced Technology), and PE 0603005A (Combat Vehicle and Automotive 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 Aviation and Missile Research, Development, and Engineering Center (AMRDEC) located at Huntsville, AL.

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B. Program Change Summary ($ in Millions)	**FY 2010**	**FY 2011**	**FY 2012 Base**	**FY 2012 OCO**	**FY 2012 Total**
Previous President's Budget	86.559	84.553	73.859	-	73.859
Current President's Budget	83.649	84.553	90.602	-	90.602
Total Adjustments	-2.910	-	16.743	-	16.743
• Congressional General Reductions		-			
• Congressional Directed Reductions		-			
• Congressional Rescissions	-	-			
• Congressional Adds		-			
• Congressional Directed Transfers		-			
• Reprogrammings	-0.796	-			
• SBIR/STTR Transfer	-2.114	-			
• Adjustments to Budget Years	-	-	16.743	-	16.743

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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
206: *MISSILE SIMULATION*	3.384	3.502	3.554	-	3.554	3.612	3.677	3.644	3.524	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project matures and demonstrates advanced modeling and simulation tools 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 weapon system life cycles. 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.

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 Aviation and Missile Research, Development, and Engineering Center, (AMRDEC) Huntsville, AL.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Title: Missile Simulation	3.384	3.502	3.554
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, and simulations to support missile design.			
FY 2010 Accomplishments: Integrated and evaluated performance of the following components: common HWIL computing and interface capabilities, personal computer based scene generation technology, a short-wave infrared projector, facility monitor technology, 6-degree-of-freedom simulations, a signal injection system, and seeker hardware integration technology; designed a sample interface for the HWIL laser radar (LADAR) projection system; integrated infrared solar source designed under PE 0602303A into the HWIL facility to analyze solar implications on missile system performance; and designed a visualization environment to parametrically evaluate art-of-the-possible missile design capabilities.			
FY 2011 Plans: Enhance the common HWIL computing capability to support data-intensive LADAR and radar projection seeker simulations; continue maturation of seeker signal injection for active radar and LADAR seekers; continue improvements to the solar simulator; continue design of a visualization environment capability to parametrically evaluate missile system performance.			
FY 2012 Plans: Will continue simulation maturation to improve run-time performance of scene generators; will improve HWIL multi-mode scene generation capabilities; will increase standardization of HWIL interfaces to reduce integration time of different guidance systems;			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
will increase fidelity of real-time technical and programmatic modeling and simulation tools (visualization and fast-running models); and will leverage advancements in computer processing capabilities to improve fidelity and runtime of simulations.			
Accomplishments/Planned Programs Subtotals	3.384	3.502	3.554

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 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
263: *FUTURE MSL TECH INTEGR(FMTI)*	40.861	42.002	60.716	-	60.716	61.086	62.528	38.110	34.829	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project matures and demonstrates advanced missile and interceptor technologies, such as seekers, guidance and controls, propulsion, and airframes . The project goal is to reduce the cost per kill of precision guided missiles. This project matures technologies from PE 0602303A and directly supports systems managed by the Program Executive Officer for Missiles and Space.

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 Aviation and Missile Research, Development, and Engineering Center (AMRDEC), Huntsville, AL.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Title: Technology for Non-Line-of-Sight Launch System (NLOS-LS) Variants ***Description:*** This effort focuses on demonstrating technologies that leverage the NLOS-LS Container Launch Unit (C/LU) to provide a versatile mix of fires for defeat of conventional and asymmetrical threats in all environments. ***FY 2010 Accomplishments:*** Designed and demonstrated critical components to support concept refinement and sample fabrication of NLOS-LS variant missiles capable of rapid, precision deployment of lethal and non-lethal payloads. Performed subsystem and system-level evaluation in a laboratory environment. Performed an evaluation of payload delivery feasibility through proof-of-principle flight demonstrations and high fidelity simulations. Investigated, identified, and coordinated design interfaces for selected high payoff payload candidates; evaluated and matured the most promising interfaces to enable integration into the NLOS-LS variant.	4.269	-	-
Title: Technology for Guided Missiles and Interceptors ***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 Plans:***	-	7.219	5.674

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Design and demonstrate guidance, control, seeker, propulsion, and aerodynamic technologies in support of missile-based interceptor designs for force protection systems; design technologies to support highly responsive guidance of tactical interceptors to defeat high velocity threats. ***FY 2012 Plans:*** Will continue efforts to design and demonstrate guidance, control, propulsion, and airframe technologies to enable a highly responsive interceptor to defeat incoming RAM threats; will design small radar frequency seeker technologies capable of guiding an interceptor to incoming RAM threats; will integrate these technologies with guided interceptor designs for flight demonstration; and will 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 2010 Accomplishments:*** Fabricated, integrated, and functionally evaluated composite Joint Air-to-Ground Missile (JAGM) guidance electronics unit (GEU) housing for improving thermal dissipation; completed image-based stabilization/people tracking subsystems for non-gimbaled electro-optical seeker systems for small precision munitions; conducted a static and dynamic evaluation of JAGM electronic safe and arm device (ESAD) and completed the technical data package of the design; and down-selected Tube-launched, Optically-tracked, Wire-guided (TOW) rate sensor package for missile guidance to be flight demonstrated. ***FY 2011 Plans:*** Demonstrate image-based stabilization/tracking algorithms using captive flight; conduct static and dynamic evaluations of high performance insensitive munition propulsion systems; perform functional and environmental evaluation of composite JAGM sample GEU housing; demonstrate advanced interconnections in a representative small precision munition processor; and fabricate and field demonstrate form factored small semi-active laser seeker for small precision munitions. ***FY 2012 Plans:*** Will complete design of composite missile propulsion casing and perform static performance evaluation; will complete design of common ESAD in Javelin configuration; and will design uncooled state-of-the-art infrared seeker design and conduct captive flight demonstration in support of Javelin upgrades.	7.176	11.656	8.000
Title: Small Organic Precision Munition Integrated Technology Demonstration	-	-	11.000

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Description: This effort designs, fabricates, integrates, and flight demonstrates critical components to determine system-level performance of a small organic precision munition to enable small units to organically dominate asymmetric threats in complex terrain. This effort matures and demonstrates technology from PE602303A and the Applied Smaller, Lighter, and Cheaper Munition Components effort. ***FY 2012 Plans:*** Will integrate and flight demonstrate image stabilization and people tracking on a surrogate munition platform; will complete the design, fabricate, and conduct dynamic evaluations of a small height of burst sensor package to provide warhead effects against soft targets; will fabricate, integrate, and demonstrate a small warhead with improved effects against asymmetric threats; and will characterize 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.			
Title: Close Combat Networking of Weapons and Sensors ***Description:*** This effort matures and demonstrates enabling technology to provide network lethality capability for transition to Javelin and Tube-launched, Optically-tracked, Wire-guided (TOW) missile systems to increase Warfighter lethality, survivability, and situational awareness. ***FY 2010 Accomplishments:*** Completed and fully integrated all mission application enhancements with sample networked TOW Improved Target Acquisition System (ITAS) and networked Javelin Command Launch Unit (CLU) with strap-on Far Target Locator; performed system-level evaluation; performed CLU and ITAS network integration; conducted cooperative networked TOW ITAS and Javelin CLU capability demonstration in September 2010.	5.362	-	-
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 2010 Accomplishments:*** Completed performance evaluation of missile motor critical components, selected the best technical approach, and began design, analysis, and fabrication of flight-ready motor hardware for static demonstrations. ***FY 2011 Plans:***	4.696	3.382	4.363

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Complete static demonstrations of missile motors over operational temperature range; begin fabrication of flight-weight hardware assets for the best technical approach in order to conduct flight demonstrations. ***FY 2012 Plans:*** Will complete fabrication of best technical approach for demonstration; and will integrate the propulsion system in a controlled flight vehicle for demonstration of improved insensitive munition capabilities.			
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 2010 Accomplishments:*** Completed final designs of vertical launch and pitch-over components; integrated the launcher and pitch-over apparatus with the interceptor and technical fire control components for system level Hardware-in-the-Loop (HWIL) evaluation; and updated the vertical launch and pitch-over component designs, software, and simulations based on evaluation results. ***FY 2011 Plans:*** Continue system-level HWIL evaluation to verify required performance; fabricate components and integrate for guided flight demonstrations against single RAM targets; update the vertical launch and pitch over designs and system simulation based on evaluation results.	4.850	4.891	-
Title: Enhanced Precision Interceptor Technology ***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 2010 Accomplishments:***	7.737	7.922	-

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Completed interceptor component final designs, fabrication, and performance evaluation; integrated interceptor components and conducted system-level Hardware-in-the-Loop (HWIL) evaluation; and updated the interceptor designs and simulations based on the evaluation results. ***FY 2011 Plans:*** Fabricate interceptors for guided flight demonstrations against single RAM targets and perform pre-flight HWIL evaluation on each interceptor; continue system-level HWIL evaluation and prepare interceptors for guided flight demonstrations; and update 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. Complimentary work is performed in the Defense against RAM, 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. ***FY 2010 Accomplishments:*** Completed final designs, fabrication, and performance evaluation of technical fire control components and software; integrated technical fire control components with interceptor to support system-level Hardware-in-the-Loop (HWIL) evaluation; and updated the technical fire control node design, software, and simulations based on evaluation results. ***FY 2011 Plans:*** Fabricate one technical fire control node for guided flight demonstration against single RAM targets; mature technical fire control software and integrate technical fire control node with the interceptor components to support system-level HWIL evaluation to verify correct fire control solution and launch command are generated; and update the technical fire control design and system simulation based on HWIL evaluation results. ***FY 2012 Plans:*** Will complete fabrication of a technical fire control node for each interceptor flight demonstration; will integrate technical fire control components with interceptor guidance section and tracking and fire control system components for pre-flight evaluation in HWIL; will 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; will conduct guided flight demonstrations using technical fire control nodes to control each counter RAM interceptor through live-fire shoot down of single RAM threats; and will update technical fire control design and system simulation based on HWIL evaluation and flight demonstration results.	6.771	6.932	6.835
Title: Guided Interceptor Technology for defense against Rockets, Artillery, and Mortars	-	-	11.976

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Description: This effort demonstrates a guided missile-based interceptor system with a high explosive warhead initially focused to defeat rockets, artillery, and mortars (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 unit. The complementary efforts: 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. 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. ***FY 2012 Plans:*** Will update guided interceptor and launch system designs based on hardware-in-the-loop (HWIL) evaluation; will integrate components and fabricate interceptors and a launch system for flight demonstration against single RAM threat; will conduct pre-flight HWIL evaluation of each guided interceptor to ensure successful flight demonstration; will integrate the interceptor and launch system with the technical fire control node and tracking and fire control system; will 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; will update designs and system simulation based on flight demonstration results.			
Title: Hit-to-Kill Interceptor Technology for Defense against Rockets, Artillery, and Mortars ***Description:*** This effort demonstrates a compact, radar frequency guided hit-to-kill missile-based interceptor initially focused to defeat rockets, artillery, and mortar (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. The complementary efforts: 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. 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. ***FY 2012 Plans:*** Will update the hit-to-kill interceptor and launch system designs based on hardware-in-the-loop (HWIL) evaluation; will integrate components and fabricate interceptors and launch system for flight demonstration; will conduct pre-flight HWIL evaluation of each hit-to-kill interceptor to ensure successful flight demonstration; will integrate the interceptor and launch system with the technical fire control node and tracking and fire control system; will flight demonstrate the ability of the integrated interceptors, launch	-	-	12.868

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
system, technical fire control node, and tracking and fire control system to defeat single RAM threats in flight within the required timeline; will update designs and system simulation based on flight demonstration results.			
Accomplishments/Planned Programs Subtotals	40.861	42.002	60.716

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 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
550: *COUNTER ACTIVE PROTECTION*	7.831	8.547	7.522	-	7.522	0.008	0.009	0.009	4.100	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. Efforts include the development of 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. 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. This project complements work done on adaptive infrared suppressor and acoustic signature technologies matured in the PE 0603003A (Aviation Advanced Technology) Project 313. This effort is building on the expertise gained through support of rockets, missile, sensors, and active control technology to create innovative solutions for survivability.

The cited work is consistent with the Department of 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 Aviation and Missile Research, Development, and Engineering Center (AMRDEC), Huntsville, AL.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Title: Kinetic Energy Active Protection System (KEAPS) Guided Interceptor	7.831	8.547	7.522
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 2010 Accomplishments: Conducted guided flight demonstrations to evaluate guidance accuracy under increasing degrees of launch error and electronic safe and arm device (ESAD) performance; integrated the target detection device (TDD) into guided interceptor for flight demonstration; conducted dynamic/dynamic warhead evaluation to verify warhead performance against kinetic energy tank rounds.			
FY 2011 Plans: Conduct guided flight demonstrations against live threats to evaluate TDD performance limits; integrate interceptor and conduct guided flight demonstrations to verify the interceptor can navigate to the intercept point; and integrate warhead into interceptor.			
FY 2012 Plans:			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Will continue flight demonstration of interceptors with the TDD integrated; will fabricate interceptors with seeker, ESAD, TDD, and warhead integrated to demonstrate the capability to defeat tank fired kinetic energy rounds in flight; will 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	7.831	8.547	7.522

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 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
704: *Advanced Missile Demo*	7.509	18.418	8.810	-	8.810	4.834	6.707	12.438	17.226	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.

The cited work is consistent with the Department of 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 Aviation and Missile Research, Development, and Engineering Center (AMRDEC), Huntsville, AL.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Title: Counter Rockets, Artillery, Mortars (RAM) Tracking and Fire Control	7.509	11.918	8.810
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. Complementary work is conducted in the Technical Fire Control Technology effort in PE 0603313A Project 263.			
FY 2010 Accomplishments: Completed fire control system assembly fabrication and began to integrate with the other system components; conducted laboratory evaluations to demonstrate the fire control system can track RAM targets with the required accuracy.			
FY 2011 Plans: Complete fabrication of the fire control system hardware and software for guided flight demonstrations of interceptors; evaluate tracking and fire control system accuracy through modeling and simulation to verify it meets the required performance; and update the tracking and fire control system designs and system simulations based on evaluation results.			
FY 2012 Plans: Will update tracking and fire control system hardware and software designs; will 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; will conduct demonstrations to verify the tracking and fire control system can detect incoming			

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
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 2010	FY 2011	FY 2012
RAM threats and provide the technical fire control node with a firing solution; will update the system simulation based on 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 Plans:*** Support system-level HWIL evaluation. Integrate technologies for two missile concept designs to perform guided flight demonstrations against single RAM threats.	-	6.500	-
Accomplishments/Planned Programs Subtotals	7.509	18.418	8.810

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 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 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
G03: *Area Defense Advanced Technology*	1.920	12.084	10.000	-	10.000	8.000	-	-	-	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.

The cited work is consistent with the Department of 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 Aviation and Missile Research, Development, and Engineering Center (AMRDEC), Huntsville, AL.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Title: Air Defense Advanced Technology	1.920	2.084	-
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 2010 Accomplishments:*** Matured the design of critical components for an air defense capability, performed component evaluation in a laboratory environment, and matured high fidelity simulations. ***FY 2011 Plans:*** Continue design and demonstration of critical components; and integrate and demonstrate an air defense system capability in a relevant environment.			
Title: Deployable Force Protection Missile Technology	-	10.000	10.000
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 for a force protection role. ***FY 2011 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
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 2010	FY 2011	FY 2012
Demonstrate missile system technologies for affordable effects to provide area protection for smaller FOBs; design guidance, control, actuation, and propulsion technology to enable 360 degree protection; design fire control systems to provide 360 degree protection to a re-configurable protected area using multiple missiles and launchers. ***FY 2012 Plans:*** Will integrate missile component technologies into missile systems; will integrate missile system with the fire control systems; Will demonstrate missile and fire control systems individually and will evaluate performance of the combined systems.			
Accomplishments/Planned Programs Subtotals	1.920	12.084	10.000

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 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603313A: *Missile and Rocket Advanced Technology*	PROJECT NA6: *Missile and Rocket Initiatives (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
NA6: *Missile and Rocket Initiatives (CA)*	22.144	-	-	-	-	-	-	-	-	Continuing	Continuing

A. Mission Description and Budget Item Justification

Congressional Interest Item funding for Missile and Rocket advanced technology development.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Title: Rapid Response System for Protection of Air and Ground Vehicles ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Supported development of high data-rate passive infrared (IR) sensor technology to detect, cue, and track threat weapons for active protection technology for aircraft and ground vehicle applications.	2.546	-	-
Title: Long Range Hypersonic Interceptor ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Supported a study investigating technologies that apply to countering very high speed strike weapons.	1.592	-	-
Title: Advanced Commercial Technology Insertion for Aviation & Missile Research, Development, & Engineering ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Supported development of a system architecture for graphical scene generation for Hardware-in-the-Loop.	3.084	-	-
Title: Army Responsive Tactical Space System Exerciser (ARTSSE) ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Developed a system simulation testbed for performance analysis and evaluation of Operationally Responsive Space (ORS) technologies.	2.985	-	-
Title: Captive Carry Sensor Test-Bed	2.388	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
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** NA6: *Missile and Rocket Initiatives (CA)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Description: This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Developed captive carry platforms for testing of complex guided munitions control units (GCUs) and associated sensors in realistic flight environments.			
Title: Anti-Tamper Research and Development ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Provided the research, development, and testing of technologies to reduce or eliminate the threat of reverse-engineering or software extraction from the guidance/avionics package for military aircraft and missiles.	3.024	-	-
Title: Waterside Wide Area Tactical Coverage & Homing (WaterWATCH) ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Provided capability to continuously monitor waterway perimeters with an integrated/automated multi-phenomenology sensor suite.	3.182	-	-
Title: Scenario Generation for Integrated Air and Missile Defense Evaluation ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Developed scenarios to support Integrated Air and Missile Defense testing and evaluation.	3.343	-	-
Accomplishments/Planned Programs Subtotals	22.144	-	-

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.