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Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Army **DATE:** February 2011

APPROPRIATION/BUDGET ACTIVITY				R-1 ITEM NOMENCLATURE							
2040: <i>Research, Development, Test & Evaluation, Army</i> BA 5: <i>Development & Demonstration (SDD)</i>				PE 0605450A: <i>Joint Air-to-Ground Missile (JAGM)</i>							
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	118.459	130.340	127.095	-	127.095	136.284	108.591	56.019	56.677	Continuing	Continuing
JA6: <i>JOINT AIR-TO-GROUND MISSILE (JAGM)</i>	118.459	130.340	127.095	-	127.095	136.284	108.591	56.019	56.677	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Joint Air-to-Ground Missile (JAGM) is an air-launched missile system that provides advanced line-of-sight (LOS) and beyond-line-of-sight (BLOS) capabilities, including precision point and fire-and-forget (active and passive) seeker targeting technologies; increased range; and increased lethality against soft and hardened moving and stationary targets. The system will be used with fixed-wing aircraft, rotary-wing aircraft, and unmanned aircraft systems (UAS).

The JAGM System will replace aviation-launched TOW, the HELLFIRE family of missiles, and the Navy's Maverick family of missiles. JAGM is a joint program with the Army, Navy, and United States Marine Corps that addresses rotary/fixed wing and UAS requirements. The Army is funding common missile development and integration to Army unique platforms with the Navy funding their platform integration requirements. The Super Hornet (F/A 18E/F), the Apache (AH-64D), and the Super Cobra (AH-1Z) are threshold platforms with integration by Milestone C (FY15) and Initial Operational Capability (IOC) beginning in FY17. Other threshold platforms are the Seahawk (MH-60R), Extended Range Multi Purpose (ERMP) UAS (MQ-1C), and the Army OH-58 Cockpit and Sensor Upgrade Program (CASUP). Integration timelines for MH-60R, MQ-1C ERMP and the OH-58 CASUP is FY15 and will be updated prior to Milestone B as those programs mature. JAGM will increase the Warfighter's operational flexibility by effectively engaging a variety of stationary and mobile targets on the battlefield, including advanced heavy/light armored vehicles, bunkers, buildings, patrol craft, command and control vehicles, transporter/erector (e.g., SCUD) launchers, artillery systems, and radar/air defense systems. Its tri-mode seeker will provide robust capability in adverse weather, day or night, and in an obscured/countermeasure environment, against both stationary and moving targets. JAGM supports more efficient logistics for expeditionary force tailoring by replacing several missile variants with a single, interoperable weapon. The warhead is designed for high performance against both armored and non-armored targets. This missile allows battlefield resupply flexibility in a variety of environments, thereby minimizing the logistics burden of the combat force. The JAGM System includes missile, trainers, containers, support equipment, and launcher modifications.

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2040: Research, Development, Test & Evaluation, Army		PE 0605450A: Joint Air-to-Ground Missile (JAGM)				
BA 5: Development & Demonstration (SDD)						
B. Program Change Summary (\$ in Millions)		FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Previous President's Budget		126.775	130.340	127.534	-	127.534
Current President's Budget		118.459	130.340	127.095	-	127.095
Total Adjustments		-8.316	-	-0.439	-	-0.439
• Congressional General Reductions			-			
• Congressional Directed Reductions			-			
• Congressional Rescissions		-	-			
• Congressional Adds			-			
• Congressional Directed Transfers			-			
• Reprogrammings		-4.066	-			
• SBIR/STTR Transfer		-4.250	-			
• Adjustments to Budget Years		-	-	-0.439	-	-0.439

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Exhibit R-2A, RDT&E Project Justification: PB 2012 Army									DATE: February 2011		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 5: Development & Demonstration (SDD)				R-1 ITEM NOMENCLATURE PE 0605450A: Joint Air-to-Ground Missile (JAGM)				PROJECT JA6: JOINT AIR-TO-GROUND MISSILE (JAGM)			
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
JA6: JOINT AIR-TO-GROUND MISSILE (JAGM)	118.459	130.340	127.095	-	127.095	136.284	108.591	56.019	56.677	Continuing	Continuing
Quantity of RDT&E Articles											
Note Not applicable for this item.											
A. Mission Description and Budget Item Justification The Joint Air-to-Ground Missile (JAGM) is an air-launched missile system that provides advanced line-of-sight (LOS) and beyond-line-of-sight (BLOS) capabilities, including precision point and fire-and-forget (active and passive) seeker targeting technologies; increased range; and increased lethality against soft and hardened moving and stationary targets. The system will be used with fixed-wing aircraft, rotary-wing aircraft, and unmanned aircraft systems (UAS). The JAGM System will replace aviation-launched TOW, the HELLFIRE family of missiles, and the Navy's Maverick family of missiles. JAGM is a joint program with the Army, Navy and United States Marine Corps that addresses rotary/fixed wing and UAS requirements. The Army is funding common missile development and integration to Army unique platforms with the Navy funding their platform integration requirements. The Super Hornet (F/A 18E/F), the Apache (AH-64D), and the Super Cobra (AH-1Z) are threshold platforms with integration by Milestone C (FY15) and Initial Operational Capability (IOC) beginning in FY17. Other threshold platforms are the Seahawk (MH-60R), Extended Range Multi Purpose (ERMP) UAS (MQ-1C), and the Army OH-58 Cockpit and Sensor Upgrade Program (CASUP). Integration timelines for MH-60R, MQ-1C ERMP and the OH-58 CASUP is FY15 and will be updated prior to Milestone B as those programs mature. JAGM will increase the Warfighter's operational flexibility by effectively engaging a variety of stationary and mobile targets on the battlefield, including advanced heavy/light armored vehicles, bunkers, buildings, patrol craft, command and control vehicles, transporter/erector (e.g., SCUD) launchers, artillery systems, and radar/air defense systems. Its tri-mode seeker will provide robust capability in adverse weather, day or night, and in an obscured/countermeasure environment, against both stationary and moving targets. JAGM supports more efficient logistics for expeditionary force tailoring by replacing several missile variants with a single, interoperable weapon. The warhead is designed for high performance against both armored and non-armored targets. This missile allows battlefield resupply flexibility in a variety of environments, thereby minimizing the logistics burden of the combat force. The JAGM System includes missile, trainers, containers, support equipment, and launcher modifications.											
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)									FY 2010	FY 2011	FY 2012
Title: Preliminary Design Review (PDR)									24.308	-	-
Articles:									0		
Description: Both JAGM contractors held PDRs in June 2010.											
FY 2010 Accomplishments:											

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2010	FY 2011
PDR actions are closed.			
Title: Prototype Flights Description: During Technology Demonstration (TD) contract execution, the contractors were required to complete a Preliminary Design Review (PDR) for a system that meets the JAGM Performance Specification and to build and fly prototype missiles to demonstrate integration of the critical technologies. FY 2010 Accomplishments: TD Phase missile test flights completed September 2010.		35.205 0	-
Title: Software Simulation Algorithm Maturity Description: The program will use a Modeling and Simulation (M&S) strategy that provides an Integrated Flight Simulation (IFS), a software test station, and a high fidelity hardware in the loop simulation facility. FY 2010 Accomplishments: The IFS has been developed by both JAGM contractors and preliminary verification activities have begun. Performance assessments of the JAGM contractor's software was completed for the preliminary design review and indicated performance capability above the expected level for this phase of the program. FY 2011 Plans: The IFS results will supplement the flight test data to determine system effectiveness during test. The flight test data will support verification and validation by independent agents from the Army and Navy.		7.180 0	6.297 0
Title: Design Verification Test (DVT)/Engineering Development Test (EDT) Description: The contractor will conduct design verification testing and component qualification testing leading to a Critical Design Review (CDR). FY 2010 Accomplishments: Initial DVT component tests complete. TD phase Engineering Development Tests initiated missile test flights Jun 2010. Contractor tests were completed Sep 2010. FY 2011 Plans:		38.984 0	45.286 0

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)			FY 2010	FY 2011	FY 2012
DVT and EDT activities include government component testing, test-planning, range coordination, and missile integration testing to further reduce EMD risk.					
Title: Apache Integration Articles: Description: Integration activities will be addressed in the JAGM Platform Integration Plan. The Plan identifies Apache integration participants, scope and schedule of integration activities. FY 2010 Accomplishments: Proposed software interface changes have been submitted by JAGM contractors and platform fit checks have been completed during the TD Phase. FY 2011 Plans: Apache integration in FY11 will develop, control, and maintain the interfaces between the JAGM missile and Apache platform.			5.210 0	10.187 0	-
Title: Milestone B Articles: Description: JAGM system will successfully demonstrate exit criteria meeting entrance requirements for MS B. FY 2010 Accomplishments: MS B documentation is on schedule. FY 2011 Plans: MS B is scheduled for 3rd Qtr FY11.			7.572 0	5.047 0	-
Title: Development Activities to Support Critical Design Review (CDR) Articles: Description: During the 48-month EMD phase, the JAGM prime contractor will complete all major component and subsystem CDRs, System CDR, and testing and platform integration activities with the Platform primes on the AH-64D, AH-1Z, F/A-18E/F, and platform integration designs for the MH-60R, MQ-1C, and OH-58 CASUP. FY 2011 Plans: Prime contractor begins design activities and component qualification testing 4th Qtr FY11.			-	38.518 0	-
Title: Enter Engineering Manufacturing, and Development (EMD) Phase Articles:			-	25.005 0	-

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)			FY 2010	FY 2011	FY 2012
Description: JAGM EMD is further divided into two sub-phases: a 15-month Integrated System Design and a 33-month System Capability and Manufacturing Process Demonstration. The first of these sub-phases culminates in a successful CDR and the latter with MS C.					
FY 2011 Plans: Contract award is scheduled 4th Qtr FY11 for a 48 month development effort.					
Title: Component Qualification			-	-	55.105
Description: A cornerstone of the EMD phase includes completing all component qualifications prior to entering System Critical Design Review (CDR). Component qualification will give the JAGM program an accurate assessment of the JAGM system's maturity design before entering the system environmental qualification phase and pilot production line activities.					
FY 2012 Plans: Complete the majority of component qualification prior to CDR.					
Title: Subsystem/System Critical Design Review (CDR)			-	-	47.803
Description: Accomplish major component and subsystem CDR, System CDR, and testing and platform integration activities with the Platform primes. System CDR is further enhanced by requiring demonstrated maturity of the tactical software to 90% of all software traced requirements prior to entry of System CDR.					
FY 2012 Plans: Complete major component and subsystem CDR, testing, and platform integration activities.					
Title: Integrated Baseline Review (IBR)			-	-	4.045
Description: JAGM Product Office and Prime Contractor will review the entire EMD scope of technical work (SOW and SOO). The JAGM IBR team and prime will develop and implement the technical plan. This will lead to an assessment of JAGM technical risk and allocation of resources necessary to meet the technical requirements within the schedule.					
FY 2012 Plans: JAGM IBR team conducts Performance Measurement Baseline reviews, which tracks the Budgeted Cost of Work Scheduled. The team will conduct reviews with the prime.					
Title: Sub-System Qualification			-	-	8.303

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)									FY 2010	FY 2011	FY 2012
Description: The JAGM PO will conduct subsystem performance and qualification testing with the JAGM System launcher, missile and software installed on AH-64D Blk II, AH-1Z,F/A-18E/F platforms.											
FY 2012 Plans: The JAGM Product Office will prepare for subsystem performance and qualification testing with the JAGM System launcher, missile and software installed on AH-64D Blk II, AH-1Z, and F/A-18E/F platforms.											
Title: Platform Integration									-	-	11.839
Description: The contractor will initiate platform integration during EMD, the contractor initiated activities on the MS-C Threshold Platforms to include characterization of F/A-18E/F flying qualities. The scope of EMD includes platform integration activities. During EMD, the JAGM system will perform integration on all six threshold platforms. Platform integration activities will occur in two distinct phases for the six JAGM threshold platforms. During EMD, integration of the JAGM system will be completed on the F/A-18E/F, AH-64D, and AH-1Z platforms to support the MS C decision. While some integration efforts on the remaining threshold platforms may begin prior to MS C, completion of the integration of the remaining threshold platforms, MH-60R, OH-58 CASUP, and MQ-1C will occur subsequent to MS C. This approach does create a level of overlap between the LRIP phase and platform integration on the second group of threshold platforms.											
FY 2012 Plans: Prepare for initial JAGM missile system platform integration.											
Accomplishments/Planned Programs Subtotals									118.459	130.340	127.095
C. Other Program Funding Summary (\$ in Millions)											
Line Item	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
• C70302: Joint Air-to-Ground MSLS (JAGM)							5.496	96.213	97.886	Continuing	Continuing
• PE:: Navy RDTE	61.762	100.846	118.395		118.395		129.651	61.629	34.147	Continuing	Continuing
• SSN:: Navy Procurement							9.869	166.722	174.673	Continuing	Continuing
D. Acquisition Strategy											
The JAGM System is an ACAT 1D Joint Army/Navy/USMC program with the Army designated as lead service. The JAGM system is a common air-to-ground precision guided missile for use by Joint Service manned and unmanned aircraft to destroy high-value stationary, moving, and relocateable land and naval targets. JAGM provides current and future aviation platforms a common, multi-mode weapon, with reactive targeting capability, which satisfies the sum of needs across											

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<p>the joint platforms and eliminates the requirement for separate upgrades to multiple existing missile systems. The JAGM program has four phases: a Technology Demonstration (TD) phase including system integration and PDR, an Engineering Manufacturing, and Development (EMD) phase, a Production & Deployment (PD) phase, and an Operations & Support phase. Following solicitation and formal source selection, the government competitively awarded Fixed Price Incentive (FPI) contracts (with full cost reporting) to two contractors for the 27-month TD phase. The TD phase culminated with PDR and competitive fly-off of the contractor's prototype missiles. Milestone B has been adjusted to 3QFY11 to account for delays in approval of Milestone B documentation. The TD contractors will be asked to submit proposals for the EMD and Low Rate Initial Production (LRIP) phases. A source selection process will evaluate the contractor's proposals for the EMD and LRIP portion of the PD phases. Offeror's plans to facilitate competition during the PD phase will be considered during the evaluation process for the EMD contract. The government plans to award a single contract for the 48-month EMD phase, including an option for Advance Procurement items to support the follow-on LRIP portion of the PD phase. Fixed Price Type contracts are planned for the PD phase (LRIP and full rate production (FRP)).</p> <p><u>E. Performance Metrics</u></p> <p>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.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2012 Army											DATE: February 2011		
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2040: Research, Development, Test & Evaluation, Army BA 5: Development & Demonstration (SDD)				PE 0605450A: Joint Air-to-Ground Missile (JAGM)				JA6: JOINT AIR-TO-GROUND MISSILE (JAGM)					
Management Services (\$ in Millions)				FY 2011		FY 2012 Base		FY 2012 OCO		FY 2012 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
System Eng/ Project Management	C/FP	Various:Various	6.359	7.793		7.520		-		7.520	Continuing	Continuing	Continuing
Subtotal			6.359	7.793		7.520		-		7.520			
Product Development (\$ in Millions)				FY 2011		FY 2012 Base		FY 2012 OCO		FY 2012 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Raytheon	C/FP	Tucson, Arizona:TD Prime Contract	50.000	-		-		-		-	Continuing	Continuing	Continuing
Lockheed Martin	C/FP	Orlando, Florida:TD Prime Contract	48.710	-		-		-		-	Continuing	Continuing	Continuing
Support Contracts	C/FP	Various:NA	5.328	10.290		7.742		-		7.742	Continuing	Continuing	Continuing
EMD Prime Contract	C/CPIF	NA:EMD Prime Contract	-	103.654		98.436		-		98.436	Continuing	Continuing	Continuing
Development Engineering	C/FP	Various:NA	2.653	2.963		5.165		-		5.165	Continuing	Continuing	Continuing
Subtotal			106.691	116.907		111.343		-		111.343			
Test and Evaluation (\$ in Millions)				FY 2011		FY 2012 Base		FY 2012 OCO		FY 2012 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Other Gov Agencies	C/FP	Various:Various	1.767	5.640		8.232		-		8.232	Continuing	Continuing	Continuing
Subtotal			1.767	5.640		8.232		-		8.232			
			Total Prior Years Cost	FY 2011		FY 2012 Base		FY 2012 OCO		FY 2012 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			114.817	130.340		127.095		-		127.095			
Remarks													

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Exhibit R-4, RDT&E Schedule Profile: PB 2012 Army			DATE: February 2011
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	FY 2010				FY 2011				FY 2012				FY 2013				FY 2014				FY 2015				FY 2016			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Preliminary Design Review (PDR)																												
Milestone B																												
Critical Design Review																												
Advance Procurement 1																												
Milestone C																												
Low Rate Initial Production 1																												
Advance Procurement 2																												
Low Rate Initial Production 2																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2012 Army			DATE: February 2011
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Preliminary Design Review (PDR)	2	2010	2	2010
Milestone B	2	2011	2	2011
Critical Design Review	4	2012	4	2012
Advance Procurement 1	1	2015	1	2015
Milestone C	3	2015	3	2015
Low Rate Initial Production 1	4	2015	4	2015
Advance Procurement 2	1	2016	1	2016
Low Rate Initial Production 2	4	2016	4	2016