

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

May 2009

BUDGET ACTIVITY 5 - System Development and Demonstration		PE NUMBER AND TITLE 0604854A - Artillery Systems - EMD			
COST (In Thousands)	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	30603	33190	23318	Continuing	Continuing
509 LIGHTWEIGHT 155M HOWITZER	2960	5552	5645		14157
516 PALADIN/FAASV	27643	27638	17673	Continuing	Continuing

A. Mission Description and Budget Item Justification: This program element supports the Joint Light Weight 155mm Howitzer (LW155) and the Paladin/FAASV Improvement programs.

The LW155, a joint program with the Marine Corps, provides the replacement for the current 1970's vintage M198, 155mm Towed Howitzer. The LW155 provides significant improvement in strategic and tactical mobility over the M198. Project 509 supports Towed Artillery Digitization (TAD) Block II, a software upgrade to the digital fire control system for the M777A2(LW155).

The Paladin Integrated Management (PIM) Program which began in FY08 is incorporating a fleet management strategy that addresses obsolescence, reliability, maintainability, and supportability faced on the current fleet platforms (M109A6 and M992A2). The focus is on the following obsolescence areas: power train, suspension, power management, and electronic sub-systems. This allows the opportunity to touch the following areas: next generation fire control system, navigation system, communication/data transfer, Vehicle Health Management System (VHMS), and improved gun drive system. These system level improvements enhance the Paladin mission effectiveness, increase reliability as well as reduce life cycle costs and address electronic obsolescence with the obsolete components and provide the Army with a more viable platform which meets the needs of the maneuver commander out till 2050.

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BUDGET ACTIVITY
5 - System Development and Demonstration

PE NUMBER AND TITLE
0604854A - Artillery Systems - EMD

<u>B. Program Change Summary</u>	FY 2008	FY 2009	FY 2010
Previous President's Budget (FY 2009)	24067	42300	23808
Current BES/President's Budget (FY 2010)	30603	33190	23318
Total Adjustments	6536	-9110	-490
Congressional Program Reductions		-9110	
Congressional Rescissions			
Congressional Increases			
Reprogrammings	7209		
SBIR/STTR Transfer	-673		
Adjustments to Budget Years			-490

Change Summary Explanation: Funding - FY 2008: Funds reprogrammed to support Paladin requirements.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

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BUDGET ACTIVITY 5 - System Development and Demonstration		PE NUMBER AND TITLE 0604854A - Artillery Systems - EMD			PROJECT 509
COST (In Thousands)	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate	Cost to Complete	Total Cost
509 LIGHTWEIGHT 155M HOWITZER	2960	5552	5645		14157

A. Mission Description and Budget Item Justification: The Lightweight 155mm (LW155) Towed Howitzer, a jointly managed program with the Marine Corps, replaces the M198, 155mm Towed Howitzer. LW155 provides significant strategic and tactical mobility improvements. Project 509 supports Towed Artillery Digitization (TAD) Block II, an upgrade to the digital fire control system for the M777A2 (LW155).

<u>Accomplishments/Planned Program:</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>
Funds Matrix Support Software Engineers for TAD Block II Software Development	2960	5397	5645
Small Business Innovative Research/Small Business Technology Transfer Programs (SBIR/STTR)		155	
Total	2960	5552	5645

<u>B. Other Program Funding Summary</u>	FY 2008	FY 2009	FY 2010	To Compl	Total Cost
Procurement, Marine Corps LW155 Towed Howitzer with TAD Prod, BLIN 218500	235502	71493	61420		368415
Procurement, WTCV, Army, LW155 with TAD G01700	470591	112871	157568		741030

Comment: FY 2010 WTCV Base funding in the amount of \$49572 will procure 17 Lightweight 155MM Towed Howitzers (LW155).
FY 2010 OCO funding in the amount of \$107996 will procure 36 Lightweight 155MM Towed Howitzers (LW155).

C. Acquisition Strategy Towed Artillery Digitization (TAD) is an evolutionary acquisition strategy for the Lightweight 155mm Towed Howitzer (LW155). Block 0 consisted of "glass and iron" optical sights as the weapon's fire control. Block 1 TAD incorporated digitized aiming and pointing which increased accuracy and enabled a battery of howitzers to emplace and engage the enemy within 2 to 3 minutes as opposed to 15 to 20 minutes. Block 1a added the ability for the LW155 Howitzer to fire the XM982 Excalibur Precision Munition. Funding identified above will be used to upgrade to Block 2, which is the objective TAD configuration. The primary benefit of TAD Block 2 will be the addition of mission processing capability at the platform, enabling enhanced responsiveness and flexibility to the battlefield commander. It will also integrate a Muzzle Velocimeter for increased accuracy.

ARMY RDT&E COST ANALYSIS (R3)

May 2009

BUDGET ACTIVITY			PE NUMBER AND TITLE							PROJECT		
5 - System Development and Demonstration			0604854A - Artillery Systems - EMD							509		
I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	FY 2010 Cost	FY 2010 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Funds Matrix Support Software Engineers for TAD Software Development		ARDEC, Picatinny Arsenal, NJ		2960	1Q	5397	1Q	5645	1Q		14002	
SBIR/STTR						155					155	
Subtotal:				2960		5552		5645			14157	
II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	FY 2010 Cost	FY 2010 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Subtotal:												
III. Test And Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	FY 2010 Cost	FY 2010 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Subtotal:												
IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	FY 2010 Cost	FY 2010 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Subtotal:												
Project Total Cost:				2960		5552		5645			14157	

Schedule Profile (R4 Exhibit)

May 2009

BUDGET ACTIVITY
5 - System Development and Demonstration

PE NUMBER AND TITLE
0604854A - Artillery Systems - EMD

PROJECT
509

Event Name	FY 08				FY 09				FY 10				FY 11				FY 12				FY 13				FY 14				FY 15			
	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	1	2	3	4
(1) IBR	[Red shaded area]																															
Trade Study / Downselect	[Blue bar]																															
Software Requirements Definition	[Blue bar]																															
Preliminary Design	[Blue bar]																															
(2) Preliminary Design Review	[Blue triangle]																															
Detailed Design	[Blue bar]																															
Component Qualification Testing	[Blue bar]																															
Coding and Unit Test	[Blue bar]																															
(3) Coding Complete	[Blue triangle]																															
Integration and Engineering Evaluation Test	[Blue bar]																															
Software Formal Qualification Test	[Blue bar]																															

Schedule Detail (R4a Exhibit)

May 2009

BUDGET ACTIVITY		PE NUMBER AND TITLE						PROJECT	
5 - System Development and Demonstration		0604854A - Artillery Systems - EMD						509	
<u>Schedule Detail</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>FY 2012</u>	<u>FY 2013</u>	<u>FY 2014</u>	<u>FY 2015</u>	
IBR	1Q								
Trade Study / Downselect	1Q								
Software Requirements Definition	2Q								
Preliminary Design	2Q - 4Q								
Preliminary Design Review		1Q							
Detailed Design		1Q - 4Q							
Component Qualification Testing			1Q - 2Q						
Coding and Unit Test			2Q - 3Q						
Coding Complete			3Q						
Integration and Engineering Evaluation Test			3Q - 4Q						
Software Formal Qualification Test			4Q						

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

May 2009

BUDGET ACTIVITY 5 - System Development and Demonstration	PE NUMBER AND TITLE 0604854A - Artillery Systems - EMD			PROJECT 516	
COST (In Thousands)	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate	Cost to Complete	Total Cost
516 PALADIN/FAASV	27643	27638	17673	Continuing	Continuing

A. Mission Description and Budget Item Justification: The Paladin Integrated Management (PIM) Program is incorporating a fleet management strategy that addresses obsolescence, reliability, maintainability, and supportability faced on the current fleet platforms (M109A6 and M992A2). PIM focuses on the following obsolescence areas: power train, suspension, power management, and electronic sub-systems. These system level changes address obsolescence and sustainment issues on the current fleet, increase reliability and maneuverability as well as reduce life cycle costs. PIM provides the Army with a more viable platform which meets the needs of the maneuver commander out till 2050.

<u>Accomplishments/Planned Program:</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>
Paladin Integrated Management (PIM) Development	27643	21176	10112
Test and Evaluation		5689	7200
Program management			361
Small Business Innovative Research/Small Business Technology Transfer Program		773	
Total	27643	27638	17673

<u>B. Other Program Funding Summary</u>	FY 2008	FY 2009	FY 2010	To Compl	Total Cost
PA, WTCV, Paladin/FAASV	60448	28828	134123		223399

Comment: These funds cover the current Paladin/FAASV fleet and PIM production efforts starting in FY09.

C. Acquisition Strategy The PIM program is part of the overall HBCT fleet management strategy for the Paladin/Field Artillery Ammunition Support Vehicle (FAASV) to address ongoing obsolescence issues and ensure long term sustainment of these systems. The PIM program leverages both Government and Contractor capabilities in developing a system's level approach to address the obsolescence issues through the integration of proven Bradley and Future Combat Systems(FCS) common components (power train, suspension and electronics) into a new chassis. To obtain the best value for the Army, PM Fire Support Platform (FSP) is using the Original Equipment Manufacturer (OEM) as the system integrator for developing and producing these Paladin/FAASV Integrated Management (PIM) vehicles. The PIM development/integration effort began in FY08 utilizing a System Technical Support (STS) work directive that covered System Functional Review (SFR), Preliminary Design Review (PDR) and Critical Design Review (CDR) system engineering activities and early procurement of key components to support the building of 5 Howitzers/2 FAASVs that will undergo Government Testing in FY09-11. In FY09, the PM awarded a cost reimbursable R&D contract for the completion of PIM development efforts and the fabrication, assembly and delivery of 7 prototypes (5

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PROJECT

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howitzers/2 FAASV) for Government testing (Development Testing, Limited User Ttest, and Live Fire). In FY10, after Milestone C approval, the PM anticipates awarding a contract for the fabrication and delivery of 13 PIM sets (13 Paladins and 13 FAASV's) as part of Low Rate Initial Production (LRIP) of which 8 sets will be used for Initial Operational Test (IOT) testing.

ARMY RDT&E COST ANALYSIS (R3)

May 2009

BUDGET ACTIVITY			PE NUMBER AND TITLE							PROJECT		
5 - System Development and Demonstration			0604854A - Artillery Systems - EMD							516		
I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	FY 2010 Cost	FY 2010 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Component Design and Software Development	STS/CPFF	Northrop Grumman, Carson, CA	5027								5027	6250
System Integration	STS/CPFF	BAE Systems, York, Pa	4834								4569	7304
TDP Development	MIPR	Other Gov't Agencies	452								452	452
Software Development & System Integration	MIPR	TACOM-ARDEC, Picatinny, NJ	10990								7093	4136
PIM Development	STS/CPFF	BAE		26531	2Q	21949	2Q	10112	2Q		58592	
Initiate PIM IPT Structure	STS/CPFF	BAE/Northrup Grumman	1688								1327	966
Subtotal:			22991	26531		21949		10112			77060	19108
II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	FY 2010 Cost	FY 2010 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Logistics	MIPR	TACOM-ACALA, Moline, IL	229								229	370
TARDEC			367								367	
Engineering	MIPR	Various									820	
Subtotal:			596								1416	370
III. Test And Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	FY 2010 Cost	FY 2010 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Component Level Testing	MIPR	TACOM-ARDEC, Picatinny, NJ	953								953	1158

ARMY RDT&E COST ANALYSIS (R3)

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System Level Testing	MIPR	Various OGAs	930	1002	2Q	5689	2Q	7200	2Q		14821	4022
Subtotal:			1883	1002		5689		7200			15774	5180

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	FY 2010 Cost	FY 2010 Award Date	Cost To Complete	Total Cost	Target Value of Contract
PMO Support	NA	PM Paladin/FAASV, Picatinny, NJ/TACOM	1213	110	2Q			361	2Q		1684	995
Subtotal:			1213	110				361			1684	995

Project Total Cost:	26683	27643		27638		17673			95934	25653
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Schedule Detail (R4a Exhibit)

May 2009

BUDGET ACTIVITY		PE NUMBER AND TITLE						PROJECT	
5 - System Development and Demonstration		0604854A - Artillery Systems - EMD						516	
<u>Schedule Detail</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>FY 2012</u>	<u>FY 2013</u>	<u>FY 2014</u>	<u>FY 2015</u>	
Initiate PIM IPT Structure									
PIM Development and Integration	2Q - 4Q	1Q - 4Q	1Q - 3Q						
Critical Design Review		1Q							
Contractor Testing		3Q - 4Q							
Government Development Test		4Q	1Q - 4Q	1Q - 2Q					
Live Fire Testing		1Q - 4Q	1Q - 4Q	1Q - 4Q					
Milestone C			3Q						
Low Rate Initial Production Contract			3Q - 4Q						
Low Rate Initial Production Deliveries				3Q - 4Q	1Q				
Full Rate Production					3Q - 4Q	1Q - 4Q	1Q - 4Q	1Q - 4Q	