

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2008

BUDGET ACTIVITY
5 - System Development and Demonstration

PE NUMBER AND TITLE
0604854A - Artillery Systems - EMD

COST (In Thousands)	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	1598	24067	42300	23808	5858	5562	5366	Continuing	Continuing
509 LIGHTWEIGHT 155M HOWITZER		5925	5570	5737					17232
516 PALADIN/FAASV	1598	18142	36730	18071	5858	5562	5366	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 current Paladin/Field Artillery Ammunition Vehicle (FAASV) project allows for the integration of several selected system improvements which provide for: development and integration of the Excalibur (M982) extended range projectile requirements into the Paladin Digital Fire Control System (PDFCS). These systems improvements improved the Paladin mission effectiveness, increase reliability as well as reduce life cycle costs and address electronic obsolescence with the obsolete Paladin Automatic Fire Control System (AFCS). The Paladin Integrated Management (PIM) Program which will begin in FY08 will take the Paladin product cycle to the next level to address all obsolescence, reliability, maintainability and supportability faced by the Paladin and FAASV today and the near future to include: Power Train upgrade; Suspension system; electronic sub-systems to include the next generation fire control system, navigation system, communication/data transfer and Vehicle Health Management system; Improvement Gun Drive System to meet the needs of the future battle field.

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<u>B. Program Change Summary</u>	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2008/2009)	1632	24221	24073
Current BES/President's Budget (FY 2009)	1598	24067	42300
Total Adjustments	-34	-154	18227
Congressional Program Reductions		-154	
Congressional Rescissions			
Congressional Increases			
Reprogrammings	12		
SBIR/STTR Transfer	-46		
Adjustments to Budget Years			18227

Change Summary Explanation: Funding: FY 2009 -- Lightweight 155 program, funding increased to support software development and engineering efforts for lethality and survivability enhancements, to include ballistic computation at the weapon system and the addition of a Muzzle Velocity System to increase accuracy.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

BUDGET ACTIVITY 5 - System Development and Demonstration			PE NUMBER AND TITLE 0604854A - Artillery Systems - EMD					PROJECT 509		
COST (In Thousands)	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	Cost to Complete	Total Cost	
509 LIGHTWEIGHT 155M HOWITZER		5925	5570	5737					17232	

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

<u>Accomplishments/Planned Program:</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
Funds Matrix Support Software Engineers for TAD Block II Software Development		5759	5570
Small Business Innovative Research/Small Business Technology Transfer Programs (SBIR/STTR)		166	
Total		5925	5570

<u>B. Other Program Funding Summary</u>	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	To Compl	Total Cost
Procurement, Marine Corps LW155 Towed Howitzer with TAD Prod, BLIN 218500	93960	175500	2500	2600	2700				277260
Procurement, WTCV, Army, LW155 with TAD G01700	172194	410972	113205	38067	35765	46699	46679		863581

Comment:

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)

February 2008

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 2007 Cost	FY 2007 Award Date	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Funds Matrix Support Software Engineers for TAD Software Development		ARDEC, Picatinny Arsenal, NJ				5759	1Q	5570	1Q		11329	
Small Business Innovative Research/Small Business Technology Transfer Program						166					166	
Subtotal:						5925		5570		14100	14100	25595
II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award Date	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 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 2007 Cost	FY 2007 Award Date	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 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 2007 Cost	FY 2007 Award Date	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	Cost To Complete	Total Cost	Target Value of Contract

ARMY RDT&E COST ANALYSIS (R3)

February 2008

BUDGET ACTIVITY 5 - System Development and Demonstration			PE NUMBER AND TITLE 0604854A - Artillery Systems - EMD						PROJECT 509		
	Type				Date		Date		Date		Contract
Subtotal:											

Project Total Cost:					5925		5570		14100	25595	
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Schedule Profile (R4 Exhibit)

February 2008

BUDGET ACTIVITY
5 - System Development and Demonstration

PE NUMBER AND TITLE
0604854A - Artillery Systems - EMD

PROJECT
509

Event Name	FY 07				FY 08				FY 09				FY 10				FY 11				FY 12				FY 13			
	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																												
Trade Study / Downselect																												
Software Requirements Definition																												
Preliminary Design																												
(2) Preliminary Design Review																												
Detailed Design																												
Component Qualification Testing																												
Coding and Unit Test																												
(3) Coding Complete																												
Integration and Engineering Evaluation Test																												
Software Formal Qualification Test																												

Schedule Detail (R4a Exhibit)

February 2008

BUDGET ACTIVITY
5 - System Development and Demonstration

PE NUMBER AND TITLE
0604854A - Artillery Systems - EMD

PROJECT
509

<u>Schedule Detail</u>	<u>FY 2007</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>
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)

February 2008

BUDGET ACTIVITY 5 - System Development and Demonstration		PE NUMBER AND TITLE 0604854A - Artillery Systems - EMD						PROJECT 516	
COST (In Thousands)	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	Cost to Complete	Total Cost
516 PALADIN/FAASV	1598	18142	36730	18071	5858	5562	5366	Continuing	Continuing

A. Mission Description and Budget Item Justification: The current Paladin/Field Artillery Ammunition Vehicle (FAASV) project allows for the integration of several selected system improvements which provide for: development and integration of the Excalibur (M982) extended range projectile requirements into the Paladin Digital Fire Control System (PDFCS). These systems improvements improved the Paladin mission effectiveness, increase reliability as well as reduce life cycle costs and address electronic obsolescence with the obsolete Paladin Automatic Fire Control System (AFCS). The Paladin Integrated Management (PIM) Program which will begin in FY08 will take the Paladin product cycle to the next level to address all obsolescence, reliability, maintainability and supportability faced by the Paladin and FAASV today and the near future to include: Power Train upgrade; Suspension system; electronic sub-systems to include the next generation fire control system, navigation system, communication/data transfer and Vehicle Health Management system; Improvement Gun Drive System to meet the needs of the future battle field.

<u>Accomplishments/Planned Program:</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
Initiate PIM IPT Structure	1598		
Paladin Integrated Management (PIM) Development		17635	36730
Small Business Innovative Research/Small Business Technology Transfer Program		507	
Total	1598	18142	36730

<u>B. Other Program Funding Summary</u>	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	To Compl	Total Cost
PA, WTCV, Paladin/FAASV	44384	22471	28913	98785	157504	176912	221414	Continuing	Continuing

Comment:

C. Acquisition Strategy The Paladin/FAASV project will leverage both Government and Contractor capabilities to accomplish the development of the Paladin/FAASV system improvement projects. Government in-house engineering will perform some component level design and system integration. Final System Level Testing will be performed by Other Government Agencies (OGA). Competitive contracts will be used for many of the component level design and hardware fabrication. To the extent possible, maximum use of existing commercial off-the-shelf hardware and software will be utilized.

ARMY RDT&E COST ANALYSIS (R3)

February 2008

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 2007 Cost	FY 2007 Award Date	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 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	4569								4569	7304
TDP Development	MIPR	Other Gov't Agencies	452								452	452
Software Development & System Integration	MIPR	TACOM-ARDEC, Picatinny, NJ	7093								7093	4136
PIM Development	STS/CPFF	BAE/Northrup Grumman				16635	2Q	29763	2Q		46398	
Initiate PIM IPT Structure	STS/CPFF	BAE/Northrup Grumman	361	966	2Q						1327	966
Small Business Innovative Research/Small Business Technology Transfer Program						507					507	
Subtotal:			17502	966		17142		29763			65373	19108
II. Support Costs												
II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award Date	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Logistics	MIPR	TACOM-ACALA, Moline, IL	229								229	370
TARDEC				367	2-3Q						367	
Engineering	MIPR	Various						4967	2Q		4967	
Subtotal:			229	367				4967			5563	370
III. Test And Evaluation												
III. Test And Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award Date	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	Cost To Complete	Total Cost	Target Value of Contract

ARMY RDT&E COST ANALYSIS (R3)

February 2008

BUDGET ACTIVITY			PE NUMBER AND TITLE								PROJECT	
5 - System Development and Demonstration			0604854A - Artillery Systems - EMD								516	
	Type				Date		Date		Date		Contract	
Component Level Testing	MIPR	TACOM-ARDEC, Picatinny, NJ	953							953	1158	
System Level Testing	MIPR	Various OGAs	930		800	2Q	2000	2Q		3730	4022	
Subtotal:			1883		800		2000			4683	5180	
IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award Date	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	Cost To Complete	Total Cost	Target Value of Contract
PMO Support	NA	PM Paladin/FAASV, Picatinny, NJ/TACOM	898	265	2Q	200	2Q				1363	995
Subtotal:			898	265		200					1363	995
Project Total Cost:			20512	1598		18142		36730			76982	25653

Schedule Profile (R4 Exhibit)

February 2008

BUDGET ACTIVITY
5 - System Development and Demonstration

PE NUMBER AND TITLE
0604854A - Artillery Systems - EMD

PROJECT
516

Event Name	FY 07				FY 08				FY 09				FY 10				FY 11				FY 12				FY 13			
	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
PIM Development																												
Initiate PIM IPT Structure																												

Schedule Detail (R4a Exhibit)

February 2008

BUDGET ACTIVITY 5 - System Development and Demonstration		PE NUMBER AND TITLE 0604854A - Artillery Systems - EMD					PROJECT 516	
<u>Schedule Detail</u>	<u>FY 2007</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>	
PIM Development		2Q - 4Q	1Q - 4Q	1Q - 4Q	1Q - 4Q	1Q - 4Q	1Q - 4Q	
Initiate PIM IPT Structure	2Q - 4Q							