

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2004

BUDGET ACTIVITY

7 - Operational system development

PE NUMBER AND TITLE

0203735A - Combat Vehicle Improvement Programs

COST (In Thousands)	FY 2003 Actual	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	81285	31336	15952	12796	13089	8709	6613	Continuing	Continuing
330 ABRAMS TANK IMPROVE PROG	80330	25205	15952	12796	13089	8709	6613	Continuing	Continuing
718 GRND COMBAT VEHICLE HTI	955	6131	0	0	0	0	0	0	15895

A. Mission Description and Budget Item Justification: This Program Element (PE) responds to vehicle deficiencies identified during past and present Army operations, continues technical system upgrades, and addresses needed evolutionary enhancements to tracked combat vehicles. This PE provides combat effectiveness and Operating and Support (O&S) cost reduction enhancements for the Abrams tanks through a series of product improvements. These systems support the Current and Future Force transition path of the Transformation Campaign Plan (TCP).

B. Program Change Summary	FY 2003	FY 2004	FY 2005
Previous President's Budget (FY 2004)	82702	24486	16121
Current Budget (FY 2005 PB)	81285	31336	15952
Total Adjustments	-1417	6850	-169
Congressional program reductions		-299	
Congressional rescissions	-950		
Congressional increases		7200	
Reprogrammings	-467	-51	
SBIR/STTR Transfer			
Adjustments to Budget Years			-169

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PROJECT

330

COST (In Thousands)	FY 2003 Actual	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	Cost to Complete	Total Cost
330 ABRAMS TANK IMPROVE PROG	80330	25205	15952	12796	13089	8709	6613	Continuing	Continuing

A. Mission Description and Budget Item Justification: This project funds improvements to the Abrams Main Battle Tank (M1 series). The Abrams mission is to close with and destroy enemy forces on the integrated battlefield using firepower, maneuver, and shock effect. The M1A2 was the Army's first fully digital ground combat system developed under this project. It was succeeded by the M1A2 SEP, which is the current production model. SEP refers to a System Enhancement Package which upgraded the M1A2's computer systems and its night vision capabilities. Post SEP development efforts are focusing on improvements yielding significant life cycle cost reductions or survivability enhancements. The Abrams engine improvement program is the most significant of these efforts in the Abrams Recapitalization Program. All M1A2 SEP tanks will be equipped with the improved engine. The objective is a more reliable and easier-to-repair engine that significantly reduces both the Operations and Support (O&S) burden and the armored forces logistics footprint. The Abrams Product Manager also plans to explore a variety of armor package configurations and auxiliary power unit designs to the M1A2 SEP tank that will permit it to become more survivable and to effectively run the tank's on-board computer systems. The auxiliary power unit designs considered will replace previous program efforts on the Under Armor Auxiliary Power Unit (UAAPU); previous efforts on an UAAPU were discontinued when they were found not to meet M1A2 SEP tank operational requirements. Congress added funds for Abrams light weight track development to the President's FY2004 budget request. This system supports the current transition path of the Transformation Campaign Plan (TCP).

<u>Accomplishments/Planned Program</u>	FY 2003	FY 2004	FY 2005
Abrams Engine Improvement Program	58776	18398	2640
Abrams Legacy Fleet Embedded Diagnostics	2321	0	0
Parts Obsolescence and System Technical Support	4300	3612	4800
Alternative Armor Solution	7433	1500	1500
Alternative Auxiliary Power Unit	7500	0	7012
Abrams Track	0	962	0
Small Business Innovative Research/Small Business Technology Transfer Programs (SBIR/STTR).	0	733	0
Totals	80330	25205	15952

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B. Other Program Funding Summary

	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	To Compl	Total Cost
Abrams Upgrade Program (GA0750)	384238	3317	0	0	0	0	0	0	974590
Abrams Vehicle Modification (GA0700)	159449	106885	116917	451379	366147	339899	297584	519300	2438179
System Enhancement Pgm (GA0730)	85183	180050	292152	0	0	0	0	0	656012
Abrams Training Devices (GB1302)	11858	0	3624	3709	1073	1074	1075	0	34059
Training Device Mod (GA5208)	5411	6206	3643	3754	1073	1074	1075	0	27702
Initial Spares (GE0161)	9882	5350	11442	5363	0	0	0	0	47527

C. Acquisition Strategy: Honeywell is the prime contractor for the Abrams engine improvement program. General Dynamics Land Systems Division (GDLS) is the prime contractor for the vehicle integration effort.

ARMY RDT&E COST ANALYSIS(R3)									February 2004			
BUDGET ACTIVITY 7 - Operational system development					PE NUMBER AND TITLE 0203735A - Combat Vehicle Improvement Programs					PROJECT 330		
I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2003 Cost	FY 2003 Award Date	FY 2004 Cost	FY 2004 Award Date	FY 2005 Cost	FY 2005 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Prior Contracts	Various	Various	621329	0		0		0		0	621329	621329
b . Abrams Engine Improvement	C-CPAF	Honeywell International Phoenix, AZ	141424	39115	3Q	8398	2-3Q	2640		0	191577	191659
c . Integration of improved engine into vehicle	SS-CPFF	General Dynamics Sterling Heights, MI	68221	16565	2-4Q	0	2-3Q	0		0	84786	84786
d . Other Contracts	Various	Various	34710	22329	2-4Q	6807	2-3Q	13312	1-4Q	Continue	77158	0
Subtotal:			865684	78009		15205		15952		Continue	974850	897774
II. Support Cost	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2003 Cost	FY 2003 Award Date	FY 2004 Cost	FY 2004 Award Date	FY 2005 Cost	FY 2005 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Embedded Diagnostics	MIPR	Various	17023	2321		0		0		0	19344	0
Subtotal:			17023	2321		0		0		0	19344	0

ARMY RDT&E COST ANALYSIS(R3)									February 2004				
BUDGET ACTIVITY					PE NUMBER AND TITLE					PROJECT			
7 - Operational system development					0203735A - Combat Vehicle Improvement Programs					330			
III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2003 Cost	FY 2003 Award Date	FY 2004 Cost	FY 2004 Award Date	FY 2005 Cost	FY 2005 Award Date	Cost To Complete	Total Cost	Target Value of Contract	
a . Various Test Sites	MIPR	Aberdeen Proving Ground, MD; Yuma Proving Ground, AZ; White Sands Missile Range, NM	55601	0		10000	3Q	0		0	65601	0	
Subtotal:			55601	0		10000		0		0	65601	0	
IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2003 Cost	FY 2003 Award Date	FY 2004 Cost	FY 2004 Award Date	FY 2005 Cost	FY 2005 Award Date	Cost To Complete	Total Cost	Target Value of Contract	
Subtotal:			0	0		0		0		0	0	0	
Project Total Cost:			938308	80330		25205		15952		Continue	1059795	897774	

Schedule Profile (R4 Exhibit)																					February 2004											
BUDGET ACTIVITY 7 - Operational system development										PE NUMBER AND TITLE 0203735A - Combat Vehicle Improvement Programs												PROJECT 330										
Event Name	FY 02				FY 03				FY 04				FY 05				FY 06				FY 07				FY 08				FY 09			
	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				
Abrams Engine Improvement Program (AEIP) In-Vehicle Test																																
(1) AEIP Production Decision																																
(2) AEIP Production Contract Award																																
(3) Alternative Armor Contract Award																																
(4) Alternative Auxiliary Power Unit Award																																

Schedule Detail (R4a Exhibit)						February 2004	
BUDGET ACTIVITY 7 - Operational system development			PE NUMBER AND TITLE 0203735A - Combat Vehicle Improvement Programs			PROJECT 330	
<u>Schedule Detail</u>	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
First In-Vehicle Testing of Improved Engine	2Q						
Complete Engine Improvement Contract		2Q					
Complete GDLS Integration Contract			1Q				
Alternative Armor Contract Award	4Q						
Alternative Auxiliary Power Unit Award		2Q					

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February 2004

BUDGET ACTIVITY
7 - Operational system development

PE NUMBER AND TITLE
0203735A - Combat Vehicle Improvement Programs

PROJECT
718

COST (In Thousands)	FY 2003 Actual	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	Cost to Complete	Total Cost
718 GRND COMBAT VEHICLE HTI	955	6131	0	0	0	0	0	0	15895

A. Mission Description and Budget Item Justification: Project D718, Ground Combat Vehicle Horizontal Technology Integration (HTI), is a project initiated for the purpose of developing technology improvements which have application to or insertion opportunities across multiple Ground Combat System (GCS) vehicles, both current and future (e.g. Future Combat Systems (FCS)).

- 1) This project supports the maturation of the Hybrid Electric M113 into a production representative system configuration.
- 2) The Strategic Focus Group and Automotive Electronics/Architecture Trade Study examines electronics and software architecture growth to determine the best path to position architecture programs to support current P3I efforts and future combat system developments.
This PE supports the Current and Future Force transition path of the Transformation Campaign Plan (TCP)

Accomplishments/Planned Program	FY 2003	FY 2004	FY 2005
Program Management	955	0	0
Hybrid Electric Engineering, Logistics, and Test	0	3071	0
Strategic Focus Group and Automotive Electronic / Architecture	0	1922	0
Digitization Support	0	960	0
Small Business Innovative Research / Small Business Technology Transfer Programs (SBIR/STTR).	0	178	0
Totals	955	6131	0

B. Other Program Funding Summary: Not applicable for this item.

C. Acquisition Strategy: This Project will work towards the resolution of technology concerns that impact current and future GCS systems.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		February 2004
BUDGET ACTIVITY 7 - Operational system development	PE NUMBER AND TITLE 0203735A - Combat Vehicle Improvement Programs	PROJECT 718
<p>1) M113 Hybrid Electric development.</p> <p>2) The Strategic Focus Group and Automotive Electronics/Architecture Trade Study for Common Ground Architecture was awarded in FY03 to a GSA approved Contractor, a follow on effort is programmed for FY04.</p> <p>3) Digitization Support at Ft. Hood</p> <p>This project supports the Current and Future Force transition path of the Transformation Campaign Plan (TCP)</p>		

ARMY RDT&E COST ANALYSIS(R3)									February 2004			
BUDGET ACTIVITY 7 - Operational system development					PE NUMBER AND TITLE 0203735A - Combat Vehicle Improvement Programs					PROJECT 718		
I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2003 Cost	FY 2003 Award Date	FY 2004 Cost	FY 2004 Award Date	FY 2005 Cost	FY 2005 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . LWR Development	MIPR	Booz Allen Hamilton	2685	0		0		0		0	2685	0
b . FBCB2 Architecture Study	Fixed Price	Carnegie Mellon	75	0		0		0		0	75	0
c . Common Ground Architecture Study	Fixed Price	Veridian Engineering	381	0		0		0		0	381	0
d . RTCOE Exp	CPIF	UDLP, Minn, MD	1265	0		0		0		0	1265	0
e . Objective IC3	CP	Open Competition	1312	0		0		0		0	1312	0
f . FY00 effort			7638	0		0		0		0	7638	0
g . New Generation Electronics	CPFF	Camber, Huntsville, AL	0	955	3Q	0		0		0	955	0
h . M113 Hybrid Electric Development	CPIF	UDLP, San Jose, CA	0	0		2287	1-2Q	0		0	2287	0
i . Combat Vehicle Electronic	TBD	TBD	0	0		1978	2-3Q	0		0	1978	0
j . Digitization Support	MIPR	Ft. Hood, TX	0	0		989	2Q	0		0	989	0

ARMY RDT&E COST ANALYSIS(R3)									February 2004			
BUDGET ACTIVITY					PE NUMBER AND TITLE					PROJECT		
7 - Operational system development					0203735A - Combat Vehicle Improvement Programs					718		
I. Product Development (continued)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2003 Cost	FY 2003 Award Date	FY 2004 Cost	FY 2004 Award Date	FY 2005 Cost	FY 2005 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Subtotal:			13356	955		5254		0		0	19565	0
II. Support Cost	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2003 Cost	FY 2003 Award Date	FY 2004 Cost	FY 2004 Award Date	FY 2005 Cost	FY 2005 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Tech Spt. - LWR	MIPR	CECOM	201	0		0		0		0	201	0
b . Objective IC3 ABRAMS STS	CP	GDLS	934	0		0		0		0	934	0
c . Objective IC3 BRADLEY STS	CP	UDLP	934	0		0		0		0	934	0
d . Objective IC3 ABRAMS Training Device Upgrade	CP	GDLS	0	0		0		0		0	0	0
e . Objective IC3 BRADLEY Training Device Upgrade	CP	UDLP	0	0		0		0		0	0	0
f . M113 Hybrid Electric Development	CPIF	UDLP, San Jose, CA	0	0		553	1-2Q	0		0	553	0
Subtotal:			2069	0		553		0		0	2622	0

ARMY RDT&E COST ANALYSIS(R3)									February 2004			
BUDGET ACTIVITY 7 - Operational system development					PE NUMBER AND TITLE 0203735A - Combat Vehicle Improvement Programs						PROJECT 718	
III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2003 Cost	FY 2003 Award Date	FY 2004 Cost	FY 2004 Award Date	FY 2005 Cost	FY 2005 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . M113 Hybrid Electric Development	CPIF	UDLP, San Jose, CA	0	0		324	1-2Q	0		0	324	0
Subtotal:			0	0		324		0		0	324	0
IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2003 Cost	FY 2003 Award Date	FY 2004 Cost	FY 2004 Award Date	FY 2005 Cost	FY 2005 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . In House Spt PEO GCSS PM's	MIPR	TARDEC	489	0		0		0		0	489	0
b . Camber Support for Objective IC3	CP	Camber Corp.	533	0		0		0		0	533	0
Subtotal:			1022	0		0		0		0	1022	0
Project Total Cost:			16447	955		6131		0		0	23533	0