

# ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)

June 2001

BUDGET ACTIVITY  
4 - DEM/VAL

PE NUMBER AND TITLE  
0603854A - ARTILLERY SYSTEMS - DEMVAL

PROJECT  
505

COST (In Thousands)	FY 2000 Actual	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	Cost to Complete	Total Cost
505 ARTILLERY SYSTEMS DEM/VAL	262152	352051	447949	0	0	0	0	0	0	0

## A. Mission Description and Budget Item Justification:

**PLEASE NOTE:** This administration has not addressed FY2003-2007 requirements. All FY 2003-2007 budget estimates included in this book are notional only and subject to change.

This program element supports the Program Definition and Risk Reduction (PDRR) efforts for the Crusader - Advanced Development Program. The Crusader system is the Army's next generation self-propelled howitzer (SPH) and artillery resupply vehicles (RSVs) designed to support Army XXI, Joint Vision 2010 and is an integral component of the Army's Transformation. Crusader will have significantly increased capabilities in the areas of lethality, mobility, survivability, resupply, command and control, and sustainability by capitalizing on emerging, advanced technologies. The SPH will also achieve increased lethality levels through independent operations. The RSVs will have significantly increased capabilities in the areas of resupply, mobility and survivability and will provide a single source of ammunition, fuel, propellant and other supplies for the SPH. In consonance with the Army Transformation, the Crusader development has been restructured to improve transportability and relevance to the Army's Transformation and objective force. The focus of the revised Crusader program is to increase all modes of deployability while retaining all of its Key Performance Parameters. The revised Crusader system reduces weight and volume and employs a change in resupply vehicle philosophy (an equal mix of tracked and wheeled resupply vehicles). The restructured program leverages the successful development to date and continues development activities that support the revised Crusader concept and significant weight reduction initiatives. Major subsystems and technologies remain largely unchanged, but will be repackaged. The program will remain in the Program Definition and Risk Reduction (PDRR) phase to improve deployability and relevance to the Army's transformation, and transition to Engineering and Manufacturing Development (EMD) in fiscal year 2002 with the procurement of EMD Long Lead Items. This system supports the Legacy transition path of the Transformation Campaign Plan (TCP).

## FY 2000 Accomplishments

- 214379 Product Development: Redirected efforts to develop the lightweight Crusader concept under Crusader PDRR contract. Continued efforts in support of integration and risk reduction of critical technologies. Initiated development/Integration of software release 3 and integrated builds two and three. Completed Electronic Bench Top Developmental System (EBTDS). Integrated Crusader Emulator (ICE) development. Delivered 3.0 Operating System and Services (OSS). Selected Powerpack/Drive Train (PP/DT) developer and initiated development of new (PP/DT). Initiated Component Maturation/Weight reduction initiatives. Delivered SPH1 Emulator to YPG for testing.
- 35898 Support and Management: Continued project management efforts; to include engineering analysis, product development team support and engineering management activities. Continued coordination and development of MSII activities in accordance with new program approach.

**ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)****June 2001**

BUDGET ACTIVITY

**4 - DEM/VAL**

PE NUMBER AND TITLE

**0603854A - ARTILLERY SYSTEMS - DEMVAL**

PROJECT

**505****FY 2000 Accomplishments (Continued)**

- 11875 Test and Evaluation: Initiated testing of SPH1 Emulator at YPG. Conducted Survivability Risk Reduction tasks (Compartmentation, Vehicle Section Tests - VST) testing. Purchased ammunition and propellant for program testing.

Total 262152

**FY 2001 Planned Program**

- 290372 Product Development: Continue efforts by developing Preliminary Design for lightweight Crusader concepts under Crusader PDRR contract. Continue efforts in support of integration and risk reduction of critical technologies. Checkout and test Software Release 3. Start Integration/Assembly of new Powerpack/Drive Train. Initiate Survivability Risk Reduction Tasks. Continue component Maturation/Weight reduction initiatives. Configure Turret and Resupply Test Stands and demonstrate system performance/performance growth.
- 34146 Support and Management: Continue project management efforts; to include engineering analysis, product development team support and engineering management activities. Continue coordination and development of MSII activities in accordance with new program approach.
- 17247 Test and Evaluation: Continue testing of SPH 1 Emulator at YPG. Continue survivability risk reduction testing. Purchase of ammunition and propellant for program testing.
- 10286 Small Business Innovation Research/Small Business Technology Transfer

Total 352051

**FY 2002 Planned Program**

- 396981 Product Development: Continue Detailed Design efforts for Lightweight Crusader concept under Crusader PDRR contract. Continue efforts in support of integration and risk reduction of critical technologies. Continue checkout and test Software Release 3. Initiate integration of release 5 software. Delivery of new prototype Powerpack/Drive Train. Continue Survivability Risk Reduction Tasks. Continue component Maturation/Weight reduction initiatives. Continue configuring turret and Resupply Test Stands and demonstrate system performance/performance growth.
- 38257 Support and Management: Continue project management efforts; to include engineering analysis, product development team support and engineering management activities. Continue coordination and development of MSII activities in accordance with new program approach.
- 12711 Test and Evaluation: Continue testing of SPH 1 Emulator at YPG. Initiate PDRR Performance T&E of Powerpack/Drive Train. Continue Survivability Risk Reduction Testing. Purchase of ammunition and propellant for program testing.

Total 447949

# ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)

June 2001

BUDGET ACTIVITY  
4 - DEM/VAL

PE NUMBER AND TITLE  
0603854A - ARTILLERY SYSTEMS - DEMVAL

PROJECT  
505

<u>B. Program Change Summary</u>	FY 2000	FY 2001	FY 2002	FY 2003
Previous President's Budget (FY2001 PB)	266158	355309	446674	0
Appropriated Value	268137	355309	0	0
Adjustments to Appropriated Value	0	0	0	0
a. Congressional General Reductions	0	0	0	0
b. SBIR / STTR	-7006	0	0	0
c. Omnibus or Other Above Threshold Reductions	-1072	0	0	0
d. Below Threshold Reprogramming	3000	0	0	0
e. Rescissions	-907	-3258	0	0
Adjustments to Budget Years Since FY2001 PB	0	0	1275	0
New Army Transformation Adjustment	0	0	0	0
Current Budget Submit (FY 2002/2003 PB )	262152	352051	447949	0

<u>C. Other Program Funding Summary</u>	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Compl	Total Cost
RDTE, BA5, Army, PE 0604854, D503	0	0	39449	0	0	0	0	0	0	0
Procurement, WTCV, Army, G83500	0	0	0	0	0	0	0	0	0	0
Procurement, WTCV, Army, G83600	0	0	0	0	0	0	0	0	0	0
RDTE, BA5, Army, PE 0604854, D2KT	0	225	199	0	0	0	0	0	0	0
Procurement, Ammo, Army, ER 8021	42601	39565	87413	0	0	0	0	0	0	0
RDTE, BA5, Army, PE 0604645, D175	2800	2180	0	0	0	0	0	0	0	0
Procurement, Ammo, Army, ER 8017	13951	45215	37548	0	0	0	0	0	0	0
Procurement, OPA, Army, D16500*	0	0	0	0	0	0	0	0	0	0

# ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)

June 2001

BUDGET ACTIVITY  
4 - DEM/VAL

PE NUMBER AND TITLE  
0603854A - ARTILLERY SYSTEMS - DEMVAL

PROJECT  
505

## C. Other Program Funding Summary (continued)

FY 2000 FY 2001 FY 2002 FY 2003 FY 2004 FY 2005 FY 2006 FY 2007 To Compl Total Cost

**C. Other Program Funding Summary:** \*Funding summary represents a portion of the overall funding in D16500, Other Procurement, Army.

**D. Acquisition Strategy:** On 29 December 1994, a Sole Source-CPIF contract award was made selecting United Defense, Limited Partnership (UDLP) as the prime contractor for the PDRR phase of Crusader. General Dynamics Land Systems (Warren, MI) and General Dynamics Armament Systems (Burlington, VT) are the major sub-contractors in the areas of mobility and resupply respectively. On 19 March 1996, the Army changed the armament system for Crusader from liquid propellant (LP) to solid propellant (SP) as a consequence of cost and persistent technical problems. In June 1996, UDLP selected the government's Advanced Solid Propellant Armament System (XM297 cannon and Modular Artillery Charge System (MACS) as the basis for SP Crusader). On 6 November 1996, TACOM-ARDEC signed a Memorandum of Agreement (MOA) with UDLP establishing a unique teaming arrangement for the Government to provide engineering services to UDLP for the development of the SP armament system. Delay in the decision to switch from LP to SP and alignment of program activities to match fiscal profile required an adjustment in the schedule portion of the Acquisition Program Baseline (APB). On 23 October 1997, the Office of the Secretary of Defense approved Crusader's revised APB. The revised APB leveraged acquisition reform initiatives and featured a single continuous objective development path. The seamless transition from PDRR to EMD eliminated inefficiencies in ramping down/up during the milestone decision. In accordance with the Transformation Plan dated December 1999, Crusader went through a redefinition effort for reduced weight and increased transportability. A revised program schedule and budget was developed to support this effort. Additionally, in June 2000, a revision to the Crusader Acquisition Strategy was signed to support this path forward. The FY01 President's Budget reflected this change. Due to this restructure of both cost and schedule an adjustment to the Acquisition Program Baseline (APB) was required. On 18 December 2000, the Office of the Secretary of Defense approved Crusader's revised APB. The strategy for development of the lightweight Crusader is to build on the successful development to date on major subsystems; e.g. continue development and testing of the XM297 cannon, exercise the resupply subsystem and software in the Systems Integration Facility (SIF), and continue electronics and software development. The strategy is to continue these efforts, without a break, develop weight reduction technologies and initiatives, and re-design the system with the current contractor team.

## E. Schedule Profile

	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
Delivery of SPH 1 Emulator & initiate testing *	2Q			0	0	0	0	0
Select Powerpack/Drivetrain Developer *	4Q			0	0	0	0	0
Delivery of prototype Powerpack/Drivetrain			4Q	0	0	0	0	0
Delivery of Gen 1 Electronics		3Q		0	0	0	0	0
Milestone II				0	0	0	0	0

<b>ARMY RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)</b>						<b>June 2001</b>	
BUDGET ACTIVITY <b>4 - DEM/VAL</b>				PE NUMBER AND TITLE <b>0603854A - ARTILLERY SYSTEMS - DEMVAL</b>		PROJECT <b>505</b>	
<b><u>E. Schedule Profile (continued)</u></b>				<u>FY 2000</u>		<u>FY 2001</u>	
				<u>FY 2002</u>		<u>FY 2003</u>	
				<u>FY 2004</u>		<u>FY 2005</u>	
				<u>FY 2006</u>		<u>FY 2007</u>	
<p>*Milestone completed</p>							

ARMY RDT&E COST ANALYSIS(R-3)									June 2001			
BUDGET ACTIVITY 4 - DEM/VAL					PE NUMBER AND TITLE 0603854A - ARTILLERY SYSTEMS - DEMVAL					PROJECT 505		
I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Systems Contractor	SS/CPIF	UDLP, Minneapolis, MN	855971	222070	1Q	368331	1Q	0	0	0	0	0
b . Systems Development Engineering	PO	ARDEC, Picatinny Arsenal, NJ	64768	13629	1Q	8404	1Q	0	0	0	0	0
c . Systems Development Engineering	PO	TACOM, Warren, MI	3004	650	1Q	898	1Q	0	0	0	0	0
d . Systems Development Engineering	PO	ARL, Adelphi, MD	6532	2668	1Q	2542	1Q	0	0	0	0	0
e . Systems Development Engineering	PO	Various OGAs	9573	4933	1Q	1306	1Q	0	0	0	0	0
f . Systems Development Engineering	Various	Various contracts	15699	46422	1-2Q	15500	1-2Q	0	0	0	0	0
Subtotal:			955547	290372		396981		0		0	0	0

ARMY RDT&E COST ANALYSIS(R-3)									June 2001			
BUDGET ACTIVITY 4 - DEM/VAL					PE NUMBER AND TITLE 0603854A - ARTILLERY SYSTEMS - DEMVAL					PROJECT 505		
II. Support Cost	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Development Support	PO	PM Crusader, Picatinny Arsenal, NJ	25434	8177	1Q	8606	1Q	0	0	0	0	0
b . Development Support	PO	ARDEC, Picatinny Arsenal, NJ	37577	10254	1Q	9821	1Q	0	0	0	0	0
c . Integrated Logistics Support	PO	RIA, Rock Island, IL	911	179	1Q	236	1Q	0	0	0	0	0
d . Development Support	PO	TACOM, Warren, MI	7875	2027	1-2Q	2264	1-2Q	0	0	0	0	0
e . Development Support	PO	ARL, Adelphi, MD	3275	710	1-2Q	1144	1-2Q	0	0	0	0	0
f . Development Support	PO	Various OGAs	4815	1923	1-3Q	1846	1-3Q	0	0	0	0	0
g . Development Support	Various	Various contracts	11795	7209	1-3Q	10430	1-3Q	0	0	0	0	0
Subtotal:			91682	30479		34347		0		0	0	0

ARMY RDT&E COST ANALYSIS(R-3)									June 2001			
BUDGET ACTIVITY <b>4 - DEM/VAL</b>					PE NUMBER AND TITLE <b>0603854A - ARTILLERY SYSTEMS - DEMVAL</b>					PROJECT <b>505</b>		
III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Development Test and Evaluation	PO	TECOM (YPG, AZ; CSTA, APG, MD)	10005	7482	1-3Q	4718	1-3Q	0	0	0	0	0
b . Ammunition and propellant	PO	Various	22981	9765	1-3Q	7993	1-3Q	0	0	0	0	0
Subtotal:			32986	17247		12711		0		0	0	0
IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Project Management Support	SS/FP	Vector Research, Inc., MI	1722	600	1-2Q	600	1-2Q	0	0	0	0	0
b . Project Management Support	SS/FP	System Research & Integration, Inc., VA	405	150	1-2Q	156	1-2Q	0	0	0	0	0
c . Project Management Support	SS/FP	GSA, VA	130	0		0		0	0	0	0	0
d . Project Management Support	SS/FP	Camber, Inc., NJ	440	223	1-2Q	125	1-2Q	0	0	0	0	0



ARMY RDT&E COST ANALYSIS(R-3)									June 2001			
BUDGET ACTIVITY 4 - DEM/VAL					PE NUMBER AND TITLE 0603854A - ARTILLERY SYSTEMS - DEMVAL					PROJECT 505		
IV. Management Services (continued)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
e . Project Management Support	SS/FP	SAIC, VA	2113	864	1-2Q	773	1-2Q	0	0	0	0	0
f . Project Management Support	SS/FP	Robbins Gioia, VA	253	0		0		0	0	0	0	0
g . Project Management Support	SS/FP	Genisys, TX	191	105	1-2Q	110	1-2Q	0	0	0	0	0
h . Systems Engineering Support	SS/FP	PRC, VA	402	110	1Q	120	1Q	0	0	0	0	0
i . Systems Engineering Support	SS/FP	LMI, VA	458	0		140	1Q	0	0	0	0	0
j . Systems Engineering Support	SS/FP	SAIC, VA	81	0		0		0	0	0	0	0
k . Systems Engineering Support	SS/FP	Camber Inc, NJ	142	243	2Q	243	1-2Q	0	0	0	0	0
l . Systems Engineering Support	SS/FP	TBD	0	340	1-2Q	148	1-2Q	0	0	0	0	0
m . Software Development Support	SS/FP	Mitre Corporation, VA	1549	182	1Q	250	1Q	0	0	0	0	0

ARMY RDT&E COST ANALYSIS(R-3)									June 2001			
BUDGET ACTIVITY 4 - DEM/VAL					PE NUMBER AND TITLE 0603854A - ARTILLERY SYSTEMS - DEMVAL					PROJECT 505		
IV. Management Services (continued)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
n . Software Development Support	SS/FP	SAIC, VA	753	250	1-2Q	760	1-2Q	0	0	0	0	0
o . Software Development Support	SS/FP	High Performance Technology Inc (HPT- I), VA	236	394	1-2Q	332	1-2Q	0	0	0	0	0
p . Software Development Support	SS/FP	Averstar Inc, OK	0	206	2Q	153	1-2Q	0	0	0	0	0
q . Software Development Support	SS/FP	Camber Inc, NJ	291	0		0		0	0	0	0	0
r . SBIR/STTR	N/A	N/A	0	10286		0		0	0	0	0	0
Subtotal:			9166	13953		3910		0		0	0	0
Project Total Cost:			1089381	352051		447949		0		0	0	0