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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603653A Advanced Tank Armament System
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COST <i>(In Thousands)</i>	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	8464	1922	118139	177609	83194	8759	8739	Continuing	Continuing
DB99 Tank and Medium Caliber Armaments	8464	1922	8816	8791	8780	8759	8739	Continuing	Continuing
DC03 Medium Armored Vehicle Development*	0	0	109323	168818	74414	0	0	0	352555

*A separate Program Element will be established for the Medium Armored Vehicle Development program. FY 2002 and 2003 funding presently in project DC03 will be realigned to the new PE.

A. Mission Description and Budget Item Justification: This PE supports development of the Advanced Tank Armament System (ATAS) and Family of Medium Armored Vehicles (MAV). The ATAS program develops leap-ahead lethality improvements for tank and medium caliber armored systems and other direct fire systems. ATAS provides gun and fire control technologies that address current materiel needs as well as reductions in Operation & Support (O&S) costs. It provides the assured lethality technology upgrades for legacy systems as well as future platforms to defeat the increasingly more capable armored vehicles of potential adversaries. ATAS develops and combines maturing technology and demonstrates the combined improvements on specific weapon platforms such as Abrams, Bradley, Future Scout and Cavalry System (FSCS), Medium Armored Vehicles, etc. This leverages the technology across platforms and saves RDTE funding for these programs.

An immediate need exists for a MAV equipped C-130 transportable Brigade Combat Team (BCT), capable of deployment to anywhere on the globe in a combat ready configuration. A dynamic asymmetric threat environment demands full spectrum, strategically responsive, agile and dominant land forces. Immediate response by a lethal, versatile, tactically agile joint force capable of operational maneuver once in the Area of Operations is essential to fulfilling the Warfighting needs of the National Command Authority. The MAV equipped BCT is this force. This project will fund the RDT&E tasks necessary to field the MAV as part of the BCT.

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BUDGET ACTIVITY

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PE NUMBER AND TITLE

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B. Program Change Summary	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (FY 2000/2001 PB)	8867	1937	8870
Appropriated Value	8928	1937	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-61		
b. SBIR / STTR	-227		
c. Omnibus or Other Above Threshold Reductions		-8	
d. Below Threshold Reprogramming	-140		
e. Rescissions	-36	-7	
Adjustments to Budget Years Since FY 2000/2001 PB			-731
New Army Transformation Adjustment		TBD	+110000
Current Budget Submit (FY 2001 PB)	8464	1922	118139

Change Summary Explanation: FY2001 Funding – Project DC03 was created and funded to reflect the New Army Transformation.

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BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603653A Advanced Tank Armament System				PROJECT DB99	
COST (In Thousands)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
DB99 Tank and Medium Caliber Armaments	8464	1922	8816	8791	8780	8759	8739	Continuing	Continuing
<p>A. Mission Description and Budget Item Justification: The program develops leap-ahead lethality improvements for tank and medium caliber armored systems and other direct fire systems. ATAS provides gun and fire control technologies that address current materiel needs as well as reductions in Operation & Support (O&S) costs. It provides the assured lethality technology upgrades for legacy systems as well as future platforms to defeat the increasingly more capable threat armored vehicles.</p> <p>ATAS develops and combines maturing technology and demonstrates the combined improvements on specific weapon platforms such as Abrams, Bradley, Future Scout and Cavalry System (FSCS), Medium Armored Vehicles, etc. This leverages the technology across platforms and saves RDTE funding for programs such as the FSCS and the Medium Armored Vehicles of the Medium Brigade Combat Team.</p> <p>In conjunction with the Marine Corps and the Project Manager for the Abrams Tank, the program will complete the demonstration of an Automatic Target Tracker (ATT) for the Abrams tank in FY00. The ATT increases the tank crew's ability to quickly kill battlefield targets by providing the ability to lock-on and automatically track targets. This automatic lock-on and tracking ability will also reduce gunner training time and associated O&S costs. Completion of the ATT Demonstration was rescheduled to include Marine Corps requirements. Electronic Muzzle Reference Sensor (EMRS) testing for the Abrams tank will finish in FY00. If successful, the EMRS will eliminate the current radioactive tritium light source (and associated environmental issues and O&S costs) in the existing Muzzle Reference Sensor.</p> <p>The program is investigating a German developed gun tube as a potential lethality improvement to the Abrams tank. This long barrel 120mm-gun tube, the L55, is currently being fielded in the German Leopard-2A6 tank. This gun tube will expand the battlespace of the Abrams by allowing the tank crew to kill increasingly more lethal enemy tanks at extended ranges. Watervliet Arsenal (New York) is fabricating the U.S. version called the M256E1. This will be completed in FY01.</p> <p>Also in FY01, potential improvements leveraging available medium caliber technologies will be investigated to improve the Bradley Infantry Fighting Vehicle. Advanced fire control gun/turret drive and stabilization systems are also being developed to control the longer gun tube to meet U.S. requirements. Both the US and German versions will be tested, integrated and demonstrated in an M1A2 Abrams tank. The associated fire control and integration developments can also applied to the current M256 gun to improve fire-on-the-move capability and to prevent the gun tube from impacting the ground while the vehicle is moving cross country.</p> <p>In future years, improved bore coatings and better gun tube manufacturing and straightening techniques will be developed to reduce gun tube life cycle costs and enable the development of more advanced ammunition in the future. Together with other Army organizations, the program is planning the development of Abrams fire control system improvements to allow it to kill enemy targets at much longer ranges with the Tank Extended Range Munitions. A fire control demonstration of an improved position-locating device, coordinate processing software, target data sets and communication processes is planned.</p> <p>FY 1999 Accomplishments:</p> <ul style="list-style-type: none"> • 2550 Completed long gun (L55/M256E1) hardware fabrication & testing • 2450 Completed stabilization/fire control system component fabrication & test for L55/M256E1 • 2000 Continued turret integration of L55/M256E1 • 1464 Demonstrated & tested of L55/M256E1 <p>Total 8464</p>									
Project DB99			Page 3 of 10 Pages			Exhibit R-2A (PE 0603653A)			

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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603653A Advanced Tank Armament System	PROJECT DB99
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FY 2000 Planned Program:

- 400 Begin L55/ M256E1 gun barrels & mounting hardware testing
 - 440 Begin L55/M256E1 hardware & software modifications testing
 - 500 Begin L55/ M25E1 tank integration
 - 400 Complete Automatic Target Tracker testing and transfer equipment to FSCS
 - 130 Complete Electronic Muzzle Reference Sensor testing
 - 52 Small Business Innovative Research/Small Business Technology Transfer Program (SBIR/STTR)
- Total 1922

FY 2001 Planned Program:

- 2200 Complete L55/M256E1 gun barrel testing
 - 3200 Complete L55/M256E1 hardware & software integration including M256 work
 - 200 Begin Medium Caliber Testing and Evaluation
 - 3216 Complete L55/M256E1 M1A2 demonstration
- Total 8816

B. Other Program Funding Summary: Not applicable

C. Acquisition Strategy: The technologies in Tank & Medium Caliber Armaments will be demonstrated then transferred to PM Abrams, PM-FSCS and other weapon platform PMs for further technological development and will flow into the next major upgrade or Engineering Change Proposal (ECP) to the current Abrams tank. Several contractors and government agencies are used to develop or integrate existing technologies.

D. <u>Schedule Profile</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
Complete turret modification design	1Q*						
Procure L55 gun barrels	3Q*						
Fabricate M256E1 gun barrels	4Q*						
Complete sub-component test	4Q*						
L55/M256E1 gun barrel testing		1Q*-4Q	1Q				
Complete Auto Target Tracker Demonstration		2Q**					
Transfer Components to FSCS program		2Q*					
L55/M256E1 hardware & software testing		2Q-4Q	1Q				
Complete EMRS testing		3Q					
L55/M256E1 tank integration		3Q-4Q	1Q-2Q				

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D. Schedule Profile	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
L55/M256E1 tank testing			3Q-4Q				
Initiate Medium Caliber Gun Testing and Evaluation			3Q-4Q				
Tantalum Coating Development				1Q-4Q	1Q-4Q	1Q-4Q	
TERM Fire Control Development				1Q-4Q	1Q-3Q		
Straightening Development				2Q-4Q	1Q-4Q		
TERM Fire Control Demonstration					4Q		
Begin M1A2 SEP Fire Control Integration					1Q		
Firing of Straightened & Coated Tubes							1Q-4Q

*Completed milestone
 ** Moved to include USMC requirements

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ARMY RDT&E COST ANALYSIS (R-3)										DATE February 2000		
BUDGET ACTIVITY 4 - Demonstration and Validation					PE NUMBER AND TITLE 0603653A Advanced Tank Armament System					PROJECT DB99		
I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. M256E1	MIPR	Benet Labs, Watervliet, NY Gov	5686	1300		300		1246		Cont	Cont	
b. L55 Gun Tubes	SS & FP	Rheinmetall, Ratingen, GE		750	Dec 1998	250		475		Cont	Cont	
c. M1A2 Integration	SS & CPFF	GDLS, Sterling Heights, MI	1970	1900	Jul 1998	200		2225		Cont	Cont	
d. Fire Control Development	CPFF	Raytheon (TI) Systems, Dallas, Texas	16826	2400	Sep 1990	300		150		Cont	Cont	
e. Fire Control Development	MIPR	ARDEC, Picatinny Arsenal, NJ	500	335		300		120		Cont	Cont	
f. EMRS	MIPR	ARDEC, Picatinny Arsenal, NJ	457	200						Cont	Cont	
g. ATT	MIPR	Multiple	271	200						Cont	Cont	
h. Misc	MIPR	Multiple	652	130		130		100		Cont	Cont	
Subtotal Product Development:			26362	7215		1480		4316		Cont	Cont	
II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. ATT	MIPR	ATC, APG, MD	200	200						Cont	Cont	
b. M256E1 & L55 Testing	MIPR	ATC, APG, MD		500		270		3500		Cont	Cont	
c. Medium Caliber Evaluation and Testing	MIPR	ATC, APG, MD						200		Cont	Cont	
Subtotal Support Costs:			200	700		270		3700		Cont	Cont	
III. Test and Evaluation: Not applicable												

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ARMY RDT&E COST ANALYSIS (R-3)	DATE February 2000
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603653A Advanced Tank Armament System	PROJECT DB99
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IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Program Management	MIPR	PM-TMAS	535	549		120		800		Cont	Cont	
b. SBIR/STTR						52					52	
Subtotal Management Services:			535	549		172		800		Cont	Cont	
Project Total Cost:			27097	8464		1922		8816		Cont	Cont	

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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603653A Advanced Tank Armament System	PROJECT DC03
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COST (<i>In Thousands</i>)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
DC03 Medium Armored Vehicle Development*	0	0	109323	168818	74414	0	0	0	352555

*A separate Program Element will be established for the Medium Armored Vehicle Development program. FY 2002 and 2003 funding presently in project DC03 will be realigned to the new PE.

A. Mission Description and Budget Item Justification: This Project (DC03) supports the development of the Family of Medium Armored Vehicles (MAV). An immediate need exists for a Medium Armored Vehicle equipped C-130 transportable Brigade Combat Team (BCT), capable of deployment to anywhere on the globe in a combat ready configuration. A dynamic asymmetric threat and operational environment demands full spectrum, strategically responsive, agile and dominant land forces. Immediate response by a lethal, versatile, tactically agile joint force capable of operational maneuver once in the Area of Operations is essential to fulfilling the Warfighting needs of the National Command Authority. The MAV-equipped BCT is this force. The MAV family includes the following planned systems: Infantry Carrier, Mobile Gun System, Reconnaissance Vehicle, Antitank Guided Missile Vehicle (ATGM), Command and Control/TOC Vehicle, Mortar Carrier, Self-Propelled Howitzer, Engineer Vehicle, Striker/Fire Support Team Vehicle, Nuclear, Biological and Chemical (NBC) Reconnaissance Vehicle, Medical Evacuation/Medical Treatment Vehicle, and Recovery Vehicle. The use of a common platform/common chassis design reduces requirements for repair parts and logistics support in the area of operations. RDTE funding will be used in the short term to address obsolescence and integration issues, to make corrections to vehicle design and for systems design for the interim vehicle. In the mid-term, RDTE funding will be used to design/incorporate fixes for unit identified deficiencies and desired changes, for systems improvements such as digitization, and for system capability enhancements.

FY 1999 Accomplishments: Project not funded in FY 1999

FY 2000 Planned Program: New Army Transformation funding for FY 2000 has yet to be determined.

FY 2001 Planned Program:

- 83645 Continue design/refinement of MAV variants
 - 20542 Systems Testing
 - 5136 Program Management
- Total 109323

B. <u>Other Program Funding Summary</u>	<u>FY 1999</u>	<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>To Compl</u>	<u>Total Cost</u>
PA, WTCV, G85100 MAV		TBD	537077	107242	898141	853373	1036619	Cont'd	Cont'd

C. Acquisition Strategy: In October 1999, the Army leadership announced a vision of the future. This vision includes a Brigade structure and organization which is crucial to the Army's strategic responsiveness goals of deploying from the CONUS base to the global theater of operation one Brigade within 96 hours, one Division within 120 hours, and five Divisions within 30 days. TACOM is taking action to achieve this vision for the Army via accelerated procurement of the family of Medium Armored Project DC03

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Vehicles. An RFP will be developed by the end of 2nd Quarter FY00, with a planned contract award in 4th Quarter FY00. Contractors will present their concept for the Brigade Combat Team (BCT). It is currently planned that contract(s) will be awarded for the family of Medium Armored Vehicle Systems to equip the new brigade organization. It is anticipated that the solution to meeting the Program Objective may include the acquisition of: off-the-shelf equipment, non-developmental items, traditional development, systems' integrator (multiple ground combat vehicle and sustainment solutions), systems' integrator (vehicle and non-vehicle solutions; complete brigade support), or a mix of the aforementioned staggered over time and across variants, or other solutions.

D. Schedule Profile	<u>FY 1999</u>	<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>	<u>FY 2008</u>
Release of Draft Solicitation		1Q00								
Final Receipt of White Paper Comments		2Q00								
Release of Formal Request for Proposals		2Q00								
Receipt of Proposals		3Q00								
Contract Award		4Q00								
First Unit Equipped			2Q01							

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ARMY RDT&E COST ANALYSIS (R-3)

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BUDGET ACTIVITY
4 - Demonstration and Validation

PE NUMBER AND TITLE
0603653A Advanced Tank Armament System

PROJECT
DC03

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. MAV Development	TBD	Unknown	NA	TBD	Jun 00	74862	Nov 00	184601	259463	259463
b. Other Contracts	Various	Unknown	NA	TBD	Unk	418	Nov 00	1031	1449	1449
c. GFM	Requisition					8365	Oct 00	20626	28991	28991
Subtotal Product Development:						83645		206258	289903	289903

Remark: MAV Development supports all 12 MAV variants.

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Other Gov't Agencies	MIPR	TACOM, Warren, MI Various	0	TBD	Unk	4108	Oct 00	8420	12528	12528
Subtotal Support Costs:						4108		8420	12528	

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
System Testing	MIPR	ATEC, APG, MD	0	0	NA	20542	Oct 00	26450	46992	46992
Subtotal Test and Evaluation:						20542		26450	46992	46992

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. PMO Support	NA	TACOM, Warren, MI	0	TBD	TBD	925	Oct 00	1894	2819	2819
b. Contractor PM Support	CP	Unknown	0	TBD	TBD	103	Oct 00	210	313	313
Subtotal Management Services:						1028		2104	3132	

Project Total Cost:						109323		243232	352555	
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