

# ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2004

## BUDGET ACTIVITY

### 4 - Advanced Component Development and Prototypes

## PE NUMBER AND TITLE

0603639A - Tank and Medium Caliber Ammunition

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	26367	26055	39697	64708	59243	71594	60427	0	443697
643 120MM CONVENTIONAL TANK AMMUNITION	4930	5314	1940	8	9	5	0	0	67942
64B 105MM CONVENTIONAL TANK AMMUNITION	18626	3873	0	21	22	9	0	0	46078
656 MOUNTED COMBAT SYSTEM (MCS) AMMUNITION	0	14932	37757	61267	58355	70763	60427	0	319844
694 MEDIUM CALIBER AMMUNITION	2811	1936	0	3412	857	817	0	0	9833

**A. Mission Description and Budget Item Justification:** The Tank and Medium-caliber Ammunition (TMA) Program Element (PE) encompasses a comprehensive program to develop, rapidly transition to production, and field, advanced tank, medium caliber, and other munitions. These programs will ensure continued battlefield overmatch and lethality of U.S. maneuver forces despite worldwide development and proliferation of enhanced armored vehicle protection technologies. To do this, TMA will identify and develop promising technologies through competitive development and streamlined acquisition procedures. All ammunition development funds within this PE are managed to facilitate transitions between phases, avoid administrative delays, and focus resources on the most promising areas.

FY 2005 supports the development of Mid Range Munitions (MRM) for the Future Combat System (FCS) Mounted Combat System (MCS). MRM will add significant capability to the FCS. It will add significant capability to the Future Force; it will provide greater hit probability at extended ranges, both line-of sight and beyond-line-of sight, increased survivability and lethality for the MCS and will have potential for the Mobile Gun System in the Stryker Brigade Combat Team (SBCT) and Abrams Main Battle Tank in the current force. MRM will expand the Maneuver Task Force Commander's battle space significantly and consequently improve our soldier's survivability.

FY 2004 and prior year funding also supports /supported MRM as well as the following other ammunition rounds: Kinetic Energy (120mm, M829A3), Training Ammunition (120mm, XM1002 and 25mm M910E1), and Anti-Personnel Ammunition (105mm, XM1040 and 120mm, XM1028).

To date, six rounds of tank ammunition (M829, M829A1, M829A2, M830A1, M831 and M829A3) have completed development and transitioned to production.

This PE supports the Current-to Future and Future transition paths of the Transformation Campaign Plan (TCP).

**ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)****February 2004****BUDGET ACTIVITY****4 - Advanced Component Development and Prototypes****PE NUMBER AND TITLE****0603639A - Tank and Medium Caliber Ammunition**

<b><u>B. Program Change Summary</u></b>	<b>FY 2003</b>	<b>FY 2004</b>	<b>FY 2005</b>
Previous President's Budget (FY 2004)	26492	11249	1943
Current Budget (FY 2005 PB)	26367	26055	39697
Total Adjustments	-125	14806	37754
Congressional program reductions			
Congressional rescissions		-224	
Congressional increases		15100	
Reprogrammings	-125	-70	
SBIR/STTR Transfer			
Adjustments to Budget Years			37754

FY 2004: Project 656 received a Congressional plus up of \$15.1M for Preliminary Design Work for the Mounted Combat System Ammunition.

FY 2005: Project 656 received \$37.8 M for contract award and start of Systems Development and Demonstration for Mounted Combat System Ammunition.

<b>ARMY RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>							<b>February 2004</b>			
BUDGET ACTIVITY <b>4 - Advanced Component Development and Prototypes</b>				PE NUMBER AND TITLE <b>0603639A - Tank and Medium Caliber Ammunition</b>				PROJECT <b>643</b>		
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
643	120MM CONVENTIONAL TANK AMMUNITION	4930	5314	1940	8	9	5	0	0	67942
<p><b><u>A. Mission Description and Budget Item Justification:</u></b> This project develops ammunition for the Current Tank Force and the Future Combat System (FCS).</p> <p>FY 2005 funding is provided for completion of Product Qualification Testing (PQT) of the XM1028 120mm Canister Cartridge.</p> <p>FY 2004 and prior year funding supports the development of the 120mm XM1028 Anti-personnel Canister Cartridge. This cartridge meets an urgent requirement from the Commander-in-Chief, United States Forces Korea (USFK), to provide rapid, effective, and lethal fire against massed assaulting infantry with hand-held anti-tank weapons and automatic weapons at close range (700 meters or less). The cartridge expels 1115 tungsten ball, similar in concept to a shotgun. However, the XM1028 has no fuze and is intended to be a simple, low-cost, low-technology cartridge. This project leverages ongoing and projected International Cooperative developments such as Future Tank Main Armament (FTMA) and other program arrangements and agreements.</p> <p>FY 2003 funding supports the development of the 120mm XM1002 Target Practice Multi-Purpose With Tracer (TPMP-T) training cartridge. This cartridge will be ballistically similar, complementary training cartridge to the currently fielded M830A1 High Explosive Anti-Tank Multi-Purpose with Tracer (HEAT-MP-T) service cartridge and will provide realistic training for Abrams tank crews. Tank training cartridges are required due to installation firing ranges restrictions on many types of service ammunitions.</p> <p>This project supports the Current-to-Future transition paths of the Transformation Campaign Plan (TCP).</p>										
<b><u>Accomplishments/Planned Program</u></b>							<b>FY 2003</b>	<b>FY 2004</b>	<b>FY 2005</b>	
XM1002 TPMP-T Cartridge Engineering and Manufacturing Development (EMD) Phase 1 completion and Phase 2.							3430	0	0	
Systems Development and Demonstration (SDD) (XM1028).							1500	5176	0	
Complete PQT (XM1028).							0	0	1940	
Small Business Innovative Research/Small Business Technology Transfer Programs.							0	138	0	
<b>Totals</b>							<b>4930</b>	<b>5314</b>	<b>1940</b>	

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

February 2004

BUDGET ACTIVITY

**4 - Advanced Component Development and Prototypes**

PE NUMBER AND TITLE

**0603639A - Tank and Medium Caliber Ammunition**

PROJECT

**643**

## **B. Other Program Funding Summary**

	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	To Compl	Total Cost
E73300-M831/M831A1 120mm Heat Tank Trainer Cartridge	49700	39609	34394	27261	0	0	0	0	197392
E73400-M865 120mm KE Tank Trainer Cartridge	102912	84022	89851	88825	102617	130873	124845	Continuing	Continuing
E78011 M1028 120mm Canister Cartridge	42597	36249	42500	44603	45875	45834	45907	Continuing	Continuing
E78011 M1028 120mm Canister Cartridge	0	5844	7345	8363	0	0	0	0	21552
E73201 M1002 120mm MPAT Tank Trainer Cartridge	0	4138	15473	25090	49383	69603	65164	Continuing	Continuing

## **C. Acquisition Strategy:** FY 05 funds provide for completion of XM1028 PQT.

FY 03 and FY 04 funds the development of the XM1028 Canister Cartridge using a streamlined acquisition strategy, keeping costs low while meeting scheduled requirements; this round transitions to production in FY 04.

FY 03 funds development of the XM1002 TPMP-T training cartridge using a steamlined acquisition strategy, keeping costs low while meeting scheduled requirements. The XM1002 will replace the current M831A1 training cartridge. This round transitions to production in FY 04.

Operational Requirements Documents (ORDs) have been approved for the XM1028 and the XM1002.

ARMY RDT&E COST ANALYSIS(R3)									February 2004			
BUDGET ACTIVITY					PE NUMBER AND TITLE					PROJECT		
4 - Advanced Component Development and Prototypes					0603639A - Tank and Medium Caliber Ammunition					643		
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 . MRM (Contract)	CPFF	Scientific Technical Associates (STA)	100	0		0		0		0	100	0
b . MRM (Integration Contract)	C-CPFF	Raytheon, AZ	450	0		0		0		0	450	0
c . XM1002 TPMP-T Ctg	FFP	Alliant Ammunition Systems, Twin Cities Army Ammunition Plant, New Brighton, MN	4715	0		0		0		0	4715	0
d . TACOM-ARDEC (XM1002)	MIPR	Picatinny Arsenal, NJ	1300	935	1-2Q	0		0		0	2235	0
e . Miscellaneous (XM1002)	MIPR	Multiple	520	234	1-2Q	0		0		0	754	0
f . Gen Dyn Ord Tactical Sys (G-DOTS) (XM1028)	FFP	St. Petersburg, FL	2200	0		2388	1Q	1440	1Q	0	6028	0
g . TACOM-ARDEC (XM1028)	MIPR	Picatinny Arsenal, NJ	100	650	1-2Q	588	1-4Q	100	1-4Q	0	1438	0
Subtotal:			9385	1819		2976		1540		0	15720	0

ARMY RDT&E COST ANALYSIS(R3)									February 2004				
BUDGET ACTIVITY					PE NUMBER AND TITLE					PROJECT			
4 - Advanced Component Development and Prototypes					0603639A - Tank and Medium Caliber Ammunition					643			
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	
			0	0		0		0		0	0	0	
Subtotal:													
Remarks: Not Applicable													
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 . Aberdeen Test Center (XM1002)	MIPR	Aberdeen PG, MD	375	1700	1-2Q	0		0		0	2075	0	
b . Miscellaneous (XM1002)	MIPR	Multiple	200	361	1-2Q	0		0		0	561	0	
c . Aberdeen Test Center (XM1028)	MIPR	Aberdeen PG, MD	300	650	1-2Q	1800	1-4Q	100	1-2Q	0	2850	0	
d . Miscellaneous (XM1028)	MIPR	Multiple	0	0		200	1-4Q	100	1-4Q	0	300	0	
Subtotal:			875	2711		2000		200		0	5786	0	
Remarks: Testing includes all testing needed to support MRM, XM1028 and XM1002 Cartridges.													

ARMY RDT&E COST ANALYSIS(R3)									February 2004			
BUDGET ACTIVITY <b>4 - Advanced Component Development and Prototypes</b>					PE NUMBER AND TITLE <b>0603639A - Tank and Medium Caliber Ammunition</b>					PROJECT <b>643</b>		
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 . PM-MAS (MRM)	MIPR	Multiple	1450	0		0		0		0	1450	0
b . PM-MAS (XM1002)	MIPR	Picatinny Arsenal, NJ	610	200	1-2Q	0		0		0	810	0
c . PM-MAS (XM1028)	MIPR	Picatinny Arsenal, NJ	100	200	1-2Q	200	1-4Q	200	1-4Q	0	700	0
d . SBIR/STTR			0	0		138	2Q	0		0	138	0
Subtotal:			2160	400		338		200		0	3098	0
Project Total Cost:			12420	4930		5314		1940		0	24604	0

Schedule Profile (R4 Exhibit)																				February 2004												
BUDGET ACTIVITY 4 - Advanced Component Development and Prototypes										PE NUMBER AND TITLE 0603639A - Tank and Medium Caliber Ammunition												PROJECT 643										
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	1	2	3	4
XM1002 MPAT Trainer (120mm)																																
SDD, LRP, FRP																																
(1) MS C, (2) TC-STD																																
XM1028 Canister (120mm)																																
SDD, LRP, FRP																																
(3) MS C, (4) TC-STD																																



Schedule Detail (R4a Exhibit)						February 2004	
BUDGET ACTIVITY <b>4 - Advanced Component Development and Prototypes</b>			PE NUMBER AND TITLE <b>0603639A - Tank and Medium Caliber Ammunition</b>			PROJECT <b>643</b>	
<u><b>Schedule Detail</b></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>	<u>FY 2009</u>
XM1002 TP-T CARTRIDGE							
Cartridge Design Freeze	2Q						
Procure PQT propellant/propulsion components	1-2Q						
Procure other PQT components/LAP	1-3Q						
Test PQT	4Q	1Q					
Milestone C		2Q					
XM1028 CANISTER CARTRIDGE							
Design and Evaluation Testing	1-4Q						
Prototype Manufacturing		1Q					
Qualification Testing		3Q	1-2Q				
Milestone C		3Q					

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

February 2004

## BUDGET ACTIVITY

**4 - Advanced Component Development and Prototypes**

## PE NUMBER AND TITLE

**0603639A - Tank and Medium Caliber Ammunition**

## PROJECT

**64B**

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
64B	105MM CONVENTIONAL TANK AMMUNITION	18626	3873	0	21	22	9	0	0	46078

**A. Mission Description and Budget Item Justification:**For FY 2005, there is no funding for this project.

FY 2004 and prior year funding provides / provided for the development of the XM1040, a 105mm anti-personnel canister cartridge urgently needed for the Stryker Brigade Combat Team (SBCT) Mobile Gun System (MGS). This munition will be capable of suppressing dismounted infantry assaults in close / restricted terrain. This 2-year development effort leverages technologies developed for the preceding XM1028 120mm anti-personnel canister cartridge program. Like the XM1028, the XM1040 canister cartridge is envisioned to be similar in concept to a shotgun shell, expelling the payload upon muzzle exit. Unlike previous anti-personnel tank cartridges, the XM1040 will have no fuze and is intended to be a simple, low cost, low-technology cartridge.

FY 2003 funding provided for preliminary design efforts for the Mid Range Munition (MRM) for the Future Combat System's Mounted Combat System. Beginning in FY 2004, funding for MRM is in Project 656.

<b>Accomplishments/Planned Program</b>	<b>FY 2003</b>	<b>FY 2004</b>	<b>FY 2005</b>
Contract Award/Prototype Manufacturing (XM1040).	2274	3774	0
Kinetic Energy (KE) Smart Ctg Demo.	0	0	0
KE 105mm Preliminary Design (MRM).	5608	0	0
TM3 105mm Preliminary Design (MRM).	9744	0	0
GPS and Anti-Jam Development (MRM).	1000	0	0
Small Business Innovative Research / Small Business Technology Transfer Programs.	0	99	0
<b>Totals</b>	<b>18626</b>	<b>3873</b>	<b>0</b>

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February 2004

BUDGET ACTIVITY

**4 - Advanced Component Development and Prototypes**

PE NUMBER AND TITLE

**0603639A - Tank and Medium Caliber Ammunition**

PROJECT

**64B**

## B. Other Program Funding Summary

	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	To Compl	Total Cost
PAA SSN E24300: CTG, 105mm HEP-T, w/Fuze M393E3	2068	7792	7834	6500	0	0	0	0	30160
PAA SSN E22300: CTG, 105mm TP-T, M478	5610	9740	14689	20521	20751	21936	19472	Continuing	Continuing
PAA SSN E24400 CTG, 105mm Canister, M1040	0	2922	4896	6600	4743	5924	7416	Continuing	Continuing

## C. Acquisition Strategy: There are no FY 05 funds in this project.

FY 03 and FY 04 funds the development of the XM1040, 105mm anti-personnel Canister cartridge required for the Mobile Gun System (MGS) in the new Stryker Brigade Combat Teams (SBCTs) with follow-on production upon completion. The contract award was competitive and developed using performance specifications leveraging the technology of the preceding XM1028, 120mm anti-personnel Canister cartridge. This project uses a streamlined acquisition strategy, keeping costs low while meeting scheduled requirements. This round transitions to production in FY 04.

The Operational Requirements Document (ORD) for this program has been approved.

ARMY RDT&E COST ANALYSIS(R3)									February 2004			
BUDGET ACTIVITY					PE NUMBER AND TITLE					PROJECT		
4 - Advanced Component Development and Prototypes					0603639A - Tank and Medium Caliber Ammunition					64B		
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 . Alliant Tech Systems (MRM)	SS-CPFF	Clearwater, FL	10200	3570	2Q	0		0		0	13770	0
b . Raytheon (MRM)	SS-CPFF	Tucson, AZ	6000	8398	2Q	0		0		0	14398	0
c . Electro-Radiation Inc. (MRM)	SS-CPFF	Fairfield, NJ	700	750	2Q	0		0		0	1450	0
d . TACOM-ARDEC (MRM)	MIPR	Picatinny Arsenal, NJ	2610	946	2-4Q	0		0		0	3556	0
e . Miscellaneous (MRM)	MIPR	Multiple	1190	777	2-4Q	0		0		0	1967	0
f . Alliant Tech Systems (XM1040)	CPFF	Arden Hills, MN	0	2300	1-2Q	2124	2Q	0		0	4424	0
g . TACOM-ARDEC (XM1040)	MIPR	Picatinny Arsenal, NJ	0	348	1-4Q	500	2Q	0		0	848	0
h . Miscellaneous (XM1040)		Multiple	0	0	1-4Q	100	3Q	0		0	100	0
Subtotal:			20700	17089		2724		0		0	40513	0

ARMY RDT&E COST ANALYSIS(R3)									February 2004			
BUDGET ACTIVITY <b>4 - Advanced Component Development and Prototypes</b>					PE NUMBER AND TITLE <b>0603639A - Tank and Medium Caliber Ammunition</b>					PROJECT <b>64B</b>		
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
			0	0		0		0		0	0	0
Subtotal:												
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 . Yuma Proving Ground (MRM)	MIPR	Yuma, AZ	100	600	2-4Q	0		0		0	700	0
b . Army Evaluation Center (AEC) (MRM)	MIPR	Aberdeen, MD	75	147	2Q	0		0		0	222	0
c . Army Research Lab (ARL) (MRM)	MIPR	Aberdeen, MD	350	200	2-4Q	0		0		0	550	0
d . Aberdeen Test Center (XM1040)	MIPR	Aberdeen, MD	0	0	1-2Q	600	3Q	0		0	600	0
e . Yuma Proving Ground (XM1040)	MIPR	Yuma, AZ	0	0	1-2Q	100	3Q	0		0	100	0
f . AMSAA (ARL)	MIPR	Aberdeen, MD	0	0	1-2Q	150	2Q	0		0	150	0

ARMY RDT&E COST ANALYSIS(R3)									February 2004			
BUDGET ACTIVITY					PE NUMBER AND TITLE					PROJECT		
4 - Advanced Component Development and Prototypes					0603639A - Tank and Medium Caliber Ammunition					64B		
III. Test and Evaluation (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:			525	947		850		0		0	2322	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 . PM-MAS (MRM)	Multiple	Picatinny Arsenal, NJ	2302	350		0		0		0	2652	0
b . PM-MAS (XM1040)	Multiple	Picatinny Arsenal, NJ	0	240	1-4Q	200	1-4Q	0		0	440	0
c . SBIR/STTR			0	0		99	2Q	0		0	99	0
Subtotal:			2302	590		299		0		0	3191	0
Project Total Cost:			23527	18626		3873		0		0	46026	0

Schedule Profile (R4 Exhibit)																						February 2004											
BUDGET ACTIVITY 4 - Advanced Component Development and Prototypes												PE NUMBER AND TITLE 0603639A - Tank and Medium Caliber Ammunition																PROJECT 64B					
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				
XM1040 Canister (105mm)  SDD  LRP, FRP  (1) Type Classification																																	
						SDD																											
										LRP								Full Rate Production															
														1																			

Schedule Detail (R4a Exhibit)						February 2004	
BUDGET ACTIVITY <b>4 - Advanced Component Development and Prototypes</b>			PE NUMBER AND TITLE <b>0603639A - Tank and Medium Caliber Ammunition</b>			PROJECT <b>64B</b>	
<u>Schedule Detail</u>	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Airframe and Propulsion Compulsion Tests (KE/TM3)	2Q						
Test Hardware Manufacturing (MRM)	2-4Q						
Preliminary Tests (MRM)	4Q	1Q					
Guide to Hit Test (MRM)		1Q					
Analog to Digital Conversion (GPS) (MRM)	4Q	1Q					
Contract Award (XM1040)	2Q						
Engineering Design Tests (XM1040)		3-4Q					
Milestone C (XM1040)		4Q					



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## PE NUMBER AND TITLE

**0603639A - Tank and Medium Caliber Ammunition**

## PROJECT

**656**

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
656	MOUNTED COMBAT SYSTEM (MCS) AMMUNITION	0	14932	37757	61267	58355	70763	60427	0	319844

**A. Mission Description and Budget Item Justification:** This project will develop the ammunition suite for the Future Combat System (FCS) Mounted Combat System (MCS). It includes the Mid Range Munition (MRM), Advance Kinetic Energy, and the future Multi-Purpose rounds.

The Mid Range Munition (MRM) will provide FCS MCS with a precision munition capable of hitting and killing all battlefield targets at beyond line of sight ranges between 2-12k increasing survivability and lethality, and expanding the Maneuver Task Force Commanders battle space. It supports FCS Increment 1 objectives of expanded battle space, and multi-mission direct and indirect fire capability. MRM leverages state of the art sensor technologies to provide immediate responsive fires to support Family of Vehicles or other scouts.

The Advance KE will provide line-of-sight, fast response lethality to rapidly destroy threat targets in close fight.

The multi-purpose round will allow the MCS to support operations in complex and urban terrain, providing capability against massed infantry, structure, and self-protection against rotary aircraft.

For FY 2003 and prior years, funding for MRM is in Project 64B.

This project develops the necessary changes to platform weapons and fire control systems brought about by ever more capable ammunition. Additionally, this project will leverage ongoing and projected International Cooperative developments such as Future Tank Main Armament (FTMA) and other program arrangements and agreements.

The project supports the Current-to-Future and Future transformation paths of the Transformation Campaign Plan.

## Accomplishments/Planned Program

	FY 2003	FY 2004	FY 2005
Contract Award and start of System Development and Demonstration (SDD).	0	0	37757
KE 120mm Preliminary Design.	0	5698	0
CE 120mm Preliminary Design.	0	5699	0

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**4 - Advanced Component Development and Prototypes**

PE NUMBER AND TITLE

**0603639A - Tank and Medium Caliber Ammunition**

PROJECT

**656****Accomplishments/Planned Program (continued)**

GPS and Anti-Jam Development.

Small Business Innovative Research/Small Business Technology Transfer Programs.

Totals

FY 2003

FY 2004

FY 2005

0

3100

0

0

435

0

0

14932

37757

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

**C. Acquisition Strategy:** The Mid Range Munition (MRM) Program is currently in the Technology Base. It is scheduled to transition (Milestone B) to System Development and Demonstration (SDD) at the end of FY04. There are currently two competing technical concepts. The SDD contract competition will be limited to the two current contractors, Raytheon and Alliant Tech Systems. The SDD contract will contain priced production options. The MRM schedule coincides with the Mounted Combat System development schedule for FCS increment I. MRM is designated as an "FCS Complementary System".

ARMY RDT&E COST ANALYSIS(R3)									February 2004			
BUDGET ACTIVITY					PE NUMBER AND TITLE					PROJECT		
4 - Advanced Component Development and Prototypes					0603639A - Tank and Medium Caliber Ammunition					656		
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 . MRM System Contractor	CPIF/AF	TBS	0	0		0		29257	1Q	0	29257	0
b . Alliant Tech Systems	SS-CPFF	Clearwater, FL	0	0		3708	1-3Q	0		0	3708	0
c . Raytheon	SS-CPFF	Tucson, AZ	0	0		3709	1-3Q	0		0	3709	0
d . Electro-Radiation, Inc	SS-CPFF	Fairfield, NJ	0	0		2800	2-3Q	0		0	2800	0
e . TACOM-ARDEC	MIPR	Picatinny Arsenal, NJ	0	0		1600	2-4Q	1500	1-4Q	0	3100	0
f . Miscellaneous	MIPR	Multiple	0	0		600	1-4Q	500	2-3Q	0	1100	0
Subtotal:			0	0		12417		31257		0	43674	0

ARMY RDT&E COST ANALYSIS(R3)									February 2004				
BUDGET ACTIVITY					PE NUMBER AND TITLE					PROJECT			
4 - Advanced Component Development and Prototypes					0603639A - Tank and Medium Caliber Ammunition					656			
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	
			0	0		0		0		0	0	0	
Subtotal:													
Remarks: Not Applicable													
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 . YPG, ATC	MIPR	Yuma AZ/APG, MD	0	0		430	1-3Q	1000	1-3Q	0	1430	0	
b . Army Research Lab	MIPR	Aberdeen PG, MD	0	0		250	1-3Q	1500	1-4Q	0	1750	0	
c . Redstone Arsenal	MIPR	Huntsville, AL	0	0		400	2-3Q	3000	2-3Q	0	3400	0	
d . Miscellaneous	MIPR	Multiple	0	0		500	2-4Q	500	2Q	0	1000	0	
Subtotal:			0	0		1580		6000		0	7580	0	

ARMY RDT&E COST ANALYSIS(R3)									February 2004				
BUDGET ACTIVITY					PE NUMBER AND TITLE					PROJECT			
4 - Advanced Component Development and Prototypes					0603639A - Tank and Medium Caliber Ammunition					656			
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 . PM-TMAS	MIPR	Picatinny Arsenal, NJ	0	0		500	1-4Q	500	1-4Q	0	1000	0	
b . SBIR/STTR			0	0		435	2Q	0		0	435	0	
Subtotal:			0	0		935		500		0	1435	0	
Project Total Cost:			0	0		14932		37757		0	52689	0	

Schedule Profile (R4 Exhibit)																				February 2004													
BUDGET ACTIVITY 4 - Advanced Component Development and Prototypes										PE NUMBER AND TITLE 0603639A - Tank and Medium Caliber Ammunition														PROJECT 656									
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				
MRM/MCS Ammunition																																	
SDD														SDD																			
(1) Design Readiness Review																						1											
Prototype Manufacturing														Prototype Mfg.																			
(2) MS C / Low Rate Production																														2			

Schedule Detail (R4a Exhibit)						February 2004	
BUDGET ACTIVITY <b>4 - Advanced Component Development and Prototypes</b>			PE NUMBER AND TITLE <b>0603639A - Tank and Medium Caliber Ammunition</b>			PROJECT <b>656</b>	
<u><b>Schedule Detail</b></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>	<u>FY 2009</u>
Continuation of Guide-to-Hit test		2Q					
Release Request for Proposal (RFP)		3Q					
Source Selection		4Q					
Initiate System Development and Demonstration			1Q				
Design Readiness Review					3Q		
Prototype Manufacturing			1-4Q	1-4Q	1-2Q		
Milestone C - Low Rate Production							1Q

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

February 2004

## BUDGET ACTIVITY

### 4 - Advanced Component Development and Prototypes

## PE NUMBER AND TITLE

**0603639A - Tank and Medium Caliber Ammunition**

## PROJECT

**694**

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
694 MEDIUM CALIBER AMMUNITION	2811	1936	0	3412	857	817	0	0	9833

**A. Mission Description and Budget Item Justification:** This project will develop Medium Caliber Ammunition for the Bradley Fighting Vehicle System (BFVS), the Future Combat System (FCS) and other systems using Medium Caliber Armaments.

This project also develops the necessary changes to platform weapons and fire control systems brought about by ever more capable ammunition and will leverage ongoing and projected International Cooperative developments such as Future Tank Main Armament (FTMA) and many other program arrangements and agreements.

For FY 2005, there is no funding for this project.

FY 2004 and prior year funding supports the development of the 25mm M910E1 Target Practice, Discarding Sabot w/Tracer (TPDS-T) cartridge. The 25mm M910E1 will provide 0-2500 meter ballistic similarity to the current tactical tactical, the 25mm M919 Armor Piercing, Fin Stabilized, Discarding Sabot w/Tracer (APFSDS-T) as well as its predecessor, the M791 cartridge. This new training round will resolve a BFVS training issue, since the 25mm M910 TPDS-T cartridge is not ballistically similar to the M919 cartridge.

This project supports the Current-to-Future and Future Transition paths of the Transformation Campaign Plan (TCP).

<b>Accomplishments/Planned Program</b>	<b>FY 2003</b>	<b>FY 2004</b>	<b>FY 2005</b>
Contract Award/Prototype Design and Development (25mm M910E1).	2811	0	0
Contract Award/Option Production Qualification Test (25mm M910E1).	0	1882	0
Small Business Innovative Research/Small Business Technology Transfer Programs.	0	54	0
<b>Totals</b>	<b>2811</b>	<b>1936</b>	<b>0</b>



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

February 2004

BUDGET ACTIVITY

**4 - Advanced Component Development and Prototypes**

PE NUMBER AND TITLE

**0603639A - Tank and Medium Caliber Ammunition**

PROJECT

**694**

## B. Other Program Funding Summary

	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	To Compl	Total Cost
PAA SSN E08210 , M919 25mm KE (Bradley)	46280	10413	0	0	0	0	0	0	86393
PAA SSN E08204, M910 25mm TPDS-T	16856	440	87	0	0	0	0	0	38044
PAA SSN E08203 M793 25mm TP-T	28082	7819	7513	6005	13987	15377	16069	Continuing	Continuing
PAA SSN E08211, M910E1 25mm TPDS-T	0	0	14000	8620	30176	29000	28559	Continuing	Continuing

C. Acquisition Strategy: There are no FY 05 funds in this project.

FY 03 and FY 04 funds the two year development of the 25mm M910E1 Target Practice, Discarding Sabot w/Tracer (TPDS-T) for the Bradley Fighting Vehicle System (BFVS) with follow-on production upon completion. The contract award was competitive. This project uses a streamlined acquisition strategy using performance specifications to keep costs low while meeting schedule requirements. This program will transition to production in FY 05.

ARMY RDT&E COST ANALYSIS(R3)									February 2004			
BUDGET ACTIVITY <b>4 - Advanced Component Development and Prototypes</b>					PE NUMBER AND TITLE <b>0603639A - Tank and Medium Caliber Ammunition</b>					PROJECT <b>694</b>		
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 . Alliant Tech Systems	CPIF	Minneapolis, MN	0	2396	4Q	1095	1-2Q	0		0	3491	0
b . ARDEC	MIPR	Picatinny Arsenal, NJ	0	215	1-4Q	100	1-4Q	0		0	315	0
Subtotal:			0	2611		1195		0		0	3806	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
Subtotal:			0	0		0		0		0	0	0

ARMY RDT&E COST ANALYSIS(R3)									February 2004			
BUDGET ACTIVITY <b>4 - Advanced Component Development and Prototypes</b>					PE NUMBER AND TITLE <b>0603639A - Tank and Medium Caliber Ammunition</b>					PROJECT <b>694</b>		
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 . Yuma Proving Grounds (M910E1)	MIPR	Yuma, AZ	0	0		487	2-3Q	0		0	487	0
Subtotal:			0	0		487		0		0	487	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 . PM-MAS (M910E1)	In House	Picatinny Arsenal, NJ	0	200	1-4Q	200	1-4Q	0		0	400	0
b . SBIR/STTR			0	0		54	2Q	0		0	54	0
Subtotal:			0	200		254		0		0	454	0
Project Total Cost:			0	2811		1936		0		0	4747	0

Schedule Profile (R4 Exhibit)																							February 2004									
BUDGET ACTIVITY 4 - Advanced Component Development and Prototypes												PE NUMBER AND TITLE 0603639A - Tank and Medium Caliber Ammunition												PROJECT 694								
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				
XM910E1, 25mm, TP-T																																
XM910E1 EMD/SDD																																
M910 Production																																
(1) MS C																																
M910A1 Line Cut-in & Production																																

Schedule Detail (R4a Exhibit)						February 2004	
BUDGET ACTIVITY <b>4 - Advanced Component Development and Prototypes</b>			PE NUMBER AND TITLE <b>0603639A - Tank and Medium Caliber Ammunition</b>			PROJECT <b>694</b>	
<u><b>Schedule Detail</b></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>	<u>FY 2009</u>
25MM M910E1							
Contract Award	4Q						
Engineering Design Tests		1-2Q					
Prototype Manufacturing		2-3Q					
Qualification Testing		3-4Q					
Milestone C		4Q					