

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2004

BUDGET ACTIVITY

5 - System Development and Demonstration

PE NUMBER AND TITLE

0604814A - Artillery Munitions - EMD

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	102141	122631	133297	114444	115242	100997	113519	Continuing	Continuing
708 XM982 PROJECTILE	102141	122631	133297	114444	100378	81188	92630	Continuing	Continuing
709 ADVANCED FIELD ARTILLERY MUNITION	0	0	0	0	14864	19809	20889	Continuing	Continuing

A. Mission Description and Budget Item Justification: This program funds multiple efforts; the Excalibur XM982 Projectile Blocks I and III, the Spin Stabilized-Sensor Fuzed Munition (SS-SFM) and the Non Line of Sight – Cannon (NLOS-C) Non-Lethal Munitions.

XM982 Projectile funds the development of the Excalibur 155mm projectile and integration of the Unitary warhead (Block I) and Discriminating (Block III). Excalibur provides improved fire support through a Precision Guided Extended Range family of munitions with greatly increased accuracy and reduced collateral damage in support of the Future Objective Force. The Excalibur will be compatible with the Non Line of Sight-Cannon (NLOS-C) and the Joint Lightweight 155 (JLW155). The Excalibur will allow greater standoff and faster defeat of potential threats, increasing soldier survivability while reducing the ammunition workload. The Product Management Office (PMO) recently completed a merger with the Trajectory Correctable Munitions (TCM) program to reduce program risk. Excalibur Unitary is an international program, teamed with the Kingdom of Sweden (KoS), who will contribute resources towards the development in accordance with an established Project Agreement. This system supports the Stryker Brigade Combat Team (SBCT) to Future transition path of the Transformation Campaign Plan (TCP).

Funding also conducts an assessment of SS-SFM systems. SS-SFM's are advanced "fire and forget" smart artillery projectiles that can be used in all 155mm artillery systems. SS-SFM's use one or more sensors to defeat self-propelled artillery and lightly armored targets in all weather and environmental conditions. This system supports Current to Future transition path of the Transformation Campaign Plan (TCP).

Advanced Field Artillery Munition (AFAM) funds the development of the Future Combat System – Cannon (FCS-C) Non-Lethal Munitions. This system supports the Future transition path of the Transformation Campaign Plan (TCP).

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	FY 2003	FY 2004	FY 2005
Previous President's Budget (FY 2004)	102188	133994	153389
Current Budget (FY 2005 PB)	102141	122631	133297
Total Adjustments	-47	-11363	-20092
Congressional program reductions		-10000	
Congressional rescissions		-1054	
Congressional increases			
Reprogrammings	-47	-309	
SBIR/STTR Transfer			
Adjustments to Budget Years			-20092

FY05: Transfer to procurement (-\$19.0M) to fund Initial Capability Excalibur projectiles for the Joint Lightweight 155. Funds realigned (-\$1.1M) to higher priority requirements.

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COST (In Thousands)	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Cost to	Total Cost
	Actual	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Complete	
708 XM982 PROJECTILE	102141	122631	133297	114444	100378	81188	92630	Continuing	Continuing

A. Mission Description and Budget Item Justification: This project funds two programs, the Excalibur XM982 Projectile and the Spin Stabilized-Sensor Fuzed Munition (SS-SFM).

XM982 Projectile funds the development of the Excalibur 155mm projectile and integration of the Unitary warhead (Block I) and Discriminating Variant (Block III). Excalibur provides improved fire support through a Precision Guided Extended Range family of munitions with greatly increased accuracy and reduced collateral damage in support of the Objective Force. The Excalibur will be compatible with the Future Combat System (FCS) Non-Line of Sight Cannon (NLOS-C) and the digitized Joint Lightweight 155 (JLW155) howitzer. The Excalibur will allow greater standoff and faster defeat of potential threats, increasing soldier survivability while reducing the ammunition workload. Excalibur Unitary is an international program, teamed with the Kingdom of Sweden (KoS), who will contribute resources towards the development in accordance with an established Project Agreement. This system supports the Transformation Campaign Plan (TCP).

Funding also conducts compliance testing in accordance with the Joint Ballistics Memorandum of Understanding (JBMOU). SS-SFM's are advanced "fire and forget" smart artillery projectiles that can be used in all 155mm artillery systems. SS-SFM's use one or more sensors to defeat self-propelled artillery and lightly armored targets in all weather and environmental conditions. This system supports the Transformation Campaign Plan (TCP).

<u>Accomplishments/Planned Program</u>	FY 2003	FY 2004	FY 2005
Continue airframe tactical structure and projectile integration efforts to conduct contractor development testing with merged Excalibur-TCM design.	22615	29664	28550
Continue guidance unit integration, gun hardening, tactical telemetry, systems software development, and programmed maneuver flight demonstration.	30763	38762	43257
Continue to execute Systems and Specialty Engineering activities, to include specification development, Cost As Independent Variable (CAIV), program metric tracking, and conduct modeling of lethality, effectiveness, and aeroballistics, and requirements analysis to incorporate a tactical telemetry system.	14122	18847	23166
Continue Unitary warhead development, to include structure penetration, and fragmentation testing	10512	9483	9330
Continue Platform Integration effort including design and build of prototype hardware for Platform Integration Kit and Portable Inductive Artillery Fuze Setter (EPIAFS) and development of Advanced Field Artillery Tactical Direction System (AFATDS) integration.	7600	8234	8474

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

	FY 2003	FY 2004	FY 2005
Continue merger assessment of technology of TCM program with Excalibur program.	7500	0	0
Procure and test 16 structure test projectiles, 8 soft recovery Guidance system evaluation test projectiles, 27 ballistic environment measurement rounds, and 36 warhead test projectiles for FY03 Contractor Development Testing.	9029	0	0
Procure and test 30 structure test projectiles, 16 soft recovery Guidance system evaluation test projectiles, 6 full up system rounds, and 48 warhead test projectiles for FY04 Contractor Development Testing.	0	7390	0
Procure and test 22 structure test projectiles, 15 soft recovery Guidance system evaluation test projectiles, 32 full up system rounds, and 90 warhead test projectiles for FY05 Contractor Development Testing.	0	0	13520
SS-SFM JBMOU Testing	0	6724	7000
Small Business Innovative Research/Small Business Technology Transfer Programs	0	3527	0
Totals	102141	122631	133297

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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
Procurement Ammunition Army: E80103	0	0	16960	54523	80033	174445	285402	3677670	4289033
OPA2: Enhanced Portable Inductive Fuze Setter (E-PIAFS): AD3260	0	0	1985	4994	4500	4200	0	0	15679
RDTE: 0604814A D709 Advanced Field Artillery Munition	0	0	0	0	14864	19809	20889	Continuing	Continuing

C. Acquisition Strategy: Excalibur is a family of 155mm Precision Guided Extended Range Munitions. A competitive source selection awarded an Engineering and Manufacturing Development (E&MD) contract for the initial variant, with options for the other variant's development and all Low Rate Initial Production quantities (LRIPs). The Product Management Office (PMO) merged the Trajectory Correctable Munitions (TCM) and Excalibur programs to satisfy the common guided extended range requirement. This merger will reduce program risk through incorporation of TCM technology. The PMO awarded a single, merged contract for the balance of System Development and Demonstration (SDD) with options for LRIP. In coordination with the Defense Acquisition Executive, the Army has implemented a spiral development process to provide for early fielding of projectiles to the Joint Lightweight (JLW) howitzer platforms. The first spiral (Ia-1) will meet the most critical Operational Requirement Document (ORD) Block Ia Key Performance Parameter (KPP) requirements and will be ready for fielding by the fourth quarter fiscal year (FY) 2006. The second spiral (Ia-2) will meet all of the ORD Block Ia KPP requirements and will field to the Future Combat System's Non-Line of Sight Cannon (NLOS-C) in addition to JLW by the fourth quarter FY08. The third spiral (Ib-1) will meet all of the ORD Block Ib KPP requirements and will be fielded to both NLOS-C & JLW by the fourth quarter FY11.

JBMOU compliance testing includes safety certification and firing table development. This strategy includes funding for compliance testing only. It does not fund procurement of projectiles for the stockpile.

ARMY RDT&E COST ANALYSIS(R3)									February 2004			
BUDGET ACTIVITY 5 - System Development and Demonstration					PE NUMBER AND TITLE 0604814A - Artillery Munitions - EMD					PROJECT 708		
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 . Excalibur Development	C/CPAF	Raytheon Missile System,Tucson, AZ	81873	68978	1-4Q	79570	1-4Q	84075	1-4Q	Continue	314496	418737
b . Award Fee on Excalibur Development Contract	N/A	Raytheon Missile System,Tucson, AZ	0	4604	2-4Q	5929	2-4Q	13973	2-4Q	Continue	24506	33848
c . TCM Merger Assessment	FP	Bofors Defence	3430	11000	1-3Q	0		0		0	14430	10930
d . Platform Integration-Systems Contractor	CPAF	TBD	0	0		150	1Q	150	1Q	600	900	1500
e . Misc Support Contracts	Various	Various	367	500	1-4Q	530	1-4Q	530	1-2Q	Continue	1927	1367
f . Platform Integration/Fire Control	SS/CPIF	Raytheon AFATDS, Ft Wayne, IN	0	68	1Q	520	1Q	1200	1Q	Continue	1788	1830
g . Platform Integration Firing Tables Development	MIPR	TACOM-ARDEC, Firing Tables Branch	0	400	2Q	420	1Q	441	1Q	Continue	1261	0
h . SS-SFM Test Projectiles	C/FFP	TBD	0	0		5084	2Q	5900	1Q	0	10984	0
i . Platform Integration	CPIF	BAE	0	0		3739	3Q	4000	2Q	0	7739	0
Subtotal:			85670	85550		95942		110269		Continue	378031	468212

ARMY RDT&E COST ANALYSIS(R3)									February 2004			
BUDGET ACTIVITY 5 - System Development and Demonstration					PE NUMBER AND TITLE 0604814A - Artillery Munitions - EMD					PROJECT 708		
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 . Program Management	In House	Excalibur PM, Picatinny Arsenal, NJ	4369	4500	1-4Q	3208	1-4Q	3337	1-4Q	Continue	15414	0
b . Government IPT Support-Excalibur XM982	MIPR	TACOM-ARDEC, Picatinny Arsenal, NJ	11013	3874	1-4Q	7128	1-4Q	5702	1-4Q	Continue	27717	0
c . Government TCM Support	MIPR	TACOM-ARDEC, Picatinny Arsenal, NJ	560	350	2Q	0		0		0	910	0
d . Goverment Support- Ft Sill	MIPR	Ft. Sill, OK	554	850	2Q	850	1Q	426	1Q	Continue	2680	0
e . Paladin Platform Integration	MIPR	PM Paladin/TACOM-ARDEC, Picatinny Arsenal, NJ	450	200	1-4Q	0		0		0	650	0
f . Modeling and Structural Development	MIPR	Army Research Labs, Adelphi, MD	1401	920	2-3Q	1200	1-2Q	852	1-2Q	Continue	4373	0
g . Govt IPT Support Platform Integration	MIPR	TACOM-ARDEC, Picatinny Arsenal, NJ	2951	500	1-4Q	2140	1-4Q	1605	1-4Q	4190	11386	0
h . Milestone Support	SS/FP	Camber, Alexandria, VA	299	300	2Q	221	2Q	250	2Q	Continue	1070	0
i . Technical Spt Contract for Platform Integration	SS/FP	Camber, Dallas, TX	179	120	2Q	150	1-2Q	160	1-2Q	247	856	0

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II. Support Cost (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
j . Fire Control development support	PM EFCS / TSM AFATDS	Ft Monmouth, NJ/Ft Sill, OK	0	200	2-3Q	210	1-2Q	221	1-2Q	Continue	631	0
k . Miscellaneous Support	MIPR	Various	252	120	1-4Q	253	1-4Q	250	1-4Q	Continue	875	0
l . Platform Integration Software Support	MIPR	Navy Surface Warfare Center, MD	80	100	2-4Q	210	1-4Q	250	1-4Q	100	740	0
m . PM CAS SS-SFM	In-House	PM CAS, Picatinny Arsenal, NJ	0	0		250	1Q	250	1Q	0	500	0
Subtotal:			22108	12034		15820		13303		Continue	67802	0

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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 . TECOM Test Range	MIPR	YPG, Yuma, AZ	4400	1989	2-4Q	3100	1-4Q	3500	1-4Q	Continue	12989	0
b . Test Instrumentation and Analysis	MIPR	Army Research Labs, Adelphi, MD	540	750	2-4Q	1212	1-4Q	1300	1-4Q	Continue	3802	0
c . Telemetry Support	SS/FF	Physical Science Laboratories (PSL), Las Cruces, NM	676	400	2Q	420	1Q	420	1Q	Continue	1916	0
d . Telemetry Support	MIPR	TACOM-ARDEC, Picatinny Arsenal, NJ	1386	258	2Q	3397	1Q	1185	1Q	Continue	6226	0
e . Telemetry Cryptographic Support	MIPR	Ft. Huachuca, AZ	78	60	1Q	0	1Q	0	1Q	Continue	138	0
f . Tri-Service Software Assessment	MIPR	OSD, Wash, DC	61	0		0		0		0	61	0
g . Operational Test Support	MIPR	ATEC, Alexandria, VA	0	180	2Q	140	2Q	450	2Q	6179	6949	0
h . Target Replacement, Definition, Maintenance and Repair and Threat Assessment	MIPR	Various	100	100	2-4Q	100	1-2Q	1200	1-2Q	Continue	1500	0
i . ARDEC Testing	MIPR	ARDEC, Picatinny Arsenal, NJ	475	300	2-4Q	300	1-4Q	300	1-4Q	685	2060	0

ARMY RDT&E COST ANALYSIS(R3)									February 2004				
BUDGET ACTIVITY					PE NUMBER AND TITLE					PROJECT			
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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	
j . Test Gun Equipment	MIPR	Watervliet Arsenal, NY	2050	520	2-4Q	1200	1-2Q	520	1-2Q	0	4290	0	
k . SS-SFM Testing	MIPR	TBD	0	0		1000	4Q	850	3Q	0	1850	0	
Subtotal:			9766	4557		10869		9725		Continue	41781	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	
Remarks: Not Applicable													
Project Total Cost:			117544	102141		122631		133297		Continue	487614	468212	

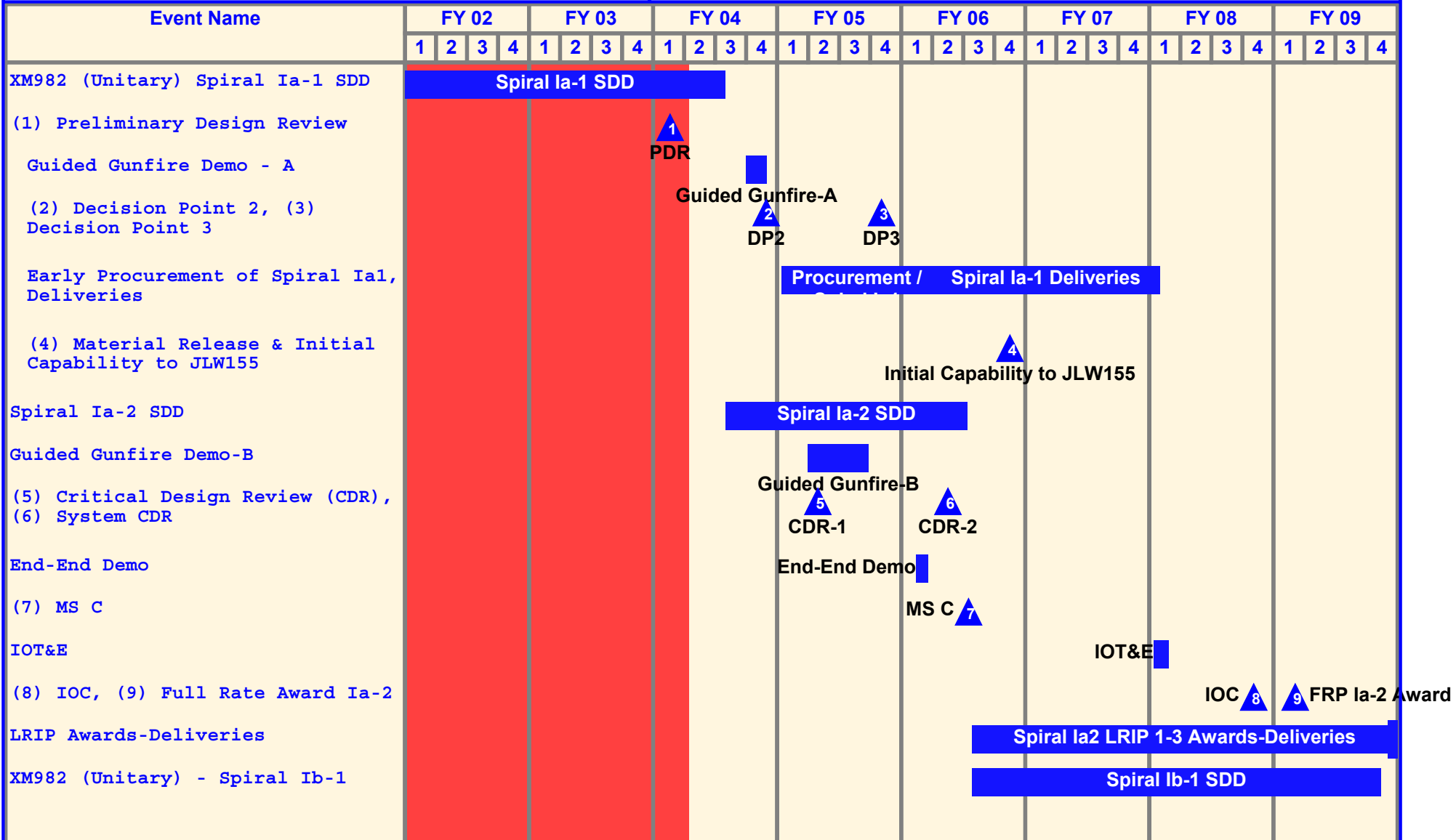
Schedule Profile (R4 Exhibit)

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Schedule Detail (R4a Exhibit)						February 2004	
BUDGET ACTIVITY 5 - System Development and Demonstration			PE NUMBER AND TITLE 0604814A - Artillery Munitions - EMD			PROJECT 708	
<u>Schedule Detail</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>
Warhead Contractor Development Test Firing	1-4Q	1-4Q	1-3Q				
Guidance Soft Recovery Testing/Sys. Reliability Growth	1-4Q	1-4Q	1-4Q	1-4Q	1-3Q		
Guided Gunfire A (Tactical Guidance System Testing)		3Q					
Early Fielding Production			1Q				
Guided Gunfire B (Initial Full System Test Firing)			2Q				
System Critical Design Review (CDR) -1			2Q				
System Final CDR -2				2Q			
Inductive Fuze Setter Preliminary Design Review (PDR)		2Q					
Inductive Fuze Setter CDR			3Q				
Start Developmental Technical (DT) Test, Evaluation & Qualification				1Q			
Milestone C				3Q			
Initial Capability to JLW155				4Q			
Complete Developmental Technical Test and Evaluation					2Q		
Award LRIP II Contract					2Q		
System IOT&E						1Q	
System IOC						4Q	
Spiral 1b-1 IPR				3Q			

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	February 2004
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MD	PROJECT 709
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5 - System Development and Demonstration

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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
709	ADVANCED FIELD ARTILLERY MUNITION	0	0	0	0	14864	19809	20889	Continuing	Continuing

A. Mission Description and Budget Item Justification: Advanced Field Artillery Munition (AFAM) funds the development of Future Combat System-Cannon (FCS-C) Non-Lethal Munitions.

<u>Accomplishments/Planned Program</u>	Not applicable for this item.
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B. Other Program Funding Summary: Not applicable for this item.

C. Acquisition Strategy: Not applicable for this item.