

UNCLASSIFIED

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604814A Sense and Destroy Armor Munition - Engineering Development
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COST (<i>In Thousands</i>)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	10485	31602	19366	9775	1827	0	0	0	0	1019541
D2ST SADARM Operational Test	4864	0	0	0	0	0	0	0	0	5156
D644 Generic SADARM Engineering Development	5621	31602	19366	9775	1827	0	0	0	0	1014385

A. Mission Description and Budget Item Justification: Sense and Destroy Armor (SADARM) munitions will provide an enhanced fire/counterfire capability for 155mm howitzer delivery systems. SADARM can attack targets well beyond the Forward Line of Troops (FLOT) in a fire-and-forget mode. SADARM can be used in day and night, inclement weather and degraded battlefield conditions.

These capabilities will be enhanced by the SADARM Product Improvement (PI) program which began in FY 1997. The PI SADARM submunition will have an enlarged footprint (permitting each submunition to cover approximately three times the area of the baseline SADARM), and improved infrared sensor to see targets from higher altitudes. As a result, the PI SADARM will be more effective against all of its targets. When ejected from the 155mm projectile, the PI SADARM submunitions deploy and descend toward the ground at a constant velocity and spin rate. The submunitions contain an improved sensing mechanism which combines a dual-mode millimeter wave sensor with an improved infrared sensor array. If a target is present within the scan area (approximately 53,000 square meters or 12 football fields), the submunition detects and destroys the target.

B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (<u>FY 1999 PB</u>)	10847	20813	12873	1960
Appropriated Value	11494	31813		
Adjustments to Appropriated Value				
a. Congressional General Reductions	-647	-211		
b. SBIR / STTR	-272			
c. Other Above Threshold Reductions	-90			
d. Below Threshold Reprogramming				
e. Rescissions				
Adjustments to Budget Years Since <u>FY 1999 PB</u>			+6493	+7815
Current Budget Submit (<u>FY 1999 / 2000 PB</u>)	10485	31602	19366	9775

Change Summary Explanation: Funding - FY 2000: Transfer from SADARM Procurement to RDTE to fund a restructured SADARM PI program (+6748)

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FY 2001: Transfer from SADARM Procurement to RDTE to fund a restructured SADARM PI program (+7946).		

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BUDGET ACTIVITY 5 - Engineering and Manufacturing Development				PE NUMBER AND TITLE 0604814A Sense and Destroy Armor Munition - Engineering Development				PROJECT D644		
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D644 Generic SADARM Engineering Development	5621	31602	19366	9775	1827	0	0	0	0	1014385
<p>A. <u>Mission Description and Justification:</u> : Sense and Destroy Armor (SADARM) munitions will provide an enhanced fire/counterfire capability for 155mm howitzer delivery systems. SADARM can attack targets well beyond the Forward Line of Troops (FLOT) in a fire-and-forget mode. SADARM can be used in day and night, inclement weather and degraded battlefield conditions.</p> <p>These capabilities will be enhanced by the SADARM Product Improvement (PI) program which began in FY 1997. The PI SADARM submunition will have an enlarged footprint (permitting each submunition to cover approximately three times the area of the baseline SADARM), improved infrared sensor to see targets from higher altitudes. As a result, the PI SADARM will be more effective against all of its targets. When ejected from the 155mm projectile, the PI SADARM submunitions deploy and descend toward the ground at a constant velocity and spin rate. The submunitions contain an improved sensing mechanism which combines a dual-mode millimeter wave sensor with an improved infrared sensor array. If a target is present within the scan area (approximately 53,000 square meters or 12 football fields), the submunition detects and destroys the target.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 100 Simulation trade studies with Hardware in-the-loop (HWIL) to investigate application of Commercial Off-the-Shelf (COTS) technologies. • 1500 Warhead design improvements to maintain lethality at longer ranges. • 1830 Defined sensor component requirements and software interfaces. • 681 Procurement of long lead component level sensor hardware. • 1510 Government participation in joint design Integrated Product Teams (IPT's). <p>Total 5621</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 1000 Continue simulation efforts with HWIL to conduct hardware/software trade studies for PI SADARM. • 4698 Select optimum warhead design and begin lethal mechanism range firings. • 13564 Sensor Development: <ul style="list-style-type: none"> - Prototype development and initial fabrication of component level sensor hardware. - Mechanical design changes to increase footprint size. - Testing to assure gun survivability of sensor components. 										
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- Upgrade of test instrumentation to support the program Captive Flight Tests (CFT).

FY 1999 Planned Program: (continued)

- 4128 Continued procurement and fabrication of test hardware.
 - 7380 Continued government support to IPT design and gun survivability testing.
 - 832 Small Business Innovative Research/Small Business Technology Transfer (SBIR/STTR) Programs
- Total 31602

FY 2000 Planned Program:

- 700 Support HWIL for the qualification of the improved sensor electronics.
 - 5500 Complete lethal mechanism optimization and conduct qualification testing to meet PI lethality requirements.
 - 7182 Conduct captive flight tests of improved sensor and begin system integration activities.
 - 3402 Fabrication of system test hardware consisting of sensor units and inert flight hardware.
 - 2582 Government support to IPT's, CFT and system level integration tests.
- Total 19366

FY 2001 Planned Program:

- 700 Complete sensor qualification with HWIL simulation.
 - 2422 Complete lethal mechanism qualification and prepare engineering change proposals for production.
 - 3578 Complete system level qualification.
 - 1445 Fabrication of system level test hardware consisting of inert flight hardware and 12 tactical projectiles.
 - 1630 Government support to complete PI Engineering Manufacturing and Development (EMD) and the transition of design changes into production.
- Total 9775

B. <u>Other Program Funding Summary</u>	<u>FY 1998</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>	To Compl	Total Cost
Procurement, Ammunition, Army, SSN E66300 Proj, Arty, 155mm SADARM, M898	65343	31453	54546	63605	76486	92792	154629	82829	1266700	2056700

C. Acquisition Strategy R&D: The cost plus incentive fee (CPIF) contracts were awarded in FY 1986 to Aerojet Electrosystems and Honeywell. In FY 1991, a design select eliminated the Honeywell competition. Aerojet then selected Honeywell (now Alliant Techsystems) as their prime sub-contractor and they have continued this relationship into production. The Engineering and Manufacturing Development contract with Aerojet has been completed.

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The SADARM Submunition Product Improvement Program was awarded on 24 February 1997 to GenCorp Aerojet, Azusa, CA for the design, development, fabrication, integration, and testing of improvements on a sole source basis in accordance with FAR 6.302-1, Only One Responsible Source. Due to a funding decrement in FY98, contract restructure modification P00013 was signed on 19 March 1998 reflecting a no cost 5-month period of performance extension (from April 2001 to September 2001).

D. Schedule Profile	<u>FY 1997</u>	<u>FY 1998</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 2004</u>	<u>FY 2005</u>
Award Second LRP Contract	2Q*									
Award Product Improvement Contract	2Q*									
IOTE		4Q*								
ASARC/Full Rate Production Decision			1Q							
First Unit Equipped Basic SADARM			4Q							
PI Captive Flight Tests 1 st Qtr				1Q						
PI SADARM System Qualification Test					3Q					
Complete PI EMD Contract					4Q					

* Denotes completed milestone

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ARMY RDT&E COST ANALYSIS (R-3)										DATE February 1999		
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development				PE NUMBER AND TITLE 0604814A Sense and Destroy Armor Munition - Engineering Development						PROJECT D644		
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. Prod Improv: Contract	SS/CPAF	Aerojet- Azusa, CA	10612	22060	OCT 98	16384	OCT 99	6865	OCT 00	0	55921	55921
b. Basic SADARM Contract	C/CPIF	Aerojet- Azusa, CA	436202							0	436202	
c. Government Support			60493								60493	
d. Basic SADARM Contract	C/CPIF	Alliant Tech Sys Hopkins, MN	188038							0	188038	
e. MLRS Rocket Integration	SS/CPIF	Loral Vought Sys Dallas, TX	90535							0	90535	
f. Miscellaneous	MIPR		7645							0	7645	
Subtotal Product Development:			793525	22060		16384		6865			838834	
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. PM SADARM	Allot	Picatinny Arsenal, NJ	761	400		450		450		300	2361	
b. ARDEC Eng Support	MIPR	Picatinny Arsenal, NJ	16918	3601	OCT 98	1232	OCT 99	1060	OCT 00	556	23367	
c. MLRS Rocket Integration	MIPR	PMO-MLRS, Huntsville, AL	16266								16266	
d. Miscellaneous	MIPR		8868	1032	DEC 98	100	DEC 99	300	DEC 00	671	10971	
Subtotal Support Costs:			42813	5033		1782		1810		1527	52965	
III. Test and Evaluation	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. Projectile Testing	MIPR	YPG Yuma, AZ	21117	550		200	DEC 99	200	DEC 00	0	22067	
b. Rocket Testing	MIPR	WSMR New Mexico	26487							0	26487	

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III. Test and Evaluation	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
c. Miscellaneous	MIPR		67118	120	DEC 98	300	DEC 99	200	DEC 00	0	67738	
d. HWIL SADARM PI	MIPR	MICOM, Huntsville, Ala	755	1000	DEC 98	700	DEC 99	700	DEC 00	300	3455	
e. Army Research Lab	MIPR	Adelphi, MD		2007							2007	
Subtotal Test and Evaluation:			115477	3677		1200		1100		300	121754	
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
SBIR/STTR				832							832	
Subtotal Management Services				832							832	
Project Total Cost:			951815	31602		19366		9775		1827	1014385	