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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0203802A Other Missile Product Improvement Programs						
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
Total Program Element (PE) Cost	1613	1239	9914	14817	29173	19552	86858	101829	Continuing	Continuing
045 Hellfire Product Improvement Program	675	0	0	0	0	0	0	0	0	0
D336 TOW Product Improvement Program	938	1239	9914	2464	10809	3513	0	0	14322	374899
D689 ATACMS BLK IIIB	0	0	0	0	0	0	0	5200	Continuing	Continuing
D785 Longbow Hellfire PIP	0	0	0	12353	18364	16039	54040	75537	Continuing	Continuing
D786 Laser Guided Rocket	0	0	0	0	0	0	32818	21092	0	53910

A. Mission Description and Budget Item Justification: The TOW PIP provides advances in the day/night sight improvements, fire control and missile improvements. Improvements are required to maintain the infantry's capability to support the US Army mission of crisis response to regionally based threat and allows for TOW to continue to be integral to the strategic principle of forward presence. Included in this PIP are missile improvements to include a lethality effort against new/evolving threats to include Counter Active Protection System (CAPS) and the Improved Target Acquisition System (ITAS). The missile improvements are accomplished through technology insertion (TI) to enhance TOW missile performance against the evolving threat and to support the resumption of TOW missile production by replacing obsolete technologies with design for manufacturing and affordability improvements. The ITAS is a technology insertion program using Second Generation Forward Looking Infrared (FLIR) technology to upgrade the current TOW Target Acquisition and Fire Control subsystems. The ITAS program includes development of training devices. The Army TACMS IIIB will achieve ranges equivalent to the Army TACMS Block IA and will employ an earth penetrator warhead designed to neutralize "Hard and Deeply Buried Targets." These target sets might include underground command and control facilities, or surface-to-surface missile storage and assembly areas. An evolutionary improvement program is needed to maintain the effectiveness of the Hellfire Army TACMS, TOW and Hydra-70 systems. The Longbow Hellfire missile provides a fire-and-forget capability, greatly increasing the Longbow weapon system effectiveness and aircraft survivability. The Longbow system is deployable by day or night, in adverse weather, and in countermeasures environment. The Longbow Hellfire PIP will develop Home-on-Jam (HOJ)/Anti-Jam (AJ) and limited Counter-Active Protection System (CAPS) capabilities for the missile. The HOJ/AJ and CAPS objective is to maintain the Longbow systems low vulnerability and susceptibility to existing and future "hard kill" Active Protection System (APS) threats and battlefield jammer threats. Modernized Hellfire will provide the AH-64 and RAH-64 with a fire-and-forget Hellfire capability, greatly increasing weapon system effectiveness and aircraft survivability. The Modernized Hellfire missile will effectively engage and destroy advanced armor on the digital battlefield well into the next century. Modernized Hellfire will enter Engineering Manufacturing Development (EMD) in FY03. Modernized Hellfire missile will be designed and tested to achieve the following: fire-and-forget, increased range, increased survivability (both missile and platform),

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BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0203802A Other Missile Product Improvement Programs				PROJECT D336		
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
D336 TOW Product Improvement Program	938	1239	9914	2464	10809	3513	0	0	14322	374899
<p>A. <u>Mission Description and Budget Item Justification:</u> Project D336 -TOW Product Improvement Program: Provides for continued development of improvements to the TOW missile system. Improvements are required to maintain the Infantry's capability to support the US Army mission of crisis response to regionally based threats and allow TOW to continue to be integral to the strategic principle of forward presence. Included in this PIP are missile improvements (sensor, lethality, aerodynamics, guidance, control, reduced missile time of flight), and Improved Target Acquisition System (ITAS). The missile improvements are accomplished through technology insertion (TI) to enhance TOW missile performance against the evolving threat (CAPS) and to support the resumption of TOW missile production by replacing obsolete technologies with design for manufacturing and affordability (DFMA) improvements. The ITAS increases the capability of the TOW Heavy Antitank Weapon System by providing improved target detection and acquisition range, improved probability of hit, enhanced fire control capabilities and improved logistics supportability through modular design and extensive built-in test equipment. The ITAS program includes development of training devices, contains the Army's pathfinder common components for its Second Generation FLIR and sustains common components production concurrent with the Improved Bradley Acquisition System (IBAS). The ITAS design provides simple growth potential for digitization applications and upgrades the anti-armor capability of light forces using the TOW System.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 553 Continued EMD efforts on ITAS Indoor Trainer • 385 Continued missile enhancement efforts against the evolving threat [to include Counter Active Protection System (CAPS)] <ul style="list-style-type: none"> - Updated analytical/simulation model based on latest intelligence reports - Designed/tested long stand-off warhead - Demonstrated electrical active/passive measures <p>Total 938</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 202 Complete ITAS Indoor Trainer • 1016 Continue missile enhancement efforts against the evolving threat [to include Counter Active Protection System (CAPS)] <ul style="list-style-type: none"> -Update analytical/simulation model based on latest intelligence reports - Test long stand-off warhead - Test electrical active/passive measures • 21 Small Business Innovative Research/Small Business Technology Transfer Programs <p>Total 1239</p>										
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203802A Other Missile Product Improvement Programs	PROJECT D336
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FY 2000 Planned Program:

- 3837 System design and integration of A-CAPS into the TOW 2B missile to maintain capability against threat armor equipped with Active Protective System (APS)
 - 1265 Procure component/prototype hardware for qualification of A-CAPS
 - 1944 Initiate A-CAPS system qualification flight tests
 - 2568 Begin design/integration of RF Data Link into TOW 2B missile
 - 300 Conduct analyses/trade studies on design for manufacturing and affordability (DFMA) candidates
- Total 9914

FY 2001 Planned Program:

- 2464 Complete A-CAPS system qualification flight tests
- Total 2464

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>	<u>To Complete</u>	<u>Total Cost</u>
Missile Procurement, Army										
C61700 ITAS/TOW Mods	61601	62141	68306	60785	64148	56477	59097	60706	0	1040712
TOW 2 C59300	732					22664	36604	54491		2388008

C. Acquisition Strategy: The ITAS is a technology insertion program utilizing Second Generation FLIR technology to upgrade the current TOW Target Acquisition and Fire Control subsystems. The second Low Rate Initial Production (LRIP) contract was awarded to the EMD contractor in FY 98. First Full Rate Production (FRP) contract will be awarded in FY 99. The TOW Technology Insertion program will enhance TOW 2B missile performance against threat armor equipped with Active Protective System (APS) and integrate DFMA improvements to replace obsolete technologies to support resumption of TOW 2B missile production. The development contract will be awarded in FY 2000. The first production contract will be awarded in FY 2003.

D. <u>Schedule Profile</u>	<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>
ITAS LRIP II		2 nd Qtr*					
ITAS Milestone III Review			3 rd Qtr				
Award TOW 2B development contract				2 nd Qtr			
Conduct TOW 2B PDR				4 th Qtr			
Conduct TOW 2B CDR					3 rd Qtr		

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BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0203802A Other Missile Product Improvement Programs			PROJECT D336	
D. Schedule Profile	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	
Fabricate TOW 2B prototypes/conduct qualification tests						1 st -4 th Qtr		
Complete TOW 2B Qualification Testing							1 st Qtr	
TOW 2B Production Decision IPR							1 st Qtr	

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ARMY RDT&E COST ANALYSIS (R-3)										DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0203802A Other Missile Product Improvement Programs					PROJECT D336		
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. PY Sunk Cost	60640	145427								145427		
b. Texas Instruments, McKinney, TX	C/CPIF/AF	59724								59724		
c. STRICOM, Orlando, FL	MIPR	9128								9128		
d. Misc.	Various	4197	493							4690		
e. TOW 2B (TBD)	TBD				6807		633			7440		
Subtotal Product Development:			218476	493	6807		633			226409		
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. PY Sunk Cost		46912								46912		
b. PM CCAWS, RSA	PO	2827	29		1657		1831			6344		
c. MICOM, RSA,AL	PO	14993	110							15103		
d. Misc.	Various	2683								2683		
Subtotal Support Costs:			67415	139	1657		1831			71042		
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. PY Sunk Cost		42221								42221		
b. TECOM,APG,MD	PO	15836	607							16443		
c. TEXCOM, Ft Bliss, TX	MIPR	1557								1557		
d. Misc.	Various	1726								1726		
e. TECOM, RTTC	MIPR				1450					1450		
Subtotal Test and Evaluation:			61340	607	1450					63397		
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203802A Other Missile Product Improvement Programs	PROJECT D336
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IV. Management Services: Not applicable

	Total PYs Cost	<u>FY 1999</u> Cost		<u>FY 2000</u> Cost		<u>FY 2001</u> Cost		Cost To Complete	Total Cost	Target Value of Contract
Project Total Cost:	347231	1239		9914		2464			360848	

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BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0203802A Other Missile Product Improvement Programs					PROJECT D785	
COST (In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
D785 Longbow Hellfire PIP	0	0	0	12353	18364	16039	54040	75537	Continuing	Continuing
<p>A. <u>Mission Description and Budget Item Justification:</u> Expanding regional power threats require an evolutionary improvement program to maintain the effectiveness of the Hellfire, Army TACMS, TOW and Hydra-70 systems. The Longbow Hellfire missile provides a fire-and-forget capability, greatly increasing the Longbow weapon system effectiveness and aircraft survivability. The Longbow system is deployable by day or night, in adverse weather, and in countermeasures environment. The Longbow Hellfire PIP will develop Home-on-Jam (HOJ)/Anti-Jam (AJ) and limited Counter-Active Protection System (CAPS) capabilities for the missile. The HOJ/AJ and CAPS objective is to maintain the Longbow systems low vulnerability and susceptibility to existing and future "hard kill" Active Protection System (APS) threats and battlefield jammer threats. Modernized Hellfire will provide the AH-64 and RAH-64 with a fire-and-forget Hellfire capability, greatly increasing weapon system effectiveness and aircraft survivability. The Modernized Hellfire missile will effectively engage and destroy advanced armor on the digital battlefield well into the next century. Modernized Hellfire will enter Engineering Manufacturing Development (EMD) in FY03. Modernized Hellfire missile will be designed and tested to achieve the following: fire-and-forget, increased range, increased survivability (both missile and platform), decreased timeline, decreased weight, decreased size, and modularity for future enhancements. Modernized Hellfire will be compatible with existing launch platforms and the RAH-66. Funding for FY 2001 and 2002 applies only to the Longbow Hellfire PIP program.</p> <p>FY 1998 Accomplishments: Project not funded in FY 98.</p> <p>FY 1999 Planned Program: Project not funded in FY 99.</p> <p>FY 2000 Planned Program: Project not funded in FY 00.</p> <p>FY 2001 Planned Program:</p> <ul style="list-style-type: none"> • 10870 Product Development • 494 Support Costs • 371 Test and Evaluation Support • 618 Management Services Support <p>Total 12353</p>										
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BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0203802A Other Missile Product Improvement Programs				PROJECT D785	
B. Other Program Funding Summary	<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	Total
Missile Procurement Army									Compl	Cost
C70300 Longbow Hellfire/LBHF	231164	345125	294269	288330	225387	186111	26405	22457	1137500	3232438
<p>C. Acquisition Strategy: Development for HOJ/AJ and CAPS improvements will be done by AMCOM labs and contract development by Longbow Limited Liability.</p>										
D. Schedule Profile	<u>FY 1996</u>	<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 2005</u>
Concept formulation/acquisition strategy LBHF PIP						1 st Qtr				
LLC contract award LBHF PIP						1 st Qtr				
Requirements definition LBHF PIP						2 nd Qtr				
Complete detailed design LBHF PIP							1 st Qtr			
Integration and testing LBHF PIP							2 nd Qtr			
Missile firings LBHF PIP							4 th Qtr			
Engineering Change Proposal LBHF PIP							4 th Qtr			
EMD Modernized Hellfire								2 nd Qtr		
Integration and testing Modernized Hellfire									3 rd Qtr	
Design/Test/Qual Modernized Hellfire										1 st Qtr
Qualification Modernized Hellfire										3 rd Qtr
Rail Flights										2 nd Qtr

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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
Longbow HF PIP												
a. LLL	LC/CPFF	TBD						10590	Nov	16246	26836	
b. RDEC Spt Contracts	TBD	TBD						280	Dec	296	576	
Modernized Hellfire												
c. LLL	LC/CPFF	TBD								260270	260270	
d. RDEC Spt Contracts	TBD	TBD								3924	3924	
Subtotal Product Development:								10870		280736	291606	

Remarks: *Includes requirements/threat definition, preliminary/detailed design, and testing in hardware-in-the-loop and missile firings.

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
Longbow HF PIP												
a. In-House Gov't Support								136	Qtrly	216	352	
b. RDEC Support								358	Qtrly	512	870	
Modernized Hellfire												
c. In-House Gov't Support										3067	3067	
d. RDEC Support										6542	6542	
Subtotal Support Costs:								494		10337	10831	

Remarks: *Includes salaries and travel for other government agencies in support of Longbow PIP and Modernized Hellfire.

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
Longbow HF PIP												
a. RTTC Gov't Support								371	Qtrly	657	1028	
Modernized Hellfire												
b. RTTC Gov't Support										26362	26362	
Subtotal Test and Evaluation:								371		27019	27390	

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Remarks: *Includes RDEC and RTTC support for system reviews and testing, as well as support from RTTC and ARL for test assets and range support.

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
Longbow HF PIP												
a. In-House Support								618	Qtrly	727	1345	
Modernized Hellfire												
b. In-House Support										15461	15461	
Subtotal Management Services:								618		16188	16806	

Remarks: *Includes salaries and travel for collocated and core personnel.

Project Total Cost:								12353		334280	346633	
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