

UNCLASSIFIED

<b>ARMY RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)</b>	DATE <b>February 2000</b>
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<b>BUDGET ACTIVITY</b> <b>7 - Operational System Development</b>	<b>PE NUMBER AND TITLE</b> <b>0203802A Other Missile Product Improvement Programs</b>
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COST <i>(In Thousands)</i>	FY1999 Actual	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	1201	17687	64418	84555	34240	32508	20873	0	502138
D336 TOW Product Improvement Program	1201	17687	52141	66335	34240	0	0	0	418260
D785 Longbow Hellfire PIP	0	0	12277	18220	0	0	0	0	30497
D786 Laser Guided Rocket	0	0	0	0	0	32508	20873	0	53381

**A. Mission Description and Justification:** The TOW Fire and Forget (F&F) Missile program provides the next generation missile for light, early entry contingency forces equipped with the TOW Improved Target Acquisition System (ITAS). This program provides enhanced survivability to Light Infantry Forces by enabling engagement of enemy threats and immediate movement to safety. This fire and forget technology is required by U.S. Army Infantry School (USAIS) to maintain the infantry's capability to support the U.S. Army mission of crisis response to regionally based threat and allows this technology to be integral to the strategic principal of forward presence. The TOW F&F includes a dual mode of attack with the primary mode being fire and forget and the alternate mode being Command Line-of-Sight (CLOS) guidance to ensure maximum engagement throughout varying battlefield conditions. The TOW F&F offers enhanced range as well as maximum standoff against enemy threats. This program includes improved lethality against new/evolving enemy threats to include Counter Active Protection System (CAPS) and will be launched from the Improved Target Acquisition System (ITAS). This program will utilize modern production processes and technologies with Design for Manufacturing and Affordability (DFMA). The TOW F&F is required to be modular in design for future growth and shelf life extension. 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 countermeasure environments. The Longbow Hellfire Product Improvement Program (PIP) will develop and qualify Home-on-Jam (HOJ)/Anti-Jam (AJ) and demonstrate limited 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. The Advanced Precision Kill Weapon System (APKWS), presently funded in project D786 Laser Guided Rocket, will consist of a laser guidance section that uses existing Hydra-70 rocket components and launch equipment. The APKWS is a highly accurate weapon that will complement the Hellfire missile in precision strike against soft point targets. The APKWS will provide improved accuracy over the current 2.75 rocket used on the AH-64 Apache, OH-58 Kiowa Warrior and the future RAH-66 Comanche helicopters. The APKWS seeker program will develop, test and qualify a laser guidance section for the Hydra-70 rocket. The laser seeker program funding includes system level qualification for APKWS. The APKWS seeker will improve accuracy and is expected to provide four times the number of kills, a substantial reduction in collateral damage to minimize fratricide, and a significant reduction in cost as a result of fewer rockets being required.

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**0203802A Other Missile Product Improvement Programs**

<b>B. Program Change Summary</b>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget ( <u>FY 2000/2001</u> PB)	1239	9914	14817
Appropriated Value	1248	17914	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-9		
b. SBIR / STTR	-21		
c. Omnibus or Other Above Threshold Reductions		-73	
d. Below Threshold Reprogramming	-13		
e. Rescissions	-4	-154	
Adjustments to Budget Years Since <u>FY 2000/2001</u> PB			+49601
Current Budget Submit ( <u>FY 2001</u> PB)	1201	17687	64418

Change Summary Explanation: Funding for FY 2001: Project 336 - TOW PIP (+49677) - Funding increase to support the Army's TOW Fire and Forget EMD Program.

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BUDGET ACTIVITY <b>7 - Operational System Development</b>				PE NUMBER AND TITLE <b>0203802A Other Missile Product Improvement Programs</b>				PROJECT <b>D336</b>		
COST (In Thousands)	FY1999 Actual	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	1201	17687	52141	66335	34240	0	0	0	418260	
<p><b>A. <u>Mission Description and Justification:</u> Project D336 -TOW Product Improvement Program</b> Provides the next generation missile for light, early entry contingency forces equipped with the TOW Improved Target Acquisition System (ITAS). Provides enhanced survivability to Light Infantry Forces by enabling engagement of enemy threats and immediate movement to safety. Required to maintain the infantry's capability to support the U.S. Army mission of crisis response to regionally based threat and allows this technology to be integral to the strategic principal of forward presence. The TOW F&amp;F includes a dual mode of attack with the primary mode being fire and forget and the alternate mode being Command Line-of-Sight (CLOS) guidance to ensure maximum engagement throughout varying battlefield conditions. The TOW F&amp;F offers enhanced range as well as maximum standoff against enemy threats. This program will utilize modern production processes and technologies with Design for Manufacturing and Affordability (DFMA). This program includes improved lethality against new/evolving enemy threats to include Counter Active Protection System (CAPS) and will be launched from the Improved Target Acquisition System (ITAS). The TOW F&amp;F is required to be modular in design for future growth and shelf life extension.</p> <p><b>FY 1999 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• 200 Continued efforts on ITAS Indoor Trainer</li> <li>• 1001 Continued missile enhancement efforts against the evolving threat [to include Counter Active Protection System (CAPS)] <ul style="list-style-type: none"> <li>-Updated analytical/simulation model based on latest intelligence reports</li> <li>- Tested long stand-off warhead</li> <li>- Tested electrical active/passive measures</li> </ul> </li> </ul> <p>Total 1201</p> <p><b>FY 2000 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• 1696 Release EMD Request for Proposal; Conduct Source Selection; Complete Milestone II; and Award EMD Contract.</li> <li>• 11417 Initiate Component Design, Simulation, and System Engineering Analysis for Preliminary Design Review (PDR).</li> <li>• 3500 Complete PDR.</li> <li>• 598 Prepare for Early User Assessment.</li> <li>• 476 Small Business Innovative Research/Small Business Technology Transfer Programs</li> </ul> <p>Total 17687</p>										
Project D336			Page 3 of 10 Pages				Exhibit R-2A (PE 0203802A)			

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BUDGET ACTIVITY <b>7 - Operational System Development</b>	PE NUMBER AND TITLE <b>0203802A Other Missile Product Improvement Programs</b>	PROJECT <b>D336</b>

**FY 2001 Planned Program:**

- 6724 Complete Critical Design Review (CDR) and update TOW F&F Simulations.
  - 24533 Continue System Engineering Analysis and Design; Pilot Line Development and Preparation; Procure Sub-Vendor Prototype Hardware and Test Equipment.
  - 20884 Initiate Procurement of Hardware for Pre-Production Test; Initiate Testing; Conduct Early User Assessment; Prepare and Update Missile Design Documentation.
- Total      52141

**B. Other Program Funding Summary**

	<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	62998	67704	64562	67408	59847	63539	59954	Cont	Cont
TOW 2 C59300					14494	78275	89561	Cont	Cont

**B. Acquisition Strategy:** The TOW F&F missile program is a technology insertion program utilizing the latest seeker and guidance technology to provide a high performance and reliable fire and forget missile. The TOW F&F program will be an Acquisition Category II program based upon DOD 5000.2-R guidelines. The Request for Proposal (RFP) was released 1<sup>st</sup> quarter FY00 and EMD contract award is scheduled for 3<sup>rd</sup> quarter FY00. The TOW F&F program includes a 42 month competitive EMD phase, followed by Low Rate Initial Production (LRIP) and Full Rate Production (FRP).

**D. Schedule Profile**

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>
Release TOW F&F RFP		1 <sup>st</sup> Qtr			
Award TOW F&F EMD contract		3 <sup>rd</sup> Qtr			
Conduct TOW F&F PDR		4 <sup>th</sup> Qtr			
Conduct TOW F&F CDR			3 <sup>rd</sup> Qtr		
Conduct TOW F&F PPT			4 <sup>th</sup> Qtr	4 <sup>th</sup> Qtr	
Conduct TOW F&F PPQT					1 <sup>st</sup> Qtr
Conduct TOW F&F Limited User Test (LUT)					1 <sup>st</sup> Qtr

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<b>ARMY RDT&amp;E COST ANALYSIS (R-3)</b>										DATE <b>February 2000</b>		
BUDGET ACTIVITY <b>7 - Operational System Development</b>					PE NUMBER AND TITLE <b>0203802A Other Missile Product Improvement Programs</b>					PROJECT <b>D336</b>		
<b>I. Product Development</b>	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 1999 Cost</u>	<u>FY 1999 Award Date</u>	<u>FY 2000 Cost</u>	<u>FY 2000 Award Date</u>	<u>FY 2001 Cost</u>	<u>FY 2001 Award Date</u>	Cost To Complete	Total Cost	Target Value of Contract
a. PY Sunk Cost			145427								145427	
b. ITAS EMD	C/CPIF/AF	Raytheon, McKinney, TX	59724								59724	
c. ITAS Training Development	MIPR	STRICOM, Orlando, FL	9128			50	Apr	151	Dec	310	9639	
d. Misc.	Various	Various	4197	448	Dec	1104	Mar	2020	Dec	3650	11419	
e. TOW F&F EMD	CPIF	TBD				13603	Jun	44807	Dec	81560	139970	
Subtotal Product Development:			218476	448		14757		46978		85520	366179	
<b>II. Support Costs</b>	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 1999 Cost</u>	<u>FY 1999 Award Date</u>	<u>FY 2000 Cost</u>	<u>FY 2000 Award Date</u>	<u>FY 2001 Cost</u>	<u>FY 2001 Award Date</u>	Cost To Complete	Total Cost	Target Value of Contract
a. PY Sunk Cost			46912								46912	
b. Program Mgt Support	PO	PM CCAWS, RSA	2827	247	Qtrly	2179	Qtrly	2168	Qtrly	6571	13992	
c. Functional Gov't Support	PO	MICOM, RSA, AL	14993	223	Qtrly						15216	
c. Misc.	Various	Various	2683								2683	
Subtotal Support Costs:			67415	470		2179		2168		6571	78803	
<b>III. Test and Evaluation</b>	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 1999 Cost</u>	<u>FY 1999 Award Date</u>	<u>FY 2000 Cost</u>	<u>FY 2000 Award Date</u>	<u>FY 2001 Cost</u>	<u>FY 2001 Award Date</u>	Cost To Complete	Total Cost	Target Value of Contract
a. PY Sunk Cost			42221								42221	
b. Program Test Support	MIPR	TECOM, APG, MD	15836					15	Qtrly	166	16017	
c. Program Test Support	MIPR	TEXCOM, Ft. Bliss, TX	1557								1557	
d. Misc.	Various	Various	1726			359	Qtrly	554	Qtrly	2877	5516	
e. Program Test Support	MIPR	TECOM, RTTC		283	Qtrly	392	Qtrly	2426	Qtrly	16525	19626	

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<b>ARMY RDT&amp;E COST ANALYSIS (R-3)</b>										DATE <b>February 2000</b>	
BUDGET ACTIVITY <b>7 - Operational System Development</b>					PE NUMBER AND TITLE <b>0203802A Other Missile Product Improvement Programs</b>					PROJECT <b>D336</b>	
Subtotal Test and Evaluation:			61340	283		751		2995		19568	84937
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	1201		17687		52141		111659	529919	
Project D336			Page 6 of 10 Pages				Exhibit R-3 (PE 0203802A)				

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<b>BUDGET ACTIVITY</b> <b>7 - Operational System Development</b>	<b>PE NUMBER AND TITLE</b> <b>0203802A Other Missile Product Improvement Programs</b>	<b>PROJECT</b> <b>D785</b>
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COST (In Thousands)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D785 Longbow Hellfire PIP	0	0	12277	18220	0	0	0	0	30497

**A. Mission Description and Justification:** Expanding regional power threats require an evolutionary improvement program to maintain the effectiveness of the Hellfire, Army Tactical Missile System (ATACMS), TOW and Hydra-70 systems. The Longbow Hellfire missile provides a fire-and-forget capability, greatly increasing the Longbow weapon system's effectiveness and aircraft survivability. The Longbow system is deployable by day or night, in adverse weather, and in countermeasures environments. The Longbow Hellfire Product Improvement Program (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 Hellfire Missile System's low vulnerability and susceptibility to existing and future "hard kill" Active Protection System (APS) threats and battlefield jammer threats.

**FY 1999 Accomplishments:** Project not funded in FY 1999.

**FY 2000 Planned Program:** Project not funded in FY 2000.

**FY 2001 Planned Program:**

- 10294 Product Development
  - 744 Support Costs
  - 621 Test and Evaluation Support (includes 5 prototype test articles)
  - 618 Management Services Support
- Total 12277

<b>B. <u>Other Program Funding Summary</u></b>	<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</u>	<u>Total</u>
Missile Procurement Army								<u>Compl</u>	<u>Cost</u>
C70300 Longbow Hellfire/LBHF	343294	292851	285363	222722	184037	26117	22178	Cont	Cont

**C. Acquisition Strategy:** Development of the Longbow Hellfire HOJ/AJ and CAPS will be done jointly with the prime contractor, Longbow Limited Liability Company (LLC). The U.S. Army Aviation and Missile Command (AMCOM) labs will provide assistance/technical expertise during the development effort.

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<b>D. Schedule Profile</b>	<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 <sup>st</sup> Qtr				
LLLC contract award LBHF PIP			1 <sup>st</sup> Qtr				
Requirements definition LBHF PIP			1 <sup>st</sup> Qtr				
Complete detailed design LBHF PIP				1 <sup>st</sup> Qtr			
Integration and testing LBHF PIP				2 <sup>nd</sup> Qtr			
Missile firings LBHF PIP				4 <sup>th</sup> Qtr			
Engineering Change Proposal LBHF PIP				4 <sup>th</sup> Qtr			

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**ARMY RDT&E COST ANALYSIS (R-3)**

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**BUDGET ACTIVITY**  
**7 - Operational System Development**

**PE NUMBER AND TITLE**  
**0203802A Other Missile Product Improvement Programs**

**PROJECT**  
**D785**

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. LLC	LC/CPFF	TBD						10014	Nov	13705	23719	
b. RDEC Spt Contracts	TBD	TBD						280	Dec	296	576	
Subtotal Product Development:								10294		14001	24295	

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								205	Qtrly	422	627	
b. RDEC Support								539	Qtrly	912	1451	
Subtotal Support Costs:								744		1334	2078	

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								621	Qtrly	1968	2589	
Subtotal Test and Evaluation:								621		1968	2589	

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.

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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
Longbow HF PIP												
a. In-House Support								618	Qtrly	917	1535	
Subtotal Management Services:								618		917	1535	

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

Project Total Cost:								12277		18220	30497	
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