

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

DATE

February 2003

BUDGET ACTIVITY

07 - Operational System Development

PE NUMBER AND TITLE

0101120F ADVANCED CRUISE MISSILE

PROJECT

4798

COST (\$ in Thousands)	FY 2002 Actual	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	Cost to Complete	Total Cost
4798 Life Extension Program	2,302	2,727	13,364	7,760	5,795	6,917	3,006	386	0	45,973
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

In FY 2003, Project 4798 renamed Life Extension Program (formerly Life Extension Study). This action did not change program content.

In FY 2004, Project 4798, Life Extension Program, includes two new start efforts, one of which was funded by Cost of War Defense Emergency Response Funds (DERF).

(U) A. Mission Description

AGM-129, The Advanced Cruise Missile (ACM), is a low-observable air-launched, strategic missile with significant improvements over the Air Launched Cruise Missile B version (ALCM-B) in range, accuracy, and survivability. Armed with a W-80 warhead, it is designed to evade air and ground-based defenses in order to strike heavily defended, hardened targets at any location within any enemy's territory. The ACM is designed for B-52H external carriage and there is currently 404 ACM in the inventory. The ACM fleet design service life expires between the years 2003 and 2008.

A Service Life Extension Plan (SLEP) was developed to meet an AF Long Range Plan requirement to extend ACM Service Life to FY30. The results of Service Life Extension Program (SLEP) studies will identify system components that cannot be sustained beyond the standard service life. The current system is experiencing obsolescence of parts/components. Missile support equipment and components are becoming non-supportable. Service Life Extension of this critical weapon is essential to meet ACC and STRATCOM SIOP commitments.

The current requirement for ACM SLEP is the development of a conforming JTIK door design. The program will develop 2 prototype JTIK doors for qualification and system-level testing.

New test range safety requirements and a Department of Energy (DOE)-mandated Joint Test Assembly (JTA) redesign, required the AF to re-configure existing Joint Test Instrumentation Kit (JTIK) doors and Non-tactical Test Instrumentation Kit (NTIK) doors. Range Commanders Council (RCC) #319 safety mandates require flight test vehicles, used on the test ranges, to possess a Global Positioning System (GPS) tracking capability in FY04 due to the shutting down of existing range radar systems.

Together government and contractor personnel prepared an efficient, economical program schedule, in order to realize potential program economies of scale and to ensure the contractor can manage any increased workload. The JTIK development effort is a low risk program, but an essential effort because DOE-compliant JTIK doors will be required in FY04 in order to continue conducting flight testing for weapon system reliability data collection used for Nuclear Certification and support of

Project 4798

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(U) A. Mission Description Continued

the W-80 Warhead Life Extension Program (LEP).

The ACM Subsystem Simulator (SSS) and Advanced Missile Simulator (AMS) Upgrade will develop, integrate, test and install a real-time simulation system that replaces aging and obsolete equipment. This requirement was identified as part of the ACM SLEP study to upgrade the simulation systems in the AF Avionics Software Integration Facility (ASIF) and the System Integration Lab (SIL). To extend the service life of the ACM to FY30, the real-time computer based simulation systems must be upgraded to resolve aging and obsolescence issues. These systems have many irreplaceable electronic components with high probability of failure. The ability to resolve real-time missile hardware and software anomalies and missile flight test investigations will not be possible without a reliable simulation system provided by this upgrade.

Development of an ACM Aging and Surveillance (A&S) program for the Nuclear Weapons Sub-System (NWSS) components is a Program Management Directive (PMD) requirement. The A&S program is required to analyze critical warhead interface missile components. Fault diagnostics will be accomplished and the data collected from the A&S tests will indicate failure trends and the rate of aging within each component. This effort will develop test equipment, utilizing Commercial Off-the-Shelf (COTS) to the maximum extent possible, and software necessary to lay in a test program for the NWSS components.

Cruise Missile Functional Ground Testing (FGT) is required to provide the capability to non-destructively accomplish functional flight simulation of a full-up missile flight profile on the ground to obtain additional reliability data. This capability will provide critical reliability data without the cost of flight test mission and will also retain the missiles in the inventory. This effort will develop the software and hardware for an existing test facility for accomplishment of the ground tests.

The W-80 LEP replaces warhead components to extend its service life. The National Nuclear Security Administration (NNSA) is responsible for most of the refurbishment costs associated with the W-80 Warhead. The Air force is responsible for funding ACM/W-80 integration. Integration includes evaluation of interface control changes as part of the Initial Concept Design, missile testing and logistics requirements necessary to support a First Production Unit (FPU) delivery of 2008.

(U) FY 2002 (\$ in Thousands)

(U) \$0	JTIK Accomplishments/Planned Program
(U) \$870	Continued Integration and Compatibility Testing of New JTIK Components
(U) \$1,010	Continued JTIK Door/Vehicle Qualification and Integration
(U) \$422	Continued Electromagnetic Compatibility (EMC) Testing of New JTIK Door/Vehicle
(U) \$2,302	Total

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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0101120F ADVANCED CRUISE MISSILE	PROJECT 4798																																												
<p>(U) <u>A. Mission Description Continued</u></p> <p>(U) <u>FY 2003 (\$ in Thousands)</u></p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;">(U) \$0</td> <td>JTIK Accomplishments/Planned Program</td> </tr> <tr> <td>(U) \$913</td> <td>Initiate System Design for Subsystem Simulator (SS) and Advanced Missile Simulator (AMS) Upgrade</td> </tr> <tr> <td>(U) \$930</td> <td>Begin Integration Design for 3rd Party Software to Support PDR of SS and AMS upgrade</td> </tr> <tr> <td>(U) \$884</td> <td>Re-Host Raytheon Developed/Maintained software for SS and AMS</td> </tr> <tr> <td>(U) \$2,727</td> <td>Total</td> </tr> </table> <p>(U) <u>FY 2004 (\$ in Thousands)</u></p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;">(U) \$0</td> <td>Subsystem Simulator and Advanced Missile Simulator Accomplishments/Planned Program</td> </tr> <tr> <td>(U) \$1,360</td> <td>Continue system design efforts for SS and AMS, SS software CDR, Interface design review, detailed component design, component fabrication and test, hardware acquisition,</td> </tr> <tr> <td>(U) \$1,120</td> <td>Conduct SS and AMS software development, system integration and test, validation and verification (V&V)</td> </tr> <tr> <td>(U) \$530</td> <td>SS and AMS Component fabrication and test, hardware integration and test.</td> </tr> <tr> <td>(U) \$0</td> <td>Nuclear Weapons Sub-system (NWSS) Aging & Surveillance Accomplishments/Planned Program</td> </tr> <tr> <td>(U) \$807</td> <td>Conduct Nuclear Weapons Subsystem (NWSS) component aging & surveillance program, initial design, PDR, hardware acquisition, software design & code</td> </tr> <tr> <td>(U) \$687</td> <td>Complete Final Design Review, system integration and test, engineering data</td> </tr> <tr> <td>(U) \$560</td> <td>Conduct acceptance testing, documentation, delivery and installation, demonstration</td> </tr> <tr> <td>(U) \$0</td> <td>Cruise Missile Functional Ground Test (FGT) Accomplishments/Planned Program</td> </tr> <tr> <td>(U) \$1,800</td> <td>Begin Cruise Missile Functional Ground Test (FGT) software design/development</td> </tr> <tr> <td>(U) \$1,800</td> <td>Begin FGT hardware design/development</td> </tr> <tr> <td>(U) \$1,400</td> <td>Begin FGT System/Missile integration and test</td> </tr> <tr> <td>(U) \$0</td> <td>ACM/W-80 Warhead Life Extension Program Support Accomplishments/Planned Program</td> </tr> <tr> <td>(U) \$2,035</td> <td>ACM Interface Change evaluations and contractor Interface Control Document Support for W-80 LEP</td> </tr> <tr> <td>(U) \$125</td> <td>ACM/W-80 Integration Data development</td> </tr> <tr> <td>(U) \$1,140</td> <td>ACM/W-80 Integration Ground Test and Flight Test support</td> </tr> <tr> <td>(U) \$13,364</td> <td>Total</td> </tr> </table> <p>(U) <u>B. Budget Activity Justification</u></p> <p>These programs are in Budget Activity 7, Operational System Development, due to efforts supporting a fielded, post Milestone III weapon system.</p>			(U) \$0	JTIK Accomplishments/Planned Program	(U) \$913	Initiate System Design for Subsystem Simulator (SS) and Advanced Missile Simulator (AMS) Upgrade	(U) \$930	Begin Integration Design for 3rd Party Software to Support PDR of SS and AMS upgrade	(U) \$884	Re-Host Raytheon Developed/Maintained software for SS and AMS	(U) \$2,727	Total	(U) \$0	Subsystem Simulator and Advanced Missile Simulator Accomplishments/Planned Program	(U) \$1,360	Continue system design efforts for SS and AMS, SS software CDR, Interface design review, detailed component design, component fabrication and test, hardware acquisition,	(U) \$1,120	Conduct SS and AMS software development, system integration and test, validation and verification (V&V)	(U) \$530	SS and AMS Component fabrication and test, hardware integration and test.	(U) \$0	Nuclear Weapons Sub-system (NWSS) Aging & Surveillance Accomplishments/Planned Program	(U) \$807	Conduct Nuclear Weapons Subsystem (NWSS) component aging & surveillance program, initial design, PDR, hardware acquisition, software design & code	(U) \$687	Complete Final Design Review, system integration and test, engineering data	(U) \$560	Conduct acceptance testing, documentation, delivery and installation, demonstration	(U) \$0	Cruise Missile Functional Ground Test (FGT) Accomplishments/Planned Program	(U) \$1,800	Begin Cruise Missile Functional Ground Test (FGT) software design/development	(U) \$1,800	Begin FGT hardware design/development	(U) \$1,400	Begin FGT System/Missile integration and test	(U) \$0	ACM/W-80 Warhead Life Extension Program Support Accomplishments/Planned Program	(U) \$2,035	ACM Interface Change evaluations and contractor Interface Control Document Support for W-80 LEP	(U) \$125	ACM/W-80 Integration Data development	(U) \$1,140	ACM/W-80 Integration Ground Test and Flight Test support	(U) \$13,364	Total
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<div style="display: flex; justify-content: space-between;"> Project 4798 Page 3 of 8 Pages Exhibit R-2 (PE 0101120F) </div>																																														

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BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0101120F ADVANCED CRUISE MISSILE			PROJECT 4798				
(U) <u>C. Program Change Summary (\$ in Thousands)</u>											
		<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>Total Cost</u>						
(U)	Previous President's Budget	2,462	2,788	5,310	38,305						
(U)	Appropriated Value	2,462	2,788								
(U)	Adjustments to Appropriated Value										
	a. Congressional/General Reductions		-30		-30						
	b. Small Business Innovative Research	-149			-314						
	c. Omnibus or Other Above Threshold Reprogram		-31		-31						
	d. Below Threshold Reprogram										
	e. Rescissions	-11			-11						
(U)	Adjustments to Budget Years Since FY 2003 PBR			8,054	8,054						
(U)	Current Budget Submit/FY 2004 PBR	2,302	2,727	13,364	45,973						
(U) <u>Significant Program Changes:</u>											
FY04 increase is a result of Cost of War funding to develop Cruise Missile Functional Ground Test (FGT) capability, and to begin ACM interface evaluation and flight test support of W-80 LEP.											
(U) <u>D. Other Program Funding Summary (\$ in Thousands)</u>											
		<u>FY 2002</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>	<u>Cost to</u>	<u>Total Cost</u>
		<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	
(U)	MPAF, Aeronautical Vehicle (BA02, PE 0101120F, P-2)	0	0	0	0	0	0			0	0
(U)	MPAF, Missile Modifications (BA03, PE 0101120F, P-9)	773	3,313	3,498	4,211	3,215	1,274	96	0	0	16,380
(U)	MPAF, Replenishment Spares (BA04, PE 0101120F, P-17)	6,801	9,565	9,379	9,644	8,314	1,951	343	352	Continuing	TBD
(U)	MPAF, Missile Modification Initial Spares (BA04, PE 0101120F, P-16)	0	379	311	309	309	244	252	258	Continuing	TBD
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(U) **E. Acquisition Strategy**

JTIK door development will be performed by the prime contractor, Raytheon, utilizing Cost Plus Fixed Fee (CPFF). Sub-System Simulator and Advanced Missile Simulator Upgrades will be performed by the prime contractor, Raytheon, utilizing a Firm Fixed Price (FFP) contract. Aging & Surveillance (A&S) program development is planned to be by a FFP contract with E-Spectrum Technologies. The Cruise Missile FGT development will be performed by the prime contractor, utilizing a CPFF contract. Contract support for W-80 LEP will be acquired using Time & Materials (T&M) on existing sustainment contract.

(U) **F. Schedule Profile**

	<u>FY 2002</u>				<u>FY 2003</u>				<u>FY 2004</u>			
	1	2	3	4	1	2	3	4	1	2	3	4
(U) FY01 New-Start approval received 11/21/01	*											
(U) JTIK Development												
(U) Contract Award		*										
(U) PDR			*									
(U) CDR				*								
(U) Prototype delivery (2)				*	X							
(U) Integration Testing					X	X						
(U) Qual, Test & Evaluation					X	X	X	X				
(U) Subsystem Simulator/Advanced Missile Sim												
(U) Contract Award						X						
(U) SS Software PDR								X				
(U) SS Software CDR										X		
(U) AMS PDR											X	
(U) AMS CDR (1Q FY05)												
(U) SS Hardware Integration Test (1Q FY05)												
(U) System Integration Testing (2Q FY05)												
(U) FCA/PCA (2Q FY05)												
(U) Deliver & Install (4Q FY05)												
(U) ACM NWSS A&S program development												
(U) Contract Award										X		
(U) PDR										X		
(U) Final Design review												X

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BUDGET ACTIVITY					PE NUMBER AND TITLE					PROJECT		
07 - Operational System Development					0101120F ADVANCED CRUISE MISSILE					4798		
(U) F. Schedule Profile Continued												
					<u>FY 2002</u>		<u>FY 2003</u>		<u>FY 2004</u>			
					1	2	3	4	1	2	3	4
(U) Deliver/Install (2Q FY05)												
(U) Acceptance Test (3Q FY05)												
(U) Functional Ground Test Development												
(U) Contract Award										X		
(U) PDR											X	
(U) CDR												X
(U) FQT (2Q FY05)												
(U) Delivery (3Q FY05)												
(U) ACM/W-80 Life Extension Program (LEP) Integration Support												
(U) Contract Award									X			
(U) Ground Test (Support)										X	X	
(U) Flight Test (Support)											X	
Note: * Represents a Completed Event; X Represents a Planned Event												

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2003			
BUDGET ACTIVITY					PE NUMBER AND TITLE				PROJECT	
07 - Operational System Development					0101120F ADVANCED CRUISE MISSILE				4798	
(U) A. Project Cost Breakdown (\$ in Thousands)										
					FY 2002		FY 2003		FY 2004	
(U) JTIK Integration testing, door/vehicle qualification, EMC testing of new JTIK door/vehicle					2,302					
(U) Perform system design for Sub-System/Advance Missile Simulator SS/AMS Upgrade							913			
(U) Integration design for 3rd party software to support PDR of SS/AMS upgrade							930			
(U) Re-Host Raytheon developed/maintained software for SS/AMS							884			
(U) Continued SS/AMS system design, SS software CDR, interface design review, detailed component design, component fab and test, hardware acquisition									1,360	
(U) Conduct SS/AMS software development, system integration & test, validation & verification (V&V)									1,120	
(U) SS/AMS component fabrication and test, hardware integration and test.									530	
(U) A&S initial design, PDR, hardware acquisition, software design & code									807	
(U) A&S final design review, system integration and test, engineering data									687	
(U) A&S acceptance testing, documentation, delivery & installation, demonstration									560	
(U) Cruise Missile Functional Ground Test (FGT) software design/development									1,800	
(U) FGT hardware design/development									1,800	
(U) FGT System/missile integration and test									1,400	
(U) ACM/W-80 LEP Interface Control Change evaluation and design support									2,035	
(U) ACM/W-80 Integration data development									125	
(U) ACM/W-80 Integration ground test and flight test support									1,140	
(U) Total					2,302		2,727		13,364	
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)										
(U) Performing Organizations:										
Contractor or		Contract								
Government		Method/Type		Award or		Performing		Project		
Performing		or Funding		Obligation		Activity		Office		Total Prior
Activity		Vehicle		Date		EAC		EAC		to FY 2002
								Budget		Budget
								FY 2002		FY 2003
								FY 2004		Budget to
								Complete		Total
										Program
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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 2003		
BUDGET ACTIVITY				PE NUMBER AND TITLE				PROJECT		
07 - Operational System Development				0101120F ADVANCED CRUISE MISSILE				4798		
(U) <u>Performing Organizations Continued:</u>										
<u>Product Development Organizations</u>										
Raytheon (JTIK)	CPFF	Dec 01	6,183	6,183	3,881	2,302	0	0	0	6,183
Raytheon (SS/AMS)	CPFF	2Q FY03	8,532	8,532	0	0	2,727	3,010	2,795	8,532
E Spectrums (A&S)	CPFF	2Q FY04	2,054	2,054	0	0	0	2,054		2,054
Raytheon (FGT)	CPFF	2Q FY04	5,000	5,000	0	0	0	5,000	0	5,000
Raytheon (W80 Sup)	T&M	1Q FY04	7,996	7,996	0	0	0	1,996	6,000	7,996
Raytheon (SLEP)	TBD	2Q FY06	TBD	TBD					6,012	6,012
<u>Support and Management Organizations</u>										
OC-ALC/PSM (W80 Sup)		2Q FY04	1,092	1,092	0	0	0	200	892	1,092
<u>Test and Evaluation Organizations</u>										
49 TES (W80 Sup)	Fund	2Q FY04	9,104	9,104	0	0	0	1,104	8,000	9,104
	cite/MIPR									
(U) <u>Government Furnished Property:</u>										
	<u>Contract</u>									
	<u>Method/Type</u>	<u>Award or</u>								
<u>Item</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Delivery</u>		<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>Description</u>	<u>Vehicle</u>	<u>Date</u>	<u>Date</u>		<u>to FY 2002</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Property</u>										
<u>Support and Management Property</u>										
<u>Test and Evaluation Property</u>										
None										
					<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>Subtotals</u>					<u>to FY 2002</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>Complete</u>	<u>Program</u>
Subtotal Product Development					3,881	2,302	2,727	12,060	14,807	35,777
Subtotal Support and Management					0	0	0	200	892	1,092
Subtotal Test and Evaluation					0	0	0	1,104	8,000	9,104
Total Project					3,881	2,302	2,727	13,364	23,699	45,973
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