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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2013 Air Force **DATE:** February 2012

<b>APPROPRIATION/BUDGET ACTIVITY</b> 3600: <i>Research, Development, Test &amp; Evaluation, Air Force</i> BA 7: <i>Operational Systems Development</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0207163F: <i>Advanced Medium Range Air-to-Air Missile</i>
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COST (\$ in Millions)	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total	FY 2014	FY 2015	FY 2016	FY 2017	Cost To Complete	Total Cost
Total Program Element	60.834	77.830	87.041	-	87.041	88.849	80.901	41.251	35.888	Continuing	Continuing
673777: <i>AMRAAM</i>	60.834	77.830	87.041	-	87.041	88.849	80.901	41.251	35.888	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

**Note**  
 The Cost to Complete and Total Cost for MDAP projects in this program element are documented in the R3. The Cost to Complete and Total Cost on the R2 are entered as "Continuing" and not reflective of the total cost for MDAP projects since the R2 does not account for prior years funding.

**A. Mission Description and Budget Item Justification**

The Air Force and Navy continue to develop improvements to the Advanced Medium Range Air-to-Air Missile (AMRAAM) to counter existing and emerging air vehicle threats, operating at high or low altitude, and having advanced Electronic Attack (EA) capabilities. The AMRAAM Pre-Planned Product Improvement (P3I) program allows Air Force and Navy to continue a joint research and development program. This enables AMRAAM to be compatible with advanced fighters, enhances AMRAAM capability and operational flexibility against current and projected threats, incorporates high payoff technology development, performs risk reduction activities and investigates new variants and/or alternate missions which may use AMRAAM attributes. The AIM-120D (Phase 4) delivers improved performance via Global Positioning System (GPS)-aided navigation, a two-way datalink capability for enhanced aircrew survivability and improved network compatibility, and incorporates new guidance software which improves kinematic and weapon effectiveness performance. Phase 4 Functional Configuration Audit (FCA) was successfully completed in September 2009. In FY2010, a period of combined Developmental Test (DT)/Operational Test (OT) was initiated to ensure overall aircraft and missile weapons system maturity prior to the start of dedicated OT. Dedicated OT will start in FY2012. The program includes integration of the missile onto the F/A-18E/F, F-15C/D/E, F-16, F-22A, and F-18 C/D. To keep the existing inventory as effective as possible, the Air Force and Navy also develop, test, and field improvements that are implemented via software upgrades reprogrammed into fielded weapons, and/or hardware upgrades inserted into production units. AMRAAM is a joint Air Force/Navy, Acquisition Category IC (ACAT IC) program with Air Force as lead service.

This program is in Budget Activity 7-Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

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<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2011</b>	<b>FY 2012</b>	<b>FY 2013 Base</b>	<b>FY 2013 OCO</b>	<b>FY 2013 Total</b>
Previous President's Budget	62.922	77.830	95.078	-	95.078
Current President's Budget	60.834	77.830	87.041	-	87.041
Total Adjustments	-2.088	-	-8.037	-	-8.037
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.767	-			
• Other Adjustments	-0.321	-	-8.037	-	-8.037

**Change Summary Explanation**

FY2011 adjustments Cong General Reductions -\$0.321 and SBIR -\$1.767

<b>C. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2011</b>	<b>FY 2012</b>	<b>FY 2013 Base</b>	<b>FY 2013 OCO</b>	<b>FY 2013 Total</b>
<b>Title:</b> System Improvement Program (SIP)/Software Upgrade Program (SWUP)/Electronic Protection (EP)	34.100	46.357	52.926	-	52.926
<b>Description:</b> Provide software upgrades/system improvement/electronic protection (SWUP/SIP/EP)					
<b>FY 2011 Accomplishments:</b>					
1. AIM-120C SWUP- Effort continued work towards maturing the second Candidate Development Set to Preliminary Design Review (PDR) level of design maturity including alternative guidance algorithm (AGA). Selected mature candidates will be developed under alternate efforts.					
2. EP-Continued EP implementation phase for AIM-120C missiles. Specific tasks included the completion of the software design, completion of the Critical Design Review (CDR) and continued developmental hardware in the loop (HWIL) testing and captive flight testing, and continued Concept Refinement/Risk Reduction (CR/RR) activities further developing EP techniques for future upgrades.					
3. AIM-120D SIP – Continued candidate evaluation and selection and preliminary design activities, including lab and/or captive flight tests to provide data necessary to evaluate performance and feasibility of potential upgrades. Completed CR/RR prototyping and evaluation of selected hardware candidates. Conducted final down-select review including the warfighter and operational testers to define candidates that will be carried forward for future SIP implementation. Continued study of efficient/effective integration of other system					

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**C. Accomplishments/Planned Programs (\$ in Millions)**

improvements, parts obsolescence issues, and cost reduction initiatives. Began resolution of AIM-120D issues identified during DT.

***FY 2012 Plans:***

1. AIM-120C SWUP-Effort will include completion of Set 2 Candidates to a PDR maturity level. Candidates will provide fidelity improvements to C-7 tactical software and simulation model upgrades to enhance the fidelity of missile performance predictions. New target models will also be developed under this effort. Preliminary designs for AGA candidate will be completed in FY12.
2. EP-Complete software development captive flight testing and Formal Qualification Testing (FQT) for both C3-C6 and C7 configurations. Release software for the live fire test program. Continue preparation activities for future EP upgrades, conduct PDR, and begin implementation effort to address advanced threats in AIM-120C7 missiles. In addition, start China Lake HWIL and Missile Room 3 upgrades to support the EP program.
3. AIM-120D SIP-Continue candidate evaluation and preliminary design activities, including lab and/or captive flight tests to provide data necessary to evaluate performance and feasibility of potential upgrades. Complete resolution of AIM-120D issues identified during DT and deliver AIM-120D software to OT. Award contract to implement the SIP 1 increment, conduct PDR and CDR. Software Trouble Reports (STRs)/Deficiency Reports (DRs) from OT and the field will be incorporated where possible in the software developed under this contract. Continue study of efficient/effective integration of other system improvements, parts obsolescence issues, and cost reduction initiatives.

***FY 2013 Base Plans:***

1. AIM-120C SWUP-Effort will include maturing new target models and simulation candidates.
2. EPIP – Complete live fire developmental test program for both C3-C6 and C7 configurations and release software for dedicated operational testing. Hold CDR for EPIP Advanced software tape 1 and continue implementation effort to address advanced threats in AIM-120C7 missiles. Complete China Lake HWIL upgrades.
3. AIM-120D SIP-Continue candidate evaluation and selection and preliminary design activities, including lab and/or captive flight tests to provide data necessary to evaluate performance and feasibility of potential upgrades. Deliver SIP 1 increment software to OT. Continue the implementation phase for the SIP 1 increment and begin the implementation phase of SIP 2 increment. Planned tasks include captive flight test missions, completion of software design, and completion of SIP 2 increment PDR and CDR.

***FY 2013 OCO Plans:***

FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total

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<b>C. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2011</b>	<b>FY 2012</b>	<b>FY 2013 Base</b>	<b>FY 2013 OCO</b>	<b>FY 2013 Total</b>
N/A					
<p><b>Title:</b> Test and Evaluation</p> <p><b>Description:</b> Continue test and evaluation; Provide support to DT/OT.</p> <p><b>FY 2011 Accomplishments:</b> Continued AIM-120D DT/OT testing. Continued infrastructure investments to support AIM-120D OT, SIP, SWUP and EP activities. Completed EP Basic software development captive flight test (FT) program.</p> <p><b>FY 2012 Plans:</b> Start dedicated AIM-120D OT. Accomplish OT Readiness Review (OTRR) and certify the missile ready for dedicated OT. Start dedicated OT captive carry and free FT on F/A-18E/F and F-15C/D, and continue infrastructure investments to support AIM-120D OT, SIP, SWUP and EP activities. Begin EP Basic live fire FT program. This will consist of integrated DT/OT captive missions, pre-flight missions, and missile launches. Begin EP Advanced captive flight test program.</p> <p><b>FY 2013 Base Plans:</b> Complete AIM-120D dedicated OT, to include captive carry and free FT. Field AIM-120D on F/A-18 E/F and F-15 C/D. Complete EP Basic integrated DT/OT live fire FT program. This will consist of both captive missions and missile launches. Begin EP Basic Dedicated OT FT program. This will consist of between two to four live fire launches and multiple captive missions based on flight test launch aircraft availability. Continue EP Advanced captive FT program.</p> <p><b>FY 2013 OCO Plans:</b> N/A</p>	11.495	17.755	10.587	-	10.587
<p><b>Title:</b> Aircraft Integration</p> <p><b>Description:</b> Aircraft Integration - Integrate Phase 4 on multiple aircraft platforms.</p> <p><b>FY 2011 Accomplishments:</b> Aircraft Integration - Continued integration of Phase 4 on multiple aircraft platforms.</p> <p><b>FY 2012 Plans:</b> Aircraft Integration - Continuing integration of Phase 4 on multiple aircraft platforms.</p> <p><b>FY 2013 Base Plans:</b></p>	15.239	13.718	23.528	-	23.528

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<b>C. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2011</b>	<b>FY 2012</b>	<b>FY 2013 Base</b>	<b>FY 2013 OCO</b>	<b>FY 2013 Total</b>
Aircraft Integration - Continuing integration of Phase 4 on multiple aircraft platforms.					
<b><i>FY 2013 OCO Plans:</i></b> N/A					
<b>Accomplishments/Planned Programs Subtotals</b>	60.834	77.830	87.041	-	87.041

<b>D. Other Program Funding Summary (\$ in Millions)</b>											
<u>Line Item</u>	<u>FY 2011</u>	<u>FY 2012</u>	<u>FY 2013 Base</u>	<u>FY 2013 OCO</u>	<u>FY 2013 Total</u>	<u>FY 2014</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• PE 0207163F, AMRAAM, MPAF, BP20: <i>MPAF, BP20</i>	346.430	202.176	229.637	0.000	229.637	340.015	356.796	381.742	380.686	2,800.498	12,404.980
• PE 0207163F, AMRAAM, MPAF, BP25: <i>MPAF, BP25, Replan Spares</i>	0.817	0.804	0.805	0.000	0.805	0.809	0.811	0.842	0.856	6.005	0.000
• PE 0207163F, AMRAAM, MPAF, BP26: <i>MPAF, BP26, Initial Spares</i>	0.071	0.082	0.082	0.000	0.082	0.084	0.085	0.087	0.089	0.667	71.447
• PE 0207163F, AMRAAM, MPAF, BP22: <i>MPAF, BP22, Modifications</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	16.704

**E. Acquisition Strategy**

The AIM-120D completed an FCA in September 2009. The program entered the DT/OT phase of flight test in 2010. Three successful DT/OT shots were conducted but several anomalies were discovered during this period. These anomalies were attributed to software maturity with the missile and aircraft integration. Several of the anomalies have been mitigated. Further improvements are being flight-tested in early FY2012. The program plans to enter dedicated OT in the third quarter of FY2012.

The AIM-120D Missile Performance Specification (MPS) and Interface Control Document (ICD) define the requirement to integrate the Phase 4 AMRAAM onto the F-15, F-16, and F-22A. Integration activities are supported via a series of contractual efforts managed via the host platform programs. For AMRAAM upgrades, contracts were awarded to analyze potential candidates to improve the AIM-120C/D configurations to provide the warfighter the capability to counter current and emerging threats. Candidates that are at the appropriate level of technical maturity will be incorporated via a series of design implementation contracts. Less mature high-payoff candidates will continue to be developed further via concept refinement/risk reduction contracts for incorporation in future development activities.

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**F. Performance Metrics**

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

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<b>Exhibit R-4, RDT&amp;E Schedule Profile:</b> PB 2013 Air Force		<b>DATE:</b> February 2012
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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2013 Air Force		<b>DATE:</b> February 2012
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
EPIP CDR	1	2011	1	2011
AIM-120D SIP Hardware CR/RR award	1	2011	1	2011
Lot 25 (FY11) contract award	4	2011	4	2011
AIM-120D OT	2	2012	4	2013
AIM-120D SIP Post-OT build contract award	2	2013	3	2014
AIM-120D SIP Post-OT build PDR	2	2013	2	2013
FCA for EPIP	2	2013	2	2013