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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Air Force **Date:** February 2016

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207163F / <i>Advanced Medium Range Air-to-Air Missile (AMRAAM)</i>
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COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	379.889	79.767	46.160	62.470	0.000	62.470	61.145	65.228	66.430	67.613	65.000	893.702
673777: <i>AMRAAM</i>	379.889	79.767	46.160	62.470	0.000	62.470	61.145	65.228	66.430	67.613	65.000	893.702
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

Program MDAP/MAIS Code: 185

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 development program also enables AMRAAM compatibility 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 latest AMRAAM variant, the AIM-120D, delivers improved performance via Global Positioning System (GPS)-aided navigation; two-way datalink capability for enhanced aircrew survivability and improved network compatibility; and incorporates new guidance software which improves kinematic performance and weapon effectiveness. Operational Testing (OT) was completed in Jul 14 and the Air Force and Navy authorized operational fielding in Jan 15. The Navy declared Initial Operational Capability (IOC) in Jan 15 and the Air Force declared IOC in Jul 15. The program continues to address aircraft integration efforts to maintain compatibility/ performance of the missile with changes occurring on threshold AMRAAM platforms per Capability Production Document (CPD). 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 AMRAAMs, 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. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	82.195	46.160	55.444	0.000	55.444
Current President's Budget	79.767	46.160	62.470	0.000	62.470
Total Adjustments	-2.428	0.000	7.026	0.000	7.026
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-2.428	0.000			
• Other Adjustments	0.000	0.000	7.026	0.000	7.026

Change Summary Explanation

FY17 - Funding added for AIM-120 Advanced Electronic Protection Improvement Program (EPIP)

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
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Title: System Improvement Program (SIP) / Electronic Protection Improvement Program (EPIP)	39.970	26.173	46.369	0.000	46.369
Description: Provide system improvements/electronic protection improvements					
FY 2015 Accomplishments:					
1. EPIP Basic: Fielded EPIP Basic capability improvements in AIM-120C-7 missiles (Tape 9 Rev 4). Completed Operational Test (OT) activities required to field capability in AIM-120C-3 through C-6 missiles (Tape 7 Rev 29), awaiting final fielding recommendations from AFOTEC.					
2. EPIP Advanced: Continued Advanced EPIP development effort to address advanced threats in AIM-120C-7 missiles. Completed Tape 1 development captive flight testing and Tape 1 Technical Review Board (TRB) milestone required to begin live fire activities. Completed required activities and conducted Tape 2 Critical Design Review (CDR) in Nov 15. Continued Tape 2 captive flight tests.					
3. AIM-120D SIP: Continued SIP-1 design implementation and successfully executed two Integrated Test shots to demonstrate AIM-120D software improvements prior to Functional Configuration Audit (FCA) and dedicated Operational Test (OT). Completed the SIP-2 risk reduction phase with a successful Preliminary Design Review (PDR) and awarded the SIP-2 Engineering and Manufacturing Development (EMD) contract, transitioning					

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C. Accomplishments/Planned Programs (\$ in Millions)						
to integrated software design implementation. Solicited and awarded the SIP-3 Technology Maturation and Risk Reduction (TMRR) effort as well as the Solution Analysis/Candidate Selection Process which will analyze software implementation candidates to keep pace with evolving threats.						
FY 2016 Plans:						
1. EPIP Basic: Field EPIP Basic capability improvements in AIM-120C-3 through C-6 missiles (Tape 7 Rev 29).						
2. EPIP Advanced: Complete Tape 1 development effort to address advanced threats in AIM-120C-7 missiles. Begin Tape 1 dedicated OT program. Conducted Tape 2 CDR and continue development captive flight testing.						
3. AIM-120D SIP: Complete SIP-1 OT and deploy the first AIM-120D improvement software increment to the Air Force and Navy AMRAAM inventory. Continue SIP-2 EMD and conduct a Critical Design Review (CDR). Continue SIP-3 TMRR, as well as the AIM-120D Candidate Selection and Mission Requirements Analysis processes. Solicit the SIP-3 EMD contract proposal.						
FY 2017 Base Plans:						
1. EPIP Advanced: Complete Tape 1 dedicated OT program and field Tape 1 EPIP Advanced capability improvements in AIM-120C-7 missiles (Tape 9 Rev 5). Complete Tape 2 live fire program and development effort. Begin Tape 2 dedicated OT program.						
2. AIM-120D SIP: Continue SIP-2 EMD, complete Integrated Test missions to show improved AMRAAM capabilities against electronic attack techniques, and conduct FCA prior to dedicated OT. Continue SIP-3 TMRR to PDR and award the follow-on SIP-3 EMD contract. Continue the AIM-120D Candidate Selection and Mission Requirements Analysis processes.						
FY 2017 OCO Plans:						
N/A						
Title: Test and Evaluation		11.498	11.049	12.001	0.000	12.001
Description: Test and evaluation; Provides support to DT/OT						
FY 2015 Accomplishments:						
Supplied necessary test equipment and field team support for completion of AIM-120D SIP 1 OT and AIM-120C-3 through 6 EPIP Basic OT. Accomplished SIP-1 OT Readiness Review (OTRR), certified the missile ready for dedicated OT, and conducted captive carry and free flight on F/A-18E/F and F-15C/D. Continued						

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C. Accomplishments/Planned Programs (\$ in Millions)										
<p>infrastructure investments to support AIM-120D OT, SIP, and EPIP activities. Continued support and Test Resources for Advanced EPIP Tape 1 DT captive flight test and IT live fire shots; Advanced EPIP Tape 2 development and DT captive flight test programs; and SIP 1 and 2 captive, DT, and IT shots.</p> <p>FY 2016 Plans: Continue infrastructure investments to support AIM-120D OT, SIP, and EPIP activities. Develop new equipment necessary to meet SIP 2 and future requirements. Provide support personnel and test resources to complete Advanced EPIP Tape 1 final IT live-fire shots and dedicated OT live-fire shots. Continue to provide support personnel and resources to complete Advanced EPIP Tape 2 development efforts and captive flight test, AIM-120D SIP 1 OT, and begin SIP 2 DT/captive flight testing during EMD.</p> <p>FY 2017 Base Plans: Continue infrastructure investments to support AIM-120D OT, SIP, and EPIP activities. Develop new equipment necessary to meet SIP 3 and future requirements. Provide support personnel and test resources to complete Advanced EPIP Tape 1 OT reporting and field software. Provide support personnel and test resources to complete Advanced EPIP Tape 2 IT live-fire and dedicated OT live-fire shots. Continue to provide support personnel and test resources to complete AIM-120D SIP 2 DT/captive program and prepare for a SIP 2 OTRR at the end of FY17.</p> <p>FY 2017 OCO Plans: N/A</p>						FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
<p>Title: Aircraft Integration</p> <p>Description: Aircraft Integration - Integrate AIM-120D on multiple aircraft platforms</p> <p>FY 2015 Accomplishments: Continued integration and testing of AIM-120D on multiple threshold aircraft platforms.</p> <p>FY 2016 Plans: Continue integration and testing of AIM-120D on multiple threshold aircraft platforms.</p> <p>FY 2017 Base Plans: Continue integration and testing of AIM-120D on multiple threshold aircraft platforms.</p> <p>FY 2017 OCO Plans:</p>						28.299	8.938	4.100	0.000	4.100

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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
N/A					
Accomplishments/Planned Programs Subtotals	79.767	46.160	62.470	0.000	62.470

D. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017 Base</u>	<u>FY 2017 OCO</u>	<u>FY 2017 Total</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• MPAF: BA02: Line Item # MAMRA0: <i>Missile Procurement, Air Force</i>	329.600	380.028	350.144	0.000	350.144	445.548	470.016	472.962	468.452	1,709.435	13,008.830
• MPAF: BA04: Line Item # 00099K: <i>Initial Spares/Repair Parts</i>	2.062	1.996	2.072	0.000	2.072	2.063	2.041	2.076	2.113	6.596	101.719
• WPN: BA02: Line Item # 2206: <i>Weapons Procurement, Navy</i>	2.165	204.189	205.790	0.000	205.790	263.064	274.694	270.482	275.703	953.767	4,582.229
• RDTE: BA07: Line Item # 0981: <i>RDTE, Navy</i>	9.820	32.172	40.350	0.000	40.350	46.349	32.347	32.729	33.394	106.089	455.844

Remarks

E. Acquisition Strategy
 The EPIP program is underway to keep AIM-120C missiles capable against the growing electronic attack threat environment. EPIP Basic development completed in Jun 14. Capability improvement continues with the EPIP Advanced effort. This effort was awarded in Jun 12 as a CPFF with performance awards. This development effort is planned for completion in Apr 17.

Post OT System Improvements Program (SIP) is underway as part of the AIM-120D missile upgrade program. SIP Increment 1 (SIP-1) awarded in 2009 as a CPFF effort aims to improve baseline AIM-120D capabilities. SIP-2 EMD, which incorporates basic EPIP in the AIM-120D, was awarded in Jul 15. This CPFF effort was awarded for 19 months. SIP-3 TMRR was awarded in Sep 15 as a 19-month CPFF effort with SIP-3 EMD award planned for FY 17. SIP-3 primarily incorporates AEPIP capabilities in the AIM-120D.

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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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Air Force **Date:** February 2016

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207163F / <i>Advanced Medium Range Air-to-Air Missile (AMRAAM)</i>	Project (Number/Name) 673777 / AMRAAM
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Product Development (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
System Improvement Program (SIP)/Electronic Protection (EP)	SS/CPFF	Raytheon : Tucson, AZ	156.615	38.698	Mar 2015	24.828	Mar 2016	44.944	Mar 2017	0.000		44.944	201.455	466.540	467.068
F-22 Aircraft Integration	MIPR	Wright-Patterson AFB : Dayton, OH	85.464	23.800	Jan 2015	5.820	Jan 2016	0.000		0.000		0.000	0.000	115.084	115.084
RMS Aircraft Integration	SS/CPFF	Raytheon : Tucson, AZ	2.163	4.499	Jan 2015	3.118	Jan 2016	4.100	Jan 2017	0.000		4.100	35.504	49.384	49.384
Subtotal			244.242	66.997		33.766		49.044		0.000		49.044	236.959	631.008	631.536

Remarks
SIP/EP Cost Plus Fixed Fee (CPFF) software development design implementation contracts include incentive events which must be achieved in order to earn full fixed fee amount.

Support (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	-

Test and Evaluation (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Government Test	Various	Various : Various	59.410	3.586	Jan 2015	4.746	Jan 2016	4.479	Jan 2017	0.000		4.479	33.679	105.900	105.900
RMS Test	SS/CPFF	Raytheon : Various, AZ	64.868	7.912	Jan 2015	6.303	Jan 2016	7.522	Jan 2017	0.000		7.522	44.414	131.019	131.019
Subtotal			124.278	11.498		11.049		12.001		0.000		12.001	78.093	236.919	236.919

Remarks
Various = T&E activities take place at numerous locations across the US. Too many activities and locations to list.

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Exhibit R-4, RDT&E Schedule Profile: PB 2017 Air Force		Date: February 2016
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207163F / <i>Advanced Medium Range Air-to-Air Missile (AMRAAM)</i>	Project (Number/Name) 673777 / AMRAAM

	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Lot 28 (FY14 funds) contract award	■																											
Lot 29 (FY15 funds) contract award		■																										
AIM-120D SIP-1 OT					■	■	■	■																				
AIM-120D SIP-1 IOC									■	■	■	■																
AIM-120D SIP-2 CDR									■	■	■	■																
AIM-120D SIP-2 EMD													■	■	■	■												
AIM-120D SIP-2 IOC																	■	■	■	■								
AIM-120D SIP-3 TMRR																												
AIM-120D SIP-3 CDR													■	■	■	■												
AIM-120D SIP-3 IOC																									■	■	■	■
AIM-120D SIP-4 CDR																												
AIM-120D F-22 IOC													■	■	■	■												
EPIP Adv Tape 1 FCA									■	■	■	■																
EPIP Adv Tape 2 CDR																	■	■	■	■								
EPIP Adv Tape 2 FCA													■	■	■	■												
Form, Fit, Function (F3R) FCA																									■	■	■	■
F3R IOC																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Air Force		Date: February 2016
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207163F / <i>Advanced Medium Range Air-to-Air Missile (AMRAAM)</i>	Project (Number/Name) 673777 / AMRAAM

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Lot 28 (FY14 funds) contract award	1	2015	1	2015
Lot 29 (FY15 funds) contract award	2	2015	2	2015
AIM-120D SIP-1 OT	1	2016	2	2016
AIM-120D SIP-1 IOC	4	2016	4	2016
AIM-120D SIP-2 CDR	3	2016	3	2016
AIM-120D SIP-2 EMD	4	2015	4	2018
AIM-120D SIP-2 IOC	2	2019	2	2019
AIM-120D SIP-3 TMRR	4	2015	3	2017
AIM-120D SIP-3 CDR	3	2018	3	2018
AIM-120D SIP-3 IOC	2	2021	2	2021
AIM-120D SIP-4 CDR	3	2020	3	2020
AIM-120D F-22 IOC	2	2018	2	2018
EPIP Adv Tape 1 FCA	2	2016	2	2016
EPIP Adv Tape 2 CDR	1	2016	1	2016
EPIP Adv Tape 2 FCA	3	2017	3	2017
Form, Fit, Function (F3R) FCA	1	2020	1	2020
F3R IOC	2	2021	2	2021

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