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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force									Date: May 2017			
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0207163F I Advanced Medium Range Air-to-Air Missile (AMRAAM)							
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	459.428	44.335	62.470	61.322	0.000	61.322	65.254	66.461	67.620	69.004	43.600	939.494
673777: AMRAAM	459.428	44.335	62.470	61.322	0.000	61.322	65.254	66.461	67.620	69.004	43.600	939.494
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
Program MDAP/MAIS Code: 185												
A. Mission Description and Budget Item Justification												
<p>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 July 2014 and the Air Force and Navy authorized operational fielding in January 2015. The Navy declared Initial Operational Capability (IOC) in January 2015 and the Air Force declared IOC in July 2015. The program continues to address aircraft integration efforts to maintain compatibility/performance of the missile with changes occurring on threshold AMRAAM platforms per the 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.</p>												
<p>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.</p>												

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B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	
Previous President's Budget	46.160	62.470	61.145	0.000	61.145	
Current President's Budget	44.335	62.470	61.322	0.000	61.322	
Total Adjustments	-1.825	0.000	0.177	0.000	0.177	
• 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	-0.119	0.000				
• SBIR/STTR Transfer	-1.706	0.000				
• Other Adjustments	0.000	0.000	0.177	0.000	0.177	
Change Summary Explanation						
No Significant Changes						
C. Accomplishments/Planned Programs (\$ in Millions)				FY 2016	FY 2017	FY 2018
Title: System Improvement Program (SIP) / Electronic Protection Improvement Program (EPIP)				26.341	41.298	37.853
Description: Provide system improvements/electronic protection improvements						
FY 2016 Accomplishments:						
1. EPIP Advanced: Completed Tape 1 development effort to address advanced threats in AIM-120C-7 missiles. Tape 1 Functional Configuration Audit (FCA) completed on 12 July 2016 and started Tape 1 dedicated OT program. Completed Tape 2 Critical Design Review (CDR) in November 2015; conducted subsequent development captive flight test.						
2. AIM-120D SIP: Completed SIP-1 OT to support FY 17 deployment of the first AIM-120D improvement software increment to the Air Force and Navy AMRAAM inventory. Continued SIP-2 Engineering and Manufacturing Development (EMD) and completed Critical Design Review (CDR) on 13 July 2016. Continued SIP-3 Technology Maturation and Risk Reduction (TMRR) with a successful System Requirement Review (SRR), as well as the AIM-120D SIP Candidate Selection Process. Released a SIP-3 EMD request for proposal to implement advanced threat countermeasures into the AIM-120D inventory.						
FY 2017 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. Conduct FCA and begin Tape 2 dedicated OT program.						

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<b>Appropriation/Budget Activity</b> 3600: <i>Research, Development, Test &amp; Evaluation, Air Force I BA 7: Operational Systems Development</i>		<b>R-1 Program Element (Number/Name)</b> PE 0207163F <i>I Advanced Medium Range Air-to-Air Missile (AMRAAM)</i>		
<b>C. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
2. AIM-120D SIP: Field SIP-1 software to Air Force and Navy units. Continue SIP-2 EMD, to include three Integrated Test (IT) missions to show improved AMRAAM capabilities against electronic attack techniques. Continue SIP-3 TMRR to System Functional Review (SFR) and PDR, and award the follow-on SIP-3 EMD contract. Solicit and award the SIP-4 TMRR effort to mature AIM-120D capabilities, optimizing F3R missile configuration hardware. Continue the AIM-120D SIP Candidate Selection Process to analyze solutions of the warfighters' priority deficiencies and enhancements.  <b>FY 2018 Plans:</b> 1. EPIP Advanced: Finish Tape 2 dedicated OT efforts.  2. AIM-120D SIP: Conduct SIP-2 FCA and Operational Test Readiness Review (OTRR) to approve the start of dedicated SIP-2 OT. Continue SIP-3 EMD to CDR. Continue SIP-4 TMRR to SRR and SFR. Continue the AIM-120D SIP Candidate Selection Process to analyze solutions of the warfighters' priority deficiencies and enhancements.				
<b>Title:</b> Test and Evaluation  <b>Description:</b> Test and evaluation; Provides support to Developmental Testing/Operational Testing (DT/OT); Develop test resources equipment necessary to complete DT/OT events; Provide field team support personnel and services  <b>FY 2016 Accomplishments:</b> Continued infrastructure investments to support AIM-120D DT, OT, SIP, and EPIP activities. Developed test assets necessary to meet SIP 2 and beyond requirements. Provide support personnel and test resources to complete Advanced EPIP Tape 1 final IT live-fire shots and with follow on 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. Provided equipment and support for various aircraft integration captive test and live-fire shots.  <b>FY 2017 Plans:</b> Continue infrastructure investments to support AIM-120D DT, OT, SIP, and AEPIP activities. Develop new test assets necessary to meet SIP-3 and beyond requirements. Provide support personnel and test resources to complete Advanced EPIP Tape 1 OT reporting, and the software fields. Provide support personnel and test resources to complete Advanced EPIP Tape 2 IT live-fire shots and then the dedicated OT live-fire shots. Continues to provide support personnel and test resources to complete AIM-120D SIP-2 DT/captive program and prepares for a SIP-2 OTRR at the end of FY17. Continue to provide equipment and support for various aircraft integration captive test and live-fire shots.  <b>FY 2018 Plans:</b> Continue infrastructure investments to support AIM-120D DT, OT, SIP, and AEPIP activities. Develop new test assets necessary to meet SIP-3 and beyond requirements. Provide support personnel and test resources to complete Advanced EPIP and support a fielding recommendation. Continues to provide support personnel and test resources to complete AIM-120D SIP-3 DT and OT		12.174	17.814	18.969

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C. Accomplishments/Planned Programs (\$ in Millions)										FY 2016	FY 2017	FY 2018
events and prepares for a SIP-3 OTRR. Continue to provide equipment and support for various aircraft integration captive test and live-fire shots.												
Title: Aircraft Integration										5.820	3.358	4.500
Description: Aircraft Integration - Integrate AIM-120D on multiple aircraft platforms												
FY 2016 Accomplishments: Continued integration and testing of AIM-120D on multiple threshold aircraft platforms.												
FY 2017 Plans: Continue integration and testing of AIM-120D on multiple threshold aircraft platforms.												
FY 2018 Plans: Continue integration and testing of AIM-120D on multiple threshold aircraft platforms.												
Accomplishments/Planned Programs Subtotals										44.335	62.470	61.322
D. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost	
• MPAF: BA02: Line Item # MAMRA0: Missile Procurement, Air Force	362.028	342.144	304.327	0.000	304.327	470.016	430.962	468.452	444.471	1,444.425	12,966.907	
• MPAF: BA04: Line Item # 000999: Initial Spares/Repair Parts	1.996	2.072	2.067	0.000	2.067	2.041	2.076	2.113	2.155	6.715	102.212	
• MPAF: BA04: Line Item # 000999 R...: Replen Spares/Repair Parts	0.810	0.817	0.834	0.000	0.834	0.847	0.861	0.877	0.895	2.788	9.528	
• WPN: BA02: Line Item # 2206: Weapons Procurement, Navy	202.773	204.697	197.109	0.000	197.109	284.679	288.445	299.484	302.831	644.555	4,565.796	
• RDTE: BA07: Line Item # 0981: RDTE, Navy	31.215	40.350	25.360	0.000	25.360	32.358	32.738	33.405	24.069	49.447	396.980	
Remarks												
E. Acquisition Strategy												
The EPIP Advanced program is underway to keep AIM-120C missiles capable against the growing electronic attack threat environment. This effort was awarded in June 2012 as a CPFF with performance awards. This development effort is planned for completion in July 2017.												

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Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 0207163F I Advanced Medium Range Air-to-Air Missile (AMRAAM)	
<p>Post-OT System Improvement 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 AIM120D, was awarded in July 2015. This CPIF effort was awarded for 19 months. SIP-3 TMRR was awarded in September 2015 as a 19-month CPFF effort with SIP-3 EMD award planned for FY 17. SIP-3 primarily incorporates AEPIP software capabilities in the AIM-120D.</p> <p><b>F. Performance Metrics</b></p> <p>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.</p>		

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<b>Exhibit R-3, RDT&amp;E Project Cost Analysis: FY 2018 Air Force</b>												<b>Date: May 2017</b>			
<b>Appropriation/Budget Activity</b> 3600 / 7						<b>R-1 Program Element (Number/Name)</b> PE 0207163F / Advanced Medium Range Air-to-Air Missile (AMRAAM)						<b>Project (Number/Name)</b> 673777 / AMRAAM			
<b>Product Development (\$ in Millions)</b>				<b>FY 2016</b>		<b>FY 2017</b>		<b>FY 2018 Base</b>		<b>FY 2018 OCO</b>		<b>FY 2018 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
System Improvement Program (SIP)/Electronic Protection (EP)	SS/CPFF	Raytheon : Tucson, AZ	194.534	25.338	Mar 2016	39.873	Jun 2017	36.382	Jun 2018	0.000		36.382	182.658	478.785	478.785
F-22 Aircraft Integration	MIPR	Wright-Patterson AFB : Dayton, OH	109.070	5.820	Jan 2016	0.000		0.000		0.000		0.000	0.000	114.890	114.890
RMS Aircraft Integration	SS/CPFF	Raytheon : Tucson, AZ	6.662	0.000	Jan 2016	3.358	May 2017	4.500	May 2018	0.000		4.500	30.900	45.420	45.420
<b>Subtotal</b>			310.266	31.158		43.231		40.882		0.000		40.882	213.558	639.095	639.095
<b>Remarks</b> 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.															
<b>Support (\$ in Millions)</b>				<b>FY 2016</b>		<b>FY 2017</b>		<b>FY 2018 Base</b>		<b>FY 2018 OCO</b>		<b>FY 2018 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Subtotal</b>			-	-		-		-		-		-	-	-	-
<b>Test and Evaluation (\$ in Millions)</b>				<b>FY 2016</b>		<b>FY 2017</b>		<b>FY 2018 Base</b>		<b>FY 2018 OCO</b>		<b>FY 2018 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
Government Test	Various	Various : Various	62.527	2.844	Jan 2016	6.273	Jan 2017	5.579	Jan 2018	0.000		5.579	33.093	110.316	110.316
RMS Test	SS/CPFF	Raytheon : Various, AZ	74.193	9.330	Jan 2016	11.541	Jan 2017	13.390	Jan 2018	0.000		13.390	56.280	164.734	164.734
<b>Subtotal</b>			136.720	12.174		17.814		18.969		0.000		18.969	89.373	275.050	275.050
<b>Remarks</b> Various = T&E activities take place at numerous locations across the US. Too many activities and locations to list.															

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<b>Exhibit R-3, RDT&amp;E Project Cost Analysis: FY 2018 Air Force</b>												<b>Date:</b> May 2017			
<b>Appropriation/Budget Activity</b> 3600 / 7						<b>R-1 Program Element (Number/Name)</b> PE 0207163F / <i>Advanced Medium Range Air-to-Air Missile (AMRAAM)</i>				<b>Project (Number/Name)</b> 673777 / AMRAAM					

  

<b>Management Services (\$ in Millions)</b>				<b>FY 2016</b>		<b>FY 2017</b>		<b>FY 2018 Base</b>		<b>FY 2018 OCO</b>		<b>FY 2018 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
Program Management Administration	Various	Various : Various	12.442	1.003	Jan 2016	1.425	Jan 2017	1.471	Jan 2018	0.000		1.471	9.008	25.349	25.349
<b>Subtotal</b>			12.442	1.003		1.425		1.471		0.000		1.471	9.008	25.349	25.349

  

	<b>Prior Years</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Project Cost Totals</b>	459.428	44.335	62.470	61.322	0.000	61.322	311.939	939.494	-

  

**Remarks**

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<b>Exhibit R-4, RDT&amp;E Schedule Profile: FY 2018 Air Force</b>			<b>Date: May 2017</b>		
<b>Appropriation/Budget Activity</b> 3600 / 7		<b>R-1 Program Element (Number/Name)</b> PE 0207163F / <i>Advanced Medium Range Air-to-Air Missile (AMRAAM)</i>			<b>Project (Number/Name)</b> 673777 / AMRAAM

	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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
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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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> FY 2018 Air Force			<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 3600 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0207163F / <i>Advanced Medium Range Air-to-Air Missile (AMRAAM)</i>	<b>Project (Number/Name)</b> 673777 / AMRAAM	

## Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
AIM-120D SIP-1 OT	1	2016	4	2016
AIM-120D SIP-1 IOC	4	2016	3	2017
AIM-120D SIP-2 CDR	4	2016	4	2016
AIM-120D SIP-2 EMD	1	2016	4	2018
AIM-120D SIP-2 IOC	2	2019	2	2019
AIM-120D SIP-3 TMRR	1	2016	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	4	2016	4	2016
EPIP Adv Tape 2 CDR	1	2016	1	2016
EPIP Adv Tape 2 FCA	4	2017	4	2017
Form, Fit, Function (F3R) FCA	2	2021	2	2021
F3R IOC	2	2022	2	2022

### Note

The EPIP Advanced program is underway to keep AIM-120C missiles capable against the growing electronic attack threat environment. This effort was awarded in June 2012 as a CPFF with performance awards. This development effort is planned for completion in July 2017.

Post-OT System Improvement 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 AIM120D, was awarded in July 2015. This CPIF effort was awarded for 19 months. SIP-3 TMRR was awarded in September 2015 as a 19-month CPFF effort with SIP-3 EMD award planned for FY 17. SIP-3 primarily incorporates AEPIP software capabilities in the AIM-120D.