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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Air Force **Date:** February 2020

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 0207161F / <i>Tactical AIM Missiles</i>
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COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	194.623	29.042	10.314	19.417	0.000	19.417	26.760	21.187	14.254	14.515	55.471	385.583
674132: <i>AIM-9 Product Improvement</i>	194.623	29.042	10.314	19.417	0.000	19.417	26.760	21.187	14.254	14.515	55.471	385.583
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

Program MDAP/MAIS Code: 442

Note

Funding in FY11 and beyond is for the Block II program only. The AIM-9X Block I program costs for FY11 and prior are \$233.583M.

A. Mission Description and Budget Item Justification

The AIM-9X Block II/II+ Sidewinder (AIM-9X Blk II/II+) continues the evolution of the AIM-9 series of missiles. This missile program delivers a launch and leave, air combat munition that uses passive Infrared (IR) energy to acquire and track enemy air targets and complements the radar guided Advanced Medium Range Air-to-Air Missile (AMRAAM). The missile provides first shot, first kill opportunities while conducting basic fighter maneuvering (dogfighting) Within Visual Range (WVR) which is essential for aircrew survival. The AIM-9X provides these opportunities with unmatched offensive and defensive capabilities against threats WVR, even when IR countermeasures are employed. The AIM-9X also provides air superiority in the Beyond Visual Range (BVR) air-to-air battle. Anti-tamper features have been incorporated to protect improvements inherent in this design. The AIM-9X Block II missile is critical for projecting power and winning decisively against threats identified in Defense Planning Guidance and the Air Force Strategic Master Plan.

AIM-9X is a Post Milestone C, Acquisition Category IC (ACAT-IC) joint service program led by the Department of the Navy. The Block II program has completed independent operational testing and found to be operationally effective and operational/suitable. The program achieved Air Force Initial Operational Capability (IOC) in September 2016 and received Full Rate Production decision in August 2015. The first Full Rate Production Lot contract was awarded in September 2015. This budget line will continue technical refresh of critical obsolete components, implement cost reduction initiatives, improve insensitive munitions performance, correct deficiencies, and increase capabilities through software enhancements, and conduct testing to ensure platform integration onto threshold US Air Force aircraft.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver AIM-9X weapon system capabilities. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605831F.

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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	37.230	10.314	19.452	0.000	19.452
Current President's Budget	29.042	10.314	19.417	0.000	19.417
Total Adjustments	-8.188	0.000	-0.035	0.000	-0.035
• 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	-7.261	0.000			
• SBIR/STTR Transfer	-0.927	0.000			
• Other Adjustments	0.000	0.000	-0.035	0.000	-0.035

Change Summary Explanation

FY 2019 reduction of \$7.261M for higher Air Force priorities

FY 2019 reduction of \$0.927M for SBIR

FY 2021 reduction of \$0.035M for inflation adjustment

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
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Title: AIM- 9X Product Development

27.147	9.049	17.699
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Description: Continuation of Primary Hardware Development/Pre-Planned Product Improvement (Tech Refresh) efforts for the AIM-9X weapon system. This includes Systems Engineering / Program management, as well as support required to ensure AIM-9X missile integration with threshold US Air Force aircraft platforms. This also includes efforts to redesign missile components in order to resolve obsolescence to ensure missile producibility and increase reliability. Improve anti-tamper and cyber security technology improvements, implement cost reduction initiatives, and comply with the Insensitive Munitions (IM) requirements. In addition, the program will evaluate and begin risk reduction efforts that will address hardware and software improvements to facilitate follow-on capability and mitigate obsolescence.

FY 2020 Plans:

Continue Engineering Manufacturing Development required to redesign, integrate, test and qualify components due to obsolescence and implement cost reduction initiatives to include System Improvement Program (SIP) III Inertial Measurement Unit and processor hardware Critical Design Review (CDR). Continue to support v9.4 Block II software improvements to pace the threat and fully utilize the capabilities of the missile. Continue anti-tamper and cyber security technology improvements. Continue

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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
to develop missile hardware design improvements necessary to enhance IM performance. Evaluate and begin risk reduction efforts that will address hardware and software improvements to facilitate follow-on capability and mitigate obsolescence. FY 2021 Plans: Continue Engineering Manufacturing Development required to redesign, integrate, test and qualify components due to obsolescence and implement cost reduction initiatives to include execution of SIP III Inertial Measurement Unit and processor hardware. In addition, continue development of the version 10.4 software, as well continue to support v9.4 Block II software testing. Continue anti-tamper and cyber security technology improvements. Continue to develop missile hardware design improvements necessary to enhance IM performance. Continue evaluation and risk reduction efforts to address hardware and software improvements to facilitate follow-on capability and obsolescence mitigation. FY 2020 to FY 2021 Increase/Decrease Statement: Funding increased due to FY20 funding reductions to account for the availability of prior year execution balances.			
Title: AIM-9X, Test and Evaluation Description: Test and Evaluation (T&E) and associated governmental support required to ensure the AIM-9X missile integration with US Air Force aircraft platforms. Developmental and Operational testing of Operation Flight Software. FY 2020 Plans: Complete Developmental integration and Testing DT/IT-D1 of Operational Flight Software v9.4 including improvements associated with additional integrating on Air Force aircraft. FY 2021 Plans: Complete Operational Testing (OT-D1) of Operational Flight Software v9.4 and field v9.4 Block II software. Flight test Operational Flight Software v10.4. FY 2020 to FY 2021 Increase/Decrease Statement: Funding increased due to FY20 funding reductions to account for the availability of prior year execution balances.	1.895	1.265	1.718
Accomplishments/Planned Programs Subtotals	29.042	10.314	19.417

D. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2021</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To</u>	<u>Total Cost</u>
			<u>Base</u>	<u>OCO</u>	<u>Total</u>					<u>Complete</u>	
• MPAF 02 Line Item M09HAI: <i>Sidewinder (AIM-9X)</i>	118.253	155.289	164.769	-	164.769	117.514	121.816	120.381	122.537	1,368.894	2,289.453

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D. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u> <u>Base</u>	<u>FY 2021</u> <u>OCO</u>	<u>FY 2021</u> <u>Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• MPAF 04 Line Item 000999: <i>Replen Spares, USAF</i>	2.713	5.818	5.906	-	5.906	6.026	6.133	6.243	6.354	0.000	39.193
• MPAF 04 Line Item 000999 <i>(2)...: Initial Spares, USAF</i>	1.800	0.234	1.861	-	1.861	2.699	2.732	1.968	2.004	51.185	64.483
• RDTE 07 PE 0207161N: <i>Tactical AIM Missile</i>	36.444	19.488	5.859	-	5.859	6.015	3.948	1.637	0.445	0.000	73.836
• WPN Line Item 2209: <i>Sidewinder</i>	121.481	149.239	126.485	-	126.485	110.636	97.194	124.508	126.523	1,323.166	2,179.232

Remarks

E. Acquisition Strategy

Milestone C decision for Low Rate Initial Production (LRIP) was held June 24, 2011. The program received USN Initial Operational Capability (IOC) in March 2015 and Full Rate Production (FRP) Approval in August 2015 followed by contract award for FRP-1 in September 2015. The Air Force achieved IOC in September 2016. The program awarded the FRP-3 contract in March 2017, awarded FRP-4 in December 2018, and awarded FRP-5 in April 2019. The program plans to award FRP-6 in February 2020. In February 2019, the Acquisition Program Baseline for the Navy and USAF was revised to increase total missile procurements and extend missile procurements through 2035.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Air Force **Date:** February 2020

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207161F / <i>Tactical AIM Missiles</i>	Project (Number/Name) 674132 / <i>AIM-9 Product Improvement</i>
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Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
Software/OFP Upgrade/Hdw Development	SS/CPFF	RMS : Tucson, AZ	141.584	24.271	Jun 2019	4.305	May 2020	13.694	Oct 2020	-		13.694	99.568	283.422	312.877
Flight Termination System	MIPR	NAWC WD : China Lake, CA	2.699	0.360	Dec 2019	2.195	Feb 2020	2.000	Feb 2021	-		2.000	7.488	14.742	-
Munitions Improvement Study (USG)	MIPR	NAWC WD : China Lake, CA	11.943	0.500	Apr 2019	0.500	Apr 2020	0.500	Apr 2021	-		0.500	3.401	16.844	-
Systems Engineering (USG)	MIPR	NAWC WD : China Lake, CA	3.625	0.494	May 2019	1.050	Feb 2020	0.500	Feb 2021	-		0.500	3.205	8.874	-
Aircraft Integration	SS/CPFF	Boeing : St. Louis, MO	0.762	0.126	Apr 2019	0.125	May 2020	0.125	May 2021	-		0.125	0.850	1.988	2.112
Subtotal			160.613	25.751		8.175		16.819		-		16.819	114.512	325.870	N/A

Test and Evaluation (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
DT&E/OT&E	PO	Eglin AFB : Eglin, FL	26.224	1.537	May 2019	1.089	Jan 2020	1.542	Jan 2021	-		1.542	10.491	40.883	-
IT/OT Support F-15	SS/CPAF	RMS : Tuscon, AZ	0.155	0.358	Mar 2019	0.176	May 2020	0.176	May 2021	-		0.176	1.197	2.062	0.994
Subtotal			26.379	1.895		1.265		1.718		-		1.718	11.688	42.945	N/A

Management Services (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
PMA	Various	Eglin AFB : Eglin, FL	7.631	1.396	Jan 2019	0.874	Jan 2020	0.880	Jan 2021	-		0.880	5.987	16.768	8.904
Subtotal			7.631	1.396		0.874		0.880		-		0.880	5.987	16.768	N/A

			Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			194.623	29.042	10.314	19.417	-	19.417	132.187	385.583	N/A

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	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
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<u>Remarks</u>									
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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Air Force **Date:** February 2020

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207161F / <i>Tactical AIM Missiles</i>	Project (Number/Name) 674132 / <i>AIM-9 Product Improvement</i>
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	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025							
	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-9X Production Milestones																																
Contract Award: Lot 19 (FRP 5)			■																													
Contract Award: Lot 20 (FRP 6)					■																											
Contract Award: Lot 21 (FRP 7)										■																						
Contract Award: Lot 22 (FRP 8)														■																		
Contract Award: Lot 23 (FRP 9)																		■														
Contract Award: Lot 24 (FRP 10)																						■										
Contract Award: Lot 25 (FRP 11)																										■						
Production Deliveries: Lot 16 (FRP 2)	■	■	■	■																												
Production Deliveries: Lot 17 (FRP 3)			■	■	■	■																										
Production Deliveries: Lot 18 (FRP 4)					■	■	■	■	■																							
Production Deliveries: Lot 19 (FRP 5)									■	■	■	■	■																			
Production Deliveries : Lot 20 (FRP 6)																	■	■	■	■												
Production Deliveries: Lot 21 (FRP 7)																					■	■	■	■								
Production Deliveries: Lot 22 (FRP 8)																									■	■	■	■				
Production Deliveries: Lot 23 (FRP 9)																									■	■	■	■				
AIM-9X Block II System Improvement Program (SIP) II																																
Operational Flight Software Release v9.317		■																														
AIM-9X Block II Tech Refresh (SIP III): Hardware																																
Controlled Actuation System (CAS) Battery Design		■	■	■	■	■	■																									
Phase II Hardware (IMU, Dome & Processor)	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
Phase II Hardware Critical Design Review					■																											

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Air Force **Date:** February 2020

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207161F / <i>Tactical AIM Missiles</i>	Project (Number/Name) 674132 / <i>AIM-9 Product Improvement</i>
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	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025							
	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				
Phase II Hardware Cut In: Engineering Change Proposal																																
AIM-9X Block II Tech Refresh (SIP III): Software																																
Software v9.4 Improvements: Development Testing (DT-D1)	█	█	█	█																												
Software v9.4 Improvements: Development Test / Integrated Testing (DT/IT-D1)	█	█	█	█	█	█	█	█																								
Insensitive Munition Warhead Risk Reduction, Studies and Testing	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Software v9.4 Improvements: Operational Test Readiness Review (OTRR)																																
Software v9.4 Improvements: Operational Testing (OT-D1)																																
Software v9.4 Improvements: Software v9.4 Release																																
Software v10.4 Rehost: Development Testing (DT-D2)	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█																
Software v10.4 Rehost: Software v10.4 Release																																
AIM-9X Block II Tech Refresh (SIP IV)																																
Hardware and Software Obsolescence																																

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Air Force		Date: February 2020
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>AIM-9X Production Milestones</i>				
Contract Award: Lot 19 (FRP 5)	3	2019	3	2019
Contract Award: Lot 20 (FRP 6)	2	2020	2	2020
Contract Award: Lot 21 (FRP 7)	2	2021	2	2021
Contract Award: Lot 22 (FRP 8)	2	2022	2	2022
Contract Award: Lot 23 (FRP 9)	2	2023	2	2023
Contract Award: Lot 24 (FRP 10)	2	2024	2	2024
Contract Award: Lot 25 (FRP 11)	2	2025	2	2025
Production Deliveries: Lot 16 (FRP 2)	1	2019	3	2019
Production Deliveries: Lot 17 (FRP 3)	3	2019	2	2020
Production Deliveries: Lot 18 (FRP 4)	2	2020	2	2021
Production Deliveries: Lot 19 (FRP 5)	2	2021	4	2022
Production Deliveries : Lot 20 (FRP 6)	1	2023	4	2023
Production Deliveries: Lot 21 (FRP 7)	4	2023	3	2024
Production Deliveries: Lot 22 (FRP 8)	3	2024	2	2025
Production Deliveries: Lot 23 (FRP 9)	3	2025	4	2025
<i>AIM-9X Block II System Improvement Program (SIP) II</i>				
Operational Flight Software Release v9.317	2	2019	2	2019
<i>AIM-9X Block II Tech Refresh (SIP III): Hardware</i>				
Controlled Actuation System (CAS) Battery Design	2	2019	3	2020
Phase II Hardware (IMU, Dome & Processor)	1	2019	1	2022
Phase II Hardware Critical Design Review	3	2020	3	2020
Phase II Hardware Cut In: Engineering Change Proposal	4	2021	4	2021

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Air Force **Date:** February 2020

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Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>AIM-9X Block II Tech Refresh (SIP III): Software</i>				
Software v9.4 Improvements: Development Testing (DT-D1)	1	2019	3	2019
Software v9.4 Improvements: Development Test / Integrated Testing (DT/IT-D1)	1	2019	3	2020
Insensitive Munition Warhead Risk Reduction, Studies and Testing	1	2019	2	2025
Software v9.4 Improvements: Operational Test Readiness Review (OTRR)	2	2020	2	2020
Software v9.4 Improvements: Operational Testing (OT-D1)	2	2020	1	2021
Software v9.4 Improvements: Software v9.4 Release	3	2021	3	2021
Software v10.4 Rehost: Development Testing (DT-D2)	1	2019	1	2022
Software v10.4 Rehost: Software v10.4 Release	3	2022	3	2022
<i>AIM-9X Block II Tech Refresh (SIP IV)</i>				
Hardware and Software Obsolescence	1	2020	4	2024