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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development</i>					R-1 Program Element (Number/Name) PE 0205456A / <i>Lower Tier Air and Missile Defense (AMD) System</i>							
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	-	78.720	64.159	69.417	-	69.417	79.562	80.962	96.042	113.641	Continuing	Continuing
EF9: <i>System Integration and Test</i>	-	78.720	64.159	69.417	-	69.417	79.562	80.962	96.042	113.641	Continuing	Continuing

Note

Funds in this program were a realignment of funds from PE 0605456A PA3.

A. Mission Description and Budget Item Justification

The PATRIOT system includes a family of hardware, software, interceptors (GEM, PAC-2, PAC-3/MSE) and Ground Support Equipment. As software and hardware improvements are developed, there is a continuing need for system level modeling, simulation, integration and testing. Modeling and Simulation allow for performance assessment against all threats that would not be possible in flight tests due to cost, target and range constraints. Flight testing is periodically required for validation of the Modeling and Simulation as well as satisfying Army Test and Evaluation Command/Director, Operational Test and Evaluation (ATEC/DOTE) requirements of segment improvements.

PATRIOT is an integral part of the overall Air and Missile Defense (AMD) Architecture and enables the incremental fielding of the system capability for Army Air and Missile Defense Battalions.

FY2017 base dollars in the amount of \$69.417 million continues program development with the integration of missile and ground system software and hardware to complete Post Deployment Build-8 (PDB-8) and continue with PDB-8.05 activities. Continues the testing program to support the Test and Evaluation Master Plan (TEMP) and system testing/analysis for PDB-8/8.05 Development Test and Evaluation (DTE) and Initial Operational Test & Evaluation (IOT&E).

B. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	78.720	64.159	60.214	-	60.214
Current President's Budget	78.720	64.159	69.417	-	69.417
Total Adjustments	0.000	0.000	9.203	-	9.203
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	9.203	-	9.203

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Change Summary Explanation

Adjustment to Budget Years was to fully fund PDB-8 testing, which supports a Full Rate Production decision.

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Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0205456A / Lower Tier Air and Missile Defense (AMD) System				Project (Number/Name) EF9 / System Integration and Test			
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
EF9: System Integration and Test	-	78.720	64.159	69.417	-	69.417	79.562	80.962	96.042	113.641	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Continues efforts funded in PAC-3/MSE Missile 0605456A prior to FY15..

A. Mission Description and Budget Item Justification

The PATRIOT system includes a family of hardware, software, interceptors (GEM, PAC-2,PAC-3/MSE) and Ground Support Equipment. As software and hardware improvements are developed, there is a continuing need for system level modeling, simulation, integration and testing. Modeling and Simulation allows for performance assessment against all threats that would not be possible in flight tests due to cost, target and range constraints. Flight testing is periodically required for validation of Modeling and Simulation as well as satisfying ATEC/DOTE requirements of segment improvements.

PATRIOT is an integral part of the overall Air and Missile Defense (AMD) Architecture and enables the incremental fielding of the system capability for Army Air and Missile Defense Battalions.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Program Development, Integration, and Support	13.158	25.428	31.794	-	31.794
Description: Funding is provided for the following effort:					
FY 2015 Accomplishments:					
-Program development.					
-Integration of missile and ground system hardware and software in support of Post Deployment Build-8 (PDB-8).					
FY 2016 Plans:					
-Continuing program development.					
-Continuing integration of missile and ground system hardware and software in support of PDB-8 activities.					
-Begins PDB-8.05 program development activities.					
FY 2017 Base Plans:					
-Continues program development which includes PATRIOT program modeling and simulation (M&S) laboratory infrastructure maintenance as well as the conduct of M&S for hardware/software capability improvements.					

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Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0205456A / Lower Tier Air and Missile Defense (AMD) System	Project (Number/Name) EF9 / System Integration and Test

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
-Continues integration of missile and ground system hardware and software to complete PDB-8 activities. -Continues with PDB-8.0.5 activities which include Advanced Electronic Protection (EP) improvements and Mission Tailoring Threat Data Base maintenance.					
Title: Testing, Targets, Modeling and Simulation Description: Funding is provided for the following effort: FY 2015 Accomplishments: -Continued testing program to include utilization of targets/threat simulators and modeling efforts. -Continued test activities to support the Test and Evaluation Master Plan (TEMP). -Completed system testing/analysis for Post Production Build-8 (PDB-8) Development Test & Evaluation (DTE). FY 2016 Plans: -Continues testing program to include utilization of targets/threat simulators and modeling efforts. -Continues test activities to support the TEMP. -Continues system testing/analysis for PDB-8 DTE and Initial Operational Test & Evaluation (IOT&E). FY 2017 Base Plans: -Continues the testing program to include utilization of targets/threat simulators, flight simulator and modeling efforts. -Continues test activities to support the TEMP. -Continues system testing/analysis for PDB-8/8.05 DTE and IOT&E.	65.562	38.731	37.623	-	37.623
Accomplishments/Planned Programs Subtotals	78.720	64.159	69.417	-	69.417

C. Other Program Funding Summary (\$ in Millions)											
Line Item	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
• PE 0605456A, Project PA3: PE 0605456A, Project PA3 PAC-3/MSE Missile	33.709	2.272	-	-	-	-	-	-	-	0.000	35.981
• SSN C53101: SSN C53101 MSE Missile	532.605	514.946	423.201	-	423.201	459.040	497.009	529.839	520.513	Continuing	Continuing

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Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0205456A / Lower Tier Air and Missile Defense (AMD) System	Project (Number/Name) EF9 / System Integration and Test
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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017</u> <u>Base</u>	<u>FY 2017</u> <u>OCO</u>	<u>FY 2017</u> <u>Total</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• SSN C50016: SSN C50016, Lower-Tier Air and Missile Defense (AMD)	110.300	115.075	126.470	-	126.470	112.888	122.768	150.444	120.542	Continuing	Continuing
• PE 0604319A, Project DU3, IFPC2: PE 0604319A, Project DU3, IFPC2 (FY12 PE 0603305A IFPC II - Intercept)	92.475	155.361	-	-	-	40.003	80.004	120.004	120.006	Continuing	Continuing
• SSN C62002: SSN C62002, IFPC Inc 2-I Block 1 System	-	-	19.319	-	19.319	47.289	138.547	174.760	287.325	Continuing	Continuing
• SSN C62001: SSN C62001, IFPC Inc 2-I Block 1 Missile	-	-	-	-	-	73.552	123.106	186.840	146.300	Continuing	Continuing
• PE0604820A, Project E10: PE0604820A, Project E10 SENTINEL	5.022	12.309	15.983	-	15.983	20.844	20.612	30.106	41.402	Continuing	Continuing
• PE 0605457A, Project S40: PE 0605457A, Project S40, Army Integrated Air and Missile Defense (AIAMD)	147.250	222.075	252.811	-	252.811	169.070	152.942	32.914	34.447	Continuing	Continuing
• SSN BZ5075: SSN BZ5075, IAMD Battle Command System (IBCS)	-	20.917	204.969	-	204.969	287.220	372.916	440.567	439.780	Continuing	Continuing
• PE0604741A, Project 126, 146, 149: PE0604741A, Project 126, 146, 149; Air Defense C21 Eng Dev	15.898	24.569	15.965	-	15.965	16.106	16.288	14.466	8.500	Continuing	Continuing
• SSN AD50700: SSN AD50700 Air & Missile Defense Planning & Control Sys	27.374	28.176	54.376	69.958	124.334	17.005	17.960	6.366	6.951	Continuing	Continuing
• PE 0202429A: PE 0202429A Proj EP8, JLENS COCOM EXERCISE	43.248	10.565	45.482	-	45.482	6.746	-	-	-	0	106.041

Remarks
This program is an integral part of the Army Integrated Air and Missile Defense (IAMD) architecture.

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D. Acquisition Strategy

The design objective of the PATRIOT system is to provide an element of an integrated Air and Missile Defense system capable of being modified to cope with the evolving threat. This strategy minimizes technological risks and provides a means of enhancing system capability through planned upgrades of deployed systems. PAC-3 system development efforts further improve system capabilities against emerging and reactive threats. The PAC-3 Missile Program focuses on developing, fabricating and testing the high velocity, hit to kill, surface to air missile and associated ground support equipment to provide essential increases in battle space, accuracy, lethality and firepower to counter and destroy evolving air defense threats. The missile performance is demonstrated through a series of flight tests and modeling and simulation activities. The PAC-3 MSE program evolves the PAC-3 system providing extended ranges, insensitive munitions enhancements, and greater logistical flexibility. The PAC-3 MSE will be fielded to U.S. PATRIOT units.

E. Performance Metrics

N/A

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

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Management Services (\$ 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 Program Management	RO	Various : Huntsville, Alabama	0.000	1.150	Dec 2014	1.158	Dec 2015	0.964	Dec 2016	-		0.964	Continuing	Continuing	0
PAC-3 Product Office	RO	Project Office : Huntsville, AL	0.000	0.165	Dec 2014	1.100	Dec 2015	1.051	Dec 2016	-		1.051	Continuing	Continuing	0
Subtotal			0.000	1.315		2.258		2.015		-		2.015	-	-	0.000

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			
Program Integration MSE LMMFC	Various	Lockheed Martin Missiles and Fire Control (LMMFC) : Dallas, Texas	0.000	-		12.300	Dec 2015	16.641	Dec 2016	-		16.641	Continuing	Continuing	0
MSE/PAC-3 Raytheon	Various	Raytheon : Waltham, Massachusetts	0.000	4.450	Jan 2015	3.800	Jan 2016	4.569	Jan 2017	-		4.569	Continuing	Continuing	0
SETA Contracts	Various	Multiple : Multiple	0.000	3.083	Feb 2015	1.850	Feb 2016	0.889	Feb 2017	-		0.889	Continuing	Continuing	0
U.S. Other Government Agencies (OGAs)	MIPR	Various : Huntsville, Alabama	0.000	4.310	Dec 2014	5.220	Dec 2015	7.680	Dec 2016	-		7.680	Continuing	Continuing	0
Subtotal			0.000	11.843		23.170		29.779		-		29.779	-	-	0.000

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			
Targets/Threats Simulators	MIPR	Various : Huntsville, Alabama	0.000	25.345	Dec 2014	22.188	Dec 2015	26.345	Dec 2016	-		26.345	Continuing	Continuing	0
Modeling and Simulation	MIPR	Various : Huntsville, Alabama	0.000	3.724	Dec 2014	3.000	Dec 2015	3.065	Dec 2016	-		3.065	Continuing	Continuing	0
Contractor T&E	Various	Multiple : Multiple	0.000	8.425	Dec 2014	7.458	Dec 2015	1.625	Dec 2016	-		1.625	Continuing	Continuing	0
Other T&E funding	MIPR	Various : WSMR, NM	0.000	3.550	Dec 2014	2.585	Dec 2015	2.822	Dec 2016	-		2.822	Continuing	Continuing	0

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Army		Date: February 2016
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
PATRIOT System Testing, Integration and Evaluation	1	2015	4	2021
Program Development, Integration, and Support	1	2015	4	2021
Testing, Targets, Modeling and Simulation	1	2015	4	2021
PDB-8.0.5 Agile Build	1	2017	4	2021
PDB-8 Fielding	1	2018	4	2021
PDB-8 IOC	1	2018	2	2018