

# UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy										Date: February 2018		
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy I BA 5: System Development & Demonstration (SDD)					R-1 Program Element (Number/Name) PE 0605450N I Joint Air-to-ground Missile (JAGM)							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	201.446	17.834	15.473	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	234.753
2211: Joint Air-to-Ground Missile	201.446	17.834	15.473	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	234.753
Program MDAP/MAIS Code: Project MDAP/MAIS Code(s): P355												
Note Starting in FY 2019, funding for Joint Air-to-Ground Missile (JAGM) was realigned to PE 0605450M.												
A. Mission Description and Budget Item Justification The Joint Air-to-Ground Missile (JAGM) is an air-launched missile system that will utilize dual-mode seeker technology providing advanced line-of-sight and beyond-line-of-sight capabilities, including precision point and fire-and-forget seeker targeting and increased lethality against soft, hardened, moving, stationary, land, maritime threats. JAGM will additionally provide robust capability in adverse weather, day or night and in obscured/countermeasure environments. The JAGM Increment 1 system will replace aviation-launched; tube-launched, optically-tracked, wire-guided (TOW), and Helicopter Launched Fire-&Forget Missile (HELLFIRE) Systems. JAGM is an Army-led joint program that addresses rotary wing, fixed wing, and unmanned aerial vehicle requirements. The Department of Navy threshold platform is the AH-1Z. The JAGM system includes missile, trainers, containers, support equipment and software modifications to the M-299 launcher.  The JAGM program is part of the Navy's Integrated Fire Control (IFC) approach to address advanced threat capabilities in the Anti-Access/Area-Denial (A2AD) environment. IFC solutions enable individual system capabilities to be leveraged across an effects chain, placing the full spectrum of tactical capability in the hands of the warfighter. IFC solutions that push engagement distances beyond the launch platform's radar horizon and allow the United States Navy to operate in, and control, contested battle space in littoral waters and A2/AD environments are increasingly critical as more and more scenarios require compressed and coordinated fire control timelines.  JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under system development and demonstration because it includes those projects that have passed Milestone B approval and are conducting engineering and manufacturing development tasks aimed at meeting validated requirement prior to full-rate production decision.												

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Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
1319: Research, Development, Test & Evaluation, Navy I BA 5: System Development & Demonstration (SDD)		PE 0605450N I Joint Air-to-ground Missile (JAGM)			
B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	17.880	15.473	7.086	-	7.086
Current President's Budget	17.834	15.473	0.000	-	0.000
Total Adjustments	-0.046	0.000	-7.086	-	-7.086
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.046	0.000			
• Rate/Misc Adjustments	0.000	0.000	-7.086	-	-7.086
Change Summary Explanation					
Starting in FY 2019, funding for Joint Air-to-Ground Missile (JAGM) was realigned to PE 0605450M.					

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy										Date: February 2018		
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0605450N / Joint Air-to-ground Missile (JAGM)				Project (Number/Name) 2211 / Joint Air-to-Ground Missile			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
2211: Joint Air-to-Ground Missile	201.446	17.834	15.473	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	234.753
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
Project MDAP/MAIS Code: P355												
Note Starting in FY 2019, funding for Joint Air-to-Ground Missile (JAGM) was realigned to PE 0605450M.												
A. Mission Description and Budget Item Justification The Joint Air-to-Ground Missile (JAGM) is an air-launched missile system that will utilize dual-mode seeker technology providing advanced line-of-sight and beyond-line-of-sight capabilities, including precision point and fire-and-forget seeker targeting and increased lethality against soft, hardened, moving, stationary, land, maritime threats. JAGM will additionally provide robust capability in adverse weather, day or night and in obscured/countermeasure environments. The JAGM Increment 1 system will replace aviation-launched; tube-launched, optically-tracked, wire-guided (TOW), and Helicopter Launched Fire-&Forget Missile (HELLFIRE) Systems. Later increments of JAGM will be fixed wing compatible. JAGM is an Army-led joint program that addresses rotary wing, fixed wing and unmanned aerial vehicle requirements. The Department of Navy threshold platform is the AH-1Z. The JAGM system includes missile, trainers, containers, support equipment and software modifications to the M-299 launcher.												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: JAGM Engineering and Manufacturing Development (EMD) Phase  Articles:								17.834	15.473	0.000	0.000	0.000
								-	-	-	-	-
FY 2018 Plans: FY 2018 plans include continued execution of EMD phase and AH-1Z integration activities, including continued airworthiness certification, software development, fixed wing studies & analysis, Developmental Testing (DT), Integration Testing (IT),and a planned DT assist period to support Milestone C. AH-1Z software development and test efforts will continue in support of fleet software release planned for the FY 2020 Initial Operational Capability (IOC).												
FY 2019 Base Plans: N/A												
FY 2019 OCO Plans: N/A												
FY 2018 to FY 2019 Increase/Decrease Statement:												

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2019 Navy				<b>Date:</b> February 2018				
<b>Appropriation/Budget Activity</b> 1319 / 5			<b>R-1 Program Element (Number/Name)</b> PE 0605450N / <i>Joint Air-to-ground Missile (JAGM)</i>			<b>Project (Number/Name)</b> 2211 / <i>Joint Air-to-Ground Missile</i>		

  

<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	<b>FY 2017</b>	<b>FY 2018</b>	<b>FY 2019 Base</b>	<b>FY 2019 OCO</b>	<b>FY 2019 Total</b>
Program funding shifted to PE 0605450M, starting in FY 2019.					
<b>Accomplishments/Planned Programs Subtotals</b>	17.834	15.473	0.000	0.000	0.000

  

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• RDT&E ARMY, 0605450A: <i>JAGM</i>	47.446	34.626	11.900	-	11.900	3.000	2.000	0.000	0.000	Continuing	Continuing
• MPA, ARMY, C70302: <i>JAGM</i>	99.011	178.432	276.462	-	276.462	296.589	302.019	305.112	414.099	3,096.995	4,996.457
• WPN, NAVY, 2248: <i>JAGM</i>	21.922	3.789	24.109	-	24.109	24.142	49.438	50.423	76.253	1,302.797	1,552.873

  

**Remarks**

  

**D. Acquisition Strategy**

The Joint Air-to-Ground Missile (JAGM) system is an ACAT-1C Joint Army/Navy Major Defense Acquisition Program (MDAP) with the Army designated as lead service. Milestone B was achieved in July 2015 with Milestone C planned for 3QFY 2018. The Engineering, Manufacturing and Development contract was a full and open competition and was awarded July 2015. The vendor, Lockheed Martin, is responsible for the production of a technically mature and fully producible JAGM Guidance Section (GS) as well as the integration of the GS with the current HELLFIRE-R missile warhead and motor section for Increment 1 capability. The Army is responsible for the development and production of the JAGM missile and integration on the AH-64 Apache. The Navy is responsible for integration of the JAGM on the United States Marine Corps AH-1Z with an Initial Operational Capability (IOC) in FY 2020.

  

**E. Performance Metrics**

Milestone C in FY 2018; IOC in FY 2020

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy												Date: February 2018			
Appropriation/Budget Activity 1319 / 5						R-1 Program Element (Number/Name) PE 0605450N / Joint Air-to-ground Missile (JAGM)				Project (Number/Name) 2211 / Joint Air-to-Ground Missile					
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NAWCWD : China Lake, CA	49.472	3.404	Nov 2016	1.014	Nov 2017	0.000		-		0.000	0.000	53.890	-
Systems Engineering	WR	NAWCAD : Patuxent River, MD	1.602	0.537	Dec 2016	0.459	Nov 2017	0.000		-		0.000	0.000	2.598	-
Aircraft Integration	WR	NAWCAD : Patuxent River, MD	9.837	0.500	Dec 2016	0.563	Nov 2017	0.000		-		0.000	0.000	10.900	-
Aircraft Integration (AH-1Z)	Various	NAWCWD : China Lake, CA	6.218	0.600	Mar 2017	2.040	Nov 2017	0.000		-		0.000	0.000	8.858	-
Contractor Aircraft Integration (AH-1Z)	Various	Northrup Grumman : Woodlawn Hills, CA	4.958	9.072	Sep 2017	3.436	Sep 2018	0.000		-		0.000	0.000	17.466	-
Integration & Test	Various	JAMS : Huntsville, AL	28.970	0.540	Mar 2017	1.576	Jan 2018	0.000		-		0.000	0.000	31.086	-
Contractor Integration & Test	C/FPIF	Lockheed Martin : Orlando, FL	12.948	0.000		0.000		0.000		-		0.000	0.000	12.948	13.448
Studies and Analysis	WR	NAWCWD : China Lake, CA	0.000	0.000		0.600	Mar 2018	0.000		-		0.000	0.000	0.600	-
Prior year cost Prod Dev no longer funded in the FYDP	Various	Various : Various	11.555	0.000		0.000		0.000		-		0.000	0.000	11.555	-
Subtotal			125.560	14.653		9.688		0.000		-		0.000	0.000	149.901	N/A
Remarks															
Contractor Aircraft Integration (AH-1Z) - Funding in this line includes software support associated with the integration of JAGM on the AH-1Z.															
Integration & Test - Funding in this line includes integration & test support, modeling & simulation and telemetry kits.															
Contractor Integration & Test - Funding in this line includes hardware and support associated with the Engineering and Manufacturing Development (EMD) contract.															
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Logistics Support	WR	NAWCWD : China Lake, CA	0.248	0.883	Nov 2016	0.163	Nov 2017	0.000		-		0.000	0.000	1.294	-

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Appropriation/Budget Activity 1319 / 5						R-1 Program Element (Number/Name) PE 0605450N / Joint Air-to-ground Missile (JAGM)				Project (Number/Name) 2211 / Joint Air-to-Ground Missile					
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Logistics Support	WR	NAWCAD : Patuxent River, MD	0.087	0.068	Dec 2016	0.076	Nov 2017	0.000		-		0.000	0.000	0.231	-
Prior year Support cost no longer funded in the FYDP	Various	Various : Various	12.447	0.000		0.000		0.000		-		0.000	0.000	12.447	-
Subtotal			12.782	0.951		0.239		0.000		-		0.000	0.000	13.972	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test & Evaluation	Various	NAWCAD : Patuxent River, MD	4.115	0.426	Mar 2017	0.451	Nov 2017	0.000		-		0.000	0.000	4.992	-
Test & Evaluation	Various	NAWCWD : China Lake, CA	0.000	0.000		2.043	Nov 2017	0.000		-		0.000	0.000	2.043	-
Test & Evaluation	Various	USMC : MCAS Yuma, AZ	0.000	0.000		1.121	Mar 2018	0.000		-		0.000	0.000	1.121	-
Test & Evaluation	Various	Various : Various	0.000	0.210	Nov 2016	0.639	Nov 2017	0.000		-		0.000	0.000	0.849	-
Prior year T&E cost no longer funded in the FYDP	Various	Various : Various	41.328	0.000		0.000		0.000		-		0.000	0.000	41.328	-
Subtotal			45.443	0.636		4.254		0.000		-		0.000	0.000	50.333	N/A
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Contr Eng Supt - ETS (NONFFRDC)	Various	Various : Various	2.853	0.633	Feb 2017	0.936	Feb 2018	0.000		-		0.000	0.000	4.422	-
Management Services	Various	NAWCAD : Patuxent River, MD	14.273	0.900	Nov 2016	0.296	Nov 2017	0.000		-		0.000	0.000	15.469	-
Travel	Various	NAWCAD : Patuxent River, MD	0.535	0.061	Oct 2016	0.060	Oct 2017	0.000		-		0.000	0.000	0.656	-

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<b>Exhibit R-3, RDT&amp;E Project Cost Analysis: PB 2019 Navy</b>												<b>Date:</b> February 2018			
<b>Appropriation/Budget Activity</b> 1319 / 5						<b>R-1 Program Element (Number/Name)</b> PE 0605450N / Joint Air-to-ground Missile (JAGM)						<b>Project (Number/Name)</b> 2211 / Joint Air-to-Ground Missile			

  

<b>Management Services (\$ in Millions)</b>				<b>FY 2017</b>		<b>FY 2018</b>		<b>FY 2019 Base</b>		<b>FY 2019 OCO</b>		<b>FY 2019 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>
Prior year Mngt Svcs cost no longer funded in the FYDP	Various	Various : Various	0.000	0.000		0.000		0.000		-		0.000		0.000	0.000	-
<b>Subtotal</b>			17.661	1.594		1.292		0.000		-		0.000		0.000	20.547	N/A

  

	<b>Prior Years</b>	<b>FY 2017</b>	<b>FY 2018</b>	<b>FY 2019 Base</b>	<b>FY 2019 OCO</b>	<b>FY 2019 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Project Cost Totals</b>	201.446	17.834	15.473	0.000	-	0.000	0.000	234.753	N/A

  

**Remarks**

1) Program acquisition milestones (minus unique Initial Operating Capability) and production milestones are joint program milestones for both Army and Navy.

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PE 0605450N: *Joint Air-to-ground Missile (JAGM)*  
Navy

R-1 Line #170

**R-1 Program Element (Number/Name)**  
PE 0605450N / *Joint Air-to-ground Missile (JAGM)*

<b>Project (Number/Name)</b>	2211 / Joint Air-to-Ground Missile
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1319 / 5

JAGM		FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
		1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Acquisition Milestones								MS-C ▲					FRP Decision ◆		IOC ▲														
Reviews																													
Test and Evaluation																													
	Integration	AH1-Z Integration																											
	AH-1Z Integration	AH1-Z Integration																											
	Software Development					DT Assist	DT/IT																						
	Testing/Integration Testing					DT/IT																							
	Operational Testing												OT																
													OT Reporting																
	Software Integration Lab Testing	SIL Testing																											
Production Milestones																													
	Contract Awards							LRIP 1 (Army Only) ●																					
								LRIP 2 (WPN) ●				LRIP 3 (WPN) ●			FRP (WPN) ●														
	Deliveries					DT/IT Test Asset Qty 44 (RDTE,N)		OT Test Asset Qty 8 (RDTE,N)																					
										LRIP 1 (Army Only)																			
	</																												

2019PB - 0605450N - 2211



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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2019 Navy			<b>Date:</b> February 2018
<b>Appropriation/Budget Activity</b> 1319 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0605450N / <i>Joint Air-to-ground Missile (JAGM)</i>	<b>Project (Number/Name)</b> 2211 / <i>Joint Air-to-Ground Missile</i>	

**Schedule Details**

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>JAGM</b>				
Acquisition Milestones: Milestone C	3	2018	3	2018
Acquisition Milestones: IOC	2	2020	2	2020
Acquisition Milestones: FRP Decision	4	2019	4	2019
Test and Evaluation: AH-1Z Integration: AH-1Z Integration	1	2017	3	2018
Test and Evaluation: Software Development Testing/Integration Testing: DT Assist	1	2018	2	2018
Test and Evaluation: Software Development Testing/Integration Testing: DT/IT	3	2018	3	2019
Test and Evaluation: Operational Testing: OT	3	2019	4	2019
Test and Evaluation: Operational Testing: OT Reporting	4	2019	4	2019
Test and Evaluation: Software Integration Lab Testing: SIL Testing	1	2017	3	2018
Production Milestones: Contract Awards: LRIP 1 (Army Only)	3	2018	3	2018
Production Milestones: Contract Awards: LRIP 2 (WPN)	3	2018	3	2018
Production Milestones: Contract Awards: LRIP 3 (WPN)	2	2019	2	2019
Production Milestones: Contract Awards: FRP (WPN)	1	2020	1	2020
Production Milestones: Deliveries: DT/IT Test Asset	1	2018	2	2018
Production Milestones: Deliveries: OT Test Asset	3	2018	4	2018
Production Milestones: Deliveries: LRIP 1 (Army Only)	4	2018	2	2019
Production Milestones: Deliveries: LRIP 2 (WPN)	3	2019	2	2021
Production Milestones: Deliveries: LRIP 3 (WPN)	3	2021	2	2022
Production Milestones: Deliveries: FRP (WPN)	3	2022	2	2023