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Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0605450M / <i>Joint Air-to-ground Missile (JAGM)</i>
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COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
Total Program Element	6.451	13.427	12.713	0.356	-	0.356	-	-	-	-	-	-
2211: <i>Joint Air-to-Ground Missile</i>	6.451	13.427	12.713	0.356	-	0.356	-	-	-	-	-	-

Program MDAP/MAIS Code:
Project MDAP/MAIS Code(s): P355

Note
 Prior to FY 2019, funding for Joint Air-to-Ground Missile (JAGM) was aligned to PE 0605450N.

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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B. Program Change Summary (\$ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	18.393	12.713	0.359	-	0.359
Current President's Budget	13.427	12.713	0.356	-	0.356
Total Adjustments	-4.966	0.000	-0.003	-	-0.003
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-3.356	0.000			
• SBIR/STTR Transfer	-1.610	0.000			
• Rate/Misc Adjustments	0.000	0.000	-0.003	-	-0.003

Change Summary Explanation

Financial:

FY20 \$1.610M reduction related to FY20 SBIR and \$3.356 removed in a below threshold reprogramming action.

Acquisition Milestones:

FRP Decision moved from 3Qtr FY20 to 2Qtr FY22.

Navy IOC moved from 2Qtr FY20 to 4Qtr FY21.

Changes in Milestone dates were needed in order to address technical issues with the AH-1Z platform software.

Technical:

SCS 8.2 has been renamed 20.1.5

SCS 8.2.3 has been renamed 21.1.5

Contract Awards:

LRIP 4 and LRIP 5 have been added to the schedule.

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605450M / Joint Air-to-ground Missile (JAGM)	Project (Number/Name) 2211 / Joint Air-to-Ground Missile
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COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
2211: Joint Air-to-Ground Missile	6.451	13.427	12.713	0.356	-	0.356	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: P355

Note
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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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: JAGM Engineering and Manufacturing Development (EMD) Phase	13.427	12.713	0.356	0.000	0.356
Articles:	-	-	-	-	-
FY 2021 Plans: FY 2021 plans include updates to the AH-1Z software to integrate additional JAGM functionality on the USMC AH-1Z platform software configuration set 21.1.5 (SCS-21.1.5). Associated efforts include mission planning updates, modeling & simulation efforts in support of SCS-21.1.5 DT/IT testing, platform software development, airworthiness and platform integration activities, required updates to documentation, training, and support equipment and completion of required Developmental and Integrated flight Testing (DT / IT) in support of fleet release of SCS-21.1.5.					
FY 2022 Base Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605450M / Joint Air-to-ground Missile (JAGM)	Project (Number/Name) 2211 / Joint Air-to-Ground Missile

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
FY 2022 funding will cover continued software correction of deficiencies and associated airworthiness engineering / logistics support and any required test validation including integration testing, operation testing and cyber testing. FY 2022 OCO Plans: N/A FY 2021 to FY 2022 Increase/Decrease Statement: Decrease of \$12.357M from FY 2021 to FY 2022 is due to AH-1Z completing integration and testing of JAGM capabilities, including IOT&E.					
Accomplishments/Planned Programs Subtotals	13.427	12.713	0.356	0.000	0.356

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

<u>Line Item</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022 Base</u>	<u>FY 2022 OCO</u>	<u>FY 2022 Total</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• RDT&E ARMY, 0605450A: JAGM	6.314	7.566	2.142	-	2.142	-	-	-	-	-	-
• MPA, ARMY, C70302: JAGM	199.295	196.548	152.177	-	152.177	-	-	-	-	-	-
• WPN/2248: Joint Air Ground Missile (JAGM)	75.729	43.647	49.702	-	49.702	-	-	-	-	-	-

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 achieved June 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 2021.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605450M / Joint Air-to-ground Missile (JAGM)	Project (Number/Name) 2211 / Joint Air-to-Ground Missile
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Product Development (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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			
Systems Engineering	WR	NAWCWD : China Lake, CA	0.901	0.274	Nov 2019	1.156	Nov 2020	0.040	Nov 2021	-		0.040	-	-	-
Systems Engineering	WR	NAWCAD : Patuxent River, MD	0.459	0.769	Nov 2019	0.703	Nov 2020	0.065	Nov 2021	-		0.065	-	-	-
Aircraft Integration (AH-1Z)	WR	NAWCAD : Patuxent River, MD	0.372	1.011	Nov 2019	0.883	Feb 2021	0.000		-		0.000	-	-	-
Aircraft Integration (AH-1Z)	Various	NAWCWD : China Lake, CA	0.000	0.000		0.531	Feb 2021	0.000		-		0.000	-	-	-
Integration & Test	Various	JAMS : Huntsville, AL	0.271	0.000		0.870	Feb 2021	0.000		-		0.000	-	-	-
Contractor Integration & Test	C/FFP	Lockheed Martin : Orlando, FL	0.000	1.399	Mar 2020	0.375	Jan 2021	0.251	Mar 2022	-		0.251	-	-	-
Subtotal			2.003	3.453		4.518		0.356		-		0.356	-	-	N/A

Remarks

Contractor Integration & Test - Funding supports execution of Platform Integration and DT/IT Testing.

Support (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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			
Integrated Logistics Support	WR	NAWCWD : China Lake, CA	0.163	0.229	Nov 2019	0.250	Nov 2020	0.000		-		0.000	-	-	-
Integrated Logistics Support	WR	NAWCAD : Patuxent River, MD	0.076	0.000		0.120	Nov 2020	0.000		-		0.000	-	-	-
Prior year Support cost no	Various	Various : Various	0.000	4.070	Nov 2019	0.000	Oct 2020	0.000		-		0.000	-	-	-
Subtotal			0.239	4.299		0.370		0.000		-		0.000	-	-	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605450M / Joint Air-to-ground Missile (JAGM)	Project (Number/Name) 2211 / Joint Air-to-Ground Missile
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Test and Evaluation (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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			
Test & Evaluation	Various	NAWCAD : Patuxent River, MD	0.341	0.600	Mar 2021	2.978	Nov 2020	0.000		-		0.000	-	-	-
Test & Evaluation	Various	NAWCWD : China Lake, CA	0.000	0.000		0.465	Nov 2020	0.000		-		0.000	-	-	-
Test & Evaluation	Various	USMC : MCAS Yuma, AZ	2.564	3.854	Nov 2019	2.665	Nov 2020	0.000		-		0.000	-	-	-
Test & Evaluation	Various	Various : Various	0.132	0.629	Nov 2019	0.553	Nov 2020	0.000		-		0.000	-	-	-
Subtotal			3.037	5.083		6.661		0.000		-		0.000	-	-	N/A

Management Services (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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			
Contr Eng Supt - ETS (NONFFRDC)	Various	Various : Various	0.816	0.491	Nov 2019	0.696	Feb 2021	0.000		-		0.000	-	-	-
Management Services	Various	NAWCAD : Patuxent River, MD	0.296	0.023	Nov 2019	0.389	Nov 2020	0.000		-		0.000	-	-	-
Travel	Various	NAWCAD : Patuxent River, MD	0.060	0.078	Nov 2019	0.079	Nov 2020	0.000		-		0.000	-	-	-
Subtotal			1.172	0.592		1.164		0.000		-		0.000	-	-	N/A

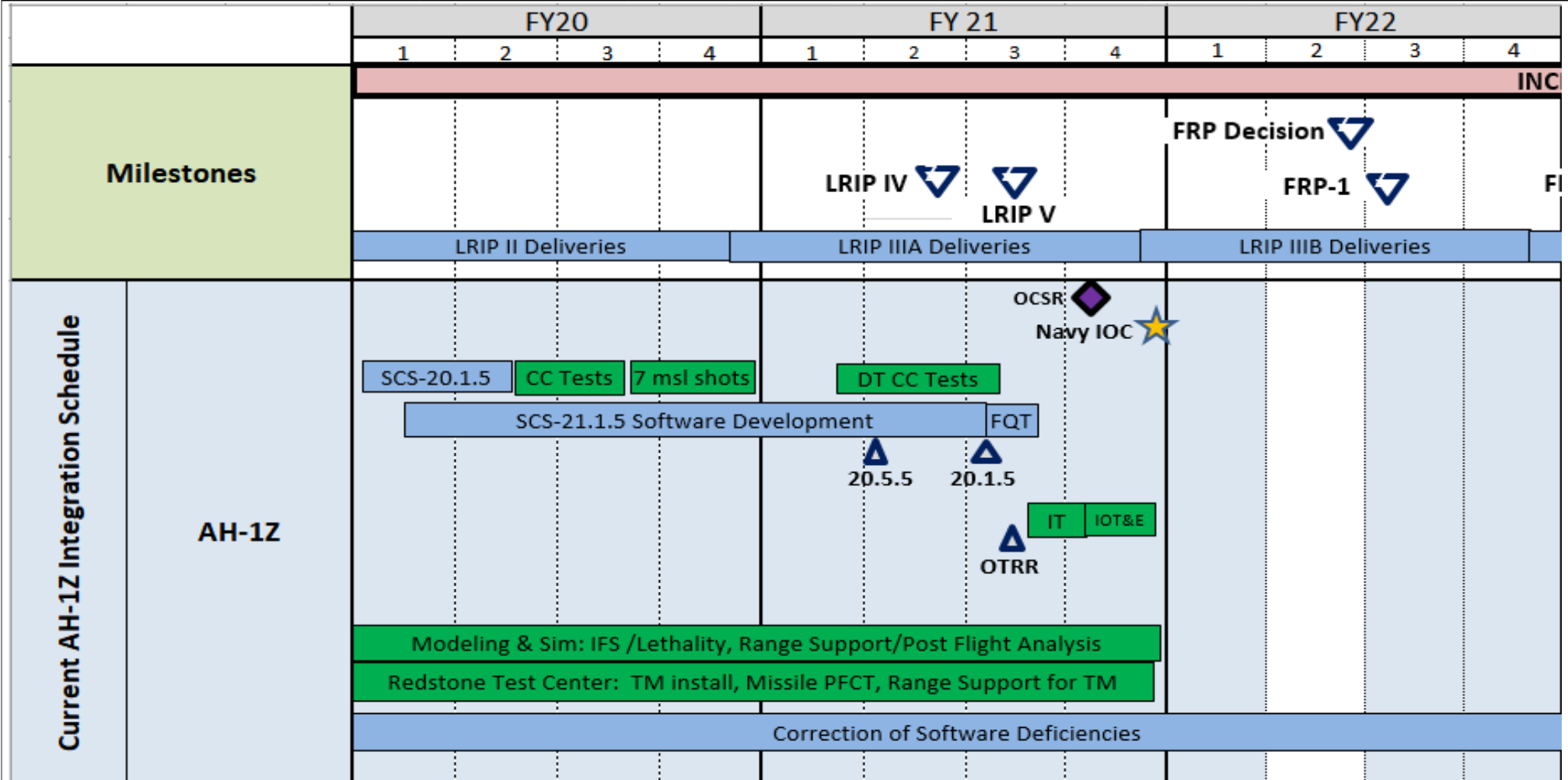
	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	6.451	13.427	12.713	0.356	-	0.356	-	-	N/A

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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Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy Date: May 2021

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605450M / Joint Air-to-ground Missile (JAGM)	Project (Number/Name) 2211 / Joint Air-to-Ground Missile
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Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605450M / Joint Air-to-ground Missile (JAGM)	Project (Number/Name) 2211 / Joint Air-to-Ground Missile

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
JAGM				
IOC	4	2021	4	2021
FRP Decision	2	2022	2	2022
Test and Evaluation: AH-1Z Integration: AH-1Z Integration	1	2020	4	2021
Test and Evaluation: Software Development Testing/Integration Testing: Software Development AH-1Z Software 21.1.5	1	2020	3	2021
Test and Evaluation: Software Development Testing/Integration Testing: DT/IT Software Development testing 20.1.5	1	2021	3	2021
Test and Evaluation: Software Development Testing/Integration Testing: Software Correction of Deficiencies	1	2020	4	2022
Test and Evaluation: Software Development Testing/Integration Testing: Modeling & Simulation	1	2020	4	2021
Test and Evaluation: Operational Testing: OT	4	2021	4	2021
Test and Evaluation: Software Integration Lab Testing: Test & Evaluation DT/IT/OT 21.1.5	3	2021	4	2021
Production Milestones: Contract Awards: LRIP 4 (WPN)	2	2021	2	2021
Production Milestones: Contract Awards: LRIP 5 (WPN)	3	2021	3	2021
Production Milestones: Contract Awards: FRP Decision (WPN)	2	2022	2	2022
Production Milestones: Contract Awards: FRP 1 (WPN)	3	2022	3	2022
Production Milestones: Deliveries: LRIP 2 (WPN)	1	2020	4	2020
Production Milestones: Deliveries: LRIP 3A (WPN)	4	2020	4	2021
Production Milestones: Deliveries: LRIP 3B (WPN)	4	2021	4	2022
Production Milestones: Deliveries: LRIP 4 (WPN)	4	2022	4	2022