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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 0605450A / Joint Air-to-Ground Missile (JAGM)
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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	-	12.440	6.585	8.891	-	8.891	2.161	2.312	2.997	3.005	Continuing	Continuing
JA6: Joint Air-To-Ground Missile (JAGM)	-	12.440	6.585	8.891	-	8.891	2.161	2.312	2.997	3.005	Continuing	Continuing

Program MDAP/MAIS Code: 355

A. Mission Description and Budget Item Justification

The Joint Air-to-Ground Missile (JAGM) program is an Army-led, Acquisition Category (ACAT) IC Major Defense Acquisition Program (MDAP) with joint interest with the United States (U.S.) Air Force, U.S. Marine Corps (USMC), and U.S. Navy. The JAGM is the next generation of aviation-launched, fire and forget missiles to replace the HELLFIRE Laser and Longbow radar missiles. JAGM will be used by joint service aircraft for destruction of high value stationary, moving, and relocatable land and maritime targets from standoff range in day, night, adverse weather, and obscured battlefield conditions.

The Fiscal Year (FY) 2021 dollars in the amount of \$8.900 million will continue the objective platform review, analysis, and threat management; continue the development of the Captive Air Training Missile (CATM) to address training needs; continue test and evaluation and develop documentation for Air Worthiness Release.

B. Program Change Summary (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	11.758	9.500	8.900	-	8.900
Current President's Budget	12.440	6.585	8.891	-	8.891
Total Adjustments	0.682	-2.915	-0.009	-	-0.009
• Congressional General Reductions	-	-	-	-	-
• Congressional Directed Reductions	-	-2.915	-	-	-
• Congressional Rescissions	-	-	-	-	-
• Congressional Adds	-	-	-	-	-
• Congressional Directed Transfers	-	-	-	-	-
• Reprogrammings	0.682	-	-	-	-
• SBIR/STTR Transfer	-	-	-	-	-
• Adjustments to Budget Years	-	-	-0.009	-	-0.009

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Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605450A / Joint Air-to-Ground Missile (JAGM)				Project (Number/Name) JA6 / Joint Air-To-Ground Missile (JAGM)			
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
JA6: Joint Air-To-Ground Missile (JAGM)	-	12.440	6.585	8.891	-	8.891	2.161	2.312	2.997	3.005	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Joint Air-to-Ground Missile (JAGM) program is an Army-led, Acquisition Category (ACAT) IC Major Defense Acquisition Program (MDAP) with joint interest with the United States (U.S.) Air Force, U.S. Marine Corps (USMC), and U.S. Navy. The JAGM is the next generation of aviation-launched, fire and forget missiles to replace the HELLFIRE Laser and Longbow radar missiles. JAGM will be used by joint service aircraft for destruction of high value stationary, moving, and relocatable land and maritime targets from standoff range in day, night, adverse weather, and obscured battlefield conditions.

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

	FY 2019	FY 2020	FY 2021
Title: Full Rate Production (FRP) Decision Preparation	0.673	0.426	-
Description: The JAGM Product Office and Other Government Agencies (OGAs) will confirm that JAGM is producible, as well as operable, safe, and logistically supportable.			
FY 2020 Plans: The JAGM Product Office completed government testing and Full Material Release (FMR) documentation to support a FRP decision.			
FY 2020 to FY 2021 Increase/Decrease Statement: Funding decrease from FY 2020 to FY 2021 due to Full Rate Production Decision Review scheduled for May 2020.			
Title: Post MS C Developmental, Integrated, and Operational Testing	6.729	-	-
Description: The JAGM Product Office and OGAs will demonstrate JAGM Operational Suitability and Effectiveness with AH-64E.			
Title: Apache AH-64E and JAGM Software Integration	2.625	-	-
Description: The JAGM Product Office will continue to work JAGM capability on E-model Apaches.			
Title: Integration and Counter Measure/Threat Management	2.413	4.214	3.789
Description: The JAGM Product Office and OGAs will continue objective platform review, analysis, and threat management. The JAGM Product Office and OGAs will perform technical assessments, concept studies, prepare documentation, and perform risk reduction efforts.			

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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605450A / Joint Air-to-Ground Missile (JAGM)	Project (Number/Name) JA6 / Joint Air-To-Ground Missile (JAGM)		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020	FY 2021
<p>FY 2020 Plans: The JAGM Product Office and OGAs conducted government software testing as well as review and analysis of objective Army platforms. Software testing included risk mitigation against emerging threats. The JAGM Product Office and OGAs performed technical assessments, concept studies, prepared documentation, and performed risk reduction efforts.</p> <p>FY 2021 Plans: The JAGM Product Office and OGAs will continue government software testing as well as review and analysis of objective Army platforms. The JAGM Product Office will address emerging threats via risk mitigation software testing and stand off capability to increase platform and crew survivability. The JAGM Product Office and OGAs will perform technical assessments, concept studies, prepare documentation, and perform risk reduction efforts.</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: Funding increase from FY 2020 to FY 2021 due to risk mitigation against counter measure/emerging threats and analysis of objective platforms.</p>				
<p>Title: Captive Air Training Missile (CATM) Development</p> <p>Description: The CATM is used for captive flight training and for qualification of aircrews to employ tactical missiles in combat. The JAGM Product Office will develop an inert missile configuration that will meet training needs.</p> <p>FY 2020 Plans: The JAGM Product Office and prime contractor initiated JAGM CATM development. The prime contractor developed CATM hardware and software.</p> <p>FY 2021 Plans: The JAGM Product Office and prime contractor will continue JAGM CATM development. The prime contractor will develop CATM hardware and software.</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: Funding increase from FY20 to FY21 due to continued CATM Development.</p>		-	1.645	1.997
<p>Title: CATM Testing</p> <p>Description: The JAGM Product Office and OGAs will continue development testing and qualification of the JAGM CATM; achieve air worthiness on threshold platforms.</p> <p>FY 2021 Plans:</p>		-	-	3.105

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
The JAGM Product Office and OGAs will continue Test and Evaluation and develop documentation for Air Worthiness Release. Test and Evaluation will verify AH-64E Software Integration through captive carry and environmental testing. FY 2020 to FY 2021 Increase/Decrease Statement: Funding increase from FY 2020 to FY 2021 due to the CATM testing.			
Title: FY 2020 SBIR/STTR Transfer Description: Funding transferred in accordance with Title 15 USC ?638 FY 2020 Plans: Funding transferred in accordance with Title 15 USC ?638 FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638	-	0.300	-
Accomplishments/Planned Programs Subtotals	12.440	6.585	8.891

C. 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>
• C70302: Joint Air-to-Ground MSLS (JAGM)	256.462	199.295	213.397	-	213.397	165.494	213.375	208.607	206.140	0.000	1,462.770
• NAVY - 0605450M: Navy JAGM Missile RDT&E	16.031	18.393	12.806	-	12.806	0.317	0.325	0.334	0.341	Continuing	Continuing
• NAVY - 0206138M: Navy JAGM Missile Procurement	24.109	90.966	49.431	-	49.431	50.418	76.246	77.770	-	Continuing	Continuing
• AF - 0201109F: Air Force Missile Procurement	-	15.000	0.000	-	0.000	-	-	-	-	0.000	15.000

Remarks

D. Acquisition Strategy

The JAGM Production and Deployment (PD) Acquisition Strategy (AS) was approved at Milestone C on 15 June 2018. Three Low-Rate Initial Production (LRIP) contract options were awarded in August, September, and December 2018. Initial Operational Capability (IOC) of 96 missiles and was achieved in March 2019. Initial Operational Testing was completed in May 2019. Full Rate Production Decision Review is scheduled for May 2020.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army												Date: February 2020			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0605450A / Joint Air-to-Ground Missile (JAGM)				JA6 / Joint Air-To-Ground Missile (JAGM)							
Management Services (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
System Eng/ Project Management	C/LH	Various : Performers	84.527	0.404	Oct 2018	0.450	Nov 2019	-		-		-	Continuing	Continuing	Continuing
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.300		-		-		-	0.000	0.300	-
Subtotal			84.527	0.404		0.750		-		-		-	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
Technology Development Prime Contract	C/FFP	TD : Prime Contract	371.319	-		-		-		-		-	0.000	371.319	-
Rocket Motor Insensitive Munition (IM) Qualification	C/CPFF	Defense Ordnance Technology Consortium (DOTC) : Picatinny Arsenal, NJ	39.731	-		-		-		-		-	0.000	39.731	-
Electro-Mechanical Control Actuator System (EMCAS)	C/CPFF	Defense Ordnance Technology Consortium (DOTC) : Picatinny Arsenal, NJ	4.033	-		-		-		-		-	0.000	4.033	-
Integrated Warhead	C/CPFF	Defense Ordnance Technology Consortium (DOTC) : Picatinny Arsenal, NJ	2.982	-		-		-		-		-	0.000	2.982	-
EMD Long Lead Contract (Backends)	SS/FFP	Lockheed Martin : Orlando, FL	8.082	-		-		-		-		-	0.000	8.082	-
Development Engineering	C/LH	Various : Performers	21.648	-		-		-		-		-	0.000	21.648	-
EMD Prime Contract	C/FPIF	Lockheed Martin : Orlando, Florida	70.256	-		-		-		-		-	0.000	70.256	-
Apache Indefinite Delivery/ Indefinite Quantity (IDIQ) Contract	C/CPFF	Boeing Company : Mesa, AZ	16.475	2.625		-		-		-		-	0.000	19.100	-

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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			
JAGM Engineering Services	SS/CPFF	Lockheed Martin : Orlando, FL	-	-		3.364	Mar 2020	5.477	Mar 2021	-		5.477	0.000	8.841	Continuing
Subtotal			534.526	2.625		3.364		5.477		-		5.477	0.000	545.992	N/A

Remarks
 (C / FFP) - Competitive/Firm Fixed Price
 (C / CPFF) - Competitive/Cost-Plus Fixed Fee
 (C / LH) - Competitive/Labor Hour
 (SS / FFP) - Sole Source/Firm Fixed Price
 (C / FPIF) - Competitive/Fixed Price Incentive (Firm Target)

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			
Other Gov Agencies	C/LH	Various : Performers	121.477	9.411	Nov 2018	2.471	Nov 2019	3.414	Nov 2020	-		3.414	0.000	136.773	Continuing
Subtotal			121.477	9.411		2.471		3.414		-		3.414	0.000	136.773	N/A

Project Cost Totals	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
	740.530	12.440		6.585		8.891	-	8.891	Continuing

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
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Event Name	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
IOC		▲ 1																										
IOT&E		▲ 2																										
Full Rate Production (FRP) Decision							▲ 3																					
CATM Development																												
CATM Testing																												
Tech Assessments (HW and SW) Against Emerging Threats																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605450A / <i>Joint Air-to-Ground Missile (JAGM)</i>	Project (Number/Name) JA6 / <i>Joint Air-To-Ground Missile (JAGM)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
EMD	4	2015	3	2018
Army System & Integration Testing	4	2015	3	2018
Limited User Testing (LUT)	2	2018	2	2018
MS C Decision	3	2018	3	2018
IOC	2	2019	2	2019
IOT&E	3	2019	3	2019
Full Rate Production (FRP) Decision	3	2020	3	2020
CATM Development	1	2020	1	2022
CATM Testing	1	2021	3	2022
Tech Assessments (HW and SW) Against Emerging Threats	1	2019	4	2039

Note

MS: Milestone
 IOC: Initial Operational Capability
 IOT&E: Initial Operational Test & Evaluation
 CATM: Captive Air Training Missile
 HW: Hardware
 SW: Software