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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army **Date:** March 2023

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0607142A / Aviation Rocket System Product Improvement and Development							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	0.000	8.831	11.312	3.014	0.000	3.014	0.000	0.000	0.000	0.000	Continuing	Continuing
EW9: Aviation Rocket System Product Improvement and Dev	-	8.831	11.312	3.014	-	3.014	-	-	-	-	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Aviation Rockets and Small Guided Munitions Product Improvement and Development line funds the development, integration and test of current and future munitions and launchers, and their interface to platforms. Additionally, it will fund a range of improvement initiatives to modernize the Hydra-70 2.75 inch rocket and launcher system. The current Hydra-70 2.75 inch rocket system requires performance improvements to comply with 1) US Code - Title 10, Chapter 141, Section 2389 "Ensuring Safety regarding Insensitive Munitions", 2) Department of Defense (DoD) Directive 5000.1, Chairman of the Joint Chiefs of Staff (CJCS) Instruction 3170.01C, Under Secretary of Defense for Acquisition, Technology, and Logistics (OUSD (AT&L)) Memorandum of January 26, 1999, "Exemption for Existing Inventory Items to Insensitive Munitions (IM) Requirements", 3) signed Initial Capability Document (ICD) for Army Aviation Weapons, Sub-Systems and Munitions (AAWSSM), 4) Air Launched Effects (ALE) Initial Capability Refinement Document (ICRD) dated 21 October 2019, 5) Future Attack Reconnaissance Aircraft Abbreviated Capabilities Development Document (FARA A-CDD) dated 15 August 2022, and 6) existing/emerging Headquarters, Department of the Army (HQDA) G-3/5/7 and U.S. Army Training and Doctrine Command (TRADOC) aviation weapon requirements for guided and unguided rocket and munition systems. Improvements to existing rocket systems and munitions will include design, qualification and integration of precision guidance capability, increased lethality, improved target suppression, increased standoff range, reduced minimum engagement range, improved pre-launch constraints and munitions communications/programmability, increased stowed kills, increased product reliability, improved hardness against unplanned stimuli, reduced Warfighter workload, and reduced environmental impact for both manned and unmanned applications.

The Fiscal Year (FY) 2024 dollars in the amount of \$3.014 million will be used for technical assessments, risk reduction efforts, technology maturation, demonstration, engineering design, engineering/manufacturing development, testing, integration, and document preparation to support current and future Army Aviation manned and unmanned platforms and munitions.

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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0607142A / <i>Aviation Rocket System Product Improvement and Development</i>
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B. Program Change Summary (\$ in Millions)	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024 Base</u>	<u>FY 2024 OCO</u>	<u>FY 2024 Total</u>
Previous President's Budget	12.417	11.312	3.078	-	3.078
Current President's Budget	8.831	11.312	3.014	-	3.014
Total Adjustments	-3.586	0.000	-0.064	-	-0.064
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-3.586	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-0.064	-	-0.064

Change Summary Explanation
Decreased funding to support higher Army priorities.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Army										Date: March 2023		
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0607142A / Aviation Rocket System Product Improvement and Development				Project (Number/Name) EW9 / Aviation Rocket System Product Improvement and Dev			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
EW9: Aviation Rocket System Product Improvement and Dev	-	8.831	11.312	3.014	-	3.014	-	-	-	-	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Aviation Rockets and Small Guided Munitions Product Improvement and Development line funds the development, integration and test of current and future munitions and launchers, and their interface to platforms. Additionally, it will fund a range of improvement initiatives to modernize the Hydra-70 2.75 inch rocket and launcher system. The current Hydra-70 2.75 inch rocket system requires performance improvements to comply with 1) US Code - Title 10, Chapter 141, Section 2389 "Ensuring Safety regarding Insensitive Munitions", 2) Department of Defense (DoD) Directive 5000.1, Chairman of the Joint Chiefs of Staff (CJCS) Instruction 3170.01C, Under Secretary of Defense for Acquisition, Technology, and Logistics (OUSD (AT&L)) Memorandum of January 26, 1999, "Exemption for Existing Inventory Items to Insensitive Munitions (IM) Requirements", 3) signed Initial Capability Document (ICD) for Army Aviation Weapons, Sub-Systems and Munitions (AAWSSM), 4) Air Launched Effects (ALE) Initial Capability Refinement Document (ICRD) dated 21 October 2019, 5) Future Attack Reconnaissance Aircraft Abbreviated Capabilities Development Document (FARA A-CDD) dated 15 August 2022, and 6) existing/emerging Headquarters, Department of the Army (HQDA) G-3/5/7 and U.S. Army Training and Doctrine Command (TRADOC) aviation weapon requirements for guided and unguided rocket and munition systems. Improvements to existing rocket systems and munitions will include design, qualification and integration of precision guidance capability, increased lethality, improved target suppression, increased standoff range, reduced minimum engagement range, improved pre-launch constraints and munitions communications/programmability, increased stowed kills, increased product reliability, improved hardness against unplanned stimuli, reduced Warfighter workload, and reduced environmental impact for both manned and unmanned applications.

The Fiscal Year (FY) 2024 dollars in the amount of \$3.014 million will be used for technical assessments, risk reduction efforts, technology maturation, demonstration, engineering design, engineering/manufacturing development, testing, integration, and document preparation to support current and future Army Aviation manned and unmanned platforms and munitions.

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

	FY 2022	FY 2023	FY 2024
Title: Guided Air-to-Ground Rocket (AGR) variants (Advanced Precision Kill Weapon System (APKWS))	1.192	1.044	1.064
Description: These funds will be used to optimize current and future air-to ground variant integration on the Apache and for activities required to obtain an Army Materiel Release. This effort will utilize in-house expertise and Other Government Agencies in order to complete activities, including design and build of all-up-round (AUR) containers and test assets, conduct of environmental qualification testing, performance of ground firings, update of aviation platform software, support of Apache weapon survey firings, technical support to platform integration and testing, and development and revision of training/maintenance materiel.			
FY 2023 Plans:			

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
<p>Continue characterization of performance changes/improvements of single software variant block upgrade of guided rockets and qualify for use on Army Aviation platforms.</p> <p>FY 2024 Plans: Complete characterization of performance changes/improvements of single variant block upgrade (SVBU) guided rockets and qualification for use on Army Aviation platforms will be conducted.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: No significant increase.</p>				
<p>Title: Army Aviation Weapons</p> <p>Description: These funds will be used for fielded Army Aviation modular weapon systems and their interface to fielded launchers and platforms. These efforts will utilize in-house subject matter expertise, Other Government Agencies, defense industry capabilities, and Other Transactional Agreements to complete activities, including technical assessment, risk reduction efforts, technology maturation, demonstration, engineering design, engineering/manufacturing development, test, integration and document preparation for Army Aviation manned and unmanned platforms.</p> <p>FY 2023 Plans:</p> <ol style="list-style-type: none"> 1. Continue analysis, engineering design, and demonstration of propulsion, sensor, datalink and navigation technologies that will enable future munitions to meet requirements of the Army Aviation Weapons, Sub-Systems and Munitions Initial Capability Document and the Army Aviation Muniton Strategy. 2. Continue studies, assessments, risk reduction effort and documentation to determine feasibility of the adaptation of future guided and unguided munition technologies. 3. Proceed from launcher concept development to prototype development, integration, and testing phase with future and enduring munitions. <p>FY 2024 Plans:</p> <ol style="list-style-type: none"> 1. Continue analysis, engineering design, and demonstration of warhead, fuze, propulsion, sensor, datalink and navigation technologies that will enable future munitions to meet requirements of the Army Aviation Weapons, Sub-Systems and Munitions Initial Capability Document and the Army Aviation Muniton Strategy. 2. Continue modeling and simulation, studies, assessments, risk reduction effort and documentation to determine feasibility of the adaptation of future guided and unguided munition technologies. 3. Continue launcher concept development to prototype development, integration, and testing phase with future and enduring munitions. <p>FY 2023 to FY 2024 Increase/Decrease Statement:</p>		4.745	7.018	1.467

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Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607142A / Aviation Rocket System Product Improvement and Development	Project (Number/Name) EW9 / Aviation Rocket System Product Improvement and Dev
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Decrease due to completion of efforts for technology and concept maturation supporting Army Aviation Munition Strategy.			
Title: Modular Effects Launcher (MEL)/Launcher Electronics Assembly (LEA)	2.894	2.837	0.483
Description: These funds will be used to upgrade and enhance launcher components to support current and future munitions outlined in the Army Aviation Weapons, Sub-Systems and Munitions Initial Capability Document, dated 17 July 2018, the Air Launched Effects (ALE) Initial Capability Refinement Document (ICRD) dated 21 October 2019, and the Future Attack Reconnaissance Aircraft Abbreviated Capabilities Development Document (FARA A-CDD) dated 15 August 2022. This effort allows the Government to align technology-enabling solutions with the Army Aviation Weapons, Sub-Systems and Munitions Initial Capability Document, maturing technological developments of launcher component prototypes to mitigate launcher limitations. The launcher component efforts will define and provide the interfaces between aircraft and emerging munitions utilizing a nonproprietary, open systems architecture allowing easy compatibility when integrating onto aviation platforms. The inherent flexibility of an open architecture serves as a building block for future weapon systems.			
FY 2023 Plans: 1. Complete launcher technologies architecture design, and structure concept development. 2. Complete technical assessments and concept studies to inform capabilities against evolving threats.			
FY 2024 Plans: Integrate enduring munitions with the emerging launcher technology.			
FY 2023 to FY 2024 Increase/Decrease Statement: Decrease due to completion of launcher technology development.			
Title: SBIR/STTR Transfer	-	0.413	-
FY 2023 Plans: Funding transferred in accordance with Title 15 USC §638			
FY 2023 to FY 2024 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC §638			
Accomplishments/Planned Programs Subtotals	8.831	11.312	3.014

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• E37300: Rocket, Hydra 70, All Types	117.536	171.697	87.293	-	87.293	71.429	93.758	74.619	74.619	Continuing	Continuing

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

<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u> <u>Base</u>	<u>FY 2024</u> <u>OCO</u>	<u>FY 2024</u> <u>Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
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Remarks

E37300 procures guided and unguided Hydra Rockets

D. Acquisition Strategy

The Acquisition Strategy utilizes in-house expertise, Other Government Agencies, defense industry capabilities, and when appropriate Other Transactional Agreements. The strategy allows the Government the ability to support urgent operational needs and unanticipated requirements, which require immediate and expert attention.

This strategy will allow the Government to maintain the relevance of the Hydra-70 all-up-round rocket, its variants, and Small Guided Munitions, and posture for emerging requirements and capabilities, while leveraging new authorities and progressing as many technologies as funding allows.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 7				PE 0607142A / Aviation Rocket System Product Improvement and Development				EW9 / Aviation Rocket System Product Improvement and Dev							
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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 Engineering/Project Management	Various	Various : Performers	10.781	2.499	Nov 2021	1.562	Nov 2022	0.464	Nov 2023	-		0.464	Continuing	Continuing	-
SBIR/STTR Transfer	C/TBD	Various : Various	-	-		0.413	Apr 2023	-		-		-	Continuing	Continuing	-
Subtotal			10.781	2.499		1.975		0.464		-		0.464	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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
Advanced Precision Kill Weapon System (APKWS)	MIPR	CCDC : Redstone Arsenal, AL	1.793	1.005	Feb 2022	0.894	Apr 2023	0.708	Apr 2024	-		0.708	0.000	4.400	-
Army Aviation Weapons	MIPR	Various : Various Performers	12.382	0.402	Dec 2021	5.002	Mar 2023	0.961	Mar 2024	-		0.961	Continuing	Continuing	-
Modular Effects Launcher (MEL)/Launcher Electronics Assembly (LEA)	MIPR	CCDC : Redstone Arsenal, AL	8.595	2.075	Mar 2022	2.431	Mar 2023	0.404	Mar 2024	-		0.404	Continuing	Continuing	-
Subtotal			22.770	3.482		8.327		2.073		-		2.073	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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
Research Studies	MIPR	CCDC : Redstone Arsenal, AL	2.076	2.850	Jan 2022	1.010	Apr 2023	0.477	Jan 2024	-		0.477	Continuing	Continuing	-
Subtotal			2.076	2.850		1.010		0.477		-		0.477	Continuing	Continuing	N/A
Project Cost Totals			35.627	8.831		11.312		3.014		-		3.014	Continuing	Continuing	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607142A / Aviation Rocket System Product Improvement and Development	Project (Number/Name) EW9 / Aviation Rocket System Product Improvement and Dev

Event Name	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	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
APKWS - AH-64E Fire Control Optimization	██████████																											
APKWS - SVBU Performance Characterization / Fire Control...	██																											
Technology Analysis, Development, and Improvement in sup...	██																											
AAWSSM Munitions Technologies and Capabilities Studies									▲ 1																			
AAWSSM Launcher Risk Mitigation Demo												▲ 2																

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607142A / Aviation Rocket System Product Improvement and Development	Project (Number/Name) EW9 / Aviation Rocket System Product Improvement and Dev

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
APKWS - AH-64E Fire Control Optimization	3	2021	2	2022
APKWS - SVBU Performance Characterization / Fire Control Optimization	3	2021	3	2024
Technology Analysis, Development, and Improvement in support of AAWSSM ICD	2	2019	1	2025
AAWSSM Munitions Technologies and Capabilities Studies	1	2024	1	2024
AAWSSM Launcher Risk Mitigation Demo	3	2024	3	2024

Note
 APKWS: Advanced Precision Kill Weapon System
 AAWSSM ICD: Army Aviation Weapons, Sub-Systems and Munitions Initial Capability Document
 SVBU: Single Variant Block Upgrade