

UNCLASSIFIED

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0605051A / <i>Aircraft Survivability Development</i>
--	---

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	-	60.127	19.123	24.900	-	24.900	13.107	14.576	15.454	16.681	0.000	163.968
ER7: <i>Aircraft Survivability Equipment Development</i>	-	36.930	12.083	15.177	-	15.177	7.890	9.751	10.578	11.750	0.000	104.159
ER8: <i>Common Missile Warning System (CMWS)</i>	-	23.197	7.040	9.723	-	9.723	5.217	4.825	4.876	4.931	0.000	59.809

A. Mission Description and Budget Item Justification

This funding line is a key enabler of the Army Modernization Priorities in support of the Aircraft Survivability Equipment (ASE) as well as the Future Vertical Lift (FVL) Future Attack Reconnaissance Aircraft (FARA) and Future Long-Range Assault Aircraft (FLRAA) platforms. The Aircraft Survivability Development program includes Projects titled Aircraft Survivability Equipment Development (ER7) and Common Missile Warning System (CMWS) (ER8). This program also includes funding for Joint Urgent Operational Needs Statement (JUONS) SO-0010 Phase 2a, Headquarters Department of the Army (HQDA) Directed Requirement for Advanced Threat Warner (ATW) portion of Phase 3 ATW/Common Infrared Countermeasures Quick Reaction Capability (ATW/CIRCM QRC), and Limited Interim Missile Warning System Quick Reaction Capability (LIMWS QRC).

ER7: Aircraft Survivability Development.

The objective of the ASE Development project is to improve Radio Frequency (RF) ASE for Army Aviation. APR-39 Radar Warning Receiver (RWR) detects, categorizes, and prioritizes RF emitters and provides a visual / aural alert to aircrew members warning them of targeting by RF-guided weapons. The Milestone Decision Authority (MDA) approved Phases 1 and 2 of a 3-phased path forward.

Phase 1, APR-39C(V)1/4, serves as an obsolescence / sustainment upgrade to the Processor Line Replaceable Unit (LRU) for AN/APR-39A(V) RWR implemented to ensure that the currently fielded system remains viable until affordable improved RF ASE capability can be pursued in Phases 2 and 3.

Phase 2A is RWR Modernization begins by adopting the United States Navy APR-39D(V)2 system. APR-39D(V)2 will significantly improve the RF threat coverage, automatic detection and identification of threat types, bearing, and lethality. Phase 2B, the APR-39E(V)2, Modernized Radar Warning Receiver (MRWR), is an Army Engineering Change Proposal (ECP) to APR-39D(V)2, approved in the Acquisition Decision Memorandum (ADM) signed June 24, 2019. This ECP will implement enhanced hardware and software upgrades to keep APR-39 technically relevant against new and emerging agile threats. APR-39E(V)2 is part of the suite of ASE mission equipment for the FVL platforms.

Phase 3 adds active Radio Frequency Electronic Countermeasures (RF-ECM) capability for selected aircraft with Material Development Decision (MDD) planned in the future.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0605051A / <i>Aircraft Survivability Development</i>	
Justification: FY 2024 Base RDT&E funding of \$15.177 million supports APR-39E(V)2 Hardware and Software System Development, Systems Engineering and Program Management (SEPM), Limited User Testing (LUT), Government Environmental and EMI Qualification Testing.		
ER8: Common Missile Warning System (CMWS). The CMWS program is a missile warning system that cues both flare and laser-based countermeasures to defeat incoming Infrared (IR)-seeking missiles and will alert aircrews to the presence of certain incoming munitions. The B-Kit consists of the components which perform the missile detection and aircrew notification, munitions detection and aircrew notification, false alarm rejection, and countermeasure employment/cueing functions of the system. The CMWS Electronic Control Unit (ECU) receives ultraviolet (UV) missile detection data from Electro-Optic Missile Sensors (EOMS), which detect UV signals, and sends a missile alert signal to warn aircrews via on-board avionics. Tier 1 threat missiles detected and tracked by CMWS are subsequently defeated by a combination of missile seeker countermeasures, including decoy flares and IR Laser Jamming (currently Common Infrared Countermeasures (CIRCM) -multiple platforms and Advanced Threat Infrared Countermeasures (ATIRCM)-equipped CH-47 platform only). In addition CMWS ECU receives from the EOMS munitions detection data which it also passes to the aircrew through aural and visual alerts. The aircrew then applies the appropriate Tactics, Techniques and Procedures (TTPs) to break contact or engage the enemy with own-ship ordnance. CMWS Generation 3 (Gen 3) ECU in conjunction with ongoing software development efforts will address outstanding materiel release conditions and ensure protection against emerging IR-guided missile threats. Due to evolving threats, CMWS will remain in the Army inventory beyond 2040 and must remain relevant against emerging threats.		
The A-Kit for CMWS includes mounting hardware, wiring harnesses, cables, and other components necessary to install and interface the mission kit on host aircraft. The A-Kit ensures the mission kit is functionally and physically operational with a specific host aircraft type.		
As a part of Phase 2a of the JUONS (SO-0010) program, the Army integrated the Department of the Navy Large Aircraft Infrared Countermeasure (DoN LAIRCM) system onto the Army and Special Operations Aircraft platforms. Due to a number of challenges, circumstances, and variables, the Army updated the Advanced Threat Warning/CIRCM QRC and LIMWS Directed Requirements (dated November 16, 2018). The updated requirements extend the utilization of ATW DoN LAIRCM on conventional Army aircraft and cancel the need for the ATW/CIRCM QRC system for the conventional Army. (It should be noted that the updated requirement maintains the need for ATW/CIRCM on the Special Operations Aircraft. Sustainment of ATW on Special Operations Aircraft will transfer to Special Operations Aircraft budget line in FY23). As a result, the Army did not acquire the ATW sensors for use in Phase 3 of the JUONS effort. Instead, the Army accelerated the procurement of the CIRCM QRC systems for use with the currently fielded CMWS in preparation for transition to the LIMWS system.		
LIMWS QRC addresses the HQDA Directed Requirement to provide a greater capability than CMWS, the current Program of Record (POR), to bridge the gap between CMWS and the future POR. LIMWS is required to provide increased detection range, improved detection in clutter, more agile algorithms to rapidly respond to emerging threats, and eliminates the need for sensor alignments. To maintain overmatch of quickly emerging threat technology and tactics, LIMWS will explore and develop system modifications and performance improvements.		
Justification:		

UNCLASSIFIED

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0605051A / <i>Aircraft Survivability Development</i>
--	---

CMWS: FY 2024 Base RDTE dollars in the amount of \$7.875 million will fund Future Sensor and Algorithm Analysis, Threat and Vulnerability Analysis, Systems Engineering and Program Management (SEPM), Model Based Systems Engineering (MBSE), Aviation Artificial Intelligence (AI) Training Environment effort, and Future Vertical Lift (FVL).

LIMWS: FY 2024 Base RDTE dollars in the amount of \$1.848 million fund USG SEPM and Threat Analysis and Algorithm Concepts.

- References:
- Joint Staff, J-8 Deputy Director for Requirements (DOR) memorandum, April 24, 2015
 - Phase 2a SOCOM JUONs SO-0010, Joint Rapid Acquisition Cell (JRAC) memorandum, May 29, 2015
 - Directed Requirement for the Phase 3 Advanced Threat Warner and Common Infrared Countermeasure Quick Reaction Capability (ATW/CIRCM QRC) to Support Joint Urgent Operational Need (JUON) SO-0010, CIRCM Critical Intelligence Parameters Breach, December 18, 2015
 - Directed Requirement for Limited Interim Missile Warning System to Detect Enemy Man Portable Air Defense Systems, March 26, 2017
 - Update to the Directed Requirement for the United States Special Operations Command Joint Urgent Operational Needs SO-0010 Threat Detection and Countermeasures to Enemy Man Portable Air Defense System Capability, November 16, 2018
 - Directed Requirement for Limited Interim Missile Warning System to Detect Enemy Man Portable Air Defense Systems, November 16, 2018
 - Aircraft Survivability Equipment (ASE) Modernization Fielding Guidance, Change 1, November 19, 2018
 - Acquisition Decision Memorandum (ADM) for Radio Frequency (RF) Project Manager Aircraft Survivability Equipment (PM ASE) Engineering Change Proposal (ECP) for Radar Warning Receiver AN/APR39-D(V)2 to AN/APR39-E(V)2, June 24, 2019 by PEO IEW&S.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	61.768	19.123	16.610	-	16.610
Current President's Budget	60.127	19.123	24.900	-	24.900
Total Adjustments	-1.641	0.000	8.290	-	8.290
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-1.641	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	8.290	-	8.290

Change Summary Explanation

The increase of \$8.290 million in FY 2024 Base funding is due to a combination of the following: An increase in ER7 Base funding of \$6.713 million, an increase in ER8 Base funding of \$1.848 million for LIMWS QRC, and a decrease of ER8 Base funding of \$0.271 for CMWS.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2024 Army										Date: March 2023		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605051A / Aircraft Survivability Development				Project (Number/Name) ER7 / Aircraft Survivability Equipment 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
ER7: Aircraft Survivability Equipment Development	-	36.930	12.083	15.177	-	15.177	7.890	9.751	10.578	11.750	0.000	104.159
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This funding line is a key enabler of the Army Modernization Priorities in support of FVL FARA and FLRAA platforms.

The objective of the ASE Development project is to improve RF ASE for Army aviation. APR-39 RWR detects, categorizes, and prioritizes RF emitters and provides a visual / aural alert to aircrew members warning them of targeting by RF-guided weapons. The MDA approved Phases 1 and 2 of a 3-phased path forward.

Phase 1, APR-39C(V)1/4, serves as an obsolescence / sustainment upgrade to the Processor LRU of APR-39A(V) RWR implemented to ensure that the currently fielded system remains viable until affordable improved RF ASE capability can be pursued in Phases 2 and 3.

Phase 2A is RWR Modernization begins by adopting the United States Navy APR-39D(V)2 system. APR-39D(V)2 will significantly improve the RF threat coverage, automatic detection and identification of threat types, bearing, and lethality. Phase 2B, the APR-39E(V)2, MRWR, is an Army ECP to APR-39D(V)2, approved in the ADM signed June 24, 2019. This ECP will implement enhanced hardware and software upgrades to keep APR-39 technically relevant against new and emerging agile threats. APR-39E(V)2 is part of the suite of ASE mission equipment for the FVL platforms.

Phase 3 adds active RF-ECM capability for selected aircraft with MDD planned in the future.

Justification: FY 2024 Base RDT&E funding of \$15.177 million supports APR-39E(V)2 Hardware and Software System Development, Systems Engineering and Program Management (SEPM), Limited User Testing (LUT), Government Environmental and EMI Qualification Testing.

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

	FY 2022	FY 2023	FY 2024
Title: Phase 2 Radio Frequency Countermeasure (CM)	36.930	11.642	15.177
Description: Phase 2A is RWR Modernization begins by adopting the United States Navy APR-39D(V)2 system. APR-39D(V)2 will significantly improve the RF threat coverage, automatic detection and identification of threat types, bearing, and lethality. Phase 2B, the APR-39E(V)2, MRWR, is an Army ECP to APR-39D(V)2, approved in the ADM signed June 24, 2019. This ECP will implement enhanced hardware and software upgrades to keep APR-39 technically relevant against new and emerging agile threats. APR-39E(V)2 is part of the suite of ASE mission equipment for the FVL platforms.			
FY 2023 Plans:			

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605051A / Aircraft Survivability Development	Project (Number/Name) ER7 / Aircraft Survivability Equipment Development
--	--	--

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>Will fund APR-39E(V)2 hardware and software system development, systems engineering and program management, initial system government qualification and performance testing. Supports preliminary analysis for integration of ASE systems on FVL FARA and FLRAA platforms.</p> <p>FY 2024 Plans: Will fund APR-39E(V)2 Hardware and Software System Development, Systems Engineering and Program Management (SEPM), Limit User Testing (LUT), Government Environmental and EMI Qualification Testing.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: The increase is required to complete software and hardware development, engineering support, DT/OT and government testing.</p> <p>Title: SBIR/STTR Transfer</p> <p>Description: : Funding transferred in accordance with Title 15 USC §638.</p> <p>FY 2023 Plans: : Funding transferred in accordance with Title 15 USC §638.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: : Funding transferred in accordance with Title 15 USC §638.</p>	-	0.441	-
Accomplishments/Planned Programs Subtotals	36.930	12.083	15.177

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>
• AZ3511: Radio Frequency CM	54.841	158.883	146.016	-	146.016	120.698	114.510	120.583	102.607	3,257.349	4,075.487

Remarks

D. Acquisition Strategy
 Army RF ASE is managed by Project Manager (PM) ASE for development, testing, procurement, integration and installation on Army rotary wing and fixed wing Special Electronic Mission Aircraft (SEMA) aviation platforms. PM ASE proposed a three-phased path forward commensurate with user priorities and affordability considerations. The MDA approved Phases 1 and 2 of a 3-phased path forward.

Phase 1, APR-39C(V)1/4, serves as an obsolescence / sustainment upgrade to the Processor LRU of APR-39A(V) RWR implemented to ensure that the currently fielded system remains viable until affordable improved RF ASE capability can be pursued in Phases 2 and 3.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605051A / <i>Aircraft Survivability Development</i>	Project (Number/Name) ER7 / <i>Aircraft Survivability Equipment Development</i>
<p>Phase 2A is RWR Modernization begins by adopting the United States Navy APR-39D(V)2 system. APR-39D(V)2 will significantly improve the RF threat coverage, automatic detection and identification of threat types, bearing, and lethality. Phase 2B, the APR-39E(V)2, MRWR, is an Army ECP to APR-39D(V)2, approved in the ADM signed June 24, 2019. This ECP will implement enhanced hardware and software upgrades to keep APR-39 technically relevant against new and emerging agile threats. APR-39E(V)2 is part of the suite of ASE mission equipment for the FVL platforms.</p> <p>Phase 3 adds active RF-ECM capability for selected aircraft with MDD planned in the future.</p>		

UNCLASSIFIED

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 / 5				PE 0605051A / Aircraft Survivability Development				ER7 / Aircraft Survivability Equipment Development								
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	
Threat Management/SEPM	Various	Various : -	12.434	1.910	Nov 2021	1.167	Nov 2022	1.120	Nov 2023	-		1.120	Continuing	Continuing	-	
SBIR/STTR	Various	Various : -	-	-		0.441		-		-		-	0.000	0.441	-	
Subtotal			12.434	1.910		1.608		1.120		-		1.120	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	
APR-39E(V)2 SW & HW Development	Various	OGA : Aberdeen Proving Grounds, MD	114.861	18.400	Oct 2021	5.332	Oct 2022	9.807	Oct 2023	-		9.807	Continuing	Continuing	-	
Subtotal			114.861	18.400		5.332		9.807		-		9.807	Continuing	Continuing	N/A	
Test and Evaluation (\$ 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	
DT/OT	Various	Various : -	3.439	6.140	Mar 2022	3.001	Mar 2023	3.750	Mar 2024	-		3.750	Continuing	Continuing	-	
Government System Test and Evaluation	Various	Various : -	26.263	10.480	Oct 2021	2.142	Oct 2022	0.500	Oct 2023	-		0.500	Continuing	Continuing	-	
Subtotal			29.702	16.620		5.143		4.250		-		4.250	Continuing	Continuing	N/A	
Project Cost Totals			156.997	36.930		12.083		15.177		-		15.177	Continuing	Continuing	N/A	
Remarks																

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605051A / Aircraft Survivability Development	Project (Number/Name) ER7 / Aircraft Survivability Equipment Development

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Threat Vulnerability Analysis//SIL Updates	3	2016	4	2017
Phase 2B APR-39E(V)2 Software and Hardware Development	2	2018	4	2024
Phase 2B APR-39E(V)2 Government System Test and Evaluation	3	2021	2	2024
Phase 2B APR-39E(V)2 DT/OT	2	2022	2	2024
Phase 2B APR-39E(V)2 Platform Integration	2	2020	4	2023
Threat Management	4	2020	4	2027

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2024 Army										Date: March 2023		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605051A / Aircraft Survivability Development				Project (Number/Name) ER8 / Common Missile Warning System (CMWS)			
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
ER8: Common Missile Warning System (CMWS)	-	23.197	7.040	9.723	-	9.723	5.217	4.825	4.876	4.931	0.000	59.809
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Common Missile Warning System (CMWS) program is a missile warning system that cues both flare and laser-based countermeasures to defeat incoming Infrared (IR) seeking missiles and will alert aircrews to the presence of certain incoming munitions. The B-Kit consists of the components which perform the missile detection and aircrew notification, munitions detection and aircrew notification, false alarm rejection, and countermeasure employment/cueing functions of the system. The CMWS Electronic Control Unit (ECU) receives ultraviolet (UV) missile detection data from Electro-Optic Missile Sensors (EOMS), which detect UV signals, and sends a missile alert signal to warn aircrews via on-board avionics. Tier 1 threat missiles detected and tracked by the CMWS are subsequently defeated by a combination of missile seeker countermeasures, including decoy flares and IR Laser Jamming (currently Common Infrared Countermeasures (CIRCM) and Advanced Threat Infrared Countermeasures (ATIRCM) equipped CH-47 platform only). In addition, the CMWS ECU receives from the EOMS munitions detection data which it also passes to the aircrew through aural and visual alerts. The aircrew then applies the appropriate Tactics, Techniques and Procedures (TTPs) to break contact or engage the enemy with own-ship ordnance. The CMWS Generation 3 (Gen 3) ECU in conjunction with ongoing software development efforts will address outstanding materiel release conditions and ensure protection against emerging IR-guided missile threats. Due to evolving threats, CMWS will remain in the Army inventory beyond 2040 and must remain relevant against emerging threats.

The A-Kit for CMWS includes mounting hardware, wiring harnesses, cables, and other components necessary to install and interface the mission kit on host aircraft. The A-Kit ensures the mission kit is functionally and physically operational with a specific host aircraft type.

As a part of Phase 2a of the Joint Urgent Operational Needs Statement (JUONS) (SO-0010) program, the Army integrated the DoN LAIRCM system onto the Army and Special Operations Aircraft Platforms. Due to a number of challenges, circumstances, and variables, the Army updated the Advanced Threat Warning/CIRCM QRC and LIMWS Directed Requirements (dated November 16, 2018). The updated requirements extend the utilization of ATW DoN LAIRCM on conventional Army aircraft and cancel the need for the ATW/CIRCM QRC system for the conventional Army. (It should be noted that the updated requirement maintains the need for ATW/CIRCM on the Special Operations Aircraft. Sustainment of ATW on Special Operations Aircraft will transfer to Special Operations Aircraft budget line in FY23). As a result, the Army did not acquire the ATW sensors for use in Phase 3 of the JUONS effort. Instead, the Army accelerated the procurement of the CIRCM QRC systems for use with the currently fielded CMWS in preparation for transition to the LIMWS system.

Phase 4 Limited Interim Missile Warning System Quick Reaction Capability (LIMWS QRC) addresses the Headquarters Department of the Army (HQDA) Directed Requirement to provide a greater capability than CMWS, the current Program of Record (POR), to bridge the gap between CMWS and the future POR. LIMWS is required to provide increased detection range, improved detection in clutter, more agile algorithms to rapidly respond to emerging threats, and eliminates the need for sensor alignments. To maintain overmatch of quickly emerging threat technology and tactics, LIMWS will explore and develop system modifications and performance improvements.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2024 Army		Date: March 2023		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605051A / Aircraft Survivability Development	Project (Number/Name) ER8 / Common Missile Warning System (CMWS)		
<p>CMWS: FY 2024 Base Research Development Test and Evaluation (RDTE) dollars in the amount of \$7.875 million will fund Future Sensor and Algorithm Analysis, Threat and Vulnerability Analysis, Systems Engineering and Program Management (SEPM), Model Based Systems Engineering (MBSE), Aviation Artificial Intelligence (AI) Training Environment effort, and Future Vertical Lift (FVL).</p> <p>LIMWS: FY 2024 Base RDTE dollars in the amount of \$1.848 million fund United States Government (USG) SEPM and Threat Analysis and Algorithm Concepts.</p>				
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
<p>Title: CMWS Product Development and Management Services</p> <p>Description: Research Development Test and Evaluation (RDTE) funding supports continuing development engineering threat and vulnerability analysis, Systems Engineering and Program Management (SEPM), and integration with other ASE Systems.</p> <p>FY 2023 Plans: FY 2023 Base Research Development Test and Evaluation (RDTE) dollars in the amount of \$7.040 million will fund Future Sensor and Algorithm Analysis, Threat and Vulnerability Analysis, Systems Engineering and Program Management (SEPM), and Model Based System Engineering (MBSE).</p> <p>FY 2024 Plans: FY 2024 Base Research Development Test and Evaluation (RDTE) dollars in the amount of \$7.875 million will fund Future Sensor and Algorithm Analysis, Threat and Vulnerability Analysis, Systems Engineering and Program Management (SEPM), Model Based System Engineering (MBSE), Aviation Artificial Intelligence (AI) Training Environment effort, and Future Vertical Lift (FVL).</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: The increase is required to continue Future Sensor and Algorithm Analysis, Threat and Vulnerability Analysis, Systems Engineering and Program Management (SEPM), and Model Based System Engineering (MBSE), Aviation Artificial Intelligence (AI) Training Environment effort, and Future Vertical Lift (FVL).</p>		6.368	6.783	7.875
<p>Title: Phase 4 LIMWS QRC</p> <p>Description: Phase 4 Limited Interim Missile Warning System Quick Reaction Capability (LIMWS QRC) is a follow-on bridging solution to the Joint Urgent Operational Needs Statement (JUONS) SO-0010 to provide a greater capability than the current Program of Record (POR), Common Missile Warning System (CMWS), until the future Program of Record (POR) is available. LIMWS is a Chief of Staff of the Army approved Directed Requirement issued by Army G-8 on March 26, 2017. LIMWS QRC provides an enhanced missile warning system to detect emerging and evolving enemy Man Portable Air Defense Systems (MANPADS) threats.</p> <p>FY 2024 Plans:</p>		13.829	-	1.848

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605051A / Aircraft Survivability Development	Project (Number/Name) ER8 / Common Missile Warning System (CMWS)

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
FY 2024 Base Research Development Test and Evaluation (RDTE) dollars in the amount of \$1.848 million fund United States Government (USG) Systems Engineering and Program Management (SEPM) and Threat Analysis and Algorithm Concepts. FY 2023 to FY 2024 Increase/Decrease Statement: The increase is required to support hardware and software efforts for Special Operations Aircraft and software Threat Analysis and Algorithm efforts for Conventional Army Platforms and Special Operations Aircraft.			
Title: SBIR/STTR Transfer Description: Funding transferred in accordance with Title 15 USC §638. 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.	-	0.257	-
Title: Program Increase - Aviation Artificial Intelligence Virtual Training Environment	3.000	-	-
Accomplishments/Planned Programs Subtotals	23.197	7.040	9.723

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
• AZ3517: CMWS	148.570	107.112	72.041	-	72.041	5.216	14.253	14.305	14.276	706.012	1,081.785

Remarks

D. Acquisition Strategy
 CMWS: Procurement of US Government Common Missile Warning System (CMWS) A-Kit and B-Kits are complete. CMWS is managed as Mission Equipment for deploying units and fielded as directed by Headquarters Department of the Army (HQDA) G-3/5/7. The CMWS program will continue to be supported through a five year services-only Cost Plus Fixed Fee or Cost Plus Incentive Fee contract, with services which began on July 31, 2019.

Phase 2a JUONS DoN LAIRCM and Phase 3 CIRCM QRC: JUONS S0-0010 acquisition strategy includes aircraft prime contractor engineering support contracted to a Government test organization. Aircraft integration for JUONS will be handled through government operated organizations and industry partners.

Phase 4 Limited Interim Missile Warning System Quick Reaction Capability (LIMWS QRC): Acquisition strategy included a full and open competition for selection of prime vendor for development of B-Kits, development of A-Kits, and support testing for the lead program. Additional platform A-Kit development will be completed by government organizations, small business and industry partners.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605051A / <i>Aircraft Survivability Development</i>	Project (Number/Name) ER8 / <i>Common Missile Warning System (CMWS)</i>
<p>Threat and Vulnerability analysis efforts will be used to determine if an algorithm update is required to maintain missile warning threat overmatch and provide input to improve US Government authoritative threat modeling updates.</p> <p>Future Sensor and Algorithm Analysis development equally supports Man Portable Air Defense Systems (MANPADS) and Hostile Fire overmatch through evaluation of emerging sensor technologies and advances in algorithm techniques. This analysis identifies opportunities to optimize performance and modernize fielded systems in order to maintain relevance for the future.</p> <p>CMWS Systems Engineering and Program Management (SEPM) is necessary due to the nature of emerging and current threat(s). Threat(s) analyses include, when required, collaboration support with intelligence organizations, course of action planning, root cause investigations, threat and laboratory hardware maintenance, and lab tools upgrade to support specific performance analyses.</p> <p>Development of Model Based Systems Engineering (MBSE) models of CMWS and LIMWS will align to Program Executive Office Aviation (PEO AVN) system engineering models. Continued MBSE development supports improved performance, weight reduction and testing.</p>		

UNCLASSIFIED

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 / 5				PE 0605051A / Aircraft Survivability Development						ER8 / Common Missile Warning System (CMWS)					
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
CMWS Systems Engineering Program Management	Various	Various : PM ASE, HSV, AL	10.774	0.914	Jan 2022	0.857	Jan 2023	1.017	Jan 2023	-		1.017	Continuing	Continuing	Continuing
SBIR/STTR Transfer	Various	Various : Various	0.212	-		0.257		-		-		-	0.000	0.469	-
Subtotal			10.986	0.914		1.114		1.017		-		1.017	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
CMWS Future Sensor and Algorithm Analysis	Various	Various : Various	7.824	1.742	Mar 2022	2.491	Mar 2023	3.251	Mar 2023	-		3.251	0.000	15.308	-
JUONS SO-0010 Training	Various	Various : Various	0.200	3.000	Aug 2022	-		-		-		-	0.000	3.200	-
Limited Interim Missile Warning System (LIMWS) - Development Engineering	Various	Various : PM ASE, HSV, AL	211.827	7.234	Mar 2022	-		1.332	Mar 2023	-		1.332	Continuing	Continuing	Continuing
CMWS Threat and Vulnerability Analysis	Various	Various : Various	9.896	3.712	Mar 2022	3.435	Mar 2023	3.607	Mar 2023	-		3.607	Continuing	Continuing	Continuing
Subtotal			229.747	15.688		5.926		8.190		-		8.190	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
LIMWS - Contractor Support	Various	Various : PM ASE, HSV, AL	9.829	2.001	Jan 2022	-		-		-		-	0.000	11.830	-
Subtotal			9.829	2.001		-		-		-		-	0.000	11.830	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army												Date: March 2023				
Appropriation/Budget Activity 2040 / 5				R-1 Program Element (Number/Name) PE 0605051A / Aircraft Survivability Development				Project (Number/Name) ER8 / Common Missile Warning System (CMWS)								
Test and Evaluation (\$ 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	
LIMWS - Government Testing	Various	Various : PM ASE, HSV, AL	73.861	4.594	Mar 2022	-		0.516	Mar 2023	-		0.516	Continuing	Continuing	Continuing	
Subtotal			73.861	4.594		-		0.516		-		0.516	Continuing	Continuing	N/A	
			Prior Years	FY 2022	FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract		
Project Cost Totals			324.423	23.197	7.040		9.723		-		9.723	Continuing	Continuing	N/A		

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605051A / Aircraft Survivability Development	Project (Number/Name) ER8 / Common Missile Warning System (CMWS)

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
CMWS Threat and Vulnerability Analysis	[Redacted]																											
CMWS Future Sensor and Algorithm Analysis	[Redacted]																											
Phase 4 LIMWS QRC Development Engineering and Test	[Redacted]																											

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605051A / Aircraft Survivability Development	Project (Number/Name) ER8 / Common Missile Warning System (CMWS)

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
CMWS System Dev/Tier 2 and 3 Upgrades	2	2011	4	2019
CMWS Gen 3 Production	3	2012	4	2016
CMWS Threat Analysis Database (TAD)	2	2012	4	2019
CMWS Vulnerability Analysis and Assessment of Technology	2	2015	4	2019
CMWS Threat and Vulnerability Analysis	1	2020	4	2030
CMWS Future Sensor and Algorithm Analysis	1	2017	4	2030
Phase 3 ATW/CIRCM QRC Engineering, Integration, and Test	2	2016	1	2020
Phase 4 LIMWS QRC Development Engineering and Test	3	2017	4	2028