Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Army	Date: March 2024
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603327A *I Air and Missile Defense Systems Engineering*

COST ($ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	0.000	15.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
FG9: *Air and Missile Defense (AMD) Electronic Warfare*	-	15.000	-	-	-	-	-	-	-	-	Continuing	Continuing

Note

There is no requested funding for Project FG9: Air and Missile Defense (AMD) Electronic Warfare for FY 2025.

A. Mission Description and Budget Item Justification

Funding in this program supports Cyber and Electromagnetic Activities (CEMA) and Deep CEMA efforts to conduct realistic assessments of Army Integrated Fires performance, identify system vulnerabilities, and develop mitigations against threats across the Cyber and Electromagnetic spectrum. Army radars and sensors, integrated air and missile defense mission command and fire control, Radio Frequency (RF) data and voice networks, and Positioning, Navigation, and Timing (PNT) technology will be assessed against current and postulated threat systems and techniques. Potential solutions developed by the Army, other Services, and Defense agencies (for example Missile Defense Agency) to close identified gaps will be demonstrated and assessed in live and simulated CEMA environments. Assessment events will be conducted approximately every two years. Implementation of potential solutions will occur between events using system-specific funding. The proposed solutions will then be assessed at the next event after implementation.

Included in this line are funds to plan and execute periodic CEMA and Deep CEMA activities, in conjunction with Air and Missile Defense and Long-Range Cross Functional Teams to support the Army Integrated Fires system, to include other Service and other Agency radar and sensor systems as appropriate. Funding will be used to develop solutions to protect Army weapon systems from emerging and future CEMA threats such as advanced Electronic Warfare techniques, Radio Frequency-enabled cyber effects, use of photonics, etc. Efforts in this program will also develop tools for use by Army radar and sensor systems to improve overall system performance in contested environments, to include effects-based CEMA Modeling and Simulation (M&S) to assess Army CEMA concepts in Hardware-In-The-Loop (HWIL) environment. Additionally, virtual models of critical hardware and software are being developed and implemented to allow for destructive testing with advanced CEMA threats in a lab environment. There will be continual interface with intelligence communities to maintain cognizance of emerging CEMA threats and incorporate these threats in future CEMA demonstrations. These activities follow a time-phased roadmap that identifies the investments needed to improve the resiliency of Army radar and sensors, C2, and RF data and voice networks in contested CEMA environments.

Deep CEMA efforts support assessment of quantum-based hardware, development of software algorithms, and will integrate cutting-edge technology prototypes into Army weapon systems for advanced experimentation and assessment.

There is no funding requested in this project in FY25.

Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Army	Date: March 2024
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603327A *I Air and Missile Defense Systems Engineering*

B. Program Change Summary ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	15.000	0.000	0.000	-	0.000
Current President's Budget	15.000	0.000	0.000	-	0.000
Total Adjustments	0.000	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2023	FY 2024
Project: FG9: *Air and Missile Defense (AMD) Electronic Warfare*		
Congressional Add: *Program Increase - Machine Learning for Integrated Fires*	10.000	-
Congressional Add: *Program Increase - Software Memory Protection Methods*	5.000	-
Congressional Add Subtotals for Project: FG9	15.000	-
Congressional Add Totals for all Projects	15.000	-

Exhibit R-2A, RDT&E Project Justification: PB 2025 Army												Date: March 2024
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603327A / *Air and Missile Defense Systems Engineering*				Project (Number/Name) FG9 / *Air and Missile Defense (AMD) Electronic Warfare*			
COST ($ in Millions)	**Prior Years**	**FY 2023**	**FY 2024**	**FY 2025 Base**	**FY 2025 OCO**	**FY 2025 Total**	**FY 2026**	**FY 2027**	**FY 2028**	**FY 2029**	**Cost To Complete**	**Total Cost**
FG9: *Air and Missile Defense (AMD) Electronic Warfare*	-	15.000	-	-	-	-	-	-	-	-	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Funding in this program supports Cyber and Electromagnetic Activities (CEMA) and Deep CEMA efforts to conduct realistic assessments of Army Integrated Fires performance, identify system vulnerabilities, and develop mitigations against threats across the Cyber and Electromagnetic spectrum. Army radars and sensors, integrated air and missile defense mission command and fire control, Radio Frequency (RF) data and voice networks, and Positioning, Navigation, and Timing (PNT) technology will be assessed against current and postulated threat systems and techniques. Potential solutions developed by the Army, other Services, and Defense agencies (for example Missile Defense Agency) to close identified gaps will be demonstrated and assessed in live and simulated CEMA environments. Assessment events will be conducted approximately every two years. Implementation of potential solutions will occur between events using system-specific funding. The proposed solutions will then be assessed at the next event after implementation.

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Deep CEMA efforts support assessment of quantum-based hardware, development of software algorithms, and will integrate cutting-edge technology prototypes into Army weapon systems for advanced experimentation and assessment.

There is no funding requested in this project in FY25.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024
Congressional Add: Program Increase - Machine Learning for Integrated Fires	10.000	-
FY 2023 Accomplishments: Continues software memory protection and machine learning.		

Exhibit R-2A, RDT&E Project Justification: PB 2025 Army		Date: March 2024
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0603327A / *Air and Missile Defense Systems Engineering*	**Project (Number/Name)** FG9 / *Air and Missile Defense (AMD) Electronic Warfare*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024
Continues support of memory protection and machine learning in contested environment.		
Congressional Add: Program Increase - Software Memory Protection Methods	5.000	-
FY 2023 Accomplishments: Continue development of technology transition paths for software memory protection methods that align with on-going missile programs and air and defense missile systems. Execute prototype implementation of software memory protection methods to immunize missile programs, and air and missile defense systems, from the primary cybersecurity threat to software today, memory corruption exploits.		
Congressional Adds Subtotals	15.000	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Assessment events will be conducted approximately every two years in live and simulated CEMA environments. In addition to Government planning and conduct of assessments, funding will also be provided through various contracts for subject matter expertise.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Army			Date: March 2024
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603327A / *Air and Missile Defense Systems Engineering*	Project (Number/Name) FG9 / *Air and Missile Defense (AMD) Electronic Warfare*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Machine Learning for Integrated Fires	Various	Various : Various	10.000	10.000	Apr 2023	-		-		-		-	0.000	20.000	-
Software Memory Protection Methods	Various	Various : Various	5.000	5.000	Apr 2023	-		-		-		-	0.000	10.000	-
		Subtotal	15.000	15.000		-		-		-		-	0.000	30.000	N/A

	Prior Years	FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	15.000	15.000		-		-		-		-	0.000	30.000	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2025 Army		Date: March 2024
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0603327A / *Air and Missile Defense Systems Engineering*	**Project (Number/Name)** FG9 / *Air and Missile Defense (AMD) Electronic Warfare*

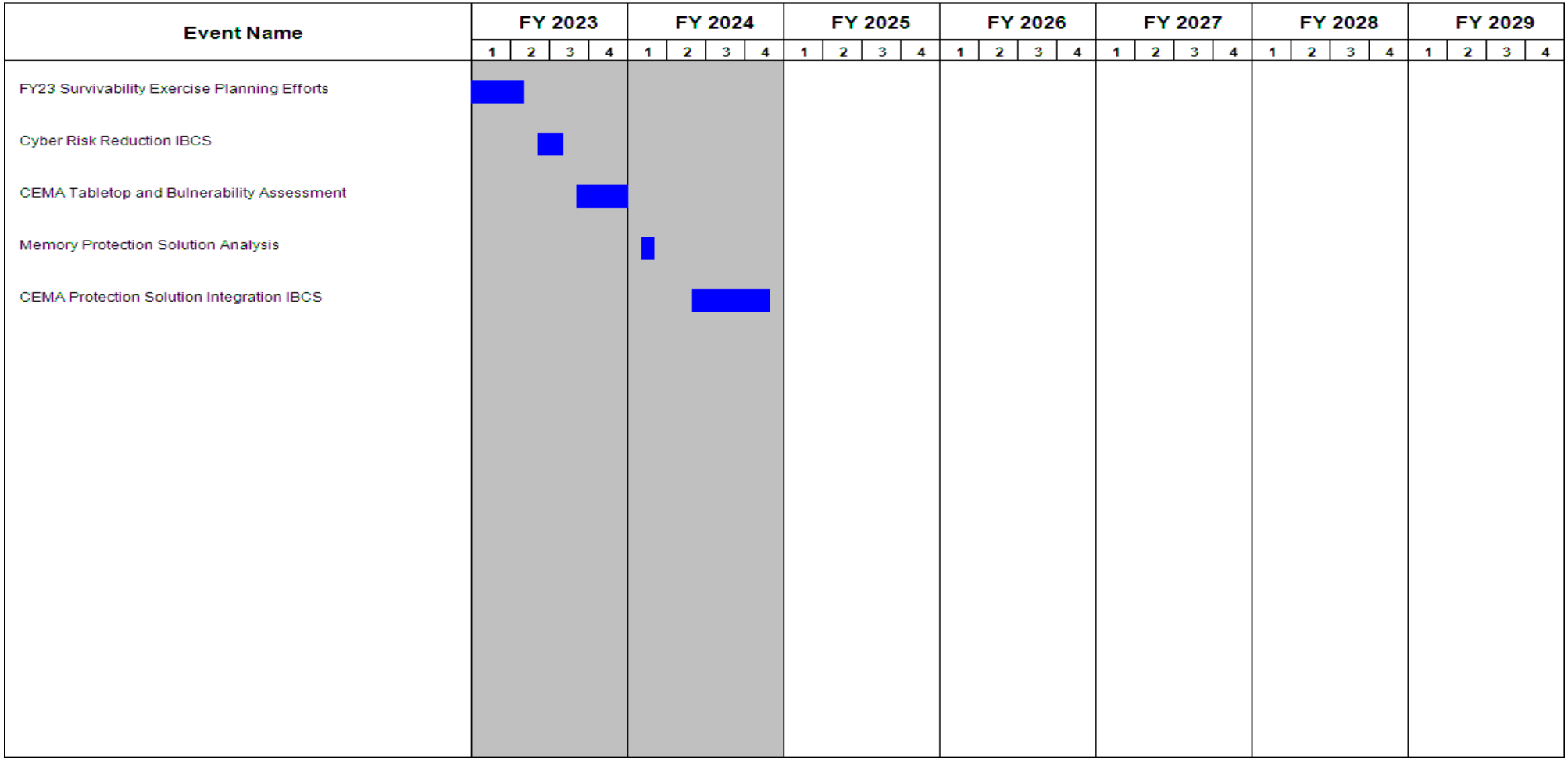

Exhibit R-4A, RDT&E Schedule Details: PB 2025 Army		Date: March 2024
Appropriation/Budget Activity 2040 / 4	**R-1 Program Element (Number/Name)** PE 0603327A / *Air and Missile Defense Systems Engineering*	**Project (Number/Name)** FG9 / *Air and Missile Defense (AMD) Electronic Warfare*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
FY21 Survivability Exercise Planning Efforts	4	2020	2	2021
FY21 Survivability Exercise	2	2021	3	2021
FY21 Survivability Exercise Analysis and Trade Studies	3	2021	1	2022
FY 21 Survivability Exercise Report and Implementation	2	2022	4	2022
Air and Missile Defense Systems Hardware Virtualization	2	2019	4	2022
Interoperabiilty of Integrated Air and Missile Defense (Congressional Adds)	4	2018	2	2021
FY23 Survivability Exercise Planning Efforts	4	2022	2	2023
Cyber Risk Reduction IBCS	2	2023	3	2023
CEMA Tabletop and Bulnerability Assessment	3	2023	4	2023
Memory Protection Solution Analysis	1	2024	1	2024
CEMA Protection Solution Integration IBCS	2	2024	4	2024