Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army											Date: April 2022	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604741A *I Air Defense Command, Control and Intelligence - Eng Dev*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	62.058	59.518	39.541	-	39.541	34.335	49.488	48.268	54.448	Continuing	Continuing
126: *PEO Electronic Protect*	-	15.049	3.827	-	-	-	-	-	-	-	0.000	18.876
146: *Air & Msl Defense Planning Control Sys*	-	8.085	2.877	1.255	-	1.255	3.495	3.281	3.282	3.315	Continuing	Continuing
149: *Counter-Rockets, Artillery & Mortar*	-	0.875	-	-	-	-	-	-	-	-	Continuing	Continuing
FG5: *Counter Unmanned Aerial Systems (UAS)*	-	38.049	52.814	38.286	-	38.286	30.840	46.207	44.986	51.133	Continuing	Continuing

A. Mission Description and Budget Item Justification

A portion of this funding line is a key enabler of the Army Modernization Priorities in support of Air Missile Defense Planning and Control System (AMDPCS). AMDPCS provides integration of air and missile defense operations at all echelons. Specifically, the Air and Missile Defense Work Station (AMDWS) provides a correlated air picture using local radars, allowing the Commander the visibility and situational understanding of the airspace; automated defense design and staff planning tools in AMDWS afford soldiers horizontal and vertical collaborative planning with adjacent units. Air Defense System Integrator (ADSI) serves as a joint tactical data link gateway/air picture, and when correlated by FAAD C2 and displayed on AMDWS, provides a near real time, three dimensional air picture for the Commander. Joint Tactical Terminal (JTT) provides soldiers Theater Ballistic Missile (TBM) early warning, allowing them to take appropriate actions. AMDPCS is fielded to Army Air and Missile Defense Commands (AAMDC), Air Defense Artillery Brigades (ADA BDE), Air and Missile Defense Battalions (AMD BN), and Terminal High Altitude Area Air Defense Batteries (THAAD BTRY). Air Defense Airspace Management (ADAM), a variant of AMDPCS with similar capabilities, is fielded to Corps, Divisions, Brigade Combat Teams (BCT), and multi-functional support brigades. As part of the capability and technology reuse, AMDWS external interfaces are being leveraged by Integrated Battle Command System (IBCS) to avoid redevelopment of existing capabilities. AMDWS and FAAD C2 are core components of the Air and Missile Defense system-of-systems currently deployed in combat zones.

The C-RAM system-of-systems is an evolutionary program that detects RAM launches, provides localized warning to the defended area, intercepts rounds in flight, and enhances response to and defeat of enemy forces. C-RAM combines multi-service fielded and non-developmental item sensors, command and control (C2) equipment, warning systems, and a modified U.S. Navy intercept system (Land-based Phalanx Weapon System [LPWS]), all connected via a wireless local area network. The FAAD C2 system has been enhanced to integrate the sensors, weapons, and warning systems to provide C2 for the C-RAM system-of-systems. FAAD C2 software correlates the RAM sensor data, evaluates the threat, provides early warning, directs engagements, and cues counterfire systems and reaction forces. FAAD C2 employs an agile software development, maintenance, and sustainment strategy, with Urgent Materiel Releases (UMR) every six (6) months and Full Materiel Releases (FMR) every 15-18 months to keep pace with rapidly fielding integrated systems to meet operational needs. C-RAM capability in theater is supported through the Overseas Contingency Operations (OCO) process. Base RDT&E supports FAAD C2 basic Air Defense functionality as well as directed enhancements to the C-RAM system-of-systems capability, such as development and integration of C-RAM network security enhancements and development of all-digital radar technology to address emerging threats.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604741A *I Air Defense Command, Control and Intelligence - Eng Dev*

Counter-Unmanned Aircraft Systems (C-UAS) efforts will provide forces at all echelons with cross-domain capabilities, while supporting joint operational requirements. These combined arms solutions will support the full kill-chain and result in solutions addressing fixed/semi-fixed, mobile platform, and dismounted missions. Development efforts are aligned with Joint Requirements Oversight Council Memorandum (JROCM) 078-20, which codifies the threshold and objective capability requirements for C-UAS development and focuses on technologies which increase capabilities to identify, classify, track, and defeat Groups 1-3 UAS threats.

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	62.058	59.518	0.000	-	0.000
Current President's Budget	62.058	59.518	39.541	-	39.541
Total Adjustments	0.000	0.000	39.541	-	39.541
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	39.541	-	39.541

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	Project (Number/Name) 126 / *PEO Electronic Protect*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
126: *PEO Electronic Protect*	-	15.049	3.827	-	-	-	-	-	-	-	0.000	18.876
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Army Long-Range Persistent Surveillance (ALPS) is a passive sensor that provides long range surveillance against Cruise Missile (CM), Fixed Wing (FW), Rotary Wing (RW), and Unmanned Aircraft System (UAS) threats. Prototype systems will be provided to meet EUCOM, INDOPACOM, and CENTCOM (JUON-CC-0576) identified operational needs and to conduct an assessment via a report by the combatant commander(s). The objectives of this effort are to provide component and subsystem maturity in a system-of-systems environment and to reduce subsequent integration risk into Joint and Army Command and Control systems.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: ALPS Development and Integration	15.049	3.687	-
Description: Provide ALPS systems to meet multiple Combatant Command (COCOM) operational needs and integrate ALPS into the Army Integrated Air and Missile Defense (AIAMD) architecture. Prototype systems are being provided to meet multiple Combatant Command operational needs and to conduct an assessment. The objectives of this effort are to prove component and subsystem maturity in a system-of-systems environment and to reduce subsequent integration risk. ALPS will also be integrated into the AIAMD architecture. ***FY 2022 Plans:*** Deploy and install ALPS prototype systems to meet the urgent operational requirements of multiple combatant commands, specifically EUCOM, INDOPACOM, and CENTCOM. Site survey and operational activities will support efforts to ensure mission success. Complete the combatant commander assessment. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease is based on a projected decline in requirements in FY 2023 for ALPS			
Title: SBIR/STTR Transfer	-	0.140	-
Description: Funding transferred in accordance with Title 15 USC 638. ***FY 2022 Plans:*** Funding transferred in accordance with Title 15 USC 638. ***FY 2022 to FY 2023 Increase/Decrease Statement:***			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	**Project (Number/Name)** 126 / *PEO Electronic Protect*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Funding transferred in accordance with Title 15 USC 638.			
Accomplishments/Planned Programs Subtotals	15.049	3.827	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• EF9: *System Integration and Test*	-	-	-	-	-	-	-	-	-		
• EX2: *Lower Tier Air Missile Defense (LTAMD) Capability*	308.805	297.629	382.147	-	382.147	89.187	89.984	90.002	90.874	0.000	1,348.628
• FM3: *Future Interceptor*	-	6.895	8.179	-	8.179	8.210	8.202	8.205	8.285	0.000	47.976
• C53101: *MSE Missile*	678.148	771.696	1,037.093	-	1,037.093	978.741	982.922	991.265	1,002.608	Continuing	Continuing
• C62002: *IFPC INC 2-I BLOCK 1 SYSTEM*	62.461	19.053	18.924	-	18.924	386.383	670.667	712.994	722.152	0.000	2,592.634
• 0604117A: *Maneuver - Short Range Air Defense (M-SHORAD)*	5.776	39.376	225.147	-	225.147	461.536	519.511	252.825	271.364	0.000	1,775.535
• C14300: *M-SHORAD - Procurement*	517.287	331.575	135.747	-	135.747	58.336	205.657	487.003	487.120	Continuing	Continuing
• 0604820A: *Radar Development*	105.271	122.607	71.259	-	71.259	74.055	31.655	8.578	8.662	0.000	422.087
• S40: *Army Integrated Air and Missile Defense*	213.956	159.873	265.288	-	265.288	289.312	344.958	182.204	131.523	0.000	1,587.114
• BZ5075: *IAMD Battle Command System*	198.587	296.872	438.967	-	438.967	412.920	457.335	458.445	457.608	Continuing	Continuing
• 0604741A: *Air Defense Command, Control and Intelligence - Eng Dev*	62.058	59.518	39.541	-	39.541	34.335	49.488	48.268	54.448	Continuing	Continuing
• AD5070: *AIR & MSL Defense Planning & Control Sys*	62.517	67.193	72.619	-	72.619	-	-	-	-	0.000	202.329
• 0605052A: *Indirect Fire Protection Capability Inc 2 - Block 1*	152.399	182.257	131.093	-	131.093	59.266	10.774	10.778	-	0.000	546.567
• 149: *Counter-Rockets, Artillery & Mortar*	0.875	-	0.000	-	0.000	-	-	-	-	0.000	0.875
• 146: *Air & Msl Defense Planning Control Sys*	8.085	2.877	1.255	-	1.255	3.495	3.281	3.282	3.315	0.000	25.590

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	**Project (Number/Name)** 126 / *PEO Electronic Protect*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost

Remarks

ALPS was previously funded under PE 0603327A.

D. Acquisition Strategy

ALPS utilizes an existing Defense Ordnance Technology Consortium (DOTC) Other Transaction Authority (OTA) to develop and integrate prototype systems to meet multiple Combatant Command operational needs. An assessment of the prototype systems, provided in response to Combatant Command operational needs, will be used to refine requirements and assess the Army's longer-term strategy.

ALPS is executing an acquisition strategy to rapidly deliver commercial off-the-shelf (COTS)-based prototypes to COCOMs based on urgent, operational requirements. ASA(ALT) designated PEO MS as the office of primary responsibility (OPR) for ALPS (19 Jan 2018 memo).

The ALPS Acquisition Strategy consists of rapid integration and deployment activities. Site survey, procurement of prototype systems, deployment of those systems, and contractor logistics support are the primary subordinate tasks within the ALPS efforts to rapidly integrate and deploy systems. These tasks will end by fourth quarter FY22 due to the conclusion of Urgent Need. ALPS will seek Operations and Maintenance, Army (OMA) Other Contingency Operations (OCO) for contractor logistics support of the systems after the end of funding, assuming COCOMs continued need for ALPS capability. ALPS will participate yearly in an integration event at the PEO MS level to integrate with current C2 and Air and Missile Defense (AMD) systems.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	**Project (Number/Name)** 126 / *PEO Electronic Protect*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Other Government Agencies & Government Program Management	Various	Various : Various	1.161	1.461		1.200		-		-		-	Continuing	Continuing	Continuing
FY22 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.140		-		-		-	0.000	0.140	-
		Subtotal	1.161	1.461		1.340		-		-		-	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ALPS Development, Integration, and Installation	Various	Various : Various	12.949	13.588	May 2021	2.487	May 2022	-		-		-	0.000	29.024	-
		Subtotal	12.949	13.588		2.487		-		-		-	0.000	29.024	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	14.110	15.049		3.827		-		-		-	Continuing	Continuing	N/A

Remarks

ALPS was previously funded under PE 0603327A.

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	**Project (Number/Name)** 126 / *PEO Electronic Protect*

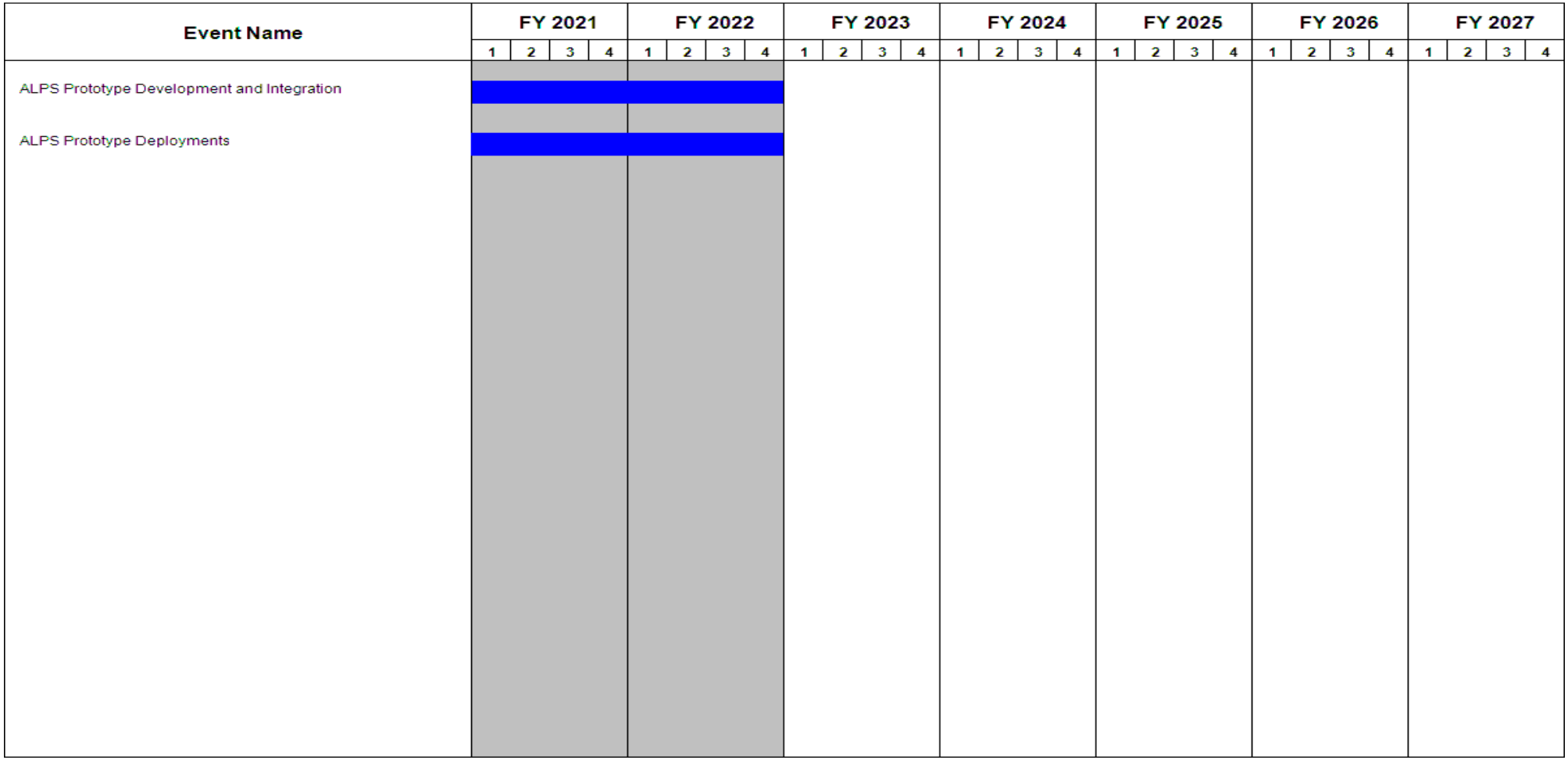

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	**Project (Number/Name)** 126 / *PEO Electronic Protect*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
ALPS Prototype Development and Integration	1	2017	4	2022
ALPS Prototype Deployments	3	2019	4	2022

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	Project (Number/Name) 146 / *Air & Msl Defense Planning Control Sys*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
146: *Air & Msl Defense Planning Control Sys*	-	8.085	2.877	1.255	-	1.255	3.495	3.281	3.282	3.315	Continuing	Continuing
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 Air and Missile Defense.

The Air Missile Defense Planning and Control System (AMDPCS) provides integration of air and missile defense operations at all echelons. AMDPCS is comprised of the following major subsystems: Air Missile Defense Work Station (AMDWS) provides a correlated air picture using local radars, allowing the Commander the visibility and situational understanding of the airspace; tools in AMDWS afford Soldiers horizontal and vertical collaborative planning with adjacent units. Air Defense System Integrator (ADSI) serves as a joint tactical datalink gateway/air picture. Forward Area Air Defense Command and Control (FAAD C2), correlates the joint and local air picture and when displayed on AMDWS, provides a near real time, three dimensional air picture for the Commander. Joint Tactical Terminal (JTT) provides Soldiers Theater Ballistic Missile (TBM) early warning allowing them to take appropriate actions. AMDPCS are currently fielded to Army Air and Missile Defense Commands (AAMDC), Air Defense Artillery Brigades, (ADA BDE), Air and Missile Defense Battalions (AMD BN) and Terminal High Altitude Area Defense Batteries (THAAD BTRY). Air Defense Airspace Management (ADAM), a variant of AMDPCS, are fielded to Corps, Divisions, Brigade Combat Teams (BCTs) and multi-functional support brigades. AMDPCS is also being procured to support Interim Maneuver Short Range Air Defense (IM-SHORAD), European Deterrence Initiative (EDI), and Grow the Army (GTA) initiative. As part of the capability and technology reuse, AMDWS external interfaces are being leveraged by Integrated Battle Command System (IBCS) to avoid redevelopment of existing capabilities. AMDWS and FAAD C2 are core components of the Air and Missile Defense system-of-systems currently deployed in combat zones.

FY 2023 Base dollars in the amount of $1.255 million fund cyber compliance and certification of AMDWS software, as well as accreditation of AMDPCS family-of-systems shelters and software.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: AMDWS Software Development	7.305	2.097	0.559
Description: Supports LandWarNet, Common Operating Environments (COE), and Defense Information Systems Agency (DISA) architecture framework. AMDWS software engineering and development ensures interoperability and integration with maneuver battle command elements. AMDWS will interface with Integrated Air and Missile Defense (IAMD) and serves as a planning tool for the system-of-systems, as well as providing external interfaces.			
FY 2022 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	**Project (Number/Name)** 146 / *Air & Msl Defense Planning Control Sys*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Funding maintains cyber security compliance and interoperability updates. ***FY 2023 Plans:*** Funding provides critical cyber security compliance only. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease in funding to support critical cyber security compliance in FY23.			
Title: Engineering, Development, Test and Evaluation ***Description:*** Ensure interoperability and cyber compliance through engineering, development, test, and evaluation of the AMDPCS family-of-systems shelter objective configurations; execute evaluation and finalization of the AMDPCS tactical communications, data processing, and vehicle/shelter/power generation/environmental system block upgrade program for fielded systems. ***FY 2022 Plans:*** Support updates to the AMDPCS family-of-systems shelter objective configurations and migration to Integrated Battle Command System (IBCS) configuration. ***FY 2023 Plans:*** Maintains interoperability and cyber compliance for AMDPCS family-of-systems shelter objective configurations and migration to Integrated Battle Command System (IBCS) configuration. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increase due to projected slight increases in interoperability and cyber compliance for AMDPCS family-of-systems.	0.529	0.424	0.437
Title: Software System Certification Testing, Accreditation, and Approval of Authority-to-Operate (ATO) ***Description:*** Accomplish software system certification testing, accreditation, and approval of ATOs for the various software systems; BitLocker encryption and other authorized/approved G6 software implementation; Army and joint integration and interoperability assessments. ***FY 2022 Plans:*** Conduct one Army Interoperability Certification (AIC) test and test activities required to maintain Authority to Operate (ATO). ***FY 2023 Plans:*** Conduct Information Assurance Vulnerability Assessments and Management activities, and maintain required Authority to Operate (ATOs). ***FY 2022 to FY 2023 Increase/Decrease Statement:***	0.251	0.251	0.259

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	**Project (Number/Name)** 146 / *Air & Msl Defense Planning Control Sys*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Increase due to projected slight cost to accomplish software system certification testing, accreditation, and approval of ATOs for the various software systems.			
Title: SBIR/STTR Transfer ***Description:*** Funding transferred in accordance with Title 15 USC 638 ***FY 2022 Plans:*** Funding transferred in accordance with Title 15 USC 638 ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding transferred in accordance with Title 15 USC 638	-	0.105	-
Accomplishments/Planned Programs Subtotals	8.085	2.877	1.255

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• AD5070: *AIR & MSL Defense Planning & Control Sys*	62.517	67.193	72.619	-	72.619	-	-	-	-	0.000	202.329
• 0605457A: *Army Integrated Air and Missile Defense (AIAMD)*	213.956	159.873	265.288	-	265.288	289.312	344.958	182.204	131.523	0.000	1,587.114
• BZ5075: *IAMD Battle Command System*	198.587	296.872	438.967	-	438.967	412.920	457.335	458.445	457.608	Continuing	Continuing
• 0604117A: *Maneuver - Short Range Air Defense (M-SHORAD)*	5.776	39.376	225.147	-	225.147	461.536	519.511	252.825	271.364	0.000	1,775.535
• C14300: *M-SHORAD - Procurement*	517.287	331.575	135.747	-	135.747	58.336	205.657	487.003	487.120	Continuing	Continuing

Remarks

This program is an integral part of the Army Integrated Fires Mission Command (IFMC) convergence capability for Integrated Battle Command System (IBCS) architecture.

D. Acquisition Strategy

The acquisition strategy relies on non-development items (NDI) and evolutionary software development to rapidly meet the demands of air defense battle management command, control, communications, computers, and intelligence (BM/C4I) requirements and to keep pace with automated information technologies. The concept

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	**Project (Number/Name)** 146 / *Air & Msl Defense Planning Control Sys*

of evolutionary software development is accomplished in a series of AMDWS block releases and upgrades. AMDPCS is being fielded to both the Army's Active and Reserve components.

The AMDWS software development contract is sole source (SS)/cost plus fixed fee (CPFF) to Northrop Grumman.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	Project (Number/Name) 146 / *Air & Msl Defense Planning Control Sys*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Administration	Various	Various : Various	34.026	0.839	Dec 2020	0.291	Dec 2021	0.299	Dec 2022	-		0.299	Continuing	Continuing	Continuing
SBIR/STTR	TBD	Various : TBD	-	-		0.105		-		-		-	0.000	0.105	-
		Subtotal	34.026	0.839		0.396		0.299		-		0.299	Continuing	Continuing	N/A

Remarks

Not Applicable

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AMDWS Software Development and Engineering	SS/CPFF	Northrop Grumman : Huntsville AL	178.694	6.432	Oct 2020	2.037	Oct 2021	0.559	Oct 2022	-		0.559	Continuing	Continuing	Continuing
PIFF Development Engineering	C/FFP	Telephonics : Farmingdale NY	14.340	-		-		-		-		-	0.000	14.340	-
ADSI Software Development and Engineering	SS/T&M	Ultra Electronics : Austin, TX	6.859	-		-		-		-		-	0.000	6.859	-
Developmental Engineering	Various	Various : Various	47.339	0.755	Dec 2020	0.383	Dec 2021	0.334	Dec 2022	-		0.334	Continuing	Continuing	Continuing
		Subtotal	247.232	7.187		2.420		0.893		-		0.893	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Certification/Testing	Various	JITC : Ft Huachuca, AZ	1.484	0.025	Feb 2021	0.026	Feb 2022	0.027	Feb 2023	-		0.027	Continuing	Continuing	Continuing
Interoperability Assessment	Various	CTSF : Ft Hood, TX	1.930	0.034	May 2021	0.035	May 2022	0.036	May 2023	-		0.036	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	**Project (Number/Name)** 146 / *Air & Msl Defense Planning Control Sys*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	3.414	0.059		0.061		0.063		-		0.063	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	284.672	8.085		2.877		1.255		-		1.255	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	**Project (Number/Name)** 146 / *Air & Msl Defense Planning Control Sys*

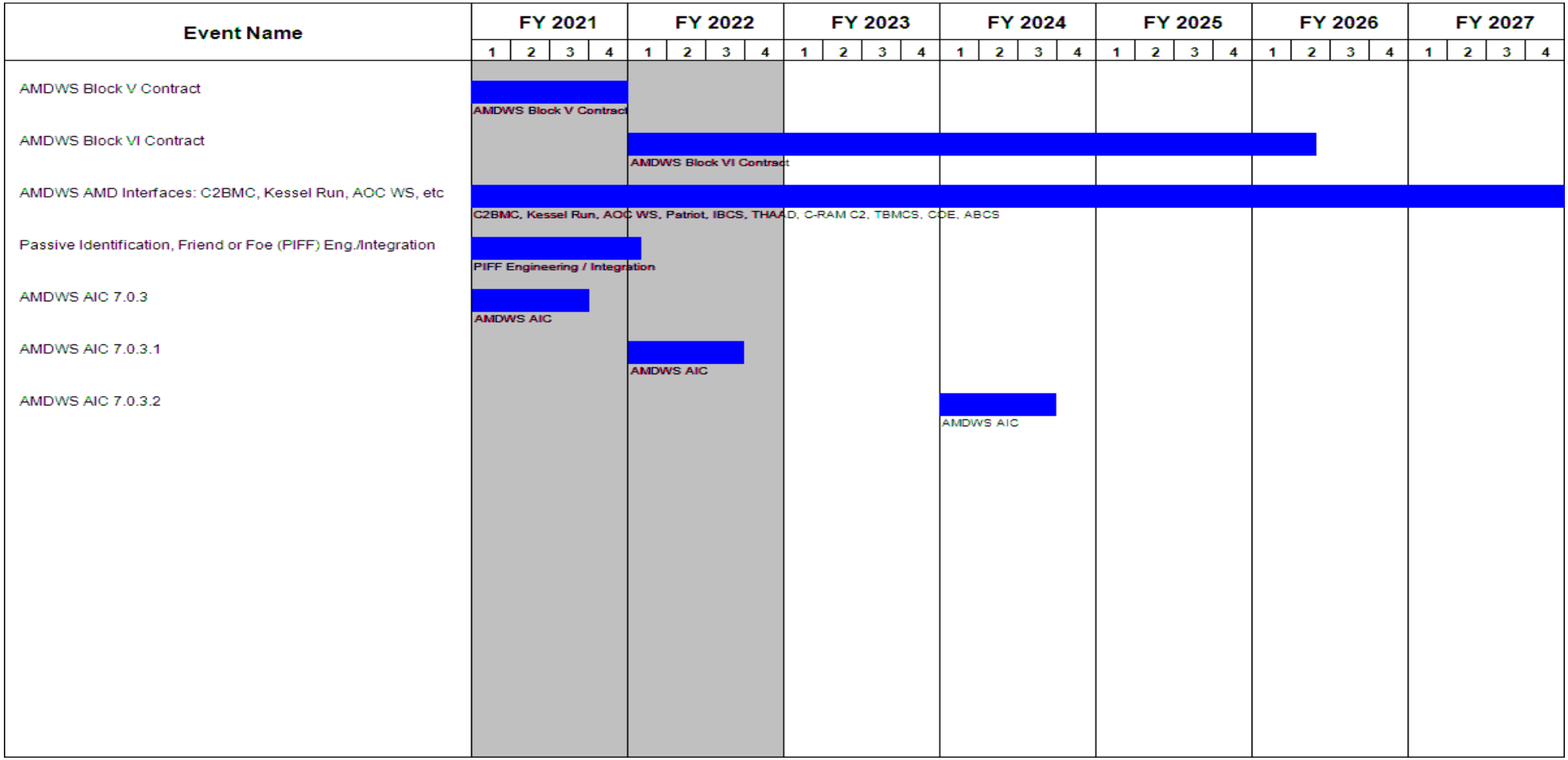

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	**Project (Number/Name)** 146 / *Air & Msl Defense Planning Control Sys*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
AMDWS Block V Contract	2	2011	4	2021
AMDWS Block VI Contract	1	2022	2	2026
AMDWS AMD Interfaces: C2BMC, Kessel Run, AOC WS, etc	4	2012	4	2030
Passive Identification, Friend or Foe (PIFF) Eng./Integration	4	2018	1	2022
ADSI Software Engineering Development and Test	1	2006	4	2017
AWA 16.1 (COE ADAM) DOTMLPF Eval / NIE 16.2	4	2015	4	2017
Army Warfighting Assessment (AWA) 17.1 / NIE 17.2	4	2016	3	2017
Army Warfighting Assess. 18.1 / Network Integration Eval. 18.2	4	2017	3	2018
AMDWS Software Certification Test (SCT) 7.0.2	3	2019	4	2019
AMDWS Army Interoperability Certification (AIC) 7.0.2	1	2020	3	2020
AMDWS AIC 7.0.3	1	2021	3	2021
AMDWS AIC 7.0.3.1	1	2022	3	2022
AMDWS AIC 7.0.3.2	1	2024	3	2024

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	Project (Number/Name) 149 / *Counter-Rockets, Artillery & Mortar*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
149: *Counter-Rockets, Artillery & Mortar*	-	0.875	-	-	-	-	-	-	-	-	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Decrease in Fiscal Year (FY) 2022 as a result of Forward Area Air Defense Command and Control (FAAD C2) transitioning to sustainment.

A. Mission Description and Budget Item Justification

The Counter-Rocket, Artillery, Mortar (C-RAM) system-of-systems detects RAM launches, provides localized warning to the defended area, intercepts rounds in flight, and enhances response to and defeat of enemy forces. C-RAM combines multi-service fielded and non-developmental item sensors, command and control (C2) equipment, warning systems, and a modified U.S. Navy intercept system (Land-based Phalanx Weapon System [LPWS]), all connected via a wireless local area network. The FAAD C2 system integrates the sensors, weapons, and warning systems to provide C2 for the CRAM system-of-systems. FAAD C2 software correlates the RAM sensor data, evaluates the threat, provides early warning, directs engagements, and cues counterfire systems and reaction forces. FAAD C2 employs an agile software development strategy, with Urgent Materiel Releases (UMR) every six months and Full Materiel Releases (FMR) every 15-18 months. Base RDT&E supports FAAD C2 basic Air Defense functionality and incorporation of new Link-16 messaging.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: FAAD C2 Software Development and Enhancements	0.875	-	-
Description: Funds system-of-systems development and upgrades based on the bi-annual release of the Integrated Air and Missile Defense (IAMD) Validated Online Lifecycle Threat (VOLT) and changes in threat, integration of emerging requirements from external PMs (Mission Command) and other services/agencies, technology insertions (Internet Protocol-based communications), and interoperability requirements (joint interoperability, military standard, information assurance compliance, external interface updates). Provides development and regression testing to ensure C-RAM C2 enhancements do not negatively impact the performance of the C-RAM system-of-systems. Includes continued development of electronic warfare capabilities to counter evolving threats. Includes product assurance and further incorporation of new Link-16 messaging.			
Accomplishments/Planned Programs Subtotals	0.875	-	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• H30504: *C-RAM Enhancements*	20.069	6.153	0.000	-	0.000	-	-	-	-	0.000	26.222

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	**Project (Number/Name)** 149 / *Counter-Rockets, Artillery & Mortar*	

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• 146: *Air & Msl Defense Planning Control Sys*	8.085	2.877	1.255	-	1.255	3.495	3.281	3.282	3.315	Continuing	Continuing
• AD5070: *AIR & MSL Defense Planning & Control Sys*	62.517	67.193	72.619	-	72.619	-	-	-	-	0.000	202.329
• S40: *Army Integrated Air and Missile Defense*	213.956	159.873	265.288	-	265.288	289.312	344.958	182.204	131.523	Continuing	Continuing
• BZ5075: *IAMD Battle Command System*	198.587	296.872	438.967	-	438.967	412.920	457.335	458.445	457.608	Continuing	Continuing
• E10: *Sentinel*	105.271	122.607	71.259	-	71.259	74.055	31.655	8.578	8.662	Continuing	Continuing
• L86: *LIGHTWEIGHT COUNTER MORTAR RADAR (LCMR)*	5.179	-	0.000	-	0.000	-	-	-	-	0.000	5.179
• L88: *Enhanced AN/TPQ 36*	13.099	-	0.000	-	0.000	-	-	-	-	0.000	13.099
• B05201: *Lightweight Counter Mortar Radar*	5.332	-	0.000	-	0.000	-	-	-	-	Continuing	Continuing
• B05310: *AN/TPQ-53 Counterfire Target Acquisition Radar*	71.404	-	91.233	-	91.233	-	-	-	-	Continuing	Continuing
• FG5: *Counter Unmanned Aerial Systems (UAS)*	38.049	52.814	38.286	-	38.286	30.840	46.207	44.986	51.133	Continuing	Continuing
• H30505: *Counter Unmanned Aerial Systems (C-UAS) Efforts*	41.000	-	0.000	-	0.000	-	-	-	-	Continuing	Continuing
• 0604117A: *Maneuver - Short Range Air Defense (M-SHORAD)*	5.776	39.376	225.147	-	225.147	461.536	519.511	252.825	271.364	0.000	1,775.535

Remarks

This program is an integral part of the Army Integrated Air and Missile Defense (IAMD) architecture.

D. Acquisition Strategy

The C-RAM program is following an evolutionary acquisition strategy for rapid fielding of mature technology to the user. The objective of the strategy is to balance needs, available technology, and resources to quickly provide a robust capability to engage RAM threats. Multiple C-RAM systems have transitioned to acquisition programs, including C-RAM Intercept, which fields existing LPWS guns to two Indirect Fire Protection Capability/Avenger battalions, and RAM Warn, which provides early, localized warning to all maneuver brigade combat teams. Development and upgrade of FAAD/C-RAM C2 software, to include enhanced capability to support emerging mission command requirements, technology insertion, and interoperability, is accomplished through a five-year CPIF contract awarded to Northrop Grumman Mission Systems.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	**Project (Number/Name)** 149 / *Counter-Rockets, Artillery & Mortar*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Administration	Various	Various : Various	26.829	0.073	Nov 2019	-		-		-		-	Continuing	Continuing	Continuing
		Subtotal	26.829	0.073		-		-		-		-	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
C-RAM C2 Development and Enhancements	C/CPIF	Northrop Grumman : Redondo Beach, CA	108.495	0.802	Apr 2021	-		-		-		-	Continuing	Continuing	Continuing
Secure Communications	SS/CPFF	Northrop Grumman : Huntsville, AL	9.578	-		-		-		-		-	0.000	9.578	-
Secure Communications (Next Gen)	C/CPFF	Northrop Grumman : Huntsville, AL	15.000	-		-		-		-		-	0.000	15.000	-
All-Digital Radar Development	C/FFP	Raytheon Company : Andover, MA	16.000	-		-		-		-		-	Continuing	Continuing	Continuing
LPWS Enhancements	C/CPIF	Raytheon Company : Tucson, AZ	10.307	-		-		-		-		-	0.000	10.307	-
Multi-Layered Tactical Protection System	SS/FFP	DOTC Kord - Rocky Research : Huntsville, AL	5.000	-		-		-		-		-	0.000	5.000	-
		Subtotal	164.380	0.802		-		-		-		-	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Miscellaneous Test Support	Various	Various : Various	24.210	-		-		-		-		-	Continuing	Continuing	Continuing
End-to-End Modeling & Simulation	SS/CPFF	Northrop Grumman : Redondo Beach, CA	14.615	-		-		-		-		-	0.000	14.615	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	Project (Number/Name) 149 / *Counter-Rockets, Artillery & Mortar*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	38.825	-		-		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	230.034	0.875		-		-		-		-	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	**Project (Number/Name)** 149 / *Counter-Rockets, Artillery & Mortar*

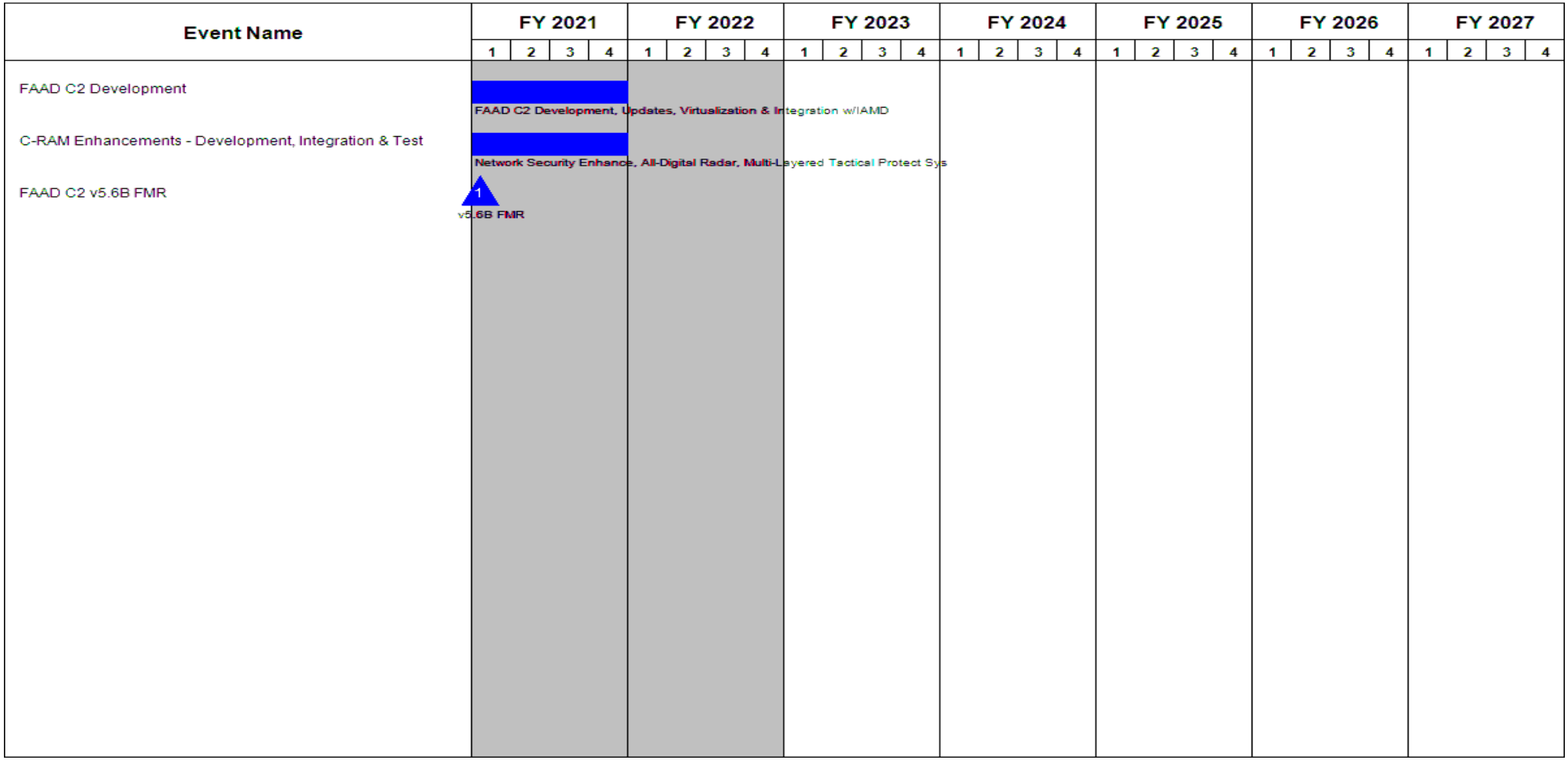

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	**Project (Number/Name)** 149 / *Counter-Rockets, Artillery & Mortar*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
C-RAM C2 v5.5C-2.0 Full Material Release (FMR)	2	2016	2	2016
FAAD C2 Development	1	2013	4	2021
C-RAM Directed Enhancements - Integration & Test	1	2012	4	2017
C-RAM Enhancements - Development, Integration & Test	1	2016	4	2021
LPWS Sp. 6.4.1 Urgent Materiel Release (UMR)	4	2017	4	2017
C-RAM C2 v5.5C-2.2p3 Full Software Release	3	2018	3	2018
C-RAM C2 v5.6A-1.0p1.1 and v5.6A-1.0p3 Urgent Materiel Release (UMR)	4	2018	4	2018
LPWS Sp. 6.4.3.1 and FAAD C2 v5.6A-2.2 UMR	2	2019	2	2019
FAAD C2 v5.6A-2.4 UMR	3	2019	3	2019
FAAD C2 v5.6B System Certification Test (SCT)	3	2019	3	2019
Army Interoperability Certification (AIC) T11.24 (v5.6B)	4	2019	4	2019
Joint Interoperability Test (JIT) 20-02 (V5.6C)	1	2020	2	2020
FAAD C2 v5.6A Full Materiel Release (FMR)	1	2020	1	2020
C-RAM C2 v5.5C-2.0 Full Materiel Release (FMR)	2	2016	2	2016
C-RAM Intercept Operational Assessment (OA)	2	2015	2	2015
C-RAM Intercept (LPWS Spiral 6.0) Materiel Release	3	2016	3	2016
FAAD C2 v5.6A-2.4p2 Rapid Acquisition Authority (OFS/OIR)	1	2020	1	2020
AIC 20.2 (v5.6C)	2	2020	2	2020
FAAD C2 v5.6C SCT	4	2020	4	2020
FAAD C2 v5.6B FMR	1	2021	1	2021

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	Project (Number/Name) FG5 / *Counter Unmanned Aerial Systems (UAS)*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
FG5: *Counter Unmanned Aerial Systems (UAS)*	-	38.049	52.814	38.286	-	38.286	30.840	46.207	44.986	51.133	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Counter-Unmanned Aircraft Systems (C-UAS) efforts will provide forces at all echelons with cross-domain capabilities, while supporting joint operational requirements. These combined arms solutions will support the full kill-chain and result in solutions addressing fixed/semi-fixed, mobile platform, and dismounted missions. Development efforts are aligned with Joint Requirements Oversight Council Memorandum (JROCM) 078-20, which codifies the threshold and objective capability requirements for C-UAS development and focuses on technologies which increase capabilities to identify, classify, track, and defeat Groups 1-3 UAS threats.

Funding supports:

Fixed/Mobile System Development:
FY 2023 Base dollars in the amount of $11.734 million will fund rapid component prototyping, facilitate operational assessments, pursue development and integration of mature hardware, address obsolescence, and test performance improvements of existing systems against current and near-term threats (managed by Program Executive Office Missiles and Space (PEO MS)).

Tech Refresh for Army JUON/JEON Efforts:
FY 2023 Base dollars in the amount of $5.265 million will fund technological development of C-UAS capabilities supporting deployed systems, to keep pace with evolving threats in response to existing Joint Urgent Operational Need (JUON) CC-0558 (managed by PEO MS).

FY 2023 Base dollars in the amount $1.647 million will fund technology refreshes in support of existing Army Joint Emergent Operational Need (JEON) system improvements in response to ST-0008, to provide Army priority fixed sites with the ability to detect, engage, and defeat Groups 1 and 2 UAS (managed by PEO Intelligence, Electronic Warfare and Sensors (IEWS)).

Family of Counter UAS Systems (FoCUS):
FY 2023 Base dollars in the amount of $2.711 million will fund the development and test of a UAS detection system with man-out-of-the-loop (MOTL) operations, providing passive UAS search, target interrogation, and verification (managed by United States Army, Special Operations Command (USASOC)).

Next Generation Product Development:
FY 2023 Base dollars in the amount of $16.929 million will fund prototyping, pursue development and integration of emerging technologies, and test performance improvements of new systems against a 2035 threat (managed by PEO MS).

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	**Project (Number/Name)** FG5 / *Counter Unmanned Aerial Systems (UAS)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Fixed/Mobile System Development ***Description:*** Funds rapid component prototyping, facilitates operational assessments, pursues development and integration of mature hardware, addresses obsolescence, and tests performance improvements of existing systems against current and near-term threats. ***FY 2022 Plans:*** FY 2022 Base funding will support efforts aligned with JROCM 078-20 and Army Requirements, including hardware and software development for a small, flat-panel fire control radar to provide Fixed Site LIDS (FS-LIDS) and mounted systems with an enhanced air surveillance capability against fixed wing, rotary wing, and Groups 1-3 UASs. Also supports twice-yearly C-UAS System of Systems integration/record tests for new and enhanced components, systems, and subsystems. ***FY 2023 Plans:*** FY 2023 Base funding will support prototype build and integration efforts for a small, flat-panel fire control radar, to provide fixed and mounted systems with an enhanced air surveillance capability against fixed wing, rotary wing, and Groups 1-3 UAS. Funding will support biannual C-UAS system of systems integration/record tests for new and enhanced components, systems, and subsystems. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 Base funds decrease due to completion of hardware and software design efforts.	9.673	15.252	11.734
Title: Tech Refresh for Army JUON/JEON Efforts ***Description:*** Funds technology refreshes in response to ST-0008 and continues technological development of C-UAS capabilities supporting deployed systems in response to JUON CC-0558. ***FY 2022 Plans:*** FY 2022 Base funding will provide technology refreshes in support of existing Army JEON system improvements in response to ST-0008 to provide Army priority fixed sites with the ability to detect, engage and defeat group 1 and 2 UAS. This funding will also support technological development of C-UAS systems deployed under existing JUON CC-0558, to include improvements to electronic warfare effectiveness against current and future threats. ***FY 2023 Plans:*** FY 2023 Base funding will provide technology refresh supporting existing Army JEON system improvements in response to ST-0008, to develop new and emerging signals of interest to pace the evolving threat and provide Army priority fixed sites with the ability to detect, engage, and defeat Groups 1 and 2 UAS. This funding will also support technological development of C-UAS	5.000	6.688	6.912

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	**Project (Number/Name)** FG5 / *Counter Unmanned Aerial Systems (UAS)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
systems deployed under existing JUON CC-0558, to include improvements to electronic warfare effectiveness against current and future threats. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 Base funds increase due to a slight rise in C-UAS mission requirements costs.			
Title: Family of Counter UAS Systems (FoCUS) ***Description:*** Matures artificial intelligence and machine learning algorithms that enable FoCUS man-out-of-the-loop (MOTL) operations and passive UAS sensor search, target interrogation, and verification capabilities. Continued algorithm development supports operational assessment and follow-on procurement of FoCUS capabilities required to mitigate critical counter-small UAS capability gaps in CONUS and OCONUS. ***FY 2022 Plans:*** FY 2022 Base funding continues software development efforts increasing Artificial Intelligence and Machine Learning Algorithms used by JCO-identified "C2 Decision Aids" solutions, integrates additional passive sensor capabilities (e.g., passive radar and DRVID), and increases other prototype user interfaces. Continues to integrate advanced sensor input devices and output capabilities needed for a passive capability. Delivers two Inc 1B prototypes, resets Inc 1A prototypes, and provides sparing for transition of the prototypes to ARSOF for sustainment and CONOPS/TTP development. ***FY 2023 Plans:*** FY 2023 Base funding supports the development, test, and integration of software and artificial intelligence and machine learning algorithms that enable FoCUS MOTL operations and passive UAS sensor search, target interrogation, and verification capabilities. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 Base funds decrease due to completion of development effort.	15.000	30.234	2.711
Title: Next Generation Product Development ***Description:*** Funds prototyping, purses development and integration of emerging technologies, and tests performance improvements of new systems against a 2035 threat. ***FY 2023 Plans:*** FY 2023 Base funding will identify and characterize emerging technologies which support prototyping, integration, and testing of new systems or components to increase the capability to detect, track, and defeat the 2035 C-sUAS threat. Testing will ensure technologies meet environmental and reliability/survivability/availability requirements. ***FY 2022 to FY 2023 Increase/Decrease Statement:***	-	-	16.929

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	**Project (Number/Name)** FG5 / *Counter Unmanned Aerial Systems (UAS)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
FY 2023 Base funds increase due to integration and testing.			
Title: OSD Universal C2 Demonstration Support ***Description:*** Funds development, integration, testing, and demonstration of C-UAS C2 interoperability improvements for multi-domain C-UAS engagements.	8.376	-	-
Title: FY 2022 SBIR/STTR Transfer ***Description:*** Funding transferred in accordance with Title 15 USC 638 ***FY 2022 Plans:*** Funding transferred in accordance with Title 15 USC 638 ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding transferred in accordance with Title 15 USC 638	-	0.640	-
Accomplishments/Planned Programs Subtotals	38.049	52.814	38.286

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• H30505: *Counter Unmanned Aerial Systems (C-UAS) Efforts*	41.000	-	0.000	-	0.000	-	-	-	-	0.000	41.000
• AD0511: *C-SUAS FIXED*	-	434.058	326.364	-	326.364	58.866	27.705	42.345	32.936	0.000	922.274

Remarks

D. Acquisition Strategy

The C-UAS program is transitioning from a rapid acquisition and deployment of interim capabilities, in response to JUON CC-0558 and JEON ST-0008, to a formalized acquisition approach. Technical refresh will enable JUON capabilities to remain current, and incremental improvements will mitigate gaps created by enemy Groups 1-3 UAS, until they can be acquired using a formal Program of Record based on a Capabilities Development Document (CDD). An Abbreviated-Capability Development Document (A-CDD) will address future C-UAS requirements, creating enduring next generation C-UAS solutions. The C-UAS program will leverage the flexibility of the Adaptive Acquisition Framework by pursuing a combination of acquisition pathways. C-UAS efforts utilize multiple contract vehicles, types, and vendors.

The C-UAS program incorporates development and test for survivability and resiliency in denied environments and will incorporate emerging technologies as they mature.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	**Project (Number/Name)** FG5 / *Counter Unmanned Aerial Systems (UAS)*

C-UAS is a component of an integrated fires development effort that includes survivability, resiliency, and effectiveness improvements against advanced threats from near-peer adversaries. This effort includes integration with an evolving common fires mission command, common development tools and processes, and annual test and evaluation to provide data to support program assessments and progress toward closure of performance gaps.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	Project (Number/Name) FG5 / *Counter Unmanned Aerial Systems (UAS)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management - JUON CC-0558	Various	Various : Various	31.800	0.769	Dec 2020	1.868	Nov 2021	1.163	Nov 2022	-		1.163	Continuing	Continuing	-
Program Management - FoCUS	Various	Various : Various	-	-		3.050	Nov 2021	0.244	Nov 2022	-		0.244	0.000	3.294	-
Program Management - JEON ST-0008	Various	Various : Various	-	-		-		0.148	Nov 2022	-		0.148	Continuing	Continuing	-
Program Management - Next Generation	Various	Various : Various	-	-		-		1.524	Dec 2022	-		1.524	Continuing	Continuing	-
SBIR/STTR Transfer	TBD	Various : Various	-	-		0.640		-		-		-	0.000	0.640	-
		Subtotal	31.800	0.769		5.558		3.079		-		3.079	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Fixed/Mobile System Development	C/IDIQ	Multiple : Multiple	85.149	7.717	Mar 2021	12.934	Mar 2022	10.287	Mar 2023	-		10.287	Continuing	Continuing	-
Kinetic Defeat Development	Various	Multiple : Multiple	138.953	-		-		-		-		-	0.000	138.953	-
Sensor Development	Various	Various : Various	94.439	-		-		-		-		-	0.000	94.439	-
C-UAS C2 Software Development	C/CPFF	Northrop Grumman : Redondo Beach, CA	30.490	8.376	Apr 2021	-		-		-		-	0.000	38.866	-
Dismounted/Handheld Systems Development	Various	Multiple : Multiple	19.022	-		-		-		-		-	0.000	19.022	-
Family of Counter UAS Systems (FoCUS)	Various	Multiple : Multiple	-	15.000	Jan 2022	23.184	Jan 2022	2.199	Feb 2023	-		2.199	0.000	40.383	-
Tech Refresh for Army JUON/JEON Efforts	C/Various	Multiple : Multiple	-	5.000	Mar 2021	5.920	Mar 2022	5.606	Mar 2023	-		5.606	Continuing	Continuing	-
Next Generation Product Development	TBD	To Be Determined : To Be Determined	-	-		-		13.729	Feb 2023	-		13.729	Continuing	Continuing	-
FY20 OMNIBUS Funding	Various	Various : Various	37.950	-		-		-		-		-	0.000	37.950	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	Project (Number/Name) FG5 / *Counter Unmanned Aerial Systems (UAS)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	406.003	36.093		42.038		31.821		-		31.821	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Support - JUON CC-0558	MIPR	Various : Various	64.622	1.187		1.218	Dec 2021	1.279	Dec 2022	-		1.279	Continuing	Continuing	-
Test Support - FoCUS	Various	Various : Various	-	-		4.000	Dec 2021	0.268	Jan 2023	-		0.268	0.000	4.268	-
Test Support - JEON ST-0008	Various	Various : Various	-	-		-		0.163	Dec 2022	-		0.163	Continuing	Continuing	-
Test Support - Next Generation	Various	Various : Various	-	-		-		1.676	Mar 2023	-		1.676	Continuing	Continuing	-
		Subtotal	64.622	1.187		5.218		3.386		-		3.386	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	502.425	38.049		52.814		38.286		-		38.286	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	**Project (Number/Name)** FG5 / *Counter Unmanned Aerial Systems (UAS)*

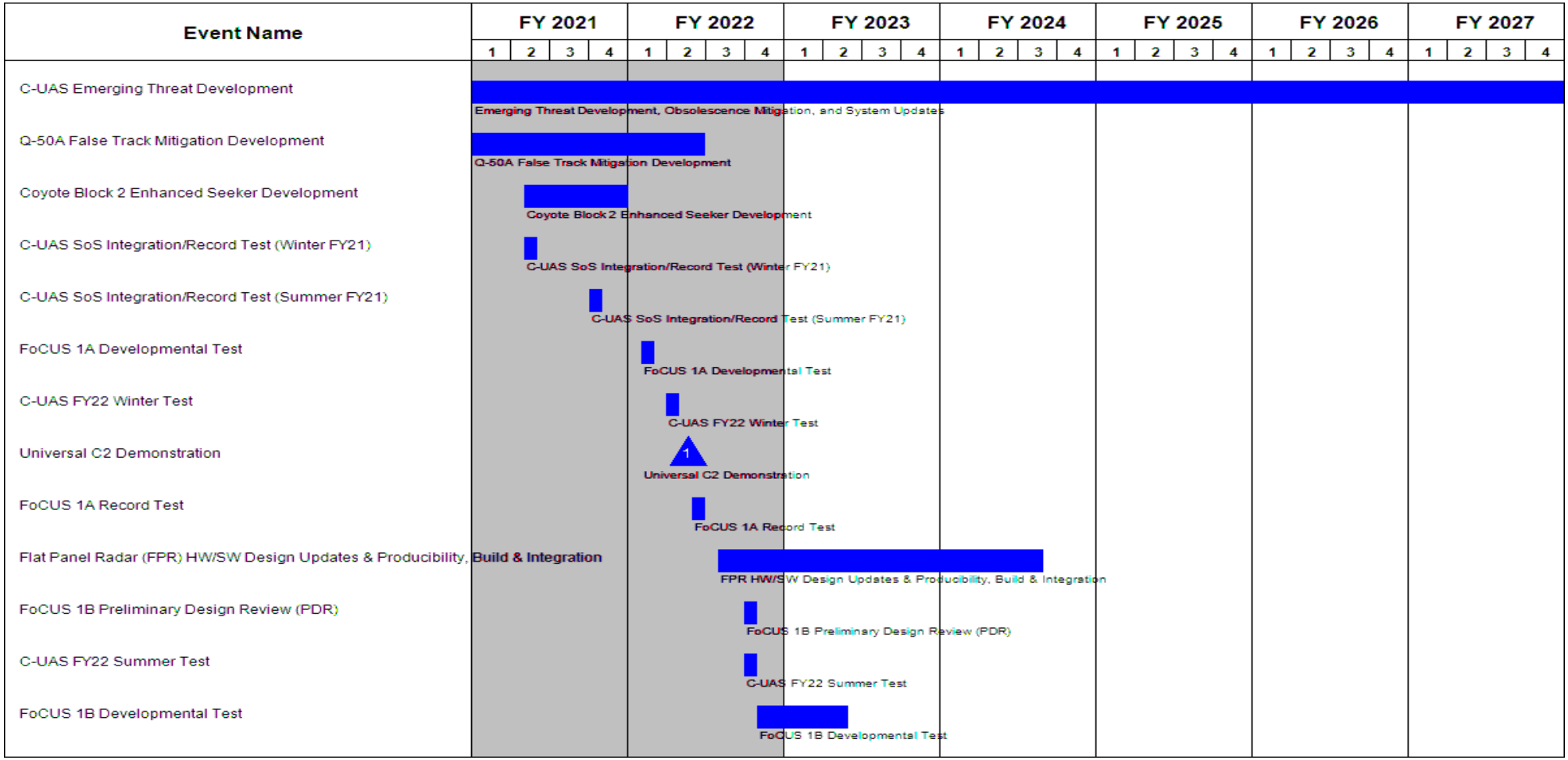

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	**Project (Number/Name)** FG5 / *Counter Unmanned Aerial Systems (UAS)*

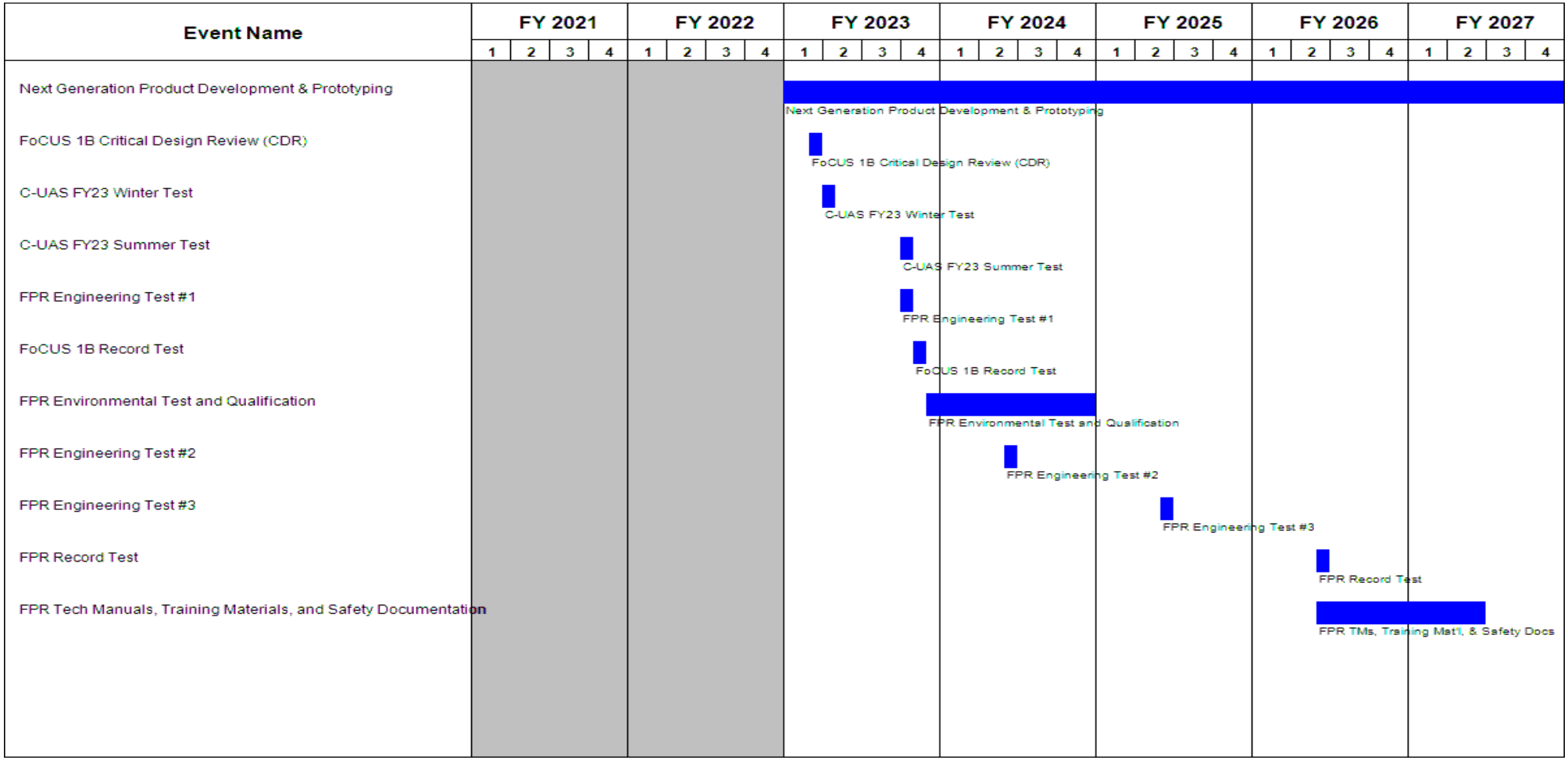

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	**Project (Number/Name)** FG5 / *Counter Unmanned Aerial Systems (UAS)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
C-UAS Emerging Threat Development	1	2017	4	2027
Q-50A False Track Mitigation Development	1	2021	2	2022
Coyote Block 2 Enhanced Seeker Development	2	2021	4	2021
Mobile LIDS (M-LIDS) Inc 1 Testing and Downselect	1	2018	1	2018
Expeditionary LIDS (E-LIDS) Engineering and Record Test	2	2018	2	2018
M-LIDS Inc 1 Engineering and Record Test	3	2018	4	2018
LIDS System-of-Systems (SoS) Record Test	4	2018	1	2019
E-LIDS/M-LIDS Inc 1 Engineering Test	3	2019	3	2019
LIDS Advanced Position, Navigation & Timing (PNT) Test	4	2019	4	2019
Inc 2 SoS Record Test	1	2020	1	2020
FS-LIDS/M-LIDS Inc 2 Record Test	1	2020	2	2020
M-LIDS Inc 2 Delta Record Test #1	3	2020	3	2020
M-LIDS Inc 2 Delta Record Test #2	4	2020	4	2020
C-UAS FY20 Summer Test	4	2020	4	2020
C-UAS SoS Integration/Record Test (Winter FY21)	2	2021	2	2021
C-UAS SoS Integration/Record Test (Summer FY21)	4	2021	4	2021
FoCUS 1A Developmental Test	1	2022	1	2022
C-UAS FY22 Winter Test	2	2022	2	2022
Universal C2 Demonstration	2	2022	2	2022
FoCUS 1A Record Test	2	2022	2	2022
Flat Panel Radar (FPR) HW/SW Design Updates & Producibility, Build & Integration	3	2022	3	2024
FoCUS 1B Preliminary Design Review (PDR)	4	2022	4	2022

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604741A / *Air Defense Command, Control and Intelligence - Eng Dev*	**Project (Number/Name)** FG5 / *Counter Unmanned Aerial Systems (UAS)*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
C-UAS FY22 Summer Test	4	2022	4	2022
FoCUS 1B Developmental Test	4	2022	2	2023
Next Generation Product Development & Prototyping	1	2023	4	2027
FoCUS 1B Critical Design Review (CDR)	1	2023	1	2023
C-UAS FY23 Winter Test	2	2023	2	2023
C-UAS FY23 Summer Test	4	2023	4	2023
FPR Engineering Test #1	4	2023	4	2023
FoCUS 1B Record Test	4	2023	4	2023
FPR Environmental Test and Qualification	4	2023	4	2024
FPR Engineering Test #2	2	2024	2	2024
FPR Engineering Test #3	2	2025	2	2025
FPR Record Test	2	2026	2	2026
FPR Tech Manuals, Training Materials, and Safety Documentation	2	2026	2	2027