Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army											Date: March 2023	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0303142A *I SATCOM Ground Environment (SPACE)*							
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	-	16.186	18.297	26.838	-	26.838	11.731	12.388	12.497	12.638	Continuing	Continuing
253: *Dscs-Dcs (Phase II)*	-	3.931	7.808	11.902	-	11.902	4.914	4.921	4.973	5.029	Continuing	Continuing
456: *MILSATCOM System Engineering*	-	12.255	2.920	1.776	-	1.776	1.765	2.410	2.465	2.493	0.000	26.084
CO7: *Protected Tactical Satellite Communications*	-	-	7.569	13.160	-	13.160	5.052	5.057	5.059	5.116	0.000	41.013

A. Mission Description and Budget Item Justification

Project 253, Dscs-Dcs (Phase II), SATCOM Ground Environment (SPACE) - A portion of this funding line is directly aligned to support the Network Army Modernization Priority.

FY 2024 Base funding in the amount of $11.902 million develops Satellite Communication (SATCOM) ground subsystem equipment and software in support of Joint Chiefs of Staff (JCS) validated Mission Command Network and Systems requirements for the worldwide Defense Enterprise Wideband SATCOM System (DEWSS). DEWSS is composed of the Super High Frequency (SHF) Defense Satellite Communications System (DSCS) and Wideband Global SATCOM (WGS) programs, which are required to support legacy, interim and emerging communication space architectures and future force requirements. Expansion of the WGS constellation and upgrades to both DSCS and WGS are vital to support the Army's emerging power projection and rapid deployment role. DSCS and WGS provide multiple channels of tactical end-to-end connectivity and interoperability with strategic networks and national decision-makers, satisfying JCS network operations in support of the President, JCS, combatant commanders, military departments, Department of State and other government departments and agencies.

Project 456, MILSATCOM System Engineering is directly aligned to Army Network Modernization Priority.

FY 2024 Base funding in the amount of $1.776 million - MILSATCOM System Engineering assures the tactical Army satellite communications (SATCOM) and SATCOM On-the-Move (SOTM) systems are engineered to legally and efficiently operate worldwide. MILSATCOM System Engineering shapes Joint SATCOM systems' design efforts, standards development and planning processes. MILSATCOM System Engineering represents the Army's tactical interests within Department of Defense (DoD), Commercial and International forums to ensure affordable and scalable future SATCOM capabilities for maneuver forces. These efforts are synchronized with the Space Force and DoD's plans for Protected Tactical Waveforms (PTW) on Wideband Global SATCOM (WGS), the Protected Tactical Satellite (PTS), and commercial SATCOM systems. These efforts also ensure that the Army continues to evaluate evolving technologies for the planning and designing of SATCOM solutions that reduce technical and programmatic impacts. MILSATCOM System Engineering expertise supports obtaining SATCOM modem and terminal certifications for Tactical Network systems to operate on the network, provides SATCOM spectrum management and lab support, and supports testing and integration of Assured Position Navigation and Timing (APNT) capabilities.

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army	Date: March 2023
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0303142A *I SATCOM Ground Environment (SPACE)*

MILSATCOM System Engineering also provides the technical and programmatic expertise to facilitate the Unified Network Capabilities and Integration (UNCI) integration mission of transport convergence and integration of N-CFT emerging solutions within the Tactical Network portfolio as part of future Capability Sets. MILSATCOM SE provides the programmatic and technical expertise to coordinate the UNCI mission to align and integrate elements of the Tactical Network portfolio in support of units such as the Expeditionary Signal Battalion (ESB) and Multi Domain Task Force (MDTF). MILSATCOM System Engineering expertise supports the evaluation and integration of commercial SATCOM (COMSATCOM) capabilities with MILSATCOM and Tactical Network systems in support of pathway diversity and other modernization efforts. MILSATCOM System Engineering supports the development of the Network Centric Waveform Technology (NCW-T) to support regional SATCOM planning and management. MILSATCOM System Engineering expertise with lab testing and analysis supports future efforts to support One Network Service Support Center and the ability to evaluate Low Probability of Intercept (LPI), Low Probability of Detection (LPD), Transmission Security (TRANSEC), and resiliency capabilities of current and emerging technologies.

Project CO7, Protected Anti-Jam Tactical SATCOM is directly aligned to Army Network Modernization Priority.

Project CO7, Protected Anti-Jam Tactical SATCOM funding supports continued Air Force/Army Anti-Jam Modem (A3M) development (previously referred to as Block I Large Form Factor (LFF)), contactor and government system engineering, program management and development of Army modem (previously referred to as Block II Small Form Factor (SFF)).

Protected Anti-Jam Tactical SATCOM (Protected SATCOM) fills a critical communications gap for Anti-Jam SATCOM capability for mobile ground forces conducting expeditionary operations in electronically contested environments. It provides the ability for the Army tactical terminals to be resilient in a contested environment and protect against catastrophic loss of situational awareness and command and control during critical battle movement with Anti-Jam capabilities.

A3M will offer tactical Army protection against interference that is either intentional or unintentional. These DoD Joint efforts are synchronized with United States Space Force (USSF) and Army for execution of Protected Tactical Waveforms (PTW) on Wideband Global SATCOM (WGS), Protected Tactical Satellites (PTS), and commercial SATCOM systems.

Protected Tactical Anti-Jam SATCOM supports initial development, testing and certification of production representative PTW modems, incorporating Army requirements, to support continued spiral development of critical protected communications capabilities to address resiliency in jamming environments. In FY 2024, the Army begins development of a dual waveform, small form factor modem variant. The Resilient Anti-Jam Modem (RAM) (previously referred to as Block II Small Form Factor (SFF)) will provide on the move and early entry satellite terminals with adaptive, anti-jam communications for the highest levels of protected communications in multi domain operations. The Protected/Resilient SATCOM Abbreviated - Capabilities Development Document was validated and approved in June 2021.

FY 2024 funding in the amount of $13.160 million will support Logistics Support and Data Development, contactor and government system engineering and program management, test and certification and development of Army RAM.

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Army					Date: March 2023
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*			R-1 Program Element (Number/Name) PE 0303142A *I SATCOM Ground Environment (SPACE)*		
B. Program Change Summary ($ in Millions)	**FY 2022**	**FY 2023**	**FY 2024 Base**	**FY 2024 OCO**	**FY 2024 Total**
Previous President's Budget	15.222	18.321	15.133	-	15.133
Current President's Budget	16.186	18.297	26.838	-	26.838
Total Adjustments	0.964	-0.024	11.705	-	11.705
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	0.964	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	11.705	-	11.705
• FFRDC Transfer	-	-0.024	-	-	-

Change Summary Explanation

FY 2024 increase of $11.705 million aligned to Army Network Modernization Priorities in support of the National Defense Strategy. The funding will support engineering efforts to complete the design, integration, test and development of First Article Test (FAT) units.

Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303142A / *SATCOM Ground Environment (SPACE)*	Project (Number/Name) 253 / *Dscs-Dcs (Phase II)*	

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
253: *Dscs-Dcs (Phase II)*	-	3.931	7.808	11.902	-	11.902	4.914	4.921	4.973	5.029	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project 253, Dscs-Dcs (Phase II), SATCOM Ground Environment (SPACE) supports the Army's Network Modernization Strategy Line of Effort (LOE) 1 - Unified Network. Efforts are aligned to support the Network-Cross Functional Team capability set approach to achieve the network modernization strategy.

FY 2024 Base dollars in the amount of in the amount of $11.850 million develops Satellite Communication (SATCOM) ground subsystem equipment and software in support of Joint Chiefs of Staff (JCS) validated Mission Command Network and Systems requirements for the worldwide Defense Enterprise Wideband SATCOM System (DEWSS). DEWSS is composed of the Super High Frequency (SHF) Defense Satellite Communications System (DSCS) and Wideband Global SATCOM (WGS) programs, which are required to support legacy, interim and emerging communication space architectures and future force requirements. Expansion of the WGS constellation and upgrades to both DSCS and WGS are vital to support the Army's emerging power projection and rapid deployment role. DSCS and WGS provide multiple channels of tactical end-to-end connectivity and interoperability with strategic networks and national decision-makers, satisfying JCS network operations in support of the President, JCS, combatant commanders, military departments, Department of State and other government departments and agencies.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Title: SATCOM Terminal Digital Intermediate Frequency Implementation Analysis	1.299	4.158	4.151
Description: SATCOM Terminal Digital Intermediate Frequency (IF) implementation analysis and experimentations aimed at improving bandwidth efficiency of gateway terminals while providing an additional layer of resiliency through terminal redundancy. These analysis and experimentations include various evaluations for digital terminal components to replace current, less efficient, analog components. These analyses also include assessment of terrestrial connectivity among SATCOM terminals to enable Continuity of Operations (COOP) and failover scenarios required for resiliency.			
FY 2023 Plans: Integrate Digital IF Solutions for the Interconnect Facility (ICF) Replacement Wideband Signal Processors (WSP), COTS LAN Switches and Routers and High Speed Fiber Optics into the Prototyping, Integration, Test, Training (PITT) facility at Tobyhanna Army Depot (TYAD). Perform technical assessments and Wideband Global SATCOM (WGS) delta certification tests.			
FY 2024 Plans: Continue to integrate Digital IF Solutions for the Interconnect Facility (ICF) Replacement Wideband Signal Processors (WSP), COTS LAN Switches and Routers and High Speed Fiber Optics into the Prototyping, Integration, Test, Training (PITT) facility at Tobyhanna Army Depot (TYAD). Perform technical assessments and Wideband Global SATCOM (WGS) delta certification tests.			
FY 2023 to FY 2024 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303142A / *SATCOM Ground Environment (SPACE)*	**Project (Number/Name)** 253 / *Dscs-Dcs (Phase II)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
FY 2024 funding increase supports planned lifecycle of the effort.			
Title: Electromagnetic Interference Mitigation Analysis ***Description:*** Continue to assess multiple interference mitigation/cancellation technologies for effectiveness in improving reliability/ resiliency of strategic and tactical communications. Mature technology to software/firmware that will improve protected SATCOM modem/terminal performance in electro-magnetic interference contested environment. Technology will also improve terminal performance against adversary and friendly satellite link jamming resources. ***FY 2023 Plans:*** Integrate Interference Mitigation algorithms into Enterprise Digital IF Multi-carrier (EDIM) Modem. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** Funding decrease due to conclusion of effort in FY 2023.	1.495	0.400	-
Title: Low Earth Orbit (LEO)/Medium Earth Orbit (MEO) Satellite Service Integration ***Description:*** Investigate the availability of LEO/MEO Satellite Services in the commercial market place and assess their viability for use at Department of Defense (DoD) SATCOM gateways.	1.137	-	-
Title: Enterprise Digital IF Multi-carrier (EDIM) Modem ***Description:*** Complete integration of various commercial technologies on to a single modem platform to replace the existing almost out of life EDIM modem currently fielded at all DoD Gateways. New technologies include multi-carrier capability to assist future growth of SATCOM, Digital IF to enable resiliency and path diversity and Interference Cancellation to improve reliability of SATCOM communication links. Additionally, complete production of testing units in order to begin First Article Test and Wideband Global SATCOM (WGS) system certification. ***FY 2023 Plans:*** Integrate Multi-carrier capabilities, Interference Cancellation Algorithms and Digital IF technology into EDIM Modem. Initiate Non-Recurring Engineering (NRE) contract to integrate, test and certify EDIM Modem Platform. ***FY 2024 Plans:*** Continue Non-Recurring Engineering (NRE) efforts to integrate, test and certify the EDIM Modem Platform. ***FY 2023 to FY 2024 Increase/Decrease Statement:***	-	2.965	7.751

Exhibit R-2A, RDT&E Project Justification: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303142A / *SATCOM Ground Environment (SPACE)*	**Project (Number/Name)** 253 / *Dscs-Dcs (Phase II)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Funding increased due to FY 2023 funds being non-recurring engineering efforts to develop a preliminary design. FY 2024 funds are for non-recurring engineering efforts to complete the design, integrate, test and develop First Article Test (FAT) units. FY 2024 increase is due to integration, testing and certification of the modified EDIM modem.			
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.	-	0.285	-
Accomplishments/Planned Programs Subtotals	3.931	7.808	11.902

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
• BB8500: *Defense Enterprise Wideband Satcom Systems*	90.928	107.228	101.181	-	101.181	89.138	92.670	92.713	92.793	Continuing	Continuing

Remarks

D. Acquisition Strategy

This finances Project Manager, Integrated Enterprise Networks (PM-IEN) netcentric systems engineering, modem risk mitigation, and risk management framework support. Funding provides for SATCOM terminal upgrades, enhancement of baseband throughput capabilities, technology insertion and upgrades which improves SATCOM gateway resiliency while allowing for full utilization of Wideband Global SATCOM (WGS) capabilities. Both the Wideband SATCOM Operational Management System (WSOMS) and the Enterprise Wideband SATCOM Terminal System (EWSTS) Capability Production Documents (CPDs) contain Netcentric-Ready Key Performance Parameters (NR-KPPs) as required by CJCSI 6212.01C. Netcentric efforts are required to facilitate the migration from the current trunk-based communications systems to Internet Protocol (IP) based systems and to engineer, test and integrate IP based capabilities into WSOMS and EWSTS systems. Studies, risk mitigation, system integration and advanced demonstrations for Netcentric baseband and policy-based control will accommodate technology insertion, data sharing, remote operations, architecture efforts and use of commercial technology, thus ensuring the life of the Defense Enterprise Wideband Satellite System (DEWSS) terminal family beyond 2035 and reducing lifecycle costs and enterprise requirements on the WGS and Defense Satellite Communication System (DSCS) satellites in the future. Contracting approach for new technology is through the use of Broad Agency Announcements (BAA) and Other Transaction Authority (OTA) contracts.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303142A / *SATCOM Ground Environment (SPACE)*	Project (Number/Name) 253 / *Dscs-Dcs (Phase II)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SBIR/STTR Transfer	TBD	To Be Determined : To Be Determined	-	-		0.285		-		-		-	0.000	0.285	-
		Subtotal	-	-		0.285		-		-		-	0.000	0.285	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SATCOM Terminal Digital IF Implementation Analysis	MIPR	Aberdeen Proving Ground : MD	1.885	1.125	Jan 2022	3.206	Jan 2023	3.336	Jan 2024	-		3.336	Continuing	Continuing	Continuing
Electromagnetic Interference Mitigation Analysis	MIPR	Aberdeen Proving Ground : MD	1.666	1.244	Jan 2022	0.400	Jan 2023	-		-		-	Continuing	Continuing	Continuing
Low Earth Orbit/Medium Earth Orbit (LEO/MEO)	MIPR	Aberdeen Proving Ground : MD	-	0.967	Jan 2022	-		-		-		-	Continuing	Continuing	Continuing
Enterprise Digital IF Multi-carrier (EDIM) Modem System Engineering Analysis	MIPR	ACC - Rock Isand : IL	-	-		2.965	Jan 2023	7.751	Jan 2024	-		7.751	Continuing	Continuing	Continuing
		Subtotal	3.551	3.336		6.571		11.087		-		11.087	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
In-house Support	Allot	PdM WESS : Ft. Belvoir, VA	0.060	0.045		0.060		0.015		-		0.015	Continuing	Continuing	Continuing
Contractor Support	MIPR	ACC : Rock Island, IL	0.601	0.550	Jan 2022	0.892	Jan 2023	0.800	Feb 2024	-		0.800	Continuing	Continuing	Continuing
		Subtotal	0.661	0.595		0.952		0.815		-		0.815	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303142A / *SATCOM Ground Environment (SPACE)*	Project (Number/Name) 253 / *Dscs-Dcs (Phase II)*	

	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	4.212	3.931		7.808		11.902		-		11.902	Continuing	Continuing	N/A

Remarks

SATCOM Terminal Digital Intermediate Frequency (IF) demonstrations with multi-vendor equipment will be conducted using live satellite links between Tobyhanna Army Depot (TYAD) and Joint SATCOM Engineering Center (JSEC) at Aberdeen Proving Grounds. All components demonstrated will be at Technology Readiness Level (TRL) 6.

Electromagnetic Interference Algorithms at TRL 6 will be hosted on a stand-alone hardware platform and tested at JSEC using live satellite links. All verified algorithms and performance specifications will transition to the Enterprise Digital IF Multi-Carrier (EDIM) modem program during 4Q FY 2023.

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303142A / *SATCOM Ground Environment (SPACE)*	**Project (Number/Name)** 253 / *Dscs-Dcs (Phase II)*

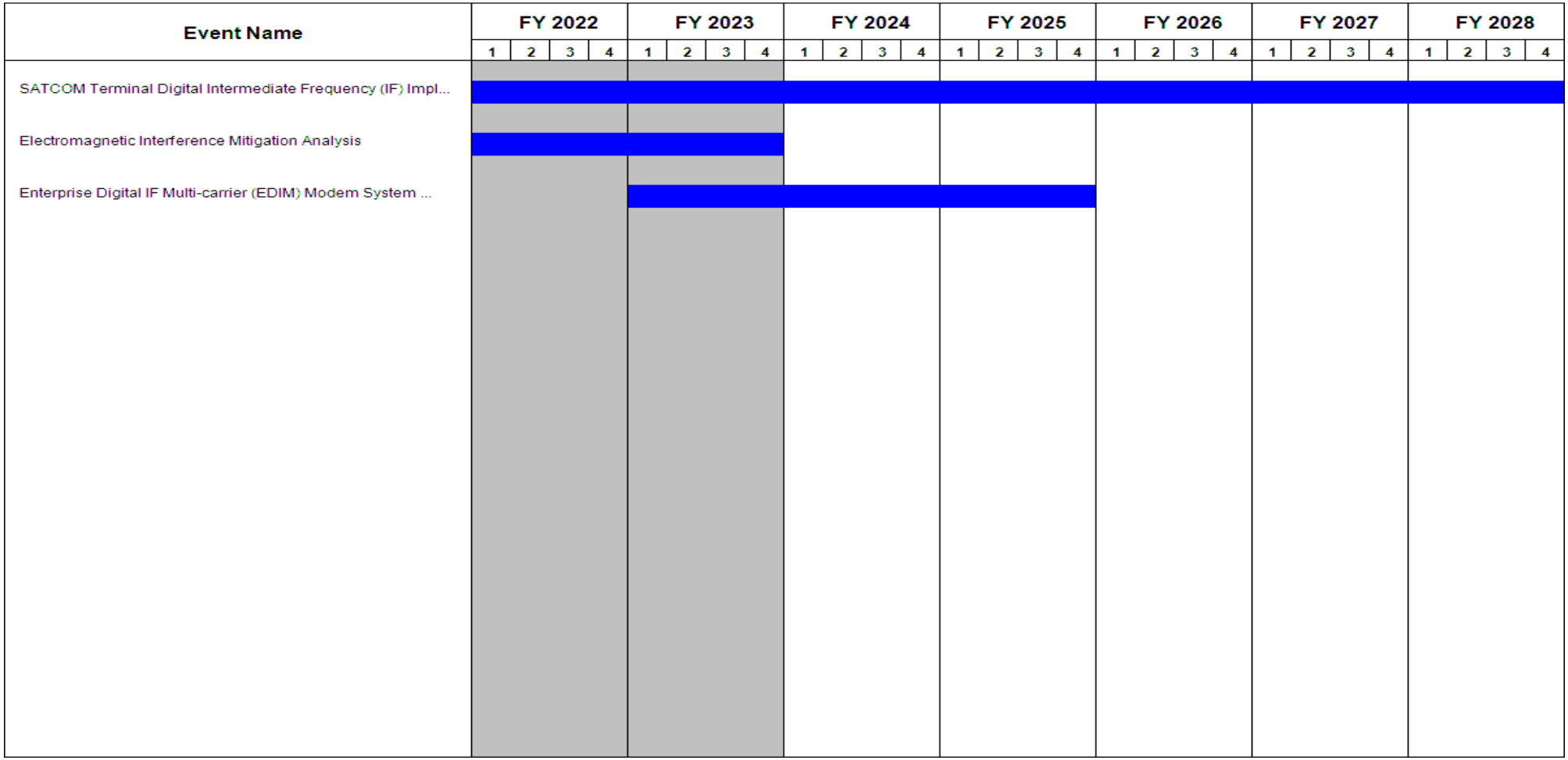

Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303142A / *SATCOM Ground Environment (SPACE)*	**Project (Number/Name)** 253 / *Dscs-Dcs (Phase II)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
SATCOM Terminal Digital Intermediate Frequency (IF) Implementation Analysis	1	2021	4	2028
Electromagnetic Interference Mitigation Analysis	1	2021	4	2023
Enterprise Digital IF Multi-carrier (EDIM) Modem System Engineering Analysis	1	2023	4	2025

Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303142A / *SATCOM Ground Environment (SPACE)*	Project (Number/Name) 456 / *MILSATCOM System Engineering*	

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
456: *MILSATCOM System Engineering*	-	12.255	2.920	1.776	-	1.776	1.765	2.410	2.465	2.493	0.000	26.084
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project 456, MILSATCOM System Engineering is directly aligned to the Army Network Modernization Priority.

FY 2024 Base funding in the amount of $1.776 million - MILSATCOM System Engineering assures the tactical Army satellite communications (SATCOM) and SATCOM On-the-Move (SOTM) systems are engineered to legally and efficiently operate worldwide. MILSATCOM System Engineering shapes Joint SATCOM systems' design efforts, standards development and planning processes. MILSATCOM System Engineering represents the Army's tactical interests within Department of Defense (DoD), Commercial and International forums to ensure affordable and scalable future SATCOM capabilities for maneuver forces. These efforts are synchronized with the Space Force and DoD's plans for Protected Tactical Waveforms (PTW) on Wideband Global SATCOM (WGS), the Protected Tactical Satellite (PTS), and commercial SATCOM systems. These efforts also ensure that the Army continues to evaluate evolving technologies for the planning and designing of SATCOM solutions that reduce technical and programmatic impacts. MILSATCOM System Engineering expertise supports obtaining SATCOM modem and terminal certifications for Tactical Network systems to operate on the network, provides SATCOM spectrum management and lab support, and supports testing and integration of Assured Position Navigation and Timing (APNT) capabilities.

MILSATCOM System Engineering also provides the technical and programmatic expertise to facilitate the Unified Network Capabilities and Integration (UNCI) integration mission of transport convergence and integration of N-CFT emerging solutions within the Tactical Network portfolio as part of future Capability Sets. MILSATCOM SE provides the programmatic and technical expertise to coordinate the UNCI mission to align and integrate elements of the Tactical Network portfolio in support of units such as the Expeditionary Signal Battalion (ESB) and Multi Domain Task Force (MDTF). MILSATCOM System Engineering expertise supports the evaluation and integration of commercial SATCOM (COMSATCOM) capabilities with MILSATCOM and Tactical Network systems in support of pathway diversity and other modernization efforts. MILSATCOM System Engineering supports the development of the Network Centric Waveform Technology (NCW-T) to support regional SATCOM planning and management. MILSATCOM System Engineering expertise with lab testing and analysis supports future efforts to support One Network Service Support Center and the ability to evaluate Low Probability of Intercept (LPI), Low Probability of Detection (LPD), Transmission Security (TRANSEC), and resiliency capabilities of current and emerging technologies.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Title: Protected communications system engineering and WGS communications	0.924	0.502	0.253
Description: Provides systems engineering support for technology maturation, development and planning associated with joint SATCOM development efforts, and supports testing and integration of Assured Position Navigation and Timing (APNT) capabilities.			

Exhibit R-2A, RDT&E Project Justification: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303142A / *SATCOM Ground Environment (SPACE)*	**Project (Number/Name)** 456 / *MILSATCOM System Engineering*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
FY 2023 Plans: Funding supports continued systems engineering and analysis for Protected Communications and WGS Communications, as well as development and technology maturation of Network Centric Waveform Tool (NCW-T). ***FY 2024 Plans:*** Continue to support systems engineering and analysis for Protected Communications and WGS Communications, as well as development and technology maturation of NCW-T. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** Funding decreased due to prioritization of terminal and modem certification efforts.			
Title: Systems architecture and analysis support ***Description:*** Provides systems engineering support relating to the architecture and analysis of NCW-T and collaborative SATCOM efforts. These efforts, such as research, analysis, technical engineering and integration services for bandwidth studies and future technology insertions, impact Army use of military and commercial satellite constellations and integration of enabling technologies. Provides SATCOM spectrum management and supports Joint/DoD standards development and strategic planning. Provides additional programmatic support across the tactical network. ***FY 2023 Plans:*** Funding supports continued in house engineering support, contractor support, and system architecture and analysis. ***FY 2024 Plans:*** Continue to support in house engineering support, contractor support, and system architecture and analysis. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** Funding decreased due to prioritization of terminal and modem certification efforts.	0.815	1.461	0.510
Title: Testing and certification of critical SATCOM and SATCOM On-the-Move communication and network technologies ***Description:*** Provides support for testing and certification of the critical SATCOM and SATCOM On-the-Move (SOTM) communication and network technologies. ***FY 2023 Plans:*** Funding supports continued testing and certification of critical SATCOM and SOTM communication and network technologies. ***FY 2024 Plans:***	0.252	0.600	0.761

Exhibit R-2A, RDT&E Project Justification: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303142A / *SATCOM Ground Environment (SPACE)*	**Project (Number/Name)** 456 / *MILSATCOM System Engineering*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Continue to support continued testing and certification of critical SATCOM and SOTM communication and network technologies. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** Funding increased due to prioritization of testing and certification of critical SATCOM and SOTM communication and network technologies.			
Title: Protected Tactical Waveform (PTW) Modem Development and Testing	10.264	-	-
Title: Unified Network Capabilities and Integration Program Management and Support ***Description:*** Provides programmatic and technical expertise in systems engineering test, evaluation, and integration in support of aligning and integrating elements of the Tactical Network Portfolio. ***FY 2023 Plans:*** Funding supports systems engineering and integration efforts in support of NCW Technology development and test as well as testing and certification of critical SATCOM and SOTM Technology. ***FY 2024 Plans:*** Continue to support systems engineering and integration efforts in support of NCW Technology development and test as well as testing and certification of critical SATCOM and SOTM Technology. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** Funding increase supports planned lifecycle of the effort.	-	0.250	0.252
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.	-	0.107	-
Accomplishments/Planned Programs Subtotals	12.255	2.920	1.776

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303142A / *SATCOM Ground Environment (SPACE)*	**Project (Number/Name)** 456 / *MILSATCOM System Engineering*

D. Acquisition Strategy

MILSATCOM System Engineering provides advanced systems engineering, research, development, test, and evaluation (RDTE) and integration of new and emerging technologies to optimize terminal performance and communications control. Once the technologies are mature and deemed feasible, funding and management responsibility for implementation and integration of the technology will transition to Tactical Network and related Programs of Record.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303142A / *SATCOM Ground Environment (SPACE)*	Project (Number/Name) 456 / *MILSATCOM System Engineering*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SBIR/STTR Transfer	TBD	TBD : TBD	-	-		0.107		-		-		-	0.000	0.107	-
		Subtotal	-	-		0.107		-		-		-	0.000	0.107	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Protected Communications and WGS Communications	C/FPIF	Various : APG, MD	0.580	0.924	Apr 2022	0.752	Apr 2023	0.253	Apr 2024	-		0.253	0.000	2.509	-
Protected Tactical Waveform (PTW) Modem Development	C/IDDQ	To Be Determined : To Be Determined	10.912	10.264	Mar 2022	-		-		-		-	0.000	21.176	-
		Subtotal	11.492	11.188		0.752		0.253		-		0.253	0.000	23.685	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering (In House)	MIPR	Various : APG, MD	0.330	-		-		-		-		-	0.000	0.330	-
Engineering Contractor Support	C/T&M	Various : APG, MD	1.546	-		-		-		-		-	0.000	1.546	-
System Architecture and Analysis Support	MIPR	CERDEC : APG, MD	0.208	0.815	Dec 2021	1.461	Dec 2022	0.510	Dec 2023	-		0.510	0.000	2.994	-
Unified Network Capabilities and Integration Program Management and Support	C/T&M	Various : APG	-	-		-		0.252	Dec 2023	-		0.252	0.000	0.252	-
		Subtotal	2.084	0.815		1.461		0.762		-		0.762	0.000	5.122	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303142A / *SATCOM Ground Environment (SPACE)*	Project (Number/Name) 456 / *MILSATCOM System Engineering*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Certification	MIPR	CERDEC : APG, MD	0.214	0.252	Dec 2021	0.600	Dec 2022	0.761	Dec 2023	-		0.761	0.000	1.827	-
		Subtotal	0.214	0.252		0.600		0.761		-		0.761	0.000	1.827	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	13.790	12.255		2.920		1.776		-		1.776	0.000	30.741	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303142A / *SATCOM Ground Environment (SPACE)*	**Project (Number/Name)** 456 / *MILSATCOM System Engineering*

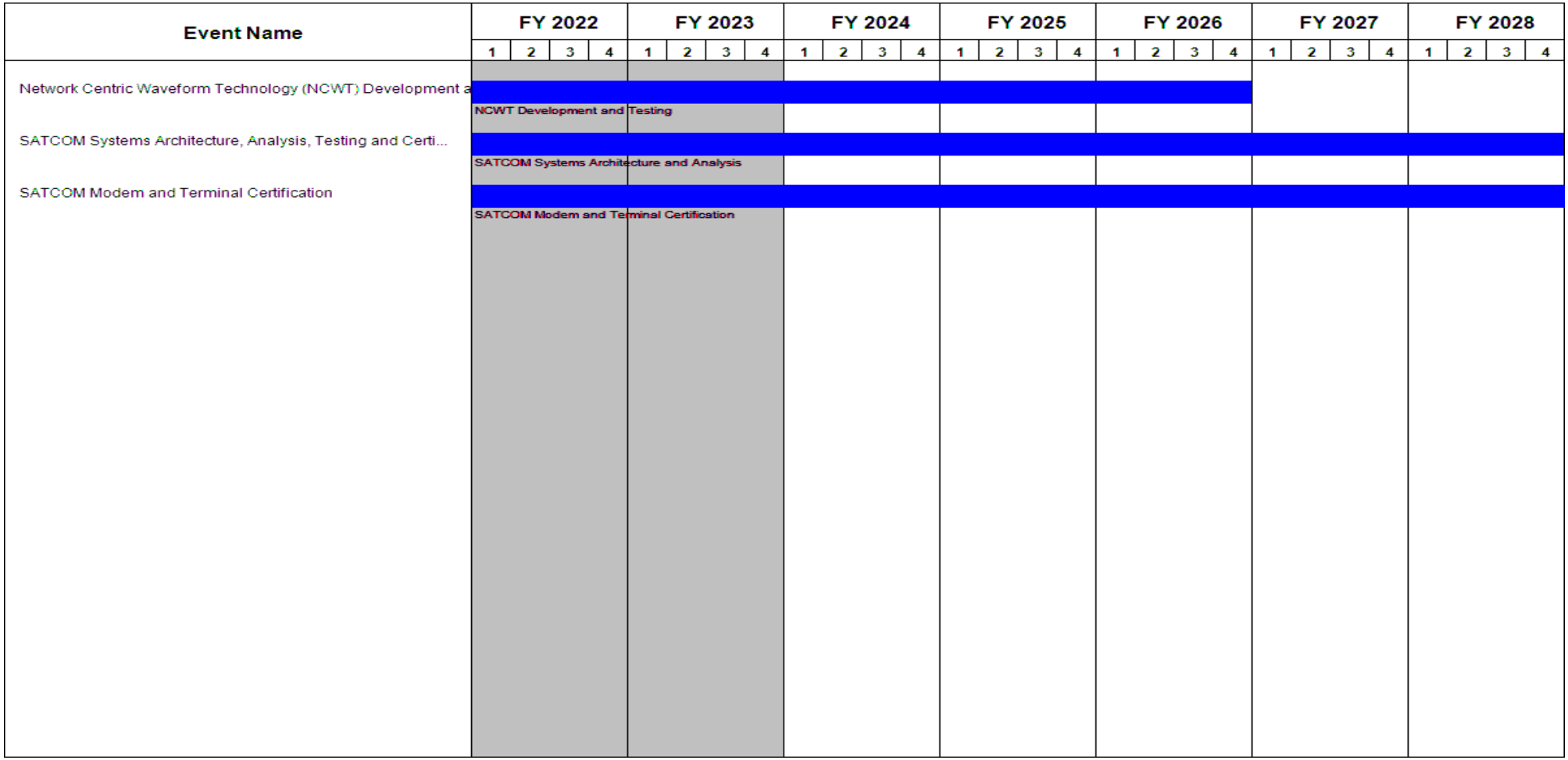

Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303142A / *SATCOM Ground Environment (SPACE)*	**Project (Number/Name)** 456 / *MILSATCOM System Engineering*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Network Centric Waveform Technology (NCWT) Development and Testing	1	2021	4	2026
SATCOM Systems Architecture, Analysis, Testing and Certification	1	2021	4	2028
SATCOM Modem and Terminal Certification	1	2022	1	2029

Exhibit R-2A, RDT&E Project Justification: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303142A / *SATCOM Ground Environment (SPACE)*	Project (Number/Name) CO7 / *Protected Tactical Satellite Communications*	

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
CO7: *Protected Tactical Satellite Communications*	-	-	7.569	13.160	-	13.160	5.052	5.057	5.059	5.116	0.000	41.013
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This funding line is directly aligned to the Army Network Modernization Priority.

Protected Anti-Jam Tactical SATCOM (Protected SATCOM) fills a critical communications gap for Anti-Jam SATCOM capability for mobile ground forces conducting expeditionary operations in electronically contested environments. It provides the ability for the Army tactical terminals to be resilient in a contested environment and protect against catastrophic loss of situational awareness and command and control during critical battle movement with Anti-Jam capabilities.

Air Force/Army Anti-Jam Modem (A3M) will offer tactical Army protection against interference that is either intentional or unintentional. These DoD Joint efforts are synchronized with United States Space Force (USSF) and Army for execution of Protected Tactical Waveforms (PTW) on Wideband Global SATCOM (WGS), Protected Tactical Satellites (PTS), and commercial SATCOM systems.

Protected Tactical Anti-Jam SATCOM supports initial development, testing and certification of production representative PTW modems, incorporating Army requirements, to support continued spiral development of critical protected communications capabilities to address resiliency in jamming environments. In FY 2024, the Army begins development of a dual waveform, small form factor modem variant. The Resilient Anti-Jam Modem (RAM) (previously referred to as Block II Small Form Factor (SFF)) will provide on the move and early entry satellite terminals with adaptive, anti-jam communications for the highest levels of protected communications in multi domain operations. The Protected/Resilient SATCOM Abbreviated - Capabilities Development Document was validated and approved in June 2021.

FY 2024 funding in the amount of $13.160 million will support Logistics Support and Data Development, contactor and government system engineering and program management, test and certification and development of Army RAM.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Title: PTW Block I Modem Development	-	5.248	-
Description: PTW Development of Air Force/Army Anti-Jam Modem (A3M) (Block I) supports development and engineering of Army requirements for the PTW modems that will be utilized for protected tactical communications.			
FY 2023 Plans: Funding supports system test and evaluation and development of Block I Modems.			
FY 2023 to FY 2024 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303142A / *SATCOM Ground Environment (SPACE)*	**Project (Number/Name)** CO7 / *Protected Tactical Satellite Communications*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Funding decreased due to completion of A3M Block I development and the program shifting to support the Resilient Anti-Jam Modem (RAM).			
Title: Logistics Support and Data Development ***Description:*** Funding supports the total documentation (training, tech manuals) and logistics support package. The efforts associated with the design, development, and production of prototype training equipment, and the execution of training services. Effort also transforms data into government format, including technical data providing instructions for installation, operation, maintenance, training, and support, all to be formatted into a technical manual. ***FY 2023 Plans:*** Funding supports development of training materials for Block I/II modems. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** Funding decreased due to completion of logistics support and data development for A3M.	-	0.208	-
Title: Government System Engineering and Program Management Support (SEPM) ***Description:*** Funding supports Government System Engineering and Program Management (SEPM) which includes programmatic personnel, and other related administrative costs. Government Program Management consists of matrix personnel labor and travel requirements. This includes all required program oversight, system engineering and technical control, risk management, and fielding support. ***FY 2023 Plans:*** Funding support SEPM efforts related to Block I/II modem development. ***FY 2024 Plans:*** Funding supports programmatic activities related to completing A3M development and initiating RAM development. This includes Army network systems architecture and analysis. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** Funding increased as the Army ramps up the development of the RAM, which requires additional personnel due to technical complexity associated with miniaturization of the Army modem.	-	0.359	1.004
Title: Contractor System Engineering and Program Management Support (SEPM) ***Description:*** Funding supports Contractor System Engineering and Program Management (SEPM) which includes programmatic personnel (program analyst, budget analyst, engineer), and other related administrative costs. ***FY 2023 Plans:***	-	0.454	1.457

Exhibit R-2A, RDT&E Project Justification: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303142A / *SATCOM Ground Environment (SPACE)*	**Project (Number/Name)** CO7 / *Protected Tactical Satellite Communications*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Funding supports Contractor System Engineering and Program Management (SEPM) which includes programmatic personnel (program analyst, budget analyst, engineer, etc.), travel, and other related administrative costs. ***FY 2024 Plans:*** Funding supports programmatic activities related to completing A3M Block I modem development and initiating the RAM development. This includes Army network systems architecture and analysis. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** Funding increased as the Army ramps up development of the RAM, which requires additional personnel due to technical complexity associated with miniaturization of the Army modem.			
Title: Test and Certification ***Description:*** Funding for Government-led labor for testing and certification. ***FY 2023 Plans:*** FY 2023 funding provides support for Government-led labor for testing and certification efforts. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** No FY 2024 funding due to completion of test and certification of the A3M in FY 2023.	-	1.024	-
Title: Resilient Anti-Jam Modem Development (RAM) ***Description:*** FY 2024 funding supports development of a small form factor Resilient Anti-Jam Modem (RAM). This activity supports engineering of Army requirements for PTW modems in protected tactical communications. This will be an Army led activity. ***FY 2024 Plans:*** The Army will begin development of a small form factor Resilient Anti-Jam Modem (RAM). ***FY 2023 to FY 2024 Increase/Decrease Statement:*** FY 2024 Funding increase due to development of a small form factor RAM for Protected SATCOM.	-	-	10.699
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:***	-	0.276	-

Exhibit R-2A, RDT&E Project Justification: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303142A / *SATCOM Ground Environment (SPACE)*	**Project (Number/Name)** CO7 / *Protected Tactical Satellite Communications*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Funding transferred in accordance with Title 15 USC §638.			
Accomplishments/Planned Programs Subtotals	-	7.569	13.160

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
• B34002: *Protected Anti Jam Tactical SATCOM*	-	5.853	19.122	-	19.122	36.985	37.133	37.150	37.182	0.000	173.425

Remarks

Production to support procurement and fielding of A3Ms. In FY 2023, Army procured 63 modems and will procure 297 modems in FY 2024.

D. Acquisition Strategy

The Protected Anti-Jam Tactical SATCOM (Protected SATCOM) is a Joint effort with United States Space Force (USSF) for development and consists of A3M Block I and Resilient Anti-Jam Modem (RAM) (previously known as Block II). The A3M Block I modem leverages the USSF Acquisition Strategy (AS), and Memorandum of Agreement (MOA) signed 14 June 2019 with Space Force for collaborative modem development and cost sharing for the A3M Block I modem. The Protected SATCOM Acquisition Strategy for Resilient Anti-Jam Modem (RAM) development will leverage successfully tested technology from the A3M (Block I) effort and is Army only requirement. RAM is designed to provide resilient and anti-jam capability for Army SATCOM terminals and will coordinate modem development with Army tactical terminal program offices. The program will leverage an existing IDIQ contract established by USSF for the development of A3M and RAM.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303142A / *SATCOM Ground Environment (SPACE)*	Project (Number/Name) CO7 / *Protected Tactical Satellite Communications*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government System Enginnering and Program Management	MIPR	Various : APG	-	-		0.359	Dec 2022	1.004	Dec 2023	-		1.004	0.000	1.363	-
Contractor Systems Engineering and Program Support	C/T&M	Various : APG	-	-		0.454	Dec 2022	1.457	Dec 2023	-		1.457	0.000	1.911	-
SBIR/STTR Transfer	TBD	TBD : TBD	-	-		0.276		-		-		-	0.000	0.276	-
		Subtotal	-	-		1.089		2.461		-		2.461	0.000	3.550	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Logistics Support and Data Development	MIPR	various : APG	-	-		0.208	Dec 2022	-		-		-	0.000	0.208	-
PTW Development of Block I Modems	C/FPIF	L3 Harris : Salt Lake City, Utah, Camden, NJ	-	-		5.248	Oct 2022	-		-		-	0.000	5.248	-
Army Modem Development	C/FPIF	L3 Harris : Salt Lake City, Utah, Camden, NJ	-	-		-		10.699	Dec 2023	-		10.699	0.000	10.699	-
		Subtotal	-	-		5.456		10.699		-		10.699	0.000	16.155	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Certification	MIPR	JSEC : APG, MD	-	-		1.024	Nov 2022	-		-		-	0.000	1.024	-
		Subtotal	-	-		1.024		-		-		-	0.000	1.024	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Army			Date: March 2023
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0303142A / *SATCOM Ground Environment (SPACE)*	Project (Number/Name) CO7 / *Protected Tactical Satellite Communications*	

	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	-	-		7.569		13.160		-		13.160	0.000	20.729	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303142A / *SATCOM Ground Environment (SPACE)*	**Project (Number/Name)** CO7 / *Protected Tactical Satellite Communications*

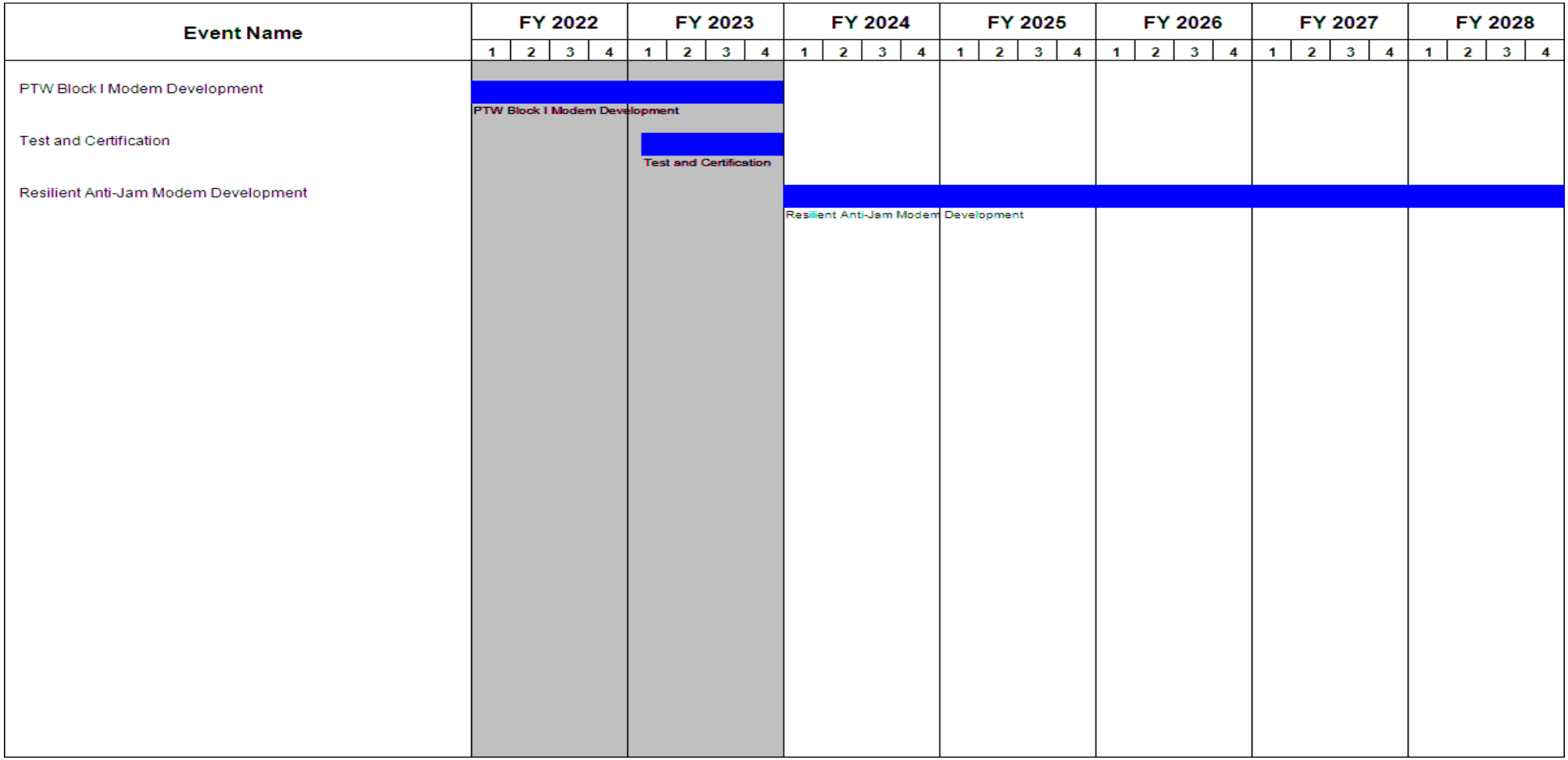

Exhibit R-4A, RDT&E Schedule Details: PB 2024 Army		Date: March 2023
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0303142A / *SATCOM Ground Environment (SPACE)*	**Project (Number/Name)** CO7 / *Protected Tactical Satellite Communications*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
PTW Block I Modem Development	2	2020	4	2023
Test and Certification	1	2023	4	2023
Resilient Anti-Jam Modem Development	1	2024	4	2029