Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army												Date: March 2019
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0304270A / *Electronic Warfare Development*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	14.616	8.922	19.675	3.200	22.875	56.417	67.971	37.954	29.321	0.000	238.076
EW5: *Electronic Warfare Development - MIP*	-	5.751	1.881	10.077	3.200	13.277	9.349	6.218	6.292	6.357	0.000	49.125
EW6: *ARAT-TSS - MIP*	-	8.865	7.041	9.598	-	9.598	10.068	10.453	10.662	10.864	0.000	67.551
FJ5: *Terrestrial Layer System (MIP)**	-	0.000	0.000	0.000	-	0.000	37.000	51.300	21.000	12.100	0.000	121.400

*This project's R-2a exhibit has been suppressed due to funding not beginning until after FY 2020

A. Mission Description and Budget Item Justification

This Program Element encompasses engineering and manufacturing development for tactical Electronic Warfare (EW) terrestrial (ground) employment applications. The systems under this program provide the Army with the capability to detect, identify, locate, collect/process, report, and engage (disrupt, degrade or deny) hostile forces to prevent their effective use of communications, counter-mortar/counter-battery radars, surveillance radars, and electronically fused munitions.

Project EW5 provides for Prophet Enhanced, the current system under the Prophet Ground acquisition program. Its primary mission is to provide 24-hour Situation Development and Information Superiority to the supported maneuver brigade enabling the most effective engagement of enemy forces. Prophet Enhanced provides a modular, scalable, open architecture based system solution optimized for ease of use in a variety of configurations (Stationary-Fixed, Mobile and Manpack).

Project EW6 provides for the Army Reprogramming Analysis Team (ARAT), a Department of the Army established project to develop techniques, methods, tools and architecture to reprogram mission software embedded in Army EW systems, Force Protection Systems (FPS), and Target Sensing Systems (TSS) in response to changes in threat signatures. ARAT Research and Development enables continuous development of: 1) automated threat analysis tools to rapidly detect (flag) threat changes within intelligence systems, 2) tools to minimize the time to develop EW Mission Software and Products (MSP) for both air and ground EW systems, 3) tools and technology to minimize the time required to test and validate MSPs, 4) improved communications conduits to transmit mission software changes to field users, and 5) enhanced mission-software uploading tools. These efforts allow for rapid threat analysis, simulation, mission software development, distribution and uploading of mission software changes directly to the supported Soldier in the field. The ARAT project will develop, test and equip an Army-wide infrastructure capable of rapidly reprogramming electronic combat software embedded in offensive and defensive weapon systems.

Project FJ5 provides for Terrestrial Layer System (TLS), a new start effort that initiates in FY 2020 and has the first year of funding in this Program Element in FY2021 to address a Signals Intelligence (SIGINT), Electronic Warfare (EW), and Cyber-enabling integrated solution to support Multi Domain Battle capability gaps and provide Force Protection, Situational Development, and Information Superiority to the maneuver forces.

Fiscal Year 2020 funds Electronic Warfare (EW) Development for Prophet Enhanced efforts (Project EW5) and the Army Reprogramming Analysis Team (ARAT) efforts (Project EW6).

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army	Date: March 2019
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0304270A *I Electronic Warfare Development*

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	14.616	8.922	16.142	-	16.142
Current President's Budget	14.616	8.922	19.675	3.200	22.875
Total Adjustments	0.000	0.000	3.533	3.200	6.733
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	3.533	3.200	6.733

Change Summary Explanation

$3.533 million Base is a result of $4.000M increase for Enhanced Signal Processing (ESP) kit development and integration onto Prophet Platforms (Project EW5) in support of the most recent National Defense Strategy and Near Peer Operations, and decrease of $.467 million to account for the availability of prior year execution balances.

$3.200 million OCO increase for development and integration of Theater Specific Signals of Interest (SOI) into the Prophet Enhanced system (Project EW5) in support of Army Modernization Priorities.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0304270A / *Electronic Warfare Development*	Project (Number/Name) EW5 / *Electronic Warfare Development - MIP*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
EW5: *Electronic Warfare Development - MIP*	-	5.751	1.881	10.077	3.200	13.277	9.349	6.218	6.292	6.357	0.000	49.125
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Prophet Enhanced is the current system under the Prophet Ground acquisition program. Funds provide for development and integration of Technical Insertion upgrades for Next Generation Signals and state-of-the-art Signals Intelligence (SIGINT) exploitation techniques to increase the capabilities of the Prophet Enhanced and maintain operational relevance. The Prophet Enhanced is the tactical commander's sole organic ground-based SIGINT/Electronic Warfare system for the Multi-Function Teams (MfTs) organic to the Brigade Combat Teams (BCTs) and Expeditionary-Military Intelligence Brigades (E-MIBs). Its primary mission is to provide 24-hour Situation Development and Information Superiority to the supported maneuver brigade to enable the most effective engagement of enemy forces. Prophet Enhanced provides a modular, scalable, open architecture-based system solution optimized for ease of use in a variety of configurations (Stationary-Fixed, Mobile and Manpack). It also incorporates product modification, integration, and test of equipment for rapid integration of Technical Insertions (TI) and product development to ensure operational relevance.

Justification:
FY 2020 Base funding in the amount of $10.077 million will support continuing non-recurring engineering upgrades to the Prophet Enhanced Signals of Interest (SOI) baseline to support the National Defense Strategy that is Near Peer focused; funding will develop the Intelligence and Electronic Warfare Tactical Proficiency Trainer and Target Signature Arrays (IEWTPT/TSA), integrate the Enhanced Signal Processing (ESP) kit onto the Prophet Enhanced system, and continue to pursue signal of interest upgrades.

FY 2020 OCO funding in the amount of $3.200 million will support the development, integration and testing/accreditation of new, Theater Specific, signal capabilities to ensure that Prophet keeps pace with the constantly changing signal environment and to ensure that Prophet maintains its operational relevance against key enemy threats.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Program Management	0.130	-	0.450	-	0.450
Description: Development of next generation signals, enhanced SIGINT exploitation, and improved manpack signal sets enable the Prophet system to remain operationally relevant with state-of-the-art Signal and Threat exploitation capabilities.					
FY 2020 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0304270A / *Electronic Warfare Development*	**Project (Number/Name)** EW5 / *Electronic Warfare Development - MIP*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Funds will provide for matrix and contractor system engineering and program management support for the Prophet program. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increased funding in FY 2020 allows for the support of required system engineering and program management labor costs.					
Title: Upgrade to JICD 4.2 ***Description:*** JCID 4.2 will allow Theater Netcentric Geolocation (TNG) capabilities to leverage collaborative networks.	3.409	-	-	-	-
Title: Signal of Interest upgrades ***Description:*** The Signal Environment that Prophet Systems exploit is constantly changing with evolving threats. This environment creates gaps in Prophet?s ability to collect and exploit these signals. Prophet must constantly integrate software upgrades to remain relevant against these numerous, key, and high-priority emerging threats. ***FY 2019 Plans:*** Continuing development of Next Generation SIGINT capabilities to include, but not limited to upgrades to incorporate the National Intelligence Community architecture, numerous key Redhawk, X-Midas and Salvage software applications and integration of the Enhanced Signal Processing (ESP) kit into the Prophet Enhanced system. The software applications and ESP kits address signal exploitation gaps in Prophet?s ability to exploit key tactical Near Peer signals and emerging signal threats. ***FY 2020 Base Plans:*** Continuing, but not limited to development of Next Generation SIGINT capabilities into the Prophet SIGINT Software (PS2). The new signals and libraries of signals address key exploitation gaps in the Prophet system's ability to collect against key tactical near peer signals and emerging threats. ***FY 2020 OCO Plans:*** Development of, but not limited to Theater Specific Next Generation SIGINT capabilities, including Redhawk, X-Midas and Salvage software applications. ***FY 2019 to FY 2020 Increase/Decrease Statement:***	2.212	1.881	2.000	3.200	5.200

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0304270A / *Electronic Warfare Development*	**Project (Number/Name)** EW5 / *Electronic Warfare Development - MIP*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Increased funding in FY 2020 and OCO funding allows for increased development of high priority Signals of Interest (SOI) and integration of SOI libraries, which is a more economical means of increasing the number of signals the Prophet Enhanced system can exploit.					
Title: Intelligence and Electronic Warfare Tactical Proficiency Trainer and Target Signature Arrays (IEWTPT/ TSA) ***Description:*** The Intelligence and Electronic Warfare Tactical Proficiency Trainer and Target Signature Arrays (IEWTPT/TSA) is required to conduct training to sustain operator proficiency on the Prophet Enhanced after the system has been fielded and post New Equipment Training (NET) training. ***FY 2020 Base Plans:*** Continued development of Intelligence and Electronic Warfare Tactical Proficiency Trainer and Target Signature Arrays (IEWTPT/TSA) training systems. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Both the Prophet Enhanced software and the integration readiness of IEWTPT/TSA have reached the maturity level requiring funding in FY20.	-	-	3.000	-	3.000
Title: Enhanced Signal Processing Operational Testing ***Description:*** Operational testing required after integration of the Enhanced Signal Processing kit into the Prophet Enhanced system. ***FY 2020 Base Plans:*** Funds provide for, but are not limited to release testing of the system-level Prophet System Software (PS2) to include accreditation and productization of all New Technical Insertion (TI) capabilities. The final release software version is fielded to all the Prophet Systems to upgrade capabilities against Peer Near Peer and emerging threats. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funds not required prior to FY 2020 based on this effort being a final packaging of PS2, which is being developed through early FY 2020.	-	-	1.044	-	1.044
Title: Enhanced Signal Processing Integration & Development ***Description:*** Effort to integrate the Enhanced Signal Processing kit into the Prophet Enhanced system.	-	-	3.583	-	3.583

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0304270A / *Electronic Warfare Development*	**Project (Number/Name)** EW5 / *Electronic Warfare Development - MIP*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
FY 2020 Base Plans: Non-recurring engineering included but not limited to integrate the Enhanced Signal Processing kit onto the Prophet Enhanced system. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2020 is the first year that the effort was resourced.					
Accomplishments/Planned Programs Subtotals	5.751	1.881	10.077	3.200	13.277

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• BZ9753: *Prophet Enhanced Modifications (MIP)*	49.093	43.847	55.052	2.051	57.103	44.602	12.150	-	-	Continuing	Continuing
• BZ9751: *SPECIAL PURPOSE SYSTEMS (MIP)*	4.241	4.162	4.000	-	4.000	4.048	4.096	4.145	4.194	Continuing	Continuing
• DX9: *National Integration To Tactical Systems(MIP)*	5.320	9.060	4.490	-	4.490	4.223	5.183	4.425	4.537	Continuing	Continuing
• 0604021A: *Electronic Warfare Technology Maturation (MIP)*	-	-	18.043	-	18.043	18.800	-	-	-	0.000	36.843

Remarks

D. Acquisition Strategy

The Prophet Research and Development (R&D) Acquisition Strategy is structured to maintain operational relevancy of Prophet Enhanced systems in a dynamic threat environment while reducing risk and streamlining business and engineering processes. Contracting activities are to maintain SIGINT relevance and complete Technical Insertion (TI) to Prophet Enhanced systems to pursue the latest Signals of Interest and design against obsolescence. The Technical Insertion (TI) contract supports R&D and other developmental work.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0304270A / *Electronic Warfare Development*	Project (Number/Name) EW5 / *Electronic Warfare Development - MIP*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	Various	PM Electronic Warfare & Cyber : APG, MD	1.481	0.130	Jan 2018	-		0.450	Dec 2019	-		0.450	Continuing	Continuing	Continuing
		Subtotal	1.481	0.130		-		0.450		-		0.450	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Upgrade to JICD 4.2	SS/CPFF	GD Mission Systems : Scottsdale, AZ	-	3.409	Jan 2018	-		-		-		-	Continuing	Continuing	Continuing
Signals of Interst Upgrade	SS/CPFF	GD Mission Systems : Scottsdale, AZ	-	2.212	Jan 2018	1.881	Jan 2019	2.000	Jan 2020	3.200	Jul 2020	5.200	Continuing	Continuing	Continuing
IEWTPT/TSA	SS/CPFF	GD Mission Systems : Scottsdale, AZ	-	-		-		3.000	Jan 2020	-		3.000	0.000	3.000	-
Enhanced Signal Processing Integration & Development	SS/CPFF	GD Mission Systems : Scottsdale, AZ	-	-		-		3.583	Jan 2020	-		3.583	Continuing	Continuing	Continuing
		Subtotal	-	5.621		1.881		8.583		3.200		11.783	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Enhanced Signal Processing Operational Testing	MIPR	Army Test & Evaluation Command : Ft. Huachuca, AZ	-	-		-		1.044	Mar 2020	-		1.044	0.000	1.044	-
		Subtotal	-	-		-		1.044		-		1.044	0.000	1.044	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0304270A / *Electronic Warfare Development*	Project (Number/Name) EW5 / *Electronic Warfare Development - MIP*	

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1.481	5.751		1.881		10.077		3.200		13.277	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0304270A / *Electronic Warfare Development*	**Project (Number/Name)** EW5 / *Electronic Warfare Development - MIP*

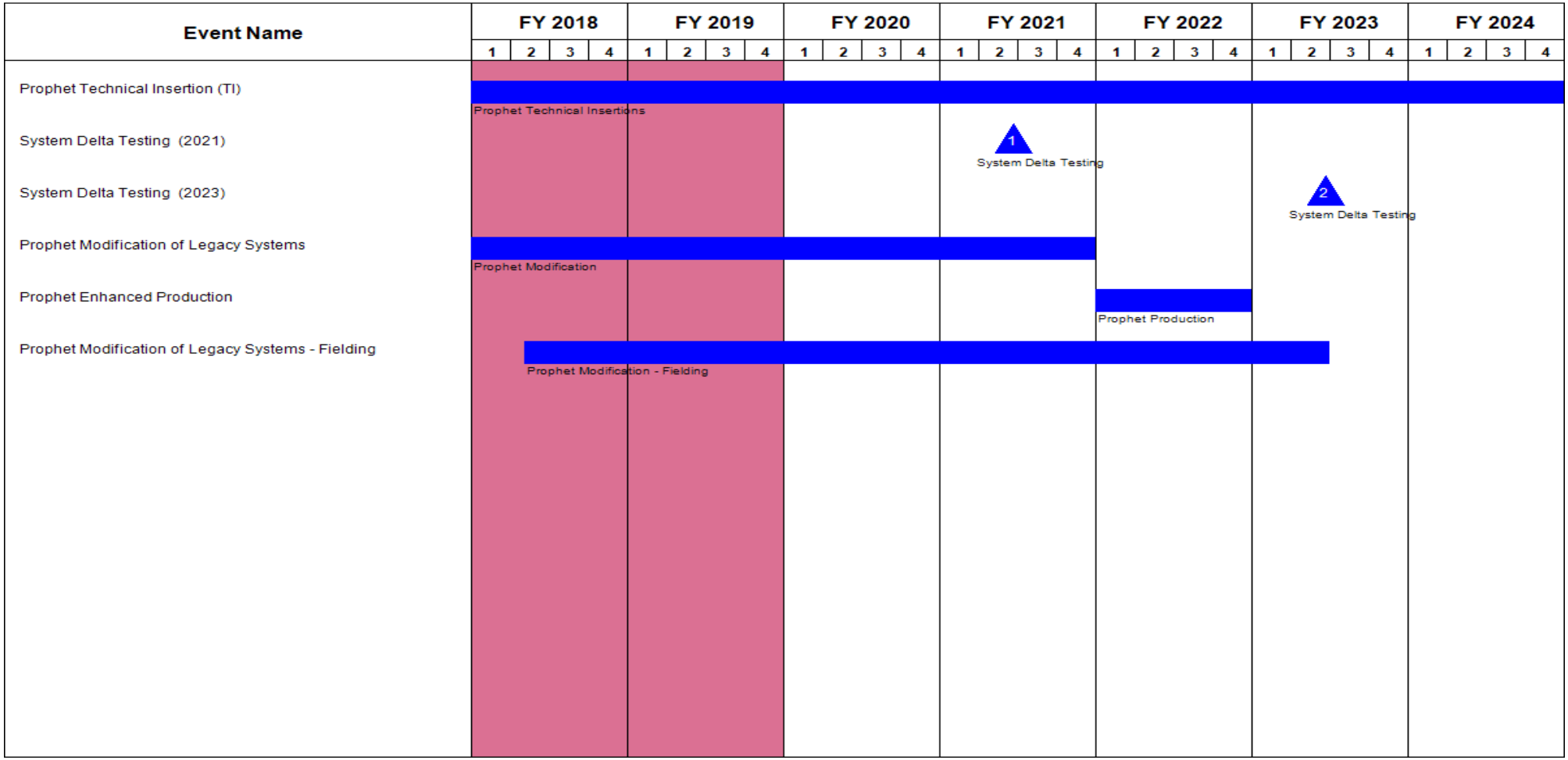

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0304270A / *Electronic Warfare Development*	**Project (Number/Name)** EW5 / *Electronic Warfare Development - MIP*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Prophet Technical Insertion (TI)	4	2008	4	2024
System Delta Testing (2021)	2	2021	2	2021
System Delta Testing (2023)	2	2023	2	2023
Prophet Modification of Legacy Systems	3	2017	4	2021
Prophet Enhanced Production	1	2022	4	2022
Prophet Modification of Legacy Systems - Fielding	2	2018	2	2023

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0304270A / *Electronic Warfare Development*	Project (Number/Name) EW6 / *ARAT-TSS - MIP*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
EW6: *ARAT-TSS - MIP*	-	8.865	7.041	9.598	-	9.598	10.068	10.453	10.662	10.864	0.000	67.551
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The Army Reprogramming Analysis Team (ARAT) is a Department of the Army established program to develop techniques, methods, tools, and architecture to rapidly reprogram mission software embedded in Army Electronic Warfare (EW) Force Protection Systems (FPS) in response to changes in threat signatures. The regulatory guidance directing this mission is contained in Army Regulation (AR) 525-15, AR 525-22, and AR 95-1. The ARAT develops integrated technical solutions required to counter increasingly sophisticated EW Signal threats to US Forces. The ARAT mission software reprogramming infrastructure supports the Army Campaign Plan to provide the Regionally Aligned Forces tactical Commander timely rapid-reprogramming capability of EW systems with mission software. The ARAT mission responsibility is to develop and distribute Mission Software and Products to forward deployed combat forces. ARAT identifies and analyzes worldwide threat signature changes which affect EW systems; determines the impact of observed Signal Intelligence (SIGINT) signature changes; rapidly develops new mission software to adapt friendly systems to detect and defeat enemy threats to U.S. Army ground and air platforms; disseminates the Mission Software and Products to forward deployed forces, and provides government developed tools and software to upload new mission software into the affected EW systems.

A. Mission Description and Budget Item Justification

Current military operations are conducted in a rapidly changing threat environment, where Improvised Explosive Devices (IEDs), Infra Red (IR) man-portable air defense systems (MANPADS) seekers, radar guided surface-to-air-missiles (SAM), laser guided weapons, anti-helicopter mines, and targeting sensors are proliferating and evolving. Integrated solutions are required to counter increasingly sophisticated EW threats. The ARAT reprogramming infrastructure supports the tactical Commander by providing timely rapid reprogramming of mission software and information dissemination for Army supported, Joint and allied services. ARAT supports integrated reprogramming of target acquisition, target engagement, vehicle survivability, and Aircraft Survivability Equipment (ASE). ARAT rapid-reprogramming infrastructure supports tactical requirements for deployed aircraft and ground-based (e.g. Counter Radio-Controlled Improvised Explosive Device (CREW)) survivability systems. ARAT identifies and analyzes threat signature changes which affect EW systems; determines the impact of observed signature changes; develops new mission software to adapt the system to the changes; disseminates the mission software; and provides methods to upload the new mission software into the affected EW systems. Each element within the ARAT infrastructure plays a specific role within the program's rapid reprogramming process, providing the Soldier with the capability to install mission and target identification software at the lowest possible level, thus maximizing flexibility for tactical commanders. ARAT participates in the operational and developmental test design of Army EW systems, and supports Joint Service Reprogramming Exercises in all theaters. ARAT Research and Development enables continuous development of: 1) automated threat analysis tools to rapidly detect (flag) threat changes within the intelligence system, 2) tools to minimize the time to develop Mission Software and Products (MSP), 3) tools and technology to minimize the time required to test and validate MSPs, 4) improved communications conduits to rapidly transmit mission software to upload into supported EW systems. These efforts allow for rapid threat analysis, threat modeling and simulation, mission software development and testing, distribution and uploading of mission software directly to the supported Soldier in the field.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0304270A / *Electronic Warfare Development*	**Project (Number/Name)** EW6 / *ARAT-TSS - MIP*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Keeping Pace with the Enemy and Technology	4.872	3.722	5.972	-	5.972
Description: This effort focuses on developing a capability for the Government to rapidly develop and distribute organic mission software solutions for multiple EW systems. The Army must continually modernize and enhance software tools, hardware modernization, and processes counter enemy technology. ARAT EW6 Military Intelligence Program (MIP) executes Research, Development, Test, and Evaluation (RDTE) funding to provide an organic Army capability for this organization to rapidly develop, test and distribute mission software solutions for forward deployed combat forces. ***FY 2019 Plans:*** This FY effort will capitalize on accomplishments in FY 2018 and will continue to enhance: 1) Intelligence data requirements to support MSP development for EO/UV/IR spectrums and other multi-spectral sensors for aviation and non-aviation EW systems, 2) Government organic knowledge and application-base enabling reprogramming of future systems, 3)USG capability for the reprogramming of multi-spectral EW systems. ***FY 2020 Base Plans:*** ARAT's FY 2020 plan will continue to focus on the rapid development, testing, and distribution of mission software for regions worldwide. In support of Air Mission software development, ARAT will continue automating threat simulation development, Radio Frequency automated signal generation, automating threat analysis tools, developing a universal mission software generation tool, and software hardening capability. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** ARAT has increased from FY 2019 to FY 2020 due to increased emphasis on automation of threat simulations development and threat analysis tools.					
Title: Infrastructure Improvements Multispectral	1.637	1.104	1.306	-	1.306
Description: This effort focuses on enhancing the Army's Multispectral Missile Warning System (MWS) software sustainment infrastructure. With the worldwide proliferation of MANPADS the Army must have the capability to rapidly analyze and develop mission software solutions that detect and counter MANPADS to defend Army Aviation platforms against this lethal threat. ***FY 2019 Plans:*** Will continue to conduct infrastructure enhancements for an OFP software development environment to enable the USG to develop and deploy an OFP environment for MWS. Continue evaluation of data and conduct analysis requirements for MANPADS characterization and enhance the organic government analysis and					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0304270A / *Electronic Warfare Development*	**Project (Number/Name)** EW6 / *ARAT-TSS - MIP*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
sustainment process to support OFPs and subsequently adapt MWSs to new threats. Enhance government organic capability, thereby decreasing the risk that systems cannot be readily adapted to changing threats. ***FY 2020 Base Plans:*** ARAT will continue to enhance Multispectral Mission Software development, testing, and distribution infrastructure. ARAT will continue modernization of the multispectral software development environment as well as automation of threat analysis tools and multispectral simulation capabilities. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** There is only a slight increase from FY 2019 to FY 2020. The increase is attributed to slightly higher costing expected on the various planned efforts.					
Title: Infrastructure Improvement Radio Frequency General ***Description:*** This effort focuses on enhancing the Army's Radio Frequency (RF) EW system Mission Software and Products (MSP) development and distribution infrastructure. The Army must fight in a contested and congested EW environment. Mission software solutions to defend against RF threats must be rapidly developed, tested, and distributed to Soldiers on an ever changing battlefield. ***FY 2019 Plans:*** Further augment the ARAT communications architecture to enhance the rapid secure transmission of mission software changes to EW systems, with emphasis on remote user and highly mobile Soldier connectivity. Will continue to enhance the USG integrated EW development and test environment to ensure MSP and threat countermeasure integration on the respective EW platform. ***FY 2020 Base Plans:*** In support of Ground Electronic Warfare Radio Frequency Mission Software development, ARAT will develop modernization efforts for the automated testing of mission software, develop laboratory environmental models that replicate actual physical and climatic environments worldwide, and optimize threat automation tools. Additionally, ARAT will create a software tool that will control various versions of Radio Frequency (RF) simulators and RF Signal Generators. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** There is only a slight increase from FY 2019 to FY 2020. The increase is attributed to slightly higher costing expected on the various planned efforts.	1.538	1.349	1.469	-	1.469
Title: Threat Flagging and Mission Data Set Reprogramming Tool Development	0.818	0.866	0.851	-	0.851

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0304270A / *Electronic Warfare Development*	**Project (Number/Name)** EW6 / *ARAT-TSS - MIP*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Description: This effort focuses on enhancing the Army's capability to monitor changes in enemy EW systems that affect system performance of Army detection, declaration, and countermeasure EW systems onboard. The enemy is continuously developing or modifying it's EW systems. For Army platforms to have protection against enemy systems it must have a robust capability to immediately detect changes in threat system performance and rapidly develop, test, and distribute a mission software solution that counters the threat. This effort will enhance the Army's capability bridge detection of a change in enemy threat and the rapid development of MSP. ***FY 2019 Plans:*** Continue to enhance spiral applications for ARAT internal system specific threat flagging, threat analysis, mission software generation and testing processes. Will conduct spiral enhancement of threat flagging (threat performance change detection) and intelligence analytical tools, based on supported systems performance criteria, to rapidly identify and counter emerging and changing threats that adversely affect the performance of the EW systems. Will continue to enhance mission software development, testing and validation tools to decrease time from threat-change detection to the distribution of MSP in order to increase the accuracy and fidelity of threat identification, and reduce the engineering involvement/workload associated with the manually intensive analysis and MSP development processes. Will continue to enhance software tools that enhance a data support infrastructure that employs the EWIR database. ***FY 2020 Base Plans:*** ARAT will continue the design and development of the modernized Threat Change Detection (TCD) tool. This tool will provide the enhanced ability for the Army to rapidly detect and analyze National level captured signal intelligence parametric data. The TCD tool will utilize analytical tools to assess the change in threat emitters and to prioritize the lethality of a threat change and its impact to US Forces. Additionally, ARAT will continue with modernization efforts of the mission software generation tools and hardware infrastructure. Planned FY 2020 effort will include the creation of a Universal Mission Data Set Generation (UMG) tool. The UMG tool will consolidate the current multiple Mission Data Set Generation tools into a single tool. The benefit of a single tool will enhance the Mission Software development process by reducing the sustainment of 5 Generation tools into a single Generation tool. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** There is only a slight decrease from FY 2019 to FY 2020. The decrease is attributed to lower costing expected on the various planned efforts.					
Accomplishments/Planned Programs Subtotals	8.865	7.041	9.598	-	9.598

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0304270A / *Electronic Warfare Development*	**Project (Number/Name)** EW6 / *ARAT-TSS - MIP*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The efforts to be funded in this project will require a combination of systems specific and high-tech knowledge. The contractual services portion for the project will be obtained from both the Communications-Electronics Command (CECOM) Software Engineering Center (SEC) competitive omnibus and the Research, Development and Engineering Command (RDECOM) and the Defense Technical Intelligence Center (DTIC) high tech contracts.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0304270A / *Electronic Warfare Development*	Project (Number/Name) EW6 / *ARAT-TSS - MIP*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	Various	CECOM SEC : Aberdeen Proving Ground, MD	0.522	8.865		0.161		0.182	Mar 2020	-		0.182	Continuing	Continuing	Continuing
		Subtotal	0.522	8.865		0.161		0.182		-		0.182	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
USG Labor	Various	CECOM SEC : Various Locations	3.111	-		0.372		0.383		-		0.383	0.000	3.866	-
Travel	Various	CECOM SEC : Various Locations	0.838	-		0.080		0.084		-		0.084	0.000	1.002	-
		Subtotal	3.949	-		0.452		0.467		-		0.467	0.000	4.868	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	Various	CECOM SEC, RDECOM, DTIC : Various Locations	34.726	-		6.428		8.949	Mar 2020	-		8.949	Continuing	Continuing	Continuing
		Subtotal	34.726	-		6.428		8.949		-		8.949	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	39.197	8.865		7.041		9.598		-		9.598	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0304270A / *Electronic Warfare Development*	**Project (Number/Name)** EW6 / *ARAT-TSS - MIP*

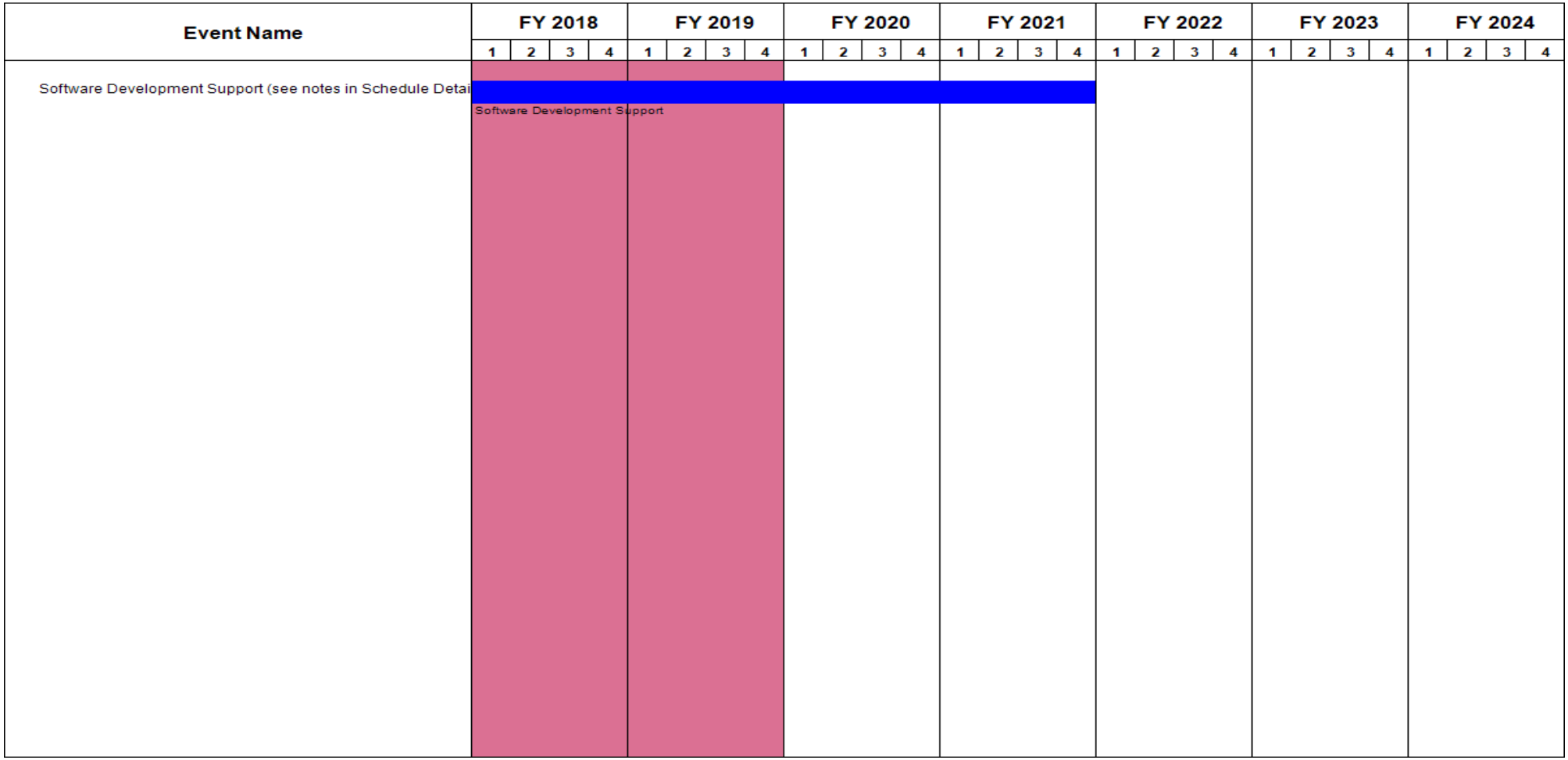

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0304270A / *Electronic Warfare Development*	**Project (Number/Name)** EW6 / *ARAT-TSS - MIP*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Software Development Support (see notes in Schedule Detail)	1	2015	4	2021

Note

- Software Test Automation
- Threat Analysis Data Evaluation Tool
- Enhance Data Distribution