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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 0604270A / 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	-	68.935	58.627	70.539	-	70.539	51.711	23.397	9.811	7.909	0.000	290.929
DX5: <i>Electronic Warfare And Management Tool</i>	-	31.809	18.295	23.514	-	23.514	8.251	7.039	2.019	0.000	0.000	90.927
DX6: <i>Multi-Function Electronic Warfare (MFEW)</i>	-	23.376	31.688	41.574	-	41.574	38.183	11.272	5.659	5.750	0.000	157.502
ET7: <i>Radio Frequency Interference Mitigation</i>	-	4.276	0.999	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.275
VS6: <i>Integrated Electronic Warfare Systems</i>	-	9.474	7.645	5.451	-	5.451	5.277	5.086	2.133	2.159	0.000	37.225

A. Mission Description and Budget Item Justification

This program element (PE) encompasses engineering and manufacturing development for tactical Electronic Warfare (EW). The Integrated Electronic Warfare System (IEWS) is a capability set that integrates electronic attack, protect and support functions to dramatically improve the ability to seize, retain, and exploit an advantage within the electromagnetic spectrum (EMS). It is based on a modular, scalable and open architecture to allow Army Brigade Combat Team (BCT) and Joint Force Commander's to tailor capability responses against a variety of EW threats/scenarios.

The IEWS capability set is structured along four program lines of effort: 1) Project DX5 Electronic Warfare Planning and Management Tools (EWPMT), 2) Project DX6 Multi-Function EW (MFEW), 3) Project VS6 Counter Radio-Controlled Improvised Explosive Devices (RCIED) Electronic Warfare (CREW) which provides current defensive electronic attack capability, and 4) Project ET7 Radio Frequency Interference Mitigation (RIM) which resolves radio frequency interference and electromagnetic fratricide and enables electronic warfare and communications compatibility.

Project DX5 - The Electronic Warfare Planning and Management Tool (EWPMT) is a software solution that provides the Commander, their staff (Electronic Warfare Officer (EWO) and Spectrum Manager), and the Cyber Electromagnetic Activities (CEMA) working group/cell the ability to control, manage, and dominate the Electromagnetic Spectrum (EMS) in order to fight in contested and congested EMS/Cyber environments. EWPMT will provide: capabilities to plan, coordinate, manage, and de-conflict Electronic Warfare (EW) activities, the ability for remote control & management of EW assets to conduct offensive and defensive Electronic Attack and cyber, EW targeting, enable maneuver through CEMA operations, and synchronize EW, Spectrum Management Operations (SMO) and CEMA across Intelligence, Operations, and Signals. EWPMT will integrate essential data elements to include but not limited to Mission Command, Intelligence, Fires, Signals to successfully execute Multi-Domain Operations and meet the Commander's needs and desired effects.

Project DX6 - The Multi-Function EW (MFEW) is a capability set that will provide the BCT Commander with an organic Electronic Attack (EA) and Electronic Warfare Support (ES) capability. MFEW variants empower Commanders to shape the Electromagnetic Spectrum (EMS) to their advantage. MFEW will provide commanders with an organic EW capability that dramatically improves a land force's ability to seize, retain, and exploit an advantage within the EMS in order to execute successful

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army	Date: March 2019
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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604270A / <i>Electronic Warfare Development</i>
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unified land operations. These capabilities give the commander a competitive advantage by denying, degrading the enemy's ability to conduct Command and Control (C2), Intelligence, Surveillance and Reconnaissance (ISR), and targeting; and allows the commander to optimize effects within the EMS at the time and place of their choosing. These systems are networked with a C2 system that enables remote operation and dynamic tasking/reprogramming.

Project ET7 - Radio Frequency Interference Mitigation (RIM) is a cross cutting capability to centrally manage and provide oversight to identify, define, test, and coordinate development of Radio Frequency (RF) interference mitigation material solutions to resolve mutual RF interference and electromagnetic fratricide for Spectrum Dependent Systems (SDS).

Project VS6 - Counter Radio Controlled Improvised Explosive Device (RCIED) Electronic Warfare (CREW) provides for protection for ground forces operating in vehicle convoys, single vehicle operations and fixed locations in all theatres of operations. It is programmable to migrate with the evolving threat and provides non-lethal capabilities which enable freedom of movement across depth/breadth of the operational environment.

B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	71.671	78.699	88.746	-	88.746
Current President's Budget	68.935	58.627	70.539	-	70.539
Total Adjustments	-2.736	-20.072	-18.207	-	-18.207
• Congressional General Reductions	-0.056	-0.072			
• Congressional Directed Reductions	-	-20.000			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-2.680	-			
• Adjustments to Budget Years	-	-	-18.207	-	-18.207

Change Summary Explanation

In FY 2020, \$5.759 million was reduced as a result of Radio Frequency Interference Mitigation (RIM), Project ET7 cancellation.

In FY 2020, the reduction of \$12.448 million represents program rephrasing of Base funding from FY 2020 to out years.

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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 0604270A / <i>Electronic Warfare Development</i>				Project (Number/Name) DX5 / <i>Electronic Warfare And Management Tool</i>			
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
DX5: <i>Electronic Warfare And Management Tool</i>	-	31.809	18.295	23.514	-	23.514	8.251	7.039	2.019	0.000	0.000	90.927
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
The Electronic Warfare Planning and Management Tool (EWPMT) is a software solution that provides the Commander, their staff (Electronic Warfare Officer (EWO) and Spectrum Manager), and the Cyber Electromagnetic Activities (CEMA) working group/cell the ability to control, manage, and dominate the Electromagnetic Spectrum (EMS) in order to fight in contested and congested EMS/Cyber environments. EWPMT will provide: capabilities to plan, coordinate, manage, and de-conflict Electronic Warfare (EW) activities, the ability for remote control & management of EW assets to conduct offensive and defensive Electronic Attack and cyber, EW targeting, enable maneuver through CEMA operations, and synchronize EW, Spectrum Management Operations (SMO) and CEMA across Intelligence, Operations, and Signals. EWPMT will integrate essential data elements to include but not limited to Mission Command, Intelligence, Fires, Signals to successfully execute Multi-Domain Operations and meet the Commander's needs and desired effects.												
Justification: FY2020 Base funds in the amount of \$23.514 million will continue Capability Drop 4 (CD4) development, as well as continue CD3 testing and support activities for the EWPMT program.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2018	FY 2019	FY 2020	
Title: EWPMT									31.809	17.714	23.514	
Description: EWPMT is a software application that will allow the Commander, staff, and CEMA element a mission command capability to plan, coordinate, manage, and de-conflict unit EW and spectrum management activities across Intelligence, Operations, and Signals.												
FY 2019 Plans: Continue CD3 development, test and support activities Award CD4 development, test and support activities												
FY 2020 Plans: Complete CD3 testing and deliver CD3 baseline Continue CD4 development, test and support activities												
FY 2019 to FY 2020 Increase/Decrease Statement:												

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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 0604270A / <i>Electronic Warfare Development</i>			Project (Number/Name) DX5 / <i>Electronic Warfare And Management Tool</i>				

B. Accomplishments/Planned Programs (\$ in Millions)				FY 2018	FY 2019	FY 2020
An increase of \$5.800 million is to support completion of CD3 testing overlapping with the continued CD4 development in FY 2020						
Title: FY 2019 SBIR / STTR Transfer				-	0.581	-
FY 2019 Plans: FY 2019 SBIR/STTR Transfer						
FY 2019 to FY 2020 Increase/Decrease Statement: FY 2019 SBIR/STTR Transfer						
Accomplishments/Planned Programs Subtotals				31.809	18.295	23.514

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u> <u>Base</u>	<u>FY 2020</u> <u>OCO</u>	<u>FY 2020</u> <u>Total</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• K00002: <i>EW Planning & Management Tools (EWPMT)</i>	5.805	5.875	7.568	-	7.568	7.857	0.793	-	-	Continuing	Continuing
Remarks EWPMT Fielding Support which includes New Equipment Training (NET); delta training; Interim Contractor Support (ICS); and SETA Support.											
D. Acquisition Strategy EWPMT is an Automated Information System (AIS) that will follow an evolutionary acquisition strategy using a Capability Drop (CD) construct for rapid development and integration of new Electronic Warfare and Spectrum Management capabilities to pace the near peer threats as well as provide for continuous product improvements.											
E. Performance Metrics N/A											

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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 0604270A / <i>Electronic Warfare Development</i>				Project (Number/Name) DX5 / <i>Electronic Warfare And Management Tool</i>					
Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
PMO Staff/Travel	Various	PM Electronic Warfare & Cyber : Aberdeen Proving Ground, MD	10.576	2.159	Dec 2017	-		0.100	Mar 2020	-		0.100	0.000	12.835	-
Subtotal			10.576	2.159		-		0.100		-		0.100	0.000	12.835	N/A
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
EMD Contract - EWPMT CD1	C/IDIQ	Raytheon : Fort Wayne, IN	18.200	-		-		-		-		-	0.000	18.200	18.200
EMD Contract - EWPMT CD2	C/IDIQ	Raytheon : Fort Wayne, IN	18.252	6.107	Dec 2017	-		-		-		-	0.000	24.359	24.359
EMD Contract - EWPMT CD3	C/IDIQ	Raytheon : Fort Wayne, IN	-	18.020	Apr 2018	10.607	Dec 2018	-		-		-	0.000	28.627	28.627
EMD Contract - EWPMT CD4	C/IDIQ	Raytheon : Fort Wayne, IN	-	-		1.869	Jun 2019	16.029	Dec 2019	-		16.029	10.102	28.000	28.000
FY 2019 SBIR / STTR Transfer	TBD	TBD : TBD	-	-		0.581		-		-		-	0.000	0.581	-
Subtotal			36.452	24.127		13.057		16.029		-		16.029	10.102	99.767	N/A
Remarks															
FY 2020 funds in the amount of \$16.029 million represent incremental funding for CD4 development on the CD4 Task Order to be awarded July 2019															
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
EWPMT Technical and Engineering Support	Option/ CPFF	Various : Various	21.821	3.152	Dec 2017	3.918	Dec 2018	3.873	Dec 2019	-		3.873	Continuing	Continuing	Continuing
Subtotal			21.821	3.152		3.918		3.873		-		3.873	Continuing	Continuing	N/A

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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 0604270A / <i>Electronic Warfare Development</i>				Project (Number/Name) DX5 / <i>Electronic Warfare And Management Tool</i>				

Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
EWPMT Test Support	MIPR	Various : Various	3.483	2.371	Dec 2017	1.320	Jul 2019	3.512	Dec 2019	-		3.512	Continuing	Continuing	Continuing
Subtotal			3.483	2.371		1.320		3.512		-		3.512	Continuing	Continuing	N/A

Remarks
FY 2020 funds in the amount of \$3.512 million will continue CD3 testing

	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	72.332	31.809	18.295	23.514	-	23.514	Continuing	Continuing	N/A

Remarks

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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 0604270A / <i>Electronic Warfare Development</i>		Project (Number/Name) DX5 / <i>Electronic Warfare And Management Tool</i>	

Event Name	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
EWPMT Contract																												
CD1 Fielding																												
Development and Test for CD2																												
Test CD2 (Limited User Test)																												
Limited Deployment Decision for CD2																												
Development and Test for CD3																												
Development and Test for CD4																												
Test CD3 (Limited User Test)																												
Limited Deployment Decision for CD3																												
Initial Operational Test Event																												
Full Deployment Decision																												

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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 0604270A / <i>Electronic Warfare Development</i>	Project (Number/Name) DX5 / <i>Electronic Warfare And Management Tool</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
EWPMT Contract	1	2014	4	2022
Development and Test for CD 1	4	2014	3	2016
Test CD 1 (Government Confidence test)	2	2016	2	2016
CD1 Fielding	4	2016	3	2018
Development and Test for CD2	4	2016	4	2018
Test CD2 (Limited User Test)	3	2018	3	2018
Limited Deployment Decision for CD2	2	2019	2	2019
Development and Test for CD3	3	2018	3	2020
Development and Test for CD4	4	2019	2	2022
Test CD3 (Limited User Test)	2	2020	2	2020
Limited Deployment Decision for CD3	4	2020	4	2020
Initial Operational Test Event	3	2021	2	2022
Full Deployment Decision	2	2022	2	2022

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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 0604270A / <i>Electronic Warfare Development</i>				Project (Number/Name) DX6 / <i>Multi-Function Electronic Warfare (MFEW)</i>			
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
DX6: <i>Multi-Function Electronic Warfare (MFEW)</i>	-	23.376	31.688	41.574	-	41.574	38.183	11.272	5.659	5.750	0.000	157.502
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Multi-Function Electronic Warfare (MFEW) is a capability set that will provide BCT Commanders with an organic offensive Electronic Attack (EA) and Electronic Warfare Support (ES) capability. MFEW variants empower Commanders to shape the Electromagnetic Spectrum (EMS) to their advantage. MFEW will provide Commanders with an organic EW capability that dramatically improve a land force capabilities to seize, retain, and exploit an advantage within the EMS in order to execute successful unified land operations. These capabilities give the Commander a competitive advantage by denying or degrading the enemy's ability to conduct Command and Control (C2); Intelligence, Surveillance and Reconnaissance (ISR); and targeting, and allows the Commander to optimize effects within the EMS at the time and place of their choosing. These systems are networked with EWPMT and offensive cyber to enable remote operation and dynamic tasking or reprogramming.

Justification:

FY 2020 Base funding in the amount of \$41.574 million will provide for MFEW Air Large follow-on Engineering and Manufacturing Development (EMD) activities and system prototyping, contractor test support, air worthiness testing, and Government Developmental Testing / Limited User Test (DT/LUT). In addition, this funding will provide for development of Electronic Attack software techniques needed to address MFEW threats required per the MFEW Capability Development Document.

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

	FY 2018	FY 2019	FY 2020
Title: Multi-Function EW (MFEW) Air	23.376	30.113	41.574
Description: MFEW-Air Large is an airborne Electronic Warfare payload to be integrated onto a class IV Unmanned Aerial Vehicle to provide offensive Electronic Attack (EA) and Electronic Warfare Support (ES) capability to the BCT.			
FY 2019 Plans: MFEW Air Development and Test activities			
FY 2020 Plans: Engineering and Manufacturing Development (EMD) activities and development of EMD systems for test			
FY 2019 to FY 2020 Increase/Decrease Statement: Increase of \$11.461M is due to a ramp up of EMD activities for MFEW Air Large.			
Title: FY 2019 SIBR / STTR Transfer	-	1.575	-
FY 2019 Plans:			

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Appropriation/Budget Activity 2040 / 5				R-1 Program Element (Number/Name) PE 0604270A / <i>Electronic Warfare Development</i>			Project (Number/Name) DX6 / <i>Multi-Function Electronic Warfare (MFEW)</i>				
B. Accomplishments/Planned Programs (\$ in Millions)							FY 2018	FY 2019	FY 2020		
FY 2019 SIBR / STTR Transfer											
<i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> FY 2019 SIBR / STTR Transfer											
Accomplishments/Planned Programs Subtotals							23.376	31.688	41.574		
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
• B05000: <i>Multi-Function Electronic Warfare (MFEW) Systems</i>	-	-	6.420	-	6.420	21.522	24.109	25.196	14.322	0.000	91.569
Remarks MFEW Air procurement to include long lead items.											
D. Acquisition Strategy The Multi-Function EW (MFEW) is a capability set that will provide the BCT Commander with organic offensive Electronic Attack (EA), Electronic Warfare Support (ES), and Defensive Electronic Attack (DEA) capabilities. Initially, the MFEW-AL variant payload will be developed. MFEW-AL will deliver scalable, non-lethal effects to support Unified Land Operations and protect personnel, equipment, and facilities. A competitive Other Transaction Authority (OTA) Acquisition Strategy is being employed for MFEW-AL development. The MFEW-AL EMD effort uses a tailored Acquisition Strategy to rapidly deliver an initial airborne EW capability to the Army using the Consortium for Command, Control, Communications, and Computer Technologies (C5) OTA. Phase 1: MFEW-Air awarded an OTA for development and delivery of a prototype capable of demonstrating EW capabilities; Phase 2: Follow-on Engineering and Manufacturing Development (EMD) activities, development of EMD systems, and test using C5 OTA. The program will use all acquisition authorities to execute and/or accelerate the program.											
E. Performance Metrics N/A											

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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 0604270A / <i>Electronic Warfare Development</i>				Project (Number/Name) DX6 / <i>Multi-Function Electronic Warfare (MFEW)</i>					
Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Office Support - MFEW Air	Allot	CECOM : Aberdeen Proving Ground, MD	0.139	0.756	Jan 2018	1.656	Jan 2019	0.239	Jan 2020	-		0.239	0.000	2.790	-
Subtotal			0.139	0.756		1.656		0.239		-		0.239	0.000	2.790	N/A
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
MFEW OTA Prototype Design&Development Contract	C/FFP	C5 Consortium OTA : Acquisition Contracting Center-New Jersey	-	18.890	Sep 2018	0.117	Jan 2019	-		-		-	0.000	19.007	-
Command and Control Development Contract	C/Various	Various : Various	0.800	0.240	Aug 2018	1.800	Jan 2019	-		-		-	0.000	2.840	-
MFEW Techniques and risk reduction activities	C/CPFF	Various : APG, MD	-	1.329	Nov 2018	8.803	Jan 2019	3.416	Jan 2020	-		3.416	0.000	13.548	-
MFEW OTA EMD Contract	C/FFP	C5 Consortium OTA : Acquisition Contracting Center-New Jersey	-	-		-		33.578	Feb 2020	-		33.578	0.000	33.578	-
Build and integrate networked mobile emitter capabilities	C/Various	CERDEC Flight Activity : APG, MD	-	-		8.115	Jan 2019	-		-		-	0.000	8.115	-
FY 2019 SIBR / STTR Transfer	TBD	TBD : TBD	-	-		1.575		-		-		-	0.000	1.575	-
Subtotal			0.800	20.459		20.410		36.994		-		36.994	0.000	78.663	N/A

UNCLASSIFIED

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Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering - MFEW Air	C/CPFF	AASKI : Aberdeen Proving Ground, MD	-	1.679	Jul 2018	0.396	Dec 2018	1.777	Dec 2019	-		1.777	0.000	3.852	-
Government Engineering - MFEW Air	MIPR	Various : Aberdeen Proving Ground, MD	0.220	0.482	Dec 2017	0.815	Dec 2018	1.004	Dec 2019	-		1.004	0.000	2.521	-
Technical Support - MFEW Air	C/Various	Various : Aberdeen Proving Ground, MD	0.200	-		-		-		-		-	0.000	0.200	-
Subtotal			0.420	2.161		1.211		2.781		-		2.781	0.000	6.573	N/A
Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test (DT) / Flight Testing (Air)	TBD	Various : APG, MD	-	-		-		1.060	Apr 2020	-		1.060	0.000	1.060	-
Test range and test support	Various	Various : Various	-	-		3.305	Mar 2019	0.500	Mar 2020	-		0.500	0.000	3.805	-
Pod evaluation and flight test	Various	CERDEC Flight Activity : APG, MD	-	-		5.106	Jan 2019	-		-		-	0.000	5.106	-
Subtotal			-	-		8.411		1.560		-		1.560	0.000	9.971	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			1.359	23.376		31.688		41.574		-		41.574	0.000	97.997	N/A
Remarks															

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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 0604270A / <i>Electronic Warfare Development</i>		Project (Number/Name) DX6 / <i>Multi-Function Electronic Warfare (MFEW)</i>	

Event Name	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Tailored Milestone B			▲1																									
MFEW Air OTA Award				▲2																								
MFEW Air OTA Prototype Design&Development																												
MFEW Air OTA EMD																												
Developmental Test (DT)/Flight Testing/Airworthiness																												
Tailored Milestone C																												
IOT&E																												
MFEW Air EDM Refurbishment, Production and Fielding																												
MFEW Air Large Long Lead Item purchase																												

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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 0604270A / <i>Electronic Warfare Development</i>	Project (Number/Name) DX6 / <i>Multi-Function Electronic Warfare (MFEW)</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Tailored Milestone B	3	2018	3	2018
MFEW Air OTA Award	4	2018	4	2018
MFEW Air OTA Prototype Design&Development	4	2018	2	2020
MFEW Air OTA EMD	2	2020	4	2022
Developmental Test (DT)/Flight Testing/Airworthiness	3	2020	4	2022
Tailored Milestone C	3	2021	3	2021
IOT&E	3	2021	4	2021
MFEW Air EDM Refurbishment, Production and Fielding	3	2021	4	2026
MFEW Air Large Long Lead Item purchase	4	2020	4	2025

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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 0604270A / <i>Electronic Warfare Development</i>				Project (Number/Name) ET7 / <i>Radio Frequency Interference Mitigation</i>			
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
ET7: <i>Radio Frequency Interference Mitigation</i>	-	4.276	0.999	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.275
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Radio Frequency Interference Mitigation (RIM) is a cross cutting capability to centrally manage and provide oversight to identify, define, test, and coordinate development of Radio Frequency (RF) interference mitigation material solutions to resolve mutual RF interference and electromagnetic fratricide for Spectrum Dependent Systems (SDS).

Centralized management of RIM offers a holistic approach for identification, system of systems engineering, developmental testing, and maturing of RIM solutions to address current and evolving RF interference issues. User and acquisition communities will synchronize, integrate, and codify RIM requirements to facilitate the cross cutting approach necessary for the efficient procurement of common RIM products. This approach will eliminate the need for separate hardware and platform integration research and development efforts for SDS and platforms. An integrated approach will eliminate the need for separate hardware and platform integration research and development efforts for SDS and platform Program Managers. RIM products are intended to preserve the investment that the Army has made in current Electronic Warfare (EW) and Mission Command Transport SDS and provide a strategy for future efforts for new SDS development with integrated RIM solutions.

Justification:
FY2020 Base funding for RIM was adjusted to zero (0) dollars.

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

	FY 2018	FY 2019	FY 2020
Title: RF Interference Mitigation	4.276	0.949	-
Description: RIM is a System of Systems Enterprise approach that will allow Spectrum Dependent Systems to co-exist with Force Protection assets.			
FY 2019 Plans: Continue IC Light development, continue IC Algorithm development, and provide engineering support.			
FY 2019 to FY 2020 Increase/Decrease Statement: FY 2020 funding for RIM was adjusted to zero (0) dollars.			
Title: FY 2019 SIBR / STTR Transfer	-	0.050	-
FY 2019 Plans:			

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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 0604270A / <i>Electronic Warfare Development</i>	Project (Number/Name) ET7 / <i>Radio Frequency Interference Mitigation</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019
FY 2019 SIBR/STTR Transfer			
<i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> FY 2019 SIBR/STTR Transfer			
Accomplishments/Planned Programs Subtotals		4.276	0.999
			-
C. Other Program Funding Summary (\$ in Millions) N/A			
Remarks			
D. Acquisition Strategy Radio Frequency (RF) Interference Mitigation (RIM) will follow a System of Systems enterprise strategy to develop and test hardware solutions such as tunable filters and Interference Cancellers (IC) to address RF interference on Army platforms. Designated platforms will procure, integrate and test RIM solutions with their associated spectrum dependent systems. The RIM acquisition strategy shifted focus from tunable filter technology to IC technology. The decision to shift focus was a direct result of the S&T community accelerating the technical maturity. IC technology will enhance the warfighters ability to utilize the spectrum compared to tunable filter technology. Additionally, RIM is being leveraged through the U.S. Army Europe (USAREUR) and Cyber Electromagnetic Activities (CEMA) Operational Needs Statement (ONS) and this effort could result in future capabilities.			
E. Performance Metrics N/A			

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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 0604270A / <i>Electronic Warfare Development</i>				Project (Number/Name) ET7 / <i>Radio Frequency Interference Mitigation</i>					
Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	MIPR	PM Electronic Warfare & Cyber : APG, MD	0.298	0.323	Dec 2017	-		-		-		-	Continuing	Continuing	Continuing
Subtotal			0.298	0.323		-		-		-		-	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Development Models	TBD	TBD : TBD	2.238	2.895	Dec 2017	-		-		-		-	Continuing	Continuing	-
FY 2019 SBIR / STTR Transfer	TBD	TBD : TBD	-	-		0.050		-		-		-	0.000	0.050	-
Subtotal			2.238	2.895		0.050		-		-		-	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Support	Allot	Various : Various	1.456	1.058	Dec 2017	0.949	Dec 2018	-		-		-	Continuing	Continuing	-
Subtotal			1.456	1.058		0.949		-		-		-	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			3.992	4.276		0.999		-		-		-	Continuing	Continuing	N/A
Remarks															

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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 0604270A / <i>Electronic Warfare Development</i>		Project (Number/Name) ET7 / <i>Radio Frequency Interference Mitigation</i>	

Event Name	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Development and testing for Tunable Filters																												
Developmental Testing for Tunable Filters																												
Development for Interference Cancellation (IC)																												
Developmental Testing (DT) for IC																												
Development for IC Algorithm																												

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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 0604270A / <i>Electronic Warfare Development</i>	Project (Number/Name) ET7 / <i>Radio Frequency Interference Mitigation</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Development and testing for Tunable Filters	3	2017	3	2018
Developmental Testing for Tunable Filters	2	2019	2	2019
Development for Interference Cancellation (IC)	1	2018	2	2019
Developmental Testing (DT) for IC	3	2019	4	2019
Development for IC Algorithm	1	2019	4	2019

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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 0604270A / <i>Electronic Warfare Development</i>				Project (Number/Name) VS6 / <i>Integrated Electronic Warfare Systems</i>			
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
VS6: <i>Integrated Electronic Warfare Systems</i>	-	9.474	7.645	5.451	-	5.451	5.277	5.086	2.133	2.159	0.000	37.225
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
Counter Radio Controlled Improvised Explosive Device (RCIED) Electronic Warfare (CREW) provides for protection of ground forces operating in vehicle convoys, single vehicle operations, and fixed locations in operational theaters. It is programmable to mitigate evolving threats and provides non-lethal capabilities which enable freedom of movement across the depth and breadth of the operational environment.												
Justification: FY 2020 Base funding in the amount of \$5.451 million supports the continued development of CREW Relevancy technologies.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2018	FY 2019	FY 2020	
Title: IEWS - CREW									9.474	7.534	5.451	
Description: The Integrated Electronic Warfare System (IEWS) will provide multiple capabilities, to include Electronic Warfare Planning and Management Tool (EWPMT), Multi-Function EW (MFEW), and Defensive Electronic Attack (DEA). The Army's only current Defensive Electronic Warfare solution is Counter Radio Controlled Improvised Explosive Device (RCIED) Electronic Warfare (CREW).												
FY 2019 Plans: Continue Secondary Unit HW upgrade and software development.												
FY 2020 Plans: Integrate Duke Secondary Unit design and test the full system.												
FY 2019 to FY 2020 Increase/Decrease Statement: Decrease of \$2.083 million will extend timeline to complete Duke Secondary Unit hardware upgrade.												
Title: FY 2019 SIBR / STTR Transfer									-	0.111	-	
FY 2019 Plans: FY 2019 SIBR / STTR Transfer												
FY 2019 to FY 2020 Increase/Decrease Statement: FY 2019 SIBR / STTR Transfer												
Accomplishments/Planned Programs Subtotals									9.474	7.645	5.451	

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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 0604270A / <i>Electronic Warfare Development</i>	Project (Number/Name) VS6 / <i>Integrated Electronic Warfare Systems</i>
<u>C. Other Program Funding Summary (\$ in Millions)</u> N/A		
<u>Remarks</u>		
<u>D. Acquisition Strategy</u> CREW Relevancy will provide for the continued growth and conduct of research, development, and testing against emerging Radio Controlled Improvised Explosive Device (RCIED) threats. Continuing research, development, and testing will allow the technology to remain relevant and responsive to emerging threats and approved user requirements. Award five year Indefinite Delivery Indefinite Quantity (ID/IQ) contract to enable maximum flexibility as technology matures and as the RCIED threat changes. A Cost Plus Fixed Fee (CPFF) ID/IQ contract was awarded in FY16 with a five year period of performance to develop system improvements to address emerging threats.		
<u>E. Performance Metrics</u> N/A		

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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 0604270A / <i>Electronic Warfare Development</i>				Project (Number/Name) VS6 / <i>Integrated Electronic Warfare Systems</i>					
Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
PMO Staff/Travel for EWPMT	Allot	PM Electronic Warfare & Cyber : Aberdeen Proving Ground, MD	4.956	-		-		-		-		-	0.000	4.956	-
Program and Technical Assistance support	C/CPFF	TBD : Aberdeen Proving Ground, MD	3.789	-		-		-		-		-	0.000	3.789	-
PMO Staff/Travel for CREW	Allot	PM Electronic Warfare & Cyber : Aberdeen Proving Ground, MD	2.334	0.220	Dec 2017	0.233	Dec 2018	0.238	Dec 2019	-		0.238	0.000	3.025	-
Subtotal			11.079	0.220		0.233		0.238		-		0.238	0.000	11.770	N/A
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
EMD Contract - EWPMT	C/CPIF	SOTERA Defense Solutions Herndon, VA : RAYTHEON Fort Wayne, IN	38.318	-		-		-		-		-	0.000	38.318	-
IEWS Engineering and Development	MIPR	I2WD : Aberdeen MD	5.557	-		-		-		-		-	0.000	5.557	-
Risk Reduction Studies for MFEW	MIPR	Various : Various	7.969	-		-		-		-		-	0.000	7.969	-
Develop CREW H/W and S/W solutions	C/CPFF	SRC, Inc. : Syracuse, NY	11.694	8.343	Feb 2018	6.796	Nov 2018	4.702	Nov 2019	-		4.702	0.000	31.535	-
FY 2019 SIBR / STTR Transfer	TBD	TBD : TBD	-	-		0.111		-		-		-	0.000	0.111	-
Subtotal			63.538	8.343		6.907		4.702		-		4.702	0.000	83.490	N/A

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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 0604270A / <i>Electronic Warfare Development</i>						Project (Number/Name) VS6 / <i>Integrated Electronic Warfare Systems</i>			
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
MFEW Technical/ Engineering Support - Contractor	C/CPFF	GTRI : Atlanta, GA	2.046	-		-		-		-		-	0.000	2.046	-
Government Engineering Support	MIPR	CERDEC : Aberdeen Proving Ground, MD	4.169	-		-		-		-		-	0.000	4.169	-
EWPMT Architecture Study	MIPR	Various : Various	1.194	-		-		-		-		-	0.000	1.194	-
CREW Engineering support	C/CPFF	Various : Various	3.207	-		-		-		-		-	0.000	3.207	-
CREW Government Engineering support	MIPR	Various : Various	2.724	0.519	Jan 2018	0.205	Dec 2018	0.211	Dec 2019	-		0.211	0.000	3.659	-
Subtotal			13.340	0.519		0.205		0.211		-		0.211	0.000	14.275	N/A
Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
EWPMT Test support	MIPR	Various : TBD	1.096	-		-		-		-		-	0.000	1.096	-
Operational Assessment (OA) of DV4 systems	MIPR	Yuma Proving Ground : Yuma, AZ	1.950	-		-		-		-		-	0.000	1.950	-
Continous evaluation of CREW Technologies	MIPR	Yuma Proving Ground Yuma, AZ : YPG, AZ	1.326	0.392	May 2018	0.300	May 2019	0.300	May 2020	-		0.300	0.000	2.318	-
Subtotal			4.372	0.392		0.300		0.300		-		0.300	0.000	5.364	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			92.329	9.474		7.645		5.451		-		5.451	0.000	114.899	N/A
Remarks															

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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 0604270A / <i>Electronic Warfare Development</i>		Project (Number/Name) VS6 / <i>Integrated Electronic Warfare Systems</i>	

Event Name	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Develop H/W and S/W solutions for CREW																												
Force Protection, Technique Development, and SAASM																												
Secondary Unit Development																												
Folllow On Secondary Unit Development																												
Improved Interoperability with Comms Systems and Antenna Development																												
Implemented Technique Assessment																												
Secondary Unit-Hardware Assessment																												
Secondary Unit-Software and Implemented Techniques Assessment																												
CREW/Comms Interoperability Assessment																												

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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 0604270A / <i>Electronic Warfare Development</i>	Project (Number/Name) VS6 / <i>Integrated Electronic Warfare Systems</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
EWPMT Milestone B Decision	3	2013	3	2013
EWPMT Contract	3	2013	4	2014
MFEW Risk Reduction Studies	3	2013	4	2014
Delivery of CREW-2 Duke (DV4) Systems for Development	1	2014	1	2014
Operational Assessment and Engineering test of Duke (DV4) systems	2	2014	4	2014
CREW Relevancy Development Contract Award	2	2016	2	2016
Develop H/W and S/W solutions for CREW	2	2016	4	2021
Force Protection, Technique Development, and SAASM	2	2016	2	2018
Secondary Unit Development	3	2018	3	2021
Folllow On Secondary Unit Development	2	2021	2	2026
Improved Interoperability with Comms Systems and Antenna Development	1	2021	2	2021
Implemented Technique Assessment	3	2018	3	2018
Secondary Unit-Hardware Assessment	3	2019	3	2019
Secondary Unit-Software and Implemented Techniques Assessment	3	2020	3	2020
CREW/Comms Interoperability Assessment	3	2021	3	2021