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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army **Date:** February 2018

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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	33.419	71.671	78.699	-	78.699	88.746	63.780	37.514	18.265	0.000	392.094
DX5: <i>Electronic Warfare And Management Tool</i>	-	20.704	33.120	20.187	-	20.187	23.541	8.280	6.984	2.023	0.000	114.839
DX6: <i>Multi-Function Electronic Warfare (MFEW)</i>	-	1.359	24.310	44.611	-	44.611	47.964	41.241	22.802	13.587	0.000	195.874
ET7: <i>Radio Frequency Interference Mitigation</i>	-	3.992	4.454	6.247	-	6.247	5.759	4.472	2.607	2.655	0.000	30.186
VS6: <i>Integrated Electronic Warfare Systems</i>	-	7.364	9.787	7.654	-	7.654	11.482	9.787	5.121	0.000	0.000	51.195

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 - EWPMT will provide the Electronic Warfare Officer (EWO) planning capabilities to coordinate, manage, and deconflict the use of the Electromagnetic Spectrum and synchronize spectrum operations within the Cyber Electromagnetic Activities (CEMA) cell. EWPMT will integrate data elements from Mission Command, Intelligence, and Fires to achieve a Common Operating Picture (COP) of the Electromagnetic Operational Environment.

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 from BCT to CORPS 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 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.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army	Date: February 2018
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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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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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	37.242	71.671	81.511	-	81.511
Current President's Budget	33.419	71.671	78.699	-	78.699
Total Adjustments	-3.823	0.000	-2.812	-	-2.812
• Congressional General Reductions	-0.015	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.208	-			
• Adjustments to Budget Years	-	-	-2.812	-	-2.812
• RAA not appropriated	-2.600	-	-	-	-

Change Summary Explanation

In FY 2019, \$.947 million was realigned to Operations and Maintenance, Army (OMA) for manpower.

The FY 2019 funding request was reduced by \$1.865 million to account for the availability of prior year execution balances.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
DX5: <i>Electronic Warfare And Management Tool</i>	-	20.704	33.120	20.187	-	20.187	23.541	8.280	6.984	2.023	0.000	114.839
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Electronic Warfare Planning and Management Tool (EWPMT) will provide the Commander, his staff (Electronic Warfare Officer (EWO) and Spectrum Manager), and the Cyber Electromagnetic Activities (CEMA) working group/cell the ability to control and manage the Electromagnetic Spectrum (EMS). EWPMT will provide: capabilities to plan, coordinate, manage, and de-conflict Electronic Warfare (EW) activities, the ability to employ assets to conduct offensive and defensive Electronic Attack, 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 from Mission Command, Intelligence, Fires, Signals to successfully execute a Multi-Domain battle and meet the Commander's needs and desired effects.

Justification:

FY 2019 funds in the amount of \$20.187 million will continue Capability Drop 3 (CD3) development, test and support activities, as well as begin CD4 initial development for the EWPMT program.

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

	FY 2017	FY 2018	FY 2019
Title: EWPMT	20.704	33.120	20.187
Description: EWPMT is a suite of software tools and applications that will allow the Commander and staff a mission command capability to plan, coordinate, manage, and de-conflict unit EW and spectrum management activities.			
FY 2018 Plans: Complete CD2 development, test and support activities Award CD3 development, test and support activities			
FY 2019 Plans: Continue CD3 development, test and support activities Award CD4 development, test and support activities			
FY 2018 to FY 2019 Increase/Decrease Statement: A decrease of \$12,933K was due to a higher Development cost in FY18 due to the CD3 Cyber Situational Understanding development.			
Accomplishments/Planned Programs Subtotals	20.704	33.120	20.187

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018	
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>			
C. Other Program Funding Summary (\$ in Millions)											
			<u>FY 2019</u>	<u>FY 2019</u>	<u>FY 2019</u>					<u>Cost To</u>	
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>Base</u>	<u>OCO</u>	<u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Complete</u>	<u>Total Cost</u>
• K00002: <i>K00002 - EW Planning & Management Tools (EWPMT)</i>	3.235	5.805	5.947	-	5.947	7.846	8.145	1.000	20.000	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 a Major Automated Information System (MAIS) that will follow an evolutionary acquisition strategy using an Incrementally Deployed Software Intensive Program for rapid development and continuous product improvements. The overall strategy is to deploy software Capability Drops (CDs) to allow an incremental merger of the Electronic Warfare and Spectrum Management software tools.											
E. Performance Metrics N/A											

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
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 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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	7.868	2.708	Dec 2016	2.159	Dec 2017	-		-		-	0.000	12.735	-
Subtotal			7.868	2.708		2.159		-		-		-	0.000	12.735	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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	6.020	12.232	Feb 2017	6.107	Dec 2017	-		-		-	0.000	24.359	24.359
EMD Contract - EWPMT CD3	C/IDIQ	Raytheon : Fort Wayne, IN	-	-		18.020	Apr 2018	13.080	Jan 2019	-		13.080	0.000	31.100	31.100
EMD Contract - EWPMT CD4	C/IDIQ	Raytheon : Fort Wayne, IN	-	-		-		1.869	Jul 2019	-		1.869	15.031	16.900	16.900
Subtotal			24.220	12.232		24.127		14.949		-		14.949	15.031	90.559	N/A
Remarks															
FY2019 funds in the amount of \$13.080 million will continue CD3 development on the CD3 Task Order to be awarded April 2018.															
FY2019 funds in the amount of \$1.869 million will begin CD4 initial development on the CD4 Task Order to be awarded July 2019.															
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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	Allot	Various : Various	16.783	5.038	Dec 2016	3.152	Dec 2017	3.918	Dec 2018	-		3.918	Continuing	Continuing	Continuing
Subtotal			16.783	5.038		3.152		3.918		-		3.918	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army													Date: February 2018		
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>					
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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
Remarks Increase in cost in FY19 account for overlap of CD3 and CD4 development contracts requiring additional manpower.															
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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	2.757	0.726	Aug 2017	3.682	Dec 2017	1.320	Mar 2019	-		1.320	Continuing	Continuing	Continuing
Subtotal			2.757	0.726		3.682		1.320		-		1.320	Continuing	Continuing	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			51.628	20.704		33.120		20.187		-		20.187	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018		
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 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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																												
Initial Operational Capability (IOC)																												
Development and Test of CD2																												
Test CD2 (Limited User Test)																												
Limited Deployment Decision of CD2																												
Development and Test of CD3																												
Development and Test of CD4																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
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 of CD 1	4	2014	3	2016
Test CD 1 (Government Confidence test)	2	2016	2	2016
CD1 Fielding	4	2016	3	2018
Initial Operational Capability (IOC)	1	2017	1	2017
Development and Test of CD2	4	2016	4	2018
Test CD2 (Limited User Test)	3	2018	3	2018
Limited Deployment Decision of CD2	2	2019	2	2019
Development and Test of CD3	3	2018	3	2020
Development and Test of CD4	4	2019	2	2022

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
DX6: <i>Multi-Function Electronic Warfare (MFEW)</i>	-	1.359	24.310	44.611	-	44.611	47.964	41.241	22.802	13.587	0.000	195.874
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 the BCT Commander 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 improves a land force's ability 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, 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 to enable remote operation and dynamic tasking/reprogramming.

MFEW-Air is an airborne payload to be mounted on both manned and unmanned aerial platforms. MFEW-Air is comprised of three variants: Air Large (Class IV Unmanned Aerial Vehicle), Air Small (Class III Unmanned Aerial Vehicle), and manned rotary wing payloads. MFEW-Air will retain the capability to operate independently or integrated with EW systems providing a layered EW approach. This will provide the Commander the ability to detect, identify (ID), locate and place effects on emitters.

Justification:
FY 2019 Base dollars in the amount of \$44.611 million will support MFEW development activities.

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

	FY 2017	FY 2018	FY 2019
Title: Multi-Function EW (MFEW) Air	1.359	20.259	39.898
Description: MFEW-Air is an airborne Electronic Warfare payload to be integrated onto an Unmanned and manned Aerial Vehicle to provide offensive Electronic Attack (EA) and Electronic Warfare Support (ES) capability to the BCT.			
FY 2018 Plans: MS B decision and Engineering & Manufacturing Development (EMD) activities.			
FY 2019 Plans: MFEW Air Development and Test activities			
FY 2018 to FY 2019 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018	
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 2017	FY 2018
Increase due to ramp up in Milestone B and EMD activities.			
Title: Other Multi-Function EW (MFEW) variants Description: Other MFEW variants risk reduction activities to include regulatory and statutory documentation development. FY 2018 Plans: Develop required statutory/regulatory documentation and Request for Proposal (RFP) to support a Milestone decision and EMD activities. FY 2019 Plans: Complete documentation for MS B decision and conduct EMD activities. FY 2018 to FY 2019 Increase/Decrease Statement: Increase due to a ramp up of Pre Milestone and EMD activities.		-	4.051
			4.713
Accomplishments/Planned Programs Subtotals		1.359	24.310
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
The Multi-Function EW (MFEW) is a capability set that will provide the BCT Commander with an organic offensive Electronic Attack (EA), and Electronic Warfare Support (ES), and Defensive Electronic Attack (DEA) capability. Initially, an air large variant payload will be developed. MFEW will deliver scalable non-lethal effects to support Unified Land Operations and protect personnel, equipment and facilities. A competitive contract award is planned for MFEW-Air.			
E. Performance Metrics			
N/A			

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
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 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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	TBD	PM Electronic Warfare & Cyber : Aberdeen Proving Ground, MD	-	0.139	Jul 2017	0.936	Jan 2018	0.480	Jan 2019	-		0.480	0.000	1.555	-
Program Management Office Support - Other MFEW Variants	TBD	PM Electronic Warfare & Cyber : Aberdeen Proving Ground, MD	-	-		0.206	Jan 2018	-		-		-	0.000	0.206	-
Subtotal			-	0.139		1.142		0.480		-		0.480	0.000	1.761	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 Development Contract	C/TBD	PM Electronic Warfare & Cyber : Aberdeen Proving Ground, MD	-	-		10.198	Jun 2018	29.508	Jun 2019	-		29.508	0.000	39.706	-
Command and Control Development Contract	MIPR	National Security Agency/Cross Access Geolocation (NSA/XAG) : Ft. Meade, MD	-	0.800	Jul 2017	3.450	Jan 2018	5.425	Jan 2019	-		5.425	0.000	9.675	-
Subtotal			-	0.800		13.648		34.933		-		34.933	0.000	49.381	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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	TBD	TBD : Aberdeen Proving Ground, MD	-	-		2.125	Jan 2018	3.225	Jan 2019	-		3.225	0.000	5.350	-
Government Engineering - MFEW Air	MIPR	TBD : Aberdeen Proving Ground, MD	-	0.220	May 2017	2.725	Jan 2018	-		-		-	0.000	2.945	-

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Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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
Technical Support (FFRDC) - MFEW Air	TBD	TBD : Aberdeen Proving Ground, MD	-	0.200	May 2017	0.825	Jan 2018	2.220	Jan 2019	-		2.220	0.000	3.245	-
Contractor Engineering - Other MFEW Variants	TBD	TBD : Aberdeen Proving Ground, MD	-	-		2.088	Jan 2018	-		-		-	0.000	2.088	-
Government Engineering - Other MFEW Variants	MIPR	TBD : Aberdeen Proving Ground, MD	-	-		1.507	Jan 2018	2.960	Jan 2019	-		2.960	0.000	4.467	-
Technical Support - Other MFEW Variants	TBD	TBD : Aberdeen Proving Ground, MD	-	-		0.250	Jan 2018	0.793	Jan 2019	-		0.793	0.000	1.043	-
Subtotal			-	0.420		9.520		9.198		-		9.198	0.000	19.138	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	1.359		24.310		44.611		-		44.611	0.000	70.280	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018		
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 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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
MS B Documentation Preparation (Air)																												
Request For Proposal (RFP) Decision Point (Air)																												
Milestone B (Air)																												
MFEW Development (Air)																												
Developmental Test (DT)/Flight Testing (Air)																												
Milestone C (Air)																												
Operational Assessment (OA) (Air)																												
IOTE (Air)																												
MFEW Development (Other Variants)																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
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
MS B Documentation Preparation (Air)	3	2017	3	2018
Request For Proposal (RFP) Decision Point (Air)	1	2018	1	2018
Milestone B (Air)	3	2018	3	2018
MFEW Development (Air)	3	2018	4	2020
Developmental Test (DT)/Flight Testing (Air)	4	2019	1	2022
Milestone C (Air)	4	2020	4	2020
Operational Assessment (OA) (Air)	3	2020	3	2020
IOTE (Air)	1	2021	1	2021
MFEW Development (Other Variants)	3	2018	4	2022

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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) ET7 / <i>Radio Frequency Interference Mitigation</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
ET7: <i>Radio Frequency Interference Mitigation</i>	-	3.992	4.454	6.247	-	6.247	5.759	4.472	2.607	2.655	0.000	30.186
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:

FY 2019 Base funds in the amount of \$6.247 million will provide engineering support activities to continue the development of Interference Cancellation (IC) Light technology and develop the IC Algorithm technology to mitigate interference between Force Protection and Communication systems.

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

	FY 2017	FY 2018	FY 2019
Title: RF Interference Mitigation	3.992	4.454	6.247
Description: RIM is a System of Systems Enterprise approach that will allow Spectrum Dependent Systems to co-exist with Force Protection assets.			
FY 2018 Plans: Continue IC Light development, award IC Algorithm development, and provide engineering support.			
FY 2019 Plans: Continue IC Light development, continue IC Algorithm development, and provide engineering support.			
FY 2018 to FY 2019 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018	
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 2017	FY 2018
An increase of \$1.958 million in FY 2019 is to produce 30 IC Light test assets.			
Accomplishments/Planned Programs Subtotals		3.992	4.454
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, Interference Cancellers (IC) to address RF interference on Army platforms. Designated platforms will procure, integrate and test RIM solutions with their association spectrum dependent systems.			
The RIM acquisition strategy shifted focus from tunable filter technology to IC technology. The decision to shift focus from tunable filters to IC technology 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.			
E. Performance Metrics			
N/A			

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
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 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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	Jan 2017	0.323	Dec 2017	-		-		-	Continuing	Continuing	Continuing
Subtotal			-	0.298		0.323		-		-		-	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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	Jun 2017	2.895	Dec 2017	5.011	Dec 2018	-		5.011	Continuing	Continuing	-
Subtotal			-	2.238		2.895		5.011		-		5.011	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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	Mar 2017	1.236	Dec 2017	1.236	Dec 2018	-		1.236	Continuing	Continuing	-
Subtotal			-	1.456		1.236		1.236		-		1.236	Continuing	Continuing	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	3.992		4.454		6.247		-		6.247	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018		
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 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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 for Interference Cancellation (IC)									[Redacted]																			
Developmental Testing (DT) for IC									[Redacted]																			
Development for IC Algorithm									[Redacted]																			
Developmental Testing for IC Algorithm									[Redacted]																			

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army			Date: February 2018
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 for Interference Cancellation (IC)	1	2018	2	2019
Developmental Testing (DT) for IC	3	2019	4	2019
Development for IC Algorithm	1	2019	3	2020
Developmental Testing for IC Algorithm	3	2020	4	2020

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
VS6: <i>Integrated Electronic Warfare Systems</i>	-	7.364	9.787	7.654	-	7.654	11.482	9.787	5.121	0.000	0.000	51.195
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 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.

Justification: FY 2019 Base dollars in the amount of \$7.654 million continues to support the development of CREW Relevancy technologies.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
<p>Title: IEWS</p> <p>Description: The IEW System (IEWS) Systems of Systems (SoS) will consist of Electronic Warfare Planning and Management Tool (EWPMT), Multi-Function EW (MFEW), and Defensive Electronic Attack (DEA).</p> <p>FY 2018 Plans: CREW Relevancy: Continue the development and testing of HW/SW solutions for CREW-2 Duke, specifically, development for the Secondary Unit system upgrade.</p> <p>FY 2019 Plans: Complete Secondary Unit HW upgrade and continue SW development.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Ramp down of Secondary Unit system upgrade.</p>	7.364	9.787	7.654
Accomplishments/Planned Programs Subtotals	7.364	9.787	7.654

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
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>
D. Acquisition Strategy 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 all approved user requirements. Award five year indefinite delivery indefinite quantity (ID/IQ) contract enables maximum flexibility as technology matures and as the RCIED threat changes. Cost Plus Fixed Fee (CPFF) ID/IQ Task Orders will be awarded throughout the five year effort to address the developing threat with system improvements.		
E. Performance Metrics N/A		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
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 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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	1.659	0.675	Oct 2016	1.070	Jan 2018	0.700	Dec 2018	-		0.700	0.000	4.104	-
Subtotal			10.404	0.675		1.070		0.700		-		0.700	0.000	12.849	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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	7.632	4.062	Feb 2017	5.667	Feb 2018	4.306	Feb 2019	-		4.306	0.000	21.667	-
Subtotal			59.476	4.062		5.667		4.306		-		4.306	0.000	73.511	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
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 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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	1.929	1.278	Nov 2016	0.900	Jan 2018	1.230	Jan 2019	-		1.230	0.000	5.337	-
CREW Government Engineering support	MIPR	Various : Various	2.186	0.538	Nov 2016	0.650	Jan 2018	0.638	Jan 2019	-		0.638	0.000	4.012	-
Subtotal			11.524	1.816		1.550		1.868		-		1.868	0.000	16.758	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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	0.515	0.811	Mar 2017	1.500	Mar 2018	0.780	Mar 2019	-		0.780	0.000	3.606	-
Subtotal			3.561	0.811		1.500		0.780		-		0.780	0.000	6.652	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			84.965	7.364		9.787		7.654		-		7.654	0.000	109.770	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018		
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 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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
Force Protection, Technique Development, and SAASM																												
Secondary Unit Development																												
Improved Interoperability with Comms Systems and Antenna Development																												
Force Protection Assessment																												
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 2019 Army			Date: February 2018
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
CREW Relevancy Development Contract Award	2	2016	2	2016
Force Protection, Technique Development, and SAASM	2	2016	2	2018
Secondary Unit Development	2	2018	1	2021
Improved Interoperability with Comms Systems and Antenna Development	1	2021	2	2021
Force Protection Assessment	3	2017	3	2017
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