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 0605051A / *Aircraft Survivability 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	-	121.530	60.979	21.965	34.933	56.898	22.712	10.456	14.548	18.823	0.000	305.946
ER7: *Aircraft Survivability Equipment Development*	-	16.168	26.165	16.163	-	16.163	16.894	5.327	7.752	11.896	0.000	100.365
ER8: *Common Missile Warning System (CMWS)*	-	105.362	34.814	5.802	34.933	40.735	5.818	5.129	6.796	6.927	0.000	205.581

A. Mission Description and Budget Item Justification

The Aircraft Survivability Development budget line includes Aircraft Survivability Equipment Development (ER7) and Common Missile Warning System (ER8). This budget line also includes funding for Joint Urgent Operational Needs Statement (JUONS) SO-0010 Phase 2a, Headquarters Department of the Army (HQDA) Directed Requirement for the Advanced Threat Warner (ATW) portion of the ATW/ Common Infrared Countermeasures Quick Reaction Capability (ATW/CIRCM QRC), and the next generation missile warning system.

ER7: Aircraft Survivability Development.
The objective of the Aircraft Survivability Equipment (ASE) Development project is to improve Radio Frequency (RF) ASE for Army aviation. The APR-39 Radar Warning Receiver (RWR) detects, categorizes, and prioritizes RF emitters and provides a visual / aural alert to aircrew members warning them of targeting by RF-guided weapons. The Milestone Decision Authority (MDA) approved Phases 1 and 2 of a 3-phased path forward.

Phase 1 serves as an obsolescence / sustainment upgrade to the Processor Line Replaceable Unit (LRU) of the AN/APR-39A(V) RWR implemented to ensure that the currently fielded system remains viable until an affordable improved RF ASE capability can be pursued in Phases 2 and 3.

Phase 2 RWR Modernization begins by adopting the United States Navy APR-39D(V)2 system. APR-39D(V)2 will significantly improve the RF threat coverage, automatic detection and identification of threat types, bearing, and lethality. This phase ends upon completion of the Modernized RWR (MRWR) which is an ECP to the APR-39D(V)2 that will implement enhanced hardware upgrades to keep the APR-39D(V)2 technically relevant against agile threats.

Phase 3 adds active Electronic Countermeasures (ECM) jamming capability for selected aircraft; Materiel Development Decision (MDD) for this ECM jamming capability phase is not expected until later in the Future Years Defense Program (FYDP).

Justification: Fiscal Year (FY) 2019 Base RDT&E funding of $16.163 million supports MRWR development.

ER8: Common Missile Warning System (CMWS).
The US Army operational requirements concept for Aviation Infrared (IR) countermeasure systems is known as the Suite of Integrated Infrared Countermeasures (SIIRCM). SIIRCM is an integrated warning and countermeasure system to enhance aircraft survivability against IR-guided threat missile systems. The CMWS is a core

element of the SIIRCM concept. CMWS is an integrated ultraviolet (UV) missile warning system, with an Improved Countermeasure Dispenser (ICMD) serving as a subsystem to a host aircraft.

The CMWS program is a UV missile warning system that cues both flare and laser-based countermeasures to defeat incoming IR-seeking missiles and will alert aircrews to the presence of certain incoming unguided munitions. The B-Kit consists of the components which perform the missile detection and aircrew notification, unguided munitions detection and aircrew notification, false alarm rejection, and countermeasure employment/cueing functions of the system. The CMWS Electronic Control Unit (ECU) receives UV missile detection data from Electro-Optic Missile Sensors (EOMS) and sends a missile alert signal to warn aircrews via on-board avionics. Tier 1 threat missiles detected and tracked by the CMWS are subsequently defeated by a combination of missile seeker countermeasures, including decoy flares and IR Laser Jamming (currently Advanced Threat Infrared Countermeasures (ATIRCM)-equipped CH-47 platform only). In addition, the CMWS ECU receives from the EOMS unguided munitions detection data which it also passes to the aircrew through aural and visual alerts. The aircrew then applies the appropriate Tactics, Techniques and Procedures (TTPs) to break contact or engage the enemy with own-ship ordnance. The CMWS Generation 3 (Gen 3) ECU in conjunction with ongoing software development efforts will address outstanding materiel release conditions to achieve a Full Materiel Release (FMR) for CMWS and ensure protection against emerging IR-guided missile threats.

The A-Kit for CMWS includes mounting hardware, wiring harnesses, cables, and other components necessary to install and interface the mission kit on host aircraft. The A-Kit ensures the mission kit is functionally and physically operational with a specific host aircraft type.

Phase 2a DoN LAIRCM (JUONS S0-0010) and Phase 3 ATW/CIRCM QRC Initially, a select number of aircraft in the threat area of responsibility will be outfitted with the Phase 2a Department of the Navy Large Aircraft Infrared Countermeasure (DoN LAIRCM) system. However, this approach came with a Space, Weight and Power - Cooling (SWaP-C) penalty which is being addressed as a follow-on JUONS solution requirement using the Phase 3 Advanced Threat Warner (ATW) / Common Infrared Countermeasure (CIRCM) Quick Reaction Capability (QRC). The intent of the Phase 3 ATW/CIRCM QRC effort is to reduce the SWaP-C associated with the Phase 2a solution.

Phase 4 Limited Interim Missile Warning System (LIMWS) QRC The Phase 4 LIMWS QRC effort is a follow-on bridging solution to the JUONS SO-0010 to fill a global capability gap until the Advanced Threat Detection System (ATDS) Program of Record is fielded. The LIMWS QRC effort provides advance missile detection capability to an increased number of aircraft outside of the Phase 2a and Phase 3 efforts areas of responsibility.

Justification:
CMWS: FY 2019 Base Research, Development, Test, and Evaluation (RDTE) dollars in the amount of $5.802 million fund development engineering of the Threat Analysis Database (TAD), future sensor & algorithm analysis, vulnerability analysis and assessment of technologies (VAAT), and Systems Engineering Process Management (SEPM).

Phase 3 Advanced Threat Warner and Common Infrared Countermeasure Quick Reaction Capability (ATW & CIRCM QRC): FY 2019 Overseas Contingency Operations (OCO) RDTE dollars in the amount of $5.110 million fund System Test & Evaluation (ST&E) and tech manual development.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army	Date: February 2018
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605051A *I Aircraft Survivability Development*

Phase 4 Limited Interim Missile Warning System (LIMWS): FY19 Overseas Contingency Operations (OCO) RDTE dollars in the amount of $29.823 million are estimated to fund test of system and design for lead platform and development of follow-on platform designs.

Joint Staff, J-8 Deputy Director for Requirements (DOR) memorandum, April 24, 2015
Phase 2a SOCOM JUONs S0-0010, Joint Rapid Acquisition Cell (JRAC) memorandum, May 29, 2015
Directed Requirement for the Phase 3 Advanced Threat Warner and Common Infrared Countermeasure Quick Reaction Capability (ATW & CIRCM QRC) to Support Joint Urgent Operational Need (JUON) S0-0010, CIRCM Critical Intelligence Parameters Breach, December 18, 2015
Directed Requirement for the Phase 4 Limited Interim Missile Warning System (LIMWS) QRC, March 26, 2017

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	124.243	60.979	10.362	-	10.362
Current President's Budget	121.530	60.979	21.965	34.933	56.898
Total Adjustments	-2.713	0.000	11.603	34.933	46.536
• Congressional General Reductions	-0.016	-			
• Congressional Directed Reductions	-7.000	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.297	-			
• Adjustments to Budget Years	-	-	11.603	34.933	46.536
• Other Adjustments 1	-10.000	-	-	-	-
• Other Adjustments 2	15.600	-	-	-	-

Change Summary Explanation

FY17 adjustment of $15,600 is OCO funding added for LIMWS

FY19 Adjustment of $11.603 adds funding for ER7 and ER8 Product Development

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 0605051A / *Aircraft Survivability Development*	Project (Number/Name) ER7 / *Aircraft Survivability Equipment 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
ER7: *Aircraft Survivability Equipment Development*	-	16.168	26.165	16.163	-	16.163	16.894	5.327	7.752	11.896	0.000	100.365
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The objective of the Aircraft Survivability Equipment (ASE) Development project is to improve Radio Frequency (RF) ASE for Army aviation. The APR-39 Radar Warning Receiver (RWR) detects, categorizes, and prioritizes RF emitters and provides a visual / aural alert to aircrew members warning them of targeting by RF-guided weapons. The Milestone Decision Authority (MDA) approved Phases 1 and 2 of a 3-phased path forward.

Phase 1 serves as an obsolescence / sustainment upgrade to the Processor Line Replaceable Unit (LRU) of the AN/APR-39A(V) RWR implemented to ensure that the currently fielded system remains viable until affordable improved RF ASE capability can be pursued in Phases 2 and 3.

Phase 2 RWR Modernization begins by adopting the United States Navy APR-39D(V)2 system. APR-39D(V)2 will significantly improve the RF threat coverage, automatic detection and identification of threat types, bearing, and lethality. This phase ends upon completion of the Modernized RWR (MRWR) which is an ECP to the APR-39D(V)2 that will implement enhanced hardware upgrades to keep the APR-39D(V)2 technically relevant against agile threats.

Phase 3 adds active Electronic Countermeasures (ECM) jamming capability for selected aircraft; Materiel Development Decision (MDD) for this ECM jamming capability phase is not expected until later in the Future Years Defense Program (FYDP).

Justification: Fiscal Year (FY) 2019 Base RDT&E funding of $16.337 million supports MRWR development.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Phase 2 Radio Frequency Countermeasure (CM)	16.168	26.165	16.163	-	16.163
Description: Phase 2 RWR Modernization					
FY 2018 Plans: Will fund software improvement and ECP development, platform integration, Government Test and Evaluation and Support/Management services.					
FY 2019 Base Plans: Will fund MRWR hardware and software development.					
FY 2018 to FY 2019 Increase/Decrease Statement:					

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 0605051A / *Aircraft Survivability Development*	**Project (Number/Name)** ER7 / *Aircraft Survivability Equipment Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Fiscal Year (FY) 2018 Base RDT&E funding of $26.165 million supports MRWR development. FY 2019 Base RDT&E funding of $16.163 million supports MRWR development.					
Accomplishments/Planned Programs Subtotals	16.168	26.165	16.163	-	16.163

C. Other Program Funding Summary ($ in Millions)

Line Item	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
• AZ3511: *Radio Frequency CM (AZ3511)*	72.425	57.743	51.135	-	51.135	103.639	86.092	93.254	161.244	Continuing	Continuing

Remarks

D. Acquisition Strategy

Army RF ASE is managed by Project Manager ASE (PM ASE) for development, testing, procurement, integration and installation on Army rotary wing and small fixed wing aviation platforms. PM ASE proposed a three-phased path forward commensurate with user priorities and affordability considerations. The Milestone Decision Authority (MDA) approved Phases 1 and 2 of a 3-phased path forward.

Phase 1 addresses obsolescence/Diminishing Manufacturing Sources (DMS) issues associated with the currently fielded AN/APR-39A(V) RWR via sole source ECP awarded to the APR-39A manufacturer.

Phase 2 adopts the United States Navy (USN) APR-39D(V)2 system, limiting service-unique design, test, and integration expenses. Adoption of the APR-39D(V)2 in limited quantity, followed by development, testing, procurement, and fielding of the Modernized RWR (MRWR) will address the significant RF capability gap while avoiding additional up-front costs associated with a single-Service solution.

Phase 3 will develop and integrate active Electronic Countermeasures jamming capability for select aircraft.

E. Performance Metrics

N/A

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 0605051A / *Aircraft Survivability Development*	Project (Number/Name) ER7 / *Aircraft Survivability Equipment Development*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Threat Management	Various	Various : -	8.839	-		0.284		-		-		-	Continuing	Continuing	Continuing
Project Management	Various	Various : -	0.429	1.166		0.258		-		-		-	Continuing	Continuing	Continuing
		Subtotal	9.268	1.166		0.542		-		-		-	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Digital Radar Warning Receiver (RWR) (D(V)2)	Various	Lab Demo / Study : Various	10.634	-		-		-		-		-	Continuing	Continuing	Continuing
H/W & S/W Development	Various	OGA : Aberdeen Proving Grounds, MD	3.037	7.099	Feb 2017	23.955	Apr 2018	16.163	Dec 2018	-		16.163	Continuing	Continuing	Continuing
SIL Updates	MIPR	I2WD : Aberdeen Proving Grounds, MD	1.726	0.821	Jan 2017	-		-		-		-	Continuing	Continuing	Continuing
Depot Standup	MIPR	Tobyhanna : Tobyhanna, PA	1.052	0.011		-		-		-		-	0.000	1.063	-
Platform Integration	Various	Multiple : -	4.516	-		0.036		-		-		-	Continuing	Continuing	Continuing
		Subtotal	20.965	7.931		23.991		16.163		-		16.163	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Support	Various	Various : -	3.132	1.050		0.503		-		-		-	Continuing	Continuing	Continuing
Matrix Support	Various	Various : -	6.800	-		-		-		-		-	Continuing	Continuing	Continuing
		Subtotal	9.932	1.050		0.503		-		-		-	Continuing	Continuing	N/A

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 0605051A / *Aircraft Survivability Development*	Project (Number/Name) ER7 / *Aircraft Survivability Equipment Development*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Multi-Service DT/OT	Various	Various : -	2.987	0.073		0.379		-		-		-	Continuing	Continuing	Continuing
Government System Test and Evaluation	Various	Various : -	14.111	5.948		0.750		-		-		-	Continuing	Continuing	Continuing
		Subtotal	17.098	6.021		1.129		-		-		-	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	57.263	16.168		26.165		16.163		-		16.163	Continuing	Continuing	N/A

Remarks

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 0605051A / *Aircraft Survivability Development*	**Project (Number/Name)** ER7 / *Aircraft Survivability Equipment Development*

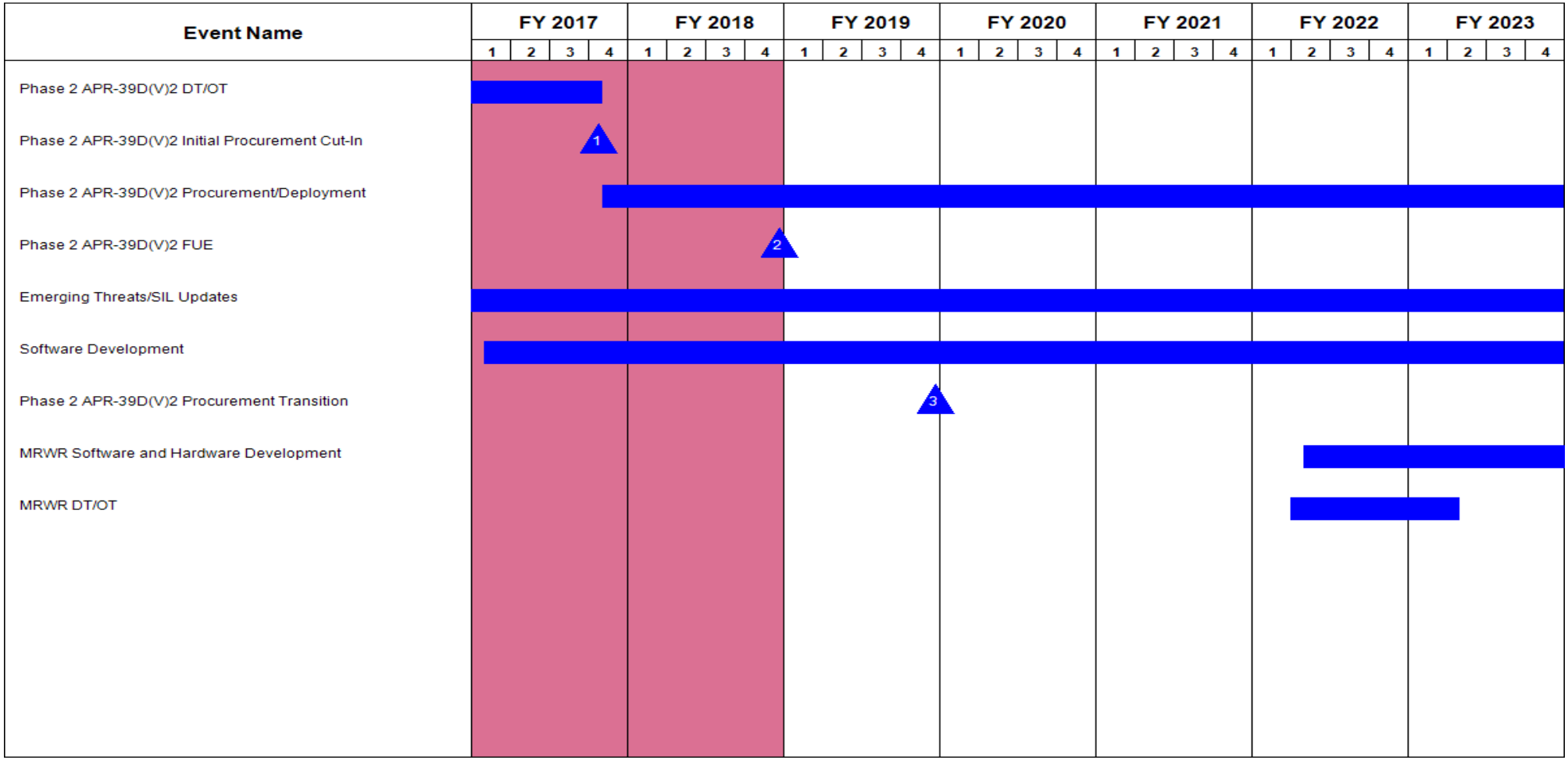

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605051A / *Aircraft Survivability Development*	**Project (Number/Name)** ER7 / *Aircraft Survivability Equipment Development*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Phase 2 APR-39D(V)2 Army Design Requirements Insertion	3	2013	2	2014
Phase 2 APR-39D(V)2 Prototype Fabrication	4	2013	2	2015
Phase 2 APR-39D(V)2 DT/OT	3	2016	4	2017
Phase 2 APR-39D(V)2 Platform Integration	1	2014	3	2016
Phase 2 APR-39D(V)2 Initial Procurement Cut-In	4	2017	4	2017
Phase 2 APR-39D(V)2 Procurement/Deployment	4	2017	4	2023
Phase 2 APR-39D(V)2 FUE	4	2018	4	2018
Emerging Threats/SIL Updates	3	2016	4	2023
Software Development	1	2015	4	2023
Phase 2 APR-39D(V)2 Procurement Transition	4	2019	4	2019
MRWR Software and Hardware Development	2	2022	3	2026
MRWR DT/OT	2	2022	2	2023

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 0605051A / *Aircraft Survivability Development*	Project (Number/Name) ER8 / *Common Missile Warning System (CMWS)*	

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
ER8: *Common Missile Warning System (CMWS)*	-	105.362	34.814	5.802	34.933	40.735	5.818	5.129	6.796	6.927	0.000	205.581
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The US Army operational requirements concept for Aviation Infrared (IR) countermeasure systems is known as the Suite of Integrated Infrared Countermeasures (SIIRCM). SIIRCM is an integrated warning and countermeasure system to enhance aircraft survivability against IR-guided threat missile systems. The CMWS is a core element of the SIIRCM concept. CMWS is an integrated ultraviolet (UV) missile warning system, with an Improved Countermeasure Dispenser (ICMD) serving as a subsystem to a host aircraft.

The CMWS program is a UV missile warning system that cues both flare and laser-based countermeasures to defeat incoming IR-seeking missiles and will alert aircrews to the presence of certain incoming unguided munitions. The B-Kit consists of the components which perform the missile detection and aircrew notification, unguided munitions detection and aircrew notification, false alarm rejection, and countermeasure employment/cueing functions of the system. The CMWS Electronic Control Unit (ECU) receives UV missile detection data from Electro-Optic Missile Sensors (EOMS) and sends a missile alert signal to warn aircrews via on-board avionics. Tier 1 threat missiles detected and tracked by the CMWS are subsequently defeated by a combination of missile seeker countermeasures, including decoy flares and IR Laser Jamming (currently Advanced Threat Infrared Countermeasures (ATIRCM)-equipped CH-47 platform only). In addition, the CMWS ECU receives from the EOMS unguided munitions detection data which it also passes to the aircrew through aural and visual alerts. The aircrew then applies the appropriate Tactics, Techniques and Procedures (TTPs) to break contact or engage the enemy with own-ship ordnance. The CMWS Generation 3 (Gen 3) ECU in conjunction with ongoing software development efforts will address outstanding materiel release conditions to achieve a Full Materiel Release (FMR) for CMWS and ensure protection against emerging IR-guided missile threats.

The A-Kit for CMWS includes mounting hardware, wiring harnesses, cables, and other components necessary to install and interface the mission kit on host aircraft. The A-Kit ensures the mission kit is functionally and physically operational with a specific host aircraft type.

Phase 2a DoN LAIRCM (JUONS S0-0010) and Phase 3 ATW & CIRCM QRC Initially, a select number of aircraft in the threat area of responsibility will be outfitted with the Phase 2a Department of the Navy Large Aircraft Infrared Countermeasure (DoN LAIRCM) system. However, this approach came with a Space, Weight and Power - Cooling (SWaP-C) penalty which is being addressed as a follow-on JUONS solution requirement using the Phase 3 Advanced Threat Warner (ATW) and Common Infrared Countermeasure (CIRCM) Quick Reaction Capability (QRC). The intent of the Phase 3 ATW & CIRCM QRC effort is to reduce the SWaP-C associated with the Phase 2a solution.

Phase 4 Limited Interim Missile Warning System (LIMWS) QRC The Phase 4 LIMWS QRC effort is a follow-on bridging solution to the JUONS SO-0010 to fill a global capability gap until the Advanced Threat Detection System (ATDS) Program of Record is fielded. The LIMWS QRC effort provides advance missile detection capability to an increased number of aircraft outside of the Phase 2a and Phase 3 efforts areas of responsibility.

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 0605051A / *Aircraft Survivability Development*	**Project (Number/Name)** ER8 / *Common Missile Warning System (CMWS)*

Justification:
CMWS: FY 2019 Base Research, Development, Test, and Evaluation (RDTE) dollars in the amount of $5.802 million fund development engineering of the Threat Analysis Database (TAD), future sensor & algorithm analysis, vulnerability analysis and assessment of technologies (VAAT) and Systems Engineering Project Management (SEPM).

Phase 3 ATW & CIRCM QRC: FY 2019 Overseas Contingency Operations (OCO) RDTE dollars in the amount of $5.110 million will fund System Test & Evaluation (ST&E), technical manual development, and integration efforts to support the Phase 3 Advanced Threat Warner and Common Infrared Countermeasure Quick Reaction Capability (ATW & CIRCM QRC) efforts.

Phase 4 Limited Interim Missile Warning System (LIMWS) QRC : FY19 Overseas Contingency Operations (OCO) RDTE dollars in the amount 29.823 million are estimated to fund test of system and design for lead platform and development of follow-on platform designs.

Joint Staff, J-8 Deputy Director for Requirements (DOR) memorandum, April 24, 2015
Phase 2a SOCOM JUONs S0-0010, Joint Rapid Acquisition Cell (JRAC) memorandum, May 29, 2015
Directed Requirement for the Phase 3 Advanced Threat Warner and Common Infrared Countermeasure Quick Reaction Capability (ATW & CIRCM QRC) to Support Joint Urgent Operational Need (JUON) S0-0010, CIRCM Critical Intelligence Parameters Breach, December 18, 2015
Directed Requirement for the Phase 4 Limited Interim Missile Warning System (LIMWS) QRC, March 26, 2017

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: CMWS Product Development and Management Services	4.152	4.714	5.802	-	5.802
Description: RDTE funding supports continuing development engineering of the TAD, salaries, and integration with other ASE Systems.					
FY 2018 Plans: FY 2018 Base RDTE dollars in the amount of $4.714 million will fund Product Development - TAD and Future Sensor and Algorithm Analysis; and Management Services - CMWS Systems Engineering Program Management.					
FY 2019 Base Plans: FY 2019 Base RDTE dollars in the amount of $5.802 million will fund Product Development - Threat Analysis Detection (TAD), Future Sensor and Algorithm Analysis, and Vulnerability Analysis and Assessment of Technologies (VAAT); Management Services - CMWS Systems Engineering Program Management.					
FY 2018 to FY 2019 Increase/Decrease Statement:					

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 0605051A / *Aircraft Survivability Development*	**Project (Number/Name)** ER8 / *Common Missile Warning System (CMWS)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Funding increase is due to current approved allocation of funds in FY19.					
Title: JUONS SO-0010 Phase 2a OCO ***Description:*** JUONS Phase 2a will integrate the Department of the Navy Large Aircraft Infrared Countermeasure (DoN LAIRCM) system on a select number of aircraft in the threat area of responsibility.	11.410	-	-	-	-
Title: Phase 3 ATW /CIRCM QRC OCO ***Description:*** Phase 3 ATW/CIRCM QRC will displace JUONS Phase 2a to achieve reduction in SWaP. ***FY 2018 Plans:*** There is no FY18 Base funding for this effort. ***FY 2019 Base Plans:*** There is no FY19 Base funding for this effort. ***FY 2019 OCO Plans:*** Phase 3 Advanced Threat Warner and Common Infrared Countermeasure Quick Reaction Capability (ATW & CIRCM QRC): FY 2019 Overseas Contingency Operations (OCO) RDTE dollars in the amount of $5.110 million will fund System Test & Evaluation (ST&E) and technical manual development, and integration efforts to support the Phase 3 ATW & CIRCM QRC efforts. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding decrease due to product transitioning from development phase to the production phase.	56.066	30.100	0.000	5.110	5.110
Title: Phase 4 LIMWS QRC ***Description:*** Phase 4 Limited Interim Missile Warning System (LIMWS) is a follow-on bridging solution to the JUONS SO-0010 to fill a global capability gap until the Advanced Threat Detection System (ATDS) Program of Record is fielded. LIMWS is a Chief of Staff of the Army approved Directed Requirement issued by Army G-8 on 26 Mar 2017. LIMWS QRC provides an enhanced missile warning system to detect emerging and evolving enemy Man Portable Air Defense Systems (MANPADS) threats. FY19 funding is required to complete system development and conduct integration and system level testing as well as develop and test platform specific hardware (A-kits) for integration of the LIMWS system onto Army aircraft. ***FY 2019 Base Plans:***	33.734	-	0.000	29.823	29.823

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 0605051A / *Aircraft Survivability Development*	**Project (Number/Name)** ER8 / *Common Missile Warning System (CMWS)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
There is no FY19 Base funding for this effort. ***FY 2019 OCO Plans:*** FY2019 Overseas Contingency Operations (OCO) RDTE dollars in the amount of $29.823 million are estimated to fund test of system and design for lead platform and development of follow-on platform designs. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding increase due to first year of funding on PE 0605051A - ER8 for Phase 4 LIMWS QRC is FY19.					
Accomplishments/Planned Programs Subtotals	105.362	34.814	5.802	34.933	40.735

C. Other Program Funding Summary ($ in Millions)

Line Item	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
• AZ3517: *CMWS*	97.741	166.567	13.496	84.387	97.883	14.077	10.645	10.110	8.325	0.000	405.348

Remarks

D. Acquisition Strategy

CMWS: The acquisition strategy includes buying CMWS B-Kits to support fielding requirements and installation of A-Kits on all modernized aircraft. The previous CMWS production contract was a firm fixed-priced (FFP), Indefinite Delivery, Indefinite Quantity (IDIQ) contract. A FFP bridge contract was awarded March 2013 for CMWS hardware. The follow-on CMWS production FFP/Cost Plus Fixed Fee (CPFF) IDIQ contract is a 3 year firm fixed price contract to procure the remaining Generation 3 Electronic Control Unit (ECU) and A-Kits and was awarded SEP 2013. The Gen 3 ECU, which provides increased processing capacity and enables unguided munitions detection, became a part of the system in FY 2010; First Unit Equipped (FUE) for the Gen 3 ECU was achieved in Operation Enduring Freedom (OEF) on 18 September 2013. All aircraft deployed to OEF have received the new processor with hostile fire detection capability. Gen 3 ECUs will gradually replace all Gen 2 ECUs across the Aviation fleet between now and 2018.

JUONS Phase 2a DoN LAIRCM and Phase 3 ATW & CIRCM QRC: JUONS S0-0010 acquisition strategy includes aircraft prime contractor engineering support contracted to a Government test organization. Aircraft integration for JUONS will be handled through government operated organizations and industry partners.

Phase 4 Limited Interim Missile Warning System (LIMWS) QRC: Acquisition strategy includes a full and open competition for selection of prime vendor for development of B-Kit and development of A-Kit and support testing for the lead program. Additional platform A-Kit development will be handled by government organizations and industry partners.

E. Performance Metrics

N/A

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 0605051A / *Aircraft Survivability Development*	Project (Number/Name) ER8 / *Common Missile Warning System (CMWS)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CMWS Systems Engineering Program Management	Various	Various : PM ASE, HSV, AL	8.139	0.415		0.370		0.586	Jan 2019	-		0.586	Continuing	Continuing	Continuing
Advanced Missile Warning System Systems Engineering Program Management	TBD	TBD : TBD	-	2.000		-		-		-		-	0.000	2.000	-
JUONS SO-0010 Phase 2a Systems Engineering Program Management	Various	Various : PM ASE, HSV, AL	0.317	1.310		-		-		-		-	0.000	1.627	-
ATW & CIRCM QRC Systems Engineering Program Management	Various	Various : PM ASE, HSV, AL	1.600	5.544		1.000		-		-		-	Continuing	Continuing	Continuing
LIMWS - SEPM	Various	Various : PM ASE, HSV, AL	-	5.634		-		0.000		0.489	Jan 2019	0.489	0.000	6.123	-
		Subtotal	10.056	14.903		1.370		0.586		0.489		1.075	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CMWS tier 2/3 Upgrades	Various	Various : -	2.000	-		-		-		-		-	Continuing	Continuing	Continuing
CMWS Threat Analysis Database Design	Various	BAE : Various	0.455	-		-		-		-		-	Continuing	Continuing	Continuing
CMWS Threat Analysis Database (TAD)	Various	BAE : Various	3.417	2.702		2.188		1.910	Mar 2019	-		1.910	Continuing	Continuing	Continuing
CMWS Enhanced Sensor Study & Evaluation	Various	Various : -	11.466	-		-		-		-		-	0.000	11.466	-
CMWS Data Modeling	TBD	Various : Various	0.688	-		-		-		-		-	Continuing	Continuing	Continuing
CMWS Future Sensor and Algorithm Analysis	Various	Various : TBD	-	1.035		2.156		1.938	Mar 2019	-		1.938	Continuing	Continuing	Continuing

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 0605051A / *Aircraft Survivability Development*	Project (Number/Name) ER8 / *Common Missile Warning System (CMWS)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CMWS Prime Contractor--Integration Engineering	TBD	TBD,TBD : TBD	7.787	-		-		-		-		-	Continuing	Continuing	Continuing
CMWS Aircraft Integration	TBD	Various : Various	19.974	-		-		-		-		-	Continuing	Continuing	Continuing
CMWS Software	TBD	Various : Various	3.000	-		-		-		-		-	Continuing	Continuing	Continuing
CMWS Vulnerability and Assesment of Technologies (VAAT)	Various	Various : PM ASE, HSV, AL	-	-		-		1.368	Mar 2019	-		1.368	0.000	1.368	-
JUONS SO-0010 Phase 2a Prime Contractor -- Integration Engineering	Various	Various : Various	3.742	5.100		-		-		-		-	0.000	8.842	-
JUONS SO-0010 Phase 2a Software	Various	Various : Various	1.534	-		-		-		-		-	0.000	1.534	-
JUONS SO-0010 Phase 2a Training	Various	Various : Various	0.200	-		-		-		-		-	0.000	0.200	-
ATW & CIRCM QRC Development Engineering	Various	Northrup Grumman : Rolling Meadow, IL	-	-		5.100		-		-		-	0.000	5.100	-
ATW & CIRCM QRC ATW System Development and Qualification	Various	Various : Various	29.453	24.021		-		-		-		-	Continuing	Continuing	Continuing
ATW & CIRCM QRC Aircraft Integration	Various	Various : Various	1.442	22.781		-		-		-		-	Continuing	Continuing	Continuing
Limited Interim Missile Warning System (LIMWS) - Development Engineering	Various	Various : PM ASE, HSV, AL	-	21.234		-		0.000		10.893	Jan 2019	10.893	0.000	32.127	-
		Subtotal	85.158	76.873		9.444		5.216		10.893		16.109	Continuing	Continuing	N/A

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 0605051A / *Aircraft Survivability Development*	Project (Number/Name) ER8 / *Common Missile Warning System (CMWS)*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
LIMWS - Matrix Support	Various	Various : PM ASE, HSV, AL	-	2.433		-		0.000		3.260	Jan 2019	3.260	0.000	5.693	-
LIMWS - Contractor Support	Various	Various : PM ASE, HSV, AL	-	2.433		-		0.000		6.086	Jan 2019	6.086	0.000	8.519	-
		Subtotal	-	4.866		-		0.000		9.346		9.346	0.000	14.212	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CMWS Test and Evaluation	TBD	Various : Various	16.156	-		-		-		-		-	Continuing	Continuing	Continuing
JUONS SO-0010 Phase 2a Test and Evaluation	Various	Various : Various	21.709	5.000		-		-		-		-	0.000	26.709	-
ATW & CIRCM QRC Test and Evaluation/Tech Manuals	Various	Various : Various	-	3.720		24.000		0.000		5.110	Mar 2019	5.110	Continuing	Continuing	Continuing
LIMWS - Government Testing	Various	Various : PM ASE, HSV, AL	-	-		-		0.000		9.095	Mar 2019	9.095	0.000	9.095	-
		Subtotal	37.865	8.720		24.000		0.000		14.205		14.205	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	133.079	105.362		34.814		5.802		34.933		40.735	Continuing	Continuing	N/A

Remarks

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 0605051A / *Aircraft Survivability Development*	**Project (Number/Name)** ER8 / *Common Missile Warning System (CMWS)*

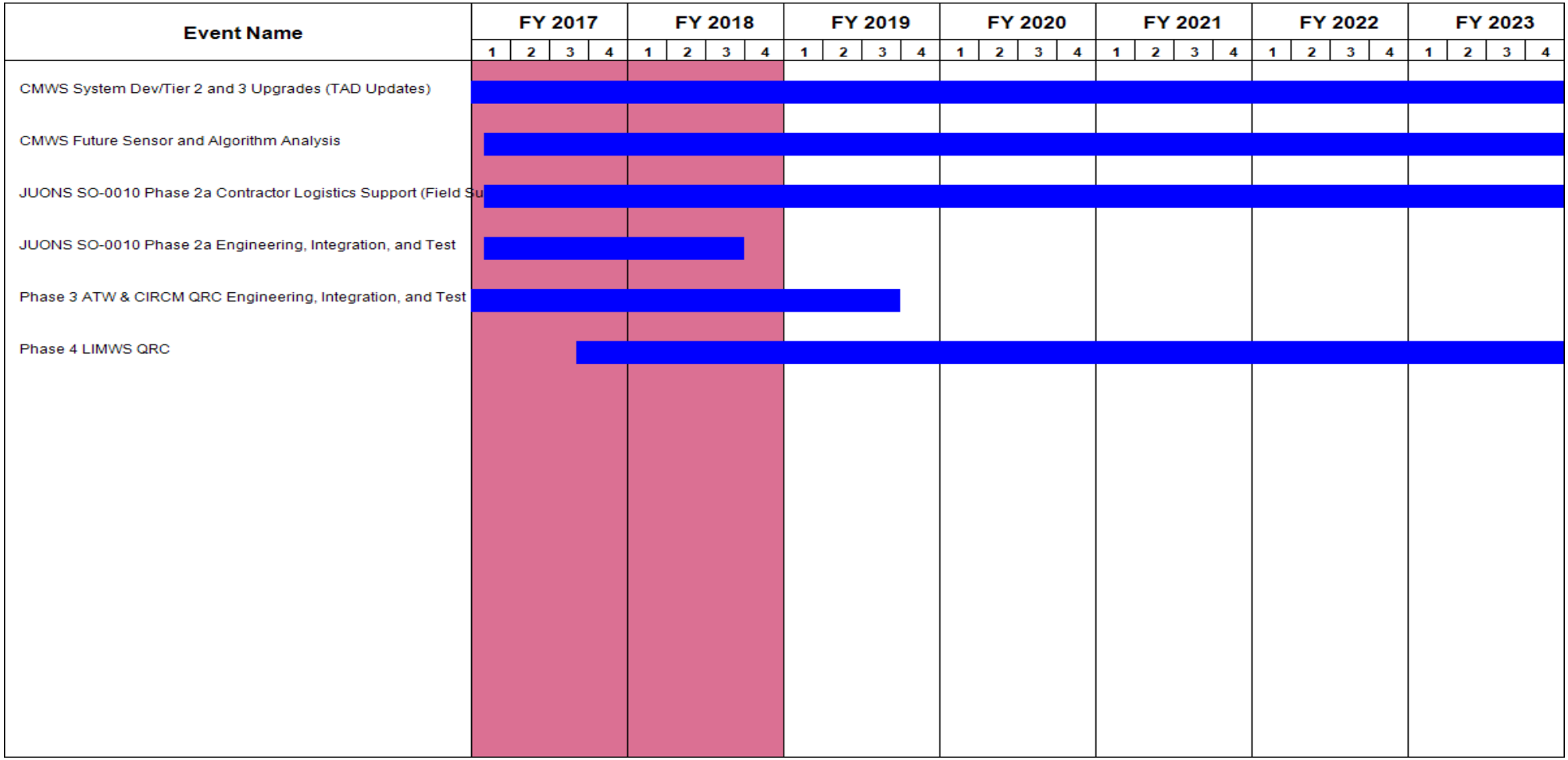

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605051A / *Aircraft Survivability Development*	**Project (Number/Name)** ER8 / *Common Missile Warning System (CMWS)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
CMWS System Dev/Tier 2 and 3 Upgrades (TAD Updates)	2	2011	4	2023
CMWS Future Sensor and Algorithm Analysis	1	2017	4	2023
JUONS SO-0010 Phase 2a Contractor Logistics Support (Field Support)	1	2017	4	2023
JUONS SO-0010 Phase 2a Engineering, Integration, and Test	1	2016	3	2018
Phase 3 ATW & CIRCM QRC Engineering, Integration, and Test	2	2016	3	2019
Phase 4 LIMWS QRC	3	2017	4	2023