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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2017 Army **Date:** February 2016

<b>Appropriation/Budget Activity</b> 2040: <i>Research, Development, Test &amp; Evaluation, Army / BA 5: System Development &amp; Demonstration (SDD)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0605051A / <i>Aircraft Survivability Development</i>
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COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	-	0.000	78.112	41.133	73.110	114.243	98.447	41.768	141.917	114.451	Continuing	Continuing
ER7: <i>Aircraft Survivability Equipment Development</i>	-	0.000	15.115	16.815	-	16.815	20.227	5.675	5.820	9.545	Continuing	Continuing
ER8: <i>Common Missile Warning System (CMWS)</i>	-	0.000	62.997	24.318	73.110	97.428	78.220	36.093	136.097	104.906	418.718	934.459

**Note**

Funds from projects EE3 (A/C Surv Equip Dev) and EE4 (Common Missile Warning System (CMWS)), Program Element (PE) 0605035A (Common Infrared Countermeasures (CIRCM)) are restructured to projects ER7 (Aircraft Survivability Equipment Development) and ER8 (Common Missile Warning System (CMWS)) respectively, PE 0605051A (Aircraft Survivability Development) for Fiscal Year (FY) 2016 and beyond for more efficient and effective program management.

**A. Mission Description and Budget Item Justification**

The Aircraft Survivability Development budget line includes Aircraft Survivability 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 and 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, adopts the ongoing United States Navy Class I RWR Engineering Change Proposal (ECP), commonly referred to as the 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. Under Phase 2, the Army will develop enhancements to the APR-39D(V)2 as hardware upgrades needed to keep the APR-39D(V)2 technically relevant and address emerging Low Probability Intercept (LPI) and frequency 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).

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<b>Appropriation/Budget Activity</b> 2040: <i>Research, Development, Test &amp; Evaluation, Army / BA 5: System Development &amp; Demonstration (SDD)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0605051A / <i>Aircraft Survivability Development</i>	
<p>ER8: Common Missile Warning System (CMWS).</p> <p>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.</p> <p>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 material release conditions to achieve a Full Material Release (FMR) for CMWS and ensure protection against emerging IR-guided missile threats.</p> <p>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.</p> <p>JUONS SO-0010 will integrate the Department of the Navy Large Aircraft Infrared Countermeasure (DoN LAIRCM) system on a select number of Army and SOCOM aircraft in the threat area of responsibility. The purpose of this JUONS is to detect and defeat proliferate Surface-to-Air Missiles (SAM) threats. HQDA has provided a follow up Directed Requirement to this JUONS to reduce Space, Weight and Power (SWaP) and accelerate delivery of Common Infrared Countermeasures (CIRCMs).</p> <p>FY 2017 Overseas Contingency Operations (OCO) Research, Development, Test, and Evaluation (RDTE) dollars in the amount of \$11.510 million are required to complete final development and testing of A-kits and integration of the Phase 2a solution in support of JUONS SO-0010 for the Operation Inherent Resolve (OIR) theater of operations.</p> <p>FY 2017 OCO RDTE dollars in the amount of \$61.600 million are required for integration efforts to support the ATW &amp; CIRCM QRC solution in support of JUONS SO-0010 for the OIR theater of operations. The intent of the ATW &amp; CIRCM QRC program is to reduce the SWaP that require operational tradeoffs that are associated with the Phase 2a solution.</p> <p>Joint Staff, J-8 Deputy Director for Requirements (DDR) memorandum, April 24, 2015 SOCOM JUONs SO-0010, Joint Rapid Acquisition Cell (JRAC) memorandum, May 29, 2015</p>		

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2017 Army	<b>Date:</b> February 2016
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<b>Appropriation/Budget Activity</b> 2040: <i>Research, Development, Test &amp; Evaluation, Army / BA 5: System Development &amp; Demonstration (SDD)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0605051A / <i>Aircraft Survivability Development</i>
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Directed Requirement for the Advanced Threat Warner and Common Infrared Countermeasure Quick Reaction Capability (ATW & CIRCM QRC) to Support Joint Urgent Operational Need (JUON) SO-0010, CIRCM Critical Intelligence Parameters Breach, 18 December 2015

<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>
Previous President's Budget	0.000	18.112	31.015	-	31.015
Current President's Budget	0.000	78.112	41.133	73.110	114.243
Total Adjustments	0.000	60.000	10.118	73.110	83.228
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	60.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	10.118	73.110	83.228

**Change Summary Explanation**

Funds were added due to emerging Man Portable Air Defense System (MANPADS) threat and Senior Leader and congressional interest in closing the gap between JUONS efforts and next Program of Record (PoR).

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Army										<b>Date:</b> February 2016		
<b>Appropriation/Budget Activity</b> 2040 / 5					<b>R-1 Program Element (Number/Name)</b> PE 0605051A / Aircraft Survivability Development				<b>Project (Number/Name)</b> ER7 / Aircraft Survivability Equipment Development			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
ER7: Aircraft Survivability Equipment Development	-	0.000	15.115	16.815	-	16.815	20.227	5.675	5.820	9.545	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**Note**

Funds from project EE3 (A/C Surv Equip Dev), Program Element (PE) 0605035A (Common Infrared Countermeasures (CIRCM)) are restructured to project ER7 (Aircraft Survivability Equipment Development), PE 0605051A (Aircraft Survivability Development) for Fiscal Year (FY) 2016 and beyond for more efficient and effective program management.

**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, adopts the ongoing United States Navy Class I RWR Engineering Change Proposal (ECP), commonly referred to as the 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. Under Phase 2, the Army will develop enhancements to the APR-39D(V)2 as hardware upgrades needed to keep the APR-39D(V)2 technically relevant and address emerging Low Probability Intercept (LPI) and frequency 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) 2017 Base RDT&E funding of \$16.815 million supports RWR software development, qualification testing, and Software Integration Lab (SIL) updates.

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

	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>
<b>Title:</b> Phase 2 Radio Frequency Countermeasure (CM)	-	15.115	16.815	-	16.815
<b>Description:</b> Phase 2 Product Development (Digital RWR).					

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Army	<b>Date:</b> February 2016
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<b>Appropriation/Budget Activity</b> 2040 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0605051A / Aircraft Survivability Development	<b>Project (Number/Name)</b> ER7 / Aircraft Survivability Equipment Development
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
<p><b>FY 2016 Plans:</b> Will fund RWR software development and emerging threats.</p> <p><b>FY 2017 Base Plans:</b> Will fund Product Development - RWR software development and SIL updates, Support Costs - Contractor Support and Matrix Support; Test and Evaluation - Multi-Service Developmental Testing/Operational Testing (DT/OT) and Government System Test and Evaluation; and Management Services - Threat Management and Project Management.</p>					
<b>Accomplishments/Planned Programs Subtotals</b>	-	15.115	16.815	-	16.815

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<u>Line Item</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017 Base</u>	<u>FY 2017 OCO</u>	<u>FY 2017 Total</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• AZ3511: Radio Frequency CM (AZ3511)	56.163	28.730	50.425	-	50.425	50.067	40.833	74.147	57.498	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 on-going United States Navy (USN) RWR Class I Correction of Deficiencies ECP commonly referred to as the APR-39D(V)2 system, limiting service-unique design, test, and integration expenses. Full Army participation throughout the remaining development, testing, procurement, fielding, and sustainment of the APR-39D(V)2 Digital RWR will address the significant Army RF capability gap while avoiding additional costs associated with a single-Service solution. This multi-Service approach also fields an effective and suitable material solution sooner to support the re-balance of the National Defense Strategy to the RF threat-heavy Asia-Pacific Region.

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

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Army		<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 2040 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0605051A / <i>Aircraft Survivability Development</i>	<b>Project (Number/Name)</b> ER7 / <i>Aircraft Survivability Equipment Development</i>

<b><u>E. Performance Metrics</u></b> N/A
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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Army												Date: February 2016			
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)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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
Threat Management	Various	Various : -	8.833	-		0.235		0.282	Apr 2017	-		0.282	Continuing	Continuing	Continuing
Project Management	Various	Various : -	0.429	-		0.253		0.253	Jan 2017	-		0.253	Continuing	Continuing	Continuing
<b>Subtotal</b>			9.262	-		0.488		0.535		-		0.535	-	-	-
Product Development (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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
Digital Radar Warning Receiver (RWR)	Various	Lab Demo / Study : Various	10.634	-		-		-		-		-	Continuing	Continuing	Continuing
S/W Development	Various	OGA : Aberdeen Proving Grounds, MD	1.498	-		3.615		5.705	Jan 2017	-		5.705	Continuing	Continuing	Continuing
SIL Updates	MIPR	I2WD : Aberdeen Proving Grounds, MD	1.726	-		-		0.814	Jan 2017	-		0.814	Continuing	Continuing	Continuing
Depot Standup	MIPR	Tobyhanna : Tobyhanna, PA	1.052	-		-		-		-		-	0	1.052	0
Platform Integration	Various	Multiple : -	1.844	-		2.050		-		-		-	Continuing	Continuing	Continuing
Emerging Threats	MIPR	OGA : Aberdeen Proving Grounds, MD	0.000	-		-		-		-		-	Continuing	Continuing	Continuing
<b>Subtotal</b>			16.754	-		5.665		6.519		-		6.519	-	-	-
Support (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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 Support	Various	Various : -	2.803	-		0.911		1.206	Jan 2017	-		1.206	Continuing	Continuing	Continuing
Matrix Support	Various	Various : -	6.430	-		-		0.117	Jan 2017	-		0.117	Continuing	Continuing	Continuing
<b>Subtotal</b>			9.233	-		0.911		1.323		-		1.323	-	-	-



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**Exhibit R-4, RDT&E Schedule Profile: PB 2017 Army** **Date:** February 2016

<b>Appropriation/Budget Activity</b> 2040 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0605051A / Aircraft Survivability Development	<b>Project (Number/Name)</b> ER7 / Aircraft Survivability Equipment Development
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Event Name	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	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
Phase 2 APR-39D(V)2 Prototype Fabrication																												
Phase 2 APR-39D(V)2 DT/OT																												
Phase 2 APR-39D(V)2 Platform Integration																												
(1) Phase 2 APR-39D(V)2 Procurement Decision									▲ 1																			
Phase 2 APR-39D(V)2 Procurement/Deployment																												
(2) Phase 2 APR-39D(V)2 FUE													▲ 2															
Emerging Threats/SIL Updates																												
Software Development																												

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2017 Army		<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 2040 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0605051A / Aircraft Survivability Development	<b>Project (Number/Name)</b> ER7 / Aircraft Survivability Equipment Development

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Phase 2 APR-39D(V)2 Prototype Fabrication	4	2013	2	2015
Phase 2 APR-39D(V)2 DT/OT	3	2016	2	2017
Phase 2 APR-39D(V)2 Platform Integration	1	2014	3	2016
Phase 2 APR-39D(V)2 Procurement Decision	2	2017	2	2017
Phase 2 APR-39D(V)2 Procurement/Deployment	2	2017	4	2021
Phase 2 APR-39D(V)2 FUE	4	2018	4	2018
Emerging Threats/SIL Updates	3	2016	4	2021
Software Development	1	2015	4	2021

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Army										<b>Date:</b> February 2016		
<b>Appropriation/Budget Activity</b> 2040 / 5					<b>R-1 Program Element (Number/Name)</b> PE 0605051A / Aircraft Survivability Development				<b>Project (Number/Name)</b> ER8 / Common Missile Warning System (CMWS)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
ER8: Common Missile Warning System (CMWS)	-	0.000	62.997	24.318	73.110	97.428	78.220	36.093	136.097	104.906	418.718	934.459
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**Note**

Funds from project EE4 (Common Missile Warning System (CMWS)), Program Element (PE) 0605035A (Common Infrared Countermeasures (CIRCM)) are restructured to project ER8 (Common Missile Warning System (CMWS)), PE 0605051A (Aircraft Survivability Development) for Fiscal Year (FY) 2016 and beyond for more efficient and effective program management.

**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 material release conditions to achieve a Full Material Release (FMR) for CMWS and ensure protection against emerging IR-guided missile threats.

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Joint Urgent Operational Needs Statement (JUONS) SO-0010 will integrate the Department of the Navy Large Aircraft Infrared Countermeasure (DoN LAIRCM) system on a select number of Army and Special Operations Command (SOCOM) aircraft in the threat area of responsibility. The purpose of this JUONS is to detect and defeat proliferate Surface-to-Air Missiles (SAM) threats. Headquarters Department of the Army (HQDA) has provided a follow up Directed Requirement to this JUONS to reduce Space, Weight and Power (SWaP) and accelerate delivery of Common Infrared Countermeasures (CIRCMs).

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**Exhibit R-2A, RDT&E Project Justification:** PB 2017 Army **Date:** February 2016

<b>Appropriation/Budget Activity</b> 2040 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0605051A / Aircraft Survivability Development	<b>Project (Number/Name)</b> ER8 / Common Missile Warning System (CMWS)
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Justification: FY 2017 Base Research, Development, Test, and Evaluation (RDTE) dollars in the amount of \$24.318 million includes \$4.318 million to support development engineering of the Threat Analysis Database (TAD), integration with other Aircraft Survivability Equipment systems, and future sensor and algorithm analysis.

FY 2017 Base RDTE dollars in the amount of \$20.000 million is for the development, integration, and qualification of an advanced missile warning system and program management.

FY 2017 Overseas Contingency Operations (OCO) RDTE dollars in the amount of \$11.510 million are required to complete final development and testing of A-kits and integration of the Phase 2a solution in support of JUONS SO-0010 for the Operation Inherent Resolve (OIR) theater of operations.

FY 2017 OCO RDTE dollars in the amount of \$61.600 million are required for integration efforts to support the Advanced Threat Warner and Common Infrared Countermeasure Quick Reaction Capability (ATW & CIRCUM QRC) solution in support of JUONS SO-0010 for the OIR theater of operations. The intent of the ATW & CIRCUM QRC program is to reduce the SWaP that require operational tradeoffs that are associated with the Phase 2a solution.

Joint Staff, J-8 Deputy Director for Requirements (DDR) memorandum, April 24, 2015

SOCOM JUONS SO-0010, Joint Rapid Acquisition Cell (JRAC) memorandum, May 29, 2015

Directed Requirement for the Advanced Threat Warner and Common Infrared Countermeasure Quick Reaction Capability (ATW & CIRCUM QRC) to Support Joint Urgent Operational Need (JUON) SO-0010, CIRCUM Critical Intelligence Parameters Breach, 18 December 2015

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

	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
<p><b>Title:</b> CMWS Product Development and Management Services</p> <p><b>Description:</b> RDTE funding supports continuing development engineering of the TAD, salaries, and integration with other ASE Systems.</p> <p><b>FY 2016 Plans:</b> FY 2016 Base RDTE dollars in the amount of \$2.997 million will fund Product Development – TAD; and Management Services – CMWS Systems Engineering Program Management.</p> <p><b>FY 2017 Base Plans:</b> FY 2017 Base RDTE dollars in the amount of \$4.318 million will fund Product Development - TAD and Future Sensor and Algorithm Analysis; and Management Services - CMWS Systems Engineering Program Management. FY 2017 Base RDTE dollars in the amount of \$20.000 million will fund Product Development -</p>	-	2.997	24.318	-	24.318

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Advanced Missile Warning System Development Engineering; and Management Services – CMWS Systems Engineering Program Management.					
<b>Title:</b> JUONS SO-0010 Phase 2a Congressional Add <b>Description:</b> 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. <b>FY 2016 Plans:</b> FY 2016 Base RDTE dollars in the amount of \$43.300 million will fund Product Development – JUONS SO-0010 Phase 2a Prime Contractor – Integration Engineering and JUONS SO-0010 Phase 2a Aircraft Integration; and Management Services – JUONS SO-0010 Phase 2a Systems Engineering Program Management.	-	43.300	-	-	-
<b>Title:</b> JUONS SO-0010 Phase 2a OCO <b>Description:</b> 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. <b>FY 2017 Base Plans:</b> This project only has OCO dollars for FY17 <b>FY 2017 OCO Plans:</b> Complete final development and testing of A-kits and integration of the Phase 2a solution in support of JUONS SO-0010. Efforts include: Prime Contractor Integration and Engineering; Test and Evaluation of the Phase 2a solution; and government Systems Engineering and Program Management.	-	-	0.000	11.510	11.510
<b>Title:</b> ATW & CIRCM QRC Congressional Add <b>Description:</b> The intent of the ATW & CIRCM QRC program is to reduce the SWaP that require operational tradeoffs that are associated with the JUONS SO-0010 Phase 2a solution. <b>FY 2016 Plans:</b> Begin ATW & CIRCM QRC development and qualification of the new Army ATW processor and the ATW transfer alignment function. Funding will also begin software integration with the current ATW processor. Efforts will also begin on A-Kit development/Integration. Efforts will also include Army systems engineering and program management efforts.	-	16.700	-	-	-
<b>Title:</b> ATW & CIRCM QRC OCO	-	-	0.000	61.600	61.600

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Army		<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 2040 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0605051A / Aircraft Survivability Development	<b>Project (Number/Name)</b> ER8 / Common Missile Warning System (CMWS)

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

	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
<b>Description:</b> The intent of the ATW & CIRCM QRC program is to reduce the SWaP that require operational tradeoffs that are associated with the JUONS SO-0010 Phase 2a solution.					
<b>FY 2017 Base Plans:</b> This project only has OCO dollars for FY17					
<b>FY 2017 OCO Plans:</b> Continue development and qualification of the new Army ATW processor and the ATW transfer alignment function. Complete software integration with the current ATW processor and begin the software integration with the new Army ATW processor. Continue QRC A-Kit development/Integration efforts for UH-60M, UH-60L, HH-60M, CH-47F, AH-64E, MH-47G and MH-60M. Funding will also support the modification of the JUONS SO-0010 Phase 2a A-Kit to accommodate the new Army ATW processor and CIRCM on all aircraft.					
<b>Accomplishments/Planned Programs Subtotals</b>	-	62.997	24.318	73.110	97.428

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

Line Item	FY 2015	FY 2016	FY 2017	FY 2017	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	Cost To	Total Cost
			Base	OCO	Total					Complete	
• APA Funding:: SSN AZ3517; BA4; CMWS	201.912	104.348	41.626	56.115	97.741	37.225	32.719	18.775	10.917	69.608	573.245

**Remarks**

**D. Acquisition Strategy**

The acquisition strategy includes buying CMWS B-Kits to support the Army Force Generation (ARFORGEN) model 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 ECUs 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 ECU's will gradually replace all Gen 2 ECU's across the Aviation fleet between now and 2017.

The advanced missile warning system acquisition strategy includes contracting with the Original Equipment Manufacturer (OEM) via Basic Ordering Agreement (BOA).

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Army		<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 2040 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0605051A / <i>Aircraft Survivability Development</i>	<b>Project (Number/Name)</b> ER8 / <i>Common Missile Warning System (CMWS)</i>
JUONS SO-0010 acquisition strategy includes aircraft prime contractor engineering support contracted via BOA and Military Interdepartmental Purchase Requisition (MIPR) to a Government test organization. Aircraft integration for JUONS will be handled through government operated organizations and industry partners.		
<b>E. Performance Metrics</b> N/A		

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Army** **Date:** February 2016

<b>Appropriation/Budget Activity</b> 2040 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0605051A / Aircraft Survivability Development	<b>Project (Number/Name)</b> ER8 / Common Missile Warning System (CMWS)
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<b>Management Services (\$ in Millions)</b>				<b>FY 2015</b>		<b>FY 2016</b>		<b>FY 2017 Base</b>		<b>FY 2017 OCO</b>		<b>FY 2017 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>			
CMWS Systems Engineering Program Management	Various	Various : PM ASE, HSV, AL	7.800	-		0.378	Mar 2016	2.387	Oct 2016	-		2.387	Continuing	Continuing	Continuing
JUONS SO-0010 Phase 2a Systems Engineering Program Management	Various	Various : PM ASE, HSV, AL	0.000	-		3.000	Mar 2016	0.000		1.310	Oct 2016	1.310	0	4.310	0
ATW & CIRCM QRC Systems Engineering Program Management	Various	Various : PM ASE, HSV, AL	0.000	-		1.600	Mar 2016	0.000		5.544	Oct 2016	5.544	Continuing	Continuing	Continuing
<b>Subtotal</b>			7.800	-		4.978		2.387		6.854		9.241	-	-	-

<b>Product Development (\$ in Millions)</b>				<b>FY 2015</b>		<b>FY 2016</b>		<b>FY 2017 Base</b>		<b>FY 2017 OCO</b>		<b>FY 2017 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>			
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
Threat Analysis Database (TAD)	Various	BAE : Various	0.874	-		2.619	May 2016	2.131	May 2017	-		2.131	Continuing	Continuing	Continuing
CMWS Enhanced Sensor Study & Evaluation	Various	Various : -	11.466	-		-		-		-		-	0	11.466	0
CMWS Data Modeling	TBD	Various : Various	0.688	-		-		-		-		-	Continuing	Continuing	Continuing
Future Sensor and Algorithm Analysis	Various	Various : TBD	0.000	-		-		1.800	Feb 2017	-		1.800	Continuing	Continuing	Continuing
Prime Contractor-- Integration Engineering	TBD	TBD, TBD : TBD	7.787	-		-		-		-		-	Continuing	Continuing	Continuing
Advance Missile Warning Systems Development Engineering	TBD	TBD : TBD	0.000	-		-		18.000	Jan 2017	-		18.000	0	18.000	0
Aircraft Integration	TBD	Various : Various	19.974	-		-		-		-		-	Continuing	Continuing	Continuing
Software	TBD	Various : Various	3.000	-		-		-		-		-	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Army												Date: February 2016			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0605051A / Aircraft Survivability Development				ER8 / Common Missile Warning System (CMWS)							
Product Development (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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
JUONS SO-0010 Phase 2a Prime Contractor -- Integration Engineering	Various	Various : Various	0.000	-		12.500	Mar 2016	0.000		5.200	Jan 2017	5.200	0.000	17.700	0
JUONS SO-0010 Phase 2a Aircraft Integration	Various	Various : Various	0.000	-		27.800	Mar 2016	-		-		-	0	27.800	0
ATW & CIRCM QRC Aircraft Integration	Various	Various : Various	0.000	-		-		0.000		25.548	Jan 2017	25.548	Continuing	Continuing	Continuing
ATW & CIRCM QRC ATW System Development and Qualification	Various	Various : various	0.000	-		15.100	Mar 2016	0.000		26.788	Jan 2017	26.788	Continuing	Continuing	Continuing
<b>Subtotal</b>			46.244	-		58.019		21.931		57.536		79.467	-	-	-
Test and Evaluation (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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
Test and Evaluation	TBD	Various : Various	16.156	-		-		-		-		-	Continuing	Continuing	Continuing
JUONS SO-0010 Phase 2a Test and Evaluation	Various	Various : Various	0.000	-		-		0.000		5.000	Jan 2017	5.000	0	5.000	0
ATW & CIRCM QRC Test and Evaluation	Various	Various : Various	0.000	-		-		0.000		3.720	Jan 2017	3.720	Continuing	Continuing	Continuing
<b>Subtotal</b>			16.156	-		-		0.000		8.720		8.720	-	-	-
<b>Project Cost Totals</b>			70.200	-		62.997		24.318		73.110		97.428	-	-	-
<b>Remarks</b>															

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**Exhibit R-4, RDT&E Schedule Profile: PB 2017 Army** **Date:** February 2016

<b>Appropriation/Budget Activity</b> 2040 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0605051A / Aircraft Survivability Development	<b>Project (Number/Name)</b> ER8 / Common Missile Warning System (CMWS)
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Event Name	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	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
CMWS System Dev/Tier 2 and 3 Upgrades (TAD Updates)																												
CMWS Gen 3 Production																												
Future Sensor and Algorithm Analysis																												
Advance Missile Warning Development Engineering																												
JUONS SO-0010 Engineering, Integration, and Test																												
ATW & CIRCM QRC Engineering, Integration, and Test																												

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2017 Army		<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 2040 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0605051A / <i>Aircraft Survivability Development</i>	<b>Project (Number/Name)</b> ER8 / <i>Common Missile Warning System (CMWS)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
CMWS System Dev/Tier 2 and 3 Upgrades (TAD Updates)	2	2011	4	2021
CMWS Gen 3 Production	3	2012	4	2016
Future Sensor and Algorithm Analysis	1	2017	4	2021
Advance Missile Warning Development Engineering	1	2017	4	2021
JUONS SO-0010 Engineering, Integration, and Test	1	2017	3	2017
ATW & CIRCM QRC Engineering, Integration, and Test	1	2017	3	2018

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