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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2016 Army **Date:** February 2015

<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 0605035A / <i>Common Infrared Countermeasures (CIRCM)</i>
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COST (\$ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
Total Program Element	-	-	145.337	77.570	-	77.570	72.909	63.577	54.401	25.641	Continuing	Continuing
EB4: <i>CIRCM</i>	-	-	128.189	77.570	-	77.570	72.909	63.577	54.401	25.641	Continuing	Continuing
EE3: <i>A/C Surv Equip Dev</i>	-	-	14.838	-	-	-	-	-	-	-	Continuing	Continuing
EE4: <i>Common Missile Warning System (CMWS)</i>	-	-	2.310	-	-	-	-	-	-	-	Continuing	Continuing

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

The Aircraft Survivability Development budget line includes Common Missile Warning System (EE4), Aircraft Survivability Equipment Development (EE3), and Common IR Counter Measure (EB4).

EE3: FY16 funds have moved to ER7, PE 0605051A (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 Radio Frequency (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) Radar Warning Receiver (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 near-spherical 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, including integrated suite control functionality, threat correlation and off-boarding capability, and 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).

EE4: FY16 funds have moved to ER8, PE 0605051A (Aircraft Survivability Development).

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 Common Missile

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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 0605035A / <i>Common Infrared Countermeasures (CIRCM)</i>	
<p>Warning System (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 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>EB4:</p> <p>The Common Infrared Countermeasure (CIRCM) is an infrared (IR) countermeasure system that interfaces with a Missile Warning System (MWS) to provide near spherical protection of the host platform in order to defeat IR threat missiles. The CIRCM will provide the sole acquisition of future laser-based IR countermeasure systems for all rotary-wing, tilt-rotor, and small fixed-wing aircraft across the Department of Defense. The US Army's concept of CIRCM is part of the Suite of Integrated Infrared Countermeasures (SIIRCM). The core components of the SIIRCM concept are: a Missile Warning System (MWS), IR expendable countermeasures (flares) and a laser-based IRCM. The SIIRCM detects, declares and initiates IRCM against IR-guided Surface-to-Air Missiles (SAM) or Air-to-Air Missiles (AAM). The CIRCM is the next generation of the laser-based IRCM component and will interface with both the Army's Common Missile Warning System (CMWS) and the Navy's future missile warning system. CIRCM was approved to be funded to the Director, Cost Assessment and Program Evaluation Independent Cost Estimate (CAPE ICE) through Milestone B (MS B) per Defense Acquisition Executive Acquisition Decision Memorandum (DAE) (ADM), December 28, 2011.</p> <p>The A-Kit for CIRCM 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. The CIRCM B-Kit is the mission kit (laser, pointer tracker, and controller) required to achieve near spherical coverage for an aircraft.</p> <p>EB4 justification:</p>		

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2016 Army	<b>Date:</b> February 2015
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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 0605035A / <i>Common Infrared Countermeasures (CIRCM)</i>
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Fiscal Year 2016 Base RDT&E in the amount of \$77.570 million supports the Engineering and Manufacturing Development (EMD) phase to include twelve A-Kit prototypes, platform integration, and integration with other Aircraft Survivability Equipment (ASE) systems.

<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2014</b>	<b>FY 2015</b>	<b>FY 2016 Base</b>	<b>FY 2016 OCO</b>	<b>FY 2016 Total</b>
Previous President's Budget	-	145.409	143.099	-	143.099
Current President's Budget	-	145.337	77.570	-	77.570
Total Adjustments	-	-0.072	-65.529	-	-65.529
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-0.072	-65.529	-	-65.529

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2016 Army										<b>Date:</b> February 2015		
<b>Appropriation/Budget Activity</b> 2040 / 5					<b>R-1 Program Element (Number/Name)</b> PE 0605035A / <i>Common Infrared Countermeasures (CIRCM)</i>				<b>Project (Number/Name)</b> EB4 / <i>CIRCM</i>			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2014</b>	<b>FY 2015</b>	<b>FY 2016 Base</b>	<b>FY 2016 OCO</b>	<b>FY 2016 Total</b>	<b>FY 2017</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
EB4: <i>CIRCM</i>	-	-	128.189	77.570	-	77.570	72.909	63.577	54.401	25.641	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**Note**

Funds in the program are a realignment of funds from program VU8, PE 0604270A (Electronic Warfare Development) for more efficient and effective program management.

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

The Common Infrared Countermeasure (CIRCM) is an infrared (IR) countermeasure system that interfaces with a Missile Warning System (MWS) to provide near spherical protection of the host platform in order to defeat IR threat missiles. The CIRCM will provide the sole acquisition of future laser-based IR countermeasure systems for all rotary-wing, tilt-rotor, and small fixed-wing aircraft across the Department of Defense. The US Army's concept of CIRCM is part of the Suite of Integrated Infrared Countermeasures (SIIRCM). The core components of the SIIRCM concept are: a Missile Warning System (MWS), IR expendables countermeasures (flares) and a laser-based IRCM. The SIIRCM detects, declares and initiates IRCM against IR-guided Surface-to-Air Missiles (SAM) or Air-to-Air Missiles (AAM). The CIRCM is the next generation of the laser-based IRCM component and will interface with both the Army's Common Missile Warning System (CMWS) and the Navy's future missile warning system. CIRCM was approved to be funded to the Director, Cost Assessment and Program Evaluation Independent Cost Estimate (CAPE ICE) through Milestone B (MS B) per Defense Acquisition Executive Acquisition Decision Memorandum (DAE) (ADM), December 28, 2011.

The A-Kit for CIRCM includes mounting hardware, wiring harnesses, 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. The CIRCM B-Kit is the mission kit (laser, pointer tracker, and controller) required to achieve near spherical coverage for an aircraft.

Justification:

Fiscal Year 2016 Base RDT&E in the amount of \$77.570 million supports the Engineering and Manufacturing Development (EMD) phase to include nine B-Kit prototypes, platform integration, and integration with other Aircraft Survivability Equipment (ASE) systems.

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

	<b>FY 2014</b>	<b>FY 2015</b>	<b>FY 2016</b>
<b>Title:</b> Development Efforts	-	128.189	77.570
<b>Description:</b> RDT&E dollars begin the design and development of the CIRCM system.			
<b>FY 2015 Plans:</b> RDT&E dollars support the CIRCM EMD phase, prototype manufacturing for twelve B-Kit prototypes, and platform integration.			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2016 Army							<b>Date:</b> February 2015				
<b>Appropriation/Budget Activity</b> 2040 / 5			<b>R-1 Program Element (Number/Name)</b> PE 0605035A / <i>Common Infrared Countermeasures (CIRCM)</i>				<b>Project (Number/Name)</b> EB4 / <i>CIRCM</i>				
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>							<b>FY 2014</b>	<b>FY 2015</b>	<b>FY 2016</b>		
"Other Testing" includes funds to acquire test threat assets.											
<b>FY 2016 Plans:</b> RDT&E dollars support the CIRCM EMD phase to include Critical Design Review (CDR), software testing, Airworthiness Release (AWR) testing, flight testing, Reliability Demonstration Testing (RDT), B-Kit ship set prototype deliveries, A-Kit integration, prototype A-Kit Modification Work Order (MWO) development, Training Support Plan (TSP) and Technical Manual (TM) development.											
"Other Testing" includes funds to acquire test threat assets.											
<b>Accomplishments/Planned Programs Subtotals</b>							-	128.189	77.570		
<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<b>Line Item</b>	<b>FY 2014</b>	<b>FY 2015</b>	<b>FY 2016 Base</b>	<b>FY 2016 OCO</b>	<b>FY 2016 Total</b>	<b>FY 2017</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• : <i>APA Funding:</i> <i>APA, BA 4, AZ3537</i>	-	-	-	-	-	64.942	104.858	166.201	216.127	Continuing	Continuing
<b>Remarks</b>											
None											
<b>D. Acquisition Strategy</b>											
The December 28, 2011 DAE ADM authorized entry into the Technology Development (TD) phase, designated the program a pre-Major Defense Acquisition Program (MDAP), and approved the updated exit criteria. CIRCM will continue pre-MS B activities until MS B approval. Contract award to a single vendor is anticipated in the third quarter of FY15. The EMD contract will include priced options for Other Platform A-Kit Development, A-Kit Engineering Support, Low Rate Initial Production (LRIP) 1 and 2 Prototypes (Hardware and Installs), LRIP 1 and 2 Engineering and Test Support, Software Technical Data Package (TDP), Navy funded requirements, and Defense Exportability Features (DEF). Upon CIRCM MS C approval planned for the fourth quarter of FY17, the LRIP and Engineering Support options may be exercised and the program may immediately enter the Production & Deployment phase with First Unit Equipped (FUE) planned for third quarter of FY19, and a Full Rate Production Decision Review (FRPDR) planned for the third quarter of FY19.											
<b>E. Performance Metrics</b>											
N/A											

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2016 Army												Date: February 2015				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
2040 / 5				PE 0605035A / Common Infrared Countermeasures (CIRCM)				EB4 / CIRCM								
<b>Management Services (\$ in Millions)</b>				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 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	
System Engineering Program Management	Various	Various : -	0.000	-		10.588		9.503		-		9.503	Continuing	Continuing	Continuing	
<b>Subtotal</b>			0.000	-		10.588		9.503		-		9.503	-	-	-	
<b>Product Development (\$ in Millions)</b>				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 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	
Non-Recurring Engineering (NRE)	C/CPFF	Various : -	0.000	-		39.042	Jun 2015	34.626	Jan 2016	-		34.626	Continuing	Continuing	Continuing	
Prototype Manufacturing	C/FPIF	Various : -	0.000	-		40.031	Jun 2015	13.890	Jan 2016	-		13.890	Continuing	Continuing	Continuing	
Other R&D	Various	Various : -	0.000	-		5.290		5.167	Mar 2016	-		5.167	Continuing	Continuing	Continuing	
Data	Various	Various : -	0.000	-		-		1.427	May 2016	-		1.427	Continuing	Continuing	Continuing	
<b>Subtotal</b>			0.000	-		84.363		55.110		-		55.110	-	-	-	
<b>Support (\$ in Millions)</b>				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 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	
Support Equipment	Various	Various : -	0.000	-		0.700		1.500	Jul 2016	-		1.500	Continuing	Continuing	Continuing	
<b>Subtotal</b>			0.000	-		0.700		1.500		-		1.500	-	-	-	
<b>Test and Evaluation (\$ in Millions)</b>				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 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	
Government System Test and Evaluation	Various	Various : -	0.000	-		2.500		5.050	Apr 2016	-		5.050	Continuing	Continuing	Continuing	
Other Testing	Various	Various : -	0.000	-		30.038		6.407	May 2016	-		6.407	Continuing	Continuing	Continuing	
<b>Subtotal</b>			0.000	-		32.538		11.457		-		11.457	-	-	-	



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**Exhibit R-4, RDT&E Schedule Profile: PB 2016 Army** **Date:** February 2015

<b>Appropriation/Budget Activity</b> 2040 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0605035A / <i>Common Infrared Countermeasures (CIRCM)</i>	<b>Project (Number/Name)</b> EB4 / <i>CIRCM</i>
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Event Name	FY 2014				FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020			
	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
TD Phase																												
Laser Integration Test and Evaluation (LITE) Lab																												
Reliability Demonstration Test (TD)																												
Guided Weapons Evaluation Facility (GWEF) - TD Phase																												
Pallet Flight Test																												
Bridge Activity																												
(1) MS B																												
(2) EMD Contract Award																												
EMD Phase																												
Critical Design Review (CDR) Risk Reduction Test Activity																												
(3) CDR																												
Prototype Deliveries																												
Developmental Test Activity																												

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**Exhibit R-4, RDT&E Schedule Profile: PB 2016 Army** **Date:** February 2015

<b>Appropriation/Budget Activity</b> 2040 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0605035A / <i>Common Infrared Countermeasures (CIRCM)</i>	<b>Project (Number/Name)</b> EB4 / <i>CIRCM</i>
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Event Name	FY 2014				FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020							
	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				
Reliability Demonstration Test (EMD)																																
GWEF - EMD Phase																																
(1) MS C																																
LRIP																																
Initial Operational Test and Evaluation (IOT&E)																																
(2) FUE																																
(3) FRPDR																																

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<b>Exhibit R-4A, RDT&amp;E Schedule Details: PB 2016 Army</b>		<b>Date:</b> February 2015
<b>Appropriation/Budget Activity</b> 2040 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0605035A / <i>Common Infrared Countermeasures (CIRCM)</i>	<b>Project (Number/Name)</b> EB4 / <i>CIRCM</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
TD Phase	3	2012	4	2014
Laser Integration Test and Evaluation (LITE) Lab	1	2014	1	2014
Reliability Demonstration Test (TD)	1	2014	2	2014
Guided Weapons Evaluation Facility (GWEF) - TD Phase	2	2013	4	2014
Pallet Flight Test	2	2014	2	2014
Bridge Activity	4	2014	2	2015
MS B	3	2015	3	2015
EMD Contract Award	3	2015	3	2015
EMD Phase	3	2015	4	2017
Critical Design Review (CDR) Risk Reduction Test Activity	3	2015	3	2016
CDR	3	2016	3	2016
Prototype Deliveries	1	2016	1	2017
Developmental Test Activity	1	2016	3	2017
Reliability Demonstration Test (EMD)	4	2016	3	2017
GWEF - EMD Phase	2	2016	3	2017
MS C	4	2017	4	2017
LRIP	4	2017	4	2018
Initial Operational Test and Evaluation (IOT&E)	1	2019	1	2019
FUE	3	2019	3	2019
FRPDR	3	2019	3	2019

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2016 Army										<b>Date:</b> February 2015		
<b>Appropriation/Budget Activity</b> 2040 / 5					<b>R-1 Program Element (Number/Name)</b> PE 0605035A / <i>Common Infrared Countermeasures (CIRCM)</i>				<b>Project (Number/Name)</b> EE3 / <i>A/C Surv Equip Dev</i>			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2014</b>	<b>FY 2015</b>	<b>FY 2016 Base</b>	<b>FY 2016 OCO</b>	<b>FY 2016 Total</b>	<b>FY 2017</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
EE3: <i>A/C Surv Equip Dev</i>	-	-	14.838	-	-	-	-	-	-	-	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**Note**

Funds in the program are a realignment of funds from program 665, PE 0604270A (Electronic Warfare Development). Transitioned to Project ER7, PE 605051A Aircraft Survivability Development in FY 2016.

**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 Radio Frequency (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) Radar Warning Receiver (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 near-spherical 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, including integrated suite control functionality, threat correlation and off-boarding capability, and 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: There is no Fiscal Year (FY) 2016 Base RDT&E dollar funding requirement for PE 655035 project EE3. FY16 justification is reported under ER7.

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

	<b>FY 2014</b>	<b>FY 2015</b>	<b>FY 2016</b>
<b>Title:</b> Phase 2 Radio Frequency CM	-	14.838	-
<b>Description:</b> Phase 2 Product Development (Digital RWR)			
<b>FY 2015 Plans:</b>			

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**Exhibit R-2A, RDT&E Project Justification:** PB 2016 Army **Date:** February 2015

<b>Appropriation/Budget Activity</b> 2040 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0605035A / <i>Common Infrared Countermeasures (CIRCM)</i>	<b>Project (Number/Name)</b> EE3 / <i>A/C Surv Equip Dev</i>
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2014</b>	<b>FY 2015</b>	<b>FY 2016</b>
Will fund testing of Phase 2 prototypes, Mission Data Set (MDS) development, platform integration on AH-64E, and integration with other ASE systems.			
<b>Accomplishments/Planned Programs Subtotals</b>	-	14.838	-

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

Line Item	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
• AZ3511: <i>Radio Frequency CM (AZ3511)</i>	-	56.163	28.730	-	28.730	145.749	23.538	41.133	144.724	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) Radar Warning Receiver (RWR) via sole source Engineering Change Proposal (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 3 years 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.

**E. Performance Metrics**

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2016 Army												Date: February 2015			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0605035A / Common Infrared Countermeasures (CIRCM)				EE3 / A/C Surv Equip Dev							
<b>Management Services (\$ in Millions)</b>				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 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
Other Development	TBD	Various : -	7.985	-		0.267		-		-		-	Continuing	Continuing	Continuing
Project Management	Various	Various : -	0.182	-		0.247		-		-		-	Continuing	Continuing	Continuing
<b>Subtotal</b>			8.167	-		0.514		-		-		-	-	-	-
<b>Product Development (\$ in Millions)</b>				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 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	MIPR	OGA, : Aberdeen Proving Ground, MD	0.000	-		2.817		-		-		-	Continuing	Continuing	Continuing
SIL Updates	MIPR	- : AMRDEC	0.000	-		1.121		-		-		-	Continuing	Continuing	Continuing
Depot Standup	MIPR	Tobyhanna : Tobyhanna, PA	1.052	-		-		-		-		-	Continuing	Continuing	Continuing
Platform Integration	TBD	Multiple : -	0.000	-		2.729		-		-		-	Continuing	Continuing	Continuing
<b>Subtotal</b>			11.686	-		6.667		-		-		-	-	-	-
<b>Support (\$ in Millions)</b>				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 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 : -	2.359	-		0.397		-		-		-	Continuing	Continuing	Continuing
Matrix Support	Various	Various : -	6.236	-		0.114		-		-		-	Continuing	Continuing	Continuing
<b>Subtotal</b>			8.595	-		0.511		-		-		-	-	-	-



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**Exhibit R-4, RDT&E Schedule Profile: PB 2016 Army** **Date:** February 2015

<b>Appropriation/Budget Activity</b> 2040 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0605035A / <i>Common Infrared Countermeasures (CIRCM)</i>	<b>Project (Number/Name)</b> EE3 / <i>A/C Surv Equip Dev</i>
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Event Name	FY 2014				FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020			
	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
(1) Phase 1 APR-39C(V)1 Fielding Decision	▲ Ph 1 APR-39C(V)1 Fielding Decision																											
(2) Phase 1 APR-39C(V)1 FUE	▲ Ph 1 APR-39C(V)1 FUE																											
Phase 2 APR-39D(V)2 Army Design Requirements Insertion	■ Ph 2 APR-39D(V)2 Army Design Rqmts Insert																											
Phase 2 APR-39D(V)2 Prototype Fabrication and Qualification	■ Ph 2 APR-39D(V)2 Prototype fab/Qual																											
Phase 2 APR-39D(V)2 DT/OT	■ Ph 2 APR-39D(V)2 DT/OT																											
Phase 2 APR-39D(V)2 Platform Integration	■ Ph 2 APR-39D(V)2 Platform Integration																											
(3) Phase 2 APR-39D(V)2 Procurement Decision	▲ Ph 2 APR-39D(V)2 Procurement Decision																											
Phase 2 Procurement / Deployment	■ Ph 2 Procurement / Deployment																											
(4) Phase 2 APR-39D(V)2 FUE	▲ Ph 2 APR-39D(V)2 FUE																											
Emerging Threats	■ Emerging Threats																											
Software Development	■ Software Developr																											

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2016 Army		<b>Date:</b> February 2015
<b>Appropriation/Budget Activity</b> 2040 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0605035A / <i>Common Infrared Countermeasures (CIRCM)</i>	<b>Project (Number/Name)</b> EE3 / <i>A/C Surv Equip Dev</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Phase 1 APR-39C(V)1 Fielding Decision	2	2014	2	2014
Phase 1 APR-39C(V)1 FUE	3	2014	3	2014
Phase 2 APR-39D(V)2 Army Design Requirements Insertion	3	2013	2	2014
Phase 2 APR-39D(V)2 Prototype Fabrication and Qualification	4	2013	2	2015
Phase 2 APR-39D(V)2 DT/OT	1	2017	1	2017
Phase 2 APR-39D(V)2 Platform Integration	1	2014	1	2016
Phase 2 APR-39D(V)2 Procurement Decision	2	2017	2	2017
Phase 2 Procurement / Deployment	2	2017	4	2020
Phase 2 APR-39D(V)2 FUE	4	2018	4	2018
Emerging Threats	3	2016	4	2020
Software Development	1	2015	4	2018

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2016 Army										<b>Date:</b> February 2015		
<b>Appropriation/Budget Activity</b> 2040 / 5					<b>R-1 Program Element (Number/Name)</b> PE 0605035A / <i>Common Infrared Countermeasures (CIRCM)</i>				<b>Project (Number/Name)</b> EE4 / <i>Common Missile Warning System (CMWS)</i>			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2014</b>	<b>FY 2015</b>	<b>FY 2016 Base</b>	<b>FY 2016 OCO</b>	<b>FY 2016 Total</b>	<b>FY 2017</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
EE4: <i>Common Missile Warning System (CMWS)</i>	-	-	2.310	-	-	-	-	-	-	-	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**Note**

FY15 funds in the program are a realignment of funds from program VU7, PE 0604270A (Electronic Warfare Development). FY16 funds are realigned to Project ER8, PE 605051A (Aircraft Survivability Development).

**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 Common Missile Warning System (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 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.

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.

Justification: There is no Fiscal Year (FY) 2016 Base RDT&E dollar funding requirement for EE4. FY16 justification is reported under ER8.

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

	<b>FY 2014</b>	<b>FY 2015</b>	<b>FY 2016</b>
<b>Title:</b> Development Effort	-	2.310	-
<b>Description:</b> -			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2016 Army		<b>Date:</b> February 2015
<b>Appropriation/Budget Activity</b> 2040 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0605035A / <i>Common Infrared Countermeasures (CIRCM)</i>	<b>Project (Number/Name)</b> EE4 / <i>Common Missile Warning System (CMWS)</i>

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2014</b>	<b>FY 2015</b>	<b>FY 2016</b>
<b><i>FY 2015 Plans:</i></b> RDT&E funding supports continuing development engineering of the Threat Analysis Database (TAD), salaries, and integration with other ASE systems.			
<b>Accomplishments/Planned Programs Subtotals</b>	-	2.310	-

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<b>Line Item</b>	<b>FY 2014</b>	<b>FY 2015</b>	<b>FY 2016 Base</b>	<b>FY 2016 OCO</b>	<b>FY 2016 Total</b>	<b>FY 2017</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• APA: BA 4 AZ3517	103.021	60.401	78.348	-	78.348	42.000	38.331	33.358	19.110	Continuing	Continuing

**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/CPFF IDIQ contract is a 3 year firm fixed price contract to procure the remaining Generation 3 Electronic Control Units (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.

**E. Performance Metrics**

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2016 Army												Date: February 2015			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0605035A / Common Infrared Countermeasures (CIRCM)				EE4 / Common Missile Warning System (CMWS)							
Management Services (\$ in Millions)				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 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
CMWS Systems Engineering Program Management	Various	Various : PM ASE, HSV, AL	2.670	-		0.206		-		-		-	Continuing	Continuing	Continuing
<b>Subtotal</b>			2.670	-		0.206		-		-		-	-	-	-
Product Development (\$ in Millions)				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 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
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 : TBD	0.000	-		2.104	Jun 2015	-		-		-	Continuing	Continuing	Continuing
CMWS Enhanced Sensor Study & Evaluation	TBD	Various : -	11.466	-		-		-		-		-	Continuing	Continuing	Continuing
<b>Subtotal</b>			13.921	-		2.104		-		-		-	-	-	-
<b>Project Cost Totals</b>			16.591	-		2.310		-		-		-	-	-	-
<b>Remarks</b>															

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**Exhibit R-4, RDT&E Schedule Profile: PB 2016 Army** **Date:** February 2015

<b>Appropriation/Budget Activity</b> 2040 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0605035A / <i>Common Infrared Countermeasures (CIRCM)</i>	<b>Project (Number/Name)</b> EE4 / <i>Common Missile Warning System (CMWS)</i>
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Event Name	FY 2014				FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020			
	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 System Dev/Tier 2 & 3 Upgrades (TAD Updates)																											
CMWS Enhanced Sensor Study & Evaluation	CMWS Enhanced Sensor Study & Evaluation																											
CMWS Gen 3 Production	CMWS Gen 3 Production																											

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2016 Army		<b>Date:</b> February 2015
<b>Appropriation/Budget Activity</b> 2040 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0605035A / <i>Common Infrared Countermeasures (CIRCM)</i>	<b>Project (Number/Name)</b> EE4 / <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	2019
CMWS Enhanced Sensor Study & Evaluation	3	2012	1	2014
CMWS Gen 3 Production	3	2012	3	2016