



Selected Acquisition Report (SAR)

RCS: DD-A&T(Q&A)823-446



Common Infrared Countermeasure (CIRCM)

As of FY 2020 President's Budget

Defense Acquisition Management
Information Retrieval
(DAMIR)

This document contains information that may be exempt from mandatory disclosure under the FOIA.

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Sensitivity Originator

Organization: PM Aircraft Survivability Equipment (ASE)
Organization Email:
Organization Phone: 256-842-7850

Common Acronyms and Abbreviations for MDAP Programs

Acq O&M - Acquisition-Related Operations and Maintenance
ACAT - Acquisition Category
ADM - Acquisition Decision Memorandum
APB - Acquisition Program Baseline
APPN - Appropriation
APUC - Average Procurement Unit Cost
\$B - Billions of Dollars
BA - Budget Authority/Budget Activity
Blk - Block
BY - Base Year
CAPE - Cost Assessment and Program Evaluation
CARD - Cost Analysis Requirements Description
CDD - Capability Development Document
CLIN - Contract Line Item Number
CPD - Capability Production Document
CY - Calendar Year
DAB - Defense Acquisition Board
DAE - Defense Acquisition Executive
DAMIR - Defense Acquisition Management Information Retrieval
DoD - Department of Defense
DSN - Defense Switched Network
EMD - Engineering and Manufacturing Development
EVM - Earned Value Management
FOC - Full Operational Capability
FMS - Foreign Military Sales
FRP - Full Rate Production
FY - Fiscal Year
FYDP - Future Years Defense Program
ICE - Independent Cost Estimate
IOC - Initial Operational Capability
Inc - Increment
JROC - Joint Requirements Oversight Council
\$K - Thousands of Dollars
KPP - Key Performance Parameter
LRIP - Low Rate Initial Production
\$M - Millions of Dollars
MDA - Milestone Decision Authority
MDAP - Major Defense Acquisition Program
MILCON - Military Construction
N/A - Not Applicable
O&M - Operations and Maintenance
ORD - Operational Requirements Document
OSD - Office of the Secretary of Defense
O&S - Operating and Support
PAUC - Program Acquisition Unit Cost

PB - President's Budget
PE - Program Element
PEO - Program Executive Officer
PM - Program Manager
POE - Program Office Estimate
RDT&E - Research, Development, Test, and Evaluation
SAR - Selected Acquisition Report
SCP - Service Cost Position
TBD - To Be Determined
TY - Then Year
UCR - Unit Cost Reporting
U.S. - United States
USD(AT&L) - Under Secretary of Defense (Acquisition, Technology and Logistics)
USD(A&S) - Under Secretary of Defense (Acquisition and Sustainment)

Program Information

Program Name

Common Infrared Countermeasure (CIRCM)

DoD Component

Army

Responsible Office

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References

SAR Baseline (Development Estimate)

Defense Acquisition Executive (DAE) Approved Acquisition Program Baseline (APB) dated July 08, 2016

Approved APB

Army Acquisition Executive (AAE) Approved Acquisition Program Baseline (APB) dated November 15, 2018

Mission and Description

The Common Infrared Countermeasure (CIRCM), an ACAT IC MDAP, is the next generation lightweight, laser-based infrared countermeasure component that will interface with both the Army's Common Missile Warning System and future missile warning systems (MWS) to defeat current and emerging missile threats to target rotary-wing, tilt-rotor and small fixed-wing aircraft across the DoD. CIRCM receives hand-off from the MWS and employs a pointing and tracking system to track incoming missiles. CIRCM jams the missile by using laser energy, thus degrading the tracking capability of the missile and causing it to miss the aircraft. CIRCM is utilizing Open Systems Architecture which allows flexibility with software and hardware refreshes to keep pace with future threats. Advanced Threat Infrared Countermeasure (ATIRCM) is the antecedent system for CIRCM.

~~(U//FOUO)~~ Executive Summary~~(U//FOUO)~~ Program Highlights Since Last Report

(U) The PEO Intelligence, Electronic Warfare and Sensors (IEW&S) certifies the CIRCM requirements are stable and funding is adequate for the program to execute within its baseline cost parameters. The PEO IEW&S reports a decrease in the CIRCM program risks since the last submission of the CIRCM SAR due to the completion of EMD activities and a successful Milestone C. Northrop Grumman Systems Corporation (NG) is continuing to drive manufacturing improvements with their suppliers in order to increase production levels toward a FRP capacity.

(U) As mentioned above, the CIRCM program completed all EMD activities, received a Milestone C decision on September 14, 2018, and awarded the LRIP 1 options on the EMD contract on September 18, 2018. LRIP 1 options are for 13 CIRCM B-Kits, six HH/UH-60M A-Kits, and engineering services to support the Initial Operational Test & Evaluation (IOT&E). Additionally, the LRIP 2 A-Kit option was awarded on September 25, 2018 to provide 24 HH/UH-60M A-Kits to support First Unit Equipped.

(U) The JROC reviewed and approved the CIRCM CPD on August 20, 2018. Of note, within the CPD, the Army Acquisition Objective and Army Procurement Objective for CIRCM A-Kits was increased from 3,373 to 3,642 units, and CIRCM B-Kits was increased from 1,076 to 1,781 units.

(U) The CIRCM program completed a multi-pronged test program made up of Hardware-in-the-Loop (HWIL) testing, Government Flight Testing (GFT), Free Flight Missile Testing (FFMT), and Reliability Demonstration Testing (RDT). During the Army Systems Acquisition Review Council, the Army Test and Evaluation Command (ATEC) / Director, Operational Test and Evaluation assessed the CIRCM system to have demonstrated effectiveness, and is on track to be suitable and survivable.

(U) CIRCM system effectiveness was measured during HWIL testing against all KPP threats, GFT for a total of 229.2 flight hours installed on the UH-60M, and FFMT where the system successfully countered 20 of the 20 single shot and five of five multiple shot engagements; resulting in the CIRCM system meeting or exceeding all performance requirements.

(b)(3):10 USC § 130



(U) The CIRCM program received an FY 2018 \$30.9M Congressional Procurement plus-up to accelerate the procurement of CIRCM as approved in the Milestone C ADM. In September 2018, PM ASE was notified that the final FY 2019 Congressional mark in RDT&E previously reported was reduced from \$26M to \$20M. To mitigate the impact of this cut, CIRCM aircraft integration activities for the AH-64E and CH-47F will be partially funded in FY 2019. The program will require FY 2020 RDT&E funds by the 1st Quarter FY 2020 to complete these activities without causing a work stoppage. A delay in receipt of these funds to complete platform integration could delay initial Combat Aviation Brigade (CAB) operational capability.

(U) As the program shifts attention to IOT&E, risk management activities will focus on Government flight test execution,

partnering with Defense Contract Management Activity (DCMA) for increased supply chain management accountability, and ensuring a healthy production ramp-up rate to FRP. In addition, aircraft integration will focus on the CH-47F and AH-64E platforms to round out the integration requirements of outfitting a complete CAB for IOC.

(U) On April 24, 2018, the DCMA Center of Excellence conducted a review of the implementation of the approved NG Corrective Action Plan (CAP) for the Level III Corrective Action Report issued on November 27, 2017. As a result of that review, the determination was made that NG failed to follow the accepted CAP; their EVM system, and the Divisional Administrative Contracting Officer increased the withhold from two percent to five percent. In response, NG implemented a series of measures to restore confidence. As of September 07, 2018, DCMA approved the EVM system in accordance with successful demonstration of the approved Level III CAP resulting rescinding the funding withhold.

(U) There are no significant software related issues with CIRCM at this time.

History of Significant Developments Since Program Initiation	
History of Significant Developments Since Program Initiation	
Date	Significant Development Description
December 2011	CIRCM received an ADM approval to enter Technology Demonstration Phase at Milestone A with two vendors to foster competition and reduce risk.
July 2014	An ADM approved release of the request for proposal for CIRCM EMD and directed the Army to return for a Milestone B DAB prior to award of the EMD contract and down select to one vendor.
August 2015	The DAE signed the Milestone B ADM authorizing entry into EMD and certifying all applicable provisions of section 2366b, title 10, U.S. Code
July 2016	The DAE approved the CIRCM Development APB. The APB established program threshold and objective values for the minimum number of cost, schedule and performance attributes that describe the program over its life cycle.
November 2017	The DAE signed an ADM that delegated MDA for CIRCM to the Secretary of the Army, and designated CIRCM as an ACAT IC Program.
November 2017	The U.S. Government and Northrop Grumman completed negotiations on the contract modification for the \$22.9M cost over-run and a six month contract extension.
August 2018	The JROC approved the CIRCM CPD.
August 2018	The Assistant Secretary of the Army for Financial Management and Comptroller approved the CIRCM Milestone C Army Cost Position.
September 2018	The Army Acquisition Executive approved entry into the Production and Deployment Phase/Milestone C, and LRIP up to 178 B-Kits (10 percent of the total quantity of 1,781 B-Kits).
October 2018	CIRCM completed Reliability Demonstration Testing (RDT) which demonstrated a 71% reduction in total failures from previous testing. The Army Test and Evaluation Command final score of 151 hours Mean Time Between Operational Mission Failure (MTBOMF) at 50% confidence and a Mission Effecting Fix Effectiveness Factor adjusted score of 215 hours MTBOMF in the RDT environment. The Milestone C exit criteria is 150 hours MTBOMF.
November 2018	The DAE approved the Milestone C APB.

Threshold Breaches

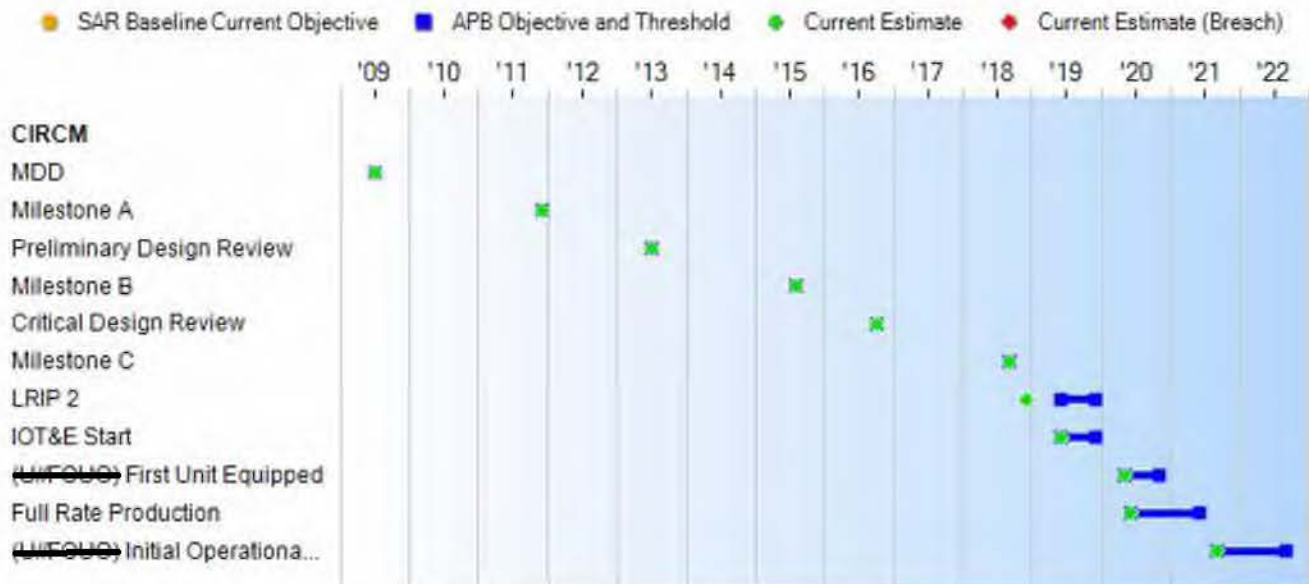
APB Breaches

- Schedule
- Performance
- Cost
 - RDT&E
 - Procurement
 - MILCON
 - Acq O&M
- O&S Cost
- Unit Cost
 - PAUC
 - APUC

Nunn-McCurdy Breaches

- Current UCR Baseline
 - PAUC None
 - APUC None
- Original UCR Baseline
 - PAUC None
 - APUC None

~~(U//FOUO)~~ Schedule



(U//FOUO) Schedule Events				
Events	SAR Baseline Development Estimate	Current APB Production Objective/Threshold	Current Estimate	
MDD	Jul 2009	Jul 2009	Jul 2009	Jul 2009
Milestone A	Dec 2011	Dec 2011	Dec 2011	Dec 2011
Preliminary Design Review	Jul 2013	Jul 2013	Jul 2013	Jul 2013
Milestone B	Aug 2015	Aug 2015	Aug 2015	Aug 2015
Critical Design Review	Oct 2016	Oct 2016	Oct 2016	Oct 2016
Milestone C	Mar 2018	Sep 2018	Sep 2018	Sep 2018
LRIP 2	Apr 2019	Jun 2019	Dec 2019	Dec 2018 (Ch-1)
IOT&E Start	Jun 2019	Jun 2019	Dec 2019	Jun 2019 (Ch-2)
(U//FOUO) First Unit Equipped	(b)(3):10 USC § 130			
Full Rate Production	Dec 2019	Jun 2020	Jun 2021	Jun 2020
(U//FOUO) Initial Operational Capability	(b)(3):10 USC § 130			

Change Explanations

(Ch-1) The current estimate for LRIP 2 changed from June 2019 to December 2018 to reflect actual date of LRIP 2 contract award, achieved seven months ahead of schedule.

(Ch-2) The current estimate for the IOT&E start date changed from December 2019 to June 2019 to align schedule with the approved CIRCM APB.

Acronyms and Abbreviations

FUE - First Unit Equipped

IOT&E - Initial Operational Test and Evaluation

MDD - Materiel Development Decision

Performance

Performance Characteristics				
SAR Baseline Development Estimate	Current APB Production Objective/Threshold	Demonstrated Performance	Current Estimate	
Sustainment Materiel Availability				
65%	88%	74%	TBD	74% (Ch-1)
Sustainment Operational Availability				
98%	98%	95%	TBD	95% (Ch-1)

Classified Performance information is provided in the classified annex to this submission.

Requirements Reference

JROC Memorandum approved the CPD on August 20, 2018.

Change Explanations

(Ch-1) The current estimate for Sustainment Materiel Availability changed from 65% to 74%, and Sustainment Operational Availability changed from 98% to 95%, as demonstrated in the AMSAA modeling during the EMD date.

Acronyms and Abbreviations

AMSAA - Army Materiel Systems Analysis Activity
 JROC - Joint Requirements Oversight Council

Track to Budget

RDT&E

Appn	BA	PE	
Army	2040	05	0604270A
	Project		Name
	VU8		CIRCM (Sunk)
Army	2040	05	0605035A
	Project		Name
	EB4		CIRCM

Procurement

Appn	BA	PE	
Army	2031	04	0210108A
	Line Item		Name
	AZ3537		CIRCM

Acq O&M

Appn	BA	PE	
Army	2020	04	0702806A
	Subactivity Group		Name
	435		Acquisition and Management Support: Aircraft Survivability Equipment (Shared)

Cost and Funding

Cost Summary

Total Acquisition Cost							
Appropriation	BY 2018 \$M			BY 2018 \$M	TY \$M		
	SAR Baseline Development Estimate	Current APB Production Objective/Threshold		Current Estimate	SAR Baseline Development Estimate	Current APB Production Objective	Current Estimate
RDT&E	791.4	865.9	952.7	862.0	799.7	895.5	895.5
Procurement	1869.4	3042.8	3347.2	3057.2	2263.3	3767.2	3772.3
Flyaway	--	--	--	2373.5	--	--	2954.8
Recurring	--	--	--	2311.3	--	--	2877.0
Non Recurring	--	--	--	62.2	--	--	77.8
Support	--	--	--	683.7	--	--	817.5
Other Support	--	--	--	587.8	--	--	701.0
Initial Spares	--	--	--	95.9	--	--	116.5
MILCON	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Acq O&M	0.0	11.9	13.1	11.9	0.0	14.5	14.5
Total	2660.8	3920.6	N/A	3931.1	3063.0	4677.2	4682.3

Current APB Cost Estimate Reference

Army Cost Position dated August 28, 2018

The Base Year for the program has been updated from FY 2015 to FY 2018 using the following deflators:

Appn Category	Deflation Factor
RDT&E	1.04872772
Procurement	1.04872772
Acq O&M	1.04872772

Cost Notes

The Milestone C Army Cost Position was approved July 31, 2018 and reflects the following Risk Considerations - The Milestone C B-Kit estimate is based on pricing from the Quick Reaction Capability contracts 1 and 2, previously awarded for CIRCM B-Kits. Since this data is current, the risk of underestimating future FRP unit prices is low. Some cost risk remains in Pointer-Tracker pricing due to fluctuations in the U.S dollar and British pound exchange rate.

Total Quantity			
Quantity	SAR Baseline Development Estimate	Current APB Production	Current Estimate
RDT&E	48	48	48
Procurement	1076	1781	1781
Total	1124	1829	1829

Quantity Notes

The CIRCM unit of measure is the B-Kit; A-Kit costs are included in Non End Item Recurring Flyaway costs. Both the A-Kit and B-Kit quantities were increased to support the FY 2019 National Defense Strategy, rotary wing aircraft capabilities.

The Milestone C Army Cost Position (ACP) was approved July 31, 2018 and reflects an increase in quantities from the approved CDD quantities of 1,076 B-Kits and 3,373 A-Kits to the approved CPD quantities of 1,781 B-Kits and 3,642 A-Kits. CIRCM received the official Milestone C decision on September 14, 2018. The CIRCM APB was revised to reflect the increase in quantity in the CPD as outlined in the approved ACP.

The Army approved additional quantities for an orderly production ramp-up in FY 2020 - FY 2021, these quantities are reflected in the current estimate.

Cost and Funding

Funding Summary

Appropriation Summary									
FY 2020 President's Budget / December 2018 SAR (TY\$ M)									
Appropriation	Prior	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	To Complete	Total
RDT&E	595.8	29.4	34.5	24.3	7.1	11.3	5.1	188.0	895.5
Procurement	37.2	36.8	168.8	237.7	215.7	252.8	332.7	2490.6	3772.3
MILCON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Acq O&M	0.0	0.2	0.8	0.8	0.8	0.8	0.9	10.2	14.5
PB 2020 Total	633.0	66.4	204.1	262.8	223.6	264.9	338.7	2688.8	4682.3
PB 2019 Total	623.2	89.5	160.5	147.6	151.1	170.1	205.1	1505.3	3052.4
Delta	9.8	-23.1	43.6	115.2	72.5	94.8	133.6	1183.5	1629.9

Quantity Summary										
FY 2020 President's Budget / December 2018 SAR (TY\$ M)										
Quantity	Undistributed	Prior	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	To Complete	Total
Development	48	0	0	0	0	0	0	0	0	48
Production	0	24	24	81	120	101	125	125	1181	1781
PB 2020 Total	48	24	24	81	120	101	125	125	1181	1829
PB 2019 Total	48	0	24	48	48	48	60	100	748	1124
Delta	0	24	0	33	72	53	65	25	433	705

Cost and Funding

Annual Funding By Appropriation

Annual Funding							
2040 RDT&E Research, Development, Test, and Evaluation, Army							
Fiscal Year	Quantity	TY \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2010	--	--	--	--	--	--	25.5
2011	--	--	--	--	--	--	4.6
2012	--	--	--	--	--	--	101.9
2013	--	--	--	--	--	--	39.5
2014	--	--	--	--	--	--	92.5
2015	--	--	--	--	--	--	101.3
2016	--	--	--	--	--	--	74.5
2017	--	--	--	--	--	--	79.8
2018	--	--	--	--	--	--	76.2
2019	--	--	--	--	--	--	29.4
2020	--	--	--	--	--	--	34.5
2021	--	--	--	--	--	--	24.3
2022	--	--	--	--	--	--	7.1
2023	--	--	--	--	--	--	11.3
2024	--	--	--	--	--	--	5.1
2025	--	--	--	--	--	--	35.7
2026	--	--	--	--	--	--	36.8
2027	--	--	--	--	--	--	37.3
2028	--	--	--	--	--	--	6.6
2029	--	--	--	--	--	--	5.5
2030	--	--	--	--	--	--	3.1
2031	--	--	--	--	--	--	3.1
2032	--	--	--	--	--	--	3.2
2033	--	--	--	--	--	--	3.3
2034	--	--	--	--	--	--	3.3
2035	--	--	--	--	--	--	3.4
2036	--	--	--	--	--	--	3.5
2037	--	--	--	--	--	--	3.5
2038	--	--	--	--	--	--	3.6
2039	--	--	--	--	--	--	3.7
2040	--	--	--	--	--	--	3.8
2041	--	--	--	--	--	--	3.8
2042	--	--	--	--	--	--	3.9
2043	--	--	--	--	--	--	4.0
2044	--	--	--	--	--	--	4.1

CIRCM

December 2018 SAR

2045	--	--	--	--	--	--	4.2
2046	--	--	--	--	--	--	4.2
2047	--	--	--	--	--	--	4.4
Subtotal	48	--	--	--	--	--	895.5

Annual Funding							
2040 RDT&E Research, Development, Test, and Evaluation, Army							
Fiscal Year	Quantity	BY 2018 \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2010	--	--	--	--	--	--	28.5
2011	--	--	--	--	--	--	5.0
2012	--	--	--	--	--	--	109.9
2013	--	--	--	--	--	--	41.9
2014	--	--	--	--	--	--	96.2
2015	--	--	--	--	--	--	103.6
2016	--	--	--	--	--	--	75.4
2017	--	--	--	--	--	--	79.2
2018	--	--	--	--	--	--	74.3
2019	--	--	--	--	--	--	28.2
2020	--	--	--	--	--	--	32.4
2021	--	--	--	--	--	--	22.4
2022	--	--	--	--	--	--	6.4
2023	--	--	--	--	--	--	10.0
2024	--	--	--	--	--	--	4.4
2025	--	--	--	--	--	--	30.4
2026	--	--	--	--	--	--	30.7
2027	--	--	--	--	--	--	30.5
2028	--	--	--	--	--	--	5.3
2029	--	--	--	--	--	--	4.3
2030	--	--	--	--	--	--	2.4
2031	--	--	--	--	--	--	2.3
2032	--	--	--	--	--	--	2.4
2033	--	--	--	--	--	--	2.4
2034	--	--	--	--	--	--	2.4
2035	--	--	--	--	--	--	2.4
2036	--	--	--	--	--	--	2.4
2037	--	--	--	--	--	--	2.3
2038	--	--	--	--	--	--	2.4
2039	--	--	--	--	--	--	2.4
2040	--	--	--	--	--	--	2.4
2041	--	--	--	--	--	--	2.4
2042	--	--	--	--	--	--	2.4
2043	--	--	--	--	--	--	2.4
2044	--	--	--	--	--	--	2.4
2045	--	--	--	--	--	--	2.4
2046	--	--	--	--	--	--	2.4
2047	--	--	--	--	--	--	2.4
Subtotal	48	--	--	--	--	--	862.0

Annual Funding 2031 Procurement Aircraft Procurement, Army							
Fiscal Year	Quantity	TY \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2018	24	30.9	2.4	3.9	37.2	--	37.2
2019	24	11.1	7.5	--	18.6	18.2	36.8
2020	81	99.3	10.2	6.0	115.5	53.3	168.8
2021	120	136.9	19.7	--	156.6	81.1	237.7
2022	101	121.1	17.9	--	139.0	76.7	215.7
2023	125	147.3	21.7	5.4	174.4	78.4	252.8
2024	125	149.7	31.6	--	181.3	151.4	332.7
2025	125	152.3	47.7	3.7	203.7	53.5	257.2
2026	125	155.2	56.1	10.6	221.9	36.2	258.1
2027	125	157.3	54.4	3.9	215.6	43.5	259.1
2028	125	161.1	51.4	4.0	216.5	38.7	255.2
2029	125	164.1	50.6	11.2	225.9	33.7	259.6
2030	125	167.1	40.3	4.1	211.5	26.9	238.4
2031	125	170.2	40.7	4.2	215.1	25.6	240.7
2032	125	173.4	40.9	11.9	226.2	28.2	254.4
2033	125	176.7	35.4	4.4	216.5	38.8	255.3
2034	56	97.2	36.4	4.5	138.1	18.0	156.1
2035	--	--	30.0	--	30.0	6.9	36.9
2036	--	--	11.2	--	11.2	8.4	19.6
Subtotal	1781	2270.9	606.1	77.8	2954.8	817.5	3772.3

Annual Funding 2031 Procurement Aircraft Procurement, Army							
Fiscal Year	Quantity	BY 2018 \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2018	24	29.8	2.3	3.8	35.9	--	35.9
2019	24	10.5	7.1	--	17.6	17.2	34.8
2020	81	92.0	9.4	5.6	107.0	49.3	156.3
2021	120	124.3	17.9	--	142.2	73.6	215.8
2022	101	107.8	15.9	--	123.7	68.3	192.0
2023	125	128.6	18.9	4.7	152.2	68.4	220.6
2024	125	128.1	27.0	--	155.1	129.6	284.7
2025	125	127.8	40.1	3.1	171.0	44.8	215.8
2026	125	127.6	46.2	8.7	182.5	29.8	212.3
2027	125	126.8	44.0	3.1	173.9	35.0	208.9
2028	125	127.4	40.5	3.2	171.1	30.6	201.7
2029	125	127.2	39.2	8.7	175.1	26.1	201.2
2030	125	127.0	30.5	3.1	160.6	20.5	181.1
2031	125	126.8	30.3	3.1	160.2	19.1	179.3
2032	125	126.6	29.9	8.7	165.2	20.6	185.8
2033	125	126.5	25.3	3.2	155.0	27.8	182.8
2034	56	68.2	25.6	3.2	97.0	12.6	109.6
2035	--	--	20.7	--	20.7	4.7	25.4
2036	--	--	7.5	--	7.5	5.7	13.2
Subtotal	1781	1833.0	478.3	62.2	2373.5	683.7	3057.2

The CIRCM unit of measure is the B-Kit; A-Kit costs are included in Non End Item Recurring Flyaway costs.

Annual Funding 2020 Acq O&M Operation and Maintenance, Army		
Fiscal Year	TY \$M	
	Total Program	
2019		0.2
2020		0.8
2021		0.8
2022		0.8
2023		0.8
2024		0.9
2025		0.9
2026		0.9
2027		0.9
2028		0.9
2029		1.0
2030		1.0
2031		1.0
2032		1.0
2033		1.0
2034		0.8
2035		0.5
2036		0.3
Subtotal		14.5

Annual Funding 2020 Acq O&M Operation and Maintenance, Army		
Fiscal Year	BY 2018 \$M	
	Total Program	
2019		0.2
2020		0.8
2021		0.7
2022		0.7
2023		0.7
2024		0.8
2025		0.8
2026		0.8
2027		0.7
2028		0.7
2029		0.8
2030		0.8
2031		0.8
2032		0.7
2033		0.7
2034		0.6
2035		0.4
2036		0.2
Subtotal		11.9

Low Rate Initial Production

Item	Initial LRIP Decision	Current Total LRIP
Approval Date	8/25/2015	9/14/2018
Approved Quantity	37	178
Reference	Milestone B ADM	Milestone C ADM
Start Year	2018	2018
End Year	2019	2020

The Milestone C ADM approved LRIP quantities up to the statutory ceiling of 10-percent in order to provide a gradual production ramp-up to FRP.

(U//~~FOUO~~) Foreign Military Sales**(U//~~FOUO~~) Notes**

(b)(3):10 USC § 130

(U) While there are currently no FMS cases (active or in process) at this point in the program, the DEF pilot program and the Defense Systems Steering Committee provisos memo will dictate the requirements and process by which CIRCM can be potentially exported and sold via FMS in the future. Defense Infrared Countermeasures technologies are not eligible for direct commercial sales at this time.

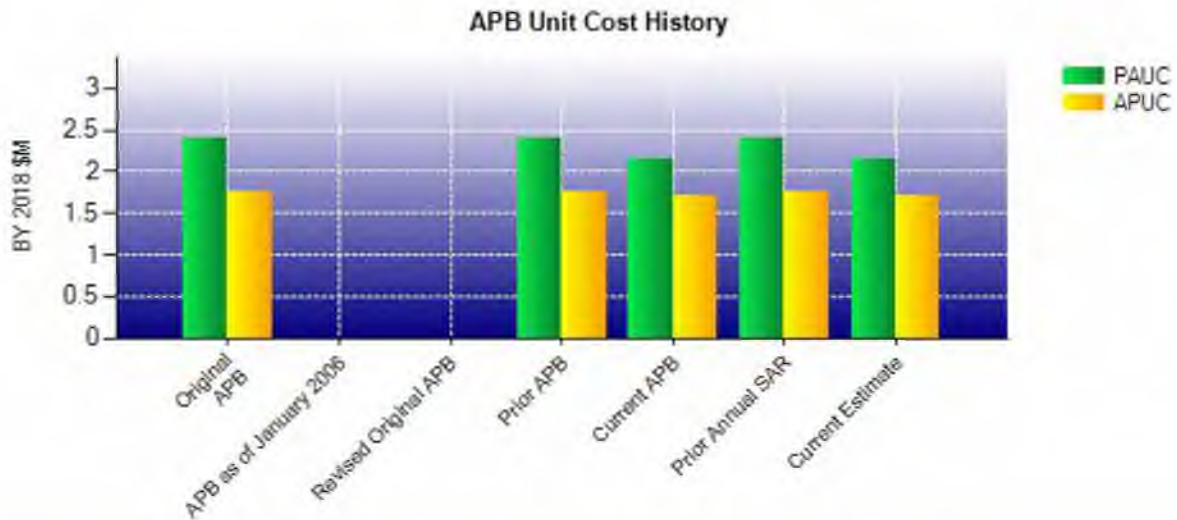
(U) If FMS are requested before the successful completion of Initial Operational Test & Evaluation, the PM will request approval, via a Yockey Waiver, from USD(A&S), as required, prior to FMS, commitment to sell or agreement to license for export.

Nuclear Costs

None

~~(U//FOUO)~~ Unit Cost

Current UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 2018 \$M	BY 2018 \$M	% Change
	Current UCR Baseline (Nov 2018 APB)	Current Estimate (Dec 2018 SAR)	
Program Acquisition Unit Cost			
Cost	3920.6	3931.1	
Quantity	1829	1829	
Unit Cost	2.144	2.149	+0.23
Average Procurement Unit Cost			
Cost	3042.8	3057.2	
Quantity	1781	1781	
Unit Cost	1.708	1.717	+0.53
Original UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 2018 \$M	BY 2018 \$M	% Change
	Original UCR Baseline (Jul 2016 APB)	Current Estimate (Dec 2018 SAR)	
Program Acquisition Unit Cost			
Cost	2660.8	3931.1	
Quantity	1124	1829	
Unit Cost	2.367	2.149	-9.21
Average Procurement Unit Cost			
Cost	1869.4	3057.2	
Quantity	1076	1781	
Unit Cost	1.737	1.717	-1.15



APB Unit Cost History					
Item	Date	BY 2018 \$M		TY \$M	
		PAUC	APUC	PAUC	APUC
Original APB	Jul 2016	2.393	1.756	2.725	2.103
APB as of January 2006	N/A	N/A	N/A	N/A	N/A
Revised Original APB	N/A	N/A	N/A	N/A	N/A
Prior APB	Jul 2016	2.393	1.756	2.725	2.103
Current APB	Nov 2018	2.144	1.708	2.557	2.115
Prior Annual SAR	Dec 2017	2.394	1.755	2.716	2.098
Current Estimate	Dec 2018	2.149	1.717	2.560	2.118

SAR Unit Cost History

Current SAR Baseline to Current Estimate (TY \$M)									
PAUC Development Estimate	Changes								PAUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
2.725	0.001	-0.416	-0.022	0.000	0.081	0.000	0.191	-0.165	2.560

Current SAR Baseline to Current Estimate (TY \$M)									
Initial APUC Development Estimate	Changes								APUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
2.103	0.003	-0.181	-0.023	0.000	0.020	0.000	0.196	0.015	2.118

(U//FOUO) SAR Baseline History				
Item	SAR Planning Estimate	SAR Development Estimate	SAR Production Estimate	Current Estimate
Milestone A	N/A	Dec 2011	N/A	Dec 2011
Milestone B	N/A	Aug 2015	N/A	Aug 2015
Milestone C	N/A	Mar 2018	N/A	Sep 2018
IOC	N/A	Jul 2021	N/A	Sep 2021
Total Cost (TY \$M)	N/A	3063.0	N/A	4682.3
Total Quantity	N/A	1124	N/A	1829
PAUC	N/A	2.725	N/A	2.560

Cost Variance

Summary TY \$M					
Item	RDT&E	Procurement	MILCON	Acq O&M	Total
SAR Baseline (Development Estimate)	799.7	2263.3	--	--	3063.0
Previous Changes					
Economic	-3.5	-10.3	--	--	-13.8
Quantity	--	--	--	--	--
Schedule	--	--	--	--	--
Engineering	--	--	--	--	--
Estimating	-27.3	+29.4	--	+25.6	+27.7
Other	--	--	--	--	--
Support	--	-24.5	--	--	-24.5
Subtotal	-30.8	-5.4	--	+25.6	-10.6
Current Changes					
Economic	+0.9	+14.8	--	+0.1	+15.8
Quantity	--	+1160.2	--	--	+1160.2
Schedule	--	-40.5	--	--	-40.5
Engineering	--	--	--	--	--
Estimating	+125.7	+6.2	--	-11.2	+120.7
Other	--	--	--	--	--
Support	--	+373.7	--	--	+373.7
Subtotal	+126.6	+1514.4	--	-11.1	+1629.9
Adjustments	--	--	--	--	--
Total Changes	+95.8	+1509.0	--	+14.5	+1619.3
CE - Cost Variance	895.5	3772.3	--	14.5	4682.3
CE - Cost & Funding	895.5	3772.3	--	14.5	4682.3

Summary BY 2018 \$M					
Item	RDT&E	Procurement	MILCON	Acq O&M	Total
SAR Baseline (Development Estimate)	791.4	1869.4	--	--	2660.8
Previous Changes					
Economic	--	--	--	--	--
Quantity	--	--	--	--	--
Schedule	--	--	--	--	--
Engineering	--	--	--	--	--
Estimating	-18.6	+18.6	--	+21.6	+21.6
Other	--	--	--	--	--
Support	--	-20.1	--	--	-20.1
Subtotal	-18.6	-1.5	--	+21.6	+1.5
Current Changes					
Economic	--	--	--	--	--
Quantity	--	+879.1	--	--	+879.1
Schedule	--	--	--	--	--
Engineering	--	--	--	--	--
Estimating	+89.2	+4.5	--	-9.7	+84.0
Other	--	--	--	--	--
Support	--	+305.7	--	--	+305.7
Subtotal	+89.2	+1189.3	--	-9.7	+1268.8
Adjustments	--	--	--	--	--
Total Changes	+70.6	+1187.8	--	+11.9	+1270.3
CE - Cost Variance	862.0	3057.2	--	11.9	3931.1
CE - Cost & Funding	862.0	3057.2	--	11.9	3931.1

Previous Estimate: December 2017

RDT&E	\$M	
	Base Year	Then Year
Current Change Explanations		
Revised escalation indices. (Economic)	N/A	+0.9
Updated cost estimating methodology for Threat Asset Acquisition & Advanced Threats based on historical CIRCM costs. (Estimating)	+130.6	+168.7
Congressional marks in FY 2018 and FY 2019 caused delays in aircraft integration activities for the AH-64E and CH-47F and funding was rephased appropriately to mitigate impacts. (Estimating)	-49.9	-51.4
FY 2015 and FY 2016 funding was updated to actuals. (Estimating)	+8.6	+8.5
Adjustment for current and prior escalation. (Estimating)	-0.1	-0.1
RDT&E Subtotal	+89.2	+126.6

Procurement	\$M	
	Base Year	Then Year
Current Change Explanations		
Revised escalation indices. (Economic)	N/A	+14.8
Total Quantity variance resulting from an increase of 705 CIRCM B-Kits from 1,076 to 1,781. (Subtotal)	+474.5	+639.3
The CIRCM B-Kits increased from 1,076 to 1,781 (+705). (Quantity)	(+469.9)	(+633.0)
Allocation to Estimating resulting from Quantity change. (Estimating) (QR)	(+4.6)	(+6.3)
The CIRCM A-Kit quantity increased from 3,373 to 3,642 (+269) & the CIRCM B-Kits increased from 1,076 to 1,781 (+705). (Quantity)	+409.2	+527.2
Acceleration of procurement buy profile from FY 2034 to FY 2021 to provide a smooth ramp -up to full rate production rate of 125 B-Kits per year. (Schedule)	0.0	-40.5
Adjustment for current and prior escalation. (Estimating)	-0.1	-0.1
Increase in Other Support based on updated cost methodology for code updates & testing for electronics jamming. (Support)	+216.6	+264.7
Increase in Initial Spares is based on the deployment plan that all 1,781 B-Kits would be operational. (Support)	+89.2	+109.1
Adjustment for current and prior escalation. (Support)	-0.1	-0.1
Procurement Subtotal	+1189.3	+1514.4

(QR) Quantity Related

Acq O&M	\$M	
	Base Year	Then Year
Current Change Explanations		
Revised escalation indices. (Economic)	N/A	+0.1
Updated cost estimate is based on increased number of personnel and higher average labor rate. (Estimating)	-9.6	-11.1
Adjustment for current and prior escalation. (Estimating)	-0.1	-0.1
Acq O&M Subtotal	-9.7	-11.1

~~(U//FOUO)~~ Contracts

Contract Identification	
Appropriation:	RDT&E
Contract Name:	CIRCM EMD
Contractor:	Northrop Grumman Systems Corporation
Contractor Location:	600 Hicks Road Rolling Meadows, IL 60008-1015
Contract Number:	W58RGZ-15-C-0067
Contract Type:	Cost Plus Fixed Fee (CPFF), Fixed Price Incentive(Firm Target) (FPIF), Firm Fixed Price (FFP)
Award Date:	August 28, 2015
Definitization Date:	August 28, 2015

Contract Price							
Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
140.2	142.7	71	149.5	170.7	71	153.6	153.6

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to negotiated changes on the contract.

The difference between the current target price and the estimated price at completion (contractor and PM) is based on an estimated cost overrun of \$4.1M to be funded by Northrop Grumman.

(U//FOUO) Contract Variance		
Item	Cost Variance	Schedule Variance
(b)(3):10 USC § 130		

Cost and Schedule Variance Explanations

The unfavorable net change in the cost variance is due to front loading of engineering tasks to accelerate IOT&E.

The unfavorable net change in the schedule variance is due to supplier testing and hardware delivery delay.

General Contract Variance Explanation

From this report forward, referenced variance explanations will be focused upon the current active CLINs so that current issues will be highlighted.

(U//~~FOUO~~) Notes

(U) The EMD contract contains FPIF CLINs for the procurement of production representative hardware in support of test and integration activities. CPFF CLINs consist of all non-recurring engineering and development activities. The Firm Fixed Price (FFP) CLIN consists of the procurement of the software Technical Data Package.

(U) The EMD contract with Northrop Grumman Systems Corporation (NG) experienced a \$22.9M cost overrun and a six-month schedule delay associated with increased software development costs, late B-Kit (System Processor Unit, Lasers and Pointer/Tracker) deliveries, insufficient reliability growth, higher than anticipated reliability failures and increased time required to verify full implementation of fixes. The six-month EMD contract modification and extension addressed the underestimated software development and incorporated the reliability improvements into hardware assets for testing. No fee was added as part of the cost overrun settlement and it was internally funded by the forfeited \$15.1M technical incentive fee of the original EMD contract and \$7.8M in realized test efficiencies. Under the advisement of Defense Contract Management Agency (DCMA) the contract modification did not reset the cost or schedule baseline given the short remaining duration of EMD. Further, the extension included a monetized risk matrix to be internally funded by NG to offset and mitigate any further repeated performance problems.

(U) In July 2017, the DCMA found NG inaccurately reported its program schedule and financial data. A Level III Corrective Action Report was approved in November 2017 resulting in the disapproval of the NG's EVM System (EVMS). This disapproval resulted in a five-percent withhold penalty on all payments until the system was corrected and full implementation verified.

(U) On September 7, 2018, NG received notification from DCMA that their EVMS was found acceptable in accordance with the terms and conditions of DFARS 252.234-7002, Earned Value Management System, and approved. The approved is applicable to Northrop Grumman Electronic Business Segment Rolling Meadows location (CAGE Code 26916). As a result, payment withholding implemented against contracts identified in the final determination notice was discontinued. The previously withheld amounts associated with the final determination are released and NG is authorized to submit a bill for all withheld amounts.

(U) On August 6, 2018, the Government concluded negotiations for consideration for contractor poor performance and Government harm due to contractor delays which impacted planned Government test activities. Modification P00027 to Contract W58RGZ-15-C-0067 was awarded to reflect the negotiated considerations. In summary, this settlement resulted in NG agreeing to internally fund \$4.1M to cover potential cost overruns during the current period of performance and up to three months of CLIN 0001 period of performance slip through December 30, 2018. Additional agreement details can be found in P00027 of the contract.

(b)(3) 10 USC § 130

Deliveries and Expenditures

Deliveries				
Delivered to Date	Planned to Date	Actual to Date	Total Quantity	Percent Delivered
Development	35	35	48	72.92%
Production	0	0	1781	0.00%
Total Program Quantity Delivered	35	35	1829	1.91%

Expended and Appropriated (TY \$M)			
Total Acquisition Cost	4682.3	Years Appropriated	10
Expended to Date	530.5	Percent Years Appropriated	26.32%
Percent Expended	11.33%	Appropriated to Date	699.4
Total Funding Years	38	Percent Appropriated	14.94%

The above data is current as of March 11, 2019.

Operating and Support Cost

Cost Estimate Details

Date of Estimate:	July 31, 2018
Source of Estimate:	Service ICE
Quantity to Sustain:	1781
Unit of Measure:	B-Kit
Service Life per Unit:	15.00 Years
Fiscal Years in Service:	FY 2019 - FY 2047

The CIRCM B-Kit is the mission kit required to achieve near spherical coverage for an aircraft. The B-Kit consists of two Pointer/Trackers, two Lasers, and one System Processor Unit.

Total acquisition quantity (1,829) includes the production quantity that will be fielded/sustained (1,781) plus 48 RDT&E-funded systems that are not production representative units and will not be fielded or sustained.

Sustainment Strategy

Interim Contractor Support is currently planned to sustain CIRCM up to four years post IOC. The long term sustainment strategy is informed by a Business Case Analysis (BCA) of Product Support Alternatives conducted during EMD resulting in a planned strategy to pursue a Public-Private Partnership. An updated BCA will be conducted prior to FRP. In addition, the PM will procure software data rights to facilitate transition to organic software sustainment.

Antecedent Information

Advanced Threat Infrared Countermeasure (ATIRCM) is the antecedent system for CIRCM. The ATIRCM estimates are based on actual contract cost. ATIRCM completed production and fielding of 120 B-Kits.

Cost Element	Annual O&S Costs BY2018 \$K	
	CIRCM Average Annual Cost Per B-Kit	ATIRCM (Antecedent) Average Annual Cost Per B-Kit
Unit-Level Manpower	7.459	68.268
Unit Operations	0.133	40.862
Maintenance	18.784	40.320
Sustaining Support	11.933	99.194
Continuing System Improvements	3.917	55.995
Indirect Support	0.000	--
Other	0.000	--
Total	42.226	304.639

Item	Total O&S Cost \$M			
	CIRCM			ATIRCM (Antecedent)
	Current Production APB Objective/Threshold		Current Estimate	
Base Year	1132.6	1245.9	1128.0	548.4
Then Year	1674.5	N/A	1665.6	N/A

Disposal Cost is included in the Operating and Support Cost of the current APB objective and threshold for this program.

The FY 2020 PB estimate is based on the July 31, 2018 Milestone C Army Cost Position (ACP). The ACP reflects increases in quantities from the approved CDD quantities of 1,076 B-Kits and 3,373 A-Kits to the approved CPD quantities of 1,781 B-Kits and 3,642 A-Kits. CIRCM received the official Milestone C ADM on September 14, 2018.

Equation to Translate Annual Cost to Total Cost

Total O&S Cost (\$1128.0M) = number of B-Kits (1,781) x System Service Life (15 years) x Average Annual O&S Cost (\$42.223K) (BY 2018\$) (includes Military Personnel Cost (MPA))

O&S Cost Variance		
Category	BY 2018 \$M	Change Explanations
Prior SAR Total O&S Estimates - Dec 2017 SAR	710.6	
Programmatic/Planning Factors	417.4	Quantity-related.
Cost Estimating Methodology	0.0	
Cost Data Update	0.0	
Labor Rate	0.0	
Energy Rate	0.0	
Technical Input	0.0	
Other	0.0	
Total Changes	417.4	
Current Estimate	1128.0	

Disposal Estimate Details

Date of Estimate: July 31, 2018
Source of Estimate: Service ICE
Disposal/Demilitarization Total Cost (BY 2018 \$M): 7.6

Disposal cost estimate is based on cost per pound of B-Kit.