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Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Air Force **Date:** May 2021

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207412F <i>I Control and Reporting Center (CRC)</i>
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COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
Total Program Element	-	6.642	16.012	9.875	0.000	9.875	-	-	-	-	-	-
67485L: <i>CRC Modernization</i>	-	6.642	16.012	9.875	0.000	9.875	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

The Control and Reporting Center (CRC) is a mobile, ground-based theater air control system (TACS) surveillance and battle management command and control (BMC2) element. It is a customizable, modular, transportable, and persistent weapon system employed at the tactical level to support air and surface operations to provide direct command and control to all air assets in an assigned Area of Responsibility (AOR) and to report back to the Joint Force Air Combat Commander (JFACC). The CRC is a family of systems which include: AN/TYQ-23A(V)1 Tactical Air Operations Module (TAOM), AN/TSC-147 Joint Tactical Information Distribution System (JTIDS) Module, AN/TRC-213/214 Remote Radio Secure Voice System (RRSVS), CRC Organic Software and the AN/TPS-75 radar which will be replaced and integrated into the Three-Dimensional Expeditionary Long-Range Radar (3DELRR) System. Air Combat Command (ACC) CRC Capability Road map provides for the modernization of this family of systems and will be programmed into phased updates through 2037.

CRC is part of the Air Force's Advanced Battle Management System (ABMS) initiative, to which CRC will provide a tactical C2 capability. CRC Modernization (formerly known as CRC Bridge to ABMS) strategy in FY20 commenced a consolidation of previous modernization efforts into a larger initiative that continues the upgrading of BMC2, sensors, and communications systems. These continuing modernization efforts will allow CRC to adopt a leaner, modular and streamlined architecture that can be tailored to execute a wide range of operations. Furthermore, CRC will develop organic operating software solutions that will ingest and disseminate Moving Target Indicator (MTI) feeds and tracks, enable Open Mission Systems (OMS)/Universal Command and Control Interface (UCI) compliance, and integrate Top Secret (TS)/ Sensitive Compartmented Information (SCI)/Special Access Program (SAP) hardware and software capability solutions. The organic software development efforts rely on having a steady stream of RDT&E funding through the FYDP.

In FY 2022, CRC development efforts support CRC Modernization include, but are not limited to: AN/TYQ-23A(V)1, AN/TRC-213/214 architecture modernization upgrades, RRSVS radio modernization upgrades (Second-Generation Anti-Jam Tactical UHF Radio for NATO (SATURN)/Mobile User Objective System (MUOS)/ Ethernet Over Internet Protocol (EOIP)), continuous software development/integration/deployment using Agile and development, security and operations (DevSecOps), 3DELRR Integration, Ground and Air MTI trackers, TS/SCI/Joint Worldwide Intelligence Communication System (JWICS) and Talon Thresher, SAP, hardware and software integration, ABMS, TS accredited structures and storage solutions in pursuit of emerging technology for OMS/Open System Architecture (OSA) advancements, along with possible hardware changes to support ABMS software/hardware development work and collaboration with other ABMS software factories, integration of Link 16 Radios and Secure Internet Protocol Router Network (SIPRNet) capabilities, TS/SCI/SAP accredited structures and storage solutions in pursuit of emerging technology for OMS/OSA advancements. Additionally, possible hardware changes to support ABMS architecture and Live/Virtual/Constructive (L/V/C) Operations capability, multilevel security, edge computing, and artificial intelligence/machine learning solutions. Additional CRC modifications are required for the system to keep pace with evolving COTS/GOTS components, DoD directives, changes in the underlying IT environment and any other emerging requirements, and to remain

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interoperable, certified, supportable, and compliant through the development, integration, testing, fielding, training and related equipment of new CRC capabilities, upgrades and electronic warfare techniques such as "Angry Kitten".

The FY 2022 funding request was reduced by 0.522 million to account for the availability of prior year execution balances.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver weapon system capability. The use of such programs funds would be in addition to the civilian pay expenses budgeted in program element 0605831F. In FY20 \$0.462M was expended for civilian pay expenses in this program element, and in FY21 \$1.042M is forecasted for civilian pay expenses in this program element.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary (\$ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	8.109	16.041	10.546	0.000	10.546
Current President's Budget	6.642	16.012	9.875	0.000	9.875
Total Adjustments	-1.467	-0.029	-0.671	0.000	-0.671
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-0.029			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-1.203	0.000			
• SBIR/STTR Transfer	-0.264	0.000			
• Other Adjustments	0.000	0.000	-0.671	0.000	-0.671

Change Summary Explanation

FY 2020: Decreased \$1.203M for Below Threshold Reprogramming.

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: CRC Modernization (formerly known as CRC Bridge to ABMS)	6.642	16.012	9.875	0.000	9.875
Description: CRC Modernization (formerly known as CRC Bridge to ABMS) efforts will incorporate all future modernization efforts. The following efforts will continue in FY21 and continue into FY22: - Radio Modernization: Upgrading existing radio configuration to include new software and hardware capable of MUOS and SATURN					

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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
<p>- CRC Modernization: OMS/UCI development/integration, organic system software development and upgrades in collaboration with ABMS Software factories, JWICS integration, Ground and Air MTI tracker integration, Multi-Level Security/Cross Domain Solution (MLS/CDS) Implementation, L/V/C Operations capability</p> <p>FY 2021 Plans:</p> <ul style="list-style-type: none"> - Complete Radio Modernization prototypes and perform Developmental Testing/Operational Testing (DT/OT) testing activities (Joint Interoperability Test Command (JITC) and Air Force System Interoperability Test (AFSIT)); this effort was consolidated from "CRC Bridge to ABMS" program narrative in FY21 as defined above - Develop, test, and integrate MTI prototypes - Pursue efforts related to, but not excluded to, OMS/UCI development/integration, continuous software development, Mode 5 implementation, JWICS integration, MLS/CDS Implementation, L/V/C Operations capability, and AN/TPS-75 modernization - Develop, test, and integrate organic software; complete bi-weekly sprints developing requirements pulled from the CRC Functional Capabilities Document; development efforts may include but not be limited to Ground and Air MTI, sensor data ingestion, "platformONE" migration, recording and playback solutions, and electronic warfare techniques such as "Angry Kitten" - Develop and build modernized AN/TYQ-23A(V)1 and AN/TRC-213/214 prototype; this effort will primarily focus on, but not limited to, the integration and reduction in size of both the AN/TYQ-23A(V)1 and AN/TRC-213/214 and the adoption of a mobile and scalable architecture <p>FY 2022 Base Plans:</p> <ul style="list-style-type: none"> - Field minimum viable product of organic software - Continue development, test and integration of additional CRC requirements - Provide technical assistance for fielded software - Maintain security patches and required updates - Test and integrate modernized AN/TYQ-23A(V)1 and AN/TRC-213/214 prototype <p>FY 2022 OCO Plans: N/A</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: Funding decreased due to the expected completion of Radio Modernization development efforts in FY21.</p>					
Accomplishments/Planned Programs Subtotals	6.642	16.012	9.875	0.000	9.875

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

<u>Line Item</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u> <u>Base</u>	<u>FY 2022</u> <u>OCO</u>	<u>FY 2022</u> <u>Total</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• OPAF 03 833040: <i>Theater Air Control Sys Improvemen</i>	0.000	13.374	18.658	0.000	18.658	-	-	-	-	-	-

Remarks

E. Acquisition Strategy

The CRC Capability Roadmap provides for the modernization of the CRC family of systems and will be programmed into phased updates through 2037 to further advance current and future battlespace awareness and tactical battle management command and control capabilities. A variety of contract and organic vehicles will be used depending on type of effort and skills required. Management strategy relies on Air Force Program Executive Office for Digital (AFPEO BM) as the Milestone Decision Authority and the Air Force Life Cycle Management Center (AFLCMC) as the Contracting Authority.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Air Force												Date: May 2021				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
3600 / 7				PE 0207412F / Control and Reporting Center (CRC)				67485L / CRC Modernization								
Product Development (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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	
CRC Modernization	C/Various	Various : Hill AFB, UT	-	5.003	Jan 2020	7.540	Jun 2021	3.901	Dec 2021	0.000		3.901	-	-	-	
CRC 520th Organic Software Development	C/FP	520 SWEG : Hill AFB, UT	-	0.824	Sep 2020	4.839	Dec 2020	3.175	Dec 2021	0.000		3.175	-	-	-	
Subtotal			-	5.827		12.379		7.076		0.000		7.076	-	-	N/A	
Support (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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	
CRC Modernization Direct Cite Authority - Additional 11 Civilian Positions	RO	Various : Hill AFB, UT	-	0.462	Jun 2020	1.042	Oct 2020	1.200	Oct 2021	0.000		1.200	-	-	-	
Subtotal			-	0.462		1.042		1.200		0.000		1.200	-	-	N/A	
Test and Evaluation (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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	
CRC Modernization Test Support	Various	Various : Various	-	0.322		0.209	Aug 2021	0.599	Nov 2021	0.000		0.599	-	-	-	
Subtotal			-	0.322		0.209		0.599		0.000		0.599	-	-	N/A	
Management Services (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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	
Booze Allen Hamilton	C/FP	Not specified. : TBD	-	0.031	Jun 2020	1.192	Mar 2021	-		-		-	-	-	-	
HX5	C/FP	Not specified. : TBD	-	-		1.190	Mar 2021	1.000	Mar 2022	-		1.000	-	-	-	
Subtotal			-	0.031		2.382		1.000		-		1.000	-	-	N/A	

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Exhibit R-4, RDT&E Schedule Profile: PB 2022 Air Force		Date: May 2021
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FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
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

<i>AN/TRC-213/214 RRSVS Radio Modernization Upgrade</i>	
Design and Development	
Integration and Testing	
<i>CRC Modernization</i>	
Development and Integration	
Integration and Testing	

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Exhibit R-4A, RDT&E Schedule Details: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207412F / <i>Control and Reporting Center (CRC)</i>	Project (Number/Name) 67485L / <i>CRC Modernization</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>AN/TRC-213/214 RRSVS Radio Modernization Upgrade</i>				
Design and Development	2	2020	4	2020
Integration and Testing	4	2020	1	2022
<i>CRC Modernization</i>				
Development and Integration	1	2021	4	2022
Integration and Testing	4	2021	4	2022