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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Air Force **Date:** February 2020

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 0102326F / <i>Region/Sector Operation Control Center Modernization Program</i>
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COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	5.904	0.000	5.929	0.000	5.929	0.782	0.796	0.810	0.825	Continuing	Continuing
674592: <i>R/SAOC MODERNIZATION</i>	-	5.904	0.000	5.929	0.000	5.929	0.782	0.796	0.810	0.825	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Regional/Sector Operation Center Modernization program supports the NORAD/NORTHCOM homeland defense and air sovereignty mission for fixed Air Defense Sectors.

BATTLE CONTROL SYSTEM-FIXED (BCS-F): BCS-F is a bi-national development program with Canada. The BCS-F Program is an AF Homeland Defense battle management command and control system with the capability to integrate data from existing and future civil and military defense surveillance systems into a comprehensive air picture. BCS-F provides tactical communications and data link capabilities with other military and civil systems responsible for planning, directing, coordinating and controlling forces for air surveillance, air defense, and control of sovereign US air space. This integrated air picture enhances the capability to conduct peacetime air sovereignty operations and transition to active air defense operations in the event of aggression.

BATTLE CONTROL SYSTEM-FIXED MODIFICATION ONE (BCS-F Modification 1): BCS-F Modification 1 effort will support the implementation of Automatic Dependent Surveillance-Broadcast (ADS-B) data feeds and Earth Center Earth Fixed (ECEF). The BCS-F Modification 1 effort will be executed as a Cooperative Development Program between the US and Canada.

BATTLE CONTROL SYSTEM-FIXED MODERNIZATION: BCS-F Modernization will support sensor integration, Agile development, Combat ID, and system virtualization for the BCS-F system.

NATIONAL CAPITAL REGION-INTEGRATED AIR DEFENSE SYSTEM (NCR-IADS): NCR-IADS is a post-September 11, 2001 rapidly fielded capability that improves low altitude detection capability in order to prosecute airborne threats to the NCR. NCR-IADS provides ground-based air defense of the National Capitol Region airspace, and provides an integrated air picture, ground air defense weapons, enhanced regional situational awareness and forensic data collection capabilities for the warfighter mission to protect the NCR. Efforts may include but are not limited to, studies, system engineering, development, integration, and test & evaluation required to prevent system obsolescence and evolving cyber security requirements.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver BCS-F capabilities. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605898F, and 0605833F.

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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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	6.112	0.000	6.427	0.000	6.427
Current President's Budget	5.904	0.000	5.929	0.000	5.929
Total Adjustments	-0.208	0.000	-0.498	0.000	-0.498
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.208	0.000			
• Other Adjustments	0.000	0.000	-0.498	0.000	-0.498

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
<p>Title: Battle Control Systems-Fixed Modification 1</p> <p>Description: Continue systems engineering, development, risk reduction, integration, test & evaluation and fielding of the BCS-F Modification 1 effort. The BCS-F Modification 1 effort will be executed as a Cooperative Program between the US and Canada.</p> <p>FY 2020 Plans: Activities include, but are not limited to: - Continue BCS-F Modification 1 ADS-B and ECEF integration, test and evaluation, documentation, and fielding. - There is no funding in FY20 and will be treated as a skip year.</p> <p>FY 2021 Plans: Activities include, but are not limited to: - Continue BCS-F Modification 1 ADS-B and ECEF integration, test and evaluation, documentation, and fielding.</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: FY20 has no funding and FY21 will continue BCS-F Modification 1 ADS-B and ECEF integration, test and evaluation, documentation, and fielding.</p>	5.904	0.000	5.482
<p>Title: Battle Control Systems-Fixed Modernization</p>	0.000	0.000	0.447

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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
<p>Description: BCS-F Modernization will support sensor integration, Agile development, Combat ID, and system virtualization for the BCS-F system.</p> <p>FY 2020 Plans: There is no funding in FY20 and will be treated as a skip year.</p> <p>FY 2021 Plans: Activities include but are not limited to: - Implementation of Air Combat Command's Combat Identification capability - Integration of new sensors into BCS-F to improve Air Defense Sector situational awareness and ability to respond to emerging threats. - Support user feedback for improvement of the BCS-F user interfaces. - Studies to support implementation of machine learning, artificial intelligence, cloud-based operations into BCS-F weapon system to better support emerging threats. - NCR-IADS studies, system engineering, development, integration, and test & evaluation.</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: FY20 has no funding and will be treated as a skip year. FY21 will continue sensor integration, Agile development, Combat ID, and system virtualization.</p>			
Accomplishments/Planned Programs Subtotals	5.904	0.000	5.929

D. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2021</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To</u>	<u>Total Cost</u>
			<u>Base</u>	<u>OCO</u>	<u>Total</u>					<u>Complete</u>	
• OPAF 03 080330: <i>Battle Control System - Fixed</i>	2.849	3.063	3.118	-	3.118	3.175	3.231	3.290	3.351	0.000	22.077

Remarks

E. Acquisition Strategy
Acquisition Strategy: The Program Management Office (PMO) completed a full and open competition for BCS-F Modification 1 efforts. The BCS-F PMO has finalized a Project Arrangement (PA) to establish a cooperative development program with Canada. These efforts will conclude with development and a single release to the Air Defense Sectors.

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<p>Management Strategy: Efforts will be managed by BCS-F PMO in conjunction with Canada PMO and are under the purview of the Air Force Program Executive Officer for Battle Management (AFPEO BM). Air Force Life Cycle Management Center (AFLCMC) is the Contracting Authority.</p> <p>Contracting Strategy: The BCS-F PMO utilized a full and open competition to complete the development and integration of these capabilities. Cost Plus contract with some Fixed Price and Time & Material CLINs will be utilized where possible and appropriate.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Air Force **Date:** February 2020

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0102326F / Region/Sector Operation Control Center Modernization Program	Project (Number/Name) 674592 / R/SAOC MODERNIZATION
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Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
BCS-F Modification 1	Various	Various : Various	-	4.075	Apr 2019	-		3.000	Jan 2021	-		3.000	Continuing	Continuing	0.000
BCS-F Modernization	Various	Various : Various	-	-		-		0.447	Jun 2021	-		0.447	Continuing	Continuing	-
Subtotal			-	4.075		-		3.447		-		3.447	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
46th Test Wing/Other Test Act	Various	Various : Various	-	0.163	Mar 2020	-		0.751	Jan 2021	-		0.751	Continuing	Continuing	0.000
Subtotal			-	0.163		-		0.751		-		0.751	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
PMA - A&AS	Various	Various : Hanscom AFB, MA	-	0.745	Jul 2020	-		0.766	Jul 2021	-		0.766	Continuing	Continuing	-
PMA - FRDC	Various	Various : Hanscom AFB, MA	-	0.511	Oct 2019	-		0.515	Oct 2020	-		0.515	Continuing	Continuing	-
PMA - Other	Various	Various : Hanscom AFB, MA	-	0.410	May 2020	-		0.450	May 2021	-		0.450	Continuing	Continuing	-
Subtotal			-	1.666		-		1.731		-		1.731	Continuing	Continuing	N/A

			Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	5.904	0.000	5.929	-	5.929	Continuing	Continuing	N/A

Remarks
FY20 has no funding and will be treated as a skip year.

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Air Force		Date: February 2020
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	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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>Battle Control System Fixed Modification 1</i>																												
Complete Development																												
System Acceptance Test (SAT)																												
Developmental Test (DT)																												
AF System Interoperability Test (AFSIT)																												
<i>Battle Control System Fixed Modernization Efforts</i>																												
Agile Capabilities Development																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Air Force		Date: February 2020
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Battle Control System Fixed Modification 1</i>				
Complete Development	1	2019	4	2020
System Acceptance Test (SAT)	4	2020	1	2021
Developmental Test (DT)	2	2021	4	2021
AF System Interoperability Test (AFSIT)	4	2021	1	2022
<i>Battle Control System Fixed Modernization Efforts</i>				
Agile Capabilities Development	3	2021	4	2025