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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force										Date: February 2019		
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 1203873F I Ballistic Missile Defense Radars							
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	15.881	0.000	15.881	28.188	16.084	7.944	8.087	0.000	76.184
674820: Sensor Development	-	0.000	0.000	15.881	0.000	15.881	28.188	16.084	7.944	8.087	0.000	76.184
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

COBRA DANE (CD) is a 40+ year old radar located on Eareckson AS, AK (Shemya Island, AK), executing two missions: Missile Defense (MD) and Space Situational Awareness (SSA). SSA mission supports New Foreign Launches (NFLs) and Space Catalog maintenance to include space debris tracking. CD will acquire through design, development, Integration, and test a modern architecture to enhance mission capability providing Warfighter and Stakeholder customers direct operational benefit. CD utilizes Federally Funded Research and Development Centers (FFRDC), Systems Engineering and Integration (SE&I), University Affiliated Research Center (UARC) and Assistance and Advisory Services Contractors to support programmatic and technical activities. Activities include studies and analysis to support both current program planning and execution and future program planning. Specifically, the Automated Data Processing Equipment (ADPE) Rehost program upgrades the CD system's radar back end mission data processing, radar management and control, and signal processing capabilities to a modern architecture that facilitates long term mission resiliency, cyber security, system viability, high operational availability, and rapid hardware and software development and deployment capability. FY17 Above Threshold Reprograming (ATR) RDT&E funds were provided to the Missile Defense Agency (MDA) to accelerate the joint Air Force and MDA modernization program of the CD radar which opens the door for a non-traditional acquisition approach using an Other Transaction Authority (OTA) agreement through the OSD Defense Innovation Unit (DIU) Organization. This program element may include necessary civilian pay expenses required to manage, execute, and deliver Cobra Dane's weapon system capability. 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, and 0605898F. In addition to funds being used to modernize this back end of the radar, these funds will also be used for out-year planning of front end component modernization including enhancement of communication elements.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is \$14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

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.

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B. Program Change Summary (\$ in Millions)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total		
Previous President's Budget		0.000	0.000	15.881	0.000	15.881		
Current President's Budget		0.000	0.000	15.881	0.000	15.881		
Total Adjustments		0.000	0.000	0.000	0.000	0.000		
• 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		0.000	0.000					
• Other Adjustments		0.000	0.000	0.000	0.000	0.000		
Change Summary Explanation								
This is not a new start program, but a continuation of effort for a joint Air Force and Missile Defense Agency program. Air Force takes over funding to continue this joint effort starting in FY20 to develop and integrate prototypes procured using FY17 ATR and FY18 MDA funding.								
C. Accomplishments/Planned Programs (\$ in Millions)				FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: ADPE Rehost Upgrade, Phase II				0.000	0.000	15.881	0.000	15.881
Description: The Automated Data Processing Equipment (ADPE) Rehost Phase II continues evolutionary, non-traditional prototype development funded under FY17 Congressional ATR and FY18 Missile Defense Agency funds into a development program. FY20 funds transition the program into the developmental and integration phase to operationalize prototypes procured using non-traditional acquisition methods which will evolve the Cobra Dane radar back end mission data processing, radar management and control, and signal processing capabilities to a modern open architecture. This architecture will facilitate long term mission resiliency, cyber security, system viability, high operational availability, and rapid hardware and software development and deployment capability.								
FY 2019 Plans: N/a								
FY 2020 Base Plans: Planned projects include software lab preparations, further development of system hardware and software, system integration and spiral development and testing. In addition to funds being used to modernize the back								

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C. Accomplishments/Planned Programs (\$ in Millions)			FY 2018	FY 2019	FY 2020 Base
<p>end of the radar, these funds may also be used for out-year planning of front end component modernization including enhancement of communication elements.</p> <p>FY 2020 OCO Plans: n/a</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: FY20 - This is a new Program Element. Funding responsibility transitions to the Air Force in FY20. Previously funded under the FY17 Congressional ATR and FY18 MDA. The funds transition the evolutionary, non-traditional prototype efforts into the developmental and integration phase to operationalize prototypes procured using non-traditional acquisition methods. The evolves the Cobra Dane radar back end mission data processing, radar management and control, and signal processing capabilities to a modern open architecture.</p>					
Accomplishments/Planned Programs Subtotals			0.000	0.000	15.881
D. Other Program Funding Summary (\$ in Millions) N/A					
Remarks					
E. Acquisition Strategy This acquisition strategy will use a non-traditional approach to modernize and enhance existing capabilities using a non-compete follow-on award of the Defense Innovation Unit (DIU) Other Transaction Authority (OTA) Agreement in accordance with allowances provided in 10 U.S.C 2371b(f). This approach will provide an extension of system service life to ensure warfighter capability thru at least 2030. This evolutionary migration to a current open system approach also provides foundation for adaptable system sustainment and addition of future capabilities.					
F. Performance Metrics Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.					

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force												Date: February 2019			
Appropriation/Budget Activity 3600 / 7						R-1 Program Element (Number/Name) PE 1203873F / Ballistic Missile Defense Radars				Project (Number/Name) 674820 / Sensor Development					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
ADPE Phase II, Development; S/W & H/W integration	TBD	Various : TBD	-	0.000		0.000		15.000	Jan 2020	-		15.000	Continuing	Continuing	-
Subtotal			-	0.000		0.000		15.000		-		15.000	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Program Management Support	TBD	Various : TBD	-	-		-		0.881	Mar 2020	-		0.881	Continuing	Continuing	-
Subtotal			-	-		-		0.881		-		0.881	Continuing	Continuing	N/A
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	0.000		0.000		15.881		-		15.881	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force			Date: February 2019		
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	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	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
ADPE Rehost Phase II																												
Prototype completion and Validation MDA Funded RDT&E																												
Phase II Development & Integration																												
Software Lab Prep & Development																												
Hardware/Software Development																												
Systems Integration																												
Spiral Development & Test																												
Operational Assessment																												
BMC3 Comm Modernization																												
Beam Steering Group Modernization																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>ADPE Rehost Phase II</i>				
Prototype completion and Validation MDA Funded RDT&E	1	2019	1	2020
Phase II Development & Integration	2	2020	3	2022
Software Lab Prep & Development	2	2020	1	2022
Hardware/Software Development	2	2020	4	2021
Systems Integration	3	2020	4	2021
Spiral Development & Test	4	2020	4	2021
Operational Assessment	4	2021	3	2022
BMC3 Comm Modernization	1	2022	4	2022
Beam Steering Group Modernization	1	2022	4	2024