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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 5: System Development & Demonstration (SDD)					R-1 Program Element (Number/Name) PE 0605931F I B-2 Defensive Management System							
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	1,267.408	148.946	253.258	294.400	0.000	294.400	164.610	72.100	0.184	0.000	0.000	2,200.906
653844: B-2 DMS	1,267.408	148.946	253.258	294.400	0.000	294.400	164.610	72.100	0.184	0.000	0.000	2,200.906
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
Program MDAP/MAIS Code: 431												
A. Mission Description and Budget Item Justification												
<p>The Defensive Management System Modernization (DMS-M) program enhances the B-2 direct attack capability by addressing emerging and future 21st century threats and robust modern Integrated Air Defense Systems (IADS). By leveraging "state-of-the-art" electronic warfare antennae, processors, controllers and displays, B-2 aircrews will realize unprecedented situational battlespace awareness and dynamic, real-time threat avoidance in the most complex radio frequency emitter environments. The inherent increased sensitivity of the modernized DMS over the legacy system, with increased processing power, will build a battlespace picture that could be shared with joint force platforms by on-board communication systems. The current B-2 DMS was designed in the 1980s and has not received any upgrades to date. Also, many components of the legacy DMS are not supportable and will severely impact aircraft availability without significant investment in reliability and maintainability upgrades.</p> <p>During development, the engineering baseline will be finalized and four production representative kits will be procured to support integrated development/operational test and a pre-Milestone C Operational Assessment, as well as B-2 Nuclear Certification testing. Diminishing manufacturing sources and materiel shortages for affected components and subassemblies, will be addressed to protect the planned production program by mitigating unplanned part redesign and requalification risks.</p> <p>Funds may be used to resolve emerging safety of flight and diminishing manufacturing sources issues, accommodate technology insertion and fulfill FAA or other mandates necessary to ensure continued aircrew safety and mission effectiveness.</p> <p>The Milestone Decision Authority (MDA) approved an updated Acquisition Strategy and signed an Acquisition Decision Memorandum (ADM) on May 11, 2017. The ADM authorized the program to change the technical architecture and contract type via Engineering Change Proposal (ECP). DMS-M awarded a Firm Fixed Price (FFP) Unfixed Contract Action (UCA) on May 24, 2017 to implement the changes. EMD period of performance was extended through July 2022. The revised program strategy leverages development from other Air Force Family of Systems programs and implements additional, classified capability to improve weapon system survivability in contested airspace. The strategy also provides risk reduction and addresses obsolescence concerns for other programs. The Air Force Cost Accounting Agency (AFCAA) updated the Service Cost Position (SCP) on June 4, 2018 to reflect the new strategy.</p> <p>This program element may include necessary civilian pay expenses required to manage, execute, and deliver B-2 DMS-M 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.</p>												

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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 5, System Development and Demonstration (SDD) because it has passed Milestone B approval and is conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full rate production.						
B. Program Change Summary (\$ in Millions)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget		194.570	261.758	135.684	0.000	135.684
Current President's Budget		148.946	253.258	294.400	0.000	294.400
Total Adjustments		-45.624	-8.500	158.716	0.000	158.716
• Congressional General Reductions		0.000	0.000			
• Congressional Directed Reductions		-40.200	-8.500			
• 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		-5.424	0.000			
• Other Adjustments		0.000	0.000	158.716	0.000	158.716
Change Summary Explanation						
FY 2018 reductions were a Congressional mark of \$40.200M due to changes in acquisition strategy, and \$5.424M for Small Business Innovative Research (SBIR).						
FY 2019 reduction was a Congressional mark of \$8.5M due to forward financing.						
FY20 increase reflects new Service Cost Position approved 4 Jun 18.						
C. Accomplishments/Planned Programs (\$ in Millions)				FY 2018	FY 2019	FY 2020
Title: B-2 Defensive Managment System Modernization (DMS-M) EMD				148.946	253.258	294.400
Description: DMS Modernization program develops improved aircrew situational awareness through replacement of passive antennas, receiver/processors, and display processors. DMS-M also addresses critical system shortfalls, and improves legacy DMS component repair issues.						
FY 2019 Plans:						

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C. Accomplishments/Planned Programs (\$ in Millions)										FY 2018	FY 2019	FY 2020
Continue working EMD efforts, complete PD7.1 software certification and begin ground/flight test.												
FY 2020 Plans: Continue working EMD efforts, complete PD7.2 software certification, and execute Milestone C and continue flight test.												
FY 2019 to FY 2020 Increase/Decrease Statement: Funding increase due to increase in scope of development work with change in acquisition strategy.												
Accomplishments/Planned Programs Subtotals										148.946	253.258	294.400
D. Other Program Funding Summary (\$ in Millions)												
Line Item	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	
• APAF 05 Line Item b2dms0: B-2 DMS	-	0.000	0.000	-	0.000	328.000	294.500	88.872	78.130	0.000	789.502	
• APAF 06 Line Items 000999: Acft Initial Spares & Repairs	-	-	-	-	-	0.000	58.500	15.404	15.681	0.000	89.585	
• APAF 07 Line Item 000075: Other Production Charges	-	-	0.000	-	0.000	0.020	14.300	12.855	13.127	0.000	40.302	
Remarks												
E. Acquisition Strategy Key elements of the overall acquisition strategy include: use of sole source contract with a prime/integrating contractor (Northrop Grumman) who will perform subsystem and component competitions where appropriate, use of Firm Fixed Price (FFP) development contract, and the combination of developmental upgrades with software sustainment blocks to minimize the number of software releases, aircraft downtime, and differences in fielded configurations. The May 2017 acquisition strategy changed the design architecture to leverage mature systems from other platforms to reduce risk and refocus effort to integrate common unmodified hardware.												
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 / 5						R-1 Program Element (Number/Name) PE 0605931F / B-2 Defensive Management System				Project (Number/Name) 653844 / B-2 DMS					
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
Air Vehicle - Technology Development	SS/CPFF	Various : Various, NV	726.260	-		-		-		-		-	0.000	726.260	-
Air Vehicle - Engineering and Manufacturing Development (EMD)	SS/FFP	Various : Various, NV	477.086	103.774	Oct 2017	196.120	Oct 2018	174.266	Oct 2019	-		174.266	162.841	1,114.087	-
Subtotal			1,203.346	103.774		196.120		174.266		-		174.266	162.841	1,840.347	N/A
Remarks Northrop-Grumman, Palmdale, CA is the prime contractor and integrator.															
Support (\$ 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
Trainers	C/CPIF	WPAFB : Dayton, OH	0.000	14.934	Dec 2017	7.534	Nov 2018	17.966	Nov 2019	-		17.966	11.966	52.400	-
Mission Planning	C/CPIF	Hanscom : Boston, MA	0.000	5.143	Nov 2017	8.461	Feb 2019	22.271	Feb 2020	-		22.271	1.822	37.697	-
Subtotal			0.000	20.077		15.995		40.237		-		40.237	13.788	90.097	N/A
Test and Evaluation (\$ 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
Government Test	MIPR	AFFTC : Various, NV	21.426	7.973	Oct 2017	16.470	Oct 2018	20.400	Oct 2019	-		20.400	1.471	67.740	-
Subtotal			21.426	7.973		16.470		20.400		-		20.400	1.471	67.740	N/A

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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
PMA	Various	Various : Various, NV	42.636	17.122	Nov 2017	24.673	Nov 2018	59.497	Nov 2019	-		59.497	58.794	202.722	-
Subtotal			42.636	17.122		24.673		59.497		-		59.497	58.794	202.722	N/A
Remarks															
PMA increases from FY18 to FY19 and FY19 to FY20 reflect the allocation across all B-2 programs; B-2 DMS is the largest program and therefore pays the largest share with significant increase after the termination of EHF SATCOM.															
			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			1,267.408	148.946		253.258		294.400		-		294.400	236.894	2,200.906	N/A
Remarks															
Northrop-Grumman, the prime contractor for the B-2 weapon system, is the integrator and prime contractor for B-2 DMS activities.															

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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
B-2 DMS																												
DMS-M EMD																												
DMS-M Critical Design Review																												
DMS-M Combined Developmental Test / Operational Test (DT/OT)																												
DMS-M Milestone C - Low Rate Initial Production (LRIP) Decision																												
DMS-M Production																												
DMS-M Full Rate Production (FRP) Decision																												
DMS-M Certification of Airworthiness																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0605931F / <i>B-2 Defensive Management System</i>	Project (Number/Name) 653844 / <i>B-2 DMS</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>B-2 DMS</i>				
DMS-M EMD	1	2018	3	2022
DMS-M Critical Design Review	4	2018	4	2018
DMS-M Combined Developmental Test / Operational Test (DT/OT)	3	2019	2	2021
DMS-M Milestone C - Low Rate Initial Production (LRIP) Decision	4	2020	4	2020
DMS-M Production	1	2021	4	2024
DMS-M Full Rate Production (FRP) Decision	3	2022	3	2022
DMS-M Certification of Airworthiness	2	2021	3	2022