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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 5: <i>System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0605931F / <i>B-2 Defensive Management System</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	1,416.354	244.638	250.100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1,911.092
653844: <i>B-2 DMS</i>	1,416.354	244.638	250.100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1,911.092
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	

Program MDAP/MAIS Code: 431

A. Mission Description and Budget Item Justification

The B-2A Spirit is the world's most advanced long-range strike asset. The unique combination of range, payload and stealth (anti-access and global strike missions) characteristics allow the B-2 to target and destroy the highest value enemy targets, regardless of location, and return home safely. RDT&E projects are necessary to both preserve this strategic advantage as well as increase the flexibility and lethality of this national asset tasked across a broad spectrum, from tactical to national objectives.

This RDT&E program reflects the restructure of the current DMS-M EMD effort and transition to the modernization of the B-2 cockpit display sub-system. The current display sub-system lacks the processing power to provide necessary situational awareness to air crews in the projected dense threat environments of the future. Also, the legacy multi-function display units (MDUs) are not supportable due to obsolescence and repair issues. Without this program, display availability will severely impact aircraft availability.

During development, the engineering baseline will be finalized and production representative kits will be purchased to support SW development, platform integration, integrated development/operational test and a pre-Milestone C production assessment, as well as B-2 Nuclear Certification testing. Diminishing manufacturing sources and materiel shortages for affected components, will be addressed to protect the planned production program by mitigating unplanned part redesign and requalification risks. This effort will also require investment in systems engineering and software development to integrate the AGP into the B-2's P6 architecture that includes the legacy Threat Emitter Locator system and associated displays that were not part of the original DMS-M baseline.

In FY 2020 and prior, the B-2 DMS-M effort is documented in PE 0605931F B-2 DMS, Project 653844 B-2 DMS; beginning in FY 2021, this effort is documented in PE 0101127F B-2 Squadrons, Project 675345 B-2 Modernization.

Restructuring B-2 DMS-M saved \$9.8M in FY 2021: PE 0605931F is reduced \$164.610M, and PE 0101127F is increased \$154.768M.

Restructuring B-2 DMS-M Description: Delays in the acquisition of B-2 DMS-M reduced return on investment. In response to this shifting timeline, the Air Force realigns funding to address reliability and sustainment of the B-2 cockpit display system until end-of-life, while developing new capabilities aligned to the National Defense Strategy (NDS).

UNCLASSIFIED

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The FY 2021 budget reflects a significant restructure of the B-2 DMS-M program that reduces the program scope to modernize the B-2 display functionality including multi-function display units (MDUs) and Advanced Graphics Processor (AGP) of the baselined DMS-M program. Details associated with the restructured displays program are included in PE 0101127F.

The FY 2020 funds will be utilized to continue display system hardware and software development and testing including limited flight tests on the baselined DMS-M program, perform acquisition and contracting activities to efficiently reduce program scope, disposition equipment purchased under the EMD contract, remove hardware no longer required from development labs and flight test aircraft, perform systems engineering to develop a detailed architecture to integrate previously replaced legacy capabilities with modernized displays, procure legacy hardware including Threat Emitter Locator System (TELS) required to restore test aircraft capabilities that DMS-M is no longer modernizing.

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.

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 element 0605831F.

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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	253.258	294.400	164.610	0.000	164.610
Current President's Budget	244.638	250.100	0.000	0.000	0.000
Total Adjustments	-8.620	-44.300	-164.610	0.000	-164.610
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-44.300			
• 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	-8.620	0.000			
• Other Adjustments	0.000	0.000	-164.610	0.000	-164.610

Change Summary Explanation

FY 2019 reduction reflects \$8.6200M for Small Business Innovative Research (SBIR)

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FY 2020 decrease reflects Congressional mark of \$44.300M due to unjustified growth in Management Services (\$34.300M) and Test and Evaluation funding early to need (\$10.000M)

FY 2021 decrease reflects restructure of current DMS-M EMD effort and transition to Multi-Function Display Unit Replacement (MDU-R) / Advanced Graphics Processor (AGP) development effort, and transfer of remaining funds to PE 0101127F.

C. Accomplishments/Planned Programs (\$ in Millions)

	FY 2019	FY 2020	FY 2021
Title: B-2 Defensive Management System Modernization (DMS-M) EMD 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 2020 Plans: Accommodate transition from previous DMS-M scope to maximize software re-use for reduced display only program. Release RFP for multi-function display unit redesign, execute EMD efforts. FY 2021 Plans: N/A - Transitioned to PE 0101127F FY 2020 to FY 2021 Increase/Decrease Statement: Decrease reflects restructure of current DMS-M EMD effort and transition to MDU/AGP development effort.	244.638	250.100	0.000
Accomplishments/Planned Programs Subtotals	244.638	250.100	0.000

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

N/A

Remarks

Transitioned to PE 0101127F in FY 2021

E. Acquisition Strategy

See acquisition strategy in PE 0101127F for the B-2 DMS-M Displays program.

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

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
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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			
Product Development	C/CPAF	Not specified. : TBD	0.000	-		-		-		-		-	0.000	0.000	-
Air Vehicle - Technology Development	SS/CPFF	Various : Various, NV	726.260	-		-		-		-		-	0.000	726.260	-
Air Vehicle - Engineering and Manufacturing Development (EMD)	SS/ Various	Various : Various, NV	580.860	196.120	Oct 2018	174.266	Oct 2019	0.000	Oct 2020	-		0.000	0.000	951.246	-
Subtotal			1,307.120	196.120		174.266		0.000		-		0.000	0.000	1,677.506	N/A

Remarks
Northrop-Grumman, Palmdale, CA is the prime contractor and integrator.

Support (\$ 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			
Support	C/CPAF	Not specified. : TBD	0.000	-		-		-		-		-	0.000	0.000	-
Trainers	C/CPIF	WPAFB : Dayton, OH	14.934	7.534	Nov 2018	17.966	Nov 2019	0.000	Nov 2020	-		0.000	0.000	40.434	-
Mission Planning	C/CPIF	Hanscom : Boston, MA	5.143	8.461	Feb 2019	22.271	Feb 2020	0.000	Feb 2021	-		0.000	0.000	35.875	-
Subtotal			20.077	15.995		40.237		0.000		-		0.000	0.000	76.309	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			
Test and Evaluation	C/CPAF	Not specified. : TBD	0.000	-		-		0.000		-		0.000	0.000	0.000	-
Government Test	MIPR	AFFTC : Various, NV	29.399	16.470	Oct 2018	10.400	Oct 2019	0.000	Oct 2020	-		0.000	0.000	56.269	-
Subtotal			29.399	16.470		10.400		0.000		-		0.000	0.000	56.269	N/A

UNCLASSIFIED

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

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
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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			
Management Services	C/CPAF	Not specified. : TBD	0.000	-		-		-		-		-	0.000	0.000	-
PMA	Various	Various : Various, NV	59.758	16.053	Nov 2018	25.197	Nov 2019	0.000	Nov 2020	-		0.000	0.000	101.008	-
Subtotal			59.758	16.053		25.197		0.000		-		0.000	0.000	101.008	N/A

Remarks
Funding supports the A&AS, government travel, WSSC lab support, and enterprise support contract with Northrop Grumman. Activities on the Northrop Grumman contract include but are not limited to, configuration management, security, test support, and risk management.

	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	1,416.354	244.638	250.100	0.000	-	0.000	0.000	1,911.092	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 2021 Air Force		Date: February 2020
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>

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

B-2 DMS	
Multi-Functional Display Unit Replacement (MDU-R) RFP Release	█
MDU-R Contract Award	█
MDU-R EMD (FY21 and beyond in PE 0101127F)	██████

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Air Force		Date: February 2020
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>				
Multi-Functional Display Unit Replacement (MDU-R) RFP Release	2	2020	2	2020
MDU-R Contract Award	3	2020	3	2020
MDU-R EMD (FY21 and beyond in PE 0101127F)	3	2020	4	2020

Note

FY 2021 DMS-M effort is documented in PE 0101127F B-2 Squadrons, Project 675345 B-2 Modernization.