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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 / BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</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	-	290.097	323.624	520.023	0.000	520.023	568.349	489.435	430.644	276.376	Continuing	Continuing
671803: <i>B-52 AFMC Test Assets</i>	-	0.000	4.069	15.654	0.000	15.654	4.263	4.263	0.000	2.666	0.000	30.915
671805: <i>B-52 VLF/LF Modernization</i>	-	0.000	10.000	12.976	0.000	12.976	8.967	20.567	0.000	0.000	0.000	52.510
671807: <i>Advanced Targeting POD Display Upgrade</i>	-	0.000	5.397	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.397
671810: <i>B-52 AEHF Integration</i>	-	0.000	0.000	5.024	0.000	5.024	37.443	37.442	55.669	79.078	Continuing	Continuing
675039: <i>B-52 System Improvements</i>	-	77.946	12.050	11.166	0.000	11.166	0.050	0.050	0.000	0.000	Continuing	Continuing
675041: <i>Bomber Tactical Data Link</i>	-	26.017	2.878	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	28.895
675050: <i>CONNECT</i>	-	6.055	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.055
675055: <i>GPS-IU</i>	-	28.424	1.986	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	30.410
675056: <i>B-52 Radar Modernization Program (RMP)</i>	-	77.333	109.278	168.692	0.000	168.692	187.452	177.035	110.989	46.860	Continuing	Continuing
675057: <i>B-52 Low Cost Improvement (LCI)</i>	-	2.605	2.607	2.600	0.000	2.600	2.656	2.705	0.000	0.000	Continuing	Continuing
675129: <i>B-52 CERP</i>	-	59.717	175.359	299.402	0.000	299.402	327.518	247.373	263.986	147.772	Continuing	Continuing
675160: <i>B-52 Crypto Modernization</i>	-	12.000	0.000	4.509	0.000	4.509	0.000	0.000	0.000	0.000	Continuing	Continuing

A. Mission Description and Budget Item Justification

The B-52H is a long-range bomber capable of delivering the widest variety of nuclear and conventional standoff and direct attack munitions in the Air Force. The Air Force plans to fly the B-52H to at least 2050.

The B-52H modernization efforts are needed to perform current and future wartime missions and to ensure relevance, lethality and survivability. Additionally, modernization projects alleviate aircraft obsolescence issues due to Diminishing Manufacturing Sources (DMS) while at the same time providing improved capabilities to the B-52H weapon system that require significant hardware and software development and testing.

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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 0101113F / <i>B-52 Squadrons</i>
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This program element may include necessary civilian pay expenses required to manage, execute, and deliver B-52 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 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	325.264	325.974	515.207	0.000	515.207
Current President's Budget	290.097	323.624	520.023	0.000	520.023
Total Adjustments	-35.167	-2.350	4.816	0.000	4.816
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-4.350			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	2.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-25.304	0.000			
• SBIR/STTR Transfer	-9.863	0.000			
• Other Adjustments	0.000	0.000	4.816	0.000	4.816

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 675039: *B-52 System Improvements*

Congressional Add: *IR Missile Warning System*

Congressional Add: *AFGSC Innovation Hub*

Congressional Add: *Mission Data Recorder*

Congressional Add Subtotals for Project: 675039

Project: 675041: *Bomber Tactical Data Link*

Congressional Add: *Bomber Tactical Data Link - Congressional Add*

Congressional Add Subtotals for Project: 675041

Project: 675160: *B-52 Crypto Modernization*

Congressional Add: *B-52 Crypto Modernization Congressional Add*

	FY 2019	FY 2020
	24.000	0.000
	0.000	2.000
	10.000	0.000
	34.000	2.000
	1.450	0.000
	1.450	0.000
	12.000	-

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Air Force	Date: February 2020
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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 0101113F / <i>B-52 Squadrons</i>
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Congressional Add Details (\$ in Millions, and Includes General Reductions)

	FY 2019	FY 2020
Congressional Add Subtotals for Project: 675160	12.000	-
Congressional Add Totals for all Projects	47.450	2.000

Change Summary Explanation

Change Summary Explanation

FY19: Decrease of (-\$35.167M) consists of: SBIR Transfers and reprogramings.

FY20: Decrease of (-\$2.350M) consists of: ATP (-\$4.35M) (Congressional Mark), B-52 Modernization AFGSC Initiative +\$2.00M (Congressional Add)

FY21: Increase of \$4.816M consists of: ATP (-\$1.191M), AFMC Test Assets (-\$0.028M), CERP (-\$0.661M), LCI (-\$0.005M), RMP (-\$0.308M), Crypto Modernization +4.509M, VLF/LF (-\$0.024M), AEHF +\$2.524M.

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force										Date: February 2020		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons				Project (Number/Name) 671803 / B-52 AFMC Test Assets			
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
671803: B-52 AFMC Test Assets	-	0.000	4.069	15.654	0.000	15.654	4.263	4.263	0.000	2.666	0.000	30.915
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Prior to FY 2020, Project 671803, B-52 AFMC Test Assets funding is documented in Project 675039, B-52 System Improvement

A. Mission Description and Budget Item Justification

The B-52 AFMC Test Assets project will provide funding for the test aircraft, manpower, and facilities at the Air Force Test Center located at Edwards AFB, California. This project will support the developmental testing and sustainment needs of the B-52 weapon system. Funds include cost of one Test Aircraft #60-036 Programmed Depot Maintenance (PDM) performed at Tinker AFB OK.

Costs include any analysis, documentation, and related expenses necessary to establish a program of record and support the B-52 weapon system. Additionally, other costs include PMA and centralized support and initiatives for anticipated weapon system enhancements (to include efforts to improve weapon system operational capabilities, safety, supportability, maintainability, reliability, and total cost of ownership).

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 continue aircrew safety and mission effectiveness.

Funds may be used to address emerging and short-notice Diminishing manufacturing and material shortage (DMSMS) issues.

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: B-52 AFMC Test Aircraft Asset Support	0.000	4.069	15.654	0.000	15.654
Description: B-52 Test Support provides funding for the test aircraft, manpower and facilities at the Air Force Test Center, Edwards AFB and Programmed Depot Maintenance (PDM). This will support the developmental testing and sustainment needs of the B-52.					
FY 2020 Plans: Provide funding for the test aircraft, manpower and facilities at the Air Force Test Center, Edwards AFB. This will support the developmental testing and sustainment needs of the B-52.					
FY 2021 Base Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force	Date: February 2020
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Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 671803 / <i>B-52 AFMC Test Assets</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Provide funding for the test aircraft, manpower and facilities at the Air Force Test Center, Edwards AFB. This will support the developmental testing and sustainment needs of the B-52. Increase Trainer capabilities and upgrades. <i>FY 2021 OCO Plans:</i> N/A <i>FY 2020 to FY 2021 Increase/Decrease Statement:</i> Increase due to enhancing capability of trainers.					
Accomplishments/Planned Programs Subtotals	0.000	4.069	15.654	0.000	15.654

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

N/A

Remarks

D. Acquisition Strategy

Funding sent to Edwards AFB for the test aircraft, manpower, and facilities at the Air Force Test Center located at Edwards AFB, California.

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

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 671803 / <i>B-52 AFMC Test Assets</i>
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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>AFMC Test Aircraft support</i>	
Test Support	

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

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 671803 / <i>B-52 AFMC Test Assets</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>AFMC Test Aircraft support</i>				
Test Support	1	2020	4	2025

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

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons	Project (Number/Name) 671805 / B-52 VLF/LF Modernization
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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
671805: B-52 VLF/LF Modernization	-	0.000	10.000	12.976	0.000	12.976	8.967	20.567	0.000	0.000	0.000	52.510
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Prior to FY 2020, Project 671805 B-52 VLF/LF Modernization funding is documented in Project 675039 B-52 System Improvements

A. Mission Description and Budget Item Justification

The B-52 VLF/LF Modernization integrates a receive-only, low frequency receiver and antenna subsystem to provide a secure, survivable strategic nuclear communication capability for the B-52. This project will consist of integrating an existing VLF/LF terminal into the B-52. Integration includes Group A wiring, rack and antenna, and the Group B terminal Line Replaceable Unit (LRU).

Funds may be used to address emerging and short-notice Diminishing Manufacturing and Material Shortage (DMSMS) issues. As the VLF/LF provides future communication growth to the B-52, emerging security/certification requirements (nuclear certification, cyber security, program protection, crypto modernization, etc.) as well as other aircraft upgrades (Link 16, EHF, 1760 IWBU, Mode S/Mode 5, IFF, BSB, Re-Engine, etc.) may require studies and/or support for potential impact to VLF/LF. Funds may be used to procure, test, and field terminals.

DMS efforts to include removal of end-of-life software/hardware within simulators systems and move to a modular, common open system architecture that is sustainable and cyber-resilient.

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.

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: B-52 Very Low Frequency/Low Frequency (VLF/LF)	0.000	10.000	12.976	0.000	12.976
Description: Provides secure, survivable, receive-only strategic nuclear communication for the B-52					
FY 2020 Plans: Continue EMD phase to support fielding decision. Award EMD contract FY20 2Q. Accomplish System Requirements Review (SRR) and Preliminary Design Review (PDR)					
FY 2021 Base Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force	Date: February 2020
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Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons	Project (Number/Name) 671805 / B-52 VLF/LF Modernization
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Continue EMD phase to support fielding decision. Accomplish Preliminary Design Review (PDR) and Critical Design Review (CDR).					
FY 2021 OCO Plans: N/A					
FY 2020 to FY 2021 Increase/Decrease Statement: Increase is to ramp up to EMD phase to support fielding decision.					
Accomplishments/Planned Programs Subtotals	0.000	10.000	12.976	0.000	12.976

C. Other Program Funding Summary (\$ in Millions)										
<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021 Base</u>	<u>FY 2021 OCO</u>	<u>FY 2021 Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To Complete</u>
• APAF 05 B05200: BP11 Production	0.000	0.000	0.000	-	0.000	33.523	19.497	8.065	-	Continuing

Remarks

D. Acquisition Strategy
The Milestone Decision Authority (MDA) approved the 25 January 2019 decision of the B-52 VLF/LF Acquisition Strategy Panel (ASP), which authorized the program to enter into the EMD phase with the Original Equipment Manufacturer (OEM). The program office received a proposal from the OEM on 16 August 2019. The program office plans to award an EMD contract in 2QFY20.

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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 0101113F / B-52 Squadrons	Project (Number/Name) 671805 / B-52 VLF/LF 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			
SBIR Reduction	TBD	Not specified. : TBD	-	-		-		0.456	Mar 2021	0.000		0.456	Continuing	Continuing	-
VLF/LF EMD	SS/CPFF	Various : Oklahoma, OK	-	-		6.430	Mar 2020	10.302	Jan 2021	-		10.302	Continuing	Continuing	-
Subtotal			-	-		6.430		10.758		0.000		10.758	Continuing	Continuing	N/A

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			
VLF/LF Program Office Support	Various	Various : TBD	-	-		1.515	Mar 2020	1.098	Sep 2021	0.000		1.098	Continuing	Continuing	-
VLF/LF Trainers	Allot	Not specified. : TBD	-	-		0.046	Mar 2020	0.000		-		0.000	Continuing	Continuing	-
Subtotal			-	-		1.561		1.098		0.000		1.098	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			
VLF/LF Test	PO	Not specified. : TBD	-	-		0.046	Jan 2021	0.168	Apr 2021	-		0.168	Continuing	Continuing	-
VLF/LF Cyber Security	TBD	Not specified. : TBD	-	-		0.046	Jan 2021	-		-		-	Continuing	Continuing	-
VLF/LF Certifications	TBD	Not specified. : TBD	-	-		0.046	Jan 2021	0.400	Sep 2021	0.000		0.400	Continuing	Continuing	-
Subtotal			-	-		0.138		0.568		0.000		0.568	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			
Not specified.	C/CPAF	Not specified. : TBD	-	-		-		-		-		-	Continuing	Continuing	-
A&AS, Travel, Centralized Support	Various	Various : TBD	-	-		1.871	Mar 2020	0.552	Sep 2021	0.000		0.552	Continuing	Continuing	-
Subtotal			-	-		1.871		0.552		0.000		0.552	Continuing	Continuing	N/A

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 671805 / <i>B-52 VLF/LF Modernization</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>B-52 VLF/LF Modernization</i>				
ASP	1	2019	1	2019
EMD	2	2020	3	2023
MS C	3	2023	3	2023
IOC	2	2024	2	2024
Production	4	2023	4	2025

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force										Date: February 2020		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons				Project (Number/Name) 671807 / Advanced Targeting POD Display Upgrade			
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
671807: <i>Advanced Targeting POD Display Upgrade</i>	-	0.000	5.397	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.397
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

FY19: B-52 Advanced Target POD MFCD funding is documented in Project 675039 B-52 System Improvements
 FY20: A new Project 671807 for B-52 Advanced Target POD MFCD was created
 FY21: \$11.116M was incorrectly mapped to the old Project 675039 for ATP MFCD work.

A. Mission Description and Budget Item Justification

The B-52 Advanced Targeting Pod (ATP) Multi-Functional Color Display (MFCD) project consists of a monitor upgrade with a 10 gigabyte Ethernet connection. The current targeting pod display is outdated and experiencing a historic break rate. Additionally, the current monitor does not support current and emerging video resolution improvements of the fielded Sniper and LITENING ATPs. The B-52's ATP is now capable of transmitting HD color and video at a much higher resolution than the current monochrome monitor; this upgrade will improve situational awareness and combat lethality.

Costs include any analysis, documentation, and related expenses necessary to establish a Program of Record and support the B-52 weapon system. Additionally, other costs include PMA and centralized support and initiatives for anticipated weapon system enhancements (to include efforts to improve weapon system operational capabilities, safety, supportability, maintainability, reliability, and total cost of ownership).

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 continue aircrew safety and mission effectiveness.

Funds may be used to address emerging and short-notice Diminishing manufacturing and material shortage (DMSMS) issues.

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: B-52 Advanced Target Pod Multi-Functional Color Display	0.000	5.397	0.000	0.000	0.000
Description: B-52 Advanced Targeting Pod Monitor Upgrade with 10 Gig Ethernet connection. ATPs are capable of transmitting high definition color, picture in picture video at a much higher resolution than the current monochrome ATP monitor can display. Capability increase will improve combat lethality and situational awareness.					
FY 2020 Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons	Project (Number/Name) 671807 / Advanced Targeting POD Display Upgrade

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Pre-EMD activities including ASP and requirements development for the B-52 Advanced Targeting Pod Monitor Upgrade with 10 Gig Ethernet connection. FY 2021 Base Plans: See Project 675039 for \$11.116M for ATP MFCD work that was incorrectly mapped to the old Project FY 2021 OCO Plans: N/A FY 2020 to FY 2021 Increase/Decrease Statement: Increased funding due to additional development activities for the B-52 Advanced Targeting Pod Monitor Upgrade with 10 Gig Ethernet connection and increase EMD efforts. \$11.116M currently identified in Project 675039.					
Accomplishments/Planned Programs Subtotals	0.000	5.397	0.000	0.000	0.000

C. Other Program Funding Summary (\$ in Millions)											
Line Item	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
• APAF 05 B05200: <i>Advanced Target Pod MFCD Production</i>	-	-	-	-	-	22.884	16.195	16.487	-	0.000	55.566
• APAF 06 000999: <i>Initial Spares</i>	-	-	-	-	-	-	2.229	2.269	-	0.000	4.498

Remarks

D. Acquisition Strategy
Acquisition Strategy pending approval from MOA. Anticipated 2QFY20

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Air Force												Date: February 2020				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
3600 / 7				PE 0101113F / B-52 Squadrons				671807 / Advanced Targeting POD Display Upgrade								
Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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	
Advanced Target Pod Multi-Functional Color Display Development	TBD	TBD : TBD	-	-		3.097	Nov 2020	-		-		-	Continuing	Continuing	-	
Advanced Targeting Pod LITENING OFF	SS/CPAF	Northrop Grumman : Rolling Meadows, IL	-	-		1.000	Apr 2020	-		-		-	Continuing	Continuing	-	
Advanced Targeting Pod Sniper OFF	SS/CPAF	Lockheed Martin : Orlando, FL	-	-		1.000	Apr 2020	-		-		-	Continuing	Continuing	-	
Subtotal			-	-		5.097		-		-		-	Continuing	Continuing	N/A	
Management Services (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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 Administration, Travel and Management Support	C/CPAF	AFLCMC: Tinker AFB, OK : Tinker AFB, OK	-	-		0.300	Sep 2020	-		-		-	Continuing	Continuing	-	
Subtotal			-	-		0.300		-		-		-	Continuing	Continuing	N/A	
Project Cost Totals			-	-		5.397		-		-		-	Continuing	Continuing	N/A	
Remarks																

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons	Project (Number/Name) 671807 / Advanced Targeting POD Display Upgrade

	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
ATP-MFCD																												
MDD	■																											
EMD																												
Integration Studies																												
Milestone C																												
Production																												
IOC																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 671807 / <i>Advanced Targeting POD Display Upgrade</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>ATP-MFCD</i>				
MDD	1	2019	1	2019
EMD	1	2021	1	2022
Integration Studies	2	2019	4	2020
Milestone C	1	2022	1	2022
Production	2	2022	2	2024
IOC	4	2022	4	2022

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force										Date: February 2020		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons				Project (Number/Name) 671810 / B-52 AEHF Integration			
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
671810: B-52 AEHF Integration	-	0.000	0.000	5.024	0.000	5.024	37.443	37.442	55.669	79.078	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Prior to FY 2020, Project 671810 B-52 AEHF Integration funding is documented in Project 675041 B-52 Bomber Tactical Data Link

A. Mission Description and Budget Item Justification

The B-52 Advance Extremely High Frequency (AEHF) Integration SATCOM system provides a survivable, low probability of intercept/detection, high bandwidth system that ensures secure intra/inter-flight and two-way command and control communications in the modern anti-access/aerial denial battle space. This communications upgrade replaces the Military Strategic and Tactical Relay (MILSTAR) Ultra High Frequency (UHF) SATCOM capability (MILSTAR is nearing system end of life) on the B-52. The AEHF Integration effort will integrate the radio, antenna and system components required to provide two-way EHF communication for the B-52.

Funds may be used to address emerging and short-notice Diminishing Manufacturing and Material Shortage (DMSMS) issues. As AEHF Integration provides future communication growth to the B-52, emerging security/certification requirements (nuclear certification, cyber security, program protection, crypto modernization, etc.) as well as other aircraft upgrades (Link 16, VLF/LF, 1760 IWBU, Mode S/Mode 5, IFF, BSB, CERP, etc.) may require studies and/or support for potential impact to AEHF. Funds may be used to procure, test, and field terminals.

DMS efforts to include removal of end-of-life software/hardware within simulators systems and move to a modular, common open system architecture that is sustainable and cyber-resilient. Implement requirements and standards defined under the Simulator Common Architecture Requirements and Standards (SCARS) initiative.

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.

Trainers and Upgrades for B-52 AEHF

In order to maintain currency with the latest aircraft configuration, the B-52 Systems Improvements projects will update existing trainers or use Computer-Based Training (CBT) to add any new systems improvement functionality to meet user training requirements and update/maintain the Systems Integration Lab (SIL) for the Weapon System Trainers (WSTs).

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: B-52 AEHF Integration	0.000	0.000	5.024	0.000	5.024
Description: The B-52 Advance Extremely High Frequency (AEHF) Integration SATCOM system provides a survivable, low probability of intercept/detection, high bandwidth system that ensures secure intra/inter-flight					

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force	Date: February 2020
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Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons	Project (Number/Name) 671810 / B-52 AEHF Integration
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B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
and two-way command and control communications in the modern anti-access/aerial denial battle space. This communications upgrade replaces the Military Strategic and Tactical Relay (MILSTAR) and its Ultra High Frequency (UHF) SATCOM capability (MILSTAR is nearing system end of life) on the B-52. The AEHF Integration effort will integrate the radio, antenna and system components required to provide two-way EHF communication for the B-52.					
FY 2020 Plans: see Project 675041 B-52 Bomber Tactical Data Link for FY20 work					
FY 2021 Base Plans: Ramp to risk reduction efforts					
FY 2021 OCO Plans: N/A					
FY 2020 to FY 2021 Increase/Decrease Statement: Increase due to ramp in risk reduction efforts					
Accomplishments/Planned Programs Subtotals	0.000	0.000	5.024	0.000	5.024

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

N/A

Remarks

D. Acquisition Strategy

The Milestone Decision Authority (MDA) for AEHF is AFNWC/NC and the program will utilize the B-1/B-52 Flexible Acquisition and Sustainment Contract to award studies and the Engineering, Manufacturing and Development effort to the Original Equipment Manufacturer. The OEM will be responsible for the integration of the AEHF terminal which will be provided as Government Furnished Equipment.

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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 0101113F / B-52 Squadrons	Project (Number/Name) 671810 / B-52 AEHF Integration
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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			
AEHF Development	SS/CPAF	various : various	-	-		0.000		1.000	Mar 2021	-		1.000	Continuing	Continuing	-
Risk Reduction	C/CPAF	various : various	-	-		-		3.824	Mar 2021	-		3.824	Continuing	Continuing	-
Subtotal			-	-		0.000		4.824		-		4.824	Continuing	Continuing	N/A

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			
Other Government Services	C/CPAF	Not specified. : TBD	-	-		-		0.100	Mar 2021	-		0.100	Continuing	Continuing	-
Subtotal			-	-		-		0.100		-		0.100	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			
A&AS, Travel, Support	Various	various : various	-	-		-		0.100	Mar 2021	-		0.100	Continuing	Continuing	-
Subtotal			-	-		-		0.100		-		0.100	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		-	-	0.000	5.024	-	5.024	Continuing	Continuing	N/A

Remarks

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

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons	Project (Number/Name) 671810 / B-52 AEHF Integration
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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

EMD	
EMD	
Integration Studies	
Flight Test	
Milestone C	

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

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 671810 / <i>B-52 AEHF Integration</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
EMD				
EMD	1	2020	3	2025
Integration Studies	1	2020	1	2022
Flight Test	3	2024	2	2025
Milestone C	3	2025	3	2025

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force										Date: February 2020		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons				Project (Number/Name) 675039 / B-52 System Improvements			
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
675039: B-52 System Improvements	-	77.946	12.050	11.166	0.000	11.166	0.050	0.050	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2020, PE 0101113F, B-52 Squadrons, Project 675039, B-52 System Integration efforts were transferred to PE 0101113F, B-52 Squadrons, Project 671805, B-52 VLF/LF Modernization, Project 671803, B-52 Test Support, and Project 671807 Advanced Target POD MFCD in order to provide a separate BPACs for FY19 new start effort.

In FY 2021, Project 671807 Advanced Target POD MFCD funding is shown in B-52 Squadrons, Project 675039.

Correct implementation of funding

- \$11.116M Project 671807 Advanced Target POD MFCD funding

- \$0.050M B-52 System Integration efforts

A. Mission Description and Budget Item Justification

B-52 System Improvements is a comprehensive project to facilitate future capabilities and ensure the B-52's viability in performing current and future wartime missions. The scope of work may include development of an AoA, studies and analysis, a CDD, and/or any other analysis or documentation necessary to establish a POR. Additionally, this project may include airborne integration experiments or demonstrations of emerging technologies. Support of the platform integration efforts are necessary to identify and resolve challenges associated with integrating multiple programs and activities planned for the B-52 fleet.

B-52 AMFC Test Support: The B-52 Test Support (FY19 only) project will provide funding for the test aircraft, manpower, and facilities at the Air Force Test Center located at Edwards AFB, California. This project in FY19 will support the developmental testing and sustainment needs of the B-52 weapon system.

B-52 VLF/LF Modernization: The B-52 VLF/LF Modernization integrates a receive-only, low frequency receiver and antenna subsystem to provide a secure, survivable strategic nuclear communication capability for the B-52. This project will consist of integrating an existing VLF/LF terminal into the B-52. Integration includes Group A wiring, rack and antenna, and the Group B terminal Line Replaceable Unit (LRU).

Funds may be used to address emerging and short-notice Diminishing Manufacturing and Material Shortage (DMSMS) issues. As the VLF/LF provides future communication growth to the B-52, emerging security/certification requirements (nuclear certification, cyber security, program protection, crypto modernization, etc.) as well as other aircraft upgrades (HERC (LRSO), Link 16, EHF, 1760 IWBU, Mode S/Mode 5, IFF, BSB, CERP, etc.) may require studies and/or support for potential impact to VLF/LF. Funds may be used to procure, test, and field terminals.

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force	Date: February 2020
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Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 675039 / <i>B-52 System Improvements</i>
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DMS efforts to include removal of end-of-life software/hardware within simulators systems and move to a modular, common open system architecture that is sustainable and cyber-resilient. Implement requirements and standards defined under the Simulator Common Architecture Requirements and Standards (SCARS) initiative.

B-52 Advanced Targeting Pod (ATP) Multi-Functional Color Display (MFCD)

The B-52 Advanced Targeting Pod (ATP) Multi-Functional Color Display (MFCD) project consists of a monitor upgrade with a 10 gigabyte Ethernet connection. The current targeting pod display is outdated and experiencing a historic break rate. Additionally, the current monitor does not support current and emerging video resolution improvements of the fielded Sniper and LITENING ATPs. The B-52's ATP is now capable of transmitting HD color and video at a much higher resolution than the current monochrome monitor; this upgrade will improve SA and combat lethality.

B-52 Infrared Missile Warning System - cancelled

The project will complete design, integration, and testing for overseas operations for installation on the B-52. The current missile warning system was designed in the 1970s and must be replaced to counter current and future threats.

B-52 Mission Data Recorder

Provides permanent crash survivable flight data recorder information to meet FAA and other regulatory requirements. Produces digital recordings enhancing aircrew mission reconstruction and release validation in AOR.

B-52 AFGSC Innovation Hub

Support Air Force Global Strike Command (AFGSC) A5B's efforts to take innovative approaches to B-52 modernization.

Costs include any analysis, documentation, and related expenses necessary to establish a POR and support the B-52 weapon system. Additionally, other costs include PMA and centralized support and initiatives for anticipated weapon system enhancements (to include efforts to improve weapon system operational capabilities, safety, supportability, maintainability, reliability, and total cost of ownership).

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 continue aircrew safety and mission effectiveness.

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: B-52 Systems Improvements	0.050	0.050	0.050	0.000	0.050
Description: Initiate Analysis of Alternatives, modeling, simulation, testing, and demonstration, including but not limited to: Studies of existing and planned avionics, communications/navigation, electrical, weapons, flight, and nuclear-related aircraft systems and subsystems to support the future viability of the B-52 fleet.					
FY 2020 Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force			Date: February 2020		
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons	Project (Number/Name) 675039 / B-52 System Improvements			
B. Accomplishments/Planned Programs (\$ in Millions)					
Continue Analysis of Alternatives, modeling, simulation, testing, and demonstration, including but not limited to: Studies of existing and planned avionics, communications/navigation, electrical, weapons, flight, and nuclear-related aircraft systems and subsystems to support the future viability of the B-52 fleet					
FY 2021 Base Plans: Continue Analysis of Alternatives, modeling, simulation, testing, and demonstration, including but not limited to: Studies of existing and planned avionics, communications/navigation, electrical, weapons, flight, and nuclear-related aircraft systems and subsystems to support the future viability of the B-52 fleet					
FY 2021 OCO Plans: N/A					
FY 2020 to FY 2021 Increase/Decrease Statement: Will be level FY20 to FY21 once funding put into correct BPACs (\$0.050M in FY20 vs \$0.050M in FY21).					
FY21 funding of \$11.166M consists of a. \$0.050M (Other Mods) Program code APB000 - BPAC 675039 - will remain b. \$11.116M (Advanced Targeting POD) Program Code DDV000 - BPAC 671807) - will be transferred to correct BPAC					
Title: AFMC Test Assets					
Description: B-52 AFMC Test Assets provides funding for the test aircraft, manpower and facilities at the Air Force Test Center, Edwards AFB. This will support the developmental testing and sustainment needs of the B-52 from FY19-23.					
FY 2020 Plans: N/A. Funds moved to BPAC 671803					
FY 2021 Base Plans: N/A					
FY 2021 OCO Plans: N/A					
FY 2020 to FY 2021 Increase/Decrease Statement: N/A					
Title: B-52 VLF/LF Modernization					
	17.766	0.000	0.000	0.000	0.000
	24.551	0.000	0.000	0.000	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force	Date: February 2020
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Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 675039 / <i>B-52 System Improvements</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
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<p>Description: The B-52 Very Low Frequency (VLF)/Low Frequency (LF) effort integrates a receive-only, VLF/LF receiver and antenna subsystem to provide a secure, survivable strategic nuclear communication capability for the B-52. This project will consist of integrating an existing VLF/LF terminal into the B-52. Integration includes Group A wiring, rack and antenna, and the Group B terminal Line Replaceable Unit (LRU).</p> <p>FY 2020 Plans: N/A. N/A. Funds moved to BPAC 671805</p> <p>FY 2021 Base Plans: N/A</p> <p>FY 2021 OCO Plans: N/A</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: N/A</p>					
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<p>Title: Advanced Target POD MFCD</p> <p>Description: B-52 Advanced Targeting Pod Monitor Upgrade with 10 Gig Ethernet connection. ATPs are capable of transmitting high definition color, picture in picture video at a much higher resolution than the current monochrome ATP monitor can display. Capability increase will improve combat lethality and situational awareness.</p> <p>FY 2020 Plans: Funds moved to BPAC 671807</p> <p>FY 2021 Base Plans: Begin EMD development activities for the B-52 Advanced Targeting Pod Monitor Upgrade with 10 Gig Ethernet connection. (this funding was incorrectly mapped to this Project and should be mapped to 671807).</p> <p>FY 2021 OCO Plans: N/A</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement:</p>	1.579	0.000	11.116	0.000	11.116
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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force **Date:** February 2020

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons	Project (Number/Name) 675039 / B-52 System Improvements
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
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If mapped correctly to Project 671807, the increase from FY20 (\$5.397) to FY21 (\$11.116M) for Advanced Target POD MFCF funding for additional development activities for the B-52 Advanced Targeting Pod Monitor Upgrade with 10 Gig Ethernet connection and increase EMD efforts.					
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<p>Title: Mission Data Recorder - Non Congressional Add in FY20</p> <p>Description: Data recorder design and flight testing.</p> <p>FY 2020 Plans: Continuing work related to the Mission Data Recorder to make the T-1 modification a Permanent Modification to the platform.</p> <p>FY 2021 Base Plans: N/A</p> <p>FY 2021 OCO Plans: Funding decreased from \$10M to \$0M. Projected completion of RDT&E activities.</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: N/A</p>	0.000	10.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	43.946	10.050	11.166	0.000	11.166

	FY 2019	FY 2020
<p>Congressional Add: IR Missile Warning System</p> <p>FY 2019 Accomplishments: Complete design, integration, and testing for overseas operations for installation on B-52.</p> <p>FY 2020 Plans: N/A. Program will be cancelled</p>	24.000	0.000
<p>Congressional Add: AFGSC Innovation Hub</p> <p>FY 2019 Accomplishments: N/A</p> <p>FY 2020 Plans: Support future investments such as Agile PODs, Future Comm Data Links, Hypersonic Kill Chain Research & Development</p>	0.000	2.000
<p>Congressional Add: Mission Data Recorder</p>	10.000	0.000

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

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 675039 / <i>B-52 System Improvements</i>
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	FY 2019	FY 2020
FY 2019 Accomplishments: Data recorder design and flight testing.		
FY 2020 Plans: Develop Data recorder design and flight testing.		
Congressional Adds Subtotals	34.000	2.000

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

<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u> <u>Base</u>	<u>FY 2021</u> <u>OCO</u>	<u>FY 2021</u> <u>Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• APAF 05 B052000: <i>BP11 Aircraft Procurement Low Cost Mods</i>	0.452	5.460	0.470	-	0.470	0.480	0.489	0.498	0.506	Continuing	Continuing

Remarks

D. Acquisition Strategy

Analyses of Alternatives will be conducted by various AFLCMC organizations and AFGSC.

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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 0101113F / B-52 Squadrons	Project (Number/Name) 675039 / B-52 System Improvements
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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			
System Improvements Studies and Analysis	SS/ Various	The Boeing Company, 559 SMXS/MXDPBA : Oklahoma City, OK	-	-		-		-		-		-	Continuing	Continuing	-
VLF/LF EMD - BPAC 671805	SS/CPFF	Various : Oklahoma City, OK	-	21.663	Jul 2019	-		-		-		-	Continuing	Continuing	-
Advanced Target POD MFCD - BPAC 671807	TBD	TBD : Oklahoma City, OK	-	1.579	Jun 2019	-		11.116	Jan 2021	-		11.116	Continuing	Continuing	-
AEHF Integration - BPAC 671810	TBD	TBD : Oklahoma City, OK	-	-		-		-		-		-	Continuing	Continuing	-
Low Cost Mods TBD BPAC 675057	TBD	TBD : Oklahoma City, OK	-	-		-		-		-		-	Continuing	Continuing	-
Mission Data Recorder	TBD	TBD : Oklahoma City, OK	-	10.000	Mar 2019	10.000	May 2020	-		-		-	Continuing	Continuing	-
IR Missile Warning System	C/CPAF	NA : TBD	-	24.000	Mar 2019	-		-		-		-	Continuing	Continuing	-
AFGSC Innovation Hub	C/CPAF	TBD : Barksdale, LA	-	-		2.000	Jul 2020	-		-		-	Continuing	Continuing	-
Subtotal			-	57.242		12.000		11.116		-		11.116	Continuing	Continuing	N/A

Remarks
TBD

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			
VLF/LF Program Office Support- BPAC 671805	RO	Not specified. : TBD	-	0.521	Jul 2019	-		-		-		-	Continuing	Continuing	-
VLF/LF Trainers- BPAC 671805	Allot	Not specified. : TBD	-	0.552	Jul 2019	-		-		-		-	Continuing	Continuing	-
Subtotal			-	1.073		-		-		-		-	Continuing	Continuing	N/A

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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 0101113F / B-52 Squadrons	Project (Number/Name) 675039 / B-52 System Improvements
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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			
AFMC Test Aircraft support - BPAC 671803	PO	AFTC : Edwards AFB, CA	-	17.766	Aug 2019	-		-		-		-	Continuing	Continuing	-
VLF/LF Test - BPAC 671805	PO	Not specified. : TBD	-	0.169	Jul 2019	-		-		-		-	Continuing	Continuing	-
VLF/LF Cyber Security - BPAC 671805	TBD	Not specified. : TBD	-	0.150	Jul 2019	-		-		-		-	Continuing	Continuing	-
VLF/LF Certification - BPAC 671805	TBD	Not specified. : TBD	-	0.046	Jul 2019	-		-		-		-	Continuing	Continuing	-
Subtotal			-	18.131		-		-		-		-	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			
B-52 Centralized Support, Program Management Administration, TDY, A&AS Contractor Support - 675039	Various	TBD : NV	-	0.050	Jan 2019	0.050	Mar 2020	0.050	Jan 2021	-		0.050	Continuing	Continuing	-
B-52 Centralized Support, Travel - 675039	Various	Various : TBD	-	1.450		-		-		-		-	Continuing	Continuing	-
Subtotal			-	1.500		0.050		0.050		-		0.050	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			-	77.946	12.050	11.166	-	11.166	Continuing	Continuing	N/A

Remarks

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

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 675039 / <i>B-52 System Improvements</i>
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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

Systems Improvements	
System Improvements Studies and Analysis, etc. (Began 2Q16)	
AFMC Test Aircraft support - BPAC 671803	
Test Support	
B-52 VLF/LF Modernization - BPAC 671805	
EMD	
ATP - MFCD BPAC 671807	
EMD	
IR Missile Warning System UON	
Integration and Test	
Production and Installation	
Mission Data Recorder	
Permanent Modification of Mission Data Recorder	

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

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 675039 / <i>B-52 System Improvements</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Systems Improvements</i>				
System Improvements Studies and Analysis, etc. (Began 2Q16)	1	2019	4	2025
<i>AFMC Test Aircraft support - BPAC 671803</i>				
Test Support	1	2019	4	2019
<i>B-52 VLF/LF Modernization - BPAC 671805</i>				
EMD	3	2019	4	2019
<i>ATP - MFCD BPAC 671807</i>				
EMD	3	2019	4	2019
<i>IR Missile Warning System UON</i>				
Integration and Test	1	2019	2	2019
Production and Installation	3	2019	4	2019
<i>Mission Data Recorder</i>				
Permanent Modification of Mission Data Recorder	2	2019	4	2021

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

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons	Project (Number/Name) 675041 / Bomber Tactical Data Link
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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
675041: <i>Bomber Tactical Data Link</i>	-	26.017	2.878	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	28.895
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2020, PE 0101113F, B-52 Squadrons, Project 675041, B-52 Bomber Tactical Data Link efforts were transferred to PE 0101113F, B-52 Squadrons, Project 671810, B-52 AEHF Integration in order to provide a separate BPACs for FY19 new start effort.

A. Mission Description and Budget Item Justification

The B-52 Combat Network Communications Technology (CONNECT) Capability Development Document (CDD), dated 18 March 2004, captures the requirements for a Tactical Data Link (TDL) capability on the B-52. The B-52 TDL provides low latency, jam-resistant situational awareness and C2 communications needed to support in-theater operations and missions. This project will consist of integrating an existing off-the-shelf Link 16 terminal into the B-52. Integration includes Group A wiring, rack and antennae, and the Group B terminal, blanking unit and notch filter LRUs. The TDL terminal will be fully integrated with CONNECT. This Line-of-Sight (LOS) Link 16 capability allows the warfighter to utilize this capability by maintaining situational awareness, avoiding threats, and employing an array of weapons.

Funds may be used to address emerging and short-notice DMSMS issues. As the Link-16 upgrade brings additional capability to the B-52, emerging security requirements (JRE messaging, crypto modernization, etc.) as well as other aircraft upgrades (1760 IWBW, Mode S/Mode 5, IFF, BSB updates, RMP, CERP, etc.) may require study/support for potential impact to the CONNECT and Link-16 system. Funds may also be used for Engineering Development Models (EDMs) as well as testing and fielding terminals.

DMS efforts to include removal of end-of-life software/hardware within simulators systems and move to a modular, common open system architecture that is sustainable and cyber-resilient. Additionally, implementation requirements and standards are defined under the Simulator Common Architecture Requirements and Standards (SCARS) initiative.

Funds may be used to procure, test, and field terminals. DMS efforts to include removal of end-of-life software/hardware within simulators systems and move to a modular, common open system architecture that is sustainable and cyber-resilient. Implement requirements and standards defined under the Simulator Common Architecture Requirements and Standards (SCARS) initiative. 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. In order to maintain currency with the latest aircraft configuration, the B-52 Systems Improvements projects will update existing trainers or use Computer-Based Training (CBT) to add any new systems improvement functionality to meet user training requirements and update/maintain the Systems Integration Lab (SIL) for the Weapon System Trainers (WSTs).

Funds may be used to resolve emerging safety of flight and DMS issues, accommodate technology insertion, and fulfill FAA (or other) mandates necessary to ensure continued aircrew safety and mission effectiveness.

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

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons	Project (Number/Name) 675041 / Bomber Tactical Data Link
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
N/A					
FY 2020 to FY 2021 Increase/Decrease Statement: N/A					
Accomplishments/Planned Programs Subtotals	24.567	2.878	0.000	0.000	0.000

	FY 2019	FY 2020
Congressional Add: Bomber Tactical Data Link - Congressional Add	1.450	0.000
FY 2019 Accomplishments: Completed Critical Design Review (1QFY19). Approved of new unit that will be beneficial to multiple future B-52H Communication Systems modernization programs.		
FY 2020 Plans: N/A		
Congressional Adds Subtotals	1.450	0.000

C. Other Program Funding Summary (\$ in Millions)	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
• APAF 05 Line Item B05200: BP11 Production	-	11.925	25.977	-	25.977	20.696	9.854	3.796	-	0.000	72.248
• APAF 06 000999: Initial Spares	-	2.381	2.495	-	2.495	-	-	-	-	0.000	4.876
• RDTE 07 BPAC 671810: B-52 AEHF (not including Bomber Tactical Datalink)	13.449	0.000	0.000	-	0.000	0.000	0.000	0.000	-	Continuing	Continuing

Remarks
 FY19 is only year containing both Bomber Tactical Data Link and AEHF funding.
 FY20 - only contains Bomber Tactical Data Link funding

D. Acquisition Strategy
 The Milestone Decision Authority (MDA) approved the 28 October 2016 decision of the B-52 Link-16 Acquisition Strategy Panel (ASP), which authorized the program to enter into the EMD phase with the Original Equipment Manufacturer (OEM). Once complete, the program will proceed to Milestone C and Full Rate Production.

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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 0101113F / B-52 Squadrons	Project (Number/Name) 675041 / Bomber Tactical Data Link
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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			
Link 16 EMD - Wright Patt - BPAC 675041	SS/ Various	Boeing : Oklahoma City, OK	-	6.409	Feb 2019	-		-		-		-	Continuing	Continuing	-
Subtotal			-	6.409		-		-		-		-	Continuing	Continuing	N/A

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			
Trainers - Link 16 BPAC 675041	C/CPAF	Not specified. : TBD	-	2.039	Feb 2019	2.878	Apr 2020	-		-		-	Continuing	Continuing	-
Subtotal			-	2.039		2.878		-		-		-	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			
Studies Link 16 BPAC 675041	C/CPAF	Not specified. : TBD	-	1.447	Feb 2019	-		-		-		-	Continuing	Continuing	-
Test Link 16 BPAC 675041	C/CPAF	Not specified. : TBD	-	1.207	Feb 2019	-		-		-		-	Continuing	Continuing	-
Studies AEHF Development - BPAC 671810	C/CPAF	Not specified. : TBD	-	13.404	May 2019	-		-		-		-	Continuing	Continuing	-
Subtotal			-	16.058		-		-		-		-	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			
A&AS, Travel, Centralized Support - Link 16 BPAC 675041	Various	Various : NV	-	1.466	Mar 2019	-		-		-		-	Continuing	Continuing	-

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

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 675041 / <i>Bomber Tactical Data Link</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Bomber Tactical Data Link</i>				
EMD	1	2019	4	2020
Milestone C	1	2021	1	2021
Production and Install	1	2021	3	2024
IOC	2	2022	2	2022
FOC	3	2024	3	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force										Date: February 2020		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons				Project (Number/Name) 675050 / CONECT			
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
675050: CONECT	-	6.055	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.055
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The B-52H Combat Network Communication Technology (CONECT) acquisition project supports nuclear and conventional operations by upgrading the B-52H fleet with data and voice communications capabilities along with improved threat and situational awareness to support participation in network centric operations. This CONECT modification includes procurement of 74 aircraft kits + 2 EMD kits that will be installed in conjunction with Programmed Depot Maintenance (PDM). Ground station mission planning hardware, support equipment, initial spares, and Interim Contractor Support will be procured. Additional initial support/readiness efforts will develop and upgrade B-52H training devices with CONECT functionality. The CONECT training device upgrades provide full CONECT functionality to support aircrew training. The Aircrew Training Devices (ATDs) include three B-52H Weapon System Trainers (WST) and two Offensive Station Mission Trainers (OSMT), and the upgrades will also be installed in the Systems Integration Lab (SIL). The Other Government Cost line includes, but is not limited to, Diminishing Manufacturing Sources (DMS) costs to maintain the production configuration through the identification, review and monitoring of items with high obsolescence risk potential, classification of identified items according to criticality, identification of alternatives and implementation of resolutions. Resolutions may include non-recurring engineering (NRE) and/or replacement costs for DMS components, bridge buys of DMS components until NRE can be completed or Life of Type buys, whichever is most appropriate. Included in the Support Equipment line is the planning for establishment of an organic Depot capability, stand-up of the depot, procurement of depot equipment and procurement of the CONECT ground station. Funds may be used to address emerging and short-notice Diminishing Manufacturing and Material Shortage (DMSMS) issues. DMS efforts to include removal of end-of-life software/hardware within simulators systems and move to a modular, common open system architecture that is sustainable and cyber-resilient. Implement requirements and standards defined under the Simulator Common Architecture Requirements and Standards (SCARS) initiative.

As the CONECT upgrade brings additional capability to the B-52, emerging communication and security requirements (upgrades to IBR, JRE messages, crypto modernization, etc.) and aircraft upgrades (1760 IWBU, Mode S/Mode 5 Identification, IFF, etc.) may require study for potential impacts to CONECT. In order to maintain currency with the latest aircraft configuration, the CONECT project will update existing trainers (using stimulate/simulate/computer-based training or a mix) to add CONECT functionality to meet user-training requirements, and update/maintain the SIL for the WSTs. In order to assist PDM during after-install checkout and Barksdale AFB and Minot AFB units with maintenance checkout and operational training, a CONECT ground station is being developed.

DMS efforts to include removal of end-of-life software/hardware within simulators systems and move to a modular, common open system architecture that is sustainable and cyber-resilient. Additionally, implementation requirements and standards are defined under the Simulator Common Architecture Requirements and Standards (SCARS) initiative.

Funds support Weapons System Trainers for the CONECT program.

Funds may be used to address emerging and short-notice DMSMS issues. Funds may also 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.

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons	Project (Number/Name) 675050 / CONECT

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<p>Title: B-52 CONECT</p> <p>Description: Diminishing Manufacturing Source (DMS) redesign development and test effort. Continued engineering design of CONECT capability into the B-52 training systems. Began incorporating changes required due to updates in Government Furnished Equipment (GFE) and crypto modernization requirements. Incorporated/integrated CONECT with recurring updates of the B-52 software baseline. As the CONECT upgrade brings additional capability to the B-52, emerging communication and security requirements (upgrades to the IBR, JRE messages, crypto modernization, etc.) and aircraft upgrades (1760 Internal Weapons Bay Upgrade, Mode S/Mode 5 IFF, etc.) may require study for potential impacts to CONECT. CONECT will update the existing trainers and/or use computer-based training to add CONECT functionality to meet user-training requirements, and update/maintain the System Integration Lab (SIL) and for the WST. A CONECT ground station, is required in order to assist PDM during after-install checkout, and provide Barksdale/Minot units with maintenance checkout and operational training capability.</p> <p>FY 2020 Plans: FY19 last year of RDT&E funding</p> <p>FY 2021 Base Plans: N/A</p> <p>FY 2021 OCO Plans: N/A</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: N/A</p>	6.055	0.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	6.055	0.000	0.000	0.000	0.000

C. Other Program Funding Summary (\$ in Millions)											
Line Item	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
• APAF 05 Line Item B05200: BP11 Production	23.844	13.567	0.000	-	0.000	32.790	5.671	-	-	0.000	75.872
• APAF 06 000999: Initial Spares	-	-	-	-	-	-	-	-	-	0.000	0.000
• APAF 07 Line Item B05200: Post Production Support	12.819	2.341	0.936	-	0.936	5.656	5.757	-	-	0.000	27.509

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force	Date: February 2020
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Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 675050 / <i>CONNECT</i>
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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u> <u>Base</u>	<u>FY 2021</u> <u>OCO</u>	<u>FY 2021</u> <u>Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
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Remarks

D. Acquisition Strategy

The B-52 CONECT EMD prime contract is a sole source to Boeing Defense, Space & Security (DSS) in Oklahoma City, OK. Boeing DSS designs, develops, tests and procures necessary equipment from their subcontractors; developed engineering drawings, logistic and technical data. Advanced Training Consulting is the current contractor for the trainer update to integrate CONECT into the existing trainers.

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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 0101113F / B-52 Squadrons	Project (Number/Name) 675050 / CONECT
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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			
AFTRS R3 Integration	SS/CPAF	The Boeing Company : Oklahoma City, OK	-	1.000	Dec 2018	-		-		-		-	0.000	1.000	-
CONECT Weapon Sys Trainer Update	C/Various	Aviation Training Consultants LLC : Edmond, OK	-	2.417	Feb 2019	-		-		-		-	0.000	2.417	-
Subtotal			-	3.417		-		-		-		-	0.000	3.417	N/A

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			
Product Support	Various	Not specified. : NV	-	1.138	Apr 2019	-		-		-		-	0.000	1.138	-
Subtotal			-	1.138		-		-		-		-	0.000	1.138	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			
EMD Test Jet to FRP Configuration	C/CPAF	Not specified. : TBD	-	1.500	Dec 2018	-		-		-		-	0.000	1.500	-
Subtotal			-	1.500		-		-		-		-	0.000	1.500	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			-	6.055	0.000	-	-	-	0.000	6.055	N/A

Remarks

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

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons	Project (Number/Name) 675050 / CONECT
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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

CONECT	
Weapon System Trainer (WST) Upgrade	
WST System Integration Lab (SIL) Development	
System Integration Lab Relocation	
Offensive Station Mission Trainer (OSMT) Development	
Production and Installation	
FOC	

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

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 675050 / <i>CONNECT</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
CONNECT				
Weapon System Trainer (WST) Upgrade	1	2019	4	2019
WST System Integration Lab (SIL) Development	1	2019	1	2019
System Integration Lab Relocation	1	2019	4	2019
Offensive Station Mission Trainer (OSMT) Development	2	2019	4	2019
Production and Installation	1	2019	3	2021
FOC	3	2021	3	2021

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force										Date: February 2020		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons					Project (Number/Name) 675055 / GPS-IU		
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
675055: GPS-IU	-	28.424	1.986	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	30.410
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The GPS IU Upgrade program will provide increased throughput and memory capacity by replacing the current processor, static memory, and necessary associated electronics with a newer processor, more memory, and sustainable electronic packages. This program will replace six Circuit Card Assemblies (CCA) which include combining three Circuit Cards into one Input/Output (I/O) CCA. The Backplane and Motherboard will require an upgrade to integrate the new CCAs: the Central Processing Unit / 1553, the power supply CCA, and the video graphics cards. The Input/Output CCA will combine the Discrete Inputs Analog, Audio Video (DAAV), Discrete Outputs (DOA) and Serial Busses functionality. This upgrade will improve system reliability and address Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues on subcomponents of the IU.

In addition the new GPS IU will retain the existing functions and interfaces of the legacy GPS IU, and provide additional interfaces to allow for future growth requirements: Which include two Ethernet Ports and two connectors on face-plate for future growth.

The GPS IU integrates GPS Position, Navigation and Timing (PNT) data into navigation, communications, and weapons systems on board the B-52. The GPS IU acts as a controller for a MIL-STD-1553 data bus communications path. The major areas of support include GPS interface control and monitoring, targeting pod functions, navigation displays for the Pilot and Copilot stations, and Identification Friend or Foe (IFF) control functions.

Originally developed with a 33MHz processor with 4MB of Static Random Access Memory (SRAM), the GPS IU has become overloaded as more software has been added to the B-52. Currently operating at 86% throughput capacity and at 90% memory capacity, exceeding the designated safety threshold of 95% memory load in 2019. The GPS IU is also facing parts obsolescence issues. Studies show that the current spares will be exhausted by 2020. The upgrade will improve system reliability and address Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues on subcomponents of the IU. The modified GPS IU will retain the existing functions and interfaces of the legacy GPS IU, and provide additional interfaces to allow for future growth requirements.

GPS IU requires upgrading to incorporate any other GPS dependent capabilities on the B-52 platform. B-52 fleet will have the capability to carry additional GPS dependent weapons and targeting pods, and the increased capacity to incorporate future GPS-dependent capabilities beyond 2018.

Funds may be used to address emerging and short-notice Diminishing Manufacturing and Material Shortage (DMSMS) and Development Testing (DT)/ Operational Testing(OT) issues.

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.

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

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 675055 / <i>GPS-IU</i>
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DMS efforts to include removal of end-of-life software/hardware within simulators systems and move to a modular, common open system architecture that is sustainable and cyber-resilient. Implement requirements and standards defined under the Simulator Common Architecture Requirements and Standards (SCARS) initiative.

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Global Positioning System (GPS) Interface Unit (IU)	28.424	1.986	0.000	-	0.000
Description: Global Positioning System (GPS) Interface Unit (IU) Upgrade will replace six circuit card assemblies in the GPS IU, the backplane, and the chassis.					
FY 2020 Plans: Configuration Control Board, and Technology Readiness Review					
FY 2021 Base Plans: Development/Operational Flight test. Completion of EMD, Milestone C and FRP Decision					
FY 2020 to FY 2021 Increase/Decrease Statement: Funding decreases due to ramp down of EMD effort in preparation for Production					
Accomplishments/Planned Programs Subtotals					
	28.424	1.986	0.000	-	0.000

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

<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021 Base</u>	<u>FY 2021 OCO</u>	<u>FY 2021 Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• APAF 06 Line Item	-	11.097	23.871	-	23.871	-	0.000	-	-	0.000	34.968
<i>B05200: BP11 Production</i>											
• APAF 06 000999: <i>Initial Spares</i>	-	-	-	-	-	8.052	1.543	-	-	0.000	9.595

Remarks

D. Acquisition Strategy

The GPS IU Modernization program began development in the Technology Maturation and Risk Reduction (TMRR) phase via a sole source contract to Boeing Defense, Space & Security (DSS) in Oklahoma City, OK. Development is currently in the EMD phase via a sole source contract to Boeing DSS, OKC, awarded Sep 2018. Deliverables include software, eight modernized prototypes, logistics support, ground and flight test support, and engineering drawings. MS B was approved June 2018.

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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 0101113F / B-52 Squadrons	Project (Number/Name) 675055 / GPS-IU
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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			
GPS-IU TMRR	SS/ Various	Boeing : Oklahoma City, OK	-	-		-		-		-		-	0.000	0.000	-
GPS-IU EMD Contract	SS/ Various	Boeing : Oklahoma City, OK	-	28.164	Mar 2019	-		-		-		-	0.000	28.164	-
Subtotal			-	28.164		-		-		-		-	0.000	28.164	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			
419th test	PO	Not specified. : TBD	-	-		1.986	Mar 2020	-		-		-	Continuing	Continuing	-
Subtotal			-	-		1.986		-		-		-	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, Contractor Support, Travel	Various	Various : NV	-	0.260	Oct 2018	-		-		-		-	0.000	0.260	-
Subtotal			-	0.260		-		-		-		-	0.000	0.260	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		-	28.424	1.986	-	-	-	Continuing	Continuing

Remarks

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

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons	Project (Number/Name) 675055 / GPS-IU
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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

GPS-IU	
EMD	
DT/OT	
MS C	
Production & Installs	
FOC	

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

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 675055 / <i>GPS-IU</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>GPS-IU</i>				
EMD	1	2019	4	2021
DT/OT	2	2021	3	2021
MS C	3	2021	3	2021
Production & Installs	4	2021	1	2023
FOC	1	2023	1	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force										Date: February 2020		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons					Project (Number/Name) 675056 / B-52 Radar Modernization Program (RMP)		
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
675056: B-52 Radar Modernization Program (RMP)	-	77.333	109.278	168.692	0.000	168.692	187.452	177.035	110.989	46.860	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The B-52 Radar Modernization Program (RMP) supports nuclear and conventional operations by replacing the current APQ-166 radar on the B-52H aircraft. The APQ-166 system will be increasingly difficult to sustain due to diminished manufacturing sources and obsolescent technologies; the current failure rate of the APQ-166 places long-duration missions at risk. This modernization program will encompass the radar antenna array and up to 14 individual LRUs that comprise the entire radar system. Development, production and installation of new components and systems to replace the legacy equipment; to be installed on all 76 B-52H aircraft. RMP will take advantage of advances in technology and on-going development efforts to acquire, to the maximum extent possible, previously developed Radar systems and integrate them into the B-52. The use of new technology will increase both the overall reliability of the radar system and the capabilities for new missions. This Radar Modernization Program will allow the operational command (AF Global Strike Command) to fully utilize the capabilities of the B-52H aircraft to employ an array of nuclear and conventional weapons and to perform mission-essential navigation and weather avoidance functions. In addition, applicable training devices for the new radar subsystem must also be developed, modified and/or upgraded in conjunction with the aircraft modifications.

This upgrade will affect all three Weapon System Trainers (WST), the WST Training Systems Integration Laboratory (SIL), and both B-52 Offensive Station Maintenance Trainers (OSMT). As the RMP upgrade brings additional capability to the B-52, emerging security/certification requirements (nuclear certification, cyber security, program protection, crypto modernization, etc.), increased radar integration (advanced targeting pod, mission planning, open mission systems considerations, crew vehicle interfaces and Electronic Warfare System), as well as other aircraft upgrades (e.g., Link 16, EHF, 1760 IWBU, Mode S/Mode 5, IFF, GPS/INS, BSB, Re-Engine, EWS, etc.) may impact the RMP. Funds may be used to address emerging and short-notice Diminishing Manufacturing and Material Shortage (DMSMS) issues. DMS efforts to include removal of end-of-life/obsolete software/hardware within the weapons system and simulators systems enabling a move to a modular, common open system architecture that is sustainable and cyber-resilient. Implement requirements and standards defined under the Simulator Common Architecture Requirements and Standards (SCARS) initiative may also be required. Additionally, funds may be used to resolve emerging safety of flight, accommodate technology insertion and fulfill FAA or other mandates necessary to ensure continued aircrew safety and nuclear/conventional mission effectiveness.

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Radar Modernization Program	77.333	109.278	168.692	0.000	168.692
Description: Support nuclear and conventional operations by replacing the current APQ-166 radar on the B-52H aircraft. Development and production of new systems to replace the legacy equipment and to be installed on all 76 B-52H aircraft.					

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons	Project (Number/Name) 675056 / B-52 Radar Modernization Program (RMP)

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<p><i>FY 2020 Plans:</i> Continue integration/technical design with OEM and subcontractors, leading to completion of a weapons system level Preliminary Design Review (PDR). Additionally, procure initial System Integration Laboratory (SIL) Kits and complete Milestone B and award EMD contract in 2QFY21.</p> <p><i>FY 2021 Base Plans:</i> Continue integration/technical design with OEM and subcontractors, leading to completion of a weapons system level Preliminary Design Review (PDR). Entering EMD Phase.</p> <p><i>FY 2021 OCO Plans:</i> N/A</p> <p><i>FY 2020 to FY 2021 Increase/Decrease Statement:</i> Complete RR and enter EMD Phase.</p>					
Accomplishments/Planned Programs Subtotals	77.333	109.278	168.692	0.000	168.692

C. Other Program Funding Summary (\$ in Millions)											
Line Item	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
• APAF 05 Lineltem B05200: BP11 Production	-	0.009	0.000	-	0.000	2.361	39.493	193.597	-	Continuing	Continuing
• APAF 07 Line Item B05200: Post Production Support	-	-	0.098	-	0.098	0.100	0.102	0.104	-	Continuing	Continuing
• APAF 06 000999: Initial Spares	-	0.118	0.197	-	0.197	0.200	0.204	0.208	-	Continuing	Continuing

Remarks

D. Acquisition Strategy
The Milestone Decision Authority approved the B-52 RMP Acquisition Strategy (AS) on 13 March 2018. Per the AS, the OEM completed radar and other supplier selections in June 2019. The OEM is executing ongoing contract work with the subsystem suppliers, integration, acquisition planning, and risk reduction activities leading to a system PDR by 4th Qtr FY20.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Air Force												Date: February 2020				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
3600 / 7				PE 0101113F / B-52 Squadrons				675056 / B-52 Radar Modernization Program (RMP)								
Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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	
Product Development	C/CPAF	Not specified. : TBD	-	-		-		152.358	Dec 2020	-		152.358	Continuing	Continuing	-	
Risk Reduction	TBD	Not specified. : NV	-	73.205	Jul 2019	98.723	Mar 2020	-		-		-	Continuing	Continuing	-	
Subtotal			-	73.205		98.723		152.358		-		152.358	Continuing	Continuing	N/A	
Support (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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	
Support	C/CPAF	Not specified. : TBD	-	-		1.249	Mar 2020	-		-		-	Continuing	Continuing	-	
Cyber Security Support	C/CPAF	Not specified. : TBD	-	0.732	Dec 2018	-		-		-		-	Continuing	Continuing	-	
Subtotal			-	0.732		1.249		-		-		-	Continuing	Continuing	N/A	
Test and Evaluation (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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	
Test and Evaluation	C/CPAF	Not specified. : TBD	-	-		-		1.200	Dec 2020	-		1.200	Continuing	Continuing	-	
Trainers	C/CPAF	Not specified. : TBD	-	-		-		6.000	Dec 2020	-		6.000	Continuing	Continuing	-	
Test RMP BPAC 675056	C/CPAF	Not specified. : TBD	-	0.276	Dec 2018	0.300	Mar 2020	-		-		-	Continuing	Continuing	-	
Studies RMP Development	C/CPAF	Not specified. : TBD	-	1.966	Dec 2018	0.550	Mar 2020	1.500	Dec 2020	-		1.500	Continuing	Continuing	-	
Subtotal			-	2.242		0.850		8.700		-		8.700	Continuing	Continuing	N/A	
Management Services (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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	
Management Services	C/CPAF	Not specified. : TBD	-	-		-		-		-		-	Continuing	Continuing	-	
Management Support, A&AS, PMA	Various	Not specified. : NV	-	1.154	Aug 2019	8.456	Mar 2020	7.634	Dec 2020	-		7.634	Continuing	Continuing	-	

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons	Project (Number/Name) 675056 / B-52 Radar Modernization Program (RMP)

	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>Radar Modernization Program</i>																												
Acquisition Planning	■																											
Risk Reduction	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Development Request for Proposal Release				■																								
MS B										■																		
EMD										■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Flight Testing															■	■	■	■	■	■	■	■	■	■	■	■	■	■
MS C																											■	■
Production																											■	■

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 675056 / <i>B-52 Radar Modernization Program (RMP)</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Radar Modernization Program</i>				
Acquisition Planning	1	2019	1	2019
Risk Reduction	1	2019	2	2021
Development Request for Proposal Release	4	2019	4	2019
MS B	2	2021	2	2021
EMD	2	2021	2	2025
Flight Testing	3	2022	3	2024
MS C	4	2024	4	2024
Production	2	2025	4	2025

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force										Date: February 2020		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons				Project (Number/Name) 675057 / B-52 Low Cost Improvement (LCI)			
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
675057: B-52 Low Cost Improvement (LCI)	-	2.605	2.607	2.600	0.000	2.600	2.656	2.705	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program will include projects to facilitate future B-52 capabilities. Scope of work may involve, but is not limited to, Avionics, Navigation, Situational Awareness (SA) and Defensive Systems. Additionally, develop and integrate emerging technologies for specialized B-52 missions to include Intelligence Surveillance and Reconnaissance (ISR), Targeting and Weapons. Additionally, this funding also includes future prototyping efforts.

DMS efforts to include removal of end-of-life software/hardware within simulators systems and move to a modular, common open system architecture that is sustainable and cyber-resilient. Additionally, implementation requirements and standards are defined under the Simulator Common Architecture Requirements and Standards (SCARS) initiative.

Funds may be used to address emerging and short-notice DMSMS issues. Funds may be used to resolve emerging safety of flight and DMS issues, accommodate technology insertion, and fulfill FAA (or other) mandates necessary to ensure continued aircrew safety and mission effectiveness.

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: B-52 Low Cost Improvements	2.605	2.607	2.600	0.000	2.600
Description: Develop and integrate emerging technologies for specialized B-52 missions to include ISR, targeting, and weapons. This includes performing demonstrations and experimentation of emerging and advanced technologies, as well as supporting external agency projects of the technology in a relevant environment.					
FY 2020 Plans: Develop and integrate emerging technologies for specialized B-52 missions to include ISR, targeting, and weapons. This includes performing demonstrations and experimentation of emerging and advanced technologies, as well as supporting external agency projects of the technology in a relevant environment. Perform work necessary to make the Mission Data Recorder a permanent modification on the platform.					
FY 2021 Base Plans:					

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

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons	Project (Number/Name) 675057 / B-52 Low Cost Improvement (LCI)
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B. Accomplishments/Planned Programs (\$ in Millions)

Develop and integrate emerging technologies for specialized B-52 missions to include ISR, targeting, and weapons. This includes performing demonstrations and experimentation of emerging and advanced technologies, as well as supporting external agency projects of the technology in a relevant environment.

FY 2021 OCO Plans:

N/A

FY 2020 to FY 2021 Increase/Decrease Statement:

N/A.

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<p><i>FY 2021 OCO Plans:</i> N/A</p> <p><i>FY 2020 to FY 2021 Increase/Decrease Statement:</i> N/A.</p>					
Accomplishments/Planned Programs Subtotals	2.605	2.607	2.600	0.000	2.600

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

<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021 Base</u>	<u>FY 2021 OCO</u>	<u>FY 2021 Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• APAF 05 Line item B05200: BP11 Production	2.362	2.412	2.457	-	2.457	2.508	2.553	2.600	-	Continuing	Continuing

Remarks

D. Acquisition Strategy

Studies and Analyses will be conducted by various AFLCMC organizations and AFGSC.

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons	Project (Number/Name) 675057 / B-52 Low Cost Improvement (LCI)

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

Low Cost Improvements	
Low Cost Improvements Studies and Analyses	

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 675057 / <i>B-52 Low Cost Improvement (LCI)</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Low Cost Improvements</i>				
Low Cost Improvements Studies and Analyses	2	2021	4	2025

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force										Date: February 2020		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons				Project (Number/Name) 675129 / B-52 CERP			
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
675129: B-52 CERP	-	59.717	175.359	299.402	0.000	299.402	327.518	247.373	263.986	147.772	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

B-52 CERP is a Middle Tier Section 804 program and not an MDAP.

A. Mission Description and Budget Item Justification

The B-52 Commercial Engine Replacement Program (CERP) supports nuclear and conventional operations by replacing the current TF33-PW-103 engine on the B-52H aircraft. The TF33-PW-103 engine is increasingly difficult to sustain due to diminished manufacturing sources and obsolescent technologies; the AF Propulsion Directorate projects the engine will become unsustainable by 2030. This sustainment program will replace the current TF33-PW-103 engine with jet engines of similar size, weight, and thrust characteristics. The development, production and installation of new engines and related subsystems will replace the legacy equipment on all 76 B-52H aircraft. B-52 CERP will take advantage of advances in technology and on-going development efforts to acquire engines and integrate them into the B-52. The use of new technology will increase both the overall reliability/maintainability of the propulsion system and produce additional electrical power generation capabilities for emerging requirements. The B-52 CERP will allow the operational command (AF Global Strike Command) to fully utilize the capabilities of the B-52H aircraft to employ an array of nuclear and conventional weapons while saving fuel and extending the range/loiter capabilities of the aircraft. In addition, applicable training devices for the engine throttles and engine health monitoring subsystem must also be developed, modified and/or upgraded in conjunction with the aircraft modifications. This upgrade will also require corresponding modification of the Weapon System Trainers (WST). As B-52 CERP brings additional capability to the B-52, emerging security/certification requirements (nuclear hardening, cyber security, program protection, etc.) will also need to be addressed. Several concurrent aircraft upgrades during the CERP may necessitate the construction of facilities or facility upgrades/modification. In addition, it may necessitate studies be performed to determine optimal engine installation and deployment options.

Cost includes any other analysis or documentation and related expenses necessary to establish a program of record and support the B-52 Weapon System. Cost includes Program Management Administration (PMA) costs, centralized support and initiatives for anticipated weapon system enhancements, to include efforts to improve weapon system operational capabilities, safety, supportability, maintainability, reliability, and total cost of ownership.

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.

DMS efforts to include removal of end-of-life software/hardware within simulators systems and move to a modular, common open system architecture that is sustainable and cyber-resilient. Implement requirements and standards defined under the Simulator Common Architecture Requirements and Standards (SCARS) initiative.

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: B-52 CERP	59.717	175.359	299.402	-	299.402

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

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons	Project (Number/Name) 675129 / B-52 CERP
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B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<p>Description: This sustainment program will replace the current TF33-PW-103 engine with jet engines of similar size, weight, and thrust characteristics. The development, production and installation of new engines and related subsystems will replace the legacy equipment on all 76 B-52H aircraft. B-52 CERP will take advantage of advances in technology and on-going development efforts to acquire engines and integrate them into the B-52.</p> <p>FY 2020 Plans: Moving out of System Requirements phase, Initiate Rapid Prototyping phase 1 with Boeing as the integrator. Initiate and ensure proper Source Selection process.</p> <p>FY 2021 Base Plans: Continue Rapid Prototyping phase 1. Select engine vendor. VSP Increment 1</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: Increase in approved funding needed to continue Rapid Prototype phase 1 contract and award engine vendor contract.</p>					
Accomplishments/Planned Programs Subtotals	59.717	175.359	299.402	-	299.402

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

<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021 Base</u>	<u>FY 2021 OCO</u>	<u>FY 2021 Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• APAF 05 0101113F: B-52 SQUADRONS	-	-	-	-	-	-	-	-	683.929	Continuing	Continuing

Remarks

D. Acquisition Strategy

Acquisition strategy and FY16 NDAA Section 804 authority approved Sept 2018. Completing Risk Reduction activities, and initiating Rapid Prototyping phase 1 activities.

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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 0101113F / B-52 Squadrons	Project (Number/Name) 675129 / B-52 CERP
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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			
Systems Improvements Studies and Analysis	SS/ Various	The Boeing Co : Oklahoma City, OK	-	-		-		-		-		-	Continuing	Continuing	-
Risk Reduction, Acquisition Planning, preliminary integration design and Engine Source Selection System Performance Requirements decomposition	SS/CPFF	The Boeing Co : Oklahoma City, OK	-	20.000	Dec 2018	-		-		-		-	Continuing	Continuing	-
Integration Risk Analysis via Other Transaction	C/FFP	SOSSEC Consortium : Atkinson, NH	-	29.000	May 2019	-		-		-		-	Continuing	Continuing	-
Rapid Prototyping Phase 1 Contract Award	SS/CPIF	The Boeing Co : Oklahoma City, OK	-	-		169.359	Mar 2020	113.075	Mar 2021	-		113.075	Continuing	Continuing	280.000
Engine Contract Award	C/FFP	TBD : TBD, OK	-	-		-		175.426	Mar 2021	-		175.426	Continuing	Continuing	-
Subtotal			-	49.000		169.359		288.501		-		288.501	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			
Edwards AFTC	PO	Edwards AFB : Edwards AFB	-	-		-		5.000	Oct 2020	-		5.000	Continuing	Continuing	-
Subtotal			-	-		-		5.000		-		5.000	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			
Program Management Administration, Centralized Support, A&AS support, TDY, OGC	Various	EPASS Contract for A&AS : WPAFB, OH	-	10.717	Nov 2018	6.000	Mar 2020	5.901	Oct 2020	-		5.901	Continuing	Continuing	-

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

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 675129 / <i>B-52 CERP</i>
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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>B-52 CERP</i>	
System Requirement Phase	
Virtual Power Pod Prototype	
Prototype Development Phase 1	
Virtual System Prototype Increment 1	
Prototype Development Phase 2	
Virtual System Prototype Increment 2	
Physical System Prototype 1	
Physical System Prototype 2	

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

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 675129 / <i>B-52 CERP</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>B-52 CERP</i>				
System Requirement Phase	1	2019	4	2020
Virtual Power Pod Prototype	1	2020	1	2020
Prototype Development Phase 1	2	2020	1	2022
Virtual System Prototype Increment 1	3	2021	3	2021
Prototype Development Phase 2	1	2022	4	2025
Virtual System Prototype Increment 2	2	2022	2	2022
Physical System Prototype 1	1	2025	1	2025
Physical System Prototype 2	2	2025	2	2025

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

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons	Project (Number/Name) 675160 / B-52 Crypto Modernization
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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
675160: B-52 Crypto Modernization	-	12.000	0.000	4.509	0.000	4.509	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Upgrades aircraft with Mobile User Objective System (MUOS) capable ARC-210 radio systems to prevent loss of BLOS voice and data communications capability.

Funds may be used to address emerging and short-notice Diminishing Manufacturing and Material Shortage (DMSMS) issues.

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.

DMS efforts to include removal of end-of-life software/hardware within simulators systems and move to a modular, common open system architecture that is sustainable and cyber-resilient. Implement requirements and standards defined under the Simulator Common Architecture Requirements and Standards (SCARS) initiative.

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: B-52 Crypto Modernization	-	0.000	4.509	0.000	4.509
Description: Upgrades aircraft with MUOS capable ARC-210 radio systems to prevent loss of BLOS voice and data communications capability.					
FY 2020 Plans: Continue to utilize FY19 funds to support Critical Design review (CDR). The program office is requesting additional funding through the Unfunded Requirement (UFR) process to continue the support of EMD contract, test & evaluation, and Milestone C efforts.					
FY 2021 Base Plans: Support Critical Design review (CDR). The program office is requesting additional funding through the Unfunded Requirement (UFR) process to continue the support of EMD contract, test & evaluation, and Milestone C efforts.					
FY 2021 OCO Plans: N/A					
FY 2020 to FY 2021 Increase/Decrease Statement:					

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

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons	Project (Number/Name) 675160 / B-52 Crypto Modernization
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
FY19 funding used to bridge through FY20.					
Accomplishments/Planned Programs Subtotals	-	0.000	4.509	0.000	4.509

	FY 2019	FY 2020
Congressional Add: B-52 Crypto Modernization Congressional Add	12.000	-
FY 2019 Accomplishments: The program office awarded a contract to the OEM on 20 December 2018. The program office completed Software Requirements Review (SRR) and Preliminary Design Review (PDR) during FY19.		
Congressional Adds Subtotals	12.000	-

C. Other Program Funding Summary (\$ in Millions)						Cost To					
<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021 Base</u>	<u>FY 2021 OCO</u>	<u>FY 2021 Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Complete</u>	<u>Total Cost</u>
• APAF 05 Line item B05200: BP11 Production	-	0.000	0.000	-	0.000	3.485	2.397	-	-	0.000	5.882

Remarks
Combined Acquisition Strategy (AS) and AS Panel conducted Dec 2017 and approved Jan 2018. Initial POE submitted / approved Apr 2018. EMD contract awarded Dec 2018

D. Acquisition Strategy
The Milestone Decision Authority (MDA) approved the 31 January 2018 decision of the B-52 Crypto Modernization Acquisition Strategy Panel (ASP), which authorized the program to enter into the EMD phase with the Original Equipment Manufacturer (OEM). The program office awarded a contract to the OEM on 20 December 2018. EMD efforts are underway and scheduled to be complete by FY23. Once complete, the program office will brief the updated ASP and Milestone C for full rate production and fielding for approval from the MDA.

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

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / B-52 Squadrons	Project (Number/Name) 675160 / B-52 Crypto Modernization
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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>Crypto Modernization</i>	
Risk Reduction Activities	
EMD	
MS C	
IOC	
Production and Installation	

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

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0101113F / <i>B-52 Squadrons</i>	Project (Number/Name) 675160 / <i>B-52 Crypto Modernization</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Crypto Modernization</i>				
Risk Reduction Activities	1	2019	2	2019
EMD	1	2019	4	2022
MS C	1	2023	1	2023
IOC	4	2023	4	2023
Production and Installation	1	2023	2	2025