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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Air Force **Date:** March 2023

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 0401119F / <i>C-5 Airlift Squadrons (IF)</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	-	16.998	3.100	29.502	0.000	29.502	33.612	51.848	52.909	54.823	Continuing	Continuing
671307: <i>C-5 REPLACE MULTIFUNCT CONTROL AND DISPLAY (RMCD)</i>	-	16.998	3.100	26.502	0.000	26.502	32.742	32.867	0.000	0.000	0.000	112.209
671308: <i>C-5 Modernization Efforts</i>	-	0.000	0.000	3.000	0.000	3.000	0.870	18.981	52.909	54.823	Continuing	Continuing

Note
 This program, BA 7, PE 0401119F, project , Next Generation Airlift (NGAL), is a new start.

A. Mission Description and Budget Item Justification

The C-5M carries outsized and heavy cargo (tanks, helicopters, etc.) between main operating bases. Additionally, the aircraft is capable of carrying 73 troops and 36 standard 463-L pallets. There are 52 C-5 aircraft in the Air Force fleet. The fleet was delivered to the Air Force between 1969 and 1989. Initial service life for the aircraft was 30,000 flight hours. Service life is extended out to 2040 as a result of the reliability enhancement and re-engining program (RERP) modification.

C-5M RDT&E efforts are split into two main lines of effort: Project 671307 is the C-5M Replace Multi-functional Controls and Display (RMCD) program, a modification to mitigate the obsolescence of the current control and display units. Project 671308 has two major thrusts: one line for Next Generation Airlift (NGAL) Capability Studies; the other develops future solutions for needed upgrades to combat obsolescence, safety of flight, and reliability/availability/maintainability issues.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver C-5 Modernization capability. The use of such programs funds would be in addition to the civilian pay expenses budgeted in program element 0605827F, 0605828F, 0605829F, 0605831F, 0605832F, 0605833F, 0605898F, 0606398F. In FY 2022, \$0.000 million was expended for civilian pay expenses in this program element, and in FY 2023 \$0.000 million is forecast for civilian pay expenses in this program element.

Funding will provide for program management & administration, studies and analysis, risk reduction efforts, Advisory and Assistance Services, change orders, and other government costs such as travel, directorate support, Government Furnished Equipment (GFE), and over and above costs. Funding may also be used to fund studies and analysis for address Diminishing Manufacturing Sources (DMS) or new family of system aircraft concepts.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

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B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	17.507	6.100	0.000	0.000	0.000
Current President's Budget	16.998	3.100	29.502	0.000	29.502
Total Adjustments	-0.509	-3.000	29.502	0.000	29.502
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-3.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.509	0.000			
• Other Adjustments	0.000	0.000	29.502	0.000	29.502

Change Summary Explanation

FY 2023 funding was reduced by \$3.000 million for a Congressional Directed Reduction due to "integration contract delays".

FY 2024 funding was increased by \$29.502 million to support RMCD modification efforts and NGAL developmental activities.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force										Date: March 2023		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0401119F / C-5 Airlift Squadrons (IF)				Project (Number/Name) 671307 / C-5 REPLACE MULTIFUNCT CONTROL AND DISPLAY (RMCD)			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
671307: C-5 REPLACE MULTIFUNCT CONTROL AND DISPLAY (RMCD)	-	16.998	3.100	26.502	0.000	26.502	32.742	32.867	0.000	0.000	0.000	112.209
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The C-5M Replace Multi-functional Controls and Display (RMCD) program is a modification to mitigate the obsolescence of the current control and display units. The RMCD program is also a comprehensive effort to ensure appropriate RMCD Line Replaceable Units (LRU) are developed and installed on the C-5M allowing aircraft operation in accordance with civil airspace access mandates for both US National Airspace System (NAS) and international civil airspace.

This effort centers on modifying the current display units to support legacy inputs and integration of new system capabilities with margin for growth by upgrading displays power solution. Use of mixed displays (current and new) is not permissible due to obsolescence and human factors considerations.

This modification may include software development, data, cyber security, testing, installation, spares, Systems Integration Lab (SIL), prototypes, and other program support activities. Funding may be used to address Diminishing Manufacturing Sources (DMS). The modification helps to maintain aircraft availability as the new multi-functional controls and displays replaces the current controls and displays. Funding supports studies and analysis, risk reduction efforts, Advisory and Assistance Services (A&AS), program support costs, change orders, and other government costs such as travel, directorate support, government furnished equipment (GFE), and over and above costs.

Current RMCD funding required for development activities through FY26. RMCD experienced delays during integration of monitors with existing aircraft software that required purchase and incorporation of Lockheed Martin proprietary software. Initial procurement funds not required until FY 2026.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver C-5 Modernization capability. The use of such programs funds would be in addition to the civilian pay expenses budgeted in program element 0605827F, 0605828F, 0605829F, 0605831F, 0605832F, 0605833F, 0605898F, 0606398F. In FY 2022 \$0.000 million was expended for civilian pay expenses in this program element, and in FY 2023 \$0.000 million is forecast for civilian pay expenses in this program element

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

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: C-5 Replace Multi-Functional Controls and Display	16.998	3.100	26.502	0.000	26.502
Description: Replace Multi-Functional Controls and Display will enable the C-5M to achieve wartime mission requirements by maintaining fleet availability (mission capable rate).					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0401119F / C-5 Airlift Squadrons (IF)	Project (Number/Name) 671307 / C-5 REPLACE MULTIFUNCT CONTROL AND DISPLAY (RMCD)

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p><i>FY 2023 Plans:</i> Continue EMD activity options and continue hardware development to deliver Engineering Units for Displays and Graphics Processor Units.</p> <p><i>FY 2024 Base Plans:</i> Ramp up of EMD activities to include but not limited to software development, data, cyber security, testing, installation, spares, Systems Integration Lab (SIL), prototypes, and other program support activities. and continuing hardware and engineering development activities to deliver Engineering Units for Displays and Graphics Processor Units.</p> <p><i>FY 2024 OCO Plans:</i> N/A</p> <p><i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> Funding increased due to ramp up of EMD activities to include but not limited to software integration, testing, and contractor development support.</p>					
Accomplishments/Planned Programs Subtotals	16.998	3.100	26.502	0.000	26.502

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• APAF 05 Line Item C00500: C-5 Mods	16.827	17.533	27.637	-	27.637	53.821	33.481	34.243	33.843	38.980	256.365
• APAF 06 Line Item C00500: Initial Spares	0.000	1.269	2.053	-	2.053	3.167	0.000	0.000	0.000	0.000	6.489
• APAF 05 Line Item C00500 (2)...: Training PE 0401897F	7.848	3.633	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	11.481
• APAF 07 Line Item C00500: Post Production Support	0.000	18.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	18.000

Remarks

D. Acquisition Strategy
Program Acquisition Strategy Panel (ASP) approved program's acquisition strategy on 4 Apr 20. This strategy approved executing an Other Transaction Authority (OTA) contract to procure proof of concept hardware for test/analysis, award a Sole Source EMD contract to Lockheed Martin Aerospace for system software and hardware

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0401119F / C-5 Airlift Squadrons (IF)	Project (Number/Name) 671307 / C-5 REPLACE MULTIFUNCT CONTROL AND DISPLAY (RMCD)
<p>tech insertion, system integration, data management, systems engineering, logistics, test and training to modify 2 aircraft. At completion of EMD, the program would move into Milestone C for LRIP and production to follow.</p> <p>Delta ASP #1 to add risk reduction for hardware development and contractor software development oversight/metrics to use Agile development processes approved 08 Oct 20.</p> <p>Delta ASP #2 to exercise OT Hardware Amendment 1 approved 17 Dec 21.</p> <p>Delta ASP #3 approved 12 May 22 to align EMD contractor requirements based on limited funding in FY23/24 and to update software development strategy.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Air Force **Date:** March 2023

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0401119F / C-5 Airlift Squadrons (IF)	Project (Number/Name) 671307 / C-5 REPLACE MULTIFUNCT CONTROL AND DISPLAY (RMCD)
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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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			
Integration Contract	SS/CPPIF	Lockheed Martin : Marietta, GA	-	1.441	Sep 2022	-		15.559	Jan 2024	-		15.559	Continuing	Continuing	-
Phase 0 / Integration Contract	SS/CPPIF	Lockheed Martin : Marietta, GA	-	10.136	Jun 2022	3.100	Mar 2023	0.000	Jun 2024	-		0.000	Continuing	Continuing	-
Other Transaction Authority (OTA)	SS/FP	SOSSEC, Inc : Salem, NH	-	3.918	Sep 2022	-		4.985	Jan 2024	-		4.985	Continuing	Continuing	-
Subtotal			-	15.495		3.100		20.544		-		20.544	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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			
PSC-OGCs	Various	WPAFB/RobinsAFB : TBD	-	0.470	Aug 2022	-		2.542	Apr 2024	-		2.542	Continuing	Continuing	-
Subtotal			-	0.470		-		2.542		-		2.542	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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			
Contractor Test	PO	AFLCMC/WLS : Robins AFB, GA	-	1.008	May 2022	-		2.200	Jan 2024	-		2.200	Continuing	Continuing	-
SIL	MIPR	AFMC 578 SWES/ MXDPAA : Robins AFB, GA	-	0.025	Jul 2022	-		1.216	Jan 2024	-		1.216	Continuing	Continuing	-
Subtotal			-	1.033		-		3.416		-		3.416	Continuing	Continuing	N/A

			Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	16.998	3.100	26.502	-	26.502	Continuing	Continuing	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0401119F / C-5 Airlift Squadrons (IF)	Project (Number/Name) 671307 / C-5 REPLACE MULTIFUNCT CONTROL AND DISPLAY (RMCD)

FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
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

Replace Multi-Functional Control & Display	
OTA H/W Contract Award	
Milestone B	
Phase 0 / Integration Contract	
PDR	
EMD	
SIL Testing	
CDR	
Developmental Test	
Milestone C	
IOC	

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0401119F / C-5 Airlift Squadrons (IF)	Project (Number/Name) 671307 / C-5 REPLACE MULTIFUNCT CONTROL AND DISPLAY (RMCD)

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Replace Multi-Functional Control & Display</i>				
OTA H/W Contract Award	2	2022	1	2025
Milestone B	2	2023	2	2023
Phase 0 / Integration Contract	3	2022	4	2026
PDR	2	2023	2	2023
EMD	3	2023	4	2026
SIL Testing	4	2024	3	2025
CDR	2	2024	2	2024
Developmental Test	1	2026	3	2026
Milestone C	4	2026	4	2026
IOC	1	2028	1	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force										Date: March 2023		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0401119F / C-5 Airlift Squadrons (IF)				Project (Number/Name) 671308 / C-5 Modernization Efforts			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
671308: C-5 Modernization Efforts	-	0.000	0.000	3.000	0.000	3.000	0.870	18.981	52.909	54.823	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 7, PE 0401119F, project , Next Generation Airlift (NGAL), is a new start.

A. Mission Description and Budget Item Justification

This funding line is designed to support aircraft Research, Development, Test & Evaluation (RDT&E) efforts including, but not limited to: studies and analyses, risk reduction efforts, Advisory and Assistance Services (A&AS), program support costs, change orders, and other government costs such as travel, directorate support, government furnished equipment (GFE), and over and above costs. Types of activities supported will include software development, data, cyber security, testing, installation, spares, Systems Integration Lab (SIL), prototypes, and other program support activities.

Funding in FY24 supports initial capability studies for a concept preliminarily termed the Next Generation Airlift (NGAL) that will determine requirements and technologies available to support a next generation airlift family of systems. A Capabilities Based Assessment (CBA) is the first step required prior to Analysis of Alternative (AoA) and Initial Capabilities Document (ICD) which are required for ACAT I programs. The CBA will consider which family of systems to integrate to accomplish rapid cargo delivery, survivability, and connectivity to assure Joint partner delivery in contested environments.

All funds allocated to this BPAC in FY25-28 are dedicated to C-5 modernization efforts which will be prioritized in accordance with AMC processes. These efforts may include Mobile User Objective System (MUOS) Antenna upgrades, Second Generation Anti-Jam Tactical UHF Radio for NATO (SATURN), and viability improvement initiatives.

This program element may include necessary emergent or unanticipated civilian pay expenses required to manage, execute, and deliver emergent or unanticipated weapon system capability. In FY 2022 \$0.000M and in FY 2023 \$0.000M was expended for civilian pay expenses in this program element.

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

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Next Generation Airlift (NGAL)	-	0.000	3.000	0.000	3.000
Description: Initial Study of Capabilities					
FY 2023 Plans: N/A					
FY 2024 Base Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force	Date: March 2023
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Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0401119F / C-5 Airlift Squadrons (IF)	Project (Number/Name) 671308 / C-5 Modernization Efforts
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Funding supports initial capability studies for the Next Generation Airlift (NGAL). FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: Funding increased due to ramp up of studies and analyses to determine the operational requirements for the NGAL.					
Accomplishments/Planned Programs Subtotals	-	0.000	3.000	0.000	3.000

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

N/A

Remarks

D. Acquisition Strategy

Funding in FY 2024 supports initial study of capabilities required and technologies available to support a next generation airlift family of systems. A Capabilities Based Assessment (CBA) is the first step required prior to Analysis of Alternative (AoA) and Initial Capabilities Document (ICD) which are required for ACAT I programs. The CBA will consider which family of systems to integrate for rapid deliver cargo, survivability, and connectivity to assure Joint partner delivery in contested environment.

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Air Force **Date:** March 2023

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0401119F / C-5 Airlift Squadrons (IF)	Project (Number/Name) 671308 / C-5 Modernization Efforts
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	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	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

Next Generation Airlift	
Studies & Analysis	[REDACTED]

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0401119F / C-5 Airlift Squadrons (IF)	Project (Number/Name) 671308 / C-5 Modernization Efforts

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Next Generation Airlift				
Studies & Analysis	3	2024	2	2025