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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2023 Air Force **Date:** April 2022

<b>Appropriation/Budget Activity</b> 3600: <i>Research, Development, Test &amp; Evaluation, Air Force I BA 5: System Development &amp; Demonstration (SDD)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0207701F / <i>Full Combat Mission Training</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	9.060	12.064	3.028	0.000	3.028	7.597	7.740	7.903	8.078	Continuing	Continuing
655012: <i>Full Combat Mission Training</i>	-	9.060	12.064	3.028	0.000	3.028	7.597	7.740	7.903	8.078	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

Full Combat Mission Training (FCMT) supports Air Force Distributed Mission Operations (DMO) and Live-Virtual-Constructive (LVC) integration. FCMT funding provides research in areas benefiting the DMO/LVC environment as a whole; provides research and development to facilitate integration of fielded and newly acquired, Air Force owned training devices into DMO/LVC networks; enhances the quality of training for the systems added to the network; enables aircrews to network with LVC components to form the integrated DMO battlespace; links geographically distributed high-fidelity combat and combat support training devices including Command and Control and Intelligence, Surveillance, and Reconnaissance systems and develops, demonstrates and inserts Multi-Level Security (MLS) capability. This capability enables warfighters to exercise and train at the operational and strategic levels of war as well as conduct networked unit-level training at home station.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver weapon system 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 FY21 \$0.0M was expended for civilian pay expenses in this program element, and in FY22 \$0.0M is forecasted for civilian pay expenses in this program element.

This program is in Budget Activity 5, System Development and Demonstration (SDD) because it has passed Milestone B approval and is conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full rate production.

<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>
Previous President's Budget	9.405	7.064	0.000	0.000	0.000
Current President's Budget	9.060	12.064	3.028	0.000	3.028
Total Adjustments	-0.345	5.000	3.028	0.000	3.028
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	5.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.345	0.000			
• Other Adjustments	0.000	0.000	3.028	0.000	3.028

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**Appropriation/Budget Activity**  
 3600: *Research, Development, Test & Evaluation, Air Force I BA 5: System Development & Demonstration (SDD)*

**R-1 Program Element (Number/Name)**  
 PE 0207701F / *Full Combat Mission Training*

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

**Project:** 655012: *Full Combat Mission Training*

Congressional Add: *Airborne Augmented Reality for Pilot Training*

Congressional Add Subtotals for Project: 655012

Congressional Add Totals for all Projects

FY 2021	FY 2022
0.000	5.000
0.000	5.000
0.000	5.000

**Change Summary Explanation**

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY 2023 cannot be made in a relevant manner.

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Air Force										<b>Date:</b> April 2022		
<b>Appropriation/Budget Activity</b> 3600 / 5					<b>R-1 Program Element (Number/Name)</b> PE 0207701F / Full Combat Mission Training				<b>Project (Number/Name)</b> 655012 / Full Combat Mission Training			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>FY 2026</b>	<b>FY 2027</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
655012: Full Combat Mission Training	-	9.060	12.064	3.028	0.000	3.028	7.597	7.740	7.903	8.078	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

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This program element may include necessary civilian pay expenses required to manage, execute, and deliver weapon system 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 FY21 \$0.0M was expended for civilian pay expenses in this program element, and in FY22 \$0.0M is forecasted for civilian pay expenses in this program element.

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

	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023</b>
<b>Title:</b> Cross Domain Solutions (CDS)	1.534	1.458	0.980
<b>Description:</b> Development, demonstration, and insertion of Multi-Level Security (MLS) capability supporting Live Virtual Constructive training for fifth generation platforms.			
<b>FY 2022 Plans:</b> Continue encrypted data integration for Cross Domain Solutions (CDS) supporting Augmented Reality Virtual Reality (AR VR) and trainer technology insertion for fifth generation aircraft platforms.			
<b>FY 2023 Plans:</b> Deliver F-35 Cross Domain Solutions (CDS) to demonstrate/validate/update 4th to 5th gen integrated secure training. Establish relevant Operational Test and Training Infrastructure efforts supporting Live, Virtual, and Constructive (LVC) test and training for fifth generation aircraft.			
<b>FY 2022 to FY 2023 Increase/Decrease Statement:</b>			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Air Force		<b>Date:</b> April 2022		
<b>Appropriation/Budget Activity</b> 3600 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0207701F / Full Combat Mission Training	<b>Project (Number/Name)</b> 655012 / Full Combat Mission Training		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023</b>
Funding decreased due to nearing completion of evaluation and assessment of Cross Domain Solutions.				
<p><b>Title:</b> Distributed Mission Operations Development</p> <p><b>Description:</b> Development, demonstrations, studies and insertions of Live Virtual Constructive related technologies and proficiency based continuation training strategies.</p> <p><b>FY 2022 Plans:</b> Demonstrate common learning/scenario management capabilities in local unit and larger scale events. Begin creation/modifications of standards to support learning managed readiness. Create standards-based specifications for integrating innovative technologies.</p> <p><b>FY 2023 Plans:</b> Complete enhanced analytics for local unit and larger distributed events. Demonstrate learning management and scenario capabilities for proficiency-based training with Joint Synthetic Environment/Effects Based Simulation.</p> <p><b>FY 2022 to FY 2023 Increase/Decrease Statement:</b> Funding decreased due to reducing support studies and enhanced analytics for Distributed Mission Operations and Live Virtual Constructive training.</p>		4.132	2.980	0.803
<p><b>Title:</b> Development and validation of Live Virtual Constructive assessment tools.</p> <p><b>Description:</b> Studies to assess and validate Live Virtual Constructive (LVC) training and accreditation of portions of this process; studies to develop objective enhancement and measurement tools for the LVC environment.</p> <p><b>FY 2022 Plans:</b> Continue development and field test of LVC environment assessment tools. Evaluate readiness tracking database integration for routine use in ops. Complete initial evaluations of readiness data integration with current readiness reporting Systems of Record. Begin encrypted range data integration for warfighter and complete field evaluation and refinement of LVC environment assessment tool and metrics.</p> <p><b>FY 2023 Plans:</b> Complete validation of training environment assessments for an identified set of ACC Virtual and Constructive environments. Continue readiness metrics and tracking tools refinement to measure training proficiency gained during live, virtual, constructive events. Begin development of secure cloud-based readiness data tracking, storage and retrieval for training.</p> <p><b>FY 2022 to FY 2023 Increase/Decrease Statement:</b></p>		2.044	1.525	0.620

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Air Force		<b>Date:</b> April 2022		
<b>Appropriation/Budget Activity</b> 3600 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0207701F / Full Combat Mission Training	<b>Project (Number/Name)</b> 655012 / Full Combat Mission Training		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023</b>
Funding decreased due to nearing completion of initial assessment of Live Virtual Constructive tools.				
<b>Title:</b> Network Studies		1.350	1.101	0.625
<b>Description:</b> Research and development to provide for the integration of fielded and newly introduced, Air Force, Joint and Coalition high-fidelity flight and mission trainers.				
<b>FY 2022 Plans:</b> Continue development and evaluation of data specifications that enable more rapid, higher fidelity constructive modeling in Distributed Mission Operations (DMO). Continue development and evaluation of lower cost simulation environments to augment training, rehearsal and exercise at local units and at larger event locations. Continue solution analyses for peer fight gaps identified in field training and exercise environment evaluations. Complete AR VR database development for AR VR applications. Complete learning management tools evaluations and make recommendations for alternatives for fuller integration. Complete initial data specifications for rapid model development and integration.				
<b>FY 2023 Plans:</b> Begin integration and evaluation of a proficiency-based learning ecosystem for Combat Air Force (CAF) future training. Begin alignment of CAF proficiency based training capabilities with Air Education and Training Command (AETC) Pilot Training Transformation. Continue development and evaluation of tools to create contested effects in local and distributed training events. Continue creation and evaluation of GOTS/COTS lightweight simulators for deployable training. Complete development and fielding of Augmented Reality Virtual Reality technology and tools repository for maintenance and tactical training.				
<b>FY 2022 to FY 2023 Increase/Decrease Statement:</b> Funding decreased due to finalizing initial studies for development of specifications for Live Virtual Constructive training.				
<b>Accomplishments/Planned Programs Subtotals</b>		9.060	7.064	3.028
		<b>FY 2021</b>	<b>FY 2022</b>	
<b>Congressional Add:</b> Airborne Augmented Reality for Pilot Training		0.000	5.000	
<b>FY 2021 Accomplishments:</b> N/A				
<b>FY 2022 Plans:</b> Develop capability and airborne augmented reality technology for pilot training.				
<b>Congressional Adds Subtotals</b>		0.000	5.000	
<b>C. Other Program Funding Summary (\$ in Millions)</b>				
N/A				

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Air Force		<b>Date:</b> April 2022
<b>Appropriation/Budget Activity</b> 3600 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0207701F / <i>Full Combat Mission Training</i>	<b>Project (Number/Name)</b> 655012 / <i>Full Combat Mission Training</i>

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

**Remarks**

**D. Acquisition Strategy**

Air Force Research Laboratory (AFRL) will conduct research/studies to develop/implement Cross Domain Solutions (CDS) supporting Live Virtual Constructive (LVC) training. Fielded and projected Air Force flight and mission training systems without LVC capability will be modified to ensure training compatibility.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
3600 / 5				PE 0207701F / Full Combat Mission Training				655012 / Full Combat Mission Training							
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
Augmented Reality Development	TBD	Air Force Research Lab : WPAFB, OH	-	-		5.000	Jan 2023	-		-		-	Continuing	Continuing	-
<b>Subtotal</b>			-	-		5.000		-		-		-	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
Cross Domain Solutions (CDS): Development, Testing and insertion of Multi-Level-Security protocols, Cross Domain rule set development and accreditation	Various	Air Force Research Lab, 711 Human Performance Wing, Human : Dayton, OH	-	1.534	Jan 2021	1.458	Jan 2022	0.980	Jan 2023	-		0.980	Continuing	Continuing	-
Develop DMO Capabilities: demonstration, studies and insertion of distributed mission ops related technologies and proficiency based continuation training	Various	Air Force Research Lab, 711 Human Performance Wing : Dayton, OH	-	4.132	Jan 2021	2.980	Jan 2022	0.803	Jan 2023	-		0.803	Continuing	Continuing	-
Validation of warfighter seasoning and development of objective performance enhancements for DMO/ LVC environment	Various	Air Force Research Lab, 711 Human Performance Wing : Dayton, OH	-	2.044	Jan 2021	1.525	Jan 2022	0.620	Jan 2023	-		0.620	Continuing	Continuing	-
Other Network Studies: Supporting integration of newly fielded high-fidelity training systems and networks	Various	Air Force Research Lab, 711 Human Performance Wing : Dayton, OH	-	1.350	Jan 2021	1.101	Jan 2022	0.625	Jan 2023	-		0.625	Continuing	Continuing	-
<b>Subtotal</b>			-	9.060		7.064		3.028		-		3.028	Continuing	Continuing	N/A



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<b>Exhibit R-4, RDT&amp;E Schedule Profile: PB 2023 Air Force</b>		<b>Date:</b> April 2022
<b>Appropriation/Budget Activity</b> 3600 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0207701F / Full Combat Mission Training	<b>Project (Number/Name)</b> 655012 / Full Combat Mission Training

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<b>Full Combat Mission Training</b>																												
Develop Multi-Level Security testbed and support testing on 5th Gen systems																												
Develop 4th to 5th generation rule sets for coalition integration																												
Develop metrics for routine proficiency evaluations and determine standard format for storing/analyzing proficiency data																												
Create and evaluate alternative data formats for routinely tracking and storing performance and proficiency data																												
Refine learning managed scenario and integrate with LVC events																												
Develop and integrate After Action Review tools for Mission Training Centers																												
Develop metrics and tools to measure training proficiency gained during LVC events / standardize implementation at Distributed Training Centers (DTCs)																												
Conduct interoperability studies to evaluate the training value of 5th generation interoperable coalition training on the Combat Air Forces (CAF) DMO network																												
Develop joint and coalition data standards and evaluate data management methods to support LVC events																												
Demonstrate persistent performance measurement and readiness assessment in fourth to 5th generation LVC events																												

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**Exhibit R-4, RDT&E Schedule Profile:** PB 2023 Air Force **Date:** April 2022

<b>Appropriation/Budget Activity</b> 3600 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0207701F / Full Combat Mission Training	<b>Project (Number/Name)</b> 655012 / Full Combat Mission Training
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	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	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
Develop gateways and CDS to integrate high-fidelity trainers with Air Force, joint, and coalition networks																												
Evaluate compressed DIS network standards for CDS in DMO																												
Integrate and evaluate multi-domain operations and kill-chain training scenarios for contested environments																												
Evaluate multi-national mission planning and debrief technologies in research training events																												
Implement, evaluate, and field technologies aligned with future training strategies for LVC																												
Develop specifications for live data harvesting using encrypted systems and tools																												
Update Five Eyes (FVEY) rule sets for full 4th, 5th and autonomous tactical employment training																												
Create Secure LVC testbed environment for kill chain and JADC2 ops training via DMO																												
<b>Augmented Reality Development</b>																												
Release Request For Proposal (RFP)																												
Award Development Contract																												
Begin initial design and development efforts																												

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2023 Air Force		<b>Date:</b> April 2022
<b>Appropriation/Budget Activity</b> 3600 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0207701F / <i>Full Combat Mission Training</i>	<b>Project (Number/Name)</b> 655012 / <i>Full Combat Mission Training</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b><i>Full Combat Mission Training</i></b>				
Develop Multi-Level Security testbed and support testing on 5th Gen systems	1	2021	2	2022
Develop 4th to 5th generation rule sets for coalition integration	1	2021	2	2022
Develop metrics for routine proficiency evaluations and determine standard format for storing/analyzing proficiency data	1	2021	2	2022
Create and evaluate alternative data formats for routinely tracking and storing performance and proficiency data	1	2021	2	2022
Refine learning managed scenario and integrate with LVC events	1	2021	1	2025
Develop and integrate After Action Review tools for Mission Training Centers	1	2021	2	2025
Develop metrics and tools to measure training proficiency gained during LVC events / standardize implementation at Distributed Training Centers (DTCs)	1	2021	4	2023
Conduct interoperability studies to evaluate the training value of 5th generation interoperable coalition training on the Combat Air Forces (CAF) DMO network	1	2021	4	2022
Develop joint and coalition data standards and evaluate data management methods to support LVC events	1	2021	3	2023
Demonstrate persistent performance measurement and readiness assessment in fourth to 5th generation LVC events	1	2021	3	2026
Develop gateways and CDS to integrate high-fidelity trainers with Air Force, joint, and coalition networks	1	2021	1	2024
Evaluate compressed DIS network standards for CDS in DMO	1	2021	3	2025
Integrate and evaluate multi-domain operations and kill-chain training scenarios for contested environments	1	2021	2	2024
Evaluate multi-national mission planning and debrief technologies in research training events	1	2021	4	2024

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**Exhibit R-4A, RDT&E Schedule Details:** PB 2023 Air Force **Date:** April 2022

<b>Appropriation/Budget Activity</b> 3600 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0207701F / Full Combat Mission Training	<b>Project (Number/Name)</b> 655012 / Full Combat Mission Training
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Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Implement, evaluate, and field technologies aligned with future training strategies for LVC	1	2021	2	2025
Develop specifications for live data harvesting using encrypted systems and tools	2	2023	4	2026
Update Five Eyes (FVEY) rule sets for full 4th, 5th and autonomous tactical employment training	4	2024	4	2026
Create Secure LVC testbed environment for kill chain and JADC2 ops training via DMO	3	2022	2	2026
<b>Augmented Reality Development</b>				
Release Request For Proposal (RFP)	3	2022	3	2022
Award Development Contract	2	2023	2	2023
Begin initial design and development efforts	2	2023	2	2024