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

Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
3600: <i>Research, Development, Test & Evaluation, Air Force I BA 5: System Development & Demonstration (SDD)</i>					PE 0207701F / <i>Full Combat Mission Training</i>							
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	-	0.978	9.797	9.422	0.000	9.422	6.999	7.125	7.252	7.386	Continuing	Continuing
655012: <i>Full Combat Mission Training</i>	-	0.978	9.797	9.422	0.000	9.422	6.999	7.125	7.252	7.386	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. DMO is an operational readiness initiative enabling the USAF to exercise and train at the operational and strategic levels of war while facilitating unit-level training. FCMT funding provides research in areas benefiting the AF 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. Develops, demonstrates and inserts multi-level security capability. This capability allows the warfighters at home station to exercise and train at the operational and strategic levels of war as well as conduct networked unit-level training.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver Full Combat Mission Training capabilities. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605831F.

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

B. Program Change Summary (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	1.015	9.797	9.846	0.000	9.846
Current President's Budget	0.978	9.797	9.422	0.000	9.422
Total Adjustments	-0.037	0.000	-0.424	0.000	-0.424
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• 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	-0.037	0.000			
• Other Adjustments	0.000	0.000	-0.424	0.000	-0.424

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force										Date: February 2020		
Appropriation/Budget Activity 3600 / 5					R-1 Program Element (Number/Name) PE 0207701F / Full Combat Mission Training				Project (Number/Name) 655012 / Full Combat Mission Training			
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
655012: Full Combat Mission Training	-	0.978	9.797	9.422	0.000	9.422	6.999	7.125	7.252	7.386	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

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

	FY 2019	FY 2020	FY 2021
Title: FCMT Cross Domain Solutions (CDS)	0.234	1.714	1.638
Description: Development, demonstration, and insertion of multi-level security (MLS) capability.			
FY 2020 Plans:			
- Continue accreditation for coalition rule sets			
- Continue fourth to fifth generation MLS rule development for routine LVC environment integration			
- Evaluate and assess commercial and government off-the-shelf cross domain solution devices			
- Develop updates for cross domain rule sets			
- Validate CDS at upgraded classification/program levels with local Air Force Research Laboratory space boundary			
FY 2021 Plans:			
Continues capability development efforts and testing of multi-level security rule-set development to add multi-domain command and control capability to the synthetic training environment.			
FY 2020 to FY 2021 Increase/Decrease Statement:			
Funding decrease FY20 to FY21 is due to economic adjustments.			
Title: FCMT Develop DMO Capabilities	0.270	4.594	4.381

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020	FY 2021
<p>Description: Development, demonstrations, studies and insertions of DMO/LVC related technologies and proficiency based continuation training strategies.</p> <p>FY 2020 Plans:</p> <ul style="list-style-type: none"> - Continue validation and accreditation of integrated scenarios and syllabi across DMO environments at a high fidelity to demonstrate persistent performance measurement and readiness assessment in 4th to 5th generation LVC events, and evaluate integration of different data management and tracking methods to support large scale, secure and persistent Joint and Coalition LVC events - Validate MTC code upgrades in testbeds with operators - Bring advanced research training testbeds up to higher classification levels to commence full on fighter integration (F-16, F-22, and F-35) and accomplish accreditations at higher classification and program levels - Develop joint and collation data standards and evaluate data management methods to support LVC events <p>FY 2021 Plans:</p> <p>Continues RDT&E efforts to leverage capability of the Joint Synthetic Environment (JSE) to develop proficiency evaluations and determine standard format(s) for storing/analyzing proficiency data. Continue to refine learning managed scenario(s) and integrate with LVC events.</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement:</p> <p>Funding decrease FY20 to FY21 is due to economic adjustments.</p>				
<p>Title: FCMT Validation of warfighter seasoning and development of objective performance enhancements</p> <p>Description: Studies to assess and validate warfighter seasoning in continuation training and accreditation of portions of this process; studies to develop objective enhancement and measurement tools for the DMO/LVC environment.</p> <p>FY 2020 Plans:</p> <ul style="list-style-type: none"> - Continue research and development for the integration of F-35, Joint and Coalition Trainers into the CAF DMO network - Continue interoperability studies to evaluate the training value of fifth generation interoperable coalition training on the CAF DMO network - Continue the validation of rule sets for the LVC environment and evaluate network architectures and typologies for distributed secure LVC events out across joint and coalition players - Continue to develop metrics and tools to measure training proficiency gained during LVC events <p>FY 2021 Plans:</p>		0.291	2.104	2.048

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020	FY 2021
Continue development of joint and coalition data standards and evaluate data management methods to support LVC events. Accelerates F-35 integration at the Virtual Test & Training Center (VTTC) to achieve coalition and joint training capability objectives. FY 2020 to FY 2021 Increase/Decrease Statement: Funding decrease FY20 to FY21 is due to economic adjustments.				
Title: FCMT Other Network Studies Description: Research and development to provide for the integration of fielded and newly introduced, Air Force, Joint and Coalition high-fidelity flight and mission trainers. FY 2020 Plans: - Demonstrate integration of F-35, Joint and Coalition Trainers into the CAF DMO network - Conclude interoperability studies to evaluate the training value of fifth generation interoperable coalition training on the CAF DMO network - Continue development of common Joint and Coalition data standards for secure, interoperable training at joint and coalition levels of analysis - Continue demonstrations of persistent performance measurement and readiness assessment in fourth to fifth generation LVC events - Continue development of gateways and CDS to integrate high-fidelity trainers with Air Force, joint, and coalition networks FY 2021 Plans: Supports essential RDT&E efforts to integrate enterprise models (weather, terrain, threats, etc....) and common computer generated forces to achieve level 4 training capability at Distributed Training Centers (DTCs). FY 2020 to FY 2021 Increase/Decrease Statement: Funding decrease FY20 to FY21 is due to economic adjustments.		0.183	1.385	1.355
Accomplishments/Planned Programs Subtotals		0.978	9.797	9.422
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				

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D. Acquisition Strategy

Each platform joining the DMO/LVC environment selects its own acquisition strategy based on Using Command needs, Economic Analysis, and the magnitude of the training system changes required to provide DMO capability. The initial systems in the DMO/LVC environment; F-15C/E, Airborne Warning and Control System, and F-16 Block 40/50, all required new training systems. Additionally, the Operations and Integration capability was created. The Training Simulation Service (TSS) acquisition strategy was used to meet a portion of these requirements. In the TSS approach, the contractor owns and provides the simulator equipment, maintains simulator concurrency with weapon systems, and has incentives to keep the equipment up to date with simulator and network technologies. Currently fielded and projected Air Force-owned Flight and Mission Training Systems without DMO/LVC capability will be modified using FCMT funds to ensure compatibility with the DMO/LVC environment. To accomplish this, the Air Force Research Laboratory will conduct research/studies to Develop/implement CDS, develop DMO capabilities, validate warfighter seasoning, develop objective performance enhancements, and conduct other network studies.

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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 / 5				PE 0207701F / Full Combat Mission Training				655012 / Full Combat Mission Training							
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	-	-		-		-		-		-	Continuing	Continuing	-
FCMT 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	-	0.234	Jan 2019	1.714	Jan 2020	1.639	Jan 2021	-		1.639	Continuing	Continuing	-
FCMT 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	-	0.270	Jan 2019	4.594	Jan 2020	4.380	Jan 2021	-		4.380	Continuing	Continuing	-
FCMT 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	-	0.291	Jan 2019	2.104	Jan 2020	2.048	Jan 2021	-		2.048	Continuing	Continuing	-
FCMT Other Network Studies: Research and Development to support integration of newly fielded high-fidelity training systems and networks	Various	Air Force Research Lab, 711 Human Performance Wing : Dayton, OH	-	0.183	Jan 2019	1.385	Jan 2020	1.355	Jan 2021	-		1.355	Continuing	Continuing	-
Subtotal			-	0.978		9.797		9.422		-		9.422	Continuing	Continuing	N/A
Project Cost Totals			-	0.978		9.797		9.422		-		9.422	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 / 5	R-1 Program Element (Number/Name) PE 0207701F / <i>Full Combat Mission Training</i>	Project (Number/Name) 655012 / <i>Full Combat Mission Training</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Full Combat Mission Training				
Develop Multi-Level Security testbed and support testing on 5th Gen systems	2	2020	2	2022
Develop 4th to 5th generation rule sets for coalition integration	1	2019	4	2020
Evaluate and assess commercial and government off-the-shelf cross domain solution devices	1	2019	2	2020
Perform accreditation for cross domain solution rule sets	2	2020	3	2022
Develop rule sets for routine LVC environment integration	2	2020	2	2022
Continue to develop CDS rule sets	1	2019	1	2020
Integrate scenarios and syllabi across DMO environments	1	2019	1	2019
Develop metrics for routine proficiency evaluations and determine standard format for storing/analyzing proficiency data	1	2019	2	2021
Create and evaluate alternative data formats for routinely tracking and storing performance and proficiency data	3	2019	3	2021
Refine learning managed scenario and integrate with live, virtual, constructive events	3	2019	4	2023
Validate training environment credibility assessments for an identified set of Air Combat Command Virtual and Constructive Environments	3	2019	3	2020
Develop and integrate After Action Review tools for Mission Training Centers	1	2020	2	2025
Develop metrics and tools to measure training proficiency gained during LVC events / standardize implementation at Distributed Training Centers (DTCs)	2	2019	4	2022
Integrate 5th generation systems into DMO network	1	2020	4	2022
Conduct interoperability studies to evaluate the training value of fifth generation interoperable coalition training on the CAF DMO network	1	2020	4	2022
Develop joint and coalition data standards and evaluate data management methods to support live, virtual, and constructive events	1	2020	4	2024

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

Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0207701F / Full Combat Mission Training	Project (Number/Name) 655012 / Full Combat Mission Training
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Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Evaluation of the integration of different data management and tracking methods to support large scale, secure and persistent Joint and Coalition LVC events.	2	2019	3	2020
Demonstrate persistent performance measurement and readiness assessment in fourth to fifth generation LVC events	3	2020	2	2025
Evaluate network architectures and typologies for distributed secure LVC events	1	2019	2	2020
Develop gateways and cross domain solutions to integrate high-fidelity trainers with Air Force, joint, and coalition networks	3	2020	1	2024
Evaluate compressed DIS network standards for CDS in DMO	1	2019	3	2024
Integrate and evaluate multi-domain operations and kill-chain training scenarios for contested environments	3	2020	2	2024
Evaluate multi-national mission planning and debrief technologies in research training events	4	2020	4	2024
Implement, evaluate, and field technologies aligned with future training strategies for LVC	2	2020	4	2025