Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force										Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force I* BA 7: *Operational Systems Development*						**R-1 Program Element (Number/Name)** PE 0207605F *I Wargaming and Simulation Centers*					

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	12.369	6.141	4.316	0.000	4.316	6.365	7.660	7.391	6.734	Continuing	Continuing
672888: *Distributed Mission Operations Center (DMOC)*	-	12.369	6.141	4.316	0.000	4.316	6.365	7.660	7.391	6.734	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Distributed Mission Operations Center (DMOC) - The DMOC provides comprehensive Live, Synthetic, and Blended (LSB) simulation capabilities which prepare warfighters to conduct dominant operations in air, land, sea, space, and cyber domains for theater-level, full spectrum combat training for Air Force, joint service, and coalition partners. The DMOC training capabilities reach 31 geographically separated Live, Virtual, and Constructive (LVC) locations across 17 time zones representing such assets as real-world weapon systems, operator-in-the-loop, and constructive or computer-driven simulations. It is responsible for development and integration of scenarios, models, and databases and the integration of participating sites into Virtual Flag (VF) training events via numerous network connections, DMOC-developed interoperability tools, and controlled interfaces in support of Air Force, joint, and coalition warfighter readiness. In addition, activities include Distributed Mission Operations (DMO) technology and capability studies/analyses which support both current and future program planning and execution by:

1. Distributed Mission Operations Capability/Battlespace Systems Development: The DMOC upgrades and enhances the capabilities of various systems, tools, and simulators to incorporate ever-changing technology and emerging training requirements into DMO events, such as Virtual Flag (VF) and Coalition VF (CVF), to enhance the quality of warfighter training. Activities include Environment Generator development, DMO Tool Development, and Simulator Enhancement. DMOC is in partnership with the US Naval Air Warfare Center-Aircraft Division (NAWCAD) to enhance the capabilities of the Next Generation Threat System (NGTS). The NGTS is the primary environment generator for both Blue and Red Air in DMOC White Force. DMO Tool development includes: a) DMOC Replay Tool (DRT) facilitates a more complete mission review and debrief capability of the exercises as more sites and systems are added to events; b) enhancement & improvement of the Distributed Interactive Simulation (DIS) Filter and the Doctor-J (Dr. J) tools to enable tactical datalinks to be communicated and translated between disparate simulator and operationally fielded (i.e. live aircraft) communication formats; c) Development of Intelligence, Surveillance, and Reconnaissance (ISR)/Battle Damage Assessment (BDA) to improve damage state models used by intelligence analysts in exercises; and d) development of solutions for integrating Contested Degraded Operations (geographical and communications jamming) into DMO events; and simulator enhancement efforts to incorporate Mission Package standards upgrades into the Control and Reporting Center (CRC) Simulation Package (CSP) to allow a real-world system to be used as a simulator when needed in DMO events.

2. Assessment & Authorization (A&A)/Software Certification: The DMOC supports cybersecurity requirements definition, integration/test support, analysis, systems engineering support, A&A of core systems, and support software certification. The DMOC implements cybersecurity requirements and is working towards the application of the Risk Management Framework (RMF) and Continuous Monitoring. Efforts include Cross-Domain Information Sharing / Multi-national Information Sharing (CDIS/ MNIS) ruleset development, load sharing, and testing; integration and testing of various newly developed / updated systems such as the DMOC Replay Tool, Dr. J, DIS Filter, and the DMOC Battlespace; and support of Air Force Network Integration Center (AFNIC) software certification.

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Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force I* BA 7: *Operational Systems Development*		**R-1 Program Element (Number/Name)** PE 0207605F *I Wargaming and Simulation Centers*

3. Distributed Training Sites & Systems Integration: DMOC integrates up to 30 geographically separated LVC training locations and 50+ systems into LSB DMO training events such as VF and CVF by resolving interoperability issues between disparate systems and networks so that all exercise participants can interact in the DMO environment. New sites and systems are incorporated into LSB DMO events each year based on higher headquarters and Combatant Commander's (CCDRs) emerging requirements.

The FY 2020 funding request was reduced by $1.940 million to account for the availability of prior year execution balances.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	12.839	6.141	6.256	0.000	6.256
Current President's Budget	12.369	6.141	4.316	0.000	4.316
Total Adjustments	-0.470	0.000	-1.940	0.000	-1.940
• 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	0.000	0.000			
• Other Adjustments	-0.470	0.000	-1.940	0.000	-1.940

Change Summary Explanation

The FY 2020 funding request was reduced by $1.940 million to account for the availability of prior year execution balances due to under-execution.

C. Accomplishments/Planned Programs ($ in Millions)

	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Distributed Mission Operations (DMO) Capability / Battlespace Systems Development	4.548	4.589	2.931	0.000	2.931
Description: Simulation software/hardware development in support of users conducting RDT&E, mission rehearsal, and concepts of operation development.					

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force I* BA 7: *Operational Systems Development*		**R-1 Program Element (Number/Name)** PE 0207605F *I Wargaming and Simulation Centers*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
FY 2019 Plans: - Continue DMO tool enhancements - Continue DMOC/NAWCAD Partnership: Enhance NGTS source code to implement future Air Force DMO requirements, Develop/Install DMOC customized NGTS 3.2.1 - Continue to explore, improve, and execute the plan for battlespace virtualization - Provide support to Virtual Test and Training Center (VTTC) at Nellis AFB as needed to provide interoperability, integration, and testing of high end advanced training and tactics capabilities - Fully complete Win 10/RHEL 6 conversion and necessary software/DMO tool testing. **FY 2020 Base Plans:** - Will continue DMO tool enhancements - Will continue DMOC/NAWCAD Partnership: Enhance NGTS source code to implement future Air Force DMO requirements, Develop/Install future versions of DMOC customized NGTS - Will continue to explore, improve, and execute the plan for battlespace virtualization and DMO tools - Will provide support to Virtual Test and Training Center (VTTC) at Nellis AFB as needed to provide interoperability, integration, and testing of high end advanced training and tactics capabilities - Will prepare readiness posture for emerging technologies and cybersecurity measures. **FY 2020 OCO Plans:** None **FY 2019 to FY 2020 Increase/Decrease Statement:** Normal contract inflation					
Title: Assessment and Authorization (A&A)/Software Certification **Description:** Support requirements definition, integration test support, scenario development, analysis, systems engineering support, and Certification and Accreditation (C&A) and Networthiness of core systems. Implement requirements of Cybersecurity, Risk Management Framework, and Continuous Monitoring. **FY 2019 Plans:** - Continue testing for the following Assessment and Authorization activities: -- Obtain final ATO from HAF/A3 for Battlespace	0.505	0.514	0.328	0.000	0.328

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force				Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force I* BA 7: *Operational Systems Development*			**R-1 Program Element (Number/Name)** PE 0207605F *I Wargaming and Simulation Centers*		

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
-- Maintain ATO for Jumper Room with accompanying SSP modifications for even-driven needs - Continue to assess DMOC software for AFNIC E/APL process viability and test accordingly - Continue support of CVF and RED KITE with CDIS ruleset development, testing, and implementation ***FY 2020 Base Plans:*** - Will continue testing for the following Assessment and Authorization activities: -- Maintain ATO from HAF/A3 for Battlespace -- Maintain ATO for Jumper Room with accompanying SSP modifications for even-driven needs - Will continue to assess DMOC software for AFNIC E/APL process viability and test accordingly - Will provide A&A support for virtualization effort - Will continue support of CVF and RED KITE with CDIS ruleset development, testing, and implementation. ***FY 2020 OCO Plans:*** None ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Normal Contract Inflation					
Title: Distributed Training Sites and Systems Integration ***Description:*** Establish distributed training site system integration and interoperability between DMOC, operational units, and modeling & simulation facilities. ***FY 2019 Plans:*** - Continue the development of LVC concepts in support of VF/CVF/RF integration efforts - Continue to support/leverage/collaborate DMOC efforts with Virtual Test and Training Center at Nellis to enable a high end advanced testing and tactics (HEAT2) capability - Continue to support emerging higher headquarters/CCDR requirements - Continue Virtual-into-Live integration and testing with NTTR/VTTC/RF - Expand Jumper Room support to CJCS events - Expand current practice of distributed training to include White Force personnel at the DTOC - Integrate two additional MSAT (RPA) systems into the Battlespace - Upgrade MJAT/MSAT software to allow coalition participation - Integrate 2 PUMST (Army RPA) into the Battlespace for valuable joint RPA training	1.018	1.038	1.057	0.000	1.057

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force			Date: February 2019		
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force I* BA 7: *Operational Systems Development*			**R-1 Program Element (Number/Name)** PE 0207605F *I Wargaming and Simulation Centers*		

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
- Add additional site connections to Joint RPA sites ***FY 2020 Base Plans:*** - Will continue the development of LVC concepts in support of VF/CVF/RF integration efforts - Will continue to support/leverage/collaborate DMOC efforts with Virtual Test and Training Center at Nellis to enable a high end advanced testing and tactics (HEAT2) capability - Will continue to support emerging higher headquarters/CCDR requirements - Will continue Virtual-into-Live integration and testing with NTTR/VTTC/RF - Will expand Jumper Room support to CJCS events - Will expand current practice of distributed training - Will establish NMON connection for use in joint training exercises ***FY 2020 OCO Plans:*** None ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Normal Contract Inflation					
Title: Air, Space and Cyberspace Collaborative Environment - Information Operations Suite (ACE-IOS) *Description:* Air, Space and Cyberspace Collaborative Environment - Information Operations Suite (ACE-IOS) provides the authoritative representation of Air Force information operations. ACE-IOS is comprised of models that support training and mission rehearsal for the Air Force, Joint Task Force commanders, and Combatant Commander's battle staffs during Joint and Service exercises and experimentations. ***FY 2019 Plans:*** N/A ***FY 2020 Base Plans:*** N/A ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding decreased due to under-execution in FY 2019	6.298	0.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	12.369	6.141	4.316	0.000	4.316

Exhibit R-2, **RDT&E Budget Item Justification:** PB 2020 Air Force	**Date:** February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0207605F *I Wargaming and Simulation Centers*

D. Other Program Funding Summary ($ in Millions)

 N/A

Remarks

 N/A

E. Acquisition Strategy

 Distributed Mission Operations Center (DMOC):

 The DMOC supports AF/Joint/Coalition DMO and the Joint National Training Capability (JNTC) through the development and integration of DMO training and test events, networks, scenarios, and databases. Due to evolving modeling & simulation technology, the DMOC is an on-going, evolutionary effort to keep pace with those changes by continuously developing/upgrading DMO environment generators, systems, and tools and ensuring integration/interoperability of new systems into DMO to provide the best warfighter training possible.

 DMOC has the following two primary contracts that manage the acquisition, development, testing, and integration of DMO standards, training, modeling and simulation, cross-domain information sharing testbed, and exercises on AF/Joint/Coalition DMO networks. Additionally, Military Interdepartmental Purchase Requests (MIPRs) are sent to other external organizations (i.e. NAWCAD and DMOC-S) to fund development of DMO tools that support DMOC efforts.

 Infrastructure, Development, and Engineering (IDE) Contract: Develops/upgrades various DMOC tools, systems, and simulators that are needed to conduct DMO training events. Develops, implements, and tests technical solutions for the integration of sites/systems into VF, CVF, and other DMO events. IDE is a firm-fixed-price contract.

 Command and Control Technical Support Contract (C2TSC): Supports government by assisting with development of technical requirements for upgrades to various systems and tools that will be developed by the IDE contractor and then performs acceptance testing of the those products. Develops requirements for site/system integration of sites/systems into VF, CVF, and other DMO events. C2TSC is a firm-fixed-price contract. The current C2TSC is scheduled to end on 25 Mar 19 with a follow-on contract scheduled to start on 26 Mar 19.

F. Performance Metrics

 Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force													Date: February 2019	
Appropriation/Budget Activity 3600 / 7						R-1 Program Element (Number/Name) PE 0207605F / Wargaming and Simulation Centers						Project (Number/Name) 672888 / Distributed Mission Operations Center (DMOC)		

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Distributed Mission Operations (DMO) Capability / Battlespace Systems Development, Certification & Accreditation (C&A) and Networthiness, and Distributed Training Sites& Systems Integration	C/FFP	General Dynamics IT : Kirtland AFB, NM	-	4.201	Jan 2018	3.643	Jan 2019	2.640	Jan 2020	-		2.640	Continuing	Continuing	17.662
NAWCAD NGTS Development	MIPR	NAWCAD : Patuxent River, MD	-	0.375	Nov 2017	0.375	Nov 2018	0.375	Nov 2019	-		0.375	Continuing	Continuing	-
ACE-IOS	C/T&M	CACI, Inc : Lackland AFB, TX	-	5.723	Dec 2017	-		-		-		-	Continuing	Continuing	50.665
Subtotal			-	10.299		4.018		3.015		-		3.015	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Technical requirements development, integration/ acceptance testing, and engineering support	C/FFP	Alpha-Omega : Kirtland AFB, NM	-	1.020	Jul 2018	-		-		-		-	Continuing	Continuing	8.442
Follow-on requirements development, integration/ acceptance testing, and engineering support	C/FFP	TBD : Kirtland AFB, NM	-	0.000		1.866	Mar 2019	1.040	Mar 2020	-		1.040	Continuing	Continuing	9.614
Subtotal			-	1.020		1.866		1.040		-		1.040	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force													Date: February 2019	
Appropriation/Budget Activity 3600 I 7				R-1 Program Element (Number/Name) PE 0207605F I Wargaming and Simulation Centers							Project (Number/Name) 672888 I Distributed Mission Operations Center (DMOC)			

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DMOC Program Management Office Support	Various	705 CTS : Kirtland AFB, NM	-	0.259	Oct 2017	0.257	Oct 2018	0.261	Oct 2019	0.000		0.261	Continuing	Continuing	-
ACE-IOS Program Management Office Support	Various	90 COS : Lackland AFC, TX	-	0.791	Oct 2017	-		-		-		-	Continuing	Continuing	-
Subtotal			-	1.050		0.257		0.261		0.000		0.261	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	12.369		6.141		4.316		0.000		4.316	Continuing	Continuing	N/A

Remarks

Exhibit R-4, **RDT&E Schedule Profile:** PB 2020 Air Force		**Date:** February 2019
Appropriation/Budget Activity 3600 *I* 7	**R-1 Program Element (Number/Name)** PE 0207605F *I Wargaming and Simulation Centers*	**Project (Number/Name)** 672888 *I Distributed Mission Operations Center (DMOC)*

	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	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
DMO																												
DMO Capability / Battlespace Systems Development																												
Virtual Flag (VF)																												
Virtual Flag / Coalition Virtual Flag exercises																												
ACE-IOS																												
ACE-IOS Version 5.0.19																												

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 *I* 7	**R-1 Program Element (Number/Name)** PE 0207605F *I Wargaming and Simulation Centers*	**Project (Number/Name)** 672888 *I Distributed Mission Operations Center (DMOC)*

Schedule Details

Events by Sub Project	Start		End	
	Quarter	**Year**	**Quarter**	**Year**
DMO				
DMO Capability / Battlespace Systems Development	1	2018	4	2024
Virtual Flag (VF)				
Virtual Flag / Coalition Virtual Flag exercises	1	2018	4	2024
ACE-IOS				
ACE-IOS Version 5.0.19	1	2018	4	2018