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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force										Date: May 2017		
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0207601F I USAF Modeling and Simulation							
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	20.358	16.666	10.175	0.000	10.175	10.341	10.533	10.716	10.936	Continuing	Continuing
674567: M&S Foundations	-	11.215	5.676	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
675135: Warfighter Readiness	-	9.143	10.990	10.175	0.000	10.175	10.341	10.533	10.716	10.936	Continuing	Continuing

## Note

In FY 2018, PE 0207601F, USAF Modeling and Simulation, Project 674567, M&S Foundations (MSF) efforts were transferred to PE 0207605F, Wargaming and Simulation Centers, Project 672888, Distributed Mission Operations Center (DMOC), in order to support the Air, Space, and Cyberspace Constructive Environment - Information Operations Suite (ACE-IOS).

## A. Mission Description and Budget Item Justification

United States Air Force (USAF) Modeling and Simulation (M&S) Program Element (PE) is broken into two thrust areas: Modeling and Simulation Foundations, and Warfighter Readiness. It directly supports USAF, Joint and Coalition composite training and rehearsal, concept development, and acquisition and testing through modeling and simulation development as well as the integration of these across and within Live, Virtual, and Constructive (LVC) environments. This program focuses on support of Department of Defense (DoD) Training Transformation (T2). It allows the authoritative portrayal of new and emerging USAF capabilities within DoD and coalition LVC environments; as well as reciprocating capabilities within USAF LVC environments.

LVC environments today are used as the most cost effective and practical means to meet mission needs. In support of the DoD T2 initiative, USAF M&S program thrust areas develop and modernize models and simulations that are the constructive backbone of USAF and joint training and rehearsal. Once these models and simulations are developed, they are integrated across training LVC environments for use by Major and Combatant Commands. This development and integration is imperative to ensure that air, space, and cyberspace training and mission rehearsal activities are supported with realistic, interoperable, and readily available tools, data, and services. These, in turn, enable joint, coalition, and interagency training required to prepare forces for combat by generating the air and space picture for the Air and Space Operations Center (AOC), Joint Force Air Component Commander (JFACC), and Joint Force Commander in combat exercises; training over 100,000 personnel per year in exercises (e.g., Ulchi Freedom Guardian, Red & Blue Flags, Unified Endeavor, etc). These programs also provide the current foundational environment that enables warfighters to interact with high-fidelity tactical cockpit simulators, which replicate high demand/low density platforms that are often unavailable for training due to real-world operations; while simultaneously linking it to warfighters using their current command and control systems 1,000 miles away and the constructive simulations being run from key operational wargaming and simulation centers worldwide.

USAF M&S is integral to inter-agency Homeland Defense (HLD) exercises chartered to train combat units tasked to protect the Homeland. This generates equipment and manpower efficiencies by using simulations which reduce fuel consumption, aircraft wear and tear, and manpower costs. In support of the DoD drive to improve the effectiveness and efficiency of its enterprise-wide acquisition business processes, the USAF M&S Program Element develops and supports enhancements to models, simulations, tools, and the LVC infrastructure to provide for system-of-systems M&S capabilities across the lifecycle, reduce developmental costs, and minimize risks.

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<b>Appropriation/Budget Activity</b> 3600: <i>Research, Development, Test &amp; Evaluation, Air Force I BA 7: Operational Systems Development</i>	<b>R-1 Program Element (Number/Name)</b> PE 0207601F / <i>USAF Modeling and Simulation</i>
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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>B. Program Change Summary (\$ in Millions)</b>	<b><u>FY 2016</u></b>	<b><u>FY 2017</u></b>	<b><u>FY 2018 Base</u></b>	<b><u>FY 2018 OCO</u></b>	<b><u>FY 2018 Total</u></b>
Previous President's Budget	24.945	16.666	16.877	0.000	16.877
Current President's Budget	20.358	16.666	10.175	0.000	10.175
Total Adjustments	-4.587	0.000	-6.702	0.000	-6.702
• 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	-3.988	0.000			
• SBIR/STTR Transfer	-0.599	0.000			
• Other Adjustments	0.000	0.000	-6.702	0.000	-6.702

**Change Summary Explanation**

FY16: Reduction of \$3.988 million reprogrammed for higher Air Force priorities.

FY18: Reduction of \$6.702 million to PE 0207605F, Wargaming and Simulation Centers for Distributed Mission Operations Center (DMOC).

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0207601F / USAF Modeling and Simulation				Project (Number/Name) 674567 / M&S Foundations			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
674567: M&S Foundations	-	11.215	5.676	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
Note												
In FY 2018, PE 0207601F, USAF Modeling and Simulation, Project 674567, (MSF) efforts were transferred to PE 0207605F, Wargaming and Simulation Centers, Project 672888, DMOC, in order to support ACE-IOS.												
A. Mission Description and Budget Item Justification												
MSF focuses on integrating foundational capabilities needed to improve the usefulness of M&S capabilities derived from the Warfighter Readiness (WR) thrust. The efforts supporting the MSF thrust include both concept exploration and development.												
MSF provides the capability to rapidly and efficiently create realistic and accurate synthetic operational battlespaces to support the full spectrum of activities associated with concept development to acquisition and testing through composite training and mission rehearsal.												
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 Commands (COMD) battle staffs during Joint and Service exercises and experimentations.												
Simulation and Analysis Facility (SIMAF) focuses on fostering M&S tools, data, and infrastructure to enable high confidence acquisition of capabilities to support the joint warfighter. This includes Live-Virtual-Constructive (LVC) infrastructure, tools and processes supporting LVC events, and models, tools, data, simulations/stimulation to support requirements definition, systems engineering and test activities. Activities include M&S support for studies and analysis to support both current program planning and execution and future program planning. These efforts will enable more efficient delivery of effective capabilities to the warfighter while reducing the time and resources required for design, development, test and evaluation, maintainability and sustainment.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2016	FY 2017	FY 2018	
Title: Air Constructive Environment - Information Operations Suite (ACE-IOS)									6.248	5.676	0.000	
Description: ACE-IOS provides the authoritative representation of Air Force information operations. IOS is comprised of models that support training and mission rehearsal for the USAF, Joint Task Force commanders, and CCMD battle staffs during Joint and Service exercises and experimentations.												
FY 2016 Accomplishments:												
- Completed ACE-IOS version 5.0.17												
- Developed design/development plan and initiated ACE-IOS transition to an open systems architecture design												
- Used DISA DI2E development environment												

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Air Force		<b>Date:</b> May 2017	
<b>Appropriation/Budget Activity</b> 3600 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0207601F / USAF Modeling and Simulation	<b>Project (Number/Name)</b> 674567 / M&S Foundations	
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>
<ul style="list-style-type: none"> <li>- Enhanced functional capability enabling Air Force Synthetic Environment for Reconnaissance and Surveillance (AFSERS) full two-way engagements, damage, and reporting</li> <li>- Completed the integration of DTED and LOS service remaining modules (Jamming, EW, and Networks)</li> <li>- Designed cross-initialization and run-time synchronization interface to Suter Project System</li> <li>- Created USMTF production module with enhanced user features, message content options, and additional message types</li> </ul> <p><b>FY 2017 Plans:</b></p> <ul style="list-style-type: none"> <li>- Complete ACE-IOS version 5.0.18</li> <li>- Continue to ACE-IOS open systems architecture design with IOC of July 2018</li> <li>- Design and implement secure process communication and standardized protocols</li> <li>- Design and develop USMTF production module to free Java Server Pages (JSP) implementation</li> <li>- Design and initiate license-free replacements for two commercial licensed applications</li> <li>- Design and develop SCADA plus additional functionality projecting first-order network effects onto cascading battlefield effects</li> </ul> <p><b>FY 2018 Plans:</b> N/A</p>			
<p><b>Title:</b> Simulation and Analysis Facility (SIMAF)</p> <p><b>Description:</b> Develop, enhance and verify models, tools, data, simulations/stimulation environments for systems engineering and test activities.</p> <p><b>FY 2016 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>- Supported activities that include studies and analysis of current program planning/execution and future program planning</li> <li>-- Enabled more efficient delivery of effective capabilities to the warfighter</li> <li>-- Reduced the time and resources required for design, development, test and evaluation, maintainability and sustainment</li> <li>- Supported the development and maturation of collaborative processes and capabilities within airborne network and air-ground layer interaction systems-of-systems assessments</li> </ul> <p><b>FY 2017 Plans:</b> N/A</p> <p><b>FY 2018 Plans:</b> N/A</p>		4.967	0.000
<b>Accomplishments/Planned Programs Subtotals</b>		11.215	5.676
			0.000

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Air Force		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 3600 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0207601F / <i>USAF Modeling and Simulation</i>	<b>Project (Number/Name)</b> 674567 / <i>M&amp;S Foundations</i>
<b>C. Other Program Funding Summary (\$ in Millions)</b> N/A		
<b>Remarks</b>		
<b>D. Acquisition Strategy</b> Air Force Life Cycle Management Center (AFLCMC) at Hanscom AFB, MA and the Simulation and Analysis Facility, Wright-Patterson AFB, OH manage the project's acquisition process. AFLCMC develops threats through engineering assessments and analysis. SIMAF focuses on M&S tools, data, and infrastructure to enable a high confidence of acquisition capabilities to support the warfighter. Their acquisition goals are achieved through incremental development of the project's M&S activities. All major contracts are awarded using full and open competition.		
<b>E. Performance Metrics</b> 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.		

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0207601F / USAF Modeling and Simulation				Project (Number/Name) 675135 / Warfighter Readiness			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
675135: Warfighter Readiness	-	9.143	10.990	10.175	0.000	10.175	10.341	10.533	10.716	10.936	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
Modeling and Simulation support to our Warfighter's Readiness is a United States Air Force (USAF) corporate imperative to ensure air, space, cyberspace training, and mission rehearsal activities are supported with realistic, interoperable, and readily available, tools, data, services and environments. Warfighter readiness supports Department of Defense (DoD) Training Transformation (T2) and Joint National Training Capability (JNTC) along with the USAF priorities and core functions. Activities also include studies and analysis to support both current program planning, execution, and future program planning.												
It includes several complimentary programs, initiatives and areas for investment: Warfighter and Joint Training Integration supports the Chief of Staff of the Air Force (CSAF) directed Live, Virtual, and Constructive (LVC) integration efforts and is a critical piece to the USAF's implementation of the Strategic Plan for Transforming DoD Training. The goal of LVC training and mission rehearsal is to prepare our warfighters for the full range of military operations and maintain the combat readiness levels required by the Combatant Commands. This can only be accomplished by training and rehearsing in realistic operational environments. These environments include live training ranges and virtual simulators enhanced with constructive entities. Specific training and mission rehearsal events can include some or all of these simultaneously; making the ability to integrate LVC capabilities a necessity.												
The Air, Space, and Cyberspace Constructive Environment (ASCCE) is the USAF's authoritative federation of constructive training models and tools realistically representing the tactical and operational capabilities the USAF brings to the joint fight. It includes the Air Force Modeling and Simulation Training Toolkit (AFMSTT), which provides the authoritative representation of AF and joint theater-level air and space power and is used to train Air and Space Operations Center (AOC) personnel and Combat Commanders battle staffs. The primary models in the AFMSTT are the Air Warfare Simulation (AWSIM) and Air Base Simulation (ABS).												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2016	FY 2017	FY 2018	
Title: Air, Space, and Cyberspace Constructive Environment (ASCCE)									9.143	10.990	10.175	
Description: Air Force Modeling & Simulation Training Toolkit (AFMSTT)/Air Warfare Simulation (AWSIM)												
FY 2016 Accomplishments:												
- Initiated development for AFMSTT Version 5.11 to be fielding in FY17.												
- Completed the transition of the new AFMSTT five year single award ID/IQ contract												
- Completed successful transition of the AFMSTT 5.10 developmental baseline to the new contract/contractor												
- Continued AFMSTT legacy product improvements												
- Updated C2 M&S relative to blue and red low observable aircraft and Earth Gravitational Modeling												
FY 2017 Plans:												

# UNCLASSIFIED

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Air Force		<b>Date:</b> May 2017	
<b>Appropriation/Budget Activity</b> 3600 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0207601F / USAF Modeling and Simulation	<b>Project (Number/Name)</b> 675135 / Warfighter Readiness	
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>
<ul style="list-style-type: none"> <li>- Complete the development, test, and fielding of AFMSTT Version 5.11</li> <li>- Initiate development of AFMSTT Version 5.13</li> <li>- Continue with new diagnostic software enhancements and model control enhancements</li> <li>- Continue with deprecation of select legacy point to point interfaces; address integration changes with AF role in Joint and Army federations</li> <li>- Continue modeling updates associated with real world operational and technical changes; new C2 systems' interfaces to ensure continued accurate and realistic AF LVC support</li> <li>- Start long lead prototyping to thin client interfaces</li> </ul> <p><b>FY 2018 Plans:</b></p> <ul style="list-style-type: none"> <li>- Will complete the development, test, and fielding of AFMSTT Version 5.13</li> <li>- Will initiate development of AFMSTT Version 6.1</li> <li>- Will continue with new Risk Management Framework (RMF) Accreditation, security enhancements, and new C2 interfaces with AOC WS</li> <li>- Will complete new joint requirements and model interface changes to the Federate Object Models (FOMs) to support training objectives</li> <li>- Will complete transition to AFMSTT Unified Mission Control (UMC) architecture with early deprecation of additional legacy point to point</li> <li>- Will continue long lead prototyping to thin client interfaces</li> </ul>			
<b>Accomplishments/Planned Programs Subtotals</b>		9.143	10.990
<b>C. Other Program Funding Summary (\$ in Millions)</b>			
N/A			
<b>Remarks</b>			
<b>D. Acquisition Strategy</b>			
Air Force Life Cycle Management Center (AFLCMC) at Hanscom AFB, MA manages the project's acquisition process. AFLCMC develops threats through engineering assessments and analysis. Acquisition goals are achieved through incremental development of the project's M&S activities. All major contracts are awarded using full and open competition.			
<b>E. Performance Metrics</b>			
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.			

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force												Date: May 2017			
Appropriation/Budget Activity 3600 / 7						R-1 Program Element (Number/Name) PE 0207601F / USAF Modeling and Simulation				Project (Number/Name) 675135 / Warfighter Readiness					
Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
AFMSTT	C/CPFF	Aegis Technologies Group, INC : Huntsville, AL	-	4.920	Jun 2011	0.000		0.000		0.000		0.000	Continuing	Continuing	-
AFMSTT/AWSIM	C/CPFF	Cole Engineering Services, Inc : Orlando, FL	-	2.600	Mar 2016	9.733	Feb 2017	8.968	Feb 2018	0.000		8.968	Continuing	Continuing	-
Subtotal			-	7.520		9.733		8.968		0.000		8.968	-	-	-
Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
Subtotal			-	-		-		-		-		-	-	-	-
Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
Subtotal			-	-		-		-		-		-	-	-	-
Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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	C/Various	AFLCMC : Hanscom AFB, MA	-	1.623	Oct 2015	1.257	Oct 2016	1.207	Oct 2017	0.000		1.207	Continuing	Continuing	-
Subtotal			-	1.623		1.257		1.207		0.000		1.207	-	-	-



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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force										Date: May 2017					
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0207601F / USAF Modeling and Simulation					Project (Number/Name) 675135 / Warfighter Readiness					
			Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	9.143		10.990		10.175		0.000		10.175	-	-	-

Remarks

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<b>Exhibit R-4, RDT&amp;E Schedule Profile:</b> FY 2018 Air Force			<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 3600 / 7		<b>R-1 Program Element (Number/Name)</b> PE 0207601F / USAF Modeling and Simulation			<b>Project (Number/Name)</b> 675135 / Warfighter Readiness

	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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
- AFMSTT v5.11																												
- AFMSTT v5.13																												
- AFMSTT v6.1																												
- AFMSTT v6.3																												
- AFMSTT v6.5																												
- AFMSTT v6.7																												
- AFMSTT v6.9																												

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> FY 2018 Air Force			<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 3600 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0207601F / <i>USAF Modeling and Simulation</i>	<b>Project (Number/Name)</b> 675135 / <i>Warfighter Readiness</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
- AFMSTT v5.11	2	2016	2	2017
- AFMSTT v5.13	2	2017	2	2018
- AFMSTT v6.1	2	2018	2	2019
- AFMSTT v6.3	2	2019	2	2020
- AFMSTT v6.5	2	2020	2	2021
- AFMSTT v6.7	2	2021	2	2022
- AFMSTT v6.9	2	2022	4	2022