

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 2000																																														
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0207601F USAF Modeling and Simulation																																																		
COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost																																													
Total Program Element (PE) Cost	13,632	21,093	17,624	14,929	11,232	11,458	11,684	Continuing	TBD																																													
671008 National Air and Space Warfare Model (NASM)	11,920	15,430	11,909	11,180	7,395	7,544	7,692	Continuing	TBD																																													
674567 Joint Modeling and Simulation System (JMASS)	1,712	5,663	5,715	3,749	3,837	3,914	3,992	Continuing	TBD																																													
Quantity of RDT&E Articles	0	0	0	0	0	0	0	Continuing	TBD																																													
<p>(U) A. Mission Description Provides RDT&E funding for major USAF Modeling and Simulation efforts such as the National Air and Space [Warfare] Model (NASM)-the air and space element of the Joint Simulation System (JSIMS); and the Joint Modeling and Simulation System (JMASS). JSIMS will be the sole readiness training simulation used by all CINCs, Services, NAFs and at all simulation centers to train Joint Force Commanders, Joint Task Force staffs, Components and their staffs, including Joint Force Air Component Commanders and Air Operations Center personnel. JMASS provides High Level Architecture (HLA)-compliant architecture for engagement level simulations.</p> <p>(U) B. Budget Activity Justification Initiated in FY 94, this program is in budget activity 7 - Operational System Development, Research Category because it provides RDT&E funding for major USAF Modeling and Simulation efforts.</p> <p>(U) C. Program Change Summary (\$ in Thousands)</p> <table border="1"> <thead> <tr> <th></th> <th>FY 1999</th> <th>FY 2000</th> <th>FY 2001</th> <th>Total Cost</th> </tr> </thead> <tbody> <tr> <td>(U) Previous President's Budget (FY 2000 PBR)</td> <td>14,478</td> <td>19,299</td> <td>17,624</td> <td></td> </tr> <tr> <td>(U) Appropriated Value</td> <td>14,899</td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Adjustments to Appropriated Value</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> a. Congressional/General Reductions</td> <td>-421</td> <td></td> <td></td> <td></td> </tr> <tr> <td> b. Small Business Innovative Research</td> <td>-455</td> <td></td> <td></td> <td></td> </tr> <tr> <td> c. Omnibus or Other Above Threshold Reprogram</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> d. Below Threshold Reprogram</td> <td>-324</td> <td></td> <td></td> <td></td> </tr> <tr> <td> e. Rescissions</td> <td>-67</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>											FY 1999	FY 2000	FY 2001	Total Cost	(U) Previous President's Budget (FY 2000 PBR)	14,478	19,299	17,624		(U) Appropriated Value	14,899				(U) Adjustments to Appropriated Value					a. Congressional/General Reductions	-421				b. Small Business Innovative Research	-455				c. Omnibus or Other Above Threshold Reprogram					d. Below Threshold Reprogram	-324				e. Rescissions	-67			
	FY 1999	FY 2000	FY 2001	Total Cost																																																		
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0207601F USAF Modeling and Simulation
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<u>(U) C. Program Change Summary (\$ in Thousands) Continued</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
f. Other		21,093		
(U) Adjustments to Budget Years Since FY 2000 PBR				
(U) Current Budget Submit/FY 2001 PBR	13,632	21,093	17,624	TBD
<u>(U) Significant Program Changes:</u> Significant Program Changes: In FY00, funding from PE64256F, Threat Simulator Development, was transferred into PE27601F in FY00 and FY01 for the Joint Modeling and Simulation (JMASS) program development.				

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 2000	
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0207601F USAF Modeling and Simulation				PROJECT 671008	
COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
671008 National Air and Space Warfare Model (NASM)	11,920	15,430	11,909	11,180	7,395	7,544	7,692	Continuing	TBD
<p>(U) <u>A. Mission Description</u> This program provides funds for Air Force and Joint wargaming architecture and model development, primarily in support of battlestaff training, education, and military operations. A new wargaming model, NASM, is being developed to replace the existing Air Force standard Air Warfare Simulation (AWSIM). NASM will expand the use and role of modeling and simulation (M&S) in support of operational and acquisition decision making, and increase the interoperability between Air Force and joint efforts. NASM includes an overall USAF M&S architecture and provides a reusable, portable, scaleable, robust distributed core for other simulations. It includes an air combat resolution model to meet the needs of USAF MAJCOMs and Unified/Specified Command air components to train Air Component Commanders and their battle staffs. Primary users will be the unified command air components, Commanders in Chief (CINCs), Joint Forces Air Component Commander's (JFACC), and Service components, as supported by BLUE FLAG and WPC for use in joint exercises involving air, ground, and sea campaigns. NASM is the air component portion of the DoD, Joint Staff and Services Joint Simulation System (JSIMS) which includes Enterprise partner programs from the Joint Staff, Army, Navy (and USMC), DIA, NRO and NSA under CINC JFCOM sponsorship.</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u> (U) \$9,795 Continued development of specific air objects to support JSIMS architecture (U) \$2,125 Continued NASM integration effort and operate the program management office (U) \$11,920 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u> (U) \$11,125 Continue development of specific air objects to support JSIMS architecture (U) \$2,355 Continue NASM integration effort and operate the program management office (U) \$1,950 Upgrade Synthetic Theater Operations Research Model (STORM) and Powerscene model. (U) \$15,430 Total</p> <p>(U) <u>FY 2001 (\$ in Thousands)</u> (U) \$9,546 Continue development of specific air objects to support JSIMS architecture (U) \$2,363 Continue NASM integration effort and operate the program management office (U) \$11,909 Total</p> <p>(U) <u>B. Project Change Summary</u></p>									
Project 671008			Page 3 of 8 Pages				Exhibit R-2A (PE 0207601F)		

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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0207601F USAF Modeling and Simulation	PROJECT 671008
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(U)	<u>C. Other Program Funding Summary (\$ in Thousands)</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Cost to</u>	<u>Total Cost</u>
		<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	
(U)	AF RDT&E								Continuing	TBD
(U)	Other APPN								Continuing	TBD

(U) D. Acquisition Strategy
 NASM provides the Air and Space software components of the Joint Simulation System (JSIMS). Resources are reviewed and measured against an Enterprise program baseline, with the Earned Value and performance measurement reporting against the baseline accomplished on a monthly basis. The contract was selected by source selection and is a Cost Plus Award Fee (CPAF).

(U) E. Schedule Profile

		<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
		1	2	3	4	1	2	3	4	1	2	3	4
(U)	Initial Op Capability (IOC) 3QFY02												
(U)	Full Op Capability (FOC) 4QFY04												

NASM development schedule is aligned with the Joint Simulation System (JSIMS) Acquisition Program Baseline (APB) development schedule required to achieve Initial Operational Capability (IOC) in FY02 and Full Operational Capability (FOC) in FY04.

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development					PE NUMBER AND TITLE 0207601F USAF Modeling and Simulation			PROJECT 671008		
(U) A. Project Cost Breakdown (\$ in Thousands)										
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>
(U)	Software development					9,795		11,125		9,546
(U)	Program Management/Contractor Support					2,125		2,355		2,363
(U)	Congressional Add; Synthetic Theater Operations Research Model (STORM) upgrade					0		1,950		0
(U)	Total					11,920		15,430		11,909
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)										
(U) Performing Organizations:										
<u>Contractor or</u>	<u>Contract</u>									
<u>Government</u>	<u>Method/Type</u>	<u>Award or</u>	<u>Performing</u>	<u>Project</u>						
<u>Performing</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Organizations</u>										
Raytheon (NASM)	TRN	3 Mar 97	74,541	74,541	17,135	9,172	13,010	9,489	27,383	76,189
Raytheon (AWSIM/R)	TRN	7 Apr 94	9,876	9,876	11,454				0	11,454
Hughes (AWSIM/R)	TRN	2 Jun 94	4,676	4,676	4,059				0	4,059
TRW (AFSOM)	TRN	12 Dec 97	39	39	39				0	39
<u>Support and Management Organizations</u>										
Tech Eng Mgt Spt (TEMS)	Del Order	1 Feb 94	15,413	15,413	8,082	1,193	1,200	1,200	3,471	15,146
MITRE	Contract Mod	11 Aug 94	13,200	13,200	5,869	1,194	1,200	1,200	3,471	12,934
Other*	Various	Various	19,180	19,180	17,112	361	20	20	1,644	19,157
*Includes Prototype Contracts										
<u>Test and Evaluation Organizations</u>										
					<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
					<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Subtotals</u>										
Subtotal Product Development					32,687	9,172	13,010	9,489	27,383	91,741
Subtotal Support and Management					31,063	2,748	2,420	2,420	8,586	47,237
Subtotal Test and Evaluation										
Total Project					63,750	11,920	15,430	11,909	35,969	138,978

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BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0207601F USAF Modeling and Simulation				PROJECT 674567	
COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
674567 Joint Modeling and Simulation System (JMASS)	1,712	5,663	5,715	3,749	3,837	3,914	3,992	Continuing	TBD
<p>(U) <u>A. Mission Description</u> The Joint Modeling & Simulation System (JMASS) is a simulation support environment for the development, configuration, execution, and analysis of high fidelity, repeatable simulations with re-usable models-focus is tactical/engagement level simulations with the present concentration on electronic combat. JMASS is a full system software implementation of a modern object based simulation architecture. JMASS provides users with the tools to: Develop objects, assemble these objects into models, configure the models in a complete simulation, execute the simulation, and post process the simulation data. JMASS tools assist users in developing fully compliant objects; users concentrate on the models and analysis, not computer science.</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u> (U) \$507 High Level Architecture (HLA) Compliance (U) \$245 Improved User Interface (U) \$675 Developed Request For Proposal (RFP) documentation and operate the program management office (U) \$285 Prototyped JMASS software on a Personal Computer (PC) (U) \$1,712 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u> (U) \$2,463 JMASS Model Space Object (MSO) development (computer representations of individual DoD weapon systems) (U) \$1,700 JMASS Architecture development (Environment, Terrain, Human interaction, background models and simulations) (U) \$1,500 JMASS Integration with Other Service Simulations (U) \$5,663 Total</p> <p>(U) <u>FY 2001 (\$ in Thousands)</u> (U) \$3,949 JMASS Model Space Object (MSO) development (computer representations of individual DoD weapon systems) (U) \$1,000 JMASS Architecture development (Environment, Terrain, Human interaction, background models and simulations) (U) \$766 JMASS Integration with Other Service Simulations (U) \$5,715 Total</p> <p>(U) <u>B. Project Change Summary</u> PE 64256F, Threat Simulator Development, transferred \$2.1M in FY00 and FY01 for JMASS Joint Program Development.</p>									
Project 674567			Page 6 of 8 Pages				Exhibit R-2A (PE 0207601F)		

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BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0207601F USAF Modeling and Simulation				PROJECT 674567		
(U) C. Other Program Funding Summary (\$ in Thousands)										
	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Cost to</u>	<u>Total Cost</u>	
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>		
(U) AF RDT&E										
(U) Other APPN										
(U) PE64256F, Threat Simulator Development Project 3321 (EW Test Resources)	4,100							Continuing	TBD	
(U) D. Acquisition Strategy										
All major contracts for JMASS model development will be awarded after full and open competition.										
(U) E. Schedule Profile										
			<u>FY 1999</u>			<u>FY 2000</u>			<u>FY 2001</u>	
			1	2	3	4	1	2	3	4
(U) Milestone 2 - RFP (completed 3QFY99)					*					
(U) Contract Award								X		
(U) Initial Delivery										X

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development					PE NUMBER AND TITLE 0207601F USAF Modeling and Simulation				PROJECT 674567	
(U) <u>A. Project Cost Breakdown (\$ in Thousands)</u>										
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>
(U)	Software Development					1,030		4,363		4,215
(U)	Contractor Support					240		1,000		1,000
(U)	Program Management Support					442		300		500
(U)	Total					1,712		5,663		5,715
(U) <u>B. Budget Acquisition History and Planning Information (\$ in Thousands)</u>										
(U) <u>Performing Organizations:</u>										
	<u>Contractor or</u>	<u>Contract</u>								
	<u>Government</u>	<u>Method/Type</u>	<u>Award or</u>	<u>Performing</u>	<u>Project</u>					
	<u>Performing</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>
	<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>
	<u>Product Development Organizations</u>									
	Various	Various				1,712	5,663	5,715	Continuing	TBD
	<u>Support and Management Organizations</u>									
	<u>Test and Evaluation Organizations</u>									
	<u>Subtotals</u>					<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>
						<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>
	Subtotal Product Development					1,712	5,663	5,715	TBD	TBD
	Subtotal Support and Management									
	Subtotal Test and Evaluation									
	Total Project					1,712	5,663	5,715	TBD	TBD