

UNCLASSIFIED

PE NUMBER: 0708612F

PE TITLE: Computer Resources Support Improvement Program

Exhibit R-2, RDT&E Budget Item Justification	DATE February 2004
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BUDGET ACTIVITY 07 Operational System Development	PE NUMBER AND TITLE 0708612F Computer Resources Support Improvement Program
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Cost (\$ in Millions)	FY 2003 Actual	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	Cost to Complete	Total
Total Program Element (PE) Cost	2.049	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	TBD
4851 Embedded Comp Res Spt Prog Impr	2.049	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	TBD

Note: Program terminated to meet higher AF priorities.

(U) A. Mission Description and Budget Item Justification

This crosscutting program improves the support of mission-critical software intensive systems for numerous Air Force weapon systems. It validates, matures and supports the rapid transition of emerging software technologies to improve the capabilities of AF weapon systems in response to changing mission or changing threat requirements. This program also develops and transitions effective technologies to organizations in order to enhance their ability to develop, acquire, manage, and sustain mission critical software.

This program is in Budget Activity 7, Operational System Development, because it provides support to operational systems.

(U) B. Program Change Summary (\$ in Millions)

	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
(U) Previous President's Budget	2.094	0.000	
(U) Current PBR/President's Budget	2.049	0.000	
(U) Total Adjustments	-0.045	0.000	
(U) Congressional Program Reductions	-0.022		
Congressional Rescissions			
Congressional Increases			
Reprogrammings	-0.023		
SBIR/STTR Transfer			
(U) <u>Significant Program Changes:</u>			
Not applicable.			

Exhibit R-2a, RDT&E Project Justification

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BUDGET ACTIVITY 07 Operational System Development				PE NUMBER AND TITLE 0708612F Computer Resources Support Improvement Program			PROJECT NUMBER AND TITLE 4851 Embedded Comp Res Spt Prog Impr		
Cost (\$ in Millions)	FY 2003 Actual	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	Cost to Complete	Total
4851 Embedded Comp Res Spt Prog Impr	2.049	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0		

Note: Program terminated in FY 2003 due to higher Air Force priorities.

(U) A. Mission Description and Budget Item Justification

This crosscutting program improves the support of mission-critical software intensive systems for numerous Air Force weapon systems. It validates, matures and supports the rapid transition of emerging software technologies to improve the capabilities of AF weapon systems in response to changing mission or changing threat requirements. This program also develops and transitions effective technologies to organizations in order to enhance their ability to develop, acquire, manage, and sustain mission critical software.

This program is in Budget Activity 7, Operational System Development, because it provides support to operational systems.

(U) B. Accomplishments/Planned Program (\$ in Millions)

	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
(U) Continued development of technologies and methodologies that will incrementally upgrade legacy systems to support their cost-effective employment and sustainment. Conducted life cycle cost and trade off analyses of the different technologies and methodologies. Continued demonstrating, in designated aircraft, the processes and tools for wrapping embedded software, real-time object request broker technology, and emulation technology into fielded weapon systems. Continued transition of these technologies as they mature and are validated.	0.458		
(U) Developed and implemented enhancements to the Reconfigurable Aerospace Computer Emulators to improve the reliability and maintainability of aging on-board aerospace computers. Continued validation of developed technologies to incrementally upgrade on-board computers with commercial microprocessor-based computer emulation technology. Demonstrated the backward compatibility of these technologies and enhancements with existing mission critical software.	0.060		
(U) Continue development of a Virtual Engineering Environment (VEE) for software development. Continue developing test environments incorporating new technologies and commercial-off-the-shelf (COTS) components. Conduct trade off analyses of these technologies and COTS components. Continue demonstrations to validate the effectiveness of VEE in supporting software development and sustainment for weapon systems. Transition VEE to selected weapon system programs.	0.060		
(U) Continue the Embedded Systems Interoperability Demonstration. Continue integration and testing of open systems hardware, software, and simulated tactical communications links. Continue simulation testing to evaluate the real-time communications capabilities of these open system components. Complete affordability analyses. Develop test plans and procedures to conduct flight testing that will evaluate the real-time communications capabilities of	0.515		

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BUDGET ACTIVITY 07 Operational System Development	PE NUMBER AND TITLE 0708612F Computer Resources Support Improvement Program	PROJECT NUMBER AND TITLE 4851 Embedded Comp Res Spt Prog Impr
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these components.	
(U) Continued development of Embedded Information System Re-engineering (EISR) technologies. Completed development of an automated re-engineering capability to evolve software for embedded information systems. Continued development of the software tools necessary to implement re-engineering technologies. Continued testing and demonstrations of EISR technologies with pilot programs. Transitioned the EISR technologies to designated software support activities.	0.320
(U) Continued the development of Assured Middleware For Real-Time Embedded Systems. Developed Information Assurance (IA) techniques and technologies for embedded information systems in aerospace and ground-based platforms. Conducted domain analyses to define the requirements for IA technologies. Evaluated commercial-off-the-shelf (COTS) IA technologies and their capabilities in real-time environments. Conducted trade off analyses of these technologies and COTS components. Developed strategies for implementing multi-level secure real-time operating systems that support a secure real-time Common Object Request Broker Architecture.	0.420
(U) Continued analyses of Real-Time (RT) Java for Embedded Systems to investigate RT Java applicability to the infosphere and embedded information system applications. Continued demonstrations of the functionality of legacy Operational Flight Programs (OFPs) implemented in RT Java. Continued analyses of the implementation of RT Java OFPs with current OFPs implemented in higher-order languages. Continued demonstrations of the capability of RT Java OFPs to support the interoperability between the Command, Control, Communications, and Intelligence.	0.216
(U) Total Cost	2.049 0.000 0.000

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

	<u>FY 2003</u> <u>Actual</u>	<u>FY 2004</u> <u>Estimate</u>	<u>FY 2005</u> <u>Estimate</u>	<u>FY 2006</u> <u>Estimate</u>	<u>FY 2007</u> <u>Estimate</u>	<u>FY 2008</u> <u>Estimate</u>	<u>FY 2009</u> <u>Estimate</u>	<u>Cost to</u> <u>Complete</u>	<u>Total Cost</u>
(U) AF RDT&E									
(U) Other APPN									
(U) PE 0708612F/3080	2.069	0.000	0.000	0.000	0.000			Continuing	TBD
(U) PE 0708612F/3400	8.794	0.000	0.000	0.000	0.000			Continuing	TBD

(U) D. Acquisition Strategy

All major contracts within this Program Element were awarded after full and open competition.

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Exhibit R-3, RDT&E Project Cost Analysis

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BUDGET ACTIVITY			PE NUMBER AND TITLE					PROJECT NUMBER AND TITLE				
07 Operational System Development			0708612F Computer Resources Support Improvement Program					4851 Embedded Comp Res Spt Prog Impr				
<u>(U) Cost Categories</u>	<u>Contract Method & Type</u>	<u>Performing Activity & Location</u>	<u>Total</u>	<u>FY</u>	<u>FY</u>	<u>FY</u>	<u>FY</u>	<u>FY</u>	<u>FY</u>	<u>Cost to</u>	<u>Total</u>	<u>Target</u>
(Tailor to WBS, or System/Item Requirements) (\$ in Millions)			<u>Prior to FY</u>	<u>2003</u>	<u>2003</u>	<u>2004</u>	<u>2004</u>	<u>2005</u>	<u>2005</u>	<u>Complete</u>	<u>Cost</u>	<u>Value of</u>
			<u>2003</u>	<u>Cost</u>	<u>Award</u>	<u>Cost</u>	<u>Award</u>	<u>Cost</u>	<u>Award</u>			<u>Contract</u>
			<u>Cost</u>		<u>Date</u>		<u>Date</u>		<u>Date</u>			
<u>(U) Product Development</u>												
Science Applications International Corporation	DO	N/A		0.000						Continuing	TBD	
TRW	DO	N/A		0.000						Continuing	TBD	
Boeing	DO	N/A		1.045						Continuing	TBD	
Lockheed-Martin	DO	N/A		0.814						Continuing	TBD	
Raytheon	DO	N/A		0.190						Continuing	TBD	
Subtotal Product Development			0.000	2.049		0.000		0.000		Continuing	TBD	0.000
Remarks:												
<u>(U) Support</u>												0.000
Subtotal Support			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Remarks:												
<u>(U) Test & Evaluation</u>												0.000
Subtotal Test & Evaluation			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Remarks:												
<u>(U) Management</u>												0.000
Subtotal Management			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Remarks:												
<u>(U) Total Cost</u>			0.000	2.049		0.000		0.000		Continuing	TBD	0.000

Exhibit R-4, RDT&E Schedule Profile

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BUDGET ACTIVITY
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PROJECT NUMBER AND TITLE
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Impr

		FY03			
		1Q	2Q	3Q	4Q
Enterprise Strategy for Aging Avionics	Continuing Projects	██████████	██████████	██████████	██████████
Embedded Systems Interoperability Demonstration	Continuing Projects	██████████	██████████	██████████	██████████
Embedded Information Systems Re-engineering	Continuing Projects	██████████	██████████	██████████	██████████
Assured Middleware for Real-Time Embedded Systems	Continuing Projects	██████████	██████████	██████████	██████████
Incremental Upgrade of Legacy Systems	Continuing Projects	██████████	██████████	██████████	██████████
Reconfigurable Aerospace Computer Emulator	Continuing Projects	██████████	██████████	██████████	██████████
Real-Time Defense Information Infrastructure	Continuing Projects	██████████	██████████	██████████	██████████
Common Operational Environment Support	Continuing Projects	██████████	██████████	██████████	██████████
Virtual Engineering Environment	Continuing Projects	██████████	██████████	██████████	██████████
Real-Time Java for Embedded Systems	Continuing Projects	██████████	██████████	██████████	██████████

Exhibit R-4a, RDT&E Schedule Detail

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BUDGET ACTIVITY

07 Operational System Development

PE NUMBER AND TITLE

0708612F Computer Resources
Support Improvement Program

PROJECT NUMBER AND TITLE

4851 Embedded Comp Res Spt Prog
Impr

(U) <u>Schedule Profile</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
(U) Enterprise Strategy for Aging Avionics	1-4Q		
(U) Embedded Systems Interoperability Demonstration	1-4Q		
(U) Embedded Information Systems Re-engineering	1-4Q		
(U) Assured Middleware for Real-Time Embedded Systems	1-4Q		
(U) Incremental Upgrade of Legacy Systems	1-4Q		
(U) Reconfigurable Aerospace Computer Emulator	1-4Q		
(U) Real-Time Defense Information Infrastructure Common Operational Environment Support	1-4Q		
(U) Virtual Engineering Environment	1-4Q		
(U) Real-Time Java for Embedded Systems	1-4Q		