

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

DATE

February 2000

BUDGET ACTIVITY

04 - Demonstration and Validation

PE NUMBER AND TITLE

0603617F Command Control and Communication Applications

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	8,234	7,769	7,828	7,936	8,068	8,228	8,392	Continuing	TBD
642314 Tactical Air Surveillance	444	446	448	452	458	466	476	Continuing	TBD
642317 Tactical Air Information Production & Distribution	3,047	3,075	3,097	3,142	3,194	3,257	3,323	Continuing	TBD
642321 Tactical Battle Information Management	4,540	4,029	4,060	4,109	4,177	4,261	4,346	Continuing	TBD
643804 Tactical Air Forces Systems Integration	203	219	223	233	239	244	247	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

This program is designed to rapidly transition development efforts in the science and technology base directly to warfighting commands. Projects are directly responsive to operational requirements for improved battle management, communications, theater missile defense (TMD), and surveillance capability. This program takes advantage of advanced information technology developments throughout the services and industry as well as off-the-shelf technology. The program develops, integrates and supports fielding of joint mission critical software applications to the Theater Battle Management Core Systems and the Air Force Global Command and Control System. The program develops, integrates and validates information distribution and assurance technologies in the areas of enterprise network management and control, defensive information warfare, and communications connectivity required for modernization and improvement of the Air Force Global Grid.

(U) B. Budget Activity Justification

This program is in Budget Activity 4, Demonstration and Validation, because its products are primarily advanced development models, rapid prototype efforts, and software developed through evolutionary acquisition methods.

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(U) C. Program Change Summary (\$ in Thousands)

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U) Previous President's Budget (FY 2000 PBR)	7,731	7,833	7,898	TBD
(U) Appropriated Value	7,770	7,833		
(U) Adjustments to Appropriated Value				
a. Congressional/General Reductions	-39			
b. Small Business Innovative Research	-208			
c. Omnibus or Other Above Threshold Reprogram		-64		
d. Below Threshold Reprogram	756			
e. Rescissions	-45			
f. Other				TBD
(U) Adjustments to Budget Years Since FY 2000 PBR			-70	
(U) Current Budget Submit/FY 2001 PBR	8,234	7,769	7,828	TBD
(U) <u>Significant Program Changes:</u>				

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)							DATE February 2000			
BUDGET ACTIVITY 04 - Demonstration and Validation				PE NUMBER AND TITLE 0603617F Command Control and Communication Applications				PROJECT 642314		
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
642314	Tactical Air Surveillance	444	446	448	452	458	466	476	Continuing	TBD
<p>(U) <u>A. Mission Description</u> Develops and demonstrates advanced aerospace surveillance technology in support of next generation sensors and sensor signal processing. Investigates non-radar and/or adjunct radar sensors to address the Combat Air Forces (CAF) surveillance, detection, tracking and identification requirements not satisfied by an active radar.</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u> (U) \$265 Continued Track Before Detect for TMD (U) \$179 Initiated Ground Theater Air Control System (GTACS) Bistatic/Electronic Support Measures (ESM) System Definition (U) \$444 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u> (U) \$203 Complete Track Before Detect for TMD (U) \$166 Complete GTACS Bistatic/ESM System Definition (U) \$77 Initiate GTACS Bistatic/ESM ground demonstration (U) \$446 Total</p> <p>(U) <u>FY 2001 (\$ in Thousands)</u> (U) \$178 Complete GTACS Bistatic/ESM ground demonstration (U) \$270 Initiate GTACS Bistatic/ESM airborne demonstration (U) \$448 Total</p> <p>(U) <u>B. Project Change Summary</u> Not applicable</p>										
Project 642314			Page 3 of 20 Pages				Exhibit R-2A (PE 0603617F)			

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 2000	
BUDGET ACTIVITY 04 - Demonstration and Validation				PE NUMBER AND TITLE 0603617F Command Control and Communication Applications				PROJECT 642314	
(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) RDT&E, AF (0603789F, Project 4072)	6,583	10,851	9,788	8,526	7,591	7,750	7,911	Continuing	TBD
(U) RDT&E, AF (0207412F, Project 485L)	423	467	450	436	426	435	375	Continuing	TBD
(U) D. Acquisition Strategy									
All contracts in this project are awarded in full competition and are Cost Plus Fixed Fee (CPFF) or Cost Plus Award Fee (CPAF) as appropriate for advanced development.									
(U) E. Schedule Profile									
				<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>	
				1	2	3	4	1	2
(U) Track Before Detect for TMD									3
(U) GTACS Bistatic/ESM System Definition									4
(U) GTACS Bistatic/ESM Ground Demo									X
Note: * represents a completed event; X represents a planned event.									

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000			
BUDGET ACTIVITY				PE NUMBER AND TITLE				PROJECT		
04 - Demonstration and Validation				0603617F Command Control and Communication Applications				642314		
(U) A. Project Cost Breakdown (\$ in Thousands)										
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>
(U)	Primary Hardware Development					390		394		415
(U)	Government Engineering Support					54		52		33
(U)	Total					444		446		448
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)										
(U) Performing Organizations:										
<u>Contractor or Government Performing Activity</u>	<u>Contract Method/Type or Funding Vehicle</u>	<u>Award or Obligation Date</u>	<u>Performing Activity EAC</u>	<u>Project Office EAC</u>	<u>Total Prior to FY 1999</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Organizations</u>										
Hughes	C/CPFF	June 95	1,179	1,179	1,179	0	0	0	0	1,179
DSA	Tsk Ordr	Apr 97	502	502	502	0	0	0	0	502
	Agmt									
Northrop-Grumman	Tsk Ordr	Aug 98	488	488	0	287	204	0	0	491
	Agmt									
Sensis	TBD	TBD	264	264	0	99	166	0	0	265
TBD	TBD	TBD	0	0	0	0	19	390	Continuing	TBD
<u>Support and Management Organizations</u>										
AF Research Lab	In-house	n/s	N/A	N/A	6,419	58	57	58	Continuing	TBD
Miscellaneous	Various	Various	N/A	N/A	0	0	0	0	Continuing	TBD
<u>Test and Evaluation Organizations</u>										

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)			DATE February 2000			
BUDGET ACTIVITY	PE NUMBER AND TITLE			PROJECT		
04 - Demonstration and Validation	0603617F Command Control and Communication Applications			642314		
	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>Subtotals</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
Subtotal Product Development	1,681	386	389	390	TBD	TBD
Subtotal Support and Management	6,419	58	57	58	TBD	TBD
Subtotal Test and Evaluation						
Total Project	8,100	444	446	448	TBD	TBD

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)							DATE February 2000				
BUDGET ACTIVITY 04 - Demonstration and Validation			PE NUMBER AND TITLE 0603617F Command Control and Communication Applications					PROJECT 642317			
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
642317	Tactical Air Information Production & Distribution		3,047	3,075	3,097	3,142	3,194	3,257	3,323	Continuing	TBD
<p>(U) <u>A. Mission Description</u> Integrates, demonstrates and transitions advanced information assurance and distribution technologies to acquisition organizations in support of the Integrated Command and Control System (IC2S). The goal is the creation of an assured, global information grid to support the warfighter and to support experimentation and demonstration processes (e.g. JEFX) to reduce the risk of transitioning advanced government or commercial information technologies into military enterprise systems. In coordinating with the strategic planning activities of AF/SC, AC2ISRC, HQ ESC, AFCA, ACC and AMC this project has been reorganized to more effectively demonstrate/validate the transition of AFRL technology into AF planned product acquisitions. The three program focus areas included in this project are; the Airborne Communication Relay (ACR) which provides for robust communications connectivity, the AF Comprehensive Enterprise Management (ACEM) which provides capabilities for C2 enterprise network management and control, and the AF Enterprise Defense (AFED) which incorporates defensive information assurance capabilities into AF enterprise systems.</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u></p> <p>(U) \$441 Continued the airborne-transportable radio wideband/multi-band antenna developments</p> <p>(U) \$811 Continue UAV radio electromagnetic interference/compatibility research and test for a communications UAV</p> <p>(U) \$912 Continue the airborne-transportable radio wideband Power Amplifier (PA) development</p> <p>(U) \$231 Initiate the transition of advanced development Project 2335 error mitigation hardware/software and deployable communications management software into deployable capability at Langley AFB, VA</p> <p>(U) \$141 Initiate development of advanced, wideband suitcase satellite communications (SATCOM) capability</p> <p>(U) \$511 Initiate effort to transition and demonstrate the (Proj 4519/DARPA) On Board Switch (OBS) technology for tanker relay and Phase 2 ACN applications</p> <p>(U) \$3,047 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u></p> <p>(U) \$167 Complete development of wideband/multiband antennas and prepare for transition to Phase 2 ACN and tanker relay platforms</p> <p>(U) \$696 Complete evaluation of antenna placement issues for ACN platform</p> <p>(U) \$697 Complete design of wideband PA and prepare for transition to Phase 2 ACN and tanker relay platforms</p> <p>(U) \$595 Continue integration of technology to improve performance of commercial ATM over tactical media via error correction and channel</p>											
Project 642317			Page 7 of 20 Pages					Exhibit R-2A (PE 0603617F)			

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BUDGET ACTIVITY 04 - Demonstration and Validation				PE NUMBER AND TITLE 0603617F Command Control and Communication Applications			PROJECT 642317																																																			
<p>(U) <u>A. Mission Description Continued</u></p> <p>(U) <u>FY 2000 (\$ in Thousands) Continued</u></p> <p style="padding-left: 40px;">management technologies</p> <p>(U) \$346 Conduct field demonstration of suitcase SATCOM and assess suitability for airborne platforms</p> <p>(U) \$574 Integrate software programmable radios with OBS capability into tanker relay demonstration</p> <p>(U) \$3,075 Total</p> <p>(U) <u>FY 2001 (\$ in Thousands)</u></p> <p>(U) \$1,200 Airborne Comm Relay (ACR)</p> <p>(U) \$1,020 Air Force Enterprise Management (AFEM)</p> <p>(U) \$877 Air Force Enterprise Defense (AFED)</p> <p>(U) \$3,097 Total</p> <p>(U) <u>B. Project Change Summary</u></p> <p>Project has been restructured to address the focus areas identified by AC2ISRC, specifically 'Enabling the Global Grid'. Three project programs were created to address this: Airborne Communications Relay (ACR), AF Comprehensive Enterprise Management(ACEM) and AF Enterprise Defense (AFED).</p> <p>(U) <u>C. Other Program Funding Summary (\$ in Thousands)</u></p> <table border="1" style="width:100%; border-collapse: collapse; margin-left: 20px;"> <thead> <tr> <th></th> <th><u>FY 1999</u></th> <th><u>FY 2000</u></th> <th><u>FY 2001</u></th> <th><u>FY 2002</u></th> <th><u>FY 2003</u></th> <th><u>FY 2004</u></th> <th><u>FY 2005</u></th> <th><u>Cost to</u></th> <th><u>Total Cost</u></th> </tr> <tr> <th></th> <th><u>Actual</u></th> <th><u>Estimate</u></th> <th><u>Estimate</u></th> <th><u>Estimate</u></th> <th><u>Estimate</u></th> <th><u>Estimate</u></th> <th><u>Estimate</u></th> <th><u>Complete</u></th> <th></th> </tr> </thead> <tbody> <tr> <td>(U) RDT&E, AF (0602702F, Project 4519)</td> <td align="right">17,055</td> <td align="right">10,817</td> <td align="right">13,208</td> <td align="right">13,300</td> <td align="right">13,990</td> <td align="right">14,577</td> <td align="right">16,026</td> <td align="center">Continuing</td> <td align="center">TBD</td> </tr> <tr> <td>(U) RDT&E, AF (0603789F, Project 2335)</td> <td align="right">3,907</td> <td align="right">4,093</td> <td align="right">2,557</td> <td align="right">5,087</td> <td align="right">5,198</td> <td align="right">5,306</td> <td align="right">5,416</td> <td align="center">Continuing</td> <td align="center">TBD</td> </tr> <tr> <td>(U) RDT&E, AF (0603789F, Project 4216)</td> <td align="right">2,316</td> <td align="right">2,458</td> <td align="right">2,640</td> <td align="right">2,687</td> <td align="right">2,752</td> <td align="right">2,809</td> <td align="right">2,868</td> <td align="center">Continuing</td> <td align="center">TBD</td> </tr> </tbody> </table>										<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) RDT&E, AF (0602702F, Project 4519)	17,055	10,817	13,208	13,300	13,990	14,577	16,026	Continuing	TBD	(U) RDT&E, AF (0603789F, Project 2335)	3,907	4,093	2,557	5,087	5,198	5,306	5,416	Continuing	TBD	(U) RDT&E, AF (0603789F, Project 4216)	2,316	2,458	2,640	2,687	2,752	2,809	2,868	Continuing	TBD
	<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) RDT&E, AF (0602702F, Project 4519)	17,055	10,817	13,208	13,300	13,990	14,577	16,026	Continuing	TBD																																																	
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(U) RDT&E, AF (0603789F, Project 4216)	2,316	2,458	2,640	2,687	2,752	2,809	2,868	Continuing	TBD																																																	
Project 642317			Page 8 of 20 Pages			Exhibit R-2A (PE 0603617F)																																																				

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BUDGET ACTIVITY 04 - Demonstration and Validation	PE NUMBER AND TITLE 0603617F Command Control and Communication Applications	PROJECT 642317
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(U) **D. Acquisition Strategy**
 The Information Grid Division of the Air Force Research Laboratory's Information Directorate manages the acquisition of technology to be integrated via ESC's Global Grid and Defensive Information Warfare PAD's into acquisition programs such as Theater Deployable Communications (TDC) and the CITS/BITS programs. All contracts are awarded under full competition and include Cost Plus Fixed Fee (CPFF) and Cost Plus Award Fee (CPAF) as appropriate for advanced development efforts. All contracts use Evolutionary Prototyping, with heavy user participation.

(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) C2 Link				*								
(U) --JEFX 99 Demonstration			*									
(U) Deployable Asyn Transfer Mechanism (ATM)		*										
(U) -- Global Patriot & Ft Gordon exercises	*	*										
(U) --Proto HDWR installed Reachback Facility		*										
(U) Airborne Comm Relay (ACR)												X
(U) -- Phase I/II Demo						X			X			
(U) -- Multi-Band Antenna Design								X				
(U) -- Wideband Power Amplifier Design								X				
(U) -- Phase III EFX Demo												X
(U) AF Comp Enterprise Mgmt (ACEM)												X
(U) --Validate Cmdr's C2 ACEM tools								X				
(U) --Install ACEM tools in Proto HDWR												X
(U) AF Enterprise Defense (AFED)												
(U) --Version 1.0 prototype demo								X				
(U) --Expand to 4 ACC sites										X		
(U) -- Integrate adv Defense Info Warfare s/w												X
(U) Info For Global Research (IFGR)												
(U) --Initiate AMC/TACC integration												X

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000			
BUDGET ACTIVITY				PE NUMBER AND TITLE				PROJECT		
04 - Demonstration and Validation				0603617F Command Control and Communication Applications				642317		
(U) A. Project Cost Breakdown (\$ in Thousands)										
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>
(U)	(U)	Primary Hardware/Software integration				2,838		2,592		2,610
(U)	(U)	Government Engineering Support				184		192		196
(U)	(U)	Contractor Engineering Support				25		291		291
(U)		Total				3,047		3,075		3,097
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)										
(U) Performing Organizations:										
<u>Contractor or Government</u>	<u>Contract Method/Type</u>	<u>Award or Obligation</u>	<u>Performing Activity</u>	<u>Project Office</u>	<u>Total Prior to FY 1999</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>						
<u>Product Development Organizations</u>										
GE Marconi		Sept 98	1,661	1,661	210	797	646	0	0	1,653
BBN		Sept 96	1,370	1,370		217	545	593	0	1,355
USAF C2BL	PD				0	147	0	0	0	147
Various	TBD	TBD	TBD	TBD	0	1,382	1,369	1,982	Continuing	TBD
<u>Support and Management Organizations</u>										
AF Research Lab	In-house	N/A	N/A	N/A	12,153	207	220	228	Continuing	TBD
MITRE		N/A	N/A	TBD		297	295	294	Continuing	TBD
<u>Test and Evaluation Organizations</u>										
Not Applicable										
(U) Government Furnished Property:										
<u>Item</u>	<u>Contract Method/Type</u>	<u>Award or Obligation</u>	<u>Delivery</u>		<u>Total Prior to FY 1999</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Description</u>	<u>Vehicle</u>	<u>Date</u>	<u>Date</u>							

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BUDGET ACTIVITY 04 - Demonstration and Validation				PE NUMBER AND TITLE 0603617F Command Control and Communication Applications			PROJECT 642317		
(U) <u>Government Furnished Property Continued:</u>									
	<u>Contract</u>	<u>Award or</u>	<u>Delivery</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>Item</u>	<u>Method/Type</u>	<u>or Funding</u>	<u>Obligation</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>Description</u>	<u>Vehicle</u>	<u>Date</u>	<u>Date</u>						
<u>Product Development Property</u>									
Not Applicable									
<u>Support and Management Property</u>									
<u>Test and Evaluation Property</u>									
				<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>Subtotals</u>				<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
Subtotal Product Development				210	2,543	2,560	2,575	TBD	TBD
Subtotal Support and Management				12,153	504	515	522	TBD	TBD
Subtotal Test and Evaluation									
Total Project				12,363	3,047	3,075	3,097	TBD	TBD

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BUDGET ACTIVITY 04 - Demonstration and Validation				PE NUMBER AND TITLE 0603617F Command Control and Communication Applications				PROJECT 642321	
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
642321 Tactical Battle Information Management	4,540	4,029	4,060	4,109	4,177	4,261	4,346	Continuing	TBD
<p>(U) <u>A. Mission Description</u> Designs and integrates improvements to system software and Command Control (C2) applications via spiral development, rapid prototyping and maximum user participation in all design activities. Current focus is the functional development of the Joint Defensive Planner (JDP), designated by the Joint Staff (J6V) Joint Standards Air Operations Software Configuration Control Board as a joint application for use by all the Services. JDP will provide the single theater air and missile defense automated system that aids Joint air defense duty officers and the Area Air Defense Commander (AADC) and staff in planning the integrated employment of Defensive Counter-Air and Active and Passive Defenses in conjunction with Offensive Counter-Air, to destroy or neutralize enemy aircraft and theater missiles. Development is compliant with the Defense Information Infrastructure (DII) Common Operating Environment (COE) for integration into Theater Battle Management Core System (TBMCS) and the Global Command and Control System (GCCS). Future efforts respond to evolving concepts advocated by the Aerospace C2 & Intelligence Surveillance Reconnaissance Center (AC2ISRC). Emphasis is on Distributed Collaborative Dynamic Battle Management of Expeditionary Aerospace Forces (EAF) in areas such as planning, execution management, retasking (mission reflow), effects based operations, campaign assessment, atmospheric and space environmental effects on weapons and surveillance systems, and information warfare in support of Joint, Combined and Coalition Theater Air Operations.</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u> (U) \$710 Initiated FLEX integration into TBMCS V1.0.1 (U) \$692 Continued development of FLEX coordinated replanning (reflow) prototype (U) \$3,138 Initiated integration of Joint Defensive Planner (JDP) as TBMCS DII COE compliant segments (U) \$4,540 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u> (U) \$42 Complete initial DII COE FLEX coordinated replanning (reflow) prototype for TBMCS V2.X (U) \$2,602 Continue Joint Defensive Planner (JDP) V2.0 software development (U) \$1,192 Initiate integration activity for coordinated strategy-to-task for offensive (FLEX), Joint Defensive Planner (JDP), and information operations, including atmospheric environment impacts Prototypes for TBMCS V2.X (U) \$193 Adapt Joint Defensive Planning, Air Tasking Order (FLEX) monitor and retasking for Battle Control Center (U) \$4,029 Total</p>									
Project 642321			Page 12 of 20 Pages				Exhibit R-2A (PE 0603617F)		

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE February 2000																																																		
BUDGET ACTIVITY 04 - Demonstration and Validation	PE NUMBER AND TITLE 0603617F Command Control and Communication Applications	PROJECT 642321																																																		
<p>(U) <u>A. Mission Description Continued</u></p> <p>(U) <u>FY 2001 (\$ in Thousands)</u></p> <p>(U) \$1,407 Complete JDP software development and integration into TBMCS V 2.X</p> <p>(U) \$497 Adapt JDP TBMCS V2.0 for GCCS-AF Integration</p> <p>(U) \$596 Initiate effects based operations for joint aerospace operations</p> <p>(U) \$1,000 Continue integration activity for coordinated strategy-to-task for offensive, defensive and information operations including atmospheric environment impacts prototypes for TBMCS V2.X</p> <p>(U) \$560 Initiate decision aids for space environment impact effects on coordinated strategy-to-task for joint air operations</p> <p>(U) \$4,060 Total</p> <p>(U) <u>B. Project Change Summary</u> Not Applicable</p> <p>(U) <u>C. Other Program Funding Summary (\$ in Thousands)</u></p> <table border="0" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;"></th> <th style="width: 10%; text-align: center;"><u>FY 1999</u></th> <th style="width: 10%; text-align: center;"><u>FY 2000</u></th> <th style="width: 10%; text-align: center;"><u>FY 2001</u></th> <th style="width: 10%; text-align: center;"><u>FY 2002</u></th> <th style="width: 10%; text-align: center;"><u>FY 2003</u></th> <th style="width: 10%; text-align: center;"><u>FY 2004</u></th> <th style="width: 10%; text-align: center;"><u>FY 2005</u></th> <th style="width: 10%; text-align: center;"><u>Cost to</u></th> <th style="width: 10%; text-align: center;"><u>Total Cost</u></th> </tr> <tr> <td></td> <td style="text-align: center;"><u>Actual</u></td> <td style="text-align: center;"><u>Estimate</u></td> <td style="text-align: center;"><u>Complete</u></td> <td></td> </tr> </thead> <tbody> <tr> <td>(U) RDT&E, AF (0603789F, Project 2335)</td> <td style="text-align: center;">3,907</td> <td style="text-align: center;">4,093</td> <td style="text-align: center;">2,557</td> <td style="text-align: center;">5,087</td> <td style="text-align: center;">5,198</td> <td style="text-align: center;">5,306</td> <td style="text-align: center;">5,416</td> <td style="text-align: center;">Continuing</td> <td style="text-align: center;">TBD</td> </tr> <tr> <td>(U) RDT&E, AF (0207438F, Project 4287)</td> <td style="text-align: center;">11,972</td> <td style="text-align: center;">0</td> <td></td> <td style="text-align: center;">TBD</td> </tr> <tr> <td>(U) RDT&E, AF (0207438F, Project 4790)</td> <td style="text-align: center;">0</td> <td style="text-align: center;">23,007</td> <td style="text-align: center;">20,439</td> <td style="text-align: center;">18,120</td> <td style="text-align: center;">17,682</td> <td style="text-align: center;">20,433</td> <td style="text-align: center;">20,859</td> <td style="text-align: center;">Continuing</td> <td style="text-align: center;">TBD</td> </tr> </tbody> </table> <p>(U) <u>D. Acquisition Strategy</u> The Systems Division of the Air Force Research Laboratory's Information Directorate manages the acquisition of technology under the direct guidance of the AC2ISRC. The objective is to integrate into the Theater Battle Management Core System (TBMCS) through a Memorandum of Understanding (MOU) entitled 'Shared management of TBMCS Technology Development' with the TBMCS System Program Office (SPO). As nominated by the Air Staff, some applications are designed for integration into the Air Force Global Command and Control System (GCCS-AF). All contracts are awarded under full competition and include Cost Plus Fixed Fee (CPFF) and Cost Plus Award Fee (CPAF) as appropriate for advanced development efforts. All contracts use the Spiral Development Model and Evolutionary Prototyping, with heavy user participation from all the Services, and produce joint software applications, as designated by the JCS Joint Standard Air Operations Software Configuration Control Board.</p>				<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) RDT&E, AF (0603789F, Project 2335)	3,907	4,093	2,557	5,087	5,198	5,306	5,416	Continuing	TBD	(U) RDT&E, AF (0207438F, Project 4287)	11,972	0	0	0	0	0	0		TBD	(U) RDT&E, AF (0207438F, Project 4790)	0	23,007	20,439	18,120	17,682	20,433	20,859	Continuing	TBD
	<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>																																											
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Project 642321	Page 13 of 20 Pages	Exhibit R-2A (PE 0603617F)																																																		

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)										DATE February 2000				
BUDGET ACTIVITY					PE NUMBER AND TITLE					PROJECT				
04 - Demonstration and Validation					0603617F Command Control and Communication Applications					642321				
(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) TBM Systems Integration Evaluation														
(U) FLEX														
(U) - TBMCS V1.0 integration	*													
(U) - TBMCS V1.0.1 integration			*											
(U) Replanning (reflow) prototype demo					*									
(U) Joint Defensive Planner software development and integration														
(U) - EP #2/3		*					X							
(U) GCCS Integration								X						
(U) - Functional Validation Model #1 & 2									X		X			
(U) - TBMCS V x.x integration												X		
(U) Battle Control Center Evaluations.								X						
(U) Coordinated Strategy-to-task Spiral 1								X						
(U) Coordinated Strategy-to-task Spiral 2												X		
(U) Effects Based Operations Spiral 1												X		
Note: * represents a completed event; X represents a planned event														

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000			
BUDGET ACTIVITY				PE NUMBER AND TITLE				PROJECT		
04 - Demonstration and Validation				0603617F Command Control and Communication Applications				642321		
(U) A. Project Cost Breakdown (\$ in Thousands)										
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>
(U)	Software Development					3,266		3,046		2,822
(U)	Government Engineering Support					690		749		866
(U)	Contractor Engineering Support					584		234		372
(U)	Total					4,540		4,029		4,060
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)										
(U) Performing Organizations:										
<u>Contractor or Government</u>	<u>Contract Method/Type</u>	<u>Award or Obligation</u>	<u>Performing Activity</u>	<u>Project Office</u>	<u>Total Prior to FY 1999</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>						
<u>Product Development Organizations</u>										
Logicon	C/CPFF	June 94	9,782	9,782	9,114	912	45		0	10,071
PRB Assoc.	C/CPAF	Feb 97	7,435	7,435	1,496	2,500	2,324	1,015	380	7,715
TBD							647	1,754	Continuing	TBD
<u>Support and Management Organizations</u>										
AF Research Lab	In-house	N/A	N/A	TBD	27,423	642	779	921	Continuing	TBD
Lockheed Martin							115	193	Continuing	TBD
Litton/TASC						486	119	177	Continuing	TBD
Miscellaneous	Various	Various	N/A	TBD						
<u>Test and Evaluation Organizations</u>										
Not Applicable										

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)			DATE February 2000			
BUDGET ACTIVITY	PE NUMBER AND TITLE			PROJECT		
04 - Demonstration and Validation	0603617F Command Control and Communication Applications			642321		
	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>Subtotals</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
Subtotal Product Development	10,610	3,412	3,016	2,769	TBD	TBD
Subtotal Support and Management	27,423	1,128	1,013	1,291	TBD	TBD
Subtotal Test and Evaluation						
Total Project	38,033	4,540	4,029	4,060	TBD	TBD

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)							DATE February 2000																						
BUDGET ACTIVITY 04 - Demonstration and Validation				PE NUMBER AND TITLE 0603617F Command Control and Communication Applications				PROJECT 643804																					
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																				
643804 Tactical Air Forces Systems Integration	203	219	223	233	239	244	247	Continuing	TBD																				
<p>(U) <u>A. Mission Description</u> Provides systems engineering and integration support to the Aerospace Command Control & Intelligence Surveillance Reconnaissance Center (AC2ISRC) development efforts. Project addresses integration and interoperability issues associated with AC2ISRC directed efforts, makes recommendations, identifies deficiencies, and establishes requirements for development efforts.</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u> (U) \$103 Evaluated the Joint Defensive Planner advanced technology demonstration prototype (U) \$100 Analyzed Commander's Planning and Execution Tool (CPET) Prototype Candidate for technology transition within PE (U) \$203 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u> (U) \$219 Initiates detailed analysis of strategy-to-task Prototype tools for development and interoperability (See BPAC 64321) for technology transition within PE (U) \$219 Total</p> <p>(U) <u>FY 2001 (\$ in Thousands)</u> (U) \$223 Initiates detailed analysis of effects based operations prototype tools for development and interoperability (see BPAC 642321) for technology transition within PE (U) \$223 Total</p> <p>(U) <u>B. Project Change Summary</u> None</p> <p>(U) <u>C. Other Program Funding Summary (\$ in Thousands)</u></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:15%;"></th> <th style="width:10%;"><u>FY 1999</u> Actual</th> <th style="width:10%;"><u>FY 2000</u> Estimate</th> <th style="width:10%;"><u>FY 2001</u> Estimate</th> <th style="width:10%;"><u>FY 2002</u> Estimate</th> <th style="width:10%;"><u>FY 2003</u> Estimate</th> <th style="width:10%;"><u>FY 2004</u> Estimate</th> <th style="width:10%;"><u>FY 2005</u> Estimate</th> <th style="width:10%;"><u>Cost to</u> Complete</th> <th style="width:10%;"><u>Total Cost</u></th> </tr> </thead> <tbody> <tr> <td>(U) Not Applicable</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>											<u>FY 1999</u> Actual	<u>FY 2000</u> Estimate	<u>FY 2001</u> Estimate	<u>FY 2002</u> Estimate	<u>FY 2003</u> Estimate	<u>FY 2004</u> Estimate	<u>FY 2005</u> Estimate	<u>Cost to</u> Complete	<u>Total Cost</u>	(U) Not Applicable									
	<u>FY 1999</u> Actual	<u>FY 2000</u> Estimate	<u>FY 2001</u> Estimate	<u>FY 2002</u> Estimate	<u>FY 2003</u> Estimate	<u>FY 2004</u> Estimate	<u>FY 2005</u> Estimate	<u>Cost to</u> Complete	<u>Total Cost</u>																				
(U) Not Applicable																													
<p>Project 643804</p>																													

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 04 - Demonstration and Validation	PE NUMBER AND TITLE 0603617F Command Control and Communication Applications	PROJECT 643804
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(U) **D. Acquisition Strategy**
Not Applicable

(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) Evaluate Commander's Planning Execution Tool design			*									
(U) Evaluate JDP prototype(s)				*								
(U) Evaluate Strategy-To-Task prototypes								X				
(U) Evaluate effects based ops prototypes												X

Note: * represents a completed event; X represents a planned event.

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000				
BUDGET ACTIVITY				PE NUMBER AND TITLE				PROJECT			
04 - Demonstration and Validation				0603617F Command Control and Communication Applications				643804			
(U) A. Project Cost Breakdown (\$ in Thousands)											
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>	
(U)	Systems Engineering						103		219	223	
(U)	Government Engineering Support						100				
(U)	Contractor Engineering Support						203		219	223	
(U)	Total										
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)											
(U) Performing Organizations:											
	<u>Contractor or Government Performing Activity</u>	<u>Contract Method/Type or Funding Vehicle</u>	<u>Award or Obligation Date</u>	<u>Performing Activity EAC</u>	<u>Project Office EAC</u>	<u>Total Prior to FY 1999</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
	<u>Product Development Organizations</u>										
	ISX Corp	Task Order		100	100	0	100				100
	<u>Support and Management Organizations</u>										
	MITRE	SS/TO&P	Various	N/A	TBD	2,138	0	0	0	Continuing	TBD
	AF Research Lab/AC2ISRC	In-house	N/A	N/A	TBD	132	103	219	223	Continuing	TBD
	Miscellaneous	Various	Various	N/A	TBD	0	0	0	0	Continuing	TBD
	<u>Test and Evaluation Organizations</u>										
(U) Government Furnished Property:											
	<u>Item Description</u>	<u>Contract Method/Type or Funding Vehicle</u>	<u>Award or Obligation Date</u>	<u>Delivery Date</u>		<u>Total Prior to FY 1999</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
	<u>Product Development Property</u>										
	Not Applicable										
	<u>Support and Management Property</u>										
	Not Applicable										
Project 643804				Page 19 of 20 Pages				Exhibit R-3 (PE 0603617F)			

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)		DATE				
04 - Demonstration and Validation		0603617F Command Control and Communication Applications			February 2000	
BUDGET ACTIVITY		PE NUMBER AND TITLE			PROJECT	
(U) <u>Government Furnished Property Continued:</u>						
<u>Test and Evaluation Property</u>						
Not Applicable						
		<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>
<u>Subtotals</u>						<u>Total</u>
Subtotal Product Development		0	100			100
Subtotal Support and Management		2,270	103	219	223	TBD
Subtotal Test and Evaluation						TBD
Total Project		2,270	203	219	223	TBD