

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603617F Command Control & Communications Applications
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	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	6,469	7,731	7,833	7,898	8,002	8,140	8,308	8,482	Continuing	TBD
2314 Tactical Air Surveillance	574	446	450	452	456	462	471	481	Continuing	TBD
2317 Tactical Air Information Production & Distribution	1,518	3,064	3,100	3,124	3,168	3,223	3,289	3,359	Continuing	TBD
2321 Tactical Battle Information Management	4,243	4,017	4,062	4,097	4,143	4,214	4,302	4,392	Continuing	TBD
3804 Tactical Air Forces Systems Integration	134	204	221	225	235	241	246	250	Continuing	TBD
Quantity of RDT&E Articles	0	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 technology developments throughout the services and industry as well as off-the-shelf technology. The program also defines system architectures and develops communications technology for modernization and improving the Air Force portion of the Tri-Service communications networks which the Defense Information Systems Agency (DISA) oversees.

(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) <u>Program Change Summary (\$ in Thousands)</u>					
	<u>FY 1998</u>	<u>_____</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Cost</u>
(U) Previous Presidents Budget (FY 1999 PB)		7,770	7,975		TBD
(U) Appropriated Value		7,770			
(U) Adjustments to Appropriated Value					
	-273	-39			
	-145				
c. Omnibus/Other Above Threshold Reprogramming					
d. Below Threshold Reprogramming	-714				
(U) Adjustments to Budget Years Since FY 1999 PB			-142		
(U) Current Budget Submit/FY 2000 PB	6,469		7,833	7,898	
 (U) Significant Program Changes:					
FY99: \$208 identified as a source for SBIR					

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603617F Command Control & Communications Applications				PROJECT 2314		
<i>COST (\$ In Thousands)</i>	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
2314 Tactical Air Surveillance	574	446	450	452	456	462	471	481	Continuing	TBD
<p>(U) A. <u>Mission Description :</u></p> <p>Develops advanced technology and demonstrates equipment improvements to the Theater Air Control System (TACS) ground surveillance radars. Investigates non-radar and/or adjunct radar sensors to address the Combat Air Forces (CAF) surveillance, detection, and tracking requirements not satisfied by an active radar. Develops advanced surveillance technology in support of next generation sensors and sensor signal processing.</p> <p>(U) <u>FY 1998 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 21 Initiate Track Before Detect for Theater Missile Defense (TMD) with adaptive elevation angle estimation - (U) \$ 140 Completed analysis of solid state versus tube based transmitter for AN/TPS-75 Radar Set - (U) \$ 413 Completed waveform and signal processor design and evaluation - (U) \$ 574 Total <p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 263 Continue Track Before Detect for TMD - (U) \$ 171 Initiate Ground Theater Air Control System (GTACS) Bistatic/Electronic Support Measures (ESM) System Definition - (U) \$ 12 Identified as a source for SBIR - (U) \$ 446 Total <p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 199 Continue Track Before Detect for TMD - (U) \$ 200 Complete GTACS Bistatic/ESM System Definition - (U) \$ 51 Initiate Target Identification for AN/TPS-75 radar set - (U) \$ 450 Total 										
Project 2314			<i>Page 3 of 23 Pages</i>				Exhibit R-2A (PE 0603617F)			

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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603617F Command Control & Communications Applications	PROJECT 2314																																	
<p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> – (U) \$ 40 Complete Track Before Detect for TMD – (U) \$ 412 Continue Target Identification for AN/TPS-75 radar set – (U) \$ 452 Total <p>(U) B. <u>Project Change Summary - Description of Significant Changes:</u> Not applicable.</p> <p>(U) C. <u>Other Program Funding Summary (\$ in Thousands):</u></p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;"></th> <th style="text-align: center;"><u>FY 1998</u></th> <th style="text-align: center;"><u>FY 1999</u></th> <th style="text-align: center;"><u>FY 2000</u></th> <th style="text-align: center;"><u>FY 2001</u></th> <th style="text-align: center;"><u>FY 2002</u></th> <th style="text-align: center;"><u>FY 2003</u></th> <th style="text-align: center;"><u>FY 2004</u></th> <th style="text-align: center;"><u>FY 2005</u></th> <th style="text-align: center;"><u>To</u> <u>Compl</u></th> <th style="text-align: center;"><u>Total</u> <u>Cost</u></th> </tr> </thead> <tbody> <tr> <td>(U) RDT&E, AF (0603789F, Project 4072)</td> <td style="text-align: right;">6,285</td> <td style="text-align: right;">6,583</td> <td style="text-align: right;">10,851</td> <td style="text-align: right;">9,788</td> <td style="text-align: right;">8,526</td> <td style="text-align: right;">7,591</td> <td style="text-align: right;">7,750</td> <td style="text-align: right;">7,911</td> <td style="text-align: center;">Cont</td> <td style="text-align: center;">TBD</td> </tr> <tr> <td>(U) RDT&E, AF (0207412F, Project 485L)</td> <td style="text-align: right;">374</td> <td style="text-align: right;">423</td> <td style="text-align: right;">467</td> <td style="text-align: right;">450</td> <td style="text-align: right;">436</td> <td style="text-align: right;">426</td> <td style="text-align: right;">435</td> <td style="text-align: right;">375</td> <td style="text-align: center;">Cont</td> <td style="text-align: center;">TBD</td> </tr> </tbody> </table>				<u>FY 1998</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>To</u> <u>Compl</u>	<u>Total</u> <u>Cost</u>	(U) RDT&E, AF (0603789F, Project 4072)	6,285	6,583	10,851	9,788	8,526	7,591	7,750	7,911	Cont	TBD	(U) RDT&E, AF (0207412F, Project 485L)	374	423	467	450	436	426	435	375	Cont	TBD
	<u>FY 1998</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>To</u> <u>Compl</u>	<u>Total</u> <u>Cost</u>																									
(U) RDT&E, AF (0603789F, Project 4072)	6,285	6,583	10,851	9,788	8,526	7,591	7,750	7,911	Cont	TBD																									
(U) RDT&E, AF (0207412F, Project 485L)	374	423	467	450	436	426	435	375	Cont	TBD																									
Project 2314	<i>Page 4 of 23 Pages</i>	Exhibit R-2A (PE 0603617F)																																	

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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603617F Command Control & Communications Applications	PROJECT 2314
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(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 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) Tube-based transmitter panel performance and R&M testing		*														
(U) Tube-based versus solid-state eval		*														
(U) Develop waveform signal processor				*												
(U) Track Before Detect for TMD															X	
(U) GTACS Bistatic/ESM System Definition										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 1999	
BUDGET ACTIVITY 4 - Demonstration and Validation					PE NUMBER AND TITLE 0603617F Command Control & Communications Applications					PROJECT 2314	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U)	Primary Hardware Development				559	359	374	374			
(U)	Government Engineering Support				10	60	60	61			
(U)	Travel				5	15	16	17			
(U)	Identified as a source for SBIR					12					
(U)	Total				574	446	450	452			
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR								12			12
<u>Product Development Organizations</u>											
Hughes	C/CPFF	June 95	1,179	1,179	1,179	0	0	0	0	0	1,179
DSA	Tsk Ord Agmt	Apr 97	905	905	502	403	0	0	0	0	905
Northrop-Grumman	Tsk Ord Agmt	Aug 98	435	435	0	21	217	164	33	0	435
TBD	TBD	TBD	309	309	0	0	142	167	0	0	309
TBD	TBD	TBD	TBD	TBD	0	0	0	43	341	Cont	TBD
<u>Support and Management Organizations</u>											
AF Research Lab	In-house	n/s	N/A	N/A	6,419	75	75	76	78	Cont	TBD
Project 2314					Page 6 of 23 Pages				Exhibit R-3 (PE 0603617F)		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY					PE NUMBER AND TITLE					PROJECT	
4 - Demonstration and Validation					0603617F Command Control & Communications Applications					2314	
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Miscellaneous	Various	Various	N/A	N/A	0	75	0	0	0	Cont	TBD
<u>Test and Evaluation Organizations</u> - Not Applicable.					0	0	0	0	0	0	0
(U) B. Budget Acquisition History and Planning Information Continued (\$ in Thousands)											
Government Furnished Property: Not Applicable.											
					Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR							12				
Subtotal Product Development					1,681	424	359	374	374	Cont	TBD
Subtotal Support and Management					6,419	150	75	76	78	Cont	TBD
Subtotal Test and Evaluation					0	0	0	0	0	Cont	TBD
Total Project					8,100	574	446	450	452	Cont	TBD

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BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603617F Command Control & Communications Applications					PROJECT 2317	
<i>COST (\$ In Thousands)</i>	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
2317 Tactical Air Information Production & Distribution	1,518	3,064	3,100	3,124	3,168	3,223	3,289	3,359	Continuing	TBD
<p>(U) A. <u>Mission Description:</u> Transitions advanced communications to the Theater Deployable Communications (TDC) program in support of Theater Battle Management (TBM) command and control enhancements. The goal is to reduce the risk of transitioning advanced government or commercial off-the-shelf technology into military communications systems. Capabilities developed include modular programmable radio technologies and improvements to survivability, deployability, interoperability, and control of communications networks. The SPEAKeasy program core technologies and concept were demonstrated and transitioned to support the Joint Tactical Radio System (JTRS) Joint Program Office (JPO) acquisition activities. This project will continue to develop and transition risk-reduced capabilities required for airborne platforms to effectively host the JTRS. Unmanned Airborne Vehicles (UAV)/Advanced Communications Node (ACN) platforms are intended to be the first so equipped, followed by other wider body aerospace platforms.</p> <p>(U) <u>FY 1998 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 220 Completed Special Operations Command (SOCOM) analysis of tactical wideband user information services - (U) \$ 690 Expanded the Deployable Asynchronous Transfer Mode (ATM) capability at Langley AFB, VA to enable wartime bandwidth management - (U) \$ 140 Initiated airborne-transportable radio wideband/multi-band antenna developments - (U) \$ 446 Initiated electromagnetic interference/compatibility research and test for a communication UAV - (U) \$ 22 Initiated airborne-transportable radio wideband Power Amplifier (PA) development. - (U) \$1,518 Total <p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 430 Continue airborne-transportable radio wideband/multi-band antenna developments - (U) \$ 800 Continue UAV radio electromagnetic interference/compatibility research and test for a communications UAV - (U) \$ 901 Continue airborne-transportable radio wideband Power Amplifier (PA) development. - (U) \$ 220 Initiate the transition of advanced development Project 2335 error mitigation hardware/software and deployable communications management software into deployable capability at Langley AFB, VA - (U) \$ 130 Initiate development of advanced, wideband suitcase satellite communications (SATCOM) capability - (U) \$ 500 Initiate effort to transition and demonstrate the (PROJ/4519/DARPA) On Board Switch (OBS) technologies for Tanker Relay and Phase 2 ACN applications - (U) \$ 83 Identified as a source for SBIR 										
Project 2317			Page 8 of 23 Pages				Exhibit R-2A (PE 0603617F)			

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<p>– (U) \$3,064 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> – (U) \$ 123 Complete development of wideband/multiband antennas. Prepare for transition to Phase 2 ACN and Tanker Relay Platforms. – (U) \$ 450 Complete evaluation of antenna placement issues for ACN platform. – (U) \$ 476 Complete design of wideband PA and prepare for transition to Phase 2 ACN and Tanker Relay Platforms. – (U) \$ 742 Continue integration of technology to improve performance of commercial ATM over tactical media via error correction and channel management technologies – (U) \$ 59 Conduct field demonstration of suitcase SATCOM and assess suitability for airborne platforms. – (U) \$1,250 Integrate software programmable radios with OBS capability into Tanker Relay Demo. – (U) \$3,100 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> – (U) \$ 940 Initiate effort to transition Reachback for the Warrior (Project 4216) capabilities into Air Mobility Command (AMC) Tactical Air Control Center. – (U) \$ 684 Initiate effort to transition the Multi Level Secure (MLS) Network Management (Project 2335) capabilities into the AMC Global Reach communications. – (U) \$1,000 Complete Tanker Relay Demo and transition capabilities to Theater Beyond Line of Sight (TBLOS) Program. – (U) \$ 500 Complete integration of Command and Control (C2) Network Managing Software at Deployable ATM Site. – (U) \$3,124 Total <p>(U) B. <u>Project Change Summary - Description of Significant Changes:</u></p> <p>With the transition of the SPEAKeasy Technology to the Joint Tactical Radio System (JTRS) System Program Office (SPO), the focus of this project has changed to address platform specific issues associated with putting multiband radios aboard an airborne platform. This platform was chosen by Aerospace Command and Control Agency (AC2A).</p> <p>(U) C. <u>Other Program Funding Summary (\$ in Thousands):</u></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th><u>FY 1998</u></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>To <u>Compl</u></th> <th>Total <u>Cost</u></th> </tr> </thead> <tbody> <tr> <td>(U) RDT&E, AF (0602702F, Project 4519)</td> <td align="right">10,207</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">Cont</td> <td align="center">TBD</td> </tr> <tr> <td>(U) RDT&E, AF (0603789F, Project 2335)</td> <td align="right">4,710</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">Cont</td> <td align="center">TBD</td> </tr> </tbody> </table>										<u>FY 1998</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>	To <u>Compl</u>	Total <u>Cost</u>	(U) RDT&E, AF (0602702F, Project 4519)	10,207	17,055	10,817	13,208	13,300	13,990	14,577	16,026	Cont	TBD	(U) RDT&E, AF (0603789F, Project 2335)	4,710	3,907	4,093	2,557	5,087	5,198	5,306	5,416	Cont	TBD
	<u>FY 1998</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>	To <u>Compl</u>	Total <u>Cost</u>																															
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BUDGET ACTIVITY
4 - Demonstration and Validation

PE NUMBER AND TITLE
**0603617F Command Control & Communications
Applications**

(U) RDT&E, AF (0603789F, Project 4216)	1,320	2,316	2,458	2,640	2,687	2,752	2,809	2,868	Cont	TBD
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Project 2317			Page 10 of 23 Pages			Exhibit R-2A (PE 0603617F)																																																																																																																																																																																											

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 4 - Demonstration and Validation					PE NUMBER AND TITLE 0603617F Command Control & Communications Applications					PROJECT 2317	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U) Primary Hardware Development					1,218	2,681	2,775	2,764			
(U) Government Engineering Support					60	60	65	75			
(U) Travel					40	40	50	60			
(U) Contractor Engineering Support					200	200	210	225			
(U) Identified as a source for SBIR						83					
(U) Total					1,518	3,064	3,100	3,124			
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR							83				83
<u>Product Development Organizations</u>											
ESC	PD	Various	TBD	TBD	210	200	200	210	225	Cont	TBD
SOCOM	PD	Sept 96	592	592	392	200	0	0	0	0	592
TBD (Airborne-transportable radio support)	TBD	TBD	TBD	TBD	0	818	2,481	2,565	2,539	Cont	TBD
<u>Support and Management Organizations</u>											
AF Research Lab	In-house	N/A	N/A	TBD	12,153	300	300	325	360	Cont	TBD
<u>Test and Evaluation Organizations</u> - Not Applicable											
Project 2317					Page 11 of 23 Pages				Exhibit R-3 (PE 0603617F)		

DATE
February 1999

BUDGET ACTIVITY
4 - Demonstration and Validation

PE NUMBER AND TITLE
0603617F Command Control & Communications Applications

Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
					0	0	0	0	0	0	TBD

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)						DATE February 1999	
BUDGET ACTIVITY		PE NUMBER AND TITLE				PROJECT	
4 - Demonstration and Validation		0603617F Command Control & Communications Applications				2317	
Government Furnished Property: Not Applicable							
(U) B. <u>Budget Acquisition History and Planning Information Continued (\$ in Thousands)</u>							
		Total					
		<u>Prior to</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>
		<u>FY 1998</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>
							<u>Total</u>
							<u>Program</u>
Identified as a source for SBIR				83			83
Subtotal Product Development	602	1,218	2,681	2,775	2,764	Cont	TBD
Subtotal Support and Management	12,153	300	300	325	360	Cont	TBD
Subtotal Test and Evaluation	0	0	0	0	0	Cont	TBD
Total Project	12,755	1,518	3,064	3,100	3,124	Cont	TBD

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603617F Command Control & Communications Applications				PROJECT 2321		
<i>COST (\$ In Thousands)</i>	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
2321 Tactical Battle Information Management	4,243	4,017	4,062	4,097	4,143	4,214	4,302	4,392	Continuing	TBD
<p>(U) A. <u>Mission Description:</u> Designs and integrates improvements to system software and Command Control and Communications (C3) applications modules via rapid prototyping and maximum user participation in all design activities. Current focus is the functional development and rapid prototyping of the Force Level Execution (FLEX) system and the Joint Defensive Planner (JDP), both of which have been designated by the Joint Staff (J6V) Joint Standards Air Operations Software Configuration Control Board as joint applications for use by all the Services. Both are being designed and developed as Defense Information Infrastructure (DII) Common Operating Environment (COE) compliant segments for integration into Theater Battle Management Core Systems (TBMCS). FLEX assists combat operations personnel in a Joint Air Operations Center (JAOC) to quickly replan or reallocate resources based on real-time threat inputs, including time critical targets (TCTs) and changes in the wartime scenario. JDP will provide the single theater air and missile defense automated system that aids 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. Future efforts will focus on spiral development of Force Level capabilities responsive to evolving concepts advocated by the Aerospace Command and Control Agency (AC2A), such as the Configurable Aerospace Command Center.</p> <p>(U) <u>FY 1998 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$2,974 Complete initial FLEX integration into TBMCS V1.0 and TBMCS remote terminals. - (U) \$1,169 Continue Joint Defensive Planner (JDP) software development - (U) \$ 100 Demonstrate FLEX airborne capabilities via TBMCS remote terminals (i.e., AWACS, JSTARS, ABCCC). - (U) \$4,243 Total <p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 301 Initiate FLEX integration into TBMCS V1.1 - (U) \$ 1,100 Begin development of coordinated FLEX replanning for TBMCS V2.0 - (U) \$ 2,508 Initiate integration of Joint Defensive Planner (JDP) as TBMCS DII COE compliant segments - (U) \$ 108 Identified as a source for SBIR - (U) \$ 4,017 Total 										
Project 2321			Page 13 of 23 Pages				Exhibit R-2A (PE 0603617F)			

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<p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 1,158 Develop DII COE compliant automated FLEX Options Generation and initiate integration activity for TBMCS V2.0 - (U) \$ 1,924 Continue Joint Defensive Planner (JDP) V2.0 software development - (U) \$ 980 Initiate integration activity for TBMCS V2.0 - (U) \$ 4,062 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 1,350 Complete FLEX development and integrate into TBMCS V3.0 - (U) \$ 1,747 Complete JDP software development and integration into TBMCS V3.0 - (U) \$ 1,000 Transition Configurable Aerospace Command Center Collaboration and Visualization segments to TBMCS - (U) \$ 4,097 Total <p>(U) B. <u>Project Change Summary - Description of Significant Changes:</u> Not applicable.</p> <p>(U) C. <u>Other Program Funding Summary (\$ in Thousands):</u></p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;"></th> <th style="text-align: center;"><u>FY 1998</u></th> <th style="text-align: center;"><u>FY 1999</u></th> <th style="text-align: center;"><u>FY 2000</u></th> <th style="text-align: center;"><u>FY 2001</u></th> <th style="text-align: center;"><u>FY 2002</u></th> <th style="text-align: center;"><u>FY 2003</u></th> <th style="text-align: center;"><u>FY 2004</u></th> <th style="text-align: center;"><u>FY 2005</u></th> <th style="text-align: center;"><u>To Compl</u></th> <th style="text-align: center;"><u>Total Cost</u></th> </tr> </thead> <tbody> <tr> <td>(U) RDT&E, AF (0603789F, Project 2335)</td> <td style="text-align: right;">4,710</td> <td style="text-align: right;">3,907</td> <td style="text-align: right;">4,093</td> <td style="text-align: right;">2,557</td> <td style="text-align: right;">5,087</td> <td style="text-align: right;">5,198</td> <td style="text-align: right;">5,306</td> <td style="text-align: right;">5,416</td> <td style="text-align: center;">Cont</td> <td style="text-align: center;">TBD</td> </tr> <tr> <td>(U) RDT&E, AF (0207438F, Project 4287)</td> <td style="text-align: right;">18,844</td> <td style="text-align: right;">11,972</td> <td style="text-align: center;">0</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;">0</td> <td style="text-align: right;">23,007</td> <td style="text-align: right;">20,439</td> <td style="text-align: right;">18,120</td> <td style="text-align: right;">17,682</td> <td style="text-align: right;">20,433</td> <td style="text-align: right;">20,859</td> <td style="text-align: center;">Cont</td> <td style="text-align: center;">TBD</td> </tr> </tbody> </table>				<u>FY 1998</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>To Compl</u>	<u>Total Cost</u>	(U) RDT&E, AF (0603789F, Project 2335)	4,710	3,907	4,093	2,557	5,087	5,198	5,306	5,416	Cont	TBD	(U) RDT&E, AF (0207438F, Project 4287)	18,844	11,972	0	0	0	0	0	0	0	TBD	(U) RDT&E, AF (0207438F, Project 4790)	0	0	23,007	20,439	18,120	17,682	20,433	20,859	Cont	TBD
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- TBMCS V2.0 integration										X																																																																																																																																																																																																																																																																																
- TBMCS V3.0 integration															X																																																																																																																																																																																																																																																																											
- Airborne SPO demos (AWACS/JSTARS)				*																																																																																																																																																																																																																																																																																						
(U) Joint Defensive Planner software development and integration																																																																																																																																																																																																																																																																																										
- Evolutionary Prototype (EP) #1				*																																																																																																																																																																																																																																																																																						
- EP #2						X																																																																																																																																																																																																																																																																																				
- EP #3 (adv tech demo)							X																																																																																																																																																																																																																																																																																			
- TBMCS V2.0 integration										X																																																																																																																																																																																																																																																																																
- Functional Validation Model #1										X																																																																																																																																																																																																																																																																																
- Functional Validation Model #2													X																																																																																																																																																																																																																																																																													
- TBMCS V3.0 integration															X																																																																																																																																																																																																																																																																											
<p>Note: * represents a completed event; X represents a planned event.</p>																																																																																																																																																																																																																																																																																										
Project 2321				Page 15 of 23 Pages				Exhibit R-2A (PE 0603617F)																																																																																																																																																																																																																																																																																		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 4 - Demonstration and Validation					PE NUMBER AND TITLE 0603617F Command Control & Communications Applications					PROJECT 2321	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U)	Software Development				3,236	2,925	3,026	2,997			
(U)	Government Engineering Support				707	659	686	700			
(U)	Travel				150	175	175	200			
(U)	Contractor Engineering Support				150	150	175	200			
(U)	Identified as a source for SBIR					108					
(U)	Total				4,243	4,017	4,062	4,097			
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR							108				
<u>Product Development Organizations</u>											
Logicon	C/CPFF	June 94	11,696	11,696	6,686	2,390	899	771	1,053	0	11,799
PRB Assoc.	C/CPAF	Feb 97	7,104	7,104	650	846	2,026	2,255	1,023	304	7,104
TBD	TBD	Dec 01	TBD	TBD	0	0	0	0	921	Cont	TBD
<u>Support and Management Organizations</u>											
AF Research Lab	In-house	N/A	N/A	TBD	27,423	857	834	861	900	Cont	TBD
Miscellaneous	Various	Various	N/A	TBD	0	150	150	175	200	Cont	TBD
<u>Test and Evaluation Organizations</u> - Not Applicable											
					0	0	0	0	0	0	TBD
Project 2321					Page 16 of 23 Pages				Exhibit R-3 (PE 0603617F)		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)						DATE February 1999		
BUDGET ACTIVITY			PE NUMBER AND TITLE			PROJECT		
4 - Demonstration and Validation			0603617F Command Control & Communications Applications			2321		
(U) B. <u>Budget Acquisition History and Planning Information Continued (\$ in Thousands)</u>								
Government Furnished Property: Not Applicable								
			Total					
			<u>Prior to</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Total</u>
			FY 1998	FY 1998	FY 1999	FY 2000	FY 2001	Program
Identified as a source for SBIR					108			108
Subtotal Product Development	7,336	3,236		2,925	3,026	2,997	Cont	TBD
Subtotal Support and Management	27,423	1,007		984	1,036	1,100	Cont	TBD
Subtotal Test and Evaluation	0	0		0	0	0	0	
Total Project	34,759	4,243		4,017	4,062	4,097	Cont	TBD

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603617F Command Control & Communications Applications	PROJECT 3804
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
3804 Tactical Air Forces Systems Integration	134	204	221	225	235	241	246	250	Continuing	TBD

(U) **A. Mission Description:** Provides systems engineering and integration support to the Aerospace Command and Control Agency (AC2A) development efforts. Project addresses integration and interoperability issues associated with AC2A directed efforts, makes recommendations, identifies deficiencies, and establishes requirements for development efforts.

(U) FY 1998 (\$ in Thousands):

- (U) \$ 80 Support analysis of TBMCS Theater Integration
- (U) \$ 54 Evaluate Joint Defensive Planner Prototype
- (U) \$ 134 Total

(U) FY 1999 (\$ in Thousands):

- (U) \$ 19 Evaluate Joint Defensive Planner advanced technology demonstration prototype
- (U) \$ 90 Identify candidate prototypes for technology transition within Program Element (PE)
- (U) \$ 90 Analyze candidate prototypes for technology transition within PE
- (U) \$ 5 Identified as a source for SBIR
- (U) \$ 204 Total

(U) FY 2000 (\$ in Thousands):

- (U) \$ 25 Begin analysis of system integration requirements in support of AC2A
- (U) \$ 146 Continue detailed analyses of candidate prototypes for technology transition within PE
- (U) \$ 50 Prioritize candidate prototypes for technology transition within PE
- (U) \$ 221 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
4 - Demonstration and Validation	0603617F Command Control & Communications Applications	3804
<p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none">- (U) \$ 29 Continue analysis of AC2A requirements for implementation/integration in PE projects- (U) \$ 96 Conduct detailed analyses of technology transition requirements for selected prototypes in PE projects- (U) \$ 100 Conduct detailed analyses of technology integration requirements for selected prototypes in PE projects- (U) \$ 225 Total <p>(U) B. <u>Project Change Summary - Description of Significant Changes:</u> None</p> <p>(U) C. <u>Other Program Funding Summary (\$ in Thousands):</u> Not Applicable.</p>		
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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603617F Command Control & Communications Applications	PROJECT 3804
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(U) D. Acquisition Strategy:

Funds will be used to support in house studies and analysis.

(U) E. Schedule Profile

	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) Analysis of TBM Core Systems theater integration				*												
-- TBM Force Level System prototype evaluations																
- AOC Combat Operations (FLEX)																
- Joint Operations		*														
- TBMCS Integration evaluation				*												
 (U) Joint Defensive Planner Evaluation/ Integration into TBMCS																
- Evaluate JDP prototype(s)								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		
BUDGET ACTIVITY 4 - Demonstration and Validation		February 1999		
PE NUMBER AND TITLE 0603617F Command Control & Communications Applications		PROJECT 3804		
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>				
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) Systems Engineering	120	0	0	0
(U) Government Engineering Support	14	25	25	29
(U) Contractor Engineering Support	0	174	196	196
(U) Identified as a source for SBIR		5		
(U) Total	134	204	221	225
Project 3804				
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Exhibit R-3 (PE 0603617F)				

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY					PE NUMBER AND TITLE					PROJECT	
4 - Demonstration and Validation					0603617F Command Control & Communications Applications					3804	
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR							5				5
<u>Product Development Organizations</u> - Not Applicable.					0	0	0	0	0	0	0
<u>Support and Management Organizations</u>											
MITRE	SS/TO&P	Various	N/A	TBD	2,138	120	0	0	0	Cont	2,258
AF Research Lab	In-house	N/A	N/A	TBD	132	14	25	25	29	Cont	TBD
Miscellaneous	Various	Various	N/A	TBD	0	0	174	196	196	Cont	TBD
<u>Test and Evaluation Organizations</u> - Not Applicable.					0	0	0	0	0	0	0
Government Furnished Property: Not Applicable.											
Project 3804											
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Exhibit R-3 (PE 0603617F)											

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)		DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603617F Command Control & Communications Applications	PROJECT 3804

(U) B. Budget Acquisition History and Planning Information Continued (\$ in Thousands)

	<u>Total Prior to FY 1998</u>	<u>Budget FY 1998</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>
Identified as a source for SBIR			5				
Subtotal Product Development	0	0	0	0	0	0	TBD
Subtotal Support and Management	2,270	134	199	221	225	Cont	TBD
Subtotal Test and Evaluation	0	0	0	0	0	0	TBD
Total Project	2,270	134	204	221	225	Cont	TBD

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