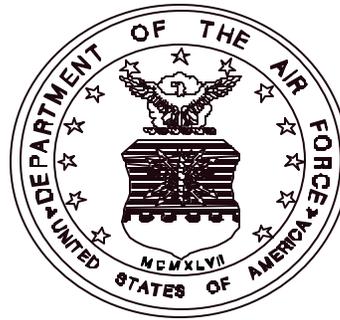


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**DEPARTMENT OF THE AIR FORCE
RDT&E DESCRIPTIVE SUMMARIES FOR
FY 2001 PRESIDENT'S BUDGET**

VOLUME III



FEBRUARY 2000

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Endurance Unmanned Aerial Vehicles	0305205F	1,427
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Space Technology	0602601F	137
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SPACETRACK	0305910F	1,519
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Specialized Undergraduate Pilot Training	0604233F	659
Submunitions	0604604F	767
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Tactical AIM Missiles	0207161F	1,087
Tactical Terminals	0305158F	1,381
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Theater Air Control Systems	0207412F	1,129
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Theater Missile Defenses	0208060F	1,223
Threat Simulator Development	0604256F	913
Titan Space Launch Vehicles	0305144F	1,375
USAF Modeling and Simulation	0207601F	1,191
Variable Stability In-Flight Simulation Test Aircraft	0604237F	589
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Weather Systems Technology	0603707F	353
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**Fiscal Year 2001 Budget Estimate Submission
RDT&E Descriptive Summaries, Volume III
February 2000**

INTRODUCTION AND EXPLANATION OF CONTENTS

1. (U) GENERAL. This document has been prepared to provide information on the United States Air Force (USAF) Research, Development, Test and Evaluation (RDT&E) program elements and projects in the FY2001 President's Budget Submission (PB). All formats in this document are in accordance with the guidelines of the DoD Financial Management Regulation, Volume 2B, Chapter 5 with the exception of the R-3 exhibit. The Air Force could not support the format matrix because our programs do not track their programs in the manner required to complete the exhibit.

- a. Contents: Exhibits R-2, R-2a and R-3 provide narrative information for all RDT&E program elements and projects within the USAF FY 2001 RDT&E program except the classified program elements. The formats and contents of this document are in accordance with the guidelines and requirement of the Congressional committees insofar as possible. The F-22 "P-5" budget exhibit directed by the Authorization Conference Report number 106-371 has been inserted behind the R-3 exhibit for program element 0604239F.
- b. The "Other Program Funding Summary" portion of the R-2 includes, in addition to RDT&E funds, Procurement funds and quantities, Military Construction appropriation funds on specific development programs, Operations and Maintenance appropriation funds where they are essential to the development effort described, and where appropriate, Department of Energy (DOE) costs.
- c. The Justification book has been assembled in accordance with DoD Financial Management Regulation 7000.14, Vol. 2B Cpt 5, Sec 050302 with the exception of the R-1; Project Funding Listing which was distributed under a separate cover due to classification.

2. (U) CLASSIFICATION.

- a. All exhibits contained in Volumes I, II and III are UNCLASSIFIED. Classified exhibits are not included in the submission due to the level of security classification and necessity of special security clearances.

PROGRAM ELEMENT COMPARISON SUMMARY
INTRODUCTION AND EXPLANATION OF CONTENTS

Program Element	Remarks
BUDGET ACTIVITY 1: BASIC RESEARCH	
BUDGET ACTIVITY 2: APPLIED RESEARCH	
0602202F, Human Effectiveness Applied Research	Project 6219 was terminated after FY 1999, but Congress added funding in FY 2000.
0602269F, Hypersonic Technology Program	Project 1025 funding for this program in FY01 is contained in PEs 0602023F Aerospace Propulsion, 0603203F Aerospace Propulsion Subsystems Integration and 0603216F Aerospace Propulsion and Power Technology.
0602601F, Space Technology	Project 1011 all rocket propulsion efforts will be transferred to 0602203F, Project 4847. Project 3326 all lasers and imaging efforts will be transferred to PE 0602605F, Projects 4866 and 4867.
0602605F, Directed Energy Technology	Projects 4866 and 4867 were transferred from PE 0602601F.
0602702F, Command, Control and Communications	Project 4506, Surveillance Technology will be transferred to Project 4594, PE 0602702F and Project 7622, PE 0602204F beginning in FY01.
BUDGET ACTIVITY 3: ADVANCED TECHNOLOGY DEVELOPMENT	
0603726F, Aerospace Information Technology Systems Integration	In FY 2001, the efforts in Project 632863, Integrated Photonics, will be conducted in PE 0603203F, Project 63665A. Prior to FY 2001, the efforts in Project 634850, Collaborative C2, were performed in PE 0603253F, Projects 632735 and 63666A.
BUDGET ACTIVITY 4: DEMONSTRATION AND VALIDATION	
0603441F, Space Based IR Arch (Dem/Val)	SBIRS Low efforts performed in Project 0007 will be transferred to PE 0604442F, Project 4598 in FY00 and 01.
0603800F, Joint Strike Fighter	Project 2025 will complete in FY01.

PROGRAM ELEMENT COMPARISON SUMMARY
INTRODUCTION AND EXPLANATION OF CONTENTS

Program Element	Remarks
BUDGET ACTIVITY 4: DEMONSTRATION AND VALIDATION Continued	
0603854F, Wideband Milsatcom	Project 4870 is a FY01 new start.
0603856F, Air Force/NRO Partnership	Project 4782, the Air Force/National Program Cooperation (AFNPC) effort is a FY01 new start.
0603859F, Pollution Prevention	Project 4852, Pollution Prevention will be transferred from PE 0605854F, previously in Budget Activity 6 beginning in FY01.
BUDGET ACTIVITY 5: ENGINEERING AND MANUFACTURING DEVELOPMENT	
0207249F, Precision Attack Systems Procurement	Project 2693 is a FY01 new start.
0604012F, Joint Helmet Mounted Cueing System	Project 4789 the Joint Helmet Mounted Cueing Systems effort is a FY01 new start.
0604201F, Integrated Avionics Planning and Development	Project 2257 will complete in FY01.
0604270F, EW Development	Project 8462 is a FY01 new start.
0604602F, Armament Ordnance Development	Project 3133 will complete in FY01.
0604327F, Hardened Target Munitions	Project 4641 will complete in FY00.
0604617F, Agile Combat Support	Project 2895 will complete in FY01.
0604706F, Life Support System	Project 412A, the K-36/3.5A Ejection Seat effort is a FY01 new start.
0604754F, Joint Tacital Information Distribution System	Project 4749, the Air Defense System Integrator effort is a FY01 new start
0604851F, ICBM	Project 4210 completes in FY00.
BUDGET ACTIVITY 6: MANAGEMENT AND SUPPORT	
0604256F, Threat Simulator Development	Project 3321, Joint Modeling and Simulation System (JMASS) funding and responsibility transferred in FY00 to PE 0207601F.

PROGRAM ELEMENT COMPARISON SUMMARY
INTRODUCTION AND EXPLANATION OF CONTENTS

Program Element	Remarks
BUDGET ACTIVITY 6: MANAGEMENT AND SUPPORT Continued	
0604256F, Threat Simulator Development	Project 7500, Foreign Materiel Acquisition and Exploitation (FMA/E) established a funding line in FY00.
0605808F, Development Planning	PE terminated in FY00.
0604759F, Major T&E Investment	Project 4759, two I&M projects started in FY00: Modeling & Simulation T&E Resources (MASTER); and Seeker T&E.
0604759F, Major T&E Investment	Project 4759, the Advanced Range Telemetry Integration (ARTM) was developed by CTEIP (OSD PE 0604940D). The ARTM I&S (Integration and Support) funding in this PE begins in FY01. Integrates the OSD developed ARTM into the Edwards AFB range.
0605854F, Pollution Prevention	Program moved into Budget Activity 4, to PE 0603859F beginning in FY01.
BUDGET ACTIVITY 7: OPERATIONAL SYSTEM DEVELOPMENT	
0101120F, Advanced Cruise Missile	Project 4798, the AGM-129A Advanced Cruise Missile Service Life Extension Program effort is a FY01 new start.
0207133F, F-16 Squadrons	Project 2671, the Automated Ground Collision Avoidance system, Falcon Star, and Targeting Pod/HARM Targeting Systems efforts are FY01 new starts.
0207141F, F-117A Squadrons	Project 3956, the F-117 Enhanced GBU-27 effort is a FY01 new start.
0303140F, Information Systems Security Program	Project 4585, Cryptologic 2020, will be funded under PE 33401F, Comm Sec, Project 4861, Cryptologic 2020, beginning in FY01.
0303601F, Milsatcom Terminals	Project 2487, the Airborne Wideband Terminal and Ground Multiband Terminal effort are a FY01 new start.
0305205F, Endurance Unmanned Aerial Vehicles	Project 4883 is a FY01 new start. Project 4816 will merge into 4799 in FY00.

PROGRAM ELEMENT COMPARISON SUMMARY
INTRODUCTION AND EXPLANATION OF CONTENTS

Program Element	Remarks
BUDGET ACTIVITY 7: OPERATIONAL SYSTEM DEVELOPMENT Continued	
0305206F, Airborne Reconnaissance System	Project 4882 is a FY01 new start.
0305207F, Manned Reconnaissance system	Project 4820 will be transferred to PE 0305202F beginning in FY01.
0305910F, Spacetrack	Project 4791, the Ground-Based Electro-Optical Deep Space Surveillance Sustainment effort is a FY00 new start.
0401115F, C-130 Airlift Squadrons	Project 4885 is a FY01 new start.
0401130F, C-17 Aircraft	Project 4886 is a FY01 new start.
0404011F, Special Operations Forces	Project 4860 is a FY01 new start.
0708612F, Computer Resources Support Improvement Program	FY01 funding was moved to this PE from PE 0708611F, Project 67309.
1001018F, NATO Joint Stars	Project 0002, the Project Definition of NATO Advanced Trans Atlantic Radar Project effort is a FY01 new start pending Congressional approval.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0303150F WWMCCS/GLOBAL COMMAND & CONTROL SYSTEM				PROJECT 674667		
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
674667	Global Command and Control System - AF	12,235	3,817	3,743	3,829	3,942	4,022	4,100	Continuing	TBD
Quantity of RDT&E Articles		0	0	0	0	0	0	0	0	0
<p>Note 1 : Funds in FY 1999 were realigned to PE 0303150F and the the new program title became Global Command and Control System (GCCS). This is an effort to consolidate and centralize accounting for the AF GCCS program, which is now the operational system of record.</p> <p>Note 2 : Beginning in FY 2000, funding for Deliberate and Crisis Action Planning and Execution Segments (DCAPES) are to be submitted as a separate project (674802) under PE 27438. For administrative purposes, FY 1999 DCAPES funds were executed under project 4667.</p> <p>(U) <u>A. Mission Description</u> The Global Command and Control System (GCCS) is the designated Command and Control migration system for the DoD. It is an integrated Command, Control, Communications, Computer, and Intelligence (C4I) system capable of supporting all echelons of the US military command structure. GCCS solves C4I interoperability problems between Service components by establishing a Defense Information Infrastructure (DII) Common Operating Environment (COE), and has an end objective to eliminate stovepipe systems. The AF is responsible for developing four of the modules that will make up the COE, and integration of AF unique applications with the COE.</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u> (U) \$3,607 GCCS Migration Support /COE Development (U) \$5,986 Crisis Action Planning Evolution (U) \$2,642 Prototype software development (U) \$12,235 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u> (U) \$983 COE Development (U) \$1,851 GCCS Migration Support (U) \$983 COE Distribution (U) \$3,817 Total</p>										
Project 674667			Page 1 of 5 Pages				Exhibit R-2 (PE 0303150F)			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 2000																																																												
BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0303150F WWMCCS/GLOBAL COMMAND & CONTROL SYSTEM	PROJECT 674667																																																												
<p>(U) <u>A. Mission Description Continued</u></p> <p>(U) <u>FY 2001 (\$ in Thousands)</u></p> <p>(U) \$944 COE Development</p> <p>(U) \$1,854 GCCS Migration Support</p> <p>(U) \$945 COE Distribution</p> <p>(U) \$3,743 Total</p> <p>(U) <u>B. Budget Activity Justification</u></p> <p>This effort is Budget Activity 7, Operational System Development, because the program develops and implements software for an operational computer network.</p> <p>(U) <u>C. Program Change 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 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>Total Cost</u></th> </tr> </thead> <tbody> <tr> <td>(U) Previous President's Budget (FY 2000 PBR)</td> <td style="text-align: center;">13,137</td> <td style="text-align: center;">3,929</td> <td style="text-align: center;">3,777</td> <td style="text-align: center;">TBD</td> </tr> <tr> <td>(U) Appropriated Value</td> <td style="text-align: center;">13,675</td> <td style="text-align: center;">3,929</td> <td></td> <td></td> </tr> <tr> <td>(U) Adjustments to Appropriated Value</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> a. Congressional/General Reductions</td> <td style="text-align: center;">-538</td> <td style="text-align: center;">-91</td> <td></td> <td></td> </tr> <tr> <td> b. Small Business Innovative Research</td> <td style="text-align: center;">-408</td> <td></td> <td></td> <td></td> </tr> <tr> <td> c. Omnibus or Other Above Threshold Reprogram</td> <td style="text-align: center;">-2,369</td> <td style="text-align: center;">-21</td> <td></td> <td></td> </tr> <tr> <td> d. Below Threshold Reprogram</td> <td style="text-align: center;">1,943</td> <td></td> <td></td> <td></td> </tr> <tr> <td> e. Rescissions</td> <td style="text-align: center;">-68</td> <td></td> <td></td> <td></td> </tr> <tr> <td> f. Other</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Adjustments to Budget Years Since FY 2000 PBR</td> <td></td> <td></td> <td style="text-align: center;">-34</td> <td></td> </tr> <tr> <td>(U) Current Budget Submit/FY 2001 PBR</td> <td style="text-align: center;">12,235</td> <td style="text-align: center;">3,817</td> <td style="text-align: center;">3,743</td> <td style="text-align: center;">TBD</td> </tr> </tbody> </table> <p>(U) <u>Significant Program Changes:</u> N/A</p>				<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>	(U) Previous President's Budget (FY 2000 PBR)	13,137	3,929	3,777	TBD	(U) Appropriated Value	13,675	3,929			(U) Adjustments to Appropriated Value					a. Congressional/General Reductions	-538	-91			b. Small Business Innovative Research	-408				c. Omnibus or Other Above Threshold Reprogram	-2,369	-21			d. Below Threshold Reprogram	1,943				e. Rescissions	-68				f. Other					(U) Adjustments to Budget Years Since FY 2000 PBR			-34		(U) Current Budget Submit/FY 2001 PBR	12,235	3,817	3,743	TBD
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Project 674667	Page 2 of 5 Pages	Exhibit R-2 (PE 0303150F)																																																												

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 2000
BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0303150F WWMCCS/GLOBAL COMMAND & CONTROL SYSTEM	PROJECT 674667

(U) **D. Other Program Funding Summary (\$ in Thousands)**

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Cost to</u>	<u>Total Cost</u>
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	
(U) AF RDT&E									
(U) Other APPN	4,436	5,672	14,753	15,083	15,365	21,617	22,011	Continuing	TBD

(U) **E. Acquisition Strategy**
 Electronics Systems Center (ESC), Hanscom AFB, MA will manage the overall AF GCCS program (Common Operating Environment (COE) and Crisis Action Planning Evolution) development. The COE development is being performed in-house to support AF contributions to the Joint service GCCS program and to support AF mission applications that utilize the COE.

(U) **F. 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) COE Development												
(U) Multi-Media		*			*			*	X	X		X
(U) Distributed Computing Services		*			*			*	X	X		X
(U) Office Automation		*			*			X	X	X		X
(U) Management Services		*			*			X	X	X		X

* Denotes Completed Event
 X Denotes Planned Event

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development					PE NUMBER AND TITLE 0303150F WWMCCS/GLOBAL COMMAND & CONTROL SYSTEM			PROJECT 674667		
(U) <u>A. Project Cost Breakdown (\$ in Thousands)</u>										
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>
(U)	Common Operating Environment (COE) Development					3,607		983		944
(U)	Crisis Action Planning Evolution					5,986				
(U)	GCCS Migration Support									
(U)	Prototype software development					2,642				
(U)	GCCS Migration Support							1,851		1,854
(U)	COE Distribution							983		945
(U)	Total					12,235		3,817		3,743
(U) <u>B. Budget Acquisition History and Planning Information (\$ in Thousands)</u>										
(U) <u>Performing Organizations:</u>										
<u>Contractor or</u>	<u>Contract</u>									
<u>Government</u>	<u>Method/Type</u>	<u>Award or</u>	<u>Performing</u>	<u>Project</u>						
<u>Performing</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Organizations</u>										
Rome Lab	FFP/FCA	Jun 95			250				Continuing	TBD
Material Systems Group	various	various			1,400				Continuing	TBD
Miscellaneous	various	various			85				Continuing	TBD
DCAPES	FFP/LHAF	Jul 98			1,700	7,715			Continuing	TBD
*In FY 00 DCAPES funding is transferred to PE 27438										
<u>Support and Management Organizations</u>										
TEMS					5,819	1,722	1,552	1,488	Continuing	TBD
MITRE					6,774	2,184	2,223	2,208	Continuing	TBD
Miscellaneous					15	614	42	47	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	
07 - Operational System Development		0303150F WWMCCS/GLOBAL COMMAND & CONTROL SYSTEM			674667	
		<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Total</u>
		<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Program</u>
<u>Subtotals</u>					<u>Budget to</u>	
					<u>Complete</u>	
Subtotal Product Development		3,435	7,715		TBD	TBD
Subtotal Support and Management		12,608	4,520	3,817	3,743	TBD
Subtotal Test and Evaluation						
Total Project		16,043	12,235	3,817	3,743	TBD

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 2000	
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0303401F Communications Security				PROJECT 674861	
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
674861 Cryptologic 2000	0	0	4,857	4,700	5,511	5,507	4,017	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0

NOTE: FY99 through FY00 funds are in PE 33140F. Beginning in FY01, funding for this effort is located in this PE.

(U) A. Mission Description
 The Cryptologic project consists of Air Force Electronic Key Management Systems (AFEKMS). AFEKMS, in concert with NSA's EKMS, provides a secure and flexible capability for the electronic generation, distribution, accounting, and management of key material, voice callwords, and communications security (COMSEC) publications for all AF weapon systems. AFEKMS replaces the existing physical distribution and management system providing COMSEC keying material for USAF Information Protection. Information Protection emphasizes access control, multi-level secure databases, trusted computing and information integrity. AFEKMS is a three tier system structure in a hierarchical arrangement. This tiered structure provides 'wholesale' to 'retail' to 'consumer' capability to distribute, manage and account for COMSEC keying material. Tier 1 installations comprise the 'wholesale' capability. Tier 2 installations comprise the distribution network and tier 3 comprises the 'retail locations' where keying material leaves the AFEKMS and enters the End Item COMSEC Equipment (EICE) - the consumer.

Acquisition includes Commercial Off The Shelf (COTS) computers and software, contractor developed application software, Government Furnished Equipment (GFE) and software such as the NSA's Local COMSEC Management Software (LCMS). Also, USAF developed application software (UAS) is necessary for unique systems such as the F-22 and unique key fill requirements of EICE for other airborne platforms.

Current technology feed into deployed Tier 2 installations: A contract study begins in Oct 99 under NSA supervision to determine the scope of re-hosting Tier 2 workstations from the current UNIX equipment to either Windows NT or SUN Solaris operating systems. This study is expected to take 15-24 months to complete. If successful re-hosting is feasible, it would reduce the hardware replacements costs to 20% of the original cost of the equipment. The Browser currently being developed will also be added to Tier 2 during tech refreshes and system upgrades.

Given the complexity of emerging communication technologies, the growing complexity of desired DOD/AF applications of these technologies, and more recently the experience and insight we have gained in the last few years in the Cryptologic 2020 application, we see the need for a solid continuous R&D line to work the constantly emerging challenges in developing, acquiring and fielding state-of-the-art Key Management Infrastructure software and COMSEC equipment.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 2000																																																							
BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0303401F Communications Security	PROJECT 674861																																																							
<p>(U) <u>A. Mission Description Continued</u></p> <p>(U) <u>FY 1999 (\$ in Thousands)</u></p> <p>(U) \$0 Activity is Funded in PE 33140F (\$1.957)</p> <p>(U) \$0 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u></p> <p>(U) \$0 Activity is Funded in PE 33140F (\$1.233)</p> <p>(U) \$0 Total</p> <p>(U) <u>FY 2001 (\$ in Thousands)</u></p> <p>(U) \$2,386 Program Office Support - for continued work on the Key Management Infrastructure (KMI) for the Defense Information Infrastructure Common Operation Environment (DII-COE) the Browser-Based Development effort & AF Public Key Infrastructure implementation</p> <p>(U) \$485 Tier 2 DII-COE Compliance</p> <p>(U) \$1,986 Local Management Device/Data Management Device (LMD/DMD) Browser Interface</p> <p>(U) \$4,857 Total</p> <p>(U) <u>B. Budget Activity Justification</u></p> <p>This program is in budget activity 7, Operational System Development, because it addresses the development and transition of information security, protection and defensive capabilities and technologies.</p> <p>(U) <u>C. Program Change Summary (\$ in Thousands)</u></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;"></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>Total Cost</u></th> </tr> </thead> <tbody> <tr> <td>(U) Previous President's Budget (FY 2000 PBR)</td> <td></td> <td></td> <td style="text-align: center;">0</td> <td></td> </tr> <tr> <td>(U) Appropriated Value</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Adjustments to Appropriated Value</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> a. Congressional/General Reductions</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> b. Small Business Innovative Research</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> c. Omnibus or Other Above Threshold Reprogram</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> d. Below Threshold Reprogram</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> e. Rescissions</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> f. Other</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Adjustments to Budget Years Since FY 2000 PBR</td> <td></td> <td></td> <td style="text-align: center;">4,857</td> <td></td> </tr> </tbody> </table>				<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>	(U) Previous President's Budget (FY 2000 PBR)			0		(U) Appropriated Value					(U) Adjustments to Appropriated Value					a. Congressional/General Reductions					b. Small Business Innovative Research					c. Omnibus or Other Above Threshold Reprogram					d. Below Threshold Reprogram					e. Rescissions					f. Other					(U) Adjustments to Budget Years Since FY 2000 PBR			4,857	
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Project 674861	Page 2 of 5 Pages	Exhibit R-2 (PE 0303401F)																																																							

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)										DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development					PE NUMBER AND TITLE 0303401F Communications Security					PROJECT 674861		
(U) <u>C. Program Change Summary (\$ in Thousands) Continued</u>												
					<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>		<u>Total Cost</u>	
(U)	Current Budget Submit/FY 2001 PBR								4,857		TBD	
(U)	<u>Significant Program Changes:</u> N/A											
(U) <u>D. Other Program Funding Summary (\$ in Thousands)</u>												
		<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Cost to</u>		<u>Total Cost</u>	
		<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>			
(U)	AF RDT&E											
(U)	Other APPN											
(U)	APPN 3600/PE 33140F/PE	1,957	1,233	0	0	0	0	0	Continuing		TBD	
	Title Information Systems Security Program/BPAC 674585/Title Cryptologic 2020											
(U)	APPN 3600/PE 64239F/PE	410							Continuing		TBD	
	Title F-22/BPAC 654069/BPAC Title Adv. Tactical Fighter											
	NOTE: FY99 through FY00 funds are in PE 33140F. Beginning in FY01, funding for this effort is located in this PE.											
(U) <u>E. Acquisition Strategy</u>												
	All major contracts within this Program Element are awarded after full and open competition.											
(U) <u>F. Schedule Profile</u>												
					<u>FY 1999</u>			<u>FY 2000</u>			<u>FY 2001</u>	
					1	2	3	4	1	2	3	4
(U)	Establish Tier 2 DII--COE Compliance										X	
(U)	Begin Development of LMD/DMD Browser Interface										X	
(U)	Start Continuous MITRE Support										X	

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development					PE NUMBER AND TITLE 0303401F Communications Security				PROJECT 674861		
(U) A. Project Cost Breakdown (\$ in Thousands)											
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>	
(U)	Software Development									4,857	
(U)	Total									4,857	
(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>											
	SAIC (GS-35F-44616)	BPA	May 98	N/A	N/A	0	0	0	985	Continuing	TBD
	L3	TBD	Dec 00	N/A	N/A	0	0	0	1,486	Continuing	TBD
	ESC	FFRDC	Nov 00	N/A	N/A	0	0	0	2,386	Continuing	TBD
<u>Support and Management Organizations</u>											
N/A											
<u>Test and Evaluation Organizations</u>											
N/A											
(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>											
N/A											
<u>Support and Management Property</u>											
N/A											
<u>Test and Evaluation Property</u>											
N/A											

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)		DATE					
07 - Operational System Development		0303401F Communications Security			February 2000		
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT					
		<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
		<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Subtotals</u>							
Subtotal Product Development		0	0	0	4,857	TBD	TBD
Subtotal Support and Management							
Subtotal Test and Evaluation							
Total Project		0	0	0	4,857	TBD	TBD

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 2000	
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0303601F MILSATCOM Terminals				PROJECT 672487	
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
672487 MILSTAR (AF - Terminals)	6,018	6,923	17,797	24,416	34,334	79,367	90,590	0	2,297,542
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0
<p>(U) <u>A. Mission Description</u> Military Satellite Communications (MILSATCOM) provides world-wide communications to strategic and tactical warfighters. The MILSATCOM Terminals Program contains efforts to develop equipment for users to communicate over military satellites, including Milstar, Advanced Extremely High Frequency (AEHF), Ultra High Frequency (UHF) satellites, Defense Satellite Communication System (DSCS), and Wideband Gapfiller as well as commercial satellites. Global Broadcast Service (GBS) is a joint program to implement a world-wide, high-capacity satellite broadcast information system that will provide a continuous, high speed, one-way flow of high volume classified and unclassified data, imagery and other information to forces in garrison, deployed, or on the move. Milstar ground and airborne Command Post Terminal (CPT) enhancements are continuing in addition to system-level testing in support of Milstar IOC II. The MILSATCOM Terminals program began a gradual transition from a Milstar-centered program to a wider focus of multiband SATCOM supporting the tactical requirements for Air Expeditionary Forces while maintaining essential strategic connectivity for nuclear forces. Future concept development efforts and new terminals development became the key focus of the AF Terminals program in FY99 and FY00. In FY01, concept development work further increases emphasis on assessment of technological alternatives (commercial and military unique) and continues the AF Terminals roadmap development, culminating in new terminal products for assured high capacity connectivity for conventional and strategic air forces and ground command and control components. Airborne wideband terminal (AWT) risk reduction and ground multiband terminal (GMT) development begin in FY01. CPT replacement will begin in FY03. The Air Force's Milstar tactical terminals, the Single Channel Anti-Jam Manportable (SCAMP) and the Secure Mobile Anti-Jam Reliable Tactical Terminal (SMART-T) are funded by the Air Force and procured by the Army. Ground and airborne UHF terminal production continues. Efforts in the UHF SATCOM program are primarily focused on the ground and airborne Demand Assigned Multiple Access (DAMA) terminals design and implementation. DSCS terminal procurement efforts sustain and modernize the Ground Mobile Forces terminal and the Jam-Resistant Secure Communications (JRSC) subnet of DSCS.</p>									
<p>(U) <u>FY 1999 (\$ in Thousands)</u></p> <p>(U) \$1,039 Continued MILSATCOM terminals support activities</p> <p>(U) \$2,542 Continued CPT upgrades/begin contractor test and operations support</p> <p>(U) \$2,437 Concept/Prototype Demonstrations/MILSATCOM Terminals Roadmap</p> <p>(U) \$6,018 Total</p>									

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 2000																																																												
BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0303601F MILSATCOM Terminals	PROJECT 672487																																																												
<p>(U) <u>A. Mission Description Continued</u></p> <p>(U) <u>FY 2000 (\$ in Thousands)</u></p> <p>(U) \$1,260 Continue MILSATCOM terminals support activities</p> <p>(U) \$2,900 Continue contractor test and operations support</p> <p>(U) \$2,763 Concept/Prototype Demo/MILSATCOM Terminals Roadmap/SATCOM testing</p> <p>(U) \$6,923 Total</p> <p>(U) <u>FY 2001 (\$ in Thousands)</u></p> <p>(U) \$2,442 Continue MILSATCOM terminals support activities</p> <p>(U) \$1,563 Continue contractor test and operations support</p> <p>(U) \$5,192 Concept/Prototype Demo/MILSATCOM Terminals Roadmap/SATCOM testing</p> <p>(U) \$5,600 Begin Ground Multiband development</p> <p>(U) \$3,000 Begin Airborne Wideband risk reduction</p> <p>(U) \$17,797 Total</p> <p>(U) <u>B. Budget Activity Justification</u> This effort is funded in Budget Activity 7, Operational System Development, because the program has completed a Milestone III review and is in production.</p> <p>(U) <u>C. Program Change Summary (\$ in Thousands)</u></p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;"></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>Total Cost</u></th> </tr> </thead> <tbody> <tr> <td>(U) Previous President's Budget (FY 2000 PBR)</td> <td style="text-align: center;">2,159</td> <td style="text-align: center;">7,026</td> <td style="text-align: center;">14,955</td> <td style="text-align: center;">1,937,934</td> </tr> <tr> <td>(U) Appropriated Value</td> <td style="text-align: center;">2,352</td> <td style="text-align: center;">7,026</td> <td></td> <td></td> </tr> <tr> <td>(U) Adjustments to Appropriated Value</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">a. Congressional/General Reductions</td> <td style="text-align: center;">-193</td> <td style="text-align: center;">-10</td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">b. Small Business Innovative Research</td> <td style="text-align: center;">-62</td> <td></td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">c. Omnibus or Other Above Threshold Reprogram</td> <td></td> <td style="text-align: center;">-38</td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">d. Below Threshold Reprogram</td> <td style="text-align: center;">3,955</td> <td></td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">e. Rescissions</td> <td style="text-align: center;">-34</td> <td style="text-align: center;">-55</td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">f. Other</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Adjustments to Budget Years Since FY 2000 PBR</td> <td></td> <td></td> <td style="text-align: center;">2,842</td> <td></td> </tr> <tr> <td>(U) Current Budget Submit/FY 2001 PBR</td> <td style="text-align: center;">6,018</td> <td style="text-align: center;">6,923</td> <td style="text-align: center;">17,797</td> <td style="text-align: center;">2,297,542</td> </tr> </tbody> </table> <p>Note: \$3.955M FY99 Below Threshold Reprogramming (BTR) funded continuation of Air Force MILSATCOM Terminals roadmap and operational support that</p>				<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>	(U) Previous President's Budget (FY 2000 PBR)	2,159	7,026	14,955	1,937,934	(U) Appropriated Value	2,352	7,026			(U) Adjustments to Appropriated Value					a. Congressional/General Reductions	-193	-10			b. Small Business Innovative Research	-62				c. Omnibus or Other Above Threshold Reprogram		-38			d. Below Threshold Reprogram	3,955				e. Rescissions	-34	-55			f. Other					(U) Adjustments to Budget Years Since FY 2000 PBR			2,842		(U) Current Budget Submit/FY 2001 PBR	6,018	6,923	17,797	2,297,542
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Project 672487	Page 2 of 6 Pages	Exhibit R-2 (PE 0303601F)																																																												

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE February 2000																																																																							
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0303601F MILSATCOM Terminals			PROJECT 672487																																																																							
<p>(U) <u>C. Program Change Summary (\$ in Thousands) Continued</u></p> <p align="right" style="margin-right: 100px;"> <u>FY 1999</u> <u>FY 2000</u> <u>FY 2001</u> <u>Total Cost</u> </p> <p>started in FY98. This funding increased levels of on-going efforts such as: (1) AF terminal roadmap definition integrating SATCOM into the Global Grid, (2) Efforts to prototype multiband airborne SATCOM antennae, (3) Assessing commercial SATCOM capabilities, and (4) Supporting DOD MILSATCOM architecture definition.</p>																																																																														
<p>(U) <u>Significant Program Changes:</u> This activity is a continuation of the FY98 effort. New starts include AWT risk reduction and GMT development to begin in FY01. FY01 adjustments add funding for Airborne Wideband terminal development.</p>																																																																														
<p>(U) <u>D. 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: 8%;"><u>FY 1999</u></th> <th style="width: 8%;"><u>FY 2000</u></th> <th style="width: 8%;"><u>FY 2001</u></th> <th style="width: 8%;"><u>FY 2002</u></th> <th style="width: 8%;"><u>FY 2003</u></th> <th style="width: 8%;"><u>FY 2004</u></th> <th style="width: 8%;"><u>FY 2005</u></th> <th style="width: 8%;"><u>Cost to</u></th> <th style="width: 8%;"><u>Total Cost</u></th> </tr> <tr> <td></td> <td align="center"><u>Actual</u></td> <td align="center"><u>Estimate</u></td> <td align="center"><u>Estimate</u></td> <td align="center"><u>Estimate</u></td> <td align="center"><u>Estimate</u></td> <td align="center"><u>Estimate</u></td> <td align="center"><u>Estimate</u></td> <td align="center"><u>Complete</u></td> <td></td> </tr> </thead> <tbody> <tr> <td>(U) AF RDT&E</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Other APPN</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Appn 10, BPAC 119992, Aircraft Procurement</td> <td align="right">8,791</td> <td align="right">19,135</td> <td align="right">24,893</td> <td align="right">48,428</td> <td align="right">43,651</td> <td align="right">41,892</td> <td align="right">65,853</td> <td align="center">Continuing</td> <td align="center">TBD</td> </tr> <tr> <td>(U) Appn 16, BPACs 836780, MILSATCOM Space and BPAC 822260, High Mobility Vehicle</td> <td align="right">25,673</td> <td align="right">41,888</td> <td align="right">48,175</td> <td align="right">37,731</td> <td align="right">43,145</td> <td align="right">59,951</td> <td align="right">47,741</td> <td align="center">Continuing</td> <td align="center">TBD</td> </tr> <tr> <td colspan="10"> Related RDT&E: PE 64479F Milstar LDR/MDR Satellite Communications PE 33110F Defense Satellite Communications System (DSCS) PE 63854F Global Broadcast Service PE 63432F Polar EHF PE 63430F Advanced EHF </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) AF RDT&E										(U) Other APPN										(U) Appn 10, BPAC 119992, Aircraft Procurement	8,791	19,135	24,893	48,428	43,651	41,892	65,853	Continuing	TBD	(U) Appn 16, BPACs 836780, MILSATCOM Space and BPAC 822260, High Mobility Vehicle	25,673	41,888	48,175	37,731	43,145	59,951	47,741	Continuing	TBD	Related RDT&E: PE 64479F Milstar LDR/MDR Satellite Communications PE 33110F Defense Satellite Communications System (DSCS) PE 63854F Global Broadcast Service PE 63432F Polar EHF PE 63430F Advanced EHF									
	<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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<p>(U) <u>E. Acquisition Strategy</u> All eighty-one Milstar Command Post terminals have been procured with investment funds. Software enhancements, testing, EDM repair, program, and technical support are continuing. These efforts will be modifications to existing contracts. Airborne Wideband will be a competitive acquisition.</p>																																																																														
<p>(U) <u>F. Schedule Profile</u></p> <p align="right" style="margin-right: 100px;"> <u>FY 1999</u> <u>FY 2000</u> <u>FY 2001</u> </p>																																																																														

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0303601F MILSATCOM Terminals	PROJECT 672487
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(U) **F. Schedule Profile Continued**

	<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) CPT Upgrades Delivery and Production	*	*	*	*	*	X	X	X	X	X	X	X
(U) Milstar SYS IOC II											X	
(U) SCAMP Deliveries Begin				*								
(U) SMART-T LRIP Deliveries					*	X	X	X				
(U) SMART-T Production Deliveries								X	X	X	X	X
(U) Airborne DAMA Terminal Upgrade												
(U) Contract Option	*					X			X			
(U) Deliveries								X	X	X	X	X
(U) Ground DAMA Terminal Deliveries	*	*	*	*	*	X	X	X	X	X	X	X
(U) Ground Multiband development									X			
(U) Airborne Wideband Terminal Risk Reduct.									X			

* Completed event
X Planned event

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0303601F MILSATCOM Terminals			PROJECT 672487			
(U) A. Project Cost Breakdown (\$ in Thousands)										
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>
(U)	MILSATCOM terminals support activities					1,039		1,260		2,442
(U)	CPT upgrades/contractor test and operations support					2,542		2,900		1,563
(U)	Concept/Prototype Demo/MILSATCOM Terminals Roadmap					2,437		2,763		5,192
(U)	Ground Multiband					0		0		5,600
(U)	Airborne Wideband					0		0		3,000
(U)	Total					6,018		6,923		17,797
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)										
(U) Performing Organizations:										
<u>Contractor or</u>	<u>Contract</u>									
<u>Government</u>	<u>Method/Type</u>	<u>Award or</u>	<u>Performing</u>	<u>Project</u>						
<u>Performing</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Organizations</u>										
Raytheon Corp	FPIF/FFP	Jun 85	889,337	889,337	883,570	1,204	2,000	1,563	1,000	889,337
Rockwell	CPIF	Aug 93	43,068	43,068	43,068	0	0	0	0	43,068
Miscellaneous	Various	Various			651,580	0	0	8,600	341,567	1,001,747
ViaSat	C/FFP	Oct 95	3,076	3,076	3,076	0	0	0	0	3,076
<u>Support and Management Organizations</u>										
MITRE	CPAF	Various	N/A	N/A	102,178	3,500	2,100	2,939	14,250	124,967
SPT Contractors	Various	Various	N/A	N/A	156,621	1,120	1,333	1,854	7,185	168,113
Tecolote	Various	Various	N/A	N/A	1,848	150	310	705	0	3,013
Miscellaneous	Various	Various	N/A	N/A	19,715	44	180	636	13,536	34,111
<u>Test and Evaluation Organizations</u>										
Wright-Labs	AF-616	N/A	N/A	N/A	22,103	0	1,000	1,500	0	24,603
Miscellaneous	Various	N/A	N/A	N/A	5,507	0	0	0	0	5,507

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)			DATE February 2000			
BUDGET ACTIVITY		PE NUMBER AND TITLE			PROJECT	
07 - Operational System Development		0303601F MILSATCOM Terminals			672487	
		<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>Total</u>				<u>Program</u>
<u>Subtotals</u>						
Subtotal Product Development		1,581,294	1,204	2,000	10,163	342,567
Subtotal Support and Management		280,362	4,814	3,923	6,134	34,971
Subtotal Test and Evaluation		27,610	0	1,000	1,500	0
Total Project		1,889,266	6,018	6,923	17,797	377,538
						2,297,542

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

DATE

February 2000

BUDGET ACTIVITY

PE NUMBER AND TITLE

07 - Operational System Development

0305099F Global Air Traffic Management (GATM)

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	24,882	6,402	8,508	9,496	7,567	7,720	7,872	Continuing	TBD
674689 Global Access Architecture	22,780	6,402	8,508	9,496	7,567	7,720	7,872	Continuing	TBD
674690 GATM Integration	2,102	0	0	0	0	0	0	0	2,102
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

4689: Global Air Traffic Management: GATM is the Air Force program designed to meet the evolving aviation requirements of the International Civil Aviation Organization (ICAO). GATM, Navigation and Safety, and Navigation Warfare (NAVWAR) are major components of the AF's Global Access, Navigation, and Safety (GANS) management effort. The Global Air Traffic Operations/Mobility Command and Control (GATO/MC2) System Program Office (SPO) supports GATM as the AF's central focal point for analyzing and evaluating operational requirements, developing aircraft system architectures, acquiring aviation equipment, and certifying weapon system implementation. The system architectures identify necessary equipment and aircraft capability shortfalls across the Air Force inventory, for mobility, information dominance, bombers, fighters, trainers, helicopters, and unmanned aerial vehicles. For those capabilities where no current solution exists, development activities are undertaken in conjunction with existing DoD communications, navigation, surveillance, and safety program offices. To facilitate development, integration, interoperability, and exploration of dual-use technologies, a reconfigurable cockpit and avionics test bed (RCAT) was developed. Dual-use capabilities of avionics to satisfy GATM and military requirements of the Air Force fleet will be explored. The SPO will continue projections of studies and prototype efforts necessary to ensure AF aviation weapon systems are postured to meet civil standards and future changes to the civil standards leading to free flight. This project supports the definition of requirements for ACAT III projects across multiple weapon systems. No existing program satisfies the requirements of the GATM initiatives.

4690: GATM Integration [for the C-130 platform]: Air Force Special Operations Command (AFSOC) funded a separate Multi-Mode Receiver (MMR) program to meet part of future GATM navigation requirements for AFSOC C-130s. GAO recommended the Air Force combine elements of AFSOC's Common Avionics Architecture for Penetration program with elements duplicated in the C-130 Avionics Modernization Program (AMP). GATM integration accurately reflects the application of AFSOC GATM funding from GATM integration to the overall C-130 AMP. Using GATM integration funds for the C-130 AMP eliminates the redundancy of two C-130 modernization efforts and minimizes down time. Realigning under the C-130 AMP provides MMR and Traffic Alert and Collision Avoidance System (TCAS) to comply with European and African airspace criteria. The MMR may incorporate a Microwave Landing System (MLS), Protected Instrument Landing System and Differential Global Positioning System. These modifications enable the MC-130H and other AFSOC aircraft to comply with changing ICAO airspace access criteria.

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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305099F Global Air Traffic Management (GATM)
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(U) **A. Mission Description Continued**
 Effort includes engineering design work, mod kit design, and kit proofing. The MC-130H and other Special Operations Forces (SOF) aircraft have highly unique and specialized software. Modification of the software involves changing the code, testing the changes, and updating software documentation and maintenance technical orders. FY99 includes initial funding to begin engineering design. In accordance with GAO recommendations, FY00 and FY01 GATM Integration funding was transferred to the C-130 AMP program for GATM initiatives.

(U) **B. Budget Activity Justification**
 Project 4689: This program upgrades avionics to add air traffic control capabilities to currently fielded weapon systems and is assigned Budget Activity 7, Operational Systems Development.
 Project 4690: This program will develop mission essential capability for fielded weapon systems and is assigned Budget Activity 7, Operational Systems Development.

(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)	26,521	6,517	8,584	
(U) Appropriated Value	27,056	6,517		
(U) Adjustments to Appropriated Value				
a. Congressional/General Reductions	-535			
b. Small Business Innovative Research	-850			
c. Omnibus or Other Above Threshold Reprogram				
d. Below Threshold Reprogram	-650			
e. Rescissions	-139			
f. Other				
(U) Adjustments to Budget Years Since FY 2000 PBR		-115	-76	
(U) Current Budget Submit/FY 2001 PBR	24,882	6,402	8,508	TBD

(U) **Significant Program Changes:**
 AFSOC GATM Integration funding has been applied against the C-130 Avionics Modernization Program (AMP). FY99 funds will be used to begin design engineering for AFSOC aircraft. FY00 and FY01 funds were transferred to the C-130 AMP for GATM initiatives.

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BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305099F Global Air Traffic Management (GATM)				PROJECT 674689	
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
674689 Global Access Architecture	22,780	6,402	8,508	9,496	7,567	7,720	7,872	Continuing	TBD
<p>(U) <u>A. Mission Description</u> 4689: Global Air Traffic Management: GATM is the Air Force program designed to meet the evolving aviation requirements of the International Civil Aviation Organization (ICAO). GATM, Navigation and Safety, and Navigation Warfare (NAVWAR) are major components of the AF's Global Access, Navigation, and Safety (GANS) management effort. The Global Air Traffic Operations/Mobility Command and Control (GATO/MC2) System Program Office (SPO) supports GATM as the AF's central focal point for analyzing and evaluating operational requirements, developing aircraft system architectures, acquiring aviation equipment, and certifying weapon system implementation. The system architectures identify necessary equipment and aircraft capability shortfalls across the Air Force inventory, for mobility, information dominance, bombers, fighters, trainers, helicopters, and unmanned aerial vehicles. For those capabilities where no current solution exists, development activities are undertaken in conjunction with existing DoD communications, navigation, surveillance, and safety program offices. To facilitate development, integration, interoperability, and exploration of dual-use technologies, a reconfigurable cockpit and avionics test bed (RCAT) was developed. Dual-use capabilities of avionics to satisfy GATM and military requirements of the Air Force fleet will be explored. The SPO will continue projections of studies and prototype efforts necessary to ensure AF aviation weapon systems are postured to meet civil standards and future changes to the civil standards leading to free flight. This project supports the definition of requirements for ACAT III projects across multiple weapon systems. No existing program satisfies the requirements of the GATM initiatives.</p>									
<p>(U) <u>FY 1999 (\$ in Thousands)</u></p>									
(U) \$2,161	System architecture definitions, development, and certification								
(U) \$1,788	Operational requirements analysis, demonstration, and evaluation								
(U) \$192	Acquisition of ID/IQ aviation equipment								
(U) \$7,557	Prototype developments and the expansion of dual-use technologies								
(U) \$9,270	Development of a GATM configurable cockpit and avionics test bed (RCAT)								
(U) \$1,812	Nav/Safety and GPS/NAVWAR integration and interoperability evaluations								
(U) \$22,780	Total								
<p>(U) <u>FY 2000 (\$ in Thousands)</u></p>									
(U) \$1,129	System architecture definitions, development, and certification								
(U) \$975	Operational requirements analysis, demonstration, and evaluation								
(U) \$2,554	Prototype developments and the expansion of dual-use technologies								
(U) \$1,426	Development of a GATM configurable cockpit and avionics test bed (RCAT)								
Project 674689			Page 3 of 17 Pages				Exhibit R-2A (PE 0305099F)		

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BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305099F Global Air Traffic Management (GATM)			PROJECT 674689			
(U) <u>A. Mission Description Continued</u>										
(U) <u>FY 2000 (\$ in Thousands) Continued</u>										
(U)	\$203	Acquisition of ID/IQ aviation equipment								
(U)	\$115	Nav/Safety and GPS/NAVWAR integration and interoperability evaluations								
(U)	\$6,402	Total								
(U) <u>FY 2001 (\$ in Thousands)</u>										
(U)	\$1,322	System architecture definitions, development, and certification								
(U)	\$1,358	Operational requirements analysis, demonstration, and evaluation								
(U)	\$2,786	Prototype developments and the expansion of dual-use technologies								
(U)	\$2,714	Development of a GATM configurable cockpit and avionics test bed (RCAT)								
(U)	\$207	Acquisition of ID/IQ aviation equipment								
(U)	\$121	Nav/Safety and GPS/NAVWAR integration and interoperability evaluations								
(U)	\$8,508	Total								
(U) <u>B. Project Change Summary</u>										
None										
(U) <u>C. Other Program Funding Summary (\$ in Thousands)</u>										
		<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Cost to</u>	<u>Total Cost</u>
		<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	
(U)	AF RDT&E									
(U)	Other APPN									
(U)	Aircraft Procurement, AF, BA-5, C-5 Avionics Modernization Program, PE 0401119F	9,700	22,600	129,937	195,268	217,337	163,120	2,385		740,347
(U)	RDT&E, AF, BA-7, C-5 AMP, PE 0401119F, C-5 Airlift Squadrons	33,594	44,172	30,084	7,295					118,685
(U)	Aircraft Procurement, AF, BA-5, C-5, 8.33 radio,	1,875								15,197
Project 674689										

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BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305099F Global Air Traffic Management (GATM)				PROJECT 674689	
(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>	
PE0401119F									
(U) Aircraft Procurement, AF, BA-5, C-9 GATM, PE 0401314F			4,635	6,875	6,825				18,335
(U) Aircraft Procurement, AF, BA-5, C-9 RVSM, PE 0401314F	3,753	4,413	5,680						13,846
(U) Aircraft Procurement, AF, BA-5, C-9 TAWS, PE 0401314F	2,151	2,989	1,765						6,905
(U) Aircraft Procurement, AF, BA-5, C-9 TCAS, PE 0401314F	3,254								11,654
(U) Aircraft Procurement, AF, BA-5, KC-10 8.33 radio, PE 0401219F	288								2,324
(U) Aircraft Procurement, AF, BA-5, KC-10 GATM, PE 0401219F	18,765	23,609	22,255	29,102	13,503				107,234
(U) Aircraft Procurement, AF, BA-5, KC-10 ADS Broadcast Datalink, PE 0401219F			3,520	2,232	6,164	3,142	1,833		16,891
(U) Aircraft Procurement, AF, BA-5, KC-10 TCAS/TAWS, PE 0401219F	15,648	13,231	6,000						41,179
(U) Aircraft Procurement, AF, BA-5, C-17 8.33 radio, PE 0401130F									25,345
Project 674689									

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(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) Aircraft Procurement, AF, BA-5, C-17 HFDL, PE 0401130F			3,150	3,150					6,300
(U) Aircraft Procurement, AF, BA-5, C-17 GPS Integrity Monitoring Capability, PE 0401130F	10,804	12,225	1,863						25,541
(U) Aircraft Procurement, AF, BA-5, C-17 PLSR, PE 0401130F									17,186
(U) Aircraft Procurement, AF, BA-5, C-17 ADS Upgrade, PE 0401130F						20,000	10,200	21,700	51,900
(U) Aircraft Procurement, AF, BA-5, C-17 RNP-4, PE 0401130F			2,622	2,622					5,244
(U) Aircraft Procurement, AF, BA-5, C-17 TAWS, PE 0401130F			343	14,571	21,496	7,094			43,504
(U) Aircraft Procurement, AF, BA-5, C-17 GATM PE 0401130F		25,600	38,400	12,800					76,800
(U) Aircraft Procurement, AF, BA-5, C-20 GATM, PE 0401314F			7,390	211	1,953				9,554
(U) Aircraft Procurement, AF, BA-5, C-20 TAWS, PE 0401314F	229	3,119	4,800	6,000					15,650
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(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)	Aircraft Procurement, AF, BA-5, C-20 TCAS, PE 0401314F	2,720								4,284
(U)	Aircraft Procurement, AF, BA-5, C-21 GATM/New Generation Cockpit, PE 0401314F	57,450	8,627	6,717	9,470	2,964	1,645	1,645		94,415
(U)	Aircraft Procurement, AF, BA-5, C-25 Windshear Warning, PE 0401314F		200							7,805
(U)	Aircraft Procurement, AF, BA-5, C-25 GATM, PE 0401314F	2,623	7,787		648	911				11,058
(U)	Aircraft Procurement, AF, BA-5, C-25 TAWS, PE 0401314F		315							3,235
(U)	Aircraft Procurement, AF, BA-5, C-32 GATM, PE 0401314F			6,572	2,296	7,546				16,414
(U)	Aircraft Procurement, AF, BA-5, T-43 TCAS, PE 0804742F						1,743	6,500		11,325
(U)	Aircraft Procurement, AF, BA-5, T-43 FDR/CVR, PE 0804742F	1,636								7,711
(U)	Aircraft Procurement, AF, BA-5, T-43 TAWS, PE 0804742F			3,072	3,459		3,653	2,866		13,050
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(U) <u>C. Other Program Funding Summary (\$ in Thousands)</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Cost to</u>	<u>Total Cost</u>
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	
(U) Aircraft Procurement, AF, BA-5, C-130 Flight Data Recorder, PE 0401115F									5,737
(U) Aircraft Procurement, AF, BA-5, C-130 Avionics Modernization Program, PE 0401115F	2,754	38,572	61,035	61,371	211,234	181,910	276,229	3,103,495	3,938,425
(U) Aircraft Procurement, AF, BA-5, C-130 ETCAS, PE 0401115F	16,154	10,323	3,500	5,350	5,800	5,800	5,800		70,103
(U) Aircraft Procurement, AF, BA-5, C-135 8.33 radio, PE 0401218F		16,613	67,200						83,813
(U) Aircraft Procurement, AF, BA-5, C-135 Interphone replacement, PE 0401218F	24,103	15,224	1,050						43,577
(U) Aircraft Procurement, AF, BA-5, C-135 GATM, PE 0401218F	48,398	29,631	86,495	225,857	215,172	147,435	57,117	203,084	1,013,189
(U) Aircraft Procurement, AF, BA-5, C-135 RVSM, PE 0401218F	27,687	47,392	40,034	16,371					141,484
(U) Aircraft Procurement, AF, BA-5, C-135 TAWS, PE 0401218F	8,932	19,383	9,439	8,788					92,708
(U) Aircraft Procurement, AF, BA-5, C-135 FDR/CVR, PE 0401218F	9,852	13,808	33,308	20,691	11,853				104,170
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(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)	Aircraft Procurement, AF, BA-5, C-135 Pacer CRAG, PE 0401218F	129,515	170,657	71,550						659,861
(U)	Aircraft Procurement, AF, BA-5, C-137 TCAS, PE0401314									4,281
(U)	Aircraft Procurement, AF, BA-5, C-141 TCAS, PE 0401118F	23,656	9,357							47,063
(U)	RDT&E , AF, BA-7, E-3 GATM, PE 0207417F						24,000	72,000		96,000
(U)	Aircraft Procurement, AF, BA-5, E-3 GATM, PE 0207417F						789	2,300		3,089
(U)	Aircraft Procurement, AF, BA-5, E-4 8.33 radio, PE 0302015F	300	556							1,232
(U)	Aircraft Procurement, AF, BA-5, E-4 TCAS, PE 0302015F	1,482	1,166	1,166						8,014
(U)	Aircraft Procurement, AF, BA-5, E-4 TAWS, PE 0302015F	1,300	1,300	2,500						8,622
(U)	Aircraft Procurement, AF, BA-5, E-4 GATM, PE 0302015F						6,731	20,500		27,231
(U)	Aircraft Procurement, AF, BA-5, E-4 FDR/CVR, PE	359	364	364						1,087
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BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305099F Global Air Traffic Management (GATM)				PROJECT 674689	
(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>	
0302015F									
(U) Aircraft Procurement, AF, BA-5, E-8 GATM, PE 0207581F					3,273	27,352	52,728		83,353
(U) RDT&E, AF, BA-7, E-8 GATM, PE 0207581F						23,700	45,300		69,000
(U) Aircraft Procurement, AF, BA-5, H-1 Integrated Data Acq Recorder, PE 0101235F	965								9,596
(U) Aircraft Procurement, AF, BA-5, H-1 TCAS, PE 0101235F			6,159	240	300	540			7,239
(U) Aircraft Procurement, AF, BA-5, GATM, PE 0305099F									1,750
(U) RDT&E, AF, BA07, B-52 GATM, PE 0101113F						10,000	25,000	40,000	75,000
(U) Aircraft Procurement, AF, BA-5, C-12 FDR/CVR, PE 0401314F	1,447								9,047
(U) Aircraft Procurement, AF, BA-5, C-12 TAWS, PE 0401314F	950	1,578	1,462						3,990
(U) D. Acquisition Strategy									
4689: The GATM Global Access Architecture acquisition strategy enables the GATO/MC2 SPO to guide equipment acquisition supporting global air traffic operations. The SPO will ensure standardization and certification of USAF platforms/systems that operate in the national and global air traffic environments. The SPO will also provide technical expertise and interface with appropriate product/support centers, battle labs, and Department of Defense (DOD) research and development facilities in the execution of assigned tasks. Program Research and Development Agreements (PRDAs), Cooperative Research and Development Agreements (CRDAs), and									
Project 674689			Page 10 of 17 Pages				Exhibit R-2A (PE 0305099F)		

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305099F Global Air Traffic Management (GATM)	PROJECT 674689
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(U) **D. Acquisition Strategy Continued**
 Indefinite Delivery/Indefinite Quantity (ID/IQ) contracts will be competitively awarded.

(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) System Architecture Definitions	*				X					X		
(U) Operational Requirements Analysis	*				X					X		
(U) Prototype Development Contract Awards	*											
(U) Development of GATM Test Bed		*										
(U) Interoperability Test Bed Evaluations					X					X		
(U) GPS/NAVWAR Integration Activities			*			X				X		

* Denotes Completed Event
 X Denotes Scheduled Event

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000				
BUDGET ACTIVITY				PE NUMBER AND TITLE				PROJECT			
07 - Operational System Development				0305099F Global Air Traffic Management (GATM)				674689			
(U) A. Project Cost Breakdown (\$ in Thousands)											
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>	
(U)	System architecture definitions, development, and certification					2,161		1,129		1,322	
(U)	Operational requirements analysis, demonstration, and evaluation					1,788		975		1,358	
(U)	Acquisition of ID/IQ aviation equipment					192		203		207	
(U)	Prototype developments and the expansion of dual-use technologies					7,557		2,554		2,786	
(U)	Development of a GATM configurable cockpit and avionics test bed (RCAT)					9,270		1,426		2,714	
(U)	Nav/Safety and GPS/NAVWAR integration and interoperability evaluations					1,812		115		121	
(U)	Total					22,780		6,402		8,508	
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)											
(U) Performing Organizations:											
	<u>Contractor or</u>	<u>Contract</u>									
	<u>Government</u>	<u>Method/Type</u>	<u>Award or</u>	<u>Performing</u>	<u>Project</u>						
	<u>Performing</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	
	<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	
										<u>Total</u>	
										<u>Program</u>	
	<u>Product Development Organizations</u>										
	MIT	FFP	Nov 98	TBD	TBD	0	1,900	350	421	Continuing	TBD
	Honeywell	IDIQ	Nov 98	TBD	TBD	0	2,642	1,719	2,095	Continuing	TBD
	Allied Signal	IDIQ	Nov 98	TBD	TBD	0	1,975	1,654	1,973	Continuing	TBD
	Northrop Grumman	CPAF	Feb 99	TBD	TBD	0	2,499	0	0	0	2,499
	Rockwell Collins	IDIQ	Nov 98	TBD	TBD	0	978	512	582	Continuing	TBD
	MITRE Corporation	CPAF	Oct 98	TBD	TBD	0	4,163	678	934	Continuing	TBD
	Horizons Technology Inc	IDIQ	Feb 99	TBD	TBD	0	2,429	812	975	Continuing	TBD
	TASC	CPFF	Jan 99	728	728	0	728	0	0	0	728
	ARINC Inc	FFP	July 99	840	840	0	840	0	0	0	840
	UNK	FFP	Sep 99	750	750	0	750	0	0	0	750
	Bremmer Associates	FFP	Feb 99	729	729	0	729	0	0	0	729
	UNK	UNK	Sep 99	500	500	0	500	0	0	0	500
	MCR	IDIQ	Feb	TBD	TBD	0	350	135	203	Continuing	TBD
	Federal Tech Services	FFP	Aug 99	300	300	0	300	0	0	0	300
Project 674689				Page 12 of 17 Pages				Exhibit R-3 (PE 0305099F)			

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE
BUDGET ACTIVITY										PROJECT
07 - Operational System Development										0305099F Global Air Traffic Management (GATM) 674689
PE NUMBER AND TITLE										
(U) Performing Organizations Continued:										
<u>Product Development Organizations</u>										
Various	various	various	TBD	TBD	0	896	191	903	Continuing	TBD
<u>Support and Management Organizations</u>										
MITRE Corporation	CPAF	Oct 99	TBD	TBD	0	477	215	218	Continuing	TBD
Various	Various	Various	TBD	TBD	864	624	136	204	Continuing	TBD
<u>Test and Evaluation Organizations</u>										
					<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>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					0	21,679	6,051	8,086	TBD	TBD
Subtotal Support and Management					864	1,101	351	422	TBD	TBD
Subtotal Test and Evaluation										
Total Project					864	22,780	6,402	8,508	TBD	TBD

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)							DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305099F Global Air Traffic Management (GATM)				PROJECT 674690	
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
674690 GATM Integration	2,102	0	0	0	0	0	0	0	2,102
<p>(U) <u>A. Mission Description</u> 4690: GATM Integration [for the C-130 platform]: Air Force Special Operations Command (AFSOC) funded a separate Multi-Mode Receiver (MMR) program to meet part of future GATM navigation requirements for AFSOC C-130s. GAO recommended the Air Force combine elements of AFSOC's Common Avionics Architecture for Penetration program with elements duplicated in the C-130 Avionics Modernization Program (AMP). GATM integration accurately reflects the application of AFSOC GATM funding from GATM integration to the overall C-130 AMP. Using GATM integration funds for the C-130 AMP eliminates the redundancy of two C-130 modernization efforts and minimizes down time. Realigning under the C-130 AMP provides MMR and Traffic Alert and Collision Avoidance System (TCAS) to comply with European and African airspace criteria. The MMR may incorporate a Microwave Landing System (MLS), Protected Instrument Landing System and Differential Global Positioning System. These modifications enable the MC-130H and other AFSOC aircraft to comply with changing ICAO airspace access criteria. Effort includes engineering design work, mod kit design, and kit proofing. The MC-130H and other Special Operations Forces (SOF) aircraft have highly unique and specialized software. Modification of the software involves changing the code, testing the changes, and updating software documentation and maintenance technical orders. FY99 includes initial funding to begin engineering design. In accordance with GAO recommendations, FY00 and FY01 GATM Integration funding was transferred to the C-130 AMP program for GATM initiatives.</p>									
<p>(U) <u>FY 1999 (\$ in Thousands)</u></p>									
(U) \$1,064	Systems engineering								
(U) \$745	Software engineering								
(U) \$293	Management and Support								
(U) \$2,102	Total								
<p>(U) <u>FY 2000 (\$ in Thousands)</u></p>									
(U) \$0	No Activity								
(U) \$0	Total								
<p>(U) <u>FY 2001 (\$ in Thousands)</u></p>									
(U) \$0	No Activity								
(U) \$0	Total								
Project 674690			Page 14 of 17 Pages				Exhibit R-2A (PE 0305099F)		

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305099F Global Air Traffic Management (GATM)	PROJECT 674690
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(U) **B. Project Change Summary**
 AFSOC GATM Integration funding has been applied against the C-130 Avionics Modernization Program (AMP). FY99 funds will be used to begin design engineering for AFSOC aircraft. FY00 and FY01 funds were transferred to the C-130 AMP.

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

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Cost to</u>	<u>Total Cost</u>
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	
(U) AF RDT&E									
(U) Other APPN									
(U) Aircraft Procurement, AF, BA-5, C-130 Avionics Modernization Program, PE 0401115F	100	55,000	74,480	77,392	224,757	192,531	271,688	1,539,700	2,437,778

(U) **D. Acquisition Strategy**
 4690: The integration acquisition strategy for AFSOC communication/navigation modifications enables the GATO/MC2 SPO to use existing contracts, when possible, to assist in the technical design and integration. The modifications will be accomplished under the SOF Integrated Weapons System Support Program (IWSSP) contract.

(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) N/A												

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000			
BUDGET ACTIVITY				PE NUMBER AND TITLE				PROJECT		
07 - Operational System Development				0305099F Global Air Traffic Management (GATM)				674690		
(U) A. Project Cost Breakdown (\$ in Thousands)										
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>
(U)	Software engineering					745				
(U)	System engineering					1,064				
(U)	Management and Support					293				
(U)	Total					2,102				
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)										
(U) Performing Organizations:										
<u>Contractor or</u>	<u>Contract</u>									
<u>Government</u>	<u>Method/Type</u>	<u>Award or</u>	<u>Performing</u>	<u>Project</u>						
<u>Performing</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Organizations</u>										
	TBD	Dec 98		1,747	0	1,814			0	1,814
<u>Support and Management Organizations</u>										
	WR-ALC/LU	TBD			0	188			0	188
	ASC/LU	TBD			0	100			0	100
<u>Test and Evaluation Organizations</u>										
(U) Government Furnished Property:										
	<u>Contract</u>									
	<u>Method/Type</u>	<u>Award or</u>								
<u>Item</u>	<u>or Funding</u>	<u>Obligation</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>Description</u>	<u>Vehicle</u>	<u>Date</u>	<u>Date</u>		<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Property</u>										
	TBD									
<u>Support and Management Property</u>										
	TBD									
<u>Test and Evaluation Property</u>										

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)		DATE					
07 - Operational System Development		0305099F Global Air Traffic Management (GATM)			February 2000		
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT					
		<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
		<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Subtotals</u>							
Subtotal Source for SBIR							
Subtotal Product Development		0	1,814			0	1,814
Subtotal Support and Management		0	288			0	288
Subtotal Test and Evaluation							
Total Project		0	2,102			0	2,102

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305110F Satellite Control Network				PROJECT 673276		
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
673276	Satellite Control Network	45,343	60,977	56,643	97,504	41,450	32,640	33,657	Continuing	TBD
	Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0
<p>(U) <u>A. Mission Description</u></p> <p>The Air Force Satellite Control Network (AFSCN) mission is to fly operational USAF and other DoD satellites. The AFSCN also provides launch and early orbit tracking operations in support of all major US launches. Air Force Space Command (AFSPC) performs operations and maintenance and Air Force Materiel Command (AFMC) performs modernization and sustainment of the system to meet requirements validated by a HQ USAF approved Operational Requirements Document (ORD). This program element contains funds for the development and acquisition of this integrated national satellite telemetry, tracking, commanding, and data relay capability to meet the requirements of the growing inventory of operational and developmental DoD, National, Civil, and Allied satellite systems. Improvement and Modernization efforts in command & control, communications, and range elements of the AFSCN will ensure DoD space systems are operationally ready to support the CINCs' warfighting requirements.</p> <p>The AFSCN is a global infrastructure of control centers, remote tracking stations (RTSs), and communications links that provide the highly reliable command and control, communications, and range systems required to support the nation's surveillance, navigation, communications, and weather satellite operations. The AFSCN is the DoD common user network that provides satellite state-of-health, tracking, telemetry, and commanding (TT&C) for the following operational satellite systems: Defense Meteorological Satellite Program (DMSP), Global Positioning System (GPS), Defense Satellite Communications System (DSCS), Defense Support Program (DSP), Fleet Satellite (FLEETSAT), Military Strategic and Tactical Relay Satellite (MILSTAR), the Navy's Ultra High Frequency Follow-On (UHF F/O), Skynet, NATO III/IV, and classified programs.</p> <p>AFSCN Improvement and Modernization (I&M): AFSCN I&M is an ongoing program of replacements and upgrades which will replace non-standard, unsupportable equipment with more reliable, maintainable and standardized hardware and software. This new equipment will enable AFSPC satellite operations to be performed with fewer, less skilled personnel and will significantly reduce hardware/software maintenance costs. The principal efforts within this program are: Network Operations Upgrades, Communications Upgrades, and Range Upgrades.</p> <p>NETWORK OPERATIONS UPGRADES: The current manpower intensive scheduling system to deconflict and allocate network TT&C assets to support operational space vehicles was replaced with Electronic Schedule Dissemination (ESD), a Year 2000-compliant system which performs network resource scheduling. The Orbit Analysis Subsystem (OAS) is a Year 2000-compliant replacement of the collision avoidance functions currently residing at Onizuka AS. The OAS will be installed at</p>										
Project 673276			Page 1 of 7 Pages				Exhibit R-2 (PE 0305110F)			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 2000
BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305110F Satellite Control Network	PROJECT 673276
(U) <u>A. Mission Description Continued</u>		
Schriever AFB CO. Both the ESD and OAS offer the potential for reducing satellite control O&M costs through enhanced commonality and standardization, simplified operations, and automation. Commercial off-the-shelf (COTS) hardware and software will be procured for the upgrades. The software portions will be modified to meet AFSPC's operational requirements.		
<p>COMMUNICATIONS UPGRADES: This effort will transition the current, costly point-to-point AFSCN communications network to a communications grid system that integrates government and commercial networks as technology becomes available. Several standardization efforts are being implemented to improve and modernize the communications and ground segment elements of the AFSCN, including: Archival recording systems to replace obsolete, manpower-intensive analog equipment with automated, standardized digital COTS systems; Wide Area Network Interface Units (WANIU) which standardize hardware and reduce O&M costs for performing multiplexing functions in the AFSCN, as well as provide an Asynchronous Transfer Mode (ATM) interface; and Operational Switch Replacement (OSR) to provide increased capacity, reliability, data quality, and user access.</p>		
<p>RANGE UPGRADES: This effort will upgrade the current Automated Remote Tracking Station (ARTS) and other Range assets. Several integrated projects will standardize the remote tracking stations, upgrade and/or replace outdated equipment in order to reduce failures, correct operational deficiencies, and reduce operating and sustainment costs.</p>		
(U) <u>FY 1999 (\$ in Thousands)</u>		
(U) \$2,000	Network Operations Upgrades: completed development of ESD/Automated Scheduling Tool for Range Operations (ASTRO) and the OAS.	
(U) \$30,692	Communications Upgrades: continued developing Archival Recorder System; continued developing Operational Switch Replacement; supported WANIU installation at RTSs and Operational Control Nodes (OCNs).	
(U) \$12,651	Network Integration and Systems Engineering: continued system engineering and integration of hardware/software to meet evolving satellite program requirements at OCNs and Remote Tracking Stations (RTSs).	
(U) \$45,343	Total	
(U) <u>FY 2000 (\$ in Thousands)</u>		
(U) \$5,164	Network Operations Upgrades: begin OAS follow-on development to continue to upgrade the radio frequency interference (RFI) capabilities.	
(U) \$31,228	Communications Upgrades: continue OSR development; complete WANIU and archival recorders.	
(U) \$15,478	Range Upgrades: begin Control and Status (C&S) Processor Upgrade development to continue the ARTS modernization effort; as a continuation of the modernization effort to standardize hardware and software, begin Standards Protocol requirements definition effort to address impact on AFSCN architecture of emerging space communications protocols being examined by DOD, NASA, and the International Standards Organization.	
(U) \$9,107	Network Integration and Systems Engineering: continue system engineering and integration of hardware/software to meet evolving satellite	
Project 673276	Page 2 of 7 Pages	Exhibit R-2 (PE 0305110F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development		PE NUMBER AND TITLE 0305110F Satellite Control Network		PROJECT 673276	
(U)	<u>A. Mission Description Continued</u>				
(U)	<u>FY 2000 (\$ in Thousands) Continued</u>				
	program requirements at OCNs and RTSs.				
(U)	\$60,977	Total			
(U)	<u>FY 2001 (\$ in Thousands)</u>				
(U)	\$2,374	Network Operations Upgrades: complete development of OAS follow-on capability.			
(U)	\$24,171	Communications Upgrades: complete OSR development; begin Defense Information System Network (DISN)-ATM connectivity development to continue communications upgrade efforts and to enable external users to connect to the AFSCN through DISN.			
(U)	\$20,266	Range Upgrades: continue Standards Protocol development; continue C&S Processor Upgrade development; begin effort to upgrade the Automated Remote Tracking Stations (ARTS) Space/Ground interface upgrade as a continuation of the ARTS modernization effort.			
(U)	\$9,832	Network Integration and Systems Engineering: continue system engineering and integration of hardware/software to meet evolving satellite program requirements at OCNs and RTSs.			
(U)	\$56,643	Total			
(U)	<u>B. Budget Activity Justification</u>				
	This effort is in Budget Activity 7, Operational System Development, because it supports a fielded system.				
(U)	<u>C. Program Change Summary (\$ in Thousands)</u>				
		<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U)	Previous President's Budget (FY 2000 PBR)	55,812	61,918	85,064	TBD
(U)	Appropriated Value	56,622	61,918		
(U)	Adjustments to Appropriated Value				
	a. Congressional/General Reductions	-810	-123		
	b. Small Business Innovative Research	-1,885			
	c. Omnibus or Other Above Threshold Reprogram		-335		
	d. Below Threshold Reprogram	-8,330			
	e. Rescissions	-254	-483		
	f. Other				TBD
(U)	Adjustments to Budget Years Since FY 2000 PBR			-28,421	
(U)	Current Budget Submit/FY 2001 PBR	45,343	60,977	56,643	TBD

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305110F Satellite Control Network	PROJECT 673276
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(U) **C. Program Change Summary (\$ in Thousands) Continued**

(U) **Significant Program Changes:**
 FY99: Resource Management System (RMS) was restructured and descoped to provide AFSCN scheduling upgrades via the Electronic Schedule Dissemination (ESD) solution, and to provide collision avoidance functions at Schriever AFB through the Orbit Analysis Subsystem (OAS) solution. Antenna upgrade development funds were used for higher Air Force priorities, with antenna improvements now planned to be accomplished through a procurement-funded replacement program.
 FY01: A reduction of \$9,400 was due to underexecution in FY99 and expected excess carry-forward through FY00, and into FY01. A \$7,300 adjustment properly aligned funds to OPAF to purchase hardware for the OAS follow-on project. A reduction of \$11,200 delayed the asset consolidation and the resource scheduling upgrade by one year.

(U) **D. 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 Complete</u>	<u>Total Cost</u>
(U) Other Procurement, AF; Budget Activity: 03; P-65; AFSCN	22,349	31,314	39,094	39,750	34,329	37,533	32,501	Continuing	TBD

(U) **E. Acquisition Strategy**

The primary objective of the AFSCN I&M program is to reduce the cost of satellite control operations while maintaining or improving reliability, maintainability, operability, and capability of current systems. A combination of performance-based specifications and commercial/industrial specifications and standards was used for these acquisitions and was tailored to state only the Government's minimum performance needs. All development contracts were competitively awarded and utilized commercial practices and streamlining to the maximum extent possible. Starting in FY96, a new streamlined contracting strategy was implemented with the award of three new contracts. This strategy resulted in the Range & Communications Development Contract (RCDC), the Network Operations Upgrade Contract (NOUC), and the Network Integration Contract (NIC). Integration efforts had previously been spread across functional and contracting lines; but with the new AFSCN contracting strategy, the NIC contractor was given responsibility for inter-segment integration. Development upgrades are being designed to be flexible in meeting new satellite program requirements while minimizing sustainment costs by taking advantage of development efforts in satellite control over a large number of government and non-government development activities. These objectives can best be reached by developing systems with an open software design and a distributed system architecture using COTS products wherever feasible.

(U) **F. Schedule Profile**

<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305110F Satellite Control Network	PROJECT 673276
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(U) **F. Schedule Profile Continued**

	<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) Network Operations Upgrades												
(U) - ESD DD-250				*								
(U) Communications Upgrades												
(U) - RTS archival installation initiation					*							
(U) - Archival DD-250								X				
(U) - WANIU Functional/Physical Configuration Audit (FCA/PCA)		*										
(U) - WANIU DD-250									X			
(U) - OSR Incremental Demonstration Review-1				*								
(U) - OSR Incremental Demonstration Review-2							X					
(U) - OSR FCA/PCA											X	
(U) - Begin External User DISN-ATM Connectivity											X	
(U) Range Upgrades												
(U) - Start Control and Status Upgrade							X					
(U) - Begin ARTS upgrade											X	
* = completed; X = planned												

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305110F Satellite Control Network				PROJECT 673276		
(U) <u>A. Project Cost Breakdown (\$ in Thousands)</u>										
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>
(U)	Network Ops Upgrades (Command and Control Upgrades)					2,000		5,164		2,374
(U)	Communications Upgrades					30,692		31,228		24,171
(U)	Range Upgrades					0		15,478		20,266
(U)	Network Integration and Systems Engineering					12,651		9,107		9,832
(U)	Total					45,343		60,977		56,643
(U) <u>B. Budget Acquisition History and Planning Information (\$ in Thousands)</u>										
(U) <u>Performing Organizations:</u>										
<u>Contractor or</u>	<u>Contract</u>									
<u>Government</u>	<u>Method/Type</u>	<u>Award or</u>	<u>Performing</u>	<u>Project</u>						
<u>Performing</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Organizations</u>										
Multiple	Multiple	Multiple	72,296	72,296	72,296	0	0	0	0	72,296
Lockheed Martin	C/CPAF	Mar 96	143,737	143,737	40,318	30,692	46,706	14,771	11,250	143,737
Lockheed Martin	C/CPAF	Apr 96	50,323	50,323	43,159	2,000	5,164	0	0	50,323
AFSCN Upgrades	TBD	Nov 00	TBD	TBD	0	0	0	32,040	Continuing	TBD
Lockheed Martin	C/CPAF	May 96	64,343	64,343	19,900	12,651	9,107	9,832	12,853	64,343
<u>Support and Management Organizations</u>										
N/A										
<u>Test and Evaluation Organizations</u>										
N/A										
(U) <u>Government Furnished Property:</u>										
	<u>Contract</u>									
	<u>Method/Type</u>	<u>Award or</u>								
<u>Item</u>	<u>or Funding</u>	<u>Obligation</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>Description</u>	<u>Vehicle</u>	<u>Date</u>	<u>Date</u>		<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305110F Satellite Control Network			PROJECT 673276		
(U) Government Furnished Property Continued:									
	<u>Contract</u>								
	<u>Method/Type</u>	<u>Award or</u>							
<u>Item</u>	<u>or Funding</u>	<u>Obligation</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>Description</u>	<u>Vehicle</u>	<u>Date</u>	<u>Date</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Property</u>									
N/A									
<u>Support and Management Property</u>									
N/A									
<u>Test and Evaluation Property</u>									
N/A									
				<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				175,673	45,343	60,977	56,643	TBD	TBD
Subtotal Support and Management									
Subtotal Test and Evaluation									
Total Project				175,673	45,343	60,977	56,643	TBD	TBD

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 2000	
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305111F Weather Service				PROJECT 672738	
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
672738 Weather Service	9,846	18,910	19,942	11,489	14,606	16,781	17,015	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0

(U) A. Mission Description
 This program provides for the modification, sustainment, and acquisition of meteorological and space environmental hardware and software supporting the observing and forecasting needs of worldwide Air Force and Army operations, as well as Special Operation Forces (SOF) and other government agencies. It provides fixed and transportable equipment supporting the Expeditionary Aerospace Force (EAF) concept with weather observing and forecasting capabilities at in-garrison and deployed locations. Efforts include: (a) Cloud Depiction and Forecast System II (CDFS II) replaces logistically unsupportable mainframe computers at the Air Force Weather Agency (AFWA), Offutt AFB, and upgrades satellite data processing, cloud depiction and forecasting weather support functions for operational commanders and classified national programs; (b) Global Theater Weather Analysis and Prediction System (GTWAPS) acquires theater weather models and associated hardware to improve the AFWA theater support capabilities; (c) Tactical Weather Radar (TWR) provides lightweight, portable Doppler weather radar to support deployed combat operations worldwide; (d) Space Weather Analysis and Forecast System (SWAFS) builds space environmental support and modernizes software capabilities to meet warfighter requirements; (e) Meteorological Operations Capability (MOC) Forecast System 21st Century (FS-21) provides user workstations capable of ingesting all sources of weather information to provide timely and precisely tailored weather products for the warfighter and supports the 'train as you fight' concept by assuring fixed and deployable systems are the same; (f) Weather Data Analysis (WDA) provides a fused infrastructure for the assimilation of advanced models, radar, lightning, and satellite data into a single user interface for the timely analysis and production of tailored weather products [In FY99 this project was named Satellite Data Handling System II (SDHS II). This name change provides consistency with the five core competency areas--see following paragraph.]; (g) MOC Observing System 21st Century (OS-21) provides a range of weather observing capabilities to include a fully automated capability for fixed and deployed locations and integrates both manual and remote systems and (h) Small Tactical Terminal (STT) provides worldwide tactical users with a survivable 'first-in' source of meteorological satellite data, processed by small portable terminals in forward areas of conflict [Funding aligned to PE 35111F in FY01. Prior year funding in PE 35160F, Defense Meteorological Satellite Program.]. Additionally, in FY99 in response to USAFE Combat Mission Needs Statement 98-008 generated during Operation Allied Force, the Target Scale Weather Forecast Model (TSWFM) was developed to provide Air Tasking Order planners the ability to anticipate and exploit weather for air operations by providing greater resolution and accuracy in weather forecasts.

(U) In FY00, Air Force Weather (AFW) programs are being aligned under the five core competency areas of Weather Data Collection, Analysis, Forecasting, Product Tailoring/Warfighter Applications, and Dissemination described in the AFW Mission Support Plan. Through this alignment, AFW will ensure an integrated and systems-oriented approach to program management decisions. Weather Data Collection will absorb TWR and MOC sensor program efforts in FY00 and beyond.

Project 672738 Page 1 of 6 Pages Exhibit R-2 (PE 0305111F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE
BUDGET ACTIVITY		PROJECT
07 - Operational System Development	0305111F Weather Service	February 2000 672738
<p>(U) <u>A. Mission Description Continued</u> Analysis will continue the SDHS II effort as WDA and ensure the interoperability of the AFW processing infrastructure with users and data sources. Weather Forecasting will continue both GTWAPS and CDFS II and begin merging strategic and operational level forecasting for greater efficiency. Product Tailoring and Warfighter Applications will continue development of MOC FS-21 which is the cornerstone of AFW support to operational users. These consolidations and realignments are critical to AFW Re-Engineering and implementation of the CSAF-directed and approved AFW Strategic Plan.</p>		
(U) <u>FY 1999 (\$ in Thousands)</u>		
(U) \$4,855	CDFS II: Continued development of cloud depiction and forecast software	
(U) \$1,829	GTWAPS: Continued operational software development for incremental IOCs	
(U) \$250	TWR: SPO support and continued development of system interfaces with Forecast and Analysis systems	
(U) \$1,327	MOC FS-21: Prepare Milestones I/II/III documentation	
(U) \$40	SDHS II: Initiated assessment of operational alternative study and preparation of Milestones I/II/III documentation	
(U) \$845	SWAFS: Performed design and architecture study in preparation for Milestones I/II and possibly III and to accommodate incremental operational software deliveries	
(U) \$700	TSWFM: Developed software for fine scale target forecasting in response to Combat Mission Needs Statement #98-008.	
(U) \$9,846	Total	
(U) <u>FY 2000 (\$ in Thousands)</u>		
(U) \$500	TWR: SPO support and continue development of system interfaces with Forecast and Analysis systems (Weather Data Collection)	
(U) \$1,127	MOC OS-21: Prepare Milestones I/II/III documentation, achieve Milestones I/II/III, and begin integration and development of component sensor systems (Weather Data Collection)	
(U) \$1,700	WDA [formerly SDHS II]: Achieve Milestones I/II/III and begin operational software development for enhanced analysis infrastructure (Analysis)	
(U) \$3,394	CDFS II: Continue development of cloud depiction and forecast software (Weather Forecasting)	
(U) \$2,246	GTWAPS: Continue operational software development for incremental IOCs (Weather Forecasting)	
(U) \$6,818	SWAFS: Achieve Milestones I/II and possibly III and begin software development for incremental deliveries (Weather Forecasting)	
(U) \$3,125	MOC FS-21: Complete Milestones I/II/III documentation, achieve Milestones I/II/III, and award a contract for FS-21 procurement and software integration (Product Tailoring/Warfighter Applications)	
(U) \$18,910	Total	
Project 672738	Page 2 of 6 Pages	Exhibit R-2 (PE 0305111F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 2000			
BUDGET ACTIVITY		PE NUMBER AND TITLE		PROJECT	
07 - Operational System Development		0305111F Weather Service		672738	
(U) <u>A. Mission Description Continued</u>					
(U) <u>FY 2001 (\$ in Thousands)</u>					
(U)	\$400	TWR: SPO support and continue development of system interfaces with Forecast and Analysis systems (Weather Data Collection)			
(U)	\$4,366	MOC OS-21: Continue development and integration of component sensor systems (Weather Data Collection)			
(U)	\$3,480	WDA: Continue software development for enhanced analysis infrastructure (Analysis)			
(U)	\$996	CDFS II: Continue development of cloud depiction and forecast software and achieve FOC (Weather Forecasting)			
(U)	\$4,581	SWAFS: Continue software development for incremental deliveries (Weather Forecasting)			
(U)	\$3,238	MOC FS-21: Continue software development and integration with regional and tactical weather systems (Product Tailoring/Warfighter Applications)			
(U)	\$2,881	STT: Continue development of software for integration of satellite weather data in tactical environment. (Weather Data Collection)			
(U)	\$19,942	Total			
(U) <u>B. Budget Activity Justification</u>					
This effort is in Budget Activity 7, Operational System Development, because it supports operational software development and system tests associated with the upgrade and replacement of currently operational systems, systems already in production, and systems with approved production funds in the DoD budget.					
(U) <u>C. Program Change Summary (\$ in Thousands)</u>					
		<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U)	Previous President's Budget (FY 2000 PBR)	10,398	19,069	15,089	TBD
(U)	Appropriated Value	10,649	19,069		
(U)	Adjustments to Appropriated Value				
	a. Congressional/General Reductions	-251	-55		
	b. Small Business Innovative Research	-340			
	c. Omnibus or Other Above Threshold Reprogram		-104		
	d. Below Threshold Reprogram	-157			
	e. Rescissions	-55			
	f. Other				
(U)	Adjustments to Budget Years Since FY 2000 PBR			4,853	TBD
(U)	Current Budget Submit/FY 2001 PBR	9,846	18,910	19,942	TBD
Project 672738		Page 3 of 6 Pages	Exhibit R-2 (PE 0305111F)		

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305111F Weather Service	PROJECT 672738
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(U) **C. Program Change Summary (\$ in Thousands) Continued**

(U) **Significant Program Changes:**
 FY01: \$2,090K transferred from SWAFS other procurement - AF to RDT&E.
 \$2,941K transferred from PE35160F to support STT.

(U) **D. 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) Other Procurement, AF, Weather Service (PE35111F WSC 833070)	47,949	41,850	48,599	48,125	45,084	45,409	46,572	Continuing	TBD

(U) **E. Acquisition Strategy**

All major contracts within this program used precompeted DoD contract vehicles or were awarded after full and open competition. Programs support DII COE compliance and use an evolutionary acquisition strategy with a series of incremental IOCs and software releases. This approach accommodates refinement and prioritization of user requirements and improves adaptability to evolving commercial activities.

(U) **F. 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) CDFS II FOC									X			
(U) SWAFS Milestones I/II and possibly III						X						
(U) MOC FS-21 Milestones I/II/III						X						
(U) MOC OS-21 Milestones I/II/III						X						
(U) SDHS II/WDA Milestones I/II/III							X					

X - Denotes planned event

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000				
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305111F Weather Service			PROJECT 672738				
(U) A. Project Cost Breakdown (\$ in Thousands)											
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>	
(U)	1st Article Development					0		1,205		0	
(U)	System Software Integration					202		1,444		2,767	
(U)	System Engineering Support					1,621		2,484		5,778	
(U)	Contractor Engineering Support					999		2,591		2,715	
(U)	Software Development					5,873		9,770		7,498	
(U)	Travel					213		300		317	
(U)	Program Management Support					938		1,016		867	
(U)	Laboratory Support					0		100		0	
(U)	Total					9,846		18,910		19,942	
(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>											
Phillips Lab	MIPR	May 94	270	270	270				0	270	
CalTech	LOE	Jun 94	1,172	1,172	1,172				0	1,172	
CSC	LOE	Jan 94	2,127	2,127	2,127				0	2,127	
GTE	FFP/PR	Oct 90	13,064	13,064	13,064				0	13,064	
PRISM(Raytheon)	LOE	Jan 93	3,497	3,497	3,497				0	3,497	
PRISM (Hughes)	LOE	Jan 93	3,396	3,396	3,396				0	3,396	
Sterling	CPAF	Jun 95	21,621	21,621	13,309	5,094	2,800	742	0	21,945	
Air Weather Svc (CDFS II related work)	MIPR	4FY95	2,900	2,900	2,900				0	2,900	
Hughes		Sep 95	1,682	1,682	1,682				0	1,682	
DNA	MIPR	Jan 95	100	100	100				0	100	
CCPL (TRW) [GTWAPS]	LOE	Dec 97	3,986	3,986	2,023	1,597	996	0	Continuing	TBD	
Project 672738				Page 5 of 6 Pages				Exhibit R-3 (PE 0305111F)			

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE
07 - Operational System Development										February 2000
BUDGET ACTIVITY					PE NUMBER AND TITLE					PROJECT
07 - Operational System Development					0305111F Weather Service					672738
(U) Performing Organizations Continued:										
<u>Product Development Organizations</u>										
Raytheon	MIPR	Sep 98	1,184	1,184	232	250	415	351	0	1,248
TBD MOC FS-21	TBD	TBD	TBD	TBD	0	0	1,842	2,143	Continuing	TBD
TBD MOC OS-21	TBD	TBD	TBD	TBD	0	0	700	3,279	Continuing	TBD
TBD SDHS II/WDA	TBD	TBD	TBD	TBD	0	0	1,073	2,141	Continuing	TBD
TASC	LOE	Sep 99	741	741	0	741	0	0	0	741
CCPL (TRW) [SWAFS]	LOE	Dec 99	4,780	4,780	0	0	4,780	0	0	4,780
TBD SWAFS	TBD	TBD	TBD	TBD	0	14	2,176	4,269	Continuing	TBD
TBD STT*	TBD	TBD	TBD	TBD	0	0	0	2,881	Continuing	TBD
*Note: prior to FY01, STT in PE 35160F.										
<u>Support and Management Organizations</u>										
Electronic Systems Center (ESC)					824	900	1,072	835	Continuing	TBD
Space and Missile Systems Center (SMC)					40	188	172	204	Continuing	TBD
MITRE/ Aerospace/ITSP					2,151	1,062	2,884	3,097	Continuing	TBD
<u>Test and Evaluation Organizations</u>										
<u>Subtotals</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>
Subtotal Product Development					43,772	7,696	14,782	15,806	TBD	TBD
Subtotal Support and Management					3,015	2,150	4,128	4,136	TBD	TBD
Subtotal Test and Evaluation										
Total Project					46,787	9,846	18,910	19,942	TBD	TBD

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

DATE

February 2000

BUDGET ACTIVITY

07 - Operational System Development

PE NUMBER AND TITLE

0305114F Air Traffic Control/Approach/Landing System (ATCALs)

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	2,870	7,279	18,093	12,279	5,579	5,885	5,995	Continuing	TBD
672026 System Support	252	231	252	237	246	194	193	Continuing	TBD
673587 Air Traffic Control Systems	2,618	7,048	17,841	12,042	5,333	5,691	5,802	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

Research, development, test, and engineering activities in this program originally focused on developing the Military Microwave Landing System Avionics (MMLSA) and acquisition of the commercially developed Commercial Microwave Landing System Avionics (CMLSA) as part of a two-decade effort to replace the Precision Approach Radars and Instrument Landing Systems that provide precision landing services even at night and in bad weather. However, with the advent of space-based technologies, the MMLSA program was canceled in the late 1980s. The focus of RDT&E activities in this program turned to a comprehensive modernization of fixed and mobile Air Traffic Control and Landing Systems (ATCALs) that will bridge the gap between the current aging fleet of ground-based ATCALs and future space-based infrastructure. In particular, the program is focused on developing systems that increase commonality and interoperability, reduce manpower requirements, reduce logistics supportability problems, and posture the service to move to space-based aerospace navigation infrastructure when that becomes feasible and affordable (in the second and third decades of the next century). Additionally, this program investigates and exploits emerging technologies in critical ATCALs support areas such as air traffic controller training and terminal instrument procedures development. This program complements other safety of flight and airspace access programs such as Global Air Traffic Management and Global Access, Navigation, and Safety. Project 2026 funds ongoing liaison and interagency cooperative studies, between the USAF Air Traffic Control and Landing Systems program office and various organizations to include other Services, the Federal Aviation Administration (FAA) and ICAO. Project 3587 funds research and development of new air traffic control surveillance, positioning, and precision approach capabilities (including the Mobile Approach Control System (MACS) which replaces non-standard, unsupported, large footprint mobile radar approach systems with a common, easily-transportable system for both the Air National Guard and REGAF). project 3587 also completes the

(U) B. Budget Activity Justification

This program is in budget activity 7 - Operational System Development, because it upgrades avionics in currently fielded weapon systems.

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

DATE
February 2000

BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305114F Air Traffic Control/Approach/Landing System (ATCALs)
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(U) <u>C. Program Change Summary (\$ in Thousands)</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U) Previous President's Budget (FY 2000 PBR)	4,389	5,588	18,254	
(U) Appropriated Value	4,729	7,344		
(U) Adjustments to Appropriated Value				
a. Congressional/General Reductions	-340			
b. Small Business Innovative Research	-145			
c. Omnibus or Other Above Threshold Reprogram				
d. Below Threshold Reprogram	-1,358			
e. Rescissions	-16	-65		
f. Other				TBD
(U) Adjustments to Budget Years Since FY 2000 PBR			-161	
(U) Current Budget Submit/FY 2001 PBR	2,870	7,279	18,093	TBD

(U) Significant Program Changes:
Funding:

1. FY 99: Below-Threshold Reprogramming of \$474 made to support higher priority programs.
2. FY00 upward adjustment transfers RDT&E funding from the National Airspace System (NAS) program (PE 305137F) to ATCALs to consolidate small RDT&E lines. The funds will still be used to complete testing and fielding of NAS systems (radars, voice switches, data automation systems, and data systems designed to assist in management of special use airspace)
3. FY01 reflects -\$161 adjustment for revised inflation assumptions

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)							DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305114F Air Traffic Control/Approach/Landing System (ATCALs)				PROJECT 672026	
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
672026 System Support	252	231	252	237	246	194	193	Continuing	TBD
<p>(U) <u>A. Mission Description</u> This continuing effort funds ongoing liaison and interagency cooperative studies, as well as interoperability analyses between the USAF Air Traffic Control and Landing Systems (ATCALs) Program Office and various organizations which include the other services, the Federal Aviation Administration (FAA), and the International Civil Aviation Organization (ICAO). Continues mission support for the ATCALs programs including several joint efforts with the FAA. RDT&E funds are used to resolve or minimize technical interface problems associated with interoperability between existing or planned DoD/FAA ATCALs equipment and capabilities.</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u> (U) \$92 Supported Air Traffic Control and Landing Systems (ATCALs) projects (U) \$111 Conducted interoperability and interface evaluations (U) \$49 Supported precision landing systems studies for the Joint Special Operations Command (U) \$252 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u> (U) \$88 Support for all ATCALs projects (U) \$96 Conduct interoperability and interface evaluations (U) \$47 Support for precision landing studies for JSOC (U) \$231 Total</p> <p>(U) <u>FY 2001 (\$ in Thousands)</u> (U) \$90 Support for all ATCALs projects (U) \$113 Conduct interoperability and interface evaluations (U) \$49 Support for precision landing studies for JSOC (U) \$252 Total</p> <p>(U) <u>B. Project Change Summary</u></p>									
Project 672026			Page 3 of 12 Pages			Exhibit R-2A (PE 0305114F)			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE February 2000
BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305114F Air Traffic Control/Approach/Landing System (ATCALs)	PROJECT 672026

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

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Cost to</u>	<u>Total Cost</u>
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	
(U) AF RDT&E									
(U) Other APPN									
N/A									

(U) **D. Acquisition Strategy**
Engineering Manufacturing Development, Fixed Price Incentive Fee (FPIF), No Non-Developmental Items (NDI)

(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) Acquisition Milestones												
(U) MACS Acquisition Strategy Approved					X							
(U) MACS RFP for Airport Surveillance Radar (ASR)/Operations Systems						X						
(U) MACS RFP for Precision Approach Radar (PAR) System (See footnote)									X			
(U) Contract Milestone												
(U) MACS source selection for ASR/Ops							X					
(U) MACS source selection for PAR (See footnote)											X	
(U) Conduct Precision Landing Studies			*			X				X		

NOTE: To save costs development and long-term sustainment costs, USAF and the US Navy will cooperatively develop the Precision Approach Radar (PAR) system associated with MACS. The Navy is performing all acquisition/contracting actions associated with the PAR system, and the timelines shown reflect the Navy's estimate provided to the System Program Office (HQ ESC/GA)

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000				
BUDGET ACTIVITY					PE NUMBER AND TITLE			PROJECT			
07 - Operational System Development					0305114F Air Traffic Control/Approach/Landing System (ATCALs)			672026			
(U) A. Project Cost Breakdown (\$ in Thousands)											
					<u>FY 1999</u>		<u>FY 2000</u>			<u>FY 2001</u>	
(U)	System Engineering				148		141			146	
(U)	Contract Engineering				81		70			86	
(U)	Test and Evaluation Support				0		0			0	
(U)	Program Management Support				11		10			10	
(U)	Travel				12		10			10	
(U)	Total				252		231			252	
(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>										
	N/A										
	<u>Support and Management Organizations</u>										
	Various	Multiple	Multiple	N/A		1,018	252	231	252		1,753
	<u>Test and Evaluation Organizations</u>										
	N/A										
(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>							
	<u>Product Development Property</u>										
	N/A										

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)				DATE February 2000		
BUDGET ACTIVITY	PE NUMBER AND TITLE			PROJECT		
07 - Operational System Development	0305114F Air Traffic Control/Approach/Landing System (ATCALs)			672026		
<p>(U) <u>Government Furnished Property Continued:</u></p> <p style="margin-left: 20px;"><u>Support and Management Property</u> N/A</p> <p style="margin-left: 20px;"><u>Test and Evaluation Property</u> N/A</p>						
	<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	1,018	252	231	252		1,753
Subtotal Support and Management						
Subtotal Test and Evaluation						
Total Project	1,018	252	231	252		1,753

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)							DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305114F Air Traffic Control/Approach/Landing System (ATCALs)				PROJECT 673587	
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
673587 Air Traffic Control Systems	2,618	7,048	17,841	12,042	5,333	5,691	5,802	Continuing	TBD
<p>(U) <u>A. Mission Description</u> This project funds research and development of new air traffic control surveillance, positioning, and precision approach capabilities (including the Mobile Approach Control System (MACS) which replaces non-standard, unsupportable, large footprint mobile radar approach systems with a common, easily-transportable system for both the Air National Guard and REGAF). This year, the project completed development of a multi-mode receiver (the Precision landing System) which will equip every C-17 with the capability to fly approaches using a variety of landing aids, including microwave landing systems and Instrument Landing Systems located close to sources of interference. This project also conducts development and testing for the National Airspace System (NAS) to support fielding of NAS hardware and software for radar systems, digital voice switches, and specialized data automation systems. Additionally, this project funds the development of a replacement system for automated development of terminal instrument procedures (the precisely-measured documents that tell pilots how to fly during final approach to avoid obstacles). This project will also investigate low-cost, high-return methods for improving interoperability between US air navigation systems and those of allied nations, especially the NATO countries.</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u> (U) \$133 Continued to perform platform integration and system engineering analyses (U) \$365 Completed PLS flight testing /certification (U) \$1,613 Mobile Approach Control System Analysis of Alternatives (U) \$507 Air Force Terminal Instrument Procedures Analysis of Alternatives (U) \$2,618 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u> (U) \$3,454 Begin Mobile Approach Control System Development (U) \$466 Support field to ensure USAF ATC interoperability with FAA and NATO (U) \$525 Begin technology insertion studies to determine USAF ATC applicability with coalition allies (U) \$847 Begin development of Air Force Terminal Instrument Procedures System (U) \$85 Identify interface improvements for NAS systems (U) \$139 Perform NAS risk reduction studies/software interoperability analyses (U) \$730 Complete NAS radar/automation testing</p>									
Project 673587			Page 7 of 12 Pages				Exhibit R-2A (PE 0305114F)		

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)							DATE February 2000																																																													
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305114F Air Traffic Control/Approach/Landing System (ATCALs)			PROJECT 673587																																																													
<p>(U) <u>A. Mission Description Continued</u></p> <p>(U) <u>FY 2000 (\$ in Thousands) Continued</u></p> <p>(U) \$802 Complete development of NAS Military Airspace Management System</p> <p>(U) \$7,048 Total</p> <p>(U) <u>FY 2001 (\$ in Thousands)</u></p> <p>(U) \$15,759 Continue Mobile Approach Control System Development</p> <p>(U) \$419 Support field activities to ensure USAF ATC interoperability with FAA and NATO</p> <p>(U) \$494 Continue technology insertion studies to determine USAF ATC applicability with coalition allies</p> <p>(U) \$540 Continue development of Air Force Terminal Instrument Procedures System</p> <p>(U) \$629 Investigate improvements in Mode S capabilities</p> <p>(U) \$17,841 Total</p> <p>(U) <u>B. Project Change Summary</u></p> <p>1. NOTE: Program awaiting \$7,890 reclassification of FY99 OPAF funds to RDT&E to support MACS development</p> <p>2. FY00 upward adjustment transfers RDT&E funding from the National Airspace System (NAS) program (PE 305137F) to ATCALs to consolidate small RDT&E lines. The funds will still be used to complete testing and fielding of NAS systems (radars, voice switches, data automation systems, and data systems designed to assist in management of special use airspace)</p> <p>4. FY01 includes approximately \$150 reduction to account for revised economic assumptions</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:20%;"></th> <th style="width:10%;"><u>FY 1999</u></th> <th style="width:10%;"><u>FY 2000</u></th> <th style="width:10%;"><u>FY 2001</u></th> <th style="width:10%;"><u>FY 2002</u></th> <th style="width:10%;"><u>FY 2003</u></th> <th style="width:10%;"><u>FY 2004</u></th> <th style="width:10%;"><u>FY 2005</u></th> <th style="width:10%;"><u>Cost to</u></th> <th style="width:10%;"><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) AF RDT&E</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) National Airspace System program (PE 305137F) (See footnote)</td> <td style="text-align: center;">1,787</td> <td style="text-align: center;">0</td> <td style="text-align: center;">201</td> <td style="text-align: center;">203</td> <td style="text-align: center;">206</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Other APPN</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Aircraft procurement, AF</td> <td style="text-align: center;">0</td> <td style="text-align: center;">Continuing</td> <td style="text-align: center;">TBD</td> </tr> </tbody> </table> <p>Project 673587</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) AF RDT&E										(U) National Airspace System program (PE 305137F) (See footnote)	1,787	0	201	203	206					(U) Other APPN										(U) Aircraft procurement, AF	0	0	0	0	0	0	0	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) AF RDT&E																																																																				
(U) National Airspace System program (PE 305137F) (See footnote)	1,787	0	201	203	206																																																															
(U) Other APPN																																																																				
(U) Aircraft procurement, AF	0	0	0	0	0	0	0	Continuing	TBD																																																											

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305114F Air Traffic Control/Approach/Landing System (ATCALs)				PROJECT 673587			
(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) OPAF - BA 3 (PE 305114F) Weapon System Code 833010	7,890	9,025	10,624	33,903	42,157	76,033	85,132	Continuing	TBD		
(U) OPAF, BA 3, (PE 305137F) Weapon System Code 833020	13,904	45,394	59,240	63,367	54,275	48,179	48,417	Continuing	6,675		
(U) OPAF, BA 5, (PE 305137F) Weapon System Code 86190A (initial Spares)	1,386	4,259	4,993	5,405	4,596	4,030	4,130	Continuing			
(U) MILCON, AF (1) The FY00 funding (\$1,756) was transferred from the NAS program element to this PE in the FY00 Defense Appropriations Act. For FY01-FY03, RDT&E, AF funds shown in this line will be consolidated in PE 305114F to provide greater management flexibility.	16,514	4,000	0	0	0	0	0	Continuing	TBD		
(U) D. Acquisition Strategy Engineering Manufacturing Development, Fixed Price Incentive Fee (FPIF), No Non-Developmental Items (NDI)											
(U) E. Schedule Profile											
				<u>FY 1999</u>			<u>FY 2000</u>		<u>FY 2001</u>		
				1	2	3	4	1	2	3	4
(U) Acquisition Milestones:											
(U) NAS Milestone II (MS II) (Jul 95)											
(U) NAS Revised Acquisition Pgm Baseline						*					
(U) NAS Amended MSII Acquisition Decision Memorandum						*					
(U) NAS Voice Switch LRIP Decision						*					
(U) NAS Radar LRIP Decision							X				
(U) NAS Automation LRIP Decision							X				
(U) NAS Radar & Automation MSIII								X			
(U) NAS IOC									X		
(U) NAS FOC (3QFY10)										X	
Project 673587											

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)											DATE February 2000					
BUDGET ACTIVITY					PE NUMBER AND TITLE						PROJECT					
07 - Operational System Development					0305114F Air Traffic Control/Approach/Landing System (ATCALs)						673587					
(U) <u>E. Schedule Profile Continued</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
(U)	Contract Milestones															
(U)	NAS Radar															
(U)	Contract Award (Aug 96)															
(U)	Complete Operational Test & Eval													X		
(U)	NAS Automation															
(U)	Contract Award (Sep 96)															
(U)	Complete Operational Test & Eval													X		
(U)	NAS Voice Switch															
(U)	Contract Award (Sep 95)															
(U)	Completed operational Test & Eval					*										
(U)	NAS Military Airspace Mgt System															
(U)	Contract Award (Nov 95)															
(U)	First Delivery/IOC					*										
(U)	MAMS Central Facility activation													X		
(U)	MACS															
(U)	Analysis of Alternatives						*									
(U)	Contract Award									X						
(U)	Developmental Operational Testing															X

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000			
BUDGET ACTIVITY				PE NUMBER AND TITLE			PROJECT			
07 - Operational System Development				0305114F Air Traffic Control/Approach/Landing System (ATCALs)			673587			
(U) A. Project Cost Breakdown (\$ in Thousands)										
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>
(U)	Primary Hardware Development					365		3,454		15,759
(U)	Primary Hardware Test and Evaluation					0		1,532		0
(U)	Test and Evaluation Support					41		80		87
(U)	Engineering/Technical Support					92		265		442
(U)	Technology Insertion Studies/integration activities					0		611		903
(U)	NAS Interoperability/Software Analyses					0		139		0
(U)	Mobile Approach Control System (MACS) AOA					1,571		0		0
(U)	Air Force Terminal Instrument Procedures Development					507		847		540
(U)	Program Management Support and Travel					42		120		110
(U)	Total					2,618		7,048		17,841
NOTE: Until FY2000, National Airspace System costs were captured in PE 305137F (National Airspace System). As of FY2000, those costs are captured in this program element.										
(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>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>						
<u>Product Development Organizations</u>										
GEC Marconi-Hazeltine	FPIF	Jun 93	19,400	19,400	10,165	365				10,530
Lear Astronics	FFP	Dec 97	2,900	2,900	2,900				0	2,900
Various	Multiple	Multiple	Continuing	Continuing	0	2,054	5,854	17,301	Continuing	TBD
<u>Support and Management Organizations</u>										
Various	Multiple	Multiple	Continuing	Continuing	4,041	199	550	540	Continuing	TBD

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000			
BUDGET ACTIVITY				PE NUMBER AND TITLE				PROJECT		
07 - Operational System Development				0305114F Air Traffic Control/Approach/Landing System (ATCALs)				673587		
(U) <u>Performing Organizations Continued:</u>										
<u>Test and Evaluation Organizations</u>										
46th Test Wing, Eglin AFB	PO	Multiple	2,135	2,235	1,835	644	0	0	2,479	
FL										
NOTE: All figures prior to FY00 for the 46th Test Wing under the 'Test and Evaluation Organizations' category was disbursed in PE 305137 (National Airspace System). Figures are shown here for reference only.										
(U) <u>Government Furnished Property:</u>										
	<u>Contract</u>									
	<u>Method/Type</u>	<u>Award or</u>								
<u>Item</u>	<u>or Funding</u>	<u>Obligation</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>Description</u>	<u>Vehicle</u>	<u>Date</u>	<u>Date</u>		<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Property</u>										
N/A										
<u>Support and Management Property</u>										
N/A										
<u>Test and Evaluation Property</u>										
N/A										
					<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					13,065	2,419	5,854	17,301	TBD	TBD
Subtotal Support and Management					4,041	199	550	540	TBD	TBD
Subtotal Test and Evaluation					1,835		644	0	0	2,479
Total Project					18,941	2,618	7,048	17,841	TBD	TBD

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305119F Medium Launch Vehicles				PROJECT 67624A	
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
67624A Medium Launch Vehicle	3,497	0	0	0	0	0	0	0	399,118
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0

(U) **A. Mission Description**
 National Security requirements dictate a continuing, highly reliable means of placing critical Department of Defense (DoD) satellites into required orbits. Assured access to space, directed by the President in the National Security Launch Strategy, will be accomplished through the use of a robust mix of Expendable Launch Vehicles (ELVs). The Medium Launch Vehicle (MLV) program provides sustainment, procurement and launch of DoD's Atlas II and Delta II ELVs at Cape Canaveral AS, FL, and at Vandenberg AFB, CA. MLV launches Defense Satellite Communication System (DSCS) and Global Positioning System (GPS) satellites. The RDT&E budget for MLV primarily consists of engineering support for system performance upgrades to both the vehicles and the launch facilities, new payload integration, sustaining engineering, and post-flight assessment to maintain the high reliability of the launch vehicles.

(U) **FY 1999 (\$ in Thousands)**
 (U) \$1,193 Delta II range required facilities upgrade
 (U) \$545 Delta II systems integration
 (U) \$1,759 Sustaining engineering and mission support for MLV launch facilities, infrastructure, and launch operations for launch complexes 3, 17, and 36
 (U) \$3,497 Total

(U) **FY 2000 (\$ in Thousands)**
 (U) \$0 No Activity
 (U) \$0 Total

(U) **FY 2001 (\$ in Thousands)**
 (U) \$0 No Activity
 (U) \$0 Total

(U) **B. Budget Activity Justification**
 This program is in Budget Activity 7, Operational Systems Development, because the Medium Launch Vehicles program is in full production and fully operational.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305119F Medium Launch Vehicles			PROJECT 67624A		
(U) C. Program Change 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>Total Cost</u>
(U)	Previous President's Budget (FY 2000 PBR)	7,338	1,179	1,963					399,118
(U)	Appropriated Value	7,375	0						
(U)	Adjustments to Appropriated Value								
	a. Congressional/General Reductions	-37							
	b. Small Business Innovative Research	-64							
	c. Omnibus or Other Above Threshold Reprogram								
	d. Below Threshold Reprogram	-3,757							
	e. Rescissions	-20							
	f. Other								
(U)	Adjustments to Budget Years Since FY 2000 PBR			-1,963					
(U)	Current Budget Submit/FY 2001 PBR	3,497	0	0					399,118
(U) Significant Program Changes:									
Funding: FY99 program changes reflect reprogramming actions of Delta funds to higher Air Force priorities due to requirement reductions for sustaining engineering.									
Recolored FY01 through FY03 funds to 3020 to eliminate existing shortfall in FFRDC support.									
(U) D. 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>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)	Other APPN								
(U)	Missile Procurement, Air Force (PE35119F, BA 5, P-1 29)	172,268	64,013	55,939	47,161	46,767	37,199	36,947	2,595,734
(U) E. Acquisition Strategy									
The MLV program is in final production and consists of two medium launch vehicles: Atlas II and the Delta II. The Air Force Atlas II launch vehicle RDT&E and production programs are complete. The procurement dollars for the Air Force Atlas II program finance the launch services for the two remaining DSCS missions on the Lockheed Martin Atlas launch base operations contract. The Delta II program primarily consists of launching Global Positioning System (GPS) satellites to replenish the current constellation. The final option on the Boeing production contract for the last 5 Delta II boosters was exercised in January 1999, so remaining Delta II procurement funds are for Delta launch operations, sustaining engineering, and program office support.									

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305119F Medium Launch Vehicles	PROJECT 67624A
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(U) **F. 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) Delta/GPS Launches					*		X	X	X	X	X	
(U) Delta/STP Launch		*										
(U) Atlas/DSCS Launches						X			X			

*=complete
X=planned (may reflect more than one launch per quarter)

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305119F Medium Launch Vehicles			PROJECT 67624A			
(U) <u>A. Project Cost Breakdown (\$ in Thousands)</u>										
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>
(U)	Delta II Range Facilities Upgrades					1,193		0		0
(U)	Delta II Systems Integration					545		0		0
(U)	Sustaining Engineering and Mission Support					1,759		0		0
(U)	Total					3,497		0		0
(U) <u>B. Budget Acquisition History and Planning Information (\$ in Thousands)</u>										
(U) <u>Performing Organizations:</u>										
<u>Contractor or</u>	<u>Contract</u>									
<u>Government</u>	<u>Method/Type</u>	<u>Award or</u>	<u>Performing</u>	<u>Project</u>						
<u>Performing</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Organizations</u>										
Lockheed Martin	SS/FFP	Jun 88	N/A	N/A	70,927				0	70,927
Boeing	SS/FFP	Sep 87	N/A	N/A	205,270				0	205,270
Boeing	C/FFP	Apr 93	N/A	N/A	25,068	1,695			0	26,763
GSAC	Various	Various	N/A	N/A	3,321				0	3,321
Austere Improvements	Various	Various	N/A	N/A	10,484					10,484
<u>Support and Management Organizations</u>										
Mission Support	SS/FPI	FY94	N/A	N/A	16,203	1,095			0	17,298
Various SMC	Various	FY94	N/A	N/A	53,218	707			0	53,925
Other Ktr Sup	SS/FFP	FY94	N/A	N/A	2,254				0	2,254
Vandenberg Sup	Various	Various	N/A	N/A	3,270				0	3,270
Environment/Safety	Various	Various	N/A	N/A	5,606				0	5,606
<u>Test and Evaluation Organizations</u>										
None										

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305119F Medium Launch Vehicles			PROJECT 67624A		
(U) <u>Government Furnished Property:</u>									
	<u>Contract</u>								
	<u>Method/Type</u>	<u>Award or</u>							
<u>Item</u>	<u>or Funding</u>	<u>Obligation</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>Description</u>	<u>Vehicle</u>	<u>Date</u>	<u>Date</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Property</u>									
None									
<u>Support and Management Property</u>									
None									
<u>Test and Evaluation Property</u>									
None									
				<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				315,070	1,695			0	316,765
Subtotal Support and Management				80,551	1,802			0	82,353
Subtotal Test and Evaluation									
Total Project				395,621	3,497			0	399,118

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305128F Security And Investigative Activities				PROJECT 671931		
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
671931	TECH SURVEIL COUNTER MEAS EQPT	1,348	1,449	467	469	473	482	492	Continuing	TBD
Quantity of RDT&E Articles		0	0	0	0	0	0	0	0	0

(U) A. Mission Description

AFOSI conducts specialized investigative activities and force protection support for Air Force (AF) commanders worldwide. This assists AF commanders in protecting their people and resources. AFOSI's mission includes investigating criminal matters affecting AF personnel, contract fraud and economic crimes involving AF weapons systems and spare parts, the investigation of environmental crime, counterdrugs, computer intrusion detection and forensic media analysis of computer crimes. This element supports Technical Surveillance Countermeasures (TSCM), Computer Crime Investigations (CCI), and technical support to criminal and counterintelligence investigations and operations conducted by AFOSI. AFOSI's TSCM mission provides security assessments to both AF and DoD facilities and programs. The purpose of CCI research is to improve AF and DoD Information Operations capability by enhancing AFOSI's ability to deter or prevent spies, hackers, or saboteurs from manipulating, damaging, or stealing sensitive war fighting data or systems. Failing that, to investigate, identify, and prosecute those who do. While most research to meet operational requirements is Operational System Development, there is also research in the category of Engineering and Manufacturing Development due to a need for modifications to present technology.

The equipment required to provide technical support to investigations is unique and complex. This equipment must be continually updated to provide state-of-the-art capabilities to detect and neutralize criminal activities targeted against the AF and DoD. In an era of advancing technology, reduced manning, and increasingly high level fraud, environmental crime and computer crime investigations, technical investigative equipment must be continuously updated to enable AFOSI special agents to have the most cost effective and best possible means of thwarting criminal acts. The evolution of a new wave of computer crimes has made AFOSI responsible for the collection, investigative analysis, national level law enforcement coordination, and dissemination of hacker activity and intrusion incidents for the Air Force. AFOSI's computer crime equipment must stay on the leading edge of technology to collect criminal information as well as pursue and apprehend criminals through a global medium. AFOSI must continually update its existing high tech computer surveillance equipment to support ongoing and future investigative operations to identify hackers and hacker groups, as well as potential hostile government activities targeting Air Force communication and control systems.

Critical Infrastructure Protection identifies weaknesses in the Air Force Critical infrastructure, highlights critical countermeasures and acquires and deploys cost-effective solutions. The intent is: to provide an Air Force-wide review of current infrastructure vulnerabilities; prioritize AF protection planning and integrate with existing programs; identify gaps based on AF needs; direct studies to refine AF requirements.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development		PE NUMBER AND TITLE 0305128F Security And Investigative Activities		PROJECT 671931	
(U)	<u>A. Mission Description Continued</u>				
(U)	<u>FY 1999 (\$ in Thousands)</u>				
(U)	\$953	Computer Crimes Investigative (CCI) equipment. RDT&E of CCI software			
(U)	\$200	Remote crime scene viewing. Worked to develop remote crime scene viewing capability			
(U)	\$50	Next generation Technical Surveillance Countermeasures (TSCM) receiver. Demonstration and validation of TSCM receiver software			
(U)	\$75	Language translation software. Strived to develop document translation software			
(U)	\$70	Information Technology (IT). Tested and evaluated IT products			
(U)	\$1,348	Total			
(U)	<u>FY 2000 (\$ in Thousands)</u>				
(U)	\$75	Telephone/Computer LAN analyzer. Development of system software and hardware enhancements			
(U)	\$75	Language translation software. Continuing development of document translation software			
(U)	\$50	Next generation Technical Surveillance Countermeasures (TSCM) receiver. Continuing development of TSCM receiver software			
(U)	\$1,249	Computer Crimes Investigative (CCI) equipment. RTD&E of CCI software			
(U)	\$1,449	Total			
(U)	<u>FY 2001 (\$ in Thousands)</u>				
(U)	\$50	Telephone/Computer LAN analyzer. Development of system software and hardware enhancements			
(U)	\$50	Next generation Technical Surveillance Countermeasures (TSCM) receiver. Continuing development of TSCM receiver software			
(U)	\$75	Language translation software. Continuing development of document translation software			
(U)	\$292	Computer Crimes Investigative (CCI) Equipment. RTD&E of CCI software.			
(U)	\$467	Total			
(U)	<u>B. Budget Activity Justification</u>				
	This program is in Budget Activity 7, Operational System Development, because its products are primarily for use in investigative activity of an operational nature.				
(U)	<u>C. Program Change Summary (\$ in Thousands)</u>				
		<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U)	Previous President's Budget (FY 2000 PBR)	458	466	467	TBD
(U)	Appropriated Value	1,458	1,466		
(U)	Adjustments to Appropriated Value				
	a. Congressional/General Reductions	-55	-9		
Project 671931		Page 2 of 6 Pages		Exhibit R-2 (PE 0305128F)	

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305128F Security And Investigative Activities			PROJECT 671931		
(U) C. Program Change Summary (\$ in Thousands) Continued									
		<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>		<u>Total Cost</u>	
	b. Small Business Innovative Research	-47							
	c. Omnibus or Other Above Threshold Reprogram			-8					
	d. Below Threshold Reprogram								
	e. Rescissions	-8							
	f. Other							TBD	
(U)	Adjustments to Budget Years Since FY 2000 PBR								
(U)	Current Budget Submit/FY 2001 PBR	1,348		1,449		467		TBD	
(U) Significant Program Changes:									
\$1.0M Congressional add in FY 99 and FY 00									
(U) D. 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>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)	AF RDT&E								
(U)	Other APPN								
(U)	Automatic Data Processing Equipment	82	0	0	191	191	195	199	
(U)	Radio Equipment	0	422	422	422	422	422	422	
(U)	Base Communication Infrastructure	1,000	0	0	0	0			1,000
(U)	Base Procured Equipment	0	0	0	0	0			0
(U)	Technical Surveillance Countermeasures Equipment	2,030	2,976	3,049	2,876	2,877			
(U)	BA63/Security & Investigative Activities/PE0305128F								
(U) E. Acquisition Strategy									
All major contracts within this Program Element were awarded via sole source contract due to the sensitivity of technologies involved.									
Project 671931		Page 3 of 6 Pages				Exhibit R-2 (PE 0305128F)			

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305128F Security And Investigative Activities	PROJECT 671931
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(U) **F. 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) TSCM Receiver/Software Suite		X				X				X		
(U) Telephone/Computer LAN Analyzer							X				X	
(U) CCI Equipment			X				X				X	
(U) Information Technology			X									
(U) Language Translation Software		X				X				X		
(U) Advanced Crime Scene Viewing						X						

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)						DATE February 2000					
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305128F Security And Investigative Activities				PROJECT 671931			
(U) <u>A. Project Cost Breakdown (\$ in Thousands)</u>											
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>	
(U)	Primary Hardware Development					278		75		50	
(U)	Software Development					1,070		1,374		417	
(U)	Total					1,348		1,449		467	
(U) <u>B. Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
(U) <u>Performing Organizations:</u>											
	<u>Contractor or</u>	<u>Contract</u>									
	<u>Government</u>	<u>Method/Type</u>	<u>Award or</u>	<u>Performing</u>	<u>Project</u>						
	<u>Performing</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	
	<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	
										<u>Total</u>	
	AF Infrastructure Protection					1,884	0	0	0	0	1,884
	Studies										
	<u>Product Development Organizations</u>										
	Matrix Engineering	SS/FFP	Feb 98	N/A	N/A	264	50	50	50		414
	Sensys Technologies	SS/FFP	Mar 98	N/A	N/A	715	0	0	0		715
	Army Research Lab	SS/FFP	Mar 99	N/A	N/A	75	275	75	75		500
	Sandia Natl Lab	SS/FFP	Feb 99	N/A	N/A	0	945	1,249	0		2,194
	Scyld Computing Service	SS/FFP	Mar 99	N/A	N/A	341	0	0	0		341
	Carrera	SS/FFP	Mar 99	N/A	N/A	260	0	0	0		260
	Sydex	SS/FFP	Apr 99	N/A	N/A	50	0	0	0		50
	NSA	SS/FFP	Sep 98	N/A	N/A	134	0	0	0		134
	US DOT	SS/FFP	Mar 99	N/A	N/A	155	0	0	0		155
	TBD	SS/FFP	Mar 99	N/A	N/A	0	0	75	342		417
	<u>Support and Management Organizations</u>										
	None										
	<u>Test and Evaluation Organizations</u>										
	None										

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305128F Security And Investigative Activities			PROJECT 671931		
(U) Government Furnished Property:									
	<u>Contract</u>								
	<u>Method/Type</u>	<u>Award or</u>							
<u>Item</u>	<u>or Funding</u>	<u>Obligation</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>Description</u>	<u>Vehicle</u>	<u>Date</u>	<u>Date</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Property</u>									
None									
<u>Support and Management Property</u>									
None									
<u>Test and Evaluation Property</u>									
Solutions Engineering	C/FFP	Jun 99		0	78	0	0		78
Fedsim	SS/FFP	Aug 99		69	0	0			69
Lucent Tech	SS/FFP	Mar 99		91	0	0			91
				<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
				<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Subtotals</u>									
AF Infrastructure Protection Studies				1,884	0	0	0	0	1,884
Subtotal Product Development				1,994	1,270	1,449	467		5,180
Subtotal Support and Management									
Subtotal Test and Evaluation				160	78	0	0		238
Total Project				4,038	1,348	1,449	467	0	7,302

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305137F National Airspace System				PROJECT 674090	
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
674090 National Airspace System (NAS)	1,777	0	200	201	204	0	0	0	107,871
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0
<p>(U) <u>A. Mission Description</u> The DOD National Airspace System program will modernize the DoD Air Traffic Control (ATC) system in parallel with the Federal Aviation Administration (FAA) modernization. DoD will acquire, to the maximum extent practical, systems on contract with the FAA to reduce development costs and prevent duplication. The DoD NAS program provides systems and facilities compatible/interoperable with the FAA modernization, prevents DoD flight delays and cancellations, continues DoD's access into Special Use Airspace (SUA), provides transparent services to military and civil aircraft, replaces aging DoD ATC systems, and increases flight safety. The Military Airspace Management System (MAMS) will more effectively schedule and manage SUA. DoD military ATC and fighting/flying readiness will be maintained.</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u> (U) \$800 Continued Military Airspace Management System (MAMS) development (U) \$321 Completed NAS DoD subsystem analysis for each DoD site (U) \$656 Continued radar and automation acquisition and test (U) \$1,777 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u> (U) \$0 Activities consolidated in PE 35114F (ATCAL5) (U) \$0 Total</p> <p>(U) <u>FY 2001 (\$ in Thousands)</u> (U) \$110 Identify interface/interoperability improvements for NAS projects (U) \$55 Perform risk reduction studies and software analyses (U) \$35 Provide on-site engineering analyses (U) \$200 Total</p> <p>(U) <u>B. Budget Activity Justification</u> This program is in budget activity 7, Operational System Development, because the DoD Air Traffic Control system is operational. NAS is not a new start program and no activities within the NAS projects will require congressional approval for a new start program.</p>									
Project 674090			Page 1 of 5 Pages				Exhibit R-2 (PE 0305137F)		

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305137F National Airspace System			PROJECT 674090			
(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)		1,780	1,756	201			109,635		
(U)	Appropriated Value		1,881	0						
(U)	Adjustments to Appropriated Value									
	a. Congressional/General Reductions		-101							
	b. Small Business Innovative Research		-58							
	c. Omnibus or Other Above Threshold Reprogram									
	d. Below Threshold Reprogram		65							
	e. Rescissions		-10							
	f. Other									
(U)	Adjustments to Budget Years Since FY 2000 PBR				-1					
(U)	Current Budget Submit/FY 2001 PBR		1,777	0	200			107,871		
(U)	<u>Significant Program Changes:</u>									
	None									
(U) D. Other Program Funding Summary (\$ in Thousands)										
		<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Cost to</u>	<u>Total Cost</u>
		<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	
(U)	AF RDT&E									
(U)	Other APPN									
(U)	Other Procurement, BA 3 Weapon system code 833020, PE0305137F	13,735	44,997	58,663	62,663	53,549	47,553	47,583	Continuing	TBD
(U)	Other Procurement, BA 5 Weapon system code 86190A, PE0305137F, (Initial Spares)	1,386	4,237	4,942	5,338	4,542	3,965	4,056	Continuing	TBD
(U) E. Acquisition Strategy										
	All major contracts were awarded after full and open competition.									

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)											DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development					PE NUMBER AND TITLE 0305137F National Airspace System						PROJECT 674090			
(U) F. 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)	Acquisition Milestones													
(U)	Milestone II (MS II) (Jul 95)													
(U)	Revised Acquisition Program Baseline													
(U)	Amended MS II Acquisition Decision Memorandum													
(U)	Voice Switch LRIP Decision													
(U)	Voice Switch FRP Decision													
(U)	Radar LRIP Decision													
(U)	Automation LRIP Decision													
(U)	Radar & Automation Milestone III													
(U)	Contract Milestones													
(U)	Radar													
(U)	Contract Award (Aug 96)													
(U)	Complete radar OT&E													
(U)	Automation													
(U)	Contract Award (Sep 96)													
(U)	Complete automation OT&E													
(U)	Voice Switch													
(U)	Contract Award (Jul 95)													
(U)	Complete voice switch OT&E													
(U)	NAS IOC													
(U)	NAS FOC Apr 2010													
(U)	MAMS													
(U)	Contract Award (Nov 95)													
(U)	MAMS First Delivery/IOC													
(U)	MAMS Control Facility Activation													
	* Denotes completed event													
	X Denotes planned event													

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)						DATE February 2000					
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305137F National Airspace System			PROJECT 674090				
(U) A. Project Cost Breakdown (\$ in Thousands)											
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>	
(U)	Software Development					800				0	
(U)	Site Surveys					100				0	
(U)	Facility/Transition Planning					0				0	
(U)	Integration/Interface Planning					274				0	
(U)	System Engineering					55				35	
(U)	Interoperability/software analyses					0				135	
(U)	Primary Hardware Test and Evaluation					508				0	
(U)	Program Management Support and Travel					40				30	
(U)	Total					1,777				200	
Note: FY00 funds have been transferred to PE 35114F (ATCALs) IAW HAC guidance on elimination of small dollar amount line items. FY01 requires same action.											
(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>Performing Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>							
<u>Product Development Organizations</u>											
Computer Based Systems	CPAF	Jun 94	3,500	3,500	3,500					3,500	
Hughes Aircraft/Raytheon	CPFF	Nov 95	13,534	13,534	12,705	829				13,534	
Raytheon (Radar)	IDIQ - FFP	Aug 96	18,275	18,275	17,875	429				18,304	
Raytheon (Automation)	IDIQ-FFP	Sep 96	5,862	3,005	3,005					3,005	
Litton-Denro	IDIQ-FFP	Jul 95	2,570	2,570	2,570					2,570	
Miscellaneous	FFP	Various	3,706	3,706	2,679					2,679	
<u>Support and Management Organizations</u>											
MITRE	CPAF	Oct 94	21,910	21,805	21,805					21,805	
Martin Marietta	FFP	Sep 94	8,700	8,700	8,700					8,700	
Miscellaneous	Multiple	Multiple	32,624	30,815	30,815	40		200	405	31,460	
Project 674090						Page 4 of 5 Pages			Exhibit R-3 (PE 0305137F)		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305137F National Airspace System			PROJECT 674090		
(U) Performing Organizations Continued:									
<u>Test and Evaluation Organizations</u>									
46th Test Wing, Eglin AFB, FL	PO	Multiple	2,135	2,235	1,835	479			2,314
(U) Government Furnished Property:									
	<u>Contract</u>	<u>Award or</u>							
	<u>Method/Type</u>	<u>Obligation</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>or Funding</u>	<u>Date</u>	<u>Date</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>Product Development Property</u>									
None									
<u>Support and Management Property</u>									
None									
<u>Test and Evaluation Property</u>									
None									
				<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				42,334	1,258				43,592
Subtotal Support and Management				61,320	40		200	405	61,965
Subtotal Test and Evaluation				1,835	479				2,314
Total Project				105,489	1,777		200	405	107,871

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 2000	
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305138F Inert Upper Stage (IUS)				PROJECT 674053	
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
674053 Upper Stage Development (IUS)	552	0	0	0	0	0	0	0	17,422
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0
<p>(U) <u>A. Mission Description</u> The Upper Stages Program provides consolidated acquisition of the Inertial Upper Stage (IUS) to support the launch of Defense Support Program (DSP) satellites. IUS is an upper stage on the Titan IV (or Shuttle) which delivers the DSP satellite to the required orbit. The RDT&E program continuously evaluates and improves upper stage reliability, cost effectiveness, and responsiveness. It supports redesign of aging equipment and spares which are no longer manufactured or available, investigates flight anomalies, and performs small studies to assist in defining future upper stages. Funding is combined with the Titan Space Launch Vehicles Program (35144F) beginning in FY00.</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u> (U) \$552 Funds being reprogrammed for higher priority Air Force items (U) \$552 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u> (U) \$0 No Activity (U) \$0 Total</p> <p>(U) <u>FY 2001 (\$ in Thousands)</u> (U) \$0 No Activity (U) \$0 Total</p> <p>(U) <u>B. Budget Activity Justification</u> This program is categorized in Budget Activity 7, Operational Systems Development, because the Inertial Upper Stage Program is fully operational.</p>									
Project 674053			Page 1 of 5 Pages				Exhibit R-2 (PE 0305138F)		

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305138F Inert Upper Stage (IUS)			PROJECT 674053		
(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)		558	0	0				
(U)	Appropriated Value		558	0					
(U)	Adjustments to Appropriated Value								
	a. Congressional/General Reductions		-3						
	b. Small Business Innovative Research								
	c. Omnibus or Other Above Threshold Reprogram								
	d. Below Threshold Reprogram								
	e. Rescissions		-3						
	f. Other								
(U)	Adjustments to Budget Years Since FY 2000 PBR								
(U)	Current Budget Submit/FY 2001 PBR		552	0	0			17,422	
(U)	<u>Significant Program Changes:</u> Beginning in FY00, funding is transferred to the Titan Space Launch Vehicles Program (35144F).								
(U) D. 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>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)	AF RDT&E								
(U)	Other APPN								
(U)	Missile Procurement, Budget Activity 5, P-25, PE 0305138	42,962	0	0	0	0	0	0	1,242,104
(U)	Related RDT&E: PE 0305144F, Titan Space Launch Vehicles, IUS portion, beginning FY00		100	63					
(U) E. Acquisition Strategy Components are currently in storage awaiting integration for launch.									

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305138F Inert Upper Stage (IUS)	PROJECT 674053
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(U) **F. 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) DoD Launches (DSP with IUS) (Last IUS mission in FY02)		*			X				X			
* Completed event												
X Planned event												

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development					PE NUMBER AND TITLE 0305138F Inert Upper Stage (IUS)			PROJECT 674053			
(U) <u>A. Project Cost Breakdown (\$ in Thousands)</u>											
						<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U)	Funds being reprogrammed for higher priority Air Force items					552	0	0			
(U)	Total					552	0	0			
(U) <u>B. Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
(U) <u>Performing Organizations:</u>											
	<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>Performing Activity</u>	<u>or Funding Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>						
<u>Product Development Organizations</u>											
	Boeing	SS/FPI/AF	Jul 85	906,671	942,335	6,148	0	0	0	0	6,148
	Boeing	SS/FPI/AF	Mar 91	151,189	158,055	1,991	0	0	0	0	1,991
	Boeing	SS/CPAF/LOE	Sep 90	0	4,064	4,064	0	0	0	0	4,064
	Boeing	SS/CPAF	Jun 97	0	10	10	552	0	0	0	562
	United Tech Corp/Pratt & Whitney	SS/CPFF	Mar 95	N/A	855	855	0	0	0	0	855
Note: EAC amounts include funds used for IUS under previous Program Elements											
FY99 funds budgeted to Boeing were reprogrammed for higher priority Air Force items											
<u>Support and Management Organizations</u>											
	Space and Missile Systems Center, LAAFB	N/A	N/A	N/A	3,802	3,802	0	0	0	0	3,802
<u>Test and Evaluation Organizations</u>											
None											
(U) <u>Government Furnished Property:</u>											
	<u>Item Description</u>	<u>Contract Method/Type</u>	<u>Award or Obligation</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>or Funding Vehicle</u>	<u>Date</u>	<u>Date</u>							

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305138F Inert Upper Stage (IUS)			PROJECT 674053		
(U) Government Furnished Property Continued:									
	<u>Contract</u>								
	<u>Method/Type</u>	<u>Award or</u>							
<u>Item</u>	<u>or Funding</u>	<u>Obligation</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>Description</u>	<u>Vehicle</u>	<u>Date</u>	<u>Date</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Property</u>									
None									
<u>Support and Management Property</u>									
None									
<u>Test and Evaluation Property</u>									
None									
				<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				13,068	552	0	0	0	13,620
Subtotal Support and Management				3,802	0	0	0	0	3,802
Subtotal Test and Evaluation									
Total Project				16,870	552	0	0	0	17,422

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305144F Titan Space Launch Vehicles				PROJECT 674135		
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
674135	Titan II/IV	69,823	44,777	25,815	27,065	0	0	0	0	3,075,067
Quantity of RDT&E Articles		0	0	0	0	0	0	0	0	0
<p>(U) <u>A. Mission Description</u></p> <p>National security requirements dictate a continuing, highly reliable means of placing critical DoD satellites into required orbits. The Titan IV program provides the capability to launch the largest of these satellites into near-earth or geosynchronous orbits from either the east or west coast launch facilities. Titan IV is used to launch Air Force, National Reconnaissance Office, and NASA payloads. This program provides several different configurations of the Titan IV [No Upper Stage (NUS), Inertial Upper Stage (IUS), and Centaur]. In addition, the Titan IV program has developed a new vehicle configuration, the Titan IVB, with solid rocket motor upgrade (SRMU), new avionics and ground support equipment to meet reliability and increased performance requirements. This program provides continuing integration support to the payload community as well as continuing engineering support to maintain system characterization and reliability.</p> <p>Since FY94, this program element also included funding for sustaining engineering, payload integration, and government costs for the Titan II space launch vehicle. In FY96, program office support was moved to procurement funding. Major RDT&E activities are static test firing of the requalified Titan IV SRMU in 3QFY00, and non-recurring integration for Milstar satellites. Remaining activities are maintaining sustaining engineering and anomaly resolution capability through the end of the program.</p> <p>Beginning in FY00, the Inertial Upper Stages Program (PE 35138F) is combined into the Titan program and provides consolidated acquisition of the IUS to support the launch of Defense Support Program (DSP) satellites. IUS is an upper stage on the Titan IV (can be modified for Shuttle) and delivers the DSP satellite to the required orbit. The RDT&E program continuously evaluates and improves upper stage reliability, cost effectiveness, and responsiveness; supports redesign of aging equipment and spares which are no longer manufactured or available; investigates flight anomalies; and conducts small studies to assist in defining future upper stages.</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u></p> <p>(U) \$43,006 Continued Solid Rocket Motor Upgrade (SRMU) requalification</p> <p>(U) \$19,727 Continued integration for Milstar</p> <p>(U) \$2,580 Titan Hardware Redesign and Obsolescence</p> <p>(U) \$4,510 Air Force Research Lab (Phillips) support to SRMU Requalification Project</p> <p>(U) \$69,823 Total</p>										
Project 674135			Page 1 of 5 Pages				Exhibit R-2 (PE 0305144F)			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development		PE NUMBER AND TITLE 0305144F Titan Space Launch Vehicles		PROJECT 674135
(U)	<u>A. Mission Description Continued</u>			
(U)	<u>FY 2000 (\$ in Thousands)</u>			
(U)	\$16,293	Completed Solid Rocket Motor Upgrade (SRMU) requalification		
(U)	\$24,570	Continue integration for Milstar		
(U)	\$1,698	Titan Hardware Redesign and Obsolescence		
(U)	\$2,116	Air Force Research Lab (Phillips) support to SRMU Requalification Project		
(U)	\$100	Inertial Upper Stage Study and design corrective actions for potential anomalies and obsolete items		
(U)	\$44,777	Total		
(U)	<u>FY 2001 (\$ in Thousands)</u>			
(U)	\$25,752	Continue integration for Milstar		
(U)	\$63	Inertial Upper Stage Study and design corrective actions for potential anomalies and obsolete items		
(U)	\$25,815	Total		
(U)	<u>B. Budget Activity Justification</u>			
	This PE is in Budget Activity 7, Operational Systems Development, because Titan II, Titan IV and the Inertial Upper Stage are in production and are operational vehicles. Major Titan IV efforts remaining are SRMU requalification and MILSTAR integration.			
(U)	<u>C. Program Change Summary (\$ in Thousands)</u>			
		<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U)	Previous President's Budget (FY 2000 PBR)	77,176	45,379	26,062
(U)	Appropriated Value	77,443	45,379	
(U)	Adjustments to Appropriated Value			
	a. Congressional/General Reductions	-267	-3	
	b. Small Business Innovative Research	-2,465		
	c. Omnibus or Other Above Threshold Reprogram		-246	
	d. Below Threshold Reprogram	-4,497		
	e. Rescissions	-391	-353	
	f. Other			
(U)	Adjustments to Budget Years Since FY 2000 PBR			-247
(U)	Current Budget Submit/FY 2001 PBR	69,823	44,777	25,815
				3,083,511
				3,075,067

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305144F Titan Space Launch Vehicles	PROJECT 674135
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(U) **C. Program Change Summary (\$ in Thousands) Continued**

(U) **Significant Program Changes:**
 FY99 funding was reprogrammed to higher Air Force priorities. DSP-22 delayed from Jul 02 to Oct 02.

(U) **D. 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) Other APPN	0	0	0	0	0	0	0	0	
(U) Missile Procurement, Budget Activity 5, Other Support (P-1 27)	535,612	429,260	469,720	370,450	51,433	28,126	35,864	0	6,853,275

(U) **E. Acquisition Strategy**

The program has implemented a revised acquisition strategy for the 39-vehicle program. During FY1996, Titan IV transitioned from the old '85-C-0019' development/production and payload integration contract to new contracts designed to improve cost accountability, correct contract discrepancies, and establish an overall programmatic view for the effort to complete the program. The new contracts combine Titan II and Titan IV production, storage, pad maintenance and deactivation, launch operations, anomaly resolution, development and hardware requalification, payload integration, and program studies to provide the greatest potential for cost savings by maximizing use of resources and eliminating duplicative processes.

(U) **F. 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) Assess Titan IVA-20 mishap	*											
(U) Complete Titan IVA-20 Return to Flight Activities			*									
(U) Begin assessment of Titan IV B-27 and B-32 mishaps			*									
(U) Complete Titan IV B-27 and B-32 Return to Flight Activities					*							
(U) Test firing of SRMU for requalification							X					
(U) Milstar launches (Milstar 6 in May 02)			*					X				X
(U) Last Titan Launch (DSP-22 in Oct 02)												
*completed event	X											
X 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			
07 - Operational System Development				0305144F Titan Space Launch Vehicles			674135			
(U) A. Project Cost Breakdown (\$ in Thousands)										
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>
(U)	Titan IV Contract Costs R&D (96-C-0035)					43,006		16,293		0
(U)	Contract Costs Unified Payload Integration (98-C-0005)					19,727		24,570		25,752
(U)	Titan Hardware Redesign & Obsolescence					2,580		1,698		0
(U)	Inertial Upper Stage Study & Design Changes					0		100		63
(U)	Facility Support					4,510		2,116		0
(U)	Total					69,823		44,777		25,815
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)										
(U) Performing Organizations:										
<u>Contractor or</u>	<u>Contract</u>									
<u>Government</u>	<u>Method/Type</u>	<u>Award or</u>	<u>Performing</u>	<u>Project</u>						
<u>Performing</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Organizations</u>										
LMC 85-C-0019	SS/FPIF	1QFY85	11,203,100	11,203,100	2,042,016				0	2,042,016
LMC 85-C-0085*	SS/FPIF	1QFY85	678,715	678,715	72,504				0	72,504
LMC 92-C-0028*	SS/CPAF	3QFY92	515,251	515,251	93,428				0	93,428
LMC 96-C-0035	SS/CPAF	3QFY96	259,690	257,613	195,070	45,586	17,991		0	258,647
LMC 98-C-0005	SS/CPAF	1QFY98	294,617	293,027	18,756	19,727	24,570	25,752	26,965	115,770
Boeing	SS/CPAF	2QFY97	N/A	N/A	0	0	100	63	100	263
Facilities	n/a	n/a			0	4,510	2,116	0	0	6,626
Note: EAC are total contract values while funding values are AF funds only										
* Contract closed										
<u>Support and Management Organizations</u>										
Tecolote, SRS, TRW, Antioch			N/A	N/A	101,557				0	101,557
Other Research & Dev.	Development		N/A	N/A	33,068				0	33,068
Aerospace			N/A	N/A	188,367				0	188,367
Other Prgm Supprt			N/A	N/A	162,821				0	162,821
Project 674135										
Page 4 of 5 Pages										
Exhibit R-3 (PE 0305144F)										

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000	
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305144F Titan Space Launch Vehicles			PROJECT 674135	
(U) <u>Performing Organizations Continued:</u>								
<u>Test and Evaluation Organizations</u>								
None								
(U) <u>Government Furnished Property:</u>								
	<u>Contract</u>							
	<u>Method/Type</u>	<u>Award or</u>						
<u>Item</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Delivery</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>
<u>Description</u>	<u>Vehicle</u>	<u>Date</u>	<u>Date</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>
<u>Product Development Property</u>								
None								
<u>Support and Management Property</u>								
None								
<u>Test and Evaluation Property</u>								
None								
				<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>
<u>Subtotals</u>				<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>
Subtotal Product Development				2,421,774	69,823	44,777	25,815	27,065
Subtotal Support and Management				485,813				0
Subtotal Test and Evaluation								
Total Project				2,907,587	69,823	44,777	25,815	27,065
								3,075,067

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 2000	
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305158F Tactical Terminals				PROJECT 674395	
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
674395 Radio	161	0	238	242	248	253	257	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0
<p>(U) <u>A. Mission Description</u> Tactical Terminals process near-real-time threat information utilized by combat units/aircrews for mission planning and execution. This program was established as part of the Air Force Tactical Exploitation of National Capabilities (TENCAP) normalization effort. Recently, the Constant Source Operator Terminal (CSOT) functionality was transformed into the Combat Intelligence System (CIS). Tactical Terminals (TT) enable the war fighter to access critical data provided by national and tactical intelligence sources. The Tactical Terminals program involves three radio programs: 1). Tactical Receive Equipment (TRE), 2). Multi-mission Advanced Tactical Terminal (MATT), and 3). Joint Tactical Terminals (JTT). Currently over 150 TRE and MATT ground systems are deployed. Air Force is jointly developing and procuring MATT as an airborne qualified radio. The Air Force has deployed 80 MATT terminals. There are ongoing efforts to integrate the Common Integrated Broadcast Service Modules (CIBS-M) into the MATT, transforming the MATT into the JTT family of terminals. The MATT and JTT have been designated Integrated Broadcast Service (IBS) terminals.</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u> (U) \$89 Continue to plan and support integration on DoD aircraft and weapon systems (U) \$72 Continue to support migration of MATT into next generation tactical terminal (JTT) (U) \$161 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u> (U) \$0 No Activity (U) \$0 Total</p> <p>(U) <u>FY 2001 (\$ in Thousands)</u> (U) \$145 In-house contractor technical support. (U) \$53 Required printing and reproduction of the JTT/MATT technical orders. (U) \$40 Travel required to support Tactical Terminal program reviews and integration of the MATT into the JTT family. (U) \$238 Total</p>									
Project 674395			Page 1 of 4 Pages				Exhibit R-2 (PE 0305158F)		

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305158F Tactical Terminals			PROJECT 674395			
(U) <u>B. Budget Activity Justification</u>										
This Program Element is assigned in Budget Activity 7, Operational System Development because it involves post-Milestone III efforts and supports development of operational systems. The Program Element also supports the Joint Tactical Terminals/ Common Integrated Broadcast Service Modules (JTT/CIBS-M) efforts for the Air Force.										
(U) <u>C. Program Change Summary (\$ in Thousands)</u>										
			<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>		<u>Total Cost</u>			
(U)	Previous President's Budget (FY 2000 PBR)		234	0	238		TBD			
(U)	Appropriated Value		237	239						
(U)	Adjustments to Appropriated Value									
	a. Congressional/General Reductions		-3	-239						
	b. Small Business Innovative Research		-5							
	c. Omnibus or Other Above Threshold Reprogram									
	d. Below Threshold Reprogram		-67							
	e. Rescissions		-1							
	f. Other		0	0			TBD			
(U)	Adjustments to Budget Years Since FY 2000 PBR									
(U)	Current Budget Submit/FY 2001 PBR		161	0	238		TBD			
(U) <u>Significant Program Changes:</u>										
(U) <u>D. Other Program Funding Summary (\$ in Thousands)</u>										
		<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Cost to</u>	<u>Total Cost</u>
		<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	
(U)	AF RDT&E									
(U)	Other APPN									
(U)	Other Procurement AF, Budget Activity 3, Weapon System Code 832070 PE 305158	6,966	24,218	3,574	4,357	4,361	4,453	4,511	Continuing	TBD

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305158F Tactical Terminals	PROJECT 674395
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(U) **E. Acquisition Strategy**
 - Technology transfer from the Naval Research Laboratory to the contractor. Evolutionary acquisition strategy for the MATT was implemented with a core capability procured during the first production option. Firm Fixed Price.
 - The JTT/CIBS-M Program is managed by the Army's Communications-Electronics Command (CECOM). Air Force JTT and CIBS-M procurement requirements will be forwarded to PM-JTT (Army) by Aerospace Command and Control Intelligence Surveillance and Reconnaissance Center (AC2ISRC)

(U) **F. 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) JTT Delivery							X				X	
(U) MATT Software Release (JTT CIBS-M)							X					
(U) MATT software Version Upgrade (SPAWAR)			*						X			

* denotes completed events
 X denotes planned events

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development					PE NUMBER AND TITLE 0305158F Tactical Terminals			PROJECT 674395		
(U) A. Project Cost Breakdown (\$ in Thousands)										
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>
(U)	Software Development					42		0		
(U)	Program Management Administration (PMA)					34		0		93
(U)	In-house Contractor Technical Support					85		0		145
(U)	Total					161		0		238
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)										
(U) Performing Organizations:										
<u>Contractor or</u>	<u>Contract</u>									
<u>Government</u>	<u>Method/Type</u>	<u>Award or</u>	<u>Performing</u>	<u>Project</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>Performing</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</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>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>						
<u>Product Development Organizations</u>										
Allied Signal, Inc.	FFP	June-98	96	96	54	41	0	0	0	95
MDA911-93-C0008										
<u>Support and Management Organizations</u>										
Mission Support		Ongoing			186	120	0	238	Continuing	TBD
<u>Test and Evaluation Organizations</u>										
					<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>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					54	41	0	0	0	95
Subtotal Support and Management					186	120	0	238	TBD	TBD
Subtotal Test and Evaluation										
Total Project					240	161	0	238	TBD	TBD

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305160F Defense Meteorological Satellite Program				PROJECT 674758		
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
674758	DMSP Program	19,983	21,207	25,372	14,934	11,882	11,131	11,396	22,057	955,279
	Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0
<p>(U) <u>A. Mission Description</u> The Defense Meteorological Satellite Program (DMSP) is a fully operational joint-service program supporting all military services. Operational commanders require timely, quality weather information to effectively employ weapon systems and protect DoD resources. DMSP is the DoD's most important and often the only source of global weather data. It provides visible and infrared cloud cover imagery (1/3 nm constant resolution) and other meteorological, oceanographic, and solar-geophysical information. This data is required over the entire earth to support global and theater military operations. At least two satellites are required in sun-synchronous, 450nm polar-orbit at all times (sun-synchronous means the satellites cross the equator at the same local sun time on each of their 14 orbits/day). Presidential Decision Directive PDD/NSTC-2 directed convergence of DMSP with the National Oceanic and Atmospheric Administration's (NOAA) polar-orbiting weather satellite system. A key step towards full program convergence was achieved in FY98 when DMSP satellite operations consolidated with NOAA satellite operations at NOAA's Suitland, MD, Satellite Operations Control Center (SOCC). DMSP F-15 was launched on a Titan-II booster in Dec 99. DMSP F-16 will be the last DMSP to launch on a Titan-II booster and is currently scheduled to launch in the Fall of 2000. The remaining DMSPs, F-17 through F-20, are all manifested to launch on the new Evolved Expendable Launch Vehicle (EELV) booster.</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u></p> <p>(U) \$12,593 Continued system integration and test, miscellaneous calibration and validation, and related support activities</p> <p>(U) \$1,195 Continued Titan II integration effort (transition from Atlas E due to inventory depletion)</p> <p>(U) \$1,910 Began EELV interface design (transition to EELV)</p> <p>(U) \$505 Began Small Tactical Terminal (field portable weather terminal) Special Sensor Microwave Imager/ Sounder (SSMIS) software upgrades</p> <p>(U) \$565 Completed Mark IVB tactical weather terminal software upgrade for the next block of satellites (5D-3)</p> <p>(U) \$3,215 Began integration studies & test analysis to retrofit DMSP satellites with Solid State Recorders (SSRs)</p> <p>(U) \$19,983 Total</p>										
Project 674758			Page 1 of 7 Pages				Exhibit R-2 (PE 0305160F)			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 2000		
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT		
07 - Operational System Development	0305160F Defense Meteorological Satellite Program	674758		
(U) <u>A. Mission Description Continued</u>				
(U) <u>FY 2000 (\$ in Thousands)</u>				
(U) \$13,311	Continue system integration and test, and related support activities			
(U) \$1,288	Continue Titan II integration effort (transition from Atlas E due to inventory depletion)			
(U) \$4,472	Continue EELV interface design (transition to EELV)			
(U) \$636	Continue Small Tactical Terminal (field portable weather terminal) SSMIS software upgrades			
(U) \$1,500	Begin SSMIS calibration and validation			
(U) \$21,207	Total			
(U) <u>FY 2001 (\$ in Thousands)</u>				
(U) \$15,594	Continue system integration and test, and related support activities			
(U) \$1,718	Continue launch vehicle integration effort			
(U) \$1,682	Continue EELV interface design (transition to EELV)			
(U) \$497	Continue Small Tactical Terminal (Field Portable Weather Terminal) SSMIS software upgrades			
(U) \$2,881	Continue integration studies and test analysis to retrofit DMSP satellites with SSRs			
(U) \$3,000	Continue SSMIS calibration and validation			
(U) \$25,372	Total			
(U) <u>B. Budget Activity Justification</u>				
This program is in Budget Activity 7, Operational Systems Development, because it supports the current operational DMSP constellation.				
(U) <u>C. Program Change Summary (\$ in Thousands)</u>				
	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U) Previous President's Budget (FY 2000 PBR)	17,397	21,535	25,938	892,020
(U) Appropriated Value	17,932	21,535		
(U) Adjustments to Appropriated Value				
a. Congressional/General Reductions	-770	-45		-815
b. Small Business Innovative Research	-517			-517
c. Omnibus or Other Above Threshold Reprogram		-116		-116
d. Below Threshold Reprogram	3,450			3,450
e. Rescissions	-112	-167		-279
f. Other				61,536
Project 674758	Page 2 of 7 Pages	Exhibit R-2 (PE 0305160F)		

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE February 2000	
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305160F Defense Meteorological Satellite Program			PROJECT 674758	
(U) C. Program Change Summary (\$ in Thousands) Continued								
			<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			<u>Total Cost</u>
(U)	Adjustments to Budget Years Since FY 2000 PBR				-566			
(U)	Current Budget Submit/FY 2001 PBR		19,983	21,207	25,372			955,279
(U)	<u>Significant Program Changes:</u>							
	Funding:							
	FY99 adjusted: \$3,450 below threshold reprogramming for integration studies/analysis for solid state data recorders for DMSPs F-15 & F-16.							
	FY01 adjusted: \$2,941 transferred to the Air Force Weather Agency for DMSP tactical terminals. \$2,375 added to fund solid state recorders.							
	Total program costs increased due to definitization of outyear funding requirements.							
	Schedule: None							
	Technical: None							
(U) D. 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>Total Cost</u>
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>
(U)	AF RDT&E							
(U)	Other APPN							
(U)	40,607	35,775	68,582	48,695	58,176	50,069	49,134	88,600
	0305160F (Budget Activity 5, Line Item P-27)							
(U)	12,215	1,823	0	0	0	0	0	264,491
	0305160F (Line Item P-63) FY01 and out funds transferred to PE 0305111F for DMSP tactical terminals.							
	Related RDT&E:							
	PE 0603434F, National Polar-orbiting Operational Environmental Satellite System (NPOESS)							
	PE 0305160N, DMSP (provides funds for Navy unique studies)							
Project 674758			Page 3 of 7 Pages			Exhibit R-2 (PE 0305160F)		

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305160F Defense Meteorological Satellite Program	PROJECT 674758
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(U) **E. Acquisition Strategy**
 Support and services contracts for the spacecraft, sensors, ground systems, and supporting software have been awarded to various contractors. No major milestone decisions remain. The program is focused on successful completion of current contracts and contractor support for spacecraft, sensors, and ground systems already procured.

(U) **F. 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) Small Tactical Terminal Deliveries Complete				*								
(U) 5D-3 Spacecraft Delivery (S-20)			*									
(U) Satellite Launches (F-15/F-16)					*				X			

* = Completed event
 X = 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		
07 - Operational System Development					0305160F Defense Meteorological Satellite Program			674758		
(U) A. Project Cost Breakdown (\$ in Thousands)										
					<u>FY 1999</u>		<u>FY 2000</u>			<u>FY 2001</u>
(U)	Launch Vehicle Transition*				2,145		5,432			3,400
(U)	Spacecraft Integration and Test#				6,880		3,984			9,701
(U)	Calibration/Validation^				84		1,500			3,109
(U)	Algorithm Development				954		1,025			1,001
(U)	MARK IVB/STT Enhancements				2,143		1,076			497
(U)	Systems Engineering Support				4,775		4,765			3,697
(U)	Program Management Support				3,002		3,425			3,967
(U)	Total				19,983		21,207			25,372
<p>* Launch Vehicle Transition funding increases in FY00 due to critical studies & analysis required to integrate DMSP spacecraft to new EELV booster. Bulk of activity must be accomplished in FY00 to maintain integration and launch schedule for DMSP F-17.</p> <p># Spacecraft Integration and Test funding increases in FY01 due to Special Sensor Microwave Imager/Sounder (SSMIS) and Solid State Recorder integration studies/analysis for DMSP F-17.</p> <p>^ Calibration/Validation funding increases in FY01 due to required Naval Research Laboratory calibration & validation of the first on-orbit SSMIS. DMSP F-16 scheduled to launch in early FY01 will carry the first SSMIS. Critical calibration/validation work is required to enable the new sensor to provide operationally useful data.</p>										
(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>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>						
<u>Product Development Organizations</u>										
Lockheed -Martin	SS/CPAF	Apr 92	3,764	3,764	3,764				0	3,764
Lockheed-Martin	SS/CPAF	May 97	29,631	29,631	321	1,504	4,714	6,339	16,455	29,333
Northrop-Grummn	SS/CPAF	May 95	5,926	5,926	1,615	3,896	0		0	5,511
TBD (OLS Sys Eng Spt)	TBD	Dec 00	750	750				150	600	750
Lockheed-Martin	C/CPAF	Oct 88	39,513	39,513	39,513				0	39,513
Harris	C/CPAF	Jun 94	8,329	8,329	5,551	1,533	1,133		0	8,217
Project 674758					Page 5 of 7 Pages			Exhibit R-3 (PE 0305160F)		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)									DATE February 2000	
BUDGET ACTIVITY					PE NUMBER AND TITLE				PROJECT	
07 - Operational System Development					0305160F Defense Meteorological Satellite Program				674758	
(U) Performing Organizations Continued:										
<u>Product Development Organizations</u>										
Det 11/GSA	MIPR	Jan 97	2,986	2,986	2,421	565			0	2,986
SMC/CL (Titan)	PO	Oct 94	6,921	6,921	1,821	1,543	1,288	1,718	79	6,449
Aerojet	SS/CPAF	May 92	2,530	2,530	2,530				0	2,530
Aerojet	C/CPAF/FFP	Mar 89	85,979	85,979	85,979				0	85,979
Aerojet	SS/CPAF	May 98	5,321	5,321	786	1,006	1,089	1,121	4,499	8,501
Hughes	SS/CPFF	May 96	371	371	157	70	72	72	0	371
AFRL	MIPR/PD	Oct 95			4,055	570	1,144	2,825	3,406	12,000
NRL	MIPR/Various	Oct 95			5,231	1,306	2,984	4,494	12,220	26,235
APL	MIPR/Various	Oct 95			1,854	770	813	664	1,084	5,185
SMC (Det 3 SSSG/NPOESS)	FCA/MIPR	Dec 95			2,506				0	2,506
Sandia	MIPR/Various	Oct 96			200		420	200	1,950	2,770
Other	Various				2,343	373	123	125	525	3,489
Historical Satellite Blocks	Various				583,786					583,786
<u>Support and Management Organizations</u>										
FFRDC	MORD*	Oct 95			13,040	2,575	2,712	2,775	6,670	27,772
PRC/bd Systems	C/CPAF	Aug 95			4,522	1,270	1,290	922	3,874	11,878
Program Mgmt					12,563	3,002	3,425	3,967	20,500	43,457
Litigation Support					1,809				0	1,809
Other	Various	Jul 91			1,958				0	1,958
Historical Satellite Blocks	Various				38,530					38,530
*MORD - Miscellaneous Obligation/Reimbursement Document -a vehicle/method for committing and obligating funds. In this case the program office sends a letter to SMC/FM to commit & obligate the funds programmed for Aerospace support.										
<u>Test and Evaluation Organizations</u>										
NONE										

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000	
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305160F Defense Meteorological Satellite Program			PROJECT 674758	
(U) <u>Government Furnished Property:</u>								
	<u>Contract</u>							
	<u>Method/Type</u>	<u>Award or</u>						
<u>Item</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Delivery</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>
<u>Description</u>	<u>Vehicle</u>	<u>Date</u>	<u>Date</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>
<u>Product Development Property</u>								
NONE								
<u>Support and Management Property</u>								
NONE								
<u>Test and Evaluation Property</u>								
NONE								
				<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>
<u>Subtotals</u>				<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>
Subtotal Product Development				744,433	13,136	13,780	17,708	40,818
Subtotal Support and Management				72,422	6,847	7,427	7,664	31,044
Subtotal Test and Evaluation								
Total Project				816,855	19,983	21,207	25,372	71,862
								955,279

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE February 2000																															
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305164F NAVSTAR Global Positioning System (User 673028 EQ) Space)				PROJECT																														
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																												
673028	Navstar GPS	36,944	49,244	66,975	50,425	50,469	50,535	50,653	Continuing	TBD																												
Quantity of RDT&E Articles		0	0	0	0	0	0	0	0	0																												
<p>(U) <u>A. Mission Description</u> The Global Positioning System (GPS) is a space-based radio positioning, navigation, and time distribution system. GPS User Equipment (UE) consists of standardized receivers, antennae, antenna electronics, etc., grouped together in sets to derive navigation and time information transmitted from GPS satellites. These receiver sets are used by all Services and DoD. RDT&E funds UE development and testing, studies and engineering to assist UE aircraft integration, software upgrades, product improvement studies, commercial GPS UE test and evaluation, and mission support. Due to increasing military GPS dependence and emerging Electronic Warfare (EW) threat, Navigation Warfare (Navwar) program was established to address EW solutions for GPS. Key elements of GPS Modernization include protecting U.S. military and allies' use of GPS, preventing hostile exploitation of GPS, and preserving civil use of GPS outside the area of operations (AOO).</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u></p> <table border="0"> <tr> <td>(U) \$731</td> <td>Continued aircraft integration development testing</td> </tr> <tr> <td>(U) \$3,324</td> <td>Continued development and product improvement testing and evaluation</td> </tr> <tr> <td>(U) \$2,890</td> <td>Continue ACTD - Protection</td> </tr> <tr> <td>(U) \$1,163</td> <td>Complete ACTD - Prevention</td> </tr> <tr> <td>(U) \$365</td> <td>Continued Navwar modeling & simulation efforts</td> </tr> <tr> <td>(U) \$106</td> <td>Complete Navwar Evaluation Team (NET) support</td> </tr> <tr> <td>(U) \$1,762</td> <td>Continued support contract</td> </tr> <tr> <td>(U) \$15,158</td> <td>Continued GPS Receiver Application Module - Selective Availability Anti-Spoofing Module (GRAM-SAASM) development</td> </tr> <tr> <td>(U) \$4,294</td> <td>Continued SAASM development</td> </tr> <tr> <td>(U) \$239</td> <td>Completed Defense Advanced GPS Receiver (DAGR) study effort</td> </tr> <tr> <td>(U) \$4,701</td> <td>Began Advanced User Equipment Technology efforts</td> </tr> <tr> <td>(U) \$707</td> <td>Continued Modernization efforts</td> </tr> <tr> <td>(U) \$1,504</td> <td>Continued in-house support</td> </tr> <tr> <td>(U) \$36,944</td> <td>Total</td> </tr> </table>											(U) \$731	Continued aircraft integration development testing	(U) \$3,324	Continued development and product improvement testing and evaluation	(U) \$2,890	Continue ACTD - Protection	(U) \$1,163	Complete ACTD - Prevention	(U) \$365	Continued Navwar modeling & simulation efforts	(U) \$106	Complete Navwar Evaluation Team (NET) support	(U) \$1,762	Continued support contract	(U) \$15,158	Continued GPS Receiver Application Module - Selective Availability Anti-Spoofing Module (GRAM-SAASM) development	(U) \$4,294	Continued SAASM development	(U) \$239	Completed Defense Advanced GPS Receiver (DAGR) study effort	(U) \$4,701	Began Advanced User Equipment Technology efforts	(U) \$707	Continued Modernization efforts	(U) \$1,504	Continued in-house support	(U) \$36,944	Total
(U) \$731	Continued aircraft integration development testing																																					
(U) \$3,324	Continued development and product improvement testing and evaluation																																					
(U) \$2,890	Continue ACTD - Protection																																					
(U) \$1,163	Complete ACTD - Prevention																																					
(U) \$365	Continued Navwar modeling & simulation efforts																																					
(U) \$106	Complete Navwar Evaluation Team (NET) support																																					
(U) \$1,762	Continued support contract																																					
(U) \$15,158	Continued GPS Receiver Application Module - Selective Availability Anti-Spoofing Module (GRAM-SAASM) development																																					
(U) \$4,294	Continued SAASM development																																					
(U) \$239	Completed Defense Advanced GPS Receiver (DAGR) study effort																																					
(U) \$4,701	Began Advanced User Equipment Technology efforts																																					
(U) \$707	Continued Modernization efforts																																					
(U) \$1,504	Continued in-house support																																					
(U) \$36,944	Total																																					
Project 673028		Page 1 of 9 Pages				Exhibit R-2 (PE 0305164F)																																

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE
BUDGET ACTIVITY		PROJECT
07 - Operational System Development		February 2000
PE NUMBER AND TITLE		PROJECT
0305164F NAVSTAR Global Positioning System (User 673028 EQ) Space)		
(U) A. Mission Description Continued		
(U) FY 2000 (\$ in Thousands)		
(U) \$736	Continue aircraft integration development testing	
(U) \$5,070	Continue development and product improvement testing and evaluation	
(U) \$3,500	Complete ACTD (Protection) objectives under Joint GPS Combat Evaluation (JGPSCE) Demo	
(U) \$11,000	Continue classified requirement	
(U) \$4,500	Continue SAASM development	
(U) \$6,100	Continue GRAM-SAASM development and begin platform demonstrations	
(U) \$3,685	Continue in-house support	
(U) \$1,934	Continue support contract	
(U) \$6,500	Continue advanced UE technology effort (Receivers)	
(U) \$2,950	Continue advanced UE technology effort (Anti-Jam Filters)	
(U) \$3,269	Continue advanced UE technology effort (Advanced Antenna)	
(U) \$49,244	Total	
(U) FY 2001 (\$ in Thousands)		
(U) \$659	Continue aircraft integration development testing	
(U) \$16,000	Begin advance UE Protection development (Receiver, Antenna)	
(U) \$2,300	Continue development and product improvement testing and evaluation	
(U) \$13,100	Continue SAASM development	
(U) \$10,000	Continue Modernization efforts (SAASM M-Code development)	
(U) \$3,696	Continue in-house support	
(U) \$2,116	Continue support contract	
(U) \$8,000	Continue classified requirement	
(U) \$7,054	Continue advanced UE technology effort (Receivers)	
(U) \$2,050	Continue advanced UE technology effort (Advanced Antenna)	
(U) \$2,000	Continue advanced UE technology effort (Anti-Jam Filters)	
(U) \$66,975	Total	
Project 673028		Exhibit R-2 (PE 0305164F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development			PE NUMBER AND TITLE 0305164F NAVSTAR Global Positioning System (User 673028 EQ) Space)				PROJECT		
(U) <u>B. Budget Activity Justification</u>									
This program element is in Budget Activity 7 - Operational System Development, because UE passed Milestone IIB in January 1992.									
(U) <u>C. Program Change Summary (\$ in Thousands)</u>									
			<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			<u>Total Cost</u>	
(U)	Previous President's Budget (FY 2000 PBR)		36,234	53,963	41,471			TBD	
(U)	Appropriated Value		36,638	49,913					
(U)	Adjustments to Appropriated Value								
	a. Congressional/General Reductions		-404	-10					
	b. Small Business Innovative Research		-685						
	c. Omnibus or Other Above Threshold Reprogram		825	-270					
	d. Below Threshold Reprogram		777						
	e. Rescissions		-207	-389					
	f. Other							TBD	
(U)	Adjustments to Budget Years Since FY 2000 PBR				25,504				
(U)	Current Budget Submit/FY 2001 PBR		36,944	49,244	66,975			TBD	
(U) <u>Significant Program Changes:</u>									
FY 2001 increase funds GPS UE Navwar Anti-Jam Technology/Modernization Security Architecture (SAASM), development efforts. Changed timing of DAGR procurement to FY02.									
(U) <u>D. Other Program Funding Summary (\$ in Thousands)</u>									
		<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>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)	AF RDT&E								
(U)	Other APPN								
(U)	Operations and Maintenance (PE 0305164F, BA 1 - Operating Forces, SAG 13D)	2,122	966	2,211	2,149	2,266	6,833	6,715	Continuing
(U)	Aircraft Procurement (PE 0305164F, BA 7, Aircraft	35,295	35,449	39,290	57,452	76,549	89,559	117,105	Continuing

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305164F NAVSTAR Global Positioning System (User 673028 EQ) Space)
PROJECT 0305164F	

(U) **D. 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>	
Support Equipment, BP19, P-74)									
(U) Other Procurement (PE 0305164F, BP 63 - Electronics & Telecommunications Equipment, WSC 6730, P-62)	3,321	2,325	1,658	4,402	4,409	4,773	4,394	Continuing	Continuing
(U) OSD RDT&E (ACTD Funding: PE 0603750D) Related RDT&E: PE 0305165F, NAVSTAR GPS (Space/Grd Segments) PE 0604480F, GPS Block IIF PE 0305176F, Combat Survivor/Evader Locator	300								

(U) **E. Acquisition Strategy**
 Several ongoing and planned concept definition and technology risk reduction programs will define and mature required GPS technologies needed for GPS Modernization. Our strategy will develop open system like architecture for a GPS receiver based on the GPS Receiver Application Module (GRAM) concept. The GRAM-SAASM program is a further risk reduction effort to integrate the GPS receiver operations internally between GRAM and SAASM. Also, several anti-jam technology risk reduction efforts will be pursued to mature technologies and prepare for technology insertion. Continue to work with platforms/users to identify requirements and upgrade paths to insert GPS enhancements.

(U) **F. Schedule Profile**

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305164F NAVSTAR Global Positioning System (User 673028 EQ) Space)	PROJECT 673028
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(U) **F. Schedule Profile Continued**

	<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) GPS ORD validation			*									
(U) GPS OIPT	*					X	X					
(U) Advance UE Technology (ie Receiver, Antenna, Filter efforts)	*	*	*	*	*	X	X	X	X	X	X	X
(U) Navwar AOA brief to JROC			*									
(U) Defense Science Board						*						
(U) GRAM-SAASM ICD Complete							X					
(U) GRAM-SAASM preproduction prototypes deliveries							X					

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development					PE NUMBER AND TITLE 0305164F NAVSTAR Global Positioning System (User 673028 EQ) Space)					PROJECT
(U) Performing Organizations Continued:										
<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>
OSD Withhold for Inflation Savings						46			0	46
<u>Product Development Organizations</u>										
Rockwell (MAGR)	C/FPIF/FFP/CPAF	Various	19,293	19,293	19,293	0	0	0	0	19,293
DOE Sandia (SAASM)	MIPR	Feb 94	Continuing	Continuing	7,982	2,605	3,400	4,500	Continuing	TBD
NAWC (SAASM)	MIPR	Oct 95	760	760	599	0	0	0	0	599
Various (SAASM)	Various	Various	Continuing	Continuing	4,041	1,539	1,100	8,600	Continuing	TBD
TBD (SAASM M-Code)	TBD	Dec 00	Continuing	Continuing	0	0	0	8,000		8,000
Alliant Techsys Inc (SAASM)	C/CPFF	Oct 95	4,782	4,782	4,632	150	0	0	0	4,782
Multiple (NAVWAR PRDAs)	C/CPAF	Aug 96	13,440	13,440	13,440	0	0	0	0	13,440
Holloman AFB (Integration)	Project Order	N/A	Continuing	Continuing	2,549	731	736	659	Continuing	TBD
General Dynamics (Various)	Time and Materials	Jan 96	1,810	1,810	1,810	0	0	0	0	1,810
Various (ACTD Prevention)	Various	Various	8,545	8,545	6,265	1,163	0	0	0	7,428
Various (ACTD Protection)	Various	Various	14,071	14,071	7,443	2,890	3,500	0	0	13,833
Adv UE Protection Dev	Various	Various	TBD	TBD	0	0	0	18,000		18,000
Various (NET)	Various	Various	10,413	10,413	10,228	106	0	0	0	10,334
Various (Classified Requirement)	Various	Various	Continuing	Continuing	7,752	0	11,000	8,000	Continuing	TBD
Various (GPS Modernization)	Various	Various	TBD	TBD	5,078	707	0	0	0	5,785
Various (Navwar M&S)	Various	Various	4,775	4,775	3,210	365	0	0	0	3,575
CeCom (DAGR study)	MIPR	Dec 97	385	385	146	239	0	0	0	385

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)									DATE February 2000	
BUDGET ACTIVITY				PE NUMBER AND TITLE					PROJECT	
07 - Operational System Development				0305164F NAVSTAR Global Positioning System (User 673028 EQ) Space)						
(U) <u>Performing Organizations Continued:</u>										
<u>Product Development Organizations</u>										
TBD (Handheld PRDA)	TBD	Apr 00	TBD	TBD	0	0	4,900	Continuing	TBD	
Various (GRAASM)	PRDA	Jul 98	23,659	23,659	6,001	15,158	6,100	0	0	27,259
<u>Support and Management Organizations</u>										
Overlook Sys (OASD/C3I)	C/CPFF	Dec 95	Continuing	Continuing	15,266	1,762	1,934	2,116	Continuing	TBD
Aerospace Corp (Technical Supt)	CPFF	Various	Continuing	Continuing	928	0	2,112	2,112	Continuing	TBD
SMC/FMB (Shared Prg Cost)	Various	Various	Continuing	Continuing	4,584	576	668	612	Continuing	TBD
PRC (Technical Supt)	Time and Materials	Dec 95	714	714	714	0	0	0	0	714
Miscellaneous (In-house support)	Various	Various	Continuing	Continuing	3,025	928	905	972	Continuing	TBD
Advanced UE Tech Invest (Tech Supt)	Various	Various	4,655	4,655	0	4,655	0	0	0	4,655
Receiver Tech (Tech Spt)	Various	Various	Continuing	Continuing	0	0	6,500	2,154	Continuing	TBD
Anti-jam Filter Tech (Tech Spt)	Various	Various	Continuing	Continuing	0	0	2,950	2,000	Continuing	TBD
Advanced Antenna (Tech Spt)	Various	Various	Continuing	Continuing	0	0	3,269	2,050	Continuing	TBD
Various (Other Navwar Studies)	Various	Various	2,375	2,375	2,375	0	0	0	0	2,375
<u>Test and Evaluation Organizations</u>										
46th TG (SAASM/Test)	Project Order	Various	31,987	31,987	31,987	0	0	0	0	31,987
46th TG (UE develop & product testing)	Project Order	Various	Continuing	Continuing	1,469	3,324	5,070	2,300	Continuing	TBD
Project 673028			Page 8 of 9 Pages					Exhibit R-3 (PE 0305164F)		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305164F NAVSTAR Global Positioning System (User 673028 EQ) Space)			PROJECT 673028		
(U) Government Furnished Property:									
<u>Item</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>Description</u>	<u>Method/Type</u>	<u>or Funding</u>	<u>Date</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Property</u>	<u>Vehicle</u>	<u>Obligation</u>	<u>Date</u>						
N/A									
<u>Support and Management Property</u>									
N/A									
<u>Test and Evaluation Property</u>									
N/A									
Subtotals				<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
				<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
					46			0	46
Subtotal Product Development				100,469	25,653	25,836	52,659	TBD	TBD
Subtotal Support and Management				26,892	7,921	18,338	12,016	TBD	TBD
Subtotal Test and Evaluation				33,456	3,324	5,070	2,300	TBD	TBD
Total Project				160,817	36,944	49,244	66,975	TBD	TBD

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305165F NAVSTAR GPS (Space)				PROJECT 673030			
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	
673030	NAVSTAR GPS (Space & Control)	101,587	107,451	250,197	209,114	181,291	132,711	101,958	Continuing	TBD	
Quantity of RDT&E Articles		0	0	0	0	0	0	0	0	0	
<p>(U) <u>A. Mission Description</u></p> <p>*Note: FY99 efforts funded in PE 64480F are described in this R-2 exhibit for program clarity.</p> <p>This program element funds Research and Development for the NAVSTAR Global Positioning System (GPS) Space and Control segments of the overall GPS program. This includes: satellite development, procurement, and deployment; training simulators; Mission Operation Support Center (MOSC); and ground control segment operation, including sustaining engineering, space and ground segments upgrades, and R&D efforts to support the entire GPS system deployment.</p> <p>The program has been restructured since the FY00 PB submission. Block IIF satellites 7 through 9 procurement was delayed by two years (FY01 to FY03) due to extended mean mission duration of Block IIA satellites currently on orbit. This PE also funds Modernization which includes adding new civil and military capabilities to 12 Block IIR and the first 6 Block IIF satellites. Block IIR modernization includes adding a second civil signal and a new military signal to the last 12 satellites. The first six Block IIF satellites will already include the second civil signal. They will be modernized to include a third civil signal (L5) and the new military signal. Starting with Block IIF, satellite vehicle 7, a higher power spot-beam antenna will be added to provide enhanced anti-jam capability. This budget request assumes a \$67.5M FY00 reprogramming action (\$18M procurement/\$45.5M RDT&E).</p> <p>Funding for the civil portion of GPS Modernization (beginning in 2001) was previously included in the Department of Transportation budget request.</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u></p> <p>(U) \$771 Continued system engineering, including Joint Spectrum Center (JSC) support and GPS Engineering Management (GEM) System development</p> <p>(U) \$2,545 Continued training simulator development</p> <p>(U) \$11,878 Completed Operational Control Segment (OCS) Consolidated Contract for Common Operator Support Environment (COSE), Block IIR Full Functionality, and continued OCS Architectural Implementation</p> <p>(U) \$3,004 OCS Transition to Operations Accomplished</p> <p>(U) \$346 Continued space long-range planning and analysis (PE 64480F and PE 35165F)</p> <p>(U) \$999 Continued GPS IIA/IIF/IIR Integrated Mission Operation Support Center (IMOSC) development</p> <p>(U) \$11,064 Continued GPS IIF direct inject (PE 64480F and PE 35165F)</p>											
Project 673030				Page 1 of 7 Pages				Exhibit R-2 (PE 0305165F)			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 2000
BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305165F NAVSTAR GPS (Space)	PROJECT 673030
(U) <u>A. Mission Description Continued</u>		
(U) <u>FY 1999 (\$ in Thousands) Continued</u>		
(U) \$303	Continued GPS program support (PE 64480F and PE 35165F)	
(U) \$23,000	Continued IIF satellite development (PE 64480F)	
(U) \$2,838	Continued IIF satellite associated development including launch vehicle integration, award fees, and integration studies and services (PE 64480F)	
(U) \$3,390	Continued clock technology development (PE 64480F)	
(U) \$29,008	Continued IIF OCS development (PE 64480F)	
(U) \$2,791	Continued IIF OCS associated development including Selective Availability Anti-Spoofing Module (SAASM) control segment (CS) changes, IIF system simulator development and studies (PE 64480F)	
(U) \$3,200	Continued GPS Modernization Space/Control development and technical support (PE 64480F)	
(U) \$6,450	Continued GPS Modernization technical support (PE 64480F)	
(U) \$101,587	Total	
(U) <u>FY 2000 (\$ in Thousands)</u>		
(U) \$1,103	Continue system engineering, including JSC support and GEM System development	
(U) \$1,685	Continue Control Segment training simulator development	
(U) \$12,917	Continue development of OCS Architectural Implementation	
(U) \$300	Complete space long-range planning and analysis	
(U) \$1,099	Continue IIA/IIF/IIR IMOSC development	
(U) \$3,444	Complete IIF satellite development	
(U) \$5,390	Continue IIF clock technology development	
(U) \$2,700	Begin IIF Space Vehicle (SV) compatibility analysis	
(U) \$1,882	Continue IIF satellite associated development including launch vehicle integration, award fees, and integration studies and services	
(U) \$2,250	Complete IIF direct inject	
(U) \$38,823	Continue IIF OCS development	
(U) \$4,083	Continue IIF OCS associated development including SAASM CS changes and IIF system simulator development	
(U) \$26,388	Continue GPS Modernization Space/Control development	
(U) \$5,052	Continue GPS Modernization technical support	
(U) \$335	Continue GPS program support	
(U) \$107,451	Total	

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 2000		
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT		
07 - Operational System Development	0305165F NAVSTAR GPS (Space)	673030		
(U) <u>A. Mission Description Continued</u>				
(U) <u>FY 2001 (\$ in Thousands)</u>				
(U) \$1,100	Continue system engineering, including JSC support and GEM System development			
(U) \$1,731	Continue CS training simulator development			
(U) \$3,707	Complete development of OCS Architectural Implementation			
(U) \$2,820	Continue IIA/IIF/IIR IMOSC development			
(U) \$4,650	Continue IIF clock technology development			
(U) \$2,347	Continue IIF SV compatibility analysis			
(U) \$4,454	Continue IIF satellite associated development including launch vehicle integration, award fees, and integration studies and services			
(U) \$42,972	Continue IIF OCS development			
(U) \$1,615	Continue IIF OCS associated development including SAASM CS changes and IIF system simulator development			
(U) \$4,900	Begin GPS Launch/Early Orbit (L/EO) consolidation			
(U) \$168,400	Continue GPS Modernization Space/Control development (for all IIF and 12 IIR satellites)			
(U) \$10,750	Continue GPS Modernization technical support			
(U) \$751	Continue GPS program support			
(U) \$250,197	Total			
(U) <u>B. Budget Activity Justification</u>				
This program is in Budget Activity 7 - Operational Systems Development because it is a post-Milestone III program.				
(U) <u>C. Program Change Summary (\$ in Thousands)</u>				
	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U) Previous President's Budget (FY 2000 PBR)	94,404	98,890	108,851	TBD
(U) Appropriated Value	94,746	108,890		
(U) Adjustments to Appropriated Value				
a. Congressional/General Reductions	-342	-1		
b. Small Business Innovative Research	-3,134			
c. Omnibus or Other Above Threshold Reprogram		-590		
d. Below Threshold Reprogram	10,885			
e. Rescissions	-568	-848		
f. Other				TBD
Project 673030	Page 3 of 7 Pages	Exhibit R-2 (PE 0305165F)		

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305165F NAVSTAR GPS (Space)			PROJECT 673030			
(U) C. Program Change Summary (\$ in Thousands) Continued										
			<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>				
(U)	Adjustments to Budget Years Since FY 2000 PBR				141,346					
(U)	Current Budget Submit/FY 2001 PBR		101,587	107,451	250,197			TBD		
(U)	<u>Significant Program Changes:</u>									
	Significant Program Changes:									
	Funding: FY1999 Below Threshold Reprogramming (BTR) -\$0.537 for canceled bills, -\$0.845 for higher AF priorities, +\$9.941 for GPS IIF design change to incorporate direct inject requirement from EELV, and +\$2.326 OCS.									
	Schedule: First GPS Block IIF launch moved from March 03 to March 05 due to extended Mean Mission Duration of the Block IIA satellites.									
	Funding/Technical: \$141,346 increase in FY 2001 for expanded Modernization efforts. This includes the first 6 Block IIF satellites and last 12 Block IIR satellites, associated upgrades to the OCS, and funds added to put second civil signal and new military signal on IIR satellites. The first 6 block IIF satellites will include the second and third civil signals along with the new military signal. Block IIF satellites 7 and on will include these signals plus a high-power spot beam for added anti-jam capability.									
(U) D. 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>Total Cost</u>	
		<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	
(U)	AF RDT&E									
(U)	Other APPN									
(U)	Operations and Maintenance (PE 0305165F, BA 1 - Operating Forces, SAG 13D)		25,323	14,653	53,548	50,285	54,450	55,635	54,300	Continuing
(U)	Missile Procurement (PE 0305165F, BA 5 - Space and Other Support, P-20, 21)		87,837	125,400	210,341	235,429	410,219	362,888	315,229	Continuing
(U)	Other Procurement (PE 0305165F, BP 83 - Electronics and Telecommunications Equipment, WSC 6790, P-68, and WSC 6730.)		7,619	14,395	12,400	7,963	7,095	8,771	9,861	Continuing
Project 673030		Page 4 of 7 Pages					Exhibit R-2 (PE 0305165F)			

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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305165F NAVSTAR GPS (Space)	PROJECT 673030
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(U) **D. 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>	
PE 0305164F, GPS User Equipment									
PE 0101221N, Fleet Ballistic Missile System									
PE 0301357F and 0305913F, Nuclear Detonation Detection System (NDS)									
PE 0305119F Space Boosters (Delta II)									
PE 0604480F, GPS Block IIF									

(U) **E. Acquisition Strategy**
 GPS OCS upgrade was competitively awarded to a single contractor (Lockheed Martin) in July 1995. Block IIF satellite and IIF ground systems development contract was competitively awarded to a single contractor (Boeing) in April 1996. The Single Prime Initiative (SPI) consolidates these efforts into one contract that was awarded to Boeing (with Lockheed Martin as a subcontractor) on 1 Oct 99.

(U) **F. 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) Continue OCS Architectural Implementation												
(U) Phase 3/4 delivery									X			
(U) IIA IMOSC system available					*							
(U) IIA IMOSC development complete									X			
(U) IIF IMOSC development begins										X		
(U) IIF satellite final design verification									X			
(U) GPS Modernization studies complete								X				
(U) Master Control Station interface to IIR Operational Support System dev				*								
(U) GPS Overarching Integrated Product Team (OIPT)				*					X			
(U) GPS Operational Requirements Document (ORD) Validation					*			X				
(U) GPS Program Review									X			
(U) GPS Modernization Space/Control development begins										X		
(U) GPS Modernization Long Lead Production begins											X	

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305165F NAVSTAR GPS (Space)	PROJECT 673030
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(U) A. Project Cost Breakdown (\$ in Thousands)			
	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) System Engineering including JSC and GEMS	771	1,103	1,100
(U) CS Training Simulator Development	2,545	1,685	1,731
(U) OCS Development/Sustainment	11,878	12,917	3,707
(U) OCS Transition to Operations	3,004	0	0
(U) Space long-range planning	346	300	0
(U) IIF direct inject	11,064	2,250	0
(U) IIA/IIF/IIR IMOSC development	999	1,099	2,820
(U) IIF satellite development	23,000	3,444	0
(U) IIF clock technology development	3,390	5,390	4,650
(U) IIF SV compatibility analysis	0	2,700	2,347
(U) IIF satellite associated development	2,838	1,882	4,454
(U) IIF Operational Control System development	29,008	38,823	42,972
(U) IIF OCS associated development	2,791	4,083	1,615
(U) GPS L/EO consolidation	0	0	4,900
(U) GPS Modernization Space/Control development	3,200	26,388	168,400
(U) GPS Modernization Technical Support	6,450	5,052	10,750
(U) GPS program support	303	335	751
(U) Total	101,587	107,451	250,197

(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>
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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE
BUDGET ACTIVITY										PROJECT
07 - Operational System Development										673030
PE NUMBER AND TITLE										
0305165F NAVSTAR GPS (Space)										
(U) Performing Organizations Continued: <u>Product Development Organizations</u>										
Lockheed-Martin	CPAF/FFP	Jul 95	124,401	124,401	60,160	17,141	0	0	0	77,301
Applied Research Labs	MIPR	Mar 97	2,766	2,766	2,366	0	683	300	0	3,349
Boeing	FPAF/CPAF	Apr 96	Continuing	Continuing	128,104	72,650	36,664	92,435	Continuing	TBD
Boeing (SPI)	CPAF/CPFF	Oct 00	Continuing	Continuing	0	0	57,924	109,295	Continuing	TBD
TBD IIR Modernization	TBD	TBD	TBD	TBD	0	0	0	30,916	0	30,916
NRL	MIPR	Various	Continuing	Continuing	1,250	3,390	5,390	4,650	15,625	30,305
GPS Modernization Tech Spt	Various	Various	Continuing	Continuing	2,208	6,450	5,052	10,750	Continuing	TBD
Miscellaneous	Various	Various			1,131	536	0	0	Continuing	TBD
<u>Support and Management Organizations</u>										
System Engineering	Various	Various	N/A	N/A	19,410	771	1,103	1,100	Continuing	TBD
Program Support	Various	Various	N/A	N/A	6,890	303	335	751	Continuing	TBD
Miscellaneous	Various	Various	N/A	N/A	805	346	300	0	0	1,451
<u>Test and Evaluation Organizations</u>										
					<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>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					195,219	100,167	105,713	248,346	TBD	TBD
Subtotal Support and Management					27,105	1,420	1,738	1,851	TBD	TBD
Subtotal Test and Evaluation										
Total Project					222,324	101,587	107,451	250,197	TBD	TBD

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305182F Spacelift Range System				PROJECT 674137		
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
674137	Range Standardization and Automation (RSA)	27,594	50,989	53,654	52,306	55,511	57,147	49,984	Continuing	TBD
	Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0
<p>(U) <u>A. Mission Description</u> The Eastern Range (ER) headquartered at Patrick AFB, FL and the Western Range (WR) headquartered at Vandenberg AFB, CA are the nation's Spacelift Ranges. They provide tracking, telemetry, communications, flight analysis, and other capabilities necessary to safely conduct Department of Defense, civil, and commercial spacelift operations; intercontinental and sea-launched ballistic missile operational test and evaluations (T&E); and aeronautical and guided weapons T&E. Many Range assets are outdated, unreliable, inefficient, and costly to operate and maintain.</p> <p>The Air Force is addressing range shortcomings through a phased modernization program. Funding identified in this document is for the modernization development efforts. Modernization is needed to meet documented requirements for a Spacelift Range System (SLRS) to support the evolving launch mission. The objectives are to improve operational flexibility, reliability, and supportability while reducing operations and maintenance costs.</p> <p>Two of the three modernization phases will continue in FY01. First, the Range Standardization and Automation (RSA) Phase IIA program will continue to develop upgrades to the control and display, and communication segments. Second, the SLRS Contract (SLRSC) will continue to develop an integrated suite of automated instrumentation, to include items previously planned for a follow-on RSA contract. Following are details of the FY99-01 RDT&E program:</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u></p> <p>(U) \$8,004 Continued RSA Phase I: Completed integration of Centralized Telemetry Processing Subsystem (CTPS). Completed Cape Fiber Optic Network (CFON) installation. Continued RSA Phase I test and evaluation.</p> <p>(U) \$17,053 Continued RSA Phase IIA: Continued integration and testing of planning and scheduling and weather product items for operational turnover. Continued development of communications network including network core. Continued development of interim flight safety product for ER. Began development of voice, video and data network modernization. Began development of Differential GPS (DGPS) metric tracking system.</p> <p>(U) \$2,537 Provided program support for Systems Program Office.</p> <p>(U) \$27,594 Total</p>										
Project 674137			Page 1 of 7 Pages				Exhibit R-2 (PE 0305182F)			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE
BUDGET ACTIVITY		PROJECT
07 - Operational System Development	0305182F Spacelift Range System	February 2000 674137
(U) <u>A. Mission Description Continued</u>		
(U) <u>FY 2000 (\$ in Thousands)</u>		
(U) \$1,768	Complete RSA Phase I: Complete RSA Phase test and evaluation and turnover.	
(U) \$35,051	Continue RSA Phase IIA: Continue integration and testing of planning and scheduling and weather product items for operational turnover. Continue development and begin testing of DGPS for metric tracking. Continue development and begin testing of voice, video and data network modernization. Continue development and begin testing of communication network including network core. Complete interim flight safety product for the ER. Begin development of final flight operations and analysis product for SLRS.	
(U) \$3,300	Begin SLRSC. Assess AFSPC's down-range instrumentation requirements and commercial off-the-shelf (COTS) products available to satisfy these requirements. Begin related design efforts.	
(U) \$2,370	Provide program support for Systems Program Office.	
(U) \$8,500	Fund California spaceport authority study and design of universal spaceport at Vandenberg AFB per congressional direction.	
(U) \$50,989	Total	
(U) <u>FY 2001 (\$ in Thousands)</u>		
(U) \$31,392	Continue RSA Phase IIA: Continue development of the final flight operations and analysis system. Complete DGPS for metric tracking. Continue development and testing of communications network including network core. Continue development and testing of voice, video and data network modernization. Complete testing of planning and scheduling and weather product items. Begin development of range operations, digital telemetry (previously referred to as CTPS), and related efforts under the control and display segment.	
(U) \$19,562	Continue SLRSC: Continue assessment of existing COTS solutions for applicability to down-range instrumentation requirements and related design efforts. Apply results of COTS assessments/design efforts to development of automated instrumentation for the SLRS, to include instrumentation previously planned for RSA program.	
(U) \$2,700	Provide program support for Systems Program Office.	
(U) \$53,654	Total	
(U) <u>B. Budget Activity Justification</u>		
	These efforts are categorized as Budget Activity 7, Operational Systems Development, because they upgrade existing operational capabilities with new systems. Funding for RSA and SLRSC design and integration for both ER and WR is consolidated in this program element to support the integrated SLRS approach.	

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305182F Spacelift Range System			PROJECT 674137		
(U) C. Program Change 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>Total Cost</u>
(U)	Previous President's Budget (FY 2000 PBR)	24,457	43,186	49,130					TBD
(U)	Appropriated Value	24,578	51,686						
(U)	Adjustments to Appropriated Value								
	a. Congressional/General Reductions	-121	-14						
	b. Small Business Innovative Research	-801							
	c. Omnibus or Other Above Threshold Reprogram			-280					
	d. Below Threshold Reprogram	4,092							
	e. Rescissions	-154	-403						
	f. Other								TBD
(U)	Adjustments to Budget Years Since FY 2000 PBR			4,524					
(U)	Current Budget Submit/FY 2001 PBR	27,594	50,989	53,654					TBD
(U) Significant Program Changes:									
FY 1999: \$3,999 added to fund RSA Phase IIA execution shortfall; \$388 added to fund AFSPC Range Safety Study; and, \$295 deducted for higher AF priorities.									
FY 2000: Congress appropriated additional \$8,500 for California universal spaceport study/design for Vandenberg AFB; RSA Phase I extended into FY 2000 to complete test and transition activities, using funding available from revised estimate of other program costs.									
FY 2001: \$5,000 transferred from OPAF to provide necessary RDT&E/OPAF mix. \$476 deducted for higher AF priorities.									
(U) D. 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>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)	OPAF, BA 03, P-66, Spacelift Range System Space*	91,340	82,682	92,714	145,209	135,403	146,268	164,479	TBD
	* FY 2001 through FY 2004 amounts reflect reductions due to transfer of funding from OPAF to RDT&E to provide necessary RDT&E/OPAF mix.								
(U) E. Acquisition Strategy									
The RSA Phase I contract was competitively awarded in FY 1993 to connect major ER stations at Antigua and Ascension Islands and the ER operations control center via a satellite communications network; to standardize and centralize telemetry processing for the ER and WR; and to modernize and automate the Cape Canaveral communications network. It ends in FY 2000.									

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305182F Spacelift Range System	PROJECT 674137
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(U) **E. Acquisition Strategy Continued**
 The RSA Phase IIA contract was competitively awarded in FY 1996 to provide an SLRS architecture and standardize and automate the ranges. It modernizes range safety, flight analysis, communications, range operations, planning and scheduling, and meteorological systems. It will end in FY 2006.

AFMC is competitively awarding the SLRSC in FY 2000 to consolidate remaining modernization efforts with systems integration and sustainment efforts under one contractor. The SLRSC will develop and procure automated down-range instrumentation originally planned for a follow-on RSA phase. The SLRSC will run through FY 2010.

(U) **F. 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) RSA Phase I												
(U) - Centralized Telemetry Processing Subsystem Installation/Checkout	*											
(U) - Cape Fiber Optic Network Installation		*										
(U) - System DT&E			*									
(U) - Operational T&E						X						
(U) - System Turnover							X					
(U) RSA Phase IIA												
(U) - Early Scheduling Tool Set for Automated Ranges Test Phase		*										
(U) - Planning and Scheduling ER Combined DT&E & IOT&E							X					
(U) - Planning and Scheduling WR Combined DT&E & IOT&E								X				
(U) - Weather ER DT&E/OT&E										X		
(U) - Weather WR DT&E/OT&E											X	
(U) -.Network Timing ER & WR Qualification Testing Complete				*								
(U) - Network Core WR Qualification Testing complete								X				
(U) - Network Manager WR Qualification Testing Complete									X			
(U) - Differential GPS for Metric Tracking Complete										X		
(U) SLRS Contract												
(U) - Acquisition Strategy Panel			*									
(U) - Contract Award						X						
(U) California Universal Spaceport Study												

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305182F Spacelift Range System	PROJECT 674137
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(U) **F. Schedule Profile Continued**

	<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) - Contract Award						X						
* = completed event; X = planned event												

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)

DATE
February 2000

BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305182F Spacelift Range System	PROJECT 674137
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(U) **A. Project Cost Breakdown (\$ in Thousands)**

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) RSA Phase I Contract	8,004	1,768	0
(U) RSA Phase IIA Contract	17,053	35,051	31,392
(U) SLRS Contract	0	3,300	19,562
(U) Program Support	2,537	2,370	2,700
(U) California Universal Spaceport Study		8,500	
(U) Total	27,594	50,989	53,654

(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>										
Harris Corp (RSA Phase I)	C/CPAF	Jun 93	93,859	96,087	86,315	8,004	1,768	0	0	96,087
Lockheed Martin (RSA Phase IIA)	C/CPAF	Nov 95	153,222	153,848	60,292	17,053	35,051	31,392	Continuing	TBD
TBD (SLRSC)	TBD	Mar 00	TBD	TBD	0	0	3,300	19,562	Continuing	TBD
<u>Support and Management Organizations</u>										
Mission Support	Various	Various	N/A	N/A	11,357	2,537	2,370	2,700	Continuing	TBD
Universal Spaceport Study	MIPR	Feb 00	N/A	N/A	0	0	8,500	0	0	8,500
<u>Test and Evaluation Organizations</u>										
N/A										

(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>
N/A									

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000	
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305182F Spacelift Range System			PROJECT 674137	
(U) Government Furnished Property Continued:								
	<u>Contract</u>	<u>Award or</u>						
<u>Item</u>	<u>Method/Type</u>	<u>or Funding</u>	<u>Delivery</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>
<u>Description</u>	<u>Vehicle</u>	<u>Date</u>	<u>Date</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>
<u>Product Development Property</u>								
GFP determination is ongoing as work progresses on each RSA Phase IIA delivery increment. The current 1000+ item GFP list is too large to be included with this document. It is available upon request.								
<u>Support and Management Property</u>								
N/A								
<u>Test and Evaluation Property</u>								
N/A								
				<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>
<u>Subtotals</u>				<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>
Subtotal Product Development				146,607	25,057	40,119	50,954	TBD
Subtotal Support and Management				11,357	2,537	10,870	2,700	TBD
Subtotal Test and Evaluation								
Total Project				157,964	27,594	50,989	53,654	TBD

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

DATE
February 2000

BUDGET ACTIVITY		PE NUMBER AND TITLE							
07 - Operational System Development		0305202F Dragon U-2 (JMIP)							
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	0	0	27,546	24,118	8,224	1,936	1,931	Continuing	TBD
674818 Advanced Technology	0	0	17,616	16,443	6,285	0	0	40,694	TBD
674820 Manned Reconnaissance Systems U-2	0	0	9,930	7,675	1,939	1,936	1,931	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

Manned Reconnaissance system U-2 funding for FY99 - FY00 in PE 0305207F. Advanced Technology funding for FY00 included in PE 0305206F (Only portion relates to this program)

The RDT&E portion of this program element funds efforts required to enhance and sustain the U-2 Dragon reconnaissance aircraft. The RDT&E efforts in this PE focus on sensor and safety of flight projects. In addition to the RDT&E funding there are procurement funds associated with these developments.

(U) B. Budget Activity Justification

This program element is categorized as Budget Activity 7 because it provides for development of technologies and capabilities in support of operational system development for the U-2 Aircraft.

(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)	0	0	0	
(U) Appropriated Value				
(U) Adjustments to Appropriated Value				
a. Congressional/General Reductions				
b. Small Business Innovative Research				
c. Omnibus or Other Above Threshold Reprogram				
d. Below Threshold Reprogram				
e. Rescissions				

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)				DATE
BUDGET ACTIVITY		PE NUMBER AND TITLE		
07 - Operational System Development		0305202F Dragon U-2 (JMIP)		
(U)	<u>C. Program Change Summary (\$ in Thousands) Continued</u>			
		<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
	f. Other		0	<u>Total Cost</u>
(U)	Adjustments to Budget Years Since FY 2000 PBR			27,546
(U)	Current Budget Submit/FY 2001 PBR		0	27,546
				TBD
(U)	<u>Significant Program Changes:</u>			
	Funding for PE 35202 project 674820 was reprogrammed from PE 305207F (FY00PBR - \$14.525M).			
	Funding for PE 35202 project 674818 was reprogrammed from a portion of PE 0305206F (FY00 PBR - \$17.616M).			
	FY01 - U-2 Electronic Warfare System (EWS) reprogramming from RDT&E to procurement (\$4.595 M).			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 2000	
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305202F Dragon U-2 (JMIP)				PROJECT 674818	
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
674818 Advanced Technology	0	0	17,616	16,443	6,285	0	0	40,694	TBD
<p>Note: FY00 funding included in PE 0305206F (Only U-2 Defensive Systems portion relates to this program)</p> <p>(U) <u>A. Mission Description</u> This project supports the U-2 Advanced Defensive System (ADS) development. ADS is designed to provide situational awareness and self-protection jamming to degrade and or detect the ability of surface-to-air and air-to-air weapon systems to engage the U-2 aircraft. A full ADS capability will be achieved through spiral upgrades. Spiral upgrades will address modern RF signals in the baseline system. Follow-on upgrades will include infrared warning and defense. Onboard and offboard data fusion will be provided as a growth provision to enhance situational awareness.</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u> (U) \$0 No Activity (U) \$0 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u> (U) \$0 Funding included in PE 0305206F (U) \$0 Total</p> <p>(U) <u>FY 2001 (\$ in Thousands)</u> (U) \$9,616 Defensive System Hardware Development (U) \$5,500 Software Development (U) \$1,000 SPO Support (U) \$1,500 System Test (U) \$17,616 Total</p> <p>(U) <u>B. Project Change Summary</u></p>									
Project 674818			Page 3 of 8 Pages				Exhibit R-2A (PE 0305202F)		

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305202F Dragon U-2 (JMIP)	PROJECT 674818
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(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) ADS RDT&E PE 35206F	0	8,600	0	0	0	0	0	Continuing	TBD
(U) ADS Production (APAF 305202)	0	0	1,561	1,522	3,895	4,042	4,121	Continuing	TBD

(U) **D. Acquisition Strategy**
 Funds are for the engineering, manufacturing and development for the U-2 Advanced Defensive System (ADS). A sole source contract will be awarded to a prime contractor which will be responsible for delivering a total system. The prime contractor may subcontract for subsystems of the ADS. Efforts include the development of ADS, integration on the U-2 aircraft, testing and production planning.

(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) U-2 ADS Milestone 2						X						
(U) ADS Phase 2 Contract Award						X						
(U) Begin ADS Flight Testing												X

Note: * denotes completed event, X denotes 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		
07 - Operational System Development				0305202F Dragon U-2 (JMIP)				674818		
(U) A. Project Cost Breakdown (\$ in Thousands)										
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>
(U)	Hardware and Software Development									9,616
(U)	Systems Engineering									3,000
(U)	Contractor Engineering Support									2,500
(U)	Government Engineering Support									1,000
(U)	System Test									1,500
(U)	Total									17,616
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)										
(U) Performing Organizations:										
<u>Contractor or</u>	<u>Contract</u>									
<u>Government</u>	<u>Method/Type</u>	<u>Award or</u>	<u>Performing</u>	<u>Project</u>						
<u>Performing</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Organizations</u>										
Adv Def Sys Cont	CPIF	2nd Qtr 00	TBD	TBD				15,116	Continuing	TBD
<u>Support and Management Organizations</u>										
ASC/RA								1,000	Continuing	TBD
<u>Test and Evaluation Organizations</u>										
Eglin AFB, Edwards AFB								1,500	Continuing	TBD
					<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								15,116	TBD	TBD
Subtotal Support and Management								1,000	TBD	TBD
Subtotal Test and Evaluation								1,500	TBD	TBD
Total Project								17,616	TBD	TBD

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 2000	
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305202F Dragon U-2 (JMIP)				PROJECT 674820	
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
674820 Manned Reconnaissance Systems U-2	0	0	9,930	7,675	1,939	1,936	1,931	Continuing	TBD
<p>Note: FY99 - FY00 funding included in PE 0305207F.</p> <p>(U) <u>A. Mission Description</u> This development project supports high payoff improvements to the U-2 Advanced Synthetic Aperture Radar System (ASARS-2) through the ASARS-2 Improvement Program (AIP). AIP improves area search, precision geolocation, and image quality characteristics sufficiently to directly support the targeting of precision guided munitions (PGMs). Complex imagery will be produced by the AIP system and support significant exploitation products for the imagery analysts. AIP champions the introduction of Asynchronous Transfer Mode (ATM) datalink formats to the ISR community and supports National Imagery Transmission Format (NITF) standards. Several Line Replaceable Units (LRU) including the Process Control Unit (PCU), Receiver - Exciter (RE), and transmitter are approaching the end of their supportability life. Developing new LRUs with next generation technology will make ASARS-2 supportable through the expected service life of the U-2 and provide capability enhancements necessary to support PGMs. Improvements to the ASARS-2 are directly transferable to Global Hawk High Altitude Endurance Unmanned Aerial Vehicles (HAE UAV) should migration of this improvement become a requirement. Funding for evaluation and risk reduction of U-2 fuel conversion from JPTS to JP-8 are also contained in this program element.</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u> (U) \$0 Funding included in PE 0305207F (U) \$0 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u> (U) \$0 Funding included in PE 0305207F (U) \$0 Total</p> <p>(U) <u>FY 2001 (\$ in Thousands)</u> (U) \$289 Continued Common Exploitation Tool Development (AIP) (U) \$1,141 Fuel Conversion (U) \$414 SPO Support (AIP and Fuel Conversion) (U) \$7,311 Continue Radar Transmitter Development (AIP) (U) \$775 Begin Radar Antenna Development (AIP) (U) \$9,930 Total</p>									
Project 674820			Page 6 of 8 Pages				Exhibit R-2A (PE 0305202F)		

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305202F Dragon U-2 (JMIP)	PROJECT 674820
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(U) **B. Project Change Summary**

(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 PE 0305207F - AIP	47,795	9,388	0	0	0	0	0	Continuing	TBD
(U) APAF, Manned Recce, 0305207F - AIP Production*	39,364	15,312	0	0	0	0	0	Continuing	TBD
(U) APAF, Manned Recce, 0305202F - AIP Production	0	0	12,777	18,659	15,380	6,066	4,016	Continuing	TBD

* First Upgrade Radar Transmitter Deliveries in 3QFY03

(U) **D. Acquisition Strategy**

For airborne collection capability upgrades, modify existing platform and associated ground control equipment via Engineering Change Proposals (ECPs)/Task orders to existing USAF contracts. For ASARS-2, develop and test new technology line replaceable units (LRU's). There is associated procurement funding tied to this development activity.

(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) ASARS-2 Improvement Program												
(U) -Begin Radar Transmitter Upgrade									X			
(U) -Deliver Block 10 Software											X	
(U) Fuel Conversion												
(U) -Cold Flow Simulation (Cont)									X			
(U) -High Altitude Cold Temp Model (Cont)									X			
(U) -Material Compatability (Cont)									X			
(U) -Thermal Stability (Cont)									X			
(U) -Engine Testing										X		

Note: * denotes completed event, X denotes planned event.

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development					PE NUMBER AND TITLE 0305202F Dragon U-2 (JMIP)			PROJECT 674820		
(U) <u>A. Project Cost Breakdown (\$ in Thousands)</u>										
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>
(U)	Primary Hardware Development									4,175
(U)	Software Development									5,068
(U)	Government Engineering Support									408
(U)	System Testing									279
(U)	Total									9,930
(U) <u>B. Budget Acquisition History and Planning Information (\$ in Thousands)</u>										
(U) <u>Performing Organizations:</u>										
<u>Contractor or</u>	<u>Contract</u>									
<u>Government</u>	<u>Method/Type</u>	<u>Award or</u>	<u>Performing</u>	<u>Project</u>						
<u>Performing</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Organizations</u>										
	Raytheon (AIP)	CPIF	3Q96	N/A	N/A			9,243	Continuing	TBD
<u>Support and Management Organizations</u>										
	ASC/RA							408	Continuing	TBD
<u>Test and Evaluation Organizations</u>										
	Edwards, AFB							279	Continuing	TBD
					<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
					<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
	<u>Subtotals</u>							9,243	TBD	TBD
	Subtotal Product Development							408	TBD	TBD
	Subtotal Support and Management							279	TBD	TBD
	Subtotal Test and Evaluation							9,930	TBD	TBD
	Total Project									

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

DATE

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BUDGET ACTIVITY

07 - Operational System Development

PE NUMBER AND TITLE

0305205F Endurance Unmanned Aerial Vehicles

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	183,017	77,866	109,215	70,106	48,467	49,465	50,559	Continuing	TBD
674755 Predator	4,261	3,907	3,696	3,773	3,839	3,917	3,994	Continuing	TBD
674799 Global Hawk	97,493	73,959	103,219	66,333	44,628	45,548	46,565	Continuing	TBD
674815 DarkStar*	33,715	0	0	0	0	0	0	0	53,783
674816 Common Ground Segment	47,548	0	0	0	0	0	0	0	47,548
674883 JTC/SIL MUSE	0	0	2,300	0	0	0	0	0	TBD
Quantity of RDT&E Articles	0	0	2	0	0	0	0	0	0

Note: The DarkStar portion of the HAE UAV ACTD was canceled on 29 Jan 99. Request for reprogramming of DarkStar funds to Global Hawk and Common Ground Segment (DD1415-1 dated 24 Aug 99, DOD Ser. No. FY99-013 PA) was approved by Congress on 23 Dec 99. DarkStar and CGS funding lines have been transferred to the Global Hawk System program. The DarkStar and CGS funding lines will be deleted.

(U) A. Mission Description

Endurance Unmanned Aerial Vehicles (UAVs) are a family of unmanned vehicles developed under two separate Advanced Concept Technology Demonstrations (ACTD) They will provide all-weather, day/night, reconnaissance and surveillance in direct support of the Joint Forces Commander and integrate with existing airborne reconnaissance architectures for mission planning, data processing, exploitation and dissemination. The RQ-1A Predator UAV is a medium altitude endurance (MAE) UAV which completed its ACTD in FY96. The RQ-4A Global Hawk is a high altitude endurance (HAE) UAV. The Global Hawk, along with its associated ground station, the Common Ground Segment, is currently scheduled to complete its ACTD phase in June 00. The program will then transition to a 'normal' acquisition program in EMD.

(U) B. Budget Activity Justification

This program is budget activity 7, Operational Systems Development, because it involves Air Force R&D to field a viable system and develop additional operational capabilities.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)			DATE February 2000	
BUDGET ACTIVITY		PE NUMBER AND TITLE		
07 - Operational System Development		0305205F Endurance Unmanned Aerial Vehicles		
(U)	<u>C. Program Change Summary (\$ in Thousands)</u>			
		<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
	<u>Total Cost</u>			
(U)	Previous President's Budget (FY 2000 PBR)	188,423	70,835	26,788
(U)	Appropriated Value	188,957	79,800	
(U)	Adjustments to Appropriated Value			
	a. Congressional/General Reductions	-534		
	b. Small Business Innovative Research			
	c. Omnibus or Other Above Threshold Reprogram		-428	
	d. Below Threshold Reprogram	-4,382		
	e. Rescissions	-1,024	-1,506	
	f. Other			TBD
(U)	Adjustments to Budget Years Since FY 2000 PBR			82,427
(U)	Current Budget Submit/FY 2001 PBR	183,017	77,866	109,215
(U)	<u>Significant Program Changes:</u>			
	(1) FY99 below threshold reprogramming transferred funds to higher Air Force priorities.			
	(2) FY01 adjustment will fund Global Hawk engineering and manufacturing development (EMD) and operationalization.			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 2000	
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305205F Endurance Unmanned Aerial Vehicles				PROJECT 674755	
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
674755 Predator	4,261	3,907	3,696	3,773	3,839	3,917	3,994	Continuing	TBD
<p>(U) <u>A. Mission Description</u> The Predator unmanned aerial vehicle (UAV) is a medium altitude endurance UAV capable of sustained (long dwell) surveillance of critical targets, under most weather conditions, at a range of 500 nm from the launch area. Twelve Predator systems are being procured (each system consists of four air vehicles, one ground control station, and one Predator primary satellite link). The Predator is equipped with Electro-Optical/Infrared (EO/IR) and Synthetic Aperture Radar (SAR) sensors. Predator also incorporates line-of-sight(LOS), narrow-band UHF SATCOM and wide-band Ku-band SATCOM datalinks capable of providing near-real-time (NRT) transmission of high resolution imagery throughout the operational envelope. The system supports the theater commander and interfaces with the Command, Control, Communication, Computer and Intelligence (C4I) architecture. The first five Predator systems were procured either from an Advanced Concept Technology Demonstration or in an interim configuration. Beginning with the sixth system, Predators will be in a Baseline configuration, with upgrades including de-icing, UHF/VHF voice relay, and IFF Mode IV. IR sensor improvements, growth payloads, work station upgrades and reliability and maintainability improvements are being considered as part of Block I. UAV Common Automatic Recovery System (UCARS) has been added by Congress. As a result of a combat mission need statement (C-MNS) generated during ALLIED FORCE operations in Kosovo, one Predator system was outfitted with a temporary laser designator for use with precision guided munitions. Congress added production funds in FY00 for a permanent laser designator capability, tactical common data link (TCDL) and dual channel communications, and directed compliance with Tactical Control System standards; all will be added to Block I improvements.</p>									
<p>(U) <u>FY 1999 (\$ in Thousands)</u></p> <p>(U) \$630 Preparation for operational test and evaluation (OT&E)</p> <p>(U) \$904 Block 1 improvements (dual channel communications, Ku SATCOM tunability, Air Force Mission Support System (AFMSS) integration)</p> <p>(U) \$290 Rectified identified air vehicle and ground station deficiencies to improve R&M</p> <p>(U) \$1,763 Integrated UAV Common Automatic Recovery System (UCARS)</p> <p>(U) \$674 Integrated temporary laser designator in response to C-MNS</p> <p>(U) \$4,261 Total</p>									
<p>(U) <u>FY 2000 (\$ in Thousands)</u></p> <p>(U) \$800 Conduct OT&E/developmental testing of Block I improvements</p> <p>(U) \$2,750 Block I improvements (IR sensor improvements, growth payloads, work station upgrades, reliability and maintainability improvements)</p> <p>(U) \$357 Field support (increased level of support to prepare for formal OT&E)</p> <p>(U) \$3,907 Total</p>									
Project 674755			Page 3 of 25 Pages				Exhibit R-2A (PE 0305205F)		

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305205F Endurance Unmanned Aerial Vehicles	PROJECT 674755
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(U) **E. Schedule Profile Continued**

	<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) TEMP approval		*										
(U) Delivery of first Baseline system						X						
(U) OT&E									X			
(U) Retrofit of ACTD Systems complete												X
* denotes completed event												
X denotes planned event												

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development					PE NUMBER AND TITLE 0305205F Endurance Unmanned Aerial Vehicles			PROJECT 674755		
(U) <u>A. Project Cost Breakdown (\$ in Thousands)</u>										
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>
(U)	Hardware/Software					1,600		1,342		2,067
(U)	Demonstrations and test					1,126		950		500
(U)	System integration and engineering support					978		1,195		704
(U)	Other technical/engineering					557		420		425
(U)	Total					4,261		3,907		3,696
(U) <u>B. Budget Acquisition History and Planning Information (\$ in Thousands)</u>										
(U) <u>Performing Organizations:</u>										
	<u>Contractor or</u>	<u>Contract</u>								
	<u>Government</u>	<u>Method/Type</u>	<u>Award or</u>	<u>Performing</u>	<u>Project</u>					
	<u>Performing</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>
	<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>
	<u>Product Development Organizations</u>									
	General Atomics	SS/CPFF	Apr 98	N/A	N/A	9,692	3,214	2,881	3,071	Continuing
	PM TESAR			N/A	N/A	2,300				0
	<u>Support and Management Organizations</u>									
	ASC					0	417	426	425	Continuing
	AD/NAVAIR					320	0			0
	<u>Test and Evaluation Organizations</u>									
	AFOTEC					795	630	600	200	0
	Misc					330				0
(U) <u>Government Furnished Property:</u>										
		<u>Contract</u>								
		<u>Method/Type</u>	<u>Award or</u>							
	<u>Item</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Delivery</u>		<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>
	<u>Description</u>	<u>Vehicle</u>	<u>Date</u>	<u>Date</u>		<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>
	<u>Product Development Property</u>									
	<u>Support and Management Property</u>									

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)

DATE

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BUDGET ACTIVITY

PE NUMBER AND TITLE

PROJECT

07 - Operational System Development

0305205F Endurance Unmanned Aerial Vehicles

674755

(U) Government Furnished Property Continued:

Test and Evaluation Property

	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
Subtotals						
Subtotal Product Development	11,992	3,214	2,881	3,071	TBD	TBD
Subtotal Support and Management	320	417	426	425	TBD	TBD
Subtotal Test and Evaluation	1,125	630	600	200	0	2,555
Total Project	13,437	4,261	3,907	3,696	TBD	TBD

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 2000	
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305205F Endurance Unmanned Aerial Vehicles				PROJECT 674799	
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
674799 Global Hawk	97,493	73,959	103,219	66,333	44,628	45,548	46,565	Continuing	TBD
<p>Notes:</p> <p>(1) The DarkStar portion of the HAE UAV ACTD was canceled on 29 Jan 99. Request for reprogramming of \$17M of FY99 DarkStar funds to Global Hawk and Common Ground Segment (DD1415-1 dated 24 Aug 99, DOD Ser. No. FY99-013 PA) was approved by Congress on 23 Dec 99.</p> <p>(2) Remaining FY01-05 DarkStar and FY00-05 CGS funding lines have been transferred to the Global Hawk System program, to be consolidated under the Global Hawk Program.. The DarkStar and CGS funding lines will be deleted.</p> <p>(U) A. Mission Description</p> <p>The Global Hawk High Altitude Endurance (HAE) UAV program consists of the Global Hawk air vehicle and the Common Ground Segment (CGS). The Global Hawk System is being designed to provide continuous, all-weather, day/night, wide area surveillance and reconnaissance and includes the communications and interfaces with other theater systems required to support joint tactical warfighters at various levels of command. The Global Hawk air vehicle will be a fully automatic, high-altitude, long endurance unmanned aircraft that is directly responsive to theater tasking. Global Hawk will integrate with the existing tactical airborne reconnaissance architectures for tasking, mission planning, data processing, exploitation, and dissemination. It is designed to provide up to 40,000 sq. nmi. of wide area search radar imagery and either Electro-Optical (EO) or Infrared Radar (IR) imagery with 1m resolution per mission or up to 1900 EO, IR, or radar spot images per mission with 0.3m resolution. The design targeting accuracy is less than 20m CEP. The Global Hawk UAV is designed to standoff, operate in a low-to-moderate air defense threat environment and collect imagery while looking deep into high threat areas.</p> <p>In FY99 the Global Hawk System continued the user demonstration phase of the ACTD. Funding was used for fabrication and integration of air vehicles 3, 4, and 5, fabrication of the System Integration Lab, airframe improvements, and continued participation in Joint Military Exercises with the other services. Global Hawk entered the user demonstration phase in June 99 and since that time it has flown in 16 exercises, disseminated imagery to 5 different users, flown for extended periods of time overwater (enroute to Alaska), and accumulated over 200 hours in FAA-controlled airspace.</p> <p>In FY00, Global Hawk funding will complete the remaining work to be done in readying air vehicles 3, 4, & 5 for flight, finish the user demonstrations (ending in June 00), and complete the Military Utility Assessment (MUA), which will render a final evaluation of Global Hawk's utility to the warfighter. Congress added \$15M to the Global Hawk funding line in FY00 to preserve the Global Hawk industrial base. This will be accomplished by ordering long-lead items to begin fabrication of the two Congressionally-authorized ACTD air vehicles for EMD, identifying those operational deficiencies to be addressed during the EMD, and preparation for transitioning to EMD in FY01.</p>									
Project 674799			Page 8 of 25 Pages				Exhibit R-2A (PE 0305205F)		

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE
BUDGET ACTIVITY		PROJECT
07 - Operational System Development	0305205F Endurance Unmanned Aerial Vehicles	February 2000 674799
(U) <u>A. Mission Description Continued</u>		
FY01 funding will be used to complete fabrication of air vehicles #6 & #7 (for EMD), Non-Recurring Engineering to evolve the Global Hawk to a Block 5 (including spiral development of sensors and other capabilities), initiate spiral development to Block 10 (ORD-compliant air vehicles) and support the overseas demonstration in Australia. The Australians are providing half of the funding for this demonstration effort.		
(U) <u>FY 1999 (\$ in Thousands)</u>		
(U) \$13,881	Product Development and Testing (Phase II)	
(U) \$40,266	Fabrication and Integration of air vehicles #3, #4, and #5 (Phase IIB)	
(U) \$28,463	Provided Contractor Demonstration and Evaluation Support necessary to accomplish Military Utility Assessment (Phase III)	
(U) \$9,000	System Integration Lab (Development Test Model)	
(U) \$5,883	Airframe Reliability and Maintainability Improvements (Producibility)	
(U) \$97,493	Total	
(U) <u>FY 2000 (\$ in Thousands)</u>		
(U) \$38,201	Provide Contractor and Government Demonstration and Evaluation Support necessary to accomplish Military Utility Assessment (Phase III)	
(U) \$2,200	Integrated Logistic Support	
(U) \$58	Complete Fabrication and Integration of air vehicles #3, #4, and #5 (Phase IIB)	
(U) \$15,000	Added to FY00 program per Congressional plus-up for the following:	
	-- Begin ACTD air vehicle #6 & #7 fabrication	
	-- Preparation for transition to EMD in FY01 (Address operability, supportability and safety deficiencies identified during the ACTD)	
(U) \$12,798	Added to program per consolidation of CGS and Global Hawk into same BPAC:	
	-- Development and test of demonstration CGS	
	-- Contractor participation in MUA	
	-- Government support, studies and related tasks for CGS	
(U) \$5,702	Government Support, Studies, and Related Tasks for the Global Hawk program	
(U) \$73,959	Total	
Project 674799	Page 9 of 25 Pages	Exhibit R-2A (PE 0305205F)

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

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BUDGET ACTIVITY

07 - Operational System Development

PE NUMBER AND TITLE

0305205F Endurance Unmanned Aerial Vehicles

PROJECT

674799**(U) A. Mission Description Continued****(U) FY 2001 (\$ in Thousands)**

- | | |
|---------------|---|
| (U) \$36,800 | Fabrication and Integration of 2 additional ACTD air vehicles for EMD (#6 and #7) (Phase IIC) |
| (U) \$44,600 | Non-recurring Engineering (NRE) to evolve the Global Hawk System to a Block 5 configuration
-- Includes spiral development of sensors and other capabilities
-- Spiral development (Block 5 to Block 10) of air vehicles which will satisfy needs identified in the MUA and ORD |
| (U) \$10,000 | Operational Demonstration in Australia |
| (U) \$6,000 | Provide Government Test and Evaluation Support |
| (U) \$5,819 | Government Support, Studies and Related Tasks for the Global Hawk System Program |
| (U) \$103,219 | Total |

(U) B. Project Change Summary

A Defense Acquisition Executive (DAE) directive issued on 20 Aug 99, directed the Air Force to initiate an acquisition program with a MSII decision at the end of FY00, buy 2 EMD air vehicles in FY01, and begin production of 2 air vehicles per year in FY02.

Approval was received from Congress on 23 Dec 99 on a DD1415-1, FY99-013 PA, to transfer \$17M of residual DarkStar funding to the Global Hawk and CGS programs. This transfer is not reflected in this PB submission, as the change has not yet been reflected in the funding database.

In response to concerns about preserving the Global Hawk industrial base, Congress added \$15M to the program in FY00 and added language authorizing the purchase of two additional ACTD air vehicles for EMD. The Congressional add will be used to begin fabrication of these 2 air vehicles and to begin preparations for EMD, which will begin in FY01, following the MSII acquisition decision in 4QFY00.

FY99 and FY00 funds for the procurement of air vehicles 6 & 7 and Pre-EMD (evolution of Global Hawk ACTD System into a FY99 Block 5 configuration) was not included in our FY99 and FY00 Budget Justification. Congress approved the reprogramming of FY99 Darkstar funds via DD Form 1415-1, DOD Serial Number FY99-013PA (approved Dec 99) to apply to this task. Additionally, in FY00 Congress added funds and authorized procurement of these additional vehicles. Initiation of this project is reflected within this FY01 Budget Request.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)							DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305205F Endurance Unmanned Aerial Vehicles			PROJECT 674799		
(U) C. Other Program Funding Summary (\$ in Thousands)									
	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Cost to</u>	<u>Total Cost</u>
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	
(U) AF RDT&E									
(U) Other APPN									
(U) Aircraft Procurement, AF (HAE UAV)			22,388	91,457	95,315	83,974	72,380	80	TBD
Funds are associated with preparation for and transition of HAE UAV ACTD to a Global Hawk System production program that will include CGS.									
(U) D. Acquisition Strategy									
The Global Hawk HAE UAV program began as an ACTD, under DARPA, in 1994. Five contractors originally submitted design proposals, with Northrop Grumman (Ryan Aeronautical Center) competitively selected to lead the design / development effort. Under the Development Phase agreement, the contractor will build and test five Global Hawk air vehicles, and a developmental ground segment. Streamlined procurement, using Other Transaction Authority, is being used to delete all non value-added tasks and documentation from the program.									
The Air Force assumed responsibility for the ACTD in October 98. Global Hawk will finish the ACTD phase in June 00, and the Military Utility Assessment (MUA) will be delivered in 4QFY00, providing an overall evaluation of Global Hawk's military utility and operational suitability. An acquisition decision in late 2000 follows delivery of the Military Utility Assessment from JFCOM.									
Based on the DAE directive of 20 Aug 99, the program will transition from an ACTD to a one year EMD (FY01) to an acquisition program (beginning in FY02). The EMD program consists of the total Global Hawk System which includes the CGS. EMD will evolve the Global Hawk System to a Block 5 configuration. While not completely ORD-compliant, these Block 5 air vehicles will have the minimum upgrades necessary to operationalize them for deployment. The program will utilize spiral development to operationalize the design of the EMD air vehicles to Block 5 to Block 10. Block 10 will correct deficiencies identified in the MUA and ORD, specifically those related to safety of flight, operability and supportability.									
In FY02 the program will commence procurement of 2 Block 5 air vehicles per year. The next upgrade will be Block 10 (ORD-compliant) air vehicles. Block 10 air vehicles are not budgeted in the current FYDP but will be addressed in future POM submissions.									
(U) E. Schedule Profile									
			<u>FY 1999</u>			<u>FY 2000</u>		<u>FY 2001</u>	

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305205F Endurance Unmanned Aerial Vehicles	PROJECT 674799
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(U) <u>E. Schedule Profile Continued</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
(U) Demonstration support award		*										
(U) User field demos with warfighters			*									
(U) ACTD ends						X						
(U) Military Utility Assessment								X				
(U) Acquisition decision								X				
(U) Start of EMD Program, purchase of air vehicles 6 & 7									X			
(U) Australian Demonstration										X		
* denotes completed event												
X denotes 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			
07 - Operational System Development				0305205F Endurance Unmanned Aerial Vehicles			674799			
(U) A. Project Cost Breakdown (\$ in Thousands)										
				<u>FY 1999</u>		<u>FY 2000</u>			<u>FY 2001</u>	
(U)	Product Development and Testing (Phase II)			13,881						
(U)	Fabrication and Integration of air vehicles #3, #4, and #5 (Phase IIB)			40,266		58				
(U)	Provide Contractor Demonstration and Evaluation Support necessary to accomplish Military Utility Assessment (Phase III)			28,463		22,735				
(U)	System Integration Lab (Development Test Model)			9,000						
(U)	Airframe Reliability and Maintainability Improvements (Producibility)			5,883						
(U)	Provide Government Demonstration and Evaluation Support necessary to accomplish Military Utility Assessment					15,466				
(U)	FY00 Congressional Plus-up for the following:					15,000				
(U)	-- Begin air vehicle #6 and #7 fabrication									
(U)	-- Begin preparation for transition to EMD in FY01									
(U)	Integrated Logistic Support					2,200				
(U)	Added to program per consolidation of CGS and Global Hawk into same BPAC:					12,798				
(U)	-- Development and test of demonstration CGS									
(U)	-- Contractor participation in MUA									
(U)	-- Government support, studies and related tasks for the CGS									
(U)	Government Support, Studies and Related Tasks for the Global Hawk System					5,702			5,819	
(U)	Fabrication and Integration of air vehicles #6 and #7 (Phase IIC)								36,800	
(U)	Non-recurring Engineering (NRE) to evolve the Global Hawk System to a Block 5 configuration								44,600	
(U)	Operational Demonstration in Australia								10,000	
(U)	Provide Government Test and Evaluation Support								6,000	
(U)	Total			97,493		73,959			103,219	
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)										
(U) Performing Organizations:										
<u>Contractor or</u>	<u>Contract</u>									
<u>Government</u>	<u>Method/Type</u>	<u>Award or</u>	<u>Performing</u>	<u>Project</u>						
<u>Performing</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
Project 674799										

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000		
BUDGET ACTIVITY				PE NUMBER AND TITLE				PROJECT	
07 - Operational System Development				0305205F Endurance Unmanned Aerial Vehicles				674799	
(U) Performing Organizations Continued:									
<u>Product Development Organizations</u>									
Ryan Aeronautical Center	SS/CPFF/IF	N/A	N/A	0	97,493	48,172	84,200	Continuing	TBD
Various						977			977
<u>Support and Management Organizations</u>									
Various		N/A	N/A	0	0	8,855	13,019	Continuing	TBD
Support ASC						1,630			1,630
<u>Test and Evaluation Organizations</u>									
AFFTC		N/A	N/A	0	0	7,250	3,000	Continuing	TBD
AFOTEC		N/A	N/A	0	0	5,825	2,000	Continuing	TBD
Various		N/A	N/A	0	0	1,250	1,000	Continuing	TBD
				<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				0	97,493	49,149	84,200	TBD	TBD
Subtotal Support and Management				0	0	10,485	13,019	TBD	TBD
Subtotal Test and Evaluation				0	0	14,325	6,000	TBD	TBD
Total Project				0	97,493	73,959	103,219	TBD	TBD

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 2000																																									
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305205F Endurance Unmanned Aerial Vehicles				PROJECT 674815																																									
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																																								
674815 DarkStar*	33,715	0	0	0	0	0	0	0	53,783																																								
<p>(U) <u>A. Mission Description</u> DarkStar portion of HAE ACTD cancelled 29 Jan 99. On 24 Aug 99 a DD1415-1 was submitted to Congress to transfer \$17M of residual DarkStar funding to the Global Hawk and CGS programs. All FY 01 through 05 funds have been transferred to the Global Hawk System Program.</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u> (U) \$16,715 Contract / Program Closeout (U) \$17,000 Transfer to Global Hawk and Common Ground Segment to correct Global Hawk 'must fix' items identified during flight test, mitigate a one-year production break, and enhance pre-Engineering Manufacturing Development (EMD) activities as required by Congress. Funds are also needed to begin pre-EMD on the CGS subprogram. Both Global Hawk and CGS require the procurement of test spare parts to support user demonstrations. (U) \$33,715 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u> (U) \$0 No funds. Line zeroed out by Congress in 00. (U) \$0 Total</p> <p>(U) <u>FY 2001 (\$ in Thousands)</u> (U) \$0 Project funds have been merged into the Global Hawk system program. (U) \$0 Total</p> <p>(U) <u>B. Project Change Summary</u></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></th> <th style="width:10%;"><u>FY 2000</u></th> <th style="width:10%;"><u>FY 2001</u></th> <th style="width:10%;"><u>FY 2002</u></th> <th style="width:10%;"><u>FY 2003</u></th> <th style="width:10%;"><u>FY 2004</u></th> <th style="width:10%;"><u>FY 2005</u></th> <th style="width:10%;"><u>Cost to</u></th> <th style="width:10%;"><u>Total Cost</u></th> </tr> <tr> <td></td> <td align="center"><u>Actual</u></td> <td align="center"><u>Estimate</u></td> <td align="center"><u>Estimate</u></td> <td align="center"><u>Estimate</u></td> <td align="center"><u>Estimate</u></td> <td align="center"><u>Estimate</u></td> <td align="center"><u>Estimate</u></td> <td align="center"><u>Complete</u></td> <td></td> </tr> </thead> <tbody> <tr> <td>(U) AF RDT&E</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Other APPN</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>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Cost to</u>	<u>Total Cost</u>		<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>		(U) AF RDT&E										(U) Other APPN									
	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Cost to</u>	<u>Total Cost</u>																																								
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>																																									
(U) AF RDT&E																																																	
(U) Other APPN																																																	

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305205F Endurance Unmanned Aerial Vehicles	PROJECT 674815
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(U) **D. Acquisition Strategy**
N/A

(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) Program terminated		*										

(U) Program terminated
* denotes completed event
X denotes 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			
07 - Operational System Development					0305205F Endurance Unmanned Aerial Vehicles			674815			
(U) A. Project Cost Breakdown (\$ in Thousands)											
					<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>		
(U)	Contract/program close-out				16,715		0		0		
(U)	transfer to Global Hawk and Common Ground Segment to correct Global Hawk must fix items identified during flight test, mitigate a one-year production break, and enhance pre-Engineering Manufacturing Development (EMD) activities as required by Congress.				17,000		0		0		
(U)	Total				33,715		0		0		
(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>Performing Activity</u>	<u>or Funding Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>						
	<u>Product Development Organizations</u>										
	LMSW	SS/CPIF		N/A	N/A	20,068	16,715			0	36,783
	Transfer to Global Hawk and Common Ground Segment - Ryan Aeronautical Center				N/A	N/A	17,000	0	0	0	17,000
	<u>Support and Management Organizations</u>										
	<u>Test and Evaluation Organizations</u>										
(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>or Funding Vehicle</u>	<u>Date</u>	<u>Date</u>							
	<u>Product Development Property</u>										
	<u>Support and Management Property</u>										
	<u>Test and Evaluation Property</u>										

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)		DATE				
07 - Operational System Development		0305205F Endurance Unmanned Aerial Vehicles			February 2000	
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT				
						674815
	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Subtotals</u>						
Subtotal Product Development	20,068	33,715	0	0	0	53,783
Subtotal Support and Management						
Subtotal Test and Evaluation						
Total Project	20,068	33,715	0	0	0	53,783

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)							DATE February 2000																																											
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305205F Endurance Unmanned Aerial Vehicles				PROJECT 674816																																										
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																																								
674816	Common Ground Segment	47,548	0	0	0	0	0	0	0	47,548																																								
<p>(U) <u>A. Mission Description</u> The Common Ground Segment (CGS) is an integral part of the HAE UAV system. With the cancellation of the DarkStar portion of the HAE UAV ACTD, there is no need to maintain a separate BPAC for the CGS. Accordingly, funds from FY00-05 have been merged into the Global Hawk program (BPAC 674799).</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u> (U) \$11,764 Development and test in support of Global Hawk system (U) \$14,303 Contractor participation in Military Utility Assessment (U) \$10,336 Government participation in Military Utility Assessment (U) \$11,145 Government support, studies, and related tasking support of the HAE UAV ACTD programs (U) \$47,548 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u> (U) \$0 Project funds have been merged into Global Hawk (U) \$0 Total</p> <p>(U) <u>FY 2001 (\$ in Thousands)</u> (U) \$0 Project funds have been merged into Global Hawk (U) \$0 Total</p> <p>(U) <u>B. Project Change Summary</u> Project funds have been transferred into the Global Hawk System program (BPAC 674799)</p> <p>(U) <u>C. Other Program Funding Summary (\$ in Thousands)</u></p> <table border="1"> <thead> <tr> <th></th> <th><u>FY 1999</u> <u>Actual</u></th> <th><u>FY 2000</u> <u>Estimate</u></th> <th><u>FY 2001</u> <u>Estimate</u></th> <th><u>FY 2002</u> <u>Estimate</u></th> <th><u>FY 2003</u> <u>Estimate</u></th> <th><u>FY 2004</u> <u>Estimate</u></th> <th><u>FY 2005</u> <u>Estimate</u></th> <th><u>Cost to</u> <u>Complete</u></th> <th><u>Total Cost</u></th> </tr> </thead> <tbody> <tr> <td>(U) AF RDT&E</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Other APPN</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Aircraft Procurement, AF (HAE UAV)</td> <td></td> <td></td> <td align="right">22,966</td> <td align="right">94,046</td> <td align="right">97,978</td> <td align="right">86,008</td> <td align="right">74,006</td> <td>Continuing</td> <td align="right">TBD</td> </tr> </tbody> </table>												<u>FY 1999</u> <u>Actual</u>	<u>FY 2000</u> <u>Estimate</u>	<u>FY 2001</u> <u>Estimate</u>	<u>FY 2002</u> <u>Estimate</u>	<u>FY 2003</u> <u>Estimate</u>	<u>FY 2004</u> <u>Estimate</u>	<u>FY 2005</u> <u>Estimate</u>	<u>Cost to</u> <u>Complete</u>	<u>Total Cost</u>	(U) AF RDT&E										(U) Other APPN										(U) Aircraft Procurement, AF (HAE UAV)			22,966	94,046	97,978	86,008	74,006	Continuing	TBD
	<u>FY 1999</u> <u>Actual</u>	<u>FY 2000</u> <u>Estimate</u>	<u>FY 2001</u> <u>Estimate</u>	<u>FY 2002</u> <u>Estimate</u>	<u>FY 2003</u> <u>Estimate</u>	<u>FY 2004</u> <u>Estimate</u>	<u>FY 2005</u> <u>Estimate</u>	<u>Cost to</u> <u>Complete</u>	<u>Total Cost</u>																																									
(U) AF RDT&E																																																		
(U) Other APPN																																																		
(U) Aircraft Procurement, AF (HAE UAV)			22,966	94,046	97,978	86,008	74,006	Continuing	TBD																																									

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305205F Endurance Unmanned Aerial Vehicles	PROJECT 674816
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(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>	

Funds are associated with preparation for and transition of HAE UAV ACTD to a Global Hawk System production program that will include CGS and be funded from BPAC 674799.

(U) **D. Acquisition Strategy**
CGS funds have been merged with Project 674799 - Global Hawk as the Global Hawk System transitions from an ACTD to a formal acquisition program.

(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) Demonstration support award

(U) Fabricate demo CGS

* denotes completed event

X denotes 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			
07 - Operational System Development				0305205F Endurance Unmanned Aerial Vehicles				674816			
(U) A. Project Cost Breakdown (\$ in Thousands)											
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>	
(U)	Development and test in support of Global Hawk system					11,764		0			
(U)	Contractor Participation in the Military Utility Assessment					14,303		0			
(U)	Government Participation in the Military Utility Assessment					10,336		0			
(U)	Government Support, Studies and Related Tasks in support of the HAE UAV ACTD Programs					11,145		0			
(U)	Total					47,548		0			
(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>											
	Raytheon			N/A	N/A		13,485	0	0	0	13,485
	Ryan Aeronautical Center			N/A	N/A		10,795	0	0	0	10,795
	Various			N/A	N/A		994	0	0	0	994
<u>Support and Management Organizations</u>											
	ASC			N/A	N/A		2,272	0	0	0	2,272
	Various			N/A	N/A		9,716	0	0	0	9,716
<u>Test and Evaluation Organizations</u>											
	AFFTC			N/A	N/A		4,307	0	0	0	4,307
	AFOTEC			N/A	N/A		4,914	0	0	0	4,914
	Various			N/A	N/A		1,065	0	0	0	1,065
(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>

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305205F Endurance Unmanned Aerial Vehicles	PROJECT 674816
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(U) Government Furnished Property Continued:

<u>Item</u>	<u>Contract Method/Type or Funding</u>	<u>Award or Obligation</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>Description</u>	<u>Vehicle</u>	<u>Date</u>	<u>Date</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Property</u>									
<u>Support and Management Property</u>									
<u>Test and Evaluation Property</u>									
<u>Subtotals</u>				<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
				<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
Subtotal Product Development					25,274	0	0	0	25,274
Subtotal Support and Management					11,988	0	0	0	11,988
Subtotal Test and Evaluation					10,286	0	0	0	10,286
Total Project					47,548	0	0	0	47,548

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 2000																																										
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305205F Endurance Unmanned Aerial Vehicles				PROJECT 674883																																										
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																																								
674883	JTC/SIL MUSE	0	0	2,300	0	0	0	0	0	TBD																																								
<p>(U) <u>A. Mission Description</u> The Joint Technology Center/System Integration Laboratory Multiple UAV Simulation Environment (JTC/SIL MUSE) provides a simulation tool for development of the Army's tactical UAV (TUAV) and the Navy's vertical takeoff UAV (VTUAV). The level of future Air Force participation in this project beyond FY01 is the subject of on-going discussions between the Air Force and OSD.</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u> (U) \$0 (U) \$0 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u> (U) \$0 (U) \$0 Total</p> <p>(U) <u>FY 2001 (\$ in Thousands)</u> (U) \$2,300 JTC/SIL MUSE (U) \$2,300 Total</p> <p>(U) <u>B. Project Change Summary</u> A separate project code within PE 35205F provides visibility of the funds supporting the JTC/SIL MUSE. The level of future Air Force participation in this project beyond FY01 is the subject of on-going discussions between the Air Force and OSD.</p> <p>(U) <u>C. Other Program Funding Summary (\$ in Thousands)</u></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></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>Cost to</u></th> <th style="text-align: center;"><u>Total Cost</u></th> </tr> <tr> <th></th> <th style="text-align: center;"><u>Actual</u></th> <th style="text-align: center;"><u>Estimate</u></th> <th style="text-align: center;"><u>Complete</u></th> <th></th> </tr> </thead> <tbody> <tr> <td>(U) AF RDT&E</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">2,300</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">Continuing</td> <td style="text-align: center;">TBD</td> </tr> <tr> <td>(U) Other APPN</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>(U) <u>D. Acquisition Strategy</u> N/A</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) AF RDT&E	0	0	2,300	0	0	0	0	Continuing	TBD	(U) Other APPN									
	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Cost to</u>	<u>Total Cost</u>																																									
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>																																										
(U) AF RDT&E	0	0	2,300	0	0	0	0	Continuing	TBD																																									
(U) Other APPN																																																		
Project 674883		Page 23 of 25 Pages				Exhibit R-2A (PE 0305205F)																																												

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305205F Endurance Unmanned Aerial Vehicles	PROJECT 674883
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(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) No activity planned												

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development					PE NUMBER AND TITLE 0305205F Endurance Unmanned Aerial Vehicles			PROJECT 674883		
(U) A. Project Cost Breakdown (\$ in Thousands)					<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U) No activity planned										
(U) Total										
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)										
(U) Performing Organizations:										
<u>Contractor or</u>	<u>Contract</u>									
<u>Government</u>	<u>Method/Type</u>	<u>Award or</u>	<u>Performing</u>	<u>Project</u>						
<u>Performing</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Organizations</u>										
No activity planned								2,300	Continuing	TBD
<u>Support and Management Organizations</u>										
<u>Test and Evaluation Organizations</u>										
(U) Government Furnished Property:										
	<u>Contract</u>									
	<u>Method/Type</u>	<u>Award or</u>								
<u>Item</u>	<u>or Funding</u>	<u>Obligation</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>Description</u>	<u>Vehicle</u>	<u>Date</u>	<u>Date</u>		<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Property</u>										
<u>Support and Management Property</u>										
<u>Test and Evaluation Property</u>										
<u>Subtotals</u>					<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
Subtotal Product Development								2,300	TBD	TBD
Subtotal Support and Management										
Subtotal Test and Evaluation										
Total Project								2,300	TBD	TBD

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

DATE

February 2000

BUDGET ACTIVITY

PE NUMBER AND TITLE

07 - Operational System Development

0305206F Airborne Reconnaissance Systems

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	123,538	136,221	136,913	105,398	142,410	151,187	125,433	Continuing	TBD
674817 Joint SIGINT Avionics Family (JSAF)	78,073	94,296	85,121	60,947	73,238	69,800	46,668	Continuing	TBD
674818 Advanced Technology	9,826	9,200	2,126	1,085	18,192	29,299	25,568	Continuing	TBD
674819 Common Data Link (CDL)	35,639	32,725	44,799	38,506	46,118	47,047	47,974	Continuing	TBD
674882 Compass Bright	0	0	4,867	4,860	4,862	5,041	5,223	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	Continuing	TBD

(U) A. Mission Description

This program funds and coordinates the development of advanced defense airborne reconnaissance technologies to ensure systems satisfy strategies and architectures to assure U.S. ability to support warfighter intelligence needs in the face of rapidly developing threat technology, proliferation of advanced weaponry, and uncertain political alignments. This program funds the development of the technologies that respond to evolving threats by emphasizing multi-service utility, interoperability among existing and planned complementary systems (i.e., sensors, ground systems, data links, and manned and unmanned platforms), and timely dissemination of intelligence information to operational forces.

(U) B. Budget Activity Justification

This program is categorized as Budget Activity 7 because it provides for development of technologies and capabilities in support of operational system development.

(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)	126,402	124,608	136,591	TBD
(U) Appropriated Value	126,768	139,608		
(U) Adjustments to Appropriated Value				
a. Congressional/General Reductions		-366	-1	
b. Small Business Innovative Research				

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

DATE
February 2000

BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305206F Airborne Reconnaissance Systems
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(U) <u>C. Program Change Summary (\$ in Thousands) Continued</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
c. Omnibus or Other Above Threshold Reprogram		-749		
d. Below Threshold Reprogram	-2,173			
e. Rescissions	-691	-2,637		
f. Other				TBD
(U) Adjustments to Budget Years Since FY 2000 PBR			322	
(U) Current Budget Submit/FY 2001 PBR	123,538	136,221	136,913	TBD
(U) <u>Significant Program Changes:</u> Funding for U-2 Advanced Defensive Systems in FY01-03 was transferred to PE 0305202F, Dragon U-2. Funding for Compass Bright in FY01-05 was transferred from PE 0305206G into PE 0305206F.				

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305206F Airborne Reconnaissance Systems				PROJECT 674817			
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	
674817	Joint SIGINT Avionics Family (JSAF)	78,073	94,296	85,121	60,947	73,238	69,800	46,668	Continuing	TBD	
<p>(U) <u>A. Mission Description</u> Provides funds for the development of sensor systems to modernize the SIGINT capability of the DoD airborne reconnaissance fleet, through a series of incremental upgrades, to meet the 2010 threat. Upgrades will embrace an open systems approach, with recognized standards, commonality, modularity, scalability, and reconfigurability. The incremental approach will ensure access to the latest technology as future budget year dollars become available. The open architecture will provide competitive opportunities to contractors who find innovative ways to use new technologies. It will also permit maximum use of commercial-off-the-shelf (COTS) and government-off-the-shelf (GOTS) capabilities developed for other applications. The goal is full compliance with all CRD requirements and all Joint Airborne SIGINT Architecture (JASA) by 2010. The development and modification of the lead integration aircraft (EP-3E) for the initial JSAF modules will provide a mechanism to begin development and operational assessment of the JSAF components. Producible JSAF components will be provided for the airborne fleet (manned and unmanned) for integration on the Air Force's RC-135V/W (Rivet Joint), the Army's Aerial Common Sensor (ACS) platform, the Air Force's U-2, and the Navy's EP-3E.</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u></p> <p>(U) \$44,866 Continued Low Band SubSystem (LBSS) development and integration</p> <p>(U) \$16,908 Continued High Band SubSystem (HBSS) development and integration</p> <p>(U) \$2,190 Continued Rivet Joint Platform development and integration</p> <p>(U) \$7,830 Continued EP-3E Platform development and integration</p> <p>(U) \$2,040 Continued U-2 Platform development and integration</p> <p>(U) \$4,239 Continued SPO Operations, Systems Engineering, Program Management Activities</p> <p>(U) \$78,073 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u></p> <p>(U) \$33,603 Continue Low Band SubSystem (LBSS) development and integration</p> <p>(U) \$20,324 Continue High Band Subsystem (HBSS) development</p> <p>(U) \$7,362 Continue Rivet Joint platform development for JSAF integration and testing</p> <p>(U) \$15,096 Continue EP-3 platform development for JSAF integration and testing</p> <p>(U) \$7,100 Continue U-2 platform development for JSAF integration and testing</p> <p>(U) \$1,000 Begin ACS platform development for JSAF integration and testing</p>											
Project 674817				Page 3 of 21 Pages				Exhibit R-2A (PE 0305206F)			

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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305206F Airborne Reconnaissance Systems	PROJECT 674817
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(U) **A. Mission Description Continued**

(U) **FY 2000 (\$ in Thousands) Continued**

(U) \$3,022	Begin Active Interference Cancellation (IC) and Modeling & Simulation (M&S) Efforts
(U) \$2,200	Begin Near Term Follow-On-Program (FOP)
(U) \$4,589	Continue SPO Operations, Systems Engineering, Program Management Activities
(U) \$94,296	Total

(U) **FY 2001 (\$ in Thousands)**

(U) \$15,854	Continue Low Band SubSystem (LBSS) development and integration
(U) \$14,117	Complete High Band SubSystem (HBSS) development and integration
(U) \$2,542	Continue Rivet Joint platform development for JSAF integration and testing
(U) \$5,800	Continue EP-3 platform development for JSAF integration and testing
(U) \$7,869	Continue U-2 platform development for JSAF integration and testing
(U) \$3,500	Continue ACS platform development for JSAF integration and testing
(U) \$4,274	Continue Active Interference Cancellation (IC) and Modeling & Simulation (M&S) Efforts
(U) \$17,400	Begin Follow-On Program (FOP) development
(U) \$8,900	Begin JSAF Developmental Support Unit (DSU) development
(U) \$4,865	Continue SPO Operations, Systems Engineering, Program Management Activities
(U) \$85,121	Total

(U) **B. Project Change Summary**

(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) None									

(U) **D. Acquisition Strategy**

The JSAF acquisition approach emphasizes full and open competition for the initial LBSS and HBSS development programs, as well as the FOPs that are planned at three year intervals beginning in 2001. A competitive source selection will be conducted for each new development effort. Estimated production costs will be a criteria for evaluation and determination of best value, thus providing justification for the follow-on sole source production contract. Although logistics support costs will not be a factor in best value determination for the initial HBSS and LBSS efforts due to the unknown variables of reliability, maintainability, mean time between failure, etc., of

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305206F Airborne Reconnaissance Systems	PROJECT 674817
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(U) **D. Acquisition Strategy Continued**
 newly developed hardware and software, the initial contractor logistics support (CLS) contract will be awarded sole source to the successful developer. This approach ensures the government receives the best value for each JSAF effort, while providing incentive to the winning development contractor. The open architecture will provide competitive opportunities during each development effort to contractors who find innovative ways to use new technologies, while permitting maximum use of commercial-off-the-shelf (COTS) and government-off-the-shelf (GOTS) capabilities developed for other applications. With delivery of the core capability, the requirements community will agree on the next increment to be acquired - which will be competitively procured. The open systems architecture provides a vehicle for exploitation and integration of COTS and GOTS, allowing the government to refresh, upgrade, enhance and evolve its system capabilities. This follow-on, competitive effort is expected to run a 2 year development and 1 year test cycle.

(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) Engineering Milestones												
(U) LBSS System Deliveries							X	X	X			
(U) RJ LBSS Integration & Flight Test Begins							X					
(U) EP-3 LBSS Integration & Flight Test Begins								X				
(U) LBSS & HBSS Integration for U-2 Begins									X			
(U) U-2 LBSS Integration & Flight Test Begins											X	
(U) High Band Prototype (HBP) flight test complete; OCONUS deployment												*
(U) High Band SubSystem (HBSS) CDR												*
(U) HBSS Factory Acceptance Test (FAT)									X			
(U) U-2 HBSS Integration & Flight Test Begins											X	
(U) JSAF Production Begins (procurement funds in platform PEs)												X
(U) JSAF DSU Development Begins										X		
(U) JSAF Follow-On Program Begins								X				

* - Denotes completed event
 X- Denotes 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			
07 - Operational System Development				0305206F Airborne Reconnaissance Systems				674817			
(U) A. Project Cost Breakdown (\$ in Thousands)											
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>	
(U)	Hardware Development					24,710		20,805		18,843	
(U)	Software Development					18,532		20,693		21,273	
(U)	Platform Integration					12,060		30,558		19,473	
(U)	Integration and Test Support					6,177		6,935		8,510	
(U)	Systems Engineering					12,355		10,716		12,157	
(U)	Program Management					4,239		4,589		4,865	
(U)	Total					78,073		94,296		85,121	
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)											
(U) Performing Organizations:											
	<u>Contractor or Government</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>											
	Sanders (LBSS)	CPAF	Feb 97	151,300	151,300	0	44,866	33,603	15,854	Continuing	TBD
	TRW (HBSS)	CPAF	Dec 97	54,700	54,700	0	16,908	20,324	14,117	Continuing	TBD
	TBD (FOP, DSU, Active IC; M&S)	TBD	FY00/01	TBD	TBD	0	0	5,222	30,574	Continuing	TBD
	Platform Integration (Includes AF, Army, Navy)		Various			0	12,060	30,558	19,711	Continuing	TBD
<u>Support and Management Organizations</u>											
	Various	Various	Various			0	4,239	4,589	4,865	Continuing	TBD
<u>Test and Evaluation Organizations</u>											
Note: Funds prior to FY99 are in PE 0305206D, Airborne Reconnaissance Advanced Development.											

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)					DATE February 2000		
BUDGET ACTIVITY			PE NUMBER AND TITLE		PROJECT		
07 - Operational System Development			0305206F Airborne Reconnaissance Systems		674817		
			<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
			<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>Complete</u>	<u>Program</u>
<u>Subtotals</u>							
Subtotal Product Development			0	73,834	89,707	TBD	TBD
Subtotal Support and Management			0	4,239	4,589	TBD	TBD
Subtotal Test and Evaluation							
Total Project			0	78,073	94,296	TBD	TBD

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305206F Airborne Reconnaissance Systems				PROJECT 674818		
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
674818	Advanced Technology	9,826	9,200	2,126	1,085	18,192	29,299	25,568	Continuing	TBD
<p>Note: Funding for U-2 Advanced Defense Systems transfers to PE 0305202F beginning in FY01.</p> <p>(U) <u>A. Mission Description</u> There are two primary objectives for the Advanced Technology funding: (1) To evaluate the utility and maturity of technology for airborne reconnaissance applications; and (2) To reduce the risk of employing emerging technologies in system upgrades, or new system acquisitions by integrating and exercising them in developmental and operational tests. These technologies address high priority collection requirements critical to the future of airborne reconnaissance systems. Specific priorities for development include increased geolocation accuracy, advanced sensor data fusion, and high data rate communications. This project also includes funding for U-2 Advanced Defensive Systems development in FY00. Near term development and feasibility demonstrations of specific technologies are conducted, followed by transition into production systems to support operational capabilities.</p> <p>* FY99 is understated by 55K. BTR not reflected in ABIDES database.</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u> (U) \$2,865 High Data Rate Communications: Completed development of air-to-air lasercomm demonstration terminals. (U) \$1,561 Modeling and Simulation: Developed software process model of Tactical Intelligence ground systems. (U) \$2,900 SYERS P3I: Completed development and flight test of SYERS P3I sensor systems. (U) \$2,000 Moving Target Exploitation (MTE): Begin Phase 1 development of automatic target recognition and imaging capability. (U) \$500 Geolocation: Continued development of capability to coregister airborne imagery with national data bases. (U) \$9,826 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u> (U) \$100 Sensor Fusion: ATACCS (Airborne Targeting and Cross Cueing System) risk reduction activities to integrate U-2 IMINT/ELINT/MASINT collection systems (U) \$400 Geolocation: Continue development of coregistration of imagery in national data bases and application of advanced exploitation tools. (U) \$100 High Data Rate Communications: Continue evaluation of air-to-air lasercomm system (U) \$8,600 Advanced Defensive System: Initiate development of U-2 Defensive Systems and conduct risk reduction project (U) \$9,200 Total</p>										
Project 674818			Page 8 of 21 Pages				Exhibit R-2A (PE 0305206F)			

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BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305206F Airborne Reconnaissance Systems				PROJECT 674818		
(U) <u>A. Mission Description Continued</u>										
(U) <u>FY 2001 (\$ in Thousands)</u>										
(U) \$145 Sensor Fusion: Continue analysis of ATACCS airborne processing, communication links and ground processing components and interfaces										
(U) \$1,500 Geolocation: Continue development and begin transition of enhanced geolocation capability to ground systems.										
(U) \$481 High Data Rate Communications: Complete air-to-air lasercomm evaluation										
(U) \$2,126 Total										
(U) <u>B. Project Change Summary</u>										
(U) <u>C. Other Program Funding Summary (\$ in Thousands)</u>										
	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Cost to</u>	<u>Total Cost</u>	
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>		
(U) PE 0305202F, Dragon U-2 (3600 RDT&E)	0	0	17,616	16,443	6,285	0	0			
(U) <u>D. Acquisition Strategy</u>										
The program targets high payoff technologies to satisfy critical unmet airborne reconnaissance collection requirements. Funds are provided to begin development and insertion of these technologies, and to reduce risk associated with their implementation in production systems. Emphasis is placed on maximizing commercial and national development efforts and investment. Funds are provided to various government laboratories and program offices to conduct these technology development efforts. Multiple contracting methods are used including the use of Engineering Change Proposals (ECPs) to modify existing contracts. Contracts have been awarded both competitively and on a sole source basis.										
(U) <u>E. Schedule Profile</u>										
			<u>FY 1999</u>			<u>FY 2000</u>			<u>FY 2001</u>	
			1	2	3	4	1	2	3	4
(U) Sensor Fusion										
(U) - ATACCS Phase I Contract Award							X			
(U) - ATACCS Risk Reduction Demos									X	
(U) Moving Target Exploitation (MTE)										
(U) - Begin Phase 1 MTE development				*						
(U) Modeling and Simulation										
(U) - Report Tactical GS simulation results				*						
Project 674818			Page 9 of 21 Pages				Exhibit R-2A (PE 0305206F)			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305206F Airborne Reconnaissance Systems	PROJECT 674818
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(U) **E. Schedule Profile Continued**

	<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) Geolocation												
(U) - Prototype deployed to support Operation Allied Force		*										
(U) - CDR						X						
(U) - Test Readiness Review							X					
(U) - Factory Acceptance Test											X	
(U) SYERS P3I												
(U) - Flight Test SYERS S/N 7				*								
(U) - Flight Test SYERS S/N 8					X							
(U) HDR Communications												
(U) - Laser Terminal Lab Test						X						
(U) U-2 Defensive Systems												
(U) - U-2 Advanced Defensive System (ADS) milestone 2						X						
(U) - ADS Phase 2 contract award						X						
*-Denotes completed event												
X-Denotes planned event												

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305206F Airborne Reconnaissance Systems				PROJECT 674819		
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
674819	Common Data Link (CDL)	35,639	32,725	44,799	38,506	46,118	47,047	47,974	Continuing	TBD
<p>(U) <u>A. Mission Description</u> The objective of the CDL effort within the Air Force is to define an interoperable command, control and communications capability for intelligence and reconnaissance assets to include both manned and unmanned platforms. CDL will achieve interoperable communications paths by employing an architecture based on developed hardware, software, and waveforms to promote commonality among the Services. The CDL program will maintain design configuration commonality resulting in lower life-cycle costs. The CDL design will permit existing and future reconnaissance assets to operate worldwide, providing sensor data directly to ground sites or via satellite or air-to-air relay when the asset and ground site are not within line-of-sight. This effort will integrate commercial satellite communications into the available satellite relay options to ensure sufficient wideband data relay capability. The system will have sufficient bandwidth to accommodate numerous sensors collecting SIGINT, IMINT (including video), Multi-spectral and other data. Modular design allows for future technology insertion. The commonality of modular components reduces non-recurring engineering and life cycle costs to the DoD user. Interoperability provides for the exchange of data across service or agency boundaries.</p>										
<p>(U) <u>FY 1999 (\$ in Thousands)</u></p>										
(U)	\$3,317	Continued configuration control of CDL architecture, specifications and modules.								
(U)	\$4,045	Continued development of CDL and Tactical Common Data Link (TCDL) interface to additional platforms.								
(U)	\$3,140	Continued to assess development of commercial network interface standards and impact to CDL interface.								
(U)	\$8,501	Continued engineering and integration of commercial satellite communication network to support airborne reconnaissance platform relay requirements.								
(U)	\$450	Began engineering and integration support of airborne reconnaissance platform requirements into National Space Communications Program.								
(U)	\$5,995	Completed covert waveform development/miniaturization/air-to-air link under the ABIT program.								
(U)	\$486	Continued SATCOM interoperability enhancements.								
(U)	\$5,325	Completed Tactical CDL flight demonstration.								
(U)	\$1,005	Continued transition to wideband bulk encryption on all CDL systems.								
(U)	\$3,375	Began development of Dual Data Link II (DDL-2) for the U-2								
(U)	\$35,639	Total								

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE
		February 2000
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
07 - Operational System Development	0305206F Airborne Reconnaissance Systems	674819
(U) <u>A. Mission Description Continued</u>		
(U) <u>FY 2000 (\$ in Thousands)</u>		
(U) \$12,050	Continue engineering/ integration of commercial satellite communication network to support airborne reconnaissance platform relay requirements and studies and analysis of alternative satellite communications to support airborne reconnaissance relay requirements	
(U) \$2,500	Continue development of Tactical CDL demonstration hardware and flight demonstration and continue to develop design for operational suitability on Intelligence, Surveillance & Reconnaissance (ISR) platforms including Predator	
(U) \$4,000	Continue integration engineering of ABIT in ISR platforms including RC-135 and Global Hawk.	
(U) \$2,300	Continue to assess development of commercial network interface standards and incorporation of commercial technologies where practical to the CDL interface including Asynchronous Transfer Mode (ATM) on TCDL.	
(U) \$2,645	Continue configuration control of CDL architecture, specifications, and modules.	
(U) \$2,000	Continue development of link modifications to incorporate wideband bulk encryption.	
(U) \$530	Continue SATCOM interoperability enhancements.	
(U) \$2,500	Continue development of CDL and TCDL interface to additional platforms including Airborne Reconnaissance Low (ARL).	
(U) \$4,200	Continue development of Dual Data link upgrade for U-2.	
(U) \$32,725	Total	
(U) <u>FY 2001 (\$ in Thousands)</u>		
(U) \$17,728	Continue engineering and integration of commercial satellite communication network to support airborne reconnaissance platform relay requirements and lease one additional transponder to support Predator and Global Hawk and studies/analysis of alternative satellite communications to support airborne reconnaissance relay requirements.	
(U) \$4,000	Continue development of Tactical CDL demonstration hardware and flight demonstration, and continue to develop design for operational suitability on ISR platforms including potential flight demonstrations on ARL, GUARDRAIL Legacy Replacement, P-3, EP-3, F/A-18 SHARP, VTUAV and Light Airborne Multi-Purpose System (LAMPS) and ATM interface upgrade.	
(U) \$5,129	Continue ABIT integration engineering of ABIT in ISR platforms including RC-135 and Global Hawk.	
(U) \$4,164	Continue to assess development of commercial network interface standards and incorporation of commercial technologies where practical to the CDL interface including upgraded U-2 sensors and Global Hawk SAR.	
(U) \$3,549	Continue configuration control of CDL architecture, specifications, and modules.	
(U) \$1,310	Continue development of link modifications to incorporate wideband bulk encryption.	
(U) \$1,500	Continue SATCOM interoperability enhancements.	
(U) \$5,419	Continue development of CDL interface to additional platform and surface terminal equipment (eg JSTARS, TARS, CHBDL) and advanced technology insertion activities	
Project 674819	Page 13 of 21 Pages	Exhibit R-2A (PE 0305206F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305206F Airborne Reconnaissance Systems	PROJECT 674819
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(U) **A. Mission Description Continued**

(U) FY 2001 (\$ in Thousands) Continued

(U) \$2,000 Continue development of DDL-2.
 (U) \$44,799 Total

(U) **B. Project Change Summary**

None.

(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) None									

(U) **D. Acquisition Strategy**

The CDL involves a multitude of technology projects which will provide for a common, interoperable wideband data link standard that has been mandated by ASD/C3I policy. Program funds are leveraged with the Service program funds to satisfy project objectives. Funds are provided to various government laboratories and program offices to fund on-going technology efforts. The individual Services use Engineering Change Proposals (ECPs) and modify existing contracts that have been awarded both competitively and on a sole source basis to implement various technology efforts.

(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) Continue Commercial Satellite Transponder Leases	*				X				X			
(U) Complete Phase 2 Tactical CDL Flight Demo on Predator				*								
(U) Phase 2a Tactical CDL Dev. Program Complete on Predator								X				
(U) Begin TCDL modification for ARL		*										
(U) Field TCDL on ARL						X						
(U) Initial ABIT U-2 Testing Complete	*											
(U) Complete ABIT RC-135 Design					X							
(U) Initial RC-135 ABIT unit delivery						X						
(U) ABIT RC-135 Flight test									X			
(U) CDL/TARS Pod Integration Study				X								

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305206F Airborne Reconnaissance Systems	PROJECT 674819
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(U) **E. Schedule Profile Continued**

	<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) ABIT Global Hawk Devel Study				X								
(U) Begin U-2 DDL 2 Development		*										
(U) U-2 DDL (U-2 Flight Test)									X			
(U) Begin TIGDL interface upgrade				*								

*-Denotes completed event
X-Denotes 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		
07 - Operational System Development					0305206F Airborne Reconnaissance Systems				674819		
(U) A. Project Cost Breakdown (\$ in Thousands)											
						<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U)	Hardware and Software Development					14,211	11,483	13,408			
(U)	Systems Engineering					4,567	3,237	4,771			
(U)	Satellite Communications					8,501	12,050	17,728			
(U)	Configuration Management					4,090	3,427	4,540			
(U)	Contractor Engineering Support					3,451	1,930	3,321			
(U)	Government Engineering Support					819	598	1,031			
(U)	Total					35,639	32,725	44,799			
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)											
(U) Performing Organizations:											
	<u>Contractor or Government</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>										
	L3Com	Multiple	Multiple			0	14,405	10,727	15,211	Continuing	TBD
	California Microwave	CPFF	Mar 99	TBD	TBD	0	2,000	1,250	500	Continuing	TBD
	Harris Corp	Other	23 Jul 97	TBD	TBD	0	3,425	1,770	1,900	Continuing	TBD
		Transaction									
	Motorola	Multiple	Multiple	TBD	TBD	0	1,005	2,000	1,310	Continuing	TBD
	Other	Multiple	Multiple			0	642	748	1,649	Continuing	TBD
	<u>Support and Management Organizations</u>										
	COMSAT RSI	FFP	17 Jul 95			0	8,501	12,050	17,728	Continuing	TBD
	Various	Multiple	Multiple			0	5,429	3,995	6,253	Continuing	TBD
	<u>Test and Evaluation Organizations</u>										
	JITC	MIPR	FY99			0	232	185	248	Continuing	TBD

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)		DATE					
07 - Operational System Development		0305206F Airborne Reconnaissance Systems			February 2000		
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT					
						674819	
		<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
		<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Subtotals</u>							
Subtotal Product Development		0	21,477	16,495	20,570	TBD	TBD
Subtotal Support and Management		0	13,930	16,045	23,981	TBD	TBD
Subtotal Test and Evaluation		0	232	185	248	TBD	TBD
Total Project		0	35,639	32,725	44,799	TBD	TBD

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 2000																																									
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305206F Airborne Reconnaissance Systems				PROJECT 674882																																									
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																																								
674882 Compass Bright	0	0	4,867	4,860	4,862	5,041	5,223	0	0																																								
<p>(U) <u>A. Mission Description</u> The COMPASS BRIGHT program develops advanced Air Force specific SIGINT capabilities to ensure that time-sensitive SIGINT collections against emerging and future target signals occur and reach the battle execution management centers fast enough to be of immediate value in the conduct of military operations.</p> <p>Note: Funding in FY99 and FY00 are in National Security Agency PE 0305206G. FY01-05 funding was transferred to Air Force (PE 0305206F) from PE 0305206G.</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u> (U) \$0 No Activity (U) \$0 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u> (U) \$0 No Activity (U) \$0 Total</p> <p>(U) <u>FY 2001 (\$ in Thousands)</u> (U) \$4,689 Continue COMPASS BRIGHT (NexGen Receiver, Active Interference Cancellation, other projects) development projects (U) \$178 SPO operations, Program Management Activities (U) \$4,867 Total</p> <p>(U) <u>B. Project Change Summary</u></p> <p>(U) <u>C. Other Program Funding Summary (\$ in Thousands)</u></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></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>Cost to</u></th> <th style="text-align: center;"><u>Total Cost</u></th> </tr> <tr> <th></th> <th style="text-align: center;"><u>Actual</u></th> <th style="text-align: center;"><u>Estimate</u></th> <th style="text-align: center;"><u>Complete</u></th> <th></th> </tr> </thead> <tbody> <tr> <td>(U) AF RDT&E</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Other APPN</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>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Cost to</u>	<u>Total Cost</u>		<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>		(U) AF RDT&E										(U) Other APPN									
	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Cost to</u>	<u>Total Cost</u>																																								
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>																																									
(U) AF RDT&E																																																	
(U) Other APPN																																																	

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305206F Airborne Reconnaissance Systems	PROJECT 674882
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(U) **D. Acquisition Strategy**
 The COMPASS BRIGHT program objective is to develop technologies for application in SIGINT systems/subsystems. Acquisition and production of these developed technologies will occur within the appropriate platform programs. On-going COMPASS BRIGHT technology development and demonstration contracts will continue through existing laboratory relationships and other existing contractual vehicles. The acquisition approach for future development projects will emphasize full and open competition.

(U) **E. Schedule Profile**

	<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4
(U) NextGen Receiver												
(U) -Digital Receiver Dev Complete										X		
(U) -LRM Dev Complete											X	
(U) - Integr & Test Complete											X	
(U) -Receiver Delivery												X
(U) Active Interference Cancellation												
(U) - Complete Prototype Testing										X		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305206F Airborne Reconnaissance Systems				PROJECT 674882		
(U) <u>A. Project Cost Breakdown (\$ in Thousands)</u>										
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>
(U)	COMPASS BRIGHT projects					0		0		4,689
(U)	SPO Operations/Program Management Activities					0		0		178
(U)	Total					0		0		4,867
(U) <u>B. Budget Acquisition History and Planning Information (\$ in Thousands)</u>										
(U) <u>Performing Organizations:</u>										
	<u>Contractor or</u>	<u>Contract</u>								
	<u>Government</u>	<u>Method/Type</u>	<u>Award or</u>	<u>Performing</u>	<u>Project</u>					
	<u>Performing</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>
	<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>
										<u>Total</u>
	<u>Product Development Organizations</u>									
	Various	Various	Various	TBD	TBD	0	0	0	4,689	Continuing
	<u>Support and Management Organizations</u>									
	Various	Various	Various	TBD	TBD	0	0	0	178	Continuing
	<u>Test and Evaluation Organizations</u>									
	None									
(U) <u>Government Furnished Property:</u>										
		<u>Contract</u>								
		<u>Method/Type</u>	<u>Award or</u>							
	<u>Item</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Delivery</u>		<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>
	<u>Description</u>	<u>Vehicle</u>	<u>Date</u>	<u>Date</u>		<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>
										<u>Total</u>
	<u>Product Development Property</u>									
	None									
	<u>Support and Management Property</u>									
	None									
	<u>Test and Evaluation Property</u>									
	None									

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)				DATE February 2000		
BUDGET ACTIVITY		PE NUMBER AND TITLE			PROJECT	
07 - Operational System Development		0305206F Airborne Reconnaissance Systems			674882	
		<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>Total</u>
	<u>Subtotals</u>					
	Subtotal Product Development	0	0	0	4,689	TBD
	Subtotal Support and Management	0	0	0	178	TBD
	Subtotal Test and Evaluation					
	Total Project	0	0	0	4,867	TBD

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

DATE
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BUDGET ACTIVITY		PE NUMBER AND TITLE							
07 - Operational System Development		0305207F Manned Reconnaissance System							
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	53,479	23,798	0	0	0	0	8,693	Continuing	TBD
674754 COBRA BALL	5,950	11,363	0	0	0	0	8,693	Continuing	TBD
674820 Manned Reconnaissance Systems U-2	47,529	12,435	0	0	0	0	0	Continuing	TBD
Quantity of RDT&E Articles	1	0	0	0	0	0	0	0	0

Funding for FY99-05 transferred to Air Force PE 0305207F from DARO Divestiture PE 0305207D. Funding for project 674820 in FY01-05 Transferred to PE 0305202F in FY01.

(U) A. Mission Description

The RDT&E portion of this PE supports development efforts required to enhance and sustain the U-2 and RC-135 reconnaissance aircraft. The RDT&E efforts in this PE focus on sensor and safety of flight projects.

(U) B. Budget Activity Justification

The program is categorized as Budget Activity 7 because it provided for development of technologies and capabilities in support of operational system development

(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)	44,241	9,388	0	TBD
(U) Appropriated Value	44,366	24,388		
(U) Adjustments to Appropriated Value				
a. Congressional/General Reductions	-125			
b. Small Business Innovative Research				
c. Omnibus or Other Above Threshold Reprogram	9,537	-130		
d. Below Threshold Reprogram				
e. Rescissions	-299	-460		
f. Other				TBD
(U) Adjustments to Budget Years Since FY 2000 PBR				

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

DATE
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305207F Manned Reconnaissance System
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(U) <u>C. Program Change Summary (\$ in Thousands) Continued</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U) Current Budget Submit/FY 2001 PBR	53,479	23,798	0	TBD

(U) Significant Program Changes:
FY99: DD1415 New Start notification for U2 Defensive Systems QRC approved by Congress. Funds reprogrammed from other AF sources to support this new start.
FY01: U-2 Electronic Warfare System (EWS) reprogramming from RDT & E to Procurement (\$4.595M).

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 2000	
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305207F Manned Reconnaissance System				PROJECT 674754	
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
674754 COBRA BALL	5,950	11,363	0	0	0	0	8,693	0	30,801
<p>(U) <u>A. Mission Description</u> Laser Ranging and Imaging System (LRIS) -- This project supports design studies, engineering analysis, non-recurring engineering, and other efforts associated with modifications to the RC-135 or its mission systems. The results of these efforts provide the requisite engineering necessary to implement modifications or provide a preliminary assessment of the technical feasibility, operability, or general military utility of an application. FY99 funds (Congressional plus-up) continues the Laser Ranging and Imaging system for the COBRA Ball platform and includes system testing in Maui. This project has been called the Field Laser Demonstration (FLD) and the Advanced Airborne Sensor (AAS) in past budget documentation. FY05 funds air traffic control and navigational safety non-recurring engineering for the RC-135 fleet.</p> <p>Multi-Function Self-Aligned Gate Technology (MSAG) -- Congress supports the development of the multi-function self-aligned gate active aperture antenna (AAA) technology for use on Reconnaissance aircraft. This system will provide wide-band, duplex, communications links simultaneously to a ground unit, other aircraft, and a satellite surrogate. This electronically steered array is a cost-effective solution to numerous DoD requirements.</p> <p>On-Board Pre-Processing (OBPP) -- The prototype pre-processing effort will develop the capability to screen the data as close to the collection source as possible and advise analysts which data requires immediate expert human intervention. The effort involves the development of an electronic support system and software development.</p>									
<p>(U) <u>FY 1999 (\$ in Thousands)</u></p> <p>(U) \$2,083 Subsystem and system integration testing</p> <p>(U) \$1,000 Design and fabricate systems</p> <p>(U) \$400 Completed Range-in-a-Box fabrication and test</p> <p>(U) \$200 Completed downselect of experimental aircraft and aircraft interface design</p> <p>(U) \$300 Developed Maui interfaces, prepare and ship system</p> <p>(U) \$1,967 Performed system performance characterization and demonstration testing</p> <p>(U) \$5,950 Total</p>									
Project 674754			Page 3 of 12 Pages				Exhibit R-2A (PE 0305207F)		

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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305207F Manned Reconnaissance System	PROJECT 674754																																		
<p>(U) <u>A. Mission Description Continued</u></p> <p>(U) <u>FY 2000 (\$ in Thousands)</u></p> <p>(U) \$4,000 LRIS (Continuation of Congressionally directed and funded program)</p> <p>(U) \$0 - \$2,400 Field Testing (LRIS)</p> <p>(U) \$0 - \$1,000 Integration of Acquisition Systems (LRIS)</p> <p>(U) \$0 - \$600 System Modification (LRIS)</p> <p>(U) \$3,000 Evaluate the MSAG AAA for use on the RC-135 as directed by Congress</p> <p>(U) \$4,363 On Board Preprocessor Prototype (OBPP - Congressionally added program)</p> <p>(U) \$0 - \$2,000 Electronic Support System (Prototype Preprocessor - Congressionally added)</p> <p>(U) \$0 - \$2,363 Preprocessing Software Development (Prototype Preprocessor)</p> <p>(U) \$11,363 Total</p> <p>(U) <u>FY 2001 (\$ in Thousands)</u></p> <p>(U) \$0 None. Prior year efforts reflect Congressionally added funding.</p> <p>(U) \$0 Total</p> <p>(U) <u>B. Project Change Summary</u></p> <p>Added the Multi-Function Self-Aligned Gate Technology and On-Board Pre-Processing effort to FY00.</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></th> <th style="width: 10%;"><u>FY 2000</u></th> <th style="width: 10%;"><u>FY 2001</u></th> <th style="width: 10%;"><u>FY 2002</u></th> <th style="width: 10%;"><u>FY 2003</u></th> <th style="width: 10%;"><u>FY 2004</u></th> <th style="width: 10%;"><u>FY 2005</u></th> <th style="width: 10%;"><u>Cost to</u></th> <th style="width: 10%;"><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) APPN 10,APAF, Line 55</td> <td style="text-align: right;">137,201</td> <td style="text-align: right;">234,385</td> <td style="text-align: right;">147,199</td> <td style="text-align: right;">142,840</td> <td style="text-align: right;">125,348</td> <td style="text-align: right;">77,632</td> <td style="text-align: right;">83,978</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></p> <p>The RC-135 development and enhancement activities are managed by the Air Force through the BIG SAFARI program in the Reconnaissance System Program Office. These projects are managed by ASC/RA. ASC/RA provides technical oversight and management of all aircraft, ground and support system modifications, integration and flight test engineering responsibility, product assurance and acceptance testing, and logistics and training activities.</p> <p>(U) <u>E. Schedule Profile</u></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;"></th> <th style="width: 25%;"><u>FY 1999</u></th> <th style="width: 25%;"><u>FY 2000</u></th> <th style="width: 25%;"><u>FY 2001</u></th> </tr> </thead> </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) APPN 10,APAF, Line 55	137,201	234,385	147,199	142,840	125,348	77,632	83,978	Continuing	TBD		<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Cost to</u>	<u>Total Cost</u>																											
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>																												
(U) APPN 10,APAF, Line 55	137,201	234,385	147,199	142,840	125,348	77,632	83,978	Continuing	TBD																											
	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>																																	
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305207F Manned Reconnaissance System	PROJECT 674754
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(U) **E. Schedule Profile Continued**

	<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) Preliminary Design Review (LRIS)		*										
(U) Critical Design Review (LRIS)		*										
(U) Prototype Delivery (LRIS)						X						
(U) Engineering Analysis Report (MSAG)											X	
(U) Electronic Support System (OBPP)									X			
(U) Software Prototype (OBPP)											X	
* - Denotes completed event												
X - Denotes planned event												

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development					PE NUMBER AND TITLE 0305207F Manned Reconnaissance System			PROJECT 674754		
(U) <u>A. Project Cost Breakdown (\$ in Thousands)</u>										
					<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U)	System Design and Analysis				1,200	3,000	0			
(U)	Fabrication and Test				4,050	6,363				
(U)	Integration and Support				700	2,000				
(U)	Total				5,950	11,363	0			
(U) <u>B. Budget Acquisition History and Planning Information (\$ in Thousands)</u>										
(U) <u>Performing Organizations:</u>										
<u>Contractor or</u>	<u>Contract</u>									
<u>Government</u>	<u>Method/Type</u>	<u>Award or</u>	<u>Performing</u>	<u>Project</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>Performing</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</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>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>						
<u>Product Development Organizations</u>										
ASC/RAB	Multiple	Aug 97	N/A	N/A	4,795	5,950	11,363		8,693	30,801
<u>Support and Management Organizations</u>										
<u>Test and Evaluation Organizations</u>										
<u>Subtotals</u>					<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
					<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
	Subtotal Product Development				4,795	5,950	11,363		8,693	30,801
	Subtotal Support and Management									
	Subtotal Test and Evaluation									
	Total Project				4,795	5,950	11,363		8,693	30,801

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305207F Manned Reconnaissance System				PROJECT 674820		
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
674820	Manned Reconnaissance Systems U-2	47,529	12,435	0	0	0	0	0	Continuing	TBD
<p>(U) <u>A. Mission Description</u> This development project supports high payoff improvements for the U-2 Advanced Synthetic Aperture Radar System (ASARS-2) through the ASARS-2 Improvement Program (AIP). AIP improves area search, precision geolocation, and image quality characteristics sufficiently to directly support the targeting of precision guided munitions (PGMs). Complex imagery will be produced by the AIP system and support significant exploitation products for the imagery analysts. AIP champions the introduction of Asynchronous Transfer Mode (ATM) datalink formats to the ISR community and supports National Imagery Transmission Format (NITF) standards. Several Line Replaceable Units (LRU) including the Process Control Unit (PCU), Receiver - Exciter (RE), and transmitter are approaching the end of their supportability life. Developing new LRUs with next generation technology will make ASARS-2 supportable through the expected service life of the U-2 and provide capability enhancements necessary to support PGMs. Improvements to the ASARS-2 are directly transferable to Global Hawk High Altitude Endurance Unmanned Aerial Vehicles (HAE UAV) should migration of this improvement become a requirement. AIP incorporated interface to Dual Data Link II (DDL II) will provide an enhanced operational capability. Also, this project accomplishes the development of a quick reaction capability (QRC) to improve the U-2 electronic warfare system (EWS) capability for Southwest Asia. Lastly this project includes funds from FY99 congressional additions to develop cockpit display improvements, conduct risk reduction studies for aircraft fuel conversion and complete reliability and maintainability upgrades and initial spares procurement for the SENIOR GLASS system.</p> <p>* FY99 is understated by 266K. BTR not reflected in ABIDES database.</p>										
<p>(U) <u>FY 1999 (\$ in Thousands)</u></p> <p>(U) \$5,000 Completed R&M upgrades and procures initial spares for SENIOR GLASS</p> <p>(U) \$3,000 Cockpit display improvements development</p> <p>(U) \$1,250 Risk reduction studies for fuels conversion to JP-8 from JP-TS</p> <p>(U) \$2,300 AIP Baseline Exploitation tools development</p> <p>(U) \$13,680 Continued development of AIP on-board processor</p> <p>(U) \$620 Flight test support</p> <p>(U) \$220 SPO Support</p> <p>(U) \$2,120 Post-processing Exploitation Tool Development (Super-Resolution, CCD, IFSAR)</p> <p>(U) \$2,500 Continued Receiver-Exciter Controller development</p> <p>(U) \$250 Advanced data storage array development</p>										
Project 674820			Page 7 of 12 Pages				Exhibit R-2A (PE 0305207F)			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE
BUDGET ACTIVITY		PROJECT
07 - Operational System Development	0305207F Manned Reconnaissance System	February 2000 674820
<p>(U) <u>A. Mission Description Continued</u></p> <p>(U) <u>FY 1999 (\$ in Thousands) Continued</u></p> <p>(U) \$4,352 Continued development of AIP Range migration software</p> <p>(U) \$2,700 Continued development of ASARS-2 Data Link</p> <p>(U) \$9,537 U-2 QRC Defensive System Development</p> <p>(U) \$47,529 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u></p> <p>(U) \$3,500 Develop DDL II interface to AIP (Congressionally added effort)</p> <p>(U) \$502 Continued development of AIP on board processor</p> <p>(U) \$1,000 Continued development of AIP Range migration software</p> <p>(U) \$4,850 U-2 QRC Defensive System development</p> <p>(U) \$1,172 Common Exploitation Tools</p> <p>(U) \$475 SPO Support (AIP)</p> <p>(U) \$636 Begin Beyond Line of Sight (BLOS) data link interface integration (AIP)</p> <p>(U) \$225 Begin Radar Transmitter Development (AIP)</p> <p>(U) \$75 Develop AIP employment concept scenarios</p> <p>(U) \$12,435 Total</p> <p>(U) <u>FY 2001 (\$ in Thousands)</u></p> <p>(U) \$0 Funding transferred to PE 0305202F</p> <p>(U) \$0 Total</p> <p>(U) <u>B. Project Change Summary</u></p> <p>FY99 Congressional adds: AIP (\$9.0M), SENIOR GLASS (\$5M), cockpit upgrade development (\$3M) and risk reduction for fuel conversion to JP-8 (\$3.6M).</p> <p>FY00 Congressional adds: Dual Data Link upgrade (\$3.5M)</p> <p>FY01 U-2 EWS QRC reprogrammed from RDT & E to procurement to meet higher priority AF and Theater requirements (\$4.595M).</p>		
Project 674820	Page 8 of 12 Pages	Exhibit R-2A (PE 0305207F)

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

DATE
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305207F Manned Reconnaissance System	PROJECT 674820
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(U) C. Other Program Funding Summary (\$ in Thousands)	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Cost to</u>	<u>Total Cost</u>
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	
(U) AF RDT&E PE 0305202 AIP	0	0	27,546	24,118	8,224	1,936	1,931	Continuing	TBD
(U) AIP Production* (APAF**) PE 0305207	39,364	15,312	0	0	0	0	0	Continuing	TBD
(U) AIP Production PE 0305202	0	0	12,777	18,659	15,380	6,066	4,016	Continuing	TBD

* First Upgraded Radar Transmitter Deliveries in 3QFY03
** APAF production funding shown in PE 0305202F FY01-05

(U) **D. Acquisition Strategy**
For airborne collection capability upgrades, modify existing platform and associated ground control equipment via Engineering Change Proposals (ECPs)/Task orders to existing USAF contracts. Develop an electronic defensive system QRC capability, then deploy and sustain on U-2 aircraft in Southwest Asia. For ASARS-2, develop and test new technology line replaceable units (LRU's) for subsequent retrofit into the U-2's, this may be performed during normal operations, U-2 Programmed Depot Maintenance (PDM), or during other ongoing U-2 modifications.

(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) Production Critical Design Review	*											
(U) Test & Evaluation Milestones N/A												
(U) -AIP Prototype Flight Test			*									
(U) -AIP Production Flight Test				*								
(U) AIP IOC							X					
(U) U-2 EWS QRC												
(U) Engineering Milestones N/A												
(U) -Contract Award		*										
(U) -SDR			*									
(U) -Critical Design Review				*								
(U) -QRC Ground Test							X					
(U) -QRC Flight Test									X			
(U) -QRC IOC										X		

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305207F Manned Reconnaissance System	PROJECT 674820
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(U) **E. Schedule Profile Continued**

	<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
(U) -AIP Interface with DDLII	1	2	3	4	1	2	3	4	1	2	3	4
(U)											X	
*- Denotes Completed Event												
X-Denotes planned event												

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305207F Manned Reconnaissance System				PROJECT 674820		
(U) A. Project Cost Breakdown (\$ in Thousands)										
					<u>FY 1999</u>	<u>FY 2000</u>		<u>FY 2001</u>		
(U)	Primary Hardware Development				30,683	6,127		0		
(U)	Software Development				13,140	5,093		0		
(U)	Government Engineering Support				2,081	400		0		
(U)	System Testing				1,625	815		0		
(U)	Total				47,529	12,435		0		
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)										
(U) Performing Organizations:										
<u>Contractor or</u>	<u>Contract</u>									
<u>Government</u>	<u>Method/Type</u>	<u>Award or</u>	<u>Performing</u>	<u>Project</u>						
<u>Performing</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Organizations</u>										
Raytheon (AIP & SENIOR GLASS)	CPIF	3Q96	N/A		0	30,081	6,726	0	Continuing	TBD
L3Comm (AIP)	CPIF	3Q96			0	2,766			0	2,766
Cockpit						3,000	0	0	0	3,000
Fuel Conversion						1,300	0	0	0	1,300
QRC						9,537	5,100			14,637
<u>Support and Management Organizations</u>										
ASC/RAP/AFRL					0	220	330		0	550
<u>Test and Evaluation Organizations</u>										
WR-ALC/LR - Site 2, Edwards AFB					0	625	279		0	904

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)		DATE						
07 - Operational System Development		0305207F Manned Reconnaissance System			February 2000			
<u>BUDGET ACTIVITY</u>	<u>PE NUMBER AND TITLE</u>	<u>PROJECT</u>						
		674820						
			<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>Total</u>	
<u>Subtotals</u>							<u>Program</u>	
Subtotal Product Development			0	46,684	11,826	0	TBD	TBD
Subtotal Support and Management			0	220	330		0	550
Subtotal Test and Evaluation			0	625	279		0	904
Total Project			0	47,529	12,435	0	TBD	TBD

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

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BUDGET ACTIVITY

PE NUMBER AND TITLE

07 - Operational System Development

0305208F Distributed Common Ground Systems

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	20,602	24,205	21,330	15,146	21,009	16,280	14,939	Continuing	TBD
674821 Distributed Common Ground System Interoperability	2,242	1,592	1,593	1,609	1,658	1,695	1,732	Continuing	TBD
674826 Common Imagery Ground / Surface Systems	18,360	22,613	19,737	13,537	19,351	14,585	13,207	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

The Distributed Common Ground System (DCGS) Program is a cooperative effort between the services and agencies to provide systems capable of receiving, processing, exploiting, and disseminating data from airborne and national reconnaissance platforms, and commercial sources. The DCGS program is developing a family of systems capable of supporting all levels of conflict, interoperable (using the Common Data Link) with reconnaissance platforms and sensors, and integrated into the Joint Command, Control, Communication, Computer and Intelligence (C4I) environment. The program integrates architectures and standards from Common Imagery Ground/Surface Systems (CIGSS) for Imagery Intelligence (IMINT); Joint Interoperable Operator Network (JION) for Signal Intelligence (SIGINT); and Joint Airborne Measurement and Signature Intelligence (MASINT) Architecture (JAMA) for MASINT.

(U) B. Budget Activity Justification

Program is in Budget Activity 7 because it provides for development of technologies and capabilities in support of operational system development.

(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)	20,906	12,820	14,018	TBD
(U) Appropriated Value	21,159	24,820		
(U) Adjustments to Appropriated Value				
a. Congressional/General Reductions	-253			
b. Small Business Innovative Research				
c. Omnibus or Other Above Threshold Reprogram		-133		
d. Below Threshold Reprogram	-189			
e. Rescissions	-115	-482		

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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305208F Distributed Common Ground Systems
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(U) <u>C. Program Change Summary (\$ in Thousands) Continued</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
f. Other				TBD
(U) Adjustments to Budget Years Since FY 2000 PBR			7,312	
(U) Current Budget Submit/FY 2001 PBR	20,602	24,205	21,330	TBD
(U) <u>Significant Program Changes:</u>				
- Congress added \$12M in FY00 for Eagle Vision				
- USAF added \$21.5M in the FY01-05 budget for Common Imagery Processor				

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305208F Distributed Common Ground Systems				PROJECT 674821		
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
674821	Distributed Common Ground System Interoperability	2,242	1,592	1,593	1,609	1,658	1,695	1,732	Continuing	TBD
<p>(U) <u>A. Mission Description</u> The Distributed Common Ground System (DCGS) Program is a cooperative effort between the services and agencies to provide systems capable of receiving, processing, exploiting, and disseminating data from airborne and national reconnaissance platforms, and commercial sources. The DCGS program is developing a family of systems capable of supporting all levels of conflict, interoperable (using the Common Data Link) with reconnaissance platforms and sensors, and integrated into the Joint C4I environment. The interoperability program integrates architectures and standards from Common Imagery Ground/Surface Systems (CIGSS) for IMINT; Joint Interoperable Operator Network (JION) for SIGINT; and Joint Airborne MASINT Architecture (JAMA) for MASINT.</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u> (U) \$1,654 Continued evolving DCGS architectures and standards for commonality and interoperability across intelligence disciplines. (U) \$338 Continued engineering development of NATO interoperability standards. (U) \$250 Managed DCGS Infrastructure Integrated Product Team (IPT) for ASD/C3I. (U) \$2,242 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u> (U) \$1,092 Continue evolving DCGS architectures and standards for commonality and interoperability across intelligence disciplines. (U) \$250 Continue engineering development of NATO interoperability standards. (U) \$250 Manage DCGS Infrastructure Integrated Product Team (IPT) for ASD/C3I. (U) \$1,592 Total</p> <p>(U) <u>FY 2001 (\$ in Thousands)</u> (U) \$1,093 Continue evolving DCGS architectures and standards for commonality and interoperability across intelligence disciplines. (U) \$250 Continue engineering development of NATO interoperability standards. (U) \$250 Manage DCGS Infrastructure IPT for ASD/C3I. (U) \$1,593 Total</p> <p>(U) <u>B. Project Change Summary</u></p>										
Project 674821			Page 3 of 11 Pages				Exhibit R-2A (PE 0305208F)			

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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305208F Distributed Common Ground Systems	PROJECT 674821
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(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) Other APPN
Procurement line is classified. See PEM for details.

(U) **D. Acquisition Strategy**
DCGS interoperability program will use FFRDC, GSA contracts, and competitive processes where possible.

(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) DCGS commonality and Interoperability standards		*										
(U) NATO Interoperability Standards		*										
(U) DCGS Infrastructure IPT		*										
(U) DCGS commonality and Interoperability standards												X
(U) NATO Interoperability Standards												X
(U) DCGS Infrastructure IPT												X
(U) DCGS commonality and Interoperability standards												X
(U) NATO Interoperability Standards												X
(U) DCGS Infrastructure IPT												X

*- Denotes Completed Event
X-Denotes planned event

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000				
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305208F Distributed Common Ground Systems				PROJECT 674821			
(U) <u>A. Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>				
(U)	Program Management				200	200	200				
(U)	System Engineering - Architectures and Interoperability				2,042	1,392	1,393				
(U)	Total				2,242	1,592	1,593				
(U) <u>B. Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
(U) <u>Performing Organizations:</u>											
<u>Contractor or</u>	<u>Contract</u>										
<u>Government</u>	<u>Method/Type</u>	<u>Award or</u>	<u>Performing</u>	<u>Project</u>							
<u>Performing</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>	
<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>	
<u>Product Development Organizations</u>											
	MITRE	SS,FFP	2Q99	N/A	N/A	550	400	400	Continuing	TBD	
	SAIC	SS,IDIQ	2Q99	N/A	N/A	700	599	493	Continuing	TBD	
	MRJ	SS,FFP	2Q99	N/A	N/A	300	250	250	Continuing	TBD	
	Other Non-Prime Gov't	Multiple	2Q99	N/A	N/A	0	492	143	250	Continuing	TBD
Contracts											
<u>Support and Management Organizations</u>											
	SAIC	SS,IDIQ	2Q99	N/A	N/A	200	200	200	Continuing	TBD	
<u>Test and Evaluation Organizations</u>											
						<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	
						<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	
										<u>Total</u>	
	<u>Subtotals</u>										
	Subtotal Product Development					0	2,042	1,392	1,393	TBD	TBD
	Subtotal Support and Management						200	200	200	TBD	TBD
	Subtotal Test and Evaluation										
	Total Project					0	2,242	1,592	1,593	TBD	TBD

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 2000	
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305208F Distributed Common Ground Systems				PROJECT 674826	
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
674826 Common Imagery Ground / Surface Systems	18,360	22,613	19,737	13,537	19,351	14,585	13,207	Continuing	TBD
<p>(U) <u>A. Mission Description</u> DCGS provides systems capable of receiving, processing, exploiting, and disseminating data from airborne and national reconnaissance platforms, and commercial sources. DCGS is a system of systems that does not need to be collocated but must be interconnected by a robust communications structure to provide data streams between intelligence collector, exploiters, producers, disseminators, and users. DCGS has four core locations: two CONUS based and two OCONUS. Other DCGS systems are distributed among Air Force operational units at numbered Air Force level, to support the Joint Task Force commander and the Air Operations Center. The CONUS based systems are deployable and capable of reachback operations via satellite. Eagle Vision is a deployable ground station for programming and collecting panchromatic, multispectral, and synthetic aperture radar broad-area imagery from commercial earth remote sensing satellites and processing/merging it with national imagery for mission planning, topographic analysis, and intelligence-gathering purposes. The AF has an operational Eagle Vision system at Ramstein AFB, GE. The Reno ANGB, NV National Eagle (commercial imagery post processing capability) is being upgraded with direct downlink capability along with direct downlink being procured for South Carolina ANG. Reno ANGB, NV also has a processing and exploitation system (networked with other DCGS sites) that supports the Theater Airborne Reconnaissance System (TARS) in addition to other DCGS missions.</p> <p>A mobile CIGSS/DCGS testbed is used by Program Offices to test interfaces with new sensors, applications, and other modifications, and to support the integration and test of DCGS components prior to introduction into the operational environment.</p> <p>The Common Imagery Processor (CIP) is a major interoperability initiative to develop a common sensor processing element within CIGSS architecture. The function of the CIP is to accept airborne imagery data, process it into an exploitable image, and output the image to other elements within CIGSS. Baseline capability includes F/A-18 and U-2 sensors. Efforts are underway to augment the CIP baseline to process data from upgraded/ new sensors and to investigate CIP as a multi-intelligence processor.</p>									
<p>(U) <u>FY 1999 (\$ in Thousands)</u></p> <p>(U) \$6,470 Continued CIGSS/DCGS sustaining engineering to implement software upgrades and enhancements to maintain compatibility with changing national and tactical interfaces. Completes JSIPS Block III upgrade (national DTS).</p> <p>(U) \$2,500 Continued CIGSS/DCGS testbed development.</p> <p>(U) \$2,572 Continued system engineering and technical support.</p> <p>(U) \$1,450 Continued USMC Tactical Exploitation Group (TEG) development efforts.</p>									
Project 674826			Page 6 of 11 Pages				Exhibit R-2A (PE 0305208F)		

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE
BUDGET ACTIVITY		PROJECT
07 - Operational System Development	0305208F Distributed Common Ground Systems	February 2000 674826
(U) <u>A. Mission Description Continued</u>		
(U) <u>FY 1999 (\$ in Thousands) Continued</u>		
(U) \$2,000	Continued sustaining engineering for commercial satellite imagery. Begin integration of 5 meter and prepare architecture for 1 meter commercial satellites.	
(U) \$3,368	Continued evolving CIP to keep pace with new sensors and projected sensor modification programs.	
(U) \$18,360	Total	
(U) <u>FY 2000 (\$ in Thousands)</u>		
(U) \$2,663	Continue CIGSS/DCGS sustaining engineering to implement software upgrades and enhancements to maintain compatibility with changing national and tactical interfaces.	
(U) \$900	Continue CIGSS/DCGS testbed development.	
(U) \$450	Continue system engineering and technical support.	
(U) \$1,950	Continue to provide sustaining engineering for commercial satellite imagery to ensure operational usability. Continue integration of 5 m and architecture preparation for 1 meter commercial satellites.	
(U) \$4,650	Continue evolving CIP to keep pace with new sensors and projected sensor modification programs. Investigate multi-int processing.	
(U) \$12,000	Upgrade and procure Eagle Vision commercial imagery direct downlink capabilities. Integrate with National Eagle. (Congressional add to FY00)	
(U) \$22,613	Total	
(U) <u>FY 2001 (\$ in Thousands)</u>		
(U) \$2,440	Continue CIGSS/DCGS sustaining engineering to implement software upgrades and enhancements to maintain compatibility with changing national/tactical interfaces and to increase interoperability with expanding ISR platform/sensor baseline.	
(U) \$1,500	Continue CIGSS/DCGS testbed development.	
(U) \$360	Continue system engineering and technical support.	
(U) \$1,950	Continue to provide sustaining engineering for commercial satellite imagery to ensure operational usability. Continue integration of new/upgraded commercial imaging satellites.	
(U) \$13,487	Continue evolving CIP to keep pace with growing sensor baseline: new and upgraded sensors. Implement initial multi-int processing upgrades.	
(U) \$19,737	Total	
(U) <u>B. Project Change Summary</u>		

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

DATE
February 2000

BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305208F Distributed Common Ground Systems	PROJECT 674826
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(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) Other APPN Procurement line is classified. See PEM for details.									TBD

(U) D. Acquisition Strategy

DCGS will use a spiral development program to field and upgrade the common ground station architecture. Systems and technology will be contracted for under a competitive Request for Proposal (RFP) process where possible.

(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) Assess national and tactical interface changes to DCGS				*								
(U) Integrate new sensors and sensor modifications into CIP		*										
(U) Integrate/Test changes in testbed		*										
(U) Complete JSIPS Block III Upgrade						X						
(U) Integrate national and tactical interface changes to DCGS							X					
(U) Integrate new sensors and sensor modifications into CIP					*							
(U) Integrate/Test changes in testbed						X						
(U) Update commercial imagery interface					*							
(U) Assess/integrate national and tactical interface changes to DCGS									X			
(U) Integrate new sensors and sensor modifications into CIP									X			
(U) Integrate/Test changes in testbed										X		
(U) Update commercial imagery interface									X			
(U) Release DCGS Spiral 00B RFP						X						
(U) Award DCGS Spiral 00B contracts							X					
(U) Field DCGS Spiral 00B upgrades									X			
(U) Release DCGS Spiral 01A RFP								X				
(U) Award DCGS Spiral 01A contracts									X			
(U) Eagle Vision Direct Downlink Award (NV & SC ANG)							X					
(U) Eagle Vision Direct Downlink Delivery (NV ANG)												X

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305208F Distributed Common Ground Systems	PROJECT 674826
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(U) E. Schedule Profile Continued

	<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4

*- Denotes Completed Event / X-Denotes 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		
07 - Operational System Development				0305208F Distributed Common Ground Systems				674826		
(U) A. Project Cost Breakdown (\$ in Thousands)										
						<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>		
(U)	Hardware/Software Development					4,343	1,387	8,515		
(U)	System Engineering					8,367	5,969	7,322		
(U)	System Integration					2,250	13,657	1,800		
(U)	Ancillary Hardware Development					2,000	600	1,100		
(U)	Program Management					1,400	1,000	1,000		
(U)	Total					18,360	22,613	19,737		
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)										
(U) Performing Organizations:										
<u>Contractor or</u>	<u>Contract</u>									
<u>Government</u>	<u>Method/Type</u>	<u>Award or</u>	<u>Performing</u>	<u>Project</u>						
<u>Performing</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Organizations</u>										
Raytheon, Garland, TX	Multiple	2Q99	N/A	N/A	0	1,665	500	300	Continuing	TBD
Northrop Grumman, Baltimore, MD	C, CPFF	2Q99	N/A	N/A	0	3,765	4,896	13,487	Continuing	TBD
Lockheed Martin, San Jose, CA	Multiple	2Q99	N/A	N/A	0	164	300	300	Continuing	TBD
TBD for DCGS Upgrades and Migration		TBD	N/A	N/A	0	0	1,069	1,600	Continuing	TBD
Matra, Velizy, FR	Multiple	1Q00	N/A	N/A	0	1,674	1,384	1,384	Continuing	TBD
Matra	SS, TBD	3Q00	N/A	N/A	0	0	11,886	0	Continuing	TBD
Other Non-Prime Gov't Contracts	TBD	TBD	N/A	N/A	0	4,995	1,122	0	Continuing	TBD
MITRE	SS, IDIQ	2Q99	N/A	N/A	0	2,572	456	566	Continuing	TBD
SAIC	SS, IDIQ	2Q99	N/A	N/A	0	2,125	0	1,100	Continuing	TBD

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 2000	
BUDGET ACTIVITY					PE NUMBER AND TITLE					PROJECT	
07 - Operational System Development					0305208F Distributed Common Ground Systems					674826	
(U) <u>Performing Organizations Continued:</u>											
<u>Support and Management Organizations</u>											
Other Non-Prime Gov't	TBD	TBD	N/A	N/A	0	1,400	1,000	1,000	Continuing	TBD	
Contracts											
<u>Test and Evaluation Organizations</u>											
					<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>	
					<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>	
Subtotals											
Subtotal Product Development					0	16,960	21,613	18,737	TBD	TBD	
Subtotal Support and Management					0	1,400	1,000	1,000	TBD	TBD	
Subtotal Test and Evaluation											
Total Project					0	18,360	22,613	19,737	TBD	TBD	

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 2000	
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305906F NCMC - TW/AA System					
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	16,113	13,230	19,309	15,815	15,703	18,171	18,216	0	TBD
673880 CMU	105	0	0	0	0	0	0	0	1,291,797
673881 Integrated TW/AA	15,089	4,465	4,136	3,669	3,677	3,750	3,825	0	TBD
674409 CMU Legacy Interface	919	0	0	0	0	0	0	0	47,451
674806 N/UWSS NORAD/USSPACECOM Warfighting System	0	8,765	15,173	12,146	12,026	14,421	14,391	0	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0

(U) **A. Mission Description**

This program element funds the evolution of the Commander-in-Chief (CINC) North American Aerospace Defense Command (NORAD)/CINC US Space Command (USSPACECOM) Battle Management Command and Control (BMC2) systems and their supporting infrastructure into an integrated, flexible, interoperable, and more cost effective architecture. This integrated BMC2 system includes the Integrated Tactical Warning and Attack Assessment (ITW/AA) command and control systems delivered under the just completed Cheyenne Mountain Upgrade (CMU) program. The RDT&E primarily funds integration of these and other existing mission areas to provide a foundation for a fused battlespace picture for the CINC, plus required additional mission capability for the command and control of space forces so that USCINCSpace can better support theater warfighting CINCs.

This program element has four related projects: The first project, CMU, was completed in early FY99 with Full Operational Capability (FOC) declaration on 29 Oct 98, ahead of the Acquisition Program Baseline (APB) schedule. The second project, ITW/AA System Engineering, is the primary source for modernization planning, integration and architecture development of modifications, upgrades and new acquisitions into the larger BMC2 system. It also provides standardization and interoperability among ITW/AA systems, the integrated BMC2 system, and other program upgrades (e.g., Space Based Infrared Systems (SBIRS) integration, National Missile Defense, and other Force Enhancements and Space Control programs). The third project, CMU Legacy Interfaces, provided software development upgrades to post-IOC CMU subsystems and direct mission software support to meet operational needs (adapting development systems to accommodate evolving older systems) and was completed in FY99. The fourth project, the NORAD/USSPACECOM Warfighting Support System (N/UWSS), provides the means by which the CINC BMC2 'system of systems' will evolve to meet CINC/NORAD/USCINCSpace's evolving mission requirements and achieve Defense Information Infrastructure Common

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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305906F NCMC - TW/AA System
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(U) **A. Mission Description Continued**
 Operating Environment (DII COE) compliance. This project is consistent with the Air Force Long Range Plan, Joint Vision 2010, and the Defense Planning Guidance. The Joint Requirements Oversight Council (JROC) approved the N/UWSS Mission Needs Statement (MNS) on 18 May 1998.

(U) **B. Budget Activity Justification**
 This program element is in Budget Activity 7, Operational System Development, because the projects in this program element support development acquisition programs or upgrades in support of operational systems.

(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)	7,333	16,408	19,481	TBD
(U) Appropriated Value	7,878	13,408		
(U) Adjustments to Appropriated Value				
a. Congressional/General Reductions	-545	-1		
b. Small Business Innovative Research	-227			
c. Omnibus or Other Above Threshold Reprogram	8,000	-73		
d. Below Threshold Reprogram	1,097			
e. Rescissions	-90	-104		
f. Other				TBD
(U) Adjustments to Budget Years Since FY 2000 PBR			-172	TBD
(U) Current Budget Submit/FY 2001 PBR	16,113	13,230	19,309	TBD

(U) **Significant Program Changes:**
 FY99: \$8000 Y2K additional supplemental appropriation to support development of the Center for Y2K Strategic Stability (CY2KSS) identified as a new start under PE0308699F in FY00 PB documentation.
 FY99 BTR: \$1,195 for Space Battle Manager Space Integration EFX 99 initiative and -\$98 to support higher AF priorities.
 FY01: Adjustment funded other AF and DoD priorities

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BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305906F NCMC - TW/AA System				PROJECT 673880	
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
673880 CMU	105	0	0	0	0	0	0	0	1,291,797
<p>(U) <u>A. Mission Description</u> The Cheyenne Mountain Upgrade (CMU) program met Joint Chiefs of Staff requirements to provide the National Command Authorities with timely, reliable, and unambiguous Integrated Tactical Warning and Attack Assessment (ITW/AA) data for force survival or retaliatory decisions in the face of air, space, or ballistic missile threats. The program provided: 1) survivable communications access for missile attack warning; 2) integrated warning of ballistic missile, atmospheric, and space threats; 3) standard user displays and warning processing systems at selected command centers; 4) an austere alternate facility capable of early/trans-attack warning and peacetime backup to the Missile Warning Center at Cheyenne Mountain. The CMU program implemented an acquisition strategy that tested and delivered four phases of user capability. Phase 1 implemented the missile warning capability in Sept 1995. Phases 2 and 3 were completed in August 1996 and July 1997, respectively. The Integrated Mission testing was completed on 5 August 1998. Full Operational Capability (FOC) was declared on 29 Oct 98.</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u> (U) \$105 Completed CMU (U) \$105 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u> (U) \$0 Not applicable (U) \$0 Total</p> <p>(U) <u>FY 2001 (\$ in Thousands)</u> (U) \$0 Not applicable (U) \$0 Total</p> <p>(U) <u>B. Project Change Summary</u> No change.</p>									
Project 673880			Page 3 of 20 Pages				Exhibit R-2A (PE 0305906F)		

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305906F NCMC - TW/AA System	PROJECT 673880
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(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) Other APPN									
(U) Other Procurement (Electronics, tele-communications equipment, & spares)* PE0305906F	12,380	10,534	17,484	15,435	14,508	14,818	15,083	Continuing	
(U) Operations & Maintenance (PE0305906F) * Includes CMU and N/UWSS	84,319	65,400	81,053	85,132	89,933	90,842	73,034	Continuing	

(U) **D. Acquisition Strategy**
All major contracts within this program element were awarded after full and open competition.

(U) **E. Schedule Profile**

	<u>FY 1999</u>			<u>FY 2000</u>			<u>FY 2001</u>					
	1	2	3	4	1	2	3	4	1	2	3	4
(U) CMU FOC	*											

* indicates completed task /X indicates scheduled task

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)						DATE February 2000					
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305906F NCMC - TW/AA System			PROJECT 673880				
(U) <u>A. Project Cost Breakdown (\$ in Thousands)</u>											
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>	
(U)	SPO Support										
(U)	Information Technology Services Program Contracts					56		0		0	
(U)	Program Support					49		0		0	
(U)	Total					105		0		0	
(U) <u>B. Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
(U) <u>Performing Organizations:</u>											
<u>Contractor or</u>	<u>Contract</u>										
<u>Government</u>	<u>Method/Type</u>	<u>Award or</u>	<u>Performing</u>	<u>Project</u>							
<u>Performing</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>	
<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>	
<u>Product Development Organizations</u>											
Lockheed-Martin	C/CPIF/AF	Oct 91	271,814	271,814	271,814	0	0	0	0	271,814	
CO Springs CO											
E-Systems	C/FPI/AF	Aug 86	103,240	103,240	103,240	0	0	0	0	103,240	
St Petersburg FL											
TRW, Inc	C/FPI/AF	Jun 87	213,761	213,761	213,761	0	0	0	0	213,761	
Carson CA											
GTE	C/CPIF/AF	Jan 92	238,415	238,415	238,415	0	0	0	0	238,415	
Needham Hgts MA											
Lockheed-Martin	SS/CPIF/AF	Mar 93	120,018	120,018	120,018	0	0	0	0	120,018	
CO Springs CO											
DISA (Govt)	PO	Oct 93	9,152	9,152	9,152	0	0	0	0	9,152	
Reston VA											
KAMAN Sciences	C/CPAF	Aug 95	3,176	3,176	3,176	0	0	0	0	3,176	
CO Springs CO											
Misc	Various	Various	820	820	820	0	0	0	0	820	

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 2000
BUDGET ACTIVITY					PE NUMBER AND TITLE					PROJECT
07 - Operational System Development					0305906F NCMC - TW/AA System					673880
(U) Performing Organizations Continued:										
<u>Support and Management Organizations</u>										
MITRE	SS/PR	Oct 95	N/A	N/A	168,615	0	0	0	0	168,615
TEMS/ITSP Contracts	C/PR	Various	N/A	N/A	72,966	56	0	0	0	73,022
Program Support	Various	Various	N/A	N/A	89,715	49	0	0	0	89,764
<u>Test and Evaluation Organizations</u>										
None										
(U) Government Furnished Property:										
<u>Contract</u>										
	<u>Method/Type</u>	<u>Award or</u>								
<u>Item</u>	<u>or Funding</u>	<u>Obligation</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>Description</u>	<u>Vehicle</u>	<u>Date</u>	<u>Date</u>		<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Property</u>										
None										
<u>Support and Management Property</u>										
None										
<u>Test and Evaluation Property</u>										
None										
					<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					960,396	0	0	0	0	960,396
Subtotal Support and Management					331,296	105	0	0	0	331,401
Subtotal Test and Evaluation										
Total Project					1,291,692	105	0	0	0	1,291,797

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305906F NCMC - TW/AA System				PROJECT 673881		
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
673881	Integrated TW/AA	15,089	4,465	4,136	3,669	3,677	3,750	3,825	Continuing	TBD
<p>(U) <u>A. Mission Description</u> This project was established to integrate new acquisitions such as the Cheyenne Mountain Upgrade (CMU) program into the Integrated Tactical Warning and Attack Assessment (ITW/AA) network when it became apparent that such efforts could only be achieved through rigorous system-of-systems design and engineering analysis of all interfaces and relationships among the twenty-six systems of the network. The project provides interface analysis and disconnect resolution among the ITW/AA systems and future program upgrades (e.g., Space Based Infrared System (SBIRS) integration, National Missile Defense, and other Force Enhancement and Space Control programs). This project supports the high priority task of integrating modifications, upgrades and new acquisitions for the USCINCSpace fixed site Command and Control nodes (e.g., Cheyenne Mountain Operations Center & Space Operations Center), component C2 nodes (14 AF Aerospace Operations Center, 20th AF Missile Operations Center) and the mobile C2 node. As USCINCSpace moves toward common infrastructures and open system platforms, this project will integrate those systems into the ITW/AA network through pre-planned vertical release upgrades. This project is the primary source for modernization planning, integration, and architecture development of modifications, upgrades and new acquisitions into the ITW/AA network. In FY99 \$8M plus-up funding under this PE was used to support development of the Center for Y2K Strategic Stability (CY2KSS) which was identified as a new start under PE0308699F in the FY00 President's Budget documentation.</p>										
<p>(U) <u>FY 1999 (\$ in Thousands)</u></p>										
(U)	\$3,361	Systems Engineering Integration Team (SEIT) and Future Plans merged into Integrated Systems Engineering (ISE), tasks include: transition space surveillance common user message traffic off AUTODIN onto new communication architecture; initial integration of new Clear radar sensor into the missile warning and space surveillance C2 nodes; initial upgrade of missile warning C2 nodes from SBIRS Increment I ground station consolidation; planning and integration activities supporting NMD's BMC3 CINC node in the ITW/AA network; and software vertical release planning								
(U)	\$3,728	AF long range planning 'jump start' funding for Space Battle Manager (SBM) command and control prototyping, supports Expeditionary Force Experiment '99 (EFX 99)								
(U)	\$8,000	Shared Early Warning System (SEWS) CY2KSS supplemental appropriation								
(U)	\$15,089	Total								

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE February 2000																														
BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305906F NCMC - TW/AA System	PROJECT 673881																														
<p>(U) <u>A. Mission Description Continued</u></p> <p>(U) <u>FY 2000 (\$ in Thousands)</u></p> <p>(U) \$2,456 Requirements, architecture, and planning for new and upgraded fixed and mobile C2 nodes and sensors including vertical release planning, communications architecture, technology roadmap, and information operations into the ITW/AA network (e.g. SBIRS and NMD).</p> <p>(U) \$1,116 Systems engineering for new and upgraded fixed and mobile C2 nodes and sensors including integrated scheduling, AUTODIN-R program, SBIRS, and NMD.</p> <p>(U) \$893 Test planning, execution, and test safety for new and upgraded fixed and mobile C2 nodes and sensors including vertical releases, AUTODIN-R program, SBIRS, and NMD.</p> <p>(U) \$4,465 Total</p> <p>(U) <u>FY 2001 (\$ in Thousands)</u></p> <p>(U) \$1,861 Requirements, architecture, and planning for new and upgraded fixed and mobile C2 nodes and sensors including vertical release planning, communications architecture, technology roadmap, and information operations into the ITW/AA network (e.g. SBIRS and NMD).</p> <p>(U) \$1,241 Systems engineering for new and upgraded fixed and mobile C2 nodes and sensors including integrated scheduling, AUTODIN-R program, SBIRS, and NMD.</p> <p>(U) \$1,034 Test planning, execution, and test safety for new and upgraded fixed and mobile C2 nodes and sensors including vertical releases, AUTODIN-R program, SBIRS, and NMD.</p> <p>(U) \$4,136 Total</p> <p>(U) <u>B. Project Change Summary</u> FY99: \$8000 Y2K additional supplemental appropriation to support development of the CY2KSS identified as a new start under PE0308699F in the FY00 President's Budget documentation. There have been a number of schedule changes which are reflected and explained in Section E. Schedule Profile.</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%; 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) All other Appn shown in the CMU, Project 3880.</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>(U) <u>D. Acquisition Strategy</u> All major contracts within this program element were awarded after full and open competition.</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) All other Appn shown in the CMU, Project 3880.									
	<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) All other Appn shown in the CMU, Project 3880.																																
Project 673881	Page 8 of 20 Pages	Exhibit R-2A (PE 0305906F)																														

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305906F NCMC - TW/AA System	PROJECT 673881
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(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) AUTODIN Transition completed									X			
(U) SBIRS - ITW/AA Increment 1 completed	*											
(U) SBIRS - ITW/AA Increment 2 completion							X					
(U) Complete Clear Radar Upgrade Integration									X			
(U) Start ITW/AA MPDS-R Legacy Comm Transition							X					
(U) Start ITW/AA Space Defense Operations Center Re-Engineering				*								
(U) Start NMD - BMC3 ITW/AA Integration				*								
(U) ITW/AA Air Initiatives completed							X					
(U) Pre-Planned ITW/AA Software Vertical Release Upgrades		*		*		X		X		X		X
(U) HAVE STARE (FPS-129) Radar Integration completed												X

* indicates task completed/X indicates scheduled task

- AUTODIN transition originally scheduled for completion Jan 00 delayed until May 00 (stage 1) for top priority space data users and (stage 2) for secondary customers coming on line throughout the remainder of the year.
- ITW/AA Processing Display System - Migration (PDS-M) dropped from list of projects when estimate exceeded available budget. Tasks being rolled into work to be awarded to the eventual ISC2 contractor in Aug 00.
- The HAVE STARE (FPS-129) Radar will not be a fully integrated element of the Missile Warning Space Surveillance System. The radar will only be integrated with the Space Control Center and the Alternate Space Control Center. HAVE STARE Radar Integration delayed one year due to radome blowing off (weather conditions this time of year in Norway preclude replacing the radome which still has to be manufactured).

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development					PE NUMBER AND TITLE 0305906F NCMC - TW/AA System			PROJECT 673881		
(U) A. Project Cost Breakdown (\$ in Thousands)										
					<u>FY 1999</u>		<u>FY 2000</u>			<u>FY 2001</u>
(U)	Major Contract Incremental Funding *				6,706		0			1,000
(U)	Award/Performance Fee				142		0			0
(U)	SPO Support									
(U)	MITRE				4,282		1,644			1,680
(U)	TEMS/ITSP Contracts				1,921		2,524			1,164
(U)	Program Support				2,038		297			292
(U)	Total				15,089		4,465			4,136
* \$1M in FY01 - As part of the Total System Performance Responsibility (TSPR) initiative (identified in the N/UWSS section D. Acquisition Strategy) some systems engineering effort formerly performed by FFRDC (MITRE) will be transitioned to the ISC2 contractor. The change in MITRE funding of \$3.052 in the Feb 99 R-3 to the current \$1.680 in this document reflects that transition in FY01.										
(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>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>						
<u>Product Development Organizations</u>										
DISA	MIPR	Apr 96	1,328	1,328	1,328				0	1,328
Lockheed Martin Co Springs, CO	C/CPIF/AF	Jun 95	6,390	6,390	6,390				0	6,390
Lockheed Martin Sunnyvale, CA	CPIF/AF	Nov 98	1,546	2,561	0	2,561			0	2,561
SPAWAR/Navy	MIPR	Nov 98	583	1,132	0	1,435			0	1,435
DTRA Dulles, VA	MIPR	Apr 99	N/A	N/A	0	1,300				1,300
ISC2 Contractor (TBD)	CP/AF	Oct 00	N/A	N/A	0	0	0	1,000	0	1,000
Prime Contractors (Various)	Various	Various	N/A	N/A	0	1,552				1,552

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE
BUDGET ACTIVITY										PROJECT
07 - Operational System Development										673881
PE NUMBER AND TITLE										
0305906F NCMC - TW/AA System										
<p>(U) Performing Organizations Continued:</p> <p><u>Support and Management Organizations</u></p>										
MITRE	CPFF	Oct 95	N/A	N/A	53,025	4,282	1,644	1,680	Continuing	TBD
TEMS/Information	C/R	Various	N/A	N/A	32,221	1,921	2,524	1,164	Continuing	TBD
Technology Services Program										
Contracts										
Program Support	N/A	Nov 95	N/A	N/A	7,128	2,038	297	292	Continuing	TBD
Prime Contractors	(Various)				812					812
<u>Test and Evaluation Organizations</u>										
None										
<p>(U) Government Furnished Property:</p>										
<u>Contract</u>										
<u>Method/Type</u>										
<u>Award or</u>										
<u>Item</u>	<u>or Funding</u>	<u>Obligation</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>Description</u>	<u>Vehicle</u>	<u>Date</u>	<u>Date</u>		<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Property</u>										
None										
<u>Support and Management Property</u>										
None										
<u>Test and Evaluation Property</u>										
None										
					<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					7,718	6,848	0	1,000	0	15,566
Subtotal Support and Management					93,186	8,241	4,465	3,136	TBD	TBD
Subtotal Test and Evaluation										
Total Project					100,904	15,089	4,465	4,136	TBD	TBD

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 2000																																																			
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305906F NCMC - TW/AA System				PROJECT 674409																																																			
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																																																		
674409 CMU Legacy Interface	919	0	0	0	0	0	0	0	47,451																																																		
<p>(U) <u>A. Mission Description</u> The FY95 Appropriations Conference Committee transferred \$41.5M from the O&M Critical Space Contract Operations Line to the RDT&E R-1 line in this program element. Congress realigned these funds from O&M to RDT&E to identify the costs associated with Cheyenne Mountain Upgrade (CMU) software development upgrades to the CMU program. To clearly account for this funding, this project, Legacy Interfaces, was established. This project provided funding for software development upgrades to the CMU program and for direct mission software support to meet operational needs and was completed in FY99.</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u> (U) \$919 Provided Cheyenne Mountain software engineering support/upgrades (U) \$919 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u> (U) \$0 Not applicable (U) \$0 Total</p> <p>(U) <u>FY 2001 (\$ in Thousands)</u> (U) \$0 Not applicable (U) \$0 Total</p> <p>(U) <u>B. Project Change Summary</u> No changes</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:5%;"><u>FY 1999</u></th> <th style="width:5%;"><u>FY 2000</u></th> <th style="width:5%;"><u>FY 2001</u></th> <th style="width:5%;"><u>FY 2002</u></th> <th style="width:5%;"><u>FY 2003</u></th> <th style="width:5%;"><u>FY 2004</u></th> <th style="width:5%;"><u>FY 2005</u></th> <th style="width:5%;"><u>Cost to</u></th> <th style="width:5%;"><u>Total Cost</u></th> </tr> <tr> <td></td> <td align="center"><u>Actual</u></td> <td align="center"><u>Estimate</u></td> <td align="center"><u>Estimate</u></td> <td align="center"><u>Estimate</u></td> <td align="center"><u>Estimate</u></td> <td align="center"><u>Estimate</u></td> <td align="center"><u>Estimate</u></td> <td align="center"><u>Complete</u></td> <td></td> </tr> </thead> <tbody> <tr> <td>(U) AF RDT&E</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Other APPN</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) All other Appns show in the CMU, project 3880</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>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Cost to</u>	<u>Total Cost</u>		<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>		(U) AF RDT&E										(U) Other APPN										(U) All other Appns show in the CMU, project 3880									
	<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>																																																			
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(U) All other Appns show in the CMU, project 3880																																																											
<p>Project 674409</p> <p align="center">Page 12 of 20 Pages</p> <p align="right">Exhibit R-2A (PE 0305906F)</p>																																																											

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305906F NCMC - TW/AA System	PROJECT 674409
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(U) **D. Acquisition Strategy**
All major contracts within this program element were awarded after full and open competition.

(U) **E. Schedule Profile**

	<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4
(U) Cheyenne Mountain test/software support upgrades	*											
* indicates task completed/X indicates planned task												

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development					PE NUMBER AND TITLE 0305906F NCMC - TW/AA System			PROJECT 674409		
(U) <u>A. Project Cost Breakdown (\$ in Thousands)</u>										
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>
(U)	SPO support					0		0		0
(U)	ITSP Contracts					824		0		0
(U)	Program Support					95		0		0
(U)	Total					919		0		0
(U) <u>B. Budget Acquisition History and Planning Information (\$ in Thousands)</u>										
(U) <u>Performing Organizations:</u>										
<u>Contractor or</u>	<u>Contract</u>									
<u>Government</u>	<u>Method/Type</u>	<u>Award or</u>	<u>Performing</u>	<u>Project</u>						
<u>Performing</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Organizations</u>										
Lockheed-Martin	CP/AF	Oct 94	9,352	9,352	9,352				0	9,352
CO Springs CO										
E-Systems	FPIF/AF	Oct 94	1,880	1,880	1,880				0	1,880
St Petersburg FL										
Kaman Sciences	CP/AF	Oct 94	18,214	18,214	18,214				0	18,214
CO Springs CO										
Kaman Sciences	CP/AF	Oct 94	12,471	12,471	12,471				0	12,471
CO Springs CO										
Navy/NISE	MIPR	Sep 95	3,244	3,244	3,244				0	3,244
<u>Support and Management Organizations</u>										
MITRE	CPFF	N/A	N/A	N/A	1,102				0	1,102
TEMS/ITSP Contracts	CPFF	N/A	N/A	N/A	261	824			0	1,085
Program Support	N/A	N/A	N/A	N/A	8	95			0	103
<u>Test and Evaluation Organizations</u>										
None										

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305906F NCMC - TW/AA System			PROJECT 674409		
(U) <u>Government Furnished Property:</u>									
	<u>Contract</u>								
	<u>Method/Type</u>	<u>Award or</u>							
<u>Item</u>	<u>or Funding</u>	<u>Obligation</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>Description</u>	<u>Vehicle</u>	<u>Date</u>	<u>Date</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Property</u>									
None									
<u>Support and Management Property</u>									
None									
<u>Test and Evaluation Property</u>									
None									
				<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				45,161				0	45,161
Subtotal Support and Management				1,371	919			0	2,290
Subtotal Test and Evaluation									
Total Project				46,532	919			0	47,451

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305906F NCMC - TW/AA System				PROJECT 674806		
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
674806	N/UWSS NORAD/USSPACECOM Warfighting System	0	8,765	15,173	12,146	12,026	14,421	14,391	Continuing	TBD
<p>(U) <u>A. Mission Description</u> The NORAD/USSPACECOM Warfighting Support System (N/UWSS) provides the foundation for the future architecture for a NORAD/USSPACECOM Battle Management/C4I 'system of systems' that complies with the Defense Information Infrastructure Common Operating Environment (DII COE), Joint Technical Architecture (JTA) standards and provides for DoD/Joint C2 interoperability. New Space C2 capability will be integrated with this architecture and the evolving legacy mission capability to provide an integrated battlespace picture. N/UWSS scope addresses all Commander-in-Chief (CINC) North American Aerospace Defense Command (NORAD)/CINC US Space Command (USSPACECOM) functions including the Integrated Tactical Warning/Attack Assessment (ITW/AA) and Space Battle Management mission applications with automated decision aids. N/UWSS objectives are to provide NORAD/USSPACECOM a C2 system that is flexible in responding to evolving mission needs (e.g. Space Based Infrared System (SBIRS), National Missile Defense (NMD), Space Control, and Information Operations); is interoperable within the NORAD/USSPACECOM warfighting functions and supporting/supported CINCs; and achieves reductions in total cost of ownership.</p> <p>The initial scope of N/UWSS will put into place an architecture to support evolution of fixed and endurable C2 nodes to DII COE compliance and develop and integrate new Space C2 capability.</p>										
<p>(U) <u>FY 1999 (\$ in Thousands)</u></p> <p>(U) \$0 Not applicable</p> <p>(U) \$0 Total</p>										
<p>(U) <u>FY 2000 (\$ in Thousands)</u></p> <p>(U) \$888 Enterprise infrastructure database development</p> <p>(U) \$743 Fused battlespace situation monitor and assessment</p> <p>(U) \$2,228 Command and Control (C2) of space forces/threat warning development</p> <p>(U) \$4,458 C2 of space forces/space battle manager to provide theater situational awareness</p> <p>(U) \$448 C2 of space forces/space operations planning and development of a Space Tasking Order (STO)</p> <p>(U) \$8,765 Total</p>										
Project 674806			Page 16 of 20 Pages				Exhibit R-2A (PE 0305906F)			

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305906F NCMC - TW/AA System	PROJECT 674806
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(U) **A. Mission Description Continued**

(U) **FY 2001 (\$ in Thousands)**

(U) \$3,319	Enterprise infrastructure database development
(U) \$3,766	Fused battlespace picture situation monitor and assessment
(U) \$2,442	C2 of space forces/threat warning development
(U) \$3,936	C2 of space forces/space battle manager to provide theater situational awareness
(U) \$1,710	C2 of space forces/space operations planning and development of a Space Tasking Order (STO)
(U) \$15,173	Total

(U) **B. Project Change Summary**

This project was a new start in FY00. There have been a number of schedule changes which are reflected and explained in Section E. Schedule Profile.

(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) Other APPN	Other procurement funds shown in CMU: project 673880.								

(U) **D. Acquisition Strategy**

N/UWSS will employ an evolutionary spiral development acquisition strategy which enables rapid development and fielding of an initial capability in response to a validated requirement. Using a spiral development acquisition strategy is important in a hardware/software intensive C2 system where 18-24 month technology cycles are common.

N/UWSS will utilize a performance-oriented contracting strategy with industry, evolving toward Total System Performance Responsibility (TSPR). All major contracts related to this project will be awarded after full and open competition.

(U) **E. Schedule Profile**

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)										DATE February 2000				
BUDGET ACTIVITY					PE NUMBER AND TITLE					PROJECT				
07 - Operational System Development					0305906F NCMC - TW/AA System					674806				
(U) <u>E. Schedule Profile Continued</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	
(U)	Interim Integrated Space Command and Control (ISC2) Contract Award				*									
(U)	ISC2 Contract Award						X		X					
(U)	C2 of Space Forces incremental delivery						X		X				X	
<p>* Indicates task completion/X indicates scheduled task.</p> <p>- ISC2 initial contract award will be in Feb 00 to two contractors followed by a rolling down select with final award in Aug 00 to one contractor.</p> <p>- FY00 PB (Feb 99) schedule profile showed only one scheduled task (X) for ISC2 contract award because at that time ISC2 contract was to be a single source contract.</p> <p>- ISC2 contract award slipped 3 months from FY00 PB (Feb 99) schedule profile. The draft RFP was released in Nov 99. The final RFP was held until critical processes (requirements, funding, test, training) could be worked and agreed to between AFSPC and PEO for C2 resulting in the delay of the final RFP release resulting in a concurrent slip to final award.</p> <p>- Due to the delay of the ISC2 contract award, an interim contractor has been hired to begin the Space Battle Management Core System (SBMCS) work which results in the C2 of Space Forces incremental delivery beginning earlier on the schedule profile. The enterprise database and fused battlespace picture incremental delivery lines were then rolled into the C2 of space forces incremental delivery line in an effort to accurately portray deliveries of all space products.</p>														
Project 674806					Page 18 of 20 Pages					Exhibit R-2A (PE 0305906F)				

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development					PE NUMBER AND TITLE 0305906F NCMC - TW/AA System			PROJECT 674806		
(U) <u>A. Project Cost Breakdown (\$ in Thousands)</u>										
						<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>		
(U)	Major Contract					0	5,460	11,541		
(U)	Award/Performance Fee					0	500	1,731		
(U)	FFRDC					0	1,440	1,225		
(U)	A&AS					0	1,115	520		
(U)	Program Support					0	250	156		
(U)	Total					0	8,765	15,173		
(U) <u>B. Budget Acquisition History and Planning Information (\$ in Thousands)</u>										
(U) <u>Performing Organizations:</u>										
<u>Contractor or</u>	<u>Contract</u>									
<u>Government</u>	<u>Method/Type</u>	<u>Award or</u>	<u>Performing</u>	<u>Project</u>						
<u>Performing</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Organizations</u>										
ISC2 Contractor (TBD)	CP/AF	Aug 00	N/A	N/A	0	0	400	13,272	Continuing	TBD
Systems Engineering Development & Integration Contractor	MIPR	Jan 00	N/A	N/A	0	0	5,560		Continuing	TBD
<u>Support and Management Organizations</u>										
FFRDC	CP/FF	Jan 00	N/A	N/A	0	0	1,440	1,225	Continuing	TBD
A&AS	CP/FF	Jan 00	N/A	N/A	0	0	1,115	520	Continuing	TBD
Program Support	N/A	Jan 00	N/A	N/A	0	0	250	156	Continuing	TBD
<u>Test and Evaluation Organizations</u>										
None										

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305906F NCMC - TW/AA System	PROJECT 674806
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(U) **Government Furnished Property:**

<u>Item</u> <u>Description</u>	<u>Contract</u> <u>Method/Type</u> <u>or Funding</u> <u>Vehicle</u>	<u>Award or</u> <u>Obligation</u> <u>Date</u>	<u>Delivery</u> <u>Date</u>	<u>Total Prior</u> <u>to FY 1999</u>	<u>Budget</u> <u>FY 1999</u>	<u>Budget</u> <u>FY 2000</u>	<u>Budget</u> <u>FY 2001</u>	<u>Budget to</u> <u>Complete</u>	<u>Total</u> <u>Program</u>
<u>Product Development Property</u>									
None									
<u>Support and Management Property</u>									
None									
<u>Test and Evaluation Property</u>									
None									
				<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				0	0	5,960	13,272	TBD	TBD
Subtotal Support and Management				0	0	2,805	1,901	TBD	TBD
Subtotal Test and Evaluation									
Total Project				0	0	8,765	15,173	TBD	TBD

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

DATE
February 2000

BUDGET ACTIVITY		PE NUMBER AND TITLE							
07 - Operational System Development		0305910F SPACETRACK							
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	42,410	54,010	2,553	583	0	0	0	0	TBD
674241 Advanced Electro Optical System (AEOS)	23,464	20,660	0	0	0	0	0	0	192,411
674279 Have Stare Radar	18,946	27,253	1,387	0	0	0	0	0	TBD
674791 GEODSS Sustainment	0	6,097	1,166	583	0	0	0	0	7,846
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0

NOTE: Have Stare total cost not available since it was transferred from Intelligence budget in FY 93

(U) A. Mission Description

The SPACETRACK program element represents a worldwide Space Surveillance Network (SSN) of dedicated, collateral, and contributing electro-optical, passive radio frequency (RF) and radar sensors. The SSN is tasked to provide space object identification and cataloging, satellite attack warning, timely notification to U.S. forces of satellite fly-over, space treaty monitoring, and scientific and technical intelligence gathering. The continued increase in satellite and orbital debris populations, as well as the increasing diversity in launch trajectories, non-standard orbits, and geosynchronous altitudes, necessitates continued modernization of the SSN to meet existing and future requirements and ensure their cost-effective supportability. The resources and responsibility for completing the HAVE STARE Radar System development were transferred to SPACETRACK from an intelligence program per Congressional direction in FY93.

The GEODSS Sustainment project, a new effort, will develop and field ten Charge Coupled Device (CCD) Cameras for the Ground-Based Electro-Optical Deep Space Surveillance (GEODSS) System, located at Socorro, NM; Diego Garcia, Indian Ocean; and Maui, Hawaii. In addition, this project will fund the purchase and integration of ten Modular Precision Angular Control Systems (MPACS).

(U) B. Budget Activity Justification

All of these projects are Budget Activity 7, Operational Systems Development, because they involve development of or modifications to operational sensor network sites.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)			DATE February 2000	
BUDGET ACTIVITY		PE NUMBER AND TITLE		
07 - Operational System Development		0305910F SPACETRACK		
(U)	<u>C. Program Change Summary (\$ in Thousands)</u>			
		<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
	<u>Total Cost</u>			
(U)	Previous President's Budget (FY 2000 PBR)	45,375	54,806	1,178
(U)	Appropriated Value	45,832	54,806	
(U)	Adjustments to Appropriated Value			
	a. Congressional/General Reductions	-457	-72	
	b. Small Business Innovative Research	-1,409		
	c. Omnibus or Other Above Threshold Reprogram		-297	
	d. Below Threshold Reprogram	-1,319		
	e. Rescissions	-237	-427	
	f. Other			TBD
(U)	Adjustments to Budget Years Since FY 2000 PBR			1,375
(U)	Current Budget Submit/FY 2001 PBR	42,410	54,010	2,553
	NOTE: Total cost data not available. Have Stare program transferred from the intelligence budget in FY93 at the direction of Congress.			
(U)	<u>Significant Program Changes:</u>			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)							DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305910F SPACETRACK				PROJECT 674241		
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
674241	Advanced Electro Optical System (AEOS)	23,464	20,660	0	0	0	0	0	0	192,411
<p>(U) <u>A. Mission Description</u> The Advanced Electro-Optical System (AEOS) is a 3.67 meter telescope addition to the Maui Space Surveillance System (MSSS). The AEOS program was initiated in FY91 per Congressional direction. Congress continued to appropriate funding for this project in FY93, FY94, FY95, and FY96. DoD budgeted for the continuation of AEOS in FY97, FY98, FY99 and in FY00. This project is in Budget Activity 7, Operational Systems Development, because it involves sustained engineering support for development of, or modifications to, an operational SPACETRACK network site. Beginning in FY01, the Air Force Research Laboratory (AFRL) will assume management of AEOS, and funding will appear in PE 63444, Budget Activity 3, Advanced Technology.</p>										
<p>(U) <u>FY 1999 (\$ in Thousands)</u></p>										
(U)	\$14,570	Continued integration & test of Radiometer, Longwave Infrared Imager (LWIR) and Adaptive Optics (A/O) System								
(U)	\$1,713	Completed the MSSS Observatory Control System (OCS)								
(U)	\$5,841	R&D upgrades to the MSSS, operational transition of AEOS, visitor programs & purchase spares								
(U)	\$1,340	University of Hawaii (UH) spectrograph and atmospheric characterization research								
(U)	\$23,464	Total								
<p>(U) <u>FY 2000 (\$ in Thousands)</u></p>										
(U)	\$10,175	Complete site testing and integration of the adaptive optics system; procurement of spares; transition of system from AFSPC to AFRL								
(U)	\$2,685	Complete integration and test upgrade to MSSS Observatory Control System								
(U)	\$7,800	Continue R&D and upgrades to MSSS (P3I items) such as AEOS/OCS enhancements to instrumentation and coude beam; advanced daylight imaging techniques and tool development								
(U)	\$20,660	Total								
<p>(U) <u>FY 2001 (\$ in Thousands)</u></p>										
(U)	\$0	No Applicable								
(U)	\$0	Total								

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305910F SPACETRACK	PROJECT 674241
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(U) **B. Project Change Summary**
 Note: The Radiometer Acceptance, Long Wave Imager (LWI) and Observatory Control System (OCS) delays were due to software/hardware failures during Site Acceptance Testing. The Adaptive Optics SAT slip is due to technical software problems. The software/hardware problems are corrected and the program is on schedule for a Jun 00 DT&E completion.

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

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Cost to</u>	<u>Total Cost</u>
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	
(U) AF RDT&E									
(U) Other APPN None			4,625	4,627	4,625	4,622	4,617	Continuing	TBD

(U) **D. Acquisition Strategy**
 All major contracts were awarded after full and open competition.

(U) **E. Schedule Profile**

	<u>FY 1999</u>			<u>FY 2000</u>			<u>FY 2001</u>					
	1	2	3	4	1	2	3	4	1	2	3	4
(U) Radiometer Acceptance				*								
(U) Long Wave Imager Acceptance				*								
(U) Observatory Control Sys Acceptance								X				
(U) Adaptive Optics System Acceptance					*							
(U) AEOS DT&E Complete								X				

* indicates task completion/X indicates planned task

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development					PE NUMBER AND TITLE 0305910F SPACETRACK			PROJECT 674241		
(U) <u>A. Project Cost Breakdown (\$ in Thousands)</u>										
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>
(U)	Congressionally directed level of effort for AEOS Maui facilities expansion					23,464		20,660		0
(U)	Total					23,464		20,660		0
(U) <u>B. Budget Acquisition History and Planning Information (\$ in Thousands)</u>										
(U) <u>Performing Organizations:</u>										
<u>Contractor or</u>	<u>Contract</u>									
<u>Government</u>	<u>Method/Type</u>	<u>Award or</u>	<u>Performing</u>	<u>Project</u>						
<u>Performing</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Organizations</u>										
Kiewit Pacific Co	C/FFP/AF	Aug 94	21,000	22,979	22,979	0	0		0	22,979
Kapolei, HI										
Contraves USA	C/FFP/AF	Dec 91	23,000	23,413	23,413	0	0		0	23,413
Pittsburgh, PA										
ROSI	C/CPAF/AF	Aug 94	31,000	36,962	27,353	7,009	2,600	0	0	36,962
Danbury, CT										
COMSAT RSI, Inc	C/FFP/AF	Aug 95	7,000	7,289	7,289	0	0	0	0	7,289
Clarksburg, MD										
Mission Research Corp	C/CPIF/AF	Jul 95	4,600	5,760	4,860	600	300	0	0	5,760
Santa Barbara, CA										
Raytheon	C/CPIF/AF	Sep 95	5,800	9,023	6,948	1,700	375	0	0	9,023
El Segundo, CA										
RTS	C/CPAF/AF	Sep 95	N/A	41,006	16,640	9,941	13,885	0	0	40,466
Kihei, Maui, HI										
RPS	C/CPAF/AF	Oct 90	N/A	41,006	12,933	0	0	0	0	12,933
Kihei, Maui, HI										
UH*	C/CR/AF	Oct 96	3,400	3,665	1,700	1,340	625	0	0	3,665
Maui, HI										
Project 674241										
Page 5 of 16 Pages										
Exhibit R-3 (PE 0305910F)										

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 2000
BUDGET ACTIVITY					PE NUMBER AND TITLE					PROJECT
07 - Operational System Development					0305910F SPACETRACK					674241
(U) <u>Performing Organizations Continued:</u>										
*Congressionally directed Spectrograph Research/Atmospheric Characterization										
<u>Support and Management Organizations</u>										
Logicon RDA	C/CPAF/AF	Oct 95	N/A	N/A	2,457	399	350	0	0	3,206
Albuquerque, NM										
Logicon RDA	C/CPAF/AF	Oct 93	N/A	N/A	3,360	0	0	0	0	3,360
Albuquerque, NM										
MIT/LL	SS	Oct 93	N/A	N/A	2,566	250	300	0	0	3,116
Cambridge, MA										
S. Systems Corp	C/CPFF/AF	Jul 93	N/A	N/A	2,976	0	0	0	0	2,976
Albuquerque, NM										
ARMY COE	SS	Jan 95	N/A	N/A	1,617	0	0	0	0	1,617
Haleakala, Maui, HI										
WJS	SS	Oct 97	N/A	N/A	259	150	150	0	0	559
Albuquerque, NM										
Program Office	Various	N/A	N/A	N/A	10,937	2,075	2,075	0	0	15,087
<u>Test and Evaluation Organizations</u>										
None										
(U) <u>Government Furnished Property:</u>										
	<u>Contract</u>									
	<u>Method/Type</u>	<u>Award or</u>								
<u>Item</u>	<u>or Funding</u>	<u>Obligation</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>Description</u>	<u>Vehicle</u>	<u>Date</u>	<u>Date</u>		<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Property</u>										
None										
<u>Support and Management Property</u>										
None										
<u>Test and Evaluation Property</u>										
None										
Project 674241					Page 6 of 16 Pages			Exhibit R-3 (PE 0305910F)		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)			DATE February 2000			
BUDGET ACTIVITY		PE NUMBER AND TITLE			PROJECT	
07 - Operational System Development		0305910F SPACETRACK			674241	
		<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>Total</u>
						<u>Program</u>
<u>Subtotals</u>						
Subtotal Product Development		124,115	20,590	17,785	0	0
Subtotal Support and Management		24,172	2,874	2,875	0	0
Subtotal Test and Evaluation						
Total Project		148,287	23,464	20,660	0	0
						192,411

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)							DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305910F SPACETRACK				PROJECT 674279		
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	
674279 Have Stare Radar	18,946	27,253	1,387	0	0	0	0	0	TBD	
NOTE: Have Stare total cost not available since it was transferred from intel budget in FY93										
(U) <u>A. Mission Description</u>										
The HAVE STARE radar (FPS-129) was transferred from the intelligence budget in FY93 at the direction of Congress. The Air Force has identified a requirement for the HAVE STARE system and has programmed funding in this program element to complete development and to deploy the system. The radar is a high resolution X-band tracking and imaging radar with a 27 meter mechanical dish antenna. The system is being deployed to Vardø, Norway, as a dedicated space surveillance sensor to support the mission of space object catalog maintenance and mission payload assessment. Progress in FY 99 was completion of the radar tower, installation of antenna, radome, and most radar electronics. The radar will not be a fully integrated element of the Missile Warning Network. The radar will only be integrated with the Space Control Center (Cheyenne Mtn AS, CO) and the Alternate Space Control Center (Dalgren Naval Surface Warfare Center, VA)										
(U) <u>FY 1999 (\$ in Thousands)</u>										
(U) \$1,200	Continued radar development incremental funding									
(U) \$5,600	Continued site preparations									
(U) \$11,224	Deployed and installed program equipment									
(U) \$922	Continued Logistics and training									
(U) \$18,946	Total									
(U) <u>FY 2000 (\$ in Thousands)</u>										
(U) \$11,900	Complete facility preparation									
(U) \$7,879	Complete system installation, integration, and checkout									
(U) \$5,084	Conduct formal system tests									
(U) \$2,150	Continue Logistics and training									
(U) \$240	Demolish test facility and cleanup test site									
(U) \$27,253	Total									
Project 674279			Page 8 of 16 Pages				Exhibit R-2A (PE 0305910F)			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)							DATE February 2000																																																																																																																																																		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305910F SPACETRACK			PROJECT 674279																																																																																																																																																		
<p>(U) <u>A. Mission Description Continued</u></p> <p>(U) <u>FY 2001 (\$ in Thousands)</u></p> <p>(U) \$500 Complete system development</p> <p>(U) \$587 Complete testing</p> <p>(U) \$300 Accomplish residual logistics and training</p> <p>(U) \$1,387 Total</p> <p>(U) <u>B. Project Change Summary</u></p> <p>FY01: Funds added to finish installation and checkout of radar in Vardo, Norway.</p> <p>Projected schedule slip (Section E): Recent accident (Nov 99) occurred in Vardo, Norway when high winds blew of the Radome. The projected schedule slip is 6-8 months. Initial Operational Capability (IOC) is now scheduled for 4th Qtr of FY01 and Full Operational Capability (FOC) is scheduled for 3rd Qtr FY02.</p> <p>(U) <u>C. Other Program Funding Summary (\$ in Thousands)</u></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></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>Cost to</u></th> <th style="text-align: center;"><u>Total Cost</u></th> </tr> <tr> <th></th> <th style="text-align: center;"><u>Actual</u></th> <th style="text-align: center;"><u>Estimate</u></th> <th style="text-align: center;"><u>Complete</u></th> <th></th> </tr> </thead> <tbody> <tr> <td>(U) AF RDT&E</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Other APPN</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Operations and Maintenance</td> <td style="text-align: right;">49,412</td> <td style="text-align: right;">51,485</td> <td style="text-align: right;">52,634</td> <td style="text-align: right;">50,860</td> <td style="text-align: right;">51,407</td> <td style="text-align: right;">53,619</td> <td style="text-align: right;">57,898</td> <td style="text-align: center;">Continuing</td> <td></td> </tr> <tr> <td>AF*</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td colspan="10">* Includes other projects in the Spacetrack program element</td> </tr> </tbody> </table> <p>(U) <u>D. Acquisition Strategy</u></p> <p>The existing contract with Raytheon was modified in the third quarter of FY98 for the dismantling, shipment, and installation of the radar, and will be extended until FY01</p> <p>(U) <u>E. Schedule Profile</u></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th colspan="3" style="text-align: center;"><u>FY 1999</u></th> <th colspan="3" style="text-align: center;"><u>FY 2000</u></th> <th colspan="3" style="text-align: center;"><u>FY 2001</u></th> </tr> <tr> <th></th> <th style="text-align: center;">1</th> <th style="text-align: center;">2</th> <th style="text-align: center;">3</th> <th style="text-align: center;">4</th> <th style="text-align: center;">1</th> <th style="text-align: center;">2</th> <th style="text-align: center;">3</th> <th style="text-align: center;">4</th> <th style="text-align: center;">1</th> <th style="text-align: center;">2</th> <th style="text-align: center;">3</th> <th style="text-align: center;">4</th> </tr> </thead> <tbody> <tr> <td>(U) Radar dismantled at Test Site (Vandenberg AFB)</td> <td></td> <td></td> <td></td> <td style="text-align: center;">*</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Begin Installation at Operational Site (Vardø, Norway)</td> <td></td> <td></td> <td></td> <td style="text-align: center;">*</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Formal System Testing Completed</td> <td></td> <td style="text-align: center;">X</td> <td></td> </tr> <tr> <td>(U) System Initial Operational Capability</td> <td></td> <td style="text-align: center;">X</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) AF RDT&E										(U) Other APPN										(U) Operations and Maintenance	49,412	51,485	52,634	50,860	51,407	53,619	57,898	Continuing		AF*										* Includes other projects in the Spacetrack program element											<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) Radar dismantled at Test Site (Vandenberg AFB)				*									(U) Begin Installation at Operational Site (Vardø, Norway)				*									(U) Formal System Testing Completed											X		(U) System Initial Operational Capability												X
	<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 674279			Page 9 of 16 Pages			Exhibit R-2A (PE 0305910F)																																																																																																																																																			

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305910F SPACETRACK	PROJECT 674279
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(U) E. Schedule Profile Continued

<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
1	2	3	4	1	2	3	4	1	2	3	4

* indicates completed event/X planned event.

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305910F SPACETRACK			PROJECT 674279			
(U) A. Project Cost Breakdown (\$ in Thousands)										
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>
(U)	System development					1,000		0		0
(U)	Site preparation and support					5,000		10,900		0
(U)	Deployment, installation and checkout					9,894		7,229		0
(U)	Logistics and training					922		2,000		0
(U)	Formal system testing					0		4,634		0
(U)	Complete open development and testing items					0		0		587
(U)	SPO support					2,130		2,290		800
(U)	Take down test facility and cleanup test site					0		200		0
(U)	Total					18,946		27,253		1,387
(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>										
Raytheon Elec Sys Sudbury, MA	C/CPIF/AF	Mar 91	26,520	26,520	3,022	10,494	12,032	500	0	26,048
Site Preparation	Various	Various	N/A	N/A	2,100	5,000	10,850	0	0	17,950
Misc	Various	Various	N/A	N/A	563	734	1,519	0	0	2,816
Total prior to FY 1999 data not available; program transferred from the intelligence budget in FY93 at the direction of Congress										
<u>Support and Management Organizations</u>										
MITRE	SS/PR	Oct 99	N/A	N/A	800	728	800	250	0	2,578
A&AS	C/PR	Various	N/A	N/A	1,123	954	800	587	0	3,464
Lincoln Lab	SS/PR	Oct 99	N/A	N/A	230	145	0	0	0	375
Program Office	Various	Various	N/A	N/A	354	451	690	50	0	1,545
Misc	Various	Various	N/A	N/A	24	440	562	0	0	1,026
Project 674279										
Page 11 of 16 Pages										
Exhibit R-3 (PE 0305910F)										

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305910F SPACETRACK	PROJECT 674279
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(U) **Performing Organizations Continued:**

Test and Evaluation Organizations

None

(U) **Government Furnished Property:**

Contract

Method/Type

Award or

Item

or Funding

Obligation

Delivery

Total Prior

Budget

Budget

Budget

Budget to

Total

Description

Vehicle

Date

Date

to FY 1999

FY 1999

FY 2000

FY 2001

Complete

Program

Product Development Property

None

Support and Management Property

None

Test and Evaluation Property

None

Total Prior

Budget

Budget

Budget

Budget to

Total

Subtotals

to FY 1999

FY 1999

FY 2000

FY 2001

Complete

Program

Subtotal Product Development

5,685

16,228

24,401

500

0

46,814

Subtotal Support and Management

2,531

2,718

2,852

887

0

8,988

Subtotal Test and Evaluation

Total Project

8,216

18,946

27,253

1,387

0

55,802

Have Stare total cost data not available; program transferred from the intelligence budget in FY93 at the direction of Congress. Prior years data reflects costs since FY93.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)							DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305910F SPACETRACK			PROJECT 674791			
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
674791	GEODSS Sustainment	0	6,097	1,166	583	0	0	0	0	7,846
<p>Note: This was a new start in FY00.</p> <p>(U) <u>A. Mission Description</u> The GEODSS Sustainment project begins in FY00 to develop and field ten Charge Coupled Device (CCD) Cameras for the Ground-Based Electro-Optical Deep Space Surveillance (GEODSS) System, located at Socorro, NM; Diego Garcia, Indian Ocean; and Maui, Hawaii. The project includes associated software changes to the Optical, Command, Control & Communications (OC3F) at Edwards AFB, CA. In addition, this project purchases and integrates ten replacement Modular Precision Angular Control Systems (MPACS) and funds associated logistics requirements, technical data and training. The project develops the first components and installs them at the test unit at site 1, Socorro, NM. Follow-on CCD cameras and MPACS will be produced and installed using Space Track Modification funds (BP83). This project, with the recently completed GEODSS Modification Program, will result in more than double the throughput and search rate of the legacy system. Without CCD camera replacement, the entire GEODSS system will be unusable in the FY02 time-frame, as mission critical Ebsicon tubes are no longer manufactured or supported by any vendor and the current supply of spares will run out by the end of 2001. This would result in loss of geosynchronous space situational awareness and less ability to assess the space order of battle of a potential aggressor.</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u> (U) \$0 Not Applicable (U) \$0 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u> (U) \$2,179 Begin CCD design (U) \$1,600 Begin camera design (U) \$1,000 Design MPACS (U) \$1,318 Develop Test bed at Site 1, Socorro, New Mexico (U) \$6,097 Total</p> <p>(U) <u>FY 2001 (\$ in Thousands)</u> (U) \$166 Stand-up and begin operational use of Test Bed at Site 1, Socorro, New Mexico (U) \$500 Complete CCD camera design (U) \$500 Test prototype camera / MPACS (U) \$1,166 Total</p>										
Project 674791		Page 13 of 16 Pages				Exhibit R-2A (PE 0305910F)				

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)							DATE February 2000																																																																																																																																																																					
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305910F SPACETRACK				PROJECT 674791																																																																																																																																																																				
<p>(U) <u>B. Project Change Summary</u> This project was reported as a new start in FY00.</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></th> <th style="width:10%;"><u>FY 2000</u></th> <th style="width:10%;"><u>FY 2001</u></th> <th style="width:10%;"><u>FY 2002</u></th> <th style="width:10%;"><u>FY 2003</u></th> <th style="width:10%;"><u>FY 2004</u></th> <th style="width:10%;"><u>FY 2005</u></th> <th style="width:10%;"><u>Cost to</u></th> <th style="width:10%;"><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) AF RDT&E</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Other APPN</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) (Space Mods for BA 83) *</td> <td></td> <td></td> <td style="text-align: center;">9,110</td> <td style="text-align: center;">8,784</td> <td style="text-align: center;">3,034</td> <td></td> <td></td> <td style="text-align: center;">0</td> <td style="text-align: center;">20,928</td> </tr> <tr> <td colspan="10">* Space modifications for the GEODSS Sustainment project only</td> </tr> </tbody> </table> <p>(U) <u>D. Acquisition Strategy</u> The contract for the GEODSS Sustainment project will be awarded after full and open competition.</p> <p>(U) <u>E. Schedule Profile</u></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:15%;"></th> <th colspan="4" style="text-align: center;"><u>FY 1999</u></th> <th colspan="4" style="text-align: center;"><u>FY 2000</u></th> <th colspan="3" style="text-align: center;"><u>FY 2001</u></th> </tr> <tr> <td></td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> </tr> </thead> <tbody> <tr> <td>(U) Contract Award</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Preliminary Design Review</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Critical Design Review</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Test Bed Standup</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Prototype Mod Kit Test</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td style="text-align: center;">X</td> <td></td> <td></td> </tr> <tr> <td>(U) Site 1 Mod Kit (1st article) in production</td> <td></td> <td style="text-align: center;">X</td> </tr> </tbody> </table> <p>* indicates completed event/X indicates planned event Operational acceptance of 1st unit at Site 1 is Aug 02</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) AF RDT&E										(U) Other APPN										(U) (Space Mods for BA 83) *			9,110	8,784	3,034			0	20,928	* Space modifications for the GEODSS Sustainment project only											<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) Contract Award						X							(U) Preliminary Design Review							X						(U) Critical Design Review								X					(U) Test Bed Standup									X				(U) Prototype Mod Kit Test										X			(U) Site 1 Mod Kit (1st article) in production												X
	<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 674791			Page 14 of 16 Pages				Exhibit R-2A (PE 0305910F)																																																																																																																																																																					

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development					PE NUMBER AND TITLE 0305910F SPACETRACK			PROJECT 674791		
(U) <u>A. Project Cost Breakdown (\$ in Thousands)</u>										
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>
(U)	System Engineering					0		1,818		200
(U)	Hardware Development					0		1,766		666
(U)	Software Development					0		600		300
(U)	Program Office Support					0		1,913		0
(U)	Total					0		6,097		1,166
(U) <u>B. Budget Acquisition History and Planning Information (\$ in Thousands)</u>										
(U) <u>Performing Organizations:</u>										
	<u>Contractor or</u>	<u>Contract</u>								
	<u>Government</u>	<u>Method/Type</u>	<u>Award or</u>	<u>Performing</u>	<u>Project</u>					
	<u>Performing</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>
	<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>
	<u>Product Development Organizations</u>									<u>Total</u>
	Prime Contractor	TBD	Feb 00	TBD	6,015	0	0	4,184	1,166	583
	<u>Support and Management Organizations</u>									
	MITRE	SS/PR	Jan 00	TBD	750	0	0	750	0	0
	MIT/Lincoln Lab	SS/PR	Jan 00	TBD	500	0	0	500	0	0
	A&AS	C/PR	Jan 00	TBD	500	0	0	500	0	0
	Other Support	Various	Jan 00	TBD	163	0	0	163	0	0
	<u>Test and Evaluation Organizations</u>									
	None									
(U) <u>Government Furnished Property:</u>										
		<u>Contract</u>								
		<u>Method/Type</u>	<u>Award or</u>							
	<u>Item</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Delivery</u>		<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>
	<u>Description</u>	<u>Vehicle</u>	<u>Date</u>	<u>Date</u>		<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>
	<u>Product Development Property</u>									<u>Total</u>
	None									

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)				DATE February 2000		
BUDGET ACTIVITY		PE NUMBER AND TITLE			PROJECT	
07 - Operational System Development		0305910F SPACETRACK			674791	
(U) <u>Government Furnished Property Continued:</u>						
<u>Support and Management Property</u>						
None						
<u>Test and Evaluation Property</u>						
None						
		<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>Total</u>
<u>Subtotals</u>						
Subtotal Product Development		0	0	4,184	1,166	583
Subtotal Support and Management		0	0	1,913	0	0
Subtotal Test and Evaluation						
Total Project		0	0	6,097	1,166	583
						7,846

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

DATE
February 2000

BUDGET ACTIVITY		PE NUMBER AND TITLE							
07 - Operational System Development		0305911F Defense Support Program							
COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	13,971	7,361	11,462	6,418	6,697	0	0	0	1,923,990
673615 Shield/Alert	10,461	7,361	7,380	4,336	4,616	0	0	0	69,426
673624 Defense Support Program	3,510	0	4,082	2,082	2,081	0	0	0	1,854,564
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0

(U) **A. Mission Description**

The Defense Support Program (DSP) is a system of satellites in geostationary orbits, fixed and mobile ground processing stations, one multi-purpose facility, and a ground communications network. DSP's primary mission is to provide strategic and tactical warning and limited attack assessment of a ballistic missile attack. Shield/ALERT (Attack and Launch Early Reporting to Theater) is a ground station mission processing capability which exploits inherent satellite capability to provide theater missile warning and cueing.

DSP 19 launched in April 1999, but the satellite failed to reach geosynchronous orbit.

(U) **B. Budget Activity Justification**

DSP is an operational system and is funded in Budget Activity 7, Operational Systems Support

(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)	11,811	7,459	7,445	1,937,812
(U) Appropriated Value	12,037	7,459		
(U) Adjustments to Appropriated Value				
a. Congressional/General Reductions	-226			
b. Small Business Innovative Research	-398			
c. Omnibus or Other Above Threshold Reprogram			-40	
d. Below Threshold Reprogram	2,636			
e. Rescissions	-78		-58	

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DATE
February 2000

BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305911F Defense Support Program
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(U) **C. Program Change Summary (\$ in Thousands) Continued**

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
f. Other				
(U) Adjustments to Budget Years Since FY 2000 PBR			4,017	-13,822
(U) Current Budget Submit/FY 2001 PBR	13,971	7,361	11,462	1,923,990

(U) **Significant Program Changes:**

Funding: \$2.1M per year in FY01, FY02 and FY03 was realigned from the Missile Procurement to the RDT&E appropriation to fund DSP 23 mission unique integration with EELV.

Funding: \$12.5M FY01-FY03 funding transferred from BPAC 673624 to 673615 to support continued engineering task development for ALERT and engineering prototype, feasibility analysis, and developmental test and evaluation for Shield.

Funding: \$1.4M FY99 received to support Space-Based Space Surveillance operations Advanced Concept Technology Demonstration (ACTD) Funds erroneously placed into BPAC 673615 versus the correct BPAC of 673624--both BPACs in this PE 35911F.

DSP 19 launched in April 1999, but the satellite failed to reach geosynchronous orbit.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305911F Defense Support Program				PROJECT 673615		
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
673615	Shield/Alert	10,461	7,361	7,380	4,336	4,616	0	0	0	69,426
<p>(U) <u>A. Mission Description</u> Beginning in 1993, the Talon Shield project developed changes to preexisting DSP processing techniques to provide a Theater Missile Defense capability. These changes provided for the timely and accurate detection, description, and tracking of Tactical Ballistic Missiles and other theater threats, and served as the basis for the activation, on 10 March 1995, of full-time ALERT System operations by the newly constituted 11th Space Warning Squadron. ALERT-generated messages are distributed to theater warfighters; they enhance attack operations/counterforce operations by providing accurate, timely launch point estimates and support active and passive defense by providing cueing data to shooters and warning data to theater assets in the form of impact point predictions. Shield has continued to serve as a key resource in the evolution of operational improvements to the ALERT System, demonstrating the value of candidate enhancements on a prototype basis in the live, real-time environment.</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u> (U) \$5,347 Continued engineering task development to prototype and implement ALERT capabilities leading up to Increment I. (U) \$2,114 Continued SBIRS ground consolidation developmental test and evaluation. (U) \$1,600 Technical analysis and independent verification and validation contractor by FFRDC (U) \$1,400 Space-Based Space Surveillance operations ACTD (placed in BPAC 673615 by error, will be properly executed in BPAC 673624) (U) \$10,461 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u> (U) \$3,446 Continue engineering prototypes and feasibility analysis. (U) \$2,715 Continued SBIRS ground consolidation developmental test and evaluation. (U) \$1,200 Technical analysis and independent verification and validation of contractor by FFRDC. (U) \$7,361 Total</p> <p>(U) <u>FY 2001 (\$ in Thousands)</u> (U) \$4,906 Continue engineering prototypes and feasibility analysis. (U) \$1,257 Continued SBIRS ground consolidation developmental test and evaluation. (U) \$1,217 Technical analysis and independent verification and validation of contractor by FFRDC. (U) \$7,380 Total</p>										
Project 673615		Page 3 of 11 Pages				Exhibit R-2A (PE 0305911F)				

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 2000	
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305911F Defense Support Program				PROJECT 673615	
(U) <u>B. Project Change Summary</u> \$4M FY00 funds has been transferred from DSP BPAC 673624 to support continued engineering task development for ALERT and engineering prototype, feasibility analysis, and developmental test and evaluation for Shield.									
(U) <u>C. Other Program Funding Summary (\$ in Thousands)</u>									
	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Cost to</u>	<u>Total Cost</u>
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	
(U) AF RDT&E									
(U) Other APPN									
(U) Missile Procurement (PE 305911F, BA-05, P-28)	86,964	108,342	106,356	113,770	100,528	30,335	35,577	6,026	7,181,833
(U) Other Procurement (PE 305911F, BA-65, P-N/A)	202	14	6	0	0	0	0	0	1,201,700
(U) Related RDT&E:									
(U) PE 603441F - SBIRS Dem/Val	144,723	0	0	0	0	0	0	0	1,154,120
(U) PE 604442F - SBIRS Low EMD	36,627	225,566	241,021	306,530	617,662	763,362	486,840	513,647	3,191,255
(U) PE 604441F- SBIRS High EMD	508,473	420,476	569,188	389,879	196,841	128,871	100,856	356,475	3,492,030
(U) <u>D. Acquisition Strategy</u> The ALERT squadron was activated on 1 Oct 94 with an ALERT Initial Operating Capability reached on 10 Mar 95. Shield RDT&E efforts develop DSP ground capabilities to satisfy continuously evolving threats. Shield supports transition to SBIRS ground architecture consolidating DSP elements.									
(U) <u>E. Schedule Profile</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	
(U) Theater Situational Analyst (TSA) Transition				*					
(U) ALERT Version 14 Operational					*				
(U) Shield Hardware Upgrade					*				

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000				
BUDGET ACTIVITY				PE NUMBER AND TITLE			PROJECT				
07 - Operational System Development				0305911F Defense Support Program			673615				
(U) A. Project Cost Breakdown (\$ in Thousands)											
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>	
(U)	Contractor Engineering Support					950		0		0	
(U)	Software Development					2,298		3,137		3,130	
(U)	Program Management Support					1,303		650		650	
(U)	Training Development					600		0		0	
(U)	Developmental Test and Evaluation					2,310		2,374		2,383	
(U)	FFRDC					1,600		1,200		1,217	
(U)	Space-Based Space Surveillance ACTD					1,400					
(U)	Total					10,461		7,361		7,380	
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)											
(U) Performing Organizations:											
	<u>Contractor or Government</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>
	Space-Based Space Surveillance operations ACTD (to be placed in 673624 BPAC)						1,400				1,400
<u>Product Development Organizations</u>											
	Aerojet	CPAF	Aug 92	7,898	7,898	7,898				0	7,898
	SPARTA	CPAF	Aug 94	487	487	487				0	487
	Lincoln Lab	PO	Mar 95	288	288	288				0	288
	Aerojet (FO)	CPAF	Oct 95	36,270	36,270	19,420	6,611	6,161	6,163	0	38,355
	Nichols Research Corporation			2,378	2,378	1,528	850			0	2,378
<u>Support and Management Organizations</u>											
	Program Office Support			N/A	N/A	67				0	67
	FFRDC			N/A	N/A	7,547	1,600	1,200	1,217	0	11,564
	Dept Air Force			N/A	N/A	6,989				0	6,989
Project 673615				Page 5 of 11 Pages				Exhibit R-3 (PE 0305911F)			

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)		DATE				
07 - Operational System Development		0305911F Defense Support Program			February 2000	
BUDGET ACTIVITY		PE NUMBER AND TITLE			PROJECT	
(U) <u>Performing Organizations Continued:</u>						
<u>Test and Evaluation Organizations</u>						
		<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>
		<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>
						<u>Total</u>
						<u>Program</u>
	Subtotals					
	Space-Based Space Surveillance operations ACTD (to be placed in 673624 BPAC)		1,400			1,400
	Subtotal Product Development	29,621	7,461	6,161	6,163	0
	Subtotal Support and Management	14,603	1,600	1,200	1,217	0
	Subtotal Test and Evaluation					
	Total Project	44,224	10,461	7,361	7,380	0
						69,426

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 2000	
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305911F Defense Support Program				PROJECT 673624	
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
673624 Defense Support Program	3,510	0	4,082	2,082	2,081	0	0	0	1,854,564
<p>(U) <u>A. Mission Description</u> The Defense Support Program (DSP) system provides a space-based surveillance system to detect and report missile and space launches and nuclear detonations in near real time during pre-, trans-, and post-attack periods. The DSP system consists of a constellation of satellites in geostationary orbits, fixed and mobile ground processing stations, one multi-purpose facility, and a ground communications network. DSP's primary mission is to provide strategic and tactical warning and limited attack assessment of a ballistic missile attack. DSP also detects and reports nuclear detonation events and provides information for theater warning and exploitation. This project funds changes associated with Year 2000 roll-over, ACTD, and DSP-to-SBIRS transition activities and EELV mission unique engineering integration.</p>									
<p>(U) <u>FY 1999 (\$ in Thousands)</u></p>									
(U) \$300	Ground based calibration technology								
(U) \$100	Year 2000 rollover								
(U) \$3,606	SBIRS Transition Support								
(U) \$672	Program Management Support								
(U) \$232	Long Range Planning								
(U) (\$1,400)	Space-Based Space Surveillance operations ACTD (placed in BPAC 673615 by error, will be properly executed in BPAC 673624)								
(U) \$3,510	Total								
<p>(U) <u>FY 2000 (\$ in Thousands)</u></p>									
(U) \$0	No activity								
(U) \$0	Total								
<p>(U) <u>FY 2001 (\$ in Thousands)</u></p>									
(U) \$2,082	Integration efforts for DSP 23 on Evolved Expandable Launch Vehicle (EELV)								
(U) \$2,000	Space-Based Space Surveillance Operations ACTD								
(U) \$4,082	Total								
Project 673624			Page 7 of 11 Pages				Exhibit R-2A (PE 0305911F)		

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)							DATE February 2000																																																																																																						
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305911F Defense Support Program				PROJECT 673624																																																																																																					
<p>(U) <u>B. Project Change Summary</u> \$4M FY00 funds transferred to support continued engineering task development for ALERT and engineering prototype, feasibility analysis, and developmental test and evaluation for Shield.</p> <p>\$2.1M per year in FY01-FY03 funds integration of DSP 23 onto the EELV-Heavy launch vehicle.</p>																																																																																																													
<p>(U) <u>C. Other Program Funding Summary (\$ in Thousands)</u></p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:15%;"></th> <th style="width:10%;"><u>FY 1999</u></th> <th style="width:10%;"><u>FY 2000</u></th> <th style="width:10%;"><u>FY 2001</u></th> <th style="width:10%;"><u>FY 2002</u></th> <th style="width:10%;"><u>FY 2003</u></th> <th style="width:10%;"><u>FY 2004</u></th> <th style="width:10%;"><u>FY 2005</u></th> <th style="width:10%;"><u>Cost to</u></th> <th style="width:10%;"><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) AF RDT&E</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Other APPN</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Missile Procurement (PE 305911F, BA-05, P-28)</td> <td style="text-align: right;">86,964</td> <td style="text-align: right;">108,342</td> <td style="text-align: right;">106,356</td> <td style="text-align: right;">113,770</td> <td style="text-align: right;">100,528</td> <td style="text-align: right;">30,335</td> <td style="text-align: right;">35,577</td> <td style="text-align: right;">6,026</td> <td style="text-align: right;">7,181,833</td> </tr> <tr> <td>(U) Other Procurement (PE 305911F, BA-65, P-N/A)</td> <td style="text-align: right;">202</td> <td style="text-align: right;">14</td> <td style="text-align: right;">6</td> <td style="text-align: right;">0</td> <td style="text-align: right;">1,201,700</td> </tr> <tr> <td>(U) Related RDT&E:</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) PE 603441F - SBIRS Dem/Val</td> <td style="text-align: right;">144,723</td> <td style="text-align: right;">0</td> <td style="text-align: right;">1,154,120</td> </tr> <tr> <td>(U) PE 604442F - SBIRS Low EMD</td> <td style="text-align: right;">36,627</td> <td style="text-align: right;">225,566</td> <td style="text-align: right;">241,021</td> <td style="text-align: right;">306,530</td> <td style="text-align: right;">617,662</td> <td style="text-align: right;">763,362</td> <td style="text-align: right;">486,840</td> <td style="text-align: right;">513,647</td> <td style="text-align: right;">3,191,255</td> </tr> <tr> <td>(U) PE 604441F - SBIRS High EMD</td> <td style="text-align: right;">508,473</td> <td style="text-align: right;">420,476</td> <td style="text-align: right;">569,188</td> <td style="text-align: right;">389,879</td> <td style="text-align: right;">196,841</td> <td style="text-align: right;">128,871</td> <td style="text-align: right;">100,856</td> <td style="text-align: right;">356,475</td> <td style="text-align: right;">3,492,030</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) AF RDT&E										(U) Other APPN										(U) Missile Procurement (PE 305911F, BA-05, P-28)	86,964	108,342	106,356	113,770	100,528	30,335	35,577	6,026	7,181,833	(U) Other Procurement (PE 305911F, BA-65, P-N/A)	202	14	6	0	0	0	0	0	1,201,700	(U) Related RDT&E:										(U) PE 603441F - SBIRS Dem/Val	144,723	0	0	0	0	0	0	0	1,154,120	(U) PE 604442F - SBIRS Low EMD	36,627	225,566	241,021	306,530	617,662	763,362	486,840	513,647	3,191,255	(U) PE 604441F - SBIRS High EMD	508,473	420,476	569,188	389,879	196,841	128,871	100,856	356,475	3,492,030
	<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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<p>(U) <u>D. Acquisition Strategy</u> DSP has finished the production of satellites 19 through 23. Current contract efforts include support for Flight 20 launch and sustainment for post production storage testing, launch preparation, and on orbit testing The Space Based Infrared Systems satellites will be the follow-on system to DSP starting in FY04. FY01-FY03 funds will be used to integrate DSP 23 on EELV.</p>																																																																																																													
<p>(U) <u>E. Schedule Profile</u></p> <table style="width:100%;"> <tr> <td style="width:45%;"></td> <td style="width:15%; text-align: center;"><u>FY 1999</u></td> <td style="width:15%; text-align: center;"><u>FY 2000</u></td> <td style="width:15%; text-align: center;"><u>FY 2001</u></td> </tr> </table>											<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>																																																																																																
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Project 673624			Page 8 of 11 Pages				Exhibit R-2A (PE 0305911F)																																																																																																						

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305911F Defense Support Program	PROJECT 673624
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(U) **E. Schedule Profile Continued**

	<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) Year 2000 DSP renovation	*											
(U) DSP Satellite 23 delivery		*										
(U) DSP 19 Launch		*										
(U) Ground based calibration technology			*									
(U) DSP 20 Launch						X						
(U) DSP 21 Launch									X			
(U) DSP 22 Launch (Sep 02)												
(U) DSP 23 Launch (Sep 03)												

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000			
BUDGET ACTIVITY					PE NUMBER AND TITLE			PROJECT		
07 - Operational System Development					0305911F Defense Support Program			673624		
(U) A. Project Cost Breakdown (\$ in Thousands)										
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>
(U)	Year 2000 roll-over activities					100		0		0
(U)	Long Range Planning					232		0		0
(U)	Space-Based Space Surveillance Operations ACTD*					1,400		0		2,000
(U)	Other Government Cost					672		0		0
(U)	SBIRS Transition Support					806		0		0
(U)	Ground Based Calibration Technology					300		0		0
(U)	DSP 23 Integration on EELV-Heavy					0		0		2,082
(U)	Total					3,510		0		4,082
*Funding of effort shared with BMDO, this causes the irregular funding profile										
(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>Performing Activity</u>	<u>or Funding Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>						
<u>Product Development Organizations</u>										
Previous DSP Contracts (1960's-1980's)					1,536,317	0	0	0	0	1,536,317
Boeing			6,300	6,300	0	0	0	2,082	4,200	6,282
Aerojet*	C/CPAF	Oct 93	25,719	25,719	25,719	0	0	0	0	25,719
Aerojet	C/CPAF	Sep 93	9,025	9,025	9,025	0	0	0	0	9,025
Aerojet	C/CPFF		25,743	25,743	25,743	0	0	0	0	25,743
Aerojet	C/CPAF	Oct 95	2,578	2,578	2,578	0	0	0	0	2,578
Loral	C/FPI/AF/CPF		28,137	37,732	37,732	0	0	0	0	37,732
DOE	P.O.		10,724	10,724	10,724	0	0	0	0	10,724
Loral	C/CPAF		22,975	22,975	22,975	0	0	0	0	22,975

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 2000		
BUDGET ACTIVITY				PE NUMBER AND TITLE				PROJECT		
07 - Operational System Development				0305911F Defense Support Program				673624		
(U) Performing Organizations Continued:										
* EAC is also funded by other appropriations.										
<u>Support and Management Organizations</u>										
Various	MIPRs			6,301	0	0	2,000	0	8,301	
Aerojet	C/ CPFF	1,305	1,305	1,305	0	0	0	0	1,305	
Aerojet/					0	0	0	0	0	
Consolidated	C/ FFP	May 96	2,518	2,518	2,518	2,206	0	0	4,724	
FFRDC	MORD		N/A	N/A	42,109	0	0	0	42,109	
Other Gov't Cost			N/A	N/A	33,732	1,304	0	0	35,036	
TRW	C/CPFF		9,872	9,872	9,872	0	0	0	9,872	
TRW Consolidated	C/CPAF	May 96	292	292	292	0	0	0	292	
PRC	C/FPIF	Apr 94	7,579	7,579	7,579	0	0	0	7,579	
SPARTA	C/CPAF	Aug 94	150	150	150	0	0	0	150	
<u>Test and Evaluation Organizations</u>										
Program Office Spprt	Various		N/A	N/A	68,101	0	0	0	68,101	
					<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
					<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Subtotals</u>										
Subtotal Product Development					1,670,813	0	0	2,082	4,200	1,677,095
Subtotal Support and Management					103,858	3,510	0	2,000	0	109,368
Subtotal Test and Evaluation					68,101	0	0	0	0	68,101
Total Project					1,842,772	3,510	0	4,082	4,200	1,854,564

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE February 2000				
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305913F NUDET Detection System (Space)				PROJECT 672808			
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	
672808	Nuc Detonation Det Sys (sensors)	12,766	14,224	17,088	17,322	18,451	23,277	21,752	Continuing	TBD	
	Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	
<p>(U) <u>A. Mission Description</u> The Nuclear Detonation (NUDET) Detection System (NDS) provides a worldwide, highly survivable capability to detect, locate, and report any nuclear detonations in the earth's atmosphere or in near space in near-real time. The NDS supports NUDET detection requirements for USSPACECOM (Integrated Tactical Warning and Attack Assessment [ITW/AA]), USSTRATCOM (Nuclear Force Management), and AFTAC (Treaty Monitoring). NDS consists of space and ground segments. The space segment consists of NUDET detection sensors on the Global Positioning System (GPS) satellites. The ground segment includes the Integrated Correlation and Display System (ICADS) and the Ground NDS Terminals (GNT).</p> <p>This NDS program element funds Research and Development of ICADS, GNT, and NDS analysis payload (NAP). ICADS provides a fixed ground receiving station. GNT provides a survivable ground receiving station. NAP improves existing NDS capability and will be integrated onto GPS Block IIR satellites 13-21. DOD also funds the development of the Electromagnetic Pulse (EMP) sensor for the Block IIR. The EMP sensor for GPS Block IIF is funded in the National Foreign Intelligence Program (NFIP).</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u> (U) \$10,084 Continued ICADS and GNT development (U) \$1,052 Continued NDS sensor on-orbit qualification (U) \$816 Completed NDS/NAP (NDS Analysis Package) program integration (U) \$100 Continued Space long range planning and analysis (U) \$714 Continued mission support requirements (U) \$12,766 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u> (U) \$12,360 Continue ICADS and GNT development (U) \$1,090 Continue NDS sensor on-orbit qualification (U) \$108 Continued Space long range planning and analysis (U) \$666 Continue mission support requirements</p>											
Project 672808				Page 1 of 6 Pages				Exhibit R-2 (PE 0305913F)			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 2000				
BUDGET ACTIVITY 07 - Operational System Development		PE NUMBER AND TITLE 0305913F NUDET Detection System (Space)		PROJECT 672808		
(U)	<u>A. Mission Description Continued</u>					
(U)	<u>FY 2000 (\$ in Thousands) Continued</u>					
(U)	\$14,224	Total				
(U)	<u>FY 2001 (\$ in Thousands)</u>					
(U)	\$15,156	Continue ICADS and GNT development				
(U)	\$1,123	Continue NDS sensor on-orbit qualification				
(U)	\$129	Continued Space long range planning and analysis				
(U)	\$680	Continue mission support requirement				
(U)	\$17,088	Total				
(U)	<u>B. Budget Activity Justification</u>					
	This program is in Budget Activity 7 - Operational System Development because it is a post-Milestone III program.					
(U)	<u>C. Program Change Summary (\$ in Thousands)</u>					
			<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U)	Previous President's Budget (FY 2000 PBR)		13,050	14,430	17,241	TBD
(U)	Appropriated Value		13,314	14,430		
(U)	Adjustments to Appropriated Value					
	a. Congressional/General Reductions		-264	-15		
	b. Small Business Innovative Research		-176			
	c. Omnibus or Other Above Threshold Reprogram			-78		
	d. Below Threshold Reprogram		-37			
	e. Rescissions		-71	-113		
	f. Other					TBD
(U)	Adjustments to Budget Years Since FY 2000 PBR				-153	
(U)	Current Budget Submit/FY 2001 PBR		12,766	14,224	17,088	TBD
(U)	<u>Significant Program Changes:</u>					
	-\$154K FY01 adjustment funded higher priority Air Force efforts.					

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BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305913F NUDET Detection System (Space)				PROJECT 672808	
(U) D. Other Program Funding Summary (\$ in Thousands)									
	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Cost to</u>	<u>Total Cost</u>
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	
(U) AF RDT&E									
(U) Other APPN									
(U) Operations & Maintenance, (PE 0305913F, BA 1, Operating Forces	5,355	5,851	8,070	9,359	8,612	8,187	9,102	Continuing	Continuing
(U) Missile Procurement, (PE 0305913F, BA 45 - Space and Other Support, P-22)	2,780	1,547	1,478	1,507	1,539	1,568	1,601	Continuing	Continuing
(U) Other Procurement, (PE 0305913F, BA 63 - Electronics and Telecom Equipment, P-64)	1,265	3,459	2,674	8,443	7,957	12,677	11,876	Continuing	Continuing
(U) Related RDT&E:									
(U) PE 305165F, Navstar GPS (Space/Ground Segment)	101,587	107,451	250,197	209,114	181,291	132,711	101,958	Continuing	Continuing
(U) PE 305911F, Defense Support Program	13,971	7,361	11,462	6,418	6,697	0	0	0	1,923,990
(U) E. Acquisition Strategy									
The NDS Acquisition Strategy is to develop and procure components to sustain the U. S. NDS capability for the GPS Block IIR and IIF satellites. Funding is sent by Military Interdepartmental Purchase Request (MIPR) from DoD and Department of Energy (DoE) to Sandia and Los Alamos National Laboratories on an existing DOE contract.									
(U) F. Schedule Profile									
				<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>	

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BUDGET ACTIVITY 07 - Operational System Development					PE NUMBER AND TITLE 0305913F NUDET Detection System (Space)					PROJECT 672808		
(U) <u>F. Schedule Profile Continued</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
(U) GPS IIF Use Case Model Overview		*										
(U) GPS IIF System Specification Review	*					X						
(U) GPS IIF System specification Configuration Control Board (CCB)		*				X						
(U) GPS IIF Phase Review	*		*		*		X		X		X	
(U) GPS IIR Acceptance Test (AT)												
(U) GPS IIR Operational Acceptance												
(U) GPS IIR Y2K Testing	*											
(U) GPS IIR O&M (S/W Modifications)		*	*	*		X	X	X	X	X	X	X
(U) GPS IIR Move to SBIRS Facility			*					X				
* Completed Event												
X Planned Event												

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development					PE NUMBER AND TITLE 0305913F NUDET Detection System (Space)				PROJECT 672808	
(U) A. Project Cost Breakdown (\$ in Thousands)										
						<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>		
(U)	ICADS and GNT Development					10,084	12,360	15,156		
(U)	NDS Sensor On-orbit Qualification					1,052	1,090	1,123		
(U)	NDS/NAP Program Integration					816	0	0		
(U)	Space long range planning and analysis					100	108	129		
(U)	Mission support requirements					714	666	680		
(U)	Total					12,766	14,224	17,088		
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)										
(U) Performing Organizations:										
	<u>Contractor or</u>	<u>Contract</u>								
	<u>Government</u>	<u>Method/Type</u>	<u>Award or</u>	<u>Performing</u>	<u>Project</u>					
	<u>Performing</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>
	<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>
	<u>Product Development Organizations</u>									
	ICADS: Sandia National	MIPR	Jan 96	Continuing	Continuing	32,318	9,343	11,509	14,287	Continuing
	Labs									
	GNT: Intermetrics	CPFF	Dec 93	1,262	1,262	1,262	0	0	0	0
	SNL	MIPR	Jan 96	Continuing	Continuing	11,873	0	0	0	0
	SAIC (Intg/Grd Supt)	Time/Matls	Dec 95	Continuing	Continuing	4,344	1,123	1,146	1,172	Continuing
	Combined GOSC/NAP:	FFP	Oct 97	3,633	3,633	6,166	816	0	0	0
	Lockhed Martin									
	SNL	MIPR	Oct 97	Continuing	Continuing	200	0	0	0	0
	SAIC	Time/Matl	Dec97	432	432	432	0	0	0	0
	W-Sensor: SRI (Stanford	CPFF	Aug 94	415	415	415	0	0	0	0
	Rscl Inst.)									
	SNL	MIPR	Oct 94	399	399	399	0	0	0	0
	Los Alamos Natl Lab	MIPR	Jan 96	Continuing	Continuing	4,077	1,052	1,090	1,123	Continuing

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 2000		
BUDGET ACTIVITY				PE NUMBER AND TITLE				PROJECT		
07 - Operational System Development				0305913F NUDET Detection System (Space)				672808		
(U) Performing Organizations Continued:										
<u>Support and Management Organizations</u>										
Mission Support	Multiple	N/A	Continuing	Continuing	3,529	171	371	377	Continuing	TBD
Long range planning	Multiple	N/A	Continuing	Continuing	73	100	108	129	Continuing	TBD
Prog Contractual Spt.	Multiple	Various	1,534	1,534	1,534	161	0	0	0	1,695
<u>Test and Evaluation Organizations</u>										
Hill AFB Utah			9	9	9					9
(U) Government Furnished Property:										
	<u>Contract</u>									
	<u>Method/Type</u>	<u>Award or</u>								
<u>Item</u>	<u>or Funding</u>	<u>Obligation</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>Description</u>	<u>Vehicle</u>	<u>Date</u>	<u>Date</u>		<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Property</u>										
N/A										
<u>Support and Management Property</u>										
N/A										
<u>Test and Evaluation Property</u>										
N/A										
					<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					61,486	12,334	13,745	16,582	TBD	TBD
Subtotal Support and Management					5,136	432	479	506	TBD	TBD
Subtotal Test and Evaluation					9					9
Total Project					66,631	12,766	14,224	17,088	TBD	TBD

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305917F Space Architect				PROJECT 674746		
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
674746	AF/National Program Cooperation	12,896	10,882	0	0	0	0	0	Continuing	TBD
	Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0
<p>FY 2001 funding for AFNPC is being requested under PE 0603856F.</p> <p>Note: In FY 2000, per Congressional direction, the National Security Space Architect (NSSA), PE 0305917F, was merged with the Air Force/NRO Partnership, PE 0603856F, into a new entity entitled 'AF/National Program Cooperation (AFNPC)'. FY00 AFNPC funding was executed in this PE, 0305917F. In FY 2001 the NSSA moves to defense-wide PE 0305190D, 'C3I Intelligence Programs'; remaining AFNPC efforts move to PE 0603856F, where FY 2001 funding is requested.</p> <p>(U) <u>A. Mission Description</u> Detailed descriptions for the AF/National Program Cooperation are in PE 0603856F, where FY 2001 funds for that effort are requested. Efforts that will remain part of AFNPC in FY 2001 are detailed there; the National Security Space Architect, part of AFNPC for FY 2000 only, is detailed below.</p> <p>The Under Secretary of Defense for Acquisition and Technology established the Department of Defense (DoD) Office of the Space Architect (OSA) to consolidate DoD space system architecture development responsibilities into a single organization. The OSA was one of DoD's responses to congressional concerns regarding DoD space management. In July 1998, a Memorandum of Understanding was signed by the Secretary of Defense and Director of Central Intelligence to incorporate the architectural activities of the National Reconnaissance Office (NRO). The name was changed to National Security Space Architect (NSSA). This organization works to integrate space system architectures, eliminate unnecessary vertical stovepiping of space programs, and achieve efficiencies in acquisition and future operations through space program integration, thereby improving space support to a variety of customers. The NSSA obtains direct support from various space planning and development organizations across the federal government and industry for space architecture planning and development. Funding in this document incorporates DoD requirements only. NRO requirements and funding to support the NSSA efforts are not included in this program element.</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u> (U) \$1,851 Space Weather Architecture (SWx) Study and Transition Planning (U) \$544 Space Control and MILSATCOM Architecture Tracking (U) \$605 Satellite Operations (SATOPS) Architecture Transition Planning (U) \$5,989 Mission Information Management (MIM) Architecture Development Team (ADT) (U) \$3,162 Core Analysis (Analysis, Modeling and Simulation, Cost, Spectrum) and Core System Engineering and Integration (SE&I) (Community Coordination, Strategic Planning, Process Support and Information Management)</p>										
Project 674746			Page 1 of 6 Pages				Exhibit R-2 (PE 0305917F)			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE
BUDGET ACTIVITY		PROJECT
07 - Operational System Development		February 2000
PE NUMBER AND TITLE		PROJECT
0305917F Space Architect		674746
(U)	<u>A. Mission Description Continued</u>	
(U)	<u>FY 1999 (\$ in Thousands) Continued</u>	
(U)	\$140	Other Architecture Studies and Architecture Study Planning
(U)	\$605	National Security Space Master Plan and National Security Space Roadmap Development and Update (included in 'Other Architecture...' in the FY 2000 RDT&E Budget Justification Exhibit for this Program Element
(U)	\$12,896	Total
(U)	<u>FY 2000 (\$ in Thousands)</u>	
(U)	\$2,324	Mission Information Management (MIM) ADT
(U)	\$456	Space Weather (SWx), Space Control and MILSATCOM Architecture Tracking
(U)	\$2,886	Core Capabilities (Space Architecture Engineering, Analytic Methods and Tools, Collaboration Technologies, Process Support, and Information Management)
(U)	\$1,686	Architectural ADTs/Studies Directed by Stakeholders (including Hyperspectral Strategy Study) and Architecture Study Planning
(U)	\$355	Satellite Operations Architecture Transition Planning and Tracking (part of 'Documentation and Support' item in FY 2000 budget justification document)
(U)	\$1,115	National Security Space Master Plan and National Security Space Roadmap Development and Update (part of 'Documentation and Support' item in FY 2000 budget justification document)
(U)	\$1,337	Technical support to the AF/NRO Integration Planning Group, ANIPG (included in PE 0603856F in the FY 2000 RDT&E Budget Item Justification)
(U)	\$723	Developing processing capabilities to exploit SBIRS sensor data for technical intelligence (included in PE 0603856F in the FY 2000 RDT&E Budget Item Justification)
(U)	\$10,882	Total
(U)	<u>FY 2001 (\$ in Thousands)</u>	
(U)	\$0	No Activity
(U)	\$0	Total
	*FY 2001 NSSA funding is requested in defense-wide PE 0305190D; remaining AFNPC funding is requested in justification for PE 0603856F.	
(U)	<u>B. Budget Activity Justification</u>	
	This program is in Budget Activity 7 because the architecture studies affect the design and acquisition of systems to be developed.	
Project 674746		Exhibit R-2 (PE 0305917F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)				DATE February 2000						
BUDGET ACTIVITY		PE NUMBER AND TITLE			PROJECT					
07 - Operational System Development		0305917F Space Architect			674746					
(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)	13,560	9,898	10,470	TBD					
(U)	Appropriated Value	13,714	10,882							
(U)	Adjustments to Appropriated Value									
	a. Congressional/General Reductions	-154								
	b. Small Business Innovative Research	-428								
	c. Omnibus or Other Above Threshold Reprogram									
	d. Below Threshold Reprogram	-164								
	e. Rescissions	-72								
	f. Other				TBD					
(U)	Adjustments to Budget Years Since FY 2000 PBR			-10,470						
(U)	Current Budget Submit/FY 2001 PBR	12,896	10,882	0	TBD					
(U) Significant Program Changes:										
FY 1999: \$164K reprogrammed to support higher Air Force priorities.										
FY 2000: Per Congressional direction, the National Security Space Architect (NSSA), PE 0305917F, was merged with the AF/NRO Partnership, PE 0603856F, into a new entity entitled 'AF/National Program Cooperation (AFNPC). AFNPC funding was executed in this PE for FY 2000.										
FY 2001 forward: NSSA funding moves to defense-wide PE 0305190D. AFNPC funding moves to PE 0603856F.										
(U) D. Other Program Funding Summary (\$ in Thousands)										
		<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Cost to</u>	<u>Total Cost</u>
		<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	
(U)	AF RDT&E									
(U)	N/A									
(U)	Other APPN									
(U)	Intelligence Community*									
	*Not available									

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

DATE
February 2000

BUDGET ACTIVITY

07 - Operational System Development

PE NUMBER AND TITLE

0305917F Space Architect

PROJECT

674746

(U) E. Acquisition Strategy

The acquisition strategy for the National Security Space Architect is detailed below; strategies for other AFNPC efforts are detailed in the budget justification for PE 0603856F.

RDT&E funds will be used to obtain infrastructure support and direct support from various space planning and development organizations across the DoD and industry, including Federally Funded Research & Development Centers (FFRDCs) and contracted System Engineering and Technical Assistance in direct support of DoD space architecture planning and development. Funds will be applied to existing contract vehicles.

- As primary support, the Space Architect plans to use two existing Space & Missile Center (SMC) contracts for technical support:
- Engineering, Analysis, Design and Development Contract; Science Applications International Corporation (SAIC)
- Engineering, Analysis and Design Contract; Nichols Research Corporation
- These contracts currently provide support to the Air Force SMC long-range planning, conceptual development, and engineering analysis and assessment efforts.

(U) F. 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) SATOPS Transition/Implementation Plan Start	*											
(U) MIM Initiate ADT	*											
(U) Position/Navigation Frequency Allocation Determination	*											
(U) Space Weather Architecture - Phase II Completion		*										
(U) SATOPS Transition/Implementation Plan Complete				*								
(U) Space Weather Architecture - Final Report Published				*								
(U) MIM 99 Report					*							
(U) Hyperspectral Strategy Study Completion								X				

* = completed event

X = planned event

*Schedule events for the NSSA are above; schedule events for AFNPC efforts moving to PE 0603856F in FY 2001 are noted in the budget justification document for that PE.

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development					PE NUMBER AND TITLE 0305917F Space Architect			PROJECT 674746		
(U) A. Project Cost Breakdown (\$ in Thousands)										
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>
(U)	Architecture Tracking and Transition Planning					1,149		811		
(U)	Space Weather Architecture					1,851		0		
(U)	National Security Space Master Plan and Roadmap					605		1,115		
(U)	Mission Information Management					5,989		2,324		
(U)	Studies/ADTs Directed by Stakeholders and Study Planning					140		1,686		
(U)	Core Capabilities & Analysis					3,162		2,886		
(U)	Technical support to the AF/NRO Integration Planning Group							723		
(U)	Develop processing capability to exploit SBIRS data for the technical intelligence (TI) mission							1,337		
(U)	Total					12,896		10,882		
(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>Performing Activity</u>	<u>or Funding Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>						
<u>Product Development Organizations</u>										
SMC	MIPR	12/98	TBD	TBD			723			723
<u>Support and Management Organizations</u>										
Aerospace	C/CPAF	1993	N/A	N/A	1,038	1,162	876		0	3,076
TASC	C/CPAF	1995	N/A	N/A	0	338	0		0	338
MITRE	C/CPAF	1993	N/A	N/A	870	783	590		0	2,243
Misc Contracts	Various	Various	N/A	N/A	3,205	1,044	38		0	4,287
Misc In-House	Various	Various	N/A	N/A	790	764	3,073		0	4,627
NRC	C/CPAF	1997	N/A	N/A	3,555	3,843	2,211		0	9,609
SAIC	C/CPAF	1997	N/A	N/A	3,950	4,962	2,034		0	10,946
ANIPG	MIPR	10/98	Continuing	Continuing			1,337			1,337
<u>Test and Evaluation Organizations</u>										
None										
Project 674746					Page 5 of 6 Pages			Exhibit R-3 (PE 0305917F)		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305917F Space Architect	PROJECT 674746
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(U) **Government Furnished Property:**

<u>Item</u> <u>Description</u>	<u>Contract</u> <u>Method/Type</u> <u>or Funding</u> <u>Vehicle</u>	<u>Award or</u> <u>Obligation</u> <u>Date</u>	<u>Delivery</u> <u>Date</u>	<u>Total Prior</u> <u>to FY 1999</u>	<u>Budget</u> <u>FY 1999</u>	<u>Budget</u> <u>FY 2000</u>	<u>Budget</u> <u>FY 2001</u>	<u>Budget to</u> <u>Complete</u>	<u>Total</u> <u>Program</u>
<u>Product Development Property</u>									
None									
<u>Support and Management Property</u>									
None									
<u>Test and Evaluation Property</u>									
None									
				<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						723			723
Subtotal Support and Management				13,408	12,896	10,159		0	36,463
Subtotal Test and Evaluation									
Total Project				13,408	12,896	10,882		0	37,186

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DATE

February 2000

BUDGET ACTIVITY

07 - Operational System Development

PE NUMBER AND TITLE

0308601F Modeling and Simulation Support

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	1,038	0	1,177	1,218	1,317	1,343	1,370	Continuing	TBD
671011 Legacy Model Transition (LMT)	355	0	386	393	402	410	418	Continuing	TBD
674566 Executive Agent for Air/Space Natural Environment	683	0	791	825	915	933	952	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	Continuing	TBD

Congress eliminated FY00 funding. The Air Force is in the process of consolidating small dollar Modeling, Simulation, and Analysis (MS&A) R&D programs (PE 38601F - 'Modeling & Simulation Support' Budget Activity 07 RDT&E (3600 appn.)) under PE 27601F - 'USAF Modeling and Simulation'. This will meet the intent of the House action to eliminate smaller PEs and provide a more cohesive, manageable USAF Modeling and Simulation development effort.

(U) A. Mission Description

This PE includes funding to support an organized growth and management of modeling and simulation (M&S) systems as the Air Force transitions from numerous legacy models and simulations to emerging DoD standard models and architecture. Numerous models currently exist and are being modified or developed for a broad range of areas including acquisition, analysis, test and evaluation, and training. The Joint Model Transition (JMT) Program (formerly known as the Legacy Model Transition) funds the upgrades to selected R&D models through a board process. The selection process allows the board to influence the direction of legacy model development and interaction for the entire modeling and simulation community. Emphasis is placed on joint applicability and acceptance. The Executive Agent for Air & Space Natural Environment (ASNE) serves the M&S community as subject matter experts for ASNE M&S databases (including relevant standards), dynamic processes, and other applications. This enables the major Joint simulation systems (i.e., Joint Warfare Simulation (JWARS), Joint Simulation System (JSIMS), Joint Modeling and Simulation System (JMASS), and Joint and Service component programs (i.e., Joint Strike Fighter (JSF), Ballistic Missile Defense Organization (BMDO), etc.) to represent the air and space natural environment rapidly, thoroughly, and consistently in a manner that promotes cost-effectiveness, ready access, interoperability, re-use, and confidence. Primary users will be unified commanders and service components for use in joint or service-specific exercises involving air, ground, sea, and space campaigns.

All FY02-07 RDT&E funding in PE: 38601F - 'Modeling and Simulation Support' will be transferred to PE: 27601F - 'USAF Modeling and Simulation'. In the interim, FY01 RDT&E funding in PE: 38601F is needed to continue integrating and developing numerous AF models and simulations into emerging DoD standard models and architecture. Added, FY01 PE: 38601 RDT&E funding provides modeling and simulation development efforts to digitally represent air and space natural environments integrated into the major Joint simulation systems (ie. Joint Warfare Simulation (JWARS), Joint Simulation System (JSIMS), Joint Modeling and Simulation System

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0308601F Modeling and Simulation Support
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(U) **A. Mission Description Continued**
(JMASS)).

(U) **B. Budget Activity Justification**
This program is in budget activity 7 - Operational System Development, because these funds support development activity for the AF as executive agent for air/space natural environment and continued development and integration of AF models in the Joint Model Transition (JMT) program.

(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)	1,090	1,069	1,177	
(U) Appropriated Value	1,093			
(U) Adjustments to Appropriated Value				
a. Congressional/General Reductions	-3			
b. Small Business Innovative Research	-30			
c. Omnibus or Other Above Threshold Reprogram				
d. Below Threshold Reprogram	-16			
e. Rescissions	-6			
f. Other				
(U) Adjustments to Budget Years Since FY 2000 PBR				
(U) Current Budget Submit/FY 2001 PBR	1,038		1,177	TBD
(U) <u>Significant Program Changes:</u> FY00 funding eliminated.				

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)							DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0308601F Modeling and Simulation Support				PROJECT 671011		
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
671011	Legacy Model Transition (LMT)	355	0	386	393	402	410	418	Continuing	TBD
<p>(U) <u>A. Mission Description</u> Numerous models are being developed for a broad range of areas including acquisition, analysis, test and evaluation, and training. The Joint Model Transition (JMT) Program (formerly known as Legacy Model Transition) supports the development and upgrade of R&D models selected through a board process. The selection process allows the board to influence the direction of model development and integration for the modeling and simulation community. Emphasis is placed on joint applicability and acceptance. All FY02-07 RDT&E funding in PE: 38601F will be transferred to PE: 27601F, titled 'USAF Modeling and Simulation'.</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u> (U) \$162 Develop and Integrate service analysis models into next generation joint models. (U) \$128 Requirements/cost-benefit analysis for Next Generation Mission Model (NGMM). (U) \$65 Develop comprehensive Digital System Models (DSMs) to support Analysis of Alternatives (AoAs) for potential development programs. DSMs digitally represent weapon system platforms and are used to evaluate existing platform capabilities against new threats, ability to upgrade weapon systems to satisfy new requirements, etc. Results of AoAs using DSMs are used as a decision tool to determine future weapon system developments and/or upgrades. (U) \$355 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u> (U) \$0 No Activity (U) \$0 Total</p> <p>(U) <u>FY 2001 (\$ in Thousands)</u> (U) \$114 Develop and integrate service analysis models into next generation joint models. (U) \$100 Requirements/cost-benefit analysis for Next Generation Mission Model (NGMM). (U) \$172 Develop comprehensive Digital System Models (DSMs) to support Analysis of Alternatives (AoAs) for potential development programs. DSMs digitally represent weapon system platforms and are used to evaluate existing platform capabilities against new threats, ability to upgrade weapon systems to satisfy new requirements, etc. Results of AoAs using DSMs are used as a decision tool to determine future weapon system developments and/or upgrades. (U) \$386 Total</p>										
Project 671011			Page 3 of 8 Pages				Exhibit R-2A (PE 0308601F)			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)							DATE February 2000																																																																																																																		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0308601F Modeling and Simulation Support				PROJECT 671011																																																																																																																	
<p>(U) <u>B. Project Change Summary</u></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></th> <th style="width:10%;"><u>FY 2000</u></th> <th style="width:10%;"><u>FY 2001</u></th> <th style="width:10%;"><u>FY 2002</u></th> <th style="width:10%;"><u>FY 2003</u></th> <th style="width:10%;"><u>FY 2004</u></th> <th style="width:10%;"><u>FY 2005</u></th> <th style="width:10%;"><u>Cost to</u></th> <th style="width:10%;"><u>Total Cost</u></th> </tr> <tr> <td></td> <td align="center"><u>Actual</u></td> <td align="center"><u>Estimate</u></td> <td align="center"><u>Estimate</u></td> <td align="center"><u>Estimate</u></td> <td align="center"><u>Estimate</u></td> <td align="center"><u>Estimate</u></td> <td align="center"><u>Estimate</u></td> <td align="center"><u>Complete</u></td> <td></td> </tr> </thead> <tbody> <tr> <td>(U) AF RDT&E</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>(U) Other APPN</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>N/A</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </tbody> </table> <p>(U) <u>D. Acquisition Strategy</u> The funds are provided to the Office of Aerospace Studies (OAS), Kirtland AFB, NM, for contract actions in the development of the Next Generation Mission Model (NGMM), Joint Model Transition Plan, and Analysis of Alternatives (AoA) studies for analysis models and digital system models. OAS will oversee a prioritization process for contract selection and development effort.</p> <p>(U) <u>E. Schedule Profile</u></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:45%;"></th> <th colspan="3" style="width:15%;"><u>FY 1999</u></th> <th colspan="3" style="width:15%;"><u>FY 2000</u></th> <th colspan="3" style="width:15%;"><u>FY 2001</u></th> </tr> <tr> <td></td> <td align="center">1</td><td align="center">2</td><td align="center">3</td> <td align="center">4</td><td align="center">1</td><td align="center">2</td><td align="center">3</td> <td align="center">4</td><td align="center">1</td><td align="center">2</td><td align="center">3</td><td align="center">4</td> </tr> </thead> <tbody> <tr> <td>(U) Fund Next Generation Mission Model project (Phase I completed 1QFY99)</td> <td align="center">*</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td align="center">X</td><td></td><td></td><td></td> </tr> <tr> <td>(U) Develop AoA studies for standard toolkit (Phase I completed 1QFY99)</td> <td align="center">*</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td align="center">X</td><td></td><td></td><td></td> </tr> <tr> <td>(U) Integrate models (P1 completed 4QFY99)</td> <td></td><td></td><td></td><td></td><td align="center">*</td><td></td><td></td><td></td><td></td><td></td><td></td><td align="center">X</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) AF RDT&E										(U) Other APPN										N/A											<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) Fund Next Generation Mission Model project (Phase I completed 1QFY99)	*								X				(U) Develop AoA studies for standard toolkit (Phase I completed 1QFY99)	*								X				(U) Integrate models (P1 completed 4QFY99)					*							X
	<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 671011			Page 4 of 8 Pages				Exhibit R-2A (PE 0308601F)																																																																																																																		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000			
BUDGET ACTIVITY					PE NUMBER AND TITLE			PROJECT		
07 - Operational System Development					0308601F Modeling and Simulation Support			671011		
(U) A. Project Cost Breakdown (\$ in Thousands)										
					<u>FY 1999</u>		<u>FY 2000</u>			<u>FY 2001</u>
(U)	Contractor Support				290		0			307
(U)	Program Management Support				25		0			30
(U)	Travel				40		0			49
(U)	Total				355		0			386
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)										
(U) Performing Organizations:										
<u>Contractor or</u>	<u>Contract</u>									
<u>Government</u>	<u>Method/Type</u>	<u>Award or</u>	<u>Performing</u>	<u>Project</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>Performing</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</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>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>						
<u>Product Development Organizations</u>										
Various	Various	Various			0	355	0	386	Continuing	TBD
<u>Support and Management Organizations</u>										
<u>Test and Evaluation Organizations</u>										
<u>Subtotals</u>					<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
					<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
Subtotal Product Development					0	355	0	386	TBD	TBD
Subtotal Support and Management										
Subtotal Test and Evaluation										
Total Project					0	355	0	386	TBD	TBD

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

DATE
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BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0308601F Modeling and Simulation Support				PROJECT 674566		
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
674566	Executive Agent for Air/Space Natural Environment	683	0	791	825	915	933	952	Continuing	TBD

(U) A. Mission Description

Air Force Director of Weather (AF/XOW) is designated as the DoD Modeling and Simulation Executive Agent (MSEA) for Air and Space Natural Environment (ASNE). This program provides funds for MSEA joint wargaming architecture, data base, model development support for Joint Warfare Simulation (JWARS), Joint Simulation System (JSIMS), Joint Modeling and Simulation System (JMASS), and other joint M&S program offices. Primary users will be unified commanders and service components for use in joint exercises involving air, ground, sea, and space campaigns. All FY02-07 RDT&E funding in PE: 38601F will be reprogrammed in the FY02-07 POM cycle to PE: 27601F, titled 'USAF Modeling and Simulation'.

(U) FY 1999 (\$ in Thousands)

- (U) \$255 Space weather model development
- (U) \$55 Production center model development
- (U) \$373 Air/Space weather effects development
- (U) \$683 Total

(U) FY 2000 (\$ in Thousands)

- (U) \$0 No Activity
- (U) \$0 Total

(U) FY 2001 (\$ in Thousands)

- (U) \$128 Space weather prototyping and integration
- (U) \$513 Production center model development
- (U) \$150 Air/Space/Land battlefield weather effects integration
- (U) \$791 Total

(U) B. Project Change Summary

FY00 funding eliminated.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0308601F Modeling and Simulation Support	PROJECT 674566
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(U) **C. Other Program Funding Summary (\$ in Thousands)**

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Cost to</u>	<u>Total Cost</u>
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	

- (U) AF RDT&E
- (U) Other APPN

(U) **D. Acquisition Strategy**
 The Executive Agent for Air & Space Natural Environment will develop, prototype, and integrate the current suite of production and research grade models for Service and Joint distributed simulation models. The majority of efforts are executed and managed through the DoD laboratory system.

(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) Architecture - ESG IOC (Completed 3QFY99)			*									
(U) Architecture - ESG FOC												X
(U) Models - CSSMS FOC												X
(U) Models - ISM IOC												X

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 2000		
BUDGET ACTIVITY					PE NUMBER AND TITLE			PROJECT		
07 - Operational System Development					0308601F Modeling and Simulation Support			674566		
(U) A. Project Cost Breakdown (\$ in Thousands)										
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>
(U)	Software Development					341		0		258
(U)	Lab Overhead/Management					77		0		80
(U)	Prototyping					240		0		428
(U)	Travel					25		0		25
(U)	Total					683		0		791
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)										
(U) Performing Organizations:										
<u>Contractor or</u>	<u>Contract</u>									
<u>Government</u>	<u>Method/Type</u>	<u>Award or</u>	<u>Performing</u>	<u>Project</u>						
<u>Performing</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Organizations</u>										
Various	Various	Various				683	0	791	Continuing	TBD
<u>Support and Management Organizations</u>										
<u>Test and Evaluation Organizations</u>										
					<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>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						683	0	791	TBD	TBD
Subtotal Support and Management										
Subtotal Test and Evaluation										
Total Project						683	0	791	TBD	TBD

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 2000	
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0308699F Shared Early Warning System				PROJECT 674838	
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
674838 Shared Early Warning System	0	11,532	4,219	4,411	3,424	2,932	2,928	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0
<p>(U) <u>A. Mission Description</u> Shared Early Warning Systems (SEWS) developed out of Presidential foreign policy initiatives beginning in 1996. Arrangements are negotiated with individual countries on a bilateral basis to provide selected region-specific missile warning data. These efforts were initially handled on an ad hoc basis through the Office of the Secretary of Defense (OSD), the Joint Staff, and the National Reconnaissance Office (NRO). Regional U.S. CINCs and other policy makers strongly support these efforts based on political and operational benefits. In 1998, SEWS was established as a formal DoD program with the Air Force as the lead service. SEWS is comprised of: program management by the system program office (SPO) to include the use of Federally Funded Research & Development Corporation and Systems Engineering and Technical Assistance contractors to develop a common SEWS architecture; coordination, maintenance, and sustainment of the existing systems hardware and software to include any necessary Y2K problem resolution; design, test, and installation of a Joint Warning Center (JWC) in Moscow; development and maintenance of a multi-lingual, web-based infrastructure to address Pre-Launch Notification System issues; and site preparation/installation for additional systems, as required.</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u> (U) \$0 Not Applicable (U) \$0 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u> (U) \$1,832 Design, Test and Install Joint Warning Center (JWC) in Moscow to include a Pre-Launch Notification System (U) \$9,700 Develop common architecture and begin installation at existing SEWS sites worldwide (U) \$11,532 Total</p> <p>(U) <u>FY 2001 (\$ in Thousands)</u> (U) \$1,200 Continue to normalize a common SEWS architecture (U) \$510 Implement Pre-Launch Notification System in additional countries as required (U) \$2,509 Begin common architecture installation at additional SEWS sites as negotiated by SECDEF via OSD (U) \$4,219 Total</p>									
Project 674838			Page 1 of 5 Pages				Exhibit R-2 (PE 0308699F)		

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

DATE
February 2000

BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0308699F Shared Early Warning System	PROJECT 674838
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(U) **B. Budget Activity Justification**

This program is in Budget Activity 7 - Operational System Development, because it supports work on currently operating systems and/or upgrades still in engineering development

(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)	0	11,532	4,220	TBD
(U) Appropriated Value	0	11,532		0
(U) Adjustments to Appropriated Value				
a. Congressional/General Reductions	0			0
b. Small Business Innovative Research	0			0
c. Omnibus or Other Above Threshold Reprogram	0			0
d. Below Threshold Reprogram	0			0
e. Rescissions	0			0
f. Other	0			TBD
(U) Adjustments to Budget Years Since FY 2000 PBR	0		-1	TBD
(U) Current Budget Submit/FY 2001 PBR	0	11,532	4,219	TBD

(U) **Significant Program Changes:**

(U) **D. Other Program Funding Summary (\$ in Thousands)**

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Cost to</u>	<u>Total Cost</u>
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	
(U) AF RDT&E	8,000								
(U) PE0305906F, NCMC TW/AA BA7									

(U) **E. Acquisition Strategy**

This program was managed through FY99 under the same ad hoc arrangements as in past years. Beginning in FY00, tasks will be implemented via the Integrated Space Command and Control (ISC2) contract. After final contract award in late-FY00 the ISC2 contract will employ an evolutionary spiral development acquisition strategy that enables rapid development and fielding of an initial capability in response to validated requirements. Implementation within the ISC2 contract will provide significant benefits to SEWS by taking advantage of the commonality between the SEWS and the missile warning mission already included as part of ISC2. This synergy will encourage the use of a common system support infrastructure and reuse of software components. The ISC2 contract will be a performance-oriented

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0308699F Shared Early Warning System	PROJECT 674838
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(U) **E. Acquisition Strategy Continued**
contract vehicle that drives Total System Performance Responsibility to industry.

(U) **F. 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) Lead Service Designation	*											
(U) CY2KSS IOC					*							
(U) ISC2 Contract Award						X		X				
(U) Complete System Architecture Development							X					
(U) Install Pre-Launch Notification System for JWC									X			
(U) JWC Site Operational									X			
(U) Standardization of additional sites with existing architecture												X

*completed task /X scheduled task.
- ISC2 initial contract award will be in Feb 00 with two contractors followed by a rolling down select with final award in Aug 00 to one contractor.

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0308699F Shared Early Warning System				PROJECT 674838			
(U) <u>A. Project Cost Breakdown (\$ in Thousands)</u>											
						<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U)	Major Contract					0	6,687	1,987			
(U)	Award/Performance Fee					0	518	435			
(U)	System Engineering					0	2,688	1,368			
(U)	Program Management Administration (PMA)					0	1,639	429			
(U)	Total					0	11,532	4,219			
(U) <u>B. Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
(U) <u>Performing Organizations:</u>											
	<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>Performing Activity</u>	<u>or Funding Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>						
<u>Product Development Organizations</u>											
	ISC2 Contractor (TBD)	CP/AF	Aug 00	N/A	N/A	0	0	2,100	2,422	Continuing	TBD
	SPAWAR	MIPR	Nov 99					1,384			1,384
	NRO	MIPR	Dec 99					3,049			3,049
	Various Ctrs/Gov Agencies	TBD	TBD	N/A	N/A	0	0	672	0	Continuing	TBD
<u>Support and Management Organizations</u>											
	FFRDC	CPFF	N/A	N/A	N/A	0	0	924	485	Continuing	TBD
	A&AS	C/R	Apr 00	N/A	N/A	0	0	1,764	883	Continuing	TBD
	PMA	N/A	N/A	N/A	N/A	0	0	1,639	429	Continuing	TBD
<u>Test and Evaluation Organizations</u>											
	N/A										
(U) <u>Government Furnished Property:</u>											
	<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>or Funding Vehicle</u>	<u>Date</u>	<u>Date</u>							

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0308699F Shared Early Warning System			PROJECT 674838		
(U) Government Furnished Property Continued:									
	<u>Contract</u>								
	<u>Method/Type</u>	<u>Award or</u>							
<u>Item</u>	<u>or Funding</u>	<u>Obligation</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>Description</u>	<u>Vehicle</u>	<u>Date</u>	<u>Date</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Property</u>									
None									
<u>Support and Management Property</u>									
None									
<u>Test and Evaluation Property</u>									
None									
				<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				0	0	7,205	2,422	TBD	TBD
Subtotal Support and Management				0	0	4,327	1,797	TBD	TBD
Subtotal Test and Evaluation									
Total Project				0	0	11,532	4,219	TBD	TBD

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 2000																																									
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0401115F C-130 AIRLIFT SQUADRONS																																													
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	0	40,123	60,496	112,976	130,937	105,577	87,659	Continuing	TBD																																								
674726 Avionics Modernization Program (AMP)	0	40,123	60,496	80,252	122,314	100,129	87,659	Continuing	TBD																																								
674885 Large Aircraft Infrared Counter Measures (LAIRCM)	0	0	0	32,724	8,623	5,448	0	0	46,795																																								
Quantity of RDT&E Articles	0	0	0	0	1	2	0	0	0																																								
<p>(U) <u>A. Mission Description</u> The C-130 Avionics Modernization Program (AMP) consolidates and installs the mandated DOD Navigation/Safety mods, the Global Air Traffic Management (GATM) systems and the C-130 Broad Area Review requirements. These mandated mods are incorporated with various other Reliability, Maintainability, and Sustainability (RM&S) upgrades. AMP modernization will improve C-130 reliability, and will give the C-130 fleet complete access to international air space. The Large Aircraft Infrared Countermeasures System (LAIRCM) will provide advanced defensive capability against IR Man-Portable Air Defense Systems (MANPADS) for large transport and tanker aircraft. LAIRCM is significantly more effective than today's traditional employment of flares. LAIRCM consists of two advanced integrated missile warning systems and an active laser countermeasures system.</p> <p>(U) <u>B. Budget Activity Justification</u> These programs are a budget activity 7 - Operational System Development because they provide funding for the modernization of a currently existing and operating system.</p> <p>(U) <u>C. Program Change Summary (\$ in Thousands)</u></p> <table border="0"> <thead> <tr> <th></th> <th><u>FY 1999</u></th> <th><u>FY 2000</u></th> <th><u>FY 2001</u></th> <th><u>Total Cost</u></th> </tr> </thead> <tbody> <tr> <td>(U) Previous President's Budget (FY 2000 PBR)</td> <td></td> <td>0</td> <td>0</td> <td>46,795</td> </tr> <tr> <td>(U) Appropriated Value</td> <td></td> <td>40,600</td> <td></td> <td></td> </tr> <tr> <td>(U) Adjustments to Appropriated Value</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> a. Congressional/General Reductions</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> b. Small Business Innovative Research</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> c. Omnibus or Other Above Threshold Reprogram</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> d. Below Threshold Reprogram</td> <td></td> <td></td> <td>-220</td> <td></td> </tr> </tbody> </table>											<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>	(U) Previous President's Budget (FY 2000 PBR)		0	0	46,795	(U) Appropriated Value		40,600			(U) Adjustments to Appropriated Value					a. Congressional/General Reductions					b. Small Business Innovative Research					c. Omnibus or Other Above Threshold Reprogram					d. Below Threshold Reprogram			-220	
	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>																																													
(U) Previous President's Budget (FY 2000 PBR)		0	0	46,795																																													
(U) Appropriated Value		40,600																																															
(U) Adjustments to Appropriated Value																																																	
a. Congressional/General Reductions																																																	
b. Small Business Innovative Research																																																	
c. Omnibus or Other Above Threshold Reprogram																																																	
d. Below Threshold Reprogram			-220																																														

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

DATE
February 2000

BUDGET ACTIVITY

PE NUMBER AND TITLE

07 - Operational System Development

0401115F C-130 AIRLIFT SQUADRONS

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

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
e. Rescissions		-257		
f. Other				
(U) Adjustments to Budget Years Since FY 2000 PBR			60,496	
(U) Current Budget Submit/FY 2001 PBR		40,123	60,496	46,795

(U) **Significant Program Changes:**

Congress approved the AF's request to reprogram FY00's \$38.6 million and FY01's \$61.0 million to RDT&E from the Aircraft Procurement account. Congress also added \$2 million to this program in FY00 for an AC-130 Leading Edge Technology program.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 2000	
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0401115F C-130 AIRLIFT SQUADRONS				PROJECT 674726	
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
674726 Avionics Modernization Program (AMP)	0	40,123	60,496	80,252	122,314	100,129	87,659	Continuing	TBD
<p>(U) A. Mission Description</p> <p>The C-130 Avionics Modernization Program (AMP) consolidates and installs the mandated DOD Navigation/Safety mods, the Global Air Traffic Management (GATM) systems and the C-130 Broad Area Review requirements. These mandated mods are incorporated with various other Reliability, Maintainability, and Sustainability (RM&S) upgrades to include: TCAS, TAWS, replace APN-59 and APQ-175 radars, replace N-1/C-12 compass, provide dual autopilots, install dual flight management systems and provide HF/UHF/VHF datalink. AMP modernization will give the C-130 fleet complete access to international air space.</p> <p>The USAF C-130 fleet consists of 15 different mission design series (MDS) to be modified by the Avionics Modernization Program (AMP). Some of these MDSs have multiple variants within each which result in a total of 20 C-130 variants to be modified by AMP. These multiple different models and cockpit configurations result in significant support and training inefficiencies. Also, these differences greatly complicate unit/aircraft interoperability at forward locations. The AMP program standardizes the cockpit configurations and avionics for these 20 different variants by installing a single core avionics package and cockpit configuration, thus eliminating the fleet's significant interoperability and training problems. (Note: the C-130J MDSs are not affected by AMP). Today, the maintainability and supportability costs for these 20 different variants are increasing at a rate greater than inflation. AMP will modernize these aircraft with new avionics suites and other cockpit equipment to bring costs down and improve aircrew interoperability.</p> <p>The baseline program (described here) modifies the first seven variants of the C-130 fleet for a total of 397 aircraft. The planned FY02 POM follow-on program will fund and complete AMP for the remaining 122 aircraft (13 variants in eight different C-130 MDSs). Each variant or group of variants will require a specific kit development and test, then will proceed through development and production serially. During FY02-FY06, these first seven variants will be in some stage of development. Some will be in the design phase, while others will be in trial installation, testing, kit proof, or production phases. This waterfall approach will result in an orderly sequencing of development and production for the many different kits required for the C-130 fleet. The early kits will be the 'core' kits upon which kits for the more complicated aircraft will be developed. Lessons learned from the early variants will be applied to subsequent variants to reduce program risk and cost. In addition, an AF fleet-wide training system will be developed.</p> <p>Note: The C-130 Avionics Modernization Program (AMP) was initially a consolidation of a number of ongoing and planned mods which was funded in FY99 and throughout the FYDP with 3010 appropriations. In the summer of 99, the scope of the AMP program changed and became more complex, thus requiring RDT&E funding. The FY 99 Omnibus requested a \$1.654 million RDT&E reprogramming to begin AMP. The Omnibus was approved, but the FY 00 Appropriations Act rescinded the FY 98 and FY 99 funds (\$1.8M and \$2.7M respectively). However, Congress did approve the AF's request to reprogram FY00's \$38.6 million to RDT&E from the procurement account. Congress also added \$2M to this program for an AC-130 Leading Edge Technology program.</p>									
Project 674726			Page 3 of 10 Pages				Exhibit R-2A (PE 0401115F)		

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)							DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0401115F C-130 AIRLIFT SQUADRONS			PROJECT 674726		
(U) <u>A. Mission Description Continued</u>									
(U) <u>FY 1999 (\$ in Thousands)</u>									
(U) \$0 No activity									
(U) \$0 Total									
(U) <u>FY 2000 (\$ in Thousands)</u>									
(U) \$32,000 Begins design and software development for AMP. This includes beginning detailed group A & B design series, hardware/software development of crew station modules/computer simulation, initiate design of system integration lab (SIL), development of training system, and continue CAAP Risk Mitigation flight testing.									
(U) \$6,123 Program office support (A&AS, SPO, TDY, training and supplies).									
(U) \$2,000 AC-130 Leading Edge Technology program (Congressional insertion)									
(U) \$40,123 Total									
(U) <u>FY 2001 (\$ in Thousands)</u>									
(U) \$52,996 Award EMD contract. Continue design and software development. This includes beginning detailed group A & B design series, hardware/software development of crew station modules/computer simulation, initiate design of system integration lab (SIL), development of training system, and continue CAAP Risk Mitigation flight testing.									
(U) \$7,500 Program office support (A&AS, SPO, TDY, training and supplies).									
(U) \$60,496 Total									
(U) <u>B. Project Change Summary</u>									
This program is budget activity 7, Operational System Development, to support full-rate production and improve the operational capability of the C-130 fleet through operational modifications.									
(U) <u>C. Other Program Funding Summary (\$ in Thousands)</u>									
	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Cost to</u>	<u>Total Cost</u>
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	
(U) AF RDT&E	0	0	2,000	0	0	0	0	0	2,000
(U) Other APPN									
(U) PE 41115F, AMP, BP1100					36,000	80,800	187,600	Continuing	Continuing
(U) <u>D. Acquisition Strategy</u>									
The EMD contract will be a competitively-awarded Cost Plus Award Fee to develop AMP kits for the first seven variants within the AF C-130 fleet.									
Project 674726			Page 4 of 10 Pages			Exhibit R-2A (PE 0401115F)			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0401115F C-130 AIRLIFT SQUADRONS	PROJECT 674726
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(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) C-130 AMP Contract Award									X			
(U) C-130 Systems Requirements Review									X			
(U) C-130 Preliminary Design Review										X		
(U) C-130 CAAP PDR												X

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000				
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0401115F C-130 AIRLIFT SQUADRONS			PROJECT 674726				
(U) A. Project Cost Breakdown (\$ in Thousands)											
					<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>		
(U)	C-130 AMP EMD				0		32,000		52,996		
(U)	Program Office Support				0		6,123		7,500		
(U)	AC-130 Leading Edge funding				0		2,000		0		
(U)	Total				0		40,123		60,496		
(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>											
	Prime Contractor	CPAF	FY01/01			0	0	32,000	52,996	Continuing	TBD
	Prime Contractor (AC-130)	CPAF	FY01/01					2,000	0	0	2,000
<u>Support and Management Organizations</u>											
	Program Support Office					0	0	6,123	7,500	Continuing	TBD
<u>Test and Evaluation Organizations</u>											
	TBD							0	0	Continuing	TBD
(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>											
	N/A					0	0	0	0	Continuing	TBD
<u>Support and Management Property</u>											
	N/A					0	0	0	0	Continuing	TBD

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0401115F C-130 AIRLIFT SQUADRONS	PROJECT 674726
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(U) <u>Government Furnished Property Continued:</u>						
<u>Test and Evaluation Property</u>						
TBD	0	0	0	0	Continuing	TBD
	<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	0	0	34,000	52,996	TBD	TBD
Subtotal Support and Management	0	0	6,123	7,500	TBD	TBD
Subtotal Test and Evaluation	0	0	0	0	TBD	TBD
Total Project	0	0	40,123	60,496	TBD	TBD

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)							DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0401115F C-130 AIRLIFT SQUADRONS				PROJECT 674885	
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
674885 Large Aircraft Infrared Counter Measures (LAIRCM)	0	0	0	32,724	8,623	5,448	0	0	46,795
<p>(U) <u>A. Mission Description</u> The Large Aircraft Infrared Countermeasures System (LAIRCM) will provide advanced defensive capability against IR Man-Portable Air Defense Systems (MANPADS) for large transport and tanker aircraft. LAIRCM is significantly more effective than today's traditional employment of flares. It will require no operator intervention after the system is activated. LAIRCM consists of two advanced integrated missile warning systems and an active laser countermeasures system. There is a multi-service Operational Requirements Document (ORD) -- LAIRCM ORD 314-92, validated on 3 Aug 98.</p> <p>LAIRCM will first be deployed on a small number of C-17 and C-130 aircraft. KC-135s are the next aircraft in the planned follow-on group. FY01 is the first year for C-17 LAIRCM funding. FY02 is the first year for C-130 funding. LAIRCM is divided into two phases. The first phase equips 20 aircraft (12 C-17s and 8 C-130s). Phase II will modify an additional 59 aircraft. Funding and kit procurement for Phase II is planned to begin in FY05.</p> <p>Installation of this system will increase the survivability of strategic aircraft when operating in areas with IR MANPADS threats. The C-17 will be first to receive LAIRCM, the first C-17 mod will be completed in FY03. Since this system will integrate existing subsystems, initial deployment should be achieved by FY03. RDT&E funds will be used for non-recurring engineering (NRE) and integration test and evaluation.</p> <p>This is an FY01 NEW START program with notification made simultaneously here and in the C-17's descriptive summary.</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u> (U) \$0 No activity (U) \$0 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u> (U) \$0 No activity (U) \$0 Total</p> <p>(U) <u>FY 2001 (\$ in Thousands)</u> (U) \$0 No activity (U) \$0 Total</p>									
Project 674885			Page 8 of 10 Pages				Exhibit R-2A (PE 0401115F)		

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

DATE
February 2000

BUDGET ACTIVITY

PE NUMBER AND TITLE

PROJECT

07 - Operational System Development

0401115F C-130 AIRLIFT SQUADRONS

674885

(U) **B. Project Change Summary**

This program is budget activity 7, Operational System Development, for continuing producibility and performance improvements to support full-rate production and increase the operational capability of the C-130 fleet through programmed modifications.

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

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Cost to</u>	<u>Total Cost</u>
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	
(U) AF RDT&E									
(U) PE 41130F, C-17 RDT&E	0	0	45,298	29,451	11,497	7,824	0	0	94,070
(U) Other APPN									
(U) PE 41130F, C-17 Procurement (BP1100)	0	0	0	33,100	51,200	48,600	6,200	7,000	146,100
(U) PE 41115F, C-130 Procurement (BP1100)	0	0	0	0	33,400	48,900	6,000	7,000	95,300

(U) **D. Acquisition Strategy**

The C-130 LAIRCM acquisition strategy is yet to be determined. It is anticipated that it will be a competitive bid process

(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) Phase I EMD: 2 Qtr FY02												

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development					PE NUMBER AND TITLE 0401115F C-130 AIRLIFT SQUADRONS			PROJECT 674885		
(U)	<u>A. Project Cost Breakdown (\$ in Thousands)</u>									
					<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U)	Total									
(U)	<u>B. Budget Acquisition History and Planning Information (\$ in Thousands)</u>									
(U)	<u>Performing Organizations:</u>									
	<u>Contractor or</u>	<u>Contract</u>								
	<u>Government</u>	<u>Method/Type</u>	<u>Award or</u>	<u>Performing</u>	<u>Project</u>					
	<u>Performing</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>
	<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>
	<u>Product Development Organizations</u>									<u>Total</u>
	<u>Support and Management Organizations</u>									<u>Program</u>
	<u>Test and Evaluation Organizations</u>									
(U)	<u>Government Furnished Property:</u>									
		<u>Contract</u>								
		<u>Method/Type</u>	<u>Award or</u>							
	<u>Item</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Delivery</u>		<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>
	<u>Description</u>	<u>Vehicle</u>	<u>Date</u>	<u>Date</u>		<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>
	<u>Product Development Property</u>									
	<u>Support and Management Property</u>									
	<u>Test and Evaluation Property</u>									
	<u>Subtotals</u>					<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>
						<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>
	Subtotal Product Development									<u>Total</u>
	Subtotal Support and Management									<u>Program</u>
	Subtotal Test and Evaluation									
	Total Project									

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

DATE
February 2000

BUDGET ACTIVITY		PE NUMBER AND TITLE							
07 - Operational System Development		0401119F C-5 Airlift Squadrons							
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	37,348	59,122	92,530	135,619	101,942	18,817	0	0	448,565
674495 Avionics Modernization Program	37,348	40,356	44,901	46,508	235	0	0	0	172,535
674835 Reliability Enhancement & Reengining Program	0	18,766	47,629	89,111	101,707	18,817	0	0	276,030
Quantity of RDT&E Articles	2	0	0	2	0	0	0	0	4

(U) **A. Mission Description**

674495: Avionics Modernization Program (AMP): Phase I of an Air Force planned two-phase modernization effort of the C-5. Formerly called the C-5 All-Weather Flight Control System (AWFCS) Reliability Improvement Program, the C-5 Avionics Modernization Program redesigns the avionics system architecture to support the AWFCS Reliability Improvement Program and Global Air Traffic Management (GATM) requirements. AMP also installs Secretary of Defense (SECDEF) directed Navigation Safety equipment: Terrain Awareness and Warning System (TAWS) [formerly Enhanced Ground Proximity Warning System (EGPWS)] and Traffic Alert and Collision Avoidance System (TCAS). The AWFCS portion of AMP replaces low reliability Line Replaceable Units (LRUs) in the automatic flight control system and replaces aging mechanical instruments in the engine and flight systems. Many control systems will be unsupported within five years. A GATM capability, which encompasses communications, navigation, and surveillance requirements, will be concurrently incorporated into the aircraft to meet current and future International Civil Aviation Organization (ICAO)/Federal Aviation Administration (FAA) requirements and to progress towards 'free flight' capability. Connectivity to Mobility command and control capabilities will also be incorporated in the AMP design. The integration of TCAS and TAWS Nav Safety enhancements in AMP satisfies great congressional interest to reduce the threat of mid-air collisions and controlled flight into terrain. The TCAS portion is accelerated to complete ahead of the rest of the AMP mod (by FY02). Two AMP RDT&E test articles are funded in FY99 for flight test and installed in 1Q FY02.

674835: Reliability Enhancement and Reengining Program (RERP): Phase II comprehensive modernization of the C-5 improves aircraft reliability, maintainability and availability. The goal of RERP is to achieve C-5 wartime mission requirements by increasing fleet availability (mission capable rate, departure reliability) while reducing total ownership costs (TOC). This effort centers around replacing TF-39 engines with a more reliable, commercially available (COTS) turbofan engine with increased takeoff thrust and stage three noise compliance. These new engines (along with new pylons, wing attach fittings and upgrades, and thrust reversers) increase payload capability, improve transportation system throughput and decrease engine removals. Numerous other system/reliability 'Bad Actors' will be addressed (e.g. auxiliary power units, electrics, hydraulics, landing gear, fuel system, airframe, fire suppression system, and pressurization/air conditioning system). Two RDT&E test articles are funded in FY02 for flight test and installed in FY04.

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

DATE
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0401119F C-5 Airlift Squadrons
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(U) **B. Budget Activity Justification**

674495: Avionics Modernization Program (AMP): This project is comprised of low technical risk efforts supporting fielded weapons systems and, therefore, was assigned to Budget Activity 7, Operational Systems Development.

674835: Reliability Enhancement and Reengining Program (RERP): This project is comprised of low technical risk efforts supporting fielded weapons systems and, therefore, was assigned to Budget Activity 7, Operational Systems Development.

(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)	33,594	63,041	56,416	463,999
(U) Appropriated Value	33,736	60,041		
(U) Adjustments to Appropriated Value				
a. Congressional/General Reductions	-142	-3		
b. Small Business Innovative Research	-1,066	0		
c. Omnibus or Other Above Threshold Reprogram	3,545	-325		
d. Below Threshold Reprogram	1,484	0		
e. Rescissions	-209	-591		
f. Other	0	0		
(U) Adjustments to Budget Years Since FY 2000 PBR	0	0	36,114	-15,434
(U) Current Budget Submit/FY 2001 PBR	37,348	59,122	92,530	448,565

(U) **Significant Program Changes:**

Since FY00 PB:

- C-5 AMP contract awarded 22 Jan 1999. Cost delta between the negotiated contract price and the AMP procurement funds budgeted in FY01, FY02 and FY03 of the FY00 PB were realigned to RDT&E for AMP and RERP. Other cost differences in AMP procurement funds in the outyears were moved to RERP procurement.
- RERP RDT&E funds in FY04 and FY05 of the FY00 PB were realigned to RERP procurement.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 2000	
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0401119F C-5 Airlift Squadrons				PROJECT 674495	
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
674495 Avionics Modernization Program	37,348	40,356	44,901	46,508	235	0	0	0	172,535
<p>(U) <u>A. Mission Description</u> 674495: Avionics Modernization Program (AMP): Phase I of an Air Force planned two-phase modernization effort of the C-5. Formerly called the C-5 All-Weather Flight Control System (AWFCS) Reliability Improvement Program, the C-5 Avionics Modernization Program redesigns the avionics system architecture to support the AWFCS Reliability Improvement Program and Global Air Traffic Management (GATM) requirements. AMP also installs Secretary of Defense (SECDEF) directed Navigation Safety equipment: Terrain Awareness and Warning System (TAWS) [formerly Enhanced Ground Proximity Warning System (EGPWS)] and Traffic Alert and Collision Avoidance System (TCAS). The AWFCS portion of AMP replaces low reliability Line Replaceable Units (LRUs) in the automatic flight control system and replaces aging mechanical instruments in the engine and flight systems. Many control systems will be unsupportable within five years. A GATM capability, which encompasses communications, navigation, and surveillance requirements, will be concurrently incorporated into the aircraft to meet current and future International Civil Aviation Organization (ICAO)/Federal Aviation Administration (FAA) requirements and to progress towards 'free flight' capability. Connectivity to Mobility command and control capabilities will also be incorporated in the AMP design. The integration of TCAS and TAWS Nav Safety enhancements in AMP satisfies great congressional interest to reduce the threat of mid-air collisions and controlled flight into terrain. The TCAS portion is accelerated to complete ahead of the rest of the AMP mod (by FY02). Two AMP RDT&E test articles are funded in FY99 for flight test and installed in 1Q FY02.</p>									
<p>(U) <u>FY 1999 (\$ in Thousands)</u></p> <p>(U) \$10,241 System Engineering / Program Management</p> <p>(U) \$22,804 AMP Kit Design / Development</p> <p>(U) \$2,512 Prototype Fabrication / Install</p> <p>(U) \$1,791 Mission Support</p> <p>(U) \$37,348 Total</p>									
<p>(U) <u>FY 2000 (\$ in Thousands)</u></p> <p>(U) \$8,300 System Engineering / Program Management</p> <p>(U) \$24,672 AMP Kit Design / Development</p> <p>(U) \$5,200 Prototype Fabrication / Install</p> <p>(U) \$2,184 Mission Support</p> <p>(U) \$40,356 Total</p>									
Project 674495			Page 3 of 12 Pages				Exhibit R-2A (PE 0401119F)		

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	<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 674495	Page 4 of 12 Pages	Exhibit R-2A (PE 0401119F)																																																																																										

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0401119F C-5 Airlift Squadrons	PROJECT 674495
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(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>	
Traffic Management (GATM)									
(U) RDT&E, AF, BA-7	24,882	6,402	8,508	9,496	7,567	7,720	7,872		TBD

(U) **D. Acquisition Strategy**
 Avionics Modernization Program: Program acquisition strategy establishes a single integrating contractor (Lockheed-Martin) to modify and qualify integrated Commercial Off-the-Shelf (COTS) line replaceable units (LRU) and software to meet C-5 performance and Global Air Traffic Management (GATM) requirements, update existing C-5 engineering and technical data, develop interface control specifications based on performance requirements, prototype the new system, and support ground and flight testing. AMP contract awarded to the Lockheed-Martin/Honeywell team on 22 January 1999. \$9.7M in FY99 procurement was added in the FY00 PB to accelerate Traffic Alert and Collision Avoidance System (TCAS) installations ahead of the rest of AMP. TCAS installs scheduled to complete in FY02.

(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) Acquisition Strategy Panel (FY97/4)												
(U) Contract Award		*										
(U) Preliminary Design Review (PDR)						X						
(U) Critical Design Review (CDR)							X					
(U) TCAS Kit Installations Start						X						
(U) TCAS Kit Installations End (FY02/4)												
(U) AMP Prototype Installation Start												X
(U) First Flight (FY02/1)												
(U) Developmental Test Start (FY02/1 - FY02/4)												
(U) Production Installation Start (FY02/4)												
(U) Prod Installation Complete (FY06/1)												

* = completed event
 X = planned event

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development					PE NUMBER AND TITLE 0401119F C-5 Airlift Squadrons			PROJECT 674495			
(U) <u>A. Project Cost Breakdown (\$ in Thousands)</u>											
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>	
(U)	System Engineering / Program Management					10,241		8,300		8,200	
(U)	AMP Kit Design / Development					22,804		24,672		24,100	
(U)	Prototype Fabrication / Install					2,512		5,200		10,200	
(U)	Mission Support					1,791		2,184		2,401	
(U)	Total					37,348		40,356		44,901	
(U) <u>B. Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
(U) <u>Performing Organizations:</u>											
	<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>Performing Activity</u>	<u>or Funding Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>						
<u>Product Development Organizations</u>											
	WR-ALC/LA				5,970	1,170	1,200	1,200	1,200	1,200	5,970
	ASC/GRA	C/CPAF	Jan 99		159,954	2,017	36,067	39,156	43,304	39,643	160,187
<u>Support and Management Organizations</u>											
<u>Test and Evaluation Organizations</u>											
	418 Test Squadrn (Edwards AFB)						81		397	5,900	6,378
(U) <u>Government Furnished Property:</u>											
	<u>Item Description</u>	<u>Contract Method/Type</u>	<u>Award or Obligation</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>	<u>or Funding Vehicle</u>	<u>Date</u>	<u>Date</u>							
	N/A										
	<u>Support and Management Property</u>										
	N/A										

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0401119F C-5 Airlift Squadrons	PROJECT 674495
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(U) Government Furnished Property Continued:

Test and Evaluation Property

N/A

	<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	3,187	37,267	40,356	44,504	40,843	166,157
Subtotal Support and Management						
Subtotal Test and Evaluation		81		397	5,900	6,378
Total Project	3,187	37,348	40,356	44,901	46,743	172,535

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BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0401119F C-5 Airlift Squadrons				PROJECT 674835	
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
674835 Reliability Enhancement & Reengining Program	0	18,766	47,629	89,111	101,707	18,817	0	0	276,030
<p>(U) <u>A. Mission Description</u> 674835: Reliability Enhancement and Reengining Program (RERP): Phase II comprehensive modernization of the C-5 improves aircraft reliability, maintainability and availability. The goal of RERP is to achieve C-5 wartime mission requirements by increasing fleet availability (mission capable rate, departure reliability) while reducing total ownership costs (TOC). This effort centers around replacing TF-39 engines with a more reliable, commercially available (COTS) turbofan engine with increased takeoff thrust and stage three noise compliance. These new engines (along with new pylons, wing attach fittings and upgrades, and thrust reversers) increase payload capability, improve transportation system throughput and decrease engine removals. Numerous other system/reliability 'Bad Actors' will be addressed (e.g. auxiliary power units, electrics, hydraulics, landing gear, fuel system, airframe, fire suppression system, and pressurization/air conditioning system). Two RDT&E test articles are funded in FY02 for flight test and installed in FY04.</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u> (U) \$0 No Activity (U) \$0 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u> (U) \$7,000 System Engineering / Program Management (U) \$10,400 RERP Kit Design / Development (U) \$1,366 Mission Support (U) \$18,766 Total</p> <p>(U) <u>FY 2001 (\$ in Thousands)</u> (U) \$13,380 System Engineering / Program Management (U) \$23,583 RERP Kit Design / Development (U) \$7,670 Prototype Fabrication / Install (U) \$2,996 Mission Support (U) \$47,629 Total</p>									
Project 674835			Page 8 of 12 Pages				Exhibit R-2A (PE 0401119F)		

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	<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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<p>(U) <u>D. Acquisition Strategy</u> Reliability Enhancement and Reengining Program (RERP): Program acquisition strategy is to consider every opportunity to utilize commercially available components and processes to: modernize C-5 products and processes to meet or exceed required system performance and support, so as to renew the weapon system until 2040. The program acquisition strategy also seeks to construct a government/industry 'partnership' to identify solutions, assign responsibility and execute to achieve AMC requirements. RERP will use fleet availability, ownership cost and system performance to balance solutions against program cost.</p>																																																																																								
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BUDGET ACTIVITY 07 - Operational System Development					PE NUMBER AND TITLE 0401119F C-5 Airlift Squadrons					PROJECT 674835			
(U) E. Schedule Profile Continued													
		<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) Acquisition Strategy Panel (ASP)					*								
(U) Pre-EMD Contract Award							X						
(U) Milestone II / DAB											X		
(U) EMD Contract Award											X		
(U) EMD Start											X		
(U) First Prototype Flight (FY04/2)													
(U) LRIP Kit Installations Begin (FY04/2)													
(U) EMD Complete (FY05/1)													
(U) MS IIIA (FY05/2 - B Model Prod Decision)													
(U) MS IIIB (FY08/1 - A Model Prod Decision)													
* = completed event													
X = planned event													

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development					PE NUMBER AND TITLE 0401119F C-5 Airlift Squadrons			PROJECT 674835		
(U) <u>A. Project Cost Breakdown (\$ in Thousands)</u>										
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>
(U)	System Engineering / Program Management					0		7,000		13,380
(U)	RERP Kit Design / Development					0		10,400		23,583
(U)	Prototype Fabrication / Install					0		0		7,670
(U)	Mission Support					0		1,366		2,996
(U)	Total					0		18,766		47,629
(U) <u>B. Budget Acquisition History and Planning Information (\$ in Thousands)</u>										
(U) <u>Performing Organizations:</u>										
	<u>Contractor or</u>	<u>Contract</u>								
	<u>Government</u>	<u>Method/Type</u>	<u>Award or</u>	<u>Performing</u>	<u>Project</u>					
	<u>Performing</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>
	<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>
	<u>Product Development Organizations</u>									
	WR-ALC									
	ASC/GRA (Pre-EMD)	FFP	Feb 2000	TBD	TBD	0	0	18,766	0	0
	ASC/GRA (EMD)	CPAF	Nov 2000	TBD	TBD	0	0	0	47,629	209,635
	<u>Support and Management Organizations</u>									
	<u>Test and Evaluation Organizations</u>									
	418 Test Squadrn (Edwards AFB) AFFTC									
(U) <u>Government Furnished Property:</u>										
		<u>Contract</u>								
		<u>Method/Type</u>	<u>Award or</u>							
	<u>Item</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Delivery</u>		<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>
	<u>Description</u>	<u>Vehicle</u>	<u>Date</u>	<u>Date</u>		<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>
	<u>Product Development Property</u>									
	N/A									

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0401119F C-5 Airlift Squadrons	PROJECT 674835
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(U) Government Furnished Property Continued:

Support and Management Property

N/A

Test and Evaluation Property

N/A

	<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	0	0	18,766	47,629	209,635	276,030
Subtotal Support and Management						
Subtotal Test and Evaluation						
Total Project	0	0	18,766	47,629	209,635	276,030

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

DATE
February 2000

BUDGET ACTIVITY		PE NUMBER AND TITLE							
07 - Operational System Development		0401130F C-17 Aircraft							
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	120,368	159,019	176,439	139,443	119,217	117,722	112,056	0	6,845,199
672569 C-17 Aircraft	120,368	159,019	131,141	109,992	107,720	109,898	112,056	0	6,751,129
674886 Large Aircraft Infrared Counter Measures (LAIRCM)	0	0	45,298	29,451	11,497	7,824	0	0	94,070
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

Airlift provides a major element of America's national security strategy and constitutes the most responsive means of meeting U.S. mobility requirements. The C-17 can perform the entire spectrum of airlift missions and is specifically designed to operate effectively and efficiently in both strategic and theater environments. The load options include troops and/or outsized/oversized/palletized cargo. The C-17 is designed to provide direct delivery of those cargo loads to austere airfields, as close as possible to the user's specified final destination. The C-17 will also use standard airfields and delivery modes. The C-17 is specifically designed to provide U.S. combat forces maximum flexibility in the selection of landing sites and support of ground forces after landing. Consequently the C-17 will land with up to 160,000 lbs payload on austere runways as small as 3,000 feet by 900 feet. The Large Aircraft Infrared Countermeasures System (LAIRCM) will provide transport and tanker aircraft an effective, active defense against shoulder-launched IR missiles.

(U) B. Budget Activity Justification

This program is budget activity 7, Operational System Development, because the program has completed Milestone III and is continuing producibility and performance improvements to support full-rate production and increase the operational capability of the C-17 through programmed modifications.

(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)	118,228	170,718	132,307	6,766,584
(U) Appropriated Value	119,069	170,718		
(U) Adjustments to Appropriated Value				
a. Congressional/General Reductions	-470	-9,809		
b. Small Business Innovative Research	-3,683			
c. Omnibus or Other Above Threshold Reprogram	9,480			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0401130F C-17 Aircraft
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(U) <u>C. Program Change Summary (\$ in Thousands) Continued</u>				
	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
d. Below Threshold Reprogram	-3,355			
e. Rescissions	-673	-1,017		
f. Other		-873		
(U) Adjustments to Budget Years Since FY 2000 PBR			44,132	78,615
(U) Current Budget Submit/FY 2001 PBR	120,368	159,019	176,439	6,845,199

(U) Significant Program Changes:
 A second project, 674886, has been added to the C-17 for the Large Aircraft Infrared Countermeasures (LAIRCM). Three aircraft have been moved from FY01 to FY03.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 2000	
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0401130F C-17 Aircraft				PROJECT 672569	
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
672569 C-17 Aircraft	120,368	159,019	131,141	109,992	107,720	109,898	112,056	0	6,751,129
<p>(U) <u>A. Mission Description</u> Airlift provides essential flexibility when responding to contingencies on short notice anywhere in the world. It is a major element of America's national security strategy and constitutes the most responsive means of meeting U.S. mobility requirements. Additional airlift capability is needed for rapid deployment of combat forces in support of national objectives. Specific tasks associated with the airlift mission include deployment, employment (airland and airdrop), sustaining support, retrograde, and combat redeployment. The C-17 can perform the entire spectrum of airlift missions and is specifically designed to operate effectively and efficiently in both strategic and theater environments. The C-17 provides a vast increase in overall airlift capability necessary to replace and exceed the capabilities lost from retiring the aging C-141 fleet from the Air Force inventory. Not only can the C-17 deliver outsize cargo to austere tactical environments, but it also reduces ground time during airland operations. The C-17 will perform the airlift mission well into this century. RDT&E efforts support productivity enhancements and product improvements, including correction of Operational Test & Evaluation (OT&E) deficiencies.</p>									
<p>(U) <u>FY 1999 (\$ in Thousands)</u></p>									
(U) \$65,461	Continue Performance Improvement Development & Testiing								
(U) \$27,330	Systems Engineering / Program Management								
(U) \$16,935	Contractor System Test & Evaluation								
(U) \$10,642	Producibility Enhancement / Performance Improvement (PE/PI) Government Flight Test								
(U) \$120,368	Total								
<p>(U) <u>FY 2000 (\$ in Thousands)</u></p>									
(U) \$105,669	Continue Performance Improvement Development & Testing								
(U) \$26,950	Systems Engineering / Program Management								
(U) \$16,400	Contractor System Test & Evaluation								
(U) \$10,000	Producibility Enhancement / Performance Improvement (PE/PI) Government Flight Test								
(U) \$159,019	Total								
Project 672569			Page 3 of 11 Pages				Exhibit R-2A (PE 0401130F)		

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)							DATE February 2000																																																												
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0401130F C-17 Aircraft			PROJECT 672569																																																												
<p>(U) <u>A. Mission Description Continued</u></p> <p>(U) <u>FY 2001 (\$ in Thousands)</u></p> <p>(U) \$74,441 Continue Performance Improvement Development & Testing</p> <p>(U) \$27,300 Systems Engineering / Program Management</p> <p>(U) \$19,400 Contractor System Test & Evaluation</p> <p>(U) \$10,000 Producibility Enhancement / Performance Improvement (PE/PI) Government Flight Test</p> <p>(U) \$131,141 Total</p> <p>(U) <u>B. Project Change Summary</u></p> <p>Funding: A second project, 674886, has been added to the C-17 for the Large Aircraft InfraRed Countermeasures (LAIRCM).</p> <p>(U) <u>C. Other Program Funding Summary (\$ in Thousands)</u></p> <table border="1" style="width:100%; border-collapse: collapse;"> <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) APAF, MYP, BA02, PE0401130F</td> <td align="right">2,873,045</td> <td align="right">3,354,888</td> <td align="right">2,890,655</td> <td align="right">3,253,498</td> <td align="right">2,406,997</td> <td align="right">1,485,765</td> <td align="right">2,234,336</td> <td></td> <td align="right">36,734,324</td> </tr> <tr> <td>(U) APAF, Initial Spares, BA06, PE0401130F</td> <td align="right">109,921</td> <td align="right">0</td> <td align="right">0</td> <td align="right">0</td> <td align="right">0</td> <td align="right">0</td> <td align="right">0</td> <td></td> <td align="right">842,938</td> </tr> <tr> <td>(U) APAF, A/C Mods, BA05, PE0401130F</td> <td align="right">51,250</td> <td align="right">95,040</td> <td align="right">97,124</td> <td align="right">150,901</td> <td align="right">175,957</td> <td align="right">231,194</td> <td align="right">254,331</td> <td></td> <td align="right">1,197,256</td> </tr> <tr> <td>(U) MilCon, Facilities, PE0401130F</td> <td align="right">70,956</td> <td align="right">26,100</td> <td align="right">13,700</td> <td align="right">0</td> <td align="right">0</td> <td align="right">0</td> <td align="right">0</td> <td></td> <td align="right">367,631</td> </tr> </tbody> </table> <p>(U) <u>D. Acquisition Strategy</u></p> <p>The C-17 Acquisition Strategy is based on five separate contracts to support the entire scope of the C-17 weapon system. These five contracts are: 1) a multi-year procurement (MYP) aircraft contract (to economically purchase the full complement of production aircraft) - (APAF); 2) a Producibility Enhancement and Performance Improvement (PE/PI) contract (to develop cost reduction changes, capability enhancements, and design fixes to service-revealed problems) - (RDT&E, AF); 3) a Flexible Sustainment (field support) contract (to support the current and future fielded aircraft) - (APAF); 4) a MYP engine contract (for Government Furnished Equipment [GFE] engines) - (APAF); and 5) a set of simulator and training contracts: two aircrew training systems (ATS) contracts (for aircrew simulators & training), and a maintenance training device contract (for devices & maintenance of same) - (APAF).</p> <p>The Congressionally-mandated Mobility Requirements Study (MRS), initially forwarded to Congress on 23 Jan 92 and updated on 28 Mar 95, validated the need for the</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) APAF, MYP, BA02, PE0401130F	2,873,045	3,354,888	2,890,655	3,253,498	2,406,997	1,485,765	2,234,336		36,734,324	(U) APAF, Initial Spares, BA06, PE0401130F	109,921	0	0	0	0	0	0		842,938	(U) APAF, A/C Mods, BA05, PE0401130F	51,250	95,040	97,124	150,901	175,957	231,194	254,331		1,197,256	(U) MilCon, Facilities, PE0401130F	70,956	26,100	13,700	0	0	0	0		367,631
	<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) APAF, MYP, BA02, PE0401130F	2,873,045	3,354,888	2,890,655	3,253,498	2,406,997	1,485,765	2,234,336		36,734,324																																																										
(U) APAF, Initial Spares, BA06, PE0401130F	109,921	0	0	0	0	0	0		842,938																																																										
(U) APAF, A/C Mods, BA05, PE0401130F	51,250	95,040	97,124	150,901	175,957	231,194	254,331		1,197,256																																																										
(U) MilCon, Facilities, PE0401130F	70,956	26,100	13,700	0	0	0	0		367,631																																																										
Project 672569		Page 4 of 11 Pages			Exhibit R-2A (PE 0401130F)																																																														

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0401130F C-17 Aircraft	PROJECT 672569
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(U) **D. Acquisition Strategy Continued**
 C-17 aircraft. Two C-17 Defense Acquisition Board (DAB) decisions, contained in the 3 Nov 95 and 1 Feb 96 USD(A&T) Acquisition Decision Memoranda (ADMs), directed the Air Force to proceed with a 120-aircraft production program and pursue a multi-year procurement for the last 80 aircraft. The FY96 Supplemental Appropriations Act and FY97 Defense Appropriations Act approved a 7-year MYP program. The Air Force is proceeding with an 80-aircraft MYP program (along with engines to support them) to complete a 120-aircraft total purchase at the maximum affordable rate (FY97-03 Quantity: 8-9-13-15-12-15-8), beginning with the economic order quantity (EOQ) funding in FY96. Fourteen additional C-17s have been programmed at the end of the 80-aircraft MYP (FY03 +1, FY04 +5, FY05 +8) to replace Air Mobility Command's (AMC's) C-141 Special Operations Low Level (SOLL) II aircraft and meet requirements not included in the 120 aircraft program. The adjusted program is: FY03, 9; FY04, 5; FY05, 8.

(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) Lot XI (13 aircraft)	*											
(U) Lot XII Adv Proc (15 aircraft)	*											
(U) Lot XII (15 aircraft)												
(U) Lot XIII Adv Proc (15 aircraft)						X						
(U) Lot XIII (12 aircraft)											X	
(U) Lot XIV Adv Proc (15 aircraft)											X	

* = completed event - contract obligation
 X = planned event - contract obligation

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0401130F C-17 Aircraft			PROJECT 672569			
(U) <u>A. Project Cost Breakdown (\$ in Thousands)</u>										
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>
(U)	Contractor Furnished Engineering & Test					109,213		146,399		120,421
(U)	Government Test & Other Government Costs (OGC)					11,155		12,620		10,720
(U)	Total					120,368		159,019		131,141
(U) <u>B. Budget Acquisition History and Planning Information (\$ in Thousands)</u>										
(U) <u>Performing Organizations:</u>										
<u>Contractor or</u>	<u>Contract</u>									
<u>Government</u>	<u>Method/Type</u>	<u>Award or</u>	<u>Performing</u>	<u>Project</u>						
<u>Performing</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Organizations</u>										
Boeing	C,FPI/FP	8/31/81	5,190,366	5,190,366	5,190,366	0			0	5,190,366
Boeing	C,CPFF	7/13/95	1,025,425	1,025,425	233,073	108,813	146,299	120,221	399,326	1,007,732
Pratt & Whitney	C,FP	5/24/91	25,346	25,346	25,346	0			0	25,346
Boeing	C,FPI	4/14/89	83,885	83,885	83,885	0			0	83,885
Pratt & Whitney	FP+EPA	4/18/95	8,306	8,306	7,506	400	100	200	100	8,306
<u>Support and Management Organizations</u>										
Mission Support OGC	PO				97,389	113	120	120	240	97,982
Site Activation OGC	PO				1,539	0			0	1,539
Miscellaneous					21,958	400	2,500	600	0	25,458
<u>Test and Evaluation Organizations</u>										
Combined Test Force	PO				226,591	10,642	10,000	10,000	40,000	297,233
Wright Labs/Arnold Eng	PO				10,252				0	10,252
Dev Center										
Other	PO				3,030				0	3,030

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0401130F C-17 Aircraft			PROJECT 672569		
(U) Government Furnished Property:									
	<u>Contract</u>	<u>Award or</u>							
<u>Item</u>	<u>Method/Type</u>	<u>Obligation</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>Description</u>	<u>or Funding</u>	<u>Date</u>	<u>Date</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Property</u>									
None									
<u>Support and Management Property</u>									
None									
<u>Test and Evaluation Property</u>									
None									
				<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				5,540,176	109,213	146,399	120,421	399,426	6,315,635
Subtotal Support and Management				120,886	513	2,620	720	240	124,979
Subtotal Test and Evaluation				239,873	10,642	10,000	10,000	40,000	310,515
Total Project				5,900,935	120,368	159,019	131,141	439,666	6,751,129

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)							DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0401130F C-17 Aircraft				PROJECT 674886	
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
674886 Large Aircraft Infrared Counter Measures (LAIRCM)	0	0	45,298	29,451	11,497	7,824	0	0	94,070
<p>(U) <u>A. Mission Description</u> The Large Aircraft Infrared Countermeasures System (LAIRCM) provides advanced defensive capability against Man-Portable Air Defense Systems (MANPADS) for large transport and tanker aircraft. LAIRCM is significantly more effective than the traditional employment of flares, and requires no operator intervention after it is turned on. LAIRCM consists of two advanced integrated missile warning systems and an active laser countermeasures system. There is a multi-service Operational Requirements Document (ORD) -- LAIRCM ORD 314-92, validated 3 Aug 98. Installation of this system will increase the survivability of strategic aircraft when operating in areas with MANPADS IR threats. Since this system will integrate subsystems, initial deployment should be achieved by FY03. RDT&E funds will be used for non-recurring engineering (NRE) and integration test and evaluation.</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u> (U) \$0 No Activity (U) \$0 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u> (U) \$0 No Activity (U) \$0 Total</p> <p>(U) <u>FY 2001 (\$ in Thousands)</u> (U) \$41,898 Award contract to begin aircraft integration for existing subsystems. (U) \$3,400 ProgramOffice Support (SPO TDY, training and supplies) (U) \$45,298 Total</p> <p>(U) <u>B. Project Change Summary</u> LAIRCM is a NEW START in FY01.</p>									
Project 674886			Page 8 of 11 Pages			Exhibit R-2A (PE 0401130F)			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0401130F C-17 Aircraft	PROJECT 674886
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(U) C. Other Program Funding Summary (\$ in Thousands)	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Cost to</u>	<u>Total Cost</u>
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	
(U) AF RDT&E									
(U) PE 401115, C-130 RDT&E	0	0	32,724	8,623	5,448	0	0	0	46,795
(U) Other APPN									
(U) PE 41130F, LAIRCM Procurement, BP 1100	0	0	0	33,100	51,200	48,600	6,200	7,000	146,100
(U) PE, 41115F, C-130 Procurement, BP1100	0	0	0	0	33,400	48,900	6,000	7,000	95,300

(U) **D. Acquisition Strategy**
The LAIRCM system for the first 12 C-17s will probably be a sole source to Boeing since aircraft is currently in production in order to facilitate initial deployment in FY03.

(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) Phase I - EMD											X	
(U) Phase II -First Installation: FY03/3												

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000				
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0401130F C-17 Aircraft			PROJECT 674886				
(U) <u>A. Project Cost Breakdown (\$ in Thousands)</u>											
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>	
(U)	Performance Development					0		0		41,898	
(U)	Systems Engineering/Program Management					0		0		3,400	
(U)	Total					0		0		45,298	
(U) <u>B. Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
(U) <u>Performing Organizations:</u>											
	<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>											
	Prime contractor: TBD	TBD	FY01/3			0	0	0	41,898	42,372	84,270
<u>Support and Management Organizations</u>											
	SPO		FY01/1			0	0	0	3,400	6,400	9,800
<u>Test and Evaluation Organizations</u>											
	TBD					0	0	0	0	0	0
(U) <u>Government Furnished Property:</u>											
	<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>											
	N/A										
<u>Support and Management Property</u>											
	N/A										
<u>Test and Evaluation Property</u>											
	N/A										

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)					DATE February 2000	
BUDGET ACTIVITY			PE NUMBER AND TITLE		PROJECT	
07 - Operational System Development			0401130F C-17 Aircraft		674886	
	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Subtotals</u>						
Subtotal Product Development	0	0	0	41,898	42,372	84,270
Subtotal Support and Management	0	0	0	3,400	6,400	9,800
Subtotal Test and Evaluation	0	0	0	0	0	0
Total Project	0	0	0	45,298	48,772	94,070

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0401214F Air Cargo Materiel Handling (463-L)				PROJECT 675150	
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
675150 Next Generation Small Loader (NGSL)	456	493	0	0	0	0	0	0	8,898
Quantity of RDT&E Articles	2	0	0	0	0	0	0	0	6
<p>(U) <u>A. Mission Description</u> This program element contains a project integral to the Air Force's ability to mobilize forces and equipment worldwide. It involves testing, developing and fielding the NGSL, which alleviates critical loader deficiencies and provides the Air Force with a state-of-the-art tactical loader capability for the future. The NGSL (25K pound capacity) program supports acquisition and delivery of a minimum requirement of 264 loaders that, with the Tunner (60K), will form the backbone of the Global Reach airlift 463-L (pallet) movement system. The NGSL replaces aging 25K loaders and complements the Tunner fleet by providing increased deployability and cargo handling capacity at smaller, but operationally vital peacetime and contingency airfields. More importantly, the NGSL has a high reach capability required for direct interface with Wide-Body Aircraft (WBA). This improved capability eliminates the current requirement for a fleet of wide-body elevator loader equipment used in conjunction with both the 40K and 25K loaders to service WBA. The NGSL, along with the Tunner, will eventually replace all of the 40K loaders and selected worn-out 25K loaders. Starting in FY97, the Air Force realigned Loader RDT&E funding from PE 0604704F, Common Support Equipment Development, into this dedicated program element, which also contains the procurement funding.</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u> (U) \$435 Engineering analysis for preproduction testing; GFE/GFP for preproduction testing; travel supporting preproduction testing (U) \$21 Acquire and test preproduction test articles (U) \$456 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u> (U) \$493 Engineering analysis for preproduction testing; GFE/GFP for preproduction testing; travel supporting preproduction testing (U) \$493 Total</p> <p>(U) <u>FY 2001 (\$ in Thousands)</u> (U) \$0 No Activity (U) \$0 Total</p>									
Project 675150			Page 1 of 4 Pages				Exhibit R-2 (PE 0401214F)		

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0401214F Air Cargo Materiel Handling (463-L)			PROJECT 675150		
(U) <u>B. Budget Activity Justification</u>									
Acquisition of the NGS� to support operational mobility aircraft requires no significant development effort; therefore, it is categorized as BA-7, operational system development.									
(U) <u>C. Program Change Summary (\$ in Thousands)</u>									
		<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			<u>Total Cost</u>		
(U)	Previous President's Budget (FY 2000 PBR)	482	502				7,439		
(U)	Appropriated Value	512	502						
(U)	Adjustments to Appropriated Value								
	a. Congressional/General Reductions	-30	-6						
	b. Small Business Innovative Research								
	c. Omnibus or Other Above Threshold Reprogram								
	d. Below Threshold Reprogram	-23							
	e. Rescissions	-3	-3						
	f. Other								
(U)	Adjustments to Budget Years Since FY 2000 PBR								
(U)	Current Budget Submit/FY 2001 PBR	456	493				8,898		
(U) <u>Significant Program Changes:</u>									
None									
(U) <u>D. Other Program Funding Summary (\$ in Thousands)</u>									
		<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>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)	AF RDT&E								
(U)	Other APPN								
(U)	Other Procurement, AF, BA-2, WSC 825150, Next Generation Small Loader, PE 0401214F	0	9,669	24,144	59,170	59,010	29,421	0	181,414

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0401214F Air Cargo Materiel Handling (463-L)	PROJECT 675150
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(U) **E. Acquisition Strategy**
 The NGSL (25K pound capacity) program supports acquisition and delivery of a minimum requirement of 264 loaders that, with the Tunner (60K), will form the backbone of the Global Reach airlift 463-L (pallet) movement system. Currently, the Air Force uses a 30-year-old 25K loader with an extremely low mean time between failure (approx. 10 hours). Additionally, the 25K loader lacks high reach capability and requires a separate wide body elevator loader (a fixed based high lift transfer platform) to off/on load KC-10 and Civil Reserve Air Fleet (CRAF) Wide-Body Aircraft (WBA). Upgrading the current loader fleet with the NGSL will correct the critical high-reach shortcomings of existing 25K loaders and will provide increased flexibility to ensure the Air Force meets its global mobility commitments. The NGSL program has selected two Non-Developmental Item (NDI) loader manufacturers to build three loaders each. Loaders will compete in a 'drive-off' competition, and the winner will be awarded a follow-on production contract (Firm Fixed Price).

(U) **F. 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) NGSL Program Transition to ASC												
(U) Test article contract award	*											
(U) Competitive drive-off (start)				*								
(U) LRIP Award								X				
(U) First Delivery										X		
(U) Full-Rate Production												X
*Denotes completed milestone												
X Denotes planned milestone												

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000			
BUDGET ACTIVITY			PE NUMBER AND TITLE				PROJECT			
07 - Operational System Development			0401214F Air Cargo Materiel Handling (463-L)				675150			
(U) A. Project Cost Breakdown (\$ in Thousands)										
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>
(U)	Acquire and test preproduction articles					21		0		0
(U)	Test monitoring, engineering tech. order development, SPO travel, equipment, program management support.					435		493		0
(U)	Total					456		493		0
(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>										
WR-ALC/LEA	FFP/PR	FY98/2			643				0	643
ASC/SMG	FFP/PR	FY99/1			6,578	21			0	6,599
ASC/SMG	FFP/PR	FY00/4			400	435	493		0	1,328
<u>Support and Management Organizations</u>										
Technical Support Contract					328				0	328
<u>Test and Evaluation Organizations</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>Subtotals</u>										
Subtotal Product Development					7,621	456	493		0	8,570
Subtotal Support and Management					328				0	328
Subtotal Test and Evaluation										
Total Project					7,949	456	493		0	8,898

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0401218F KC-135s				PROJECT 674494		
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
674494	KC-135 Aging Aircraft Program	1,018	2,242	487	484	490	499	510	Continuing	TBD
	Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0
<p>(U) <u>A. Mission Description</u> This program, in part, supports the aging aircraft corrosion and fatigue project CORAL REACH. CORAL REACH studies include the analysis and testing efforts in the area of aging aircraft, to include structural, corrosion, fatigue, and stress corrosion cracking. Additionally, the Functional System Integrity Program proactively examines individual aircraft systems for potential impacts due to aging components. The USAF will utilize these activities to improve KC-135 Programmed Depot Maintenance efficiency and to provide direction for future aging aircraft efforts to maintain the KC-135 as a viable airframe. CORAL REACH results provide accurate data for incorporation into the KC-135 Economic Life Study planned for FY00. The KC-135 Economic Life Study consists of studies for structure, systems, and component support as well as cost benefit analyses to support an Analysis of Alternatives (AOA). The AOA addresses replacement schedules for the KC-135 based on economic decision points.</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u> (U) \$270 Corrosion/crack growth rate and fatigue determination and testing (U) \$534 Functional Systems Integrity Program (FSIP) (U) \$214 Mission support/contractor support (U) \$1,018 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u> (U) \$100 Corrosion/crack growth rate and fatigue determination and testing (U) \$950 Functional Systems Integrity Program (FSIP) (U) \$192 Mission support/contractor support (U) \$1,000 Economic Service Life Study (U) \$2,242 Total</p>										
Project 674494			Page 1 of 5 Pages				Exhibit R-2 (PE 0401218F)			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 2000																																																																																																				
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT																																																																																																				
07 - Operational System Development	0401218F KC-135s	674494																																																																																																				
<p>(U) <u>A. Mission Description Continued</u></p> <p>(U) <u>FY 2001 (\$ in Thousands)</u></p> <p>(U) \$192 Corrosion/crack growth rate and fatigue determination and testing</p> <p>(U) \$50 Basic materials test and predictive technique</p> <p>(U) \$245 Mission support/contractor support</p> <p>(U) \$487 Total</p> <p>(U) <u>B. Budget Activity Justification</u></p> <p>This effort is a low technical risk effort supporting a fielded weapon system and, therefore, is assigned to Budget Activity 7, Operational Systems Development.</p> <p>(U) <u>C. Program Change Summary (\$ in Thousands)</u></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 55%;"></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: 15%; text-align: center;"><u>Total Cost</u></th> </tr> </thead> <tbody> <tr> <td>(U) Previous President's Budget (FY 2000 PBR)</td> <td style="text-align: center;">1,090</td> <td style="text-align: center;">2,268</td> <td style="text-align: center;">492</td> <td style="text-align: center;">TBD</td> </tr> <tr> <td>(U) Appropriated Value</td> <td style="text-align: center;">1,093</td> <td style="text-align: center;">2,268</td> <td></td> <td style="text-align: center;">TBD</td> </tr> <tr> <td>(U) Adjustments to Appropriated Value</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> a. Congressional/General Reductions</td> <td style="text-align: center;">-3</td> <td style="text-align: center;">-14</td> <td></td> <td style="text-align: center;">TBD</td> </tr> <tr> <td> b. Small Business Innovative Research</td> <td style="text-align: center;">-33</td> <td></td> <td></td> <td style="text-align: center;">TBD</td> </tr> <tr> <td> c. Omnibus or Other Above Threshold Reprogram</td> <td></td> <td style="text-align: center;">-12</td> <td></td> <td style="text-align: center;">TBD</td> </tr> <tr> <td> d. Below Threshold Reprogram</td> <td style="text-align: center;">-33</td> <td></td> <td></td> <td style="text-align: center;">TBD</td> </tr> <tr> <td> e. Rescissions</td> <td style="text-align: center;">-6</td> <td></td> <td></td> <td style="text-align: center;">TBD</td> </tr> <tr> <td> f. Other</td> <td></td> <td></td> <td></td> <td style="text-align: center;">TBD</td> </tr> <tr> <td>(U) Adjustments to Budget Years Since FY 2000 PBR</td> <td></td> <td></td> <td style="text-align: center;">-5</td> <td></td> </tr> <tr> <td>(U) Current Budget Submit/FY 2001 PBR</td> <td style="text-align: center;">1,018</td> <td style="text-align: center;">2,242</td> <td style="text-align: center;">487</td> <td style="text-align: center;">TBD</td> </tr> </tbody> </table> <p>(U) <u>Significant Program Changes:</u> N/A.</p> <p>(U) <u>D. 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%; 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) AF RDT&E</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Other APPN</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>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>	(U) Previous President's Budget (FY 2000 PBR)	1,090	2,268	492	TBD	(U) Appropriated Value	1,093	2,268		TBD	(U) Adjustments to Appropriated Value					a. Congressional/General Reductions	-3	-14		TBD	b. Small Business Innovative Research	-33			TBD	c. Omnibus or Other Above Threshold Reprogram		-12		TBD	d. Below Threshold Reprogram	-33			TBD	e. Rescissions	-6			TBD	f. Other				TBD	(U) Adjustments to Budget Years Since FY 2000 PBR			-5		(U) Current Budget Submit/FY 2001 PBR	1,018	2,242	487	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) AF RDT&E										(U) Other APPN									
	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>																																																																																																		
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Project 674494		Page 2 of 5 Pages	Exhibit R-2 (PE 0401218F)																																																																																																			

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0401218F KC-135s	PROJECT 674494
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(U) **E. Acquisition Strategy**

The acquisition strategy consists primarily of separate task orders (with separate statements of work) ranging from fixed price to cost plus contracts. These task orders address a myriad of aging aircraft activities against existing contract vehicles, such as the SPO-managed KC-135 Fleet Support Contract and Design Engineering Program contracts managed through the Air Logistics Centers.

(U) **F. 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) Corrosion & Fatigue Testing	*											
(U) Materials Test & Predictive Tech.	*											
(U) FSIP	*											
(U) Mission Support	*											
(U) Begin Economic Service Life Study												X
* - On-going activities												
X - Scheduled activities												

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development					PE NUMBER AND TITLE 0401218F KC-135s			PROJECT 674494			
(U) A. Project Cost Breakdown (\$ in Thousands)											
						<u>FY 1999</u>	<u>FY 2000</u>			<u>FY 2001</u>	
(U)	Corrosion/crack growth determination and testing					270	100			192	
(U)	Basic materials test and predictive technique					0	0			50	
(U)	Functional Systems Integrity Program (FSIP)					534	950			0	
(U)	Mission support/contractor support					214	192			245	
(U)	Economic service life study					0	1,000			0	
(U)	Total					1,018	2,242			487	
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)											
(U) Performing Organizations:											
	<u>Contractor or Government</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>										
	Boeing	C/KC-135 Fleet Support SS/FFP	Oct 97-Mar 01	TBD	TBD	2,022	766	2,056	250	Continuing	TBD
	<u>Support and Management Organizations</u>										
	ARINC, Frontier, other support contractors	Design Engineering Program (DEP) C/FP	Oct 97-Mar 01			148	109	86	237	Continuing	TBD
	<u>Test and Evaluation Organizations</u>										
	FAA, Wright Labs, etc.	Project Order/MPIR	Oct 97-Mar 01			100	143	100		Continuing	TBD

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)			DATE February 2000			
BUDGET ACTIVITY		PE NUMBER AND TITLE			PROJECT	
07 - Operational System Development		0401218F KC-135s			674494	
		<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		2,022	766	2,056	250	TBD
Subtotal Support and Management		148	109	86	237	TBD
Subtotal Test and Evaluation		100	143	100		TBD
Total Project		2,270	1,018	2,242	487	TBD

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0401219F KC-10S				PROJECT 674496		
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
674496	KC-10 GATM	9,447	23,331	19,526	0	0	0	0	0	52,304
	Quantity of RDT&E Articles	0	1	0	0	0	0	0	0	1
<p>(U) <u>A. Mission Description</u> Global Air Traffic Management (GATM) is based on evolving Communication, Navigation and Surveillance (CNS) and Free Flight concepts. Key elements of its architecture are Flight Management System (FMS), Dual Multi-Mode Receiver (MMR), Dual Communications Management Unit (CMU), Communications Datalinks (HF, VHF, SATCOM). Communications upgrades include a data link to augment/replace voice communications. The navigation capabilities include a fully integrated GPS and advanced flight management system. The surveillance capabilities include automatic aircraft position reporting (both enroute and oceanic).</p> <p>* NOTE: The FY99 Omnibus approved a \$13.5 million RDT&E requirement, removed \$13.5 million from KC-10 GATM Procurement, and transferred \$9.5 million to RDT&E. Congressional action transferred \$23.609 million in FY00 funds to RDT&E. FY01 funds were transferred from procurement to accurately reflect the nature of the work being accomplished.</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u> (U) \$3,780 System Engineering/Program Management (U) \$5,302 Kit Design/Development (U) \$365 Mission Support (U) \$9,447 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u> (U) \$4,287 System Engineering/Program Management (U) \$14,020 Kit Design/Development (U) \$2,833 Prototype Fabrication (U) \$2,191 Mission Support (U) \$23,331 Total</p>										
Project 674496			Page 1 of 5 Pages				Exhibit R-2 (PE 0401219F)			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 2000																																																																						
BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0401219F KC-10S	PROJECT 674496																																																																						
<p>(U) <u>A. Mission Description Continued</u></p> <p>(U) <u>FY 2001 (\$ in Thousands)</u></p> <table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:10%;">(U) \$196</td> <td style="width:90%;">System Engineering/Program Management</td> </tr> <tr> <td>(U) \$9,057</td> <td>Kit Design/Development</td> </tr> <tr> <td>(U) \$8,492</td> <td>Prototype Fabrication/Install</td> </tr> <tr> <td>(U) \$1,781</td> <td>Mission Support</td> </tr> <tr> <td>(U) \$19,526</td> <td>Total</td> </tr> </table> <p>(U) <u>B. Budget Activity Justification</u></p> <p>This effort is a low technical risk effort supporting a fielded weapon system and, therefore, is assigned to Budget Activity 7, Operational Systems Development.</p> <p>(U) <u>C. Program Change Summary (\$ in Thousands)</u></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:55%;"></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:15%; text-align: center;"><u>Total Cost</u></th> </tr> </thead> <tbody> <tr> <td>(U) Previous President's Budget (FY 2000 PBR)</td> <td align="center">0</td> <td align="center">0</td> <td align="center">0</td> <td align="center">0</td> </tr> <tr> <td>(U) Appropriated Value</td> <td align="center">0</td> <td></td> <td></td> <td align="center">0</td> </tr> <tr> <td>(U) Adjustments to Appropriated Value</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> a. Congressional/General Reductions</td> <td></td> <td align="right">-150</td> <td></td> <td align="right">-150</td> </tr> <tr> <td> b. Small Business Innovative Research</td> <td></td> <td align="right">-128</td> <td></td> <td align="right">-128</td> </tr> <tr> <td> c. Omnibus or Other Above Threshold Reprogram</td> <td align="right">9,500</td> <td></td> <td></td> <td align="right">9,500</td> </tr> <tr> <td> d. Below Threshold Reprogram</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> e. Rescissions</td> <td align="right">-53</td> <td></td> <td></td> <td align="right">-53</td> </tr> <tr> <td> f. Other</td> <td></td> <td align="right">23,609</td> <td></td> <td align="right">23,609</td> </tr> <tr> <td>(U) Adjustments to Budget Years Since FY 2000 PBR</td> <td></td> <td></td> <td align="right">19,526</td> <td align="right">19,526</td> </tr> <tr> <td>(U) Current Budget Submit/FY 2001 PBR</td> <td align="right">9,447</td> <td align="right">23,331</td> <td align="right">19,526</td> <td align="right">52,304</td> </tr> </tbody> </table> <p>(U) <u>Significant Program Changes:</u></p> <p>Funds were programmed under the 3010 appropriation in FY00 PB. Air Force determined that 3600 funds were appropriate for the NRE/Prototype of this modification. The FY99 Omnibus approved a \$13.5 million RDT&E requirement, removed \$13.5 million from KC-10 GATM Procurement, and transferred \$9.5 million to RDT&E. Congressional action transferred \$23.609 million in FY00 funds to RDT&E. FY01 funds were transferred from procurement to accurately reflect the nature of the work being accomplished.</p>			(U) \$196	System Engineering/Program Management	(U) \$9,057	Kit Design/Development	(U) \$8,492	Prototype Fabrication/Install	(U) \$1,781	Mission Support	(U) \$19,526	Total		<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>	(U) Previous President's Budget (FY 2000 PBR)	0	0	0	0	(U) Appropriated Value	0			0	(U) Adjustments to Appropriated Value					a. Congressional/General Reductions		-150		-150	b. Small Business Innovative Research		-128		-128	c. Omnibus or Other Above Threshold Reprogram	9,500			9,500	d. Below Threshold Reprogram					e. Rescissions	-53			-53	f. Other		23,609		23,609	(U) Adjustments to Budget Years Since FY 2000 PBR			19,526	19,526	(U) Current Budget Submit/FY 2001 PBR	9,447	23,331	19,526	52,304
(U) \$196	System Engineering/Program Management																																																																							
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(U) Previous President's Budget (FY 2000 PBR)	0	0	0	0																																																																				
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Project 674496	Page 2 of 5 Pages	Exhibit R-2 (PE 0401219F)																																																																						

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0401219F KC-10S	PROJECT 674496
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(U) **D. Other Program Funding Summary (\$ in Thousands)**

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Cost to</u>	<u>Total Cost</u>
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	
(U) AF RDT&E									
(U) Other APPN	595	0	36,367	31,334	19,667				87,963

PE#401219F / KC-10 Squadrons, Aircraft Procurement, AF, BA-5, KC-10 Mods, GATM, BP-11

(U) **E. Acquisition Strategy**
 The acquisition strategy is to issue a cost plus award fee contract to the Original Equipment Manufacturer (OEM) for this effort. The contract is managed at the OC-ALC.

(U) **F. 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) Acquisition Strategy Plan (FY99/1)	*											
(U) Contract Award						X						
(U) Prototype Installation Starts											X	
(U) First Flight												X
(U) Developmental Test Start												X
(U) Production Installation Start (FY03/1)												
(U) Production Installation Complete (FY04/1)												

* - On-going activities
 X - Scheduled activities

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 2000		
BUDGET ACTIVITY					PE NUMBER AND TITLE			PROJECT		
07 - Operational System Development					0401219F KC-10S			674496		
(U) A. Project Cost Breakdown (\$ in Thousands)										
						<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>		
(U)	System Engineering/Program Management					3,780	4,287	196		
(U)	Kit Design/Development					5,302	14,020	9,057		
(U)	Prototype Fabrication						2,833			
(U)	Prototype Fabrication/Install							8,492		
(U)	Mission Support					365	2,191	1,781		
(U)	Total					9,447	23,331	19,526		
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)										
(U) Performing Organizations:										
	<u>Contractor or</u>	<u>Contract</u>								
	<u>Government</u>	<u>Method/Type</u>	<u>Award or</u>	<u>Performing</u>	<u>Project</u>					
	<u>Performing</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>
	<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>
	Boeing	SS/CPAF	Sep 99-Mar	TBD	TBD	0	9,247	22,031	18,917	0
			01							50,195
	<u>Product Development Organizations</u>									
	<u>Support and Management Organizations</u>									
	EMC, Frontier, other support	C/FP	Sep 99-Mar				200	300	300	800
	contractors		01							
	AF Mission Support System	T&M	Mar 00					1,000		1,000
	(AFMSS)									
	<u>Test and Evaluation Organizations</u>									
	418 Test Squadrn	AFFTC	T&M	Jan 01					309	309
	(Edwards AFB)									

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0401219F KC-10S			PROJECT 674496		
(U) Government Furnished Property:									
	<u>Contract</u>								
	<u>Method/Type</u>	<u>Award or</u>							
<u>Item</u>	<u>or Funding</u>	<u>Obligation</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>Description</u>	<u>Vehicle</u>	<u>Date</u>	<u>Date</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Property</u>									
TBD									
<u>Support and Management Property</u>									
TBD									
<u>Test and Evaluation Property</u>									
TBD									
				<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>
				0	9,247	22,031	18,917	0	50,195
Subtotal Product Development									
Subtotal Support and Management					200	1,300	300		1,800
Subtotal Test and Evaluation							309		309
Total Project				0	9,447	23,331	19,526	0	52,304

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0404011F Special Operations Forces				PROJECT 674860	
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
674860 Special Operations Forces	0	0	1,109	300	0	0	0	0	1,409
Quantity of RDT&E Articles	0	0	2	0	0	0	0	0	0
<p>(U) <u>A. Mission Description</u> The aircrews require an enhanced capability to precisely locate and identify the modern day threats in order to meet mission requirements in a dense threat environment. Even without firing, threat systems can disrupt or negate operational missions by requiring aircrew reactions that affect mission objectives. Improved threat information from a modernized RWR will assist the aircrews in determining precise threat ranges/directions and provide option responses short of mission abort or violent aircraft maneuvering. Threat location refinements will help an enroute aircrew respond 'real-time' to previously unknown threats by providing sufficiently accurate information to allow the aircrews to reroute around hostile areas. This upgrade has been targeted for the AN/ALR-69 RWR system installed on all SOF aircraft. This upgrade effort will be designed/developed to provide improved situational awareness capability, improved reliability/maintainability, improved emitter ranging capability by factor of 100, improved angle accuracy, and increased ambiguity resolution by an order of magnitude. The present AN/ALR-69 RWR system is 1970's technology and has become increasingly difficult to maintain with the sustainment and capability issues.</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u> (U) \$0 No Activity (U) \$0 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u> (U) \$0 No Activity (U) \$0 Total</p> <p>(U) <u>FY 2001 (\$ in Thousands)</u> (U) \$700 Hardware/Software Design/Development (U) \$300 Systems Engineering Support (U) \$109 Program Office Support (U) \$1,109 Total</p>									
Project 674860			Page 1 of 5 Pages				Exhibit R-2 (PE 0404011F)		

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE February 2000																																																													
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0404011F Special Operations Forces			PROJECT 674860																																																													
<p>(U) <u>B. Budget Activity Justification</u> This program is a budget activity 7 - Operational System Development because it provides funding for the modernization of a currently existing and operating system. This is an FY01 new start.</p>																																																																				
<p>(U) <u>C. Program Change Summary (\$ in Thousands)</u></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:60%;"></th> <th style="text-align: right;"><u>FY 1999</u></th> <th style="text-align: right;"><u>FY 2000</u></th> <th style="text-align: right;"><u>FY 2001</u></th> <th style="text-align: right;"><u>Total Cost</u></th> </tr> </thead> <tbody> <tr> <td>(U) Previous President's Budget (FY 2000 PBR)</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: right;">1,110</td> <td style="text-align: right;">1,110</td> </tr> <tr> <td>(U) Appropriated Value</td> <td style="text-align: right;">0</td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Adjustments to Appropriated Value</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> a. Congressional/General Reductions</td> <td style="text-align: right;">0</td> <td></td> <td></td> <td></td> </tr> <tr> <td> b. Small Business Innovative Research</td> <td style="text-align: right;">0</td> <td></td> <td></td> <td></td> </tr> <tr> <td> c. Omnibus or Other Above Threshold Reprogram</td> <td style="text-align: right;">0</td> <td></td> <td></td> <td></td> </tr> <tr> <td> d. Below Threshold Reprogram</td> <td style="text-align: right;">0</td> <td></td> <td></td> <td></td> </tr> <tr> <td> e. Rescissions</td> <td style="text-align: right;">0</td> <td></td> <td></td> <td></td> </tr> <tr> <td> f. Other</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td></td> <td></td> </tr> <tr> <td>(U) Adjustments to Budget Years Since FY 2000 PBR</td> <td></td> <td></td> <td style="text-align: right;">-1</td> <td style="text-align: right;">-1</td> </tr> <tr> <td>(U) Current Budget Submit/FY 2001 PBR</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: right;">1,109</td> <td style="text-align: right;">1,109</td> </tr> </tbody> </table> <p>(U) <u>Significant Program Changes:</u> No changes, first submittal. This is an FY01 new start.</p>										<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>	(U) Previous President's Budget (FY 2000 PBR)	0	0	1,110	1,110	(U) Appropriated Value	0				(U) Adjustments to Appropriated Value					a. Congressional/General Reductions	0				b. Small Business Innovative Research	0				c. Omnibus or Other Above Threshold Reprogram	0				d. Below Threshold Reprogram	0				e. Rescissions	0				f. Other	0	0			(U) Adjustments to Budget Years Since FY 2000 PBR			-1	-1	(U) Current Budget Submit/FY 2001 PBR	0	0	1,109	1,109
	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>																																																																
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(U) Current Budget Submit/FY 2001 PBR	0	0	1,109	1,109																																																																
<p>(U) <u>D. Other Program Funding Summary (\$ in Thousands)</u></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:15%;"></th> <th style="text-align: right;"><u>FY 1999</u></th> <th style="text-align: right;"><u>FY 2000</u></th> <th style="text-align: right;"><u>FY 2001</u></th> <th style="text-align: right;"><u>FY 2002</u></th> <th style="text-align: right;"><u>FY 2003</u></th> <th style="text-align: right;"><u>FY 2004</u></th> <th style="text-align: right;"><u>FY 2005</u></th> <th style="text-align: right;"><u>Cost to</u></th> <th style="text-align: right;"><u>Total Cost</u></th> </tr> <tr> <td></td> <th style="text-align: right;"><u>Actual</u></th> <th style="text-align: right;"><u>Estimate</u></th> <th style="text-align: right;"><u>Complete</u></th> <td></td> </tr> </thead> <tbody> <tr> <td>(U) AF RDT&E</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Other Procurement (3010)</td> <td></td> <td></td> <td></td> <td style="text-align: right;">1,516</td> <td style="text-align: right;">11,849</td> <td style="text-align: right;">10,921</td> <td style="text-align: right;">11,002</td> <td style="text-align: right;">Continuing</td> <td style="text-align: right;">TBD</td> </tr> <tr> <td>(U) Other APPN</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>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Cost to</u>	<u>Total Cost</u>		<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>		(U) AF RDT&E										(U) Other Procurement (3010)				1,516	11,849	10,921	11,002	Continuing	TBD	(U) Other APPN																			
	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Cost to</u>	<u>Total Cost</u>																																																											
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>																																																												
(U) AF RDT&E																																																																				
(U) Other Procurement (3010)				1,516	11,849	10,921	11,002	Continuing	TBD																																																											
(U) Other APPN																																																																				
<p>(U) <u>E. Acquisition Strategy</u> An acquisition to design/develop, test, and integrate hardware/software that will provide earth coordinate location and detailed identification of lethal threat radars using the present AN/ALR-69 RWR as the baseline. Acquisition will be accomplished through full and open competitive procedures using source selection processes for award of contract. Contract award is projected for Nov 00.</p>																																																																				
Project 674860			Page 2 of 5 Pages			Exhibit R-2 (PE 0404011F)																																																														

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0404011F Special Operations Forces	PROJECT 674860
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(U) **F. 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) Contract award									X			
(U) Software Development complete												X
(U) Hardware Development complete												X
(U) Testing Begins												X

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development					PE NUMBER AND TITLE 0404011F Special Operations Forces				PROJECT 674860	
(U) A. Project Cost Breakdown (\$ in Thousands)										
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>
(U)	Software/Hardware Design/Development									700
(U)	Program Office Support									109
(U)	System Engineering Support									300
(U)	Total									1,109
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)										
(U) Performing Organizations:										
	<u>Contractor or</u>	<u>Contract</u>								
	<u>Government</u>	<u>Method/Type</u>	<u>Award or</u>	<u>Performing</u>	<u>Project</u>					
	<u>Performing</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>
	<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>
	<u>Product Development Organizations</u>									
	WR-ALC/LNRC	TBD	TBD	TBD	TBD	0	0	0	700	300
	WR-ALC/LNRC	TBD	Nov 00	TBD	TBD	0	0	0	300	0
	<u>Support and Management Organizations</u>									
	TBD	Various	Jun 01	N/A	N/A	0	0	0	109	0
	<u>Test and Evaluation Organizations</u>									
	TBD					0	0	0	0	0
(U) Government Furnished Property:										
		<u>Contract</u>								
		<u>Method/Type</u>	<u>Award or</u>							
	<u>Item</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Delivery</u>		<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>
	<u>Description</u>	<u>Vehicle</u>	<u>Date</u>	<u>Date</u>		<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>
	<u>Product Development Property</u>									
	NONE									
	<u>Support and Management Property</u>									
	NONE									
Project 674860					Page 4 of 5 Pages			Exhibit R-3 (PE 0404011F)		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0404011F Special Operations Forces	PROJECT 674860
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(U) Government Furnished Property Continued:
Test and Evaluation Property
 NONE

	<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	0	0	0	1,000	300	1,300
Subtotal Support and Management	0	0	0	109	0	109
Subtotal Test and Evaluation	0	0	0	0	0	0
Total Project	0	0	0	1,109	300	1,409

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0702207F Depot Maintenance (Non-IF)				PROJECT 673326		
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
673326	Precision Measurement & Calibration	1,438	4,744	1,515	1,533	1,558	1,587	1,613	Continuing	TBD
Quantity of RDT&E Articles		0	0	0	0	0	0	0	0	0
<p>(U) <u>A. Mission Description</u> This program develops, tests, and evaluates national and Air Force measurement standards (hardware) and calibration equipment in support of all Air Force programs and activities, including 113 Precision Measurement Equipment Laboratories (PMELs) worldwide. Metrology research and development provides technology to support systems in all phases of development and acquisition, as well as Air Force R&D laboratories, test ranges, ground test facilities, and operational weapons systems support. Rapidly changing technology requires continuing research and development of measurement standards and calibration equipment to ensure modern weapon systems meet Air Force readiness objectives. This program addresses all metrology disciplines and includes the technology areas of laser, infrared, microwave, millimeter wave, optical, physical, mechanical, electrical, electronic, and ionizing radiation measurements. Metrology is a technical discipline devoted to the science of measurements and to the study and improvement of measurement technology. Measurements are the foundation of military system development, quality assurance, hardware conformance testing and system readiness tests. The integrity of these tests is assured through calibration and traceability assurance schemes. The capability to measure and calibrate must parallel the emergence of new technology, new ranges, and new capabilities of military systems. Lack of new measurement capability impedes or blocks the successful exploitation of new technologies, especially in the movement from development laboratory to production to deployment. R&D efforts are essential within the DoD to pace these requirements, otherwise, these same new systems will suffer time delays, excessive cost, and increased risk due to unreliable test results in all phases of development, production, deployment and operation.</p>										
<p>(U) <u>FY 1999 (\$ in Thousands)</u></p>										
(U)	\$680	Completed the development of an enhanced electrical substitution radiometer, tunable lasers for radiometry and detector standards for long wavelength infrared measurements; began the tunable diode fiber laser for optic metrology and radiance response with uniform sources projects; and continued development of other national measurements standards to support Air Force infrared / laser/electro-optical weapon system and support equipment.								
(U)	\$175	Completed noise figure measurement project and continued development of standards for radar support, RF communications systems, and radar cross-section range measurements.								
(U)	\$195	Completed development of methods to characterize micro-electromechanical sensors (MEMS), began development of methods to characterize bench top wind tunnels, and continued development of improved calibration support for coordinate measuring machines (CMMs).								
(U)	\$313	Completed the fast electrical pulse project, began development of improved thin film multi junction thermal converters and continued development of standards for electrical measurements to support high accuracy electronic test equipment.								
Project 673326			Page 1 of 5 Pages				Exhibit R-2 (PE 0702207F)			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE
BUDGET ACTIVITY		PROJECT
07 - Operational System Development	0702207F Depot Maintenance (Non-IF)	February 2000 673326
(U) <u>A. Mission Description Continued</u>		
(U) <u>FY 1999 (\$ in Thousands) Continued</u>		
(U) \$75	Completed the beta measurement traceability project, continued the large area alpha radiation source metrology project and the development of national standards for calibration of ionizing radiation hazard instrumentation.	
(U) \$1,438	Total	
(U) <u>FY 2000 (\$ in Thousands)</u>		
(U) \$1,735	Complete the development of an improved blackbody calibrator and the tunable diode lasers for fiber optic metrology projects; begin projects to develop a target simulator radiometer, an improved avalanche photo diode and a domain engineered pyroelectric detector; and continue development of national measurement standards to support Air Force infrared / laser / electro-optical weapon systems and support equipment.	
(U) \$1,024	Complete the development of the microwave high power system; begin projects to develop a full scale co-conical field generation system and a direct comparison power calibration system for 2.4mm, 2.92mm and 3.5mm connectors; and continue development of standards for radar support, RF communications systems, and radar cross-section range measurements.	
(U) \$760	Complete methods to characterize bench top wind tunnels, and continue the development of improved calibration support for coordinate measuring machines (CMMs) and standards to support physical, mechanical and electro-mechanical support equipment.	
(U) \$455	Complete the next generation sampling comparator probe project; begin to develop methods to characterize enhanced wide band oscilloscopes and precision wide band measurement systems; and continue development of standards for electrical measurements to support high accuracy electronic test equipment.	
(U) \$135	Complete the large area alpha radiation source metrology project, begin the low level dosimetry traceability project and continue the development of national standards for calibration of ionizing radiation hazard instrumentation.	
(U) \$635	Begin to develop methods to automate metrology processes.	
(U) \$4,744	Total	
(U) <u>FY 2001 (\$ in Thousands)</u>		
(U) \$680	Continue development of national measurement standards to support Air Force infrared / laser / electro-optical weapon systems and support equipment.	
(U) \$260	Begin to develop WG 50-110 wave guide standards and continue development of standards for radar support, RF communications systems, and radar cross-section range measurements.	
(U) \$130	Complete development of improved calibration support for coordinate measuring machines (CMMs), and continue development of standards to support physical, mechanical and electro-mechanical support equipment.	
(U) \$350	Complete the Hall effect resistance standard project, the frequency response characteristics of capacitors projects and the improved thin film	
Project 673326	Page 2 of 5 Pages	Exhibit R-2 (PE 0702207F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 2000																																																												
BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0702207F Depot Maintenance (Non-IF)	PROJECT 673326																																																												
<p>(U) <u>A. Mission Description Continued</u></p> <p>(U) <u>FY 2001 (\$ in Thousands) Continued</u></p> <p style="padding-left: 40px;">multi junction thermoconverter project; and continue development of standards for electrical measurements to support high accuracy electronic test equipment.</p> <p>(U) \$95 Complete the large area beta source project and continue the development of national standards for calibration of ionizing radiation hazard instrumentation.</p> <p>(U) \$1,515 Total</p> <p>(U) <u>B. Budget Activity Justification</u></p> <p style="padding-left: 40px;">This program is in budget activity 7 - Operational System Development because it supports operational systems.</p> <p>(U) <u>C. Program Change Summary (\$ in Thousands)</u></p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 55%;"></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: 15%; text-align: center;"><u>Total Cost</u></th> </tr> </thead> <tbody> <tr> <td>(U) Previous President's Budget (FY 2000 PBR)</td> <td style="text-align: center;">1,496</td> <td style="text-align: center;">1,500</td> <td style="text-align: center;">1,529</td> <td style="text-align: center;">TBD</td> </tr> <tr> <td>(U) Appropriated Value</td> <td style="text-align: center;">1,500</td> <td style="text-align: center;">4,800</td> <td></td> <td></td> </tr> <tr> <td>(U) Adjustments to Appropriated Value</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">a. Congressional/General Reductions</td> <td style="text-align: center;">-4</td> <td></td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">b. Small Business Innovative Research</td> <td style="text-align: center;">-50</td> <td></td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">c. Omnibus or Other Above Threshold Reprogram</td> <td></td> <td style="text-align: center;">-26</td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">d. Below Threshold Reprogram</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">e. Rescissions</td> <td style="text-align: center;">-8</td> <td style="text-align: center;">-30</td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">f. Other</td> <td></td> <td></td> <td></td> <td style="text-align: center;">TBD</td> </tr> <tr> <td>(U) Adjustments to Budget Years Since FY 2000 PBR</td> <td></td> <td></td> <td style="text-align: center;">-14</td> <td></td> </tr> <tr> <td>(U) Current Budget Submit/FY 2001 PBR</td> <td style="text-align: center;">1,438</td> <td style="text-align: center;">4,744</td> <td style="text-align: center;">1,515</td> <td style="text-align: center;">TBD</td> </tr> </tbody> </table> <p>(U) <u>Significant Program Changes:</u></p> <p style="padding-left: 40px;">The additional funding in FY00 is to expedite the completion of several metrology projects such as to: develop the microwave high power system; develop a full scale co-conical field generation capability; improve blackbody calibration; develop target simulator radiometer; develop direct comparison power calibration system; and develop methods to characterize bench top wind tunnels. It will also be used to address requirements in areas such as automated metrology that could not be funded at previous levels.</p>				<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>	(U) Previous President's Budget (FY 2000 PBR)	1,496	1,500	1,529	TBD	(U) Appropriated Value	1,500	4,800			(U) Adjustments to Appropriated Value					a. Congressional/General Reductions	-4				b. Small Business Innovative Research	-50				c. Omnibus or Other Above Threshold Reprogram		-26			d. Below Threshold Reprogram					e. Rescissions	-8	-30			f. Other				TBD	(U) Adjustments to Budget Years Since FY 2000 PBR			-14		(U) Current Budget Submit/FY 2001 PBR	1,438	4,744	1,515	TBD
	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>																																																										
(U) Previous President's Budget (FY 2000 PBR)	1,496	1,500	1,529	TBD																																																										
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(U) Current Budget Submit/FY 2001 PBR	1,438	4,744	1,515	TBD																																																										
Project 673326	Page 3 of 5 Pages	Exhibit R-2 (PE 0702207F)																																																												

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0702207F Depot Maintenance (Non-IF)	PROJECT 673326
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(U) **D. Other Program Funding Summary (\$ in Thousands)**

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Cost to</u>	<u>Total Cost</u>
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	

- (U) AF RDT&E
- (U) Other APPN

(U) **E. Acquisition Strategy**
 Primarily accomplish through intergovernmental transfer between the Department of Defense and other Federal Departments. Secondly, accomplish through various funding vehicles.

(U) **F. 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) N/A

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development					PE NUMBER AND TITLE 0702207F Depot Maintenance (Non-IF)			PROJECT 673326		
(U) <u>A. Project Cost Breakdown (\$ in Thousands)</u>										
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>
(U)	Quality Assurance (Develop Measurement Standards & Calibration Support)					1,410		4,715		1,485
(U)	Travel					28		29		30
(U)	Total					1,438		4,744		1,515
(U) <u>B. Budget Acquisition History and Planning Information (\$ in Thousands)</u>										
(U) <u>Performing Organizations:</u>										
<u>Contractor or</u>	<u>Contract</u>									
<u>Government</u>	<u>Method/Type</u>	<u>Award or</u>	<u>Performing</u>	<u>Project</u>						
<u>Performing</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Organizations</u>										
National Institute of	MIPR (DD	Varies	TBD	TBD	13,629	1,351	3,820	1,485	Continuing	TBD
Standards & Technology	FORM 448)									
Department of Energy	MIPR (DD	Varies	TBD	TBD		59	260		Continuing	TBD
	FORM 448)									
Technical Support Contracts	Various	Varies	TBD	TBD			635		Continuing	TBD
AFMC	In House	Varies	TBD	TBD	145	28	29	30	Continuing	TBD
<u>Support and Management Organizations</u>										
<u>Test and Evaluation Organizations</u>										
					<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>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					13,774	1,438	4,744	1,515	TBD	TBD
Subtotal Support and Management										
Subtotal Test and Evaluation										
Total Project					13,774	1,438	4,744	1,515	TBD	TBD

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 2000	
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0708011F Industrial Preparedness				PROJECT 672865	
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
672865 Manufacturing Technology	50,597	51,988	53,082	53,600	54,193	55,369	56,279	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0
<p>(U) <u>A. Mission Description</u> The Manufacturing Technology (ManTech) program is a corporate Air Force program that establishes and demonstrates advancements in manufacturing process technologies, manufacturing engineering systems, and industrial practices, and transitions these advancements into weapon systems design, development, acquisition, and/or sustainment. ManTech provides cost reduction processes and practices and new manufacturing capabilities applicable to existing as well as new weapon systems under development. ManTech strives to make superior mission enabling technologies an affordable life cycle reality by expanding access to a capable, responsible, multi-use industrial base with efficiencies comparable to world class enterprises. Program efforts accelerate shop floor manufacturing process maturation, at every stage of development, through increased emphasis on cost, time, and quality risks in transition. Best processes are evaluated and adapted for application. Where mature processes are not available, laboratory-developed initial process capabilities are matured and inserted into weapon system programs. ManTech goes beyond just factory floor manufacturing/repair processes and encompasses every activity within an industrial enterprise, ranging from above the shop floor activities, including tools for integrated product process development (IPPD), to supplier base interactions and performance. The strategies and best practices of world-class enterprises are analyzed and the performance of defense suppliers benchmarked. The world's best industrial practices are adapted and validated in multiple pilot projects and deployed in defense applications. Project efforts address and target all industry levels, from large prime contractors to small material and parts vendors. Program efforts also enhance repair/remanufacture capabilities to affordably sustain the aging weapon systems inventory, thereby reducing total ownership costs.</p>									
<p>(U) <u>FY 1999 (\$ in Thousands)</u></p>									
(U) \$28,525	Established and demonstrated cost-effective and efficient manufacturing technologies for critical, high quality, reliable structural, propulsion, and electronic components and assemblies required for existing and next generation aircraft. Conducted pilot efforts in high-payoff endeavors aimed at validating potential benefits from flexible manufacturing, commercial/military integration, quality processing, and supplier improvements. Conducted long-term projects focused on IPPD tools.								
(U) \$16,107	Established and demonstrated cost-effective repair and manufacturing technologies to affordably sustain existing weapon systems and to enhance mission readiness. Reduced repair and maintenance cycle time for aging systems and established remanufacturing capabilities able to rapidly generate standardized replacement parts on demand.								
(U) \$1,445	Established and demonstrated efficient and cost-effective manufacturing methods for high performance, high reliability electronics, lightweight structures, and efficient propulsion methods for advanced tactical missiles. Established manufacturing improvements required to transition precision-guided munitions subsystems into production. Conducted pilot efforts in high-payoff endeavors aimed at validating potential benefits								
Project 672865	Page 1 of 6 Pages						Exhibit R-2 (PE 0708011F)		

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE
BUDGET ACTIVITY		PROJECT
07 - Operational System Development	0708011F Industrial Preparedness	February 2000 672865
(U) <u>A. Mission Description Continued</u>		
(U) <u>FY 1999 (\$ in Thousands) Continued</u>		
	accrued from inserting best practices in production of weapon systems.	
(U) \$4,520	Established and demonstrated affordable, flexible manufacturing processes to reduce the cost and lead time of higher performance spacecraft and launch vehicles. Established effective and efficient manufacturing technology for critical high quality, reliable electronic components and assemblies required for surveillance, tracking communications links, and data/signal processing. Conducted pilot efforts in high-payoff endeavors aimed at providing efficient, low-cost capability to produce components and weapon systems in the space, launch, and Command, Control, Communications, and Intelligence (C3I) industrial base sectors.	
(U) \$50,597	Total	
(U) <u>FY 2000 (\$ in Thousands)</u>		
(U) \$20,225	Establish and demonstrate cost-effective and efficient manufacturing technologies for critical, high quality, reliable structural, propulsion, and electronic components and assemblies required for existing and next generation aircraft. Conduct pilot efforts in high-payoff endeavors aimed at validating potential benefits accrued from flexible manufacturing, commercial/military integration, quality processing, and supplier improvements. Conduct long-term projects focused on integrated product process development (IPPD) tools. Efforts include Phase II of the Forging Supplier Initiative and continuance of the Composites Affordability Initiative, aimed at providing 50% cost reduction in fighter aircraft structures.	
(U) \$22,799	Establish and demonstrate cost-effective repair and manufacturing technologies for affordable sustainment of existing weapon systems and to enhance mission readiness. Reduce repair and maintenance cycle time for aging systems and establish remanufacturing capabilities which will rapidly generate standardized replacement parts on demand. Establish process improvements for repair/remanufacture of large area structures on legacy aircraft.	
(U) \$1,515	Establish and demonstrate efficient and cost-effective manufacturing methods for high performance, high reliability electronics, lightweight structures, and efficient propulsion methods for advanced tactical missiles. Establish manufacturing improvements required to transition precision-guided munition subsystems into production. Conduct pilot efforts in high-payoff endeavors aimed at validating potential benefits accrued from inserting best practices in the production of weapon systems.	
(U) \$6,949	Establish and demonstrate affordable, flexible manufacturing processes to reduce the cost and lead time of higher performance spacecraft and launch vehicles. Establish effective and efficient manufacturing technology for critical high quality, reliable electronic component and assemblies required for surveillance, tracking communications links, and data/signal processing. Conduct pilot efforts in high-payoff endeavors aimed at providing efficient, low-cost capability to produce components and weapon systems in the space, launch, and Command, Control, Communications, and Intelligence (C3I) industrial base sectors. Initiate effort to rapidly respond to space sector manufacturing issues.	
(U) \$500	Start and complete nickel metal-hydride replacement battery effort.	
Project 672865	Page 2 of 6 Pages	Exhibit R-2 (PE 0708011F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE
BUDGET ACTIVITY 07 - Operational System Development		PE NUMBER AND TITLE 0708011F Industrial Preparedness
		PROJECT 672865
(U)	<u>A. Mission Description Continued</u>	
(U)	<u>FY 2000 (\$ in Thousands) Continued</u>	
(U)	\$51,988	Total
(U)	<u>FY 2001 (\$ in Thousands)</u>	
(U)	\$19,402	Establish and demonstrate cost-effective and efficient manufacturing technologies for critical, high quality, reliable structural, propulsion, and electronic components and assemblies required for existing and next generation aircraft. Conduct pilot efforts in high-payoff endeavors aimed at validating potential benefits accrued from flexible manufacturing, commercial/military integration, quality processing, and supplier improvements. Conduct long-term projects focused on integrated product process development (IPPD) tools. Initiate effort to catalog and implement lean concepts. Start activity focused on modeling and simulation techniques for manufacturing enterprises.
(U)	\$21,855	Establish and demonstrate cost-effective repair and manufacturing technologies for affordable sustainment of existing weapon systems and to enhance mission readiness. Reduce repair and maintenance cycle time for aging systems and establish remanufacturing capabilities which will rapidly generate standardized replacement parts on demand. Initiate effort to address technologies for turbine engine life extension.
(U)	\$1,315	Establish and demonstrate efficient and cost-effective manufacturing methods for high performance, high reliability electronics, lightweight structures, and efficient propulsion methods for advanced tactical missiles. Establish manufacturing improvements required to transition precision guided munition subsystems into production. Conduct pilot efforts in high-payoff endeavors aimed at validating potential benefits accrued from inserting best practices in the production of weapon systems. Initiate project to establish affordable manufacturing processes for microelectronic machined structures (MEMS) applied to inertial measurement units.
(U)	\$10,510	Establish and demonstrate affordable, flexible manufacturing processes to reduce the cost and lead time of higher performance spacecraft and launch vehicles. Establish effective and efficient manufacturing technology for critical high quality, reliable electronic component and assemblies required for surveillance, tracking communications links, and data/signal processing. Conduct pilot efforts in high-payoff endeavors aimed at providing efficient, low-cost capability to produce components and weapon systems in the space, launch, and Command, Control, Communications, and Intelligence (C3I) industrial base sectors. Continue efforts to rapidly respond to space sector manufacturing issues.
(U)	\$53,082	Total
(U)	<u>B. Budget Activity Justification</u>	
	This program is in Budget Activity 7, Operational System Development, because it provides support to systems in production and/or operational use.	
Project 672865		Exhibit R-2 (PE 0708011F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)										DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development					PE NUMBER AND TITLE 0708011F Industrial Preparedness					PROJECT 672865			
(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)				52,351		51,814		53,480				
(U)	Appropriated Value				52,997		52,314						
(U)	Adjustments to Appropriated Value												
	a. Congressional/General Reductions				-646		-40						
	b. Small Business Innovative Research				-1,396								
	c. Omnibus or Other Above Threshold Reprogram						-286						
	d. Below Threshold Reprogram				-70								
	e. Rescissions				-288								
	f. Other											TBD	
(U)	Adjustments to Budget Years Since FY 2000 PBR								-398				
(U)	Current Budget Submit/FY 2001 PBR				50,597		51,988		53,082			TBD	
(U)	<u>Significant Program Changes:</u> Not Applicable.												
(U) D. Other Program Funding Summary (\$ in Thousands)													
		<u>FY 1999</u>	<u>FY 2000</u>		<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>		<u>Cost to</u>	<u>Total Cost</u>	
		<u>Actual</u>	<u>Estimate</u>		<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>		<u>Complete</u>		
(U)	AF RDT&E												
(U)	Other APPN Not Applicable.												
(U) E. Acquisition Strategy All major contracts in this Program Element were awarded after full and open competition.													
(U) F. Schedule Profile													
					<u>FY 1999</u>			<u>FY 2000</u>			<u>FY 2001</u>		
					1	2	3	4	1	2	3	4	
(U)	Not Applicable.												

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development					PE NUMBER AND TITLE 0708011F Industrial Preparedness			PROJECT 672865		
(U) A. Project Cost Breakdown (\$ in Thousands)										
						<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>		
(U)	Manufacturing technologies for aircraft components					28,525	20,225	19,402		
(U)	Repair/remanufacture technologies for weapon system sustainment					16,107	22,799	21,855		
(U)	Manufacturing methods for missile and munition assemblies					1,445	1,515	1,315		
(U)	Manufacturing processes to reduce spacecraft and launch vehicle costs					4,520	6,949	10,510		
(U)	Nickel Metal-Hydride Replacement Battery effort					0	500	0		
(U)	Total					50,597	51,988	53,082		
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)										
(U) Performing Organizations:										
<u>Contractor or</u>	<u>Contract</u>									
<u>Government</u>	<u>Method/Type</u>	<u>Award or</u>	<u>Performing</u>	<u>Project</u>						
<u>Performing</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Organizations</u>										
Numerous	Various	Various	N/A	N/A		28,280	26,353	23,837	Continuing	TBD
Howmet	Cost Share	Jul 95	N/A	N/A	11,250	4,000	3,000	3,500	500	22,250
Ontek	CPFF	Jan 95	N/A	N/A	5,448	1,452	0	0	0	6,900
Composites Affordability Initiative (Consortium)	CA	Aug 97	N/A	N/A	13,055	5,890	4,070	3,300	0	26,315
Sustainment Initiative	Various	Various	N/A	N/A	0	2,430	5,120	6,820	13,939	28,309
Engine Forging Initiative	Various	May 99	N/A	N/A	0	1,200	2,300	3,000	2,500	9,000
Parts Obsolescence Initiative	Various	Various	N/A	N/A	0	3,120	4,995	5,375	6,107	19,597
Small/Medium Supplier Initiative	Various	Various	N/A	N/A	0	300	1,800	2,000	5,527	9,627
ManTech for Affordable Spacecraft	Various	Various	N/A	N/A	0	1,875	2,350	3,650	4,265	12,140
Laser Shock Peening, Inc	CS	Aug 98	N/A	N/A	350	1,350	1,750	1,600	0	5,050
Coherent Technology, Inc	CS	Jun 97	N/A	N/A	1,400	700	250	0	0	2,350

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)					DATE February 2000	
BUDGET ACTIVITY			PE NUMBER AND TITLE		PROJECT	
07 - Operational System Development			0708011F Industrial Preparedness		672865	
(U) <u>Performing Organizations Continued:</u>						
<u>Support and Management Organizations</u>						
In house support						
<u>Test and Evaluation Organizations</u>						
		<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>
		<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>
						<u>Total</u>
<u>Subtotals</u>						<u>Program</u>
Subtotal Product Development		31,503	50,597	51,988	53,082	TBD
Subtotal Support and Management						
Subtotal Test and Evaluation						
Total Project		31,503	50,597	51,988	53,082	TBD

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0708026F Productivity, Reliability, Availability, Maintainability Program				PROJECT 672146		
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
672146	PRAM	10,040	22,075	15,227	20,741	24,137	27,536	30,929	Continuing	TBD
Quantity of RDT&E Articles		0	0	0	0	0	0	0	0	0
<p>(U) <u>A. Mission Description</u> Productivity/Reliability/Availability/Maintainability (PRAM) addresses acute reliability and maintainability (R&M) deficiencies by funding prototypes of developing, mature, and/or commercial-off-the-shelf technologies that can be incorporated into existing Air Force weapon systems and subsystems. The objective of this program is to emphasize the rapid incorporation of R&M technology 'fixes' that will improve the operational capability of weapon systems and equipment at a significantly lower cost. Average project length is twenty-seven months. This program has a proven return on investment averaging greater than 13:1 and is a key tool for reducing the total ownership cost of fielded systems and supporting infrastructure . PRAM, a level-of-funding program, depends on MAJCOM and field support to implement the technology when the initial investment is completed. Note: Congress added \$13 million to this program in FY 2000 for aging landing gear efforts (\$7 million) and blade repair facility efforts (\$6 million).</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u></p> <p>(U) \$303 Continued airframe R&M efforts to reduce overall Air Force operations and support costs.</p> <p>(U) \$204 Continued space system efforts to improve mission readiness.</p> <p>(U) \$89 Started and completed high priority, quick response R&M projects identified by the operational commands to reduce maintenance downtime.</p> <p>(U) \$5,470 Initiated and completed Modeling and Reengineering effort.</p> <p>(U) \$3,974 Completed Aging Landing Gear Life Extension program tasks.</p> <p>(U) \$10,040 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u></p> <p>(U) \$6,500 Initiate subsystem reliability and maintainability (R&M) projects that will reduce the overall maintenance burden, improve subsystem capabilities and reliability, and improve mission readiness, to include a Turbine Engine Disk Stress effort to measure in-service disks during repair/overhaul to track the onset of low cycle fatigue damage on an individual disk basis, creating the ability to predict remaining life and providing an engineering basis for service life extension.</p> <p>(U) \$463 Continue airframe reliability and maintainability (R&M) efforts to reduce overall Air Force operations and support costs.</p> <p>(U) \$1,550 Continue efforts for aerospace support equipment and base infrastructure R&M enhancements to increase equipment reliability, to include a</p>										
Project 672146				Page 1 of 5 Pages				Exhibit R-2 (PE 0708026F)		

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)										DATE February 2000							
BUDGET ACTIVITY					PE NUMBER AND TITLE					PROJECT							
07 - Operational System Development					0708026F Productivity, Reliability, Availability, Maintainability Program					672146							
(U) C. Program Change Summary (\$ in Thousands) Continued																	
					<u>FY 1999</u>					<u>FY 2000</u>			<u>FY 2001</u>	<u>Total Cost</u>			
	d. Below Threshold Reprogram					-48											
	e. Rescissions					-56				-186							
	f. Other														TBD		
(U)	Adjustments to Budget Years Since FY 2000 PBR												-2,114				
(U)	Current Budget Submit/FY 2001 PBR					10,040				22,075			15,227		TBD		
(U)	<u>Significant Program Changes:</u>																
	FY 2001 funding decrease due to higher priority Air Force requirements.																
(U) D. Other Program Funding Summary (\$ in Thousands)																	
		<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>		<u>Cost to</u>			<u>Total Cost</u>				
		<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>		<u>Complete</u>							
(U)	AF RDT&E																
(U)	Other APPN																
(U)	Related Activities:																
	(U) PE 0605011F, RDT&E for Aging Aircraft.																
(U) E. Acquisition Strategy																	
	All projects within this Program Element are awarded competitively, either by full and open competition or by amending task order contracts with competition for subcontracts.																
(U) F. 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)	Blade Repair Contract Award					*				X							
(U)	Request For Proposal Release					*				X	X			X	X		
(U)	Contract Awards					*	*	*		X	X	X	X	X	X	X	X
Project 672146					Page 3 of 5 Pages					Exhibit R-2 (PE 0708026F)							

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000			
BUDGET ACTIVITY					PE NUMBER AND TITLE			PROJECT		
07 - Operational System Development					0708026F Productivity, Reliability, Availability, Maintainability Program			672146		
(U) A. Project Cost Breakdown (\$ in Thousands)										
					<u>FY 1999</u>		<u>FY 2000</u>			<u>FY 2001</u>
(U)	Blade Tip Repair Project				5,470		6,000			0
(U)	Subsystem Reliability & Maintainability (R&M)				0		6,500			5,762
(U)	Aero Support Equipment and Base Infrastructure R&M				0		1,550			3,890
(U)	Airframe R&M				303		463			2,000
(U)	Space Systems R&M				204		0			3,000
(U)	Quick Response				89		562			575
(U)	Aging Landing Gear Life Extension				3,974		7,000			0
(U)	Total				10,040		22,075			15,227
(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>Performing Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>						
<u>Product Development Organizations</u>										
Numerous	Various	Various	N/A	N/A	3,028	300	4,462	14,227	Continuing	TBD
General Atomics	Various	Various	N/A	N/A	9,903	9,140	13,000	0	0	32,043
Lockheed-Martin	Various	Various	N/A	N/A	510	200	241	0	0	951
Jentek Sensors	CPFF	Jul 98	N/A	N/A	177	120	0	0	0	297
Raytheon	FFP	TBD	N/A	N/A	0	0	300	0	0	300
Southwest Research	FFP	TBD	N/A	N/A	0	0	100	0	0	100
TASC	FFP	TBD	N/A	N/A	0	0	40	0	0	40
Survival Inc	FFP	TBD	N/A	N/A	0	0	85	0	0	85
Bren-Tronics	FFP	TBD	N/A	N/A	0	0	877	0	0	877
Sandia Corp	FFP	TBD	N/A	N/A	0	0	40	0	0	40
General Research Corp	FFP	TBD	N/A	N/A	0	0	800	0	0	800
Project 672146					Page 4 of 5 Pages			Exhibit R-3 (PE 0708026F)		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 2000		
BUDGET ACTIVITY				PE NUMBER AND TITLE				PROJECT		
07 - Operational System Development				0708026F Productivity, Reliability, Availability, Maintainability Program				672146		
(U) <u>Performing Organizations Continued:</u>										
<u>Product Development Organizations</u>										
Fatigue Mgmt Associates	FFP	Dec 99	N/A	N/A	0	0	665	0	0	665
SAIC	FFP	Dec 99	N/A	N/A	0	0	465	0	0	465
Government	Various	Various	N/A	N/A	1,254	280	1,000	1,000	Continuing	TBD
<u>Support and Management Organizations</u>										
In house support										
<u>Test and Evaluation Organizations</u>										
					<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
					<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Subtotals</u>					14,872	10,040	22,075	15,227	TBD	TBD
Subtotal Product Development										
Subtotal Support and Management										
Subtotal Test and Evaluation										
Total Project					14,872	10,040	22,075	15,227	TBD	TBD

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0708071F Joint Logistics Program - Ammunition System				PROJECT 674679	
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
674679 Ammunition Management Standard System	14,698	11,271	11,238	11,341	11,457	11,686	11,918	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0
<p>(U) <u>A. Mission Description</u> Air Force is the Executive Agent for Joint Ammunition Management Standard System (JAMSS). JAMSS is the joint migration system being developed to improve and integrate ammunition management business functions and data across the DoD. It directly supports the goals of the DoD Logistics Strategic Plan (1996 edition) to: reduce logistics response times, provide total asset visibility, develop seamless logistics systems, and streamline the logistics infrastructure. When fully operational, JAMSS will provide integrated, flexible, and timely ammunition management information necessary for the planning, provisioning, and sustainment of military operations world-wide. The first release of the system will contain sufficient functionality to all Services to allow the current legacy systems to either be turned off completely or used minimally. The functionality to be included in the first release of JAMSS has been identified by the Munitions Management Systems Sub Group of the Joint Ordnance Commander's Group. Additional required functionality will be added in future releases based upon Service priority and available funding. When completely developed, integrated and implemented JAMSS will support functionality for all ammunition management at the Inventory Control Point (ICP) and command levels. This program is in Budget Activity 7 - Operational System Development.</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u> (U) \$11,183 Software Development (U) \$2,850 Support Contractors, Mission support, etc (U) \$573 GFE/COTS (U) \$92 GFE and COTS software update, debug, maintenance. (U) \$14,698 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u> (U) \$7,595 Software Development (U) \$3,599 Support Contractors, Mission support, etc (U) \$35 GFE/COTS (U) \$42 GFE and COTS software update, debug, maintenance (U) \$11,271 Total</p>									
Project 674679			Page 1 of 5 Pages				Exhibit R-2 (PE 0708071F)		

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0708071F Joint Logistics Program - Ammunition System			PROJECT 674679			
(U) <u>A. Mission Description Continued</u>										
(U) <u>FY 2001 (\$ in Thousands)</u>										
(U) \$7,027		Software Development								
(U) \$3,902		Support Contractors, Mission support, etc								
(U) \$309		GFE and COTS software update, debug, maintenance								
(U) \$11,238		Total								
(U) <u>B. Budget Activity Justification</u>										
This program is in Budget Activity 7 - Operational System Development because it modernizes automated information systems.										
(U) <u>C. Program Change Summary (\$ in Thousands)</u>										
		<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>					
(U)	Previous President's Budget (FY 2000 PBR)	16,021	11,333	11,338	TBD					
(U)	Appropriated Value	16,086	11,333							
(U)	Adjustments to Appropriated Value									
	a. Congressional/General Reductions	-65								
	b. Small Business Innovative Research	-384								
	c. Omnibus or Other Above Threshold Reprogram		-62							
	d. Below Threshold Reprogram	-857								
	e. Rescissions	-82								
	f. Other									
(U)	Adjustments to Budget Years Since FY 2000 PBR			-100	TBD					
(U)	Current Budget Submit/FY 2001 PBR	14,698	11,271	11,238	TBD					
(U) <u>Significant Program Changes:</u>										
IOC has slipped from Dec 99 to Mar 02										
(U) <u>D. Other Program Funding Summary (\$ in Thousands)</u>										
		<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Cost to</u>	<u>Total Cost</u>
		<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	
(U) Not Applicable										

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0708071F Joint Logistics Program - Ammunition System	PROJECT 674679
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(U) **E. Acquisition Strategy**
 DISA's Defense Enterprise Integration Services (DEIS II) contract was used to award the JAMSS development contract. DISA's DEIS II contract was awarded under full and open competition. The contractors selected under the DEIS II contract will compete for future business.

(U) **F. 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) Preliminary Prototype Review	*											
(U) Initial Contractor Test					*							
(U) Contract Modification						X						
(U) Final Contractor Test											X	
(U) System Qualification Test (SQT)												X

* - Denotes completed event.
 X - Denotes 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		
07 - Operational System Development				0708071F Joint Logistics Program - Ammunition System				674679		
(U) A. Project Cost Breakdown (\$ in Thousands)										
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>
(U)	Software Development EDS					11,183		7,595		7,027
(U)	Other Govt Costs					2,850		3,599		4,015
(U)	Government Furnished Equipment (GFE)/COTS					573		35		0
(U)	GFE and COTS software update, debug, maintenance					92		42		196
(U)	Total					14,698		11,271		11,238
(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>										
EDS	Cost + Award Fee	7 Jul 97	43,254	45,774	13,156	11,183	7,595	7,027	Continuing	TBD
Unknown	TBD			17,038	0	0	0	0	Continuing	TBD
<u>Support and Management Organizations</u>										
Innolog, KPMG, MITRE, MCR			16,612	16,612	4,787	1,793	2,147	2,211	Continuing	TBD
SPO WPAFB			17,528	17,528	1,450	927	1,152	1,495	Continuing	TBD
GFE and COTS software update, debug, maintenance.	TBD	TBD	4,990	4,990	80	92	42	196	Continuing	TBD
<u>Test and Evaluation Organizations</u>										
Army OPTEC			1,704	1,704	203	130	300	309	Continuing	TBD
IV&V			1,600	1,600	200	0	0	0	Continuing	TBD

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0708071F Joint Logistics Program - Ammunition System			PROJECT 674679		
(U) Government Furnished Property:									
<u>Item</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>									
COTS S/W and H/W	GSA Sc.	As Req'd	As Req'd	2,246	573	35	0	Continuing	TBD
<u>Support and Management Property</u>									
COTS S/W and Hardware	GSA Sch.	As Req'd	As Req'd	0	0	0	0	0	0
<u>Test and Evaluation Property</u>									
Shared with Development Resources									
				<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>Subtotals</u>									
Subtotal Product Development				15,402	11,756	7,630	7,027	TBD	TBD
Subtotal Support and Management				6,317	2,812	3,341	3,902	TBD	TBD
Subtotal Test and Evaluation				403	130	300	309	TBD	TBD
Total Project				22,122	14,698	11,271	11,238	TBD	TBD

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

DATE

February 2000

BUDGET ACTIVITY

07 - Operational System Development

PE NUMBER AND TITLE

0708611F Support Systems Development

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	23,943	33,198	32,258	28,253	27,207	27,751	27,820	Continuing	TBD
673090 Embedded Computer Resources Support Improvement Program (ESIP)	2,186	2,371	0	0	0	0	0	0	14,046
673318 Product Data Systems Modernization (PDSM)	1,168	1,360	4,697	2,860	2,909	2,966	2,546	Continuing	TBD
674654 Integrated Maintenance Data System (IMDS)*	20,589	29,467	27,561	25,393	24,298	24,785	25,274	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0

Congress added an additional \$8.0 million in RDT&E funds in FY00 for IMDS (\$8.0 million). An additional \$3.0 million was added to the IMDS project for Simulation Based Forecasting Decision Support Systems (SBFDSS)(\$1.5 million), Reengineering and Enabling Technologies (\$1.0 million), and Air Resource Rapid Reapplication Tools (\$0.5 million). The Air Force is in the process of transferring these amounts to the correct programs. \$2.0 million was earmarked for the Air Force Knowledge Management Program. Because no language accompanied this earmark, the Air Force is in the process of clarifying the intent of the earmark before proceeding. ESIP funding was transferred to PE 0708612F beginning in FY01.

(U) A. Mission Description

This basket program element supports three separate programs. The ESIP program (project 673090) improves support of embedded computer system software, automates and standardizes weapon system support processes, establishes advanced support methodologies, provides automated tools and infrastructure environments, and improves readiness support to facilitate rapid software turnaround in response to changing mission and/or threat requirements. The PDSM program (project 673318) updates Air Force digital data standards to commercial industry standards that support the Continuous Acquisition and Life-Cycle Support (CALS) concept. The IMDS program develops and fields an Air Force standard maintenance information system to integrate information systems supporting Air Force maintenance activities into a single open architecture, modern decision support system that is compatible with the Global Combat Support System - Air Force (GCSS-AF) architecture. This enhanced decision support system will increase operational production capability and support system efficiency, while decreasing mobility infrastructure requirements and cost of operations.

(U) B. Budget Activity Justification

This program is a Budget Activity 7, Operational Systems Development, because projects are being engineered to support already operational weapon systems.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)			DATE February 2000	
BUDGET ACTIVITY		PE NUMBER AND TITLE		
07 - Operational System Development		0708611F Support Systems Development		
(U)	<u>C. Program Change Summary (\$ in Thousands)</u>			
		<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
	<u>Total Cost</u>			
(U)	Previous President's Budget (FY 2000 PBR)	22,856	22,383	30,917
(U)	Appropriated Value	23,010	33,383	
(U)	Adjustments to Appropriated Value			
	a. Congressional/General Reductions	-154	-3	
	b. Small Business Innovative Research	-725		
	c. Omnibus or Other Above Threshold Reprogram		-182	
	d. Below Threshold Reprogram	1,946		
	e. Rescissions	-134		
	f. Other			
(U)	Adjustments to Budget Years Since FY 2000 PBR			1,341
(U)	Current Budget Submit/FY 2001 PBR	23,943	33,198	32,258
(U)	<u>Significant Program Changes:</u>			
	Congress added an additional \$8.0 million in RDT&E funds in FY00 for IMDS (\$8.0 million). An additional \$3.0 million was inadvertently added to this project for Simulation Based Forecasting Decision Support Systems (SBFDSS)(\$1.5 million), Reengineering and Enabling Technologies (\$1.0 million), and Air Resource Rapid Reapplication Tools (\$0.5 million). ESIP funding was transferred to PE 0708612F beginning in FY01.			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)							DATE February 2000				
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0708611F Support Systems Development				PROJECT 673090			
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	
673090	Embedded Computer Resources Support Improvement Program (ESIP)	2,186	2,371	0	0	0	0	0	0	14,046	
<p>ESIP funding transferred to PE 0708612F beginning in FY01.</p> <p>(U) <u>A. Mission Description</u> This project conducts research and development to improve the support of embedded mission-critical software intensive systems. It encompasses automation and standardization of support processes, advanced support methodologies, tools and environments, and readiness support to facilitate rapid turnaround of software in response to changing mission and/or changing threat requirements.</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u></p> <p>(U) \$127 Adaptive Software Flight Demonstration (ASFD)</p> <p>(U) \$305 Adaptive Software Technology Development (ASTD)</p> <p>(U) \$211 Automated Operational Flight Program (OFP) Validation (AutoVal)</p> <p>(U) \$305 Embedded Information Systems Re-engineering (EISR)</p> <p>(U) \$305 Incremental Software Evolution for Real-Time (INSERT)</p> <p>(U) \$376 Reconfigurable Aerospace Computer Emulator (RACE)</p> <p>(U) \$439 Virtual Test Station (VTS)</p> <p>(U) \$118 Weapon System Open Architecture Demonstration (WSOAD)</p> <p>(U) \$2,186 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u></p> <p>(U) \$15 Adaptive Software Flight Demonstration (ASFD)</p> <p>(U) \$325 Adaptive Software Technology Development (ASTD)</p> <p>(U) \$40 Embedded Information Systems Re-engineering (EISR)</p> <p>(U) \$415 Incremental Software Evolution for Real-Time (INSERT)</p> <p>(U) \$115 Incremental Upgrade of Legacy Systems Technology Demonstration (IULS TD)</p> <p>(U) \$460 Reconfigurable Aerospace Computer Emulator (RACE)</p> <p>(U) \$70 Rea-Time Defense Information Infrastructure Common Operating Environment (RT DII COE) Support</p> <p>(U) \$514 Virtual Engineering Environment (VEE)</p>											
Project 673090				Page 3 of 16 Pages				Exhibit R-2A (PE 0708611F)			

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0708611F Support Systems Development	PROJECT 673090
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(U) **A. Mission Description Continued**

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

(U) \$417 Weapon Systems Open Architecture (WSOA)

(U) \$2,371 Total

(U) FY 2001 (\$ in Thousands)

(U) \$0 No Activity (ESIP funding transferred to PE 0708612F beginning in FY01)

(U) \$0 Total

(U) **B. Project Change Summary**

N/A

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

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Cost to</u>	<u>Total Cost</u>
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	
(U) AF RDT&E									
(U) Other APPN									
(U) Other Procurement AF, BA 3, P-1:55, ESIP, PE 78611F ESIP funding transferred to PE 0708612F starting in FY01.	2,356	11,635	0	0	0	0	0	Continuing	TBD

(U) **D. Acquisition Strategy**

All major contracts are awarded after full and open competition.

(U) **E. Schedule Profile**

	<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4
(U) Start Adaptive Software Flight Demonstration (ASFD)		*										
(U) ASFD Demo					*							
(U) Adaptive Software Technology (ASTD) Demos				*							X	
(U) Automated OFP Validation Demo				*								
(U) Start Embedded Information Systems Re-engineering (EISR)		*										
(U) EISR Demos				*		X						

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

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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0708611F Support Systems Development	PROJECT 673090
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(U) E. Schedule Profile Continued

	<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) Incremental Software Evolution for Real-Time (INSERT) Demos				*			X					
(U) Incremental Upgrade of Legacy Systems (IULS) Tech Demos				*		X		X			X	
(U) Reconfigurable Aerospace Computer Emulator (RACE) Demos					*			X			X	
(U) Virtual Test Station (VTS) Demo				*		X						
(U) Start Virtual Engineering Environment				*								
(U) VEE Demos								X			X	
(U) Start Weapon Systems Open Architecture (WSOA)				*								
(U) WSOA Demo												X
(U) Real-Time DII COE IPT Support			*	*	X	X	X	X	X	X	X	X

* denotes completed event

X denotes planned event

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development					PE NUMBER AND TITLE 0708611F Support Systems Development			PROJECT 673090		
(U) A. Project Cost Breakdown (\$ in Thousands)										
					<u>FY 1999</u>		<u>FY 2000</u>			<u>FY 2001</u>
(U)	Adaptive Software Flight Demonstration (ASFD)				127		15			0
(U)	Adaptive Software Technology Development (ASTD)				305		325			0
(U)	Automated OFP Validation (AutoVal)				211		0			0
(U)	Embedded Information Systems Re-engineering (EISR)				305		40			0
(U)	Incremental Software Evolution for Real-Time (INSERT)				305		415			0
(U)	Incremental Upgrade of Legacy Systems (IULS0 Tech Demo				0		115			0
(U)	Reconfigurable Aerospace Computer Emulator (RACE)				376		460			0
(U)	Real-Time DII COE IPT Support				0		70			0
(U)	Virtual Engineering Environment				0		514			0
(U)	Virtual Test Station (VTS)				439		0			0
(U)	Weapon Systems Open Architecture (WSOA)				118		417			0
(U)	Total				2,186		2,371			0
	ESIP funding transferred to PE 0708612F starting in FY01.									
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)										
(U) Performing Organizations:										
<u>Contractor or</u>	<u>Contract</u>									
<u>Government</u>	<u>Method/Type</u>	<u>Award or</u>	<u>Performing</u>	<u>Project</u>						
<u>Performing</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Organizations</u>										
SAIC	D.O.	Various	N/A	N/A	4,384	650	381		0	5,415
TASC	D.O.	Various	N/A	N/A	2,274					2,274
TRW	D.O.	Various	N/A	N/A	1,525	282	200		0	2,007
Boeing	D.O.	Various	N/A	N/A	158	493	845		0	1,496
Lockheed Martin/CMU	D.O.	Various	N/A	N/A	157	761	875		0	1,793
Other (JAWS, RT DII)					54		70		0	124

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

DATE
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BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0708611F Support Systems Development				PROJECT 673318		
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
673318	Product Data Systems Modernization (PDSM)	1,168	1,360	4,697	2,860	2,909	2,966	2,546	Continuing	TBD

(U) A. Mission Description

This project implements the Air Force portion of the Joint Computer-Aided Acquisition and Logistics Support (JCALS) system ensuring the uninterrupted transition of legacy system functional capabilities to the new joint systems.

(U) FY 1999 (\$ in Thousands)

- (U) \$195 Managed AF technical data activities
- (U) \$11 Sustained Joint Engineering Data Management Information and Control System (JEDMICS).
- (U) \$152 Developed and maintained digital data templates for new acquisition technical orders
- (U) \$204 Plan/participated in JCALS to ensure AF requirements are met
- (U) \$376 Activated AF JCALS sites to ensure timely and accurate data is available and useable
- (U) \$152 Tested digital data specifications/standards and represented AF at international standards activities
- (U) \$78 Provided direct support to weapon systems, Logistics and Product Centers, and MAJCOMs
- (U) \$1,168 Total

(U) FY 2000 (\$ in Thousands)

- (U) \$234 Manage AF technical data activities
- (U) \$18 Sustain JEDMICS
- (U) \$183 Develop and maintain digital templates for new acquisition technical orders
- (U) \$245 Plan/participate in JCALS to ensure AF requirements are met
- (U) \$446 Activate AF JCALS sites to ensure timely and accurate data is available and useable
- (U) \$58 Test digital data specifications/standards and represent AF at international standards activities
- (U) \$176 Provide direct support to weapon systems, Logistics and Product Centers, and MAJCOMs
- (U) \$1,360 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0708611F Support Systems Development	PROJECT 673318
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(U) **A. Mission Description Continued**

(U) **FY 2001 (\$ in Thousands)**

- (U) \$643 Manage AF technical data activities
- (U) \$33 Sustain JEDMICS
- (U) \$499 Develop and maintain digital templates for new acquisition technical orders
- (U) \$673 Plan/participate in JCALS to ensure AF requirements are met
- (U) \$1,244 Activate AF JCALS sites to ensure timely and accurate data is available and useable
- (U) \$147 Test digital data specifications/standards and represent AF at international standards activities
- (U) \$458 Provide direct support to weapon systems, Logistics and Product Centers, and MAJCOMs
- (U) \$1,000 Automated Civil Engineer System (ACES)
- (U) \$4,697 Total

(U) **B. Project Change Summary**

PBD 205 transferred RDT&E funds for FY01-05 for the Automated Civil Engineer System into project 3318 (PDSM).

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

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Cost to</u>	<u>Total Cost</u>
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	
(U) AF RDT&E									
(U) Other APPN									
Not applicable.									

(U) **D. Acquisition Strategy**

All major contracts are awarded after full and open competition.

(U) **E. Schedule Profile**

	<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4
(U)												

Not applicable. This is a support and management level of effort program. All activities are ongoing.

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000			
BUDGET ACTIVITY				PE NUMBER AND TITLE				PROJECT		
07 - Operational System Development				0708611F Support Systems Development				673318		
(U) A. Project Cost Breakdown (\$ in Thousands)										
					<u>FY 1999</u>			<u>FY 2000</u>		<u>FY 2001</u>
(U)	Manage AF technical data activities				195			234		643
(U)	Plan/participate/activate JEDMICS sites				11			18		33
(U)	Test digital data specifications/standards and represent AF at international standards activities				152			58		147
(U)	Develop and maintain digital data templates for new acquisition technical orders				152			183		499
(U)	Plan/participate in JCALS to ensure AF requirements and schedules are met				204			245		673
(U)	Activate AF JCALS sites to ensure timely and accurate data is available and useable				376			446		1,244
(U)	Provide direct support to weapon systems, Logistics and Product Centers, and Major Commands (MAJCOMS)				78			176		458
(U)	Automated Civil Engineer System (ACES)				0			0		1,000
(U)	Total				1,168			1,360		4,697
PBD 205 transferred RDT&E funds for FY01-05 for the Automated Civil Engineer System (ACES) into project 3318 (PDSM).										
(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>Performing Activity</u>	<u>or Funding Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>						
<u>Product Development Organizations</u>										
ACES	TBD	TBD	N/A	N/A	0	0	0	1,000	Continuing	TBD
<u>Support and Management Organizations</u>										
RJO	ECRC	Var	N/A	N/A	6,989	364	423	1,153	Continuing	TBD
LOGTEC	GSA	Var	N/A	N/A	10,527	588	685	1,893	Continuing	TBD
BTAS	8A	Var	N/A	N/A	183	216	252	651	Continuing	TBD
<u>Test and Evaluation Organizations</u>										

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0708611F Support Systems Development	PROJECT 673318
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(U) **Government Furnished Property:**

<u>Item</u> <u>Description</u>	<u>Contract</u> <u>Method/Type</u> <u>or Funding</u> <u>Vehicle</u>	<u>Award or</u> <u>Obligation</u> <u>Date</u>	<u>Delivery</u> <u>Date</u>	<u>Total Prior</u> <u>to FY 1999</u>	<u>Budget</u> <u>FY 1999</u>	<u>Budget</u> <u>FY 2000</u>	<u>Budget</u> <u>FY 2001</u>	<u>Budget to</u> <u>Complete</u>	<u>Total</u> <u>Program</u>
<u>Product Development Property</u>									
Not Applicable									
<u>Support and Management Property</u>									
Not Applicable									
<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>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				0	0	0	1,000	TBD	TBD
Subtotal Support and Management				17,699	1,168	1,360	3,697	TBD	TBD
Subtotal Test and Evaluation									
Total Project				17,699	1,168	1,360	4,697	TBD	TBD

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0708611F Support Systems Development				PROJECT 674654		
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
674654	Integrated Maintenance Data System (IMDS)*	20,589	29,467	27,561	25,393	24,298	24,785	25,274	Continuing	TBD
<p>Congress added an additional \$8.0 million in RDT&E funds in FY00 for IMDS (\$8.0 million). In FY00, an additional \$3.0 million was added to this project for Simulation Based Forecasting Decision Support Systems (SBFDSS)(\$1.5 million), Reengineering and Enabling Technologies (\$1.0 million), and Air Resource Rapid Reapplication Tools (\$0.5 million).</p> <p>(U) <u>A. Mission Description</u> The IMDS program is an information technology program to provide maintenance personnel access to all maintenance information areas under one system. IMDS will utilize distributed databases, link designated existing legacy systems, and provide an integrated tool for interfacing with certain other legacy systems that will be sustained for the foreseeable future. The full IMDS capability is reached through multiple development increments of the application software, each increment building on the previous one. Increments 1-3 established core capabilities at the retail level. Increment 4 will begin to incorporate wholesale-level functionality as well as continue expansion of retail capabilities.</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u> (U) \$18,473 IMDS Contract Increment 3 - Base level core capabilities, design and coding, expanded interfaces, and Test Bed Activities. (U) \$1,325 Support Contractors (MITRE, Tecolote, TEMS, ITSP) (U) \$791 SPO Operations. (U) \$20,589 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u> (U) \$15,056 IMDS System Contract Increment 3 delivery to include DT&E and OT&E. (U) \$6,500 Computer-Based Training Development (U) \$1,500 Expeditionary Air Force Pre-Deployment and Rapid Data Download Capability Development (U) \$584 Support Contractors (MITRE, Tecolote, SenCom, etc.) (U) \$2,827 SPO Operations. (U) \$1,500 Simulation Based Forecasting Decision Support Systems (SBFDSS) (U) \$1,000 Reengineering and Enabling Technologies (U) \$500 Air Resource Rapid Reapplication Tools (U) \$29,467 Total</p>										
Project 674654			Page 12 of 16 Pages				Exhibit R-2A (PE 0708611F)			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0708611F Support Systems Development	PROJECT 674654
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(U) **A. Mission Description Continued**

(U) **FY 2001 (\$ in Thousands)**

(U) \$20,586	IMDS System Contract Fielding Requirements.
(U) \$782	Support Contractors (MITRE, Tecolote, SenCom, etc.).
(U) \$3,193	SPO Operations.
(U) \$3,000	Feeder Systems
(U) \$27,561	Total

(U) **B. Project Change Summary**

Congress added an additional \$8.0 million in RDT&E funds in FY00 for IMDS (\$8.0 million). In FY00, an additional \$3.0 million was added to this project for Simulation Based Forecasting Decision Support Systems (SBFDSS)(\$1.5 million), Reengineering and Enabling Technologies (\$1.0 million), and Air Resource Rapid Reapplication Tools (\$0.5 million). The Air Force is in the process of transferring these amounts to the correct programs. For FY01, PBD 726 added \$3.0 million in RDT&E funds to project 4654 (IMDS) for Feeder Systems.

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

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Cost to</u>	<u>Total Cost</u>
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	
(U) AF RDT&E									
(U) Other APPN									
(U) Other Procurement AF, BA 3. P-1:55. IMDS (PE 0708611F).	936	2,657	2,620	2,615	2,570	2,625	2,673	Continuing	TBD

(U) **D. Acquisition Strategy**

All major contracts are awarded after full and open competition.

(U) **E. Schedule Profile**

<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0708611F Support Systems Development	PROJECT 674654
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(U) **E. Schedule Profile Continued**

	<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) Beta Support Completed	*											
(U) Increment 3 Requirement Definition/Design				*								
(U) Development of IMDS core capability								X				
(U) OT&E Core (Increments 1, 2, & 3)												X

* denotes completed event
X denotes planned event

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0708611F Support Systems Development			PROJECT 674654			
(U) A. Project Cost Breakdown (\$ in Thousands)										
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>
(U)	IMDS System Contract					18,473		15,056		20,586
(U)	Computer Based Training Development					0		6,500		0
(U)	Expeditionary Air Force Pre-Deployment and Rapid Data Download Capability Development					0		1,500		0
(U)	Support Contractors					1,325		584		782
(U)	SPO Operations					791		2,827		3,193
(U)	Simulation Based Forecasting Decision Support Systems (SBFDSS)					0		1,500		0
(U)	Reengineering and Enabling Technologies					0		1,000		0
(U)	Air Resource Rapid Reapplication Tools					0		500		0
(U)	Feeder Systems					0		0		3,000
(U)	Total					20,589		29,467		27,561
Congress added an additional \$8.0 million in RDT&E funds in FY00 for IMDS (\$8.0 million). In FY00, an additional \$3.0 million was added to this project for Simulation Based Forecasting Decision Support Systems (SBFDSS)(\$1.5 million), Reengineering and Enabling Technologies (\$1.0 million), and Air Resource Rapid Reapplication Tools (\$0.5 million). The Air Force is in the process of transferring these amounts to the correct programs. For FY01, PBD 726 added \$3.0 million in RDT&E funds to project 4654 (IMDS) for Feeder Systems.										
(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>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>						
<u>Product Development Organizations</u>										
Andersen Consulting	CPAF	19 Jul 96	N/A	N/A	22,106	18,473	15,056	20,586	Continuing	TBD
Various/Proof of Concepts/Prototypes	N/A	N/A	N/A	N/A	7,079	0	0	0	0	7,079
Computer Based Training Dev	TBD	TBD	N/A	N/A	0	0	6,500	0	0	6,500
Expeditionary AF Pre-Deployment & Rapid	TBD	TBD	N/A	N/A	0	0	1,500	0	0	1,500
Project 674654										

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE
BUDGET ACTIVITY										PROJECT
07 - Operational System Development										674654
PE NUMBER AND TITLE										
0708611F Support Systems Development										
(U) <u>Performing Organizations Continued:</u>										
<u>Product Development Organizations</u>										
Data Download Capability										
Dev										
TBD	TBD	TBD	TBD	TBD	0	0	3,000	0	0	3,000
Feeder Systems	TBD	TBD	N/A	N/A	0	0	0	3,000	0	3,000
<u>Support and Management Organizations</u>										
Support Contractors	Var	Var	N/A	N/A	8,129	1,325	584	782	Continuing	TBD
SPO Operations	N/A	N/A	N/A	N/A	2,258	791	2,827	3,193	Continuing	TBD
<u>Test and Evaluation Organizations</u>										
					<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>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					29,185	18,473	26,056	23,586	TBD	TBD
Subtotal Support and Management					10,387	2,116	3,411	3,975	TBD	TBD
Subtotal Test and Evaluation										
Total Project					39,572	20,589	29,467	27,561	TBD	TBD
FY00 amount includes the Congressionally added amount of \$3.0 million that was added to this project for Simulation Based Forecasting Decision Support Systems (SBFDSS)(\$1.5 million), Reengineering and Enabling Technologies (\$1.0 million), and Air Resource Rapid Reapplication Tools (\$0.5 million).										

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0708612F Computer Resources Support Improvement Program				PROJECT 674851		
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
674851	Embedded Comp Res Spt Prog Impr	0	0	2,356	3,363	3,416	3,485	3,553	Continuing	TBD
Quantity of RDT&E Articles		0	0	0	0	0	0	0	0	0

Note: In FY 2001, funding was moved to this PE from PE 0708611F, Project 673090.

(U) **A. Mission Description**
 This program conducts research and development to improve the support of mission-critical software intensive systems. It encompasses automation and standardization of support processes, advanced support methodologies, tools and environments, and readiness support to facilitate rapid turnaround of software in response to changing mission and/or changing threat requirements.

(U) **FY 1999 (\$ in Thousands)**
 (U) \$0 Previously accomplished in PE 0708611F.
 (U) \$0 Total

(U) **FY 2000 (\$ in Thousands)**
 (U) \$0 Previously accomplished in PE 0708611F.
 (U) \$0 Total

(U) **FY 2001 (\$ in Thousands)**
 (U) \$350 Continue Adaptive Software Technology Development (ASTD). The objective of ASTD is to develop, demonstrate, and transfer adaptive software techniques for embedded weapon system software. The ASTD effort provides the defense software development community with an application design methodology allowing the use of commercial and emerging technologies to construct robust, platform-independent, resource adaptive applications. Such applications can respond to both mission profile changes (e.g., change from Air-to-Air to Air-to-Ground combat) and dynamic mission events that drive changing computational resource requirements, such as increased numbers of targets or hardware failures.

(U) \$125 Continue Incremental Upgrade of Legacy Systems Tech Demo (IULS TD). The object of IULS TD is to develop, demonstrate, and transition technology that will enable cost-effective, incremental improvements to fielded embedded information systems, affordably allowing systems to operate in a 'System of Systems'.

(U) \$300 Continue Reconfigurable Aerospace Computer Emulator (RACE). The object of RACE is to improve the reliability and maintainability of

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

DATE February 2000

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
07 - Operational System Development	0708612F Computer Resources Support Improvement Program	674851

- (U) **A. Mission Description Continued**
- (U) **FY 2001 (\$ in Thousands) Continued**
 - aging/obsolete on-board aerospace computers by replacing them with commercial microprocessor-based computer emulation technology; providing for backward compatibility with existing mission critical software and allowing for incremental software upgrades on new Commercial-Off-The-Shelf (COTS) processors.
- (U) \$75 Continue Real-Time Defense Information Infrastructure Common Operating Environment (RT DII COE). The objective of RT DII COE is to extend the ideas for reuse and commonality to improve the effectiveness of systems performing real-time Command and Control (C2) missions. Our participation provides the RT DII COE effort with needed real-time embedded system experience, adds to the effectiveness of the Computer Resource Support Improvement Program's (CRSIP's) Weapon System Open Architecture (WSOA) project, and provides the Air Force Research Lab (AFRL) with on going technical information that will eventually apply to real-time aspects of all C2 programs.
- (U) \$636 Continue Virtual Engineering Environment (VEE). The objective of VEE is to provide the DoD user with a low-cost, reconfigurable and scaleable engineering environment; develops concepts and technologies, and employs common components aimed at significantly improving embedded software development and test, while at the same time, reducing facility acquisition and maintenance costs. VEE technologies and components will be applied to both current and next-generation weapon system software development and test environments. VEE will leverage off commercial hardware and software as well as build upon existing technologies previously developed and demonstrated under the Embedded Computer Resource (ECR) Support Improvement Program (ESIP) and CRSIP.
- (U) \$870 Continue Weapon System Open Architecture (WSOA). Application of Open System Architecture (OSA) to embedded avionics applications is a key element of AFRL's strategy for future weapon systems development. Previous demonstrations supported by the DoD have shown the application of Ada 95, Object-Oriented methodology, and real-time distributed processing with open systems infrastructure to embedded avionics systems. WSOA represents the next logical extension by providing a bridge between embedded avionics and command and control computer and intelligence (C3I) systems with an open systems 'virtual backplane'.
- (U) \$2,356 Total
- (U) **B. Budget Activity Justification**
 - This program is in Budget Activity 7, Operational System Development, because it provides support to operational systems.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE February 2000		
BUDGET ACTIVITY			PE NUMBER AND TITLE				PROJECT		
07 - Operational System Development			0708612F Computer Resources Support Improvement Program				674851		
(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)		0	0	0	TBD			
(U)	Appropriated Value		0	0					
(U)	Adjustments to Appropriated Value								
	a. Congressional/General Reductions								
	b. Small Business Innovative Research								
	c. Omnibus or Other Above Threshold Reprogram								
	d. Below Threshold Reprogram								
	e. Rescissions								
	f. Other								
(U)	Adjustments to Budget Years Since FY 2000 PBR				2,356				
(U)	Current Budget Submit/FY 2001 PBR		0	0	2,356	TBD			
(U)	<u>Significant Program Changes:</u>								
	In FY 2001, funding was moved to this PE from PE 0708611F, Project 673090.								
(U) D. 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>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)	AF RDT&E								
(U)	Other APPN								
(U)	PE 0708611F/3080	2,356	2,237						4,593
(U)	PE 0708611F/3400	9,377	19,417						28,794
(U)	PE 0708612F/3080			2,288	2,341	2,394	2,445	2,500	Continuing
(U)	PE 0708612F/3400			13,877	14,099	14,386	14,667	14,957	Continuing
(U)	E. Acquisition Strategy								
	All major contracts within this Program Element were awarded after full and open competition.								
(U)	F. Schedule Profile								
				<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>	
	Project 674851								

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0708612F Computer Resources Support Improvement Program	PROJECT 674851
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(U) F. Schedule Profile Continued

	<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) Start Adaptive Software Flight Demonstration (ASFD)		*										
(U) ASFD Demo					*							
(U) Adaptive Software Technology Demos (ASTD)				*							X	
(U) Automated Operational Flight Program (OFP) Validation Demo		*		*								
(U) Start Embedded Information Systems Re-engineering (EISR)												
(U) EISR Demos				*		X						
(U) Incremental Software Evolution for Real-Time (INSERT) Demos				*			X					
(U) Incremental Upgrade of Legacy Systems (IULS) Tech Demos				*		X		X			X	
(U) Reconfigurable Aerospace Computer Emulator (RACE) Demos					*			X			X	
(U) Virtual Test Station (VTS) Demo				*		X						
(U) Start Virtual Engineering Environment (VEE)				*								
(U) VEE Demos								X			X	
(U) Start Weapon System Open Architecture (WSOA)				*								
(U) WSOA Demo												X
(U) Real-Time DII COE IPT Support			*	*	*	X	X	X	X	X	X	X

DII COE IPT: Defense Information Infrastructure (DII) Common Operating Environment (COE) Integrated Product Team (IPT)

* denotes completed event
X denotes 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		
07 - Operational System Development					0708612F Computer Resources Support Improvement Program			674851		
(U) A. Project Cost Breakdown (\$ in Thousands)										
					<u>FY 1999</u>			<u>FY 2000</u>		<u>FY 2001</u>
(U)	Adaptive Software Technology Development									350
(U)	Incremental Upgrade of Legacy Systems Tech Demo									125
(U)	Reconfigurable Aerospace Computer Emulator									300
(U)	Real-Time Defense Information Infrastructure Common Operating Environment Integrated Process Team Support									75
(U)	Virtual Engineering Environment									636
(U)	Weapon System Open Architecture									870
(U)	Total									2,356
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)										
(U) Performing Organizations:										
<u>Contractor or Government</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>										
SAIC	DO	Various	N/A	N/A				436	Continuing	TBD
TRW	DO	Various	N/A	N/A				200	Continuing	TBD
Boeing	DO	Various	N/A	N/A				1,270	Continuing	TBD
Lockheed-Martin	DO	Various	N/A	N/A				375	Continuing	TBD
Other (RT DII COE)			N/A	N/A				75	Continuing	TBD
<u>Support and Management Organizations</u>										
<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	
07 - Operational System Development				0708612F Computer Resources Support Improvement Program				674851	
(U) <u>Government Furnished Property:</u>									
	<u>Contract</u>	<u>Award or</u>							
<u>Item</u>	<u>Method/Type</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Delivery</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>
<u>Description</u>	<u>Vehicle</u>	<u>Date</u>	<u>Date</u>		<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>
<u>Product Development Property</u>									
<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>Subtotals</u>					<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>
Subtotal Product Development								2,356	TBD
Subtotal Support and Management									
Subtotal Test and Evaluation									
Total Project								2,356	TBD

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0901218F Civilian Compensation Program				PROJECT 674139	
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
674139 Civilian Compensation Program	6,700	6,891	7,209	7,020	7,150	7,307	7,468	0	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0
<p>(U) <u>A. Mission Description</u> This program element provides for payment of civilian compensation benefits for disability due to personal injury sustained while in the performance of duty or due to employment-related disease according to the Federal Employees Compensation Act (FECA) under Title 5 U.S.C., Chapter 81. The Department of Labor (DOL) administers this program and charges the Department of the Air Force for its employee costs; therefore, this is a MUST PAY bill for Air Force. The PE excludes manpower authorizations and costs.</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u> (U) \$6,700 Required to continue a program to compensate employees assigned to RDT&E facilities for worked-related injury or disease (U) \$6,700 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u> (U) \$6,891 Required to continue a program to compensate employees assigned to RDT&E facilities for worked-related injury or disease (U) \$6,891 Total</p> <p>(U) <u>FY 2001 (\$ in Thousands)</u> (U) \$7,209 Required to continue a program to compensate employees assigned to RDT&E facilities for worked-related injury or disease (U) \$7,209 Total</p> <p>(U) <u>B. Budget Activity Justification</u> This Program Element (PE) is in Budget Activity 7 in support of payment of civilian compensation benefits for disability due to personal injury sustained while in the performance of duty or due to employment-related disease according to the Federal Employees Compensation Act (FECA) under Title 5 U.S.C., Chapter 81.</p>									
Project 674139			Page 1 of 4 Pages				Exhibit R-2 (PE 0901218F)		

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)											DATE February 2000				
BUDGET ACTIVITY						PE NUMBER AND TITLE						PROJECT			
07 - Operational System Development						0901218F Civilian Compensation Program						674139			
(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)					6,737	6,973	7,210						TBD	
(U)	Appropriated Value					6,756	6,973								
(U)	Adjustments to Appropriated Value														
	a. Congressional/General Reductions					-19									
	b. Small Business Innovative Research														
	c. Omnibus or Other Above Threshold Reprogram						-38								
	d. Below Threshold Reprogram														
	e. Rescissions					-37	-44								
	f. Other													TBD	
(U)	Adjustments to Budget Years Since FY 2000 PBR							-1							
(U)	Current Budget Submit/FY 2001 PBR					6,700	6,891	7,209						TBD	
(U)	<u>Significant Program Changes:</u>														
	N/A														
(U) D. 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>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>Cost to</u>		
													<u>Complete</u>		
(U)	AF RDT&E														
(U)	Other APPN														
(U)	Operation and Maintenance					22,355	22,679	23,528	25,245	25,759	26,789	27,860	0	TBD	
(U) E. Acquisition Strategy															
N/A															
(U) F. Schedule Profile															
						<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>	
						1	2	3	4	1	2	3	4	1	
(U)	N/A														

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000				
BUDGET ACTIVITY 07 - Operational System Development					PE NUMBER AND TITLE 0901218F Civilian Compensation Program			PROJECT 674139			
(U)	<u>A. Project Cost Breakdown (\$ in Thousands)</u>										
					<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>				
(U)	n/a										
(U)	Total										
(U)	<u>B. Budget Acquisition History and Planning Information (\$ in Thousands)</u>										
(U)	<u>Performing Organizations:</u>										
	<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>
	n/a										
	<u>Product Development Organizations</u>										
	n/a										
	<u>Support and Management Organizations</u>										
	n/a										
	<u>Test and Evaluation Organizations</u>										
	n/a										
(U)	<u>Government Furnished Property:</u>										
	<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>										
	n/a										
	<u>Support and Management Property</u>										
	n/a										
	<u>Test and Evaluation Property</u>										
	n/a										

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)					DATE February 2000	
BUDGET ACTIVITY			PE NUMBER AND TITLE			PROJECT
07 - Operational System Development			0901218F Civilian Compensation Program			674139
			<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>
			<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
<u>Subtotals</u>						<u>Budget to</u>
NA						<u>Complete</u>
Subtotal Product Development						
Subtotal Support and Management						
Subtotal Test and Evaluation						
Total Project						TBD

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 2000	
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 1001018F NATO AGS				PROJECT 670002	
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
670002 NATO JSTARS	2,685	0	3,270	0	0	0	0	0	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	TBD
<p>Note: On 29 October 1999 the Air Force informed Congress of intentions for an FY99 New Start: the NATO Airborne Ground Surveillance, for the NATO Alliance Ground Surveillance (AGS) requirement. The Air Force intends to use \$.477 million, FY99 RDT&E remaining in the NATO Joint STARS line. The Air Force will support a Below Threshold Reprogramming of \$1.6 million FY00 RDT&E.</p> <p>(U) <u>A. Mission Description</u> The NATO Staff Requirement (NSR) for an Alliance Ground Surveillance (AGS) System, Sep 97, states the requirement for a NATO owned and operated capability to '...detect, locate, recognize and track specified activities on and near the surface and disseminate related data in timely manner, and thereby contribute to the successful accomplishment of the NATO military operations....' In Nov 97 the NATO Conference of National Armaments Directors (CNAD) rejected a US 'fast track' offer of the US JSTARS system to meet the AGS requirement, and directed the AGS Provisional Project Structure (PPS) to look at fresh options to satisfy the requirement. In Dec 97 the US offered the JSTARS Radar Technology Insertion Program (RTIP) advanced sensor on a platform of NATO's choice. In Apr 98 the CNAD endorsed the PPS recommendation for conducting a one year Concept Definition Study (CDS) led by the Provisional Project Office (PPO). The US led the airborne portion of the CDS and presented a study based on the US RTIP advanced sensor system. In May 99 the CNAD authorized entrance into a 2-year, RTIP-based, project definition phase for interested nations, based on a proposal by Norway. This project definition effort has been named the Trans-Atlantic Advanced Radar Project (TARP) and formal designation as a NATO Project has been requested. Nations that have agreed to participate in this effort to date are: US, Canada, Norway, Denmark, and Belgium. All NATO nations have been encouraged to join the effort and several have indicated interest in joining. In Aug 99 USD/AT&L directed the Air Force to be lead service, with support of the Army, in carrying out overall US participation in this project and to be specifically responsible for the Air Segment. The Air Force plans to support the effort through participation in a Project Definition Office (PDO) in Brussels, BE. The objective of the Project Definition effort is to prepare an international agreement, a program charter, and a request for proposal for a fully integrated and interoperable NATO owned and operated airborne ground surveillance system. Standup of the PDO is expected in Feb 00 and its work will last for approximately two years. To initiate the activity the Air Force plans to use \$.477 million FY99 RDT&E funds remaining in the NATO Joint STARS line. The FY00 effort will be supported by a below threshold reprogramming action.</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u> (U) \$380 NATO Studies (U) \$1,808 Other Government Costs (U) \$20 Provisional Program Office Support (U) \$477 Project Definition Office Support (New Start pending with Congress; letter notification)</p>									

Project 670002

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Exhibit R-2 (PE 1001018F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 2000																																																												
BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 1001018F NATO AGS	PROJECT 670002																																																												
<p>(U) <u>A. Mission Description Continued</u></p> <p>(U) <u>FY 1999 (\$ in Thousands) Continued</u></p> <p>(U) \$2,685 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u></p> <p>(U) \$0 The Air Force plans a Below Threshold Reprogramming action, upon Congressional approval of the FY99 New Start Request, to add 1,600 for support for the operations of the PDO, and other NATO studies as required.</p> <p>(U) \$0 Total</p> <p>(U) <u>FY 2001 (\$ in Thousands)</u></p> <p>(U) \$3,270 Project Definition Office support and support NATO interoperability studies and efforts</p> <p>(U) \$3,270 Total</p> <p>(U) <u>B. Budget Activity Justification</u></p> <p>This program is in Budget Activity 7, Operational System Development because it involves the modification of radar sensor technology currently fielded.</p> <p>(U) <u>C. Program Change 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 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>Total Cost</u></th> </tr> </thead> <tbody> <tr> <td>(U) Previous President's Budget (FY 2000 PBR)</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">TBD</td> </tr> <tr> <td>(U) Appropriated Value</td> <td style="text-align: center;">0</td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Adjustments to Appropriated Value</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> a. Congressional/General Reductions</td> <td style="text-align: center;">-15</td> <td></td> <td></td> <td></td> </tr> <tr> <td> b. Small Business Innovative Research</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> c. Omnibus or Other Above Threshold Reprogram</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> d. Below Threshold Reprogram</td> <td style="text-align: center;">2,700</td> <td></td> <td></td> <td></td> </tr> <tr> <td> e. Rescissions</td> <td></td> <td style="text-align: center;">0</td> <td></td> <td></td> </tr> <tr> <td> f. Other</td> <td></td> <td style="text-align: center;">0</td> <td></td> <td style="text-align: center;">TBD</td> </tr> <tr> <td>(U) Adjustments to Budget Years Since FY 2000 PBR</td> <td></td> <td></td> <td style="text-align: center;">3,270</td> <td></td> </tr> <tr> <td>(U) Current Budget Submit/FY 2001 PBR</td> <td style="text-align: center;">2,685</td> <td style="text-align: center;">0</td> <td style="text-align: center;">3,270</td> <td style="text-align: center;">TBD</td> </tr> </tbody> </table> <p>(U) <u>Significant Program Changes:</u></p> <p>A Below Threshold Reprogramming is planned to add 1,600 to FY00, for the Air Force share of support to operations of the PDO. Funding in FY01 added by DOD direction.</p>				<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>	(U) Previous President's Budget (FY 2000 PBR)	0	0	0	TBD	(U) Appropriated Value	0				(U) Adjustments to Appropriated Value					a. Congressional/General Reductions	-15				b. Small Business Innovative Research					c. Omnibus or Other Above Threshold Reprogram					d. Below Threshold Reprogram	2,700				e. Rescissions		0			f. Other		0		TBD	(U) Adjustments to Budget Years Since FY 2000 PBR			3,270		(U) Current Budget Submit/FY 2001 PBR	2,685	0	3,270	TBD
	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>																																																										
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Project 670002	Page 2 of 5 Pages	Exhibit R-2 (PE 1001018F)																																																												

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 1001018F NATO AGS	PROJECT 670002
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(U) **D. Other Program Funding Summary (\$ in Thousands)**

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Cost to</u>	<u>Total Cost</u>
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	

(U) AF RDT&E
 (U) Other APPN
 N/A

(U) **E. Acquisition Strategy**
 The U.S. and four other NATO nations (Canada, Belgium, Denmark, and Norway) are participating in a Project Definition effort for a NATO owned and operated ground surveillance capability, based on the US JSTARS Radar Technology Insertion Program (RTIP) advanced radar. The Project Definition work is expected to conclude in 2002, and is expected to produce documentation to be presented to NATO nations necessary for a decision on whether to proceed with acquisition of an airborne ground surveillance system based on this effort.

(U) **F. 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) CNAD authorization, start of RTIP- based Project Definition effort			*									
(U) Standup of Project Definition Office						X						

* - Denotes Completed Event
 X- Denotes Planned Event

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development					PE NUMBER AND TITLE 1001018F NATO AGS			PROJECT 670002		
(U) <u>A. Project Cost Breakdown (\$ in Thousands)</u>										
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>
(U)	NATO Studies					380		0		0
(U)	Other Government Costs					1,808				
(U)	Provisional Project Office Support					20				
(U)	Project Definition Office Support and NATO Interoperability studies and efforts					477				3,270
(U)	Total					2,685		0		3,270
NOTE: For FY00 RDT&E, a Below Threshold Reprogramming action is planned to add 1,600 to be used for Project Definition Office support										
(U) <u>B. Budget Acquisition History and Planning Information (\$ in Thousands)</u>										
(U) <u>Performing Organizations:</u>										
	<u>Contractor or</u>	<u>Contract</u>								
	<u>Government</u>	<u>Method/Type</u>	<u>Award or</u>	<u>Performing</u>	<u>Project</u>					
	<u>Performing</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>
	<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>
	<u>Product Development Organizations</u>									<u>Total</u>
	Northrop Grumman	IDIQ	Apr 96	2,376	2,376	2,376				2,376
	Rome Labs	Fixed Price	Sep 96	485	485	485				485
	Northrop Grumman	IDIQ	Jan 97	3,782	3,782	3,782				3,782
	Northrop Grumman	IDIQ	Dec 97	637	637	637				637
	Northrop Grumman	IDIQ	May 98	944	944	944				944
	Northrop Grumman	IDIQ	Sep 98	1,404	1,404	1,404				1,404
	Northrop Grumman	IDIQ	Dec 98	47	47	47				47
	Northrop Grumman	IDIQ	May 99	520	520	140	380			520
	Project Development Office						477		3,270	3,747
	<u>Support and Management Organizations</u>									
	ESC (Provisional					4	20			0
	Project Office)									24
	MITRE	Cost Plus	Oct 94/			1,704	1,371			0
		Award Fee	Jun 96							3,075
	TEMS	IDIQ	Mar - May			2,255	337			0
										2,592
Project 670002										

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)					DATE February 2000	
BUDGET ACTIVITY			PE NUMBER AND TITLE		PROJECT	
07 - Operational System Development			1001018F NATO AGS		670002	
(U) <u>Performing Organizations Continued:</u>						
<u>Support and Management Organizations</u>						
Miscellaneous	Various	96	800	100	0	900
	Contracts					
<u>Test and Evaluation Organizations</u>						
			<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>
			<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
<u>Subtotals</u>					<u>Budget to</u>	<u>Total</u>
Subtotal Product Development			9,815	857	3,270	13,942
Subtotal Support and Management			4,763	1,828	0	6,591
Subtotal Test and Evaluation						
Total Project			14,578	2,685	3,270	20,533

1. COMPONENT AIR FORCE (AFMC)		FY 2000 MILITARY CONSTRUCTION PROJECT DATA (computer generated)			2. DATE	
3. INSTALLATION AND LOCATION KIRTLAND AIR FORCE BASE, NEW MEXICO			4. PROJECT TITLE Minor Construction < \$500,000			
5. PROGRAM ELEMENT 62601F	6. CATEGORY CODE	7. PROJECT NUMBER	8. PROJECT COST (\$000) 660.0			
9. COST ESTIMATES						
ITEM		U/M	QUANTITY	UNIT COST	COST (\$000)	
Minor Construction using RDT&E funds for FY2000						
Construct SCIF Area, Building 497		LS			350	
Construct SCIF Area, Building 914		LS			100	
Install Animal Barriers		LS			30	
Add Lab Space, Building 362		LS			150	
Construct Parking Area		LS			30	
					660	
10. DESCRIPTION OF PROPOSED WORK Construct Sensitive Compartmented Information Facilities (SCIF) in building 497 and 914, install animal barriers around building 427, alter an area in building 362 for R&D lab space, and construct additional asphalt parking area for building 760.						
11. REQUIREMENT: Unspecified Minor Construction (13.15.4).						
PROJECT: Multiple projects as described above.						
REQUIREMENT: Additional SCIF space is required to support the DE Headquarters and the DE Satellite Assessment Center, animals living under the building must be kept out of the work area, additional lab space is needed to support classified S&T work, additional parking is needed to replace the spaces lost as a result of construction of a new facility sited in a portion of the parking lot.						
CURRENT SITUATION: Adequate SCIF space is not available, animals enter the facility from areas they inhabit under the floor, additional lab space is not available, and parking area can not handle the parking load of the facility.						
IMPACT IF NOT PROVIDED: Some classified work may be delayed or executed in a shared SCIF. Animals will continue to enter the facility disrupting the work environment. Classified lab work will not be accomplished possibly delaying some S&T programs. Cars will continue to part illegally with increased potential for vehicle accidents.						

1. COMPONENT AIR FORCE (AFMC)	FY 2000 MILITARY CONSTRUCTION PROJECT DATA (computer generated)			2. DATE	
3. INSTALLATION AND LOCATION ROME LAB, NEW YORK			4. PROJECT TITLE Minor Construction < \$500,000		
5. PROGRAM ELEMENT 62702F	6. CATEGORY CODE 610-281	7. PROJECT NUMBER ULDF93002P2	8. PROJECT COST (\$000) 465.0		
9. COST ESTIMATES					
ITEM		U/M	QUANTITY	UNIT COST	COST (\$000)
Minor Construction using RDT&E funds for FY2000: Upgrade Research Engineering Area, Bldg 106		LS			465.0
<p>10. DESCRIPTION OF PROPOSED WORK: This is a quality of life improvement for the Sensors Directorate offices in Building 106. Improvements include: replacement of existing asbestos cement partitions with a nonasbestos wall system, replacement of obsolete building systems including electrical distribution, lighting, suspended ceilings, fire detection and protection systems.</p>					
<p>11. REQUIREMENT: Unspecified Minor Construction (13.15.4). PROJECT: Upgrade Research Engineering Area, Bldg 106</p> <p>REQUIREMENT: Rome Research Site facilities require modern laboratory and professional office facilities to accomplish its mission.</p> <p>CURRENT SITUATION: Building 106 was originally built in 1943 and renovated into a laboratory in 1952, virtually no changes other than painting have occurred since. Facilities are substandard, inefficient, and outmoded by today's standards, which seriously impacts on their safety, efficiency, productivity, and denies personnel the benefit of a modern quality office/lab facility which meets AF standards.</p> <p>IMPACT IF NOT PROVIDED: The office power systems consist of 1950's vintage open bussways which pose a potential electrocution hazard to personnel, and are subject to frequent outages due to overloading will continue. All of the walls are constructed of asbestos cement partitions, and the areas above the ceilings contain friable asbestos material, whenever any minor work is accomplished, the area has to be evacuated causing lengthy unscheduled work stoppages in emergencies and scheduled work stoppages in non-emergencies</p>					

1. COMPONENT AIR FORCE	FY 2000 MILITARY CONSTRUCTION PROJECT DATA (computer generated)			2. DATE
3. INSTALLATION AND LOCATION EDWARDS AIR FORCE BASE, CALIFORNIA			4. PROJECT TITLE AIRBORNE LASER COMPLEX UPGRADE	
5. PROGRAM ELEMENT 6.33.19F	6. CATEGORY CODE 311-114	7. PROJECT NUMBER FSPM981305	8. PROJECT COST (\$000) 6,845.1	
9. COST ESTIMATES				
ITEM	U/M	QUANTITY	UNIT COST	COST (\$000)
AIRBORNE LASER COMPLEX UPGRADE				5,171.5
CONSTRUCT GROUND PRESS RECOV ASSY AREA	LS			(621.0)
FACILITY UPGRADES (B151, 369, 370)	LS			(1,948.0)
CONSTRUCT SYSTEMS INTEGRATION LAB SUPPORTING FACILITIES	LS			(2,602.5)
CONSTRUCT FUEL FARM SYSTEM	LS			699.0
CONSTRUCT NEUTRALIZATION SYSTEM	LS			(431.0)
SUBTOTAL				<u>587.1</u>
CONTINGENCY (10%)				6,457.6
TOTAL CONTRACT COST				<u>387.5</u>
SUPERVISION, INSPECTION, AND OVERHEAD (6%)				6845.1
TOTAL FUNDED COST				
10. DESCRIPTION OF PROPOSED WORK: Modify Birk Flight Test Facility to accommodate ABL test and R&D equipment. Work includes infrastructure for a Ground Pressure Recovery Assembly (GPRA), Systems Integration Lab (SIL), and associated facility upgrades at B151. Construct infrastructure for a laser fuel farm, and a neutralization subsystem at B369 and B370. (AFI 65-601, Chapter 13.15.5 Contractor Facility)				
11. REQUIREMENT: As Required				
PROJECT: Modify existing Birk Flight Test Facility (BFTF) (Building 151 and associated areas) and install necessary R&D equipment to support the Program Definition Risk Reduction (PDRR) Airborne Laser (ABL) RDT&E program.				
REQUIREMENT: The PDRR ABL program is designed to exploit powerful technologies which have evolved over the past 20 years and integrate them into a revolutionary airborne weapon system which is lethal to boosting enemy Theater Ballistic Missiles (TBMs) at extremely long ranges. The ABL also plays a significant role in assisting the other joint tiers in the Theater Missile Defense architecture by reducing the number of targets, providing missile trajectory information to the theater point defenses, and identifying TBM launch points for counter force strikes against mobile launchers. Test facilities must be capable of supporting a test program that integrates a multi megawatt chemical oxygen iodine laser (COIL) and beam control system with a large aperture telescope into a Boeing 747 400F aircraft. Since the PDRR ABL aircraft will be a first-of-its-kind, modifications and equipment installation will be designed and modified as the program proceeds. With the facility capabilities of BFTF, building a new temporary facility for the PDRR ABL is an unnecessary expense.				
CURRENT SITUATION: Current BFTF facilities were designed to support wide body aircraft like the Boeing 747-400F. However, limited facility infrastructure modifications are needed to support the weapon				

1. COMPONENT AIR FORCE	FY 2000 MILITARY CONSTRUCTION PROJECT DATA (computer generated)	2. DATE
3. INSTALLATION AND LOCATION EDWARDS AIR FORCE BASE, CALIFORNIA		
4. PROJECT TITLE AIRBORNE LASER COMPLEX UPGRADE	5. PROJECT NUMBER FSPM981305	
<p>test and operation of high energy laser systems and laboratory equipment in the SIL. The exterior apron site chosen to mount a pressure recovery system, designed to simulate PDRR ABL operating altitudes, lacks utility support. B369 and B370 lack infrastructure to support a laser fuel farm or a neutralization system. Upgrades to these facilities are necessary to support the ABL development.</p> <p>IMPACT IF NOT PROVIDED: Testing and delivery of our nations next generation laser systems will be negatively impacted. Developmental milestones will not be met, resulting in higher costs to the contractor's overhead, daily operations, and increasing the taxpayer burden. Significant costs and schedule delays will be incurred if the government cannot provide the facilities required by the integration contractor. Existing contractor facilities are not sufficient to support the PDRR ABL.</p> <p>ADDITIONAL: 10 USC 2351, 2353, and 2358 authorizes the use of RDT&E funds to construct facilities necessary for the performance of a contract. This construction project supports the PDRR ABL integration contractor.</p>		

1. COMPONENT AIR FORCE (AFMC)	FY 2000 MILITARY CONSTRUCTION PROJECT DATA (computer generated)			2. DATE	
3. INSTALLATION AND LOCATION EGLIN AIR FORCE BASE, FLORIDA			4. PROJECT TITLE Minor Construction < \$500,000		
5. PROGRAM ELEMENT 65807F	6. CATEGORY CODE 312-477	7. PROJECT NUMBER FTFA901200	8. PROJECT COST (\$000) 30.0		
9. COST ESTIMATES					
ITEM		U/M	QUANTITY	UNIT COST	COST (\$000)
Minor Construction using RDT&E funds for FY2000: FTFA901200 Commercial Water		LS			30.0
10. DESCRIPTION OF PROPOSED WORK: Install water line and fire hydrants					
<p>11. REQUIREMENT: Unspecified Minor Construction (13.15.4).</p> <p>PROJECT: Commercial Water Connection</p> <p>REQUIREMENT: Provide reliable water source to test facility to support fire protection for high value equipment.</p> <p>CURRENT SITUATION: Test Facility is currently fed by a small ¾ inch line from an existing well and has no fire protection.</p> <p>IMPACT IF NOT PROVIDED: Potential loss of high value equipment due to fire.</p>					

1. COMPONENT AIR FORCE (AFMC)	FY 2001 MILITARY CONSTRUCTION PROJECT DATA (computer generated)			2. DATE	
3. INSTALLATION AND LOCATION WRIGHT-PATTERSON AIR FORCE BASE, OHIO			4. PROJECT TITLE Minor Construction < \$500,000		
5. PROGRAM ELEMENT 62102F	6. CATEGORY CODE	7. PROJECT NUMBER ZHTV990043	8. PROJECT COST (\$000) 350.0		
9. COST ESTIMATES					
ITEM		U/M	QUANTITY	UNIT COST	COST (\$000)
Minor Construction using RDT&E funds for FY2001 Alter Building 22B for Coatings Process Line		LS			350.0
10. DESCRIPTION OF PROPOSED WORK: Demolish existing interior walls, construct new interior walls, install coatings process line, fume hoods, exhaust fans, acid neutralization pit, deionized water unit, and all support utilities.					
11. REQUIREMENT: Unspecified Minor Construction (13.15.4).					
PROJECT: Alter Building 22B top support the new Coatings Process Line					
REQUIREMENT: A ground floor location is needed to accommodate the new coatings and corrosion control equipment and process line to provide a functional work flow for all R&D coatings and corrosion projects.					
CURRENT SITUATION: An existing coatings process line is located in a separate building above a basement work area and is not capable of integrating the new equipment and process into the existing line. Space to be vacated is needed to support the expansion of the Electrochemical Testing area.					
IMPACT IF NOT PROVIDED: The coating process line will continue to exist over the basement work area with the potential for a toxic spill to seep into the basement area creating a hazardous environment for the personnel. Critically needed space will not be available for other work units in the directorate.					

1. COMPONENT AIR FORCE (AFMC)	FY 2001 MILITARY CONSTRUCTION PROJECT DATA (computer generated)			2. DATE	
3. INSTALLATION AND LOCATION ROME LAB, NEW YORK			4. PROJECT TITLE Minor Construction < \$500,000		
5. PROGRAM ELEMENT 62702F	6. CATEGORY CODE 610-281	7. PROJECT NUMBER ULDF950076	8. PROJECT COST (\$000) 350.0		
9. COST ESTIMATES					
ITEM		U/M	QUANTITY	UNIT COST	COST (\$000)
Minor Construction using RDT&E funds for FY2001: Upgrade Research Engineering Area, Bldg 104		LS			350.0
10. DESCRIPTION OF PROPOSED WORK: This is a quality of life improvement for the Sensors Directorate offices of the Photonics Center. Improvements include: The demolition of existing offices in the South end of the building, the construction of new perimeter partitions, replacement of obsolete building systems including electrical distribution, lighting, suspended ceilings, fire detection, and protection systems and the incorporation of systems furniture.					
11. REQUIREMENT: Unspecified Minor Construction (13.15.4).					
PROJECT: Upgrade Research Engineering Area, Bldg 104					
REQUIREMENT: Rome Research Site facilities require modern laboratory and professional office facilities to accomplish its mission.					
CURRENT SITUATION: This buildings facilities are outdated by today's standards. The current facility denies personnel the benefit of a modern office/lab.					
IMPACT IF NOT PROVIDED: The Rome Research Site elements currently housed in Bldg 104 will continue to operate in substandard, inefficient, and outmoded facilities having impact on efficiency and productivity.					

1. COMPONENT AIR FORCE (AFMC)	FY 2001 MILITARY CONSTRUCTION PROJECT DATA (computer generated)			2. DATE	
3. INSTALLATION AND LOCATION EDWARDS AIR FORCE BASE, CALIFORNIA		4. PROJECT TITLE Minor Construction < \$500,000			
5. PROGRAM ELEMENT 65807F	6. CATEGORY CODE 211-183	7. PROJECT NUMBER FSPM992502	8. PROJECT COST (\$000) 495.5		
9. COST ESTIMATES					
ITEM		U/M	QUANTITY	UNIT COST	COST (\$000)
Minor Construction using RDT&E funds for FY2001:					
Multi Axis Thrust Stand (MATS) Pad 17		SF	8,000		495.5
10. DESCRIPTION OF PROPOSED WORK: Construct a reinforced concrete Multi Axis Thrust Stand at Pad 17. Provide utilities to support remote electrical, fueling, and monitoring while test vehicle is on a raised stand. The test stand structure will be procured from NASA AMES at Moffett Field, CA.					
11. REQUIREMENT: Unspecified Minor Construction (13.15.4).					
PROJECT: Construct MATS at Pad 17 .					
REQUIREMENT: Construct a test stand capable of hoisting a test vehicle up to 50' above ground, with a capacity of 60 tons. A new control cab made of concrete masonry units to be placed near the pad. Concrete pad must be reinforced to withstand the weight and thrust of multiple test vehicles with no restrictions. A remotely operated system will monitor the system supplying fuel, electrical, and computer modeling information as testing progresses.					
CURRENT SITUATION: A MATS stand exists at NASA AMES that is not being used. The stand could be transferred to Pad 17, where Dryden Flight Research Facility (DFRF), NASA or Joint Strike Fighter Task Force could utilize the facility in testing the new composite vehicles.					
IMPACT IF NOT PROVIDED: Costs incurred in research and development will continue to rise. Benefits of knowledge gained from a multi-dimensional thrust exhaust nozzle could reduce costs following information gained utilizing the MATS stand at Pad 17.					

1. COMPONENT AIR FORCE (AFMC)	FY 2001 MILITARY CONSTRUCTION PROJECT DATA (computer generated)			2. DATE	
3. INSTALLATION AND LOCATION EGLIN AIR FORCE BASE, FLORIDA			4. PROJECT TITLE Minor Construction < \$500,000		
5. PROGRAM ELEMENT 65807F	6. CATEGORY CODE Multi	7. PROJECT NUMBER Multi	8. PROJECT COST (\$000) 820.0		
9. COST ESTIMATES					
ITEM		U/M	QUANTITY	UNIT COST	COST (\$000)
Minor Construction using RDT&E funds for FY2001:					
FTFA880252 Upgrade Test Project Building		LS			400.0
FTFA971041 Construct Munitions Test Facility		LS			<u>420.0</u>
Total FY2001 Minor Construction					820.0
10. DESCRIPTION OF PROPOSED WORK: Expand existing facility to accommodate test mission and construct a new facility to replace existing munitions test trailers.					
11. REQUIREMENT: Unspecified Minor Construction (13.15.4).					
PROJECT: Multiple Construction projects as described above					
REQUIREMENT: Construction to add new bay for bathrooms and office areas, a new parking lot and loading ramp to accommodate additional munitions test personnel. Construct a new facility to replace three double-wide trailers to support munitions test personnel.					
CURRENT SITUATION: Existing facility cannot accommodate additional personnel and trailers are a very inefficient and costly alternative to a permanent facility.					
IMPACT IF NOT PROVIDED: Test customers cannot be supported and munitions personnel will continue to operate out of inefficient trailer space.					

1. COMPONENT AIR FORCE (AFMC)	FY 2002 MILITARY CONSTRUCTION PROJECT DATA (computer generated)			2. DATE	
3. INSTALLATION AND LOCATION EDWARDS AIR FORCE BASE, CALIFORNIA		4. PROJECT TITLE Minor Construction < \$500,000			
5. PROGRAM ELEMENT 65807F	6. CATEGORY CODE 116-665	7. PROJECT NUMBER FSPM982523	8. PROJECT COST (\$000) 350.0		
9. COST ESTIMATES					
ITEM		U/M	QUANTITY	UNIT COST	COST (\$000)
Minor Construction using RDT&E funds for FY 2002: Construct Joint Strike Force Harrier Pad		LS			350.0
10. DESCRIPTION OF PROPOSED WORK: Construct concrete test pad					
<p>11. REQUIREMENT: Unspecified Minor Construction (13.15.4).</p> <p>PROJECT: Construct Joint Strike Force Harrier Test Pad</p> <p>REQUIREMENT: A Harrier type test pad is required to allow testing of the vertical take off capability of the new Joint Strike Fighter (JSF) aircraft while providing noise and blast attenuation.</p> <p>CURRENT SITUATION: There is no facility available to support this test requirement.</p> <p>IMPACT IF NOT PROVIDED: Lack of this mission critical capability will impede the successful testing of this state-of-the-art aircraft.</p>					

COMBATING TERRORISM

Research, Development, Test and Evaluation, AF	FY98	FY99	FY00	FY01	FY02	FY03	FY04	FY05
BA: 5 - Engineering and Manufacturing Development PE: 0604617 Agile Combat Support	1.1	2.3	0.0	0.7	0.0	0.0	0.0	0.0
BA: 7 - Operational System Development PE: 0305128F Security & Investigative Activities	3.3	1.3	1.4	0.5	0.5	0.5	0.5	0.5
TOTAL COMPONENT	4.4	3.6	1.4	1.2	0.5	0.5	0.5	0.5