

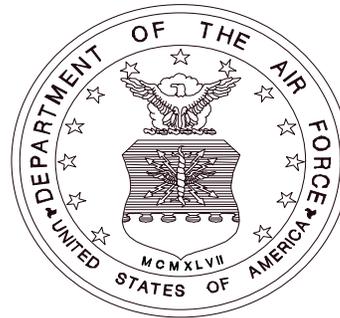
UNCLASSIFIED

DEPARTMENT OF THE AIR FORCE

FISCAL YEAR 2000/2001 BIENNIAL BUDGET ESTIMATES

RESEARCH, DEVELOPMENT, TEST AND EVALUATION

DESCRIPTIVE SUMMARIES



FEBRUARY 1999

VOLUME III

UNCLASSIFIED

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**Fiscal Year 2000/2001 Biennial Budget Estimates
RDT&E Descriptive Summaries, Volume I
February 1999**

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 FY2000/2001 President's Budget Submission (PB). All formats in this document are in accordance with the revised 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 new 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 FY1999 RDT&E program except the classified program elements. The formats and contents of this documents are in accordance with the guidelines and requirement of the Congressional committees insofar as possible.
 - 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 R-2 and R-3 exhibits contained in Volumes I and II are UNCLASSIFIED. Classified R-2 and R-3 exhibits are not included in the submission due to the level of security classification and necessity of special security clearances.

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PROGRAM ELEMENT COMPARISON SUMMARY

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Program Element

Remarks

BUDGET ACTIVITY 1: BASIC RESEARCH

No changes

BUDGET ACTIVITY 2: APPLIED RESEARCH DEVELOPMENT

0602202F, Armstrong Lab Exploratory Development

Environmental noise portion of project 7757 has been realigned to Project 7184 in FY99. Studies in support of Distributed Mission Training has been realigned from Project 7184 to Project 1123 in FY00. Toxicology hazards research program will be realigned from Project 7757 to Project 1710 beginning in FY00. PE 62102F, Project 4349 will realign to project 1900 beginning in FY00.

0602203F, Aerospace Propulsion

Project 3012 terminates in FY00

0602269F, Hypersonic Technology Program

Project 1025 terminates in FY00

0602601F, Phillips Laboratory Exploratory Development

Spectral Sensing efforts currently in Project 3326 moves into Project 8809 in FY00

0602702F, Command, Control and Communication

Project 2338 terminates in FY99 and Project 4600 terminates in FY00.

0602805F, Dual Use Science & Technology

Project 4770 is a FY99 new start

BUDGET ACTIVITY 3: ADVANCE TECHNOLOGY DEVELOPMENT

0603108F, Integrated Data Systems

Project 4427 realigns to PE 0708611F, Project 4427

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0603253F, Advanced Avionics Integration	Project 3833 realigns to Project 2735 beginning in FY99
0603302F, Space & Missile Rocket Propulsion	Project 6339 completes in FY00. Project 6339 terminates in FY00.
0603302F, Space and Missile Rocket Propulsion	Project 003 realigns to PE 0603401F, Project 1026 beginning in FY00.
0603401F, Advanced Spacecraft Technology	Project 4782 realigns to PE 0603856F, 4782 beginning in FY99. Spectral sensing work in PE 0603605F, Project 3150 realigns to Project 3784. Launch vehicle technology realigns from PE 0603302, Project 0003 to Project 1026.
0603707F, Weather Systems Technology	Project 2868 terminates in FY99
0603726F, C3 Subsystem Integration	Project 2863 realigns to Project 69CK, PE 0603203F beginning in FY01

BUDGET ACTIVITY 4: DEMONSTRATION AND VALIDATION

0603441F, Space Based IR Arch (Dem/Val) (Space)	Project 0007 realigns to PE 06044422F
0603690F, Information Operations Technology	Project 4822 is a FY00 new start
0603876F, Space Based Laser (SBL) (Space)	Prior to FY98 program funded in PE 0603173C
0604442F, Space Based IR Arch (EMD)(Space)	Project 4598 is a FY99 new start

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BUDGET ACTIVITY 5: ENGINEERING AND MANUFACTURING DEVELOPMENT

0604201F, Integrated Avionics Planning & Development	Project 2257 completes in FY01; Project 2258 completes in FY98
0604218F, Engine Model Derivative Program	Project 2634 completes in FY98
0604233F, Specialized Undergraduate Pilot Training	Project 4376 completes in FY00
0604270F, Electronic Warfare Development	Project 1011 completes in FY01
0604600F, Munitions Dispenser Development	Project 1015 completes in FY99
0604727F, Joint Standoff Weapons Systems	Project 1000 completes in FY01
0604851F, ICBM - EMD (GRP, PRP, MMRRT)	Project 4788 is an FY00 new start; Project 3085 completes in FY00; Project 4210 completes in FY00

BUDGET ACTIVITY 6: RDT&E MANAGEMENT SUPPORT

0604256F, Threat Simulator Development	Project 7500 is a FY00 new start
0603402F, Space Test Funding	Project 2617 realigns to PE 0605864F

BUDGET ACTIVITY 7: OPERATIONAL SYSTEM DEVELOPMENT

0101120F, Advanced Cruise Missile	Project 4798 is a FY00 new start
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0101122F, Air Launched Cruise Missile	Project 4797 is a FY00 new start
0102411F, North Atlantic Defense System (NADS)	Project 2980 completes in FY00
0102325F, Joint Surveillance System	Project 2996 completes in FY99
0102411F, North Atlantic Defense System	Project 2980 completes in FY99
0207131F, A-10 Squadrons	Project 4809 is a FY99 new start
02027253, Compass Call	Project 4804 is a FY00 new start
0207320F, Sensor Fused Weapons	Project 1016 completes in FY00
0207414F, Combat Intelligence System	Funding for the PE transfers to PE 0207438F, project 4790 in FY00.
0207423F, Advanced Communication System	Project 2982 completes in FY01
0207438F, Theater Battle Management (TMB) C4I	Projects 4287, 4288 and PE 27414, Project 4773 will be consolidated into project 4790 beginning in FY00. Project 4802 was previously funded in FY98 under PE 33152 and in FY99 under PE 33150.
0207601F, USAF Wargaming and Simulation	Projects 1011 and 4566 were transferred to PE 0308601F, beginning in FY99
0208019F, Integrated Broadcast Service	Realigns to PE 0603850F, Project 4778 beginning in FY00
0208031F, WRM-Equipment/Secondary Items	Project 4668 is a FY99 new start

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0302015F, E-4B National Airborne Ops Center	Project 4777 begins in FY99
0303131F, Minimum Essential Emergency Communications	Project 4521 consolidates DIRECT efforts previously being performed in PE 0603851F, Project 1024; 0604851F, Project 13C4; and PE 0303131F, Project 2832.
0303150F, WWMCCS/Global Command and Control Sys	PE 0303152 and 0303150F are consolidated beginning in FY99 and the program title has been changed to Global Command and Control System (GCCS). The DCAPEs effort will be realigned to Project 4802 in PE 27438.
0305099F, Global Air Traffic Management (GATM)	Project 4690 was transferred to PE
0305138F, Inert Upper Stage (IUS)	Project 4053 transfers to PE 0305144F beginning in FY00.
0305205F, Endurance Unmanned Aerial Vehicles	FY98 and FY99 funds are in PE 0305205D, Endurance Unmanned Aerial Vehicles
0305206F, Advanced Technology Development	FY98 and FY99 funds are in PE 0305206D, Airborne Reconnaissance Advanced Development.
0305208F, Distributed Common Ground	FY98 and FY99 funds are in PE 03052086D, Distributed Common Ground Systems (DCGS)
0305906F, NCMC-TW/AA Systems	Project 4806 is a FY00 new start; Project 3880 completes in FY99; Project 4409 completes in FY99
0305910F, Spacetrack (Space)	Project 4791 is a FY00 new start; Project 4241 completes in FY99.

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0305911F, DSP (Space)	Project 3615 completes in FY01
0305917F, Space Architect	Funding prior to FY98 is in PE 0603855F
0305953F, Evolved Expendable Launch Vehicle	Project 4594 terminates in FY99
0308699F, Shared Early Warning System	Project 4838 established to standardize management of ongoing SEW program efforts
0302015F, E-4 National Airborne Operations Center	Project 4777 is a FY99 new start
0401119F, C-5 Airlift Squadrons	Project 4835 is a FY99 new start
0401214F, Air Cargo Materiel Handling	Project 5150 completes in FY00
0708026F, Product/Reliable/Avail/Maintain Prog	Project 4761 realigns to PE 0605011, Project 4685 beginning in FY 99
0708611F, Support Systems Development (SSD)	FY98 funds for Project 4654 is in PE 0603108F, Project 4427

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Manned Destructive Suppression	0207136F	1145
Manned Reconnaissance System	0305207F	1574
Materials	0602102F	41
Medium Launch Vehicles (Space)	0305119F	1452
Milstar LDR/MDR Sat Comm (Space)	0604479F	764
Minimum Essential Emergency Communications Network (MEECN)	0303131F	1347
Mission Planning Systems	0208006F	1297
MILSATCOM Terminals	0303601F	1397
Modeling and Simulation Support	0308601F	1670
Munitions Dispenser Development	0604600F	781
National Airspace System	0305137F	1468
National Polar-orbiting Operational Environmental Satellite System (NPOESS) (Space)	0603434F	428
Navstar Global Pos Sys (User Eq) (Space)	0305164F	1502
NATO Cooperative Research and Development	0603790F	483
NATO JSTARS	1001018F	1774

ALPHABETICAL LISTING

Program Element Title	PE	
PAGE		
NAVSTAR GPS (Space)	0305165F	1514
NCMC-TW/AA SYSTEMS	0305906F	1602
North Atlantic Defense System (NADS)	0102411F	1103
Nuclear Weapons Support	0604222F	638
Nudet Detection System	0305913F	1654
Personnel, Training, and Simulation Technology	0603227F	241
Phillips Laboratory Exploratory Development	0602601F	131
Polar MILSATCOM (Space)	0603432F	424
Pollution Prevention	0605854F	1025
Product/Reliable/Avail/Maintain Prog	0708026F	1738
Ranch Hand II Epidemiology Study	0605306F	995
RAND Project Air Force	0605101F	991
RDT&E FOR AGING AIRCRAFT	0605011F	953
Region/Sector Operations Control Center	0102326F	1095
Rocket System Launch Program (Space)	0605860F	1031
Satellite Control Network (Space)	0305110F	1419
Security and Investigative Activities (S&IA)	0305128F	1458
Seek Eagle	0207590F	1273
Sensor Fuzed Weapon (SFW)	0207320F	1189
Shared Early Warning System	0308699F	1682
Space and Missile Rocket Propulsion	0603302F	279
Space Architect	0305917F	1660
Space Based Infrared Sys(SBIRS) Low	0604442F	760
Space Based IR Arch (Dem/Val) (Space)	0603441F	441
Space Based IR Arch (EMD) (Space)	0604441F	754

ALPHABETICAL LISTING

Program Element Title	PE	
PAGE		
Space Based Laser (SBL) (Space)	0603876F	378
Space Control Technology	0603438F	435
Space Systems Environmental Interactions Technology	0603410F	317
Space Test Program (Space)	0603402F	957
Space Test Program (Space)	0605864F	1035
Spacelift Range System	0305182F	1522
Spacetrack (Space)	0305910F	1622
Specialized Undergraduate Pilot Trng	0604233F	680
Submunitions	0604604F	803
Support Systems Development (SSD)	0708611F	1756
Tactical Aim Missile	0207161F	1157
Tactical Terminals	0305158F	1486
Target Systems Development	0604258F	974
Test And Evaluation Spt	0605807F	1009
Theater Air Control System	0207412F	1203
Theater Battle Management (TBM) C4I	0207438F	1238
Theater Missile Defense	0208060F	1317
Threat Simulator Development	0604256F	961
Titan Space Launch Vehicles (Space)	0305144F	1480
USAF Modeling And Simulation	0207601F	1279
Variable Stability In-Flight Simulation Test Aircraft	0604237F	598
Wargaming and Simulation Centers	0207605F	1291
Weather Service	0305111F	1427
Weather Systems Technology	0603707F	344
Wideband MILSATCOM (Space)	0603854F	570

ALPHABETICAL LISTING

Program Element Title	PE	
PAGE		
WRM-Equipment/Secondary Items	0208031F	1311
WWMCCS/Global Command and Control System	0303150F	1391

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207134F F-15E Squadrons	PROJECT 0131
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
0131 Initial Operational Test and Evaluation	120,713	103,857	112,670	100,330	93,221	50,182	73,279	74,804	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

The F-15E is the most versatile fighter in the world today. Configured with conformal fuel tanks (CFTs), the F-15E can deploy worldwide with minimal tanker support and arrive combat-ready. The F-15E retains air superiority capability and adds systems, such as Low Altitude Navigation Targeting Infrared for Night (LANTIRN), to meet the requirement for all-weather, deep penetration, and night/under-the-weather, air-to-surface attack. However, the threat includes a new generation of aircraft possessing all-weather detection and kill capabilities. The F-15E's avionics, armament, airframe, and engines must be improved to maintain its superiority against the threat into the next century. Avionics updates, exploiting proven technological advances will be incorporated into the F-15E providing expanded capability and supporting an updated and fully integrated electronic warfare suite. This will increase the offensive and defensive capability and survivability of the F-15E. The F-15E PE also funds RDT&E activities for PE # 0207130, F-15A-D.

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

- (U) \$33,249 Continued Operational Flight Program (OFP) development efforts.
- (U) \$19,946 Completed development and improvements of the APG-63 radar.
- (U) \$23,370 Continued flight test of the OFP and flight testing of improvements initiated in prior years.
- (U) \$12,900 Continued development of ALQ-135, Band 1.5
- (U) \$6,302 Continued improvements attributed to Diminishing Manufacturing Sources (DMS).
- (U) \$4,140 Integration of the Joint Helmet Mounted Cueing System (JHMCS).
- (U) \$14,600 Development of the Link-16 data link for the F-15E.
- (U) \$2,360 Tactical Electronic Warfare System Integrated Support System (TISS) Computer Upgrade
- (U) \$1,790 Development of the Combat Identification (ID) System.
- (U) \$ 600 Repaired government furnished equipment used for R&D.
- (U) \$1,456 Continued development of Programmable Armament Control Set (PACS) upgrade.
- (U) \$120,713 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational System Development	0207134F F-15E Squadrons	0131
<p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$35,495 Continue OFP development efforts. - (U) \$3,042 Complete development and improvements of the APG-63 radar - (U) \$18,975 Continue flight test of the OFP and flight testing of improvements initiated in prior years. - (U) \$4,800 Complete development of the Link-16 Data Link for the F-15E. - (U) \$7,394 Continue development of the ALQ-135 Band 1.5. - (U) \$9,876 Continue developments attributed to DMS. - (U) \$6,770 Continue development of the Combat ID System. - (U) \$4,243 Continue development of the JHMCS. - (U) \$2,900 Initiate development of the Air Data Processor (ADP) Upgrade. - (U) \$3,667 Continue integration of Smart Weapons (formerly PACS upgrade) capability into F-15E - (U) \$2,800 Continue development of Advanced Display Core Processor (ADCP) (formerly OFP effort) - (U) \$740 Continue TISS Computer Upgrade - (U) \$3,155 Identified as a source for SBIR - (U) \$103,857 Total <p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$40,528 Continue OFP development efforts. - (U) \$12,403 Continue flight test of the OFP and flight testing of improvements initiated in prior years. - (U) \$22,830 Continue development of Advanced Display Core Processor (ADCP). - (U) \$13,810 Continue integration of the Smart Weapons [formerly PACS upgrade]. - (U) \$7,800 Continue developments attributed to DMS. - (U) \$9,129 Continue development of the Combat ID System. - (U) \$3,980 Continue integration of the JHMCS. - (U) \$1,790 Complete upgrade of the Air Data Processor (ADP). - (U) \$400 Continue TISS Computer Upgrade - (U) \$112,670 Total 		
Project 0131	Page 2 of 9 Pages	Exhibit R-2 (PE 0207134F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1999																																																												
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207134F F-15E Squadrons	PROJECT 0131																																																												
<p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$18,276 Continue OFP development efforts. - (U) \$14,390 Continue flight test of the OFP and flight testing of improvements initiated in prior years. - (U) \$34,910 Continue development of Advanced Display Core Processor (ADCP). - (U) \$23,030 Continue integration of the Smart Weapons. - (U) \$8,000 Continue developments attributed to DMS. - (U) \$1,724 Continue development of the Combat ID System. - (U) \$100,330 Total <p>(U) B. Budget Activity Justification: The F-15E, which received contract award approval in FY84, is an operational aircraft and therefore the development activities in the Program Element are included in Budget Activity 7, Operational Systems Development.</p> <p>(U) C. Program Change Summary (\$ in Thousands)</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;"></th> <th style="text-align: right;"><u>FY 1998</u></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 1999 PB</td> <td style="text-align: right;">129,774</td> <td style="text-align: right;">104,207</td> <td style="text-align: right;">119,753</td> <td style="text-align: right;">107,272</td> <td style="text-align: right;">Continuing</td> </tr> <tr> <td>(U) Appropriated Value</td> <td style="text-align: right;">137,538</td> <td style="text-align: right;">104,207</td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Adjustments to Appropriated Value</td> <td></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: right;">-4,519</td> <td style="text-align: right;">-350</td> <td></td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">b. SBIR</td> <td style="text-align: right;">-3,263</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">c. Omnibus or Other Above Threshold Reprogram</td> <td style="text-align: right;">-7,782</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">d. Below Threshold Reprogramming</td> <td style="text-align: right;">-1,261</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Adjustments to Budget Years Since FY 1999 PB</td> <td></td> <td></td> <td style="text-align: right;">-7,083</td> <td style="text-align: right;">-6,942</td> <td></td> </tr> <tr> <td>(U) Current Budget Submit/FY 2000 PB</td> <td style="text-align: right;">120,713</td> <td style="text-align: right;">103,857</td> <td style="text-align: right;">112,670</td> <td style="text-align: right;">100,330</td> <td style="text-align: right;">Continuing</td> </tr> </tbody> </table>				<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>	(U) Previous President's Budget FY 1999 PB	129,774	104,207	119,753	107,272	Continuing	(U) Appropriated Value	137,538	104,207				(U) Adjustments to Appropriated Value						a. Congressional/General Reductions	-4,519	-350				b. SBIR	-3,263					c. Omnibus or Other Above Threshold Reprogram	-7,782					d. Below Threshold Reprogramming	-1,261					(U) Adjustments to Budget Years Since FY 1999 PB			-7,083	-6,942		(U) Current Budget Submit/FY 2000 PB	120,713	103,857	112,670	100,330	Continuing
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>																																																									
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Project 0131	Page 3 of 9 Pages	Exhibit R-2 (PE 0207134F)																																																												

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0207134F F-15E Squadrons				PROJECT 0131		
<p>(U) Significant Program Changes: Funding (FY99): Air Data Processor (ADP) (\$2,900) - This development funds ADP which replaces five non-supportable avionics subsystems: Air Data Computer, two Electronic Air Inlet Controllers, Pressure Sensor Assembly and Flap Blow Up Switch. Smart Weapons (\$3,667) - The Smart Weapons/PACS integration modifies existing system Programmable Armament Control System to support air to ground weapons. Advance Display Core Processor (ADCP)(\$2,800) – ADCP modification combines Multi Purpose Display Processor and the VHSIC Central Computer into one Line Replaceable Unit FY99: \$3,155 identified as a source for SBIR</p>										
(U) D. <u>Other Program Funding Summary (\$ in Thousands)</u>										
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To Compl</u>	<u>Total Cost</u>
(U) Aircraft Procurement (3010F), Line Item 5, F-15E (PE27134F) [BP 10]	213,954	0	0	0	0	0	0	0	0	213,954
(U) Aircraft Procurement (3010F), Line Item 27, F-15A-E (PEs 27130F and 27134F) [BP 11]	173,649	240,720	263,490	312,939	256,207	292,794	275,642	54,035	Continuing	Continuing
(U) Aircraft Procurement (3010F), Line Item 27, F-15 (PE27442F) [IDECM]	0	0	0	0	8,233	21,670	22,239	22,692	Continuing	Continuing
(U) Aircraft Procurement (3010F), Line Item 66, F-15A-E [BP 13]	5,950	7,118	7,398	7,451	7,557	7,772	7,976	8,138	Continuing	Continuing
(U) E. <u>Acquisition Strategy:</u>										
<p>Program is a continuation of effort which includes the development of all F-15 models. Funds are executed organically in support of equipment improvement, study, analysis, and test.</p>										
Project 0131			Page 4 of 9 Pages				Exhibit R-2 (PE 0207134F)			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)											DATE								
BUDGET ACTIVITY											February 1999								
7 - Operational System Development						PE NUMBER AND TITLE					PROJECT								
						0207134F F-15E Squadrons					0131								
(U) F. <u>Schedule Profile</u>																			
		<u>FY 1998</u>					<u>FY 1999</u>					<u>FY 2000</u>					<u>FY 2001</u>		
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4			
(U) JHMCS Developmental Testing start	*																		
(U) JHMCS Operational Testing start							X												
(U) Smart Weapons EMD start						X													
(U) Smart Weapons DT&E start															X				
(U) Operational Flight Program (OFP) Suite 3																			
(U) MSIP OT&E complete	*																		
(U) E-model OT&E start	*																		
(U) MSIP release				*															
(U) E-model release				*															
(U) OFP Suite 4 start			*																
(U) OFP Suite 4 complete																	X		
(U) OFP Suite 4 VHSIC Central Computer Critical Design Review							X												
(U) APG-63 ground integration test start	*																		
(U) APG-63 DT flight test start	*																		
(U) APG-63 IOT&E complete													X						
(U) APG-63 OT flight test start				*															
(U) Link-16 flight test start						X													
(U) Link-16 flight test complete													X						
(U) Combat ID DT start						X													
(U) ALQ-135, Band 1.5 DT&E start			*																
(U) ALQ-135, Band 1.5 OT start						X													
(U) TISS Computer Upgrade EMD complete																	X		
(U) Air Data Processor EMD start						X													
(U) Air Data Processor EMD complete												X							

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207134F F-15E Squadrons	PROJECT 0131
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(U) A. Project Cost Breakdown (\$ in Thousands)

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) Flight Test	23,370	18,975	12,403	14,390
(U) OFP	33,249	35,495	40,528	18,276
(U) Link-16 Data Link	14,600	4,800	0	0
(U) APG-63(V)1	19,946	3,042	0	0
(U) Joint Helmet Mounted Cueing System	4,140	4,243	3,980	0
(U) GFE/GFP Repair	600	0	0	0
(U) DMS (Parts Obsolescence)	6,302	9,876	7,800	8,000
(U) PACS Upgrade	1,456	0	0	0
(U) Smart Weapons	0	3,667	13,810	23,030
(U) Advance Display Core Processor (ADCP)	0	2,800	22,830	34,910
(U) Combat ID	1,790	6,770	9,129	1,724
(U) ALQ-135 Band 1.5	12,900	7,394	0	0
(U) Air Data Processor	0	2,900	1,790	0
(U) TISS Computer Upgrade	2,360	740	400	0
(U) Identified as a source for SBIR		3,155		
(U) Total	120,713	103,857	112,670	100,330

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development						PE NUMBER AND TITLE 0207134F F-15E Squadrons				PROJECT 0131	
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	<u>Budget</u> FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR							3,155				3,155
<u>Product Development Organizations</u>											
P&W (-229 Eng)	CPAF	Sep 94	6,520	6,520	6,520	0	0	0	0	0	6,520
GE (-129 Eng)	CPAF	Feb 95	7,130	7,130	7,130	0	0	0	0	0	7,130
Boeing (GFE/GFP)	FFP	Dec 93	1,975	1,975	1,375	600	0	0	0	0	1,975
OFP Suite 4/5/6 Development	CPAF	May 98	313,043	313,043	71,302	33,249	35,495	40,528	18,276	Continuing	Continuing
Boeing APG63 (Feasibility Study)	CPFF	Feb 94	778	778	778	0	0	0	0	0	778
(Risk Reduction)	CPFF	Feb 94	9,892	9,892	9,892	0	0	0	0	0	9,892
(EMD)	CPAF	Sep 94	225,494	225,494	202,506	19,946	3,042	0	0	0	225,494
Boeing (JHMCS A-D)	CPAF		12,363	12,363		4,140	4,243	3,980	0	0	12,363
PACS Upgrade	CPAF	May 95	27,410	27,410	26,887	1,456	0	0	0	0	28,343
Wright Lab (DMS)	MIPR/PRs	Sep 94	91,785	91,785	18,009	6,302	9,876	7,800	8,000	Continuing	Continuing
Smart Weapons Integration	CPAF	Feb 99	49,667	49,667	0	0	3,667	13,810	23,030	Continuing	Continuing
ADP(E)	CPAF	Jan 99	4,690	4,690	0	0	2,900	1,790	0	0	4,690
ADCP(E)	CPAF	May 99	96,941	96,941	0	0	2,800	22,830	34,910	Continuing	Continuing
NGA (ALQ-135 Band 1.5)	FFP	May 97	35,294	35,294	15,000	12,900	7,394	0	0	0	35,294
Project 0131						Page 7 of 9 Pages			Exhibit R-3 (PE 0207134F)		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development						PE NUMBER AND TITLE 0207134F F-15E Squadrons				PROJECT 0131	
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Link-16 Data Link	CPAF	Apr 98	19,400	19,400	0	14,600	4,800	0	0	0	19,400
Combat ID	CPAF	May 98	34,331	34,331	0	1,790	6,770	9,129	1,724	Continuing	Continuing
TISS Replacement	CPFF	Aug 97	4,700	4,700	1,200	2,360	740	400	0	0	4,700
<u>Support and Management Organizations</u>											
(Msn Spt) Misc.					16,708	0	0	0	0	0	16,708
<u>Test and Evaluation Organizations</u>											
Boeing (Flt Test)	FFP	Oct 96			41,315	10,500	9,000	7,790	9,139	Continuing	Continuing
Edwards (OFP)	PO	Oct 96			31,492	10,070	9,975	3,453	3,938	Continuing	Continuing
Eglin (Flt Test)	PO	Oct 96			9,410	2,800	0	1,160	1,313	Continuing	Continuing

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)						DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development			PE NUMBER AND TITLE 0207134F F-15E Squadrons			PROJECT 0131	
(U) B. Budget Acquisition History and Planning Information (Continued \$ in Thousands)							
Government Furnished Property:							
Not applicable							
	Total						
	<u>Prior to</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
	<u>FY 1998</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
Identified as a source for SBIR			3,155				3,155
Subtotal Product Development	360,599	97,343	81,727	100,267	85,940	Continuing	Continuing
Subtotal Support and Management	16,708					Continuing	Continuing
Subtotal Test and Evaluation	82,217	23,370	18,975	12,403	14,390	Continuing	Continuing
Total Project	459,524	120,713	103,857	112,670	100,330	Continuing	Continuing

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 EXHIBIT)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207136F Manned Destructive Suppression	PROJECT 4595
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4595 F-16 HARM Targeting System (HTS)	11,659	2,392	5,402	1,472	1,470	1,468	1,466	1,465	0	67,370
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

The overall Manned Destructive Suppression (MDS) program funds the development, procurement and sustainment of the Air Force's lethal Suppression of Enemy Air Defenses (SEAD) capability. The program provides certain F-16 aircraft the capability to carry and employ the AGM-88 High-Speed Anti-Radiation Missile (HARM). The F-16C/Blk 50 has been modified to carry the AN/ASQ-213 HARM Targeting System (HTS) for real-time targeting, and "range known" HARM employment - the missile's most lethal mode. RDT&E effort is focused on making the HTS system more capable in advanced threat environments, incorporating precision targeting capability, reducing support costs and extending service life.

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

- (U) \$6,128 Continued Engineering and Manufacturing Development (EMD) of HTS Upgrade Development
- (U) \$858 Developed HTS Air Force Mission Support System (AFMSS) modifications
- (U) \$4,037 Continued HTS Test and Evaluation
- (U) \$636 Continued Mission Support
- (U) \$11,659 Total

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

- (U) \$307 Complete Development of HTS Air Force Mission Support System (AFMSS) modifications
- (U) \$1,671 Continue HTS Test and Evaluation
- (U) \$409 Continue Mission Support
- (U) \$5 Identified as a Source for SBIR
- (U) \$2,392 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational System Development	0207136F Manned Destructive Suppression	4595
<p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none">- (U) \$3,902 Initiate HTS R7 Upgrade Study- (U) \$1,500 Continue Mission Support- (U) \$5,402 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none">- (U) \$1,472 Continue Mission Support- (U) \$1,472 Total <p>(U) B. <u>Budget Activity Justification:</u></p> <p>This PE is in Budget Activity 7 - Operational System Development because it supports upgrade development of F-16 HTS, a fielded system.</p>		
Project 4595	Page 2 of 6 Pages	Exhibit R-2 (PE 0207136F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)					DATE					
BUDGET ACTIVITY					February 1999					
7 - Operational System Development			PE NUMBER AND TITLE		PROJECT					
			0207136F Manned Destructive Suppression		4595					
(U) C. Program Change Summary (\$ in Thousands)										
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>					
(U) Previous President's Budget (FY 1999 PB)	12,259	2,443	0	0	55,278					
(U) Appropriated Value	13,561									
(U) Adjustments to Appropriation										
a. Congressional/General Reductions	-474	-51								
b. SBIR	-568									
c. Omnibus and Other Above Threshold	-288									
Reprogramming										
d. Below Threshold Reprogramming	-572									
(U) Adjustment to Budget Years since FY 1999 PB			5,402	1,472						
(U) Current Budget Submit/FY 2000 President's Budget	11,659	2,392	5,402	1,472	67,370					
Significant Program Changes:										
Funding was added to HARM Targeting System RDT&E effort in FY 2000 to initiate HTS R7 upgrade study and development. Upgrade effort will focus on giving HTS better capability to counter new threats, adding precision targeting capabilities, reducing future support cost and extending system life.										
FY 1999: \$5 Identified as a source for SBIR.										
(U) D. Other Program Funding Summary (\$ in Thousands)										
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To Compl</u>	<u>Total Cost</u>
(U) HTS Aircraft Procurement (BP11)AF PE 0207136F	11,866	5,738								19,679
(U) HTS Aircraft Procurement (BP19)AF PE 0207136F		10,054								26,257

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)											DATE February 1999																																																																																																																																																																																																													
BUDGET ACTIVITY 7 - Operational System Development						PE NUMBER AND TITLE 0207136F Manned Destructive Suppression						PROJECT 4595																																																																																																																																																																																																												
<p>(U) E. <u>Acquisition Strategy:</u></p> <p>The HTS program objective is to develop an enhanced HARM Targeting System capability that improves HARM effectiveness on F-16C/Blk 50 aircraft. The objective will be accomplished by EMD efforts that significantly upgrade and increase the aircraft real-time, reactive Suppression of Enemy Air Defenses (SEAD).</p> <p>(U) F. <u>Schedule Profile</u></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:25%;"></th> <th colspan="4" style="text-align: center;"><u>FY 1998</u></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="4" style="text-align: center;"><u>FY 2001</u></th> </tr> <tr> <th></th> <th>1</th><th>2</th><th>3</th><th>4</th> <th>1</th><th>2</th><th>3</th><th>4</th> <th>1</th><th>2</th><th>3</th><th>4</th> <th>1</th><th>2</th><th>3</th><th>4</th> </tr> </thead> <tbody> <tr> <td>(U) Complete F-16 HTS Upgrade Development</td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td>X</td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> </tr> <tr> <td>(U) Initiate F-16 HTS R7 Development</td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td>X</td> <td></td><td></td><td></td><td></td> </tr> <tr> <td>(U) New Buy Lot 2 Contract Award</td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td>*</td> </tr> <tr> <td>(U) Retrofit Component Prod Contract Award</td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td>*</td> </tr> <tr> <td>(U) Retrofit Installation</td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td>X</td> <td></td><td></td><td></td><td>X</td> <td></td><td></td><td></td><td></td> </tr> <tr> <td>(U) New Buy Lot 1 Pod Deliveries</td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td>*</td> </tr> <tr> <td>(U) New Buy Lot 2 Pod Deliveries</td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td>X</td> <td></td><td>X</td><td></td><td></td> </tr> <tr> <td>(U) New Buy Lot 3 Contract Award</td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td>X</td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> </tr> <tr> <td>(U) New Buy Lot 3 Pod Deliveries</td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td>X X</td> </tr> <tr> <td>(U) R6 Fielding</td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td>X</td> <td></td><td></td><td></td><td>X</td> <td></td><td></td><td></td><td></td> </tr> </tbody> </table> <p>* = Completed Event X = Planned Event</p>														<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>					1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	(U) Complete F-16 HTS Upgrade Development								X									(U) Initiate F-16 HTS R7 Development												X					(U) New Buy Lot 2 Contract Award																*	(U) Retrofit Component Prod Contract Award																*	(U) Retrofit Installation								X				X					(U) New Buy Lot 1 Pod Deliveries																*	(U) New Buy Lot 2 Pod Deliveries												X		X			(U) New Buy Lot 3 Contract Award								X									(U) New Buy Lot 3 Pod Deliveries																X X	(U) R6 Fielding								X				X				
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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207136F Manned Destructive Suppression	PROJECT 4595
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(U) A. Project Cost Breakdown (\$ in Thousands)

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) HTS Upgrade Project				
(U) HTS Pod Development	6,128	0	0	0
(U) Develop HTS Air Force Mission Support System (AFMSS) modifications	858	307	0	0
(U) Test & Evaluation	4,037	1,671	0	0
(U) HTS R7 Upgrade Study			3,902	0
(U) Mission Support	636	409	1,500	1,472
(U) Identified as a source for SBIR	0	5	0	0
(U) Total	11,659	2,392	5,402	1,472

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0207136F Manned Destructive Suppression					PROJECT 4595	
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR								5			5
<u>Product Development Organizations</u>											
Raytheon/TI Systems	SS/FFP	Various	6,808	6,808	6,808	0	0	3,902	0	0	10,710
Raytheon/TI Systems	SS/CPAF	Feb 96	24,803	24,803	24,803	6,128	0	0	0	0	30,931
AFMSS	SS/CPIF	Various			914	858	307	0	0	0	2,079
Lockheed/Ft Worth	SS/FFP	Various	2,400	2,400	2,400	0	0	0	0	0	2,400
<u>Support and Management Organizations</u>											
Prog. Mgt. and Mission Support	Various	Various			3,314	636	409	1,500	1,472	5,869	13,200
<u>Test and Evaluation Organizations</u>											
Eglin	PO	Various			901	966	595	0	0	0	2,462
Edwards	PO	Various			514	3,071	1,076	0	0	0	4,661
Light Defender		Various			922	0	0	0	0	0	922
Government Furnished Property: Not Applicable.											
Identified as a source for SBIR								5			5
Subtotal Product Development					34,925	6,986	307	3,902	0	0	46,120
Subtotal Support and Management					3,314	636	409	1,500	1,472	5,869	13,200
Subtotal Test and Evaluation					2,337	4,037	1,671	0	0	0	8,045
Total Project					40,576	11,659	2,392	5,402	1,472	5,869	67,370
Project 4595											

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207141F F-117A Squadrons	PROJECT 3956
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
3956 F-117A Stealth Fighter	8,902	5,097	4,807	2,847	2,312	3,562	10,161	7,222	1,067	61,428
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

The F-117 is the world's first operational low-observable (LO) combat aircraft. Its combination of stealth and precision weapons delivery capability allows the United States Air Force to hold even the most highly defended targets at risk. The program completed production in Jul 1990 with the delivery of the final F-117 (number 59). The single operational F-117 unit is the 49th Fighter Wing stationed at Holloman AFB, NM. The program is now primarily engaged in sustainment activities for the F-117 which is projected to remain in service through at least 2018. This program provides funds to develop improved systems to enhance combat capability while maintaining a safe, reliable and supportable aircraft.

This project provides research and development for multiple modifications to the F-117 weapons system. The MIL-STD-1760 Stores Management Processor (SMP) development continues in FY99 and is expected to be complete in FY00. The SMP modification is an essential pre-requisite for integration of advanced weapons on the F-117. Development efforts for Smart Weapons Integration, providing Joint Direct Attack Munition (JDAM) and the Wind Corrected Munitions Dispenser (WCMD) capabilities on the F-117, began in FY98 using FY97 funds originally planned for the Ozone Depleting Chemical modification. The Single Configuration Fleet (SCF) program reduces F-117 ownership costs by standardizing the F-117 fleet to a single optimized spray/sheet coating and edge configuration. The program strips the current radar absorbing materials (RAM), re-coats the aircraft with a more durable spray RAM and reduces the maintenance required for LO restoration after service panel access. A robotic application system for spray RAM has been developed to reduce installation costs and improve the quality of surface coatings. SCF development concluded in FY99 and the modification effort has started. Development efforts begin in FY02 on Fuel Quantity Processor hardware replacement to reduce fuel system maintenance requirements. Finally, development begins in FY04 to provide the F-117 with an Enhanced GBU-27 capability.

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

- (U) \$4,544 Continued development work on Stores Management Processor (SMP)
- (U) \$4,358 Completed development work on Single Configuration Fleet (SCF) in Jan 99
- (U) \$8,902 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational System Development	0207141F F-117A Squadrons	February 1999 3956
<p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none">- (U) \$4,924 Continue development work on Stores Management Processor (SMP)- (U) \$ 173 Identified as a source for SBIR- (U) \$5,097 Total <p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none">- (U) \$2,360 Complete development work on SMP- (U) \$2,447 Continue development work on Smart Weapons Integration- (U) \$4,807 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none">- (U) \$2,847 Continue development work on Smart Weapons Integration- (U) \$2,847 Total <p>(U) B. <u>Budget Activity Justification:</u></p> <p>This program is in budget activity 7, Operational System Development, because all aircraft have been delivered and the program is in its deployment phase.</p>		
Project 3956	Page 2 of 6 Pages	Exhibit R-2 (PE 0207141F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207141F F-117A Squadrons	PROJECT 3956
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(U) C. Program Change Summary (\$ in Thousands)

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U) Previous President's Budget: (FY 1999 PB)	8,964	5,147	4,896	2,903	55,589
(U) Appropriated Value	9,520	5,147			
(U) Adjustments to Appropriated Value					
a. Congressional/General Reductions	-311	-50			
b. SBIR	-246				
c. Omnibus or Other Above Threshold Reprogram	-61				
d. Below Threshold Reprogramming					
(U) Adjustments to Budget Years Since FY 1999 PB			-89	-56	
(U) Current Budget Submit/FY 2000 President's Budget	8,902	5,097	4,807	2,847	61,428

(U) Significant Program Changes:

Smart Weapons Integration development efforts began in Sep 98 using \$350K of FY97 funds originally planned for the Ozone Depleting Chemical modification, which has been cancelled due to increased cost. FY 98 and FY99 funding was redirected to support higher priority programs. Program funding for Smart Weapons Integration resumes in FY00.

FY99: \$173 identified as a source for SBIR

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

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To Compl</u>	<u>Total Cost</u>
(U) Aircraft Procurement (BA-5), Appn 3010/BP1100, AF F117A Squadrons, PE 27141F	24,898	25,570	34,646	29,580	28,172	21,808	11,955	776	TBD	TBD

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207141F F-117A Squadrons	PROJECT 3956
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(U) **E. Acquisition Strategy:** RDT&E funds are executed to develop improved capability, maintenance and safety modification development efforts. Operational Flight Program (OFP) software is continuously updated (Block Cycle Update every 2 years) to complement modification development efforts. The contracting approach varies by individual effort and involves Firm Fixed Price (FFP), Cost Plus Fixed Fee (CPFF), and Cost Plus Award Fee (CPAF) contract types.

(U) **F. Schedule Profile**

	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) Stores Management Processor (SMP) (RDT&E Started Jul 96, Finishes Mar 00; Retrofit Starts Apr 00, Finishes Sep 04)												X				
(U) Single Configuration Fleet (SCF) (RDT&E Started Apr 96, Finishes Jan 99; Retrofit Starts FY99/2, Finishes FY05)							*									
(U) Smart Weapons Integration (RDT&E Starts Sep 98, Finishes Sep 05)								*								
(U) Fuel Quantity Processor (RDT&E Starts FY 02, Finishes FY 04; Retrofit Starts FY04, Finishes FY06)																
(U) Enhanced GBU-27 (RDT&E Starts FY04, Finishes FY06)																

* = Completed event
X = Planned event

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1999				
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0207141F F-117A Squadrons			PROJECT 3956				
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
			<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>					
(U)	Development work on SMP (MIL-STD-1760)		4,544	4,924	2,360						
(U)	Development work on SCF (RAM Recoating)		4,358								
(U)	Smart Weapons Integration				2,447	2,847					
(U)	Identified as a source for SBIR			173							
(U)	Total		8,902	5,097	4,807	2,847					
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
	Contract										
	Method/Type										
	or Funding										
	Award or										
	Obligation										
	Performing										
	Activity										
	Project										
	Office										
	Total										
	Prior to										
	FY 1998										
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	FY 1999										
	Budget										
	FY 2000										
	Budget										
	FY 2001										
	Budget										
	to Compl										
	Total										
	Program										
	173										
	173										
<u>Product Development Organizations</u>											
SMP (MIL-STD-1760 modification)											
	CPAF	Jul 98	18,478	18,478	6,650	4,544	4,924	2,360	0	0	18,478
	Lockheed Martin Skunk Works, Palmdale CA										
Single Configuration Fleet (RAM Recoat Modification)											
	AF 616	Apr 96	329	329	329	0	0	0	0	0	329
	Wright Laboratory, Signature technology office										
	MIPR	Jan 98	4,751	4,751	3,284	1,467	0	0	0	0	4,751
	Sandia Labs, Albuquerque NM										
	T&M	Apr 98	5,590	5,590	2,699	2,891	0	0	0	0	5,590
	Lockheed Martin Skunk Works, Palmdale CA										
Project 3956											
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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE	
BUDGET ACTIVITY										PROJECT	
7 - Operational System Development										3956	
PE NUMBER AND TITLE											
0207141F F-117A Squadrons											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Compl	Total Program
Ozone Depleting Chemical Modification	CPFF	Sep 97	2,139	2,139	2,139	0	0	0	0	0	2,139
Lockheed Martin Skunk Works (Ozone), Palmdale CA											
Smart Wpn Integration	CPAF	Sep 98	21,880	21,880	350	0	0	2,447	2,847	16,236	21,880
Lockheed Martin Skunk Works, Palmdale CA											
Fuel Quantity Processor	TBD	FY 02	TBD	TBD	0	0	0	0	0	938	938
Contractor TBD											
Enhanced GBU-27	TBD	FY 04	TBD	TBD	0	0	0	0	0	7,150	7,150
Contractor TBD											
<u>Support and Management Organizations</u>											
Not Applicable											
<u>Test and Evaluation Organizations</u>											
Not Applicable											
(U) B. Budget Acquisition History and Planning Information Continued (\$ in Thousands)											
Government Furnished Property:											
Not Applicable											
Identified as a source for SBIR								173			173
Subtotal Product Development					15,451	8,902	4,924	4,807	2,847	24,324	61,255
Subtotal Support and Management					0	0	0	0	0	0	0
Subtotal Test and Evaluation					0	0	0	0	0	0	0
Total Project					15,451	8,902	5,097	4,807	2,847	24,324	61,428
Project 3956											
Page 6 of 6 Pages											
Exhibit R-3 (PE 0207141F)											

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207161F Tactical Aim Missile	PROJECT 4132
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4132 AIM-9 Product Improvement	51,199	52,604	41,007	17,399	2,639	4,890	16,610	5,898	0	240,212
Quantity of RDT&E Articles	0	5	17	1	0	0	0	0	0	23

Note: The RDT&E articles are deliverables under the Engineering and Manufacturing Development contract and are not separately priced. Quantities are delivered in the indicated Fiscal Years.

(U) A. Mission Description

The AIM-9X (Sidewinder) short range air-to-air missile modification program provides a launch and leave, air combat munition that uses passive infrared (IR) energy for acquisition and tracking of enemy aircraft and complements the Advanced Medium Range Air-to-Air Missile. Air superiority in the short range air-to-air missile arena is essential and includes first shot, first kill opportunity against an enemy employing IR countermeasures. Improvements in missile seeker and kinematics allow retrofit of components to current missiles to the maximum extent possible. Anti-Tamper features will be incorporated to protect improvements inherent in this design. Retrofitting of components will extend the operational effectiveness of existing inventories at an affordable cost while continuing evolution of the AIM-9 series. AIM-9X is an Acquisition Category ID (ACAT ID) joint-service program with Navy lead.

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

- (U) \$35,080 Continued manufacturing development, conducted Design Review II (DR II) and flew captive test units, started delivery of safe separation vehicles for Development Test IIB (DT-IIB) (Safe Separations)
- (U) \$5,144 Continued providing aircraft interface information to Engineering and Manufacturing Development (EMD) contractor to include any available wind tunnel tests for the F-15 and F-18
- (U) \$3,535 Continued preparations for and initiated DT-IIB
- (U) \$7,440 Provided for consulting services, technical engineering, and management support
- (U) \$51,199 Total

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

- (U) \$31,505 Continue the manufacturing development contract and accept delivery of 5 test articles
- (U) \$6,602 Continue providing aircraft interface to the EMD contractor, incorporate results of wind tunnel test for the F-15 and F-18
- (U) \$9,154 Continue DT-IIB, and start DT-IIC (Guided Launches), Operational Test IIA (OT-IIA) (Guided Launches), and conduct insensitive munitions tests
- (U) \$3,744 Provide for consulting services, technical engineering, and management support
- (U) \$1,599 Identified as source for SBIR
- (U) \$52,604 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational System Development	0207161F Tactical Aim Missile	4132
<p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$19,635 Continue the manufacturing development contract to include Technical Readiness Review (TRR) , Performance Readiness Review (PRR) leading to an Low Rate Initial Production (LRIP) award in 2nd Qtr FY00 and accept delivery of 17 test articles - (U) \$1,300 Continue providing aircraft interface to the Engineering and Manufacturing Development (EMD) contractor in support of Operational Test-IIA (OT-IIA) and DT-IIID (Launches); complete Development Test-IIC (DT-IIC) - (U) \$14,343 Continue providing government flight test support through implementation of OT-IIA and DT-IIID - (U) \$5,729 Provide for consulting services, technical engineering, and management support - (U) \$41,007 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$8,946 Continue the manufacturing development contract and accepted delivery of 1 articles - (U) \$1,181 Continue providing aircraft interface to the EMD contractor - (U) \$4,831 Continue providing government flight test support through implementation of DT-IIID and OT-IIB (Launches) - (U) \$2,441 Provide for consulting services, technical engineering, and management support - (U) \$17,399 Total <p>(U) B. Budget Activity Justification: This program is in budget activity 7 - Operational System Development, since the AIM-9X is a long-term evolution to the AIM-9M, a fielded system.</p>		
Project 4132	Page 2 of 6 Pages	Exhibit R-2 (PE 0207161F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)					DATE February 1999					
BUDGET ACTIVITY 7 - Operational System Development			PE NUMBER AND TITLE 0207161F Tactical Aim Missile			PROJECT 4132				
(U) C. Program Change Summary (\$ in Thousands)										
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total</u>	<u>Cost</u>				
(U) Previous President's Budget/FY 1999 PB	51,199	52,966	40,807	16,993	212,884					
(U) Appropriated Value	53,171	52,966								
(U) Adjustments to Appropriated Value										
a. Congressional/ General Reductions	-1,972	-362								
b. SBIR										
c. Omnibus or Other Above Threshold Reprogram										
d. Below Threshold Reprogramming										
(U) Adjustments to Budget Years Since FY 1999 PB			200	406						
(U) Current Budget Submit/FY 2000 PB	51,199	52,604	41,007	17,399	240,212					
(U) Significant Program Changes: FY99: \$1,599 identified as a source for SBIR										
(U) D. Other Program Funding Summary (\$ in Thousands)										
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To</u>	<u>Total</u>
(U) Missile Procurement, P-1 line item Tactical	0	0	31,103	29,941	61,441	65,449	83,658	66,065	925,852	1,263,709
AIM Missile Modification										
(U) SEEK EAGLE	0	0	0	2,944	5,384	1,966	0	4,330	Cont.	Cont.

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BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0207161F Tactical Aim Missile

X Planned Events * Completed Events

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0207161F Tactical Aim Missile					PROJECT 4132	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U) Project Cost Categories											
a.	Primary Hardware Development				35,080	31,505	19,635	8,946			
b.	Government Engineering Support				2,476	831	2,070	602			
c.	Contractor Engineering Support				5,144	6,602	1,300	1,181			
d.	Program Management (PMA)				4,760	2,721	3,496	1,742			
e.	Development Test and Evaluation				3,535	9,154	14,343	4,831			
f.	Travel				204	192	163	97			
g.	Identified as source for SBIR				0	1,599	0	0			
(U)	Total				51,199	52,604	41,007	17,399			
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity	Project Office	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
			<u>EAC</u>	<u>EAC</u>	<u>FY 1998</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
Identified as source for SBIR							1,599				1,599
<u>Product Development Organizations</u>											
Hughes	C/CPIF	Dec 94	5,694	5,694	5,694	0	0	0	0	0	5,694
Raytheon	C/CPIF	Dec 94	5,695	5,695	5,695	0	0	0	0	0	5,695
Raytheon	C/CPIF	Dec 96	129,227	129,227	17,270	35,080	31,505	19,635	8,946	16,791	129,227
Boeing	C/CPIF	Jan 96	20,397	20,397	4,361	5,144	6,602	1,300	1,181	1,809	20,397
Engineering Services	Various		N/A	N/A	11,082	2,476	831	2,070	602	4,736	21,797
Program Management*	PO		N/A	N/A	1,398	4,384	2,359	2,937	1,616	1,728	14,422

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0207161F Tactical Aim Missile					PROJECT 4132	
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
<u>Support and Management Organizations</u>											
Various Contracts	FFP		N/A	N/A	693	580	554	722	223	135	2,907
<u>Test and Evaluation Organizations</u> (Included in product development)											
Field Activities	PO	Oct 96	N/A	N/A	1,733	3,535	9,154	14,343	4,831	4,838	38,474
Government Furnished Property: Not Applicable											
Identified as source for SBIR					0	0	1,599	0	0	0	1,599
Subtotal Product Development					45,500	47,084	41,297	25,942	12,345	25,064	197,232
Subtotal Support and Management					693	580	554	722	223	135	2,907
Subtotal Test and Evaluation					1,773	3,535	9,154	14,343	4,831	4,838	38,474
Total Project					47,966	51,199	52,604	41,007	17,399	30,037	240,212
* Note: Navy PMA personnel are capital funded											

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207163F Adv Med Range A/A Msl	PROJECT 3777
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
3777 AMRAAM	39,181	35,663	49,783	54,184	51,355	33,894	33,521	34,459	73,900	687,364
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

The Air Force and Navy developed the baseline Advanced Medium Range Air-to-Air Missile (AMRAAM) as a high performance, all weather missile to counter existing air vehicle threats operating at high or low altitude and having advanced Electronic Protection (EP) capabilities. The AMRAAM Pre-Planned Product Improvement (P3I) program provides for a continuing, Joint Air Force/Navy research and development program which enables AMRAAM to: (1) be compatible with advanced fighters, (2) enhance AMRAAM capability and operational flexibility against mid-1990's and beyond threats, (3) incorporate high payoff technology developments, and (4) investigate new variants and/or alternate missions which may use many baseline missile attributes. Currently, improvements under the P3I program include enhanced EP capabilities; improved weapon effectiveness through improved warhead, fuzing, and guidance; and increased kinematics via a new 5-inch stretched rocket motor. AMRAAM is a joint Air Force/Navy, Acquisition Category (ACAT) IC program with Air Force as lead service.

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

- (U) \$24,076 Completed P3I Phase 2 Engineering & Manufacturing Development (EMD) for warhead and +5" rocket motor for kinematics improvement.
- (U) \$ 9,420 Completed Phase 3 risk reduction for improved seeker and enhanced EP updates.
- (U) \$ 3,438 Continued Mission Support
- (U) \$ 2,247 Continued Test and Evaluation
- (U) \$39,181 Total

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

- (U) \$ 27,954 Initiate P3I Phase 3 EP and guidance EMD
- (U) \$ 2,312 Continue Mission Support
- (U) \$ 4,347 Continue Test and Evaluation
- (U) \$ 1,050 Identified as source for SBIR
- (U) \$ 35,663 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE
BUDGET ACTIVITY 7 - Operational System Development		February 1999
PE NUMBER AND TITLE 0207163F Adv Med Range A/A Msl		PROJECT 3777
<p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$47,514 Continue P3I Phase 3 improved seeker and advanced EP updates - (U) \$ 1,990 Continue mission support - (U) \$ 279 Continue test and evaluation - (U) \$49,783 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 51,843 Continue P3I Phase 3 improved seeker and advanced EP updates - (U) \$ 2,053 Continue mission support - (U) \$ 288 Continue test and evaluation - (U) \$ 54,184 Total <p>(U) B. <u>Budget Activity Justification:</u></p> <p>This program is in budget activity 7 - Operational System Development, providing upgrades to the AIM-120C missile now in production.</p>		
Project 3777	Page 2 of 7 Pages	Exhibit R-2 (PE 0207163F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207163F Adv Med Range A/A Msl	PROJECT 3777
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(U) C. Program Change Summary (\$ in Thousands)

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U) Previous President's Budget/FY 1999 PB	39,875	45,078	47,289	41,815	664,031
(U) Appropriated Value	43,781	36,078			
(U) Adjustments to Appropriated Value					
a. Congressional/General Reductions	-1,851	-415			
b. SBIR	-1,822				
c. Omnibus or Other Above Threshold Reprogram	-927				
d. Below Threshold Reprogramming					
(U) Adjustments to Budget Years Since FY 1999 PB			2,494	12,369	
(U) Current Budget Submit/FY 2000 PB	39,181	35,663	49,783	54,184	687,364

(U) Significant Program Changes:

FY99: \$1,050 identified as source for SBIR. FY99 RDT&E Congressional Reduction (\$9M) moves modeling and simulation planned for FY99 into the following fiscal year, increasing technical risk.

FY00 adjustments include +\$2.494M; FY01 adjustments include +\$12.369M for continued efforts in the P3I Phase 3 Seeker program. Adjustments beyond the Budget Years include completion of P3I Phase 3 Seeker and Rocket Motor programs.

Phase 2 flight test slipped from 4th Qtr FY98 to 1st Qtr FY99 and was completed 22 Dec 98; SCAS FCA slipped to Feb 99. SCAS technical problems causing these slips have been resolved.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)										DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0207163F Adv Med Range A/A Msl					PROJECT 3777		
(U) D. <u>Other Program Funding Summary (\$ in Thousands)</u>												
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To Compl</u>	<u>Total Cost</u>		
(U) Missile Procurement, Budget Activity #7, PE 0207163F, P-1 Line Item, AMRAAM	101,926	92,239	97,279	98,969	116,538	110,804	112,372	114,107	216,128	6,820,607		
(U) Replenishment Spares, BP 25	0	5,218	330	237	242	241	5,598	6,085	400	71,276		
(U) Initial Spares, BP26	1,057	2,658	204	113	117	122	122	112	400	65,557		
(U) Seek Eagle	0	0	0	618	0	0	0	0	0	15,143		
(U) E. <u>Acquisition Strategy:</u>												
<p>The AMRAAM Pre-Planned Product Improvement (P3I) program takes advantage of emerging technologies to update and expand the system capabilities to meet new user requirements. The Phase 1 missile, currently in production, allows carriage on the F-22 with clipped wings and fins as well as providing some software enhancements. The phase 2 AIM-120 C4 missile adds lethality and the AIM-120 C5 missile adds kinematic improvements with a new warhead and +5 inch rocket motor. The first phase 2 missile will be AIM-120 C4s delivered in Aug of FY99. The AIM-120 C5 missiles will begin delivery in Jul of FY00. The Phase 3 missile is the first major upgrade to the seeker hardware and software to meet performance requirements for the 2003 time-period. A Cost Plus Award Fee EMD contract was awarded on 29 Oct 1999. This missile will begin deliveries in FY04. The second stage of Phase 3, beginning in FY04, will develop a new rocket motor to meet increased kinematic requirements.</p>												
(U) F. <u>Schedule Profile</u>												
		<u>FY 1998</u>			<u>FY 1999</u>			<u>FY 2000</u>			<u>FY 2001</u>	
	1	2	3	4	1	2	3	4	1	2	3	4
(U) P3I Phase 2 Tape 7B Flt Test Comp					X							
(U) P3I Phase 2 SCAS FCA (Shortened Control Actuation System)					X							
(U) P3I Phase 2 Rocket Motor FCA	X											
(U) P3I Phase 3 Seeker EMD Contract Award				X								
(U) P3I Phase 3 Seeker SDR					X							
(U) P3I Phase 3 Fuzing FCA						X						
(U) P3I Phase 3 Seeker PDR								X				
(U) P3I Phase 3 Seeker CDR											X	
Project 3777						Page 4 of 7 Pages						
Exhibit R-2 (PE 0207163F)												

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0207163F Adv Med Range A/A Msl					PROJECT 3777	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U) a.	Phase 2 EMD Warhead & Rocket Motor				24,076	0	0	0			
(U) b.	Phase 3 Risk Reduction				9,420	0	0	0			
(U) c.	Phase 3 EMD Improved Seeker and Advanced EP Updates				0	27,954	47,514	51,843			
(U) d.	Gov Mission Support				3,438	2,312	1,990	2,053			
(U) e.	Gov Test & Evaluation				2,247	4,347	279	288			
(U) f.	Identified as source for SBIR				0	1,050	0	0			
(U)	Total				39,181	35,663	49,783	54,184			
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Identified as source for SBIR							1,050				1,050
<u>Product Development Organizations</u>											
Misc. Contracts Various	SS/FFP	Annual	N/A	N/A	7,798	672	132	718	3,173	6,521	19,014
F08635-90-C-0201 Hughes*	SS/FFP	Aug 90	5,200	5,200	5,200	0	0	0	0	0	5,200
F08626-91-C-0034 Hughes	SS/CPIF	Mar 91	93,506	93,506	93,506	0	0	0	0	0	93,506
F08626-93-C-0044 (Phase 2) Hughes	SS/CPAF	Jun 94	117,558	117,558	88,257	29,301	0	0	0	0	117,558
Project 3777					Page 5 of 7 Pages				Exhibit R-3 (PE 0207163F)		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0207163F Adv Med Range A/A Msl					PROJECT 3777	
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Phase 3 Risk Reduction	SS/CPAF	Oct 95	24,484	24,484	20,961	3,523	0	0	0	0	24,484
Phase 3 Improved Fuzing Capability	SS/CPAF	Oct99	7,233	7,233	0	0	7,233	0	0	0	7,233
Phase 3 Improved Seeker and Advanced EP	SS/CPAF	Oct99	193,682	193,682	0	0	20,589	46,796	48,670	77,627	193,682
EMD Contract Phase 3 Follow on	SS/CPAF	Oct04	TBD	120,517	0	0	0	0	0	120,517	120,517
<u>Support and Management Organizations</u>											
COEA Contractor Support	PO/MIPR	Jan 94 Annual	N/A	N/A	3,358	0	0	0	0	0	3,358
JSP0 Operations	PR/REO	Annual	N/A	N/A	12,356	2,660	1,495	1,367	1,405	7,981	27,263
	REO/MIPR	Annual	N/A	N/A	17,053	778	817	623	648	3,746	23,665
<u>Test and Evaluation Organizations</u>											
Government Test	PO/MIPR	Annual	N/A	N/A	30,555	2,247	4,347	279	288	8,086	45,802
*Note: Hughes became part of Raytheon Systems effective Dec 97.											

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207163F Adv Med Range A/A Msl	PROJECT 3777
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(U) B. Budget Acquisition History and Planning Information Continued (\$ in Thousands)

<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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
Government Furnished Property:										
<u>Product Development Property</u>										
Not Applicable										
<u>Support and Management Property</u>										
Not Applicable										
<u>Test and Evaluation Property</u>										
TM/ECM Pods	MIPR/PO			2,380	0	0	0	0	2,651	5,031
Identified as a source for SBIR				0	0	1,050	0	0	0	1,050
Subtotal Product Development				215,722	33,496	27,954	47,514	51,843	204,665	581,194
Subtotal Support and Management				32,767	3,438	2,312	1,990	2,053	11,727	54,287
Subtotal Test and Evaluation				32,935	2,247	4,347	279	288	10,737	50,833
Total Project				281,424	39,181	35,663	49,783	54,184	227,129	687,364

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207247F Air Force TENCAP	PROJECT 0001
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
0001 Air Force TENCAP	13,485	6,328	10,102	9,914	10,870	10,591	10,811	11,037	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

Air Force TENCAP is a congressionally mandated program to provide the Tactical Exploitation of National Capabilities (TENCAP). The objective of TENCAP is to pursue seamless integration of present and future national space systems' capabilities into military operations for the warfighter. TENCAP expedites improvements to Air Force combat capabilities by performing operational concept demonstrations with rapid prototyping. TENCAP is not a developmental program per normal acquisition guidelines, but does support future operational systems development. To enhance combat effectiveness, TENCAP will focus in three areas:

- 1) Exploit existing national systems for the tactical warfighter TENCAP will conceive and demonstrate capabilities to exploit national systems.
- 2) Influence the design and operation of new national systems for the warfighter by advocating tactical impacts of the new systems (in the form of analysis and integration of national systems into roadmaps and architectures for Air Force weapons/C⁴I systems).
- 3) Educate warfighters about national systems capabilities (in the form of training, exercises, and readiness activities).

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

- (U) \$ 10,407 Exploited the tactical use of existing national systems for the warfighter
 - Talon Warrior (Supported training, exercises, and TENCAP applications)
 - Talon Shooter (Supported weapons delivery)
 - Talon Knight (Supported Special Operations)
 - Talon Command (Supported Air Force C2 systems)
 - Talon Vision (Supported emerging technologies and applications)
- (U) \$ 1,025 Transitioned TENCAP Concept Demonstrations to field
- (U) \$ 2,053 Program support
- (U) \$ 13,485 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational System Development	0207247F Air Force TENCAP	0001
<p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 5,035 Exploit the tactical use of existing national systems for the warfighter <ul style="list-style-type: none"> --Talon Warrior (Support for training, exercises, and TENCAP applications) --Talon Ready (Support mission planning) --Talon Shooter (Support for weapons delivery) --Talon Knight (Support Special Operations) --Talon Command (Support for Air Force C2 systems) --Talon Vision (Support for emerging technologies and applications) - (U) \$ 680 Transition TENCAP Concept Demonstrations to field - (U) \$ 407 Program support - (U) \$ 206 Identified as a source for SBIR - (U) \$ 6,328 Total <p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 7,959 Exploit the tactical use of existing national systems for the warfighter <ul style="list-style-type: none"> --Talon Warrior (Support for training, exercises, and TENCAP applications) --Talon Ready (Support mission planning) --Talon Shooter (Support for weapons delivery) --Talon Knight (Support Special Operations) --Talon Command (Support for Air Force C2 systems) - (U) \$ 770 Transition TENCAP Concept Demonstrations to field - (U) \$ 1,373 Program support - (U) \$ 10,102 Total 		
Project 0001	Page 2 of 6 Pages	Exhibit R-2 (PE 0207247F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207247F Air Force TENCAP	PROJECT 0001
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(U) FY 2001 (\$ in Thousands):

- (U) \$ 7,942 Exploit the tactical use of existing national systems for the warfighter
 - Talon Warrior (Support for training, exercises, and TENCAP applications)
 - Talon Ready (Support mission planning)
 - Talon Shooter (Support for weapons delivery)
 - Talon Knight (Support Special Operations)
 - Talon Command (Support for Air Force C2 systems)
- (U) \$ 727 Transition TENCAP Concept Demonstrations to field
- (U) \$ 1,245 Program support
- (U) \$ 9,914 Total

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

Since this effort supports fielded systems, it is in the Budget Activity #7 Operational Systems Development

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

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U) Previous President's Budget (FY 1999 PB)	14,233	6,447	10,285	10,102	Continuing
(U) Appropriated Value	15,251	6,447			
(U) Adjustments to Appropriated Value					
a. Cong Gen Reductions	-646	-119			
b. SBIR	-374				
c. Omnibus or Other Above Threshold Reprogram	-97				
d. Below Threshold Reprogramming	-649				
(U) Adjustments to Budget Years Since FY 1999 PB			-183	-188	
(U) Current Budget Submit /FY 2000 PB	13,485	6,328	10,102	9,914	Continuing
(U) Significant Program Changes:					
FY98: \$649 reprogrammed to support higher priority Air Force requirements.					
FY99: \$206 identified as a source for SBIR.					

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE February 1999					
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0207247F Air Force TENCAP			PROJECT 0001					
FY00/01: \$183 and \$188 reductions fund higher priority Air Force requirements.												
(U) D. <u>Other Program Funding Summary (\$ in Thousands)</u>												
		<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	To <u>Compl</u>	Total <u>Cost</u>	
(U) Other Procurement, Intelligence Communications Equipment Program BPAC 8322070		143	194	194	198	199	199	202	207	Cont	Cont	
 (U) E. <u>Acquisition Strategy.</u> Cost plus award fee contract with a ceiling of hours available to AFTENCAP. Theater MAJCOM mission area plan (MAP) deficiencies provide the requirements for AFTENCAP developments. Each project must meet a MAP deficiency and be approved by an AFTENCAP Colonel's Review Group. In addition, the theater MAJCOM's must be willing to budget for the project in their Program Objective Memorandum to assume future acquisition and logistics responsibilities.												
 (U) F. <u>Schedule Profile:</u>												
		<u>FY 1998</u>			<u>FY 1999</u>			<u>FY 2000</u>				
	1	2	3	4	1	2	3	4	1	2	3	4
Contractor Proposals for FY99 Projects				*								
FY99 Project Evaluations Complete					*							
FY99 Project Authority to Proceed					*							
FY00 Projects Identified						X						
FY00 Projects Evaluated and Approved							X					
FY00 Project Authority to Proceed							X					
FY01 Projects Identified								X				
FY01 Projects Evaluated and Approved									X			
FY01 Projects Authority to Proceed										X		
Project 0001												
Page 4 of 6 Pages						Exhibit R-2 (PE 0207247F)						

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1999				
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0207247F Air Force TENCAP			PROJECT 0001				
(U) A. Project Cost Breakdown (\$ in Thousands):											
		<u>FY1998</u>	<u>FY1999</u>	<u>FY2000</u>	<u>FY2001</u>						
TALON Projects:											
Vision		2,066	527	1,755	1,755						
Warrior		1,874	400	1,057	1,070						
Ready		1,393	0	0	0						
Knight		1,755	1,405	1,217	1,237						
Command		1,166	1,289	1,536	1,540						
Shooter		0	314	539	541						
SEDI Program Management		2,154	1,100	1,855	1,799						
Transition		1,025	680	770	727						
Program Support		2,053	407	1,373	1,245						
Identified as a source for SBIR			206								
(U) Total		13,485	6,328	10,102	9,914						
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR									206		
<u>Product Development Organizations:</u> None.											
<u>Support and Management Organizations:</u>											
Multiple Lockheed Martin	Various CPAF	Multiple Sep 95	Cont	Cont	15,541	4,045	857	1,373	1,245	Cont	Cont
					22,101	9,440	5265	8,729	8,669	Cont	Cont
<u>Test and Evaluation Organizations:</u> None.											
Project 0001				Page 5 of 6 Pages				Exhibit R-3 (PE 0207247F)			

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)						DATE February 1999	
BUDGET ACTIVITY			PE NUMBER AND TITLE			PROJECT	
7 - Operational System Development			0207247F Air Force TENCAP			0001	
Government Furnished Property: Not applicable. No Government property furnished to non-Government entities.							
Identified as a source for SBIR					206		
Subtotal Product Development	0	0	0	0	0	0	0
Subtotal Support and Management	37,642	13,485	6,122	10,102	9,914	Cont	Cont
Subtotal Test and Evaluation	0	0	0	0	0	0	0
Total Project	37,642	13,485	6,328	10,102	9,914	Cont	Cont

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207253F Compass Call	PROJECT 4804
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4804 Compass Call	0	12,419	4,908	5,886	3,919	3,913	3,908	0	0	34,953
Quantity of RDT&E Articles	0	0	2	2	0	0	0	0	0	0

(U) A. Mission Description

COMPASS CALL is DoD's airborne wide area coverage offensive counter information system. It denies, disrupts, degrades and deceives adversary voice and data communications, preventing and managing his ability to effectively command and control his forces in the field. The Tactical Radio Acquisition and Countermeasures Subsystem (TRACS) replaces the aging compressive receiver suite responsible for acquiring target systems with a digital, reprogrammable receiver that will enable COMPASS CALL to remain viable in countering the next generation of deployed threats. TRACS EMD and flight testing are urgently needed to complete TRACS development and enable the start of production to replace the COMPASS CALL fleet's aging receiver subsystem. The current receiver is late 1970's vintage and must be replaced to meet deployed threats and alleviate impending supportability problems. The reprogrammable nature of TRACS will allow it to remain viable for the extended future through software upgrades. These upgrades will be developed beginning in FY02 and continue throughout the life of the program, ensuring COMPASS CALL stays abreast of rapidly emerging threat technologies.

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

- (U) \$0 New Start in FY 99
- (U) \$0 Total

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

- (U) \$12,048 Start non-recurring engineering (NRE) activities for TRACS-C production
- (U) \$ 371 Identified as a source for SBIR
- (U) \$12,419 Total

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

- (U) \$4,455 Continue TRACS-C development and integration
- (U) \$ 453 Start flight test activities
- (U) \$4,908 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1999																																																												
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207253F Compass Call	PROJECT 4804																																																												
<p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$4,900 Complete TRACS-C development and integration - (U) \$ 986 Continue flight test - (U) \$5,886 Total 																																																														
<p>(U) B. <u>Budget Activity Justification</u></p> <p>This program is categorized as Budget Activity 7 because it provides for development of technologies and capabilities in support of operational system development.</p>																																																														
<p>(U) C. <u>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 1998</u></th> <th style="text-align: center;"><u>FY 1999</u></th> <th style="text-align: center;"><u>FY 2000</u></th> <th style="text-align: center;"><u>FY 2001</u></th> <th style="text-align: center;"><u>Total Cost</u></th> </tr> </thead> <tbody> <tr> <td>(U) Previous President's Budget (FY 1999 PB)</td> <td style="text-align: center;">0</td> </tr> <tr> <td>(U) Appropriated Value</td> <td></td> <td style="text-align: center;">12,500</td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Adjustments to Appropriated Value</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">a. Cong Reductions</td> <td></td> <td style="text-align: center;">-81</td> <td></td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">b. SBIR</td> <td></td> <td></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></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">d. Below Threshold Reprogramming</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Adjustments to Budget Years Since FY 1999 PB</td> <td></td> <td></td> <td style="text-align: center;">+4,908</td> <td style="text-align: center;">+5,886</td> <td style="text-align: center;">+34,953</td> </tr> <tr> <td>(U) Current Budget Submit/FY 2000 PB</td> <td style="text-align: center;">0</td> <td style="text-align: center;">12,419</td> <td style="text-align: center;">4,908</td> <td style="text-align: center;">5,886</td> <td style="text-align: center;">34,953</td> </tr> </tbody> </table>				<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>	(U) Previous President's Budget (FY 1999 PB)	0	0	0	0	0	(U) Appropriated Value		12,500				(U) Adjustments to Appropriated Value						a. Cong Reductions		-81				b. SBIR						c. Omnibus or Other Above Threshold Reprogram						d. Below Threshold Reprogramming						(U) Adjustments to Budget Years Since FY 1999 PB			+4,908	+5,886	+34,953	(U) Current Budget Submit/FY 2000 PB	0	12,419	4,908	5,886	34,953
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>																																																									
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d. Below Threshold Reprogramming																																																														
(U) Adjustments to Budget Years Since FY 1999 PB			+4,908	+5,886	+34,953																																																									
(U) Current Budget Submit/FY 2000 PB	0	12,419	4,908	5,886	34,953																																																									
<p>(U) Significant Program Changes:</p> <p>FY99: \$12.5M was added by Congress in FY99 for Compass Call TRACS-C development efforts. FY00 PB is first submission for this funding requirement which is a new start within an existing program. \$371 identified as a source for SBIR.</p>																																																														
Project 4804	Page 2 of 5 Pages	Exhibit R-2 (PE 0207253F)																																																												

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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207253F Compass Call	PROJECT 4804
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(U) D. Other Program Funding Summary (\$ in Thousands)

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	To <u>Complete</u>	Total <u>Cost</u>
(U) PE 0207253F, Aircraft Modification (3010)			2,200	10,000	16,300	25,000	10,000	0	0	63,500

(U) E. Acquisition Strategy

CPAF contracting will be employed for both EMD and flight test in FY99, FY00 and 01. Upgrades for waveform development to preserve system viability for the remainder of the program will employ CPIF contracting.

(U) F. Schedule Profile

	<u>FY 1998</u>			<u>FY 1999</u>			<u>FY 2000</u>			<u>FY 2001</u>		
	1	2	3	4	1	2	3	4	1	2	3	4
(U) TRACS-C EMD Starts					X							
(U) TRACS-C Production Long Lead Starts								X				
(U) TRACS-C Flight Test Begins									X			
(U) TRACS-C EMD Unit Deliveries Begin										X		

* Denotes completed event
X Denotes planned event

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE	
BUDGET ACTIVITY 7 - Operational System Development						PE NUMBER AND TITLE 0207253F Compass Call				PROJECT 4804	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U)	Hardware/Software Development					12,048	4,455	4,900			
(U)	System Integration						453	986			
(U)	Identified as a source for SBIR					371	0	0			
(U)	Total					12,419	4,908	5,886			
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR					N/A	0	371	0	0	0	371
<u>Product Development Organizations</u>											
Sanders	CPAF/IF	FY99	TBD	TBD	TBD	0	12,048	4,455	4,900	11,740	33,143
<u>Support and Management Organizations</u>											
None											
<u>Test and Evaluation Organizations</u>											
TBD	MIPR	FY00	TBD	TBD	TBD	0	0	453	986	0	1,439
Project 4804					Page 4 of 5 Pages			Exhibit R-3 (PE 0207253F)			

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0207253F Compass Call				PROJECT 4804		
(U) B. <u>Budget Acquisition History and Planning Information Continued (\$ in Thousands)</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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Property</u>										
None										
<u>Support and Management Property</u>										
None										
<u>Test and Evaluation Property</u>										
None										
Identified as a source for SBIR				0	0	371	0	0	0	371
Subtotal Product Development				0	0	12,048	4,455	4,900	11,740	33,143
Subtotal Support and Management										
Subtotal Test and Evaluation				0	0	0	453	986	0	1,439
Total Project				0	0	12,419	4,908	5,886	11,740	34,953

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0207268F Aircraft Engine Component Improvement Program (CIP)				PROJECT 1012		
COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
1012 Aircraft Engine Component Improvement Program	93,487	96,589	160,212	168,410	175,598	187,853	213,089	170,449	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

The Engine Component Improvement Program (CIP) provides critical sustaining engineering support (only source) for in-service Air Force engines to maintain flight safety (highest priority), to correct service revealed deficiencies, to improve system Operational Readiness (OR) and Reliability and Maintainability (R&M), to reduce engine Life Cycle Cost (LCC), and to sustain engines throughout their service life. Historically, aircraft systems change missions, tactics, and environments to meet changing threats throughout their lives. Numerous new problems can develop in the engines through actual use during deployment, production, and service, and Engine CIP provides the only funds to develop fixes for these field problems. Engine CIP funding is driven by field events and types/maturity of engines, not by the total engine quantity. Engine CIP starts with delivery of the first production engine purchased with procurement funds, and continues over the engine's life, gradually decreasing to a minimum level (safety/depot repairs) sufficient to keep older inventory engines operational. Engine CIP addresses out-of-warranty usage and life and enables the Air Force to obtain additional warranties when manufacturers incorporate Engine CIP improvements into production engines. Since operational and safety problems arise throughout a system's service life, Engine CIP must be maintained at a level to provide the engineering support to make the changes essential for continued satisfactory system performance at affordable costs. Engine CIP ensures continued improvements in engine R&M factors, which reduce outyear support costs. Historically, R&M related Engine CIP efforts reduce outyear Operations and Maintenance (O&M) and spares costs by a ratio greater than 21 to 1. MAJCOMs assume a viable Engine CIP effort is in place when submitting their budget requests for O&M and engine spares. Without the outyear cost avoidance provided by Engine CIP, outyear support funding would have to be increased drastically.

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

- (U) \$ 84,211 Funded 630 CIP tasks (248 redesign tasks, 306 repair development tasks, and 76 analysis tasks)
- (U) \$ 3,110 Funded 4760 test hours
- (U) \$ 6,166 Petroleum, oil, lubricants and other support costs
- (U) \$ 93,487 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207268F Aircraft Engine Component Improvement Program (CIP)	PROJECT 1012
<p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 84,255 625 CIP tasks (245 redesign tasks, 308 repair development tasks, and 72 analysis tasks) - (U) \$ 3,038 5075 test hours - (U) \$ 6,067 Petroleum, oil, lubricants and other support costs - (U) \$ 3,229 Identified as a source for SBIR - (U) \$ 96,589 Total <p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$131,312 837 CIP tasks (318 redesign tasks, 409 repair development tasks, and 110 analysis tasks) - (U) \$ 17,500 9100 test hours - (U) \$ 11,400 Petroleum, oil, lubricants and other support costs - (U) \$160,212 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$130,810 785 CIP tasks (294 redesign tasks, 378 repair development tasks, and 113 analysis tasks) - (U) \$ 22,600 12700 test hours - (U) \$ 15,000 Petroleum, oil, lubricants and other support costs - (U) \$168,410 Total <p>(U) <u>B. Budget Activity Justification</u> This program is in budget activity 7 - Operational System Development, Research Category 6.6 because all efforts support fielded systems.</p>		
Project 1012	Page 2 of 6 Pages	Exhibit R-2 (PE 0207268F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)					DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development		PE NUMBER AND TITLE 0207268F Aircraft Engine Component Improvement Program (CIP)			PROJECT 1012
 (U) C. <u>Program Change Summary (\$ in Thousands)</u>					
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U) Previous President's Budget (FY 1999 PB)	98,058	92,069	93,659	116,663	Continuing
(U) Appropriated Value	103,122	97,069			
(U) Adjustments to Appropriated Value					
a. Congressional/General Reductions	-4,060	-480			
b. SBIR	-1,675				
c. Omnibus or Other Above Threshold Reprogram					
d. Below Threshold Reprogramming	-3,900				
(U) Adjustments to Budget Years Since FY 1999 PB			66,553	51,747	Continuing
(U) Current Budget Submit/ FY 2000 PB	93,487	96,589	160,212	168,410	Continuing
 (U) Significant Program Changes: FY99: \$3,229 identified as a source for SBIR. In FY00 and 01 funding is increased to address the backlog of reliability and maintainability tasks and add the F-22 F119 engine to the active inventory.					
 (U) D. <u>Other Program Funding Summary (\$ in Thousands)</u> Not applicable.					
 (U) <u>RELATED ACTIVITIES:</u> (U) - PEs # 0604268A and #0604268N, Army/Navy Aircraft Engine CIPs for prior years (U) - PEs # 0207268A and #0207268N, Army/Navy Aircraft Engine CIPs for FY96 and following years					
 (U) E. <u>Acquisition Strategy</u> Contracts within this Program Element are awarded sole source to engine manufacturers. CIP tasks are generally assigned to original engine manufacturers. Tasks are assigned based on available funding and prioritization of candidate tasks.					
 (U) F. <u>Schedule Profile</u> Not applicable. CIP is a level of effort program that funds 600+ separate engineering tasks per year.					
Project 1012		Page 3 of 6 Pages		Exhibit R-2 (PE 0207268F)	

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207268F Aircraft Engine Component Improvement Program (CIP)	PROJECT 1012

(U) **A. Project Cost Breakdown (\$ in Thousands)** A project cost breakdown is not applicable to this Program, because there are no individual projects, but several hundred independently managed tasks. The bulk of the funding goes to the major engine manufacturers. Cost breakdown for follow-on years is expected to be of similar proportions.

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) Contracted Tasks	84,211	84,255	131,312	130,810
(U) AFFTC Flight Tests	367	434	1,500	1,700
(U) AEDC Altitude Tests	2,743	2,604	16,000	20,900
(U) Petroleum/Oil/Lubricants	4,290	4,717	10,000	13,500
(U) Mission Support	1,876	1,350	1,400	1,500
(U) Identified as a source for SBIR	0	3,229	0	0
(U) PE TOTAL	93,487	96,589	160,212	168,410

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0207268F Aircraft Engine Component Improvement Program (CIP)					PROJECT 1012	
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR							3,229	3,229			
<u>Product Development Organizations</u>											
GE-Evandale, OH	CPAF	Jan 98	NA	NA	NA	36,629	43,287	63,352	51,710	CONT	CONT
Pratt & Whitney	CPAF	Jan 98	NA	NA	NA	41,408	34,963	61,135	72,350	CONT	CONT
GE-Lynn, MA	CPFF	Jan 98	NA	NA	NA	2,625	2,625	2,975	2,900	CONT	CONT
Allison	CPFF	Jan 98	NA	NA	NA	1,228	1,400	1,400	1,400	CONT	CONT
Teledyne	CPFF	Jan 98	NA	NA	NA	1,309	730	1,200	1,200	CONT	CONT
Allied Signal	CPFF	Jan 98	NA	NA	NA	550	500	500	500	CONT	CONT
Williams	CPFF	Jan 98	NA	NA	NA	275	250	250	250	CONT	CONT
Sundstrand	CPFF	Jan 98	NA	NA	NA	187	500	500	500	CONT	CONT
<u>Support and Management Organizations</u>											
In House Support					NA	1,876	1,350	1,400	1,500	CONT	CONT
Petroleum/Oil/Lubricants					NA	4,290	4,717	10,000	13,500	CONT	CONT
<u>Test and Evaluation Organizations</u>											
Project 1012											

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0207268F Aircraft Engine Component Improvement Program (CIP)					PROJECT 1012	
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
AFFTC-Edwards AFB, CA					NA	367	434	1,500	1,700	CONT	CONT
AEDC-Arnold AFB, TN					NA	2,743	2,604	16,000	20,900	CONT	CONT
(U) B. Budget Acquisition History and Planning Information Continued (\$ in Thousands)											
Government Furnished Property: Not applicable											
Identified as a source for SBIR							3,229				3,229
Subtotal Product Development					NA	84,211	84,255	131,312	130,810	CONT	CONT
Subtotal Support and Management					NA	6,166	6,067	11,400	15,000	CONT	CONT
Subtotal Test and Evaluation					NA	3,110	3,038	17,500	22,600	CONT	CONT
Total Project					NA	93,487	96,589	160,212	168,410	CONT	CONT

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207320F Sensor Fuzed Weapon (SFW)	PROJECT 1016
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
1016 Sensor Fuzed Weapon	15,804	7,504	11,785	0	0	0	0	0	0	64,601
Quantity of RDT&E Articles	4	0	0	0	0	0	0	0	0	8

(U) A. Mission Description

This project continues development of the Sensor Fuzed Weapon (SFW) Pre-Planned Product Improvement (P3I). The P3I improvements to the baseline SFW will enhance weapon performance against primary targets (land combat vehicles), targets with countermeasures, and potentially allow for use against alternative targets. The improvements will also enhance the performance of SFW when fitted with the Wind Corrected Munitions Dispenser (WCMD) kit and the anti-armor version of the Joint Standoff Weapon (JSOW). All P3I improvements are at the BLU-108 submunition level. SFW is an ACAT II program.

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

- (U) \$9,954 Continued the P3I development, qualification, integration of the dual mode sensor and multi-mission warhead. Conduct munition tests.
- (U) \$4,694 Conduct dual mode sensor and multimission warhead tests
- (U) \$1,156 Continued program management support, including travel, program office supplies and equipment, training and technical engineering support
- (U) \$15,804 Total

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

- (U) \$7,030 Continue the P3I development program with contractor test and evaluation
- (U) \$347 Continue program management support, includes travel, program office supplies and equipment, training and technical engineering support
- (U) \$127 Identified as a source for SBIR
- (U) \$7,504 Total

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

- (U) \$9,865 Complete the P3I development program; correct technical problems; complete contractor development testing; and support govt. qualification testing
- (U) \$846 Continue program management support, includes travel, program office supplies and equipment, training and technical engineering support
- (U) \$1,074 Conduct and complete subsystem level testing and Cluster Bomb Unit (CBU) flight testing
- (U) \$11,785 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE February 1999			
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0207320F Sensor Fuzed Weapon (SFW)			PROJECT 1016			
(U) B. Budget Activity Justification:										
This program is in budget activity 7 - Operational System Development, because this activity funds improvements to the SFW, which is currently in production.										
(U) C. Program Change Summary (\$ in Thousands)										
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total</u>					
					<u>Cost</u>					
(U) Previous President's Budget (FY 1999 PB)	16,437	3,551	0	0	48,169					
(U) Appropriated Value	19,804	7,551								
(U) Adjustments to Appropriated Value										
a. Congressional/General Reductions	-705	-47								
b. SBIR	-2,875									
c. Omnibus or Other Above Threshold Reprogram	-420									
d. Below Threshold Reprogramming										
(U) Adjustments to Budget Years Since FY 1999 PB			11,785							
(U) Current Budget Submit/FY 2000 PB	15,804	7,504	11,785	0	64,601					
(U) Significant Program Changes:										
<p>The SFW P3I development slipped 17 months in FY98 due to technical problems with: the new dual mode sensor (infrared & laser); software; and noise from single mounting board configuration. There were reliability concerns with the micro-lens design due to requirements to maintain very precise tolerances over a 20 year life cycle. The software development process was far more resource consuming than anticipated. Finally, the prototype electronics printed wire assembly exhibited excessive noise/cross-talk. All problems have been corrected and prototype testing has revealed redesign efforts were successful. Congress added \$4,000 in the FY99 appn for laser sensor redesign and the Air Force added \$11,785 in FY00 to correct the remaining technical problems and complete the program. The weapon level testing and the P3I development will now be completed various in FY00 with first year of P3I production in FY01. FY99: \$127 identified as a source for SBIR.</p>										
(U) D. Other Program Funding Summary (\$ in Thousands)										
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To</u>	<u>Total</u>
									<u>Compl</u>	<u>Cost</u>
(U) Procurement of Ammunition, AF P-1 Line Item SFW	148,621	125,083	61,334	101,508	87,538	87,372	86,415	84,400	202,000	1,630,125
Project 1016										
Page 2 of 5 Pages										
Exhibit R-2 (PE 0207320F)										

DATE
February 1999

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0207320F Sensor Fuzed Weapon (SFW)

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	To <u>Compl</u>	Total <u>Cost</u>
(U) SEEK EAGLE Procurement of Ammunition, AF P-1 Line Item SFW	0	0	0	0	0	0	0	0	0	10,888

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)												DATE February 1999																																																																																																																																																																																														
BUDGET ACTIVITY 7 - Operational System Development						PE NUMBER AND TITLE 0207320F Sensor Fuzed Weapon (SFW)						PROJECT 1016																																																																																																																																																																																														
<p>(U) E. Acquisition Strategy: The SFW Pre-Planned Product Improvements (P3I) program is a 58 month R&D effort to enhance the BLU-108 submunition and projectile. This is a sole source Cost-Plus Award Fee (CPAF) contract for P3I to the current SFW submunition design. The SFW P3I submunition (improved BLU-108) will be used in the JSOW weapon system.</p>																																																																																																																																																																																																										
<p>(U) F. Schedule Profile</p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th colspan="4"><u>FY 1998</u></th> <th colspan="4"><u>FY 1999</u></th> <th colspan="4"><u>FY 2000</u></th> <th colspan="4"><u>FY 2001</u></th> </tr> <tr> <th></th> <th>1</th><th>2</th><th>3</th><th>4</th> <th>1</th><th>2</th><th>3</th><th>4</th> <th>1</th><th>2</th><th>3</th><th>4</th> <th>1</th><th>2</th><th>3</th><th>4</th> </tr> </thead> <tbody> <tr> <td>(U) Design and Development of P3I</td> <td>*</td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td>X</td><td></td> <td></td><td></td><td></td><td></td> </tr> <tr> <td>(U) End Trade Studies</td> <td></td><td></td><td></td><td>*</td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> </tr> <tr> <td>(U) Preliminary Design Review (PDR)</td> <td>*</td><td></td><td></td><td></td> <td></td><td></td><td></td><td>X</td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> </tr> <tr> <td>(U) Detailed Design/Development Tests</td> <td>*</td><td>*</td><td>*</td><td>*</td> <td>*</td><td>X</td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> </tr> <tr> <td>(U) Development Test Meeting</td> <td></td><td></td><td></td><td></td> <td></td><td>X</td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> </tr> <tr> <td>(U) Critical Design Review (CDR)</td> <td></td><td></td><td></td><td></td> <td></td><td>X</td><td></td><td></td> <td></td><td>X</td><td></td><td></td> <td></td><td></td><td></td><td></td> </tr> <tr> <td>(U) Hardware Build/Qualification Tests</td> <td></td><td></td><td></td><td></td> <td></td><td>X</td><td>X</td><td>X</td> <td>X</td><td>X</td><td>X</td><td></td> <td></td><td></td><td></td><td></td> </tr> <tr> <td>(U) Subsystem Level Testing</td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td>X</td><td>X</td><td>X</td> <td></td><td></td><td></td><td></td> </tr> <tr> <td>(U) System Level Testing</td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td>X</td><td>X</td> <td>X</td><td></td><td></td><td></td> </tr> </tbody> </table> <p>* = Completed Events X = Planned Events</p>																	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>					1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	(U) Design and Development of P3I	*										X						(U) End Trade Studies				*													(U) Preliminary Design Review (PDR)	*							X									(U) Detailed Design/Development Tests	*	*	*	*	*	X											(U) Development Test Meeting						X											(U) Critical Design Review (CDR)						X				X							(U) Hardware Build/Qualification Tests						X	X	X	X	X	X						(U) Subsystem Level Testing										X	X	X					(U) System Level Testing											X	X	X			
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Project 1016				Page 3 of 5 Pages				Exhibit R-2 (PE 0207320F)																																																																																																																																																																																																		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1999				
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0207320F Sensor Fuzed Weapon (SFW)				PROJECT 1016			
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
				<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>				
(U) Major Contracts				9,954	7,030	9,865	0				
(U) Support Contracts				721	307	796	0				
(U) Program Office Support				435	40	50	0				
(U) Test and Evaluation				4,694	0	1,074	0				
(U) Identified as a source for SBIR				0	127	0	0				
(U) Total				15,804	7,504	11,785	0				
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR 127			N/A	N/A	0	0	127	0	0	0	0
<u>Product Development Organizations</u>											
Textron System Defense	SS/CPAF	Jan 99	52,251	52,251	25,402	9,954	7,030	9,865	0	0	52,251
<u>Support and Management Organizations</u>											
ASC/YH	N/A	various	N/A	N/A	1,468	435	40	50	0	0	1,993
Miscellaneous	various	various	N/A	N/A	440	721	307	796	0	0	2,264
<u>Test and Evaluation Organizations</u>											
46 OG/OGML	REO	Mar 00	N/A	N/A	2,009	4,694	0	1,074	0	0	7,777
Project 1016				Page 4 of 5 Pages				Exhibit R-3 (PE 0207320F)			

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0207320F Sensor Fuzed Weapon (SFW)				PROJECT 1016		
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands) (Contd.)										
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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Property</u>										
GFE (explosive) Army, Aberdeen	MIPR	May 97	Oct 97	72	0	0	0	0	0	72
GFE (RHA Plates) Army, Aberdeen	MIPR	Jun 96	Jul 96	117	0	0	0	0	0	117
<u>Support and Management Property</u>										
None										
<u>Test and Evaluation Property</u>										
None										
Identified as source for SBIR				0	0	127	0	0	0	127
Subtotal Product Development				25,591	9,954	7,030	9,865	0	0	52,440
Subtotal Support and Management				1,908	1,156	347	846	0	0	4,257
Subtotal Test and Evaluation				2,009	4,694	0	1,074	0	0	7,777
Total Project				29,508	15,804	7,504	11,785	0	0	64,601

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207325F Joint Air-to-Surface Standoff Missile	PROJECT 4515
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4515 Joint Air-to-Surface Standoff Missile (JASSM)	163,801*	128,796	166,408	71,022	53,578	21,057	9,224	6,052	0	808,230
Quantity of RDT&E Articles	0	61**	0	0	0	0	0	0	0	61

*(U) FY 1998 Actual includes \$40,617 reclassified from the Joint Standoff Land Attack Missile (JSLAM) PE (0604611F) to the Joint Air-to-Surface Standoff Missile (JASSM) PE. This action properly aligned funds in accordance with Congressional direction and the SecDef decision to continue the JASSM program based on the Analysis of Alternatives. This action does not represent a change from the purpose for which the funds were originally appropriated.

***(U) RDT&E Test Articles quantity reflects purchase authorization for long lead items and order commitments with key sub-contractors. Test article deliveries include 20 assets in FY 2000 and 41 assets in FY2001. Quantities were inadvertently omitted from the FY99 President's Budget exhibit.

(U) A. Mission Description

JASSM is a joint Air Force/Navy program with the Air Force as the lead service. This is an ACAT ID program to provide an affordable long range, conventional air-to-surface, autonomous, precision guided, standoff cruise missile compatible with fighter and bomber aircraft able to attack a variety of fixed or relocatable targets. Initial integration efforts are for the B-52H and F-16 (Block 50). Objective aircraft include the B-1, B-2, F-15E, F-16 (Block 40), F-117, and F/A-18E/F. This descriptive summary reflects Air Force only funding.

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

- (U) \$128,768 Continued Program Definition Risk Reduction (PDRR).
- (U) \$16,467 Continued flight test support for threshold aircraft, test aircraft modifications, live fire test support, target construction.
- (U) \$10,764 Continued aircraft integration.
- (U) \$787 Continued mission planning and intelligence systems integration.
- (U) \$4,898 Continued program office support contracts.
- (U) \$2,117 Continued mission support.
- (U) \$163,801 Total

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

- (U) \$87,082 Initiate Engineering, Manufacturing, and Development (EMD).
- (U) \$23,825 Continue flight test support, test aircraft modifications, live fire test support, target construction/rehab.
- (U) \$6,648 Continue aircraft integration.
- (U) \$1,728 Continue mission planning and intelligence systems integration.
- (U) \$4,106 Continue program office support contracts.
- (U) \$2,450 Continue mission support.
- (U) \$2,957 Identified as a source for SBIR.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational System Development	0207325F Joint Air-to-Surface Standoff Missile	4515
<ul style="list-style-type: none"> - (U) \$128,796 Total 		
<p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$95,073 Continue EMD. - (U) \$41,115 Continue flight test support, test aircraft modifications, live fire test support, target construction/rehab. - (U) \$19,467 Continue aircraft integration. - (U) \$2,504 Continue mission planning and intelligence systems integration. - (U) \$6,005 Continue program office support contracts. - (U) \$2,244 Continue mission support. - (U) \$166,408 Total 		
<p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$36,543 Continue EMD. - (U) \$18,281 Continue flight test support, test aircraft modifications, live fire test support, target construction/rehab. - (U) \$9,082 Continue aircraft integration. - (U) \$3,205 Continue mission planning and intelligence systems integration. - (U) \$2,435 Continue program office support contracts. - (U) \$1,476 Continue mission support. - (U) \$71,022 Total 		
<p>(U) B. <u>Budget Activity Justification:</u></p> <p>This program is reflected in Budget Activity 7, Operational System Development, because production funds have been included in the DoD budget submission to begin Low Rate Initial Production (LRIP) in FY01.</p>		
Project 4515	Page 2 of 7 Pages	Exhibit R-2 (PE 0207325F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)					DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development		PE NUMBER AND TITLE 0207325F Joint Air-to-Surface Standoff Missile			PROJECT 4515	
(U) C. <u>Program Change Summary (\$ in Thousands)</u>						
		<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total</u> <u>Cost</u>
(U) Previous President's Budget (FY 1999 PB)		123,460	132,870	104,434	34,067	588,036
(U) Appropriated Value		128,000	129,870			
(U) Adjustments to Appropriated Value						
a. Congressional/General Reductions		-4,540	-1,074			
b. SBIR						
c. Omnibus or Other Above Threshold Reprogram		-276				
d. Below Threshold Reprogramming						
(U) Adjustments to Budget Years Since FY 1999 PB		+40,617		+61,974	+36,955	+217,237
(U) Current Budget Submit/FY 2000 PB		163,801	128,796	166,408	71,022	808,230
 (U) Significant Program Changes:						
FY99: \$2,957 identified as a source for SBIR.						
Funding: FY 1998 funding adjustments included \$40,617 reclassified from the JSLAM PE (0604611F) to the JASSM PE to properly align funds in accordance with Congressional direction and the SecDef decision to continue the JASSM program based on the results of the Analysis of Alternatives. This action does not represent a change from the purpose for which the funds were originally appropriated. FY00-05 funding adjustments include +\$86,468 due to program restructure resulting from FY98 funding restrictions and adjustments necessary to match the winning contractor's EMD program requirements, and +\$97,459 resulting from the Milestone II decision to add six months to the EMD schedule for additional risk reduction activities. FY00-05 funding also reflects inflation adjustments.						
Schedule: EMD started in November 1998 as scheduled; however, the Milestone II decision extends the EMD program by six months: EMD now 40 months (was 34 months); Low Rate Initial Production (LRIP) decision now Jan 2001 (was Jul 2000); Milestone III now July 2002 (was January 2002).						
Technical: Risk reduction activities resulting from the six month extension to EMD include additional ground test, captive carry flight test, modeling, and simulation. In addition, JASSM mission planning software will migrate from the Combat Intelligence System (CIS) to Theater Battle Management Core System (TBMCS) which is replacing CIS.						
Project 4515		Page 3 of 7 Pages		Exhibit R-2 (PE 0207325F)		

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207325F Joint Air-to-Surface Standoff Missile	PROJECT 4515
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(U) D. Other Program Funding Summary (\$ in Thousands)

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To Compl</u>	<u>Total Cost</u>
(U) Missile Procurement (AF) JASSM	0	0	0	45,921	49,150	103,653	141,794	149,119	688,654	1,178,291
(U) SEEK EAGLE	0	0	0	6,369	3,414	2,929	3,657	2,925	0	19,294

Related RDT&E: N/A

(U) E. Acquisition Strategy:

All major contracts within this Program Element were awarded through full and open competition. The EMD phase option for JASSM is Cost Plus Award Fee (CPAF). This contract type provides the government the flexibility to periodically evaluate contractor performance while motivating the contractor to execute a successful program with emphasis on cost, average unit procurement price (AUPP), schedule, and performance.

JASSM is an OSD flagship program under Cost as An Independent Variable (CAIV). This allows the contractor to have maximum trade space to develop an affordable missile that meets the three key performance parameters. Under CAIV, the program maintains a threshold AUPP of \$700,000 (BY95\$) and an objective AUPP of \$400,000 (BY95\$).

The government is buying the JASSM system based on a contractor-developed, government-approved System Performance Specification (SPS) which became contractually binding at downselect. The contractor assumes Total System Performance Responsibility (TSPR) as defined in the SPS and warrants system performance for 15 years. Accordingly, the contractor is responsible not only for the design of the missile system, but also for planning and executing the Development Test and Evaluation (DT&E) program to verify the missile system performance. In its role as facilitator and advisor to the contractor, the government formally arranges and funds the use of government flight test support for DT&E. Although funded by the government, flight test support funds are part of the negotiated commitment between the contractor and the government ensuring the contractor is able to execute the DT&E program according to the scope of the EMD contract.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207325F Joint Air-to-Surface Standoff Missile	PROJECT 4515
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(U) F. Schedule Profile

	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Downselect to Single Contractor			*													
Begin Phase II PDRR			*													
Milestone II Approval					*											
EMD Contract Award					*											
First Flight Test Vehicle Prototype Flight						X										
First DT/OT Flight									X							
Last DT/OT Flight														X		
LRIP Decision / Contract Award														X		
Begin IOT&E Flight Testing (AFOTEC)															X	

* = Completed Event

X = Planned Event

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207325F Joint Air-to-Surface Standoff Missile	PROJECT 4515
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(U) A. Project Cost Breakdown (\$ in Thousands)

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) Major Contracts	128,768	87,082	95,073	36,543
(U) Associated Contracts	10,764	6,648	19,467	9,082
(U) Support Contracts	5,685	5,834	8,509	5,640
(U) In-House	2,117	2,450	2,244	1,476
(U) Test Support	16,467	23,825	41,115	18,281
(U) Identified as a source for SBIR	0	2,957	0	0
(U) Total	163,801	128,796	166,408	71,022

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0207325F Joint Air-to-Surface Standoff Missile					PROJECT 4515	
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR							2,957				2,957
<u>Product Development Organizations</u>											
MDA - PDRR I	C/CPFF	Jun 96	125,976	125,976	72,180	53,796	0	0	0	0	125,976
LM - PDRR I& II	C/CPFF	Jun 96	153,956	153,956	78,984	74,972	0	0	0	0	153,956
LM - EMD	C/CPAF	Nov 98	237,678	237,678	0	0	87,082	95,073	36,543	18,980	237,678
NOTE: Contractors are MDA - McDonnell Douglas Aircraft; LM - Lockheed Martin											
<u>Support and Management Organizations</u>											
F-16 SPO	PO	Apr 96	N/A	N/A	2,015	3,053	2,336	10,079	5,764	12,446	35,693
B-52 SPO	PO	Sep 96	N/A	N/A	8,461	6,855	4,225	9,320	3,281	0	32,142
Other Acft SPOs	PO	Various	N/A	N/A	2,512	856	87	68	37	0	3,560
Sverdrup Inc.	C/CPAF	Jan 96	N/A	N/A	3,350	3,382	2,756	3,539	1,509	3,711	18,247
Navy	MIPR	Jan 96	N/A	N/A	2,240	101	0	0	0	0	2,341
JASSM	Misc	Various	N/A	N/A	11,002	4,319	5,528	7,214	5,607	19,415	53,085
SPO/Other											
<u>Test and Evaluation Organizations</u>											
46TW	PO	Jan 96	N/A	N/A	7,548	16,467	23,825	41,115	18,281	35,359	142,595
Government Furnished Property: Not Applicable.											
Identified as a source for SBIR							2,957				2,957
Subtotal Product Development					151,164	128,768	87,082	95,073	36,543	18,980	517,610
Subtotal Support and Management					29,580	18,566	14,932	30,220	16,198	35,572	145,068
Subtotal Test and Evaluation					7,548	16,467	23,825	41,115	18,281	35,359	142,595
Total Project					188,292	163,801	128,796	166,408	71,022	89,911	808,230
Project 4515					Page 7 of 7 Pages			Exhibit R-3 (PE 0207325F)			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207412F Theater Air Control System	PROJECT 485L
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
485L Theater Air Control System Imp (TACSI)	374	427	467	450	436	426	435	3,275	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

Ground Theater Air Control System (GTACS): GTACS provides battle management resources and a recognizable C2 air operations picture through which the Joint Forces Air Component Commander and theater commanders execute control of assigned forces to accomplish an assigned mission. GTACS supports the roles of aerospace control, force application, force enhancement, and force support. The GTACS mission is to deploy a rapid reaction capability into a theater, then to forward locations within that theater and set up self-sufficient bases of operations. This support is provided to worldwide operations ranging from military operations other than war and peacetime contingencies, to projecting decisive force into a major regional conflict to support a strategic war. GTACS elements accomplish battle management, force allocation, control of airborne assets (counter air, aerial refueling, interdiction, close air support, reconnaissance, airlift, special operations missions and others), surveillance, early warning, identification, and theater missile defense. GTACS consists of a family of communication/electronics components largely designed in the 1960s and becoming logistically insupportable. GTACS is currently not an open architecture system. There is a requirement to start implementing some of the modernization changes between FY99 and FY05. GTACS must be pre-positioned to start implementation in order to effect a "seamless" transition into the next generation of hardware and software. The GTACS program provides for connectivity among elements of the TACS within a designated Area of Responsibility to include United States Air Force, Navy, Marine Corps, Army, and allied assets.

- (U) FY 1998 (\$ in Thousands)
- (U) 76 Continue development/fielding of interoperability upgrades to MCE P3I systems
 - (U) 41 Continue development of follow-on system for GTACS Modernization
 - (U) 257 Continue program support, test, and other miscellaneous efforts
 - (U) 374 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207412F Theater Air Control System	PROJECT 485L
<p>(U) <u>FY 1999</u> (\$ in Thousands)</p> <ul style="list-style-type: none"> - (U) 60 Continue development/fielding of interoperability upgrades to MCE P3I systems - (U) 180 Continue development of follow-on system for GTACS Modernization - (U) 183 Continue program support, test, and other miscellaneous efforts - (U) 4 Identified as a source for SBIR - (U) 427 Total <p>NOTE: Program is nearing completion requiring only engineering support and program management</p> <p>(U) <u>FY 2000</u> (\$ in Thousands)</p> <ul style="list-style-type: none"> - (U) 68 Continue development/fielding of interoperability upgrades to MCE P3I systems - (U) 192 Continue development of follow-on system for GTACS Modernization - (U) 207 Continue program support, test, and other miscellaneous efforts - (U) 467 Total <p>(U) <u>FY 2001</u> (\$ in Thousands)</p> <ul style="list-style-type: none"> - (U) 48 Continue development/fielding of interoperability upgrades to MCE P3I systems - (U) 195 Continue development of follow-on system for GTACS Modernization - (U) 207 Continue program support, test, and other miscellaneous efforts - (U) 450 Total <p>(U) B. Budget Activity Justification:</p> <p>The program is in Budget Activity 7 because GTACS is a fielded, operational system currently undergoing major modifications/upgrades.</p>		
Project 485L	Page 2 of 6 Pages	Exhibit R-2 (PE 0207412F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE				
BUDGET ACTIVITY							February 1999				
7 - Operational System Development				PE NUMBER AND TITLE			PROJECT				
				0207412F Theater Air Control System			485L				
(U) C. Program Change Summary (\$ in Thousands)											
		<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total</u>	<u>Cost</u>				
(U) Previous President's Budget (FY 1999 PB)		377	431	475	458	TBD					
(U) Appropriated Value		393	431								
(U) Adjustments to Appropriated Value											
a. Congressional General Reduction		-13	-4								
b. SBIR		-3									
c. Omnibus or Other Above Threshold Reprogram		-3									
d. BelowThreshold Reprogramming											
(U) Adjustment to Budget Years Since FY 1999 PB				-8	-8						
(U) Current Budget Submit/FY 2000 PB		374	427	467	450	TBD					
 (U) Significant Program Changes:											
FY99: \$4 identified as a source for SBIR.											
 (U) D. Other Program Funding Summary (\$ in Thousands)											
		<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To</u>	<u>Total</u>
(U) Other Procurement AF Total		27,133	25,966	31,493	20,938	21,126	20,263	20,033	26,861	Cont	TBD
(U) Other Procurement Air Force, WSC 833040, Theater Air Control System Improvement		21,951	20,720	25,173	18,868	19,252	19,236	19,642	26,771	Cont	TBD
(U) Other Procurement Air Force, WSC 838010, Comm Electronic Mods		0	1,932	4,107	798	797	600			TBD	TBD
(U) Other Procurement Air Force, WSC 86190A, Initial Spares		5,182	3,314	2,213	1,272	1,077	427	391	90	Cont	TBD
Project 485L											
Page 3 of 6 Pages						Exhibit R-2 (PE 0207412F)					

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207412F Theater Air Control System	PROJECT 485L
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(U) **E. Acquisition Strategy:** MCE OM development is complete, production is ongoing until fourth quarter, FY99. Current strategy is to develop and define requirements for the GTACS follow-on system for GTACS modernization. Further strategy is to work the residual tasks associated with the MCE OM production item.

(U) **F. Schedule Profile**

	FY 1998				FY 1999				FY 2000				FY 2001			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) MCE P3I OM Interface Kit Follow-on Production Award	*															
(U) MCE P3I OM Interface Kit Article IOT&E		*														
(U) MCE P3I Initial Operational Capability (IOC)							x									
(U) JM Development Completed												x				
(U) GTACS Modernization		*													x	
(U) Program Support		*													x	

* Denotes completed event

x Denotes planned event

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207412F Theater Air Control System	PROJECT 485L
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(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) Continue development fielding of interoperability upgrades to MCE P3I system	76	60	68	48
(U) Develop follow-on system for GTACS Modernization (Air Control System {ACS} comm engineering studies, ops module hardware eng studies, ops module software eng studies)	41	180	330	334
(U) Program Management Support	257	183	69	68
(U) Identified as a source for SBIR		4		
(U) Total	374	427	467	450

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0207412F Theater Air Control System					PROJECT 485L	
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
<u>Product Development Organizations</u>											
N/A											
<u>Support and Management Organizations</u>											
Computer Support	N/A	N/A	N/A	N/A		21	23	24	24	Cont	TBD
Equipment Maintenance	N/A	N/A	N/A	N/A		6	6	7	8	Cont	TBD
Miscellaneous (TDY, Supplies, Eq Purchase)	N/A	N/A	N/A	N/A		230	154	38	36	Cont	TBD
MCE P3I	N/A	N/A	N/A	N/A		76	60	68	48	Cont	TBD
GTACS Modernization	N/A	N/A	N/A	N/A		41	180	330	334	Cont	TBD
<u>Test and Evaluation Organizations</u>											
N/A											
GFP/GFE:	None										
Government Furnished Property: None											
Identified as a source for SBIR							4				4
Subtotal Product Development							374	427	467	450	Cont TBD
Subtotal Support and Management						55,720	2,064	552		0	58,336
Subtotal Test and Evaluation						3,378	0	0		0	3,378
Project 485L											

DATE
February 1999

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0207412F Theater Air Control System

Contractor or Government Performing <u>Activity</u>	Contract Method/Type or Funding <u>Vehicle</u>	Award or Obligation <u>Date</u>	Performing Activity <u>EAC</u>	Project Office <u>EAC</u>	Total Prior to <u>FY 1998</u>	Budget <u>FY 1998</u>	Budget <u>FY 1999</u>	Budget <u>FY 2000</u>	Budget <u>FY 2001</u>	Budget to <u>Complete</u>	Total <u>Program</u>
Total Project					59,098	2,064	569			0	61,731

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 EXHIBIT)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207414F Combat Intelligence System	PROJECT 4773
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4773 Combat Intelligence System (CIS)	11,760	9,635	0	0	0	0	0	0	0	21,395
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

Note: Starting in FY00 the RDT&E funding for CIS will be transferred to PE 27438F under project 4790, TBMCS.

(U) A. Mission Description

(U) Combat Intelligence System (CIS) is the Air Force's single, standard automated intelligence system optimizing both component and unit-level intelligence functions to provide warfighters with the most accurate and timely intelligence data available. CIS is the core capability for automating the receipt, correlation, and dissemination of intelligence information to a variety of intelligence and operational systems which support combat planning and execution. As the intelligence segment to Theater Battle Management Core Systems (TBMCS), it provides an automated capability at the component and unit levels to rapidly receive and process all-source intelligence data to support Contingency Theater Automated Planning System (CTAPS). CIS builds and maintains in-theater situational awareness during deployment to the theater and provides indications and warning support after arrival. CIS is electronically interoperable and compatible with other intelligence systems, providing an integrated network capable of intelligence support to decision makers, battle planners, mission planners, and warfighters.

(U) FY 1998

- (U) \$10,210 Continue TBMCS software version 1.0 development.
- (U) \$ 406 Initiate TBMCS post version 1.0 development.
- (U) \$ 1,144 System engineering and support
- (U) \$11,760 Total

(U) FY 1999

- (U) \$ 2,367 Complete TBMCS software version 1.0 development.
- (U) \$ 5,920 Continue TBMCS v1.1 and v2.0 development.
- (U) \$ 1,075 System engineering and support.
- (U) \$ 273 Identified as a source for SBIR
- (U) \$ 9,635 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1999																																																												
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207414F Combat Intelligence System	PROJECT 4773																																																												
<p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$0 No further funding in this project. Further evolution of this functionality continues under PE 27438F, project 4790, TBMCS. - (U) \$0 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$0 No further funding in this project. Further evolution of this functionality continues under PE 27438F, project 4790, TBMCS. - (U) \$0 Total <p>(U) <u>B. Budget Activity Justification:</u></p> <p>This program was in budget activity 5, Engineering and Manufacturing Development in FY98. In FY99 this program moved to budget activity 7, Operational Systems Development because the TBMCS program is a post milestone III effort and because it incrementally upgrades and develops capabilities for currently 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: 40%;"></th> <th style="text-align: center;"><u>FY 1998</u></th> <th style="text-align: center;"><u>FY 1999</u></th> <th style="text-align: center;"><u>FY 2000</u></th> <th style="text-align: center;"><u>FY 2001</u></th> <th style="text-align: center;"><u>Total Cost</u></th> </tr> </thead> <tbody> <tr> <td>(U) Previous President's Budget (FY 1999 PB)</td> <td style="text-align: right;">11,590</td> <td style="text-align: right;">9,802</td> <td style="text-align: right;">10,172</td> <td style="text-align: right;">9,009</td> <td style="text-align: center;">TBD</td> </tr> <tr> <td>(U) Appropriated Value</td> <td style="text-align: right;">12,267</td> <td style="text-align: right;">9,802</td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Adjustments to Appropriated Value</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">a. Cong Reductions</td> <td style="text-align: right;">-425</td> <td style="text-align: right;">-167</td> <td></td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">b. Small Business Innovative Research</td> <td style="text-align: right;">-253</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">c. Omnibus or Other Above Threshold Reprogram</td> <td style="text-align: right;">- 79</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">d. Below Threshold Reprogram</td> <td style="text-align: right;">250</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Adjustments to Budget Years Since FY 1999 PB</td> <td></td> <td></td> <td style="text-align: right;">-10,172</td> <td style="text-align: right;">-9,009</td> <td></td> </tr> <tr> <td>(U) Current Budget Submit/ FY 2000 PB</td> <td style="text-align: right;">11,760</td> <td style="text-align: right;">9,635</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: right;">21,395</td> </tr> </tbody> </table> <p>(U) Significant Program Changes:</p> <p>FY99: \$273 identified as a source for SBIR</p>				<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>	(U) Previous President's Budget (FY 1999 PB)	11,590	9,802	10,172	9,009	TBD	(U) Appropriated Value	12,267	9,802				(U) Adjustments to Appropriated Value						a. Cong Reductions	-425	-167				b. Small Business Innovative Research	-253					c. Omnibus or Other Above Threshold Reprogram	- 79					d. Below Threshold Reprogram	250					(U) Adjustments to Budget Years Since FY 1999 PB			-10,172	-9,009		(U) Current Budget Submit/ FY 2000 PB	11,760	9,635	0	0	21,395
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>																																																									
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d. Below Threshold Reprogram	250																																																													
(U) Adjustments to Budget Years Since FY 1999 PB			-10,172	-9,009																																																										
(U) Current Budget Submit/ FY 2000 PB	11,760	9,635	0	0	21,395																																																									
Project 4773	<i>Page 2 of 5 Pages</i>	Exhibit R-2 (PE 0207414F)																																																												

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207414F Combat Intelligence System	PROJECT 4773
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Starting in FY00 the RDT&E funding for CIS will be transferred to PE 27438F under project 4790, TBMCS, where further evolution of TBM combat intelligence capability and interoperability will continue. CIS will be integrated with several other legacy systems in a single DII/COE compliant system and will be managed as a single project with the fielding of TBMCS 1.0 in FY99.

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

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	To <u>Compl</u>	Total <u>Cost</u>
(U) Other Procurement, AF, PE 0207414F, WSC 832010, Intel Data Handling System, CIS Portion	14,111	12,555	0	0	0	0	0	0	0	26,666
(U) Other Procurement, AF, PE 0207431F, WSC 832010, Intel Data Handling System, CIS Portion	3,612	2,885	4,692	3,245	2,844	2,834	2,895	2,959	Cont	TBD
(U) Other Procurement, PE 0207438F, WSC 832010, Intel Data Handling System	0	0	17,885	13,899	11,407	11,393	11,633	11,896	Cont	TBD

Note: The other program funds associated with PEs 0207414F and 0207431F in FY98 and FY99 and with PE 0207438F in FY00 to FY05 are reported both here and as other program funds under the descriptive summary for PE 0207438F, Theater Battle Management C4I, project 4790, TBMCS. However, only the Intel Data Handling System portion of procurement funds from PE 0207438F is shown here.

(U) E. Acquisition Strategy:

Electronic Systems Center (ESC), Hanscom AFB, MA manages the TBMCS program, including CIS. Lockheed-Martin Mission Systems (LMMS) was competitively selected after full and open competition. They were awarded a cost plus award fee contract to develop improved capabilities in support of effective Theater Battle Management and to integrate existing capabilities in the DII Common Operating Environment. The program uses an evolutionary acquisition strategy with a series of incremental software releases. This approach accommodates refinement and prioritization of user requirements and improves adaptability to improvements in commercial technology.

(U) F. Schedule Profile

	<u>FY 1998</u>			<u>FY 1999</u>			<u>FY 2000</u>			<u>FY 2001</u>		
(U) TBMCS S/W Version 1.0	1	2	3	4	1	2	3	4	1	2	3	4
(U) In-Plant Test				*								
(U) Version 1.0 Release						X						

* - Denotes completed event / X - Denotes planned event

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)						DATE February 1999					
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0207414F Combat Intelligence System					PROJECT 4773	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U) Software Development					10,616	8,287	0	0			
(U) Engineering Support					1,144	1,075	0	0			
(U) Identified as a source for SBIR						273					
(U) Total					11,760	9,635	0	0			
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR							273				273
<u>Product Development Organizations</u>											
Lockheed Martin Mission Systems	SS/CPAF/PR	Oct 95	TBD	TBD	0	10,571	8,231	0	0	0	18,802
<u>Support and Management Organizations</u>											
TEMS	C/T&M	Various	n/a	n/a	0	636	710	0	0	0	1,346
MITRE	SS/CPAF	Oct 94	n/a	n/a	0	508	365	0	0	0	873
<u>Test and Evaluation Organizations</u>											
Test Support	Project Order	Various	n/a	n/a	0	45	56	0	0	0	101
Project 4773					Page 4 of 5 Pages				Exhibit R-3 (PE 0207414F)		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207414F Combat Intelligence System	PROJECT 4773
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(U) B. Budget Acquisition History and Planning Information Continued (\$ in Thousands)

Government Furnished Property: Not Applicable

	Total Prior to <u>FY 1998</u>	Budget <u>FY 1998</u>	Budget <u>FY 1999</u>	Budget <u>FY 2000</u>	Budget <u>FY 2001</u>	Budget to <u>Complete</u>	Total <u>Program</u>
Identified as a source for SBIR			273				273
Subtotal Product Development	0	10,571	8,231	0	0	0	18,802
Subtotal Support and Management	0	1,144	1,075	0	0	0	2,219
Subtotal Test and Evaluation	0	45	56	0	0	0	101
Total Project	0	11,760	9,635	0	0	0	21,395

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0207417F Airborne Warning & Control System (AWACS)				PROJECT 411L		
COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
411L Airborne Warning & Control System (AWACS)	48,716	33,173	33,393	49,170	25,639	58,452	82,328	130,369	TBD	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description
 Develops and integrates system improvements to enable the E-3 AWACS to remain an effective, survivable airborne surveillance system for command and control of tactical forces and for strategic defense of the U.S.
 The Block 30/35 upgrade includes Electronic Support Measures (ESM), Central Computer Memory Upgrade, Joint Tactical Information Distribution System (JTIDS) Class 2H/TADIL J and NAVSTAR Global Positioning System (GPS) integrated navigation (GINS). The Block 30/35 upgrade is a production program.
 The Radar System Improvement Program (RSIP) will increase radar reliability and maintainability, improve E-3 surveillance capability against evolving threats posed by low radar cross section fighters and cruise missiles, improve electronic counter-countermeasures (ECCM), and enhance man-machine interface for the Airborne Radar Technicians (RSIP is a production program).
 The Mission Computing Upgrade (Step 1 Computers and Displays) is an Extend Sentry effort to improve the reliability of the data display and mission computing system while also correcting long-standing operational deficiencies (Step 1 C&D development will complete with the FY98 efforts). Extend Sentry is a collection of user prioritized projects targeting investment in three areas: to prevent grounding of aircraft; to buy back aircraft from maintenance downtime; and to correct long-standing deficiencies to meet operational requirements. The Computers & Displays project is the primary Extend Sentry near-term focus. Additional Extend Sentry activities will be included in out-year budget requests.
 The Offensive Counter-Air and System Architecture Improvements are concept exploration and program definition/risk reduction efforts that implement a spiral development process allowing continuous improvements such as Defense Information Infrastructure (DII)-Global Command and Control System (GCCS) compliance for real-time operating systems and "plug-and-play" software upgrades such as automated Air Tasking Orders and onboard common operational picture. These, and other new capabilities, are being developed to operate on the Step 1 Mission Computing hardware architecture as follow-on applications and were demonstrated at the Expeditionary Forces Exercise (EFX) in September 1998.
 The E-2/E-3 commonality effort focuses primarily on advanced receiver and processing technologies. This effort provides a forum to review all activities in the E-2 and E-3 AWACS programs and identify additional opportunities for technology and development exploitation. Test System 3 (TS-3)/AWACS Development and Production Test (ADAPT) support includes maintenance and operations of the government owned, contractor operated test aircraft and associated laboratory facilities located at Boeing in Seattle, Washington. Cooperative Engagement Capability (CEC) is a Navy-developed program designed to allow sensor fusion ("netting") of airborne targets for dissemination and display to multiple theater platforms. The CEC effort in this program element (PE 27417F) will integrate CEC hardware and software onto TS-3 to support a Single Integrated Air Picture (SIAP) flight demonstration in FY03.

Project 411L Page 1 of 7 Pages Exhibit R-2 (PE 0207417F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207417F Airborne Warning & Control System (AWACS)	PROJECT 411L
<p>(U) <u>FY 1998 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$16,963 Extend Sentry (Step 1 Computers & Displays Upgrade) - (U) \$ 955 Offensive Counter Air Upgrades/System Architecture Improvements - (U) \$12,752 E-2/E-3 Commonality - (U) \$18,046 Test System-3/ADAPT support and program sustaining efforts - (U) \$48,716 Total <p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 7,410 Offensive Counter Air Upgrades/Systems Architecture Improvements - (U) \$ 7,500 E-2/E-3 Commonality - (U) \$ 3,934 JTIDS DLI - (U) \$13,287 ADAPT support and program sustaining efforts - (U) \$1,042 Identified as a source for SBIR - (U) \$33,173 Total <p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 9,797 Offensive Counter Air Upgrades/Systems Architecture Improvements - (U) \$ 7,796 Test System-3/ADAPT support and program sustaining efforts - (U) \$15,800 Cooperative Engagement Capability (CEC) on TS-3 - (U) \$33,393 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$20,159 Offensive Counter Air Upgrades/Systems Architecture Improvements - (U) \$15,311 Test System-3/ADAPT support and program sustaining efforts - (U) \$13,700 Cooperative Engagement Capability (CEC) on TS-3 - (U) \$49,170 Total <p>(U) B. Budget Activity Justification: Operational Systems Development, Budget Activity 7. AWACS is a fielded, operational system currently undergoing major modifications/block upgrades and continuing sustainment activities.</p>		
Project 411L	<i>Page 2 of 7 Pages</i>	Exhibit R-2 (PE 0207417F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)						DATE February 1999				
BUDGET ACTIVITY	PE NUMBER AND TITLE				PROJECT					
7 - Operational System Development	0207417F Airborne Warning & Control System (AWACS)				411L					
(U) C. <u>Program Change Summary (\$ in Thousands)</u>										
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>					
(U) Previous President's Budget (FY 1999 PB)	43,606	28,189	26,015	36,423	TBD					
(U) Appropriated Value	46,807	34,189								
(U) Adjustments to Appropriated Value										
a. Congressional General Reductions	-2,038	-1,016								
b. SBIR	-1,170									
c. Omnibus or Other Above Threshold Reprogram	-297									
d. Below Threshold Reprogramming	5,414									
(U) Adjustments to Budget Since FY99 PB			7,378	12,747						
(U) Current Budget Submit/FY00 PB	48,716	33,173	33,393	49,170	TBD					
 (U) Significant Program Changes:										
<p>FY98: \$5.414M BTR required to fund Step 1 Computers and Displays development, lab and flight test activities, and EFX 98 efforts. FY99: \$6M Plus-up in RDT&E for mission computing and sensor processing modernization. \$1.042M identified as a source for SBIR. FY00: \$7.8M of AWACS RDT&E was transferred to the E-3 Mods Aircraft Procurement account to fund a shortfall within the AWACS Block 30/35 upgrade. The FY00 RDT&E funds were originally programmed to operate and maintain the AWACS test aircraft (TS-3) at the Boeing facility in Seattle, WA. As a result, TS-3 will be shutdown for approximately 6-8 months during FY00 and will be unavailable to participate in technology demonstrations and experiments during that period. Subsequently, \$15.8M was transferred into the FY00 AWACS RDT&E budget to support integration of CEC onto TS-3. After reductions the result is a net change of \$7.4M. FY01: \$12.7M was transferred into the FY01 AWACS RDT&E budget to support integration of CEC onto TS-3.</p>										
(U) D. <u>Other Program Funding Summary (\$ in Thousands)</u>										
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To</u>	<u>Total</u>
(U) Aircraft Procurement, AF, E-3 Mods	120,855	112,480	124,061	110,671	89,849	103,489	97,210	96,265	TBD	TBD
(U) E-3 Initial Spares, AF	6,515	3,331	40,717	33,340	14,531	2,497	18,005	7,952	TBD	TBD

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207417F Airborne Warning & Control System (AWACS)	PROJECT 411L
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(U) E. Acquisition Strategy:

Block 30/35: The Electronic Support Measures (ESM) component of Block 30/35 is joint development program with NATO. The production contract utilizes a Fixed Price Incentive Fee (FPIF) plan with options to Boeing for ESM and other Block 30/35 Group A hardware. The contract with Lockheed for the CC-2E memory upgrade is a fixed price contact with follow-on options. JTIDS and Global Positioning System hardware is acquired via their respective program office-awarded contracts. The Radar System Improvement Program (RSIP) is a cooperative development program with NATO and the United Kingdom. Boeing is the prime integrating contractor; Northrop-Grumman is the subcontractor for radar component items. The RSIP production contract is Firm Fixed Price (FFP) with priced options through FY99 and is a sole source to Boeing follow-on FY00 RSIP production contract. The Extend Sentry acquisition strategy utilizes an approved contract structure that includes multiple contracts with multiple organizations with overlapping and continuous performance periods. The Program Office has the flexibility to quickly add specific Extend Sentry tasks as funding is made available.

(U) F. Schedule Profile

	FY 1998				FY 1999				FY 2000				FY 2001			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) RSIP Trial Install Start			*													
(U) RSIP Trial Install Complete				*												
(U) RSIP IOC 2QTR FY00										X						
(U) RSIP FOT&E Complete							X									
(U) RSIP KIT DELIVERY (#1)		*														
(U) RSIP KIT DELIVERY (#2)					*											
(U) RSIP KIT DELIVERY (#3)						X										
(U) RSIP KIT DELIVERY (#4)								X								
(U) RSIP KIT DELIVERY (#5)									X							
(U) RSIP KIT DELIVERY (#6)										X						
(U) RSIP KIT DELIVERY (#7)											X					
(U) RSIP KIT DELIVERIES (#8-9)												X				
(U) RSIP KIT DELIVERIES (#10-12)													X			
(U) RSIP KIT DELIVERY (#13)															X	
(U) BLK 30/35 RAA/IOC		*														
(U) LAST BLK 30/35 MOD INDUCTION																X
(U) BLK 30/35 FOC 1QTR FY02																

* Denotes completed events
X Denotes planned events

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development						PE NUMBER AND TITLE 0207417F Airborne Warning & Control System (AWACS)				PROJECT 411L	
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing <u>Activity</u>	Contract Method/Type or Funding <u>Vehicle</u>	Award or Obligation <u>Date</u>	Performing Activity <u>EAC</u>	Project Office <u>EAC</u>	Total Prior to <u>FY 1998</u>	Budget <u>FY 1998</u>	Budget <u>FY 1999</u>	Budget <u>FY 2000</u>	Budget <u>FY 2001</u>	Budget to <u>Complete</u>	Total <u>Program</u>
Identified as a source for SBIR							1,042				
<u>Product Development Organizations</u>											
(U) Boeing(RSIP)	C/FPIF	9/89	88,500	93,517	93,517	0	0	0	0	0	93,517**
(U) WECO(RSIP)	C/FPIF	9/89	327,400	306,900	259,155	0	0	0	0	0	259,155**
(U) Boeing(Blk 30/35)	SS/FPIF	5/87	N/A	N/A	291,667	0	0	0	0	0	291,667**
(U) Extend Sentry / Offensive Counter Air Upgrades / Systems Architecture Imp.	Multiple	N/A*	N/A	N/A	45,102	17,733	13,879	9,233	26,065	TBD	TBD
(U) E-2/E-3 Commonality	Multiple	N/A	N/A	N/A	0	12,752	5,810	0	0	0	18,562
(U) CEC Integration	TBD***	TBD	42,000	42,000	0	0	0	15,800	13,700	4,600	34,100
* N/A based on Extend Sentry Acquisition Strategy which includes multiple contracts with multiple organizations with overlapping and continuing performance periods.											
** Total Program does not include NATO funds.											
*** The AWACS Program Office has signed a Memorandum of Agreement with the CEC Program Office to outline organizational responsibilities for the CEC integration activity. A request for proposal has not been released and the contract structure is TBD at this time.											
Project 411L				Page 6 of 7 Pages				Exhibit R-3 (PE 0207417F)			

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0207417F Airborne Warning & Control System (AWACS)					PROJECT 411L	
<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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Support and Management Organizations</u>											
(U)Support/TEMS MITRE, travel, other	Multiple contracts	N/A	N/A	N/A	553,227	4,044	5,068	2,860	2,905	TBD	TBD
<u>Test and Evaluation Organizations</u>											
(U) Test System-3 ADAPT Contract / Other test activities	Multiple	N/A	N/A	N/A	33,800	14,187	7,374	5,500	6,500	TBD	TBD
Government Furnished Property:											
None											
Identified as a source for SBIR							1,042				
Subtotal Product Development					689,441	30,485	19,689	25,033	39,765	TBD	TBD
Subtotal Support and Management					553,227	4,044	5,068	2,860	2,905	TBD	TBD
Subtotal Test and Evaluation					33,800	14,187	7,374	5,500	6,500	TBD	TBD
Total Project					1,276,468	48,716	33,173	33,393	49,170	TBD	TBD

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 EXHIBIT)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207423F Advanced Communications Systems
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	2,330	2,176	2,864	2,892	2,931	2,981	3,043	3,107	Continuing	TBD
1013 Theater Deployable Communications (TDC)	2,141	1,975	2,646	2,672	2,931	2,981	3,043	3,107	Continuing	TBD
2982 Anti-Jam Radio Communications	189	201	218	220	0	0	0	0	0	20,021
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Descriptions

The Advanced Communication Systems program procures commercially available ground communications equipment for deployment to theaters of operation; and develops and procures jam-resistant, ultra high frequency (UHF) and very high frequency (VHF) frequency-hopping tactical radios. The HAVE QUICK UHF radios provide the primary Air Force and DOD UHF Electronic Counter-Countermeasures (ECCM) voice communications. SINCGARS (Single Channel Ground and Airborne Radio System) provides anti-jam, VHF frequency-hopping voice and data communications and is the primary means of ECCM communications between Air Force, Army, and USMC aircraft and ground units involved in close air support and joint battlefield operations. The Theater Deployable Communications (TDC) program provides funding for the research, development, test and evaluation for the modernization of operational deployable communications, and integration of commercial off the shelf (COTS) equipment that support tactical air operations in a combat environment. This includes the integration of deployable communications equipment for active duty, guard and reserve forces. Equipment will be fielded at wings, combat communications squadrons, Air Force Special Operations Command and Air Mobility Command communication units, and Theater Air Control System units.

(U) B. Budget Activity Justification

This program is budget activity 7, Operational System Development because RDT&E funds in this program element are used to examine appropriate emerging technologies; provide software development support for the fielded HAVE QUICK family of radios; and determine and resolve integration issues pertaining to commercial-off-the-shelf (COTS) equipment.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207423F Advanced Communications Systems
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(U) C. Program Change Summary (\$ in Thousands)

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U) FY1999 President's Budget	2,728	2,348	2,916	2,947	TBD
(U) Appropriated Value	2,966	2,348			
(U) Adjustments to Appropriated Value					
a. Congressional Reductions	-174	-172			
b. SBIR	-64				
c. Omnibus and Other AboveThreshold Reprogramming	-18				
d. Below Threshold Reprogramming	-380				
Adjustment to Budget Years Since FY 1999 President Budget			-52	-55	
(U) Current Budget Submit /FY 2000 PB	2,330	2,176	2,864	2,892	TBD

(U) Significant Program Changes:
 FY99: \$67 identified as a sources for SBIR

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207423F Advanced Communications Systems	PROJECT 1013
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
1013 Theater Deployable Communications (TDC)	2,141	1,975	2,646	2,672	2,931	2,981	3,043	3,107	Continuing	TBD

(U) A. Mission Description

As clearly demonstrated during Desert Shield/Desert Storm (DS/DS), today's generation of deployable communications equipment is bulky, inflexible in design and does not meet today's projected airlift availability or interoperability standards. Air Force planning calls for initial communications assets to be in place prior to the arrival of flying forces. Deployment priorities for DS/DS did not allow timely arrival of communications assets. This program will complete joint interoperability certification testing, begin development and implementation of integrated network management software, and support field activities and conduct integration activities. This program also emphasizes COTS equipment to augment existing assets or replace tactical communications packages. The resulting Theater Deployable Communications (TDC) packages will reduce airlift requirements and be designed to support a wide range of operational scenarios during deployment/employment, expansion and sustaining operations. Communications packages will be used by theater air control, combat communications, special operations units, deployed air wings, and mobility forces worldwide.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE
BUDGET ACTIVITY		PROJECT
7 - Operational System Development	0207423F Advanced Communications Systems	February 1999 1013
<p>(U) <u>FY 1998 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U)\$ 427 Continue communications architecture planning - (U)\$ 505 Continue development of automation tools - (U)\$ 891 Continue field interoperability and integration activities - (U)\$ 318 Start production improvement and interface development - (U)\$ 2,141 Total <p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U)\$ 299 Continue communications architecture planning - (U)\$ 430 Continue development of automation tools - (U)\$ 885 Continue field interoperability and integration activities - (U)\$ 300 Continue production improvement and interface development - (U)\$ 61 Identified as a source for SBIR - (U)\$ 1,975 Total <p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U)\$ 378 Continue communications architecture planning - (U)\$ 619 Continue development of automation tools - (U)\$ 1,233 Continue field interoperability and integration activities - (U)\$ 416 Production improvement and interface development - (U)\$ 2,646 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U)\$ 382 Continue communications architecture planning - (U)\$ 626 Continue development of automation tools - (U)\$ 1,244 Continue field interoperability and intergration activities - (U)\$ 420 Production improvement and interface development 		
Project 1013	Page 4 of 13 Pages	Exhibit R-2A (PE 0207423F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 1999			
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0207423F Advanced Communications Systems			PROJECT 1013			
- (U)\$ 2,672 Total											
<p>(U) B. <u>Project Change Summary - Description of Significant Changes:</u> N/A</p>											
<p>(U) C. <u>Other Program Funding Summary (\$ in Thousands)</u></p>											
		<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	To <u>Compl</u>	Total <u>Cost</u>
(U) Other Procurement AF, Budget Activity 3, PE 0207423F		27,150	33,874	36,401	88,168	77,961	126,778	158,978	121,463	Cont.	TBD
(U) Other Procurement AF, Budget Activity 5, Weapon System Code 86190A, PE 0207423F,		4,556	1,888	1,348	3,048	98	97	99	101	Cont.	TBD
<p>(U) D. <u>Acquisition Strategy:</u> There are two Firm Fixed Price (FFP) contracts for Theater Deployable Communications (TDC): Lightweight Multiband Satellite Terminals (LMST) and the Integrated Communication Access Package (ICAP). The TDC contracts were awarded after full and open competitions. (When restricted technologies are involved, foreign competition is not allowed.)</p>											
Project 1013		Page 5 of 13 Pages				Exhibit R-2A (PE 0207423F)					

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1999					
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0207423F Advanced Communications Systems				PROJECT 1013				
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>												
				<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>					
(U)	Software Support			902	713	994	1,002					
(U)	Engineering Support			400	256	370	376					
(U)	Integration Activities			769	880	1,194	1,204					
(U)	Travel			55	55	76	77					
(U)	Miscellaneous			15	10	12	13					
(U)	Identified as a source for SBIR				61							
(U)	Total			2,141	1,975	2,646	2,672					
(U) B. <u>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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
	Identified as a source for SBIR							61				
<u>Product Development Organizations</u>												
	Various					3,567	756	560	804	813	Cont	Cont
<u>Support and Management Organizations</u>												
	MITRE	FFP	OCT 97	TBD	TBD	3,669	890	915	1,000	1,000	Cont	Cont
	TEMS	FFP	Varies			964	495	439	842	859	Cont	Cont
Project 1013				Page 7 of 13 Pages				Exhibit R-3 (PE 0207423F)				

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0207423F Advanced Communications Systems					PROJECT 2982	
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
<u>Test and Evaluation Organizations</u>											
Government Furnished Property: Not Applicable											
Identified as source for SBIR							61				
Subtotal Product Development					3,567	756	560	804	813	Cont	Cont
Subtotal Support and Management					4,633	1,385	1,354	1,842	1,859	Cont	Cont
Subtotal Test and Evaluation					0	0	0	0	0	0	0
Total Project					8,200	2,141	1,975	2,646	2,672	Cont	Cont

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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207423F Advanced Communications Systems	PROJECT 2982
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
2982 Anti-Jam Radio Communications	189	201	218	220	0	0	0	0	0	20,021

(U) A. Mission Description

The fast paced development of new frequency hopping radio technologies by potentially hostile nations dictates that the U.S. maintains a technological lead. Ultra high frequency (UHF) frequency hopping voice radios are needed for jam resistant communications between tactical aircraft and airborne and ground control elements. The HAVE QUICK wave form used in these radios is the NATO standard for UHF anti-jam communications. The HAVE QUICK UHF radios provide the primary Air Force and DOD UHF Electronic Counter-Countermeasures (ECCM) voice communications. SINGARS (Single Channel Ground and Airborne Radio System) provides anti jam, very high frequency (VHF) frequency hopping radios and data communications and is the primary means of ECCM communications between Air Force, Army, USMC aircraft and ground units involved in close air support and joint battlefield operations.

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

- (U)\$ Continue to investigate improvements in anti-jam performance and other anti-jam techniques
89
- (U)\$ 100 Begin to investigate decrease in air traffic control channel bandwidth and modulation techniques
- (U)\$ 189 Total

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

- (U)\$ Continue to investigate improvements in anti-jam performance and other anti-jam techniques
90
- (U)\$ 105 Continue to investigate decrease in air traffic control channel bandwidth and modulation techniques
- (U)\$ 6 Identified as source for SBIR
- (U)\$ 201 Total

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

- (U)\$ Continue to investigate improvements in anti-jam performance and other anti-jam techniques
110

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207423F Advanced Communications Systems	PROJECT 2982
<ul style="list-style-type: none"> - (U)\$ 108 Investigate decrease in air traffic control channel bandwidth and modulation techniques - (U)\$ 218 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U)\$ 100 Continue to investigate improvement in anti-jam performance and other anti-jam techniques; including feasibility of converting algorithms from hardware to software - (U)\$ 120 Investigate decrease in air traffic control channel bandwidth and modulation techniques including Time Division Multiple Access (TMDA) prototype development and testing - (U)\$ 220 Total <p>(U) B. Budget Activity Justification: This program is budget activity 7, Operational System Development because RDT&E funds in this program element are used to examine appropriate emerging technologies; provide software development support for the fielded HAVE QUICK family of radios; and the AN\ARE-777 (SINCGARS) radio; determine and resolve integration issues pertaining to commercial-off-the-shelf (COTS) equipment.</p>		
Project 2982	<i>Page 10 of 13 Pages</i>	Exhibit R-2A (PE 0207423F)

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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207423F Advanced Communications Systems	PROJECT 2982
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(U) C. Other Program Funding Summary (\$ in Thousands)

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To</u> Compl	<u>Total</u> Cost
(U) Other Procurement AF, Budget Activity 3, Weapon System Code 837100, PE 0207423F	3,530	0	13,309	22,169	23,628	24,003	12,777	9,703	Cont	TBD

(U) D. Acquisition Strategy:

The Anti-Jam (SINCGARS) project is a FFP contract that was awarded after full open competition

(U) E. Schedule Profile

	<u>FY 1998</u>			<u>FY 1999</u>			<u>FY 2000</u>			<u>FY 2001</u>		
(U) SINCGARS Phase II Qual Testing	1	2	3	4	1	2	3	4	1	2	3	4
(U) Investigate anti-jam improvements			*								X	
(U) Analyze decrease in ATC bandwidth												X

* denotes completed event

X denotes planned event

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0207423F Advanced Communications Systems					PROJECT 2982		
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program	
<u>Test and Evaluation Organizations</u>												
AFOTEC	N/A											
Government Furnished Property: Not Applicable												
Identified as a source for SBIR							6					
Subtotal Product Development												
Subtotal Support and Management					19,169	189	195	218	220	0	20,021	
Subtotal Test and Evaluation					0	0	0	0	0	0	0	
Total Project					19,169	189	201	218	220	0	19,997	

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207438F Theater Battle Management (TBM) C4I
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	29,208	30,254	43,727	41,433	32,663	30,388	31,020	31,667	Continuing	TBD
3330 Cmd Control Info Process Sys (C2IPS)	4,395	14,064	11,708	9,356	2,214	2,335	0	0	0	60,071
4287 Contingency Theater Automated Planning System (CTAPS)	18,844	12,321	0	0	0	0	0	0	0	82,942
4288 Wing C2 System (WCCS)	5,969	3,869	0	0	0	0	0	0	0	19,997
4790 Theater Battle Management Core System (TBMCS)	0	0	23,007	20,439	18,120	17,682	20,433	20,859	Continuing	TBD
4802 Deliberate and Crisis Action Planning and Execution Segment (DCAPES)	0	0	9,012	11,638	12,329	10,371	10,587	10,808	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

Note: Starting in FY00 the RDT&E funding for CTAPS (4287), WCCS (4288), and Combat Intelligence System (CIS) (27414F, 4773) will be combined in PE 27438F under project 4790, TBMCS. CTAPS, WCCS and CIS will be integrated in a single Defense Information Infrastructure Common Operating Environment (DII COE) compliant system and will be managed as a single project with the fielding of TBMCS 1.0 in FY99. DCAPES was previously funded in FY98 under PE 33152F and in FY99 under PE 33150F.

(U) A. Mission Description

TBM C4I develops force-level and wing-level command, control, and intelligence systems which utilize DoD's Defense Information Infrastructure (DII) common operating environment (COE). Acquisition of these systems will allow the execution of TBM planning, intelligence, and operational functions of the Joint Forces Air Component Commander (JFACC), including generation and dissemination of the air tasking order (ATO). Projects included in this program are Command & Control Information Processing System (C2IPS), Contingency Theater Automated Planning System (CTAPS), Wing Command & Control System (WCCS), Theater Battle Management Core Systems (TBMCS), and Deliberate and Crisis Action Planning and Execution Segment (DCAPES).

(U) B. Budget Activity Justification:

The TBMCS effort is Post Milestone III effort, and is in Budget Activity 7, Operational Systems Development because it incrementally upgrades and develops capabilities for currently operational systems.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207438F Theater Battle Management (TBM) C4I
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(U) C. <u>Program Change Summary (\$ in Thousands)</u>					
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U) Previous President's Budget (FY 1999 PB)	24,778	27,292	24,174	19,854	TBD
(U) Appropriated Value	27,013	30,792			
(U) Adjustments to Appropriated Value					
a. Congressional Reductions	-1,670	-538			
b. Small Business Innovative Research	-567				
c. Omnibus or Other Above Threshold Reprogram	-168				
d. Below Threshold Reprogram	4,600				
(U) Adjustments to Budget Years Since FY 1999 PB	0		19,553	21,579	
(U) Current Budget Submit / FY 2000 PB	29,208	30,254	43,727	41,433	TBD
(U) Significant Program Changes:					
FY99: \$857 identified as a source for SBIR					
Starting in FY00 the RDT&E funding for CTAPS (4287), WCCS (4288), and CIS (27414F, 4773) will be combined in PE 27438F under project 4790, TBMCS. CTAPS, WCCS and CIS will be integrated in a single DII/COE compliant system and will be managed as a single project with the fielding of TBMCS 1.0 in FY99. In addition we have transferred the DCAPEs project into TBM C4I.					
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	
(U) CIS Consolidation Into TBMCS project			10,172	9,009	
(U) DCAPEs Transfer to TBM C4I			9,012	11,638	
(U) NATO R&D Transfer to TBMCS Project			1,000	1,500	

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207438F Theater Battle Management (TBM) C4I	PROJECT 3330
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
3330 Cmd Cntrl Info Process Sys (C2IPS)	4,395	14,064	11,708	9,356	2,214	2,335	0	0	0	60,071

(U) A. Mission Description

The Command & Control Information Processing System (C2IPS) project develops communications and information processing hardware and software for all echelons of the Air Mobility Command (AMC). C2IPS provides AMC the capability to monitor in real-time the operational airlift and tanker functions associated with mission execution worldwide. The integration of C2IPS computer resources and software with improved High Frequency (HF) equipment and other available communications media will result in a unified AMC C2 System.

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

- (U) \$ 850 Continue increments 3A and 3B software development
- (U) \$ 2,514 Continue increment 3C (Performance, Network Improvements and Y2K revisions)
- (U) \$ 1,031 Start increment 4 (Detailed Planning & Scheduling for integration of AMC Aircraft Schedules)
- (U) \$ 4,395 Total

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

- (U) \$ 6,450 Complete C/S software and evaluation (3A/3B/3C)
- (U) \$ 6,215 Continue increment 4 (Detailed Planning & Scheduling for integration of AMC Aircraft Schedules)
- (U) \$ 1,000 Start requirements planning & segmentation for integration into DII COE
- (U) \$ 399 Identified as a source for SBIR
- (U) \$ 14,064 Total

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

- (U) \$ 2,769 Continue Increment 4 (Detailed Planning & Scheduling for integration of AMC Aircraft Schedules)
- (U) \$ 4,000 Continue requirement planning & segmentation for integration into DII/COE
- (U) \$ 4,939 Start next level DII/COE integration
- (U) \$ 11,708 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE February 1999				
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207438F Theater Battle Management (TBM) C4I	PROJECT 3330				
<p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 2,893 Continue Increment 4 (Detailed Planning & Scheduling for integration of AMC aircraft schedules) - (U) \$ 2,500 Continue requirements planning & segmentation for integration into DII/COE - (U) \$ 3,963 Continue higher level integration of C2IPS in DII/COE - (U) \$ 9,356 Total <p>(U) B. <u>Project Change Summary - Description of Significant Changes:</u> Not Applicable</p> <p>(U) C. <u>Other Program Funding Summary (\$ in Thousands)</u></p> <table style="margin-left: 40px; border: none;"> <tr> <td style="width: 60%;"></td> <td style="text-align: center;"><u>FY 1998</u></td> </tr> <tr> <td>(U) Other Procurement, AF PE 27438F, WSC 834520</td> <td style="text-align: center;">1,876</td> </tr> </table> <p>\$1,876 of the procurement funds in 0207438F were for procurement of C2IPS equipment for non-Air Mobility Command units.</p> <p>(U) D. <u>Acquisition Strategy</u></p> <p>The C2IPS will be developed and installed in four increments. A spiral development process is used to produce consecutive software releases within each increment. The first three increments were developed under contract with Computer Sciences Corporation. Increment 1 provided a digital data message handling capability at each Information Processing System (IPS) node and implements mission execution monitoring. Increment 2 builds on Increment 1 software to support mission planning and scheduling. Increment 3 will provide C2IPS with a client server architecture as part of the system migration efforts. Increment 4 continues the evolutionary acquisition process, using modular development through government wide agency contracts. It lays the foundation for the migration strategy that will merge features of C2IPS into TBMCS and achieve higher levels of DII/COE integration.</p>				<u>FY 1998</u>	(U) Other Procurement, AF PE 27438F, WSC 834520	1,876
	<u>FY 1998</u>					
(U) Other Procurement, AF PE 27438F, WSC 834520	1,876					
Project 3330	Page 4 of 26 Pages	Exhibit R-2A (PE 0207438F)				

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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207438F Theater Battle Management (TBM) C4I	PROJECT 3330
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(U) E. Schedule Profile

	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
*	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) <u>Increment 3 Completion Dates</u>																
(U) Spiral A (Rel 3A)					*											
(U) Spiral B (Rel 3B Comm Proc)					*											
(U) Spiral C (Rel 3C Data Partitioning)						X										
(U) <u>Increment 4 Completion Dates</u>																
(U) Spiral A (Planning & Sched)						X										
(U) Spiral B (Plan & Sched, DII/COE)								X								
(U) Spiral C (Plan & Sched, DII/COE)									X							
(U) Spiral D (Plan & Sched, DII/COE)										X						
(U) Spiral E (Plan & Sched, DII/COE)													X			
(U) Spiral F (Plan & Sched, DII/COE)															X	

Note: * Denotes Completed Event; X Denotes Planned Event

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1999				
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0207438F Theater Battle Management (TBM) C4I				PROJECT 3330			
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
				<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>				
(U)	Major Product Development Contracts			2,963	11,782	9,624	7,682				
(U)	Support Contracts			1,208	1,386	1,426	1,256				
(U)	Program Management Support			224	497	658	418				
(U)	Identified as a source for SBIR				399						
(U)	Total			4,395	14,064	11,708	9,356				
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR							399				399
<u>Product Development Organizations</u>											
CSC	FPIF	Dec 88	TBD	TBD	10,884	2,963	5,600	0	0	0	19,447
New Award	IDIQ	Dec 98	TBD	TBD	0	0	6,182	9,624	7,682	3,735	27,223
<u>Support and Management Organizations</u>											
MITRE	T&M	Oct 94	n/a	n/a	3,471	1,062	1,057	1,087	906	441	8,024
TEMS	Various	Various	n/a	n/a	820	146	329	339	350	170	2,154
ESC (government organization)	n/a	n/a	n/a	n/a	824	224	497	658	418	203	2,824
<u>Test and Evaluation Organizations</u> - Not Applicable.											

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)						DATE February 1999	
BUDGET ACTIVITY			PE NUMBER AND TITLE			PROJECT	
7 - Operational System Development			0207438F Theater Battle Management (TBM) C4I			3330	
Government Furnished Property: Not Applicable							
	Total						
	<u>Prior to</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
	<u>FY 1998</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
Identified as a source for SBIR			399				399
Subtotal Product Development	10,884	2,963	11,782	9,624	7,682	3,735	46,670
Subtotal Support and Management	5,115	1,432	1,883	2,084	1,674	814	13,002
Subtotal Test and Evaluation	0	0	0	0	0	0	0
Total Project	15,999	4,395	14,064	11,708	9,356	4,549	60,071

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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207438F Theater Battle Management (TBM) C4I	PROJECT 4287
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4287 Contingency Theater Automated Planning System (CTAPS)	18,844	12,321	0	0	0	0	0	0	0	82,942

(U) A. Mission Description

The Contingency Theater Automated Planning System (CTAPS) program directly supports the Joint Forces Air Component Commander (JFACC) in the planning and execution of the theater air campaign down to the unit level. The system is designed to an open system standard, promoting interoperability among USAF, Services, and Allied command and control systems. The air tasking order generation and dissemination capabilities of CTAPS are the standard for all DoD command and control systems.

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

- (U) \$ 9,879 Continue TBMCS software version 1.0 development.
- (U) \$ 738 Initiate TBMCS post version 1.0 development.
- (U) \$ 2,550 Continue development of new ATO format.
- (U) \$ 1,077 Systems engineering and support
- (U) \$ 4,600 Expeditionary Force Experiment
- (U) \$ 18,844 Total

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

- (U) \$ 5,727 Complete TBMCS software version 1.0 development.
- (U) \$ 4,148 Continue TBMCS v1.1 and v2.0 development.
- (U) \$ 1,100 Complete development of new ATO format.
- (U) \$ 997 System engineering and support.
- (U) \$ 349 Identified as a source for SBIR
- (U) \$12,321 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational System Development	0207438F Theater Battle Management (TBM) C4I	4287
<p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none">- (U) \$0 No further funding in this project. Further evolution of this functionality continues under project 4790, TBMCS.- (U) \$0 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none">- (U) \$0 No further funding in this project. Further evolution of this functionality continues under project 4790, TBMCS.- (U) \$0 Total <p>(U) B. <u>Project Change Summary - Description of Significant Changes:</u></p> <p>With the fielding of TBMCS 1.0 in FY99 CTAPS functionality will be integrated in TBMCS and further evolution of this functionality will be managed under project 4790, TBMCS.</p> <p>(U) C. <u>Other Program Funding Summary (\$ in Thousands) -</u></p> <p>See Other Program Funding Summary under project 4790, TBMCS. The summary under 4790 includes other program funding for CTAPS and WCCS in FY98 and FY99 to provide a consolidated view of other program funding associated with the TBMCS program.</p> <p>(U) D. <u>Acquisition Strategy:</u></p> <p>Electronic Systems Center (ESC), Hanscom AFB, MA manages the TBMCS program, including CTAPS. Lockheed-Martin Mission Systems (LMMS) was competitively selected after full and open competition. They were awarded a cost plus award fee contract to develop improved capabilities in support of effective Theater Battle Management and to integrate existing capabilities in the DII Common Operating Environment. The program uses an evolutionary acquisition strategy with a series of incremental software releases. This approach accommodates refinement and prioritization of user requirements and improves adaptability to improvements in commercial technology.</p>		
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207438F Theater Battle Management (TBM) C4I	PROJECT 4287
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(U) **E. Schedule Profile:**

	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) TBMCS S/W Version 1.0																
(U) In-Plant Test				*												
(U) Version 1.0 Release						X										
(U) TBMCS S/W Version 2.0																
(U) In-Plant Test									X							
(U) Version 2.0 Release														X		

Note: * Denotes Completed Event; X Denotes Planned Event

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1999				
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0207438F Theater Battle Management (TBM) C4I				PROJECT 4287			
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U)	System Integration and Development				17,767	10,975	0	0			
(U)	System Engineering and Support				1,077	997	0	0			
(U)	Identified as a source for SBIR					349					
(U)	Total				18,844	12,321	0	0			
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR							349				349
<u>Product Development Organizations</u>											
LMMS	CPAF	Oct 95	TBD	TBD	17,497	14,342	9,800	0	0	0	41,639
SAIC (S/W INT) Hampton VA	CPFF	Mar 94	n/a	n/a	11,085	0	0	0	0	0	11,085
SAIC (ASOC/BSD) Hampton VA, Anchorage AK	CPFF	Feb 94	n/a	n/a	3,759	0	0	0	0	0	3,759
PARAMAX (APS) St Paul MN	CPFF	Mar 94	n/a	n/a	1,207	0	0	0	0	0	1,207
Project 4287					Page 11 of 26 Pages			Exhibit R-3 (PE 0207438F)			

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE	
										February 1999	
BUDGET ACTIVITY					PE NUMBER AND TITLE					PROJECT	
7 - Operational System Development					0207438F Theater Battle Management (TBM) C4I					4287	
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
INEL (ASOC)	CPFF	Oct 94	n/a	n/a	1,243	800	0	0	0	0	2,043
Idaho Falls ID											
Logicon, Inc San Pedro, CA	CPFF	Jun 94	n/a	n/a	3,610	2,550	1,100	0	0	0	7,260
Miscellaneous	Various	Various	n/a	n/a	410	0	0	0	0	0	410
<u>Support and Management Organizations</u>											
MITRE	CPAF	Oct 94	n/a	n/a	6,528	420	339	0	0	0	7,287
TEMS	T&M	Various	n/a	n/a	3,253	657	658	0	0	0	4,568
Miscellaneous	Various	Various	n/a	n/a	2,978	0	0	0	0	0	2,978
<u>Test and Evaluation Organizations</u>											
46 TS	Project Order	Various	n/a	n/a	130	75	75	0	0	0	280
JTIC	MIPR	Various	n/a	n/a	77	0	0	0	0	0	77
Government Furnished Property: Not Applicable											
					Total						
					Prior to	Budget	Budget	Budget	Budget	Budget to	Total
					FY 1998	FY 1998	FY 1999	FY 2000	FY 2001	Complete	Program
Identified as a source for SBIR							349				349
Subtotal Product Development					38,811	17,692	10,900	0	0	0	67,403
Subtotal Support and Management					12,759	1,077	997	0	0	0	14,833
Subtotal Test and Evaluation					207	75	75	0	0	0	357
Total Project					51,777	18,844	12,321	0	0	0	82,942

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BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0207438F Theater Battle Management (TBM) C4I

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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207438F Theater Battle Management (TBM) C4I	PROJECT 4288
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4288 Wing C2 System (WCCS)	5,969	3,869	0	0	0	0	0	0	0	19,997

(U) A. Mission Description

This project includes development of mission critical application software for WCCS operating on commercially available hardware and system software. Wing commanders require an accurate, composite picture of their wing's total resources to effectively command, control, and manage their forces in support of their combat sortie generation and reporting responsibilities. Key functional areas (operations, maintenance, mission planning, intelligence, weather, etc.) use WCCS to support the wing commander in the mission execution and reporting process by exchanging critical command and control and intelligence information with functional counterparts located throughout the wing. The introduction of increasingly sophisticated weapon systems - with their need for and ability to produce large amounts of data - require an automated C2 system to bring meaningful, consolidated information to the Commander in near real-time. At many wings not yet upgraded with WCCS this information is still relayed over secure and unsecured telephones, radios, and other communications devices, as well as by runners to update multi-user status displays (grease boards) or hand written logs. These techniques have not changed substantially since World War II, and are cumbersome, error-prone, are subject to security compromise, and involve duplication of effort. Disparate programs have led to the proliferation of stovepipe systems which can not provide interoperability and do not adequately meet the needs of today's air operations. The WCCS project designs, develops, and installs an automated, standard wing-level C2 system that will be tailored to meet unique organizational requirements, provide interoperability, and reduce training and maintenance costs.

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

- (U) \$5,203 Continue TBMCS software version 1.0 development.
- (U) \$ 305 Initiate TBMCS post version 1.0 development.
- (U) \$ 461 Systems engineering and support.
- (U) \$5,969 Total

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

- (U) \$1,006 Complete TBMCS software version 1.0 development.
- (U) \$2,327 Continue TBMCS v1.1 and v2.0 development.
- (U) \$ 427 Systems engineering and support.
- (U) \$ 109 Identified as a source for SBIR
- (U) \$3,869 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207438F Theater Battle Management (TBM) C4I	PROJECT 4288
<p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$0 No further funding in this project. Further evolution of this functionality continues under project 4790, TBMCS. - (U) \$0 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$0 No further funding in this project. Further evolution of this functionality continues under project 4790, TBMCS. - (U) \$0 Total <p>(U) B. <u>Project Change Summary - Description of Significant Changes:</u></p> <p>With the fielding of TBMCS 1.0 in FY99 WCCS functionality will be integrated in TBMCS and further evolution of this functionality will be managed under project 4790, TBMCS.</p> <p>(U) C. <u>Other Program Funding Summary (\$ in Thousands)</u></p> <p>See Other Program Funding Summary under project 4790, TBMCS. The summary under 4790 includes other program funding for CTAPS and WCCS in FY98 and FY99 to provide a consolidated view of other program funding associated with the TBMCS program.</p> <p>(U) D. <u>Acquisition Strategy:</u></p> <p>Electronic Systems Center (ESC), Hanscom AFB, MA manages the TBMCS program, including WCCS. Lockheed-Martin Mission Systems (LMMS) was competitively selected after full and open competition. They were awarded a cost plus award fee contract to develop improved capabilities in support of effective Theater Battle Management and to integrate existing capabilities in the DII Common Operating Environment. The program uses an evolutionary acquisition strategy with a series of incremental software releases. This approach accommodates refinement and prioritization of user requirements and improves adaptability to improvements in commercial technology.</p>		
Project 4288	Page 14 of 26 Pages	Exhibit R-2A (PE 0207438F)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207438F Theater Battle Management (TBM) C4I	PROJECT 4288
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(U) E Schedule Profile

	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) TBMCS S/W Version 1.0																
(U) In-Plant Test				*												
(U) Version 1.0 Release						X										
(U) TBMCS S/W Version 2.0																
(U) In-Plant Test										X						
(U) Version 2.0 Release														X		

Note: * Denotes Completed Event; X Denotes Planned Event

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1999				
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0207438F Theater Battle Management (TBM) C4I				PROJECT 4288		
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U)	System Integration and Development				5,508	3,333	0	0			
(U)	Systems Engineering and Support				461	427	0	0			
(U)	Identified as a source for SBIR					109					
(U)	Total				5,969	3,869	0	0			
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
							109				109
<u>Product Development Organizations</u>											
LMMS	CPAF	Oct 95	TBD	TBD	2,837	5,508	3,333	0	0	0	11,678
SAIC	CPFF	Jan 94	n/a	n/a	5,000	0	0	0	0	0	5,000
<u>Support and Management Organizations</u>											
MITRE	CPAF	Oct 94	n/a	n/a	926	180	145	0	0	0	1,251
TEMS & Misc	Various	Various	n/a	n/a	1,268	281	282	0	0	0	1,831
<u>Test and Evaluation Organizations</u> - Not Applicable											
Project 4288					Page 16 of 26 Pages				Exhibit R-3 (PE 0207438F)		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0207438F Theater Battle Management (TBM) C4I				PROJECT 4288		
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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Property</u>										
Local Purchase	Various	Various	Various	128	0	0	0	0	0	128
<u>Support and Management Property</u> - Not Applicable										
<u>Test and Evaluation Property</u> - Not Applicable										
				<u>Total Prior to FY 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
Identified as a source for SBIR						109				109
Subtotal Product Development				7,965	5,508	3,333	0	0	0	16,806
Subtotal Support and Management				2,194	461	427	0	0	0	3,082
Subtotal Test and Evaluation				0	0	0	0	0	0	0
Total Project				10,159	5,969	3,869	0	0	0	19,997

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0207438F Theater Battle Management (TBM) C4I				PROJECT 4790	
<i>COST (\$ In Thousands)</i>	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4790 Theater Battle Management Core System (TBMCS)	0	0	23,007	20,439	18,120	17,682	20,433	20,859	Continuing	TBD
<p>(U) A. <u>Mission Description</u></p> <p>The Theater Battle Management Core Systems (TBMCS) develops force-level and wing-level command, control, and intelligence systems which utilize DoD's Defense Information Infrastructure (DII) common operating environment (COE). It links planning, intelligence and operations functions in an integrated battle management system for planning and executing the air war at the theater level. Functions supported include generation and dissemination of the air tasking order in support of the Joint Forces Air Component Commander (JFACC). Projects being integrated in TBMCS include the Contingency Theater Automated Planning System (CTAPS), Wing Command & Control System (WCCS), and Combat Intelligence System (CIS). Funds were added in FY00 and FY01 for NATO R&D to collectively enhance interoperability between the emerging NATO ACCS and TBMCS, and to share relevant research.</p> <p>(U) <u>FY 1998 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$0 Funds were reflected under CTAPS (4287), WCCS (4288), and CIS (PE 27414F, 2758) - (U) \$0 Total <p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$0 Funds were reflected under CTAPS (4287), WCCS (4288), and CIS (PE 27414F, 4773) - (U) \$0 Total <p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$14,300 Continue TBMCS software version 2.0 development. - (U) \$ 5,307 Initiate TBMCS post version 2.0 development. - (U) \$ 2,400 Systems engineering and support. - (U) \$ 1,000 NATO R&D - (U) \$23,007 Total 										
Project 4790			<i>Page 18 of 26 Pages</i>				Exhibit R-2A (PE 0207438F)			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207438F Theater Battle Management (TBM) C4I	PROJECT 4790
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(U) FY 2001 (\$ in Thousands):

- (U) \$ 2,504 Complete TBMCS software version 2.0 development.
- (U) \$14,535 Software development for TBMCS post version 2.0.
- (U) \$ 1,900 Systems engineering and support.
- (U) \$ 1,500 NATO R&D
- (U) \$20,439 Total

(U) **B. Project Change Summary - Description of Significant Changes:**

Starting in FY00 the RDT&E funding for CTAPS (4287), WCCS (4288), and CIS (27414F, 4773) will be combined in PE 27438F under project 4790, TBMCS. CTAPS, WCCS and CIS will be integrated in a single DII/COE compliant system and will be managed as a single project with the fielding of TBMCS 1.0 in FY99. NATO R&D funding was also transferred to this project in FY00 and FY 01 as shown in the program level change summary.

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

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To</u> <u>Compl</u>	<u>Total</u> <u>Cost</u>
(U) Other Procurement, AF, PE 27438F, WSC 832010	0	0	17,885	13,899	11,407	11,393	11,633	11,896	Cont	TBD
(U) Other Procurement, AF, PE 27438F, WSC 834520	42,686	44,150	47,648	51,554	44,844	44,054	44,983	45,998	Cont	TBD
(U) RDT&E, PE 0207414F, CIS	11,760	9,362	0	0	0	0	0	0	0	21,122
(U) Other Procurement, AF, PE 0207414F, WSC 832010, Intelligence Data Handling System, Combat Intelligence System portion	14,111	12,555	0	0	0	0	0	0	0	26,666
(U) Other Procurement, AF, PE 0207431F, WSC 832010, Intelligence Data Handling System, Combat Intelligence System portion	3,612	2,885	4,692	3,245	2,844	2,834	2,895	2,959	Cont	TBD

Note: This summary includes other program funding associated with CTAPS, WCCS, and CIS in FY98 and FY99 to provide a consolidated view of other program funding associated with the TBMCS program. Please note, the other program funds associated with PEs 0207414F and 0207431F in FY98 and FY99 are reported both here and as other program funds under the descriptive summary for PE 0207414F, Combat Intelligence System.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207438F Theater Battle Management (TBM) C4I	PROJECT 4790
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(U) D. Acquisition Strategy

Electronic Systems Center (ESC), Hanscom AFB, MA manages the TBMCS program. Lockheed-Martin Mission Systems (LMMS) was competitively selected after full and open competition. They were awarded a cost plus award fee contract to develop improved capabilities in support of effective Theater Battle Management and to integrate existing capabilities in the DII Common Operating Environment. The program uses an evolutionary acquisition strategy with a series of incremental software releases. This approach accommodates refinement and prioritization of user requirements and improves adaptability to improvements in commercial technology.

(U) E. Schedule Profile

	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) TBMCS S/W Version 1.0																
(U) In-Plant Test				*												
(U) Version 1.0 Release						X										
(U) TBMCS S/W Version 2.0																
(U) In-Plant Test										X						
(U) Version 2.0 Release														X		

Note: * Denotes Completed Event; X Denotes Planned Event

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)						DATE February 1999					
BUDGET ACTIVITY					PE NUMBER AND TITLE					PROJECT	
7 - Operational System Development					0207438F Theater Battle Management (TBM) C4I					4790	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U) System Integration and Development					0	0	20,607	18,539			
(U) System Engineering and Support					0	0	2,400	1,900			
(U) Total					0	0	23,007	20,439			
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
<u>Product Development Organizations</u>											
LMCCS	CPAF	Oct 95	TBD	TBD	0	0	0	19,732	17,189	Cont	TBD
AEM Inc.	FFFP	Oct 99	TBD	TBD	0	0	0	125	200	TBD	TBD
DRC	FFFP	Oct 99	TBD	TBD	0	0	0	150	150	TBD	TBD
SAIC	FFFP	Oct 99	TBD	TBD	0	0	0	175	250	TBD	TBD
AFRL, Rome NY	AF 616	Oct 99	TBD	TBD	0	0	0	175	300	TBD	TBD
ESC			TBD	TBD	0	0	0	100	150	TBD	TBD
AFRL, Hanscom	AF 616	Oct 99	TBD	TBD	0	0	0	150	300	TBD	TBD
<u>Support and Management Organizations</u>											
MITRE	CPAF	Oct 94	n/a	n/a	0	0	0	1,000	800	Cont	TBD
TEMS	T&M	Various	n/a	n/a	0	0	0	1,400	1,100	Cont	TBD
<u>Test and Evaluation Organizations</u> - Not Applicable											
Project 4790					Page 21 of 26 Pages				Exhibit R-3 (PE 0207438F)		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1999			
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0207438F Theater Battle Management (TBM) C4I			PROJECT 4790			
(U) B. <u>Budget Acquisition History and Planning Information Continued (\$ in Thousands)</u>										
Government Furnished Property: Not Applicable										
<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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Property</u>				0	0	0	0	0	0	0
<u>Support and Management Property</u>				0	0	0	0	0	0	0
<u>Test and Evaluation Property</u>										
Subtotal Product Development				0	0	0	20,607	18,539	Cont	TBD
Subtotal Support and Management				0	0	0	2,400	1,900	Cont	TBD
Subtotal Test and Evaluation				0	0	0	0	0	Cont	TBD
Total Project				0	0	0	23,007	20,439	Cont	TBD

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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207438F Theater Battle Management (TBM) C4I	PROJECT 4802
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4802 Deliberate and Crisis Action Planning and Execution Segment (DCAPES)	0	0	9,012	11,638	12,329	10,371	10,587	10,808	Continuing	TBD

Note: DCAPES was previously funded in FY98 under PE 33152F, project 4485 and in FY99 under PE 33150F, project 4667.

(U) A. Mission Description

Deliberate and Crisis Action Planning and Execution Segments (DCAPES) are being developed as the next generation AF interface to the Joint Operational Planning and Execution System (JOPEs). This effort is an evolutionary follow on to the Contingency Operations Mobility Planning and Execution System (COMPES), which is currently our interface to JOPEs. COMPES is the legacy system ported from WWMCCS to GCCS in 1996 as a stop gap measure. DCAPES will replace the functionality of COMPES with modern relational databases, integrated-distributed database, and common and shared data consistent with the Joint vision for integrated C2. DCAPES is intended to be more tightly coupled with the range of planning support systems to provide a more effective crisis action planning capability for a wider range of operational scenarios.

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

- (U) \$0 FY98 funding reflected in PE 33152F
- (U) \$0 Total

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

- (U) \$0 FY99 funding reflected in PE 33150F
- (U) \$0 Total

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

- (U) \$4,512 DCAPES Increment 1 development, prototyping, coding and internal testing
- (U) \$ 500 Government development and test support
- (U) \$ 500 DCAPES Increment 2 requirements definition
- (U) \$3,500 DCAPES Increment 2 development, requirements allocation, prototyping, and coding
- (U) \$9,012 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207438F Theater Battle Management (TBM) C4I	PROJECT 4802
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(U) FY 2001 (\$ in Thousands):

- (U) \$10,638 DCAPES Increment 2 development, prototyping, coding and testing
- (U) \$ 500 Government development testing and integration and interoperability testing.
- (U) \$ 500 DCAPES Increment 3 requirements definition
- (U) \$11,638 Total

(U) **B. Project Change Summary - Description of Significant Changes:**

All funding in project 4802, DCAPES was reported in FY99 under PE 33150F, project 4667. It was transferred to group it with other TBM C4I software development efforts intended to operate in the Defense Information Infrastructure Common Operating Environment.

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

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To Compl</u>	<u>Total Cost</u>
(U) PE 33152 (RDT&E, 4485, AF-GCCS)	2,265									2,265
(U) PE 33150 (RDT&E, 4667, Global Command and Control System - AF)		9,122								9,122

(U) **D. Acquisition Strategy**

DCAPES will be managed by Electronic Systems Center, Hanscom AFB, MA. In July 98, the DCAPES contract was awarded to the Raytheon, Computer Sciences Corporation, and Science Applications International team under Command and Control Product Line (CCPL) contracts awarded and maintained by Electronic Systems Center. The program uses an evolutionary acquisition strategy with a series of incremental software releases. This approach accommodates refinement and prioritization of user requirements and improves adaptability to improvements in commercial technology.

(U) **E. Schedule Profile**

	<u>FY 1998</u>			<u>FY 1999</u>			<u>FY 2000</u>			<u>FY 2001</u>		
	1	2	3	4	1	2	3	4	1	2	3	4
(U) DCAPES Contract Award				*								
(U) DCAPES Initial Increment Fielded									X			
(U) DCAPES Increment 2 Fielded												X

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BUDGET ACTIVITY 7 - Operational System Development
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PE NUMBER AND TITLE 0207438F Theater Battle Management (TBM) C4I
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Note: * Denotes Completed Event; X Denotes Planned Event

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1999				
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0207438F Theater Battle Management (TBM) C4I				PROJECT 4802			
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
				<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>				
(U)	Development Contract Effort			0	0	7,012	9,038				
(U)	Test Support			0	0	500	700				
(U)	Program Management Support			0	0	1,200	1,400				
(U)	Expeditionary Force Experiment			0	0	300	500				
(U)	Total			0	0	9,012	11,638				
Note: DCAPEs was previously funded in FY98 under PE 33152F, project 4485 and in FY99 under PE 33150F, project 4667.											
(U) B. <u>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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Organizations</u>											
(U)	Raytheon/CSC/ SAIC	FP/LH with award fee	Feb 98	n/a	n/a	0	0	0	7,312	9,538	Cont TBD
<u>Support and Management Organizations</u>											
(U)	Mitre	CPAF				0	0	0	800	800	Cont TBD
(U)	TEMS	T&M				0	0	0	400	600	Cont TBD
<u>Test and Evaluation Organizations</u>											
	46 Test Sqdn	MIPR				0	0	0	500	700	Cont TBD
Note: DCAPEs was previously funded in FY98 under PE 33152F, project 4485 and in FY99 under PE 33150F, project 4667.											
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207438F Theater Battle Management (TBM) C4I	PROJECT 4802
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(U) B. Budget Acquisition History and Planning Information Continued (\$ in Thousands)

Government Furnished Property: Not applicable

	Total	Budget	Budget	Budget	Budget	Budget to	Total
	<u>Prior to</u>	<u>FY 1998</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	7,312	9,538	Cont	TBD
Subtotal Support and Management	0	0	0	1,200	1,400	Cont	TBD
Subtotal Test and Evaluation	0	0	0	500	700	Cont	TBD
Total Project	0	0	0	9,012	11,638	Cont	TBD

Note: DCAPES was previously funded in FY98 under PE 33152F, project 4485 and in FY99 under PE 33150F, project 4667.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207581F Joint STARS	PROJECT 0003
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
0003 JSTARS	112,699	100,453	130,488	121,699	135,816	120,994	304,369	293,410	TBD	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

There is an Air Force and Army need to provide, from airborne platforms, near-real time surveillance and targeting information on moving and stationary ground targets (growth to maritime operations), slow moving rotary and fixed wing aircraft, and rotating antennas. This information enables operational and tactical commanders to make and execute battle decisions. To meet these needs, the Air Force and Army initiated the Joint Surveillance Target Attack Radar System (Joint STARS) program with the Air Force as lead service. Joint STARS provides target information for pairing direct attack aircraft and standoff weapons against selected targets. The system is capable of being cued by other reconnaissance, surveillance, and target acquisition systems; is able to respond rapidly to worldwide contingencies; and provides surveillance and attack information in all light and near-all-weather conditions. The operational utility of the system was effectively demonstrated by the outstanding performance of two developmental aircraft in support of combat operations during Desert Storm. Joint STARS aircraft were deployed in support of Operation Joint Endeavor in Dec 95 and again from Nov to Dec 96. In Sep 96 the Defense Acquisition Board (DAB) Milestone III Review approved full rate production of a 19 E-8C program. The 93rd Air Control Wing, Robins AFB, GA, declared Joint STARS Initial Operational Capability (IOC) in Dec 97 and the system is now participating in operational and training exercises. After the Quadrennial Defense Review recommended a revision of the Joint STARS production profile the Air Force reduced Joint STARS production from 19 to 13 E-8Cs. Funding for 14th E-8C provided during FY00 President's Budget build.

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

- (U) \$ 9,877 Continue Block 10: TADIL-J, Joint Stars Integrated Maintenance Information System (JIMIS),and Diminishing Manufacturing Sources/Commercial Off the Shelf (DMS/COTS) Efforts
- (U) \$ 55,785 Continue Block 20: General Purpose Computer/Operator Workstation (OWS), Programmable System Processor (PSP), Pulse Compression Unit (PCU), and Signal Pre-Processor (SPP) Efforts
- (U) \$ 4,521 Continue Block 30: Improved Data Modem (IDM) and SATCOM Efforts
- (U) \$ 5,199 Initiate Radar Technology Insertion Program (RTIP) (Block 40) and Studies
- (U) \$ 9,176 Continue Support Systems and Crew Trainer Development
- (U) \$ 3,474 Continue Advanced Development (EFX Initiative, Processing Improvements)
- (U) \$ 620 Continue Program Support and Miscellaneous Efforts
- (U) \$ 24,047 Continue Test Efforts
- (U) \$112,699 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational System Development	0207581F Joint STARS	0003
<p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 4,722 Continue Block 10 (TADIL-J, JIMIS, and DMS/COTS) Efforts - (U) \$ 21,116 Continue Block 20 (General Purpose computer/OWS/PSP/PCU/SPP) Efforts - (U) \$ 9,870 Continue Block 30 (IDM and SATCOM) Efforts - (U) \$ 16,814 Continue Block 40 (RTIP); Begin Data Link Study - (U) \$ 5,271 Continue Support Systems and Crew Trainer Development - (U) \$ 5,443 Continue Advanced Development (DII COE/GCCS Studies) - (U) \$ 328 Continue Program Support and Miscellaneous Efforts - (U) \$ 33,701 Continue Test Efforts - (U) \$ 3,188 Identified as a source for SBIR - (U) \$100,453 Total <p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 30,720 Continue Block 10 (TADIL-J, JIMIS, and DMS COTS) Efforts - (U) \$ 13,427 Continue Block 20 (General Purpose Computer, OWS, PSP, PCU, and SPP) Efforts - (U) \$ 13,750 Continue Block 30 (IDM, and SATCOM) Efforts - (U) \$ 37,195 Continue Block 40 (RTIP) - (U) \$ 4,474 Continue Program Support and Miscellaneous Efforts - (U) \$ 30,922 Continue Test Efforts - (U) \$130,488 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 884 Continue Block 10 (TADIL-J, JIMIS, and DMS COTS) Efforts - (U) \$ 14,601 Continue Block 30 (IDM and SATCOM) Efforts - (U) \$ 69,646 Continue Block 40 (RTIP) Efforts - (U) \$ 2,801 Continue Program Support and Miscellaneous Efforts - (U) \$ 33,767 Continue Test Efforts - (U) \$121,699 Total 		
Project 0003	<i>Page 2 of 7 Pages</i>	Exhibit R-2 (PE 0207581F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207581F Joint STARS	PROJECT 0003
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(U) B. Budget Activity Justification:

This program is in Budget Activity 7 - Operational System Development. Initial operational capability was achieved in Dec 97. Developmental work continues on system upgrades.

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

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) Previous President's Budget (FY1999 PB)	118,335	123,793	87,673	125,453
(U) Appropriated Value	126,189	101,793		
(U) Adjustments to Appropriated Value				
a. General Congressional Reductions	- 4,830	- 1,340		
b. Small Business Innovative Research	- 3,041			
c. Omnibus, Other Above Threshold Reprogramming	- 805			
d. Below Threshold Reprogramming	- 4,814			
(U) Adjustments to Budget Since FY1999 PB			42,815	- 3,754
(U) Current Budget Submit/FY2000 PB	112,699	100,453	130,488	121,699

(U) Significant Program Changes: FY99: \$3.188M identified as a source for SBIR. RTIP designated ACAT 1D 27 July 98. FY99 Begin RTIP Pre-EMD; added funding for RTIP and Link 16 efforts in FY00.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207581F Joint STARS	PROJECT 0003
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(U) D. Other Program Funding Summary (\$ in Thousands)

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	To <u>Compl</u>	Total <u>Cost</u>
(U) Aircraft Procurement, AF, BP10 (PE 27581F)	320,622	495,525	280,265	11,531	12,528	0	0	0	0*	4,157,149
(U) Modifications, BP11 (PE 27581F)	0	44,054	28,558	15,536	16,618	17,196	39,812	64,788	TBD	TBD
(U) Spares, BP16 (PE 27581F)	35,292	67,998	72,685	117,890	4,912	7,373	8,845	578	TBD	TBD
(U) Quantity, Joint STARS E-8C Aircraft Proc.	1	2	1							

* SECDEF readdressing Joint STARS force structure.
 Note: Procurement began with 2 E-8Cs per year FY93-FY97.

(U) E. Acquisition Strategy:

Joint STARS Low Rate Initial Production (LRIP) was approved by the Defense Acquisition Board (DAB) in FY93. Acquisition began with the procurement of 2 E-8Cs, in FY93, and continued at 2 E-8Cs per year through FY97. Procurement continues with 1 E-8C in FY98, 2 E-8Cs in FY99, and currently concludes with 1 E-8Cs in FY00.

(U) F. Schedule Profile

	<u>FY 1998</u>			<u>FY 1999</u>			<u>FY 2000</u>			<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	
(U) Production Aircraft Deliveries	*			*				X	X			X	X
(U) Organic Support Capability	*												
(U) IOC	*												

* Denotes completed event
 X Denotes planned event
 Note: In 1Q/FY00 two Joint STARS E-8C aircraft will be delivered

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0207581F Joint STARS					PROJECT 0003	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U)	Block 10 (TADIL-J, JIMIS and DMS/COTS) efforts				9,877	4,722	30,720	884			
(U)	Block 20 (Gen Purpose Comp/OWS/PSP/PCU/SPP) efforts				55,785	21,116	13,427	0			
(U)	Block 30 (IDM & SATCOM) efforts				4,521	9,870	13,750	14,601			
(U)	Block 40 (RTIP) efforts				5,199	16,814	37,195	69,646			
(U)	Support Systems and Crew Trainer Development				9,176	5,271	0	0			
(U)	Advanced Development				3,474	5,443	0	0			
(U)	Program Support and Miscellaneous Efforts				620	328	4,474	2,801			
(U)	Test Efforts				24,047	33,701	30,922	33,767			
(U)	Identified as a source for SBIR				0	3,188	0	0			
	TOTAL				112,699	100,453	130,488	121,699			
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998*	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
* Joint STARS RDT&E funding prior to FY98 was in PE 0604770F											
	Identified as a source for SBIR						3,188				
<u>Product Development Organization</u>											
GMSD** General Purpose Computer	CPFF	May 97	135,594	135,594	46,641	55,585	20,541	12,827	0	0	135,594
GMSD SATCOM	CPFF	May 97	48,075	48,075	0	554	9,870	13,750	14,601	9,300	48,075
Project 0003											
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Exhibit R-3 (PE 0207581F)											

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0207581F Joint STARS					PROJECT 0003	
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998*	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
GMSD	CPFF	May 97	N/A	N/A	0	5,199	16,814	37,195	69,646	TBD	TBD
Advanced Dev. (RTIP) Efforts											
GMSD Other	Various	Various	N/A	N/A	2,278,636	26,694	16,011	31,320	884	TBD	TBD
Dev. Efforts											
** Grumman Melbourne Systems Division (now Northrop Grumman)											
<u>Support and Management Organizations</u>											
Joint Program Office, Program Support		Ongoing	N/A	N/A	298,572	50	0	0	0	TBD	TBD
Other Misc. Efforts		Ongoing	N/A	N/A	63,982	570	328	4,474	2,801	TBD	TBD
<u>Test and Evaluation Organizations</u>											
GMSD, E-8C Follow-On Test Support	SS/FFP/CPFF	Aug 96	150,995	150,995	27,266	10,361	19,845	15,612	17,368	60,543	150,995
GMSD, Aircraft Over & Above Tests	SS/FFP/CPFF	Aug 96	64,639	64,639	29,697	4,287	3,298	3,248	3,519	20,590	64,639
GMSD, Follow-On Test Support MILSTRIP	SS/FFP/CPFF	Aug 96	13,618	13,618	327	1,306	300	1,880	2,100	7,705	13,618
Range Support	Allotment	N/A	N/A	N/A	25,860	903	1,003	2,070	2,270	TBD	TBD
Horizons Tech. (SETA)	Time and Materials	Various	N/A	N/A	31,683	4,453	4,889	5,225	5,425	TBD	TBD
Joint Test Force Support	Allotment	N/A	N/A	N/A	19,556	1,506	1,824	2,237	2,435	TBD	TBD
Misc. Test Efforts	Various	N/A	N/A	N/A	86,075	1,231	2,542	650	650	TBD	TBD
Project 0003					Page 6 of 7 Pages				Exhibit R-3 (PE 0207581F)		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY					PE NUMBER AND TITLE					PROJECT	
7 - Operational System Development					0207581F Joint STARS					0003	
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998*	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
<u>Support and Management Property</u>		N/A									
<u>Test and Evaluation Property</u>		N/A									
<u>Government Furnished Property:</u>		None									
Identified as source for SBIR							3,188				
Subtotal Product Development					2,325,277	88,032	63,236	95,092	85,131	TBD	TBD
Subtotal Support and Management					362,554	620	328	4,474	2,801	TBD	TBD
Subtotal Test and Evaluation					<u>220,464</u>	<u>24,047</u>	<u>33,701</u>	<u>30,922</u>	<u>33,767</u>	TBD	TBD
Total Project					2,908,295	112,699	100,453	130,488	121,699	TBD	TBD

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207590F Seek Eagle	PROJECT 4037
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4037 SEEK EAGLE Certifications	15,755	18,767	23,133	19,645	17,950	17,164	19,130	18,756	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

The Air Force has a variety of combat aircraft and numerous stores (munitions, missiles, fuel tanks, electronic countermeasures pods, etc.). Aircraft carry these stores in countless different loading combinations determined by operational scenarios, missions, and tactics. Loading configurations change as operational plans and tactics change, and as new aircraft and stores are developed and produced. Before operational use, the Air Force must certify these configurations for safe loading, carriage, and separation (jettison and normal release), and must verify ballistics accuracy under the user-certified carriage and employment parameters. The Air Force SEEK EAGLE program completes these certifications through any combination of ground and flight testing, wind tunnel testing, advanced testing software, and engineering analysis. Over 700 aircraft-store combinations exist to be certified, with new ones added on a regular basis. Depending upon the complexity, certification takes from months to years. The SEEK EAGLE program is also responsible for insertion of new and emerging technologies into the SEEK EAGLE process and providing resources for sustainment of a viable Air Force aircraft-store certification capability. Electronic Technical Orders are developed through the Combat Weapons Delivery Software (CWDS), creating cost savings by eliminating paper technical orders. SEEK EAGLE funds are currently budgeted to support certification for new weapons programs including F-22, Joint Strike Fighter (JSF), Sensor Fuzed Weapon (SFW), Wind Corrected Munitions Dispenser (WCMD), Joint Direct Attack Munition (JDAM), Joint Air to Surface Standoff Missile (JASSM), Joint Standoff Weapon (JSOW), AIM-9X, AIM-120 C-5 (AMRAAM), and many other inventory stores on inventory aircraft.

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

- (U) \$600 Initiated development of F-22 data and engineering models to use for follow-on F-22 weapons certification
- (U) \$1,810 Continued/completed various aircraft load/separation prediction capabilities using Applied Computational Fluid Dynamics (ACFD)
- (U) \$2,170 Initiated/continued/completed various automated Technical Orders/mission planning tools using CWDS
- (U) \$11,175 Initiated/continued/completed various aircraft-store certifications on fighter and bomber aircraft
- (U) \$15,755 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207590F Seek Eagle	PROJECT 4037
<p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$3,094 Continue development of F-22 data and engineering models to use for follow-on F-22 weapons certification - (U) \$2,300 Initiate/continue/complete various automated Technical Orders/mission planning tools using CWDS - (U) \$2,400 Continue/complete various aircraft load/separation prediction capabilities using Applied Computational Fluid Dynamics (ACFD) - (U) \$8,978 Initiate/continue/complete various aircraft-store certifications on fighter and bomber aircraft - (U) \$1,500 Extended range JDAM testing using CONDOR strap-on wing kit (Longshot testing) - (U) \$495 Identified as a source for SBIR - (U) \$18,767 Total <p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$3,344 Continue development of F-22 data and engineering models to use for follow-on F-22 weapons certification - (U) \$2,350 Initiate/continue/complete various automated Technical Orders/mission planning tools using CWDS - (U) \$2,500 Continue/complete various aircraft load/separation prediction capabilities using Applied Computational Fluid Dynamics (ACFD) - (U) \$14,939 Initiate/continue/complete various aircraft-store certifications on fighter and bomber aircraft - (U) \$23,133 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$3,356 Continue development of F-22 data and engineering models to use for follow-on F-22 weapons certification - (U) \$2,400 Initiate/continue/develop/complete various automated Technical Orders/mission planning tools using CWDS - (U) \$2,600 Continue/complete various aircraft load/separation prediction capabilities using Applied Computational Fluid Dynamics (ACFD) - (U) \$11,289 Initiate/continue/complete various aircraft-store certifications on fighter and bomber aircraft - (U) \$19,645 Total 		
<p>(U) <u>B. Budget Activity Justification:</u> The RDT&E Budget Activity is 7, Operational Systems Development, because the program supports fielded systems.</p>		
Project 4037	Page 2 of 6 Pages	Exhibit R-2 (PE 0207590F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207590F Seek Eagle	PROJECT 4037
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(U) D. Other Program Funding Summary (\$ in Thousands)

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost
Appropriation:										
(U) Procurement of Ammunition, AF*										
- P-1 Line JDAM	0	0	0	0	147	0	146	0	0	293
- P-1 Line WCMD	4,012	0	0	0	0	0	136	0	0	4,148
(U) Missile Procurement, AF*										
- P-1 Line JSOW	1,112	10,243	1,150	0	1,033	3,293	1,286	1,286	Cont.	Cont.
- P-1 Line AMRAAM	0	0	0	618	0	0	0	0	0	15,143
- P-1 Line AIM-9 Sidewinder	0	0	0	2,944	5,384	1,966	0	4,330	Cont.	Cont.
- P-1 Line JASSM	0	0	0	6,369	3,414	2,929	3,657	2,925	Cont.	Cont.

* Note: The SEEK EAGLE procurement dollars shown above are appropriated in each weapon's P-1 line.

(U) E. Acquisition Strategy
Budget authorization for procurement funds is given directly to the weapon system program offices, who then procure the required certification test articles through the weapon production contract.

(U) F. Schedule Profile
Note: The SEEK EAGLE program does not execute in accordance with established acquisition program milestones. Each aircraft-store configuration requested by the user goes through the SEEK EAGLE process by the designated user priority.

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
AIM-120 C-5 (AMRAAM)				X				
AIM-9X				X	X	X		X
JASSM				X	X	X	X	X
JSOW	*	X	X		X	X	X	X
JDAM					X		X	
WCMD	*						X	

* = Completed Event
X = Planned Event

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207590F Seek Eagle	PROJECT 4037
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(U) A. Project Cost Breakdown (\$ in Thousands)

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) Process Sustainment	2,100	2,400	2,500	2,600
(U) F-22 Data & Engineering Models	600	3,094	3,344	3,356
(U) Engineering Analysis	3,350	3,600	4,025	4,250
(U) Flight Testing	6,028	3,628	9,180	5,189
(U) Extended Range JDAM Testing		1,500		
(U) Wind Tunnel Testing	757	950	834	900
(U) Other	2,170	2,300	2,350	2,400
- Ballistic/ Safe Escape Analysis				
- Tech Order/P.C. Floppy Disk				
- Loading Process Development/Verification				
(U) Mission Support	750	800	900	950
(U) Identified as a source for SBIR		495		
(U) Total	15,755	18,767	23,133	19,645

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0207590F Seek Eagle					PROJECT 4037	
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR							495				495
<u>Product Development Organizations</u>											
Lockheed Martin	C/CPFF	Jul 98	15,648	15,648	0	600	3,094	3,344	3,356	5,254	15,648
<u>Support and Management Organizations</u>											
Mission Support	PO/REO	Continuous	N/A	N/A	8,317	750	800	900	950	Cont.	Cont.
<u>Test and Evaluation Organizations</u>											
46th Test Wing	PO/REO	Continuous	N/A	N/A	78,673	10,678	8,428	12,255	9,739	Cont.	Cont.
AEDC	PO/REO	Continuous	N/A	N/A	12,861	877	950	1,034	1,100	Cont.	Cont.
TBD (CONDOR)	TBD	Jan 99	1,500	1,500	0	0	1,500	0	0	0	1,500
Various	PO/REO	Continuous	N/A	N/A	35,542	2,850	3,500	5,600	4,500	Cont.	Cont.
Government Furnished Property:											
Not Applicable											
Identified as a source for SBIR							495				495
Subtotal Product Development						600	3,094	3,344	3,356	5,254	15,648
Subtotal Support and Management						8,317	750	800	900	950	Cont.
Subtotal Test and Evaluation						127,076	14,405	14,378	18,889	15,339	Cont.
Total Project						135,393	15,755	18,767	23,133	19,645	Cont.
Project 4037											

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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207601F USAF Modeling And Simulation
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	19,670	14,478	18,299	17,782	15,055	11,333	11,569	11,810	Continuing	Continuing
1008 National Air and Space Warfare Model (NASM)	14,530	12,756	12,605	12,016	11,275	7,461	7,617	7,775	Continuing	Continuing
1011 Joint Model Transition (JMT) Program	0	0	0	0	0	0	0	0	Continuing	Continuing
2888 Theater Air Command & Control Sim Facility	5,140	0	0	0	0	0	0	0	Continuing	Continuing
4566 Executive Agent for Air/Space Natural Environment*	0	0	0	0	0	0	0	0	Continuing	Continuing
4567 Joint Modeling and Simulation System (JMASS)	0	1,722	5,694	5,766	3,780	3,872	3,952	4,035	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

*Projects 1011 and 4566 were transferred to PE030861F beginning in FY 1999. Project 2888 was transferred to PE0207605F beginning in FY 1999. Reported in Justification Sheet for consistency.

(U) A. Mission Description

Program Element provides RDT&E funding for major USAF Modeling and Simulation efforts such as the National Air and Space [Warfare] Model (NASM)—the air and space element of the Joint Simulation System (JSIMS); the Joint Modeling and Simulation System (JMASS); and manpower authorizations for JSIMS. JSIMS will be the sole readiness training simulation used by all CINCs, Services, NAFs and at all simulation centers to train Joint Force Commanders, Joint Task Force staffs, Components and their staffs, including Joint Force Air Component Commanders and Air Operations Center personnel. JMASS provides High Level Architecture (HLA)-compliant architecture for engagement level simulations.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207601F USAF Modeling And Simulation
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(U) **B. Budget Activity Justification**
 Initiated in FY 94, this program is in budget activity 7 - Operational System Development, Research Category because it provides RDT&E funding for major USAF Modeling and Simulation efforts.

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

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U) FY99 President's Budget	19,807	14,899	17,621	16,099	Continuing
(U) Appropriated Value	21,718	14,899			
(U) Adjustments to Appropriated Value					
a. Cong Reductions	-1,410	-114			
b. SBIR	-503				
c. Omnibus or Other Above Threshold Reprogram					
d. Below Threshold Reprogramming					
(U) Adjustments to Budget Years Since FY 1999 PB			+1,678	+1,683	
(U) Current Budget Submit/ FY2000 PB	19,670	14,478	19,299	17,782	Continuing

(U) Significant Program Changes: Funding from PE64256F, Threat Simulator Development, was migrated into PE27601F in FY00 and FY01 for the Joint Modeling and Simulation (JMASS) program development.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207601F USAF Modeling And Simulation	PROJECT 1008
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
1008 National Air and Space Warfare Model (NASM)	14,530	12,756	12,605	12,016	11,275	7,461	7,617	7,775	Continuing	Continuing

(U) A. Mission Description

This program provides funds for Air Force and Joint wargaming architecture and model development, primarily in support of battlestaff training, education, and military operations. A new wargaming model, NASM, is being developed to replace the existing Air Force standard Air Warfare Simulation (AWSIM). NASM will expand the use and role of modeling and simulation (M&S) in support of operational and acquisition decision making, and increase the interoperability between Air Force and joint efforts. NASM includes an overall USAF M&S architecture and provides a reusable, portable, scaleable, robust distributed core for other simulations. It includes an air combat resolution model to meet the needs of USAF MAJCOMs and Unified/Specified Command air components to train Air Component Commanders and their battle staffs. Primary users will be the unified command air components, Commanders in Chief (CINCs), Joint Forces Air Component Commander's (JFACC), and Service components, as supported by BLUE FLAG and WPC for use in joint exercises involving air, ground, and sea campaigns. NASM is the air component portion of the DoD, Joint Staff and Services Joint Simulation System (JSIMS) which includes Enterprise partner programs from the Joint Staff, Army, Navy (and USMC), DIA, NRO and NSA under CINC ACOM sponsorship.

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

- (U) \$ 9,553 Continue development of specific air objects to support JSIMS architecture
- (U) \$ 3,441 Continue NASM integration effort and operate the program management office
- (U) \$ 1,536 Implement, test, field and support configuration control board (CCB) approved Re-Engineered AWSIM
- (U) \$ 14,530 Total

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

- (U) \$ 9,027 Continue development of specific air objects to support JSIMS architecture
- (U) \$ 2,701 Continue NASM integration effort and operate the program management office
- (U) \$ 1,028 Support and configuration manage the re-engineered AWSIM
- (U) \$ 12,756 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207601F USAF Modeling And Simulation	PROJECT 1008
<p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$10,428 Continue development of specific air objects to support JSIMS architecture - (U) \$ 2,220 Continue NASM integration effort and operate the program management office - (U) \$ 957 Support and configuration manage the re-engineered AWSIM - (U) \$13,605 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 9,329 Continue development of specific air objects to support JSIMS architecture - (U) \$ 1,813 Continue NASM integration effort and operate the program management office - (U) \$ 874 Support and configuration manage the re-engineered AWSIM - (U) \$12,016 Total <p><u>(U) B. Project Change Summary - Description of Significant Changes</u> None</p> <p><u>(U) C. Other Program Funding Summary (\$ in Thousands)</u> None</p>		
Project 1008	Page 4 of 12 Pages	Exhibit R-2A (PE 0207601F)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207601F USAF Modeling And Simulation	PROJECT 1008
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(U) D. Acquisition Strategy

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

(U) E. Schedule Profile

	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) AWSIM Re-engineering				X												
(U) Initial Op Capability (IOC) 3QFY01																X
(U) Full Op Capability (FOC) 4QFY03																

Note: NASM development schedule is aligned with the Joint Simulation System (JSIMS) Acquisition Program Baseline (APB) development schedule required to achieve Initial Operational Capability (IOC) in FY01 and Full Operational Capability (FOC) in FY03.

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0207601F USAF Modeling And Simulation					PROJECT 1008	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
National Air & Space Warfare Model					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U) Cost Categories:											
(U) a. Software development					10,831	10,042	10,428	9,329			
(U) c. Program Management/Contractor Support					3,699	2,714	3,177	2,687			
(U) Total					14,530	12,756	13,605	12,016			
(U) B. <u>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>Performin g Activity EAC</u>	<u>Project Office EAC</u>	<u>Total Prior to FY 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Organizations</u>											
Raytheon (NASM)	TRN	3 Mar 97	74,541	74,541	7,882	9,253	9,242	10,028	9,029	29,107	74,541
Raytheon (AWSIM/R)	TRN	7 Apr 94	9,876	9,876	9,313	2,141	0	0	0	0	9,876
Hughes (AWSIM/R)	TRN	2 Jun 94	4,676	4,676	4,059	0	0	0	0	0	4,676
TRW (AFSOM)	TRN	12 Dec 97	39	39	0	39	0	0	0	0	39
<u>Support and Management Organizations</u>											
Tech Eng Mgt Spt (TEMS)	Del Order	1 Feb 94	15,413	15,413	6,330	1,752	1,459	1,471	1,239	3,161	15,413
Project 1008					Page 6 of 12 Pages				Exhibit R-3 (PE 0207601F)		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0207601F USAF Modeling And Simulation					PROJECT 1008	
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
MITRE	Contract Mod	11 Aug 94	13,200	13,200	4,269	1,600	1,459	1,471	1,239	3,161	13,200
Other*	Various	Various	19,180	19,180	16,765	347	361	383	338	963	19,180
*Includes Prototype Contracts											
<u>Test and Evaluation Organizations</u>											
None											
Total Project			137,225	137,225	48,618	14,530	12,756	13,605	12,016	35,700	137,225
Government Furnished Property:											
Item Description	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Delivery Date		Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
<u>Product Development Property</u>											
None											
<u>Support and Management Property</u>											
None											
<u>Test and Evaluation Property</u>											
None											
Project 1008											

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0207601F USAF Modeling And Simulation					PROJECT 4567	
<i>COST (\$ In Thousands)</i>	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4567 Joint Modeling and Simulation System (JMASS)	0	1,722	5,694	5,766	3,780	3,872	3,952	4,035	Continuing	Continuing

(U) A. Mission Description

The Joint Modeling & Simulation System (JMASS) is a simulation support environment for the development, configuration, execution, and analysis of high fidelity, repeatable simulations with re-usable models—focus is tactical/engagement level simulations with the present concentration on electronic combat. JMASS is a full system software implementation of a modern object based simulation architecture. JMASS provides users with the tools to: Develop objects, assemble these objects into models, configure the models in a complete simulation, execute the simulation, and post process the simulation data. JMASS tools assist users in developing fully compliant objects; users concentrate on the models and analysis, not computer science.

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

- (U) \$0 Not Applicable

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

- (U) \$ 507 High Level Architecture (HLA) Compliance
- (U) \$ 245 Improved User Interface
- (U) \$ 685 Develop Request For Proposal (RFP) documentation and operate the program management office
- (U) \$ 285 Prototype of JMASS software on a Personal Computer (PC)
- (U) \$ 1,722 Total

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

- (U) \$ 2,494 JMASS Model Space Object (MSO) development (computer representations of individual DoD weapon systems)
- (U) \$ 1,700 JMASS Architecture development (Environment, Terrain, Human interaction, background models and simulations)
- (U) \$ 1,500 JMASS Integration with Other Service Simulations
- (U) \$ 5,694 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207601F USAF Modeling And Simulation	PROJECT 4567
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(U) FY 2001 (\$ in Thousands):

- (U) \$ 4,000 JMASS Model Space Object (MSO) development (computer representations of individual DoD weapon systems)
- (U) \$ 1,000 JMASS Architecture development (Environment, Terrain, Human interaction, background models and simulations)
- (U) \$ 766 JMASS Integration with Other Service Simulations
- (U) \$ 5,766 Total

(U) B. Project Change Summary - Description of Significant Changes

PE 64256F, Threat Simulator Development, transferred \$2.1M in FY00 and FY01 for JMASS Joint Program Development in FY00 POM.

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

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To Compl</u>	<u>Total Cost</u>
(U) PE64256F, Threat Simulator Development Project 3321 (EW Test Resources)	4,090	4,100							Continue	25,899

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207601F USAF Modeling And Simulation	PROJECT 4567
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(U) D. Acquisition Strategy

All major contracts for JMASS model development within this BPAC will be awarded after full and open competition.

(U) E. Schedule Profile

	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) Milestone 2 - RFP							X									
(U) Contract Award										X						
(U) Initial Delivery																X

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)						DATE February 1999					
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0207601F USAF Modeling And Simulation				PROJECT 4567			
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
Joint Modeling and Simulation System (JMASS)				<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>				
(U) Cost Categories											
(U) a. Software Development				0	1,030	4,394	4,266				
(U) b. Contractor Support				0	240	1,000	1,000				
(U) c. Program Management Support				0	452	300	500				
(U) Total				0	1,722	5,694	5,766				
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
<u>Product Development Organizations</u>											
Various	Various				0	0	1,722	5,694	5,766	continuing	continuing
<u>Support and Management Organizations</u>											
None											
<u>Test and Evaluation Organizations</u>											
None											
Project 4567				Page 11 of 12 Pages				Exhibit R-3 (PE 0207601F)			

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207601F USAF Modeling And Simulation	PROJECT 4567
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(U) B. Budget Acquisition History and Planning Information Continued (\$ in Thousands)

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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Property</u>										
None										
<u>Support and Management Property</u>										
None										
<u>Test and Evaluation Property</u>										
None										
Subtotal Product Development				0	0	1,722	5,694	5,766	continuing	continuing
Subtotal Support and Management										
Subtotal Test and Evaluation										
Total Project				0	0	1,722	5,694	5,766	continuing	continuing

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)									DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0207605F Wargaming and Simulation Centers					PROJECT 2888		
COST (\$ In Thousands)		FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
2888	Theater Air Command & Control Sim Facility (TACCSF)	0	5,272	5,192	5,508	6,056	6,337	6,468	6,604	TBD	Continuing
	Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

*FY98 dollars (\$5,272M) were executed through PE0207601F, USAF Modeling and Simulation, but reported here for consistency.

(U) **A. Mission Description**
 Funding provided for the Air Force's premier warfighter-in-the-loop simulation facility operated at Kirtland AFB, NM by Det 4, 505th Command and Control Evaluation Group (505 CCEG). As of 1 Oct 97, the 505 CCEG and TACCSF fall under the authority of the Air and Space Command and Control Agency (ASC2A). TACCSF's mission is to provide advanced distributed simulation to the warfighter for improving theater air and space warfare systems and concepts of operation. TACCSF is used by the ASC2A and other customers who require high-fidelity battle management, command, control, communications, computer, and intelligence (BMC4I) simulation for establishing system requirements, assessing interoperability, integrating actual C4I and weapon system, and conducting joint test and evaluation. TACCSF performs the upgrade of a complex equipment system consisting of 23 Air Force and Army weapon system simulators (containing over 2 million lines of software code), 18 internal computer networks, 36 mainframe computers, and 62 tactical warfighter-in-the-loop simulator consoles. These systems interoperate with joint service simulators and live fielded equipment via wide-area networks using state-of-the-art voice and data link communications over multiple long-haul communication circuits. FY98 funding was executed through PE0207601F, USAF Modeling and Simulation.

* (U) FY 1998 (\$ in Thousands): Executed in PE 27601F

- (U) \$ 3,310 Continue to maintain core structure to support users conducting RDT&E, mission rehearsal, and concepts of operations development
- (U) \$ 1,020 Continue to support requirements definition, test support, scenario development, analysis, system engineering support, and Verification, Validation, & Accreditation (VV&A) of core system
- (U) \$ 673 Rehost AWACS and other systems from its ten year old equipment. The models should be rehosted to take advantage of object-oriented techniques allowing the sensor models to be imported into other simulations to save money and time. This design will also support tactical data link interfaces with operational systems
- (U) \$ 207 In support of approximately 175 Temporary Duty (TDY) travels, office supplies, and host base support
- (U) \$ 62 Defense Simulation Internet (DSI) provides flexibility, dial-up connectivity between TACCSF and various other M&S facilities.
- (U) \$ 5,272 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207605F Wargaming and Simulation Centers	PROJECT 2888
<p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 3,790 Continue to maintain core structure to support users conducting RDT&E, mission rehearsal, and concepts of operation development - (U) \$ 1,134 Continue to support requirements definition, test support, scenario development, analysis, system engineering support, and VV&A of core system - (U) \$ 248 In support of approximately 175 TDY's, office supplies, and host base support - (U) \$ 100 DIS provides flexibility, dial-up connectivity between TACCSF and various other M&S facilities. - (U) \$ 5,272 Total <p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 3,843 Continue to maintain core structure to support users conducting RDT&E, mission rehearsal, and concepts of operation development. - (U) \$ 1,000 Continue to support requirements definition, test support, scenario development, analysis, system engineering support, and VV&A of core system. - (U) \$ 249 In support of approximately 175 TDY's, office supplies, and host base support - (U) \$ 100 DIS provides flexibility, dial-up connectivity between TACCSF and various other M&S facilities. - (U) \$ 5,192 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 4,092 Continue to maintain core structure to support users conducting RDT&E, mission rehearsal, and concepts of operation development. - (U) \$ 1,066 Continue to support requirements definition, test support, scenario development, analysis, system engineering support, and VV&A of core system. - (U) \$ 250 In support of approximately 175 TDY's, office supplies, and host base support - (U) \$ 100 DIS provides flexibility, dial-up connectivity between TACCSF and various other M&S facilities. - (U) \$ 5,508 Total <p>(U) B. Budget Activity Justification: This program is in budget activity 7 - Operation System Development, because it provides RDT&E funding for the continued development and upgrade of the Air Force's premier warfighter-in-the-loop simulation facility.</p>		
Project 2888	Page 2 of 6 Pages	Exhibit R-2 (PE 0207605F)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207605F Wargaming and Simulation Centers	PROJECT 2888
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(U) C. Program Change Summary (\$ in Thousands)

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U) FY 1999 President's Budget	0	5,287	5,287	5,613	Continuing
(U) Appropriated Value	5,140				
(U) Adjustments to Appropriated Value					
a. Cong Reductions		-15			
b. SBIR					
c. Omnibus or Other Above Threshold Reprogram					
d. Below Threshold Reprogramming	+132				
(U) Adjustments to Budget Years Since FY 1999 PB			-95	-105	
(U) Current Budget Submit/FY 2000 PB	5,272	5,272	5,192	5,508	Continuing

(U) Significant Program Changes: None.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207605F Wargaming and Simulation Centers	PROJECT 2888
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(U) **D. Other Program Funding Summary (\$ in Thousands)**
(N/A)

(U) **E. Acquisition Strategy:**
Provides funds for development, upgrade, and maintenance of virtual simulators. Simulators include Airborne Warning and Control Systems (AWACS), Joint Surveillance Attack Radar System (JSTARS), Advanced Airborne Sensor, Airborne Laser (ABL) TSQ-73 Fire Direction Center, PATRIOT and HAWK battalion and batteries and the F-15C to name a few.

(U) **F. Schedule Profile**

	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) Maintain Core Structure	X			X	X			X	X			X	X			X
(U) Continue Technical Support	X			X	X			X	X			X	X			X
(U) Support DIS & HLA	X			X					X			X	X			X
(U) Unit Ops Exp	X			X	X			X	X			X	X			X
(U) DSI Service Fee	X			X	X			X	X			X	X			X
(U) Rehost AWACS & MCE					X			X								

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0207605F Wargaming and Simulation Centers					PROJECT 2888	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>*FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U) Cost Categories											
(U) a. Software Development											
					3,837	3,796	3,659	3,999			
(U) b. Contractor Support											
					1,055	1,055	1,080	1,029			
(U) c. Program Management Support											
					380	421	453	480			
(U) Total											
					5,272	5,272	5,192	5,508			
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
<u>Product Development Organizations</u>											
Det 4, 505 th CCEG		1 Jan 90	continuing	continuing	0	5,272	5,272	5,192	5,508	continuing	continuing
<u>Support and Management Organizations</u>											
None											
<u>Test and Evaluation Organizations</u>											
None											
Project 2888					Page 5 of 6 Pages				Exhibit R-3 (PE 0207605F)		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1999			
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0207605F Wargaming and Simulation Centers				PROJECT 2888		
(U) B. <u>Budget Acquisition History and Planning Information Continued (\$ in Thousands)</u>										
Government Furnished Property: N/A										
<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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Property</u>										
None										
<u>Support and Management Property</u>										
None										
<u>Test and Evaluation Property</u>										
None										
Subtotal Product Development				0	5,272	5,272	5,192	5,508	continuing	continuing
Subtotal Support and Management										
Subtotal Test and Evaluation										
Total Project				0	5,272	5,272	5,192	5,508	continuing	continuing

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 EXHIBIT)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0208006F Mission Planning Systems	PROJECT 3858
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
3858 Air Force Mission Support System (AFMSS)	12,911	16,204	16,764	16,940	17,120	17,381	17,743	18,112	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

(U) The Mission Planning System program was established in 1990 to consolidate mission planning system development efforts into a single unit-level mission planning system. This program maintains and preserves combat capability on existing legacy planning systems which will migrate into a USAF wide standard mission planning system known as the Air Force Mission Support System (AFMSS). Integrating military and commercial software on Commercial-Off-The-Shelf (COTS) hardware, AFMSS encompasses evolutionary software and hardware development in an open systems architecture. AFMSS today consists of the Mission Planning System (MPS), a UNIX-based system, the Portable Flight Planning System, a PC-based system, and the Joint Mission Planning System, which is the next generation PC-based system.

(U) The MPS provides comprehensive mission planning tools to conduct missions ranging from day-today training, peace time operations/exercises to complex operations supporting conventional and nuclear armed conflict. The MPS design is centered around an open architecture, using standard protocols and interfaces, commercial off-the-shelf (COTS) hardware and software. The MPS currently or will support the following aircraft and associated weapons: B-1, B-2, B-52, C-17, F-15, F-16, F-117, AGM-130, U-2, F-22, UAVs, AGM-142, JDAM, JSOW, WCMD, ABL, JASSM, MALD, Dark Star, Global Hawk, Predator.

(U) The Portable Flight Planning System (PFPS) is the PC-based mission planning system that provides flight planning tools that support day-today training, peace time operations/exercises and conventional armed conflict. The PFPS design is based on single user PCs. The user interface uses Windows 95 and MS Windows NT. The PFPS currently or will support the following aircrafts: F-16, MC-130, EC-130, HC-130H/N/P, AC-130, E-3, E-8, C-130E/H/J, LC-130, WC-130, C-27, E-4, T-38, C-141, RC-135, HH60, KC-10, KC-135R/E, C-5, C-9, A-10, MH-53, MH-47, AH/MH-6J, MH/HH-60.

(U) The Joint Mission Planning Segment (JMPS) is a continuation effort of the AFMSS Mission Planning Systems (MPS) and Portable Flight Planning Software (PFPS) directed at merging the AFMSS and the Navy's Tactical Automated Mission Planning System (TAMPS), to form a single family of systems achieving Global Command and Control System (GCCS) compatibility through compliance with the Defense Information Infrastructure and Common Operating Environment (DII/COE).

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational System Development	0208006F Mission Planning Systems	3858
<p>(U) <u>FY 1998</u></p> <ul style="list-style-type: none"> - (U) \$ 7,951 Finalize C2.0/C2.1 software development - (U) \$ 2,298 Begin C2.3 software development - (U) \$ 2,662 Continue AFMSS A/W/E development/support/integration for the platforms listed above - (U) \$12,911 Total <p>(U) <u>FY 1999</u></p> <ul style="list-style-type: none"> - (U) \$ 1,459 MPS core software development support - (U) \$ 3,216 Begin PFPS software development support - (U) \$ 3,615 Continue AFMSS A/W/E development/support/integration for the platforms listed above - (U) \$ 6,400 Begin JMPS migration effort - (U) \$ 1,000 Stand up Responsible Test Organization (RTO) support - (U) \$ 514 Identified as a source for SBIR - (U) \$16,204 Total <p>(U) <u>FY 2000</u></p> <ul style="list-style-type: none"> - (U) \$ 2,164 Continue PFPS software development support - (U) \$ 2,822 Continue AFMSS A/W/E development /support/integration for the platforms listed above - (U) \$11,018 Continue JMPS migration effort. - (U) \$ 760 Continue Responsible Test Organization (RTO) support - (U) \$16,764 Total <p>(U) <u>FY 2001</u></p> <ul style="list-style-type: none"> - (U) \$ 1,966 Continue PFPS software development support - (U) \$ 2,519 Continue AFMSS A/W/E development/support/integration for the platforms listed above - (U) \$11,699 Continue JMPS migration effort - (U) \$ 756 Continue Responsible Test Organization (RTO) support - (U) \$16,940 Total <p>(U) B. Budget Activity Justification:</p> <p>(U) Mission Planning Systems are in budget activity 7, Operational System Development, because the program currently supports deployed AFMSS systems, which include transportable, non-deployable, and portable laptop workstations. AFMSS Block C1.5 and Block C2.0 software are operationally fielded and Block C2.1 is in the process of fielding to the Combat Air Forces (CAF). AFMSS Block C2.2, which incorporates Y2K fixes among other new requirements was released and has begun operational test and evaluation in the 1st quarter of FY99.</p>		
Project 3858	Page 2 of 8 Pages	Exhibit R-2 (PE 0208006F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0208006F Mission Planning Systems	PROJECT 3858
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(U) C. Program Change Summary (\$ in Thousands)

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U) Previous President's Budget (FY 1999)	14,747	17,090	17,069	17,262	TBD
(U) Appropriated Value	16,526	17,090			
(U) Adjustments to Appropriated Value					
a. General Congressional Reductions	-1,394	-886			
b. Small Business Innovative Research (SBIR)	-387				
c. Omnibus	-100				
d. Below Threshold Reprogramming	-1,734				
(U) Adjustments to Budget Years Since FY99 PB			-305	-322	
(U) Current Budget Submit/FY 2000 PB	12,911	16,204	16,764	16,940	TBD

(U) Significant Program Changes: N/A

FY 99: \$514 identified as a source for SBIR.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0208006F Mission Planning Systems				PROJECT 3858		
(U) D. <u>Other Program Funding Summary (\$ in Thousands)</u>										
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To</u> <u>Compl</u>	<u>Total</u> <u>Cost</u>
(U) Other Procurement, AF WSC 833040, Theater Air Control System Improvement (TACSI)	14,245	6,097	12,744	17,515	16,521	16,474	16,822	17,201	Cont	TBD
(U) Other Procurement, AF, WSC 86190A, Initial Spares	950	1,497	1,124	1,078	794	566	537	387	Cont	TBD
(U) Operations & Maintenance, AF, 0208006F	21,039	24,331	34,112	38,065	33,892	36,535	37,673	37,879	Cont	TBD
<p>(U) O&M funds for PE 28006F support the software and hardware maintenance costs of the Air Force Mission Support System (AFMSS) and the Common Mapping Production System. These funds also support the maintenance of the following existing operational systems until replaced by AFMSS: Mission Support System II (MSS IIA) supports existing combat capability for the F-15 and F-16 aircraft mission planning (F/RF-4 and F-111 are now retired); Mission Data Preparation System (MDPS) supports conventional and nuclear mission planning, aircraft/weapons avionics loading, compatibility between evolving B-1B, B-52H avionics, their weapons systems, and USSTRATCOM. O&M funding supported approximately 240 older systems in FY94. By FY99, a similar amount of funding will support over 2900 AFMSS mission planning systems world-wide.</p> <p>(U) There are no other AFMSS core related RDT&E activities for unit level mission planning in the USAF. Over 50 individual aircraft and weapons programs develop their respective software that is used in conjunction with the AFMSS core software. The aircraft and weapons software is a complimentary, synergistic effort that provides specific aircraft and weapons information and functionality to the core AFMSS software. The combined software gives the warfighter the full spectrum of mission planning and combat capabilities for their aircraft or weapon including interoperability with planned Theater Battle Management (TBM) systems.</p>										
Project 3858			Page 4 of 8 Pages				Exhibit R-2 (PE 0208006F)			

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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0208006F Mission Planning Systems	PROJECT 3858
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(U) E. Acquisition Strategy:

(U) The Air Force Mission Support System (AFMSS) program is managed within the Combat Air Forces (CAF) Command and Control (C2) Systems Program Office, Electronic Systems Center, Hanscom AFB, Massachusetts. The AFMSS acquisition strategy leverages military and commercial software integrated on Commercial-Off-The-Shelf (COTS) hardware. AFMSS encompasses evolutionary software and hardware development in an open systems architecture. The Contractors for the AFMSS projects are Sanders, a Lockheed Martin Company, for the MPS and C-17, KC-10, C-5, C-9, C-141, E-3, E-8, KC-135E/R A/W/Es; 46th Test Squadron (46TS), Eglin AFB, FL, for the PFPS; and Logicon and GDE for JMPS. A/W/E development is also performed in-house (government) by Oklahoma City Air Logistics Center (OC-ALC), Tinker AFB, Oklahoma; Sacramento Air Logistics Center (SM-ALC), McClellan AFB, Ca; Warner Robbins Air Logistics Center (WR-ALC), Robbins AFB, Ga; and Ogden Air Logistics Center (OO-ALC), Hill AFB, Utah.

(U) The Joint Mission Planning Segment (JMPS) is in the solicitation phase. The current plan is to begin migration activities in the FY99-FY05 time frame while individual weapon systems transition with planned Operational Flight Program (OFF) upgrades.

(U) F. Schedule Profile

	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) MPS C2.1 Software Release		*														
(U) MPS C2.1 OT&E Complete						X										
(U) MPS C2.2 Software Release			*													
(U) MPS C2.2 OT&E Begin					*											
(U) MPS C2.2 OT&E Complete									X							
(U) MPS C2.3 Development Begins						X										
(U) MPS C2.3 Software Release										X						
(U) MPS C2.3 OT&E Begins												X				
(U) PFPS 3.01 Software Release				*												
(U) PFPS 3.1 Software Release						X										
(U) JMPS Study Complete							X									
(U) JMPS Source Selection Complete								X								
(U) JMPS 1.0 Software Release																X

* denotes completed event
X denotes planned event

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0208006F Mission Planning Systems	PROJECT 3858
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(U) A. Project Cost Breakdown (\$ in Thousands)

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) Primary Software Development	5,334	6,940	10,000	10,900
(U) Aircraft/Weapons/Electronics (A/W/E) Integration Spt.	500	250	0	0
(U) Systems Engineering	3,500	2,905	2,589	2,290
(U) Program Management	2,900	4,095	2,952	2,551
(U) Test and Evaluation	0	1,000	760	756
(U) Miscellaneous	677	500	463	443
(U) Identified as a source for SBIR	0	514	0	0
(U) Total	12,911	16,204	16,764	16,940

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE	
BUDGET ACTIVITY 7 - Operational System Development										February 1999	
PE NUMBER AND TITLE 0208006F Mission Planning Systems										PROJECT 3858	
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government <u>Performing Activity</u>	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity <u>EAC</u>	Project Office <u>EAC</u>	Total Prior to <u>FY 1998</u>	Budget <u>FY 1998</u>	Budget <u>FY 1999</u>	Budget <u>FY 2000</u>	Budget <u>FY 2001</u>	Budget to Complete	Total Program
Identified as a source for SBIR							514				
<u>Product Development Organizations</u>											
TBD (JMPS)	TBD	TBD	TBD	TBD	0	0	4,000	8,800	9,500	Cont	TBD
Sanders	CPAF	Dec 92	TBD	TBD	87,367	5,834	572	0	0	Cont	TBD
46 TS (Eglin AFB)	Project Order	Dec 98	TBD	TBD	0	0	2,618	1,200	1,400	TBD	TBD
Logicon	CPAF	Aug 94	2,438	2,438	2,438	0	0	0	0	0	2,438
Boeing	FFP	Aug 91	6,455	6,455	6,455	0	0	0	0	0	6,455
A/W/E Integration Activity	Time & Material	Oct 98	TBD	TBD	0	0	2,333	1,847	1,614	TBD	TBD
SPO Misc Classified Progr.					3,772	677	500	463	443	Cont	TBD
					15,296	0	0	0	0	0	15,296
<u>Support and Management Organizations</u>											
FFRDC			TBD	TBD	8,848	3,500	1,940	1,737	1,517	Cont	TBD
Miscellaneous			TBD	TBD	6,632	2,900	2,727	1,957	1,710	Cont	TBD
<u>Test and Evaluation Organizations</u>											
46TW (Eglin AFB)	Project Order	Oct 98	TBD	TBD	0	0	1,000	760	756	TBD	TBD
Project 3858											

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)						DATE	
BUDGET ACTIVITY						PROJECT	
7 - Operational System Development						0208006F Mission Planning Systems	3858
Government Furnished Equipment: N/A							
	Total						
	Prior to					<u>Budget to</u>	<u>Total</u>
	<u>FY 1998</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
Subtotal Product Development	115,328	6,511	10,023	12,310	12,957	Cont	TBD
Subtotal Support and Management	15,480	6,400	4,667	3,694	3,227	Cont	TBD
Subtotal Test and Evaluation	0	0	1,000	760	756	TBD	TBD
Identified as a source for SBIR			514				
Total Project	130,808	12,911	16,204	16,764	16,940	Cont	TBD

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 EXHIBIT)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0208021F Information Warfare Support	PROJECT 0374
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
0374 Electronic Combat Support, C3 Protection/Multi-mission. Technology and Support	1,289	2,368	1,376	1,401	1,403	4,610	4,705	4,804	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) **A. Mission Description** This program responds to CINC requests for urgently needed technical solutions to operational problems. This program studies, develops and demonstrates IW/C2W prototypes to provide warning, self protection, and support to personnel and equipment against combat systems employed by enemy forces. In response to CINC tasking, this program identifies existing military and commercial research and development efforts which can satisfy unfulfilled operational requirements as identified by the Unified Commands, and quickly bridges the gap between technology developments to meld the technology to meet the warfighter's operational requirements. The Secretary of Defense identified the need for this capability in 1983, and with unanimous approval of the services and the Unified Commands, JCS made this function a part of the Joint Command and Control Warfare Center (JC2WC) mission (formerly the Joint Electronic Warfare Center (JEWEC). The Air Force as executive agent is responsible for the total funding of this effort. This program also includes the development effort for a Command and Control Warfare Analysis Targeting Tool (CATT). CATT is a computer simulation which models the impact of C2W and IW against an adversary Integrated Air Defense System. The growing customer base for the CATT includes ACC, AFMC, AFOTEC, STRATCOM, and the JC2WC, with the AF IW Center being the prime developer of the model. CATT capabilities will continue to improve to meet increasing customers demand and requirements.

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

- (U) \$1,155 Mayberry ACTD
- (U) \$29 Souder Environmental Testing
- (U) \$105 Engineering Services
- (U) \$1,289 Total

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

- (U) \$1,172 Proud Lightning
- (U) \$199 Mayberry ACTD
- (U) \$997 C2W Analysis and Targeting Tool (CATT)
- (U) \$2,368 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0208021F Information Warfare Support	PROJECT 0374
<p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$1,376 The center has established a Joint Project Office (JPO) in response to recent tasking by the Joint Staff. The JPO will support the CINCs through CINC-directed rapid prototyping, briefings and demonstrations of state of the art technology currently under development. The Center will conduct field demonstrations of the operational utility of IW technology projects. This will require coordination with the Joint Staff, CINCs, service acquisition command, laboratories, and various intelligence agencies. This will include IW source and target systems analysis, operations, and demonstration, and design, development and operations effectiveness assessment systems. - (U) \$1,376 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$1,401 The center has established a Joint Project Office (JPO) in response to recent tasking by the Joint Staff. The JPO will support the CINCs through CINC-directed rapid prototyping, briefings and demonstrations of state of the art technology currently under development. The Center will conduct field demonstrations of the operational utility of IW technologies projects. This will require coordination with the Joint Staff, CINCs, service acquisition command, laboratories, and various intelligence agencies. This will include IW source and target systems analysis, operations, and demonstration, and design, development and operations effectiveness assessment systems. - (U) \$1,401 Total <p>(U) B. Budget Activity Justification: This program is in Budget Activity 7, Operational System Deveelopment, because it studies, develops and demonstrates IW/C2W prototydes to provide warning, self protection, and support to personnel and equipment against combat systems employed by enemy forces. It identifies existing military and commercial research and development efforts which can satisfy unfulfilled operational requirements as identified by the Unified Commands, and quickly bridge the gap between technology developments and meld the technology into the warfighter's operational requirements. The Secretary of Defense identified the need for this capability in 1983, and with unanimous approval of the services and the Unified Commands, JCS made this function a part of the Joint Command and Control Warfare Center (JC2WC) mission (formerly the Joint Electronic Warfare Center (JEWEC)). The Air Force as executive agent is responsible for the total funding of this effort.</p>		
Project 0374	Page 2 of 6 Pages	Exhibit R-2 (PE 0208021F)

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)						DATE February 1999					
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0208021F Information Warfare Support			PROJECT 0374				
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
				<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>				
(U) ACTD				658	0	0	1,401				
(U) Instrumentation and Support				371	0	0					
(U) Facilities				126	412	362					
(U) Testing				29	0	0					
(U) Engineering Services				105	1,811	880					
(U) SME				0	145	134					
(U) Total				1,289	2,368	1,376	1,401				
(U) B. <u>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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Organizations</u>											
SPAWAR	DDForm 448	Aug	JC2WC	J91		216					
SWRI	AF Form 9	Apr Aug	JC2WC	J91		218					
EA	DDForm 448	MayJulAug	JC2WC	J91		210					
Miscellaneous	DDForm 448	Jan Jun	JC2WC	J91		19					
Unknown	TBD	TBD	JC2WC	J91					TBD	Ongoing	Ongoing
<u>Support and Management Organizations</u>											
SPAWAR	DDForm 448	Jun	JC2WC	J91		126					
CSC	DDForm 448	Jan Aug	JC2WC	J91		79					
SWRI	AF Form 9	Apr Aug	JC2WC	J91		72					
EWA	DDForm 448	Jul	JC2WC	J91		28					
Project 0374				Page 4 of 6 Pages				Exhibit R-3 (PE 0208021F)			

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0208021F Information Warfare Support					PROJECT 0374	
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Unknown	TBD	TBD	JC2WC	J91					TBD	Ongoing	Ongoing
<u>Test and Evaluation Organizations</u>											
Brooks AFB TX	DDForm 448	Aug	JC2WC	J91		29					
TES	AF Form 9						819	881			
Sandia Labs	DD Form448						413	357			
PRM:	DDForm448						140	138			
Unknown	TBD	TBD	JC2WC	J91					TBD	Ongoing	Ongoing
(U) B. Budget Acquisition History and Planning Information Continued (\$ in Thousands)											
Government Furnished Property:											
Item Description	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Delivery Date		Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
<u>Product Development Property</u>											
<u>Support and Management Property</u>											
CSC	DDForm 448	Aug				61					61
Unknown	TBD	TBD	JC2WC	J91					TBD	Ongoing	
<u>Test and Evaluation Property</u>											
Instrument Van	AF Form 9	Apr				190					190
Scope Lease	AF Form 9	Aug				33					33
Fiber Opt Cables	FCA	Aug				8					8
Unknown	TBD	TBD	JC2WC	J91					TBD	Ongoing	

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)				DATE February 1999		
BUDGET ACTIVITY	PE NUMBER AND TITLE			PROJECT		
7 - Operational System Development	0208021F Information Warfare Support			0374		
Subtotal Product Development	663	996		TBD	Ongoing	Ongoing
Subtotal Support and Management	366			TBD	Ongoing	Ongoing
Subtotal Test and Evaluation	260	1,372		TBD	Ongoing	Ongoing
Total Project	1,289	2,368	1,376	1,401	Ongoing	Ongoing

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0208031F WRM-Equipment/Secondary Items	PROJECT 4668
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4668 Shelter Development	0	1,466	1467	1489	2579	2800	2858	2918	0	15,581
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

This program funds development, testing and evaluation of materials, equipment, and procedures for Air Force Bare Base mobility capability better known as Harvest Falcon (HF) and Harvest Eagle (HE). Bare Base is designated and sized to support two near Major Theater Wars (MTW), which provides theater warfighters billeting, industrial, and air field capability to support a total of 68,200 combat troops and 822 aircraft at 15 austere locations--building complete bases from the ground up. Of the two systems, HF is the newest and has the greatest capability (housekeeping and airbase infrastructure). The FY00-05 Defense Guidance tasks the Air Force to support Southwest Asia contingency operations and save critical airlift resources through theater repositioning. The outstanding reputation of the Air Force Bare Base program, established during the Gulf War, has continued in successive Military-Operations-Other-Than-War (MOOTW) throughout the world. These range from Operations Southern Watch, Provide Relief, Provide Promise, Provide Comfort, Restore Hope, Sea Signal, Uphold Democracy, and Joint Endeavor, support for the aftermath of Hurricanes Andrew and Hugo, Typhoon Paka, and support for Presidential visits to Africa and China. Bare Base Systems have also supported the NASA Space Shuttle throughout the world. Harvest Falcon remains a top priority for USCINCCOM and USCINCENT, and the Commander, ACC, for the AF Expeditionary Air Force concept. Supporting MOOTW has taken its toll on equipment, and as a result HF and HE equipment requires comprehensive repair or replacement. Air Force reconstitution efforts continue although on-going MOOTW deployments delay the get well process.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0208031F WRM-Equipment/Secondary Items	PROJECT 4668
(U) <u>FY 1998 (\$ in Thousands):</u>		
- (U) \$ 0 TOTAL		
(U) <u>FY 1999 (\$ in Thousands):</u>		
- (U) \$1,200 Initiate EMD for Deployable Waste Management System		
- (U) \$ 266 Continue other technical support		
- (U) \$1,466 TOTAL		
(U) <u>FY 2000 (\$ in Thousands):</u>		
- (U) \$ 597 Initiate EMD for Bare Base Systems Cold Weather Package		
- (U) \$ 597 Continue EMD for Deployable Waste Management System		
- (U) \$ 273 Continue other technical support		
- (U) \$1,467 Total		
(U) <u>FY 2001 (\$ in Thousands):</u>		
- (U) \$ 296 Continue EMD for Bare Base Systems Cold Weather Package		
- (U) \$ 917 Continue EMD for Deployable Waste Management System		
- (U) \$ 276 Continue other technical support		
- (U) \$1,489 Total		
(U) B. Budget Activity Justification:		
<p>This program is in Budget Activity 7 because it supports development of operational HF/HE equipment, leading to deployment of new systems which provide measurable reductions in airlift sorties and increased operational efficiencies.</p> <p>Bare Base Systems Cold Weather Package: Harvest Falcon housekeeping sets are subject to worldwide deployment and a limited capability must be established to function in extreme cold weather conditions. This effort provides freeze protection for Harvest Falcon water distribution systems (pumps, pipes, etc.) and capabilities to heat tents/shelters deployed to extreme cold weather environments.</p> <p>Deployable Waste Management Systems will reduce the amount of solid, medical and hazardous waste material that must be managed and/or disposed. Solutions to be investigated include on-site incineration for solid, medical and hazardous waste materials, shredders and compactors for landfill refuse, and a closed loop waste water processing system to minimize the quantity of wasted products and reduce the need for large quantities of water to process waste at the contingency base.</p>		
Project 4668	Page 2 of 6 Pages	Exhibit R-2 (PE 0208031F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)						DATE					
BUDGET ACTIVITY						February 1999					
7 - Operational System Development				PE NUMBER AND TITLE		PROJECT					
				0208031F WRM-Equipment/Secondary Items		4668					
(U) C. <u>Program Change Summary (\$ in Thousands)</u>											
		<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total</u>					
(U) Previous President's Budget		0	1,470	1,493	1,517	<u>Cost</u>					
(U) Appropriated Value			1,470								
(U) Adjustments to Appropriated Value											
a. Congressional Gen Reductions											
b. SBIR											
c. Omnibus or Other Above Threshold											
Reprogramming											
d. Below Threshold Reprogramming											
e. Rescissions											
(U) Adjustments to Budget Years Since FY 1999 PB		0	-4	-26	-28						
(U) Current Budget Submit/FY2000 President's Budget		0	1,466	1,467	1,489	Cont					
(U) Significant Program Changes: Not Applicable											
(U) D. <u>Other Program Funding Summary (\$ in Thousands)</u>											
		<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To</u>	<u>Total</u>
(U) Other Procurement, AF, Other Base										<u>Compl</u>	<u>Cost</u>
Maintenance and Support Equipment:											
WRM-Equipment/Secondary Items (0208031F)		26,267	35,883	47,102	51,301	28,037	27,702	21,042	20,443	Cont	Cont
(WSC 845420), P-1: 100											

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0208031F WRM-Equipment/Secondary Items	PROJECT 4668
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(U) E. Acquisition Strategy: The SPO will evaluate and test commercial solutions to determine options for militarizing commercially-available products for cold weather systems. It will also evaluate work performed by Wright Laboratories, which has identified plasma-arc technology as a potential solution to safely, effectively and efficiently incinerate medical and hazardous wastes. This technology also provides capability to eliminate other waste materials, such as solid wastes/garbage, and other materials placed in landfills. Contracts expected to be competitive, firm fixed price.

(U) F. Schedule Profile

	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
BARE BASE COLD WEATHER PKG																
- Milestone I/II Brief									X							
- Contract Award										X						
- Preliminary Design Review															X	
DEPLOYABLE WASTE MGT SYS																
- Milestone I/II Brief						X										
- Contract Award								X								
- Preliminary Design Review															X	

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0208031F WRM-Equipment/Secondary Items	PROJECT 4668
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(U) A. Project Cost Breakdown (\$ in Thousands)

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) Contracts	0	550	558	566
(U) A&AS Support	0	450	431	435
(U) Other Government Agencies		180	182	185
(U) Material/Equipment		20	23	24
(U) Other Technical Support		266	273	279
(U) Total	0	1,466	1,467	1,489

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0208031F WRM-Equipment/Secondary Items					PROJECT 4668	
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
<u>Product Development Organizations</u>											
Bare Base Systems Cold Weather Package	C/FP	3Qtr/FY00	910	910	0	0	0	597	296	Cont	Cont
Deployable Waste Management System	C/FP	4Qtr/FY99	3,948	3,948	0	0	1,200	597	917	Cont	Cont
Sub-Total			6,198	6,198	0	0	1,200	1,194	1,213	Cont	Cont
Support and Management Organizations					0	0	266	273	279		Cont
Test and Evaluation Organizations: N/A											
<u>Government Furnished Property: None</u>											
Subtotal Product Development					0	0	1,200	1,194	1,213		
Subtotal Support and Management					0	0	266	273	276		
Subtotal Test and Evaluation					0	0	0	0	0		
Total Project					0	0	1,466	1,467	1,489		

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0208060F Theater Missile Defense
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	26,688	30,352	26,129	28,551	28,212	25,408	24,040	24,540	Continuing	TBD
4478 Command, Control, Communications, Computers, and Intelligence Enhancements	19,103	22,598	17,903	19,802	18,289	15,083	13,489	13,769	Continuing	TBD
4479 Attack Operations Concept Development	7,585	7,754	8,226	8,749	9,923	10,325	10,551	10,771	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

Air Force Theater Missile Defense/Time Critical Target (TMD/TCT) effort is focused in two areas: Battle Management/Command, Control, Communications, Computers, and Intelligence (BM/C4I) enhancements and improvements to existing Attack Operations systems. AF TMD concentrates on defining improvements to existing operational capabilities, developing and evaluating prototypes, demonstrating as well as simulating modifications during operational concept demonstrations, and coordinating the transition of these capabilities to operational systems. **BM/C4I projects** [including, for example, Dynamic Battle Management, Attack Operations Decision Aid (AODA), Automatic Application of Intelligence Preparation of Battlespace (A2IPB) and Joint TADIL-J Range Extension (JRE)] reduce timelines required to negate TCTs by increasing interoperability, improving battle management tools, and providing accurate target data via datalinks for Offensive Counterair (Attack Operations) against Time Critical Targets (TCTs). **Attack Operations** focuses on improving the ability to locate, identify, target and destroy theater missiles and supporting infrastructure, including theater missile threats in production, deployment, prior to and during launch, as well as soon after launch before critical mobile targets are able to egress to hide locations. The foundation for Attack Operations is improved C4I and advanced sensors and target identification capabilities, CONOPS and requirements development for offensive counterair and optimized integration with defensive systems. The AF TMD program seeks to improve existing operational capability, evaluate and demonstrate prototypes, as well as simulate and demonstrate modifications during operational concept demonstrations. This program is in Budget Activity 7 because its projects are upgrades to existing operational systems.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0208060F Theater Missile Defense
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(U) B. Budget Activity Justification

This program is in Budget Activity 7 because its projects are upgrades to existing operational systems.

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

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U) Previous President's Budget	26,873	31,057	29,605	32,394	TBD
(U) Appropriated Value	29,182	31,057			
(U) Adjustments to Appropriated Value					
a. Congressional General Reductions	-1,727	-705			
b. Small Business Innovative Research (SBIR)	-585				
c. Omnibus or Other Above Threshold Reprogram	-182				
d. Below Threshold Reprogramming					
(U) Adjustments to Budget Years Since FY 1999 PB			-3,476	-3,843	
(U) Current Budget Submit/FY 2000 PB	26,688	30,352	26,129	28,551	TBD

(U) Significant Program Changes:
FY99: \$1,004 identified as a source for SBIR

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0208060F Theater Missile Defense	PROJECT 4478
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4478 Command, Control, Communications, Computers, and Intelligence Enhancements	19,103	22,598	17,903	19,802	18,289	15,083	13,489	13,769	Continuing	TBD

(U) A. Mission Description

C4I enhancements are needed to reduce timelines required to negate TCTs by increasing interoperability, improving battle management tools, and providing accurate target data via datalinks for Offensive Counterair (Attack Operations) against Time Critical Targets (TCTs). The CAF CONOPS for C2 Against Time Critical Targets and Air Superiority Mission Area Plan (MAP) provide the foundation. The BM/C⁴I program encompasses:

- 1) **Dynamic Battle Management (DBM)** ACC vision for providing flexible, centralized C2 throughout conflict spectrum to meet Joint Vision 2010 objectives. Will allow JFACC to tailor decentralized execution to best meet the ROE and span of control requirements enabling prosecution of any TCT. DBM will identify technical capabilities and migration path required to support DBM environment consisting of wide area connectivity, decision support tools, and shared information.

- 2) **Automated Planning Tools / Decision Aids** which prototypes and demonstrates advanced decision aid capabilities to upgrade the battle management tools and infrastructure to better execute the TMD mission. Examples include the integration of the Time Critical Target Aid (TCTA) and Joint Defensive Planner (JDP) into Theater Battle Management Core Systems (TBMCS)/ Global Command and Control System (GCCS) architecture as well as the development and migration of the Attack Operations Decision Aid (AODA) into TACS platforms.

- 3) **Intelligence Preparation Of Battlespace (IPB)** which enables the Commander and supporting staff to visualize the full spectrum of adversary capabilities and course of actions (COAs) across all dimensions of the battlespace. Examples include the revision of the methodology for the IPB process as it supports TMD; development of a website populated with linked digital products; generation of training material for use in Air Force schoolhouse and field IPB training; and development of a software Automated Application of IPB (A2IPB) tool for TBMCS/GCCS to assist the intelligence analyst at a Joint Intelligence Center (JIC) and the Intel/Ops Planner at an AOC.

- 4) **Data Link Connectivity** which provides upgrades to existing Air Force platforms to better utilize existing communications systems. These include JTIDS TMD Message Set Integration and JTIDS gateways to extend range beyond line of sight and interface with National Technical Means (NTM) to provide attack and early launch reporting to theater.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0208060F Theater Missile Defense	PROJECT 4478
<u>(U) FY 1998 (\$ in Thousands):</u>		
(U) 3,826	Enhanced DBM development/M&S environment (JSTARS and AWACS) tunnels assuming and sharing BMC4I responsibilities) with DBM unique prototyping/technology; conduct DBM demonstration to divert fighters from original ATO target to prosecute TCTs.	
(U) 2,965	Integrated Intelligence Preparation of the Battlespace (IPB) evolutionary prototype (EP1) with TBMCS; adapted IPB tool for Air Intelligence Agency's Virtual Production environment; investigated area limitation functionality and tool integration, demonstrate automated procedures and system capabilities in Ops Concept Demonstrations, CINC experiments and Joint Exercises. Completed Area Limitation Technical Requirements Document (TRD) and kickoff Joint Operational Requirements Document (JORD) development	
(U) 6,112	Integrated JDP V1.0 and TCTA (ground targeting) with TBMCS 1.0 and release; began AODA prototype/technology development; kicked off Joint Targeting Execution (JTE) collaborative ID concept exploration and Automatic Target Recognition(ATR)/TCTA integration efforts.	
(U) 5,712	Conducted JTIDS Range Extension prototype development; defined and implemented Improved Situation Awareness for Missiles (ISAM) process; completed Communications Planning Module (CPM) prototype; investigated C4I contribution to Attack Operations and Real Time Information in cockpit (RTIC).	
(U) 488	Conducted MCE/TPS-75 Missile Tracking in-plant and field testing and final prototype delivery.	
(U) \$19,103	Total	
<u>(U) FY 1999 (\$ in Thousands):</u>		
(U) 6,104	Conduct DBM operations onboard AWACS and JSTARS live-fly platforms during EFX 99.	
(U) 5,690	Continue to develop IPB evolutionary prototypes (EPs) for TBMCS and Air Intelligence Agency's Virtual Production environment; demonstrate improved automated procedures and IPB system capabilities in Ops Concept Demonstrations (OCDs), CINC experiments and Joint Exercises. Complete JORD and begin Area Limitation Module spiral 1 development	
(U) 6,865	Complete AODA spiral 1 prototype development and EFX 99 demonstration; integrate and demonstrate JTE concept in laboratory (single site); complete ATR/TCTA integration and EFX 99 demonstration; kickoff Intelligence Surveillance Recce (ISR) Real Time Requirements Definition effort; utilize TCT Testbed to improve integration into operational systems and demonstrate integrated capabilities in OCDs, CINC experiments, and Joint Exercises.	
(U) 3,155	Complete JRE prototype development, EFX 99 demonstration, and implementation plan; perform kill chain based C4I analysis and ops/intel integration of RTIC.	
(U) 748	Identified as a source for SBIR	
(U) \$22,598	Total	

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE
BUDGET ACTIVITY		PROJECT
7 - Operational System Development	0208060F Theater Missile Defense	February 1999 4478
<p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <p>(U) 4,448 Expand DBM to include upgrades for AOC and GTACS and conduct DBM operations during EFX 00.</p> <p>(U) 5,893 Continue to develop IPB evolutionary prototypes (EPs) for TBMCS and Air Intelligence Agency's Virtual Production environment; demonstrate improved automated procedures and IPB system capabilities in Ops Concept Demonstrations (OCDs), CINC experiments and Joint Exercises. Complete Area Limitation Module spiral 2 prototype development and conduct EFX 00 demonstration</p> <p>(U) 4,819 Complete AODA spiral 2 prototype development and conduct EFX 00 demonstration; continue to develop JTE and conduct EFX 00 demonstration (distributed, collaborative targeting); Kickoff ISR-Real Time prototype development effort; maintain TCT Testbed to improve integration into operational systems and demonstrate integrated capabilities in OCDs, CINC experiments, and Joint Exercises.</p> <p>(U) 2,743 Continue to explore communications improvements that compress Theater Missile engagement timelines and demonstrate integrated capabilities in OCDs, CINC experiments, and Joint Exercises.</p> <p>(U) \$17,903 Total</p> <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <p>(U) 5,509 Continue expansion of DBM to include upgrades for AOC and GTACS and conduct DBM operations during EFX 00.</p> <p>(U) 5,974 Continue to develop IPB evolutionary prototypes (EPs) for TBMCS and Air Intelligence Agency's Virtual Production environment; demonstrate improved automated procedures and IPB system capabilities in Ops Concept Demonstrations (OCDs), CINC experiments and Joint Exercises. Complete Area Limitation Module spiral 2 prototype development and conduct EFX 00 demonstration</p> <p>(U) 4,900 Complete AODA spiral 2 prototype development and conduct EFX 00 demonstration; continue to develop JTE and conduct EFX 00 demonstration (distributed, collaborative targeting); kickoff ISR-Real Time prototype development effort; maintain TCT Testbed to improve integration into operational systems and demonstrate integrated capabilities in OCDs, CINC experiments, and Joint Exercises.</p> <p>(U) 3,419 Continue to explore communications improvements that compress Theater Missile engagement timelines and demonstrate integrated capabilities in OCDs, CINC experiments, and Joint Exercises.</p> <p>(U) \$19,802 Total</p> <p>(U) <u>B. Project Change Summary - Description of Significant Changes</u></p> <p>Not Applicable</p>		
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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0208060F Theater Missile Defense	PROJECT 4478
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(U) C. Other Program Funding Summary (\$ in Thousands)

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To Compl</u>	<u>Total Cost</u>
(U) RDT&E, BMDO PMA F3261, BM/C4I	11,134	9,885	13,293	12,855	13,025	13,202	12,959	13,224	TBD	TBD

(U) D. Acquisition Strategy: HQ Electronic Systems Center (ESC) provides program management for the concept exploration of C4I enhancements. Prototypes and analysis of improvements to existing C4I assets will complement the Attack Operations effort with combined participation in Operational Concept Demonstrations. These Attack Operations and C4I analyses and demonstrations are specifically targeted against operational deficiencies identified in the TMD Mission Area Plan (MAP), are traceable to the AF and JROC Mission Need Statement (MNS) and are consistent with the Air Force and Joint TMD CONOPS and in accordance with Joint Doctrine. Integration of TMD requirements and fielding of proposed material solutions will continue beyond concept exploration in the appropriate program element for a particular system. For example, the TMD demonstration and requirements analysis for F-15E ATC/R may transition into a F-15E Engineering & Manufacturing Development (EMD) and P3I project within the F-15E program element. Existing contracts will be used for those systems where engineering change proposals are appropriate. Systems Engineering and Technical Analysis (SETA) contracts will be used to support the requirements definition phase of TMD improvements. In those areas where new material solutions are necessary to correct a deficiency, the source selection process will be followed.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)											DATE February 1999								
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0208060F Theater Missile Defense						PROJECT 4478								
(U) E. <u>Schedule Profile:</u>																			
		<u>FY1998</u>					<u>FY1999</u>					<u>FY 2000</u>					<u>FY 2001</u>		
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4			
(U) TPS-75 Expert Missile Tracker Prototypes/Contingency Support Systems	X																		
(U) Establish DBM dev. environment; unique prototyping/technology development; EFX demonstrations			X			X				X				X					
(U) Demonstrate automated IPB procedures and system capabilities in Ops Concept Demos, CINC experiments and Joint Exercises.				X			X					X				X			
(U) Explore use of promising planning tools, C2 decision aids, computer processing improvements, sensor fusion technology and sensor upgrades to TACS				X			X					X				X			
(U) Continue to explore JTIDS/Link-16 Integration & Beyond LOS improvements that compress engagement timelines and demonstrate integrated capabilities				X			X					X				X			

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0208060F Theater Missile Defense	PROJECT 4478
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(U) **A. Project Cost Breakdown (\$0 in Thousands)**

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) MCE/TPS-75 Expert Missile Tracker (EMT) prototype	488	0	0	0
(U) Dynamic Battle Management (DBM)	3,826	6,140	4,448	5,509
(U) Intelligence Preparation of Battlespace (IPB)	2,965	5,690	5,893	5,974
(U) Automated Decision Aids/Planning Tools	6,114	6,865	4,819	4,900
(U) JTIDS/Link-16 Integration & Beyond LOS Capability	5,712	3,155	2,743	3,419
(U) Identified as a source for SBIR FY99	0	748	0	0
(U) Total	19,103	22,598	17,903	19,802

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0208060F Theater Missile Defense					PROJECT 4478	
(U) B. Budget Acquisition History and Planning Information (\$0 in Thousands)											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
<u>Product Development Organizations</u>											
Martin Marietta (TACCSF)	FFP	Oct 95	N/A	N/A	9,100	0	0	0	0	0	9,100
North/Grumman (TPS-75)	FFP	Oct 95	N/A	N/A	0	488	0	0	0	0	1,000
Zeltech/SPARTA PSR (IPB)	T&M	May 96	N/A	N/A	500	2,294	3,693	TBD	TBD	Continuing	TBD
Alphatech (JDP)	T&M	Mar 95	N/A	N/A	0	0	0	0	0	Continuing	TBD
Boeing (DBM)	T&M	Dec 97	N/A	N/A	0	500	1,126	TBD	TBD	Continuing	TBD
Northrop Grumman (DBM)	T&M	Dec 97	N/A	N/A	0	500	1,126	TBD	TBD	Continuing	TBD
BDM (DBM) For Profit Contractor (DBM)	T&M	Nov 97	N/A	N/A	0	250	330	TBD	TBD	Continuing	TBD
Motorola (TCTA) LMCCS (JDP) For Profit Contractor (AODA)	T&M	Jan 98	N/A	N/A	0	731	810	TBD	TBD	Continuing	TBD
Motorola (TCTA)	T&M	Mar 96	N/A	N/A	0	846	0	0	0	0	516
LMCCS (JDP)	T&M	Oct 97	N/A	N/A		1,400	0	0	0	0	1,400
For Profit Contractor (AODA)	TBD	Oct 97	N/A	N/A	0	1,316	1,900	TBD	TBD	Continuing	TBD
For Profit Contractor (MSI)	TBD	Dec 97	N/A	N/A	0	1,049	350	TBD	TBD	Continuing	TBD
Lock/Mart (MSI)	T&M	Mar 97	N/A	N/A	0	0	0	50	0	0	50

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BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0208060F Theater Missile Defense					PROJECT 4478	
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
For Profit Contractor (CPM)	T&M	Oct 97	N/A	N/A	0	90	500	TBD	TBD	Continuing	TBD
For Profit Contractor (Analyses)	TBD	Nov 97	N/A	N/A	0	160	1,194	TBD	TBD	Continuing	TBD
MASC For Profit Contractor (JRE)	T&M	Nov 96	N/A	N/A	0	0	0	0	0	Continuing	TBD
	TBD	Oct 97	N/A	N/A	0	2,619	5,152	TBD	TBD	Continuing	TBD
<u>Support and Management Organizations</u>											
FFRDC			N/A	N/A	1,605	1,994	2,054	2,116	2,180	Continuing	TBD
Non-FFRDC (ESC)			N/A	N/A	1,935	1,040	1,071	1,103	1,136	Continuing	TBD
Non-FFRDC (ACC)			N/A	N/A	0	1,640	540	556	573	Continuing	TBD
Non-FFRDC (XORFS)			N/A	N/A	0	900	927	955	984	Continuing	TBD
HQ ESC			N/A	N/A	2,251	1,286	1,077	1,109	1,142	Continuing	TBD
<u>Test and Evaluation Organizations</u>											
TBD											
Government Furnished Property:											
Identified as a source for SBIR FY99											
Subtotal Product Development					9,600	12,243	16,181	12,064	13,787	Continuing	TBD
Subtotal Support and Management					5,791	6,860	5,669	5,839	6,015	Continuing	TBD
Subtotal Test and Evaluation					0	0	0	0	0		TBD

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BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0208060F Theater Missile Defense

Total Project	15,391	19,103	22,598	17,903	19,802	Continuing	TBD
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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0208060F Theater Missile Defense				PROJECT 4479		
<i>COST (\$ In Thousands)</i>	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4479 Attack Operations Concept Development	7,585	7,754	8,226	8,749	9,923	10,325	10,551	10,771	Continuing	TBD
<p>(U) A. <u>Mission Description</u> Improvements in Attack Operations are based on the ability to locate, identify, and destroy theater missiles, their launchers, and associated infrastructure on the ground. In addition to the enhancements to C4I, the Attack Operations Project focuses on advanced sensor and target identification capabilities, CONOPS and requirements development for TMD offensive counter-air and their optimized integration with defensive systems. Specific technologies such as automatic target cueing/recognition (ATC/R) and moving target indicator/track (MTI/T) upgrades to Joint STARS, F-15E and potentially the U-2, F-16 and UAVs are to be analyzed using constructive analysis and evaluated through Technology/Operational Concept Demonstrations and CINC Experiments along with command and control connectivity upgrades critical to their optimum employment against time-critical targets. Effectiveness and affordability parameters defined will be used in support of follow on acquisition decisions involving P3I upgrades to existing weapon systems and potential new start programs within existing/other program elements.</p> <p>(U) <u>FY 1998 (\$ in Thousands):</u> (U) 2,033 Conducted Attack Operations Operational Concept Demonstration. (U) 842 Continued analysis of architectures with weapon system and BMC4I upgrades, incorporated model and threat scenario upgrades and performed engagement analyses for input to future year mission analysis. (U) 3,725 Conducted development of F-15E ATC/R prototype integrated with improved on/off-board sensor fusion. Continued demonstration of surveillance ATR prototype. (U) 985 Planned integration of prototype ATR WH&SW into Time-Critical Targeting Aid workstation. (U) 7,585 Total</p> <p>(U) <u>FY 1999 (\$ in Thousands):</u> (U) 1,362 Conduct Attack Operations Operational Concept Demonstration. (U) 1,520 Continue analysis of updated architectures with weapon system and BMC4I upgrades, to support future year mission analysis. Plan participation in future year distributed simulations to demonstrate improvements in attack operations capabilities. (U) 2,691 Conduct demonstration of F-15E ATC/R prototype with sensor fusion. (U) 1,925 Conduct development of common ATR for integration in the Time-Critical Targeting Aid (TCTA) for multi-sensor application. Continue development and demonstration planning of ATR onboard the JSTARS test aircraft (T3). (U) 256 FY99 SBIR</p>										
Project 4479			Page 11 of 16 Pages				Exhibit R-2A (PE 0208060F)			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0208060F Theater Missile Defense	PROJECT 4479
(U) 7,754	Total	
(U) <u>FY 2000 (\$ in Thousands):</u>		
(U) 2,145	Conduct Attack Operations Operational Concept Demonstration.	
(U) 1,900	Continue analysis of architectures with weapon system and BMC4I upgrades. Participate in a distributed simulation to verify improvements in attack operations capabilities from sensor to shooter that were demonstrated on prototype attack and surveillance system. Support development of users operational requirements for weapon system ORDs.	
(U) 2,090	Conduct demonstration of prototype TCTA with ATR. Conduct demonstration of JSTARS ATR with expanded target set of time-critical targets.	
(U) 2,091	Conduct development of F-15E ATC/R prototype with on- and off-board sensor fusion. Perform lab demonstration of prototyped capabilities.	
(U) 8,226	Total	
(U) <u>FY 2001 (\$ in Thousands):</u>		
(U) 2,080	Conduct Attack Operations Operational Concept Demonstration.	
(U) 2,200	Continue analysis of architectures with weapon system and BMC4I upgrades. Participate in a distributed simulation to verify improvements in attack operations capabilities from sensor to shooter that were demonstrated on prototype attack and surveillance system. Support development of users operational requirements for weapon system ORDs.	
(U) 2,235	Conduct development of F-15E ATC/R prototype with on- and off-board sensor fusion. Integrate prototyped HW & SW on F-15E aircraft.	
(U) 2,234	Conduct development of prototype ATR HW & SW for multisensor application in the TCTA.	
(U) 8,749	Total	
(U) B. <u>Project Change Summary - Description of Significant Changes:</u> Not Applicable		
(U) Not Applicable C. <u>Other Program Funding Summary (\$ in Thousands)</u>		

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0208060F Theater Missile Defense	PROJECT 4479
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(U) **D. Acquisition Strategy:** HQ Avionics Systems Center (ASC) provides the program management for the concept exploration of TMD Attack Operations. ASC conducts lab demonstrations with Wright Labs and supports Concept of Operations (CONOPS) development and requirements definition by analyzing and demonstrating measures of effectiveness for various sensor improvements and cueing schemes.

(U) **E. Schedule Profile**

	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) ATC/R Demos (F-15E/Surveillance)			X			X				X				X		
(U) Ops Concept Demonstrations		X				X				X				X		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1999				
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0208060F Theater Missile Defense				PROJECT 4479		
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U) Joint STARS ATC/R Demonstration/Improvements					985	1,925	2,091	2,234			
(U) Operational Concept Demonstration					2,033	1,362	2,145	2,080			
(U) Sensor Prototypes and Attack Ops Demonstrations/Sims					842	1,520	1,900	2,200			
(U) F-15E ATC/R Demonstrations					3,725	2,691	2,090	2,235			
(U) Identified as a source for SBIR						256					
(U) Total					7,585	7,754	8,226	8,749			
(U) B. <u>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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Organizations</u>											
Identified as a source for SBIR							256			256	256
Boeing	CPFF	Aug 94	N/A	N/A	772	0	0	0	0	0	772
Boeing	CPFF	30 May 86	N/A	N/A	890	0	0	0	0	0	890
Geometric	CPFF	Mar 95	N/A	N/A	65	0	0	0	0	0	65
Hughes-FD	CPFF	Mar 95	N/A	N/A	1,234	3,006	1,915	1,700	1,700	Continuing	TBD
Norden	CPFF	Sep 94	N/A	N/A	540	0	0	0	0	0	540
Veda	CPFF	Feb 95	N/A	N/A	200	0	0	0	0	0	200
Lincoln Lab	MIPR	Mar 95	N/A	N/A	100	0	0	0	0	0	100
Project 4479					Page 14 of 16 Pages			Exhibit R-3 (PE 0208060F)			

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0208060F Theater Missile Defense					PROJECT 4479	
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Sverdrup	CPFF	Mar 95	N/A	N/A	565	0	0	0	0	0	565
HSC/AL	MIPR	Aug 94	N/A	N/A	2,470	0	0	0	0	0	2,470
Sandia Nat Labs	MIPR	Mar 95	N/A	N/A	8,586	0	0	0	0	0	8,586
Lockheed Martin	MIPR	TBD	N/A	N/A	0	746	1,771	1,600	1,600	Continuing	TBD
Optimetrics	CPFF	TBD	N/A	N/A	0	0	150	150	150	Continuing	TBD
ESC//JTF	MIPR	TBD	N/A	N/A	0	0	0	0	600	0	600
Grumman	MIPR	Sep 96	N/A	N/A	0	0	0	0	350	0	350
ACC/XPSAS	MIPR	TBD	N/A	N/A	0	500	505	510	515	Continuing	TBD
WL/AAZ	MIPR	TBD	N/A	N/A	0	0	0	0	96	0	96
WL/AAR	MIPR	TBD	N/A	N/A	0	650	675	700	725	Continuing	TBD
AL/CFHI	MIPR	TBD	N/A	N/A	0	365	585	600	600	Continuing	TBD
WL/AAJT	MIPR	TBD	N/A	N/A	0	0	112	115	118	Continuing	TBD
<u>Support and Management Organizations</u>											
FFRDC			N/A	N/A	757	210	230	250	250	Continuing	TBD
Non-FFRDC			N/A	N/A	471	160	192	220	220	Continuing	TBD
HQ ASC			N/A	N/A	561	948	559	700	700	Continuing	TBD
<u>Test and Evaluation Organizations</u>											
28 Test/TOT	MIPR	Mar 95	N/A	N/A	17	950	416	1,581	1,075	Continuing	TBD
AFSAA	MIPR	Feb 95	N/A	N/A	350	0	0	0	0	0	350
Eglin-46 Tst Wg		May 94	N/A	N/A	5,296	50	388	100	50	Continuing	TBD

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0208060F Theater Missile Defense				PROJECT 4479		
Government Furnished Property:										
Item	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Delivery Date	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	FY 2000	FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR						256				
Subtotal Product Development				15,422	5,267	5,713	5,375	6,454	Continuing	TBD
Subtotal Support and Management				1,789	1,318	981	1,170	1,170	Continuing	TBD
Subtotal Test and Evaluation				5,663	1,000	804	1,681	1,125	Continuing	TBD
Total Project				22,874	7,585	7,754	8,226	8,749	Continuing	TBD

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0302015F E-4B National Airborne Operations Center (NAOC)	PROJECT 4777
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4777 E-4B Aircraft Modernization	0	2,137	12,666	40,516	24,587	4,205	19,541	28,204	0	131,856
Quantity of RDT&E Articles	0	0	0	1	0	0	0	0	0	1

(U) A. Mission Description and Budget Item Justification

(U) This program encompasses modernization of National Airborne Operational Center (NAOC) essential infrastructure, mission equipment, and interior, as well as mandated Global Access, Navigation, and Safety/Global Air Traffic Management (GANS/GATM) modifications to the E-4B aircraft. The NAOC supports the National Command Authority (NCA) and Joint Chiefs of Staff with a worldwide, survivable and enduring node of the National Military Command System (NMCS) for the exercise of their national security responsibilities throughout the full spectrum of conflict. These modifications are vital in order to maintain mission effectiveness and efficiency. The upgrades: 1) replace the increasingly hard-to-support 1960s era communications and computer equipment (telecommunications switch, multiplexer, messaging systems, etc) on the aircraft with modern, reliable, digital systems that will be supportable for the planned life of the platform; 2) make the commander's console and battle staff workstations compatible with GCCS architecture and software; 3) provide sound dampening to eliminate the severe ambient noise problems that prevent normal communications in the briefing room, conference room, and battle staff area without using intercom headsets; and 4) provide GANS/GATM equipment, integration and testing.

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

- (U) \$0 Total

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

- (U) \$ 1,567 Engineering Trade Studies(e.g., E-4B modification and GANS/GATM Analysis)
- (U) \$ 328 System Engineering Support
- (U) \$ 172 Program Management Support
- (U) \$ 70 Identified as a source for SBIR
- (U) \$ 2,137 Total

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

- (U) \$ 6,796 Development of E-4B Modifications
- (U) \$ 4,670 Software Development; GCCS Integration
- (U) \$ 1,200 System Engineering and Program Management Support
- (U) \$ 12,666 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational System Development	0302015F E-4B National Airborne Operations Center (NAOC)	4777
<p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none">- (U) \$ 3,894 Complete E-4B Modifications Development (Software and Hardware)- (U) \$ 17,300 Purchase Engineering Prototype- (U) \$ 12,410 Install Prototype on A/C #1- (U) \$ 5,362 System Integration, Testing, and Documentation- (U) \$ 1,550 System Engineering, and Program Management Support- (U) \$ 40,516 Total <p>(U) B. Budget Activity Justification:</p> <p>(U) This program is in budget activity 7 - Operational System Development, Research Category 6.6 because the program is developing modifications for current operations systems.</p>		
Project 4777	Page 2 of 6 Pages	Exhibit R-2 (PE 0302015F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)												DATE February 1999				
BUDGET ACTIVITY 7 - Operational System Development						PE NUMBER AND TITLE 0302015F E-4B National Airborne Operations Center (NAOC)						PROJECT 4777				
(U) E. <u>Acquisition Strategy:</u>																
<p>There are two contracts on the E-4B: a Contractor Logistics Support (CLS) contract for depot maintenance (O&M Air Force) and aircraft modifications (Aircraft Procurement Air Force). This contract was awarded to the Boeing Company after a full and open competition. The other contract was awarded sole source to the Boeing Company as the Original Equipment Manufacturer (OEM), and included the KC-10, VC-25, T-43, and others in addition to the E-4B.</p> <p>The development and prototyping of the E-4B upgrades will be accomplished under the Engineering Services Contractor as a Cost Plus Award Fee (CPAF) or Cost Plus Incentive Fee (CPIF) effort. The acquisition strategy for the production and installation of modification kits is TBD.</p>																
(U) F. <u>Schedule Profile</u>																
		<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>		
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) Begin Engineering Trade Studies							X									
(U) Complete Engineering Trade Studies									X							
(U) Begin E-4B Modifications Development										X						
(U) Complete E-4B Modifications Development															X	
(U) Begin Software Development											X					
(U) Complete Software Development															X	
(U) Purchase Engineering Prototype for A/C #1															X	
(U)Begin Install Prototype																X
X Denotes Planned Event																
Project 4777				Page 4 of 6 Pages				Exhibit R-2 (PE 0302015F)								

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0302015F E-4B National Airborne Operations Center (NAOC)					PROJECT 4777	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
Engineering Trade Studies					0	1,567					
Identified as a source for SBIR					0	70					
Development of E-4B Modifications					0		6,796	3,894			
Software Development; GCCS Integration					0		4,670				
Purchase Engineering Prototype					0			17,300			
Install Prototype on A/C #1					0			12,410			
System Integration and Testing					0			5,362			
System Engineering and Program Management Support					0	500	1,200	1,550			
(U) Total						2,137	12,666	40,516			
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR							70				70
<u>Product Development Organizations</u>											
Boeing	CPAF/CPIF	Feb 97	TBD	TBD	0	0	1,567	11,466	38,926	73,367	125,326
<u>Support and Management Organizations</u>											
ANSER	T & M	Jan 99	N/A	N/A	0	0	328	338	348	700	1,714
TRW	T & M	Oct 98	N/A	N/A			150	825	1,160	2,320	4,455
Misc	TBD	Various	TBD	TBD			22	37	42	50	151
<u>Test and Evaluation Organizations</u>											
NSA/FAA	MIPR	N/A	TBD	TBD	0	0	0	0	40	100	140
Project 4777					Page 5 of 6 Pages				Exhibit R-3 (PE 0302015F)		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1999			
BUDGET ACTIVITY 7 - Operational System Development			PE NUMBER AND TITLE 0302015F E-4B National Airborne Operations Center (NAOC)				PROJECT 4777			
(U) B. <u>Budget Acquisition History and Planning Information</u>Continued (\$ in Thousands)										
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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Property</u>		None								
<u>Support and Management Property</u>		None								
<u>Test and Evaluation Property</u>		None								
Identified as a source for SBIR						70				70
Subtotal Product Development						1,567	11,466	38,926	73,367	125,326
Subtotal Support and Management						500	1,200	1,550	3,070	6,320
Subtotal Test and Evaluation								40	100	140
Total Project							2,137	12,666	40,516	76,537
Total Project							2,137	12,666	40,516	76,537

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303110F Def Satellite Comm Sys (Space)	PROJECT 2638
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
2638 Defense Satellite Communications Sys	8,486	14,003	8,985	8,593	2,903	2,172	1,271	1,367	12,000	645,948
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

(U) Defense Satellite Communications System (DSCS) is the backbone of the Government’s satellite communications system, providing both secure voice and high data rate transmissions in the Super High Frequency band. DSCS provides unique and vital national security communications for global command and control, crisis management, intelligence and early warning data relay, treaty monitoring and surveillance information, and diplomatic traffic. The communications relayed through DSCS support the National Command Authorities, Defense Information System Network, Diplomatic Telecommunications Service, White House Communications Agency, the Air Force Satellite Control Network, and ground mobile forces of all services.

(U) The DSCS Service Life Enhancement Program (SLEP) includes additional modifications that increase the last four satellites’ capacity to tactical users by more than 200%, and implements the DoD Space Architect’s recommendation.

(U) The last two DSCS III satellites will launch on the Evolved Expendable Launch Vehicle (EELV) and will require modifications to the DSCS launch vehicle interfaces and additional launch loads analyses.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational System Development	0303110F Def Satellite Comm Sys (Space)	2638
<p>(U) <u>FY 1998 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 1,098 System Program Office Operations <ul style="list-style-type: none"> - Contractor Support - Mission Support - (U) \$ 1,400 Basic DSCS Program <ul style="list-style-type: none"> - Paid performance incentives for development satellites still on orbit and operational - Conducted programmatic tradeoffs and analyses - (U) \$ 150 Began EELV integration development - (U) \$ 5,838 Continued SLEP Modification <ul style="list-style-type: none"> - Conducted first article final assembly - Conducted SLEP rework verification article - Continued Low Noise Amplifier upgrade development to enhance performance and increase capacity for tactical users - Continue to develop satellite bandwidth modifications to increase capacity level of less capable DSCS satellites to that of satellites B8 - B11 - (U) \$ 8,486 Total <p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 2,319 System Program Office Operations <ul style="list-style-type: none"> - Contractor Support - Mission Support - (U) \$ 1,965 Basic DSCS Program <ul style="list-style-type: none"> - Pay performance incentives for development satellites still on orbit and operational - Conduct programmatic tradeoffs and analyses - (U) \$ 9,032 Continue integration development to transition last two satellites to EELVs - (U) \$ 100 Finish SLEP Modification - (U) \$ 587 Identified as a source for SBIR - (U) \$ 14,003 Total 		
Project 2638	<i>Page 2 of 7 Pages</i>	Exhibit R-2 (PE 0303110F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational System Development	0303110F Def Satellite Comm Sys (Space)	2638
<p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 2,116 System program Office Operations <ul style="list-style-type: none"> - Contractor Support - Mission Support - (U) \$ 540 Basic DSCS Program <ul style="list-style-type: none"> - Pay performance incentives for development satellites still on orbit and operational - Conduct programmatic tradeoffs and analyses - (U) \$ 6,329 Continue integration development to transition last two satellites to EELVs - (U) \$ 8,985 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 2,100 System Program Office Operations <ul style="list-style-type: none"> - Contractor Support - Mission Support - (U) \$ 2,156 Basic DSCS Program <ul style="list-style-type: none"> - Pay performance incentives for development satellites still on orbit and operational - Conduct programmatic tradeoffs and analyses - (U) \$ 1,000 Continue integration development to transition last two satellites to EELVs - (U) \$ 3,337 Generic Telemetry Simulator (GT Sim) hardware and software modifications for EELV launches - (U) \$ 8,593 Total <p>(U) B. Budget Activity Justification: (U) This program is in Budget Activity 7, Operational System Development, since DSCS is an operational system consisting of a fully operational satellite constellation and replenishment satellites awaiting launch, and associated support systems.</p>		
Project 2638	Page 3 of 7 Pages	Exhibit R-2 (PE 0303110F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)					DATE February 1999					
BUDGET ACTIVITY 7 - Operational System Development			PE NUMBER AND TITLE 0303110F Def Satellite Comm Sys (Space)			PROJECT 2638				
(U) C. <u>Program Change Summary (\$ in Thousands)</u>										
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total</u>					
	<u>Program</u>									
(U) Previous President's Budget (FY 1999 PB)	9,961	15,641	9,149	8,756	633,415					
(U) Appropriated Value	10,547	14,141								
(U) Adjustments to Appropriated Value										
a. Cong Gen Reductions	-345	-138								
b. SBIR	-243									
c. Omnibus or Other Above Threshold Reprogram	-68									
d. Below Threshold Reprogramming	-1,405									
(U) Adjustments to Budget Years Since FY 1999 PB			-164	-163						
(U) Current Budget Submit/FY 2000 PB	8,486	14,003	8,985	8,593	645,361					
(U) Significant Program Changes:										
FY98: \$1,405 used to fund higher Air Force priorities.										
FY99: \$587 identified as a source for SBIR.										
FY00: \$164 used to fund higher Air Force priorities.										
FY01: \$163 used to fund higher Air Force priorities.										
(U) D. <u>Other Program Funding Summary (\$ in Thousands)</u>										
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To</u>	<u>Total</u>
									<u>Compl</u>	<u>Cost</u>
(U) Missile Procurement, Budget Activity 5, Space and Other Support, Line Item P-27	81,405	28,641	30,765	22,976	27,110	23,062	11,982	12,272	112,000	1,960,813
(U) E. <u>Acquisition Strategy:</u>										
All satellites have been acquired and four satellites remain to launch. Enhancements to satellites not launched will be accomplished through sole source contract awards.										
Project 2638			Page 4 of 7 Pages	Exhibit R-2 (PE 0303110F)						

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303110F Def Satellite Comm Sys (Space)	PROJECT 2638
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(U) F. Schedule Profile

	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) Launch DSCS B8/IABS 9 (Jul 99)								x								
(U) Launch DSCS B1/IABS 8 (Jul 00)												x				
(U) Launch DSCS B6/IABS 7 (May 02)																
(U) Launch DSCS A3/IABS 10 (May 03)																
(U) SLEP Mod Program (Mar 96-Sep 00)												x				
(U) EELV Integration (Sep 98 - May 03)																

* = completed event; x = planned event

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0303110F Def Satellite Comm Sys (Space)					PROJECT 2638	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U)	System Program Office Operations				1,098	2,319	2,116	2,100			
(U)	Basic DSCS Program				1,400	1,965	540	2,156			
(U)	EELV Integration				150	9,032	6,329	1,000			
(U)	GT Simulator				0	0	0	3,337			
(U)	SLEP Modifications				5,838	100	0	0			
(U)	Identified as a source for SBIR				0	587	0	0			
(U)	Total				8,486	14,003	8,985	8,593			
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR							587				587
<u>Product Development Organizations</u>											
Lockheed Martin	CPAF/AF	Oct 84/Mar 96	437,500	437,500	427,571	5,838	100	0	0	0	433,509
Miscellaneous	CPAF	Various	N/A	N/A	132,623	150	9,032	6,329	4,337	0	152,471
<u>Support and Management Organizations</u>											
Aerospace Corp	PO	Various	N/A	N/A	12,900	0	0	0	0	0	12,900
Miscellaneous	Various	Various	N/A	N/A	12,904	2,498	4,284	2,656	4,256	19,713	46,481
<u>Test and Evaluation Organizations</u>											
Project 2638					Page 6 of 7 Pages				Exhibit R-3 (PE 0303110F)		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0303110F Def Satellite Comm Sys (Space)					PROJECT 2638		
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program	
(U) B. Budget Acquisition History and Planning Information Continued (\$ in Thousands)												
Government Furnished Property: None												
Item Description	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Delivery Date		Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program	
<u>Product Development Property</u>												
N/A												
<u>Support and Management Property</u>												
N/A												
<u>Test and Evaluation Property</u>												
N/A												
Identified as a source for SBIR							587				587	
Subtotal Product Development					560,194	5,988	9,132	6,329	4,337	0	585,980	
Subtotal Support and Management					25,804	2,498	4,284	2,656	4,256	19,713	59,381	
Subtotal Test and Evaluation												
Total Project					585,998	8,486	14,003	8,985	8,593	19,713	645,948	
Project 2638					Page 7 of 7 Pages				Exhibit R-3 (PE 0303110F)			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303131F Minimum Essential Emergency Communications Network (MEECN)
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	28,865	38,788	45,907	15,438	2,995	2,459	2,052	2,097	Continuing	Continuing
2832 VLF/LF System Improvements	11,741	23,338	22,102	2,743	1,458	1,187	1,466	1,511	Continuing	Continuing
4521 DIRECT	17,124	3,340	1,184	1,248	1,145	881	293	293	Continuing	Continuing
4610 MEECN EHF	0	12,110	22,621	11,447	392	391	293	293	Continuing	Continuing
Quantity of RDT&E Articles	0	7* 2/0**	7* 4/0**	0/4**	0	0	0	0	0	0

- (U) NOTES:**
- Project 4521, DIRECT, was established to consolidate efforts related to DIRECT planned for accomplishment in PE 0603851F, ICBM Modernization Dem/Val (BPAC 1024, ICBM C2 Applications), PE 0604851F, ICBM Modernization EMD (BPAC 13C4, Strategic C4 Program), PE 0101213F, Minuteman Squadrons, and PE 0303131F, MEECN (BPAC 2832, VLF/LF Systems Improvements).
 - *MMRT units **ILES units/trainers

(U) A. Mission Description

(U) MEECN systems provide assured communications connectivity between the National Command Authorities (NCA) and the strategic deterrent forces. Past MEECN projects included the High Power Transmit Set (HPTS), Ground Wave Emergency Network (GWEN), and Dual Frequency MEECN Receiver (DFMR). Current projects include the Modified Miniature Receive Terminal (MMRT) with High Data Rate (HIDAR) mode, the Defense Improved Emergency Message Automated Transmission System (IEMATS) Replacement Command and Control Terminals (DIRECT), and the ICBM LCC Extremely High Frequency (EHF) System (ILES) component of MEECN EHF.

(U) B. Budget Activity Justification:

(U) This program is in Budget Activity 7 - Operational System Development, because it supports work on currently operating systems.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)					DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development			PE NUMBER AND TITLE 0303131F Minimum Essential Emergency Communications Network (MEECN)		
(U) C. <u>Program Change Summary (\$ in Thousands)</u>					
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U) Previous President's Budget (FY 1999 PB)	32,399	39,230	44,743	13,332	Continuing
(U) Appropriated Value	34,409	39,230			
(U) Adjustments to Appropriated Value					
a. Cong Reductions	-1,236	-442			
b. SBIR	-778				
c. Actuals Reductions	-886				
d. Below Threshold Reprogramming	-2,644				
(U) Adjustments to Budget Years Since FY 1999 PB			1,164	2,106	
(U) Current Budget Submit/FY 2000 President's Budget	28,865	38,788	45,907	15,438	Continuing
(U) Significant Program Changes:					
FY98 E-4 cancelled bill reduced funds by \$2,644 deferring MMRT airborne airworthiness testing and certification. Deferred content moved to FY00/01.					
FY99 \$1,232 identified as a source for SBIR.					

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0303131F Minimum Essential Emergency Communications Network (MEECN)					PROJECT 2832	
<i>COST (\$ In Thousands)</i>	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
2832 VLF/LF System Improvements	11,741	23,338	22,102	2,743	1,458	1,187	1,466	1,511	Continuing	Continuing
<p>(U) A. <u>Mission Description</u></p> <p>(U) The Modified Miniature Receive Terminal (MMRT) Program will modify existing Miniature Receive Terminals (MRTs) and provide High Data Rate (HIDAR) capability for installation on the following platforms as a minimum: the E-4B, National Airborne Operations Center (NAOC); and the E-6B, Take Charge and Move Out (TACAMO). This program will make VLF/LF receivers fully interoperable. MRT is a Very Low Frequency/Low Frequency (VLF/LF) receiver without HIDAR already designed, developed, and installed on the B-1B and B-52H bombers. The MRTs for the MMRT program will be removed from the B-1Bs and some retired B-52s.</p> <p>(U) ICBM Launch Control Center (LCC) VLF/LF RDT&E and Production tasks are being combined with the MEECN EHF (ILES) effort contractually. The combined program will be referred to as the Minuteman MEECN Program (MMP). The ICBM Prime Integrating Contract (through OO-ALC) will be used as a contracting vehicle. Requirements, estimates and schedules remain the same as previously briefed.</p> <p>(U) HIDAR is a Joint Staff-directed effort to provide a fast and interoperable MEECN mode. This program will develop and test modifications required to retrofit current MEECN platforms with the HIDAR software and firmware.</p> <p>(U) High Power Transmit Set (HPTS) was a joint Air Force and Navy Program to provide the E-4B and the E-6B aircraft with an improved and supportable VLF transmission capability. HPTS completed development phase in 2Qtr FY95. Procurement for the E-4B is under Departmental review.</p> <p>(U) <u>FY 1998 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$10,469 Continued common MMRT and airborne integration development - (U) \$204 Secondary VLF/LF Link study/analysis - (U) \$1,068 Continuing Evaluation Program (CEP)/Studies and Analysis - (U) \$11,741 Total 										
Project 2832			Page 3 of 17 Pages				Exhibit R-2A (PE 0303131F)			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)							DATE February 1999																							
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0303131F Minimum Essential Emergency Communications Network (MEECN)			PROJECT 2832																							
<p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$8,730 Continue common MMRT and airborne integration development - (U) \$3,100 MMRT Testing - (U) \$1,367 Continuing Evaluation Program (CEP)/Studies and Analysis - (U) \$9,400 Re-start ICBM LCCs VLF/LF integration and development (part of MMP) - (U) \$741 Identified as a source for SBIR - (U) \$23,338 Total <p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$5,000 Continue common MMRT and airborne integration development - (U) \$2,091 MMRT airworthiness and nuclear certification - (U) \$1,411 Continuing Evaluation Program (CEP)/Studies and Analysis - (U) \$13,600 ICBM LCC VLF/LF integration and development (part of MMP) - (U) \$22,102 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$1,433 MMRT airworthiness and nuclear certification - (U) \$1,310 Continuing Evaluation Program (CEP)/Studies and Analysis - (U) \$2,743 Total <p>(U) B. <u>Project Change Summary - Description of Significant Changes:</u></p> <p>(U) ICBM LCC VLF/LF integration and development was accelerated by one year to avoid the costs of continued Survivable Low Frequency Communications System (SLFCS) sustainment. FY99-03 adjusted accordingly. MMRT airworthiness and nuclear certifications were deferred in FY98 and funds were added in FY00-01.</p> <p>(U) C. <u>Other Program Funding Summary (\$ in Thousands):</u></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;"></th> <th style="text-align: center;"><u>FY 1998</u></th> <th style="text-align: center;"><u>FY 1999</u></th> <th style="text-align: center;"><u>FY 2000</u></th> <th style="text-align: center;"><u>FY 2001</u></th> <th style="text-align: center;"><u>FY 2002</u></th> <th style="text-align: center;"><u>FY 2003</u></th> <th style="text-align: center;"><u>FY 2004</u></th> <th style="text-align: center;"><u>FY 2005</u></th> <th style="text-align: center;"><u>To Compl</u></th> <th style="text-align: center;"><u>Total Cost</u></th> </tr> </thead> <tbody> <tr> <td>(U) APPN 10, Aircraft Procurement - AF, (MEECN, PE 0303131F)</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">10,047</td> <td style="text-align: center;">19,029</td> <td style="text-align: center;">7,441</td> <td style="text-align: center;">1,549</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;">38,066</td> </tr> </tbody> </table>										<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To Compl</u>	<u>Total Cost</u>	(U) APPN 10, Aircraft Procurement - AF, (MEECN, PE 0303131F)	0	0	10,047	19,029	7,441	1,549	0	0	0	38,066
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To Compl</u>	<u>Total Cost</u>																				
(U) APPN 10, Aircraft Procurement - AF, (MEECN, PE 0303131F)	0	0	10,047	19,029	7,441	1,549	0	0	0	38,066																				
Project 2832			Page 4 of 17 Pages			Exhibit R-2A (PE 0303131F)																								

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A EXHIBIT)												DATE February 1999				
BUDGET ACTIVITY 7 - Operational System Development						PE NUMBER AND TITLE 0303131F Minimum Essential Emergency Communications Network (MEECN)						PROJECT 2832				
Related PEs: (U) None.																
<p>Note: PE 0101213F, Minuteman Squadrons (MMIII Modifications), BA-07, P-013 contains the ICBM LCC VLF/LF Receiver procurement funds for the EMD tasks being combined with the MEECN EHF program (Previously identified with this project). Future references will be made in BPAC 4610 exclusively.</p>																
(U) D. Acquisition Strategy:																
<p>(U) Modified Miniature Receive Terminal (MMRT) Program. Program to satisfy both the Air Force and Navy requirements via a joint effort with the Air Force Electronics Systems Center, Hanscom AFB, MA, as the lead agency. Modifies existing Miniature Receive Terminals (MRTs). EMD contract awarded in FY96 for three platforms: the E-4B (National Airborne Operations Center (NAOC)); E-6B (Take Charge and Move Out (TACAMO)); and an option for the ICBM Launch Control Centers (LCCs). Airborne MMRT production contract award planned for FY00. Deployment of airborne Air Force and Navy MMRT units will be complete by 2003. Limited ICBM LCC EMD option was exercised in 2QtrFY97 with balance of EMD to be restarted in FY99. Remaining ICBM LCC VLF/LF EMD tasks and production will be coupled with the MEECN EHF (ILES) effort contractually. The combined program will be referred to as the Minuteman MEECN Program (MMP). The ICBM Prime Integrating Contract (through OO-ALC) will be used as a contracting vehicle. Requirements, estimates and schedules remain the same as previously briefed.</p>																
(U) E. Schedule Profile																
		<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>		
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) MMRT EMD																
(U) EMD for Aircraft														X		
(U) EMD for ICBM LCCs (Phase 1)								X								
(U) CDR	X															
(U) A/C IOT&E								*						X		
(U) Milestone III Decision														X		
(U) EMD for ICBM LCC VLF/LF(Phase 2)**								*								
* Indicates task start/X Indicates task completion																
**VLF/LF tasks combined contractually with MEECN EHF (ILES).																
Project 2832				Page 5 of 17 Pages				Exhibit R-2A (PE 0303131F)								

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0303131F Minimum Essential Emergency Communications Network (MEECN)					PROJECT 2832	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U)	Prime Contract				7,430	7,830	5,000	1,250			
(U)	ICBM VLF/LF Development				0	9,400	13,600	0			
(U)	Test										
(U)	Air Force				204	0	0	0			
(U)	Navy				1,564	3,100	1,100	0			
(U)	Program Management Administration (PMA)				484	300	691	63			
(U)	SE/TA				505	600	300	120			
(U)	MITRE				131	0	0	0			
(U)	CEP/Studies and Analysis				1,068	1,367	1,411	1,310			
(U)	ALC Support				355	0	0	0			
(U)	Identified as a source for SBIR				0	741	0	0			
(U)	Total				11,741	23,338	22,102	2,743			
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR							741				
Product Development Organizations											
Rockwell	CPAF	Aug 92	13,500	13,500	13,500	0	0	0	0	0	13,500
Rockwell	CPAF	Jul 96	44,204	44,204	26,406	7,430	7,830	5,000	1,250	Continuing	Continuing
TRW	CPAF	2QtrFY99	n/a	n/a	0	0	9,400	13,600	0	0	23,000
Project 2832					Page 6 of 17 Pages				Exhibit R-3 (PE 0303131F)		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1999		
BUDGET ACTIVITY			PE NUMBER AND TITLE					PROJECT	
7 - Operational System Development			0303131F Minimum Essential Emergency Communications Network (MEECN)					2832	
<u>Support and Management Organizations</u>									
SE/TA [SRC, ASEC, MCR ATT, ANSER]	LOE	Annual	1,437	505	600	300	120	Continuing	Continuing
MITRE	LOE	Annual		131	0	0	0	Continuing	Continuing
PMA	Various	Annual		484	300	691	63	Continuing	Continuing
SPAWAR	MIPR	Annual		1,068	1,367	1,411	1,310	Continuing	Continuing
SysCen (CEP)									
ALCs	MIPR	Annual		355	0	0	0	0	355
<u>Test and Evaluation Organizations</u>									
NavAir Warfare Center	MIPR	Annual	390	1,564	3,100	1,100	0	0	6,154
Air Force	MIPR	Annual		204	0	0	0	0	204
Government Furnished Property: None.									
			Total Prior to FY 1998	FY 1998	FY 1999	FY 2000	FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR					741				
Subtotal Product Development			39,906	7,430	17,230	18,600	1,250	Continuing	Continuing
Subtotal Support and Management			1,437	2,543	2,267	2,402	1,493	Continuing	Continuing
Subtotal Test and Evaluation			390	1,768	3,100	1,100	0	0	6358
Total Project			41,733	11,741	23,338	22,102	2,743	Continuing	Continuing

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A EXHIBIT)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0303131F Minimum Essential Emergency Communications Network (MEECN)				PROJECT 4521		
COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4521 DIRECT	17,124	3,340	1,184	1,248	1,145	881	293	293	Continuing	Continuing
<p>NOTE: This project was established in Jan 96 to consolidate efforts related to DIRECT currently planned for accomplishment in PE 0603851F, ICBM Modernization Dem/Val (BPAC 1024, ICBM C2 Applications), PE 0604851F, ICBM Modernization EMD (BPAC 13C4, Strategic C4 Program), PE 0101213F, Minuteman Squadrons, and 0303131F, MEECN (BPAC 2832, VLF/LF System Improvements).</p> <p>(U) A. Mission Description</p> <p>(U) The Defense IEMATS Replacement Command and Control Terminals (DIRECT), which is the Improved Emergency Message Automated Transmission System (IEMATS) replacement program, is a Strategic Nuclear Command and Control (C2) system directly supporting the Chairman of the Joint Chiefs of Staff (CJCS) and the National Command Authorities (NCA). DIRECT will provide for all current IEMATS requirements, including the build, release, and transmission of Emergency Action Messages (EAM) to allow the CJCS and warfighters to remain responsive to NCA directives. This program will procure system hardware for seven unified command centers, a software maintenance facility and two alternate command centers. DIRECT will be compatible with the Defense Message System (DMS) when it supplants the Automated Digital Network (AUTODIN) and will interface with all other EAM distribution communications systems. AUTODIN is scheduled for closure not later than the end of calendar year 1999. The Director, Joint Staff, established an urgent and compelling need to field an IEMATS replacement system no later than second quarter FY99 to insure the orderly closure of AUTODIN Switching Centers (ASC).</p> <p>(U) Automated Codebook Module (ACM), a time-saving electronic version of current paper codebooks, is an unfunded objective requirement planned for development by the National Security Agency (NSA).</p> <p>(U) <u>FY 1998 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$16,831 Continued DIRECT Engineering and Manufacturing Development (EMD) - (U) \$0 Automated Codebook Module - (U) \$293 Continuing Evaluation Program (CEP)/Studies and Analysis - (U) \$17,124 Total <p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$3,110 Continue DIRECT Engineering and Manufacturing Development (EMD) - (U) \$0 Automated Codebook Module (ACM) - (U) \$230 Continuing Evaluation Program (CEP)/Studies and Analysis - (U) \$3,340 Total 										
Project 4521			Page 8 of 17 Pages				Exhibit R-2A (PE 0303131F)			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)							DATE February 1999																						
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0303131F Minimum Essential Emergency Communications Network (MEECN)			PROJECT 4521																						
<p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$934 DIRECT EMD - (U) \$250 Continuing Evaluation Program (CEP)/Studies and Analysis - (U) \$1,184 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$1,000 DIRECT/DMS Interface EMD - (U) \$248 Continuing Evaluation Program (CEP)/Studies and Analysis - (U) \$1,248 Total <p>(U) B. <u>Project Change Summary - Description of Significant Changes:</u></p> <p>(U) Automated Codebook Module work was indefinitely deferred due to reprogramming for higher priorities. Deferred DIRECT/DMS interface development was re-planned to begin in FY01.</p> <p>(U) C. <u>Other Program Funding Summary (\$ in Thousands):</u></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 70%;"></th> <th style="text-align: center;"><u>FY 1998</u></th> <th style="text-align: center;"><u>FY 1999</u></th> <th style="text-align: center;"><u>FY 2000</u></th> <th style="text-align: center;"><u>FY 2001</u></th> <th style="text-align: center;"><u>FY 2002</u></th> <th style="text-align: center;"><u>FY 2003</u></th> <th style="text-align: center;"><u>FY 2004</u></th> <th style="text-align: center;"><u>FY 2005</u></th> <th style="text-align: center;"><u>To</u> <u>Compl</u></th> <th style="text-align: center;"><u>Total</u> <u>Cost</u></th> </tr> </thead> <tbody> <tr> <td>(U) APPN 16, Other Procurement - AF, BA-63, P-052, Electronics and Telecommunications Equip (MEECN, PE 0303131F)</td> <td style="text-align: center;">11,546</td> <td style="text-align: center;">1,541</td> <td style="text-align: center;">5,168</td> <td style="text-align: center;">1,600</td> <td style="text-align: center;">2,100</td> <td style="text-align: center;">1,100</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;">23,055</td> </tr> </tbody> </table> <p><u>Related PEs:</u> (U) None.</p>									<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To</u> <u>Compl</u>	<u>Total</u> <u>Cost</u>	(U) APPN 16, Other Procurement - AF, BA-63, P-052, Electronics and Telecommunications Equip (MEECN, PE 0303131F)	11,546	1,541	5,168	1,600	2,100	1,100	0	0	0	23,055
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To</u> <u>Compl</u>	<u>Total</u> <u>Cost</u>																			
(U) APPN 16, Other Procurement - AF, BA-63, P-052, Electronics and Telecommunications Equip (MEECN, PE 0303131F)	11,546	1,541	5,168	1,600	2,100	1,100	0	0	0	23,055																			
Project 4521		Page 9 of 17 Pages			Exhibit R-2A (PE 0303131F)																								

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303131F Minimum Essential Emergency Communications Network (MEECN)	PROJECT 4521

D. Acquisition Strategy:

(U) DIRECT Program. A contract for EMD was awarded to GTE Government Systems, Needham, MA on 12 Jul 96. A contract modification for production was awarded 11 Aug 98.

(U) E. Schedule Profile

	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) DIRECT EMD																
(U) Development Test and Evaluation							X									
(U) CDR		X														
(U) Functional Qual Test						*	X									
(U) Required DIRECT RAA								X								
(U) DIRECT/DMS Interface EMD													*			
(U) DIRECT Procurement				*												

* Indicates task start/X indicates task completion

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303131F Minimum Essential Emergency Communications Network (MEECN)	PROJECT 4521
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(U) A. Project Cost Breakdown (\$ in Thousands)

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) Prime Contract	14,328	1,610	700	700
(U) Test	151	200	0	75
(U) Program Management Administration (PMA)	458	300	34	25
(U) SE/TA	927	400	0	0
(U) MITRE	967	600	200	200
(U) CEP/Studies and Analysis	293	230	250	248
(U) Total	17,124	3,340	1,184	1,248

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0303131F Minimum Essential Emergency Communications Network (MEECN)					PROJECT 4521	
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
<u>Product Development Organizations</u>											
GTE	CPAF	Jul 96	23,879	23,879	13,152	14,328	1,610	700	700	Continuing	Continuing
National Security Agency (NSA)	MIPR	Annually	5,000	5,000	2,500	0	0	0	0	0	2,500
<u>Support and Management Organizations</u>											
SE/TA [ASEC, ABACUS, MCR, ATT, ANSER]	LOE	Annual	n/a		1,100	927	400	0	0	Continuing	Continuing
MITRE	LOE	Annual	n/a		1,101	967	600	200	200	Continuing	Continuing
JHU-APL(CEP)	LOE	Annual	n/a		130	293	230	250	248	Continuing	Continuing
PMA	Various	Annual	n/a		187	458	300	34	25	Continuing	Continuing
<u>Test and Evaluation Organizations</u>											
Various	Various	Annual	n/a	406	120	151	200	0	75	0	546
Government Furnished Property: None											
					Total Prior to FY 1998*	FY 1998	FY 1999	FY 2000	FY 2001	Budget to Complete	Total Program
Subtotal Product Development					15,652	14,328	1,610	700	700	Continuing	Continuing
Subtotal Support and Management					2,518	2,645	1,530	484	473	Continuing	Continuing
Subtotal Test and Evaluation					120	151	200	0	75	0	546
Total Project					18,290	17,124	3,340	1,184	1,248	Continuing	Continuing
* Excludes prior year funding in VLF/LF System Improvements (BPAC 2832, this PE)											
Project 4521				Page 12 of 17 Pages				Exhibit R-3 (PE 0303131F)			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A EXHIBIT)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0303131F Minimum Essential Emergency Communications Network (MEECN)					PROJECT 4610	
COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4610 MEECN EHF	0	12,110	22,621	11,447	392	391	293	293	Continuing	Continuing
<p>(U) A. <u>Mission Description</u></p> <p>(U) This MEECN project will provide reliable, secure, and survivable communications in the Extremely High Frequency (EHF) band. Specifically, this effort is currently focused on replacing the satellite-based, ground communication links with Minuteman ICBM forces. It supplants the ICBM Super High Frequency (SHF) Satellite Terminal (ISST) receipt, providing force direction/execution, and the Ultra High Frequency (UHF) report-back links. ISST relies upon the Single Channel Transponder (SCT) package aboard the Defense Satellite Communications System (DSCS). The SCT will not be flown on the DSCS after 2003. Extending the use of SCT aboard DSCS is not practical. The UHF links depend upon the Air Force Satellite Communications (AFSATCOM) packages hosted aboard the Fleet Satellite Communications (FLTSATCOM) satellites. FLTSATCOM satellites are past their life expectancy. This integrated EHF system is called the ICBM Launch Control Center (LCC) Extremely High Frequency (EHF) System (ILES). ILES is required to meet redundancy standards established by national security directives. ILES will be combined contractually with the ICBM LCC VLF/LF tasks from BPAC 2832 and together may be referred to as the Minuteman MEECN Program (MMP).</p> <p>(U) <u>FY 1998 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$0 Total - Program starts in FY99 <p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$11,571 Engineering and Manufacturing Development (EMD) - (U) \$0 Test - (U) \$48 Continuing Evaluation Program (CEP)/Studies and Analysis - (U) \$491 Identified as a source for SBIR - (U) \$12,110 Total <p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$22,038 Continue EMD - (U) \$450 Test - (U) \$133 Continuing Evaluation Program (CEP)/Studies and Analysis - (U) \$22,621 Total 										
Project 4610			Page 13 of 17 Pages				Exhibit R-2A (PE 0303131F)			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)							DATE February 1999																																																																															
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0303131F Minimum Essential Emergency Communications Network (MEECN)				PROJECT 4610																																																																														
<p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$11,297 Continue EMD - (U) \$0 Test - (U) \$150 Continuing Evaluation Program (CEP)/Studies and Analysis - (U) \$11,447 Total <p>(U) B. Project Change Summary - Description of Significant Changes:</p> <p>(U) None</p> <p>(U) C. Other Program Funding Summary (\$ in Thousands):</p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 70%;"></th> <th style="text-align: center;"><u>FY 1998</u></th> <th style="text-align: center;"><u>FY 1999</u></th> <th style="text-align: center;"><u>FY 2000</u></th> <th style="text-align: center;"><u>FY 2001</u></th> <th style="text-align: center;"><u>FY 2002</u></th> <th style="text-align: center;"><u>FY 2003</u></th> <th style="text-align: center;"><u>FY 2004</u></th> <th style="text-align: center;"><u>FY 2005</u></th> <th style="text-align: center;">To <u>Compl</u></th> <th style="text-align: center;">Total <u>Cost</u></th> </tr> </thead> <tbody> <tr> <td>(U) APPN 16, Other Procurement - AF, BA-63, P-052, Electronics and Telecommunications Equip (MEECN, PE 0303131F)</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;">34,684</td> <td style="text-align: center;">21,278</td> <td style="text-align: center;">9,900</td> <td style="text-align: center;">7,647</td> <td style="text-align: center;">6,382</td> <td style="text-align: center;">Continuing</td> <td style="text-align: center;">Continuing</td> </tr> <tr> <td colspan="11"><u>Related PEs:</u></td> </tr> <tr> <td>(U) APPN 14, Missile Procurement - AF, BA-07, P-013 (Minuteman Squadrons, PE 0101213F)</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;">13,557</td> <td style="text-align: center;">26,074</td> <td style="text-align: center;">11,466</td> <td style="text-align: center;">1,140</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">52,237</td> </tr> </tbody> </table> <p><u>Note:</u> PE 0101213F, Minuteman Squadrons (MMIII Modifications), BA-07, P-013 contains the ICBM LCC VLF/LF Receiver procurement funds for the EMD tasks being combined with the MEECN EHF program. This was previously identified in BPAC 2832. Future references will be made in this BPAC exclusively.</p> <p>(U) D. Acquisition Strategy:</p> <p>(U) ILES Program. ILES was combined with the ICBM VLF/LF (BPAC 2832) tasks contractually. The ICBM Prime Integrating Contract (through OO-ALC) will be used as a contracting vehicle. Requirements, estimates and schedules remain the same as previously briefed.</p> <p>(U) E. Schedule Profile</p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;"></th> <th colspan="4" style="text-align: center;"><u>FY 1998</u></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="4" style="text-align: center;"><u>FY 2001</u></th> </tr> </thead> <tbody> <tr> <td>(U) Contract Award</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> <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> </tbody> </table> <p>* indicates task start/X indicates task completion</p>										<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	To <u>Compl</u>	Total <u>Cost</u>	(U) APPN 16, Other Procurement - AF, BA-63, P-052, Electronics and Telecommunications Equip (MEECN, PE 0303131F)	0	0	0	34,684	21,278	9,900	7,647	6,382	Continuing	Continuing	<u>Related PEs:</u>											(U) APPN 14, Missile Procurement - AF, BA-07, P-013 (Minuteman Squadrons, PE 0101213F)	0	0	0	13,557	26,074	11,466	1,140	0	0	52,237		<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>				(U) Contract Award	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	To <u>Compl</u>	Total <u>Cost</u>																																																																												
(U) APPN 16, Other Procurement - AF, BA-63, P-052, Electronics and Telecommunications Equip (MEECN, PE 0303131F)	0	0	0	34,684	21,278	9,900	7,647	6,382	Continuing	Continuing																																																																												
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(U) APPN 14, Missile Procurement - AF, BA-07, P-013 (Minuteman Squadrons, PE 0101213F)	0	0	0	13,557	26,074	11,466	1,140	0	0	52,237																																																																												
	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>																																																																									
(U) Contract Award	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4																																																																						
Project 4610			Page 14 of 17 Pages				Exhibit R-2A (PE 0303131F)																																																																															

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)		DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303131F Minimum Essential Emergency Communications Network (MEECN)		PROJECT 4610	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>				
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) Prime Contract	0	10,771	21,338	10,597
(U) Test	0	0	450	0
(U) Program Management Administration (PMA)	0	200	100	100
(U) SE/TA	0	400	400	400
(U) MITRE	0	200	200	200
(U) CEP	0	48	133	150
(U) Identified as a source for SBIR	0	491	0	0
(U) Total	0	12,110	22,621	11,447
Project 4610				
Page 16 of 17 Pages				
Exhibit R-3 (PE 0303131F)				

DATE
February 1999

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
**0303131F Minimum Essential Emergency
Communications Network (MEECN)**

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

Performing Organizations:

Contractor or Government Performing <u>Activity</u>	Contract Method/Type or Funding <u>Vehicle</u>	Award or Obligation <u>Date</u>	Performing Activity <u>EAC</u>	Project Office <u>EAC</u>	Total Prior to <u>FY 1998</u>	Budget <u>FY 1998</u>	Budget <u>FY 1999</u>	Budget <u>FY 2000</u>	Budget <u>FY 2001</u>	Budget to <u>Complete</u>	Total <u>Program</u>
Identified as a source for SBIR							491				
<u>Product Development Organizations</u>											
TRW	CPAF	2QtrFY99			0	0	10,771	21,338	10,597	Continuing	Continuing
<u>Support and Management Organizations</u>											
SE/TA [SRC, MCR, ATT, ANSER]	LOE	Annual			0	0	400	400	400	Continuing	Continuing
MITRE	LOE	Annual			0	0	200	200	200	Continuing	Continuing
PMA	Various	Annual			0	0	200	100	100	Continuing	Continuing
CEP	LOE	Annual			0	0	48	133	150	Continuing	Continuing
<u>Test and Evaluation Organizations</u>											
Various	Various	Annual			0	0	0	450	0	0	450

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)						DATE February 1999	
BUDGET ACTIVITY		PE NUMBER AND TITLE				PROJECT	
7 - Operational System Development		0303131F Minimum Essential Emergency Communications Network (MEECN)				4610	
Government Furnished Property: None							
	Total Prior to					Budget to	Total
	<u>FY 1998</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
Identified as a source for SBIR			491				
Subtotal Product Development	0	0	10,771	21,338	10,597	Continuing	Continuing
Subtotal Support and Management	0	0	848	833	850	Continuing	Continuing
Subtotal Test and Evaluation	0	0	0	450	0	0	450
Total Project			12,110	22,621	11,447	Continuing	Continuing

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303140F Information Systems Security Program
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	5,654	9,277	7,992	7,284	7,011	7,088	7,235	7,385	Continuing	TBD
7820 Computer Security RDT&E: Firestarter	4,014	5,378	4,835	5,375	5,113	5,202	5,310	5,421	Continuing	TBD
4585 Cryptologic 2020	1,640	1,968	1,240	0	0	0	0	0	0	4,848
4579 Information Warfare	0	1,931	1,917	1,909	1,898	1,886	1,925	1,964	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

This program provides the capability to protect and defend USAF Command, Control, Communications, Computers, and Intelligence, Surveillance, and Reconnaissance (C4ISR) and Weapon Systems from Information Warfare (IW) attacks and recover from those attacks. Primarily, the project does research and development of information protection tools and transitions them to operational systems. It also provides the acquisition community and operational warfighters the ability to manage their own risks relative to mission, task, threat, and vulnerability information; and to mitigate IW risks based on rank-ordered countermeasure recommendations. The program element consists of three complimentary projects.

The computer security project directs the R&D of information protection technology and tools to defend C4ISR systems, with emphasis on computer and network systems security, damage assessment and recovery, and multi-level systems security. It provides access control, integrity, assured services and meets warfighter's requirements. The Cryptologic 2020 project comprises R&D for the Air Force Electronic Key Management System (AFEKMS). The AFEKMS, in concert with National Security Agency's (NSA's) EKMS, provides a secure and flexible capability for the electronic generation, distribution, and management of key material, voice callwords, and Communications Security (COMSEC) publications for the F-22. AFEKMS replaces the existing physical distribution and management system providing COMSEC KEYS for USAF Information Protection. The Air Force unique AFEKMS software is required because the production software developed by NSA cannot provide the capabilities to distribute the system keys in the format needed by the F-22 Mission Support System. The Information Warfare project comprises R&D for Vulnerability Assessment/Risk Management (IW VA/RM) and Technology planning to build information protection into all AF C4ISR and weapons systems.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303140F Information Systems Security Program
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(U) B. Budget Activity Justification:
 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.

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

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U) Previous President's Budget (FY 1999 PB)	4,961	8,420	8,137	7,422	TBD
(U) Appropriated Value	5,298	9,420			
(U) Adjustments to Appropriated Value					
a. Cong Reductions	-215	-143			
b. SBIR	-123				
c. Omnibus or Other Above Threshold Reprogram	-34				
d. Below Threshold Reprogramming	+728				
(U) Adjustments to Budget Years Since FY 1999 PB			-145	-138	
(U) Current Budget Submit/FY 2000 PB	5,654	9,277	7,992	7,284	TBD

(U) Significant Program Changes:

Funding: Congressional \$1,000 add in FY99 for continued development of the Secure Interoperable Distributed Computing Systems project.

FY99: \$273 identified as a source for SBIR

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303140F Information Systems Security Program	PROJECT 7820
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
7820 Computer Security RDT&E: Firestarter	4,014	5,378	4,835	5,375	5,113	5,202	5,310	5,421	Continuing	TBD

(U) A. Mission Description

This program directs the Research & Development (R&D) of Information Protect technology/tools to provide the capability to defend USAF Command, Control, Communications, Computer, and Intelligence (C4I) Systems from Information Warfare (IW) Cyber attacks and to recover from those attacks. As the USAF single manager for Information Protect (R&D), this program directs C4I system Information Protect R&D with emphasis in computer/network systems security, damage assessment and recovery, and multi-level security. With the advent of the information age, the battlefield commander's ability to fight and win becomes more dependent upon the availability, timeliness, and integrity of the information flow/processing capability available. The requirement for global presence and global power has demanded increasing reliance on these advanced information systems with global accessibility. The susceptibilities inherent in such reliance and accessibility has heightened the awareness that the National Information Infrastructure (NII) and the Defense Information Infrastructure (DII) must be protected against attack.

Emphasis is therefore placed on R&D areas that provide deterrence of attack through cyberspace surveillance, Tactical Indications & Warning (I&W), intrusion detection and characterization of attack. As adversaries may gain access to critical AF Force information systems through a variety of means, this technology will provide the capability of collecting, integrating, and displaying threat, vulnerability, and system data indicating an attack is about to take place and/or is taking place. Current Air Force systems such as the Combat Information Transport Systems (CITS), Theater Deployable Communications (TDC) and Theater Battle Management - Core Systems (TBMCS) leverage the technology from this project to meet their info protect needs/requirements. Additionally, this project utilizes info assurance technology investments by DARPA as a jump-start for providing a solution to Air Force requirements and cooperates with DISA and other services/agencies to ensure DII info protect requirements are complied with.

This effort was used to "jump start" the new FY99 BPAC 4579, Information Warfare. Specifically, funds have been expended to initiate the development of the exportable VA/RM process and the defining of the criteria for toolset development; and for preparing both the Exportable VA/RM Process and Toolset Development Contract and the Intelligence Support Plan Contract

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303140F Information Systems Security Program	PROJECT 7820
<p>(U) <u>FY 1998 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 426 Continued development of secure interoperable distributed computing systems - (U) \$ 426 Prototyped security analysis tools for Base Information Protection (BIP) - (U) \$ 426 Continued effort to transition Defense Advanced Research Projects Agency (DARPA) intrusion detection technology to the Air Force Information Warfare Center (AFIWC) and BIP - (U) \$ 426 Continued effort to demonstrate Information Security (INFOSEC) for Air Force Network Control Centers (AFNCCs) - (U) \$ 427 Continued effort to develop technology for secure distributed collaborative planning - (U) \$ 547 Continued investigation of techniques for commercial software evaluation - (U) \$ 617 Developed prototype secure wrapper to protect systems from Commercial Off-the-Shelf (COTS) software security risks - (U) \$ 267 Developed exportable VA/RM process and toolset development criteria - (U) \$ 383 Awarded exportable VA/RM process and toolset development contract - (U) \$ 69 Awarded Intelligence Support Plan contract - (U) \$4,014 Total <p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 226 Continue development of secure data handling system for multi-level database - (U) \$1,680 Continue development of secure interoperable distributed computing systems - (U) \$ 720 Initiate development of technology for self-healing network system - (U) \$ 714 Develop methodologies for commercial software evaluation - (U) \$ 480 Complete effort to transition DARPA intrusion detection technology the Air Force Information Warfare Center (AFIWC) and BIP - (U) \$ 460 Complete effort to demonstrate INFOSEC for Air Force Network Operations System Centers (AF NOSCs) - (U) \$ 470 Initiate effort to transition secure wrapper technologies into Air Force systems. - (U) \$ 470 Initiate effort for automatic capability to trace source of intrusions - (U) \$ 158 Identified as a source for SBIR - (U) \$5,378 Total 		
Project 7820	Page 4 of 20 Pages	Exhibit R-2A (PE 0303140F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE
BUDGET ACTIVITY 7 - Operational System Development		February 1999
PE NUMBER AND TITLE 0303140F Information Systems Security Program		PROJECT 7820
<p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 710 Continue development of technology for self-healing network systems - (U) \$ 489 Begin development of Information Attack correlation methodologies - (U) \$ 872 Continue effort to transition DARPA information assurance technology to Air Force Information Warfare Center (AFIWC) and BIP - (U) \$ 589 Continue effort for automatic capability to trace source of intrusions - (U) \$ 489 Continue development of methodologies for commercial software evaluation - (U) \$ 425 Continue development of secure interoperable distributed computing systems - (U) \$ 764 Begin development of extensible prototype for Information Command & Control to support protection of warfighter mission critical information flows. - (U) \$ 497 Continue effort to transition secure wrapper technologies into Air Force systems. - (U) \$ 4,835 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 738 Continue development of technology for self-healing network systems - (U) \$ 587 Continue development of Information Attack correlation methodologies - (U) \$ 687 Continue development of methodologies for commercial software evaluation - (U) \$ 887 Continue development of extensible prototype for Information Command & Control to support protection of warfighter mission critical information flows - (U) \$ 487 Continue effort to transition secure wrapper technologies into Air Force systems. - (U) \$ 787 Continue effort to transition DARPA information assurance technology into standard Information Protect architecture - (U) \$ 437 Begin effort to develop metrics for reliable information assurance measurement & testing - (U) \$ 765 Begin technology development effort for Automated Information damage assessment, recovery and forensics - (U) \$ 5,375 Total <p>(U) B. <u>Project Change Summary - Description of Significant Changes:</u> Funding: +\$1,000 in FY99 for continued development of secure interoperable distributed computing systems.</p> <p>(U) C. <u>Other Program Funding Summary (\$ in Thousands)</u> Not applicable</p> <p>D: <u>Acquisition Strategy:</u></p> <p>All major contracts within this Program Element are awarded after full and open competition.</p>		
Project 7820	Page 5 of 20 Pages	Exhibit R-2A (PE 0303140F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)													DATE February 1999			
BUDGET ACTIVITY 7 - Operational System Development						PE NUMBER AND TITLE 0303140F Information Systems Security Program						PROJECT 7820				
(U) E. <u>Schedule Profile</u>	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) Requirements Review Board			*				X				X				X	
(U) AF NOSC INFOSEC Transition/demonstration				*				X								
(U) Secure Wrapper Tech Devel					*										X	
(U) Self Healing Network Systems					*											X
(U) MLS DB technology transition	*							X								
(U) Secure Interoperable Distributed Computing System	*											X				
(U) Development of methodologies for Commercial Software Evaluation	*															X
(U) DARPA Information Assurance Technology Transition			*									X				
(U) Devel tech for tracing intrusions					*						X					
(U) Information attack correlation technology development									X						X	
(U) Extensible prototype for Information Command & Control									X							X
(U) Development for reliable information assurance measurement & testing													X			
(U) Technology development for automated Information damage assessment, recovery and forensics													X			
(U) Develop exportable VA/RM process and toolset development criteria	*		*													
(U) Award Exportable VA/RM process & toolset development contract (see Note)				*												
(U) Award Intelligence Support Plan contract (see Note)				*												

NOTE: Acceleration of VA/RM Development continues in 1999 under BPAC 4579

KEY: * Denotes Completed Events;

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BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
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X Denotes Planned Events.

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)		DATE February 1999		
BUDGET ACTIVITY	PE NUMBER AND TITLE		PROJECT	
7 - Operational System Development	0303140F Information Systems Security Program		7820	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>				
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) Secure Data Handling System	0	226		
(U) Database Protection Mechanisms	407			
(U) Security Analysis Tools	427			
(U) DARPA Technology Insertion/Transition	852	480	872	787
(U) Secure Distributed Computing/Collaborative Planning	852	1,680	425	
(U) IP Integration Framework	757	460		
(U) Self-Healing Network System		720	710	738
(U) Traceback/Forensics		470	589	
(U) Wrappers to Secure COTS		470	497	487
(U) Information Attack Data Correlation			489	587
(U) Extensible Prototype for Information Command & Control			764	887
(U) COTS S/W Evaluation		714	489	687
(U) Reliable Information Assurance measurement & testing				437
(U) Automated Information Damage assessment, recovery & forensics				765
(U) VARM software development	455			
(U) VARM systems engineering support	162			
(U) VARM program management support	102			
(U) Identified as a source for SBIR		158		
(U) Total	4,014	5,378	4,835	5,375

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0303140F Information Systems Security Program					PROJECT 7820	
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)											
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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
	Identified as a source for SBIR				158				158		
<u>Product Development Organizations</u>											
FFRDC (MITRE)	MIPR	On-Going	N/A	N/A	0	652	620	521	566	Continuing	TBD
Multiple Contractors	CPFF	On-Going	N/A	N/A	0	2,277	3,755	3,693	4,143	Continuing	TBD
Universities	CPFF	On-Going	N/A	N/A	0	368	845	621	666	Continuing	TBD
Trident Data Systems	FFP	Aug 98	N/A	N/A	0	383	0	0	0	0	383
<u>Support and Management Organizations</u>											
MITRE	FFRDC	On-going	N/A	N/A	0	162	0	0	0	0	162
TEMS (Various)	ID/IQ	On-going	N/A	N/A	0	102	0	0	0	0	102
ZEL TEC	FFP	Jun 98	N/A	N/A	0	70	0	0	0	0	70
NOTE: The monies in FY 98 to Support and Management contracts was used to jump start the new BPAC 4579, Information Warfare. In the future these costs will be reported under that BPAC.											
<u>Test and Evaluation Organizations</u>											
N/A											
Project 7820				Page 8 of 20 Pages				Exhibit R-3 (PE 0303140F)			

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BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0303140F Information Systems Security Program

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1999			
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0303140F Information Systems Security Program					PROJECT 7820	
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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Property</u>										
N/A										
<u>Support and Management Property</u>										
N/A										
<u>Test and Evaluation Property</u>										
N/A										
Identified as a source for SBIR							158			
158										
Subtotal Product Development				0	3,680	5,220	4,835	5,375	Cont	TBD
Subtotal Support and Management				0	334	0	0	0	Cont	TBD
Subtotal Test and Evaluation				0	0	0	0	0	0	TBD
Total Project				0	4,014	5,378	4,835	5,375	Cont	TBD

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303140F Information Systems Security Program	PROJECT 4585
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4585 Cryptologic 2020	1,640	1,968	1,240	0	0	0	0	0	0	4,848

(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.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303140F Information Systems Security Program	PROJECT 4585
<p>(U) <u>FY 1998 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 159 Trustest Software Support - (U) \$ 90 Mission Support - (U) \$ 51 LCMS application software development (F-22) - (U) \$ 823 DMD/DTD software development - (U) \$ 517 DTD 2000 (NSA) - (U) \$1,640 Total <p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 814 LCMS application software development (F-22) - (U) \$1,096 DMD/DTD software development and system integration - (U) \$ 58 Identified as a source fo SBIR - (U) \$1,968 Total <p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$1,101 DMD/DTD software support development and system integration - (U) \$ 139 Transition LCMS application software development/sustainment (F-22) to Air Force - (U) \$1,240 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ No further funding in this project - (U) \$ 0 Total <p>(U) <u>B. Project Change Summary - Description of Significant Changes:</u> N/A</p>		
Project 4585	<i>Page 11 of 20 Pages</i>	Exhibit R-2A (PE 0303140F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303140F Information Systems Security Program	PROJECT 4585
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(U) C. Other Program Funding Summary (\$ in Thousands)

<u>APPN</u>	<u>PE</u>	<u>PE Title</u>	<u>BPAC</u>	<u>BPAC Title</u>	<u>FY1998</u>	<u>FY1999</u>	<u>FY2000</u>	<u>FY2001</u>	<u>FY2002</u>	<u>FY2003</u>	<u>FY2004</u>	<u>FY2005</u>	<u>To Comp</u>	<u>Total Cost</u>
3600	64239F	F-22	654069	Adv. Tactical Fighter	250		0	0	0	0	0	0	0	0
250														
3600	63011F	Special Programs	671200	SAF/FMBMB-AFOY	790	0	0	0	0	0	0	0	0	790

(U) D. Acquisition Strategy:

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

(U) E. Schedule Profile

	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) Trustest Software Support	*			*												
(U) Mission Support	*			*												
(U) F-22 UAS Development & Transition	*												X			
(U) DMD/DTD 2000 hardware/software development and system integration			*										X			

* Denotes Completed Events
X Denotes Planned Events

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0303140F Information Systems Security Program					PROJECT 4585	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U) Hardware Development					517						
(U) Software Development					1,123	1,910	1,240				
(U) Identified as a source for SBIR						58					
(U) Total					1,640	1,968	1,240				
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing <u>Activity</u>	Contract Method/Type or Funding <u>Vehicle</u>	Award or Obligation <u>Date</u>	Performing Activity <u>EAC</u>	Project Office <u>EAC</u>	Total Prior to <u>FY 1998</u>	Budget <u>FY 1998</u>	Budget <u>FY 1999</u>	Budget <u>FY 2000</u>	Budget <u>FY 2001</u>	Budget to <u>Complete</u>	Total <u>Program</u>
Identified as a source for SBIR								58			
<u>Product Development Organizations</u>											
Motorola Inc. (F19628-97-C-0600)	SS/CPFF	Apr 97	N/A	N/A	0	51	813	139	0	0	1,003
SAIC (GS-35F-44616)	BPA	May 98	N/A	N/A	0	823	1,097	1,101	0	0	3,021
National Security Agency X35	SS/CPFF	Jun 98	N/A	N/A	0	517	0	0	0	0	517
Project 4585											

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE	
7 - Operational System Development										February 1999	
BUDGET ACTIVITY					PE NUMBER AND TITLE					PROJECT	
7 - Operational System Development					0303140F Information Systems Security Program					4585	
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
<u>Support and Management Organizations</u>											
Trustest S/W						159					159
Support MSN Support						90					90
<u>Test and Evaluation Organizations</u>											
N/A											
(U) B. Budget Acquisition History and Planning Information Continued (\$ in Thousands)											
Government Furnished Property:											
Item Description	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Delivery Date		Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	FY 2000	FY 2001	Budget to Complete	Total Program
<u>Product Development Property</u> Not Applicable											
<u>Support and Management Property</u> Not Applicable											
<u>Test and Evaluation Property</u> Not Applicable											
Identified as a source for SBIR								58			
58											
Subtotal Product Development					0	1,391	1,910	1,240	0	0	4,541
Subtotal Support and Management					0	249	0	0	0	0	249

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BUDGET ACTIVITY
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Subtotal Test and Evaluation	0	0	0	0	0	0	0
Total Project	0	1,640	1,968	1,240	0	0	4,848

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303140F Information Systems Security Program	PROJECT 4579
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4579 Information Warfare	0	1,931	1,917	1,909	1,898	1,886	1,925	1,964	Continuing	TBD

(U) A. Mission Description

Builds information protection into all AF C2, ISR, and weapons systems. The project provides the acquisition community and operational warfighters the ability to manage the IW risks to their missions and operational tasks based on system threat and vulnerability information. Provides decision makers with countermeasures recommendations, rank-ordered based on most operational utility and relative cost. Looking across all assessment conducted on AF systems, the project also provide the USAF a unique system-of-systems perspective for managing IW risks, policy, and solutions that cut across individual system boundaries. The project consists of two complementary R&D efforts

Information Warfare Vulnerability Assessment & Risk Management (IW VA/RM). The development and sustainment of an IW VA/RM process and toolset comprising procedures, analytical resources, supporting threat, countermeasure, and vulnerability databases, and instruction and training materials. These will enable program acquisition and operational unit customer to conduct their own IW risk assessments. Provides sustainment for tool set, databases, and procedures. Libraries and databases of vulnerabilities, countermeasures, tools, and techniques will be developed and continually updated to allow customers to assess current information and quickly update their assessments and risk posture as threat and vulnerability information changes. Project accumulates results of individual assessments to synthesize and integrate USAF system-of-systems risk posture, supporting JFACC theater-level IW defense.

IW Technical Planning Integrated Product Team (IW TPIPT). Supports modernization planning for Counterinformation (CI) Mission Area and technology planning processes. Continuously identifies and evaluates commercial and Government inventory of available products that can be used to meet Counterinformation mission deficiencies. Develops and coordinates technology development and acquisition plans for resolving mission area deficiencies. Provides Government laboratories and private industry guidance on new technologies needed for the next 10 to 25 years.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303140F Information Systems Security Program	PROJECT 4579
<p>(U) <u>FY 1998 (\$ in Thousands):</u> (\$0 dollars expended. BPAC 7820 was used to “jump start” the project. (See BPAC 7820 for \$ expended to jump start project.))</p> <ul style="list-style-type: none"> - (U) \$ 0 Total 		
<p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 691 Continue developing exportable VA/RM process and toolset development - (U) \$ 424 Establish infrastructure: Intelligence support, metrics measurement, etc. - (U) \$ 353 Continue developing libraries and databases, system-of-systems model - (U) \$ 274 Continue IW TPIPT activities, analyses, database support - (U) \$ 132 Conduct integrated cross program assessments and solution development - (U) \$ 57 Identified as a source for SBIR - (U) \$1,931 Total 		
<p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 1,018 Continue developing exportable VA/RM process and toolset development - (U) \$ 397 Establish and support existing infrastructure: Intelligence support, metrics measurement, etc. - (U) \$ 197 Continue to develop and update libraries and databases, system-of-systems model - (U) \$ 193 Continue IW TPIPT activities, analyses, database support - (U) \$ 112 Continue to integrate cross program assessments and solution development - (U) \$ 1,917 Total 		
<p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 1,017 Continue developing exportable VA/RM process and toolset development - (U) \$ 397 Establish and support existing infrastructure: Intelligence support, metrics measurement, etc. - (U) \$ 197 Continue to develop and update libraries and databases, system-of-systems model - (U) \$ 193 Continue IW TPIPT activities, analyses, database support - (U) \$ 105 Continue to integrate cross program assessments and solution development - (U) \$ 1,909 Total 		

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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303140F Information Systems Security Program	PROJECT 4579
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(U) **B. Project Change Summary - Description of Significant Changes:**
Not Applicable

(U) **C. Other Program Funding Summary (\$ in Thousands)**
Not Applicable

(U) **D. Acquisition Strategy:**
All major contracts within this Program Element are awarded after full and open competition.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)											DATE February 1999					
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0303140F Information Systems Security Program							PROJECT 4579				
(U) E. <u>Schedule Profile</u>																
		<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>		
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) Begin VA/RM tool set development					*											
(U) Begin infrastructure, libraries, and databases development					*											
(U) Begin developing system of systems model								X								
(U) Develop & sustain AFMC fix plan					*											
(U) Develop & sustain IW TPIPT technology database (quarterly reviews)					*	X	X	X								
(U) Develop & sustain IW TPIPT technology development plan (annual)							X									
(U) Exportable VA/RM process and toolset development									X							X
(U) Establish & Support existing infrastructure: Intelligence support, metrics measurement, etc.				*					X							
(U) Continue to develop & update libraries & databases, system-of-systems model									X							X
(U) IW TPIPT activities, analyses, database support									X							X
(U) Continue to integrate cross program assessments and solution development									X							X
(U) Intelligence Support Plan finished					*											
* Denotes Completed Events X Denotes Planned Events																
Project 4579					Page 18 of 20 Pages					Exhibit R-2A (PE 0303140F)						

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0303140F Information Systems Security Program					PROJECT 4579	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U)	Software development				0	686	1,018	1,017			
(U)	Systems engineering support				0	1,067	787	787			
(U)	Program management support				0	121	112	105			
(U)	Identified as a source for SBIR					57					
(U)	Total				0	1,931	1,917	1,909			
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR							57				
<u>Product Development Organizations</u>											
Trident Data Systems					0	0	792	1,018	1,017	Continuing	TBD
	FFP	Aug 98									
<u>Support and Management Organizations</u>											
MITRE					0	0	474	394	393	Continuing	TBD
TEMS (various)					0	0	478	393	394	Continuing	TBD
	FFRDC	On-going									
	ID/IQ	On-going									
<u>Test and Evaluation Organizations</u>											
Test & Evaluation					0	0	130	112	105	Continuing	TBD
Project 4579											

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BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0303140F Information Systems Security Program

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1999			
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0303140F Information Systems Security Program			PROJECT 4579			
(U) B. Budget Acquisition History and Planning Information Continued (\$ in Thousands)										
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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>FY 2000</u>	<u>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										
Identified as a source for SBIR						57				
Subtotal Product Development				0	0	792	1,018	1,017	Continuing	TBD
Subtotal Support and Management				0	0	952	787	787	Continuing	TBD
Subtotal Test and Evaluation				0	0	130	112	105	Continuing	TBD
Total Project				0	0	1,931	1,917	1,909	Continuing	TBD

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303140F Information Systems Security Program
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	5,654	9,277	7,992	7,284	7,011	7,088	7,235	7,385	Continuing	TBD
7820 Computer Security RDT&E: Firestarter	4,014	5,378	4,835	5,375	5,113	5,202	5,310	5,421	Continuing	TBD
4585 Cryptologic 2020	1,640	1,968	1,240	0	0	0	0	0	0	4,848
4579 Information Warfare	0	1,931	1,917	1,909	1,898	1,886	1,925	1,964	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

This program provides the capability to protect and defend USAF Command, Control, Communications, Computers, and Intelligence, Surveillance, and Reconnaissance (C4ISR) and Weapon Systems from Information Warfare (IW) attacks and recover from those attacks. Primarily, the project does research and development of information protection tools and transitions them to operational systems. It also provides the acquisition community and operational warfighters the ability to manage their own risks relative to mission, task, threat, and vulnerability information; and to mitigate IW risks based on rank-ordered countermeasure recommendations. The program element consists of three complimentary projects.

The computer security project directs the R&D of information protection technology and tools to defend C4ISR systems, with emphasis on computer and network systems security, damage assessment and recovery, and multi-level systems security. It provides access control, integrity, assured services and meets warfighter's requirements. The Cryptologic 2020 project comprises R&D for the Air Force Electronic Key Management System (AFEKMS). The AFEKMS, in concert with National Security Agency's (NSA's) EKMS, provides a secure and flexible capability for the electronic generation, distribution, and management of key material, voice callwords, and Communications Security (COMSEC) publications for the F-22. AFEKMS replaces the existing physical distribution and management system providing COMSEC KEYS for USAF Information Protection. The Air Force unique AFEKMS software is required because the production software developed by NSA cannot provide the capabilities to distribute the system keys in the format needed by the F-22 Mission Support System. The Information Warfare project comprises R&D for Vulnerability Assessment/Risk Management (IW VA/RM) and Technology planning to build information protection into all AF C4ISR and weapons systems.

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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303140F Information Systems Security Program
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(U) B. Budget Activity Justification:

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.

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

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U) Previous President's Budget (FY 1999 PB)	4,961	8,420	8,137	7,422	TBD
(U) Appropriated Value	5,298	9,420			
(U) Adjustments to Appropriated Value					
a. Cong Reductions	-215	-143			
b. SBIR	-123				
c. Omnibus or Other Above Threshold Reprogram	-34				
d. Below Threshold Reprogramming	+728				
(U) Adjustments to Budget Years Since FY 1999 PB			-145	-138	
(U) Current Budget Submit/FY 2000 PB	5,654	9,277	7,992	7,284	TBD

(U) Significant Program Changes:

Funding: Congressional \$1,000 add in FY99 for continued development of the Secure Interoperable Distributed Computing Systems project.

FY99: \$273 identified as a source for SBIR

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303140F Information Systems Security Program	PROJECT 7820
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
7820 Computer Security RDT&E: Firestarter	4,014	5,378	4,835	5,375	5,113	5,202	5,310	5,421	Continuing	TBD

(U) A. Mission Description

This program directs the Research & Development (R&D) of Information Protect technology/tools to provide the capability to defend USAF Command, Control, Communications, Computer, and Intelligence (C4I) Systems from Information Warfare (IW) Cyber attacks and to recover from those attacks. As the USAF single manager for Information Protect (R&D), this program directs C4I system Information Protect R&D with emphasis in computer/network systems security, damage assessment and recovery, and multi-level security. With the advent of the information age, the battlefield commander's ability to fight and win becomes more dependent upon the availability, timeliness, and integrity of the information flow/processing capability available. The requirement for global presence and global power has demanded increasing reliance on these advanced information systems with global accessibility. The susceptibilities inherent in such reliance and accessibility has heightened the awareness that the National Information Infrastructure (NII) and the Defense Information Infrastructure (DII) must be protected against attack.

Emphasis is therefore placed on R&D areas that provide deterrence of attack through cyberspace surveillance, Tactical Indications & Warning (I&W), intrusion detection and characterization of attack. As adversaries may gain access to critical AF Force information systems through a variety of means, this technology will provide the capability of collecting, integrating, and displaying threat, vulnerability, and system data indicating an attack is about to take place and/or is taking place. Current Air Force systems such as the Combat Information Transport Systems (CITS), Theater Deployable Communications (TDC) and Theater Battle Management - Core Systems (TBMCS) leverage the technology from this project to meet their info protect needs/requirements. Additionally, this project utilizes info assurance technology investments by DARPA as a jump-start for providing a solution to Air Force requirements and cooperates with DISA and other services/agencies to ensure DII info protect requirements are complied with.

This effort was used to "jump start" the new FY99 BPAC 4579, Information Warfare. Specifically, funds have been expended to initiate the development of the exportable VA/RM process and the defining of the criteria for toolset development; and for preparing both the Exportable VA/RM Process and Toolset Development Contract and the Intelligence Support Plan Contract

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303140F Information Systems Security Program	PROJECT 7820
<p>(U) <u>FY 1998 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 426 Continued development of secure interoperable distributed computing systems - (U) \$ 426 Prototyped security analysis tools for Base Information Protection (BIP) - (U) \$ 426 Continued effort to transition Defense Advanced Research Projects Agency (DARPA) intrusion detection technology to the Air Force Information Warfare Center (AFIWC) and BIP - (U) \$ 426 Continued effort to demonstrate Information Security (INFOSEC) for Air Force Network Control Centers (AFNCCs) - (U) \$ 427 Continued effort to develop technology for secure distributed collaborative planning - (U) \$ 547 Continued investigation of techniques for commercial software evaluation - (U) \$ 617 Developed prototype secure wrapper to protect systems from Commercial Off-the-Shelf (COTS) software security risks - (U) \$ 267 Developed exportable VA/RM process and toolset development criteria - (U) \$ 383 Awarded exportable VA/RM process and toolset development contract - (U) \$ 69 Awarded Intelligence Support Plan contract - (U) \$4,014 Total <p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 226 Continue development of secure data handling system for multi-level database - (U) \$1,680 Continue development of secure interoperable distributed computing systems - (U) \$ 720 Initiate development of technology for self-healing network system - (U) \$ 714 Develop methodologies for commercial software evaluation - (U) \$ 480 Complete effort to transition DARPA intrusion detection technology the Air Force Information Warfare Center (AFIWC) and BIP - (U) \$ 460 Complete effort to demonstrate INFOSEC for Air Force Network Operations System Centers (AF NOSCs) - (U) \$ 470 Initiate effort to transition secure wrapper technologies into Air Force systems. - (U) \$ 470 Initiate effort for automatic capability to trace source of intrusions - (U) \$ 158 Identified as a source for SBIR - (U) \$5,378 Total 		
Project 7820	Page 4 of 20 Pages	Exhibit R-2A (PE 0303140F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303140F Information Systems Security Program	PROJECT 7820
(U) <u>FY 2000 (\$ in Thousands):</u>		
<ul style="list-style-type: none"> - (U) \$ 710 Continue development of technology for self-healing network systems - (U) \$ 489 Begin development of Information Attack correlation methodologies - (U) \$ 872 Continue effort to transition DARPA information assurance technology to Air Force Information Warfare Center (AFIWC) and BIP - (U) \$ 589 Continue effort for automatic capability to trace source of intrusions - (U) \$ 489 Continue development of methodologies for commercial software evaluation - (U) \$ 425 Continue development of secure interoperable distributed computing systems - (U) \$ 764 Begin development of extensible prototype for Information Command & Control to support protection of warfighter mission critical information flows. - (U) \$ 497 Continue effort to transition secure wrapper technologies into Air Force systems. - (U) \$ 4,835 Total 		
(U) <u>FY 2001 (\$ in Thousands):</u>		
<ul style="list-style-type: none"> - (U) \$ 738 Continue development of technology for self-healing network systems - (U) \$ 587 Continue development of Information Attack correlation methodologies - (U) \$ 687 Continue development of methodologies for commercial software evaluation - (U) \$ 887 Continue development of extensible prototype for Information Command & Control to support protection of warfighter mission critical information flows - (U) \$ 487 Continue effort to transition secure wrapper technologies into Air Force systems. - (U) \$ 787 Continue effort to transition DARPA information assurance technology into standard Information Protect architecture - (U) \$ 437 Begin effort to develop metrics for reliable information assurance measurement & testing - (U) \$ 765 Begin technology development effort for Automated Information damage assessment, recovery and forensics - (U) \$5,375 Total 		
(U) B. <u>Project Change Summary - Description of Significant Changes:</u>		
Funding: +\$1,000 in FY99 for continued development of secure interoperable distributed computing systems.		
(U) C. <u>Other Program Funding Summary (\$ in Thousands)</u>		
Not applicable		
D: <u>Acquisition Strategy:</u>		
All major contracts within this Program Element are awarded after full and open competition.		
Project 7820	Page 5 of 20 Pages	Exhibit R-2A (PE 0303140F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)													DATE February 1999			
BUDGET ACTIVITY 7 - Operational System Development						PE NUMBER AND TITLE 0303140F Information Systems Security Program						PROJECT 7820				
(U) E. <u>Schedule Profile</u>	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) Requirements Review Board			*				X				X				X	
(U) AF NOSC INFOSEC Transition/demonstration				*				X								
(U) Secure Wrapper Tech Devel					*										X	
(U) Self Healing Network Systems					*											X
(U) MLS DB technology transition	*							X								
(U) Secure Interoperable Distributed Computing System	*											X				
(U) Development of methodologies for Commercial Software Evaluation	*															X
(U) DARPA Information Assurance Technology Transition			*									X				
(U) Devel tech for tracing intrusions					*						X					
(U) Information attack correlation technology development									X						X	
(U) Extensible prototype for Information Command & Control									X							X
(U) Development for reliable information assurance measurement & testing													X			
(U) Technology development for automated Information damage assessment, recovery and forensics													X			
(U) Develop exportable VA/RM process and toolset development criteria	*		*													
(U) Award Exportable VA/RM process & toolset development contract (see Note)				*												
(U) Award Intelligence Support Plan contract (see Note)				*												

NOTE: Acceleration of VA/RM Development continues in 1999 under BPAC 4579
 KEY: * Denotes Completed Events;

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BUDGET ACTIVITY
7 - Operational System Development

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X Denotes Planned Events.

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)		DATE February 1999		
BUDGET ACTIVITY	PE NUMBER AND TITLE		PROJECT	
7 - Operational System Development	0303140F Information Systems Security Program		7820	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>				
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) Secure Data Handling System	0	226		
(U) Database Protection Mechanisms	407			
(U) Security Analysis Tools	427			
(U) DARPA Technology Insertion/Transition	852	480	872	787
(U) Secure Distributed Computing/Collaborative Planning	852	1,680	425	
(U) IP Integration Framework	757	460		
(U) Self-Healing Network System		720	710	738
(U) Traceback/Forensics		470	589	
(U) Wrappers to Secure COTS		470	497	487
(U) Information Attack Data Correlation			489	587
(U) Extensible Prototype for Information Command & Control			764	887
(U) COTS S/W Evaluation		714	489	687
(U) Reliable Information Assurance measurement & testing				437
(U) Automated Information Damage assessment, recovery & forensics				765
(U) VARM software development	455			
(U) VARM systems engineering support	162			
(U) VARM program management support	102			
(U) Identified as a source for SBIR		158		
(U) Total	4,014	5,378	4,835	5,375

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0303140F Information Systems Security Program					PROJECT 7820	
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)											
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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
	Identified as a source for SBIR				158				158		
<u>Product Development Organizations</u>											
FFRDC (MITRE)	MIPR	On-Going	N/A	N/A	0	652	620	521	566	Continuing	TBD
Multiple Contractors	CPFF	On-Going	N/A	N/A	0	2,277	3,755	3,693	4,143	Continuing	TBD
Universities	CPFF	On-Going	N/A	N/A	0	368	845	621	666	Continuing	TBD
Trident Data Systems	FFP	Aug 98	N/A	N/A	0	383	0	0	0	0	383
<u>Support and Management Organizations</u>											
MITRE	FFRDC	On-going	N/A	N/A	0	162	0	0	0	0	162
TEMS (Various)	ID/IQ	On-going	N/A	N/A	0	102	0	0	0	0	102
ZEL TEC	FFP	Jun 98	N/A	N/A	0	70	0	0	0	0	70
NOTE: The monies in FY 98 to Support and Management contracts was used to jump start the new BPAC 4579, Information Warfare. In the future these costs will be reported under that BPAC.											
<u>Test and Evaluation Organizations</u>											
N/A											
Project 7820				Page 8 of 20 Pages				Exhibit R-3 (PE 0303140F)			

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BUDGET ACTIVITY
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BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0303140F Information Systems Security Program					PROJECT 7820	
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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Property</u>										
N/A										
<u>Support and Management Property</u>										
N/A										
<u>Test and Evaluation Property</u>										
N/A										
Identified as a source for SBIR							158			
158										
Subtotal Product Development				0	3,680	5,220	4,835	5,375	Cont	TBD
Subtotal Support and Management				0	334	0	0	0	Cont	TBD
Subtotal Test and Evaluation				0	0	0	0	0	0	TBD
Total Project				0	4,014	5,378	4,835	5,375	Cont	TBD

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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303140F Information Systems Security Program	PROJECT 4585
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4585 Cryptologic 2020	1,640	1,968	1,240	0	0	0	0	0	0	4,848

(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.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303140F Information Systems Security Program	PROJECT 4585
<p>(U) <u>FY 1998 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 159 Trustest Software Support - (U) \$ 90 Mission Support - (U) \$ 51 LCMS application software development (F-22) - (U) \$ 823 DMD/DTD software development - (U) \$ 517 DTD 2000 (NSA) - (U) \$1,640 Total <p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 814 LCMS application software development (F-22) - (U) \$1,096 DMD/DTD software development and system integration - (U) \$ 58 Identified as a source fo SBIR - (U) \$1,968 Total <p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$1,101 DMD/DTD software support development and system integration - (U) \$ 139 Transition LCMS application software development/sustainment (F-22) to Air Force - (U) \$1,240 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ No further funding in this project - (U) \$ 0 Total <p>(U) B. <u>Project Change Summary - Description of Significant Changes:</u> N/A</p>		
Project 4585	<i>Page 11 of 20 Pages</i>	Exhibit R-2A (PE 0303140F)

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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303140F Information Systems Security Program	PROJECT 4585
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(U) C. Other Program Funding Summary (\$ in Thousands)

<u>APPN</u>	<u>PE</u>	<u>PE Title</u>	<u>BPAC</u>	<u>BPAC Title</u>	<u>FY1998</u>	<u>FY1999</u>	<u>FY2000</u>	<u>FY2001</u>	<u>FY2002</u>	<u>FY2003</u>	<u>FY2004</u>	<u>FY2005</u>	<u>To Comp</u>	<u>Total Cost</u>
3600	64239F	F-22	654069	Adv. Tactical Fighter	250		0	0	0	0	0	0	0	0
250														
3600	63011F	Special Programs	671200	SAF/FMBMB-AFOY	790	0	0	0	0	0	0	0	0	790

(U) D. Acquisition Strategy:

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

(U) E. Schedule Profile

	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) Trustest Software Support	*			*												
(U) Mission Support	*			*												
(U) F-22 UAS Development & Transition	*													X		
(U) DMD/DTD 2000 hardware/software development and system integration			*											X		

* Denotes Completed Events
X Denotes Planned Events

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0303140F Information Systems Security Program					PROJECT 4585	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U) Hardware Development					517						
(U) Software Development					1,123	1,910	1,240				
(U) Identified as a source for SBIR						58					
(U) Total					1,640	1,968	1,240				
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing <u>Activity</u>	Contract Method/Type or Funding <u>Vehicle</u>	Award or Obligation <u>Date</u>	Performing Activity <u>EAC</u>	Project Office <u>EAC</u>	Total Prior to <u>FY 1998</u>	Budget <u>FY 1998</u>	Budget <u>FY 1999</u>	Budget <u>FY 2000</u>	Budget <u>FY 2001</u>	Budget to <u>Complete</u>	Total <u>Program</u>
Identified as a source for SBIR								58			
<u>Product Development Organizations</u>											
Motorola Inc. (F19628-97-C-0600)	SS/CPFF	Apr 97	N/A	N/A	0	51	813	139	0	0	1,003
SAIC (GS-35F-44616)	BPA	May 98	N/A	N/A	0	823	1,097	1,101	0	0	3,021
National Security Agency X35	SS/CPFF	Jun 98	N/A	N/A	0	517	0	0	0	0	517
Project 4585											

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0303140F Information Systems Security Program					PROJECT 4585	
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
<u>Support and Management Organizations</u>											
Trustest S/W Support						159					159
MSN Support						90					90
<u>Test and Evaluation Organizations</u>											
N/A											
(U) B. Budget Acquisition History and Planning Information Continued (\$ in Thousands)											
Government Furnished Property:											
Item Description	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Delivery Date		Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	FY 2000	FY 2001	Budget to Complete	Total Program
<u>Product Development Property</u> Not Applicable											
<u>Support and Management Property</u> Not Applicable											
<u>Test and Evaluation Property</u> Not Applicable											
Identified as a source for SBIR								58			
58											
Subtotal Product Development					0	1,391	1,910	1,240	0	0	4,541
Subtotal Support and Management					0	249	0	0	0	0	249
Project 4585											

DATE **February 1999**

BUDGET ACTIVITY	PE NUMBER AND TITLE							
7 - Operational System Development	0303140F Information Systems Security Program							
Subtotal Test and Evaluation	0	0	0	0	0	0	0	0
Total Project	0	1,640	1,968	1,240	0	0	0	4,848

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303140F Information Systems Security Program	PROJECT 4579
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4579 Information Warfare	0	1,931	1,917	1,909	1,898	1,886	1,925	1,964	Continuing	TBD

(U) A. Mission Description

Builds information protection into all AF C2, ISR, and weapons systems. The project provides the acquisition community and operational warfighters the ability to manage the IW risks to their missions and operational tasks based on system threat and vulnerability information. Provides decision makers with countermeasures recommendations, rank-ordered based on most operational utility and relative cost. Looking across all assessment conducted on AF systems, the project also provide the USAF a unique system-of-systems perspective for managing IW risks, policy, and solutions that cut across individual system boundaries. The project consists of two complementary R&D efforts

Information Warfare Vulnerability Assessment & Risk Management (IW VA/RM). The development and sustainment of an IW VA/RM process and toolset comprising procedures, analytical resources, supporting threat, countermeasure, and vulnerability databases, and instruction and training materials. These will enable program acquisition and operational unit customer to conduct their own IW risk assessments. Provides sustainment for tool set, databases, and procedures. Libraries and databases of vulnerabilities, countermeasures, tools, and techniques will be developed and continually updated to allow customers to assess current information and quickly update their assessments and risk posture as threat and vulnerability information changes. Project accumulates results of individual assessments to synthesize and integrate USAF system-of-systems risk posture, supporting JFACC theater-level IW defense.

IW Technical Planning Integrated Product Team (IW TPIPT). Supports modernization planning for Counterinformation (CI) Mission Area and technology planning processes. Continuously identifies and evaluates commercial and Government inventory of available products that can be used to meet Counterinformation mission deficiencies. Develops and coordinates technology development and acquisition plans for resolving mission area deficiencies. Provides Government laboratories and private industry guidance on new technologies needed for the next 10 to 25 years.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303140F Information Systems Security Program	PROJECT 4579
<p>(U) <u>FY 1998 (\$ in Thousands)</u>: (\$0 dollars expended. BPAC 7820 was used to “jump start” the project. (See BPAC 7820 for \$ expended to jump start project.))</p> <ul style="list-style-type: none"> - (U) \$ 0 Total 		
<p>(U) <u>FY 1999 (\$ in Thousands)</u>:</p> <ul style="list-style-type: none"> - (U) \$ 691 Continue developing exportable VA/RM process and toolset development - (U) \$ 424 Establish infrastructure: Intelligence support, metrics measurement, etc. - (U) \$ 353 Continue developing libraries and databases, system-of-systems model - (U) \$ 274 Continue IW TPIPT activities, analyses, database support - (U) \$ 132 Conduct integrated cross program assessments and solution development - (U) \$ 57 Identified as a source for SBIR - (U) \$1,931 Total 		
<p>(U) <u>FY 2000 (\$ in Thousands)</u>:</p> <ul style="list-style-type: none"> - (U) \$ 1,018 Continue developing exportable VA/RM process and toolset development - (U) \$ 397 Establish and support existing infrastructure: Intelligence support, metrics measurement, etc. - (U) \$ 197 Continue to develop and update libraries and databases, system-of-systems model - (U) \$ 193 Continue IW TPIPT activities, analyses, database support - (U) \$ 112 Continue to integrate cross program assessments and solution development - (U) \$ 1,917 Total 		
<p>(U) <u>FY 2001 (\$ in Thousands)</u>:</p> <ul style="list-style-type: none"> - (U) \$ 1,017 Continue developing exportable VA/RM process and toolset development - (U) \$ 397 Establish and support existing infrastructure: Intelligence support, metrics measurement, etc. - (U) \$ 197 Continue to develop and update libraries and databases, system-of-systems model - (U) \$ 193 Continue IW TPIPT activities, analyses, database support - (U) \$ 105 Continue to integrate cross program assessments and solution development - (U) \$ 1,909 Total 		

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational System Development	0303140F Information Systems Security Program	4579
<p>(U) B. <u>Project Change Summary - Description of Significant Changes:</u> Not Applicable</p> <p>(U) C. <u>Other Program Funding Summary (\$ in Thousands)</u> Not Applicable</p> <p>(U) D. <u>Acquisition Strategy:</u> All major contracts within this Program Element are awarded after full and open competition.</p>		
Project 4579	Page 17 of 20 Pages	Exhibit R-2A (PE 0303140F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)											DATE February 1999					
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0303140F Information Systems Security Program							PROJECT 4579				
(U) E. <u>Schedule Profile</u>																
		<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>		
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) Begin VA/RM tool set development					*											
(U) Begin infrastructure, libraries, and databases development					*											
(U) Begin developing system of systems model								X								
(U) Develop & sustain AFMC fix plan					*											
(U) Develop & sustain IW TPIPT technology database (quarterly reviews)					*	X	X	X								
(U) Develop & sustain IW TPIPT technology development plan (annual)							X									
(U) Exportable VA/RM process and toolset development									X							X
(U) Establish & Support existing infrastructure: Intelligence support, metrics measurement, etc.				*					X							
(U) Continue to develop & update libraries & databases, system-of-systems model									X							X
(U) IW TPIPT activities, analyses, database support									X							X
(U) Continue to integrate cross program assessments and solution development									X							X
(U) Intelligence Support Plan finished					*											
* Denotes Completed Events X Denotes Planned Events																
Project 4579					Page 18 of 20 Pages					Exhibit R-2A (PE 0303140F)						

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0303140F Information Systems Security Program					PROJECT 4579	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U)	Software development				0	686	1,018	1,017			
(U)	Systems engineering support				0	1,067	787	787			
(U)	Program management support				0	121	112	105			
(U)	Identified as a source for SBIR					57					
(U)	Total				0	1,931	1,917	1,909			
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR							57				
<u>Product Development Organizations</u>											
Trident Data Systems					0	0	792	1,018	1,017	Continuing	TBD
	FFP	Aug 98									
<u>Support and Management Organizations</u>											
MITRE					0	0	474	394	393	Continuing	TBD
TEMS (various)					0	0	478	393	394	Continuing	TBD
	FFRDC	On-going									
	ID/IQ	On-going									
<u>Test and Evaluation Organizations</u>											
Test & Evaluation					0	0	130	112	105	Continuing	TBD
Project 4579											

DATE
February 1999

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0303140F Information Systems Security Program

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1999			
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0303140F Information Systems Security Program			PROJECT 4579			
(U) B. Budget Acquisition History and Planning Information Continued (\$ in Thousands)										
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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>FY 2000</u>	<u>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										
Identified as a source for SBIR						57				
Subtotal Product Development				0	0	792	1,018	1,017	Continuing	TBD
Subtotal Support and Management				0	0	952	787	787	Continuing	TBD
Subtotal Test and Evaluation				0	0	130	112	105	Continuing	TBD
Total Project				0	0	1,931	1,917	1,909	Continuing	TBD

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303141F Global Combat Support System (GCSS)	PROJECT 4655
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4655 BLSM	19,513	17,906	19,389	20,919	19,591	21,898	22,353	22,820	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

The GCSS-AF program will modernize, develop, and integrate legacy base-level standard Air Force and Department of Defense (DoD) combat support information systems. The modernized systems will be developed in compliance with and hosted on the Defense Information Infrastructure (DII) Common Operating Environment (COE). The centerpiece of the GCSS-AF effort will be a shared data environment that seeks to eliminate inaccurate data and redundant interfaces. The GCSS-AF infrastructure and a shared data environment will become the source of functional support data for command and control decision support systems that support the wing commander and theater battlestaff. GCSS-AF will ensure the availability of critical decision making information that is required at the Point-Of-Attack for the Air Force operational commanders. The modernized systems will be implemented and sustained worldwide and support both wartime and peacetime requirements using hardware, software, and communications capabilities available from standard open systems government contracts and communications infrastructure programs.

The GCSS-AF approach will *functionally modernize* those Automated Information Systems (AISs) that require improvements in business practices, *technically modernize* those AISs that require only a modernized database management system and modern technology language, simply *rehost* other AISs to the COE, and *assist* other AIS programs in achieving the GCSS-AF concept. The approach will also provide an infrastructure allowing increased integration to include sharing both data and processes. This approach will support both regional and distributed processing and serve to integrate the many “stove-pipe” legacy systems into an interoperable set of management information systems.

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

- (U) \$ 4,989 CORE Program
- (U) \$ 8,810 Integrated Logistics System-Supply Increment I
- (U) \$ 446 Support Contractors
- (U) \$ 5,268 SPO Operations
- (U) \$ 19,513 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303141F Global Combat Support System (GCSS)	PROJECT 4655
<p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 3,000 CORE Program - (U) \$ 10,000 Integrated Logistics System-Supply Increment I - (U) \$ 2,234 Defense Information Infrastructure (DII, SSG) - (U) \$ 739 Support Contractors - (U) \$ 1,491 SPO Operations - (U) \$ 442 Identified as a source for SBIR - (U) \$ 17,906 Total <p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 4,064 CORE Program - (U) \$ 10,339 Integrated Logistics System-Supply Increment I - (U) \$ 2,000 Defense Information Infrastructure (DII) - (U) \$ 1,339 Support Contractors - (U) \$ 1,647 SPO Operations - (U) \$ 19,389 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 4,064 CORE Program - (U) \$ 11,914 Integrated Logistics System-Supply Increment I&II - (U) \$ 2,000 Defense Information Infrastructure (DII) - (U) \$ 1,339 Support Contractors - (U) \$ 1,602 SPO Operations - (U) \$ 20,919 Total <p>(U) <u>B. Budget Activity Justification</u> This program is in Budget Activity 7, Operational System Development, because the program modernizes Automated Information Systems (AISs).</p>		
Project 4655	<i>Page 2 of 6 Pages</i>	Exhibit R-2 (PE 0303141F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)					DATE February 1999					
BUDGET ACTIVITY 7 - Operational System Development			PE NUMBER AND TITLE 0303141F Global Combat Support System (GCSS)			PROJECT 4655				
(U) C. <u>Program Change Summary (\$ in Thousands)</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>					
(U) Previous President's Budget FY1999 PB	19,745	17,973	19,742	21,317	Cont.					
(U) Appropriated Value	20,894	17,973								
(U) Adjustments to Appropriated Value										
a. Congressional/General Reductions	-695	-67								
b. SBIR	-452									
c. Omnibus or Other Above Threshold Reprogramming	-162									
d. Below Threshold Reprogramming	-72									
(U) Adjustments to Budget Years Since FY 1999 PB			-353	-398						
(U) Current Budget Submit/FY 2000 PB	19,513	17,906	19,389	20,919	Cont.					
(U) Significant Program Changes: \$442 identified as a source for SBIR in FY99.										
(U) D. <u>Other Program Funding Summary (\$ in Thousands)</u>										
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To Compl</u>	<u>Total Cost</u>
(U) Other Procurement AF, BA 3	0	0	0	0	0	0	15,726	31,468	Cont.	Cont.
(U) E. <u>Acquisition Strategy:</u>	All major contracts within this Program Element were awarded after full and open competition.									

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303141F Global Combat Support System (GCSS)	PROJECT 4655
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(U) F. Schedule Profile

	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) CORE Program (on-going)																
(U) DII (on-going)																
(U) Integrated Logistics System Supply																
(U) Alpha 1		*														
(U) Alpha 2						X										
(U) Alpha 3							X									
(U) Beta 1								X								
(U) Beta 2										X						
(U) Beta 3											X					
(U) IOC												X				
(U) FOC																X

* - Completed Event
X - Planned Event

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0303141F Global Combat Support System (GCSS)					PROJECT 4655	
(U) A. <u>Project Cost Breakdown (\$000 in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U)	GCSS System Contract CORE Program				4,989	3,000	4,064	4,064			
(U)	Integrated Logistics System-Supply Increment I & II*				8,810	10,000	10,339	11,914			
(U)	Defense Information Infrastructure (DII)				0	2,234	2,000	2,000			
(U)	Support Contractor				446	739	1,339	1,339			
(U)	SPO Operations				5,268	1,491	1,647	1,602			
(U)	Identified as a source for SBIR					442					
(U)	Total.				19,513	17,906	19,389	20,919			
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
							442				
<u>Product Development Organizations</u>											
Lockheed Martin	IDIQ	15 Aug 95	N/A	N/A	18,874	13,799	13,000	14,403	15,978	Cont.	Cont.
Various (Base Level System Modernization)	Various	Various	N/A	N/A	4,481	0	0	0	0	0	4,481

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0303141F Global Combat Support System (GCSS)					PROJECT 4655	
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
<u>Support and Management Organizations</u>											
Support Contractors	Various	Various	N/A	N/A	1,522	446	739	1,339	1,339	Cont.	Cont.
HQ SSG	N/A	N/A	N/A	N/A	0	5,268	3,725	3,647	3,602	Cont.	Cont.
<u>Test and Evaluation Organizations</u>											
Not applicable.											
Government Furnished Property:											
Not applicable.											
Identified as a source for SBIR											
Subtotal Product Development					23,355	13,799	13,000	14,403	15,978	Cont.	Cont.
Subtotal Support and Management					1,522	5,714	4,464	4,986	4,941	Cont.	Cont.
Subtotal Test and Evaluation					0	0	0	0	0	0	0
Total Project					24,877	19,513	17,906	19,389	20,919	Cont.	Cont.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303150F WWMCCS/Global Command and Control System	PROJECT 4667
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4667 Global Command and Control System - AF	6,695*	13,137	3,929	3,777	3,861	3,977	4,061	4,144	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

*Note 1 : FY98 funding is in Program Element (PE) 0303152F Automated Data Processing Equipment. The funds are realigned in FY 1999 to PE 0303150F and the program title changed from Automated Data Processing Equipment to Global Command and Control System (GCCS). This is an effort to consolidate/centralize accounting for the AF-GCCS program, which is now the operational system of record.

Note 2 : Beginning in FY 2000, funding for Deliberate and Crisis Action Planning and Execution Segments (DCAPES) will be submitted as a separate project (674802) under PE 27438. For administrative purposes, FY 1999 DCAPES funds will be executed under project 4667.

(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), as the first step to eliminate stovepipe systems. The AF is responsible for developing four of the modules that will make up this COE, and integration of AF unique applications with the COE.

(U) FY 1998 (Funding in PE 0303152)

- (U) \$3,000 COE Development
- (U) \$2,592 Crisis Action Planning Evolution
- (U) \$1,103 GCCS Migration Support
- (U) \$6,695 Total

(U) FY 1999

- (U) \$ 3,607 GCCS Migration Support /COE Development
- (U) \$ 6,680 Crisis Action Planning Evolution
- (U) \$ 2,442 Prototype software development
- (U) \$ 408 Identified as source for SBIR
- (U) \$13,137 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1999																																																		
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303150F WWMCCS/Global Command and Control System	PROJECT 4667																																																		
<p>(U) <u>FY 2000</u></p> <ul style="list-style-type: none"> - (U) \$ 983 COE Development - (U) \$1,963 GCCS Migration Support - (U) \$ 983 COE Distribution - (U) \$3,929 Total <p>(U) <u>FY 2001</u></p> <ul style="list-style-type: none"> - (U) \$ 944 COE Development - (U) \$1,888 GCCS Migration Support - (U) \$ 945 COE Distribution - (U) \$3,777 Total <p>(U) B. <u>Budget Activity Justification:</u> This effort is Budget Activity 7, Operational System Development, because the program develops and implements software for an operational computer network.</p> <p>(U) C. <u>Program Change Summary (\$ in Thousands)</u></p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;"></th> <th style="text-align: center;"><u>FY 1998</u></th> <th style="text-align: center;"><u>FY 1999</u></th> <th style="text-align: center;"><u>FY 2000</u></th> <th style="text-align: center;"><u>FY 2001</u></th> </tr> </thead> <tbody> <tr> <td>(U) Previous President's Budget (FY 1999 PB)</td> <td style="text-align: center;">6,741</td> <td style="text-align: center;">13,675</td> <td style="text-align: center;">13,176</td> <td style="text-align: center;">15,709</td> </tr> <tr> <td>(U) Appropriated Value</td> <td style="text-align: center;">7,820</td> <td style="text-align: center;">13,675</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;">-911</td> <td style="text-align: center;">-538</td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">b. SBIR</td> <td style="text-align: center;">-169</td> <td></td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">c. Omnibus or Other Above Threshold Reprogram</td> <td style="text-align: center;">-45</td> <td></td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">d. Below Threshold Reprogramming</td> <td style="text-align: center;">0</td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Adjustments to Budget Year since FY 1999 PB</td> <td></td> <td></td> <td style="text-align: center;">-9,247</td> <td style="text-align: center;">-11,932</td> </tr> <tr> <td>(U) Current Budget Submit/FY 2000 BES</td> <td style="text-align: center;">6,695</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> </tr> </tbody> </table> <p>(U) Significant Program Changes: FY99: \$408 identified as source for SBIR FY00: Deliberate and Crisis Action Planning Segments (DCAPES) is moved out of this program element to PE 27438 (Theater Battle Management Core Segments).</p>				<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	(U) Previous President's Budget (FY 1999 PB)	6,741	13,675	13,176	15,709	(U) Appropriated Value	7,820	13,675			(U) Adjustments to Appropriated Value					a. Congressional/General Reductions	-911	-538			b. SBIR	-169				c. Omnibus or Other Above Threshold Reprogram	-45				d. Below Threshold Reprogramming	0				(U) Adjustments to Budget Year since FY 1999 PB			-9,247	-11,932	(U) Current Budget Submit/FY 2000 BES	6,695	13,137	3,929	3,777
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Project 4667	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 1999					
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0303150F WWMCCS/Global Command and Control System				PROJECT 4667					
(U) D. <u>Other Program Funding Summary (\$ in Thousands)</u>													
		<u>FY1998</u>	<u>FY1999</u>	<u>FY2000</u>	<u>FY2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	To <u>Complete</u>	<u>Total Cost</u>		
BA-7, P-50	(U) Other Procurement, Air Force	6,995*	4,471	5,722	5,698	5,760	5,774	11,902	12,197	Continuin g	TBD		
* Reported as part of PE 0303152													
(U) E. <u>Acquisition Strategy:</u>													
<p>Electronics Systems Center (ESC), Hanscom AFB, MA will manage the overall GCCS-AF 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. The Crisis Action Planning Evolution and associated prototype software development will be commercially developed under the current Command and Control Product Line (CCPL) contract at ESC to deliver a Deliberate and Crisis Action Planning and Execution Segments (DCAPES). In July 98, the DCAPES contract was awarded to the Raytheon, Computer Sciences Corporation, and Science Applications International Corporation team under the CCPL contract.</p>													
(U) F. <u>Schedule Profile</u>													
		<u>FY 1998</u>			<u>FY 1999</u>			<u>FY 2000</u>			<u>FY 2001</u>		
		1	2	3	4	1	2	3	4	1	2	3	4
(U) Common Operating Environment (COE) Development*													
• Multi-Media		*		*		X	X	X	X		X		X
• Distributed Computing Services		*		*		X	X	X	X		X		X
• Office Automation		*		*		X	X	X	X		X		X
• Management Services		*		*		X	X	X	X		X		X
(U) Crisis Action Planning Enhancement													
• DCAPES Contract Award				*									
• DCAPES initial increment fielded								X					
* Denotes Completed Event													
X Denotes Planned Event													
(U) *Note: The COE development is incremental with scheduled releases based on the Defense Information Systems Agency (DISA) DII COE schedule.													
Project 4667		Page 3 of 5 Pages				Exhibit R-2 (PE 0303150F)							

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0303150F WWMCCS/Global Command and Control System				PROJECT 4667		
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>										
				<u>FY 1998*</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U) Common Operating Environment (COE) Development				3,000	3,607	983	944			
(U) Crisis Action Planning Evolution				2,592	6,680					
(U) GCCS Migration Support				1,103						
(U) Prototype software development				0	2,442					
(U) GCCS Migration Support						1,963	1,888			
(U) COE Distribution						983	945			
(U) Identified as a source for SBIR					408					
(U) Total				6,695	13,137	3,929	3,777			
* In PE 0303152										
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>										
Performing Organizations:										
<u>Product Development Organizations</u>										
	Contract									
Item	Method/Type	Award or		Total					Total	
<u>Description</u>	<u>Vehicle</u>	<u>Date</u>	<u>Delivery Date</u>	<u>Prior to</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Budget to Complete</u>	<u>Program</u>
(U) Rome Lab	FFP/FCA	Jun 95	N/A	250	0	0	0	0	TBD	TBD
(U) Material Systems Group	various	various	N/A	1,400	0	0	0	0	TBD	TBD
(U) Miscellaneous	various	various	N/A	85	0	0	0	0	TBD	TBD
(U) DCAPEs	FFP/LHAF	Jul 98	Mar 00	0	1700	7,715	0*	0*	TBD	TBD
*In FY 00 DCAPEs funding is transferred to PE 27438										
Identified as a source for SBIR						408				

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1999			
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0303150F WWMCCS/Global Command and Control System				PROJECT 4667		
<u>Support and Management Organizations</u>										
(U) TEMS				1650	2995	1,800	1,552	1,488	TBD	TBD
(U) MITRE				3600	2000	2,600	2,335	2,242	TBD	TBD
(U) Miscellaneous				15	0	614	42	47	0	15
<u>Test and Evaluation Organizations</u>										
N/A										
Government Furnished Property: None										
<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 1998</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
Identified as a source for SBIR						408				
Subtotal Product Development				1735*	1700*	7,715	0	0	TBD	TBD
Subtotal Support and Management				5265*	4995*	5,014	3,929	3,777	TBD	TBD
Subtotal Test & Evaluation				0*	0*	0	0	0	0	0
Total				7000*	6695*	13,137	3,929	3,777	TBD	TBD
* In PE 0303152										

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303601F MILSATCOM Terminals	PROJECT 2487
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<i>COST (\$ In Thousands)</i>	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
2487 MILSTAR (AF Terminals)	15,320	2,159	7,026	14,955	14,121	34,638	80,137	91,563	157,154	2,291,019
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

Military Satellite Communications (MILSATCOM) provides world-wide communications to strategic and tactical warfighters. The MILSATCOM Terminals Program contains efforts to develop equipment for Air Force users to communicate over military satellites, including Milstar, Ultra High Frequency (UHF) satellites, and Defense Satellite Communication System (DSCS). 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 Terminals (CPT) enhancements are continuing in addition to system-level testing in support of Milstar IOCH. Also included are the development of Air Force Terminals ROADMAP to support the DoD Architecture Working Group, efforts to prototype an EHF/GBS receive antenna for airborne platforms, and the design of a reprogrammable terminal architecture for wideband SATCOM. New Airborne EHF and CPT replacement will begin in 03. 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. Increasing requirements for UHF satellite capacity, coupled with limited channel capacity, led the Joint Staff to mandate new standards for UHF users that are designed to improve satellite access and efficiency by utilizing Demand Assigned Multiple Access (DAMA) techniques. Development efforts in the UHF SATCOM program are primarily focused on the Network Control System (NCS) and ground and airborne DAMA terminals design and implementation. These efforts will be complete in FY99. DSCS terminal procurement efforts sustain and modernize the Ground Mobile Forces terminal and the Jam-Resistant Secure Communications (JRSC) subnet of DSCS.

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

- (U) \$ 3,529 Continued basic activities to support MILSATCOM terminals
- (U) \$ 6,378 Continued CPT upgrades and processor modifications
- (U) \$ 900 Continued Milstar Wright Lab testing activities
- (U) \$ 600 Upgraded Network Control System
- (U) \$ 3,913 Concept/Prototype Demonstrations/MILSATCOM Terminals roadmap
- (U) \$ 15,320 Total

DATE
February 1999

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0303601F MILSATCOM Terminals

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

- (U) \$ 1,032 Continue MILSATCOM terminals support activities
- (U) \$ 1,065 Continue CPT upgrades/begin contractor test and operations support
- (U) \$ 62 Identified as a source for SBIR
- (U) \$ 2,159 Total

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

- (U) \$ 1,260 Continue MILSATCOM terminals support activities
- (U) \$ 4,766 Continue contractor test and operations support
- (U) \$ 1,000 Continue Milstar Wright Lab testing activity
- (U) \$ 7,026 Total

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

- (U) \$ 1,792 Continue MILSATCOM terminals support activities
- (U) \$ 6,563 Continue contractor test and operations support
- (U) \$ 1,000 Continue Milstar Wright Lab testing activity
- (U) \$ 5,600 Begin Advanced Wideband Architecture and Roadmap development
- (U) \$ 14,955 Total

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

This effort is funded in Budget Activity 7 Operational System Development because the program has completed a Milestone III review and is in production.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE February 1999			
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0303601F MILSATCOM Terminals			PROJECT 2487			
 (U) C. <u>Program Change Summary (\$ in Thousands)</u>										
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>					
(U) Previous President's Budget (FY1999 PB)	11,450	2,352	15,736	30,140	1,937,934					
(U) Appropriated Value	12,871	2,352	15,736	30,140						
(U) Adjustments to Appropriated Value										
a. Congressional General Reductions	-1,421	-193								
b. SBIR										
c. Omnibus and Other Above Threshold Reprogram	-76									
d. Below Threshold Reprogramming (BTR)	3,946									
(U) Adjustments to Budget Years Since FY1999 PB			-8,710	-15,185						
(U) Current Budget Submit/FY2000 PB	15,320	2,159	7,026	14,955	2,291,019					
 (U) Significant Program Changes: FY98 BTR funded Air Force MILSATCOM Terminals roadmap. FY00 and FY01 adjustments removed funding for Ultra High Frequency Demand Assigned Multiple Access radio integration on the B2. This integration is funded by a FY98 Congressional add under the B2 program element. FY99: \$62K identified as a source for SBIR										
 (U) D. <u>Other Program Funding Summary (\$ in Thousands)</u>										
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY2004</u>	<u>FY2005</u>	<u>To</u>	<u>Total</u>
(U) Appn 10, BPAC 119992, Aircraft Procurement	15,462	10,172	19,454	19,554	49,801	44,962	42,961	67,350	Cont	Cont
(U) Appn 16, BPAC 836780, MILSATCOM Space	17,819	27,383	46,257	36,148	38,172	43,731	60,741	48,578	Cont	Cont
 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										
Project 2487			Page 3 of 6 Pages			Exhibit R-2 (PE 0303601F)				

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303601F MILSATCOM Terminals	PROJECT 2487
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(U) E. Acquisition Strategy:

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.

(U) F. Schedule Profile

	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) CPT Upgrades Delivery and Production					*	x	x	x	x	x	x	x	x	x	x	x
(U) CPT IOT&E Phase II										x						
(U) Milstar SYS IOC II															x	
(U) SCAMP Deliveries Begin								x								
(U) SMART-T Low-Rate Initial Production						x										
(U) Airborne DAMA Terminal Upgrade																
(U) Contract Award/Option		*				x										
(U) Deliveries			*	*	*	x	x	x	x	x	x	x	x	x	x	x
(U) Ground DAMA Terminal Deliveries	*	*	*	*	*	x	x	x	x	x	x	x	x	x	x	x

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0303601F MILSATCOM Terminals					PROJECT 2487	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U)	CPT Upgrades				6,378	1,065	4,766	6,563			
(U)	Testing Support/Studies				900	0	1,000	1,000			
(U)	SPO Ops (PSA, TDY, Trng, Sup/Equip, Ktr Spt/Conv)				3,529	1,032	1,260	1,792			
(U)	Network Control System World Wide system test				600	0	0	0			
(U)	Concept/Prototype Demonstrations/MILSATCOM Terminals Roadmap				3,913	0	0	0			
(U)	Advanced Wideband				0	0	0	5,600			
(U)	Identified as a source for SBIR					62					
(U)	Total				15,320	2,159	7,026	14,955			
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	FY 2000	FY 2001	Budget to Complete	Total Program
<u>Product Development Organizations</u>											
Raytheon Corp	FPIF/FFP	Jun 85	903,255	903,255	879,801	3,769	500	4,766	6,303	7,075	902,214
Rockwell	CPIF	Aug 93	43,068	43,068	43,068	0	0	0	0	0	43,068
Miscellaneous	Various	Various	0	0	651,359	221	0	0	5,600	335,567	992,747
ViaSat	C/FFP	Oct 95	3,041	3,041	2,541	535	0	0	0	0	3,076
Source for SBIR							62				62
<u>Support and Management Organizations</u>											
MITRE	CPAF	Various	N/A	N/A	96,360	5,818	1,185	500	732	14,250	118,845
SPT Contractors	Various	Various	N/A	N/A	154,361	2,260	156	272	526	7,185	164,760
Tecolote	Various	Various	N/A	N/A	1,380	468	0	0	0	0	1,848
Project 2487					Page 5 of 6 Pages				Exhibit R-3 (PE 0303601F)		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0303601F MILSATCOM Terminals					PROJECT 2487	
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	FY 2000	FY 2001	Budget to Complete	Total Program
Miscellaneous	Various	Various	N/A	N/A	18,997	718	156	488	794	13,536	34,689
<u>Test and Evaluation Organizations</u>											
Wright-Labs	AF-616*	N/A	N/A	N/A	20,638	1,465	100	1,000	1,000	0	24,203
Miscellaneous	Various	Various	N/A	N/A	5,441	66	0	0	0	0	5,507
<u>Government Furnished Property:</u> N/A											
<u>Product Development Property:</u> N/A											
<u>Support and Management Property:</u> N/A											
<u>Test and Evaluation Property:</u> N/A											
Identified as a source for SBIR							62				62
Subtotal Product Development					1,576,769	4,525	500	4,766	11,903	342,642	1,941,105
Subtotal Support and Management					271,098	9,264	1,497	1,260	2,052	34,971	320,142
Subtotal Test and Evaluation					26,079	1,531	100	1,000	1,000	0	29,710
Total Project					1,873,946	15,320	2,159	7,026	14,955	377,613	2,291,019
* An AF-616 is an internal transfer of funds between AF organizations.											

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305099F Global Air Traffic Management (GATM)
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	864	26,521	6,517	8,584	9,576	7,634	7,795	7,957	TBD	TBD
4689 Global Access Architecture	864	24,407	6,517	8,584	9,576	7,634	7,795	7,957	TBD	TBD
4690 GATM Integration	0	2,114	0	0	0	0	0	0	0	2,114
Quantity of RDT&E Articles	0	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. 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

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305099F Global Air Traffic Management (GATM)
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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 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U) Previous President's Budget (FY1999)	0	27,056	18,155	10,695	TBD
(U) Appropriated Value	0	27,056			
(U) Adjustments to Appropriated Value					
a. Congressional/General Reductions		535			
b. SBIR					
c. Omnibus or Other Above Threshold Reprogram					
d. Below Threshold Reprogramming	864				
(U) Adjustments to Budget Years Since FY1999 PB			- 11,638	-2,111	
(U) Current Budget Submit/2000 PB	864	26,521	6,517	8,584	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.

FY99: \$850K identified as a source for SBIR

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305099F Global Air Traffic Management (GATM)	PROJECT 4689
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4689 Global Access Architecture	864	24,407	6,517	8,584	9,576	7,634	7,795	7,957	TBD	TBD

(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.

- (U) FY 1998 (\$ in Thousands):**
- (U) \$ 376 Begin system architecture definitions
 - (U) \$ 324 Begin operational requirements analysis and evaluation
 - (U) \$ 164 Begin acquisition planning and preparation
 - (U) \$ 864 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational System Development	0305099F Global Air Traffic Management (GATM)	4689
<p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 3,228 System architecture definitions, development, and certification - (U) \$ 2,288 Operational requirements analysis, demonstration, and evaluation - (U) \$ 192 Acquisition of ID/IQ aviation equipment - (U) \$ 7,584 Prototype developments and the expansion of dual-use technologies - (U) \$ 8,520 Development of a GATM configurable cockpit and avionics test bed (RCAT) - (U) \$ 1,812 Nav/Safety and GPS/NAVWAR integration and interoperability evaluations - (U) \$ 783 Identified as a source for SBIR - (U) \$24,407 Total <p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 1,129 System architecture definitions, development, and certification - (U) \$ 975 Operational requirements analysis, demonstration, and evaluation - (U) \$ 2,669 Prototype developments and the expansion of dual-use technologies - (U) \$ 1,426 Development of a GATM configurable cockpit and avionics test bed (RCAT) - (U) \$ 203 Acquisition of ID/IQ aviation equipment - (U) \$ 115 Nav/Safety and GPS/NAVWAR integration and interoperability evaluations - (U) \$ 6,517 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 1,322 System architecture definitions, development, and certification - (U) \$ 1,358 Operational requirements analysis, demonstration, and evaluation - (U) \$ 2,862 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) \$ 8,584 Total <p>(U) B. <u>Project Change Summary - Description of Significant Changes:</u> None</p>		
Project 4689	Page 4 of 15 Pages	Exhibit R-2A (PE 0305099F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305099F Global Air Traffic Management (GATM)				PROJECT 4689		
(U) C. <u>Other Program Funding Summary (\$ in Thousands)</u>										
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To Complete</u>	<u>Total Cost</u>
(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	3,069	33,594	44,172	30,084	7,295					118,685
(U) Aircraft Procurement, AF, BA-5, C-5, 8.33 radio, PE0401119F	13,322	1,875								15,197
(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	5,100	3,254								11,654
(U) Aircraft Procurement, AF, BA-5, KC-10 8.33 radio, PE 0401219F	2,036	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	6,300	15,648	13,231	6,000						41,179
(U) Aircraft Procurement, AF, BA-5, C-17 8.33 radio, PE 0401130F	18,423									25,345
(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	649	10,804	12,225	1,863						25,541

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BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
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	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To Complete</u>	<u>Total Cost</u>
(U) Aircraft Procurement, AF, BA-5, C-17 PLSR, PE 0401130F	1,700									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	1,731	229	3,119	4,800	6,000					15,650
(U) Aircraft Procurement, AF, BA-5, C-20 TCAS, PE 0401314F	764	2,720								4,284
(U) Aircraft Procurement, AF, BA-5, C-21 GATM/New Generation Cockpit, PE 0401314F	4,497	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	3,905		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	2,920		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	2,575	1,636								7,711

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BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305099F Global Air Traffic Management (GATM)				PROJECT 4689		
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To Complete</u>	<u>Total Cost</u>
(U) Aircraft Procurement, AF, BA-5, T-43 TAWS, PE 0804742F				3,072	3,459		3,653	2,866		13,050
(U) Aircraft Procurement, AF, BA-5, C-130 Flight Data Recorder, PE 0401115F	56									5,737
(U) Aircraft Procurement, AF, BA-5, C-130 Avionics Modernization Program, PE 0401115F	1,825	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	17,376	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	3,200	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	6,000	27,687	47,392	40,034	16,371					141,484
(U) Aircraft Procurement, AF, BA-5, C-135 TAWS, PE 0401218F	5,419	8,932	19,383	9,439	8,788					92,708
(U) Aircraft Procurement, AF, BA-5, C-135 FDR/CVR, PE 0401218F	2,449	9,852	13,808	33,308	20,691	11,853				104,170
(U) Aircraft Procurement, AF, BA-5, C-135 Pacer CRAG, PE 0401218F	94,071	129,515	170,657	71,550						659,861
(U) Aircraft Procurement, AF, BA-5, C-137 TCAS, PE0401314	231									4,281
(U) Aircraft Procurement, AF, BA-5, C-141 TCAS, PE 0401118F	14,050	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

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BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305099F Global Air Traffic Management (GATM)				PROJECT 4689		
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To Complete</u>	<u>Total Cost</u>
(U) Aircraft Procurement, AF, BA-5, E-4 8.33 radio, PE 0302015F	376	300	556							1,232
(U) Aircraft Procurement, AF, BA-5, E-4 TCAS, PE 0302015F	2,200	1,482	1,166	1,166						8,014
(U) Aircraft Procurement, AF, BA-5, E-4 TAWS, PE 0302015F	3,522	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 0302015F		359	364	364						1,087
(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									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	3,100	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										
Project 4689			Page 8 of 15 Pages				Exhibit R-2A (PE 0305099F)			

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BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305099F Global Air Traffic Management (GATM)					PROJECT 4689						
the execution of assigned tasks. Program Research and Development Agreements (PRDAs), Cooperative Research and Development Agreements (CRDAs), and Indefinite Delivery/Indefinite Quantity (ID/IQ) contracts will be competitively awarded.																
(U) E. <u>Schedule Profile</u>																
* = Completed event X = Planned event																
		<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>		
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) Begin System Architecture Definitions																
		*														
(U) Begin Development of Open System Architectures																
					X											
(U) Prototype Development Contract Awards																
						X										
(U) Development of GATM Test Bed																
						X										
(U) GPS/NAVWAR Integration Activities																
							X									

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305099F Global Air Traffic Management (GATM)					PROJECT 4689	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U) Identified as a source for SBIR						783					
(U) System architecture definitions, development, and certification					376	3,228	1,129	1,322			
(U) Operational requirements analysis, demonstration, and evaluation					324	2,288	975	1,358			
(U) Acquisition of ID/IQ aviation equipment					164	192	203	207			
(U) Prototype developments and the expansion of dual-use technologies					0	7,584	2,669	2,862			
(U) Development of a GATM configurable cockpit and avionics test bed (RCAT)					0	8,520	1,426	2,714			
(U) Nav/Safety and GPS/NAVWAR integration and interoperability evaluations					0	1,812	115	121			
(U) Total					864	24,407	6,517	8,584			
(U) B. <u>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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Organizations:</u> Not applicable											
	TBD	VAR	TBD	TBD	0	0	20,948	5,853	7,796	TBD	TBD
<u>Support and Management Organizations</u>											
ESC	ESC/GA				0	864	2,676	664	788	TBD	TBD
<u>Test and Evaluation Organizations</u>											
					0	0	0	0	0	0	0
Project 4689					Page 10 of 15 Pages				Exhibit R-3 (PE 0305099F)		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305099F Global Air Traffic Management (GATM)	PROJECT 4689
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(U) B. Budget Acquisition History and Planning Information Continued (\$ in Thousands)

Government Furnished Property: None

<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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
Identified as a source for SBIR							783				
Subtotal Product Development		VAR	TBD	TBD		0	20,948	5,853	7,796	TBD	TBD
Subtotal Support and Management					0	864	2,676	664	788	TBD	TBD
Subtotal Test and Evaluation					0	0	0	0	0	0	0
Total Project					0	864	24,407	6,517	8,584	TBD	TBD

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BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305099F Global Air Traffic Management (GATM)				PROJECT 4690		
COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4690 GATM Integration	0	2,114	0	0	0	0	0	0	0	2,114
<p>(U) A. <u>Mission Description</u> 4690: <u>GATM Integration</u> [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 1998 (\$ in Thousands):</u> - (U) \$ 0 Total</p> <p>(U) <u>FY 1999 (\$ in Thousands):</u> - (U) 1,032 Systems engineering - (U) 715 Software engineering - (U) 300 Management and Support - (U) 67 Identified as a source for SBIR - (U) \$ 2,114 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands):</u> - (U) \$ 0 Total</p> <p>(U) <u>FY 2001 (\$ in Thousands):</u> - (U) \$ 0 Total</p>										
Project 4690			Page 12 of 15 Pages				Exhibit R-2A (PE 0305099F)			

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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305099F Global Air Traffic Management (GATM)	PROJECT 4690
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(U) B. Project Change Summary - Description of Significant 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.

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

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY</u> <u>2005</u>	<u>To</u> <u>Complete</u>	<u>Total</u> <u>Cost</u>
(U) Aircraft Procurement, AF, BA-5, C-130 Avionics Modernization Program, PE 0401115F	2,130	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:

N/A

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305099F Global Air Traffic Management (GATM)					PROJECT 4690	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U)	Identified as a source for SBIR					67					
(U)	Software engineering					715					
(U)	System engineering					1,032					
(U)	Management and Support					300					
(U)	Total				0	2,114	0		0		
(U) B. <u>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</u>	<u>Budget</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>Prior to</u>	<u>FY 1998</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>
<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>FY 1998</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Organizations</u>											
TBD	TBD	Dec 98		1,747	0	0	1,747	0	0	0	1,747
<u>Support and Management Organizations</u>											
WR-ALC/LU	TBD						200				200
ASC/LU	TBD						100				100
<u>Test and Evaluation Organizations</u>											
							0			0	0
Project 4690					Page 14 of 15 Pages				Exhibit R-3 (PE 0305099F)		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305099F Global Air Traffic Management (GATM)	PROJECT 4690
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(U) B. Budget Acquisition History and Planning Information Continued (\$ in Thousands)

Government Furnished Property:

Item Description	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Delivery Date	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	FY 2000	FY 2001	Budget to Complete	Total Program
<u>Product Development Property</u>										
TBD										TBD
<u>Support and Management Property</u>										
TBD										TBD
<u>Test and Evaluation Property</u>										
Identified as a source for SBIR						67				67
Subtotal Product Development						1,747			0	1,747
Subtotal Support and Management						300			0	300
Subtotal Test and Evaluation						0			0	0
Total Project				0	0	2,114			0	2,114

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305110F Satellite Control Network (Space)	PROJECT 3276
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
3276 Satellite Control Network	62,554	55,812	61,918	85,064	96,428	41,818	32,956	34,019	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

(U) The Air Force Satellite Control Network (AFSCN) mission is to fly operational USAF and other DoD satellites. The AFSCN also provides launch & 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.

(U) 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.

(U) AFSCN Improvement and Modernization (I&M): AFSCN I&M is an on-going 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.

(U) NETWORK OPERATIONS UPGRADES: The current Resource Management System (RMS), which deconflicts and allocates network telemetry, tracking & command assets to support operational space vehicles, will be replaced with an automated, Year 2000-compliant system which includes network resource scheduling and orbit analysis functions to include ephemeris and events generation, radio frequency interference detection and collision avoidance. This evolution offers tremendous 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 new Resource Management System. The software portions will be modified to meet AFSPC's operational requirements.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational System Development	0305110F Satellite Control Network (Space)	3276
<p>(U) 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>(U) 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> <p>(U) <u>FY 1998 (\$ in Thousands):</u></p> <p>(U) \$19,911 <u>Network Operations Upgrades:</u> (U) Developed, tested, and fielded Resource Scheduling, Basic Orbit Service, Control and Status, and Network Performance capabilities in primary locations. Began implementation of additional orbit service capabilities into RMS. Completed common HMI and common satellite control architecture study to finish Standard Satellite Control Subsystem effort and made results available to satellite SPOs.</p> <p>(U) \$31,325 <u>Communications Upgrades:</u> (U) Continued development, integration, and test of COTS archival recorder units at RTSs. Continued development, integration, and test of WANIUs into the AFSCN. Began development of OSR.</p> <p>(U) \$11,318 <u>Network Integration and Systems Engineering:</u> (U) Continued system engineering and integration of hardware/software to meet evolving satellite program requirements at the Operational Control Nodes (OCNs) and RTSs.</p> <p>(U) \$62,554 Total</p> <p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <p>(U) \$4,415 <u>Network Operations Upgrades:</u> (U) Begin Resource Scheduling integration and test of orbit service at back-up operational location.</p> <p>(U) \$35,303 <u>Communications Upgrades:</u> (U) Complete Archival Recorder System. Continue developing Operational Switch Replacement. Support WANIU installation at RTSs and OCNs.</p> <p>(U) \$3,180 <u>Range Upgrades:</u> (U) Begin development of antenna upgrades. Current 1960's technology antennas are very expensive to maintain. Modern designs are available off-the-shelf to provide increased performance, reduced interference, and multi-frequency alternatives.</p> <p>(U) \$11,029 <u>Network Integration and Systems Engineering:</u></p>		
Project 3276	Page 2 of 7 Pages	Exhibit R-2 (PE 0305110F)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational System Development	0305110F Satellite Control Network (Space)	3276
<p>(U) Continue system engineering and hardware/software integration to meet evolving satellite program requirements at OCNs and RTSs.</p> <p>(U) \$1,885 Identified as a source for SBIR</p> <p>(U) \$55,812 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <p>(U) \$5,164 <u>Network Operations Upgrades:</u> (U) Begin Orbit Analysis Service follow-on development to provide radio frequency interference (RFI) and collision avoidance analysis capabilities for the orbital analysis system.</p> <p>(U) \$32,169 <u>Communications Upgrades:</u> (U) Continue OSR development. Complete WANIU and archival recorders.</p> <p>(U) \$15,478 <u>Range Upgrades:</u> (U) Begin Control and Status (C&S) Processor Upgrade development. 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</p> <p>(U) \$9,107 <u>Network Integration and Systems Engineering:</u> (U) Continue system engineering and integration of hardware/software to meet evolving satellite program requirements at OCNs and RTSs.</p> <p>(U) \$61,918 Total</p> <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <p>(U) \$6,774 <u>Network Operations Upgrades:</u> Complete development of Orbit Analysis Service; begin development of Resource Scheduling Capacity Upgrade</p> <p>(U) \$21,226 <u>Communications Upgrades:</u> Complete OSR development; begin Defense Information System Network (DISN)-ATM connectivity development enabling AFSCN interface with DISN.</p> <p>(U) \$45,230 <u>Range Upgrades:</u> Begin Range Interoperability upgrade to integrate mission unique ground stations into the AFSCN; continue Standards Protocol development; begin effort to upgrade the Automated Remote Tracking Stations (ARTS) Space/Ground interface upgrade to receive, demodulate, decode, and format the new Staggered Quadrature Phase Shift Key (SQPSK) signal that is required by the SBIRS program; continue C&S Processor Upgrade.</p> <p>(U) \$11,834 <u>Network Integration and Systems Engineering:</u> (U) Continue system engineering and hardware/software integration to meet evolving satellite program requirements at OCNs and RTSs</p> <p>(U) \$85,064 Total</p> <p>(U) <u>B. Budget Activity Justification:</u> (U) This effort is in Budget Activity 7, Operational System Development, because it supports a fielded system.</p> <p>(U) <u>C. Program Change Summary (\$ in Thousands)</u></p>		
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BUDGET ACTIVITY 7 - Operational System Development		PE NUMBER AND TITLE 0305110F Satellite Control Network (Space)			PROJECT 3276						
		<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	Total <u>Cost</u>					
(U) Previous President's Budget (FY 1999 PB)		73,496	56,622	100,645	101,383	Continuing					
(U) Appropriated Value		80,011	56,622								
(U) Adjustments to Appropriated Value											
a. Cong Gen Reductions		-4,513	-810								
b. SBIR		-2,013									
c. Omnibus and Other Above Threshold Reprogram		-501									
d. Below Threshold Reprogramming		-10,430									
(U) Adjustments to Budget Years since FY 1999 PB				-38,727	-16,319						
(U) Current Budget Submit/FY2000 PB		62,554	55,812	61,918	85,064	Continuing					
(U) Significant Program Changes: (\$ in Thousands)											
FY98 below threshold reprogrammings to higher Air Force priorities as a result of descope of Human-Machine Interface/standardization effort and conclusion of Centralized Control and Monitor effort due to changed user requirements.											
FY99: 1,885 identified as a source for SBIR.											
FY00-01 adjustments funded higher Air Force and DoD priorities. Several I&M efforts were descope or eliminated due to user acceptance of threshold vs objective values for AFSCN automation, data throughput, fault isolation, and orbit determination requirements; additional 13,800 adjustment in FY00 properly aligned funds to OPAF to purchase hardware for secure voice system.											
(U) D. Other Program Funding Summary (\$ in Thousands)											
		<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	To <u>Compl</u>	Total <u>Cost</u>
(U) Other Procurement, AF; Budget Activity: 03;		22,193	22,950	33,591	32,178	40,216	34,795	38,027	33,071	Continue	Continue
P-69; AFSCN											
<u>Related RDT&E:</u> Not applicable											

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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305110F Satellite Control Network (Space)	PROJECT 3276
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(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 1998</u>			<u>FY 1999</u>			<u>FY 2000</u>			<u>FY 2001</u>		
	1	2	3	4	1	2	3	4	1	2	3	4
<u>Communications Upgrades</u>												
RTS archival installation initiation							X					
WANIU Critical Design Review (CDR)				*								
OSR System Functional Review (SFR)				*								
<u>Network Operations Upgrades</u>												
HMI Standardization complete				*								
<u>Range Upgrades</u>												
Start Control and Status Upgrade								X				
Begin DISN-ATM Connectivity											X	
*=completed; X=planned												

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305110F Satellite Control Network (Space)					PROJECT 3276	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U) Network Ops Upgrades (Command and Control Upgrades)					19,911	4,415	5,164	6,774			
(U) Communications Upgrades					31,325	35,303	32,169	21,226			
(U) Range Upgrades					0	3,180	15,478	45,230			
(U) Network Integration and Systems Engineering					11,318	11,029	9,107	11,834			
(U) Identified as a source for SBIR					0	1,885	0	0			
(U) Total					62,554	55,812	61,918	85,064			
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing <u>Activity</u>	Contract Method/Type or Funding <u>Vehicle</u>	Award or Obligation <u>Date</u>	Performing Activity <u>EAC*</u>	Project Office <u>EAC</u>	Total Prior to <u>FY 1998</u>	Budget <u>FY 1998</u>	Budget <u>FY 1999</u>	Budget <u>FY 2000</u>	Budget <u>FY 2001</u>	To <u>Complete</u>	Total <u>Program</u>
*Only includes projections/options exercised to date											
Identified as a source for SBIR							1,885				
<u>Product Development Organizations</u>											
Multiple	Multiple	Multiple	72,296	72,296	72,296	0	0	0	0	0	72,296
Lockheed Martin	C/CPAF	Mar 96	126,000	130,140	32,266	31,325	35,303	32,169	21,226	continuing	continuing
Lockheed Martin	C/CPAF	Apr 96	52,258	118,400	22,349	19,911	4,415	5,164	6,774	continuing	continuing
AFSCN Upgrades	TBD	TBD	TBD	205,057	0	0	3,180	15,478	45,230	continuing	continuing
Lockheed Martin	C/CPAF	May 96	66,700	74,050	11,189	11,318	11,029	9,107	11,834	continuing	continuing
<u>Support and Management Organizations</u>											
N/A											
<u>Test and Evaluation Organizations</u>											
N/A											
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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305110F Satellite Control Network (Space)					PROJECT 3276		
<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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>To Complete</u>	<u>Total Program</u>	
Government Furnished Property: N/A												
Identified as a source for SBIR							1,885					
Subtotal Product Development			317,254	599,943	138,100	62,554	53,927	61,918	85,064	continuing	continuing	
Subtotal Support and Management												
Subtotal Test and Evaluation												
Total Project			317,254	599,943	138,100	62,554	55,812	61,918	85,064	continuing	continuing	

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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305111F Weather Service	PROJECT 2738
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
2738 Weather Service	8,070	10,398	19,069	15,089	11,586	11,785	12,030	12,281	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

(U) 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) replaces unsupportable hardware and modernizes software infrastructure and capabilities to meet warfighter requirements for the 55th Space Weather Squadron (55 SWXS); (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) Satellite Data Handling System II (SDHS II) provides a fused infrastructure for the assimilation of advanced model, radar, lightning, and satellite data into a single user interface for the timely analysis and production of tailored weather products; (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.

(U) Beginning in FY00, Air Force Weather (AFW) programs will be 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. Analysis will continue the SDHS II effort and ensure the interoperability of the AFWA 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.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305111F Weather Service	PROJECT 2738
<p>(U) <u>FY 1998 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 4,579 CDFS II: Continue to create, rewrite, and host software modules - (U) \$ 2,821 GTWAPS: Continue software development for IOC 1 - (U) \$ 433 TWR: Prepare documentation and achieve Milestones I/III - (U) \$ 237 MOC FS-21: Begin preparation of Milestones I/II documentation - (U) \$ 8,070 Total <p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 4,905 CDFS II: Continue development of cloud depiction and forecast software - (U) \$ 1,967 GTWAPS: Continue operational software development for incremental IOCs - (U) \$ 250 TWR: SPO support and continue development of system interfaces with Forecast and Analysis systems - (U) \$ 1,546 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 - (U) \$ 40 SDHS II: Initiate assessment of operational alternative study and preparation of Milestones I/II/III documentation and achieve Milestones I/II/III - (U) \$ 1,350 SWAFS: Perform design and architecture study to accommodate incremental operational software IOC deliveries - (U) \$ 340 Identified as a source for SBIR - (U) \$ 10,398 Total <p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (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) \$ 2,300 SDHS II: Achieve Milestones I/II/III and begin operational software development for enhanced analysis infrastructure (Analysis) - (U) \$ 2,894 CDFS II: Continue development of cloud depiction and forecast software (Weather Forecasting) - (U) \$ 1,646 GTWAPS: Continue operational software development for incremental IOCs (Weather Forecasting) - (U) \$ 7,477 SWAFS: Continue operational software development of SWAFS for incremental IOCs (Weather Forecasting) - (U) \$ 3,125 MOC FS-21: Continue operational software integration with regional and tactical weather systems (Product Tailoring/Warfighter Applications) - (U) \$ 19,069 Total 		
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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational System Development	0305111F Weather Service	2738
<p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none">- (U) \$ 400 TWR: SPO support and continue development of system interfaces with Forecast and Analysis systems (Weather Data Collection)- (U) \$ 4,406 MOC OS-21: Continue development and integration of component sensor systems (Weather Data Collection)- (U) \$ 3,490 SDHS II: Continue software development for enhanced analysis infrastructure and achieve Milestone III (Analysis)- (U) \$ 996 CDFS II: Continue development of cloud depiction and forecast software (Weather Forecasting)- (U) \$ 2,519 SWAFS: Continue software development for incremental IOCs (Weather Forecasting)- (U) \$ 3,278 MOC FS-21: Continue software development and integration with regional and tactical weather systems (Product Tailoring/Warfighter Applications)- (U) \$ 15,089 Total <p>(U) B. <u>Budget Activity Justification</u></p> <p>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.</p>		
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305111F Weather Service	PROJECT 2738
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(U) D. Other Program Funding Summary (\$ in Thousands)

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To Compl</u>	<u>Total Cost</u>
(U) Other Procurement, AF, Weather Service (PE35111F WSC 833070)	21,124	18,352	25,434	26,434	28,854	27,643	28,172	28,750	Cont.	Cont.

(U) E. Acquisition Strategy

All major contracts within this Program Element 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.

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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305111F Weather Service	PROJECT 2738
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(U) F. Schedule Profile

	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) GTWAPS Milestones I/II/III	*															
(U) TWR Milestones I/III				*												
(U) SWAFS Milestones I/II/III						X										
(U) MOC FS-21 Milestones I/II/III							X									
(U) MOC OS-21 Milestones I/II/III										X						
(U) SDHS II Milestones I/II/III													X			

* - Denotes completed event

X - Denotes planned event

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)						DATE February 1999					
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305111F Weather Service				PROJECT 2738			
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
				<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>				
(U) 1st Article Development				0	0	1,255	0				
(U) System Software Integration				268	202	1,444	2,217				
(U) System Engineering Support				982	1,676	2,543	3,659				
(U) Contractor Engineering Support				1,108	1,137	2,741	2,835				
(U) Software Development				5,282	5,989	9,770	5,263				
(U) Travel				173	220	300	251				
(U) Program Management Support				257	834	1,016	864				
(U) Identified as a source of SBIR					340						
(U) Total				8,070	10,398	19,069	15,089				
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR						340					
<u>Product Development Organizations</u>											
Phillips Lab	MIPR	May 94	270	270	270	0	0	0	0	0	270
CalTech	LOE	Jun 94	1,172	1,172	1,172	0	0	0	0	0	1,172
CSC	LOE	Jan 94	2,127	2,127	2,127	0	0	0	0	0	2,127
GTE	FFP/PR	Oct 90	13,064	13,064	13,064	0	0	0	0	0	13,064
PRISM(Raytheon)	LOE	Jan 93	3,497	3,497	3,497	0	0	0	0	0	3,497
PRISM (Hughes)	LOE	Jan 93	3,396	3,396	3,396	0	0	0	0	0	3,396
Project 2738				Page 7 of 9 Pages				Exhibit R-3 (PE 0305111F)			

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305111F Weather Service					PROJECT 2738	
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Sterling	CPAF	Jun 95	21,621	21,621	4,600	4,441	4,770	2,800	742	0	17,353
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands) - Continued											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Air Weather Svc (CDFS II related work)	MIPR	4FY95	2,900	2,900	2,900	0	0	0	0	0	2,900
Hughes DNA	MIPR	Sep 95	1,682	1,682	1,682	0	0	0	0	0	1,682
CCPL (TRW)	FFP	Jan 95	100	100	100	0	0	0	0	0	100
Raytheon	FFP	Dec 97	3,986	3,986	0	2,023	1,067	996	0	Cont.	Cont.
TBD/MOC FS-21	MIPR	Sep 98	1,184	1,184	0	232	250	415	351	0	Cont.
TBD/MOC OS-21	TBD	TBD	TBD	TBD	0	0	1054	2,037	2,183	Cont.	Cont.
TBD SDHS II	TBD	TBD	TBD	TBD	0	0	0	879	3,506	Cont.	Cont.
SWAFS/SMC	TBD	TBD	TBD	TBD	0	0	0	1,353	2,151	Cont.	Cont.
	LOE	3FY99	TBD	TBD	0	0	1,350	6,000	1,648	Cont.	Cont.
<u>Support and Management Organizations</u>											
Electronic Systems Center (ESC)					632	192	637	765	843	Cont.	Cont.
Space and Missile Center (SMC)					0	40	45	878	517	Cont.	Cont.
MITRE/Aerospace TEMS					1,009	1,142	885	2,946	3,148	Cont.	Cont.

		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305111F Weather Service	
<u>Test and Evaluation Organizations</u> Not Applicable		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305111F Weather Service					PROJECT 2738	
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands) - Continued</u>											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Government Furnished Property: Not Applicable											
Identified as a source for SBIR							340				
Subtotal Product Development					32,808	6,696	8,491	14,480	10,581	Cont.	Cont.
Subtotal Support and Management					1,641	1,374	1,567	4,589	4,508	Cont.	Cont.
Subtotal Test and Evaluation					0	0	0	0	0	Cont.	Cont.
Total Project					34,449	8,070	10,398	19,069	15,089	Cont.	Cont.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305114F Air Traffic Cntrl/Approach/Landing Sys (ATCALs)
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	7,876	4,389	5,588	11,854	12,381	5,629	5,942	6,059	Continuing	TBD
2026 System Support	70	253	242	254	239	248	196	195	Continuing	TBD
3587 Air Traffic Control Systems	7,806	4,136	5,346	11,600	12,142	5,381	5,746	5,864	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	1/1	0	0	0	0	0	0

(U) A. Mission Description

This effort was originally established for development of Military Microwave Landing System Avionics (MMLSA) and acquisition of the commercially developed Commercial Microwave Landing System Avionics (CMLSA). It was part of a twenty-year program to transition Air Force operations from the use of Precision Approach Radar (PAR) and Instrument Landing System (ILS) to the Microwave Landing System (MLS) for precision approach and landing. With termination of the MLS as the national precision landing standard, the effort is now being redirected to develop a replacement box for ILS avionics to sustain precision landing capability until the follow-on capability is chosen. The current Air Force ILS receivers do not meet the new specification required by the International Civil Aviation Organization (ICAO) for protection from interference problems forecast to occur after 1998. This program accomplished an Analysis of Alternatives (AOA) for the Joint Precision Approach and Landing System (JPALS) program which resulted in identification of the follow-on to the ILS and PAR systems. This program will also fund continuing studies to obtain an autonomous precision landing capability, and air traffic control studies under Global Access, Navigation, and Safety (GANS) efforts. Project 2026 funds ongoing liaison and interagency cooperative studies, between the USAF Air Traffic Control (ATC) and Landing Systems (ATCALs) 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).

(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 1999
BUDGET ACTIVITY 7 - Operational System Development			PE NUMBER AND TITLE 0305114F Air Traffic Cntrl/Approach/Landing Sys (ATCALs)		
(U) C. <u>Program Change Summary (\$ in Thousands)</u>					
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U) Previous President's Budget (FY 1999 PB)	5,928	4,729	6,989	5,580	TBD
(U) Appropriated Value	13,471	4,729			
(U) Adjustments to Appropriated Value					
a. Cong Reductions	-536	-340			
b. SBIR	-334				
c. Omnibus or Other Above Threshold Reprogram	-6,761				
d. Below Threshold Reprogramming	2,036				
e. Recisions					
f. Other		*			
(U) Adjustments to Budget Years Since FY 1999 PB			-1,401	6,274	
(U) Current Budget Submit/FY 2000 PB	7,876	4,389	5,588	11,854	TBD
(U) Significant Program Changes:					
Funding:					
(U) 1. FY 99: \$145,000 identified as a source for SBIR					
(U) 2. FY 00 includes a -\$1,300 adjustment in support of the public key initiatives and defense information infrastructure					
(U) 3. FY01 includes a +\$6,500 increase for Mobile Approach Control System development.					
*(U) 4. \$7,980 awaiting reclassification to support development of Mobile Approach Control System for Air National Guard and USAF					

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305114F Air Traffic Cntrl/Approach/Landing Sys (ATCALs)	PROJECT 2026
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
2026 System Support	70	253	242	254	239	248	196	195	Continuing	TBD

(U) A. Mission Description

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.

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

- (U) \$ 10 Support for all ATCALs projects
- (U) \$ 50 Conduct interoperability and interface evaluations
- (U) \$ 10 Support for the precision landing system studies for the Joint Special Operations Command (JSOC)
- (U) \$ 70 Total

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

- (U) \$ 89 Support for all Air Traffic Control and Landing Systems (ATCALs) projects
- (U) \$113 Conduct interoperability and interface evaluations
- (U) \$ 51 Support for the precision landing system studies for the Joint Special Operations Command (JSOC)
- (U) \$253 Total

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

- (U) \$ 88 Support for all Air Traffic Control and Landing Systems (ATCALs) projects
- (U) \$108 Conduct interoperability and interface evaluations
- (U) \$ 46 Support for the precision landing system studies for the Joint Special Operations Command (JSOC)
- (U) \$242 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305114F Air Traffic Cntrl/Approach/Landing Sys (ATCALs)	PROJECT 2026
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(U) FY 2001 (\$ in Thousands):

- (U) \$ 92 Support for all Air Traffic Control and Landing Systems (ATCALs) projects
- (U) \$113 Conduct interoperability and interface evaluations
- (U) \$ 49 Support for the precision landing system studies for the Joint Special Operations Command (JSOC)
- (U) \$254 Total

(U) **B. Project Change Summary - Description of Significant Changes:**

Not Applicable

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

Not Applicable.

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

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305114F Air Traffic Cntrl/Approach/Landing Sys (ATCALs)	PROJECT 2026
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(U) E. Schedule Profile

	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) Acquisition Milestones N/A																
(U) Contract Milestone																
(U) Initial Tower Restoral Vehicle (TRV) Delivery			*													
(U) Test and Evaluation Milestones																
(U) Operational Testing Complete																
(U) First Article Testing Complete	*															
(U) Conduct Precision Landing Studies					*					X					X	

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)						DATE February 1999					
BUDGET ACTIVITY					PE NUMBER AND TITLE					PROJECT	
7 - Operational System Development					0305114F Air Traffic Cntrl/Approach/Landing Sys (ATCALs)					2026	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
				<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>				
(U) System Engineering				40	143	147	147				
(U) Contract Engineering				20	90	75	87				
(U) Test and Evaluation Support				0	0	0	0				
(U) Program Management Support				5	10	10	10				
(U) Travel				5	10	10	10				
(U) Total				70	253	242	254				
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations: AFMC, ESC, Hanscom AFB, MA manages the overall ATCALs effort. MITRE Corporation, Bedford, MA, provides technical engineering support											
<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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Organizations:</u>											
None					0						
<u>Support and Management Organizations</u>											
Various	Multiple	Multiple	N/A		948	70	253	242	254	TBD	TBD
<u>Test and Evaluation Organizations</u>											
N/A:	N/A	N/A	0	0	0	0	0	0	0	0	0
Project 2026				Page 6 of 14 Pages				Exhibit R-3 (PE 0305114F)			

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305114F Air Traffic Cntrl/Approach/Landing Sys (ATCALs)	PROJECT 2026
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(U) B. Budget Acquisition History and Planning Information Continued (\$ in Thousands)

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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>FY 2000</u>	<u>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										
Subtotal Product Development				0	0	0	0	0		
Subtotal Support and Management				948	70	253	242	254		
Subtotal Test and Evaluation				0	0	0	0	0		
Total Project				948	70	253	242	254		

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 1999			
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305114F Air Traffic Cntrl/Approach/Landing Sys (ATCALs)				PROJECT 3587			
COST (\$ In Thousands)		FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
3587 Air Traffic Control Systems		7,806	4,136	5,346	11,600	12,142	5,381	5,746	5,864	Continuing	TBD

(U) A. Mission Description

DoD and the Department of Transportation (DOT) have a goal to develop and acquire a common civil/military precision approach and landing system that is capable of operating with Category I, II, or III signal guidance accuracy. The International Civil Aviation Organization (ICAO) and NATO designated worldwide implementation for Precision Landing System (PLS) for January 1998 with Microwave Landing System (MLS) as the standard. Due to the emergence of the Global Positioning System (GPS), as a more cost effective solution, the Air Force's precision landing development has been redirected to develop a replacement box for the Instrument Landing System (ILS) to support a precision landing capability until GPS becomes available. The replacement box capability will allow DoD to meet the ICAO requirements for FM frequency protection. This is especially critical in Europe where there is a high density of FM radio stations. The Air Force has worldwide deployment commitments and large numbers of aircraft must comply with the ICAO Standards and recommended practices. In FY97, the Air Force began a new effort to install the Precision Landing System Receiver (PLSR) on its C-17 aircraft to solve short-term operational deficiencies. In FY98, an analysis of alternatives for the Joint Precision Approach and Landing System The DoD is also tasked to maintain commonality and interoperability with new and emerging technologies being developed, introduced and placed into civil and military usage by the FAA and its NATO allies. It is essential the Air Force maintain currency in the area of emerging technologies in order to interoperable with all current and future U.S. Civil and NATO air traffic control systems.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305114F Air Traffic Cntrl/Approach/Landing Sys (ATCALs)	PROJECT 3587
<p>(U) <u>FY 1998 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$865 Continue development of a precision landing capability to include Differential GPS - (U) \$113 Perform platform integration and system engineering analyses - (U) \$208 Begin Precision Landing System (PLS) flight certification - (U)\$3,720 Joint Precision Approach and Landing System - (U)\$2,900 Autonomous Landing Guidance System - (U)\$7,806 Total <p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 84 Continue to perform platform integration and system engineering analyses - (U) \$ 365 Complete PLS flight testing /certification - (U) \$1,680 Mobile Approach Control System Analysis of Alternatives - (U) \$1,862 Begin Air Force Terminal Instrument Procedures System Development - (U) \$ 145 Identified as source of SBIR - (U) \$4,136 Total <p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$3,046 Begin Mobile Approach Control System Development - (U) \$ 466 Support field to ensure USAF ATC interoperability with FAA and NATO - (U) \$1,309 Complete Air Force Terminal Instrument Procedures System development and testing - (U) \$ 525 Begin technology insertion studies to determine USAF ATC applicability with coalition allies - (U) \$5,346 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 9,700 Continue Mobile Approach Control System Development - (U) \$ 514 Support field activities to ensure USAF ATC interoperability with FAA and NATO - (U) \$ 610 Continue technology insertion studies to determine USAF ATC applicability with coalition allies - (U) \$ 776 Investigate improvements in Mode S capabilities - (U) \$11,600 Total 		
Project 3587	Page 9 of 14 Pages	Exhibit R-2A (PE 0305114F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 1999																																																								
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305114F Air Traffic Cntrl/Approach/Landing Sys (ATCALs)				PROJECT 3587																																																								
<p>B. (U) <u>Project Change Summary (\$ in Thousands)</u></p> <p>(U) Significant Program Changes:</p> <p style="padding-left: 40px;">(U) 1. FY00 includes a -\$1,300 adjustment in support of the public key initiatives and defense information infrastructure</p> <p style="padding-left: 40px;">(U) 2. FY01 includes a +\$6,500 increase for Mobile Approach Control System development</p> <p>(U) C. <u>Other Program Funding Summary (\$ in Thousands):</u></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;"><u>FY 1998</u></th> <th style="text-align: center;"><u>FY 1999</u></th> <th style="text-align: center;"><u>FY 2000</u></th> <th style="text-align: center;"><u>FY 2001</u></th> <th style="text-align: center;"><u>FY 2002</u></th> <th style="text-align: center;"><u>FY 2003</u></th> <th style="text-align: center;"><u>FY 2004</u></th> <th style="text-align: center;"><u>FY 2005</u></th> <th style="text-align: center;"><u>To Compl</u></th> <th style="text-align: center;"><u>Total Cost</u></th> </tr> </thead> <tbody> <tr> <td>(U) 3010</td> <td style="text-align: right;">148</td> <td style="text-align: right;">0</td> <td style="text-align: center;">cont</td> <td style="text-align: center;">TBD</td> </tr> <tr> <td>(U) 3080 - BA 3</td> <td style="text-align: right;">2,350</td> <td style="text-align: right;">7,890*</td> <td style="text-align: right;">9,025</td> <td style="text-align: right;">10,624</td> <td style="text-align: right;">33,903</td> <td style="text-align: right;">42,157</td> <td style="text-align: right;">76,033</td> <td style="text-align: right;">85,132</td> <td style="text-align: center;">cont</td> <td style="text-align: center;">TBD</td> </tr> <tr> <td>(U) 3080 (PE 84775)</td> <td style="text-align: right;">6,675**</td> <td style="text-align: right;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">6,675</td> </tr> <tr> <td>(U) 3300</td> <td style="text-align: right;">3,400</td> <td style="text-align: right;">16,514</td> <td style="text-align: right;">0</td> <td style="text-align: right;">4,000</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: center;">cont</td> <td style="text-align: center;">TBD</td> </tr> </tbody> </table> <p>*Awaiting reclassification from APPN 3080 to APPN 3600 for development of the Mobile Approach Control System for the Air National Guard and USAF</p> <p>** For procurement of Air Traffic Control Simulators and Part task Trainers in support of the Air Traffic Control school house at Keesler AFB MS</p> <p>(U) D. <u>Acquisition Strategy:</u> Engineering Manufacturing Development, Fixed Price Incentive Fee (FPIF), No Non-Developmental Items (NDI)</p>											<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To Compl</u>	<u>Total Cost</u>	(U) 3010	148	0	0	0	0	0	0	0	cont	TBD	(U) 3080 - BA 3	2,350	7,890*	9,025	10,624	33,903	42,157	76,033	85,132	cont	TBD	(U) 3080 (PE 84775)	6,675**	0	0	0	0	0	0	0	0	6,675	(U) 3300	3,400	16,514	0	4,000	0	0	0	0	cont	TBD
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To Compl</u>	<u>Total Cost</u>																																																						
(U) 3010	148	0	0	0	0	0	0	0	cont	TBD																																																						
(U) 3080 - BA 3	2,350	7,890*	9,025	10,624	33,903	42,157	76,033	85,132	cont	TBD																																																						
(U) 3080 (PE 84775)	6,675**	0	0	0	0	0	0	0	0	6,675																																																						
(U) 3300	3,400	16,514	0	4,000	0	0	0	0	cont	TBD																																																						
Project 3587			Page 10 of 14 Pages				Exhibit R-2A (PE 0305114F)																																																									

DATE **February 1999**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
**0305114F Air Traffic Cntrl/Approach/Landing Sys
(ATCALs)**

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)												DATE February 1999				
BUDGET ACTIVITY 7 - Operational System Development						PE NUMBER AND TITLE 0305114F Air Traffic Cntrl/Approach/Landing Sys (ATCALs)						PROJECT 3587				
(U) E. <u>Schedule Profile</u>																
		<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>		
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) Acquisition Milestones:																
(U) Contract Milestones																
(U) Contract Award (GCA-2000)																
(U) Delivery of 1 st System				*												
(U) C-17 Precision Landing System Receiver Contract Modification																
(U) MACS AOA					X											
(U) AFTERPS Contract Award						X										
(U) MACS Contract Award												X				

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE	
BUDGET ACTIVITY										PROJECT	
7 - Operational System Development										3587	
PE NUMBER AND TITLE											
0305114F Air Traffic Cntrl/Approach/Landing Sys (ATCALs)											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
GEC Marconi-Hazeltine	FPIF	Jun 93	19,400	19,400	9,300	865	246	0	0	TBD	TBD
Lear Astronics	FFP	Dec 97	2,900	2,900	0	2,900	0	0	0		
TBD	TBD	TBD	TBD	TBD			3,542	4,966	11,230	Continue	TBD
<u>Support and Management Organizations</u>											
Various	Multiple	Multiple	N/A	N/A		4,041	203	380	370	Continue	TBD
<u>Test and Evaluation Organizations</u>											
FAA Test Center	MIPR	May 97			142	0	0			0	142
(U) B. Budget Acquisition History and Planning Information Continued (\$ in Thousands)											
Government Furnished Property:											
Item Description	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Delivery Date		Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
<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 1999
BUDGET ACTIVITY	PE NUMBER AND TITLE				PROJECT
7 - Operational System Development	0305114F Air Traffic Cntrl/Approach/Landing Sys (ATCALs)				3587
Identified as a source for SBIR				145	
Subtotal Product Development	9,300	3,765	3,788	4,966	11,230
Subtotal Support and Management		4,041	203	380	370
Subtotal Test and Evaluation			0	0	0
Total Project	9,300	7,806	4,136	5,346	11,595

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305119F Medium Launch Vehicles (Space)	PROJECT 624A
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
624A Medium Launch Vehicle	2,002	7,338	1,179	1,963	1,470	979	0	0	0	408,550
Quantity of RDT&E Articles	0	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 ELVs, including Atlas II and Delta II 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 1998: (\$ in thousands)

- (U) \$ 944 Delta II range required facilities upgrade
- (U) \$ 0 Delta II systems integration
- (U) \$ 1,058 Sustaining engineering and mission support for MLV launch facilities, infrastructure, and launch operations for launch complexes 3, 17, and 36
- (U) \$ 2,002 Total

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

- (U) \$ 500 Delta II range required facilities upgrade
- (U) \$ 700 Delta II systems integration
- (U) \$ 1,922 Sustaining engineering and mission support for MLV launch facilities, infrastructure, and launch operations for launch complexes 3, 17, and 36
- (U) \$ 3,990 Funds reprogrammed to higher Air Force priorities
- (U) \$ 226 Identified as a source for SBIR
- (U) \$ 7,338 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305119F Medium Launch Vehicles (Space)	PROJECT 624A
--	---	------------------------

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

- (U) \$ 500 Delta II range required facilities upgrade
- (U) \$ 350 Delta II systems integration
- (U) \$ 329 Sustaining engineering and mission support for MLV launch facilities, infrastructure, and launch operations for launch complexes 3, 17, and 36
- (U) \$ 1,179 Total

(U) FY 2001: (\$ in thousands)

- (U) \$ 500 Delta II range required facilities upgrade
- (U) \$ 300 Delta II systems integration
- (U) \$ 1,163 Sustaining engineering and mission support for MLV launch facilities, infrastructure, and launch operations for launch complexes 3, 17, and 36
- (U) \$ 1,963 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.

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

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total</u>
(U) Previous President's Budget (FY1999 PB)	5,130	7,375	8,009	7,992	430,139
(U) Appropriated Value	5,719	7,375			
(U) Adjustments to Appropriated Value					
a. Congressional Gen Reductions	-478	-37			
b. SBIR	-118				
c. Omnibus or Other Above Threshold Reprogram	-35				
d. Below Threshold Reprogramming	-3,086				
(U) Adjustments to Budget Years Since FY 1999 PB			-6,830	-6,029	
(U) Current Budget Submit/FY2000 President's Budget	2,002	7,338	1,179	1,963	408,550

(U) Significant Program Changes: Funding: \$3,086 of FY98 funds were reprogrammed to finance higher priority Air Force programs. Funds were available due to requirement reductions for integration and launch facility/infrastructure upgrades and improvements. \$226 of FY99 is identified as a source for SBIR. FY00 and 01 adjustments are due to reduced requirements for sustaining engineering.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)											DATE February 1999																																																																																								
BUDGET ACTIVITY 7 - Operational System Development						PE NUMBER AND TITLE 0305119F Medium Launch Vehicles (Space)					PROJECT 624A																																																																																								
<p>(U) D. Other Program Funding Summary (\$ in Thousands)</p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:30%;"></th> <th style="width:5%;">FY 1998</th> <th style="width:5%;">FY 1999</th> <th style="width:5%;">FY 2000</th> <th style="width:5%;">FY 2001</th> <th style="width:5%;">FY 2002</th> <th style="width:5%;">FY 2003</th> <th style="width:5%;">FY 2004</th> <th style="width:5%;">FY 2005</th> <th style="width:5%;">To Compl</th> <th style="width:5%;">Total Cost</th> </tr> </thead> <tbody> <tr> <td>(U) Missile Procurement, Air Force (PE35119F) (BA45, P-25/26)</td> <td align="right">195,550</td> <td align="right">175,085</td> <td align="right">64,834</td> <td align="right">54,683</td> <td align="right">41,963</td> <td align="right">10,517</td> <td align="right">6,812</td> <td align="right">0</td> <td align="right">0</td> <td align="right">2,597,534</td> </tr> </tbody> </table> <p>Related RDT&E: None</p> <p>(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 finances 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 replenishment Global Positioning System (GPS) satellites. The final option on the Boeing production contract for the last 5 Delta II boosters was exercised in January 1999. The MLV program is scheduled to start transitioning to EELV beginning with FY02 launches.</p> <p>(U) F. Schedule Profile</p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:25%;"></th> <th colspan="3" style="text-align: center;"><u>FY 1998</u></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> <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) Delta/GPS Launches</td> <td align="center">*</td> <td></td> <td></td> <td></td> <td></td> <td align="center">X</td> </tr> <tr> <td>(U) Delta/STP Launch</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></td> </tr> <tr> <td>(U) Atlas /DSCS Launches</td> <td align="center">*</td> <td></td> <td></td> <td></td> <td></td> <td align="center">X</td> <td></td> <td></td> <td></td> <td align="center">X</td> <td></td> <td></td> </tr> </tbody> </table> <p>*=complete X=planned</p>														FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost	(U) Missile Procurement, Air Force (PE35119F) (BA45, P-25/26)	195,550	175,085	64,834	54,683	41,963	10,517	6,812	0	0	2,597,534		<u>FY 1998</u>			<u>FY 1999</u>			<u>FY 2000</u>			<u>FY 2001</u>				1	2	3	4	1	2	3	4	1	2	3	4	(U) Delta/GPS Launches	*					X	X	X	X	X	X	X	(U) Delta/STP Launch					*								(U) Atlas /DSCS Launches	*					X				X		
	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost																																																																																									
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	1	2	3	4	1	2	3	4	1	2	3	4																																																																																							
(U) Delta/GPS Launches	*					X	X	X	X	X	X	X																																																																																							
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Project 624A			Page 3 of 5 Pages					Exhibit R-2 (PE 0305119F)																																																																																											

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305119F Medium Launch Vehicles (Space)					PROJECT 624A	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U)	Delta II Range Facilities Upgrades				944	500	500	500			
(U)	Delta II Systems Integration				0	700	350	300			
(U)	Sustaining Engineering and Mission Support				1,058	1,922	329	1,163			
(U)	Identified as a source for SBIR					226					
(U)	Pending below threshold reprogramming					3,990					
(U)	Total				2,002	7,338	1,179	1,963			
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
<u>Contractor or</u>	<u>Contract</u>										
<u>Government</u>	<u>Method/Type or</u>	<u>Award or</u>	<u>Performing</u>	<u>Project</u>	<u>Total</u>						
<u>Performing</u>	<u>Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</u>	<u>Prior to</u>	<u>Budget</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>FY 1998</u>	<u>FY 1998</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	0	0	0	0	70,927
Boeing	SS/FFP	Sep 87	N/A	N/A	205,270	0	0	0	0	0	205,270
Boeing	C/FFP	Apr 93	N/A	N/A	23,533	1,535	2,500	1,000	1,500	2,100	32,168
GSAC	Various	Various	N/A	N/A	3,321	0	0	0	0	0	3,321
Austere	Various	Various			10,484	0	0	0	0	0	10,484
Improvements											
Project 624A											
Page 4 of 5 Pages											
Exhibit R-3 (PE 0305119F)											

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305119F Medium Launch Vehicles (Space)					PROJECT 624A	
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
<u>Support and Management Organizations</u>											
Mission Support	SS/FPI	FY94	N/A	N/A	15,736	467	622	179	463	349	17,816
Various SMC	Various	FY94	N/A	N/A	53,218	0	0	0	0	0	53,218
Other Ktr Sup	SS/FFP	FY94	N/A	N/A	2,254	0	0	0	0	0	2,254
Vandenberg Sup Environment/Safety	Various	Various	N/A	N/A	3,270	0	0	0	0	0	3,270
	Various	Various	N/A	N/A	5,606	0	0	0	0	0	5,606
Source for SBIR							226				226
Pending BTR							3,990				3,990
<u>Test and Evaluation Organizations</u>											
Not Applicable											
Government Furnished Property: Not Applicable											
Subtotal Product Development					313,535	1,535	2,500	1,000	1,500	2,100	322,170
Subtotal Support and Management					80,084	467	4,838	179	463	349	86,380
Subtotal Test and Evaluation					0	0	0	0	0	0	0
Total Project					393,619	2,002	7,338	1,179	1,963	2,449	408,550

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305128F Security and Investigative Activities (S&IA)				PROJECT 1931		
COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
1931 TECH SURVEIL COUNTER MEAS EQPT	3,301*	1,403	466	471	473	477	487	497	0	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

* Cost of test articles embedded in overall project cost; breakout not available..

(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. There were 2800 computer security violations and/or intrusion incidents reported to AFOSI in 1996. 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.

Project 1931 Page 1 of 9 Pages Exhibit R-2 (PE 0305128F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305128F Security and Investigative Activities (S&IA)	PROJECT 1931
<p>(U) <u>FY 1998 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 480 Telephone/Computer LAN Analyzer. Demonstration and validation of upgraded software - (U) \$ 500 Computer Crimes Investigative (CCI) Equipment. RDT&E of CCI software - (U) \$ 437 Linux Media Analysis Platform. RDT&E of Linux Media Analysis Platform - (U) \$1,884 Air Force Critical Infrastructure Protection Studies - (U) \$3,301 Total <p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$55 Telephone/Computer LAN Analyzer. Demonstration and validation of upgraded software and hardware - (U) \$818 Computer Crimes Investigative (CCI) Equipment. RDT&E of CCI software - (U) \$308 Ground Penetrating Radar/Millimeter Wave Equipment. Demonstration and validation of millimeter wave technology - (U) \$100 Next Generation Technical Surveillance Countermeasures (TSCM) Receiver. Demonstration and validation of TSCM receiver - (U) \$75 Language Translation Software. Development of document translation software - (U) \$47 Identified as a Source for SBIR - (U) \$1,403 Total 		
Project 1931	<i>Page 2 of 9 Pages</i>	Exhibit R-2 (PE 0305128F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational System Development	0305128F Security and Investigative Activities (S&IA)	1931
<p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none">- (U) \$250 Telephone/Computer LAN Analyzer. Demonstration and validation of upgraded software and hardware- (U) \$142 Next Generation Technical Surveillance Countermeasures (TSCM) Receiver. Demonstration and validation of TSCM receiver- (U) \$ 74 Computer Crimes Investigative (CCI) Equipment. RTD&E of CCI software- (U) \$466 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none">- (U) \$250 Telephone/Computer LAN Analyzer. Demonstration and validation of upgraded software and hardware.- (U) \$100 Next Generation Technical Surveillance Countermeasures (TSCM) Receiver. Demonstration and validation of TSCM receiver.- (U) \$121 Computer Crimes Investigative (CCI) Equipment. RTD&E of CCI software.- (U) \$471 Total		
Project 1931	Page 3 of 9 Pages	Exhibit R-2 (PE 0305128F)

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		DATE February 1999
7 - Operational System Development	PE NUMBER AND TITLE 0305128F Security and Investigative Activities (S&IA)	PROJECT 1931

Budget Activity Justification:

This program is in Budget Activity 7, Operational System Development, because its products are primarily for use in investigative activity of an operational nature.

Program Change Summary (\$ in Thousands)

	<u>FY 1998</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Cost</u>
(U) Previous President's Budget (FY1999 PB)	458	474		TBD
(U) Appropriated Value	1458			
(U) Adjustments to Appropriated Value	-114	-55	0	
b. SBIR				
c. Omnibus or Other Above Threshold Reprogramming	-23			
(U) Adjustments to Budget Years Since FY 1999 PB		-8		
(U) Current Budget Submit/FY 2000 PB	3,301	466	471	
(U) Significant Program Changes:	\$1.8M Congressional add in FY 98 \$1.0M Congressional add in FY 99			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 1999				
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305128F Security and Investigative Activities (S&IA)				PROJECT 1931				
(U) D. <u>Other Program Funding Summary (\$ in Thousands)</u>												
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To Compl</u>	<u>Total Cost</u>		
Automatic Data Processing Equipment	95	82	0	0	187	187	191	195	TBD	TBD		
Radio Equipment	0	0	416	416	416	416	416	416	TBD	TBD		
Base Communication Infrastructure	414	1000	0	0	0	0			0	414		
Base Procured Equipment	0	0	0	0	0	0			0	0		
Technical Surveillance Countermeasures Equipment BA63/Security & Investigative Activities/PE0305128F	1928	2030	2976	3004	2831	2830	2890	2955	TBD	TBD		
(U) E. Acquisition Strategy:												
All major contracts within this Program Element were awarded via sole source contract due to the sensitivity of technologies involved.												
(U) F. <u>Schedule Profile</u>												
		<u>FY 1998</u>		<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>				
	1	2	3	4	1	2	3	4	1	2	3	4
(U) TSCM Receiver/Software Suite					X					X		
(U) Telephone/Computer LAN Analyzer		X			X							
(U) CCI Equipment		X			X							
(U) Millimeter Wave Equipment											X	
(U) Language Translation Software					X							
(U) LINUX Media Analysis Platform		X								X		
Project 1931												
Page 5 of 9 Pages												
Exhibit R-2 (PE 0305128F)												

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY					PE NUMBER AND TITLE					PROJECT	
7 - Operational System Development					0305128F Security and Investigative Activities (S&IA)					1931	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U) Primary Hardware Development					437	361	150	371			
(U) Software Development					980	305	316	100			
(U) Studies					1,884	690	0	0			
(U) Identified as a Source for SBIR					0	47	0	0			
(U) Total					3,301	1,403	466	471			
(U) B. <u>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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
Identified as a Source for SBIR							47				
<u>Product Development Organizations</u>											
Matrix Engineering	SS/FFP	Feb 98	N/A	N/A	130	960	50	0	0	0	1,140
Sensys Technologies	SS/FFP	Mar 98	N/A	N/A	152	457	55	242	250	TBD	1,156
Army Research Lab	SS/FFP	Mar 99	N/A	N/A	0	0	75	74	130	TBD	279
Rome Labs	SS/FFP	Mar 99	N/A	N/A	0	0	301	0	0	0	301
TBD	SS/FFP	Mar 99	N/A	N/A	0	0	875	150	91	TBD	1,163
Project 1931											
Page 6 of 9 Pages											
Exhibit R-3 (PE 0305128F)											

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305128F Security and Investigative Activities (S&IA)					PROJECT 1931	
<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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Support and Management Organizations:</u>											
None											
<u>Test and Evaluation Organizations:</u>											
None											
<u>Government Furnished Property:</u>											
None											
<u>Product Development Property:</u>											
None											
<u>Support and Management Property:</u>											
None											
<u>Test and Evaluation Property:</u>											
None											
Project 1931				Page 7 of 9 Pages				Exhibit R-3 (PE 0305128F)			

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)						DATE February 1999	
BUDGET ACTIVITY		PE NUMBER AND TITLE				PROJECT	
7 - Operational System Development		0305128F Security and Investigative Activities (S&IA)				1931	
Identified as a Source for SBIR					47		
Subtotal Product Development	282	1,417	1,356	466	471	TBD	TBD
Subtotal Support and Management	0	0	0			0	0
Subtotal Test and Evaluation	0	0	0			0	0
AF Infrastructure Protection Studies		1,884					
Total Project	282	3,301	1,403	466	471	TBD	TBD

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305137F National Airspace System					PROJECT 4090	
COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4090 National Airspace System (NAS)	11,635	1,780	1,756	201	203	206	0	0	0	109,635
Quantity of RDT&E Articles	2*	0	0	0	0	0	0	0	0	0

(U) **Note:** * Cost of RDT&E articles (\$3.0 Million in FY98) includes two (2) automation subsystems to support developmental/operational testing.

(U) **A. Mission Description:**
 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 effectively schedule and manage SUA. DoD military ATC and fighting/flying readiness will be maintained.

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

- (U) \$ 4,400 Continue Military Airspace Management System (MAMS) development
- (U) \$ 137 Complete facility/transition planning and continue site surveys
- (U) \$ 455 Continue NAS DoD subsystem analysis for each DoD site
- (U) \$ 2,138 Continue radar acquisition and test
- (U) \$ 4,190 Continue automation acquisition and test
- (U) \$ 315 Complete voice switch acquisition and test
- (U) \$11,635 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305137F National Airspace System	PROJECT 4090
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(U) FY 1999 (\$ in Thousands):

- (U) \$ 800 Complete Military Airspace Management System (MAMS) development
- (U) \$ 327 Complete NAS DoD subsystem analysis for each DoD site
- (U) \$ 595 Continue radar and automation acquisition and test
- (U) \$ 58 Identified as a source for SIBR
- (U) \$1,780

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

- (U) \$ 93 Identify interface/interoperability improvements for the NAS projects
- (U) \$ 163 Perform risk reduction studies and software analyses
- (U) \$1,500 Complete radar/automation test
- (U) \$1,756 Total

FY 2001 (\$ in Thousands):

- Identify interface/interoperability improvements for the NAS projects
- Perform risk reduction studies and software analyses
- Provide on site engineering analyses
- Total

(U) B. _____

This program is in budget activity 7 - Operational System Development, because the DoD Air Traffic Control system is operational.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)					DATE					
BUDGET ACTIVITY					PROJECT					
7 - Operational System Development					0305137F National Airspace System					
4090					February 1999					
(U) C. <u>Program Change Summary (\$ in Thousands)</u>										
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total</u>					
	<u>Cost</u>									
(U) Previous President's Budget (FY 1999 PB)	11,917	1,881	288	205	109,467					
(U) Appropriated Value	12,830	1,881								
(U) Adjustments to Appropriated Value										
a. Congressional General Reductions	-687	-101								
b. SBIR	-227									
c. Omnibus & Other Above Threshold Reprogramming	-81									
d. Below Threshold Reprogramming	-200									
(U) Adjustments to Budget Year Since FY 1999 PB			1,468	-4						
(U) Current Budget Submit/FY 2000 PB	11,635	1,780	1,756	201	109,635					
FY99: \$58 identified as a source for SBIR										
(U) D. <u>Other Program Funding Summary (\$ in Thousands)</u>										
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To</u>	<u>Total</u>
									<u>Cost</u>	
(U) Other Procurement, BA 3	14,820	14,014	54,394	57,635	61,762	52,670	46,784	47,792	<u>Cont</u>	<u>TBD</u>
Weapon system code 833020, PE0305137F										
(U) Other Procurement, BA 5	1,009	1,407	4,802	4,993	5,405	4,596	4,030	4,130	<u>Cont</u>	<u>TBD</u>
Weapon system code 86190A, PE0305137F, (Initial Spares)										
(U) E. <u>Acquisition Strategy:</u>										
All major contracts were awarded after full and open competition. Adjustments to funding of specific activities reflect realignment of development/test activities with the revised (22 Apr 98) Acquisition Program Baseline (APB) and amended (3 Aug 98) Acquisition Decision Memorandum (ADM).										
Project 4090					Exhibit R-2 (PE 0305137F)					

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)													DATE February 1999								
BUDGET ACTIVITY 7 - Operational System Development						PE NUMBER AND TITLE										PROJECT					
(U) F. <u>Schedule Profile</u>																					
		<u>FY 1998</u>						<u>FY 1999</u>						<u>FY 2000</u>					<u>FY 2001</u>		
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
(U)	Acquisition Milestones																				
	(U) Milestone II (MS II) (Jul 95)																				
	(U) Revised Acquisition Program Baseline			X																	
	(U) Amended MS II Acquisition Decision Memo				X																
	(U) Voice Switch LRIP Decision				X																
	(U) Voice Switch FRP Decision							X													
	(U) Radar & Automation LRIP Decision									X											
	(U) Radar & Automation Milestone III												X								
(U)	Contract Milestones																				
	(U) Radar																				
	Contract Award (Aug 96)																				
	Complete radar OT&E											X									
	(U) Automation																				
	Contract Award (Sep 96)																				
	Complete automation OT&E											X									
	(U) Voice Switch																				
	Contract Award (Jul 95)																				
	Complete voice switch OT&E								X												
(U)	NAS IOC													X							
(U)	NAS FOC Apr 2010																				
	(U) MAMS																				
	Contract Award (Nov 95)																				
	MAMS IOC							X													
* Denotes completed event																					
X Denotes planned event																					
Project 4090																					
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Exhibit R-2 (PE 0305137F)																					

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1999				
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305137F National Airspace System				PROJECT 4090			
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
				<u>FY 1998</u>	_____		<u>FY 2000</u>	<u>FY 2001</u>			
Site Surveys				4,400	800		0	0			
Facility/Transition Planning				37	100		0	0			
				50	222		0	0			
System Engineering					55		58				
Interoperability/software analyses				0			168	136			
				6,443	495		30	0			
Program Management Support and Travel					50						
Identified as a source for SIBR					58						
				11,635	1,780			201			
(U) B. _____											
Performing Organizations:											
Contractor or											
<u>Performing Activity</u>	<u>Method/Type or Funding</u>	<u>Award or Obligation</u>	<u>Performing Activity</u>	<u>Project Office</u>	<u>Total Prior to</u>	<u>Budget FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>Budget to Complete</u>	<u>Program</u>	
<u>Product Development Organizations</u>											
Computer Based Systems		Jun 94	3,500		3,500	0		0	0	3,500	
b. Aircraft	CPFF		12,705	12,705		4,400	800		0	0	
c. Raytheon (Radar)		Aug 96	18,275		17,016	859		0	0	18,275	
d. Raytheon	IDIQ-FFP	Sep 96		5,862	2,292		0	0	0	5,297	
	IDIQ-FFP	Jul 95		2,570	2,570		0	0	0	2,570	
Project 4090				Page 5 of 6 Pages				Exhibit R-3 (PE 0305137F)			

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305137F National Airspace System					PROJECT 4090	
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	FY 2000	FY 2001	Budget to Complete	Total Program
<u>Support and Management Organizations</u>											
MITRE	CPAF	Oct 94	21,910	21,910	20,595	1,210	0	0	0	0	21,805
Martin Marietta	FFP	Sep 94	8,700	8,700	8,336	364	0	0	0	0	8,700
Miscellaneous	Multiple	Multiple	32,624	32,624	30,005	1,197	122	1,756	201	409	33,690
<u>Test and Evaluation Organization</u>											
46 th Test Wing, Eglin AFB, FL	PO	Multiple	2,135	2,135	1,235	600	400	0	0	0	2,235
Government Furnished Property: None											
					Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	FY 2000	FY 2001	Budget to Complete	Total Program
Identified as a source for SIBR							58				58
Subtotal Product Development					33,683	8,264	1,200	0	0	0	43,147
Subtotal Support and Management					58,936	2,771	122	1,756	201	409	64,195
Subtotal Test and Evaluation					1,235	600	400	0	0	0	2,235
Total Project					93,854	11,635	1,780	1,756	201	409	109,635

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305138F Inert Upper Stage (IUS)	PROJECT 4053
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4053 Upper Stage Development (IUS)	10	555	0	0	0	0	0	0	0	17,425
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(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 (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. It supports redesign of aging equipment and spares which are no longer manufactured or available, investigation of flight anomalies, and small studies to assist in defining future upper stages. Beginning in FY00, funding is combined with the Titan Space Launch Vehicles Program (305144F).

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

- (U) \$ 10 Studied and designed corrective actions for anomalies and obsolete items
- (U) \$ 10 Total

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

- (U) \$ 555 Study and design corrective actions for potential anomalies and obsolete items
- (U) \$ 555 Total

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

- (U) \$ 0 Total

(U) FY 2001: (\$ in thousands)

- (U) \$ 0 Total

(U) B. Budget Activity Justification:

This program is categorized in Budget Activity 7, Operational Systems Development, because the Inertial Upper Stage Program is in the production phase and is fully operational.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)					DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development			PE NUMBER AND TITLE 0305138F Inert Upper Stage (IUS)		PROJECT 4053
(U) C. <u>Program Change Summary (\$ in Thousands)</u>					
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U) Previous President's Budget (FY1999 PB)	3,150	558	1,920	1,863	25,868
(U) Appropriated Value	3,337	558			
(U) Adjustments to Appropriated Value					
a. Cong Gen Reductions	-117	-3			
b. SBIR	-86				
c. Omnibus	-21				
d. Above Threshold Reprogramming	-1,800				
e. Below Threshold Reprogramming (BTR)	-1,303				
(U) Adjustments to Budget Years Since FY99 PB	0	0	-1,920	-1,863	
(U) Current Budget Submit/FY2000 PB	10	555	0	0	17,425
 (U) Significant Program Changes:					
None: With the success of the last few years of IUS flights, only a minimal amount of funding is being held in RDT&E, in order to keep this funding line open. In the event that an anomaly occurs, funding will need to be added into this program to study and correct the problem. Program Management Support activities have been transferred under the 3020 Procurement funding line. Beginning in FY00, funding is combined with the Titan Space Launch Vehicles Program (305144F).					
Project 4053		Page 2 of 5 Pages		Exhibit R-2 (PE 0305138F)	

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE February 1999					
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305138F Inert Upper Stage (IUS)			PROJECT 4053					
(U) D. <u>Other Program Funding Summary (\$ in Thousands)</u>												
		<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To</u>	<u>Total</u>	
										<u>Compl</u>	<u>Cost</u>	
(U) Missile Procurement, Budget Activity 5, P-23, Other Support		35,397	48,012	46,827	44,393	28,008	0	0	0	0	1,242,104	
 <u>Related RDT&E:</u>												
(U) PE 0305144F, Titan Space Launch Vehicles												
(U) PE 0102431F, Defense Support Program (DSP)												
(U) Inertial Upper Stage (IUS) program supports the NASA Space Transportation System as an upper stage used with the Space Shuttle												
 (U) E. <u>Aquisition Strategy:</u>												
Program is in final production under the fourth production contract. The components for the four remaining IUS units are procured and are in storage. The remaining procurement effort is for upper stage buildup, replacement parts, and component shelf life extension. Within the RDT&E budget for IUS, only a minimal amount is planned for the study and the design of any corrective actions needed for anomalies, if they occur, and obsolete items, if any.												
 (U) F. <u>Schedule Profile</u>												
		<u>FY 1998</u>			<u>FY 1999</u>			<u>FY 2000</u>			<u>FY 2001</u>	
(U) DoD Launches	1	2	3	4	1	2	3	4	1	2	3	4
(U) Avionics Replacement*						X		X			X	
(U) Integration, Launch Support, and Life Extension Modification*												
* Activities are continuous throughout the year.												
Project 4053			Page 3 of 5 Pages			Exhibit R-2 (PE 0305138F)						

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305138F Inert Upper Stage (IUS)					PROJECT 4053	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U)	Avionics Obsolescence Mitigation				0	0	0	0			
(U)	Program Management Support				0	0	0	0			
(U)	Systems Engineering				10	555	0	0			
(U)	Total				10	555	0	0			
(U) B. <u>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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Organizations</u>											
Boeing	SS/FPI/AF	Jul 85	906,671*	942,335*	6,148	0	0	0	0	0	6,148
	SS/FPI/AF	Mar 91	151,189*	158,055*	1,991	0	0	0	0	0	1,991
	SS/CPAF/LOE	Sep 90	N/A	N/A	4,064	0	0	0	0	0	4,064
	SS/CPAF	Jun 97	N/A	N/A	N/A	10	555	0	0	0	565
United Tech Corp/Pratt & Whitney	SS/CPFF	Mar 95	N/A	N/A	855	0	0	0	0	0	855
*Amounts include funds used for IUS under previous Program Elements											
Project 4053					Page 4 of 5 Pages			Exhibit R-3 (PE 0305138F)			

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305138F Inert Upper Stage (IUS)					PROJECT 4053	
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
<u>Support and Management Organizations</u>											
Space and Missile Systems Center, LAAFB	N/A	N/A	N/A	N/A	3,802	0	0	0	0	0	3,802
<u>Test and Evaluation Organizations</u> Not Applicable											
Government Furnished Property: Not Applicable											
					Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	FY 2000	FY 2001	Budget to Complete	Total Program
Subtotal Product Development					13,058	10	555	0	0	0	13,623
Subtotal Support and Management					3,802	0	0	0	0	0	3,802
Subtotal Test and Evaluation					0	0	0	0	0	0	0
Total Project					16,860	10	555	0	0	0	17,425

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305144F Titan Space Launch Vehicles (Space)	PROJECT 4135
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4135 Titan II/IV	62,401	77,176	45,379	26,062	27,307	0	0	0	0	3,083,511
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

(U) 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.

(U) 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 SRMU in 1QFY00, and non-recurring integration for Milstar satellites. Remaining activities are maintaining sustaining engineering and anomaly resolution capability through the end of the program.

(U) Beginning in FY00, the Upper Stages Program 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 and supports redesign of aging equipment and spares which are no longer manufactured or available, investigation of flight anomalies, and small studies to assist in defining future upper stages.

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

- (U) \$30,103 SRMU Requalification
- (U) \$15,130 Continued integration for Milstar
- (U) \$ 6,668 Titan Hardware Redesign and Obsolescence
- (U) \$10,500 Other Research and Development
- (U) \$62,401 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational System Development	0305144F Titan Space Launch Vehicles (Space)	4135
<p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$45,815 SRMU Requalification - (U) \$18,953 Continue integration for Milstar - (U) \$ 4,500 Titan Hardware Redesign and Obsolescence - (U) \$ 5,443 Other Research and Development - (U) \$ 2,465 Identified as a source for SBIR - (U) \$77,176 Total <p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$16,293 SRMU Requalification - (U) \$24,570 Continue integration for Milstar - (U) \$ 2,300 Titan Hardware Redesign and Obsolescence - (U) \$ 2,116 Other Research and Development - (U) \$ 100 Inertial Upper Stage Study and design corrective actions for potential anomalies and obsolete items - (U) \$45,379 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$25,999 Continue integration for Milstar - (U) \$ Inertial Upper Stage Study and design corrective actions for potential anomalies and obsolete items 63 - (U) \$26,062 Total <p>(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 effort remaining is SRMU recertification.</p>		
Project 4135	Page 2 of 6 Pages	Exhibit R-2 (PE 0305144F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)						DATE February 1999					
BUDGET ACTIVITY 7 - Operational System Development			PE NUMBER AND TITLE 0305144F Titan Space Launch Vehicles (Space)			PROJECT 4135					
(U) C. <u>Program Change Summary (\$ in Thousands)</u>											
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>						
(U) Previous President's Budget (FY1999 PB)	70,483	87,443	44,185	40,495	3,320,678						
(U) Appropriated Value	74,884	77,443									
(U) Adjustments to Appropriated Value											
a. Cong Gen Reductions	-2,482	-267									
b. SBIR	-1,930										
c. Omnibus	-480										
d. Other Above Threshold Reprogramming	-10,000										
e. Below Threshold Reprogramming (BTR)	2,409										
(U) Adjustments to Budget Years Since FY1999 PB			1,194	-14,433							
(U) Current Budget Submit/ FY2000 PB	62,401	77,176	45,379	26,062	3,085,511						
 (U) Significant Program Changes:											
Program has been modified to procure 40 core vehicles, and launch 39, with the last launch (DSP-22) delayed from April to July 2002. Launch vehicle hardware has been purchased, and remaining funds will be used for hardware components, which include Solid Rocket Motor Upgrades, Centaur upper stages, payload fairings and various mission-unique equipment. The IUS program is funded in the Titan PE starting in FY00. FY99: \$2,465K identified as a source for SBIR											
 (U) D. <u>Other Program Funding Summary (\$ in Thousands)</u>											
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To</u>	<u>Total</u>	
(U) Missile Procurement, Budget Activity	418,110	540,543	431,273	479,154	349,133	52,061	28,541	36,427	<u>Compl</u>	<u>Cost</u>	
5, P-24, Other Support									0	6,849,893	
<u>Related RDT&E:</u>											
(U) Not Applicable											

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)										DATE February 1999																																																																																												
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305144F Titan Space Launch Vehicles (Space)					PROJECT 4135																																																																																												
<p>(U) E. Acquisition Strategy: (U) 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. A modification has just recently been approved, to 39 Titan IV launches (last launch is DSP-22 in April 2002). A previous NRO mission, scheduled for launch in FY04, was remanifested on EELV.</p>																																																																																																						
<p>(U) F. Schedule Profile</p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:30%;"></th> <th colspan="3" style="text-align: center;"><u>FY 1998</u></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) Draft Single Acquisition Management Plan (SAMP) to OSD staff</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) 39-Vehicle Production and Launch Operations Contract Definitization</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) Titan Development (Hardware Requal) Contract Definitization</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) Last Titan Launch (Apr 02)</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>(U) Begin assessment of Titan IVA-20 mishap**</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> </tbody> </table>													<u>FY 1998</u>			<u>FY 1999</u>			<u>FY 2000</u>			<u>FY 2001</u>				1	2	3	4	1	2	3	4	1	2	3	4	(U) Draft Single Acquisition Management Plan (SAMP) to OSD staff						X							(U) 39-Vehicle Production and Launch Operations Contract Definitization				*									(U) Titan Development (Hardware Requal) Contract Definitization				*									(U) Last Titan Launch (Apr 02)													(U) Begin assessment of Titan IVA-20 mishap**				*								
	<u>FY 1998</u>			<u>FY 1999</u>			<u>FY 2000</u>			<u>FY 2001</u>																																																																																												
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(U) Begin assessment of Titan IVA-20 mishap**				*																																																																																																		
<p>*completed event X planned event **Assessing cause of mishap and Return to Flight corrective actions.</p>																																																																																																						
Project 4135			Page 4 of 6 Pages			Exhibit R-2 (PE 0305144F)																																																																																																

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305144F Titan Space Launch Vehicles (Space)					PROJECT 4135	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U) Titan IV											
	(U) Contract Costs R&D (85-C-0019/96-C-0035)				36,771	50,315	18,593	0			
	(U) Contract Costs Unified Payload Integ (92-C-0028/ 98-C-0005)				15,130	18,953	24,570	25,999			
	(U) Other Research and Development				10,500	5,443	2,116	0			
	(U) Inertial Upper Stage Study and Design changes						100	63			
	(U) Identified as a source for SBIR					2,465					
(U) Total					62,401	77,176	45,379	26,062			
(U) B. <u>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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
Identified as a source for SBIR							2,465				
2,465											
<u>Product Development Organizations</u>											
LMC 85-C-0019	SS/FPIF	1QFY85	11,110,900	11,203,100	2,042,016	0	0	0	0	0	2,042,016
LMC 85-C-0085	SS/FPIF	1QFY85	638,600	638,600	76,607	0	0	0	0	0	76,607
LMC 92-C-0028	SS/CPAF	3QFY92	594,422	585,149	93,428	0	0	0	0	0	93,428
LMC 96-C-0035	SS/CPAF	3QFY96	57,840	166,661	148,582	36,771	50,315	18,593	0	0	254,261
LMC 98-C-0005	SS/CPAF	1QFY98	292,939	292,939	3,913	15,130	18,953	24,570	25,999	27,207	115,772
Boeing	SS/SPAF	2QFY97	n/a	n/a	n/a	0	0	100	63	100	263
Facilities	n/a	n/a			93,300	0	0	0	0	0	93,300
Project 4135					Page 5 of 6 Pages			Exhibit R-3 (PE 0305144F)			

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305144F Titan Space Launch Vehicles (Space)					PROJECT 4135	
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC *	Project Office EAC *	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
<u>Support and Management Organizations</u>											
Tecolote, SRS, TRW, Antioch,			N/A	N/A	164,646	0	0	0	0	0	164,646
Other Research & Aerospace	Development		N/A	N/A	5,759	10,500	5,443	2,116	0	0	23,818
			N/A	N/A	77,836	0	0			0	77,836
Other Prgm Supprt			N/A	N/A	139,099	0	0	0	0	0	139,099
<u>Test and Evaluation Organizations</u>											
T&E			N/A	N/A	0	0	0	0	0	0	0
<u>Government Furnished Property</u> : None Identified as a source for SBIR							2,465				
2,465											
Subtotal Product Development					2,457,846	51,901	69,268	43,263	26,062	27,307	2,675,647
Subtotal Support and Management					387,340	10,500	5,443	2,116	0	0	405,399
Subtotal Test and Evaluation					0	0	0	0	0	0	0
Total Project					2,845,186	62,401	77,176	45,379	26,062	27,307	3,083,511
* NOTE: The Estimates at Complete are at the contract level and therefore include work funded by the National Reconnaissance Office, NASA and other customers. Thus, the EACs include more than just Air Force funding. The "FY" columns contain only Air Force Titan RDT&E funding.											

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305158F Tactical Terminals	PROJECT 4395
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4395 Radio	240	234	239	240	244	250	255	260	Cont	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) **Note:** The funding request for Project 4394 Combat Intelligence System (CIS) for FY98 and later has been transferred into PE 0207414F.

(U) **A. Mission Description**

Tactical Terminals processes 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) enables the warfighter to access critical data provided by national and tactical intelligence sources. Currently over 130 ground systems are deployed. Air Force is jointly developing and procuring an airborne qualified radio called Multi-mission Advanced Tactical Terminal (MATT) with US Special Operations Command (SOCOM), Defense Support Program Office (DSPO), and the Navy.

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

- (U)\$ 151 Continue to plan and support integration on DoD aircraft and weapon systems.
- (U)\$ 55 Continue to support migration of MATT into next generation tactical terminal
- (U)\$ 34 Continue MATT radio P³I development effort
- (U)\$ 240 Total

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

- (U)\$ 139 Continue to plan and support integration on DoD aircraft and weapon systems
- (U)\$ 90 Continue to support migration of MATT into next generation tactical terminal
- (U)\$ Identified as a source for SBIR
- 5
- (U)\$ 234 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational System Development	0305158F Tactical Terminals	4395
<p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none">- (U)\$ 153 Government engineering support will continue in the planning and integration on DOD aircraft and weapon systems- (U)\$ 55 MATT software development for JTT and Integrated Broadcast System (IBS) migration- (U)\$ 31 SPO support- (U)\$ 239 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none">- (U)\$ 150 Engineering support required to plan integration on DoD aircraft and weapon systems- (U)\$ 55 Continue MATT software upgrades- (U)\$ 35 SPO support- (U)\$ 240 Total <p>(U) B. <u>Budget Activity Justification</u></p> <p>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.</p>		
Project 4395	Page 2 of 7 Pages	Exhibit R-2 (PE 0305158F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305158F Tactical Terminals	PROJECT 4395
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(U) **C. Program Change Summary (\$ in Thousands)**

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U) Previous President's Budget (FY1999 PB)	243	237	243	245	TBD
(U) Appropriated Value	258	237			
(U) Adjustments to Appropriated Value					
a. Cong Reductions	-11	-3			
b. SBIR	-5				
c. Omnibus or Other Above Threshold Reprogram	-2				
d. Below Threshold Reprogramming					
(U) Adjustments to Budget Years Since FY 1999 PB			-4	-5	
(U) Current Budget Submit/FY 2000 PB	240	234	239	240	TBD

(U) Significant Program Changes:
FY99: \$5 identified as a source for SBIR

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305158F Tactical Terminals	PROJECT 4395
--	---	------------------------

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

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To</u> <u>Compl</u>	<u>Total</u> <u>Cost</u>
(U) Other Procurement AF, Budget Activity 3, Weapon System Code 832070 PE 305158	5,593	7,102	3,539	3,613	4,413	4,426	4,519	4,621	Cont.	TBD

(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 AC²A

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305158F Tactical Terminals	PROJECT 4395
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(U) F. Schedule Profile

	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) Block II Production		*														
(U) Red Side Upgrade (ECP)			*													
(U) JTT Delivery						X										
(U) Software Release							X						X			
(U) MATT software Version Upgrade															X	

* denotes completed events
X denotes planned events

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305158F Tactical Terminals					PROJECT 4395	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U)	Software Development				54	42	55	55			
(U)	Travel				34	35	35	35			
(U)	Government Engineering Support				152	152	149	150			
(U)	Identified as a source for SBIR					5					
(U)	Total				240	234	239	240			
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR							5				
<u>Product Development Organizations</u>											
Allied Signal, Inc. MDA911-93-C0008 and TBD	FFP	June-98	TBD	TBD	0	54	42	55	55	Cont	TBD
<u>Support and Management Organizations</u>											
Mission Support		Ongoing			0	186	187	184	185	Cont	TBD
<u>Test and Evaluation Organizations</u>											
0					0	0	0	0	0	0	0
Project 4395					Page 6 of 7 Pages			Exhibit R-3 (PE 0305158F)			

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)						DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development			PE NUMBER AND TITLE 0305158F Tactical Terminals			PROJECT 4395	
Government Furnished Property: N/A							
Identified as a source for SBIR			5				
Subtotal Product Development	0	54	42	55	55	Cont	TBD
Subtotal Support and Management	0	186	187	184	185	Cont	TBD
Subtotal Test and Evaluation	0	0	0	0	0	0	0
Total Project	0	240	234	239	240	Cont	TBD

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305160F Def Meteorological Satellite Prog (Space)	PROJECT 4758
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4758 DMSP	12,284	17,397	21,535	25,938	13,960	10,887	11,239	11,519	0	892,798
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

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). Vice President Gore's National Performance Review directed convergence of DMSP with NOAA's weather satellite system. DMSP satellite operations consolidated with NOAA satellite operations at NOAA's Suitland, MD, Satellite Operations Control Center (SOCC) in FY 98.

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

- (U) \$ 10,910 Continued system integration and test, calibration and validation, and related support activities.
- (U) \$ 65 Continued Titan II integration effort (transition from Atlas E due to inventory depletion).
- (U) \$ 265 Small Tactical Terminal (STT-field portable weather terminal) UHF antenna development.
- (U) \$ 1,044 Continued Mark IVB tactical weather terminal software upgrade for the next block of satellites (5D-3)
- (U) \$ 12,284 Total

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

- (U) \$ 13,136 Continue system integration and test, calibration and validation, and related support activities.
- (U) \$ 1,179 Continue Titan II integration effort (transition from Atlas E due to inventory depletion).
- (U) \$ 1,000 Begin EELV interface design (transition to EELV)
- (U) \$ 1,000 Begin Small Tactical Terminal (field portable weather terminal) SSMIS software upgrades.
- (U) \$ 565 Continue Mark IVB tactical weather terminal software upgrade for the next block of satellites (5D-3)
- (U) \$ 517 Identified as a source for SBIR

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305160F Def Meteorological Satellite Prog (Space)	PROJECT 4758
<p>– (U) \$ 17,397 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> – (U) \$ 13,433 Continue system integration and test, calibration and validation, and related support activities – (U) \$ 1,193 Continue Titan II integration effort (transition from Atlas E due to inventory depletion). – (U) \$ 3,290 Continue EELV interface design (transition to EELV) – (U) \$ 3,036 Continue Small Tactical Terminal (field portable weather terminal) SSMIS software upgrades. – (U) \$ 583 Continue Mark IVB tactical weather terminal software upgrade for the next block of satellites (5D-3) – (U) \$ 21,535 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> – (U) \$ 15,402 Continue system integration and test, calibration and validation, and related support activities – (U) \$ 978 Continue Titan II integration effort (transition from Atlas E due to inventory depletion). – (U) \$ 1,060 Continue EELV interface design (transition to EELV) – (U) \$ 7,899 Continue Small Tactical Terminal (field portable weather terminal) SSMIS software upgrades. – (U) \$ 599 Complete Mark IVB tactical weather terminal software upgrade for the next block of satellites (5D-3) – (U) \$ 25,938 Total <p>(U) B. <u>Budget Activity Justification:</u></p> <p>(U) This program is in Budget Activity 7, Operational Systems Development, because it supports the current operational DMSP constellation.</p>		
Project 4758	Page 2 of 8 Pages	Exhibit R-2 (PE 0305160F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305160F Def Meteorological Satellite Prog (Space)				PROJECT 4758		
(U) D. <u>Other Program Funding Summary (\$ in Thousands)</u>										
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To Compl</u>	<u>Total Cost</u>
(U) Missile Procurement/PE 0305160F (Budget Activity 5, Line Item P-27)	35,183	35,498	38,223	59,203	43,383	53,134	50,559	49,869	54,000	2,030,144
(U) Other Procurement/PE 0305160F (Line Item P-63)	11,945	12,681	1,675	292	195	332	0	393	0	268,308
<u>Related RDT&E:</u>										
(U) PE 0603434F, National Polar Operational Environmental Satellite System (NPOESS)										
(U) PE 0305160N, DMSP (provides funds for Navy unique studies)										
(U) E. <u>Acquisition Strategy</u>										
Support and services contracts for the spacecraft, sensors, ground systems, and supporting software have been awarded to various contractors. Since no major milestone decisions remain, future considerations facing the program center on successful completion of current contracts, and the need for future contractor support of the procured spacecraft, sensors, and ground systems.										
Project 4758			Page 4 of 8 Pages				Exhibit R-2 (PE 0305160F)			

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)												DATE February 1999				
BUDGET ACTIVITY 7 - Operational System Development						PE NUMBER AND TITLE 0305160F Def Meteorological Satellite Prog (Space)						PROJECT 4758				
(U) F. <u>Schedule Profile</u>																
		<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>		
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) Small Tactical Terminal Deliveries Complete								X								
(U) 5D-3 Spacecraft Delivery (S16-20)	*	*				X										
(U) 5D-2 Launches (F-15/F-16)								X						X		
(U) Suitland SOC IOC (DMSP Ops)			*													
(U) DMSP SOC (Offutt AFB) Closure				*												
* = Completed event X = Planned event																
Project 4758				Page 5 of 8 Pages				Exhibit R-2 (PE 0305160F)								

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305160F Def Meteorological Satellite Prog (Space)					PROJECT 4758	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U) Launch Vehicle Transition					142	2,578	5,207	3,211			
(U) Spacecraft Integration and Test					2,429	3,345	4,516	4,527			
(U) Calibration/Validation					1,200	84	0	2,000			
(U) Algorithm Development					916	900	752	692			
(U) MARK IVB/STT Enhancements					1,309	2,705	3,619	8,498			
(U) Systems Engineering Support					3,446	4,032	3,559	2,961			
(U) Program Management Support					2,842	3,236	3,882	4,049			
(U) Identified as a source for SBIR					0	517	0	0			
(U) Total					12,284	17,397	21,535	25,938			
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR							517				
<u>Product Development Organization</u>											
Lockheed -Martin	SS/CPAF	Apr 92	3,764	3,764	3,764	0	0	0	0	0	3,764
Lockheed-Martin	SS/CPAF	May 97	11,757	11,757	0	321	1,399	5,014	3,677	1,378	11,789
Northrop-Grummm	SS/CPAF	May 95	2,117	2,117	1,350	265	352	150	0	0	2,117
TBD	TBD	Dec 00			0	0	0		150	600	750
(OLS Sys Eng Spt)											
Lockheed-Martin	C/CPAF	Oct 88	39,513	39,513	39,513	0	0	0	0	0	39,513
Harris	C/CPAF	Jun 94	7,188	7,188	5,286	265	1,140		497	0	7,188
Project 4758					Page 6 of 8 Pages				Exhibit R-3 (PE 0305160F)		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305160F Def Meteorological Satellite Prog (Space)					PROJECT 4758	
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
SSSG/Det II	MIPR	Jan 97	4,168	4,168	1,377	1,044	565	583	599	0	4,168
SMC/CL (Titan)	PO	Oct 94	5,171	5,171	1,756	65	1,179	1,193	978	0	5,171
Aerojet	SS/CPAF	May 92	2,530	2,530	2,530	0	0	0	0	0	2,530
Aerojet	C/CPAF/FFP	Mar 89	85,979	85,979	85,979	0	0	0	0	0	85,979
Aerojet	SS/CPAF	May 98	6,448	6,448	0	786	1,136	1,289	1,121	2,116	6,448
Hughes	SS/CPFF	May 96	371	371	87	70	70	72	72	0	371
Phillips Lab	MIPR/PD	Oct 95			3,621	434	570	316	2,242	Cont	Cont
TBD (STT S/W Upgrades)	TBD	TBD			0	0	1,000	3,036	7,402	1,205	12,643
NRL	MIPR/Various	Oct 95			3,055	2,176	1,306	1,628	1,526	Cont	Cont
APL	MIPR/Various	Oct 95			1,478	376	770	813	664	Cont	Cont
SMC (Det 3 SSSG/NPOESS)	FCA/MIPR	Dec 95			2,506	0	0	0	0	0	2,506
Sandia	MIPR/Various	Oct 96			200	0	0	0	0	Cont	Cont
Other	Various				2,149	194	125	0	0	Cont	Cont
<u>Support and Management Organizations</u>											
FFRDC	MORD*	Oct 95			10,900	2,140	2,762	2,822	2,208	Cont	Cont
PRC/bd Systems	C/CPAF	Aug 95			3,216	1,306	1,270	737	753	Cont	Cont
Program Mgmt					9,721	2,842	3,236	3,882	4,049	Cont	Cont
Litigation Support					1,809	0	0	0	0	0	1,809
Other	Various	Jul 91			1,958	0	0	0	0	0	1,958
*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>											
Not Applicable.											
Project 4758											

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)						DATE February 1999		
BUDGET ACTIVITY		PE NUMBER AND TITLE				PROJECT		
7 - Operational System Development		0305160F Def Meteorological Satellite Prog (Space)				4758		
(U) B. <u>Budget Acquisition History and Planning Information Continued (\$ in Thousands)</u>								
Government Furnished Property: Not Applicable.								
		Total Prior to						
		<u>FY 1998</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	Budget to <u>Complete</u>	Total <u>Program</u>
Identified as a source for SBIR				517				
Subtotal Product Development		154,651	5,996	9,612	14,094	18,928	Cont	Cont
Subtotal Support and Management		27,604	6,288	7,268	7,441	7,010	Cont	Cont
Subtotal Test and Evaluation		0	0	0	0	0	0	0
Project Total		182,255	12,284	17,397	21,535	25,938	Cont	Cont
Project 4758								
Page 8 of 8 Pages								
Exhibit R-3 (PE 0305160F)								

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305164F Navstar Global Pos Sys (User Eq) (Space)	PROJECT 3028
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
3028 Navstar GPS	43,141	36,234	53,963	41,471	14,951	15,517	16,125	16,497	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

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. The three tenets of Navwar are to protect U.S. military and allies' use of GPS, prevent hostile exploitation of GPS, and preserve civil use of GPS outside the area of responsibility (AOR).

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

- (U) \$ 800 Continued aircraft integration development testing
- (U) \$ 935 Continued development and product improvement testing and evaluation
- (U) \$ 5,248 Continued ACTD - Protection
- (U) \$ 3,350 Continued ACTD - Prevention
- (U) \$ 6,956 Continued Navigational Warfare (NAVWAR) Evaluation Team (NET) support
- (U) \$ 1,855 Completed NAVWAR Industry Studies
- (U) \$ 3,210 Continued NAVWAR modeling & simulation efforts
- (U) \$ 5,409 Continued Selective Availability Anti-Spoofing Module (SAASM) development
- (U) \$ 2,700 Continued support contract
- (U) \$ 2,207 Continued in-house support
- (U) \$ 1,025 Continued classified requirement
- (U) \$ 3,299 Continued GPS Modernization studies
- (U) \$ 146 Continued Defense Advanced GPS Receiver (DAGR) study effort
- (U) \$ 6,001 Began GPS Receiver Applications Module (GRAM) SAASM development
- (U) \$43,141 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305164F Navstar Global Pos Sys (User Eq) (Space)	PROJECT 3028
<p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 731 Continue aircraft integration development testing - (U) \$ 3,206 Continue development and product improvement testing and evaluation - (U) \$ 2,108 Continue ACTD - Protection - (U) \$ 1,800 Continue ACTD - Prevention - (U) \$ 365 Continue NAVWAR modeling & simulation efforts - (U) \$ 185 Continue NAVWAR NET support - (U) \$ 1,762 Continue support contract - (U) \$ 15,158 Continue GRAM-SAASM development - (U) \$ 4,350 Continue SAASM development - (U) \$ 276 Complete DAGR study effort - (U) \$ 4,315 Begin Advanced User Equipment Technology efforts - (U) \$ 1,293 Continue in-house support - (U) \$ 685 Identified as a source for SBIR - (U) \$ 36,234 Total 		
Project 3028	Page 2 of 11 Pages	Exhibit R-2 (PE 0305164F)

DATE
February 1999

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
**0305164F Navstar Global Pos Sys (User Eq)
(Space)**

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

- (U) \$ 900 Continue aircraft integration development testing
- (U) \$ 6,200 Continue development and product improvement testing and evaluation
- (U) \$ 4,500 Continue ACTD - Protection
- (U) \$ 300 Continue ACTD - Prevention
- (U) \$ 700 Continue NAVWAR modeling & simulation efforts
- (U) \$ 11,000 Continue classified requirement
- (U) \$ 2,800 Continue SAASM development
- (U) \$ 2,500 Complete GRAM-SAAM development
- (U) \$ 2,029 Continue in-house support
- (U) \$ 1,934 Continue support contract
- (U) \$ 2,900 Continue Signal Structure studies
- (U) \$ 7,500 Continue receiver technology effort
- (U) \$ 4,700 Continue Anti-jam filter technology
- (U) \$ 6,000 Continue Beamsteering Miniaturize Antenna effort
- (U) \$ 53,963 Total

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

- (U) \$ 900 Continue aircraft integration development testing
- (U) \$ 2,300 Continue development and product improvement testing and evaluation
- (U) \$ 5,500 Continue ACTD - Protection
- (U) \$ 200 Continue ACTD - Prevention
- (U) \$ 500 Continue NAVWAR modeling & simulation efforts
- (U) \$ 7,100 Continue SAASM development
- (U) \$ 1,755 Continue in-house support
- (U) \$ 2,116 Continue support contract
- (U) \$ 5,750 Continue receiver technology effort
- (U) \$ 5,250 Continue Beamsteering Miniaturize Antenna effort
- (U) \$ 8,000 Continue classified requirement
- (U) \$ 2,100 Begin technology Insertion

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305164F Navstar Global Pos Sys (User Eq) (Space)				PROJECT 3028		
(U) D. <u>Other Program Funding Summary (\$ in Thousands)</u>										
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To Compl</u>	<u>Total Cost</u>
(U) Operations and Maintenance (PE 0305164F, BA 1 - Operating Forces, SAG 13D)	765	1,948	3,157	2,293	2,223	2,350	6,820	6,821	Cont	Cont
(U) Aircraft Procurement (PE 0305164F, BA 7, Aircraft Support Equipment, BP19, P-74)	42,421	36,005	36,237	55,287	96,878	131,187	134,328	136,835	Cont	Cont
(U) Other Procurement (PE 0305164F, BP 63 - Electronics & Telecommunications Equipment, WSC 6730, P-62)	1,495	1,458	3,774	3,763	4,471	4,300	4,816	4,524	Cont	Cont
(U) OSD RDT&E (ACTD Funding: PE 0603750D)	3,900	300								
 <u>Related RDT&E:</u>										
(U) PE 0305165F, NAVSTAR GPS (Space/Grd Segments)										
(U) PE 0604480F, GPS Block IIF										
(U) PE 0305176F, Combat Survivor/Evader Locator										
 (U) E. <u>Acquisition Strategy:</u> Several ongoing and planned concept definition and technology risk reduction programs will define and mature required GPS technologies. The Navwar Advanced Concept Technology Demonstration (ACTD) 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.										
Project 3028			Page 5 of 11 Pages				Exhibit R-2 (PE 0305164F)			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)												DATE February 1999				
BUDGET ACTIVITY 7 - Operational System Development						PE NUMBER AND TITLE 0305164F Navstar Global Pos Sys (User Eq) (Space)						PROJECT 3028				
(U) F. <u>Schedule Profile</u>																
		<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>		
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) GPS ORD coordination starts				*												
(U) GPS ORD validation						x										
(U) GPS OIPT					*	x		x								
(U) Advance UE Technology (ie Receiver, Antenna, Filter, Prevention efforts					*	x	x	x	x	x	x	x	x	x	x	x
(U) Navwar AOA completion						x										
(U) GPS Program review							x									
(U) GRAM-SAASM study				*												
(U) GRAM-SAASM ICD Complete										x						
(U) GRAM-SAASM preproduction prototypes deliveries							x	x	x							
(U) Technology Insertion													x	x	x	x

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305164F Navstar Global Pos Sys (User Eq) (Space)	PROJECT 3028

(U) A. Project Cost Breakdown (\$ in Thousands)

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) Technical Support for Aircraft Integration	800	731	900	900
(U) Development & Product Improvement Testing	935	3,206	6,200	2,300
(U) ACTD - Protection	5,248	2,108	4,500	5,500
(U) ACTD - Prevention	3,350	1,800	300	200
(U) Support Contracts	2,700	1,762	1,934	2,116
(U) In-House Support	2,207	1,293	2,029	1,755
(U) SAASM	5,409	4,350	2,800	7,100
(U) NET	6,956	185	0	0
(U) NAVWAR Industry Studies	1,855	0	0	0
(U) NAVWAR modeling & simulation	3,210	365	700	500
(U) Classified Requirement	1,025	0	11,000	8,000
(U) GPS Modernization/Stewardship	3,299	0	0	0
(U) GRAM-SAASM Development	6,001	15,158	2,500	0
(U) DAGR study effort	146	276	0	0
(U) Advance UE Technology efforts	0	4,315	0	0
(U) Signal Structure studies	0	0	2,900	0
(U) Receiver technology efforts	0	0	7,500	5,750
(U) Anti-jam Filter technology	0	0	4,700	0
(U) Beamsteering Miniaturize Antenna efforts	0	0	6,000	5,250
(U) Technology Insertion	0	0	0	2,100
(U) Identified as a source for SBIR	0	685	0	0
(U) Total	43,141	36,234	53,963	41,471

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305164F Navstar Global Pos Sys (User Eq) (Space)					PROJECT 3028	
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity Identified as a source for SBIR	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
							685				685
<u>Product Development Organizations</u>											
Rockwell (MAGR)	FPIF/FFP/CPAF	Various	19,293	19,293	19,293	0	0	0	0	0	19,293
DOE Sandia (SAASM)	MIPR	Feb 94	13,332	13,332	5,569	2,413	2,750	2,600	0	0	13,332
NAWC (SAASM)	MIPR	Oct 95	760	760	599	0	0	0	0	0	599
Various (SAASM)	Various	Various	Cont	Cont	1,263	2,778	1,600	200	7,100	Cont	Cont
Alliant Techsys Inc (SAASM)	CPFF	Oct 95	4,632	4,632	4,414	218	0	0	0	0	4,632
Multiple (NAVWAR PRDAs)	CPAF	Aug 96	13,440	13,440	11,585	1,855	0	0	0	0	13,440
Holloman AFB (Integration)	Project Order	N/A	Cont	Cont	1,749	800	731	900	900	Cont	Cont
General Dynamics (Various)	Time and Materials	Jan 96	1,810	1,810	1,810	0	0	0	0	0	1,810
Project 3028					Page 8 of 11 Pages			Exhibit R-3 (PE 0305164F)			

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305164F Navstar Global Pos Sys (User Eq) (Space)					PROJECT 3028	
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Various (ACTD Prevention)	Various	Various	9,065	8,565	2,915	3,350	1,800	300	200	0	8,565
Various (ACTD Protection)	Various	Various	19,551	19,551	2,195	5,248	2,108	4,500	5,500	0	19,551
Various (NET)	Various	Various	10,413	10,413	3,272	6,956	185	0	0	0	10,413
Various (Classified Requirement)	Various	Various	26,752	26,752	6,727	1,025	0	11,000	8,000	0	26,752
Various (GPS Modernization)	Various	Various	TBD	TBD	1,779	3,299	0	0	0	TBD	TBD
Various (Navwar M&S)	Various	Various	4,775	4,775	0	3,210	365	700	500	0	4,775
CeCom (DAGR study)	MIPR	Dec 97	422	422	0	146	276	0	0	0	422
Various (GRAASM)	PRDA	Jul 98	23,659	23,659	0	6,001	15,158	2,500	0	0	23,659
<u>Support and Management Organizations</u>											
Overlook Sys (DUSD/Space)	C/CPFF	Dec 95	Cont	Cont	12,566	2,700	1,762	1,934	2,116	Cont	Cont
Aerospace Corp (Technical Supt)	CPFF	Various	928	928	860	68	0	0	0	0	928
SMC/FMB (Shared Prg Cost)	Various	Various	Cont	Cont	3,997	587	750	750	750	Cont	Cont

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305164F Navstar Global Pos Sys (User Eq) (Space)					PROJECT 3028	
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
PRC (Technical Supt)	Time and Materials	Dec 95	714	714	714	0	0	0	0	0	714
Miscellaneous (In-house support)	Various	Various	Cont	Cont	1,473	1,552	543	1,279	1,005	Cont	Cont
Advanced UE Tech Invest (Tech Supt)	Various	Various	4,315	4,315	0	0	4,315	0	0	0	4,315
Signal Structure studies(Tech Spt)	Various	Various	2,900	2,900	0	0	0	2,900	0	0	2,900
Receiver Tech (Tech Spt)	Various	Various	Cont	Cont	0	0	0	7,500	5,750	Cont	Cont
Anti-jam Filter Tech (Tech Spt)	Various	Various	4,700	4,700	0	0	0	4,700	0	0	4,700
Beamsteering Miniaturize Antenna (Tech Spt)	Various	Various	Cont	Cont	0	0	0	6,000	5,250	Cont	Cont
Technology Insertion (Tech Spt)	Various	Various	Cont	Cont	0	0	0	0	2,100	Cont	Cont
Various (Other Navwar Studies)	Various	Various	2,375	2,375	2,375	0	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	0	31,987

Project 3028

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY					PE NUMBER AND TITLE					PROJECT	
7 - Operational System Development					0305164F Navstar Global Pos Sys (User Eq)					3028	
(Space)											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
46th TG (UE develop & product testing)	Project Order	Various	Cont	Cont	534	935	3,206	6,200	2,300	Cont	Cont
Government Furnished Property:											
(U) Not Applicable.											
Identified as a source for SBIR							685				685
Subtotal Product Development					63,170	37,299	24,973	22,700	22,200	Cont	Cont
Subtotal Support & Management					21,985	4,907	7,370	25,063	16,971	Cont	Cont
Subtotal Test and Evaluation					32,521	935	3,206	6,200	2,300	Cont	Cont
Total Project					117,676	43,141	36,234	53,963	41,471	Cont	Cont

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305165F NAVSTAR GPS (Space)
	PROJECT

COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
NAVSTAR GPS (Space & Control)	27,248	21,065	98,890	108,851	76,581	39,450	34,107	34,556	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

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 entire GPS system deployment. PE also funds Block IIF modernization efforts to include additional civil signals and improvements to the military signal beginning with satellite number 7. Funding of the additional civil signal effort is shared between the DOD and the DOT. The DOD portion of this effort is funded across the FYDP, while the DOT portion is funded in FY00 (\$17.2). DOT funding is required each year for the program to be fully executable.

Additional required DOT funding:

FY01	FY02	FY03	FY04	FY05
40.5	25.0	17.4	15.0	15.0

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

- (U) \$ 1,732 Continued system engineering including configuration management
- (U) \$ 3,111 Continued training simulator development
- (U) \$ 13,350 Continued Operational Control Segment (OCS) Consolidated Contract for Common Operator Support Environment (COSE), OCS Architectural Implementation, and Block IIR Full Functionality
- (U) \$ 6,045 Completed Sensor to Shooter accuracy improvement effort
- (U) \$ 51 Continued space long-range planning and analysis
- (U) \$ 71 Completed R&D funding of GPS Joint Program Office support (continues in procurement appropriation)
- (U) \$ 2,386 Continued GPS Modernization Studies (continues in FY 1999 in PE 0604480F)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305165F NAVSTAR GPS (Space)
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PROJECT

- (U) \$	502	Continued IIA/IIF/IIR IMOSC development	
- (U) \$	27,248	Total	

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational System Development	0305165F NAVSTAR GPS (Space)	
<u>(U) FY 1999 (\$ in Thousands):</u>		
– (U) \$ 1,330	Continue system engineering, including configuration management	
– (U) \$ 2,107	Continue training simulator development	
– (U) \$ 11,364	Continue OCS Consolidated Contract for COSE, OCS Architectural Implementation, and Block IIR Full Functionality	
– (U) \$ 2,004	Begin OCS Transition to Operations	
– (U) \$ 77	Complete space long-range planning and analysis	
– (U) \$ 2,180	Continue IIA/IIF/IIR IMOSC development	
– (U) \$ 1,320	Begin MCS interface to IIR OSS	
– (U) \$ 683	Identified as a source for SBIR	
– (U) \$ 21,065	Total	
<u>(U) FY 2000 (\$ in Thousands):</u>		
– (U) \$ 2,358	Continue system engineering, including configuration management	
– (U) \$ 1,231	Complete training simulator development	
– (U) \$ 8,796	Continue OCS Consolidated contract for COSE, OCS Architectural Implementation, and Block IIR Full Functionality	
– (U) \$ 7,495	Complete OCS Transition to Operations	
– (U) \$ 2,753	Continue IIA/IIF/IIR IMOSC development	
Project	Page 3 of 10 Pages	Exhibit R-2 (PE 0305165F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY	PE NUMBER AND TITLE PROJECT	
7 - Operational System Development	0305165F NAVSTAR GPS (Space)	
– (U) \$ 1,380	Complete MCS interface to IIR OSS	
– (U) \$ 3,444	Complete IIF satellite development	
– (U) \$ 5,390	Continue IIF clock technical support	
– (U) \$ 2,700	Continue IIF SV compatibility analysis	
– (U) \$ 5,967	Continue IIF satellite associated development including launch vehicle integration, award fees, interface document engineering, and crosslink frequency migration	
– (U) \$ 21,435	Continue IIF OCS development	
– (U) \$ 3,900	Continue GPS LEO Consolidation	
– (U) \$ 2,407	Continue IIF OCS associated development including SCN mission unique development, integration studies, and completion of system simulator	
– (U) \$ 29,634	Begin GPS Modernization Space/Control development	
– (U) \$ 98,890	Total	
Project	Page 4 of 10 Pages	Exhibit R-2 (PE 0305165F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1999																																																												
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305165F NAVSTAR GPS (Space)																																																													
PROJECT																																																														
<p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 1,648 Continue system engineering, including configuration management - (U) \$ 9,383 Continue OCS Consolidated contract for COSE, OCS Architectural Implementation, and Block IIR Full Functionality - (U) \$ 3,537 Continue IIA/IIF/IIR IMOSC development - (U) \$ 4,650 Continue IIF clock technical support - (U) \$ 4,100 Continue IIF SV compatibility analysis - (U) \$ 7,323 Continue IIF satellite associated development including launch vehicle integration, award fees, interface document engineering, and crosslink frequency migration - (U) \$ 23,987 Continue IIF OCS development - (U) \$ 6,000 Continue GPS LEO Consolidation - (U) \$ 1,269 Continue IIF OCS associated development including SCN mission unique development and integration studies - (U) \$ 4,000 Begin IIF SAASM Control System changes - (U) \$ 42,954 Continue GPS Modernization Space/Control development - (U) \$ 108,851 Total <p>(U) B. <u>Budget Activity Justification:</u></p> <p style="padding-left: 40px;">This program is in Budget Activity 7 - Operational Systems Development because it is a post-Milestone III program.</p> <p>(U) C. <u>Program Change Summary (\$ in Thousands)</u></p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;"></th> <th style="text-align: right; width: 10%;"><u>FY 1998</u></th> <th style="text-align: right; width: 10%;"><u>FY 1999</u></th> <th style="text-align: right; width: 10%;"><u>FY 2000</u></th> <th style="text-align: right; width: 10%;"><u>FY 2001</u></th> <th style="text-align: right; width: 10%;"><u>Total Cost</u></th> </tr> </thead> <tbody> <tr> <td>(U) Previous President's Budget (FY 1999 PB)</td> <td style="text-align: right;">25,146</td> <td style="text-align: right;">21,155</td> <td style="text-align: right;">11,013</td> <td style="text-align: right;">8,925</td> <td style="text-align: right;">Continuing</td> </tr> <tr> <td>(U) Appropriated Value</td> <td style="text-align: right;">26,685</td> <td style="text-align: right;">21,155</td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Adjustments to Appropriated Value</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">a. Cong Gen Reductions</td> <td style="text-align: right;">-882</td> <td style="text-align: right;">-90</td> <td></td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">b. SBIR</td> <td style="text-align: right;">-661</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">c. Omnibus or Other Above Threshold Reprogram</td> <td style="text-align: right;">-171</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">d. Below Threshold Reprogramming</td> <td style="text-align: right;">2,277</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Adjustments to Budget Years Since FY 1999 PB</td> <td></td> <td></td> <td style="text-align: right;">87,877</td> <td style="text-align: right;">99,926</td> <td></td> </tr> <tr> <td>(U) Current Budget Submit/FY 2000 PB</td> <td style="text-align: right;">27,248</td> <td style="text-align: right;">21,065</td> <td style="text-align: right;">98,890</td> <td style="text-align: right;">108,851</td> <td style="text-align: right;">Continuing</td> </tr> </tbody> </table>				<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>	(U) Previous President's Budget (FY 1999 PB)	25,146	21,155	11,013	8,925	Continuing	(U) Appropriated Value	26,685	21,155				(U) Adjustments to Appropriated Value						a. Cong Gen Reductions	-882	-90				b. SBIR	-661					c. Omnibus or Other Above Threshold Reprogram	-171					d. Below Threshold Reprogramming	2,277					(U) Adjustments to Budget Years Since FY 1999 PB			87,877	99,926		(U) Current Budget Submit/FY 2000 PB	27,248	21,065	98,890	108,851	Continuing
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>																																																									
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Project	Page 5 of 10 Pages	Exhibit R-2 (PE 0305165F)																																																												

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE February 1999																																													
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305165F NAVSTAR GPS (Space)			PROJECT																																													
<p>(U) Significant Program Changes: \$683 identified as a source for SBIR in FY 1999. \$2,277 FY 1998 Below Threshold Reprogramming is for GPS Modernization. \$26,677 FY 2000/\$23,099 FY 2001 funding transferred from PE 64480F. \$34,100 FY 2000/\$45,000 FY 2001 added for GPS Modernization, and \$27,100 FY 2000/\$31,827 FY 2001 primarily for Control Sement systems development.</p> <p>(U) D. <u>Other Program Funding Summary (\$ in Thousands)</u></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;"></th> <th style="text-align: center;"><u>FY 1998</u></th> <th style="text-align: center;"><u>FY 1999</u></th> <th style="text-align: center;"><u>FY 2000</u></th> <th style="text-align: center;"><u>FY 2001</u></th> <th style="text-align: center;"><u>FY 2002</u></th> <th style="text-align: center;"><u>FY</u> <u>2003</u></th> <th style="text-align: center;"><u>FY 2004</u></th> <th style="text-align: center;"><u>FY 2005</u></th> <th style="text-align: center;"><u>To</u> <u>Compl</u></th> <th style="text-align: center;"><u>Total</u> <u>Cost</u></th> </tr> </thead> <tbody> <tr> <td>(U) Operations and Maintenance (PE 0305165F, BA 1 - Operating Forces, SAG 13D)</td> <td style="text-align: right;">24,992</td> <td style="text-align: right;">26,094</td> <td style="text-align: right;">41,417</td> <td style="text-align: right;">43,272</td> <td style="text-align: right;">39,918</td> <td style="text-align: right;">43,197</td> <td style="text-align: right;">49,707</td> <td style="text-align: right;">50,566</td> <td style="text-align: center;">Cont</td> <td style="text-align: center;">Cont</td> </tr> <tr> <td>(U) Missile Procurement (PE 0305165F, BA 5 - Space and Other Support, P-20, 21)</td> <td style="text-align: right;">162,626</td> <td style="text-align: right;">93,599</td> <td style="text-align: right;">170,847</td> <td style="text-align: right;">257,435</td> <td style="text-align: right;">224,096</td> <td style="text-align: right;">228,902</td> <td style="text-align: right;">293,886</td> <td style="text-align: right;">217,987</td> <td style="text-align: center;">Cont</td> <td style="text-align: center;">Cont</td> </tr> <tr> <td>(U) Other Procurement (PE 0305165F, BP 83 - Electronics and Telecommunications Equipment, WSC 6790, P-68)</td> <td style="text-align: right;">10,665</td> <td style="text-align: right;">8,113</td> <td style="text-align: right;">14,648</td> <td style="text-align: right;">8,833</td> <td style="text-align: right;">9,939</td> <td style="text-align: right;">6,159</td> <td style="text-align: right;">6,978</td> <td style="text-align: right;">6,982</td> <td style="text-align: center;">Cont</td> <td style="text-align: center;">Cont</td> </tr> </tbody> </table> <p><u>Related RDT&E:</u></p> <p>(U) PE 0305164F, GPS User Equipment (U) PE 0101221N, Fleet Ballistic Missile System (U) PE 0301357F and 0305913F, Nuclear Detonation Detection System (NDS) (U) PE 0305119F Space Boosters (Delta II) (U) PE 0604480F, GPS Block IIF</p> <p>(U) E. <u>Acquisition Strategy:</u> GPS Operational Control System (OCS) upgrade was competitively awarded to a single contractor in July 1995. Block IIF satellite development contract was competitively awarded to a single contractor in April 1996.</p>										<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY</u> <u>2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To</u> <u>Compl</u>	<u>Total</u> <u>Cost</u>	(U) Operations and Maintenance (PE 0305165F, BA 1 - Operating Forces, SAG 13D)	24,992	26,094	41,417	43,272	39,918	43,197	49,707	50,566	Cont	Cont	(U) Missile Procurement (PE 0305165F, BA 5 - Space and Other Support, P-20, 21)	162,626	93,599	170,847	257,435	224,096	228,902	293,886	217,987	Cont	Cont	(U) Other Procurement (PE 0305165F, BP 83 - Electronics and Telecommunications Equipment, WSC 6790, P-68)	10,665	8,113	14,648	8,833	9,939	6,159	6,978	6,982	Cont	Cont
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY</u> <u>2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To</u> <u>Compl</u>	<u>Total</u> <u>Cost</u>																																										
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Project			Page 6 of 10 Pages			Exhibit R-2 (PE 0305165F)																																														

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305165F NAVSTAR GPS (Space)
	PROJECT

(U) F. <u>Schedule Profile</u>	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) Training simulator development complete										x						
(U) Continue OCS Consolidated Contract																
(U) Phase 2 delivery				*												
(U) Phase 3/4 delivery									x							
(U) IIA IMOSC development begins			*													
(U) IIA IMOSC system available									x							
(U) IIA IMOSC development complete												x				
(U) IIF IMOSC development begins									x							
(U) MCS interface to IIR OSS devel begins					*											
(U) MCS interface to IIR OSS dev complete											x					
(U) IIF satellite final design verification										x						
(U) IIF SAASM Control Seg devel begins													x			
(U) IIF OCS software delivery																x
(U) GPS Modernization studies began	*															
(U) GPS Modernization studies complete												x				
(U) GPS ORD Coordination begins				*												
(U) GPS OIPT			*			x						x				
(U) GPS ORD Validation							x									
(U) GPS Program Review															x	
(U) GPS Modernization Space/Control development begins													x			

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305165F NAVSTAR GPS (Space)
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(U) A. Project Cost Breakdown (\$ in Thousands)

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) System Engineering including Configuration Management	1,732	1,330	2,358	1,648
(U) Training Simulator Development	3,111	2,107	1,231	0
(U) Operational Control Segment (OCS) Development/Sustainment	13,350	11,364	8,796	9,383
(U) Sensor to Shooter	6,045	0	0	0
(U) OCS Transition to Operations		2,004	7,495	0
(U) Space long-range planning	51	77	0	0
(U) Program Office Support	71	0	0	0
(U) GPS Modernization	2,386	0	0	0
(U) IIA/IIF/IIR IMOSC development	502	2,180	2,753	3,537
(U) MCS interface to IIR OSS	0	1,320	1,380	0
(U) IIF satellite development*	0	0	3,444	0
(U) IIF clock technical support*	0	0	5,390	4,650
(U) IIF SV compatibility analysis*	0	0	2,700	4,100
(U) IIF satellite associated development*	0	0	5,967	7,323
(U) IIF Operational Control System development*	0	0	21,435	23,987
(U) GPS LEO consolidation*	0	0	3,900	6,000
(U) IIF OCS associated development*	0	0	2,407	1,269
(U) IIF SAASM Control System changes	0	0	0	4,000
(U) GPS Modernization Space/Control development	0	0	29,634	42,954
(U) Identified as a source for SBIR		683		
(U) Total	27,248	21,065	98,890	108,851

*Funded in PE 0604480F in FY 1999 and prior.

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

Performing Organizations:

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305165F NAVSTAR GPS (Space)					PROJECT	
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR							683				683
<u>Product Development Organizations</u>											
Lockheed-Martin Applied Research Labs	CPAF/FFP	Jul 95	164,816	179,726	47,567	21,626	16,389	17,782	9,351	8,089	120,804
	MIPR	Mar 97	2,766	2,766	1,561	805	0	400	0	0	2,766
Boeing North American	FPAF/CPAF	Apr 96	Cont	Cont	3,000*	1,832*	2,180*	70,240	91,170	Cont	Cont
NRL	MIPR	Dec 99	Cont	Cont	0*	0*	0*	5,390	4,650	15,625**	Cont
GPS Modernization	TBD	TBD	Cont	Cont	0	0	0	2,000	2,000	Cont	Cont
Miscellaneous	Various	Various	N/A	N/A	N/A	1,131	406	720	32	Cont	Cont
*primary funding in PE 0604480F											
**through FY05 only											
<u>Support and Management Organizations</u>											
System Engineer	Various	Various	N/A	N/A	17,678	1,732	1,330	2,358	1,648	Cont	Cont
Program Support	Various	Various	N/A	N/A	6,605	71	0	0	0	0	6,676
Miscellaneous	Various	Various	N/A	N/A	N/A	51	77	0	0	0	128
<u>Test and Evaluation Organizations</u>											
N/A											
Identified as a source for SBIR							683				683
Subtotal Product Development					52,128	25,394	18,975	96,532	107,203	Cont	Cont
Subtotal Support and Management					24,283	1,854	1,407	2,358	1,648	Cont	Cont
Project					Page 9 of 10 Pages		Exhibit R-3 (PE 0305165F)				

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305165F NAVSTAR GPS (Space)	PROJECT
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Subtotal Test and Evaluation	0	0	0	0	0	0	0
Total Project	76,411	27,248	21,065	98,890	108,851	Cont	Cont

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)									DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305182F Spacelift Range System					PROJECT 4137		
COST (\$ In Thousands)		FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4137	Range Standardization and Automation (RSA)	31,736	24,457	43,186	49,130	42,747	44,004	49,701	50,521	Continuing	Continuing
	Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) **A. Mission Description**

Two national ranges, the Eastern Range (ER) at Patrick AFB, FL, and the Western Range (WR) at Vandenberg AFB, CA, provide tracking, telemetry, range safety communications, command/control and other support capabilities necessary to safely conduct civil, commercial, and national security spacelift operations, ballistic missile test and evaluations, and a variety of aeronautical and guided weapons tests. Range assets are based on 1950s/1960s technologies and are arrayed in a highly inefficient, manpower-intensive architecture. Range instrumentation reliability is deteriorating and many of the components are obsolete and unsupported. The ranges do not provide the responsiveness and flexibility to support the nation's growing spacelift needs. Replacement of the aging systems is a necessity.

Ongoing Range Standardization and Automation (RSA) efforts will substantially overhaul and modernize the ER and the WR, treating the two as a single integrated Spacelift Range System (SLRS). RSA will develop the integrated SLRS using remote control and automation techniques to reduce the number of required operators, sites, and facilities. The result will be an SLRS reconfigurable from one major operation to another in hours versus days, costing 20% less to operate and maintain than current ranges, and supportable through existing Air Force logistics infrastructure and standard practices.

Beginning in FY 2000, the sustainment responsibility for the SLRS will migrate from Air Force Space Command (AFSPC) to Air Force Material Command (AFMC). To effect this change and satisfy remaining systems development and integration requirements, AFMC will award a consolidated SLRS Contract (SLRSC).

The primary objectives throughout all of these efforts are to preserve and enhance SLRS safety, provide more reliable and responsive operations, continue the standardization of the SLRS, and continue life cycle cost reduction.

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

- (U) \$7,968 Continued RSA Phase I: Completed design/began integration of Consolidated Telemetry Processing System (CTPS). Funded SATCOM lease.
- (U) \$22,432 Continued RSA Phase IIA: Continued control and display product item development. Began conversion of communications network infrastructure to a seamless, multipath system, including network controllers and GPS-based timing. Began work on interim flight safety program for ER.
- (U) \$1,336 Provided program support for System Program Office.
- (U) \$31,736 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305182F Spacelift Range System	PROJECT 4137
<p><u>(U) FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$7,799 Complete RSA Phase I: Complete integration of CTPS. Complete RSA Phase I test and evaluation. - (U) \$13,902 Continue RSA Phase IIA: Continue Control & Display integration and test for operational turnover; continue development of communications network including network core. Begin development of voice, video and data network modernization. Begin development of the GPS metric tracking system for the ER & WR, which replaces the O&M-intensive radars. Continue work on the interim flight safety program for the ER Operations Control Center. - (U) \$1,955 Provide program support for Systems Program Office - (U) \$801 Identified as a source for SBIR. - (U) \$24,457 Total <p><u>(U) FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$36,131 Continue RSA Phase IIA: Continue Control & Display integration and test for operational turnover; continue development of GPS for metric tracking. Continue development of voice, video and data network modernization. Complete the interim flight safety program for the ER Operations Control Center. Begin development of the ER & WR flight safety analysis tool as well as the command destruct system and begin integration of the RSA I CTPS sub-system into the RSA Phase IIA architecture. - (U) \$4,939 Begin Space Lift Range System Contract (SLRS). Assess AFSPC's down-range instrumentation requirements and commercial products available to satisfy these requirements. Begin related design efforts. - (U) \$2,116 Provide program support for Systems Program Office - (U) \$43,186 Total <p><u>(U) FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$40,663 Continue RSA Phase IIA: Continue development of the command destruct system and GPS for metric tracking. Continue development of communications network including network core. Continue development of voice, video and data network modernization. Continue development of ER & WR flight safety analysis tool and integration of the RSA Phase I CTPS sub-system into the RSA Phase IIA architecture. Begin development of the pre-planned upgrade to the Control & Display segment providing increased range safety functionality and post-operation data processing. - (U) \$6,182 SLRSC: Continue assessment of existing commercial off the shelf solutions for applicability to down-range instrumentation requirements and conduct of related design efforts. Begin development of automated instrumentation for the SLRS Operations Control Centers. - (U) \$2,285 Provide program support for Systems Program Office - (U) \$49,130 Total 		
Project 4137	Page 2 of 7 Pages	Exhibit R-2 (PE 0305182F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE February 1999				
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305182F Spacelift Range System			PROJECT 4137				
(U) B. <u>Budget Activity Justification:</u>											
<p>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. Associated procurement funding for the RSA and SLRSC efforts is under this same program element in the Other Procurement, Air Force, appropriation.</p>											
(U) C. <u>Program Change Summary (\$ in Thousands)</u>											
		<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total</u>					
(U) Previous President's Budget (FY 1999 PB)		32,018	24,578	49,572	44,465	Continuing					
(U) Appropriated Value		34,186	24,578								
(U) Adjustments to Appropriated Value											
a. Congressional/General		-1305	-121								
b. SBIR		-868									
c. Omnibus and other Above Threshold		-218									
d. Below Threshold Reprogramming		-59									
(U) Adjustments to Budget Years Since FY 1999 PB				-6,386	+4,665						
(U) Current Budget Submit/FY 2000 PB		31,736	24,457	43,186	49,130	Continuing					
(U) Significant Program Changes:											
FY 1999: \$801 identified as a source for SBIR.											
FY 2000 and FY 2001 adjustments rephase funding to support changes in planned work for RSA Phase IIA.											
(U) D. <u>Other Program Funding Summary (\$ in Thousands)</u>											
		<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To Complete</u>	<u>Total Cost</u>
(U) Other Procurement, AF, BA 03, P-68, Eastern/Western Range I&M Space *		75,118	93,552	83,410	98,625	156,910	149,241	156,193	167,362	Continuing	Continuing
(U) MILCON, AF, Project XUMU983004, Launch Operations Control Center **		26,876									26,876
(U) <u>Related RDT&E:</u> Not Applicable.											
* FY 2000 through FY 2003 amounts are higher than previously shown, because they now include initial spares funding for the RSA Phase IIA contract as a pilot program under the Reengineered Supply Support Program.											
** FY 1998 MILCON funds are in PE 0305181F for the Western Range Operations Control Center.											
Project 4137			Page 3 of 7 Pages				Exhibit R-2 (PE 0305182F)				

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational System Development	0305182F Spacelift Range System	4137
<p>(U) E. Acquisition Strategy:</p> <p>The RSA Phase I contract was competitively awarded in FY 1993 to provide interconnection between 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. RSA Phase I ends in FY 1999. The RSA Phase IIA contract was competitively awarded in FY 1996 to provide a top-down systems approach which produces a standardized SLR architecture. It modernizes range safety, data processing, communications, command and control, meteorological, and imaging systems. RSA Phase IIA will end in FY 2006.</p> <p>In addition to RSA Phases I and IIA, other contracts upgrading and sustaining the ER and WR include multiple improvement and modernization (I&M) or recapitalization contracts to modify or replace existing range systems, as well as AFSPC's operations, maintenance, and sustainment contracts at each range. The government is the de facto integrator of all of these efforts. Per mutual agreement, beginning in FY 2000, the sustainment responsibility for the SLR System will migrate from AFSPC to AFMC.</p> <p>To execute its expanded responsibilities for the SLR System, AFMC will employ the SLRSC to consolidate remaining development efforts with integration and sustainment functions under one contractor. The SLRSC will develop and procure automated down-range instrumentation originally planned for a follow-on RSA phase. Additionally, it will execute recapitalization projects previously funded under I&M programs to replace obsolete and unsupportable systems. Finally, it will provide sustainment functions, including those transferred from AFSPC as part of the logistics standardization effort.</p>		
Project 4137	Page 4 of 7 Pages	Exhibit R-2 (PE 0305182F)

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305182F Spacelift Range System	PROJECT 4137
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(U) A. Project Cost Breakdown (\$ in Thousands)

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
RSA Phase I Contract	\$7,968	\$7,799	0	0
RSA Phase IIA Contract	\$22,432	\$13,902	\$36,131	\$40,663
SLR System Contract	0	0	\$4,939	\$6,182
Program Support	\$1,336	\$1,955	\$2,116	\$2,285
Identified as a source for SBIR		\$801		
Total	\$31,736	\$24,457	\$43,186	\$49,130

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

Performing Organizations:

<u>Contractor or Government Performing Activity</u>	<u>Contract Method/Type or Funding Vehicle</u>	<u>Award or Obligat'n Date</u>	<u>Performin g Activity EAC</u>	<u>Project Office EAC</u>	<u>Total Prior to FY 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>To Complete</u>	<u>Total Program</u>
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Identified as a source for SBIR		801									
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Product Development Organizations

Harris Corp/ Loral RSA Phase I)	C/CPAF	Jun 93	93,859	93,859	78,347	7,968	7,799	0	0	0	94,114
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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305182F Spacelift Range System					PROJECT 4137	
<u>Contractor or Government Performing Activity</u>	<u>Contract Method/Type or Funding Vehicle</u>	<u>Award or Obligat'n Date</u>	<u>Performin g Activity EAC</u>	<u>Project Office EAC</u>	<u>Total Prior to FY 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>To Complete</u>	<u>Total Program</u>
Lockheed Martin (RSA Phase IIA)	C/CPAF	Nov 95	166,521	166,521	33,871	22,432	13,902	36,131	40,663	130,520	277,519
Harris Corp. (ROCC Eng'r Services)	SS/CPAF	Apr 94	23,852	23,852	23,852	0	0	0	0	0	23,852
Various (Other RSA)	Various	Various	N/A	N/A	2,913	0	0	0	0	0	2,913
Unknown (SLRSC)	TBD	Jul 99	TBD	TBD	0	0	0	4,939	6,182	TBD	TBD
<u>Support and Management Organizations</u>											
Mission Support	Various	Various	N/A	N/A	10,021	1,336	1,955	2,116	2,285	Cont.	Cont.
<u>Test and Evaluation Organizations</u>											
N/A	N/A	N/A	N/A	N/A	0	0	0	0	0	0	0
Government Furnished Property: 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.											
Identified as a source for SBIR							801				
Subtotal Product Development					138,983	30,400	21,701	41,070	46,845	TBD	TBD
Subtotal Support and Management					10,021	1,336	1,955	2,116	2,285	Cont.	Cont.
Subtotal Test and Evaluation					N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Project					149,004	31,736	24,457	43,186	49,130	Cont.	Cont.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305205F Endurance Unmanned Aerial Vehicles
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	13,437	188,423	70,835	26,788	10,698	19,098	19,346	19,902	Continuing	Continuing
4755 Predator	13,437	4,295	4,003	3,729	3,805	3,874	3,955	4,037	Continuing	Continuing
4799 Global Hawk	0	102,261	47,999	11,799	4,760	6,681	6,721	6,958	Continuing	Continuing
4815 DarkStar*	0	33,904	6,035	3,422	0	3,396	3,473	3,553	Continuing	Continuing
4816 Common Ground Segment	0	47,963	12,798	7,838	2,133	5,147	5,197	5,354	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

Note: FY98 funds for Global Hawk, DarkStar, and Common Ground Segment are in PE 0305205D, Endurance Unmanned Aerial Vehicles (EUAV). Funding for Global Hawk, DarkStar and Common Ground Segment for FY99-05 was transferred to the Air Force (PE 0305205F) from Defense-wide (PE 0305205D) as part of the DARO divestiture.
 * DarkStar portion of HAE ACTD canceled 29 Jan 99. OSD intention is to apply remaining DarkStar funds, less contract close-out costs and potential liability, to Global Hawk.

(U) A. Mission Description

Endurance Unmanned Aerial Vehicles (UAVs) are a family of unmanned vehicles developed under two separate Advanced Concept Technology Demonstrations (ACTD) that will provide all-weather, day/night, reconnaissance and surveillance in direct support of the Joint Forces Commander. They integrate existing airborne reconnaissance architectures for mission planning, data processing, exploitation and dissemination. The RQ-1A Predator UAV is a medium altitude endurance UAV which completed its ACTD in FY96. OSD decided to continue production in Aug 97. 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 in an ACTD, scheduled for completion in Dec 99. The HAE ACTD enters the military utility demonstration phase in Apr 99.

(U) B. Budget Activity Justification This program is in budget activity 7, Operational Systems Development, because it involves Air Force R&D to either field a viable system or develop additional operational capabilities.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305205F Endurance Unmanned Aerial Vehicles
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(U) C. Program Change Summary (\$ in Thousands)

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U) Previous President's Budget (FY 1999 PB)	14,147	4,307	4,076	3,800	continuing
(U) Appropriated Value	14,990	188,957			
(U) Adjustments to Appropriated Value					
a. Cong Reductions	-489	-534			
b. SBIR	-356				
c. Omnibus or Other Above Threshold Reprogram	-96				
d. Below Threshold Reprogramming	-612				
(U) Adjustments to Budget Years Since FY 1999 PB			+66,759	+22,988	
(U) Current Budget Submit/FY 2000 PB	13,437	188,423	70,835	26,788	continuing

(U) Significant Program Changes:

FY00 and FY01 funds added in Air Force POM and HAE funds transferred from Defense-wide PE0305205D to Air Force PE0305205F as part of the DARO divestiture.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305205F Endurance Unmanned Aerial Vehicles				PROJECT 4755		
COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4755 Predator	13,437	4,295	4,003	3,729	3,805	3,874	3,955	4,037	Continuing	Continuing
<p>(U) A. <u>Mission Description</u> The Predator unmanned aerial vehicle (UAV) was an Advanced Concept Technology Demonstration (ACTD) project for the development of an 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. The Predator is equipped with Electro-Optical/Infrared (EO/IR) and Synthetic Aperture Radar (SAR) sensors. The system 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 Predator is integral to the search and destruction of Critical Mobile Targets (CMT). The success of the Predator in a number of exercises and operational deployments in Bosnia prompted the Joint Requirements Oversight Council (JROC) to request an additional quantity of systems and sensors. The JROC has identified a number of P3I upgrades (de-icing, UHF/VHF voice relay, and IFF Mode IV) to be included with production systems. IR sensor improvements and growth payloads are being considered. UAV Common Automated Recovery System (UCARS) has been added by Congress.</p> <p>(U) <u>FY 1998 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 1,070 Completed VOX/IFF/De-ice - (U) \$ 1,000 Conducted operational tests/operational assessment - (U) \$ 8,290 Reliability and maintainability improvements and synthetic aperture radar non-recurring productionization - (U) \$ 1,160 Improved operational capabilities of Ku SATCOM - (U) \$ 1,500 Integrated UAV Common Automatic Recovery System (UCARS) - (U) \$ 417 Field Support - (U) \$13,437 Total 										
Project 4755			Page 3 of 22 Pages				Exhibit R-2A (PE 0305205F)			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305205F Endurance Unmanned Aerial Vehicles	PROJECT 4755
<p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 650 Conduct operational tests/operational assessment - (U) \$ 940 Block 1 improvements (accuracy, acoustics, NBC assessment) - (U) \$ 588 Improve system R&M to meet ORD requirements - (U) \$1,700 Integrate UAV Common Automatic Recovery System (UCARS) - (U) \$ 417 Field Support - (U) \$4,295 Total <p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 700 Conduct operational tests/operational assessment - (U) \$1,000 Develop interfaces to Theater Deployable Comms (TDC) - (U) \$1,877 Block 1 improvements (accuracy, acoustics, NBC assessment) - (U) \$ 426 Field Support - (U) \$4,003 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$2,179 Air vehicle operational improvements - (U) \$1,125 Ground station operational improvements - (U) \$ 425 Field Support - (U) \$3,729 Total <p>(U) B. <u>Project Change Summary - Description of Significant Changes:</u> Program management transferred from Navy Joint Program Office for Cruise Missiles and Joint UAVs to Air Force Aeronautical Systems Center on 31 Aug 98. Cost overrun on Tactical Endurance Synthetic Aperture Radar caused restructure of Block 1.</p>		
Project 4755	Page 4 of 22 Pages	Exhibit R-2A (PE 0305205F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305205F Endurance Unmanned Aerial Vehicles	PROJECT 4755
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(U) C. Other Program Funding Summary (\$ in Thousands)

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Total Cost</u>
(U) Aircraft Procurement, AF (PE 35205F), Predator	135,753	117,626	38,003	22,648	20,024	27,171	27,884	28,453	continues
(U) MILCON, AF (PE 27245F)		15,013							

(U) D. Acquisition Strategy:

Predator is in full scale production. Twelve systems plus attrition air vehicles are being acquired with the prime contractor, General Atomics Aeronautical Systems Inc., assigned total system performance responsibility (TSPR). With the exceptions of the Tactical Endurance Synthetic Aperture Radar and the Ku-band satellite link (Trojan Spirit II), which are being procured through the Army as GFE, all procurement of baseline Predator systems will be through General Atomics. Program will transition from interim contractor logistics support (ICS) to contractor logistics support (CLS) in FY99.

(U) E. Schedule Profile

	<u>FY 1998</u>			<u>FY 1999</u>			<u>FY 2000</u>			<u>FY 2001</u>		
	1	2	3	4	1	2	3	4	1	2	3	4
(U) TEMP approval				*								
(U) Delivery of first Baseline system					X							
(U) OT&E								X				
(U) Retrofit of ACTD Systems complete									X			
(U) Delivery of final Predator System												X

* denotes completed event

X denotes planned event

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)						DATE February 1999				
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305205F Endurance Unmanned Aerial Vehicles				PROJECT 4755		
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>										
				<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U)	Hardware/Software			4,254	1,620	1,217	1,174			
(U)	Demonstrations and test			4,656	1,140	1,180	1,135			
(U)	System integration and engineering support			4,110	978	1,030	995			
(U)	Other technical/engineering			417	557	576	425			
(U)	Total			13,437	4,295	4,003	3,729			
(U) B. <u>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</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Total</u>
<u>Performing</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</u>	<u>Prior to</u>	<u>FY 1998</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>FY 1998</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Program</u>
<u>Product Development Organizations</u>										
General Atomics	SS/CPFF	Apr 98	N/A	N/A	0	9,692	3,038	3,017	3,304	continuing
PM TESAR			N/A	N/A	0	2,300	0	0	0	2,300
<u>Support and Management Organizations</u>										
ASC					0	0	417	426	425	continuing
AD/NAVAIR					0	320	0	0	0	320
<u>Test and Evaluation Organizations</u>										
AFOTEC					0	795	840	560	0	2,195
Misc					0	330	0	0	0	330
Project 4755					Page 6 of 22 Pages			Exhibit R-3 (PE 0305205F)		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305205F Endurance Unmanned Aerial Vehicles				PROJECT 4755	
(U) B. Budget Acquisition History and Planning Information Continued (\$ in Thousands)									
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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</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									
Subtotal Product Development				0	11,992	3,038	3,017	3,304	continuing
Subtotal Support and Management				0	320	417	426	425	continuing
Subtotal Test and Evaluation				0	1,125	840	560	0	2,525
Total Project				0	13,437	4,295	4,003	3,729	continuing

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305205F Endurance Unmanned Aerial Vehicles				PROJECT 4799	
<i>COST (\$ In Thousands)</i>	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4799 Global Hawk	0	102,261	47,999	11,799	4,760	6,681	6,721	6,958	Continuing	Continuing
<p>Note: FY98 funds for Global Hawk are in PE 0305205D, Endurance Unmanned Aerial Vehicles (EUAV). Funding for Global Hawk for FY99-05 was transferred to the Air Force (PE 0305205F) from Defense-wide (PE 0305205D) as part of the DARO divestiture.</p> <p>(U) A. Mission Description The Global Hawk will provide continuous, all-weather, day/night, wide area communications and interfaces to theater systems to support tactical warfighters at various levels of command. The Global Hawk will be a fully automatic, high-altitude, long endurance unmanned aircraft that is directly responsive to Theater force tasking. The Global Hawk will integrate with the existing tactical airborne reconnaissance architectures for mission planning, data processing, exploitation, and dissemination. It will provide both wide area search radar and either Electro-Optical (EO) or Infrared Radar (IR) imagery (40,000 sq nm per mission) at 1m resolution and up to 1900 spot images per mission at 0.3m resolution, and will support targeting accuracy of at least 20m CEP. It will be designed for long endurance, high altitude, standoff, image collection capabilities. The Global Hawk will operate in low-to-moderate air defense threat environments with the ability to fly above, standoff, and look into high threat areas. The High Altitude Endurance (HAE) UAV Advanced Concept Technology Demonstration (ACTD) program consists of Global Hawk and a Common Ground Segment (CGS). The HAE UAV Common Ground Segment project is documented separately. The objective of the ACTD is to place the assets in the hands of the warfighter as quickly as possible so as to assess the utility of the system in the context of military exercises with other service/theater systems. The execution of the Global Hawk is directly related to funding of the HAE UAV Common Ground Segment which contains the ground segment RDT&E, and government developmental and demonstration support funding.</p> <p>(U) <u>FY 1998 (\$ in Thousands):</u> FY98 funds for Global Hawk are in PE 0305205D, Endurance Unmanned Aerial Vehicles (EUAV). - (U) \$ 0 Total</p> <p>(U) <u>FY 1999 (\$ in Thousands):</u> - (U) \$ 8,800 Product development and testing - (U) \$ 48,120 Fabrication and integration of air vehicles #3, #4, and #5 - (U) \$ 28,001 Provide contractor demonstration and evaluation support necessary to accomplish military utility assessment - (U) \$ 5,130 Integrated logistics support, Agile Support - (U) \$ 7,000 System Integration Lab - (U) \$ 5,210 Airframe reliability and Maintainability improvements - (U) \$102,261 Total</p>										
Project 4799			Page 8 of 22 Pages				Exhibit R-2A (PE 0305205F)			

DATE **February 1999**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0305205F Endurance Unmanned Aerial Vehicles

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305205F Endurance Unmanned Aerial Vehicles	PROJECT 4799
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(U) FY 2000 (\$ in Thousands):

- (U) \$41,898 Provide contractor demonstration and evaluation support necessary to accomplish military utility assessment
- (U) \$ 2,101 Integrated logistic support, Agile Support
- (U) \$ 4,000 Development of training programs and tech order documentation
- (U) \$47,999 Total

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

- (U) \$ 4,799 Investigate and implement improvements to the HAE UAV system identified in the demonstration period
- (U) \$ 5,000 Operational demonstration in Australia
- (U) \$ 1,000 Development of training programs
- (U) \$ 1,000 Develop tech order documentation
- (U) \$11,799 Total

(U) **B. Project Change Summary - Description of Significant Changes:**

Program transferred from Defense Advanced Research Projects Agency to Air Force in FY99. Funds to prepare for transition from ACTD to production (O&M and RDT&E) added in Air Force POM.

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

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To</u>	<u>Total</u>
									<u>Compl</u>	<u>Cost</u>
(U) Aircraft Procurement, AF (HAE UAV)				31,466	51,346	81,178	83,308	85,006	TBD	TBD

Funds are associated with HAE UAV ACTD preparation for and transition to production.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305205F Endurance Unmanned Aerial Vehicles	PROJECT 4799
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(U) D. Acquisition Strategy

The HAE system will be procured as a design-to-cost program to acquire maximum reconnaissance capability for a firm unit flyaway price (UFP) of \$10M (FY 94\$) per vehicle (including payload). Global Hawk was selected at the end of a competition involving multiple contractor teams. Streamlined procurement, using DARPA's Other Transaction Authority, is being used to delete all non value-added tasks and documentation from the program. Under the Development Phase agreement, the contractor will build and test two Global Hawk air vehicles. As part of this agreement, the contractor will also build a developmental ground segment. During the Demonstration Phase, program management responsibility transitioned to the Air Force on 1 Oct 98. Funding for the ACTD program ends in the third quarter of FY 2000. Funding for the post ACTD RDT&E and production begins in FY 2001. Acquisition decision will occur in 2001 after the Military Utility Assessment is delivered from USACOM.

(U) E. Schedule Profile

	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) Flight Readiness Review		*														
(U) Start development flight tests		*														
(U) Demonstration support award						X										
(U) User field demos with warfighters							X									
(U) ACTD ends										X						
(U) Military Utility Assessment											X					
(U) Acquisition decision													X			
(U) Australian Demonstration														X		
(U) Investigate & implement improvements													X			

* denotes completed event
X denotes planned event

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1999				
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305205F Endurance Unmanned Aerial Vehicles			PROJECT 4799				
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
				<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>				
(U)	A/V development, fabrication, testing				63,920						
(U)	Integrated logistics support				5,130	2,101					
(U)	Demonstration and evaluation support				28,001	41,898	5,000				
(U)	System engineering and integration support				5,210		4,799				
(U)	Develop training programs					2,000	1,000				
(U)	Develop tech orders					2,000	1,000				
(U)	Total				102,261	47,999	11,799				
Note: Program management funded in BPAC 4816, Common Ground Segment.											
(U) B. <u>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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Organizations</u>											
Teledyne Ryan	SS/CPFF/IF		N/A	N/A			69,130	4,000	3,500	Continuing	Continuing
<u>Support and Management Organizations</u>											
Teledyne Ryan	SS/CPFF/IF		N/A	N/A		5,130	2,101	8,299		Continuing	Continuing
<u>Test and Evaluation Organizations</u>											
Teledyne Ryan	SS/CPFF/IF		N/A	N/A		28,001	41,898		0	Continuing	Continuing
Project 4799				Page 11 of 22 Pages				Exhibit R-3 (PE 0305205F)			

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE			
BUDGET ACTIVITY								PROJECT			
7 - Operational System Development								0305205F Endurance Unmanned Aerial Vehicles			4799
(U) B. Budget Acquisition History and Planning Information Continued (\$ in Thousands)											
Government Furnished Property:											
<u>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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>	
<u>Product Development Property</u>											
N/A											
<u>Support and Management Property</u>											
N/A											
<u>Test and Evaluation Property</u>											
N/A											
Subtotal Product Development						69,130	4,000	3,500	Continuing	Continuing	
Subtotal Support and Management						5,130	2,101	8,299	Continuing	Continuing	
Subtotal Test and Evaluation						28,001	41,898	0	Continuing	Continuing	
Total Project						102,261	47,999	11,799	Continuing	Continuing	

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305205F Endurance Unmanned Aerial Vehicles	PROJECT 4815
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4815 DarkStar*	0	33,904	6,035	3,422	0	3,396	3,473	3,553	Continuing	Continuing

FY98 funds for DarkStar are in PE 0305205D, Endurance Unmanned Aerial Vehicles (EUAV). Funding for DarkStar for FY99-05 was transferred to the Air Force (PE 0305205F) from Defense-wide (PE 0305205D).

* DarkStar portion of HAE ACTD canceled 29 Jan 99. OSD intention is to apply remaining DarkStar funds, less contract close-out costs and potential liability, to Global Hawk.

(U) A. Mission Description

DarkStar project terminated 29 Jan 99.

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

FY98 funds for DarkStar are in PE 0305205D, Endurance Unmanned Aerial Vehicles (EUAV).

– (U) \$ 0 Total

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

– (U) \$ 33,904 Contract/program close-out

– (U) \$ 33,904 Total

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

– (U) \$6,035 Transfer to Global Hawk

– (U) \$6,035 Total

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

– (U) \$3,422 Transfer to Global Hawk

– (U) \$3,422 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305205F Endurance Unmanned Aerial Vehicles	PROJECT 4815
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(U) B. Project Change Summary - Description of Significant Changes:

Program transferred from Defense Advanced Research Projects Agency to Air Force in FY99.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305205F Endurance Unmanned Aerial Vehicles	PROJECT 4815
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(U) **C. Other Program Funding Summary (\$ in Thousands)**

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To Compl</u>	<u>Total Cost</u>
(U) Aircraft Procurement, AF (HAE UAV)				31,466	51,346	81,178	83,308	85,006	TBD	TBD

Funds are associated with preparation for and transition of HAE UAV ACTD to production.

(U) **D. Acquisition Strategy**

Program terminated on Jan 29, 1999.

(U) **E. Schedule Profile**

	<u>FY 1998</u>			<u>FY 1999</u>			<u>FY 2000</u>			<u>FY 2001</u>		
(U) Resume development flight test	1	2	3	4	1	2	3	4	1	2	3	4
(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 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305205F Endurance Unmanned Aerial Vehicles	PROJECT 4815
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(U) A. Project Cost Breakdown (\$ in Thousands)

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) Contract/program close-out		33,904		
(U) Transfer to Global Hawk			6,035	3,422
(U) Total		33,904	6,035	3,422

Note: Program management funded in BPAC 4816, Common Ground Segment.

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

Performing Organizations:

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

LMSW	SS/CPIF						33,904	0	0	0	33,904
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Support and Management Organizations

LMSW	SS/CPIF		N/A	N/A			0	0	0	0	0
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Test and Evaluation Organizations

LMSW	SS/CPIF		N/A	N/A			0	0	0	0	0
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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1999			
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305205F Endurance Unmanned Aerial Vehicles				PROJECT 4815		
(U) B. <u>Budget Acquisition History and Planning Information Continued (\$ in Thousands)</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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Property</u>										
N/A										
<u>Support and Management Property</u>										
N/A										
<u>Test and Evaluation Property</u>										
N/A										
Subtotal Product Development						33,904	0	0	0	33,904
Subtotal Support and Management						0	0	0	0	0
Subtotal Test and Evaluation						0	0	0	0	0
Total Project						33,904	0	0	0	33,904

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305205F Endurance Unmanned Aerial Vehicles				PROJECT 4816		
<i>COST (\$ In Thousands)</i>	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4816 Common Ground Segment	0	47,963	12,798	7,838	2,133	5,147	5,197	5,354	Continuing	Continuing
<p>FY98 funds for Common Ground Segment are in PE 0305205D, Endurance Unmanned Aerial Vehicles (EUAV). Funding for Common Ground Segment for FY99-05 was transferred to the Air Force (PE 0305205F) from Defense-wide (PE 0305205D).</p> <p>(U) A. <u>Mission Description</u> The Common Ground Segment (CGS) supports tactical warfighters at various levels of command with digital, near real-time, high quality imagery in exploitable form. The High Altitude Endurance (HAE) UAV Advanced Concept Technology Demonstration (ACTD) program consists of the Conventional HAE (CONV HAE) – Global Hawk, and the CGS. The HAE UAV CGS is comprised of a Launch Recovery Element (LRE), a Mission Control Element (MCE), and associated logistics support activities. The HAE UAV Common Ground Segment integrates many technologies for communications between the Global Hawk and exploitation centers/users. Without the HAE UAV Common Ground Segment, Global Hawk cannot be executed. The LRE prepares, launches, and recovers the air vehicles. The MCE plans and executes the mission, dynamically re-tasks the air vehicles (including the sensors), and processes, stores and/or disseminates the data as required. Prior to the fielding of an integrated CGS, an Interim Ground Segment (IGS) composed of the Global Hawk LRE #1, MCE #1, and Data Processing Element (DPE) will be used to conduct flight test and CGS development. The HAE UAV CGS directly supports evaluations of military utility, GFE, and field demonstrations for the Global Hawk system.</p> <p>(U) <u>FY 1998 (\$ in Thousands):</u> FY98 funds for Common Ground Segment are in PE 0305205D, Endurance Unmanned Aerial Vehicles (EUAV). – (U) \$ 0 Total</p> <p>(U) <u>FY 1999 (\$ in Thousands):</u> – (U) \$ 3,350 Development and test of demonstration CGS – (U) \$ 13,763 Contractor participation in military utility assessment – (U) \$ 11,860 Government participation in military utility assessment – (U) \$ 10,350 Government support, studies, and related tasks – (U) \$ 5,840 Repair support and improvements – (U) \$ 2,800 Exploitation system interface development – (U) \$ 47,963 Total</p>										
Project 4816			Page 18 of 22 Pages				Exhibit R-2A (PE 0305205F)			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305205F Endurance Unmanned Aerial Vehicles	PROJECT 4816
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(U) FY 2000 (\$ in Thousands):

- (U) \$ 6,992 Provide contractor evaluation and demonstration support
- (U) \$ 1,806 Perform CGS and Global Hawk government support, studies, and related tasks
- (U) \$ 4,000 Development of training programs and tech order documentation
- (U) \$12,798 Total

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

- (U) \$ 838 Investigate and implement improvements to the HAE UAV system identified in the demonstration period
- (U) \$5,000 Operational demonstration in Australia
- (U) \$1,000 Development of training programs
- (U) \$1,000 Develop tech order documentation
- (U) \$7,838 Total

(U) **B. Project Change Summary - Description of Significant Changes:**

Program transferred from Defense Advanced Research Projects Agency to Air Force in FY99.

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

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To</u> <u>Compl</u>	<u>Total</u> <u>Cost</u>
(U) Aircraft Procurement, AF (HAE UAV)				31,466	51,346	81,178	83,308	85,006	TBD	TBD

Funds are associated with preparation for and transition of HAE UAV ACTD to production.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305205F Endurance Unmanned Aerial Vehicles	PROJECT 4816
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(U) D. Acquisition Strategy

The HAE UAV Common program provides the ground segment and support items common to the Global Hawk demonstration. Addition of this capability defines the Common Ground Segment (CGS) configuration. One (1) developmental and one (1) demonstration CGS are planned to be fabricated during the ACTD. Streamlined procurement, using DARPA's Other Transaction Authority, is being used to delete all non value-added tasks and documentation from the program. During the Demonstration Phase, program management responsibility transitioned to the Air Force on 1 Oct 98. Funding for the ACTD program ends in the third quarter of FY 2000. Funding for post ACTD RDT&E begins in FY 2001. Acquisition decision follows delivery of Military Utility Assessment from USACOM.

(U) E. Schedule Profile

	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) Flight readiness review		*														
(U) Start developmental flight test with Global Hawk		*														
(U) Demonstration support award						X										
(U) Fabricate demo CGS						X										
(U) User field demos with warfighter							X									
(U) ACTD ends										X						
(U) Military Utility Assessment											X					
(U) Acquisition decision														X		
(U) Investigate and implement improvements														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 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305205F Endurance Unmanned Aerial Vehicles					PROJECT 4816	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U) Development and test of demonstration CGS						9,963					
(U) Evaluation support						24,000	6,992				
(U) System integration and engineering support						11,000	806	4,838			
(U) Develop training programs						1,000	2,000	1,000			
(U) Develop tech orders						1,000	2,000	1,000			
(U) Program Management						1,000	1,000	1,000			
(U) Total						47,963	12,798	7,838			
(U) B. <u>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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Organizations</u>											
Raytheon			N/A	N/A			24,000	4,000	2,000	Continuing	Continuing
<u>Support and Management Organizations</u>											
ASC			N/A	N/A		1,000	1,000	1,000		Continuing	Continuing
Raytheon			N/A	N/A		3,000	806	4,838		Continuing	Continuing
<u>Test and Evaluation Organizations</u>											
AFFTC			N/A	N/A		6,000	1,000		0	Continuing	Continuing
AFOTEC			N/A	N/A		3,000	2,000		0	Continuing	Continuing
Raytheon			N/A	N/A		10,963	3,992		0	Continuing	Continuing
Project 4816					Page 21 of 22 Pages				Exhibit R-3 (PE 0305205F)		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305205F Endurance Unmanned Aerial Vehicles				PROJECT 4816		
(U) B. <u>Budget Acquisition History and Planning Information Continued (\$ in Thousands)</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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Property</u>										
N/A										
<u>Support and Management Property</u>										
N/A										
<u>Test and Evaluation Property</u>										
N/A										
Subtotal Product Development						24,000	4,000	2,000	Continuing	Continuing
Subtotal Support and Management						4,000	1,806	5,838	Continuing	Continuing
Subtotal Test and Evaluation						19,963	6,992		Continuing	Continuing
Total Project						47,963	12,798	7,838	Continuing	Continuing
Project 4816				Page 22 of 22 Pages				Exhibit R-3 (PE 0305205F)		

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305206F Airborne Reconnaissance Systems
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	0	126,402	124,608	136,591	97,369	116,311	122,864	121,001	Continuing	Continuing
4817 Joint SIGINT Avionics Family (JSAF)	0	80,683	81,640	71,478	40,862	45,089	45,777	46,669	Continuing	Continuing
4818 Advanced Technology	0	9,881	9,430	19,916	17,676	24,695	29,584	25,843	Continuing	Continuing
4819 Common Data Link (CDL)	0	35,838	33,538	45,197	38,831	46,527	47,503	48,489	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

Note: FY98 funds are in PE 0305206D, Airborne Reconnaissance Advanced Development. Funding for FY99-05 transferred to PE 0305206F from PE 305206D as part of the DARO divestiture.

(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.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305206F Airborne Reconnaissance Systems
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(U) C. Program Change Summary (\$ in Thousands)

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U) Previous President's Budget (FY 1999 PB)		0	0	0	Continuing
(U) Appropriated Value		126,768			
(U) Adjustments to Appropriated Value					
a. Cong Reductions		-366			
b. SBIR					
c. Omnibus or Other Above Threshold Reprogram					
d. Below Threshold Reprogramming					
(U) Adjustments to Budget Years Since FY 1999 PB			+124,608	+136,591	
(U) Current Budget Submit/FY 2000 PB		126,402	124,608	136,591	Continuing

Note: FY98 funds are in PE 0305206D, Airborne Reconnaissance Advanced Development. Funding for FY99-05 transferred to PE 0305206F from PE 305206D as part of the DARO divestiture.

(U) Significant Program Changes:

Funding for Airborne Reconnaissance Systems for FY99-05 was transferred to the Air Force (PE 0305206F) from the Defense Airborne Reconnaissance Office (PE 305206D).

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305206F Airborne Reconnaissance Systems					PROJECT 4817	
<i>COST (\$ In Thousands)</i>	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4817 Joint SIGINT Avionics Family (JSAF)	0	80,683	81,640	71,478	40,862	45,089	45,777	46,669	Continuing	Continuing
<p><u>Note:</u> FY98 funds are in PE 0305206D, Airborne Reconnaissance Advanced Development. Funding for FY99-05 transferred to PE 0305206F from PE 305206D as part of the DARO divestiture.</p> <p>(U) A. <u>Mission Description</u></p> <p>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. Producibile JSAF components will be provided for the airborne fleet (manned and unmanned) for integration on the Air Force's RC-135V/W (Rivet Joint), an unspecified Army platform, the Air Force's AF Special, and the Navy's EP-3E.</p> <p>(U) <u>FY 1998 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$0 FY98 funds are in PE 0305206D, Airborne Reconnaissance Advanced Development. - (U) \$0 Total <p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$42,002 Continue Low Band SubSystem (LBSS) Development and Integration - (U) \$16,546 Continue High Band SubSystem (HBSS) Development and Integration - (U) \$ 5,178 Continue Rivet Joint Platform Development and Integration - (U) \$ 8,518 Continue EP-3E Platform Development and Integration - (U) \$ 4,428 Continue AF Special Platform Development and Integration - (U) \$ 4,011 Continue SPO Operations, Systems Engineering, Program Management Activities - (U) \$80,683 Total 										
Project 4817			Page 3 of 21 Pages				Exhibit R-2A (PE 0305206F)			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)							DATE February 1999					
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305206F Airborne Reconnaissance Systems			PROJECT 4817					
(U) FY 2000 (\$ in Thousands):												
-	(U)	\$23,873	Continue Low Band SubSystem (LBSS) development and integration									
-	(U)	\$17,600	Continue High Band Subsystem (HBSS) development									
-	(U)	\$ 5,951	Continue Rivet Joint platform development for JSAF integration and testing									
-	(U)	\$15,389	Continue EP-3 platform development for JSAF integration and testing									
-	(U)	\$ 9,594	Continue AF Special platform development for JSAF integration and testing									
-	(U)	\$ 4,306	Begin Active Interference Cancellation (IC) and Modeling & Simulation (M&S) Efforts									
-	(U)	\$ 4,927	Continue SPO Operations, Systems Engineering, Program Management Activities									
-	(U)	\$81,640	Total									
 (U) FY 2001 (\$ in Thousands):												
-	(U)	\$13,475	Continue Low Band SubSystem (LBSS) development and integration									
-	(U)	\$ 4,672	Complete HBSS development and integration									
-	(U)	\$ 4,003	Continue Rivet Joint platform development for JSAF integration and testing									
-	(U)	\$ 7,261	Continue EP-3 platform development for JSAF integration and testing									
-	(U)	\$ 6,043	Continue AF Special platform development for JSAF integration and testing									
-	(U)	\$ 3,720	Continue Active Interference Cancellation (IC) and Modeling & Simulation (M&S) Efforts									
-	(U)	\$16,000	Begin Follow-On Program #1 Development									
-	(U)	\$11,564	Begin JSAF System Integration Laboratory Development									
-	(U)	\$ 4,740	Continue SPO Operations, Systems Engineering, Program Management Activities									
-	(U)	\$71,478	Total									
 (U) B. <u>Project Change Summary - Description of Significant Changes:</u>												
Funding for Airborne Reconnaissance Systems for FY99-05 was transferred to the Air Force (PE 0305206F) from Defense (PE 305206D).												
 (U) C. <u>Other Program Funding Summary (\$ in Thousands)</u>												
			<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	To <u>Compl</u>	Total <u>Cost</u>
(U)	PE 0305206D, Adv Sensors, P808, RDT&E,		105,384	0	0	0	0	0	0	0	Cont.	Cont.
Defense-wide												
Note: FY98 funds are in PE 0305206D, Airborne Reconnaissance Advanced Development. Funding for FY99-05 transferred to PE 0305206F from PE 305206D as part of the DARO divestiture.												
Project 4817			Page 4 of 21 Pages				Exhibit R-2A (PE 0305206F)					

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305206F Airborne Reconnaissance Systems	PROJECT 4817
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(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 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 1998</u>			<u>FY 1999</u>			<u>FY 2000</u>			<u>FY 2001</u>		
1	2	3	4	1	2	3	4	1	2	3	4	
(U) Engineering Milestones												
(U) Low Band SubSystem (LBSS)			*									
Critical Design Review (CDR)												
(U) RJ-666 LBSS Flight Test Begins									X			
(U) EP-3 LBSS Flight Test Begins										X		
(U) AFS LBSS Flight Test Begins											X	
(U) High Band Prototype (HBP) flight test complete; OCONUS deployment			*									
(U) High Band SubSystem (HBSS) CDR						X						
(U) HBSS Development Completed										X		
(U) AFS HBSS Flight Test Begins											X	
(U) JSAF Production Begins (procurement funds in platform PEs)											X	
(U) JSAF SIL Development Begins										X		
(U) JSAF Follow-on Program #1 Begins										X		

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February 1999

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0305206F Airborne Reconnaissance Systems

<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305206F Airborne Reconnaissance Systems	PROJECT 4817
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- (U) **Contract Milestones**
- (U) LBSS System Deliveries
- (U) HBSS Factory Acceptance Test (FAT)

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 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305206F Airborne Reconnaissance Systems					PROJECT 4817	
(U) A. Project Cost Breakdown (\$ in Thousands)											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U) Hardware Development					0	22,045	18,174	16,752			
(U) Software Development					0	18,188	13,252	17,309			
(U) Platform Integration					0	18,124	30,934	17,307			
(U) Integration and Test Support					0	5,944	4,511	5,297			
(U) System Engineering					0	12,371	9,866	10,073			
(U) Program Management					0	4,011	4,903	4,740			
(U) Total						80,683	81,640	71,478			
<p><u>Note:</u> FY98 funds are in PE 0305206D, Airborne Reconnaissance Advanced Development. Funding for FY99-05 transferred to PE 0305206F from PE 305206D as part of the DARO divestiture.</p>											
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)											
Performing Organizations:											
Contractor or Government	Contract Method/Type	Award or Obligation Date	Performing Activity	Project Office	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>FY 1998</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Organizations</u>											
Sanders (LBSS)	CPAF	Feb 97	131,000	131,000	0	0	42,002	23,873	13,475	Cont.	Cont.
TRW (HBSS)	CPAF	Dec 97	39,700	39,700	0	0	16,546	17,600	4,672	Cont.	Cont.
TBD (FOP, SIL, Active IC; M&S)	TBD	FY00/01	TBD	TBD	0	0	0	4,306	31,284	Cont.	Cont
Platform Integration (Includes AF, Army, Navy)	Various	Various	Various	Various	0	0	18,124	30,934	17,307	Cont.	Cont
<p><u>Note:</u> FY98 funds are in PE 0305206D, Airborne Reconnaissance Advanced Development. Funding for FY99-05 transferred to PE 0305206F from PE 305206D as part of the DARO divestiture.</p>											
Project 4817					Page 7 of 21 Pages				Exhibit R-3 (PE 0305206F)		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305206F Airborne Reconnaissance Systems					PROJECT 4817	
(U) B. Budget Acquisition History and Planning Information Continued (\$ in Thousands)											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
<u>Support and Management Organizations</u>											
Various	Various	Various	Various	Various	0	0	4,011	4,927	4,740	Continuing	Continuing
<u>Test and Evaluation Organizations</u>											
N/A											
Government Furnished Property:											
Item Description	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Delivery Date		Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
<u>Product Development Property</u>											
None											
<u>Support and Management Property</u>											
None											
<u>Test and Evaluation Property</u>											
None											
Subtotal Product Development					0	0	76,672	76,713	66,738	Continuing	Continuing
Subtotal Support and Management					0	0	4,011	4,927	4,740	Continuing	Continuing
Subtotal Test and Evaluation					0	0	0	0	0	0	0
Total Project					0	0	80,683	81,640	71,478	Continuing	Continuing
Note: FY98 funds are in PE 0305206D, Airborne Reconnaissance Advanced Development. Funding for FY99-05 transferred to PE 0305206F from PE 305206D as part of the DARO divestiture.											
Project 4817					Page 8 of 21 Pages				Exhibit R-3 (PE 0305206F)		

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305206F Airborne Reconnaissance Systems				PROJECT 4818	
<i>COST (\$ In Thousands)</i>	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4818 Advanced Technology	0	9,881	9,430	19,916	17,676	24,695	29,584	25,843	Continuing	Continuing
<p><u>Note:</u> FY98 funds are in PE 0305206D, Airborne Reconnaissance Advanced Development. Funding for FY99-05 transferred to PE 0305206F from PE 305206D as part of the DARO divestiture.</p> <p>(U) A. <u>Mission Description</u></p> <p>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 Defensive Systems development. Near term development and feasibility demonstrations of specific technologies are conducted, followed by transition into production systems to support operational capabilities.</p> <p>(U) <u>FY 1998 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$0 FY98 funds are in PE 0305206D, Airborne Reconnaissance Advanced Development. - (U) \$0 Total <p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 2,920 High Data Rate Communications: Complete development of air-to-air lasercomm demonstration terminals. - (U) \$ 1,561 Modeling and Simulation: Develop software process model of Tactical Intelligence ground systems. - (U) \$ 2,900 SYERS P3I: Complete 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: Continue development of capability to coregister airborne imagery with national data bases. - (U) \$ 9,881 Total 										
Project 4818			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 1999																						
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305206F Airborne Reconnaissance Systems			PROJECT 4818																						
<p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 100 Sensor Fusion: MARS (Multi-Sensor Agile Reconnaissance 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) \$ 330 High Data Rate Communications: Continue evaluation of air-to-air lasercomm system - (U) \$ 8,600 Defensive System: Initiate development of U-2 Defensive Systems and conduct risk reduction project - (U) \$ 9,430 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 145 Sensor Fusion: Continue analysis of MARS airborne processing, data recorder, 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) \$ 500 High Data Rate Communications: Complete air-to-air lasercomm evaluation - (U) \$ 17,771 Defensive System: Conduct FOTE flight test, complete risk reduction project, and initiate EMD for U-2 Defensive Systems - (U) \$ 19,916 Total <p>(U) B. <u>Project Change Summary - Description of Significant Changes:</u></p> <p>Funding for Airborne Reconnaissance Systems for FY99-05 was transferred to the Air Force (PE 0305206F) from Defense (PE 305206D).</p> <p>(U) C. <u>Other Program Funding Summary (\$ in Thousands)</u></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 70%;"></th> <th style="text-align: center;"><u>FY 1998</u></th> <th style="text-align: center;"><u>FY 1999</u></th> <th style="text-align: center;"><u>FY 2000</u></th> <th style="text-align: center;"><u>FY 2001</u></th> <th style="text-align: center;"><u>FY 2002</u></th> <th style="text-align: center;"><u>FY 2003</u></th> <th style="text-align: center;"><u>FY 2004</u></th> <th style="text-align: center;"><u>FY 2005</u></th> <th style="text-align: center;"><u>To</u> <u>Compl</u></th> <th style="text-align: center;"><u>Total</u> <u>Cost</u></th> </tr> </thead> <tbody> <tr> <td>(U) PE 0305206D, Airborne Recon. Adv. Tech. Dev., P809, RDT&E, Defense-wide</td> <td style="text-align: center;">39,631</td> <td style="text-align: center;">0</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">N/A</td> </tr> </tbody> </table> <p>Note: FY98 funds are in PE 0305206D, Airborne Reconnaissance Advanced Development. Funding for FY99-05 transferred to PE 0305206F from PE 305206D as part of the DARO divestiture.</p>									<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To</u> <u>Compl</u>	<u>Total</u> <u>Cost</u>	(U) PE 0305206D, Airborne Recon. Adv. Tech. Dev., P809, RDT&E, Defense-wide	39,631	0	0	0	0	0	0	0	N/A	N/A
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To</u> <u>Compl</u>	<u>Total</u> <u>Cost</u>																			
(U) PE 0305206D, Airborne Recon. Adv. Tech. Dev., P809, RDT&E, Defense-wide	39,631	0	0	0	0	0	0	0	N/A	N/A																			
Project 4818		Page 10 of 21 Pages				Exhibit R-2A (PE 0305206F)																							

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational System Development	0305206F Airborne Reconnaissance Systems	4818
<p>(U) D. <u>Acquisition Strategy</u></p> <p>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.</p>		
Project 4818	Page 11 of 21 Pages	Exhibit R-2A (PE 0305206F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)													DATE February 1999				
BUDGET ACTIVITY 7 - Operational System Development						PE NUMBER AND TITLE 0305206F Airborne Reconnaissance Systems						PROJECT 4818					
(U) E. Schedule Profile																	
		<u>FY 1998</u>					<u>FY 1999</u>					<u>FY 2000</u>				<u>FY 2001</u>	
(U) Acquisition Milestones	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
(U) Sensor Fusion																	
(U) MARS Phase 0 Contract Award			*														
(U) MTE																	
(U) Conduct MTE testbed demonstration				*													
(U) Begin Phase 1 MTE development						X											
(U) Modeling and Simulation																	
(U) Continue Tactical GS software model				*													
(U) Report Tactical GS simulation results						X											
(U) Geolocation																	
(U) PDR		*															
(U) CDR						X											
(U) Test Readiness Review										X							
(U) Factory Acceptance Test														X			
(U) SYERS P3I																	
(U) Flight Test SYERS S/N 7							X										
(U) Flight Test SYERS S/N 8								X									
(U) HDR Communications																	
(U) Continue data terminal development	*																
(U) Begin data terminal concept phase			*														
(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							
(U) ADS ground test of SIRFC																X	
*-Denotes completed event X-Denotes planned event																	

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305206F Airborne Reconnaissance Systems					PROJECT 4818	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U) Hardware and Software Development					0	7,236	7,464	15,817			
(U) Systems Engineering					0	450	140	295			
(U) Contractor Engineering Support					0	1,611	900	1,927			
(U) Government Engineering Support					0	584	926	1,877			
(U) Total					0	9,881	9,430	19,916			
<p><u>Note:</u> FY98 funds are in PE 0305206D, Airborne Reconnaissance Advanced Development. Funding for FY99-05 transferred to PE 0305206F from PE 305206D as part of the DARO divestiture.</p>											
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
<u>Product Development Organizations</u>											
Raytheon	Various	ongoing	TBD	TBD	0	0	1,500	0	0	0	1,500
Lockheed Martin	Various	ongoing	TBD	TBD	0	0	1,255	0	0	0	1,255
Skunkworks											
Marconi Information Systems	FPLOE	18 Nov 96	TBD	TBD	0	0	475	380	1,425	Continuing	Continuing
Trex Enterprises	CPFF	9 Aug 96	TBD	TBD	0	0	1,900	0	0	0	1,900
Veridian	CPFF	9 Aug 96	TBD	TBD	0	0	325	0	0	0	325
Def Syst Contr	TBD	TBD	TBD	TBD	0	0	0	8,170	16,882	Continuing	Continuing
Other	TBD	TBD	TBD	TBD	0	0	2,449	411	619	Continuing	Continuing

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305206F Airborne Reconnaissance Systems					PROJECT 4818	
(U) B. Budget Acquisition History and Planning Information Continued (\$ in Thousands)											
<u>Support and Management Organizations</u>											
Other Gov't Orgs	Multiple	Multiple	TBD	TBD	0	0	1,977	469	990	Continuing	Continuing
<u>Test and Evaluation Organizations</u>											
N/A											
Government Furnished Property:											
	Contract				Total						
Item	Method/Type	Award or			Prior to	Budget	Budget	Budget	Budget	Budget to	Total
<u>Description</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Delivery</u>		<u>FY 1998</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
	<u>Vehicle</u>	<u>Date</u>	<u>Date</u>								
<u>Product Development Property</u>											
None											
<u>Support and Management Property</u>											
None											
<u>Test and Evaluation Property</u>											
None											
Subtotal Product Development					0	0	7,904	8,961	18,926	Continuing	Continuing
Subtotal Support and Management					0	0	1,977	469	990	Continuing	Continuing
Subtotal Test and Evaluation					0	0	0	0	0	N/A	N/A
Total Project					0	0	9,881	9,430	19,916	Continuing	Continuing
<p>Note: FY98 funds are in PE 0305206D, Airborne Reconnaissance Advanced Development. Funding for FY99-05 transferred to PE 0305206F from PE 305206D as part of the DARO divestiture.</p>											
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BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305206F Airborne Reconnaissance Systems				PROJECT 4819		
COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4819 Common Data Link (CDL)	0	35,838	33,538	45,197	38,831	46,527	47,503	48,489	Continuing	Continuing
<p><u>Note:</u> FY98 funds are in PE 0305206D, Airborne Reconnaissance Advanced Development. Funding for FY99-05 transferred to PE 0305206F from PE 305206D as part of the DARO divestiture.</p> <p>(U) A. <u>Mission Description</u></p> <p>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 1998 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$0 FY98 funds are in PE 0305206D, Airborne Reconnaissance Advanced Development. - (U) \$0 Total 										
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BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational System Development	0305206F Airborne Reconnaissance Systems	4819
<p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 3,317 Continue configuration control of CDL architecture, specifications and modules. - (U) \$ 4,045 Continue development of CDL and TCDL interface to additional platforms. - (U) \$ 3,140 Continue to assess development of commercial network interface standards and impact to CDL interface. - (U) \$ 10,500 Continue engineering and integration of commercial satellite communication network to support airborne reconnaissance platform relay requirements. - (U) \$ 450 Begin engineering and integration support of airborne reconnaissance platform requirements into National Space Communications Program. - (U) \$ 5,500 Complete covert waveform development/miniaturization/air-to-air link under the ABIT program. - (U) \$ 486 Continue SATCOM interoperability enhancements. - (U) \$ 5,300 Complete Tactical CDL flight demonstration. - (U) \$ 600 Continue transition to wideband bulk encryption on all CDL systems. - (U) \$ 2,500 Begin development of Dual Data Link II (DDL-2) for the U-2 - (U) \$ 35,838 Total <p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 15,380 Continue engineering and integration of commercial satellite communication network to support airborne reconnaissance platform relay requirements. - (U) \$ 2,000 Continue development of Tactical CDL demonstration hardware and flight demonstration, and continue to develop design for operational suitability on ISR platforms including Predator - (U) \$ 4,000 Continue covert waveform development/miniaturization/air-to-air link under the ABIT program and continue integration engineering of ABIT in ISR platforms including RC-135and Global Hawk. - (U) \$ 2,664 Continue to assess development of commercial network interface standards and incorporation of commercial technologies where practical to the CDL interface including ATM on U-2/SYERS P3I. - (U) \$ 3,000 Continue configuration control of CDL architecture, specifications, and modules. - (U) \$ 526 Continue development of link modifications to incorporate wideband bulk encryption - (U) \$ 1,049 Continue SATCOM interoperability enhancements - (U) \$ 3,419 Continue development of CDL and TCDL interface to additional platforms including ARL - (U) \$ 1,500 Continue development of Dual Data link upgrade for U-2 - (U) \$ 33,538 Total 		
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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)							DATE February 1999																						
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305206F Airborne Reconnaissance Systems			PROJECT 4819																						
<p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 18,126 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 - (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 flight demonstration on ARL and LAMPS and ATM interface upgrade. - (U) \$ 5,129 Continue covert waveform development/miniaturization/air-to-air link under the ABIT program and continue 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 U-2/RAS-1R 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 platforms including TIGDL interface upgrade - (U) \$ 2,000 Continue development of DDL-2 - (U) \$ 45,197 Total <p>(U) B. Project Change Summary - Description of Significant Changes: Funding for Airborne Reconnaissance Systems for FY99-05 was transferred to the Air Force (PE 0305206F) from Defense (PE 305206D).</p> <p>(U) C. Other Program Funding Summary (\$ in Thousands)</p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 70%;"></th> <th style="text-align: center;"><u>FY 1998</u></th> <th style="text-align: center;"><u>FY 1999</u></th> <th style="text-align: center;"><u>FY 2000</u></th> <th style="text-align: center;"><u>FY 2001</u></th> <th style="text-align: center;"><u>FY 2002</u></th> <th style="text-align: center;"><u>FY 2003</u></th> <th style="text-align: center;"><u>FY 2004</u></th> <th style="text-align: center;"><u>FY 2005</u></th> <th style="text-align: center;"><u>To</u></th> <th style="text-align: center;"><u>Total</u></th> </tr> </thead> <tbody> <tr> <td>(U) PE 0305206D, CDL, P810, RDT&E, Defense-wide</td> <td style="text-align: center;">43,430</td> <td style="text-align: center;">0</td> <td style="text-align: center;">Compl Cont.</td> <td style="text-align: center;">Cost Cont.</td> </tr> </tbody> </table> <p><u>Note:</u> FY98 funds are in PE 0305206D, Airborne Reconnaissance Advanced Development. Funding for FY99-05 transferred to PE 0305206F from PE 305206D as part of the DARO divestiture.</p> <p>(U) D. Acquisition Strategy</p> <p>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.</p>									<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To</u>	<u>Total</u>	(U) PE 0305206D, CDL, P810, RDT&E, Defense-wide	43,430	0	0	0	0	0	0	0	Compl Cont.	Cost Cont.
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To</u>	<u>Total</u>																			
(U) PE 0305206D, CDL, P810, RDT&E, Defense-wide	43,430	0	0	0	0	0	0	0	Compl Cont.	Cost Cont.																			
Project 4819		Page 17 of 21 Pages			Exhibit R-2A (PE 0305206F)																								

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)													DATE February 1999			
BUDGET ACTIVITY 7 - Operational System Development						PE NUMBER AND TITLE 0305206F Airborne Reconnaissance Systems						PROJECT 4819				
(U) E. <u>Schedule Profile</u>																
	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) Continue Commercial Satellite Transponder Leases					*				X				X			
(U) Start Tactical CDL Phase 2 Detail Design/CDL Interoperability Testing		*														
(U) Complete Phase 2 Tactical CDL Flight Demo on Predator							X									
(U) Phase 2a Tactical CDL Dev. Program Complete on Predator												X				
(U) Begin TCDL modification for ARL						X										
(U) Field TCDL on ARL									X							
(U) U-2 ABIT Prototype Delivery		*														
(U) Initial ABIT U-2 Testing Complete					*											
(U) Complete ABIT RC-135 Design								X								
(U) ABIT RC-135 Flight test														X		
(U) CDL/TARS Pod Integration Study								X								
(U) ABIT Global Hawk Devel Study								X								
(U) Complete SATCOM Interop Study			*													
(U) Start ARL/CDL SATCOM Design		*														
(U) Complete ARL SATCOM Design			*													
(U) ARL SATCOM Testing				*												
(U) Begin U-2 DDL 2 Development						X										
(U) U-2 DDL (U-2 Flight Test)													X			
(U) Global Hawk DDL modification														X		
(U) Begin TIGDL interface upgrade							X									
*-Denotes completed event X-Denotes planned event																

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305206F Airborne Reconnaissance Systems	PROJECT 4819
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(U) A. Project Cost Breakdown (\$ in Thousands)

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) Hardware and Software Development	0	12,758	8,034	13,408
(U) Systems Engineering	0	4,384	3,463	4,771
(U) Satellite Communications	0	10,500	15,380	18,126
(U) Configuration Management	0	4,002	3,679	4,540
(U) Contractor Engineering Support	0	3,399	2,278	3,321
(U) Government Engineering Support	0	795	704	1,031
(U) Total	0	35,838	33,538	45,197

Note: FY98 funds are in PE 0305206D, Airborne Reconnaissance Advanced Development. Funding for FY99-05 transferred to PE 0305206F from PE 305206D as part of the DARO divestiture.

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305206F Airborne Reconnaissance Systems					PROJECT 4819	
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
<u>Product Development Organizations</u>											
L3Com California Microwave Harris Corp	Multiple CPFF	Multiple Mar 99	Ongoing TBD	Ongoing TBD	0	0	12,461	8,440	15,211	Continuing	Continuing
Crypto Mfr - TBD	Other Transaction	23 Jul 97	TBD	TBD	0	0	2,517	950	1,900	Continuing	Continuing
Other	TBD	TBD	TBD	TBD	0	0	600	526	1,310	Continuing	Continuing
Other	Multiple	Multiple	Ongoing	Ongoing	0	0	1,653	1,747	149	Continuing	Continuing
<u>Support and Management Organizations</u>											
COMSAT RSI	FFP	17 Jul 95	Ongoing	Ongoing	0	0	10,500	15,380	18,126	Continuing	Continuing
Various	Multiple	Multiple	Ongoing	Ongoing	0	0	5,377	4,785	6,253	Continuing	Continuing
<u>Test and Evaluation Organizations</u>											
JITC	MIPR	FY99	Ongoing	Ongoing	0	0	230	210	248	Continuing	Continuing
<p><u>Note:</u> FY98 funds are in PE 0305206D, Airborne Reconnaissance Advanced Development. Funding for FY99-05 transferred to PE 0305206F from PE 305206D as part of the DARO divestiture.</p>											
Project 4819			Page 20 of 21 Pages				Exhibit R-3 (PE 0305206F)				

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1999			
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305206F Airborne Reconnaissance Systems				PROJECT 4819		
(U) B. <u>Budget Acquisition History and Planning Information Continued (\$ in Thousands)</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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Property</u>										
None										
<u>Support and Management Property</u>										
None										
<u>Test and Evaluation Property</u>										
None										
Subtotal Product Development				0	0	19,731	13,163	20,570	Continuing	Continuing
Subtotal Support and Management				0	0	15,877	20,165	24,379	Continuing	Continuing
Subtotal Test and Evaluation				0	0	230	210	248	Continuing	Continuing
Total Project				0	0	35,838	33,538	45,197	Continuing	Continuing
<p><u>Note:</u> FY98 funds are in PE 0305206D, Airborne Reconnaissance Advanced Development. Funding for FY99-05 transferred to PE 0305206F from PE 305206D as part of the DARO divestiture.</p>										
Project 4819				Page 21 of 21 Pages			Exhibit R-3 (PE 0305206F)			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305207F Manned Reconnaissance System
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	11,282	44,241	9,388	14,619	7,740	1,956	1,955	10,738	Continuing	Continuing
4820 Manned Reconnaissance Systems U-2	0	38,258	9,388	14,619	7,740	1,956	1,955	1,952	Continuing	Continuing
4754 COBRA BALL	11,282	5,983	0	0	0	0	0	8,786	0	30,801
Quantity of RDT&E Articles	1	1	0	0	0	0	0	0	0	0

Note: in FY98 funding was included in DARP PE0305207D. Funding for FY99-05 transferred to Air Force PE 0305207F from DARO Divestiture PE 0305207D

(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 Item Justification:

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

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305207F Manned Reconnaissance System
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(U) **C. Program Change Summary (\$ in Thousands)**

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U) Previous President's Budget	11,360	0	0	0	Cont
(U) Appropriated Value	12,000	44,366			
(U) Adjustments to Appropriated Value					
a. Cong Reductions	-393	-125			
b. SBIR	-248				
c. Omnibus or Other Above Threshold Reprogram	-77				
d. Below Threshold Reprogramming	0				
(U) Adjustments to Budget Years Since FY 1999 PB	0		9,388	14,619	
(U) Current Budget Submit/FY2000 PB	11,282	44,241	9,388	14,619	Cont
(U) Significant Program Changes					
Funding: in FY98 funding for the U-2 was included in DARP PE0305207D. Funding for FY99-05 transferred to Air Force PE 0305207F from DARO Divestiture 0305207D					
in FY 99 SBIR was exempted.					

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305207F Manned Reconnaissance System				PROJECT 4820		
<i>COST (\$ In Thousands)</i>	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4820 Manned Reconnaissance Systems U-2	0	38,258	9,388	14,619	7,740	1,956	1,955	1,952	Continuing	Continuing
<p>(U) A. <u>Mission Description</u> This program element funds the RDT&E portion of high payoff upgrades for the U-2 Advanced Synthetic Aperture Radar System (ASARS-2) Improvement Program (AIP). AIP upgrades and modifications will extend the usable life of this critical sensor as well as enhance its area search, precision geolocation, and image quality characteristics sufficiently to directly support the targeting of precision guided munitions (PGMs). Several key Line Replaceable Units (LRU) including the Process Control Unit (PCU), Receiver - Exciter (RE), and transmitter are approaching the end of their supportability life. Replacing the 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. Also, this project accomplishes the development of a quick reaction capability (QRC) to improve the U-2 electronic warfare system (EWS) capability in Southwest Asia. Funding for the U-2 EWS QRC was accomplished by recapitalization of U-2 O&M funding achieved through improved business practices. 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>Note: The ASARS-2 portion of the U-2 Program was previously justified in separate budget documents under the title "U-2 Support for Precision Guided Munitions".</p> <p>(U) <u>FY 1998 (\$ in Thousands):</u> Note: FY98 funding was included in DARP PE0305207D. Funding for FY99-05 transferred to Air Force PE 0305207F from DARO Divestiture PE 0305207D</p> <p align="left">- (U) \$0 Total</p>										
Project 4820			Page 3 of 13 Pages				Exhibit R-2A (PE 0305207F)			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational System Development	0305207F Manned Reconnaissance System	4820
<p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 5,000 Completes R&M upgrades and procures initials spares for SENIOR GLASS - (U) \$ 3,000 Cockpit display improvements development - (U) \$ 3,600 Risk reduction studies for fuels conversion to JP-8 from JP-TS - (U) \$ 13,758 Continued development of AIP on-board processor - (U) \$ 625 Flight test support - (U) \$ 220 SPO Support - (U) \$ 2,155 Post-processing Exploitation Tool Development (Super-Resolution, CCD, IFSAR) - (U) \$ 2,500 Continued Receiver-Exciter Controller development - (U) \$ 250 Advanced data storage array development - (U) \$ 4,384 Continued development of AIP Range migration software - (U) \$ 2,766 Continued development ASARS-2 Data Link - (U) \$ 38,258 Total <p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 795 Continued development of AIP on board processor - (U) \$ 794 Continued development of AIP Range migration software - (U) \$ 270 Flight Test Support - (U) \$ 2,421 Radar Transmitter Upgrade - (U) \$ 5,108 U-2 QRC Defensive System development - (U) \$ 9,388 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 2,000 Continued Post-Processing Exploitation Tool development - (U) \$ 500 Moving Target Exploitation (MTE) Tool development - (U) \$ 4,595 U-2 QRC Defensive System development - (U) \$ 7,524 Radar Transmitter Upgrade - (U) \$ 14,619 Total 		
Project 4820	Page 4 of 13 Pages	Exhibit R-2A (PE 0305207F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)							DATE February 1999				
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305207F Manned Reconnaissance System			PROJECT 4820				
(U) B. <u>Project Change Summary- Description of Significant Changes:</u> FY99 Congressional adds: AIP (\$9.0M), SENIOR GLASS (\$5M), cockpit upgrade development (\$3M) and risk reduction for fuel conversion to JP-8 (\$3.6M).											
(U) C. <u>Other Program Funding Summary (\$ in Thousands)</u>											
AIP Production*											
		<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To</u>	<u>Total</u>
(U) APAF, Manned Reconnaissance	0305207F	42,000	38,000	11,000	8,900	16,800	9,900	0	0	Cont	Cont
* First Upgraded Radar Transmitter Deliveries in 3QFY03											
(U) D. <u>Acquisition Strategy</u>											
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 during normal U-2 Programmed Depot Maintenance (PDM), or during other ongoing U-2 modifications. LRU's for subsequent installation during PDM will be funded by the Air Force.											
Project 4820			Page 5 of 13 Pages			Exhibit R-2A (PE 0305207F)					

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BUDGET ACTIVITY 7 - Operational System Development						PE NUMBER AND TITLE 0305207F Manned Reconnaissance System						PROJECT 4820				
(U) E. Schedule Profile																
ASARS-2 Improvement Program (AIP)																
		<u>FY 1998</u>					<u>FY 1999</u>					<u>FY 2000</u>			<u>FY 2001</u>	
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Engineering Milestones N/A																
SDR																
	*															
Production Critical Design Review																
					*											
Test & Evaluation Milestones N/A																
AIP Contingency Flight Test																
			*													
AIP Prototype Flight Test																
						X										
AIP Production Flight Test																
							X									
AIP IOC																
										X						
Begin Transmitter Upgrade																
										X						
Contract Milestones																
AIP Production Award																
- Data Link																
			*													
- Radar																
				*												
- Radar Transmitter																
										X						
U-2 EWS QRC																
Engineering Milestones N/A																
SDR																
						X										
Production Critical Design Review																
									X							
Test & Evaluation Milestones N/A																
QRC Ground Test																
										X						
QRC Flight Test																
											X					
QRC IOC																
												X				
Contract Milestones																
QRC Program Award																
						X										
*- Denotes Completed Event																
Project 4820					Page 6 of 13 Pages					Exhibit R-2A (PE 0305207F)						

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BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
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X-Denotes planned event

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1999				
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305207F Manned Reconnaissance System				PROJECT 4820			
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
				<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>				
1.	Primary Hardware Development				27,134	4,305	9,739				
2.	Software Development				10,279	4,218	4,000				
3.	Government Engineering Support				220	225	235				
4.	System Testing				625	640	645				
	TOTALS				38,258	9,388	14,619				
(U) B. <u>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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Organizations</u>											
Raytheon (AIP & SENIOR GLASS)	CPIF	3Q96	N/A	ASC/RAP			28,047	4,280	10,000	Cont	Cont
L3Comm (AIP)	CPIF	3Q96		ASC/RAP			2,766				
Lockheed (Cockpit, Fuel Conversion & QRC)	CPIF			ASC/RAP			6,600	5,108	4,619	Cont	Cont
<u>Support and Management Organizations</u>											
ASC/RAP							220				
Project 4820											
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Exhibit R-3 (PE 0305207F)											

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1999			
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305207F Manned Reconnaissance System				PROJECT 4820		
<u>Test and Evaluation Organizations</u>										
WR-ALC/LR - Site 2				625						
(U) B. <u>Budget Acquisition History and Planning Information Continued (\$ in Thousands)</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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Property</u>										
None										
<u>Support and Management Property</u>										
None										
<u>Test and Evaluation Property</u>										
None										
Subtotal Product Development						37,413	9,388	14,619	Cont	Cont
Subtotal Support and Management						220				
Subtotal Test and Evaluation						625				
Total Project						38,258	9,388	14,619	Cont	Cont

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305207F Manned Reconnaissance System	PROJECT 4754
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4754 COBRA BALL	11,282	5,983	0	0	0	0	0	8,786	0	30,801

(U) A. Mission Description

(U) 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. The FY98 project develops and evaluates a Laser Ranging and Imaging system for the COBRA BALL platform. FY99 funds (Congressional plus-up) continues the FY98 effort and includes system testing in Maui. FY05 funds air traffic control and navigational safety non-recurring engineering for the RC-135 fleet.

(U) The COBRA BALL Laser Ranging and Imaging System, a Congressionally directed project, continues the effort funded by Congress in FY97 through the design and fabrication of an Advanced Airborne Sensor (AAS) based upon previous technology developed under the Field Laser Demonstration program (PE 0305154F BPAC 4607, Congressional plus up), and produces aircraft integration design data.

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

- (U) \$ 2,892 Prototype Design
- (U) \$ 320 Simulation and Analysis
- (U) \$ 230 Aircraft Integration
- (U) \$ 250 Range-In-A-Box (testing tool)
- (U) \$ 5,460 Sensor Build and Ground Test
- (U) \$ 540 System Integration Test
- (U) \$ 110 Range-In-A-Box Test
- (U) \$ 1,480 System Integration/Program Administration
- (U) \$11,282 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)							DATE February 1999																																																																																																			
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305207F Manned Reconnaissance System			PROJECT 4754																																																																																																			
<p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> – (U) \$ 2,083 Subsystem and system integration testing – (U) \$ 1,000 Design and fabricate acquisition systems – (U) \$ 400 Complete Range-In-A Box fabrication and test – (U) \$ 200 Complete downselect of experimental aircraft and aircraft interface design – (U) \$ 300 Develop Maui interfaces, prepare and ship system – (U) \$ 2,000 Perform system performance characterization and demonstration testing – (U) \$ 5,983 Total <p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> – (U) \$0 COBRA BALL effort complete, RC-135 project starts FY05 <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> – (U) \$0 COBRA BALL effort complete, RC-135 project starts FY05 <p>(U) B. <u>Project Change Summary - Description of Significant Changes:</u> None</p> <p>(U) C. <u>Other Program Funding Summary (\$ in Thousands)</u></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;"><u>FY 1998</u></th> <th style="text-align: center;"><u>FY 1999</u></th> <th style="text-align: center;"><u>FY 2000</u></th> <th style="text-align: center;"><u>FY 2001</u></th> <th style="text-align: center;"><u>FY 2002</u></th> <th style="text-align: center;"><u>FY 2003</u></th> <th style="text-align: center;"><u>FY 2004</u></th> <th style="text-align: center;"><u>FY 2005</u></th> <th style="text-align: center;"><u>To</u></th> <th style="text-align: center;"><u>Total</u></th> </tr> <tr> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th style="text-align: right;">9,600</th> <th style="text-align: center;">Compl</th> <th style="text-align: center;">Cost</th> </tr> </thead> <tbody> <tr> <td>(U) APPN 10,APAF, Line 55</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td style="text-align: center;">Cont</td> <td style="text-align: center;">Cont</td> </tr> </tbody> </table> <p>(U) D. <u>Acquisition Strategy:</u> (U) The RC-135 sustainment and modification activities are managed by the Air Force through the BIG SAFARI program. Only the Air Force Acquisition Executive, SAF/AQ, may assign programs to BIG SAFARI. These projects are managed by a single Air Force Material Command (AFMC) organization, ASC/RAB. ASC/RAB 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) E. <u>Schedule Profile</u></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th colspan="3" style="text-align: center;"><u>FY 1998</u></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) Preliminary Design Review</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> <td></td> </tr> <tr> <td>(U) Critical Design Review</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> <td></td> </tr> <tr> <td>(U) Prototype Delivery (Q1 FY00)</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> </tbody> </table> <p>* - Denotes completed event</p>										<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To</u>	<u>Total</u>									9,600	Compl	Cost	(U) APPN 10,APAF, Line 55									Cont	Cont		<u>FY 1998</u>			<u>FY 1999</u>			<u>FY 2000</u>			<u>FY 2001</u>				1	2	3	4	1	2	3	4	1	2	3	4	(U) Preliminary Design Review					X								(U) Critical Design Review					X								(U) Prototype Delivery (Q1 FY00)								X				
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To</u>	<u>Total</u>																																																																																																
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Project 4754			Page 10 of 13 Pages			Exhibit R-2A (PE 0305207F)																																																																																																				

DATE
February 1999

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0305207F Manned Reconnaissance System

X - Denotes planned event

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)						DATE February 1999					
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305207F Manned Reconnaissance System				PROJECT 4754		
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U)	System Design and Analysis				3,212	1,200					
(U)	Fabrication and Test				6,360	4,083					
(U)	Integration and Support				1,710	700					
(U)	Total				11,282	5,983					
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
<u>Product Development Organizations</u> (FY97 activity was in PE 0305154F BPAC 4607)											
ASC/RAB	Multiple	Aug 97	N/A	N/A	4,750	11,282	5,983			8,786	30,801
<u>Support and Management Organizations</u>											
N/A											
<u>Test and Evaluation Organizations</u>											
N/A											
Project 4754				Page 11 of 13 Pages				Exhibit R-3 (PE 0305207F)			

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305207F Manned Reconnaissance System				PROJECT 4754		
(U) B. <u>Budget Acquisition History and Planning Information Continued (\$ in Thousands)</u>										
Government Furnished Property: None										
<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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Property</u>										
N/A										
<u>Support and Management Property</u>										
N/A										
<u>Test and Evaluation Property</u>										
N/A										
Subtotal Product Development				4,750	11,282	5,983	0	0	8,786	30,801
Subtotal Support and Management				0	0	0	0	0	0	0
Subtotal Test and Evaluation				0	0	0	0	0	0	0
Total Project				4,750	11,282	5,983	0	0	8,786	30,801

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305208F Distributed Common Ground Systems
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	0	20,906	12,820	14,018	13,775	13,197	13,439	13,601	Continuing	Continuing
4826 Common Imagery Ground / Surface Systems	0	18,752	11,121	12,411	12,152	11,524	11,727	11,850	Continuing	Continuing
4821 DCGS Interoperability	0	2,154	1,699	1,607	1,623	1,673	1,712	1,751	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

Note: FY 1998 funds are in PE 0305208D, Distributed Common Ground Systems
 Funding for FY99-05 transferred to PE 0305208F from PE 0305208D as part of DARO divestiture.

(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 with reconnaissance platforms and sensors, and integrated into the Joint C4I environment. The 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.

(U) B. Budget Item Justification

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

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305208F Distributed Common Ground Systems
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(U) C. Program Change Summary (\$ in Thousands)

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U) Previous President's Budget (FY1999 PB)	0	0	0	0	TBD
(U) Appropriated Value		21,159			
(U) Adjustments to Appropriated Value					
a. Cong Reductions		-253			
b. SBIR					
c. Omnibus or Other Above Threshold Reprogram					
d. Below Threshold Reprogramming					
(U) Adjustments to Budget Years Since FY 1999 PB			+12,820	+14,018	
(U) Current Budget Submit/ FY 2000 President's Budget		20,906	12,820	14,018	Continuing

(U) Change Summary Explanation:

Funding: In FY 1998, DCGS funding was included in DARP PE0305208D. Funding for FY99-05 transferred to PE 0305208F from PE 0305208D as part of DARO divestiture.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305208F Distributed Common Ground Systems	PROJECT 4826
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4826 Common Imagery Ground / Surface Systems	0	18,752	11,121	12,411	12,152	11,524	11,727	11,850	Continuing	Continuing

(U) A. Mission Description

The 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 Air Force component consists of two CONUS based DCGS systems, and a fixed PACAF system. The AF DCGS systems are distributed among Air Force operational units, numbered air force level, to support the Joint Task Force commander and the Air Operations Center. The CONUS based systems are deployable and are capable of reachback operations via satellite. The EAGLE VISION Foreign Comparative Test program is being integrated into DCGS for the near real time receipt and processing of commercial satellite imagery. In addition, the Air National Guard has processing and exploitation systems in support of the Theater Airborne Reconnaissance System (TARS) based on the DCGS architecture.

A mobile 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. The Marine Corps component is a national IMINT exploitation system common to the Air Force national exploitation system.

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 will include F/A-18 and U-2 sensors, as well as EO and SAR data from DarkStar. Efforts are underway to augment the CIP baseline to process data from upgraded/new sensors and to investigate CIP as a multi-intelligence processor.

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

- (U) 0 FY 98 funds are in PE 0305206D, Distributed Common Ground Systems
- (U) 0 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305208F Distributed Common Ground Systems	PROJECT 4826
(U) <u>FY 1999 (\$ in Thousands):</u>		
– (U) \$ 7,774	Continue CIGSS/DCGS sustaining engineering to implement software upgrades and enhancements to maintain compatibility with changing national and tactical interfaces. Completes JSIPS Block III upgrade.	
– (U) \$ 2,000	Continue CIGSS/DCGS testbed development.	
– (U) \$ 2,160	Continue system engineering and technical support.	
– (U) \$ 1,450	Continue USMC Tactical Exploitation Group (TEG) development efforts.	
– (U) \$ 2,000	Continue sustaining engineering for commercial satellite imagery. Integrate 1 meter and Landsat 7 capability.	
– (U) \$ 3,368	Continue evolving CIP to keep pace with new sensors and projected sensor modification programs.	
– (U) \$18,752	Total	
(U) <u>FY 2000 (\$ in Thousands):</u>		
– (U) \$ 2,350	Continue CIGSS/DCGS sustaining engineering to implement software upgrades and enhancements to maintain compatibility with changing national and tactical interfaces.	
– (U) \$ 1,500	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.	
– (U) \$ 4,871	Continue evolving CIP to keep pace with new sensors and projected sensor modification programs. Investigate multi-int processing.	
– (U) \$11,121	Total	
(U) <u>FY 2001 (\$ in Thousands):</u>		
– (U) \$ 2,350	Continue CIGSS/DCGS sustaining engineering to implement software upgrades and enhancements to maintain compatibility with changing national and tactical interfaces.	
– (U) \$ 1,500	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.	
– (U) \$ 6,161	Continue evolving CIP to keep pace with growing sensor baseline: new and upgraded sensors. Implement initial multi-int processing upgrades.	
– (U) \$12,411	Total	
Project 4826	Page 4 of 13 Pages	Exhibit R-2A (PE 0305208F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational System Development	0305208F Distributed Common Ground Systems	4826
<p>(U) B. <u>Project Change Summary - Description of Significant Changes:</u></p> <p>Funding for Distributed Common Ground Systems for FY99-05 transferred to the Air Force (PE 0305208F) from Defense (PE 0305208D).</p> <p>(U) C. <u>Other Program Funding Summary (\$ in Thousands)</u></p> <p>(U) D. <u>Acquisition Strategy:</u></p> <p>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.</p>		
Project 4826	Page 5 of 13 Pages	Exhibit R-2A (PE 0305208F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305208F Distributed Common Ground Systems	PROJECT 4826
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(U) E. Schedule Profile

	FY 1998				FY 1999				FY 2000				FY 2001			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(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) Complete JSIPS Block III Upgrade								X								
(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) 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 1 RFP												X				
(U) Award DCGS Spiral 1 contracts												X				
(U) Field DCGS Spiral 1 upgrades																X
(U) Release DCGS Spiral 2 RFP																X
(U) Award DCGS Spiral 2 contracts																X

*- Denotes Completed Event / X-Denotes planned event

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)						DATE February 1999				
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305208F Distributed Common Ground Systems				PROJECT 4826		
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>										
				<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U)	Hardware/Software Development				4,211	1,187	1,189			
(U)	System Engineering				8,591	6,334	7,622			
(U)	System Integration				2,450	1,000	1,000			
(U)	Ancillary Hardware Development				2,000	1,500	1,500			
(U)	Program Management				1,500	1,100	1,100			
(U)	Total				18,752	11,121	12,411			
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>										
Performing Organizations:										
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Total Program
<u>Product Development Organizations</u>										
Raytheon, Garland, TX	Multiple	2Q99	N/A	N/A		2,450	500	500		continuing
Northrop Grumman, Baltimore, MD	C, CPFF	2Q99	N/A	N/A		3,368	4,870	6,161		continuing
Lockheed Martin, San Jose, CA	Multiple	2Q99	N/A	N/A		1,000	500	500		continuing
TBD for DCGS Upgrades and Migration	TBD	TBD	N/A	N/A		7,784	2,826	2,800		continuing
Other Non-Prime Gov't Contracts	TBD	TBD	N/A	N/A		700	475	500		continuing
MITRE	SS, FFP	2Q99	N/A	N/A		1,950	450	450		continuing
SAIC	SS, IDIQ	2Q99	N/A	N/A		1,500	1,500	1,500		continuing
Project 4826				Page 7 of 13 Pages				Exhibit R-3 (PE 0305208F)		

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305208F Distributed Common Ground Systems	PROJECT 4826
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Support and Management Organizations

N/A

Test and Evaluation Organizations

N/A

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

Government Furnished Property:

Item	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Delivery Date	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Total Program
<u>Product Development Property</u>									
N/A									
<u>Support and Management Property</u>									
N/A									
<u>Test and Evaluation Property</u>									
N/A									
Subtotal Product Development						18,752	11,121	12,411	continuing
Subtotal Support and Management						0	0	0	
Subtotal Test and Evaluation						0	0	0	
Total Project						18,752	11,121	12,411	continuing

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305208F Distributed Common Ground Systems	PROJECT 4821
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4821 DCGS Interoperability	0	2,154	1,699	1,607	1,623	1,673	1,712	1,751	Continuing	Continuing

(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 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.

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

Note: In FY 1998, DCGS funding was included in DARP PE0305208D. Funding for FY99-05 transferred to PE 0305208F from PE 0305208D as part of DARO divestiture.

– (U) 0 Total

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

- (U) \$ 1,654 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) \$ 2,154 Total

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

- (U) \$ 1,199 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) \$ 1,699 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational System Development	0305208F Distributed Common Ground Systems	4821
<p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none">- (U) \$ 1,107 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) \$ 1,607 Total <p>(U) B. <u>Project Change Summary - Description of Significant Changes:</u></p> <p>Funding for Distributed Common Ground Systems for FY99-05 transferred to the Air Force (PE 0305208F) from Defense (PE 0305208D).</p> <p>(U) C. <u>Other Program Funding Summary (\$ in Thousands)</u></p> <p>n/a</p> <p>(U) D. <u>Acquisition Strategy</u></p> <p>DCGS interoperability program will use FFRDC, GSA contracts, and competitive processes where possible.</p>		
Project 4821	Page 10 of 13 Pages	Exhibit R-2A (PE 0305208F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305208F Distributed Common Ground Systems	PROJECT 4821
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(U) **E. Schedule Profile**

	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
(U) 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				
(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 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305208F Distributed Common Ground Systems	PROJECT 4821
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(U) A. Project Cost Breakdown (\$ in Thousands)

	<u>FY 1998</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		1,954	1,499	1,407
(U) Total		2,154	1,699	1,607

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

Performing Organizations:

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

Other Non-Prime Gov't Contracts	TBD	TBD	N/A	N/A		2,154	1,699	1,607		continuing	continuing
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Support and Management Organizations

N/A

Test and Evaluation Organizations

N/A

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305208F Distributed Common Ground Systems				PROJECT		
(U) B. <u>Budget Acquisition History and Planning Information Continued (\$ in Thousands)</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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Property</u>										
N/A										
<u>Support and Management Property</u>										
N/A										
<u>Test and Evaluation Property</u>										
N/A										
Subtotal Product Development						2,154	1,699	1,607	continuing	continuing
Subtotal Support and Management						0	0	0		
Subtotal Test and Evaluation						0	0	0		
Total Project						2,154	1,699	1,607	continuing	continuing

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305906F NCMC-TW/AA SYSTEMS
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	6,678	7,333	16,408	19,481	15,949	15,842	18,348	18,412	Continuing	Continuing
3880 CMU	378	110	0	0	0	0	0	0	0	1,291,802
4806 N/UWSS	0	0	11,884	15,308	12,249	12,132	14,561	14,545	Continuing	Continuing
3881 Integrated TW/AA	4,929	6,270	4,524	4,173	3,700	3,710	3,787	3,867	Continuing	Continuing
4409 Legacy Interfaces	1,371	953	0	0	0	0	0	0	0	47,485
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

This program element funds the replacement systems for the Cheyenne Mountain Complex (CMC) which provides the Command, Control, Communications and Computers (C4) in support of the Integrated Tactical Warning/Attack Assessment (Integrated TW/AA) "system of systems". This program incrementally upgrades and replaces, in an evolutionary manner, the current operational systems without loss of attack warning capability during the phased transition. The CMC supports the Commander-in-Chief (CINC) North American Aerospace Defense Command (NORAD)/CINC US Space Command (USSPACECOM) in providing the National Command Authorities, US Strategic Command (USSTRATCOM), the warfighting Commanders in Chief (CINCs), and other forward users with early warning (missile, air, and space) and assessment of attack on North America or its allies.

This program element has four related projects: The first project, Cheyenne Mountain Upgrade (CMU), was completed in early FY99 with Full Operational Capability (FOC) declaration on 29 Oct 98, well ahead of the Acquisition Program Baseline (APB) schedule. The second project, the NORAD/USSPACECOM Warfighting Support System (N/UWSS), is a new start in FY2000 and provides the means by which the Integrated TW/AA "system of systems" will evolve to meet CINC/NORAD/USCINCSpace's evolving mission requirements and achieve Defense Information Infrastructure Common 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. The third project, Integrated TW/AA System Engineering, is the primary source for modernization planning, integration and architecture development of modifications, upgrades and new acquisitions into the ITW/AA network. It also provides interface analysis and disconnect resolution among the Integrated TW/AA systems and future program upgrades (e.g., SBIRS integration, National Missile Defense, and other Force Enhancements and Space Control programs). The fourth project, Legacy Interfaces, provides 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 will be complete in FY99.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305906F NCMC-TW/AA SYSTEMS
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(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.

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

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total</u>
(U) Previous President's Budget (FY1999 PB)	6,726	7,878	4,607	4,252	Continuing
(U) Appropriated Value	7,362	7,878			
(U) Adjustments to Appropriated Value					
a. Cong Gen Reductions	-480	-545			
b. SBIR	-158				
c. Omnibus or Other Above Threshold Reprogram	-46				
d. Below Threshold Reprogramming					
(U) Adjustments to Budget Years Since FY1999 PB			11,801	15,229	
(U) Current Budget Submit/FY2000 PB	6,678	7,333	16,408	19,481	Continuing

(U) Significant Program Changes:

FY99: \$227 identified as a source for SBIR.

FY00 and FY01 increases fund the N/UWSS project.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305906F NCMC-TW/AA SYSTEMS				PROJECT 3880		
<i>COST (\$ In Thousands)</i>	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
3880 CMU	378	110	0	0	0	0	0	0	0	1,291,802
<p>(U) A. <u>Mission Description</u> The CMU program must meet Joint Chiefs of Staff requirements to provide the National Command Authorities with timely, reliable, and unambiguous Integrated TW/AA data for force survival or retaliatory decisions in the face of air, space, or ballistic missile threats. The program will provide: 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 implements an acquisition strategy that tests and delivers 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 1998 (\$ in thousands)</u> - (U) \$ 378 Completed Integrated Mission Testing - (U) \$ 378 Total</p> <p style="padding-left: 20px;">(U) <u>FY 1999 (\$ in thousands)</u> - (U) \$ 106 Completed CMU - (U) \$ 4 Identified as a source for SBIR - (U) \$ 110 Total</p> <p style="padding-left: 20px;">(U) <u>FY 2000 (\$ in Thousands):</u> - (U) \$ 0 Not applicable</p> <p style="padding-left: 20px;">(U) <u>FY 2001 (\$ in Thousands):</u> - (U) \$ 0 Not applicable</p> <p>(U) B. <u>Project Change Summary - Description of Significant Changes:</u> No change.</p>										
Project 3880			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 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305906F NCMC-TW/AA SYSTEMS	PROJECT 3880
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(U) C. Other Program Funding Summary (\$ in Thousands)

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	To <u>Compl</u>	Total <u>Cost</u>
Other Procurement (Electronics and tele-communications equipment/BA04/PE0305906F)*	8,758	12,694	14,713	17,656	18,334	18,687	19,623	18,632	Cont	Cont
(U) Operations & Maintenance (PE0305906F)	94,920	88,305	86,892	89,735	99,650	107,264	109,451	86,468	Cont	Cont

* Includes CMU, N/UWSS, and the Mobile Consolidated Command Centers (MCCCs).

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

(U) E. Schedule Profile

	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) CMU Integrated Mission Testing Completed				*												
(U) CMU FOC								*								

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305906F NCMC-TW/AA SYSTEMS	PROJECT 3880
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(U) A. Project Cost Breakdown (\$ in Thousands)

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) SPO Support				
(U) MITRE	55	0	0	0
(U) TEMS/SDAS/WSI/SAIC/NSR	151	66	0	0
(U) Program Support	172	40	0	0
(U) Identified as a source for SBIR	0	4	0	0
(U) Total	378	110	N/A	N/A

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305906F NCMC-TW/AA SYSTEMS					PROJECT 3880	
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR	N/A	N/A	N/A	N/A	0	0	4	0	0	0	4
<u>Product Development Organizations</u>											
Lockheed-Martin CO Springs CO	C/CPIF/AF	Oct 91	271,814	271,814	271,814	0	0	0	0	0	271,814
E-Systems St Petersburg FL	C/FPI/AF	Aug 86	103,240	103,240	103,240	0	0	0	0	0	103,240
TRW, Inc Carson CA	C/FPI/AF	Jun 87	213,761	213,761	213,761	0	0	0	0	0	213,761
GTE Needham Hgts MA	C/CPIF/AF	Jan 92	238,415	238,415	238,415	0	0	0	0	0	238,415
Lockheed-Martin CO Springs CO	SS/CPIF/AF	Mar 93	120,018	120,018	120,018	0	0	0	0	0	120,018
DISA (Govt) Reston VA	PO	Oct 93	9,152	9,152	9,152	0	0	0	0	0	9,152
KAMAN Sciences CO Springs CO	C/CPAF	Aug 95	3,176	3,176	3,176	0	0	0	0	0	3,176
Misc	Various	Various	820	820	820	0	0	0	0	0	820
<u>Support and Management Organizations</u>											
MITRE	SS/PR	Oct 95	N/A	N/A	168,560	55	0	0	0	0	168,615
TEMS	C/PR	Oct 95	N/A	N/A	72,815	151	66	0	0	0	73,032
Program Support	Various	Nov 95	N/A	N/A	89,543	172	40	0	0	0	89,755
Project 3880			Page 6 of 20 Pages				Exhibit R-3 (PE 0305906F)				

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305906F NCMC-TW/AA SYSTEMS					PROJECT 3880	
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
<u>Test and Evaluation Organizations</u>											
N/A											
(U) B. Budget Acquisition History and Planning Information Continued (\$ in Thousands)											
Government Furnished Property: Not Applicable.											
Identified as a source for SBIR					0	0	4	0	0	0	4
Subtotal Product Development					960,396	0	0	0	0	0	960,396
Subtotal Support and Management					330,918	378	106	0	0	0	331,402
Subtotal Test and Evaluation					0	0	0	0	0	0	0
Total Project					1,291,314	378	110	0	0	0	1,291,802

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305906F NCMC-TW/AA SYSTEMS	PROJECT 4806
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4806 N/UWSS	0	0	11,884	15,308	12,249	12,132	14,561	14,545	Continuing	Continuing

(U) A. Mission Description

The NORAD/USSPACECOM Warfighting Support System (N/UWSS) is 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. 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. N/UWSS objectives are to provide NORAD/USSPACECOM a C2 system that is flexible in responding to evolving mission needs (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.

The initial scope of N/UWSS will be to evolve existing fixed and enduring C2 nodes to DII COE compliance: the Cheyenne Mountain Complex (CMC); Mobile Command and Control Centers (MCCCs); Alternate Missile Warning Center; Canada’s National Defense Headquarters (NDHQ) Processing Display Subsystem (PDS); National Military Command Center (NMCC) PDS; and the back-up NMCC (Site-R) PDS; and the Alternate Space Control Center PDS.

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

- (U) \$ 0 Not applicable

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

- (U) \$ 0 Not applicable

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

- (U) \$ 872 Missile Warning Enterprise database development
- (U) \$ 181 Fused battlespace picture situation monitor and assessment
- (U) \$ 3,471 Command and control (C2) of space forces/threat warning
- (U) \$ 4,793 C2 of space forces/space battle manager
- (U) \$ 2,567 C2 of space forces/space operations planning
- (U) \$ 11,884 Total

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305906F NCMC-TW/AA SYSTEMS					PROJECT 4806	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U) Major Contract Incremental Funding					0	0	8,347	10,767			
(U) Award/Performance Fee					0	0	1,473	1,900			
(U) MITRE					0	0	1,240	1,580			
(U) TEMS					0	0	703	905			
(U) Program Support					0	0	121	156			
(U) Total					0	0	11,884	15,308			
(U) B. <u>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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Organizations</u>											
ISC2 Contractor (TBD)	CP/AF	Jan 00	N/A	N/A	0	0	0	9,820	12,667	Cont	Cont
<u>Support and Management Organizations</u>											
MITRE	CPFF	Jan 00	N/A	N/A	0	0	0	1,240	1,580	Cont	Cont
TEMS	CPFF	Jan 00	N/A	N/A	0	0	0	703	905	Cont	Cont
Program Support	N/A	Jan 00	N/A	N/A	0	0	0	121	156	Cont	Cont
<u>Test and Evaluation Organizations</u>											
Not applicable											
Project 4806					Page 10 of 20 Pages				Exhibit R-3 (PE 0305906F)		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1999				
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305906F NCMC-TW/AA SYSTEMS				PROJECT 4806			
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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>	
<u>Product Development Property</u>											
Not applicable											
<u>Support and Management Property</u>											
Not applicable											
<u>Test and Evaluation Property</u>											
Not applicable											
Subtotal Product Development							9,820	12,667	Cont	Cont	
Subtotal Support and Management							2,064	2,641			
Subtotal Test and Evaluation											
Total Project							11,884	15,308	Cont	Cont	

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305906F NCMC-TW/AA SYSTEMS				PROJECT 3881		
<i>COST (\$ In Thousands)</i>	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
3881 Integrated TW/AA	4,929	6,270	4,524	4,173	3,700	3,710	3,787	3,867	Continuing	Continuing
<p>(U) A. <u>Mission Description</u></p> <p>This project was established to integrate new acquisitions such as the CMU program into the Integrated TW/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 Integrated TW/AA systems and future program upgrades (e.g., 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, CINC Mission Operations Center, Space Operations Center), component C2 nodes (AFSPC's Space 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.</p> <p>(U) <u>FY 1998</u></p> <ul style="list-style-type: none"> - (U) \$ 2,218 SEIT: Provided operation integration of CMU Phase 4 installation, check-out, test and assessment; maintained program schedule; identified, tracked and resolved disconnects within the ITW/AA system. - (U) \$ 2,711 Future Plans: Managed planned incremental capability modifications to NCMC-TW/AA systems. - (U) \$ 4,929 Total <p>(U) <u>FY 1999</u></p> <ul style="list-style-type: none"> - (U) \$ 3,543 SEIT and Future Plans merged into Integrated Systems Engineering (ISE), tasks include: transition space surveillance common user message traffic off AUTODIN onto new communications architecture; initial integration on 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) \$ 2,533 AF long range planning "jump start" funding for Space Battle Manager command and control prototyping, supports Expeditionary Force Experiment '99 (EFX '99) - (U) \$ 194 Identified as a source for SBIR - (U) \$ 6,270 Total 										
Project 3881			<i>Page 12 of 20 Pages</i>				Exhibit R-2A (PE 0305906F)			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305906F NCMC-TW/AA SYSTEMS	PROJECT 3881
<p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 4,524 Integrated Systems Engineering (ISE): Planning, integration and architecture development of new and upgraded fixed and mobile C2 sensor nodes into the ITW/AA network; complete AUTODIN transition; Clear Radar Upgrade IOC; SBIRS Increment 2; BMC3-ITW/AA planning, integration and test; CINC mission operations center planning and architecture development; and software vertical release planning - (U) \$ 4,524 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 4,173 ISE: planning, integration and architecture development of new and upgraded fixed and mobile C2 centers and sensor nodes into the ITW/AA network; pre-planned vertical release upgrades; BMC3 ITW/AA planning and integration; CINC mission operations center planning and architecture development - (U) \$ 4,173 Total <p>(U) B. <u>Project Change Summary - Description of Significant Changes:</u> No significant changes.</p>		
Project 3881	Page 13 of 20 Pages	Exhibit R-2A (PE 0305906F)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305906F NCMC-TW/AA SYSTEMS	PROJECT 3881
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(U) C. Other Program Funding Summary (\$ in Thousands)

(U) Shown in the CMU, Project 3880.

(U) D. Acquisition Strategy:

All major contracts within this program element were awarded after full and open competition.

(U) E. Schedule Profile

Integrated TW/AA	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) AUTODIN Transition							X		X							
(U) SBIRS - ITW/AA Increment 1					*											
(U) SBIRS - ITW/AA Increment 2									X							
(U) ITW/AA Processing Display System - Migration (PDS-M)												X				
(U) Clear Radar Upgrade Integration					*				X							
(U) ITW/AA MPDS-R Legacy Comm Transition								X				X				
(U) ITW/AA Space Defense Operations Center Re-Engineering								X	X							
(U) NMD - BMC3 ITW/AA Integration								X			X			X		X
(U) ITW/AA Air Initiatives								X								
(U) Pre-Planned ITW/AA Software Vertical Release Upgrades					*			*	X	X	X	X	X	X	X	X
(U) HAVE STARE (FPS-129) Radar Integration*									X			X				

* 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.

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1999				
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305906F NCMC-TW/AA SYSTEMS				PROJECT 3881			
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
				<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>				
(U) Major Contract Incremental Funding					2,021						
(U) Award/Performance Fee					108						
(U) SPO Support											
(U) MITRE				4,048	3,071	3,207	3,052				
(U) TEMS/WSI				817	744	1,317	1,121				
(U) Program Support				64	132	0	0				
(U) Identified as a source for SBIR				0	194	0	0				
(U) Total				4,929	6,270	4,524	4,173				
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR	N/A	N/A	N/A	N/A	0	0	194	0	0	0	194
<u>Product Development Organizations</u>											
DISA	MIPR	Apr 96	1,328	1,328	1,328	0	0	0	0	0	1,328
Lockheed Martin Co Springs, CO	C/CPIF/AF	Jun 95	6,390	6,390	6,390	0	0	0	0	0	6,390
Lockheed Martin Sunnyvale, CA	CPIF/AF	Nov 98	1,546	1,546	0	0	1,546	0	0	0	1,546
SPAWAR/Navy	MIPR	Nov 98	583	583	0	0	583	0	0	0	583

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305906F NCMC-TW/AA SYSTEMS					PROJECT 3881	
<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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Support and Management Organizations</u>											
MITRE	CPFF	Oct 95	N/A	N/A	48,977	4,048	3,071	3,207	3,052	Cont	Cont
TEMS	CPFF	Oct 95	N/A	N/A	31,404	817	744	1,317	1,121	Cont	Cont
Program Support	N/A	Nov 95	N/A	N/A	7,064	64	132	0	0	Cont	Cont
Prime Contractors	(Various)				812	0	0	0	0	TBD	TBD
<u>Test and Evaluation Organizations</u>											
N/A											
Government Furnished Property:											
Not Applicable.											
					<u>Total Prior to FY 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
Identified as a source for SBIR					0	0	194	0	0	0	194
Subtotal Product Development					7,718	0	2,129	0	0	Cont	Cont
Subtotal Support and Management					88,257	4,929	3,947	4,524	4,173	Cont	Cont
Subtotal Test and Evaluation					0	0	0	0	0	0	0
Total Project					95,975	4,929	6,270	4,524	4,173	Cont	Cont

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305906F NCMC-TW/AA SYSTEMS				PROJECT 4409		
<i>COST (\$ In Thousands)</i>	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4409 Legacy Interfaces	1,371	953	0	0	0	0	0	0	0	47,485
<p>(U) A. <u>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 CMU software development upgrades to the CMU program. To clearly account for this funding, this project, Legacy Interfaces, was established. This project provides funding for software development upgrades to the CMU program and for direct mission software support to meet operational needs and completes in FY99.</p> <p style="margin-left: 40px;">(U) <u>FY 1998 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> – (U) \$ 1,371 Provided Cheyenne Mountain software engineering support/upgrades – (U) \$ 1,371 Total <p style="margin-left: 40px;">(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> – (U) \$ 924 Provided Cheyenne Mountain software engineering support/upgrades – (U) \$ 29 Identified as a source for SBIR – (U) \$ 953 Total <p style="margin-left: 40px;">(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> – (U) \$ 0 Not applicable <p style="margin-left: 40px;">(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> – (U) \$ 0 Not applicable <p>(U) B. <u>Project Change Summary - Description of Significant Changes:</u> No significant changes.</p>										
Project 4409			Page 17 of 20 Pages				Exhibit R-2A (PE 0305906F)			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)										DATE February 1999																																																				
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305906F NCMC-TW/AA SYSTEMS					PROJECT 4409																																																				
<p>(U) C. <u>Other Program Funding Summary (\$ in Thousands)</u> (U) Shown above at program element level.</p> <p>(U) D. <u>Acquisition Strategy:</u> All major contracts within this program element were awarded after full and open competition.</p> <p>(U) E. <u>Schedule Profile</u></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;"></th> <th colspan="4" style="text-align: center;"><u>FY 1998</u></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="4" style="text-align: center;"><u>FY 2001</u></th> </tr> </thead> <tbody> <tr> <td>Legacy Interfaces</td> <td align="center">1</td><td align="center">2</td><td align="center">3</td><td align="center">4</td> </tr> <tr> <td>(U) Cheyenne Mountain test/software support upgrades</td> <td align="center">*</td><td align="center">*</td><td align="center">*</td><td align="center">*</td> <td align="center">*</td><td align="center">X</td><td align="center">X</td><td align="center">X</td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> </tr> </tbody> </table>													<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>				Legacy Interfaces	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	(U) Cheyenne Mountain test/software support upgrades	*	*	*	*	*	X	X	X								
	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>																																																	
Legacy Interfaces	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4																																														
(U) Cheyenne Mountain test/software support upgrades	*	*	*	*	*	X	X	X																																																						
Project 4409			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 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305906F NCMC-TW/AA SYSTEMS					PROJECT 4409	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U) SPO support											
(U) MITRE					1,102	0	0	0			
(U) TEMS					261	731	0	0			
(U) Program Support					8	193	0	0			
(U) Identified as a source for SBIR					0	29	0	0			
(U) Total					1,371	953	0	0			
(U) B. <u>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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
Identified as a source for SBIR	N/A	N/A	N/A	N/A	0	0	29	0	0	0	29
<u>Product Development Organizations</u>											
Lockheed-Martin CO Springs CO	CP/AF	Oct 94	9,352	9,352	9,352	0	0	0	0	0	9,352
E-Systems	FPIF/AF	Oct 94	1,880	1,880	1,880	0	0	0	0	0	1,880
St Petersburg FL											
Kaman Sciences CO Springs CO	CP/AF	Oct 94	18,214	18,214	18,214	0	0	0	0	0	18,214
Kaman Sciences CO Springs CO	CP/AF	Oct 94	12,471	12,471	12,471	0	0	0	0	0	12,471
Navy/NISE	MIPR	Sep 95	3,244	3,244	3,244	0	0	0	0	0	3,244
Project 4409					Page 19 of 20 Pages				Exhibit R-3 (PE 0305906F)		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305906F NCMC-TW/AA SYSTEMS					PROJECT 4409	
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
<u>Support and Management Organizations</u>											
MITRE	CPFF	N/A	N/A	N/A	0	1,102	0	0	0	0	1,102
TEMS	CPFF	N/A	N/A	N/A	0	261	731	0	0		992
Program Support	N/A	N/A	N/A	N/A	0	8	193	0	0	0	201
<u>Test and Evaluation Organizations:</u> N/A											
<u>Government Furnished Property:</u> N/A											
Identified as a source for SBIR					0	0	29	0	0	0	29
Subtotal Product Development					45,161	0	0	0	0	0	45,161
Subtotal Support and Management					0	1,371	924	0	0	0	2,295
Subtotal Test and Evaluation					0	0	0	0	0	0	0
Total Project					45,161	1,371	953	0	0	0	47,485

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305910F Spacetrack (Space)
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	37,977	45,375	54,806	1,178	588	0	0	0	0	201,880
4241 Advanced Electro Optical System (AEOS)	28,267	24,640	21,000	0	0	0	0	0	0	193,927
4791 GEODSS Sustainment	0	0	6,187	1,178	588	0	0	0	0	7,953
4279 Have Stare Radar	9,710	20,735	27,619	0	0	0	0	0	0	*
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

* Prior year data not available; program transferred from the intelligence budget in FY93 at the direction of Congress
 Note: Database correction required to correct FY98 actual for project 4279

(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 1999
BUDGET ACTIVITY 7 - Operational System Development			PE NUMBER AND TITLE 0305910F Spacetrack (Space)		
(U) C. <u>Program Change Summary (\$ in Thousands)</u>					
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U) Previous President's Budget (FY1999 PB)	38,432	39,532	28,121	0	Continuing
(U) Appropriated Value	43,073	45,832			
(U) Adjustments to Appropriated Value					
a. Cong Gen Reductions	-3,679	-457			
b. SBIR	-967				
c. Omnibus or Other Above Threshold Reprogram	-261				
d. Below Threshold Reprogramming	-189				
(U) Adjustments to Budget Years Since FY1999 PB	0	0	26,685	1,178	
(U) Current Budget Submit/FY2000 PB	37,977	45,375	54,806	1,178	Continuing
 (U) Significant Program Changes: FY98 reprogramming funded higher priority Air Force requirements. FY99: \$1,409 identified as a source for SBIR. FY00 increases fund the GEODSS Sustainment and AEOS projects. FY01 increases fund the GEODSS Sustainment project.					

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305910F Spacetrack (Space)				PROJECT 4241		
<i>COST (\$ In Thousands)</i>	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4241 Advanced Electro Optical System (AEOS)	28,267	24,640	21,000	0	0	0	0	0	0	193,927
<p>*Note: FY98 funding includes Air Force Maui Optical Station (AMOS) efforts.</p> <p>(U) A. <u>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 the MSSS, and the budget will appear in Budget Activity 2, Applied Research.</p> <p>(U) <u>FY 1998</u></p> <ul style="list-style-type: none"> - (U) \$ 16,782 Continued development of adaptive optics, sensors, and integration of the telescope system - (U) \$ 1,385 Purchased pre-operational spares - (U) \$ 4,800 Continued development of AEOS and the MSSS observatory control system - (U) \$ 5,300 Continued R&D upgrades to MSSS - (U) \$ 28,267 Total <p>(U) <u>FY 1999</u></p> <ul style="list-style-type: none"> - (U) \$ 13,792 Continue integration & test of Radiometer, Longwave Infrared Imager (LWIR) and Adaptive Optics (A/O) System - (U) \$ 1,565 Complete the MSSS Observatory Control System (OCS) - (U) \$ 7,301 R&D upgrades to the MSSS, operational transition of AEOS, and visitor programs - (U) \$ 1,217 University of Hawaii (UH) spectrograph and atmospheric characterization research - (U) \$ 765 Identified as a source for SBIR - (U) \$ 24,640 Total 										
Project 4241			Page 3 of 17 Pages				Exhibit R-2A (PE 0305910F)			

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305910F Spacetrack (Space)	PROJECT 4241
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- (U) FY 2000 (\$ in Thousands):
- (U) \$ 10,515 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) \$ 21,000 Total

- (U) FY 2001 (\$ in Thousands):
- (U) \$ 0 Not Applicable

(U) **B. Project Change Summary - Description of Significant Changes:**
None

(U) **C. Other Program Funding Summary (\$ in Thousands)**
Not applicable

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

(U) **E. Schedule Profile**

	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) AEOS telescope/facility																
(U) Radiometer Acceptance						X										
(U) Long Wave Imager Acceptance						X										
(U) Observatory Control Sys Acceptance												X				
(U) Adaptive Optics System Acceptance												X				

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305910F Spacetrack (Space)					PROJECT 4241	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U)	Congressionally directed level of effort for AEOS Maui facilities expansion				28,267	23,875	21,000	0			
(U)	Identified as a source for SBIR				0	765	0	0			
(U)	Total				28,267	24,640	21,000	0			
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
<u>Contract 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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
Identified as a source for SBIR	N/A	N/A	N/A	N/A	0	0	765	0	0	0	765
<u>Product Development Organization</u>											
Kiewit Pacific Co Kapolei, HI	C/FFP/AF	Aug 94	21,000	21,302	21,302	0	0	0	0	0	21,302
Contraves USA Pittsburgh, PA	C/FFP/AF	Dec 91	23,000	23,618	22,933	685	0	0	0	0	23,618
ROSI Danbury, CT	C/CPAF/AF	Aug 94	31,000	37,368	19,188	10,015	8,167	3,985	0	0	41,355
COMSAT RSI, Inc Clarksburg, MD	C/FFP/AF	Aug 95	7,000	7,250	7,250	0	0	0	0	0	7,250
Mission Research Corp Santa Barbara, CA	C/CPIF/AF	Jul 95	4,000	5,085	4,010	850	325	370	0	0	5,555
Raytheon El Segundo, CA	C/CPIF/AF	Sep 95	5,000	6,804	3,945	2,664	1,400	375	0	0	8,384
RTS Kihei, Maui, HI	C/CPAF/AF	Sep 95	N/A	24,569	5,956	10,684	10,041	13,955	0	0	40,636
Project 4241					Page 5 of 17 Pages			Exhibit R-3 (PE 0305910F)			

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305910F Spacetrack (Space)					PROJECT 4241	
<u>Contract 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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
RPS Kihei, Maui, HI	C/CPAF/AF	Oct 90	N/A	12,933	12,933	0	0	0	0	0	12,933
UH* Maui, HI	C/CR/AF	Oct 96	3,400	1,700	1,700	0	1,217	0	0	0	2,917
*Congressionally directed Spectrograph Research											
<u>Support and Management Organizations</u>											
Logicon RDA Albuquerque, NM	C/CPAF/AF	Oct 95	N/A	N/A	1,877	580	400	350	0	0	3,207
Logicon RDA Albuquerque, NM	C/CPAF/AF	Oct 93	N/A	N/A	3,360	0	0	0	0	0	3,360
MIT/LL Cambridge, MA	SS (Sole Source)	Oct 93	N/A	N/A	2,266	300	300	200	0	0	3,066
S. Systems Corp Albuquerque, NM	C/CPFF/AF	Jul 93	N/A	N/A	2,976	0	0	0	0	0	2,976
ARMY COE Haleakala, Maui, HI	SS (Sole Source)	Jan 95	N/A	N/A	1,617	0	0	0	0	0	1,617
WJS Albuquerque, NM	SS (Sole Source)	Oct 97	N/A	N/A	0	259	150	150	0	0	559
Program Office	Various	N/A	N/A	N/A	8,707	2,230	1,875	1,615	0	0	14,427
<u>Test and Evaluation Organizations</u>											
Not applicable											

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1999			
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305910F Spacetrack (Space)				PROJECT 4241		
Government Furnished Property:										
Item <u>Description</u>	Contract Method/Type or Funding <u>Vehicle</u>	Award or Obligation <u>Date</u>	Delivery <u>Date</u>	Total Prior to <u>FY 1998</u>	Budget <u>FY 1998</u>	Budget <u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	Budget to <u>Complete</u>	Total <u>Program</u>
Subtotal Product Development				99,217	24,898	21,150	18,685	0	0	163,950
Subtotal Support and Management				20,803	3,369	2,725	2,315	0	0	29,212
Subtotal Test and Evaluation				0	0	0		0	0	0
Total Project				120,020	28,267	24,640	21,000	0	0	193,927

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305910F Spacetrack (Space)					PROJECT 4791	
<i>COST (\$ In Thousands)</i>	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4791 GEODSS Sustainment	0	0	6,187	1,178	588	0	0	0	0	7,953
<p>(U) A. <u>Mission Description and Budget Item Justification</u> 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 replacement Modular Precision Angular Control Systems (MPACS) and development of logistical data and training. This effort, when coupled with the current GEODSS Modification Program, will result in more than double the throughput and search rate of the current 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 inability to adequately monitor friendly/enemy intent in that regime.</p> <p>(U) <u>FY 1998 (\$ in Thousands):</u> - (U) \$ 0 Not applicable</p> <p>(U) <u>FY 1999 (\$ in Thousands):</u> - (U) \$ 0 Not applicable</p> <p>(U) <u>FY 2000 (\$ in Thousands):</u> - (U) \$ 3,587 Begin CCD design - (U) \$ 2,600 Begin camera design - (U) \$ 6,187 Total</p> <p>(U) <u>FY 2001 (\$ in Thousands):</u> - (U) \$ 400 Continue CCD design - (U) \$ 778 Continue camera design - (U) \$ 1,178 Total</p> <p>(U) B. <u>Program Change Summary (\$ in Thousands) - Description of Significant Changes</u> This is a new start in FY00.</p>										
Project 4791			Page 8 of 17 Pages				Exhibit R-2A (PE 0305910F)			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305910F Spacetrack (Space)	PROJECT 4791
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(U) C. Other Program Funding Summary (\$ in Thousands)

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To Compl</u>	<u>Total Cost</u>
(U) Other Procurement (Space Modifications BA 83, P-)	0	0	0	9,159	8,859	2,464	0	0	0	20,482

* Space modifications for the GEODSS Sustainment project only

(U) D. Acquisition Strategy

The contract for the GEODSS Sustainment project will be awarded after full and open competition.

(U) E. Schedule Profile

	<u>FY 1998</u>			<u>FY 1999</u>			<u>FY 2000</u>			<u>FY 2001</u>		
GEODSS Sustainment	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	

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1999				
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305910F Spacetrack (Space)				PROJECT 4791		
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U) System Development					0	0	4,487	1,178			
(U) MITRE					0	0	840	0			
(U) TEMS/SETA					0	0	760	0			
(U) Other Support					0	0	100	0			
(U) Total					0	0	6,187	1,178			
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
<u>Product Development Organizations</u>											
Prime Contractor	TBD	Dec 99	TBD	TBD	0	0	0	4,487	1,178	588	6,253
<u>Support and Management Organizations</u>											
MITRE	TBD	Dec 99	TBD	TBD	0	0	0	840	0	0	840
TEMS/SETA	TBD	Dec 99	TBD	TBD	0	0	0	760	0	0	760
Other Support	TBD	Dec 99	TBD	TBD	0	0	0	100	0	0	100
<u>Test and Evaluation Organizations</u>											
Not applicable											
Project 4791					Page 10 of 17 Pages				Exhibit R-3 (PE 0305910F)		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1999			
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305910F Spacetrack (Space)				PROJECT 4791		
(U) B. <u>Budget Acquisition History and Planning Information Continued (\$ in Thousands)</u>										
Government Furnished Property:										
Not applicable										
<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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Property</u>										
Not applicable										
<u>Support and Management Property</u>										
Not applicable										
<u>Test and Evaluation Property</u>										
Not applicable										
Subtotal Product Development				0	0	0	4,487	1,178	588	6,253
Subtotal Support and Management				0	0	0	1,700	0	0	1,700
Subtotal Test and Evaluation				0	0	0	0	0	0	0
Total Project				0	0	0	6,187	1,178	588	7,953

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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305910F Spacetrack (Space)	PROJECT 4279
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4279 Have Stare Radar	9,710	20,735	27,619	0	0	0	0	0	0	*

* Prior year data not available; program transferred from the intelligence budget in FY93 at the direction of Congress

(U) A. Mission Description

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 will be deployed to Vardø, Norway, as a dedicated space surveillance sensor to support the mission of space object catalog maintenance and mission payload assessment. While at the Vandenberg AFB test site, the radar has supported, in an ABM treaty compliant mode, NMD X-band radar technology studies, hardware prototyping and demonstrations. System dismantling began in October 1998. The system's Initial Operating Capability (IOC) is currently scheduled for late fourth quarter FY00. The 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.

(U) FY 1998

- (U) \$ 3,400 Continued radar development incremental funding
- (U) \$ 2,882 Continued preparations for deployment
- (U) \$ 3,428 Conducted X-band radar technology prototyping, studies, and demonstrations
- (U) \$ 9,710 Total

(U) FY 1999

- (U) \$ 1,300 Continue radar development incremental funding
- (U) \$ 5,700 Continue facility preparations
- (U) \$ 12,191 Deploy and install program equipment
- (U) \$ 900 Logistics and training
- (U) \$ 644 Identified as a source for SBIR
- (U) \$ 20,735 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational System Development	0305910F Spacetrack (Space)	4279
<p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 11,500 Complete facility preparation - (U) \$ 6,998 Complete system installation, integration, and checkout - (U) \$ 6,000 Conduct formal system tests - (U) \$ 2,400 Logistics and training - (U) \$ 721 Demolish test facility and cleanup test site - (U) \$ 27,619 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 0 Not Applicable <p>(U) B. <u>Project Change Summary - Description of Significant Changes:</u> None.</p>		
Project 4279	Page 13 of 17 Pages	Exhibit R-2A (PE 0305910F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)										DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305910F Spacetrack (Space)					PROJECT 4279		
(U) C. <u>Other Program Funding Summary (\$ in Thousands)</u>												
		<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	To <u>Compl</u>	Total <u>Cost</u>	
(U) Operations and Maintenance AF*		41,950	52,309	48,435	53,436	55,225	57,496	57,883	59,332	Cont	Cont	
* Includes other projects in the Spacetrack program element												
(U) D. <u>Acquisition Strategy:</u>												
The existing contract with Raytheon was modified in the third quarter of FY98 for the dismantling, shipment, and installation of the radar.												
(U) E. <u>Schedule Profile</u>												
		<u>FY 1998</u>			<u>FY 1999</u>			<u>FY 2000</u>			<u>FY 2001</u>	
	1	2	3	4	1	2	3	4	1	2	3	4
HAVE STARE Radar (FPS-129)												
(U) Award Deployment Contract Mod			*									
(U) Begin to Dismantle Radar at Test Site (Vandenberg AFB)				*								
(U) Begin to Install at Operational Site (Vardø, Norway)						X						
(U) Begin Formal System Testing								X				
(U) System Initial Operating Capability									X			
Project 4279												
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Exhibit R-2A (PE 0305910F)												

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305910F Spacetrack (Space)					PROJECT 4279	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U)	System development				1,529	2,200	1,700	0			
(U)	Site preparation and support				3,557	4,800	10,900	0			
(U)	Deployment, installation and checkout				0	9,687	3,898	0			
(U)	Logistics and training				0	700	2,400	0			
(U)	Formal system testing				0	0	5,100	0			
(U)	X-Band Radar test support				2,472	0	0	0			
(U)	SPO support				2,152	2,704	3,121	0			
(U)	Demolish test facility and cleanup test site				0	0	500	0			
(U)	Identified as a source for SBIR				0	644	0	0			
(U)	Total				9,710	20,735	27,619	0			
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR	N/A	N/A	N/A	N/A	0	0	644	0	0	0	644
* Prior year data not available; program transferred from the intelligence budget in FY93 at the direction of Congress											
<u>Product Development Organizations</u>											
Raytheon Elec Sys Sudbury, MA	C/CPIF/AF	Mar 91	29,156	29,156	*	2,956	12,387	11,398	0	0	*
Site Preparation	Various	Various	N/A	N/A	*	2,100	4,700	10,850	0	0	*
AFMC SMC	Various	Various	N/A	N/A	*	1,683	0	0	0	0	*
Misc	Project Order	Various	N/A	N/A	*	440	151	2,091	0	0	*
Project 4279					Page 15 of 17 Pages				Exhibit R-3 (PE 0305910F)		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE	
7 - Operational System Development										February 1999	
BUDGET ACTIVITY					PE NUMBER AND TITLE					PROJECT	
7 - Operational System Development					0305910F Spacetrack (Space)					4279	
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
<u>Support and Management Organizations</u>											
MITRE	SS/PR	Oct 95	N/A	N/A	*	800	700	800	0	0	*
TEMS	C/PR	Various	N/A	N/A	*	423	405	440	0	0	*
SETA	C/PR	Oct 97	N/A	N/A	*	700	575	475	0	0	*
Lincoln Lab	SS/PR	Oct 95	N/A	N/A	*	230	150	0	0	0	*
Program Office	Various	Various	N/A	N/A	*	354	583	1,003	0	0	*
Misc	Various	Various	N/A	N/A	*	24	440	562	0	0	*
<u>Test and Evaluation Organizations</u>											
Not applicable					*	0	0	0	0	0	*
Government Furnished Property:											
Identified as a source for SBIR					0	0	644	0	0	0	644
Subtotal Product Development					*	7,179	17,238	24,339	0	0	*
Subtotal Support and Management					*	2,531	2,853	3,280	0	0	*
Subtotal Test and Evaluation					*	0	0	0	0	0	*
Total Project					*	9,710	20,735	27,619	0	0	*

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305911F Defense Support Program (Space)
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COST (<i>In Thousands</i>)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	17,624	11,811	7,459	7,445	4,372	4,657	0	0	0	1,938,210
3615 Shield/Alert	9,278	8,274	3,446	3,984	0	0	0	0	0	60,355
3624 Defense Support Program	8,346	3,537	4,013	3,461	4,372	4,657	0	0	0	1,877,855
Quantity of RDT&E Articles	0	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.

(U) B. Budget Activity Justification:

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

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305911F Defense Support Program (Space)
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(U) C. Program Change Summary (\$ in Thousands)

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total</u>
(U) Previous President's Budget (FY 1999 PB)	20,689	12,037	7,595	7,587	
				1,937,812	
(U) Appropriated Value	23,193	12,037			
(U) Adjustments to Appropriated Value					
a. Congressional General Reduction/Adds	-1,959	-226			
b. SBIR/Other	-470				
c. Omnibus or Other Above Threshold Reprogram	-141				
d. Below Threshold Reprogramming	-2,999				
(U) Adjustments to Budget Years Since FY 1999 PB			-136	-142	
(U) Current Budget Submit/FY 2000 PB	17,624	11,811	7,459	7,445	
				1,937,812	

(U) Significant Program Changes:

Funding: FY99 \$398K identified as a source for Small Business Innovative Research (SBIR).

Schedule: DSP 22 launch moved from 3QFY01 to 3QFY02 to match current Air Force Space Command launch manifest.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305911F Defense Support Program (Space)				PROJECT 3615		
<i>COST (In Thousands)</i>	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
3615 Shield/Alert	9,278	8,274	3,446	3,984	0	0	0	0	0	60,355
<p>(U) A. <u>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 1998 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 4,845 Continued engineering task development to prototype and implement ALERT capabilities leading up to Increment I. - (U) \$ 2,000 Continued SBIRS ground consolidation developmental test and evaluation. - (U) \$ 2,194 Technical analysis and independent verification and validation of contractor by FFRDC - (U) \$ 239 Other Mission Support - (U) \$ 9,278 Total <p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 3,849 Continue engineering task development to prototype and implement ALERT capabilities leading up to Increment I. - (U) \$ 1,946 Continue SBIRS ground consolidation developmental test and evaluation. - (U) \$ 2,200 Technical analysis and independent verification and validation of contractor by FFRDC. - (U) \$ 279 Identified as as source for Small Business Innovative Research (SBIR) - (U) \$ 8,274 Total <p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 1,808 Continue engineering prototypes and feasibility analysis. - (U) \$ 638 Continue developmental test and evaluation of Shield. - (U) \$ 1,000 Technical analysis and independent verification and validation of contractor by FFRDC. - (U) \$ 3,446 Total 										
Project 3615			<i>Page 3 of 13 Pages</i>				Exhibit R-2A (PE 0305911F)			

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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305911F Defense Support Program (Space)	PROJECT 3615
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(U) FY 2001 (\$ in Thousands):

- (U) \$ 2,624 Continue engineering prototypes and feasibility analysis.
- (U) \$ 360 Continue developmental test and evaluation of Shield.
- (U) \$ 1,000 Technical analysis and independent verification and validation of contractor by FFRDC.
- (U) \$ 3,984 Total

(U) B. Project Change Summary - Description of Significant Changes:

(U) Substantial FY00-FY03 funding will transfer from BPAC 3624 to 3615, to support continued engineering task development for ALERT and engineering prototype, feasibility analysis, and developmental test and evaluation for Shield.

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

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To Complete</u>	<u>Total Cost</u>
(U) Missile Procurement (PE 305911F, BA-05, P-28)	85,805	88,650	111,637	109,462	117,070	103,859	30,783	36,135	203,300	7,181,833
(U) Other Procurement (PE 305911F, BA-65, P-N/A)	181	202	14	6	0	0	0	0	0	1,201,700

Related RDT&E:

- (U) PE 603441F - SBIRS Dem/Val
- (U) PE 604442F - SBIRS Low EMD
- (U) PE 604441F - SBIRS High EMD

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BUDGET ACTIVITY 7 - Operational System Development						PE NUMBER AND TITLE 0305911F Defense Support Program (Space)						PROJECT 3615																																																																																																																																																																																																																																															
<p>(U) D. Acquisition Strategy: 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 consolidating DSP elements.</p>																																																																																																																																																																																																																																																											
<p>(U) E. Schedule Profile</p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th colspan="4"><u>FY 1998</u></th> <th colspan="4"><u>FY 1999</u></th> <th colspan="4"><u>FY 2000</u></th> <th colspan="4"><u>FY 2001</u></th> </tr> <tr> <th></th> <th>1</th><th>2</th><th>3</th><th>4</th> <th>1</th><th>2</th><th>3</th><th>4</th> <th>1</th><th>2</th><th>3</th><th>4</th> <th>1</th><th>2</th><th>3</th><th>4</th> </tr> </thead> <tbody> <tr> <td>(U) ALERT Version 12 Operational</td> <td></td><td></td><td></td><td>*</td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> </tr> <tr> <td>(U) Theater Situational Analyst (TSA) System User's Manual & Training</td> <td></td><td></td><td></td><td>*</td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> </tr> <tr> <td>(U) TSA Transition</td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td>*</td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> </tr> <tr> <td>(U) ALERT Version 14 Operational</td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td>X</td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> </tr> <tr> <td>(U) Shield Hardware Upgrade</td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td>X</td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> </tr> <tr> <td>(U) ALERT Deactivation Initiated with SBIRS Inc 1 IOC</td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td>X</td> <td></td><td></td><td></td><td></td> </tr> <tr> <td>(U) SBIRS Mission Control Station Operational (Increment I)</td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td>X</td> <td></td><td></td><td></td><td></td> </tr> <tr> <td>(U) Shield/SBIRS IOC Begins</td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td>X</td> <td></td><td></td><td></td><td></td> </tr> <tr> <td>(U) Shield Support of SBIRS Low Flight Demonstration System (FDS)</td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td>X</td> </tr> <tr> <td>(U) Engineering Flight Experiment Support</td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td>X</td> </tr> <tr> <td>(U) Shield Baselined with SBIRS</td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td>X</td> </tr> <tr> <td>(U) ALERT Deactivation Completed</td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td>X</td> </tr> </tbody> </table>															<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>					1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	(U) ALERT Version 12 Operational				*													(U) Theater Situational Analyst (TSA) System User's Manual & Training				*													(U) TSA Transition								*									(U) ALERT Version 14 Operational								X									(U) Shield Hardware Upgrade								X									(U) ALERT Deactivation Initiated with SBIRS Inc 1 IOC												X					(U) SBIRS Mission Control Station Operational (Increment I)												X					(U) Shield/SBIRS IOC Begins												X					(U) Shield Support of SBIRS Low Flight Demonstration System (FDS)																X	(U) Engineering Flight Experiment Support																X	(U) Shield Baselined with SBIRS																X	(U) ALERT Deactivation Completed																X
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Project 3615				Page 5 of 13 Pages				Exhibit R-2A (PE 0305911F)																																																																																																																																																																																																																																																			

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305911F Defense Support Program (Space)					PROJECT 3615	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U) Contractor Engineering Support					820	850	0	0			
(U) Software Development					1,836	1,296	834	1,718			
(U) Program Management Support					1,727	1,203	974	906			
(U) Training Development					242	500	0	0			
(U) Developmental Test and Evaluation					2,000	1,946	638	360			
(U) Technical Data					220	0	0	0			
(U) FFRDC					2,194	2,200	1,000	1,000			
(U) Other Mission Support					239						
(U) Identified as a source for SBIR						279					
(U) Total					9,278	8,274	3,446	3,984			
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR							279				
<u>Product Development Organizations</u>											
Aerojet	CPAF	Aug 92	7,898	7,898	7,898	0	0	0	0	0	7,898
SPARTA	CPAF	Aug 94	487	487	487	0	0	0	0	0	487
Lincoln Lab	PO	Mar 95	288	288	288	0	0	0	0	0	288
Aerojet (FO)	CPAF	Oct 95	34,268	33,860	13,395	6,025	7,059	5,604	5,880	0	37,963
Nichols Research Corporation			2,508	2,508	708	820	850			0	2,378

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 1999			
BUDGET ACTIVITY				PE NUMBER AND TITLE				PROJECT			
7 - Operational System Development				0305911F Defense Support Program (Space)				3615			
<u>Support and Management Organizations</u>											
Program Office											
Support			N/A	N/A	63	4	0	0	0	67	
FFRDC			N/A	N/A	5,353	2,194	2,200	1,000	1,000	11,747	
Dept Air Force			N/A	N/A	6,754	235	0	0	0	6,989	
<u>Test and Evaluation Organizations</u>											
Not Applicable											
Government Furnished Property:											
	Contract				Total						
Item	Method/Type	Award or	Delivery		Prior to	Budget	Budget	Budget	Budget	Budget to	Total
<u>Description</u>	<u>Vehicle</u>	<u>Obligation</u>	<u>Date</u>		<u>FY 1998</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
Test Equipment			Aug 94		427	0	0	0	0	0	427
Identified as a source for Small Business Innovative Research (SBIR)							279				279
Subtotal Product Development					22,776	6,845	5,795	2,446	2,984	0	40,846
Subtotal Support and Management					12,170	2,433	2,200	1,000	1,000	0	18,803
Subtotal Government Furnished Equipment					427	0	0	0	0	0	427
Total Project					35,373	9,278	8,274	3,446	3,984	0	60,355

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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305911F Defense Support Program (Space)	PROJECT 3624
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COST (In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
3624 Defense Support Program	8,346	3,537	4,013	3,461	4,372	4,657	0	0	0	1,877,855

(U) A. Mission Description

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, Advanced Concept Technology Demonstrations (ACTD), and DSP-to-SBIRS transition activities.

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

- (U) \$ 1,961 Software change to accommodate Year 2000 roll-over.
- (U) \$ 2,011 Integrated Surveillance Systems Concept
- (U) \$ 1,326 Space-Based Space Surveillance Operations ACTD
- (U) \$ 1,860 Long-Range Planning
- (U) \$ 1,188 Program Management Support
- (U) \$ 8,346 Total

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

- (U) \$ 300 Ground based calibration technology
- (U) \$ 100 Year 2000 rollover
- (U) \$ 2,114 SBIRS Transition Support
- (U) \$ 672 Program Management Support
- (U) \$ 232 Long Range Planning
- (U) \$ 119 Identified as a source for Small Business Innovative Research (SBIR)
- (U) \$ 3,537 Total

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

- (U) \$ 204 Long Range Planning
- (U) \$ 651 Program Management Support
- (U) \$ 3,158 SBIRS Transition Support

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE February 1999																																	
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305911F Defense Support Program (Space)	PROJECT 3624																																	
<p>– (U) \$ 4,013 Total</p> <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <p>– (U) \$ 176 Long Range Planning</p> <p>– (U) \$ 389 Program Management Support</p> <p>– (U) \$ 2,896 SBIRS Transition Support</p> <p>– (U) \$ 3,461 Total</p> <p>(U) B. <u>Project Change Summary - Description of Significant Changes:</u></p> <p>(U) SBIRS High program (excluding Increment I activities) was restructured and first GEO satellite launch delayed from FY02 to FY04.</p> <p>(U) BPAC transfer from DSP to Shield for increased warfighter operational support and exercise requirements. (FY00-FY03)</p> <p>(U) C. <u>Other Program Funding Summary (\$ in Thousands)</u></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;"></th> <th style="text-align: right;"><u>FY 1998</u></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>To Complete</u></th> <th style="text-align: right;"><u>Total Cost</u></th> </tr> </thead> <tbody> <tr> <td>U) Missile Procurement (PE 305911F, BA-05, P-28)</td> <td style="text-align: right;">85,805</td> <td style="text-align: right;">88,650</td> <td style="text-align: right;">111,637</td> <td style="text-align: right;">109,462</td> <td style="text-align: right;">117,070</td> <td style="text-align: right;">103,859</td> <td style="text-align: right;">30,783</td> <td style="text-align: right;">36,135</td> <td style="text-align: right;">203,300</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;">181</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> </tbody> </table> <p><u>Related RDT&E:</u></p> <p>(U) PE 603441F - SBIRS Dem/Val</p> <p>(U) PE 604442F - SBIRS Low EMD</p> <p>(U) PE 604441F - SBIRS High EMD</p>				<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To Complete</u>	<u>Total Cost</u>	U) Missile Procurement (PE 305911F, BA-05, P-28)	85,805	88,650	111,637	109,462	117,070	103,859	30,783	36,135	203,300	7,181,833	(U) Other Procurement (PE 305911F, BA-65, P-N/A)	181	202	14	6	0	0	0	0	0	1,201,700
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To Complete</u>	<u>Total Cost</u>																									
U) Missile Procurement (PE 305911F, BA-05, P-28)	85,805	88,650	111,637	109,462	117,070	103,859	30,783	36,135	203,300	7,181,833																									
(U) Other Procurement (PE 305911F, BA-65, P-N/A)	181	202	14	6	0	0	0	0	0	1,201,700																									
Project 3624	Page 9 of 13 Pages	Exhibit R-2A (PE 0305911F)																																	

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305911F Defense Support Program (Space)	PROJECT 3624
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(U) D. Acquisition Strategy:
 DSP has finished the production of satellites 19 through 23. Current contract efforts include support for flight 19 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.

(U) E. Schedule Profile

	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
Software Releases	*	*														
Year 2000 DSP renovation	*	*	*	*												
DSP Satellite 23 delivery					X											
Satellite launches					X			X				X				
Ground based calibration technology							X									

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305911F Defense Support Program (Space)	PROJECT 3624
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(U) A. Project Cost Breakdown (\$ in Thousands)

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) Year 2000 roll-over activities	1,961	100	0	0
(U) Integrated Surveillance Systems Concept	2,011	0	0	0
(U) Long Range Planning	1,860	232	204	176
(U) Space-Based Space Surveillance Operations ACTD	1,326	0	0	0
(U) Other Government Cost	1,188	672	651	389
(U) SBIRS Transition Support	0	2,114	3,158	2,896
(U) Ground Based Calibration Technology	0	300		
(U) Identified as a source for SBIR		119		
(U) Total	8,346	3,537	4,013	3,461

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305911F Defense Support Program (Space)					PROJECT 3624		
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)												
Performing Organizations:												
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program	
Identified as a source for SBIR							119					119
<u>Product Development Organizations</u>												
Aerojet*	CPAF	Oct 93	25,719	25,719	25,719	0	0	0	0	0	25,719	
Aerojet	CPAF	Sep 93	9,025	9,025	9,025	0	0	0	0	0	9,025	
Aerojet	CPFF		25,743	25,743	25,743	0	0	0	0	0	25,743	
Aerojet	CPAF	Oct 95	2,578	2,578	2,578						2,578	
Loral	FPI/AF/CPF		28,137	37,732	37,732	0	0	0	0	0	37,732	
DOE	P.O.		10,724	10,724	10,724	0	0	0	0	0	10,724	
Loral	CPAF		22,975	22,975	22,975	0	0	0	0	0	22,975	
* EAC is also funded by other appropriations.												
<u>Support and Management Organizations</u>												
Various	MIPRs				6,301	0	0	0	0	0	6,301	
Aerojet	CPFF		1,305	1,305	1,305	0	0	0	0	0	1,305	
Aerojet/	FFP	May 96	2,518	2,518	2,518	0	0	0	0	0	2,518	
Consolidated												
FFRDC	MORD		N/A	N/A	42,109	0	0	0	0	0	42,109	
Other Gov't Cost			N/A	N/A	25,386	8,346	3,418	4,013	3,461	9,029	53,653	
TRW	CPFF		9,872	9,872	9,872	0	0	0	0	0	9,872	
TRW Consolidated	CPAF	May 96	292	292	292	0	0	0	0	0	292	
PRC	FPIF	Apr 94	7,579	7,579	7,579	0	0	0	0	0	7,579	
SPARTA	CPAF	Aug 94	150	150	150	0	0	0	0	0	150	
	MORDs		15,043	15,043	15,043	0	0	0	0	0	15,043	
Project 3624			Page 12 of 13 Pages						Exhibit R-3 (PE 0305911F)			

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305911F Defense Support Program (Space)					PROJECT 3624	
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR							119				119
Program Office Spprt	Various		N/A	N/A	68,101	0	0	0	0	0	68,101
<u>Test and Evaluation Organizations</u>											
Not Applicable.											
Government Furnished Property:											
Not Applicable											
					Total						
					<u>Prior to FY 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
Identified as a source for Small Business Innovative Research (SBIR)							119				119
Subtotal Product Development					134,496	0	0	0	0	0	134,496
Subtotal Support and Management					178,656	8,346	3,418	4,013	3,461	9,029	206,923
Subtotal Test and Evaluation					0	0	0	0	0	0	0
Adjustments: (Previous DSP Contracts)					1,536,317	0	0	0	0	0	1,536,317
Project Total					1,849,469	8,346	3,537	4,013	3,461	9,029	1,877,855

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305913F Nudet Detection System	PROJECT 2808
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
2808 Nuc Detonation Det Sys (Sensors)	12,878	13,050	14,430	17,241	14,369	16,515	21,702	21,085	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

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 AFSPC (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).

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 5 - 13. DOD also funds the development of the EMP sensor for the Block IIR. Additional funding is provided by a separate, classified PE that funds development of the version of the EMP sensor which will be integrated on the Block IIF beginning with Space Vehicle 7. The EMP sensor observes endoatmospheric events and provides highly accurate location and characterization. It supports Comprehensive Test Ban Treaty (CTBT) monitoring.

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

- (U) \$ 8,923 Continued ICADS and GNT development
- (U) \$ 1,094 Continued NDS sensor on-orbit qualification
- (U) \$ 2,533 NDS/NAP (NDS Analysis Package) program integration
- (U) \$ 255 Continued mission support requirements
- (U) \$ 73 Space Long Range Planning
- (U) \$ 12,878 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational System Development	0305913F Nudet Detection System	2808
<p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 10,289 Continue ICADS and GNT development - (U) \$ 1,054 Continue NDS sensor on-orbit qualification - (U) \$ 816 NDS/NAP (NDS Analysis Package) program integration - (U) \$ 615 Continue mission support requirements - (U) \$ 100 Space Long Range Planning - (U) \$ 176 Identified as a source for SBIR - (U) \$ 13,050 Total <p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 12,685 Continue ICADS and GNT development - (U) \$ 1,023 Continue NDS sensor on-orbit qualification - (U) \$ 722 Continue mission support requirements - (U) \$ 14,430 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 15,479 Continue ICADS and GNT development - (U) \$ 1,034 Continue NDS sensor on-orbit qualification - (U) \$ 728 Continue mission support requirements - (U) \$ 17,241 Total <p>(U) B. <u>Budget Activity Justification:</u></p> <p>This program is in Budget Activity 7 - Operational System Development because it is a post-Milestone III program.</p>		
Project 2808	Page 2 of 6 Pages	Exhibit R-2 (PE 0305913F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE				
7 - Operational System Development							February 1999				
BUDGET ACTIVITY				PE NUMBER AND TITLE			PROJECT				
7 - Operational System Development				0305913F Nudet Detection System			2808				
(U) C. Program Change Summary (\$ in Thousands)											
		<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total</u>					
						<u>Cost</u>					
(U) Previous President's Budget (FY 1999 PB)		13,360	13,314	14,352	13,342	Continuing					
(U) Appropriated Value		14,145	13,314								
(U) Adjustments to Appropriated Value											
a. Cong Gen Reductions		-469	-264								
b. SBIR		-317									
c. Omnibus or Other Above Threshold Reprogram		-481									
d. Below Threshold Reprogramming											
e. Rescission											
(U) Adjustments to Budget Years Since FY 1999 PB				78	3,899						
(U) Current Budget Submit/FY 2000 PB		12,878	13,050	14,430	17,241	Continuing					
(U) Significant Program Changes: \$176 identified as a source for SBIR in FY 1999. Increased funding in FY2000/FY 2001 funds ICADS and GNT efforts.											
(U) D. Other Program Funding Summary (\$ in Thousands)											
		<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To</u>	<u>Total</u>
										<u>Compl</u>	<u>Cost</u>
(U) Operations & Maintenance, (PE 0305913F, BA 1, Operating Forces		5,067	5,348	7,586	8,108	9,343	8,702	8,437	9,417	Cont	Cont
(U) Missile Procurement, (PE 0305913F, BA 45 - Space and Other Support, P-22)		954	2,811	1,575	1,491	1,522	1,556	1,590	1,625	Cont	Cont
(U) Other Procurement, (PE 0305913F, BA 63 - Electronics and Telecom Equipment, P-64)		7,792	1,275	3,490	2,700	8,542	8,065	12,844	12,084	Cont	Cont
Related RDT&E:											
(U) PE 305165F, NAVSTAR GPS (Space/Ground Segment)											
(U) PE 604480F, GPS Block IIF											
(U) PE 305911F, Defense Support Program											
Project 2808			Page 3 of 6 Pages				Exhibit R-2 (PE 0305913F)				

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305913F Nudet Detection System	PROJECT 2808
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(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 contract vehicle.

(U) F. Schedule Profile

	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) ICADS/GNT Milestones & Program Events																
(U) IIF Use Case Model Overview						X										
(U) IIF System Specification Review			*		*			X								
(U) IIF System specification Configuration Control Board (CCB)						X										
(U) IIF Phase Review				*	*		X		X		X		X		X	
(U) IIR Acceptance Test (AT)			*													
(U) IIR Operational Acceptance			*													
(U) IIR Y2K Testing			*		*											
(U) IIR O&M (S/W Modifications)			*			X	X	X	X	X	X	X	X	X	X	X
(U) IIR Move to SBIRS Facility				*			X		X							

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305913F Nudet Detection System					PROJECT 2808	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U) ICADS and GNT Development					8,923	10,289	12,685	15,479			
(U) NDS Sensor On-orbit Qualification					1,094	1,054	1,023	1,034			
(U) NDS/NAP Program Integration					2,533	816	0	0			
(U) Mission Support					255	615	722	728			
(U) Space Long Range Planning					73	100					
(U) Identified as a source for SBIR						176					
(U) Total					12,878	13,050	14,430	17,241			
(U) B. <u>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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
Identified as a source for SBIR							176				176
<u>Product Development Organizations</u>											
ICADS:											
Sandia National Labs	MIPR*	Jan 96	Cont	Cont	26,229	6,094	9,166	11,139	13,900	Cont	Cont
GNT:											
Intermetrics	CPFF	Dec 93	1,262	1,262	1,262	0	0	0	0	0	1,262
SNL	MIPR*	Jan 96	Cont	Cont	10,244	1,629	0	0	0	0	11,873
SAIC (Intg/Grd Supt)	Time/Matls	Dec 95	Cont	Cont	3,094	1,200	1,123	1,546	1,579	Cont	Cont
Project 2808					Page 5 of 6 Pages			Exhibit R-3 (PE 0305913F)			

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305913F Nudet Detection System					PROJECT 2808	
Combined GOSC/NAP (GPS Operational Support Contract/NDS Analysis Payload)											
Lockheed Martin	FFP	Oct 97	3,633	3,633	3,633	2,533	816	0	0	0	6,982
SNL	MIPR*	Oct 97	Cont	Cont	200	0	0	0	0	0	200
SAIC	Time/Matls	Dec 97	432	432	432	0	0	0	0	0	432
* Military Interdepartmental Purchase Request											
W-Sensor Support											
SRI (Stanford Rsch Inst.)	CPFF	Aug 94	415	415	415	0	0	0	0	0	415
SNL	MIPR	Oct 94	399	399	399	0	0	0	0	0	399
Los Alamos Natl Lab	MIPR	Jan 96	Cont	Cont	2,983	1,094	1,054	1,023	1,034	Cont	Cont
Mission Support/Management Organizations											
Mission Support	Multiple	N/A	Cont	Cont	3,319	328	715	722	728	Cont	Cont
Prog Contractual Spt.	Multiple	1,534	1,534	1,534	1,534	0	0	0	0	0	1,534
Test and Evaluation Organizations											
Hill AFB Utah			9	9	9	0	0	0	0	0	9
Identified as a source for SBIR											
Subtotal Product Development					48,891	12,550	12,159	13,708	16,513	Cont	Cont
Subtotal Support and Management					4,853	328	715	722	728	Cont	Cont
Subtotal Test and Evaluation					9	0	0	0	0	0	9
Total Project					53,753	12,878	13,050	14,430	17,241	Cont	Cont

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 EXHIBIT)									DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305917F Space Architect					PROJECT 4746	
COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4746 Space Architect	13,408	13,560	9,898	10,470	10,785	11,182	11,912	12,764	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

*FY97 and earlier funding contained in PE603855F. Funding transferred from PE603855 to this PE in FY1998 to consolidate R&D and O&M appropriations into one Program Element.

(U) **A. Mission Description** - The Under Secretary of Defense for Acquisition and Technology (USD(A&T)) 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 (MOU) was signed by the Secretary of Defense (SECDEF) and Director of Central Intelligence (DCI) 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.

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

- (U) \$ 3,299 Space Weather (SWx) Architecture Study
- (U) \$ 991 Launch Study
- (U) \$ 220 MILSATCOM Study
- (U) \$ 131 DoD Information Management Environment (DIME)
- (U) \$ 91 Satellite Operations ADT (SATOPS)
- (U) \$ 473 Space Control ADT
- (U) \$ 407 SBIRS Study
- (U) \$ 351 DUSD Space Study
- (U) \$ 278 Pos/Nav Support
- (U) \$ 5,701 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)
- (U) \$ 1,466 Other Architecture Studies and Documentation and Support
- (U) \$13,408 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational System Development	0305917F Space Architect	4746
(U) <u>FY 1999 (\$ in Thousands):</u>		
<ul style="list-style-type: none"> - (U) \$ 1,405 Space Weather (SWx) Architecture Study - (U) \$ 558 Space Control ADT - (U) \$ 40 MILSATCOM Study - (U) \$ 180 SATOPS - (U) \$ 4,239 Mission Information Management (MIM) ADT - (U) \$ 259 Pos/Nav Support - (U) \$ 3,981 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) - (U) \$ 2,470 Other Architecture Studies, Documentation and Support - (U) \$ 428 Identified as a source for SBIR - (U) \$ 13,560 Total 		
(U) <u>FY 2000 (\$ in Thousands):</u>		
<ul style="list-style-type: none"> - (U) \$ 1,811 Mission Information Management (MIM) ADT - (U) \$ 220 Space Weather (SWx) Architecture Study - (U) \$ 3,215 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) - (U) \$ 575 Space Control - (U) \$ 2,579 Architectural ADTs/Studies Directed by Stakeholders - (U) \$ 1,498 Documentation and Support - (U) \$ 9,898 Total 		
(U) <u>FY 2001 (\$ in Thousands):</u>		
<ul style="list-style-type: none"> - (U) \$ 3,168 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) - (U) \$ 590 Space Control - (U) \$ 897 Mission Information Management (MIM) ADT - (U) \$ 4,325 Architectural ADTs/Studies Directed by Stakeholders - (U) \$ 1,490 Documentation and Support - (U) \$ 10,470 Total 		
Project 4746	Page 2 of 6 Pages	Exhibit R-2 (PE 0305917F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305917F Space Architect	PROJECT 4746
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(U) B. Budget Activity Justification:

This program is in Budget Activity 7 because the architecture studies affect the design and acquisition of systems to be developed.

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

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U) Previous President's Budget (FY 1999 PB)	13,480	13,714	14,511	14,428	Cont
(U) Appropriated Value	14,590	13,714			
(U) Adjustments to Appropriated Value					
a. Congressional General Reductions/Recissions	-743	-154			
b. SBIR	-347				
c. Omnibus or Other Above Threshold Reprogram					
d. Below Threshold Reprogramming	-92				
e. Recissions					
(U) Adjustments to Budget Years Since FY 1999 PB			-4,613	-3,958	
(U) Current Budget Submit/FY 2000 PB	13,408	13,560	9,898	10,470	Cont

(U) Significant Program Changes:

FY99: \$428K identified as a source for SBIR.

FY00/01: The DoD Space Architect was changed to National Security Space Architect (NSSA) to better include NRO requirements and funding. Adjustments have been made to the Budget years for NRO funding participation in accordance with Air Force/NRO funding sharing agreement in which the NRO agreed to fund a portion of the NSSA mission as it pertains to Intelligence Community architectural studies.

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

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To Compl</u>	<u>Total Cost</u>
Intelligence Community Contribution			4,353	4,603	4,746	4,929	5,252	5,628	Cont	Cont

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)											DATE February 1999																																																																																																																																																																																																																																																																																																																																				
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305917F Space Architect						PROJECT 4746																																																																																																																																																																																																																																																																																																																																				
<p>(U) E. Acquisition Strategy: 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.</p> <ul style="list-style-type: none"> - As primary support, the Space Architect plans to use two existing Space & Missile Center (SMC) contracts for technical support: <ul style="list-style-type: none"> -- 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. <p>(U) F. Schedule Profile</p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th colspan="4"><u>FY 1998</u></th> <th colspan="4"><u>FY 1999</u></th> <th colspan="4"><u>FY 2000</u></th> <th colspan="4"><u>FY 2001</u></th> </tr> <tr> <th></th> <th>1</th><th>2</th><th>3</th><th>4</th> <th>1</th><th>2</th><th>3</th><th>4</th> <th>1</th><th>2</th><th>3</th><th>4</th> <th>1</th><th>2</th><th>3</th><th>4</th> </tr> </thead> <tbody> <tr> <td>ES/SWx Phase I Kick_off</td> <td>*</td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> </tr> <tr> <td>SBIRS Study Direction</td> <td>*</td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> </tr> <tr> <td>Space Control Executive Summary Complete</td> <td></td><td>*</td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> </tr> <tr> <td>SWx Phase II Kick-off</td> <td></td><td></td><td>*</td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> </tr> <tr> <td>SBIRS Congressional Task Report Complete</td> <td></td><td></td><td>*</td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> </tr> <tr> <td>Launch Study Final Report Close-out</td> <td></td><td></td><td></td><td>*</td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> </tr> <tr> <td>Space Control Transition/Tracking Start</td> <td></td><td></td><td></td><td>*</td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> </tr> <tr> <td>SATOPS Transition/Implementation Plan Start</td> <td></td><td></td><td></td><td></td> <td>*</td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> </tr> <tr> <td>MIM Initiate ADT</td> <td></td><td></td><td></td><td></td> <td>*</td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> </tr> <tr> <td>Pos/Nav Frequency Allocation Determination</td> <td></td><td></td><td></td><td></td> <td>*</td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> </tr> <tr> <td>SWx Phase II Completion</td> <td></td><td></td><td></td><td></td> <td></td><td>X</td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> </tr> <tr> <td>SATOPS Transition/Implementation Plan Complete</td> <td></td><td></td><td></td><td></td> <td></td><td></td><td>X</td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> </tr> <tr> <td>SWx Final Report Published</td> <td></td><td></td><td></td><td></td> <td></td><td></td><td>X</td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> </tr> <tr> <td>MIM Analyze Development Optins/Concepts</td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td>X</td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> </tr> <tr> <td>MIM Design/Analyze/Cost</td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td>X</td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> </tr> <tr> <td>MIM Develop Conclusions and Recommendations</td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td>X</td><td></td><td></td> <td></td><td></td><td></td><td></td> </tr> <tr> <td>MIM Advocate/Implementation Architecture</td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> <td>X</td><td></td><td></td><td></td> </tr> </tbody> </table> <p>* = completed event X = planned event</p>														<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>					1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	ES/SWx Phase I Kick_off	*																SBIRS Study Direction	*																Space Control Executive Summary Complete		*															SWx Phase II Kick-off			*														SBIRS Congressional Task Report Complete			*														Launch Study Final Report Close-out				*													Space Control Transition/Tracking Start				*													SATOPS Transition/Implementation Plan Start					*												MIM Initiate ADT					*												Pos/Nav Frequency Allocation Determination					*												SWx Phase II Completion						X											SATOPS Transition/Implementation Plan Complete							X										SWx Final Report Published							X										MIM Analyze Development Optins/Concepts								X									MIM Design/Analyze/Cost									X								MIM Develop Conclusions and Recommendations										X							MIM Advocate/Implementation Architecture													X			
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Launch Study Final Report Close-out				*																																																																																																																																																																																																																																																																																																																																											
Space Control Transition/Tracking Start				*																																																																																																																																																																																																																																																																																																																																											
SATOPS Transition/Implementation Plan Start					*																																																																																																																																																																																																																																																																																																																																										
MIM Initiate ADT					*																																																																																																																																																																																																																																																																																																																																										
Pos/Nav Frequency Allocation Determination					*																																																																																																																																																																																																																																																																																																																																										
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SATOPS Transition/Implementation Plan Complete							X																																																																																																																																																																																																																																																																																																																																								
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Project 4746				Page 4 of 6 Pages				Exhibit R-2 (PE 0305917F)																																																																																																																																																																																																																																																																																																																																							

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)						DATE February 1999					
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305917F Space Architect			PROJECT 4746				
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
				<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>				
MILSATCOM Study				220	40	0	0				
SWx				3,299	1,405	220	0				
Launch Study				991	0	0	0				
SBIRS				407	0	0	0				
DIME				131	0	0	0				
Position-Navigation				278	259	0	0				
Satellite Operations				91	180	0	0				
Space Control				473	558	575	590				
Mission Information Management				0	4,239	1,811	897				
DUSD Space Study				351	0	0	0				
Other Studies (Congressional, DoD, IC Studies) as Directed				39	340	2,579	4,325				
Study/ADT Common Support				4,529	6,111	4,713	4,658				
FFRDC/Not-for-Profit Support				2,599							
Identified as a source for SBIR					428						
Total				13,408	13,560	9,898	10,470				
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR							428				
<u>Product Development Organizations</u>											
None					0	0	0	0	0	0	0

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305917F Space Architect					PROJECT 4746	
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
<u>Support and Management Organizations</u>											
Aerospace	C/CPAF	1993	N/A	N/A	0	1,038	1,200	891	942	Cont	Cont
ANSER	C/CPFF	1993	N/A	N/A	0	691				Cont	Cont
MITRE	C/CPAF	1993	N/A	N/A	0	870	900	693	733	Cont	Cont
Misc Contracts	Various	Various	N/A	N/A	0	2,514	1,900	1,485	1,570	Cont	Cont
Misc In-House	Various	Various	N/A	N/A	0	790	840	594	628	Cont	Cont
NRC	C/CPAF	1997	N/A	N/A	0	3,555	3,330	2,474	2,618	Cont	Cont
SAIC	C/CPAF	1997	N/A	N/A	0	3,950	4,962	3,761	3,979	Cont	Cont
<u>Test and Evaluation Organizations</u>											
None					0	0	0	0	0	0	0
Government Furnished Property: None											
Identified as a source for SBIR							428				
Subtotal Product Development					0	0	0	0	0	0	0
Subtotal Support and Management					0	13,408	13,132	9,898	10,470	Cont	Cont
Subtotal Test and Evaluation					0	0	0	0	0	0	0
Total Project					0	13,408	13,560	9,898	10,470	Cont	Cont

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305953F Evolved Expendable Launch Veh (Space)				PROJECT 4594		
COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4594 EELV Prod & Opns	0	3,305	0	0	0	0	0	0	0	3,305
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description:
 The Evolved Expendable Launch Vehicle (EELV) program is a space launch system development program. The EELV program mission is to partner with industry to develop a national launch capability that satisfies the Government's National Mission Model (NMM) requirements and reduces the cost of space launch by at least 25%. The EELV system includes the launch vehicles, infrastructure, support systems, and interfaces. EELV provides two families of launch vehicles that will launch the Government portion of the NMM currently provided by Titan II, Delta II, Atlas II, and Titan IV launch vehicles. EELV evolved from current expendable launch systems or components and will support military, intelligence, and civil mission requirements.

(U) FY 1998 (\$ in Thousands):
 (U) \$0 EELV was funded in PE 0603853F and PE 0604853F in FY 1998.

(U) FY 1999 (\$ in Thousands):
 (U) \$3,193 Funds are no longer required due to a change in the EELV acquisition strategy and have been reprogrammed to finance higher priority Air Force requirements. No additional funding in the outyears is requested.
 (U) \$112 Identified as a source for SBIR
 (U) \$3,305 Total

(U) FY 2000 (\$ in Thousands):
 (U) \$0

(U) FY 2001 (\$ in Thousands):
 (U) \$0

(U) B. Budget Activity Justification:
 This program element is in Budget Activity 7, Operational System Development, because it supports operational deployment of a system in production.

Project 4594 Page 1 of 4 Pages Exhibit R-2 (PE 0305953F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE February 1999			
BUDGET ACTIVITY	PE NUMBER AND TITLE						PROJECT			
7 - Operational System Development	0305953F Evolved Expendable Launch Veh (Space)						4594			
(U) C. <u>Program Change Summary (\$ in Thousands)</u>										
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total</u>					
(U) Previous President's Budget (FY 1999 PB)	0	3,316	3,397	3,477	Continuing					
(U) Appropriated Value	0	3,316								
(U) Adjustments to Appropriated Value										
a. Congressional General Reductions	-11									
b. Small Business Innovative Research										
c. Omnibus or other above threshold reprogramming										
d. Below Threshold Reprogramming										
(U) Adjustments to Budget Years Since FY99 PB			- 3,397	- 3,477	Continuing					
(U) Current Budget Submit/FY 2000 PB	0	3,305	0	0	3,305					
 (U) Significant Program Changes: This funding line was established in FY98PB for non-recurring integration/mission planning for the first medium and heavy lift test launches. Revised acquisition strategy resulted in deletion of test flight concepts for EELV. Consequently, funds are no longer required and have been reprogrammed to finance higher priority Air Force requirements. FY99: \$112 identified as a source for SBIR.										
(U) D. <u>Other Program Funding Summary (\$ in Thousands)</u>										
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To Comp</u>	<u>Total</u>
(U) Missile Procurement, AF (PE 0305953F) (BA-5,P-TBD)			70,812	463,766	390,711	494,244	423,327	588,124	Cont.	Cont.
(U) NRO (Non-AF budget)	4,200									
(U) DARPA (Non-AF budget) (PE 0603226E)									95,100*	9,845**
<u>Related RDT&E:</u>										
(U) EELV Demonstration and Validation (PE 0603853F)	63,904	0	0	0	0	0	0	0	0	176,634 ***
(U) EELV EMD (PE 0604853F)	23,252	259,143	324,803	307,502	239,540	14,502	0	0	0	1,168,742
* Total includes funding in FY96 and FY97.										
** Total includes funding in FY94.										
***Total includes funding in FY95, FY96, and FY97.										
Project 4594			Page 2 of 4 Pages			Exhibit R-2 (PE 0305953F)				

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305953F Evolved Expendable Launch Veh (Space)	PROJECT 4594
<p>(U) E. <u>Acquisition Strategy:</u> The EELV concept of a family of launch vehicles emphasizes commonality of hardware and infrastructure and economies of scale to enhance production, operations, and support efficiencies. Cost improvements will be achieved through commonality; leveraging the commercial market place; reduction of supporting infrastructure (launch pads, manufacturing facilities, workforce); and optimization of production and launch operations, processes, and rates. EELV is an ongoing competitive program that initially used a rolling downselect acquisition strategy. In August 1995 four initial contracts were awarded for the Low Cost Concept Validation (LCCV) phase. In December 1996 the Air Force downselected to two contractors – Lockheed Martin and Boeing (originally McDonnell Douglas) – for the Pre-Engineering and Manufacturing Development (Pre-EMD) phase. On 16 Oct 1998, two \$500M Other Transaction Agreements (OTAs) were awarded to The Boeing Company and Lockheed Martin Astronautics for the development effort and two Initial Launch Services (ILS) contracts were awarded to Boeing for \$1.38B (19 missions) and Lockheed Martin for \$649M (9 missions). The Development/ILS approach maintains competition throughout the life of the program, leverages the growing commercial launch market, caps the Government’s development costs, and allows partnership with industry, while still reducing the program’s overall cost to launch the NMM by at least 25% over existing systems. The EELV system will launch the government portion of the NMM through 2020. This funding line was established in FY98PB for non-recurring integration/mission planning for the first medium and heavy lift test launches. Revised acquisition strategy resulted in deletion of test flight concepts for EELV; consequently, FY00-FY03 funding is deleted.</p> <p>(U) F. <u>Schedule Profile -N/A</u></p>		
Project 4594	Page 3 of 4 Pages	Exhibit R-2 (PE 0305953F)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0308601F Modeling and Simulation Support
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	0	1,090	1,069	1,188	1,228	1,329	1,356	1,385	Continuing	Continuing
1011 Joint Model Transition (JMT) Program	0	357	371	390	396	406	414	423	Continuing	Continuing
4566 Executive Agent for Air/Space Natural Environment	0	733	698	798	832	923	942	962	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(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 funds the upgrades to selected R&D legacy 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. PE also contains O&M funding for the AF portion of Aggregate Level Simulation Protocol (ALSP); Data Standards; Advanced Connectivity; M&S Resource Repository (MSRR); model Verification, Validation, and Accreditation (VV&A); and High Level Architecture (HLA).

(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 upgrade of AF legacy models.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)					DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development			PE NUMBER AND TITLE 0308601F Modeling and Simulation Support		
(U) C. <u>Program Change Summary (\$ in Thousands)</u>					
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U) FY 1999 President's Budget	0	1,093	1,088	1,210	Continuing
(U) Appropriated Value		1,093			
(U) Adjustments to Appropriated Value					
a. Cong Reductions		-3			
b. SBIR					
c. Omnibus or Other Above Threshold Reprogram					
d. Below Threshold Reprogramming					
(U) Adjustments to Budget Years Since FY 1999 PB			-19	-22	
(U) Current Budget Submit/FY 2000 PB	0	1,090	1,069	1,188	Continuing
 (U) Significant Program Changes: Not Applicable.					

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0308601F Modeling and Simulation Support	PROJECT 1011
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
1011 Joint Model Transition (JMT) Program	0	357	371	390	396	406	414	423	Continuing	Continuing

(U) A. Mission Description

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 JMT Program supports the upgrade of R&D funded legacy models selected through a board process. The selection process allows the board to influence the direction of legacy model development and interation for the modeling and simulation community. Emphasis is placed on joint applicability and acceptance.

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

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

- (U) \$ 164 Migate selected legacy analysis models to next generation joint models.
- (U) \$ 128 Requirements/cost-benefit analysis for Next Generation Mission Model (NGMM).
- (U) \$ 25 Develop comprehensive DSM plans for selected acquisition programs.
- (U) \$ 40 Support planning, executing, reporting of selected AoA studies.
- (U) \$ 357 Total

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

- (U) \$ 143 Migate selected legacy analysis models to next generation joint models.
- (U) \$ 100 Requirements/cost-benefit analysis for Next Generation Mission Model (NGMM).
- (U) \$ 78 Develop comprehensive DSM plans for selected acquisition programs.
- (U) \$ 50 Support planning, executing, reporting of selected AoA studies.
- (U) \$ 371 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational System Development	0308601F Modeling and Simulation Support	1011
<p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none">- (U) \$ 118 Migate selected legacy analysis models to next generation joint models.- (U) \$ 100 Requirements/cost-benefit analysis for Next Generation Mission Model (NGMM).- (U) \$ 122 Develop comprehensive DSM plans for selected acquisition programs.- (U) \$ 50 Support planning, executing, reporting of selected AoA studies.- (U) \$ 390 Total <p>(U) B. <u>Project Change Summary - Description of Significant Changes:</u> Not Applicable.</p>		
Project 1011	Page 4 of 12 Pages	Exhibit R-2A (PE 0308601F)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0308601F Modeling and Simulation Support	PROJECT 1011
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(U) C. Other Program Funding Summary (\$ in Thousands)
N/A

(U) D. Acquisition Strategy:
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.

(U) E. Schedule Profile

	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) Fund Next Generation Mission Model project activities	X				X				X				X			
(U) Fund selected AoA studies for standard analysis toolkit	X				X				X				X			
(U) Transition of current legacy models				X				X				X				X

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0308601F Modeling and Simulation Support	PROJECT 1011
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(U) A. Project Cost Breakdown (\$ in Thousands)

Joint Model Transition (JMT) Program	<u>FY1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) Cost Categories				
(U) a. Contractor Support	0	292	292	311
(U) b. Program Management Support		25	30	30
(U) c. Travel		40	49	49
(U) Total	0	357	371	390

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

Performing Organizations:

Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to <u>FY 1998</u>	Budget <u>FY 1999</u>	Budget <u>FY 2000</u>	Budget <u>FY 2001</u>	Budget <u>FY 2002</u>	Budget to Complete	Total Program
<u>Product Development Organizations</u>											
Various	Various	Various			0	357	371	390	396	continuing	continuing

Support and Management Organizations

None

Test and Evaluation Organizations

None

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0308601F Modeling and Simulation Support	PROJECT 1011
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(U) B. Budget Acquisition History and Planning Information Continued (\$ in Thousands)

Government Furnished Property: N/A

<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 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget FY 2002</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Property</u>										
None										
<u>Support and Management Property</u>										
None										
<u>Test and Evaluation Property</u>										
None										
Subtotal Product Development				0	357	371	390	396	continuing	continuing
Subtotal Support and Management										
Subtotal Test and Evaluation										
Total Project				0	357	371	390	396	continuing	continuing

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0308601F Modeling and Simulation Support	PROJECT 4566
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4566 Executive Agent for Air/Space Natural Environment	0	733	698	798	832	923	942	962	Continuing	Continuing

(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.

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

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

- (U) \$ 283 Space weather model development
- (U) \$ 55 Production center model implementation
- (U) \$ 395 Air/Land battlefield integration
- (U) \$ 733 Total

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

- (U) \$ 118 Space weather development, prototyping, and integration
- (U) \$ 430 Production center implementation
- (U) \$ 150 Air/Land battlefield integration
- (U) \$ 698 Total

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

- (U) \$ 135 Space weather prototyping and integration
- (U) \$ 513 Production center implementation
- (U) \$ 150 Air/Land battlefield integration
- (U) \$ 798 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0308601F Modeling and Simulation Support	PROJECT 4566
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(U) **B. Project Change Summary - Description of Significant Changes:** Not Applicable.

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

(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 to support Joint and Service specific distributed simulation models. The majority of efforts are executed and managed through the DoD laboratory system.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0308601F Modeling and Simulation Support	PROJECT 4566
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(U) E. Schedule Profile

	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) Architecture – ESG IOC							X									
(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 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0308601F Modeling and Simulation Support					PROJECT 4566	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U) Cost Categories											
(U) a. Software Development					0	369	323	265			
(U) b. Lab Overhead/Management						77	70	80			
(U) c. Prototyping						262	280	428			
(U) d. Travel						25	25	25			
(U) Total					0	733	698	798			
(U) B. <u>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 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget FY 2002</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Organizations</u>											
Various	Various	Various			0	733	698	798	832	continuing	continuing
<u>Support and Management Organizations</u>											
None											
<u>Test and Evaluation Organizations</u>											
None											
Project 4566					Page 11 of 12 Pages				Exhibit R-3 (PE 0308601F)		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0308601F Modeling and Simulation Support	PROJECT 4566
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(U) B. Budget Acquisition History and Planning Information Continued (\$ in Thousands)

Government Furnished Property: N/A

<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 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Property</u>										
None										
<u>Support and Management Property</u>										
None										
<u>Test and Evaluation Property</u>										
None										
Subtotal Product Development				0	733	698	798	832	continuing	continuing
Subtotal Support and Management										
Subtotal Test and Evaluation										
Total Project				0	733	698	798	832	continuing	continuing

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0308699F Shared Early Warning System	PROJECT 4838
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4838 Shared Early Warning System	0	0	11,532	4,220	4,410	3,424	2,932	2,928	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

Shared Early Warning Systems (SEWS) developed out of Presidential foreign policy initiatives beginning in 1996. Arrangements are negotiated with individual countries on a bi-lateral 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. OSD C3I undertook an initiative to normalize the program into a system program office, with the Air Force as lead service. In December 1998, the Air Force established SEWS as a formal DoD program. Shared Early Warning Systems work will comprise: Program Management by the Systems Program Office (SPO) to include the use of Federally Funded Research & Development Corporation and Systems Engineering and Technical Assistance contractors to develop SEWS initiatives; coordinate and maintain a systems architecture; software maintenance, to include any necessary Y2K problem resolution; development and maintenance of a multi-lingual, web-based infrastructure to address Pre-launch Notification Regime issues; sustainment of the deployed hardware and software; and site preparation/installation for new systems, as required.

(U) B. Budget Activity Justification

This program is in budget activity 7 - Operational System Development, Research Category 6.6 because it supports work on currently operating systems.

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

- (U) \$1,832 Design, Test and Install Joint Warning Center (JWC) in Moscow
- (U) \$9,700 Configure common architecture and begin installation at each site
- (U) \$11,532 Total

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

- (U) \$4,220 Continue to configure common architecture and begin installation at each site
- (U) \$4,220 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0308699F Shared Early Warning System	PROJECT 4838
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(U) **C. Program Change Summary (\$ in Thousands)**

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U) Previous President's Budget	0	0	0	0	0
(U) Appropriated Value	0	0	0	0	0
(U) Adjustments to Appropriated Value					
a. Cong Reductions	0	0	0	0	0
b. SBIR	0	0	0	0	0
c. Omnibus or Other Above Threshold Reprogram	0	0	0	0	0
d. Below Threshold Reprogramming	0	0	0	0	0
(U) Adjustments to Budget Years Since FY 1999 PB	0	0	11,532	4,220	Continuing
(U) Current Budget Submit/President's Budget	0	0	11,532	4,220	Continuing

(U) Change Summary Explanation:
OSD directed establishment of this PE to normalize management of ongoing program.

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

None.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0308699F Shared Early Warning System	PROJECT 4838
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(U) E. Acquisition Strategy
 The program will continue to be 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. 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 SEW by taking advantage of the commonality between the SEW 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 contract vehicle that drives Total System Performance Responsibility to industry.

(U) F. Schedule Profile

	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>				
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
(U) Lead Service Designation					X												
(U) ISC2 Contract Award										X							
(U) System Architecture Development																	
(U) Prelaunch Notification Regime system																	
(U) JWC Site Operational													X				
(U) Normalization of additional Sites											*					X	

* indicates task start/X indicates task completion

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1999				
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0308699F Shared Early Warning System				PROJECT 4838			
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
				<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>				
(U)	ISC2 Contract Incremental Funding			0	0	7,528	2,917				
(U)	Award/Performance Fee			0	0	1,690	658				
(U)	System Engineering			0	0	1,164	215				
(U)	Program Management Administration (PMA)			0	0	1,150	430				
(U)	Total			0	0	11,532	4,220				
(U) B. <u>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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Organizations</u>											
ISC2 Contractor (TBD)	CP/AF	Jan 00	N/A	N/A	0	0	0	9,218	3,575	Continuing	12,793
<u>Support and Management Organizations</u>											
MITRE	CPFF	N/A	N/A	N/A	0	0	0	600	65	Continuing	665
CTA	CPFF	N/A	N/A	N/A	0	0	0	564	150	Continuing	714
PMA	N/A	N/A	N/A	N/A	0	0	0	1,150	430	Continuing	1,580
<u>Test and Evaluation Organizations</u>											
N/A	N/A	N/A	N/A	N/A	0	0	0	0	0	0	
Project 4838				Page 4 of 5 Pages				Exhibit R-3 (PE 0308699F)			

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)						DATE	
BUDGET ACTIVITY						PROJECT	
7 - Operational System Development						4838	
PE NUMBER AND TITLE							
0308699F Shared Early Warning System							
<u>(U) B. Budget Acquisition History and Planning Information Continued (\$ in Thousands)</u>							
Government Furnished Property: None							
Subtotal Product Development	0	0	0	9,218	3,575	Continuing	Continuing
Subtotal Support and Management	0	0	0	2,314	645	Continuing	Continuing
Subtotal Test and Evaluation	0	0	0	0	0	0	0
Total Project	0	0	0	11,532	4,220	Continuing	Continuing

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0401119F C-5 Airlift Squadrons						
COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	3,069	33,594	63,041	56,416	53,395	102,610	107,389	44,014	0	463,999
4495 Avionics Modernization Program	3,069	33,594	44,172	30,084	7,295	0	0	0	0	118,685
4835 Reliability Enhancement & Reengining Program	0	0	18,869	26,332	46,100	102,610	107,389	44,014	0	345,314
Quantity of RDT&E Articles	0	2	0	0	2	0	0	0	0	4

(U) **A. Mission Description**

4495: Avionics Modernization Program (AMP): 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). The AWFCS replaces low reliability Line Replaceable Units (LRUs) in the automatic flight control system and replaces aging mechanical instruments in the engine and flight systems. Current trends indicate some 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 progress towards "free flight" capability. Integration of Terrain Awareness and Warning System (TAWS--formerly Enhanced Ground Proximity Warning System [EGPWS]) Nav Safety enhancement is also part of the C-5 AMP. Two RDT&E test articles are funded in FY99 for flight test and installed in FY01.

4835: Reliability Enhancement and Reengining Program (RERP): Comprehensive modernization of the C-5 improves aircraft reliability, maintainability and availability. This effort centers around replacing TF-39 engines with a more reliable, commercially available (COTS) turbofan engine with increased takeoff thrust, reduced fuel consumption 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. Program also includes a commercial-type "letter check" (phased inspection) maintenance practice and upgrades numerous other systems including: APUs (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.

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

4495: 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.

4835: 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.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)					DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development			PE NUMBER AND TITLE 0401119F C-5 Airlift Squadrons		
(U) C. <u>Program Change Summary (\$ in Thousands)</u>					
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U) Previous President's Budget (FY1999 PB)	9,160	47,940	0	0	57,100
(U) Appropriated Value	9,751	33,736			
(U) Adjustments to Appropriated Value					
a. Congressional/General Reductions	-362	-142			
b. SBIR	-231				
c. Omnibus or Other Above Threshold Reprogram	-5,062				
d. Below Threshold Reprogramming	-1,027				
(U) Adjustments to Budget Years Since FY 1999 PB			63,041	56,416	cont
(U) Current Budget Submit/FY2000 President's Budget	3,069	33,594	63,041	56,416	cont
 (U) Significant Program Changes:					
Since FY99 PB:					
- C-5 AMP installation schedule accelerated to complete by CY05 vice CY08					
- Appropriation conference reduced AMP project \$14.204M in FY99 RDT&E					
- Traffic Alert and Collision Avoidance System (TCAS) to complete ahead of the rest of C-5 AMP mod					
- Terrain Awareness and Warning System (TAWS—formerly Enhanced Ground Proximity Warning System [EGPWS]) integrated into C-5 AMP; increased RDT&E requirement and combined modification funding lines					
- C-5 RERP RDT&E funding added					
FY99: \$1.066M identified as a source for SBIR					

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0401119F C-5 Airlift Squadrons				PROJECT 4495	
<i>COST (\$ In Thousands)</i>	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4495 Avionics Modernization Program	3,069	33,594	44,172	30,084	7,295	0	0	0	0	118,685
<p>(U) A. <u>Mission Description</u> <u>4495: Avionics Modernization Program (AMP):</u> 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). The AWFCS replaces low reliability Line Replaceable Units (LRUs) in the automatic flight control system and replaces aging mechanical instruments in the engine and flight systems. Current trends indicate some 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 progress towards "free flight" capability. Integration of Terrain Awareness and Warning System (TAWS--formerly Enhanced Ground Proximity Warning System [EGPWS]) Nav Safety enhancement is also part of the C-5 AMP. Two RDT&E test articles are funded in FY99 for flight test.</p> <p>(U) <u>FY 1998 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) 822 System Engineering / Program Management - (U) 1,476 AMP Kit Design / Development - (U) 771 Mission Support - (U) \$3,069 Total <p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) 9,018 System Engineering / Program Management - (U) 20,804 AMP Kit Design / Development - (U) 1,812 Prototype Fabrication / Install - (U) 894 Mission Support - (U) 1,066 Identified as a source for SBIR - (U) \$33,594 Total 										
Project 4495			<i>Page 3 of 13 Pages</i>				Exhibit R-2A (PE 0401119F)			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)					DATE February 1999																																																																																																
BUDGET ACTIVITY 7 - Operational System Development			PE NUMBER AND TITLE 0401119F C-5 Airlift Squadrons		PROJECT 4495																																																																																																
<p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) 8,300 System Engineering / Program Management - (U) 26,500 AMP Kit Design / Development - (U) 5,200 Prototype Fabrication / Install - (U) 4,172 Mission Support - (U) \$44,172 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) 3,300 System Engineering / Program Management - (U) 13,900 AMP Kit Design / Development - (U) 10,200 Prototype Fabrication / Install - (U) 2,684 Mission Support - (U) \$30,084 Total <p>(U) <u>B. Project Change Summary - Description of Significant Changes:</u></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;"></th> <th style="text-align: right;"><u>FY 1998</u></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 (FY1999 PB)</td> <td style="text-align: right;">9,160</td> <td style="text-align: right;">47,940</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: right;">57,100</td> </tr> <tr> <td>(U) Appropriated Value</td> <td style="text-align: right;">9,751</td> <td style="text-align: right;">33,736</td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Adjustments to Appropriated Value</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> a. Congressional/General Reductions</td> <td style="text-align: right;">-362</td> <td style="text-align: right;">-142</td> <td></td> <td></td> <td></td> </tr> <tr> <td> b. SBIR</td> <td style="text-align: right;">-231</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> c. Omnibus or Other Above Threshold Reprogram</td> <td style="text-align: right;">-5,062</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> d. Below Threshold Reprogramming</td> <td style="text-align: right;">-1,027</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Adjustments to Budget Years Since FY1999 PB</td> <td></td> <td></td> <td style="text-align: right;">44,172</td> <td style="text-align: right;">30,084</td> <td style="text-align: right;">cont</td> </tr> <tr> <td>(U) Current Budget Submit/FY2000 President's Budget</td> <td style="text-align: right;">3,069</td> <td style="text-align: right;">33,594</td> <td style="text-align: right;">44,172</td> <td style="text-align: right;">30,084</td> <td style="text-align: right;">cont</td> </tr> <tr> <td colspan="6">(U) Significant Program Changes:</td> </tr> <tr> <td colspan="6">Since FY99 PB:</td> </tr> <tr> <td colspan="6">- C-5 AMP installation schedule accelerated to complete by CY05 vice CY08</td> </tr> <tr> <td colspan="6">- Appropriation conference reduced AMP project by \$14,204 in FY99 RDT&E</td> </tr> <tr> <td colspan="6">- Traffic Alert and Collision Avoidance System (TCAS) to complete ahead of the rest of C-5 AMP mod</td> </tr> <tr> <td colspan="6">- Terrain Awareness and Warning System (TAWS—formerly Enhanced Ground Proximity Warning System [EGPWS]) integrated into C-5 AMP; increased RDT&E requirement and combined modification funding lines</td> </tr> </tbody> </table>							<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>	(U) Previous President's Budget (FY1999 PB)	9,160	47,940	0	0	57,100	(U) Appropriated Value	9,751	33,736				(U) Adjustments to Appropriated Value						a. Congressional/General Reductions	-362	-142				b. SBIR	-231					c. Omnibus or Other Above Threshold Reprogram	-5,062					d. Below Threshold Reprogramming	-1,027					(U) Adjustments to Budget Years Since FY1999 PB			44,172	30,084	cont	(U) Current Budget Submit/FY2000 President's Budget	3,069	33,594	44,172	30,084	cont	(U) Significant Program Changes:						Since FY99 PB:						- C-5 AMP installation schedule accelerated to complete by CY05 vice CY08						- Appropriation conference reduced AMP project by \$14,204 in FY99 RDT&E						- Traffic Alert and Collision Avoidance System (TCAS) to complete ahead of the rest of C-5 AMP mod						- Terrain Awareness and Warning System (TAWS—formerly Enhanced Ground Proximity Warning System [EGPWS]) integrated into C-5 AMP; increased RDT&E requirement and combined modification funding lines					
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Project 4495			Page 4 of 13 Pages		Exhibit R-2A (PE 0401119F)																																																																																																

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0401119F C-5 Airlift Squadrons				PROJECT 4495		
<p>FY99 Program: \$1,066 identified as a source for SBIR</p>										
<p>(U) C. <u>Other Program Funding Summary (\$ in Thousands)</u></p>										
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To Compl</u>	<u>Total Cost</u>
(U) PE# 0401119F/C-5 Squadrons Aircraft Procurement, AF, BA-5, C-5 Mods, Avionics Modernization Program, BP-11	0	8,380	23,711	135,394	218,547	225,200	163,364	2,485	0	777,081
(U) PE# 0401119F/C-5 Squadrons Aircraft Procurement, AF, BA-5, C-5 Mods, Reliability Enhancement and Reengining Program, BP-11	0	0	0	0	17,300	18,500	104,000	465,600	cont.	cont.
(U) <u>PE# 0305099F/Global Air Traffic Management (GATM)</u> RDT&E, AF, BA-7	864	26,521	6,517	8,584	9,576	7,634	7,795	7,957	TBD	TBD
<p>(U) D. <u>Acquisition Strategy:</u> <u>Avionics Modernization Program:</u> Program acquisition strategy establishes a single integrating contractor to: modify and qualify individual 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.</p>										
Project 4495			Page 5 of 13 Pages				Exhibit R-2A (PE 0401119F)			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)												DATE February 1999				
BUDGET ACTIVITY 7 - Operational System Development						PE NUMBER AND TITLE 0401119F C-5 Airlift Squadrons						PROJECT 4495				
(U) E. <u>Schedule Profile</u>																
		<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>		
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) Acquisition Strategy Panel (FY97/4)																
(U) Draft RFP	*															
(U) Final RFP			*													
(U) Contract Award						X										
(U) Prototype Installation Start														X		
(U) First Flight (FY02/1)																
(U) Developmental Test Start (FY02/1 - FY03/1)																
(U) Production Installation Start (FY03/1)																
(U) IOC (FY03/1)																
(U) Prod Installation Complete (FY05/2)																
* = completed event																
X = planned event																
Project 4495				Page 6 of 13 Pages				Exhibit R-2A (PE 0401119F)								

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE	
BUDGET ACTIVITY										PROJECT	
7 - Operational System Development										4495	
PE NUMBER AND TITLE											
0401119F C-5 Airlift Squadrons											
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U) Identified as a source for SBIR					0	1,066	0	0			
(U) System Engineering / Program Management					822	9,018	8,300	3,300			
(U) AMP Kit Design / Development					1,476	20,804	26,500	13,900			
(U) Prototype Fabrication / Install					0	1,812	5,200	10,200			
(U) Mission Support					771	894	4,172	2,684			
(U) Total					3,069	33,594	44,172	30,084			
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government	Contract Method/Type	Award or Obligation Date	Performing Activity	Project Office	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>FY 1998</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
Identified as a source for SBIR							1,066				
1,066											
<u>Product Development Organizations</u>											
SA-ALC/LA			TBD	TBD	471	751	662	458	466	474	3,282
ASC/GRA	C/CPAF	Jan 99	TBD	TBD		2,318	31,866	43,714	29,221	921	108,040
<u>Support and Management Organizations:</u>											
<u>Test and Evaluation Organizations:</u>											
418 Test Squadrn (Edwards AFB)	AFFTC								397	5,900	6,297
Project 4495											
Page 7 of 13 Pages											
Exhibit R-3 (PE 0401119F)											

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0401119F C-5 Airlift Squadrons	PROJECT 4495
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(U) B. Budget Acquisition History and Planning Information Continued (\$ in Thousands)

Government Furnished Property: None

<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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
Identified as a source for SBIR						1,066				1,066
Subtotal Product Development				471	3,069	32,528	44,172	29,687	1,395	111,322
Subtotal Support and Management										
Subtotal Test and Evaluation								397	5,900	6,297
Total Project				471	3,069	33,594	44,172	30,084	7,295	118,685

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0401119F C-5 Airlift Squadrons				PROJECT 4835		
<i>COST (\$ In Thousands)</i>	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4835 Reliability Enhancement & Reengining Program	0	0	18,869	26,332	46,100	102,610	107,389	44,014	0	345,314
<p>(U) A. <u>Mission Description</u> 4835: Reliability Enhancement and Reengining Program (RERP): Comprehensive modernization of the C-5 improves aircraft reliability, maintainability and availability. This effort centers around replacing TF-39 engines with a more reliable, commercially available (COTS) turbofan engine with increased takeoff thrust, reduced fuel consumption 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. Program also includes a commercial-type "letter check" (phased inspection) practice and upgrades numerous other systems including: APUs (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 FY03.</p> <p>(U) <u>FY 1998 (\$ in Thousands):</u> - (U) \$0 Total</p> <p>(U) <u>FY 1999 (\$ in Thousands):</u> - (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) \$1,469 Mission Support - (U) \$18,869 Total</p> <p>(U) <u>FY 2001 (\$ in Thousands):</u> - (U) \$8,000 System Engineering / Program Management - (U) \$12,600 RERP Kit Design / Development - (U) \$3,700 Prototype Fabrication / Install - (U) \$2,032 Mission Support - (U) \$26,332 Total</p>										
Project 4835			Page 9 of 13 Pages				Exhibit R-2A (PE 0401119F)			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)							DATE February 1999				
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0401119F C-5 Airlift Squadrons			PROJECT 4835				
(U) B. <u>Project Change Summary - Description of Significant Changes:</u>											
		<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total</u>					
		0	0	0	0	Cost					
(U) Previous President's Budget		0	0	0	0	0					
(U) Appropriated Value											
(U) Adjustments to Appropriated Value											
a. Cong Reductions											
b. SBIR											
c. Omnibus or Other Above Threshold Reprogram											
d. Below Threshold Reprogramming											
(U) Adjustments to Budget Years Since FY 1999 PB				18,869	26,332	cont					
(U) Current Budget Submit/President's Budget		0	0	18,869	26,332	cont					
 (U) Significant Program Changes:											
- C-5 RERP RDT&E funding added											
(U) C. <u>Other Program Funding Summary (\$ in Thousands)</u>											
		<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To</u>	<u>Total</u>
										<u>Compl</u>	<u>Cost</u>
(U) PE# 0401119F/C-5 Squadrons											
Aircraft Procurement, AF, BA-5, C-5 Mods,	0	0	0	0	17,300	18,500	104,000	465,600		cont.	cont.
Reliability Enhancement and Reengining											
Program, BP-11											
(U) PE# 0401119F/C-5 Squadrons											
Aircraft Procurement, AF, BA-5, C-5 Mods,	0	8,380	23,711	135,394	218,547	225,200	163,364	2,485		0	777,081
Avionics Modernization Program, BP-11											

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0401119F C-5 Airlift Squadrons	PROJECT 4835
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(U) **D. Acquisition Strategy:** TBD

(U) **E. Schedule Profile**

	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) AOA Results Brief to JROC																
(U) ORD Brief to JRB/JROC (TBD)																
(U) RFI (TBD)																
(U) Draft RFP (TBD)																
(U) Final RFP (TBD)																
(U) Contract Award (TBD)																
X Denotes planned milestone																

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1999				
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0401119F C-5 Airlift Squadrons				PROJECT 4835			
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
				<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>				
(U)	System Engineering / Program Management			0	0	7,000	8,000				
(U)	RERP Kit Design / Development			0	0	10,400	12,600				
(U)	Prototype Fabrication / Install			0	0	0	3,700				
(U)	Mission Support			0	0	1,469	2,032				
(U)	Total			0	0	18,869	26,332				
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations: TBD											
<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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Organizations</u>											
TBD	TBD	TBD	TBD	TBD	0	0	0	18,869	26,332	300,113	345,314
<u>Support and Management Organizations</u>											
TBD								TBD	TBD	TBD	TBD
<u>Test and Evaluation Organizations</u>											
TBD								TBD	TBD	TBD	TBD
Project 4835											
Page 12 of 13 Pages											
Exhibit R-3 (PE 0401119F)											

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE		
BUDGET ACTIVITY								February 1999		
7 - Operational System Development				PE NUMBER AND TITLE				PROJECT		
				0401119F C-5 Airlift Squadrons				4835		
(U) B. <u>Budget Acquisition History and Planning Information Continued (\$ in Thousands)</u>										
Government Furnished Property: None										
<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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Property</u>										
N/A										N/A
<u>Support and Management Property</u>										
N/A										N/A
<u>Test and Evaluation Property</u>										
N/A										N/A
Subtotal Product Development				0	0	0	18,869	26,332	300,113	345,314
Subtotal Support and Management							TBD	TBD	TBD	TBD
Subtotal Test and Evaluation							TBD	TBD	TBD	TBD
Total Project							18,869	26,332	300,113	345,314

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0401130F C-17 Aircraft	PROJECT 2569
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
2569 C-17 Aircraft	101,822	118,228	170,718	132,307	110,921	108,676	110,964	113,260	0	6,766,584
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0*

*** Aircraft T-1, FY87 Funded**

(U) A. Mission Description

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 the 21st century. RDT&E efforts support producibility enhancements and product improvements, including correction of Operational Test & Evaluation (OT&E) deficiencies.

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

- (U) 88,432 Continue product improvement development & testing
- (U) 2,608 Airframe durability test teardown
- (U) 10,782 PE/PI Government flight test
- (U) \$101,822 Total

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

- (U) 100,616 Continue product improvement development & testing
- (U) 4,300 Landing Gear durability test and Landing Gear and Aircraft Durability Improvements
- (U) 10,000 PE/PI Government flight test
- (U) 3,683 Identified as a source for SBIR
- (U) \$118,228 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0401130F C-17 Aircraft	PROJECT 2569
<p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) 121,518 Continue Product Improvement Development & Testing - (U) 5,200 Aircraft Durability Improvements - (U) 34,000 Open architecture hardware and software facilitate avionics modernization driven by GATM requirements and diminishing sources of manufacture and repair - (U) 10,000 PE/PI Government Flight Test - (U) \$170,718 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) 113,707 Continue Product Improvement Development & Testing - (U) 8,600 Aircraft Durability Improvements - (U) 10,000 PE/PI Government Flight Test - (U) \$132,307 Total <p>(U) B. Budget Activity Justification: This program element is budgeted in 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.</p>		
Project 2569	Page 2 of 6 Pages	Exhibit R-2 (PE 0401130F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)						DATE February 1999					
BUDGET ACTIVITY 7 - Operational System Development			PE NUMBER AND TITLE 0401130F C-17 Aircraft			PROJECT 2569					
(U) C. <u>Program Change Summary (\$ in Thousands)</u>											
		<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total</u>					
						<u>Cost</u>					
(U) Previous President's Budget (FY 1999 PB)		104,568	123,069	154,369	159,266	6,614,894					
(U) Appropriated Value		110,605	119,069								
(U) Adjustments to Appropriated Value											
a. Congressional/General Reductions		-3,742	-841								
b. SBIR/STRR		-2,307									
c. Omnibus or Other Above Threshold Reprogram		-709									
d. Below Threshold Reprogramming (BTR)		-2,025									
(U) Adjustments to Budget Years Since FY 1999 PB				16,349	-26,959						
(U) Current Budget Submit/FY 2000 PB		101,822	118,228	170,718	132,307	6,766,584					
(U) Significant Program Changes:											
Funding: \$1,500 in FY98 identified as a source for a BTR.											
The FY00 and FY01 funding changes reflect a transfer to fund other priorities within the C-17 program.											
FY99 - \$3,683 identified as a source for SBIR.											
(U) D. <u>Other Program Funding Summary (\$ in Thousands)</u>											
		<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To</u>	<u>Total</u>
										<u>Compl</u>	<u>Cost</u>
(U) APAF, MYP, BA02, PE0401130F		2,130,890	2,891,026	3,385,047	3,368,535	3,235,628	1,914,962	1,524,732	2,306,170	0	40,328,037
(U) APAF, Initial Spares, BA06, PE0401130F		128,194	112,011	0	0	0	0	0	0	0	848,185
(U) APAF, A/C Mods, BA05, PE0401130F		39,908	55,147	95,643	107,590	133,384	135,273	185,746	253,843	0	1,108,208
(U) MilCon, Facilities, PE0401130F		6,470	70,956	6,247	27,200	0	0	0	0	0	361,278

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0401130F C-17 Aircraft	PROJECT 2569
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(U) E. Acquisition Strategy

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) an aircrew training systems (ATS) contract (for aircrew training) - (APAF).

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 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: 8-9-13-15-15-5), 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 meet SOF requirements not included in the 120 aircraft program. The adjusted program is: FY03, 6; FY04, 5; FY05, 8.

(U) F. Schedule Profile

	<u>FY 1998</u>			<u>FY 1999</u>			<u>FY 2000</u>			<u>FY 2001</u>		
	1	2	3	4	1	2	3	4	1	2	3	4
Lot X (9 a/c)	*											
Lot XI Adv Proc(13 a/c)		*										
Lot XI (13 a/c)					*							
Lot XII Adv Proc (15 a/c)						X						
Lot XII (15 a/c)									X			
Lot XIII Adv Proc (15 a/c)										X		
Lot XIII (15 a/c)											X	
Lot XIV Adv Proc (15 a/c)												X

* = completed event
X = planned event

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0401130F C-17 Aircraft	PROJECT 2569
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(U) A. Project Cost Breakdown (\$ in Thousands)

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) Identified as a source for SBIR	0	3,683	0	0
(U) Open architecture	0	0	34,000	0
(U) Contractor Furnished Engineering & Test	90,942	104,045	126,718	122,307
(U) Test, Other Government Costs (OGC)	10,880	10,500	10,000	10,000
(U) Total	101,822	118,228	170,718	132,307

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

Performing Organizations:

Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to <u>FY 1998</u>	Budget <u>FY 1998</u>	Budget <u>FY 1999</u>	Budget <u>FY 2000</u>	Budget <u>FY 2001</u>	Budget to <u>Complete</u>	Total <u>Program</u>
Identified as a source for SBIR							3,683				3,683
<u>Product Development Organizations</u>											
Douglas Aircraft	C,FPI/FP	8/31/81	5,190,366	5,190,366	5,190,366	0	0			0	5,190,366
Douglas Aircraft	C,CPFF	7/13/95	1,016,277	1,016,277	146,633	88,436	103,645	160,718	122,307	403,821	1,025,560
Pratt & Whitney	C,FP	5/24/91	25,346	25,346	25,346	0	0			0	25,346
Douglas Aircraft	C,FPI	4/14/89	na	na	83,885	0	0			0	83,885
Pratt & Whitney	FP+EPA	4/18/95	8,300	8,300	5,000	2,506	400			0	7,906

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE	
BUDGET ACTIVITY										PROJECT	
7 - Operational System Development										2569	
PE NUMBER AND TITLE											
0401130F C-17 Aircraft											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
<u>Support and Management Organizations</u>											
Mission Support OGC	PO				97,175	98	100	0	0	0	97,373
Site Activation OGC	PO				1,539	0	0	0	0	0	1,539
Miscellaneous					19,741	0	400	0	0	0	20,141
<u>Test and Evaluation Organizations</u>											
Combined Test Force	PO	Dec 97			216,721	10,782	10,000	10,000	10,000	40,000	297,503
Wright Labs/Arnold	PO				10,252	0	0			0	10,252
Eng Dev Center											
Other	PO				3,030	0	0			0	3,030
Government Furnished Property: None											
Identified as a source for SBIR							3,683				3,683
Subtotal Product Development					5,451,230	90,942	104,045	160,718	122,307	403,821	6,333,063
Subtotal Support and Management					118,455	98	500	0	0	0	119,053
Subtotal Test and Evaluation					230,003	10,782	10,000	10,000	10,000	40,000	310,785
Total Project					5,799,688	101,822	118,228	170,718	132,307	443,821	6,766,584

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0401214F Air Cargo Materiel Handling (463-L)	PROJECT 5150
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
5150 Next Generation Small Loader (NGSL)	5,557	482	502	0	0	0	0	0	0	7,439
Quantity of RDT&E Articles	4	2	0	0	0	0	0	0	0	6

(U) A. Mission Description

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 to 35K 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.

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

- (U) 5,078 Acquire and test preproduction test articles
- (U) 479 Program management support
- (U) \$5,557 Total

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

- (U) 461 Engineering analysis for preproduction testing; GFE/GFP for preproduction testing; travel supporting preproduction testing
- (U) 21 Acquire and test preproduction test articles
- (U) \$482 Total

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

- (U) 502 Engineering analysis for preproduction testing; GFE/GFP for preproduction testing; travel supporting preproduction testing
- (U) \$502 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)					DATE February 1999																																																												
BUDGET ACTIVITY 7 - Operational System Development			PE NUMBER AND TITLE 0401214F Air Cargo Materiel Handling (463-L)		PROJECT 5150																																																												
<p>(U) <u>FY 2001 (\$ in Thousands):</u> - (U) \$0 Total</p> <p>(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.</p> <p>(U) <u>C. Program Change Summary (\$ in Thousands)</u></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 35%;"></th> <th style="text-align: center;"><u>FY 1998</u></th> <th style="text-align: center;"><u>FY 1999</u></th> <th style="text-align: center;"><u>FY 2000</u></th> <th style="text-align: center;"><u>FY 2001</u></th> <th style="text-align: center;"><u>Total Cost</u></th> </tr> </thead> <tbody> <tr> <td>(U) Previous President's Budget (FY 1999 PB)</td> <td style="text-align: right;">5,610</td> <td style="text-align: right;">512</td> <td style="text-align: right;">511</td> <td></td> <td style="text-align: right;">7,530</td> </tr> <tr> <td>(U) Appropriated Value</td> <td style="text-align: right;">5,947</td> <td style="text-align: right;">512</td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Adjustments to Appropriated Value</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> a. Cong/General Reductions</td> <td style="text-align: right;">-225</td> <td style="text-align: right;">-30</td> <td></td> <td></td> <td></td> </tr> <tr> <td> b. SBIR</td> <td style="text-align: right;">-113</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> d. Omnibus Above Threshold Reprogramming</td> <td style="text-align: right;">-38</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> d. Below Threshold Reprogramming</td> <td style="text-align: right;">-14</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Adjustments to Budget Year Since FY 1999 PB</td> <td></td> <td></td> <td style="text-align: right;">-9</td> <td></td> <td></td> </tr> <tr> <td>(U) Current Budget Submit/FY 2000 President's Budget Submission</td> <td style="text-align: right;">5,557</td> <td style="text-align: right;">482</td> <td style="text-align: right;">502</td> <td></td> <td style="text-align: right;">7,439</td> </tr> </tbody> </table> <p>(U) Significant Program Changes: None</p>							<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>	(U) Previous President's Budget (FY 1999 PB)	5,610	512	511		7,530	(U) Appropriated Value	5,947	512				(U) Adjustments to Appropriated Value						a. Cong/General Reductions	-225	-30				b. SBIR	-113					d. Omnibus Above Threshold Reprogramming	-38					d. Below Threshold Reprogramming	-14					(U) Adjustments to Budget Year Since FY 1999 PB			-9			(U) Current Budget Submit/FY 2000 President's Budget Submission	5,557	482	502		7,439
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>																																																												
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Project 5150		Page 2 of 5 Pages		Exhibit R-2 (PE 0401214F)																																																													

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0401214F Air Cargo Materiel Handling (463-L)	PROJECT 5150
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(U) D. Other Program Funding Summary (\$ in Thousands)

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To</u> <u>Compl</u>	<u>Total</u> <u>Cost</u>
(U) Other Procurement, AF, BA-2, WSC 825150, Next Generation Small Loader, PE 0401214F	0	0	9,754	24,381	59,863	59,811	29,878		0	183,687

(U) E. Acquisition Strategy:

The NGSL (25K to 35K 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 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 1998</u>			<u>FY 1999</u>			<u>FY 2000</u>			<u>FY 2001</u>			
	1	2	3	1	2	3	1	2	3	1	2	3	4
(U) NGSL Program Transition to ASC			X										
(U) Test article contract award				X									
(U) Competitive drive-off (start)							X						
(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 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0401214F Air Cargo Materiel Handling (463-L)					PROJECT 5150	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U)	Acquire and test preproduction articles				5,078	21	0	0			
(U)	Test monitoring, engineering tech. order development, SPO travel, equipment, program management support.				479	461	502	0			
(U)	Total				5,557	482	502	0			
(U) B. <u>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</u>						
<u>Performing</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</u>	<u>Prior to</u>	<u>Budget</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>FY 1998</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Organizations:</u>											
WR-ALC/LEA	FFP/PR	FY98/2			598	45					643
ASC/SMG	FFP/PR	FY98/4				406	461	502		0	1,369
ASC/SMG	FFP/PR	FY99/1				5,078	21				5,099
<u>Support and Management Organizations:</u>											
Technical					300	28	0	0		0	328
Support Contract											
<u>Test and Evaluation Organizations:</u> Not applicable											
Government Furnished Property: None											

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0401214F Air Cargo Materiel Handling (463-L)	PROJECT 5150
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(U) B. Budget Acquisition History and Planning Information Continued (\$ in Thousands)

<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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
Subtotal Product Development				598	5,529	482	502	0	0	7,111
Subtotal Support and Management				300	28	0	0	0	0	328
Subtotal Test and Evaluation				0	0	0	0	0	0	0
Total Project				898	5,557	482	502	0	0	7,439

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0401218F KC-135 Squadrons	PROJECT 4494
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4494 KC-135 Aging Aircraft Program	1,770	1,090	2,268	492	488	494	504	516	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

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.

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

- (U) 200 Corrosion/crack growth rate and fatigue determination and testing
- (U) 390 Basic materials test and predictive technique
- (U) 950 Functional Systems Integrity Program (FSIP)
- (U) 230 Mission support/contractor support
- (U) \$1,770 Total

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

- (U) 300 Corrosion/crack growth rate and fatigue determination and testing
- (U) 500 Functional Systems Integrity Program (FSIP)
- (U) 257 Mission support/contractor support
- (U) 33 Identified as a source for SBIR
- (U) \$1,090 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0401218F KC-135 Squadrons	PROJECT 4494
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(U) FY 2000 (\$ in Thousands):

- (U) \$250 Corrosion/crack growth rate and fatigue determination and testing
- (U) \$660 Functional Systems Integrity Program (FSIP)
- (U) \$358 Mission support/contractor support
- (U) \$1,000 Economic Service Life Study
- (U) \$2,268 Total

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

- (U) \$300 Functional Systems Integrity Program (FSIP)
- (U) \$192 Mission support/contractor support
- (U) \$492 Total

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

This effort is a low technical risk effort supporting a fielded weapon system and, therefore, is assigned to Budget Activity 7, Operational Systems Development.

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

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U) Previous President's Budget (FY1999 PB)	1,863	11,093	2,310	501	cont
(U) Appropriated Value	1,992	1,093			
(U) Adjustments to Appropriated Value					
a. Congressional/General Reductions	-90	-3			
b. SBIR	-39				
c. Omnibus or Other Above Threshold Reprogram	-13				
d. Below Threshold Reprogramming	-80				
(U) Adjustments to Budget Years Since FY 1999 PB			-42	-9	cont
(U) Current Budget Submit/FY2000 President's Budget	1,770	1,090	2,268	492	cont
(U) Significant Program Changes:					
FY99: \$33 identified as a source for SBIR					

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0401218F KC-135 Squadrons	PROJECT 4494
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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 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) Corrosion & Fatigue Testing	*															
(U) Materials Test & Predictive Tech.	*															
(U) FSIP	*															
(U) Mission Support	*															
(U) Begin Economic Service Life Study										X						

Note: * - On-going activities
X - Scheduled activities

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1999				
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0401218F KC-135 Squadrons				PROJECT 4494			
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
				<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>				
(U)	Corrosion/crack growth determination and testing			200	300	250	0				
(U)	Basic materials test and predictive technique			390	0	0	0				
(U)	Functional Systems Integrity Program (FSIP)			950	500	660	300				
(U)	Mission support/contractor support			230	257	358	192				
(U)	Economic service life study			0	0	1,000	0				
(U)	Identified as a source for SBIR			0	33	0	0				
(U)	Total			1,770	1,090	2,268	492				
(U) B. <u>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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
Identified as a source for SBIR							33				
<u>Product Development Organizations</u>											
Boeing	C/KC-135 Fleet Support SS/FFP	Oct 97-Mar 01	TBD	TBD	400	1,622	745	1,060	488	continuing	continuing
<u>Support and Management Organizations</u>											
Project 4494											
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Exhibit R-3 (PE 0401218F)											

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 1999			
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0401218F KC-135 Squadrons				PROJECT 4494		
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	FY 2000	FY 2001	Budget to Complete	Total Program
ARINC, Frontier, other support contractors	Design Engineering Program (DEP) C/FP	Oct 97-Mar 01			0	148	212	1,108	0	continuing	continuing
(U) B. Budget Acquisition History and Planning Information Continued (\$ in Thousands)											
<u>Test and Evaluation Organizations</u>											
FAA, Wright Labs, etc.	Project Order/MPIR	Oct 97-Mar 99			100	0	100	100	0	continuing	continuing
Government Furnished Property: None											
Identified as a source for SBIR							33				
Subtotal Product Development					400	1,622	745	1,060	488	continuing	continuing
Subtotal Support and Management					0	148	212	1,108	0	continuing	continuing
Subtotal Test and Evaluation					100	0	100	100	0	continuing	continuing
Total Project					500	1,770	1,090	2,268	488	continuing	continuing

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0603690F Information Operations Technology	PROJECT 4822
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4822 Integrated Information Operations	0	0	491	491	490	489	489	488	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

(U) Information Operations (IO) Technology demonstrates and validates advanced technology-based capabilities and techniques to support tactical and operational commanders' and National Command Authorities' needs for offensive and defensive IO. The projects are oriented towards specific shortfalls and deficiencies documented by major commands (MAJCOMS), unified commands, and IO agencies in mission area plans and mission need statements. The labs and SPO work directly with users and battle labs to set priorities and find synergistic combinations of new technology, doctrine and training. The goal of this program is to expedite technology transition from the laboratory and industry to operational use via rapid prototyping.

(U) The Integrated Information Operations project will investigate and develop techniques and technologies for integrated IO. It will include a series of studies designed to assess cross-functional opportunities and capabilities to address various aspects of Integrated IO. Potential focus areas include integrated attack opportunities, defense opportunities, and integration of IO planning into air operations planning. Projects efforts will be prioritized and guided by the IO Technical planning Integrated Planning Team (TPIPT) in support of the Air Force Counterinformation Mission Area Plan and the DOD IO Master Plan.

(U) The initial study will investigate techniques and technologies for defending systems against sophisticated Information Warfare (IW) and computer network attacks that are beyond commercially available protection systems. Examples include options for detecting and defending against attacks on our theater RF links and nets, detecting and defending satellite up and downlinks, defending C4I systems from intelligence trade-craft and the use of deception and OPSEC as countermeasures against adversary attacks. Since this initial study is more focused at tactical defense in crisis or war, more active response options will be explored. Specific content classified. Data available upon request.

(U) The next study will assess opportunities for exploiting Integrated Air Defense Systems (IADS) vulnerabilities to a number of technologies. The objective is to complement existing and planned capabilities to suppress adversary IADS as well as highlight potential vulnerabilities of our own systems. For focus, it will explore technical solutions to deficiencies identified by the Air Force and DOD Electronic Warfare and IO long-range planning and development efforts. Specific content is classified. Data available upon request.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational System Development	0603690F Information Operations Technology	4822
<p>(U) <u>FY 1998 (\$ in Thousands):</u></p> <ul style="list-style-type: none">- (U) \$0 Total <p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none">- (U) \$0 Total <p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none">- (U) \$491 Start Initial Integrated Information Operations (IO) Study - Sophisticated IW Defense Study- (U) \$491 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none">- (U) \$146 Continue Sophisticated IW Defense Study- (U) \$345 Start Integrated Air Defense System (IADS) Exploitation Study- (U) \$491 Total <p>(U) <u>B. Budget Item Justification</u></p> <p>This program is in Budget Activity 4 - Demonstration and Validation, because it demonstrates and validates advanced technology which enhances IO systems, capabilities and techniques.</p>		
Project 4822	Page 2 of 6 Pages	Exhibit R-2 (PE 0603690F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0603690F Information Operations Technology	PROJECT 4822
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(U) **C. Program Change Summary (\$ in Thousands)**

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U) Previous President's Budget	0	0	0	0	0
(U) Appropriated Value			0	0	0
(U) Adjustments to Appropriated Value					
a. Cong Reductions					
b. SBIR					
c. Omnibus or Other Above Threshold Reprogram					
d. Below Threshold Reprogramming					
(U) Adjustments to Budget Years Since FY 1999 PB			491	491	TBD
(U) Current Budget Submit/FY2000 PB	0	0	491	491	TBD

(U) Significant Program Changes: Starting new program.

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

(U) None

(U) **RELATED ACTIVITIES:**

(U) These studies will leverage current DOD lab efforts. Studies will be deconflicted with and will complement Computer Security RDT&E and Information Warfare development efforts under 303140F, Information Systems Security Program.

(U) Some aspects of this program will be protected under the PANTHER DEN Special Access Program. Data available upon request.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0603690F Information Operations Technology	PROJECT 4822
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(U) E. Acquisition Strategy

All major contracts within this Program Element are awarded after full and open competition unless other than full and open is justified to the Designated Acquisition Commander (DAC).

(U) F. Schedule Profile

	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) Sophisticated IW Defense Study Start									X							
(U) IADS Exploitation Study Start														X		

X - Denotes planned event
* - Denotes completed event

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0603690F Information Operations Technology	PROJECT 4822
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(U) A. Project Cost Breakdown (\$ in Thousands)

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) Sophisticated IW Defense Study			491	146
(U) IADS Exploitation Study				345
(U) Total			491	491

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

Performing Organizations:

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

Contractor TBD								491	146	Cont.	TBD
Contractor TBD									345	Cont.	TBD

Support and Management Organizations

N/A

Test and Evaluation Organizations

N/A

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0603690F Information Operations Technology				PROJECT 4822		
(U) B. <u>Budget Acquisition History and Planning Information Continued (\$ in Thousands)</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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Property</u>										
N/A										
<u>Support and Management Property</u>										
N/A										
<u>Test and Evaluation Property</u>										
N/A										
Subtotal Product Development							491	491	Cont.	TBD
Subtotal Support and Management							0	0		
Subtotal Test and Evaluation							0	0		
Total Project							491	491	Cont.	TBD
Project 4822				Page 6 of 6 Pages				Exhibit R-3 (PE 0603690F)		

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0702207F Depot Maintenance (Non-If)	PROJECT 3326
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<i>COST (\$ In Thousands)</i>	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
3326 Precision Measurement & Calibration	1,387	1,496	1,500	1,529	1,546	1,572	1,603	1,631	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

This program develops, tests, and evaluates national and Air Force measurement standards and calibration equipment in support of all Air Force programs and activities, including 119 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.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0702207F Depot Maintenance (Non-If)	PROJECT 3326
<p>(U) <u>FY 1998 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$792 Complete development of a high sensitivity pyroelectric radiometer, and an improved blackbody pyrometer; and begin development of a portable cryogenic radiometer to characterize infrared test chambers. Continue development of other national measurement standards to support Air Force infrared / laser / electro-optical weapon systems and support equipment. - (U) \$205 Complete the microwave high power standards and continue development of microwave standards for noise figure measurements and radar cross-section test range measurements to support radar and RF communication systems. - (U) \$145 Begin development of methods to characterize micro-electromechanical sensors (MEMS) and continue development of improved methods to reduce coordinate measuring machine (CMM) measurement uncertainty. - (U) \$180 Begin development of methods to determine the frequency response characterization of capacitors; and continue development of national standards for electrical resistance and development of high speed pulse measurements to support high accuracy electronic test equipment. - (U) \$65 Begin the large area alpha radiation source metrology project, and continue to develop national standards and National Institute of Standards and Technology (NIST) traceability for calibration of ionizing radiation hazard instrumentation. - (U) \$1,387 Total <p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$685 Complete the development of an improved blackbody calibrator for the AF Primary Standards Laboratory, an enhanced electrical substitution radiometer, tunable lasers for radiometry and detector standards for long wavelength infrared measurements; begin the tunable diode laser for fiber optic metrology and radiance response with uniform sources projects; and continue development of other national measurement standards to support Air Force infrared / laser / electro-optical weapon systems and support equipment. - (U) \$266 Begin development of an upgraded microwave high power system and continue development of standards for radar support, RF communications systems, and radar cross-section range measurements. - (U) \$125 Complete development of methods to characterize micro-electromechanical sensors (MEMS) and continue development of improved calibration support for coordinate measuring machines (CMMs). - (U) \$305 Begin development of improved thin film multijunction thermal converters and continue development of standards for electrical measurements to support high accuracy electronic test equipment. - (U) \$65 Complete the beta measurement traceability project, continue the large area alpha radiation source metrology project and the development of national standards for calibration of ionizing radiation hazard instrumentation. - (U) \$50 Identified as source for SBIR - (U) \$1,496 Total 		
Project 3326	Page 2 of 6 Pages	Exhibit R-2 (PE 0702207F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0702207F Depot Maintenance (Non-If)	PROJECT 3326
<p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$697 Begin collimated infrared irradiance radiometer project to calibrate infrared target simulators and continue development of national measurement standards to support Air Force infrared / laser / electro-optical weapon systems and support equipment. - (U) \$260 Complete the upgrade to the microwave high power system and continue development of standards for radar support, RF communications systems, and radar cross-section range measurements. - (U) \$170 Continue 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) \$340 Complete the fast electrical pulse calibration and standards project and continue development of standards for electrical measurements to support high accuracy electronic test equipment. - (U) \$33 Complete the large area alpha radiation source metrology project and continue the development of national standards for calibration of ionizing radiation hazard instrumentation. - (U) \$1,500 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$716 Complete the tunable diode laser for fiber optic metrology project and continue development of national measurement standards to support Air Force infrared / laser / electro-optical weapon systems and support equipment. - (U) \$265 Continue development of standards for radar support, RF communications systems, and radar cross-section range measurements. - (U) \$170 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) \$345 Complete the Hall effect resistance standard project, the frequency response characteristics of capacitors projects and the improved thin film multijunction thermoconverter project; and continue development of standards for electrical measurements to support high accuracy electronic test equipment. - (U) \$33 Continue the development of national standards for calibration of ionizing radiation hazard instrumentation. - (U) \$1529 Total 		
Project 3326	Page 3 of 6 Pages	Exhibit R-2 (PE 0702207F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)					DATE February 1999																																																												
BUDGET ACTIVITY 7 - Operational System Development			PE NUMBER AND TITLE 0702207F Depot Maintenance (Non-If)		PROJECT 3326																																																												
<p>(U) B. Budget Activity Justification: This program is in budget activity 7 - Operational System Development because it supports operational systems.</p> <p>(U) C. Program Change Summary (\$ in Thousands)</p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:40%;"></th> <th style="text-align: right;"><u>FY 1998</u></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 1999 PB</td> <td style="text-align: right;">1,397</td> <td style="text-align: right;">1,500</td> <td style="text-align: right;">1,528</td> <td style="text-align: right;">1,558</td> <td style="text-align: right;">TBD</td> </tr> <tr> <td>(U) Appropriated Value</td> <td style="text-align: right;">1,482</td> <td style="text-align: right;">1,500</td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Adjustments to Appropriated Value</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> a. Cong Reductions</td> <td style="text-align: right;">-48</td> <td style="text-align: right;">-4</td> <td></td> <td></td> <td></td> </tr> <tr> <td> b. SBIR</td> <td style="text-align: right;">-37</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> c. Omnibus or Other Above Threshold Reprogram</td> <td style="text-align: right;">-10</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> d. Below Threshold Reprogramming</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Adjustments to Budget Years Since FY 1999 PB</td> <td></td> <td></td> <td style="text-align: right;">-28</td> <td style="text-align: right;">-29</td> <td></td> </tr> <tr> <td>(U) Current Budget Submit/FY 2000 PB</td> <td style="text-align: right;">1,387</td> <td style="text-align: right;">1,496</td> <td style="text-align: right;">1,500</td> <td style="text-align: right;">1,529</td> <td style="text-align: right;">TBD</td> </tr> </tbody> </table> <p>(U) Significant Program Changes: Not Applicable</p> <p>(U) D. Other Program Funding Summary (\$ in Thousands): Not Applicable</p> <p>(U) E. Acquisition Strategy: Accomplish through intergovernmental transfer between the Department of Defense and the Department of Commerce.</p> <p>(U) F. Schedule Profile: Not Applicable</p>							<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>	(U) Previous President's Budget FY 1999 PB	1,397	1,500	1,528	1,558	TBD	(U) Appropriated Value	1,482	1,500				(U) Adjustments to Appropriated Value						a. Cong Reductions	-48	-4				b. SBIR	-37					c. Omnibus or Other Above Threshold Reprogram	-10					d. Below Threshold Reprogramming						(U) Adjustments to Budget Years Since FY 1999 PB			-28	-29		(U) Current Budget Submit/FY 2000 PB	1,387	1,496	1,500	1,529	TBD
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>																																																												
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Project 3326		Page 4 of 6 Pages		Exhibit R-2 (PE 0702207F)																																																													

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0702207F Depot Maintenance (Non-If)	PROJECT 3326
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(U) A. Project Cost Breakdown (\$ in Thousands)

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) Quality Assurance (Develop Measurement Standards & Calibration Support)	1,360	1,418	1,471	1,499
(U) Travel	27	28	29	30
(U) Identified as a source for SBIR		50		
(U) Total	1,387	1,496	1,500	1,529

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

Performing Organizations:

Contractor or Government	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR							50				

Product Development Organizations

National Institute of Standards & Technology	MIPR (DD FORM 448)	1st QTR	TBD	TBD	12,269	1,360	1,418	1,471	1,499	Continue	TBD
AFMC	In House	Various	TBD	TBD	118	27	28	29	30	Continue	TBD

Support and Management Organizations

Test and Evaluation Organizations

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE			
BUDGET ACTIVITY							February 1999			
7 - Operational System Development				PE NUMBER AND TITLE			PROJECT			
				0702207F Depot Maintenance (Non-If)			3326			
Government Furnished Property: N/A										
Item	Contract Method/Type or Funding or Vehicle	Award or Obligation Date	Delivery Date	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR						50				
Subtotal Product Development				12,387	1,387	1,446	1,500	1,529	Continue	TBD
Subtotal Support and Management				0	0	0	0	0	0	0
Subtotal Test and Evaluation				0	0	0	0	0	0	0
Total Project				12,387	1,387	1,496	1,500	1,529	Continue	TBD

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0708011F Industrial Preparedness	PROJECT 2865
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
2865 Industrial Preparedness-Manufacturing Technology	42,831	52,351	51,814	53,480	54,053	54,644	55,783	56,944	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) **A. Mission Description:** 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 the organic repair/remanufacture capability to affordably sustain the aging weapon systems inventory.

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

- (U) \$32,728 Established and demonstrated cost-effective and efficient manufacturing technologies for existing and next generation aircraft.
- (U) \$5,736 Established and demonstrated cost-effective repair and manufacturing technologies for affordable sustainment of existing weapon systems.
- (U) \$2,312 Established and demonstrated efficient and cost-effective manufacturing methods for electronics, structures, and propulsion for advanced tactical missiles.
- (U) \$2,055 Established and demonstrated affordable, flexible manufacturing processes to reduce the cost and lead time of spacecraft and launch vehicles.
- (U) \$42,831 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0708011F Industrial Preparedness	PROJECT 2865
<p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$26,236 Establish and demonstrate cost-effective and efficient manufacturing technologies for existing and next generation aircraft. - (U) \$17,760 Establish and demonstrate cost-effective repair and manufacturing technologies for affordable sustainment of existing weapon systems. - (U) \$1,020 Establish and demonstrate efficient and cost-effective manufacturing methods for electronics, structures, and propulsion for advanced tactical missiles. - (U) \$5,939 Establish and demonstrate affordable, flexible manufacturing processes to reduce the cost and lead time of spacecraft and launch vehicles. - (U) \$1,396 Identified as a source for SBIR. - (U) \$52,351 Total <p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$25,776 Establish and demonstrate cost-effective and efficient manufacturing technologies for existing and next generation aircraft. - (U) \$19,717 Establish and demonstrate cost-effective repair and manufacturing technologies for affordable sustainment of existing weapon systems. - (U) \$572 Establish and demonstrate efficient and cost-effective manufacturing methods for electronics, structures, and propulsion for advanced tactical missiles. - (U) \$5,749 Establish and demonstrate affordable, flexible manufacturing processes to reduce the cost and lead time of spacecraft and launch vehicles. - (U) \$51,814 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$24,688 Establish and demonstrate cost-effective and efficient manufacturing technologies for existing and next generation aircraft. - (U) \$19,879 Establish and demonstrate cost-effective repair and manufacturing technologies for affordable sustainment of existing weapon systems. - (U) \$492 Establish and demonstrate efficient and cost-effective manufacturing methods for electronics, structures, and propulsion for advanced tactical missiles. - (U) \$8,421 Establish and demonstrate affordable, flexible manufacturing processes to reduce the cost and lead time of spacecraft and launch vehicles. - (U) \$53,480 Total 		
<p>B. Budget Activity Justification: This program is in Budget Activity 7, Operational System Development, because it provides support to systems in production and/or operational use.</p>		

DATE
February 1999

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0708011F Industrial Preparedness

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0708011F Industrial Preparedness					PROJECT 2865	
(U) A. <u>Project Cost Breakdown (\$ in Thousands):</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U)	Manufacturing technologies for aircraft components				32,728	26,236	25,776	24,688			
(U)	Repair/remanufacture technologies for weapon system sustainment				5,736	17,760	19,717	19,879			
(U)	Manufacturing methods for missile and munition assemblies				2,312	1,020	572	492			
(U)	Manufacturing processes to reduce spacecraft and launch vehicle costs				2,055	5,939	5,749	8,421			
(U)	Identified as a source for SBIR				0	1,396	0	0			
(U)	Total				42,831	52,351	51,814	53,480			
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands):</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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
Product Development Organizations											
Numerous	Various	Various	N/A	N/A	N/A	22,829	28,120	25,019	26,358	Cont	Cont
TRW	CPFF	May 94			17,900	3,100	0	0	0	0	21,000
Howmet	Cost Share	Jul 95			4,500	4,335	4,000	4,000	3,000	0	19,835
Ontek	CPFF	Jan 95			4,500	1,100	1,300	0	0	0	6,900
Spectrolab	CPFF	Sep 95			1,150	1,250	660	0	0	0	3,060
McD Douglas	CPFF	May 94			38,042	2,552	0	0	0	0	40,594
Boeing	CA	Dec 97			150	400	925	1,000	132	0	2,607
Comp Afford Init (Consortium)	CA	Aug 97			1,000	6,515	5,000	5,000	5,300	3,500	26,315
Sustainment Init	Various	Feb 99			0	0	3,500	4,500	5,000	10,000	23,000
Project 2865					Page 4 of 5 Pages				Exhibit R-3 (PE 0708011F)		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0708011F Industrial Preparedness					PROJECT 2865	
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Engine Forge Init	CA	Jan 99			0	0	1,800	3,000	3,000	1,200	9,000
Elec Parts Obs Init	Various	Various			0	750	3,000	5,345	5,040	5,225	19,360
Sm/Med Enterp Supplier Init	Various	Apr 99			0	0	500	1,800	2,000	6,000	10,300
ManTech for Afford Spacecraft	Various	Jan 99			0	0	2,150	2,150	3,650	9,650	17,600
Identified as a source for SBIR					0	0	1,396				
Total					N/A	42,831	52,351	51,814	53,480	N/A	N/A
Support and Management Organizations - In-House Support.											
Test and Evaluation Organizations - Not Applicable.											
Government Furnished Property: Not Applicable.											
Identified as a source for SBIR							1,396				
Subtotal Product Development						42,831	50,955	51,814	53,480	Cont	Cont
Subtotal Support and Management						0	0	0	0	0	0
Subtotal Test and Evaluation						0	0	0	0	0	0
Total Project						42,831	52,351	51,814	53,480	Cont	Cont

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0708026F Product/Reliable/Avail/Maintain Prog
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	21,613	10,440	9,382	17,341	20,916	24,351	27,803	31,261	Continuing	Continuing
2146 PRAM	12,221	10,440	9,382	17,341	20,916	24,351	27,803	31,261	Continuing	Continuing
4761 Aging Aircraft	9,392	0	0	0	0	0	0	0	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

Note: Project 4761, Aging Aircraft, transfers to PE 0605011F, RDT&E for Aging Aircraft, in FY 1999 and out.

(U) **A. Mission Description:** This Operational Systems Development program addresses acute reliability and maintainability (R&M) deficiencies by funding prototypes of developing and mature, 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. PRAM, a level-of-funding program, depends on MAJCOM, Air Logistics Center (ALC), and field support to implement the technology once the initial investment is completed. Note: Congress added \$22 million to this program in FY 1998 for aging aircraft (\$10 million), blade repair facility efforts (\$8 million), and aging landing gear efforts (\$4 million). PRAM funding increases in FY 2000 and beyond are due to increased emphasis on life cycle cost reduction.

(U) **B. Budget Activity Justification:** This program is in Budget Activity 7, Operational Systems Development, because projects are being engineered for already operational weapon systems.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0708026F Product/Reliable/Avail/Maintain Prog
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(U) **C. Program Change Summary (\$ in Thousands):**

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U) Previous President's Budget/FY 1999 PB	21,764	970	9,753	20,891	Cont
(U) Appropriated Value	23,032	10,470			
(U) Adjustments to Appropriated Value					
a. Congressional/General Reductions	-772	-30			
b. SBIR	-499				
c. Omnibus/Other Above Threshold Reprogrammings	-148				
d. Below Threshold Reprogrammings	0				
(U) Adjustments to Budget Years Since FY 1999 PB			-371	-3,550	
(U) Current Budget Submit/FY 2000 PB	21,613	10,440	9,382	17,341	Cont

(U) Significant Program Changes: Adjustments in FY 2000 and FY 2001 represent reallocation to higher priority Air Force needs.

FY 1999: \$296 identified as a source for SBIR.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0708026F Product/Reliable/Avail/Maintain Prog	PROJECT 2146
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
2146 PRAM	12,221	10,440	9,382	17,341	20,916	24,351	27,803	31,261	Continuing	Continuing

(U) **A. Mission Description:** Productivity/Reliability/Availability/Maintainability (PRAM) addresses acute reliability and maintainability (R&M) deficiencies by funding prototypes of developing and mature, 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 18:1. PRAM, a level-of-funding program, depends on MAJCOM and field support to implement the technology when the initial investment is completed.

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

- (U) \$7,196 Initiated projects at Oklahoma City Air Logistics Center blade repair facility aimed at improving process flow and increasing shop efficiency.
- (U) \$265 Continued B-1 projects focusing on subsystem R&M to increase overwing fairing seal and pivot bearing service lives.
- (U) \$1,953 Continued work on aerospace support equipment and base infrastructure R&M projects to reduce maintenance costs and increase equipment availability.
- (U) \$790 Continued work on aircraft avionics R&M projects to improve system availability.
- (U) \$1,137 Continued work on airframe R&M projects, including development of a durability patch for low-cost, reliable installation in the field.
- (U) \$325 Completed projects identified through Air Force Materiel Command's Technology Master Plan (TMP). TMP projects are prioritized based on operational capability, reliability and maintainability improvement, and cost.
- (U) \$95 Continued space system efforts to improve mission readiness.
- (U) \$460 Started and completed high priority quick response projects identified by operational commands to reduce maintenance downtime.
- (U) \$12,221 Total

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

- (U) \$369 Continue airframe R&M efforts to reduce overall Air Force operations and support costs.
- (U) \$70 Continue space system efforts to improve mission readiness.
- (U) \$205 Start and complete high priority, quick response R&M projects identified by the operational commands to reduce maintenance downtime.
- (U) \$5,500 Initiate and complete Modeling & Reengineering effort.
- (U) \$4,000 Complete Aging Landing Gear Life Extension effort.
- (U) \$296 Identified as a source for SBIR.
- (U) \$10,440 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational System Development	0708026F Product/Reliable/Avail/Maintain Prog	2146
<p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none">- (U) \$3,000 Initiate subsystem R&M projects that will reduce the overall maintenance burden, improve subsystem capabilities and reliability, and improve mission readiness.- (U) \$3,500 Continue airframe R&M efforts to reduce overall Air Force operations and support costs.- (U) \$1,882 Continue efforts for aerospace support equipment and base infrastructure R&M enhancements to increase equipment reliability.- (U) \$1,000 Start and complete high priority, quick response R&M projects identified by the operational commands to reduce maintenance downtime.- (U) \$9,382 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none">- (U) \$5,270 Continue work in subsystem R&M projects that will reduce the overall maintenance burden, improve subsystem capabilities and reliability, and improve mission readiness.- (U) \$6,570 Continue airframe R&M efforts to reduce overall Air Force operations and support costs.- (U) \$3,890 Continue efforts in support equipment and base infrastructure R&M to reduce maintenance costs and increase equipment availability.- (U) \$1,611 Start and complete high priority, quick response R&M projects identified by the operational commands to reduce maintenance downtime.- (U) \$17,341 Total <p>(U) B. <u>Project Change Summary - Description of Significant Changes:</u> Not Applicable.</p> <p>(U) C. <u>Other Program Funding Summary:</u></p> <p>(U) <u>Related Activities:</u></p> <ul style="list-style-type: none">- (U) PE 0605011F, RDT&E for Aging Aircraft. <p>(U) D. <u>Acquisition Strategy:</u> All projects within this Program Element were awarded competitively, either by full and open competition or by amending task order contracts with competition for subcontracts.</p>		
Project 2146	Page 4 of 11 Pages	Exhibit R-2A (PE 0708026F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)												DATE February 1999											
BUDGET ACTIVITY 7 - Operational System Development						PE NUMBER AND TITLE 0708026F Product/Reliable/Avail/Maintain Prog						PROJECT 2146											
(U) E. <u>Schedule Profile:</u>																							
		<u>FY 1998</u>						<u>FY 1999</u>						<u>FY 2000</u>						<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4							
(U) Blade Repair Contract Award		X																					
(U) Request For Proposal Release	X	X			X	X			X	X			X	X									
(U) Contract Awards		X	X			X	X			X	X			X	X								

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0708026F Product/Reliable/Avail/Maintain Prog					PROJECT 2146	
(U) A. <u>Project Cost Breakdown (\$ in Thousands):</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U)	Blade Tip Repair Project				7,196	5,500	0	0			
(U)	Aircraft Subsystem Reliability & Maintainability (R&M)				265	0	3,000	5,270			
(U)	Aero Support Equipment and Base Infrastructure R&M				1,953	0	1,882	3,890			
(U)	Aircraft Avionics R&M				790	0	0	0			
(U)	Airframe R&M				1,137	369	3,500	6,570			
(U)	Technology Master Plan Projects				325	0	0	0			
(U)	Space Systems R&M				95	70	0	0			
(U)	Quick Response				460	205	1,000	1,611			
(U)	Aging Landing Gear Life Extension				0	4,000	0	0			
(U)	Identified as a source for SBIR					296					
(U)	Total				12,221	10,440	9,382	17,341			
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands):</u>											
<u>Performing Organizations:</u>											
Contractor or	Contract										
Government	Method/Type	Award or	Performing	Project	Total					To	Total
Performing	or Funding	Obligation	Activity	Office	Prior to	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Complete</u>	<u>Program</u>
<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>FY 1998</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>		
Product Development Organizations											
Identified as a source for SBIR											
Numerous	Various	Various	N/A	N/A	N/A	3,084	442	7,829	15,341	Cont	Cont
General Atomics	Various	Various	N/A	N/A	2,707	7,196	9,102	0	0	0	19,005
Lockheed-Martin	Various	Various	N/A	N/A	N/A	510	200	0	0	0	Cont
Jentek Sensors	CPFF	Jul 98	N/A	N/A	0	177	120	0	0	0	297
Government	Various	Various	N/A	N/A	N/A	1,254	280	1,553	2,000	Cont	Cont
Total			N/A	N/A	N/A	12,221	10,440	9,382	17,341	N/A	N/A
Project 2146					Page 6 of 11 Pages				Exhibit R-3 (PE 0708026F)		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY					PE NUMBER AND TITLE					PROJECT	
7 - Operational System Development					0708026F Product/Reliable/Avail/Maintain Prog					2146	
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	To Complete	Total Program
Support and Management Organizations - In-House Support.											
Test and Evaluation Organizations - Not Applicable.											
Government Furnished Property: Not Applicable.											
Product Development Property - Not Applicable.											
Support and Management Property - Not Applicable.											
Test and Evaluation Property - Not Applicable.											
Identified as a source for SBIR							296				
Subtotal Product Development					N/A	12,221	10,144	9,382	17,341	Cont	Cont
Subtotal Support and Management					N/A	0	0	0	0	0	0
Subtotal Test and Evaluation					N/A	0	0	0	0	0	0
Total Project					N/A	12,221	10,440	9,382	17,341	Cont	Cont

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0708026F Product/Reliable/Avail/Maintain Prog	PROJECT 4761
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4761 Aging Aircraft	9,392	0	0	0	0	0	0	0	Continuing	Continuing

(U) **A. Mission Description:** This program is comprised of multiple efforts which will transition needed technologies from laboratory research and commercial technology development into fieldable tools or capabilities. Projects will target critical needs of the aging fleet such as corrosion, structural integrity, and improved non-destructive inspection (NDI) methods. Corrosion-related projects include hidden corrosion detection (NDI methods such as eddy current and thermography) and developing a corrosion prediction capability. Structural integrity projects will include the development of alternate repair capabilities and the capability to predict widespread fatigue damage. In addition to the NDI projects addressing corrosion detection, other NDI projects will address multi-layer crack detection and detection of cracks under composite patches. These projects are focused on developing tools (NDI equipment, computer models) and capabilities (alternate repair processes) for Air Logistics Centers (ALCs) use in extending useful aircraft service life, resolving flight safety problems, or replacing components no longer procurable. Projects will typically yield a single, validated prototype system or capability that is production ready; final depot or field implementation (equipment purchases, tech order updates, training, etc.) will be the responsibility of the Major Commands (MAJCOMs) and ALCs. There is strong emphasis on developing solutions that will benefit multiple weapon systems, thereby, reducing or eliminating stovepipe development of platform-specific solutions. Note: Aging aircraft efforts for FY 1999 and out are addressed in PE 0605011F, RDT&E for Aging Aircraft.

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

- (U) \$4,894 Developed and enhanced predictive tools for crack and corrosion growth, evaluated corrosion monitoring devices, evaluated material substitution as a repair option, and evaluated commercial maintenance practices to determine applicability to military aircraft.
- (U) \$395 Performed structural integrity effort to expand use of composite patch repairs beyond wing structures.
- (U) \$347 Expanded aircraft NDI capabilities, particularly the ability of ultrasonic scan to detect fatigue cracks in secondary layer structure and to assess damage in the vicinity of wing skin fasteners.
- (U) \$3,756 Developed engineering logistics analysis tools to help predict future failure rates, maintain flight safety, and extend the life of aircraft landing gear.
- (U) \$9,392 Total

(U) FY 1999: Not Applicable.

(U) FY 2000: Not Applicable.

(U) FY 2001: Not Applicable.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0708026F Product/Reliable/Avail/Maintain Prog	PROJECT 4761
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(U) **B. Project Change Summary - Description of Significant Changes:** Funding for FY 1999 and out will be provided in PE 0605011F, RDT&E for Aging Aircraft.

(U) **C. Other Program Funding:**

(U) Related Activities:

- (U) PE 0605011F, RDT&E for Aging Aircraft.

(U) **D. Acquisition Strategy:** Funding was released to the ALCs for projects for which they were OPR. The OPR determined the most appropriate contract vehicle, Design Engineering Program (DEP) contract or full and open competition, to accomplish the project.

(U) **E. Schedule Profile:**

	FY 1998				FY 1999				FY 2000				FY 2001			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) Aging Landing Gear Contract Award				X												
(U) Request For Proposal Release		X	X													
(U) Contract Awards			X	X												

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1999				
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0708026F Product/Reliable/Avail/Maintain Prog				PROJECT 4761			
(U) A. <u>Project Cost Breakdown (\$ in Thousands):</u>											
				<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>				
(U)	Corrosion Prediction Tools			4,894	0	0	0				
(U)	Structural Integrity Efforts			395	0	0	0				
(U)	Non Destructive Inspection Techniques			347	0	0	0				
(U)	Aging Landing Gear			3,756	0	0	0				
(U)	Total			9,392	0	0	0				
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands):</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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
Product Development Organizations											
Science Applic Intl Corp	FFP	Jun 98			0	1,967	0	0	0	0	1,940
Southwest Research	FFP	Sep 98			0	395	0	0	0	0	395
Natl Corrosion Indus	FFP	Jun 98			0	1,957	0	0	0	0	2,047
ARINC	FFP	Jun 98			0	970	0	0	0	0	970
General Atomics	FFP	Aug 98			0	3,556	0	0	0	0	3,556
Anal Svcs&Matl	FFP	Aug 98			0	347	0	0	0	0	347
Battelle	FFP	Aug 98			0	200	0	0	0	0	200
Total					N/A	9,392	0	0	0	0	9,392
Support and Management Organizations - Not Applicable.											
Project 4761				Page 10 of 11 Pages				Exhibit R-3 (PE 0708026F)			

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE	
										February 1999	
BUDGET ACTIVITY					PE NUMBER AND TITLE					PROJECT	
7 - Operational System Development					0708026F Product/Reliable/Avail/Maintain Prog					4761	
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Test and Evaluation Organizations - Not Applicable.											
Government Furnished Property: Not Applicable.											
Item Description	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Delivery Date		Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
<u>Product Development Property</u> - Not Applicable.											
<u>Support and Management Property</u> - Not Applicable.											
<u>Test and Evaluation Property</u> - Not Applicable.											
Subtotal Product Development					N/A	9,392	0	0	0	0	9,392
Subtotal Support and Management					N/A	0	0	0	0	0	0
Subtotal Test and Evaluation					N/A	0	0	0	0	0	0
Total Project					N/A	9,392	0	0	0	0	9,392

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0708071F Joint Logistics Program - Ammunition System				PROJECT 4679		
COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4679 Ammunition Management Standard System (AMSS)	8,342	16,021	11,333	11,338	11,437	11,559	11,800	12,046	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description
 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 Services' Configuration Management Team. 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.

(U) FY 1998 (\$ in Thousands):
 - (U) \$4,634 Software Development
 - (U) \$3,058 Support Contractors, Mission support, etc
 - (U) \$ 570 GFE/COTS
 - (U) \$ 80 GFE and COTS software update, debug, maintenance.
 - (U) \$8,342 Total

(U) FY 1999 (\$ in Thousands):
 - (U) \$ 10,785 Software Development
 - (U) \$ 3,998 Support Contractors, Mission support, etc
 - (U) \$ 289 GFE/COTS
 - (U) \$ 565 GFE and COTS software update, debug, maintenance.
 - (U) \$ 384 Identified as a source for SBIR.
 - (U) \$ 16,021 Total

Project 4679 Page 1 of 6 Pages Exhibit R-2 (PE 0708071F)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational System Development	0708071F Joint Logistics Program - Ammunition System	4679
<p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none">- (U) \$ 7,565 Software Development- (U) \$ 3,236 Support Contractors, Mission support, etc- (U) \$ 532 GFE and COTS software update, debug, maintenance- (U) \$11,333 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none">- (U) \$ 7,250 Software Development- (U) \$ 3,270 Support Contractors, Mission support, etc- (U) \$ 818 GFE and COTS software update, debug, maintenance- (U) \$11,338 Total		
Project 4679	Page 2 of 6 Pages	Exhibit R-2 (PE 0708071F)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)												DATE February 1999				
BUDGET ACTIVITY 7 - Operational System Development						PE NUMBER AND TITLE 0708071F Joint Logistics Program - Ammunition System						PROJECT 4679				
(U) F. <u>Schedule Profile</u>																
		<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>		
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) Phase One																
Preliminary Prototype Review		*														
Critical Design Review						X										
Development Test & Evaluation							X									
Full Scale Development Complete										X						
* - Denotes completed event.																
X - Denotes planned event.																
Project 4679				Page 4 of 6 Pages				Exhibit R-2 (PE 0708071F)								

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0708071F Joint Logistics Program - Ammunition System					PROJECT 4679	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U)	Software Development EDS				4,634	10,785	7,565	7,250			
(U)	Other Govt Costs				3,058	3,998	3,236	3,270			
(U)	Government Furnished Equipment (GFE)/COTS				570	289	-0-	-0-			
(U)	GFE and COTS software update, debug, maintenance				80	565	532	818			
(U)	Identified as a source for SBIR					384					
(U)	Total				8,342	16,021	11,333	11,338			
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR							\$384				
<u>Product Development Organization</u>											
EDS	Cost + Award Fee	7 Jul 97	\$24,254	\$33,506	\$8,522	\$4,634	\$10,785	\$7,565	-0-	-0-	31,506
Unknown	TBD	TBD		38,282	-0-	-0-	-0-	-0-	7,250	Cont.	Cont.
<u>Support and Management Organizations:</u>											
Innolog, KPMG, MITRE, MCR			14,786	14,786	2,829	1,958	1,753	1,273	1,302	Cont.	Cont.
SPO WPAFB			12,701	12,701	600	850	1,795	1,498	1,499	Cont.	Cont.
GFE and COTS software update, debug, maintenance.	TBD	TBD	4,990	4,990	-0-	80	565	532	818	Cont.	Cont.
Project 4679					Page 5 of 6 Pages			Exhibit R-3 (PE 0708071F)			

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 1999				
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0708071F Joint Logistics Program - Ammunition System				PROJECT 4679				
<u>Test and Evaluation Organizations:</u>												
Army OPTEC				2,146	2,146	53	150	250	265	269	Cont.	Cont.
IV&V				1,600	1,600	100	100	200	200	200	Cont.	Cont.
<u>Government Furnished Property:</u>												
<u>Product Development Property</u>												
COTS S/W and H/W	GSA Sc.	As Req'd	As Req'd			1,676	570	289	-0-	-0-	-0-	2,535
<u>Support and Management Property</u>												
COTS S/W	GSA Sch.	As Req'd	As Req'd			-0-	-0-	-0-	-0-	-0-	-0-	-0-
Hardware	GSA Sch.	As Req'd	As Req'd			-0-	-0-	-0-	-0-	-0-	-0-	-0-
<u>Test and Evaluation Property:</u> Shared with development resources												
Identified as a source for SBIR								384				
Subtotal Product Development						10,198	5,204	11,074	7,565	7,250	Cont.	Cont.
Subtotal Support and Management						3,429	2,888	4,113	3,303	3,619	Cont.	Cont.
Subtotal Test and Evaluation						153	250	450	465	469	Cont.	Cont.
Total Project						13,780	8,342	16,021	11,333	11,338	Cont.	Cont.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0708611F Support Systems Development (SSD)
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	5,792	22,856	22,383	30,917	31,412	30,415	31,049	31,696	Continuing	Continuing
3090 Embedded Computer Resources Support Improvement Program (ESIP)	1,651	2,328	2,384	2,373	3,391	3,447	3,519	3,592	Continuing	Continuing
3318 Product Data Systems Modernization (PDSM)	4,141	1,339	1,367	3,738	2,414	2,454	2,505	2,558	Continuing	Continuing
4654 Integrated Maintenance Data System (IMDS)*	0*	19,189	18,632	24,806	25,607	24,514	25,025	25,546	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

* IMDS FY 98 funds (\$19.660 million) reside within PE 0603108F. Beyond FY 98, all IMDS funds reside within PE 0708611F, project 4654.

(U) A. Mission Description

This program will develop and field 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. This enhanced decision support system will increase operational production capability and support system efficiency, while decreasing mobility infrastructure requirements and cost of operations. Other projects improve support of embedded computer system software, automate and standardize weapon system support processes, establish advanced support methodologies, provide automated tools and infrastructure environments, and improve readiness support to facilitate rapid software turnaround in response to changing mission and/or threat requirements. Efforts perform research and development to update Air Force digital data standards to commercial industry standards that support the Continuous Acquisition and Life-Cycle Support (CALS) concept. This program funds the Air Force support equipment (SE) management objective to develop, support, distribute, and maintain products that improve Air Force SE acquisition. It supports the Air Force Automatic Test Systems (ATS) Product Master Plan and Air Force ATS Database to identify and evaluate all Air Force ATS for both long and short-term planning.

(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 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0708611F Support Systems Development (SSD)
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(U) C. Program Change Summary (\$ in Thousands)

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U) Previous President's Budget FY 1999 PB	3,404	23,010	23,840	31,506	Continuing
(U) Appropriated Value	3,657	23,010			
(U) Adjustments to Appropriated Value					
a. Congressional/General Reductions	-168	-154			
b. SBIR	-66				
c. Omnibus or Other Above Threshold Reprogramming	-718				
d. Below Threshold Reprogramming	3,087				
(U) Adjustments to Budget Years Since FY 1999 PB			-1,457	-589	
(U) Current Budget Submit/FY 2000 PB	5,792	22,856	22,383	30,917	Continuing

(U) Significant Program Changes:

An additional \$3.087 million was added to project 3318 (PDSM) in FY98 for the Automated Document Conversion System (ADCS). \$648 thousand in FY99 funds identified as a source for SBIR.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0708611F Support Systems Development (SSD)	PROJECT 3090
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
3090 Embedded Computer Resources Support Improvement Program (ESIP)	1,651	2,328	2,384	2,373	3,391	3,447	3,519	3,592	Continuing	Continuing

(U) A. Mission Description

This project conducts research to improve support of embedded computer system software. 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 1998 (\$ in Thousands):

- (U) \$ 125 Advanced Avionics Verification and Validation (AAV&V)
- (U) \$ 15 Adaptive Software Flight Demonstration (ASFD)
- (U) \$ 275 Adaptive Software Technology Development (ASTD)
- (U) \$ 250 Automated Operational Flight Program (OFP) Validation (AutoVal)
- (U) \$ 15 Embedded Information Systems Re-engineering (EISR)
- (U) \$ 375 Reconfigurable Avionics Computer Emulator (RACE)
- (U) \$ 54 JAWS S3 Conference/Travel
- (U) \$ 542 Virtual Test Station (VTS)
- (U) \$ 1,651 Total

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

- (U) \$ 135 Adaptive Software Flight Demonstration (ASFD)
- (U) \$ 325 Adaptive Software Technology Development (ASTD)
- (U) \$ 225 Automated Operational Flight Program (OFP) Validation (AutoVal)
- (U) \$ 325 Embedded Information Systems Re-engineering (EISR)
- (U) \$ 325 Incremental Software Evolution for Real-Time (INSERT)
- (U) \$ 400 Reconfigurable Avionics Computer Emulator (RACE)
- (U) \$ 402 Virtual Test Station (VTS)
- (U) \$ 125 Weapon System Open Architecture Demonstration (WSOAD)
- (U) \$ 66 Identified as a source for SBIR
- (U) \$ 2,328 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)							DATE February 1999																						
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0708611F Support Systems Development (SSD)			PROJECT 3090																						
<p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 325 Adaptive Software Technology Development (ASTD) - (U) \$ 250 Automated Operational Flight Program (OFP) Validation (AutoVal) - (U) \$ 325 Incremental Software Evolution for Real-Time (INSERT) - (U) \$ 400 Reconfigurable Avionics Computer Emulator (RACE) - (U) \$ 634 Virtual Test Station (VTS) - (U) \$ 450 Weapon Systems Open Architecture (WSOA) - (U) \$ 2,384 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 375 Adaptive Software Technology Development (ASTD) - (U) \$ 400 Reconfigurable Avionics Computer Emulator (RACE) - (U) \$ 648 Virtual Test Station (VTS) - (U) \$ 950 Weapon Systems Open Architecture (WSOA) - (U) \$ 2,373 Total <p>(U) B. <u>Project Change Summary - Description of Significant Changes:</u> Not applicable.</p> <p>(U) C. <u>Other Program Funding Summary (\$ in Thousands):</u></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;"></th> <th style="text-align: center;"><u>FY 1998</u></th> <th style="text-align: center;"><u>FY 1999</u></th> <th style="text-align: center;"><u>FY 2000</u></th> <th style="text-align: center;"><u>FY 2001</u></th> <th style="text-align: center;"><u>FY 2002</u></th> <th style="text-align: center;"><u>FY 2003</u></th> <th style="text-align: center;"><u>FY 2004</u></th> <th style="text-align: center;"><u>FY 2005</u></th> <th style="text-align: center;"><u>To</u></th> <th style="text-align: center;"><u>Total</u></th> </tr> </thead> <tbody> <tr> <td>(U) Other Procurement AF, BA 3, P-1:55, ESIP</td> <td style="text-align: center;">1,898</td> <td style="text-align: center;">2,356</td> <td style="text-align: center;">2,251</td> <td style="text-align: center;">2,288</td> <td style="text-align: center;">2,341</td> <td style="text-align: center;">2,394</td> <td style="text-align: center;">2,445</td> <td style="text-align: center;">2,500</td> <td style="text-align: center;">Cont.</td> <td style="text-align: center;">Cont.</td> </tr> </tbody> </table> <p>(U) D. <u>Acquisition Strategy:</u> All major contracts are awarded after full and open competition.</p>									<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To</u>	<u>Total</u>	(U) Other Procurement AF, BA 3, P-1:55, ESIP	1,898	2,356	2,251	2,288	2,341	2,394	2,445	2,500	Cont.	Cont.
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To</u>	<u>Total</u>																			
(U) Other Procurement AF, BA 3, P-1:55, ESIP	1,898	2,356	2,251	2,288	2,341	2,394	2,445	2,500	Cont.	Cont.																			
Project 3090		Page 4 of 16 Pages			Exhibit R-2A (PE 0708611F)																								

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)														DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development							PE NUMBER AND TITLE 0708611F Support Systems Development (SSD)							PROJECT 3090		
(U) E. <u>Schedule Profile</u>																
		<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>		
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) Adaptive Software Flight Demonstration (ASFD)									X							
(U) Start Adaptive Software Technology (ASTD)		*														
(U) ASTD Demo										X				X		
(U) Start Automated OFP Validation (AutoVal)	*															
(U) AutoVal Demo												X				
(U) Start Incremental Software Evolution for Real-Time (INSERT)	*							X								
(U) INSERT Demo								X		X						
(U) Reconfigurable Avionics Computer Emulator (RACE)								X				X				X
(U) Virtual Test Station (VTS) upgrade	*					X										
(U) VTS Demonstrations								X		X				X		
(U) Weapon Systems Open Architecture (WSOA) Demonstration										X						X
(U) Embedded Information Systems Re-engineering (EISR) Demo								X								
* denotes completed event X denotes planned event																

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0708611F Support Systems Development (SSD)					PROJECT 3090	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U)	Adaptive Software Flight Demonstration (ASFD)				15	135	0	0			
(U)	Advanced Avionics Verification and Validation (AAV&V)				125	0	0	0			
(U)	Adaptive Software Technology Development (ASTD)				275	325	325	375			
(U)	Automated OFP Validation (AutoVal)				250	225	250	0			
(U)	Embedded Information Systems Re-engineering (EISR)				15	325	0	0			
(U)	Incremental Software Evolution for Real-Time (INSERT)				0	325	325	0			
(U)	Reconfigurable Avionics Computer Emulator (RACE)				375	400	400	400			
(U)	JAWS S3 Conference/Travel				54	0	0	0			
(U)	Virtual Test Station (VTS)				542	402	634	648			
(U)	Weapon Systems Open Architecture (WSOA)				0	125	450	950			
(U)	Identified as a source for SBIR					66					
(U)	Total				1,651	2,328	2,384	2,373			
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR							66				
<u>Product Development Organizations</u>											
SAIC	D.O.	Various	N/A	N/A	3,592	792	762	884	648	Continuing	Continuing
TASC	D.O.	Various	N/A	N/A	2,149	125	0	0	0	0	2,274
TRW	D.O.	Various	N/A	N/A	1,150	375	300	300	300	Continuing	Continuing
Boeing	D.O.	Various	N/A	N/A	5	153	338	663	1,187	Continuing	Continuing
Lockheed Martin	D.O.	Various	N/A	N/A	5	152	862	537	238	Continuing	Continuing
Other (JAWS VTC)						54					
Project 3090					Page 6 of 16 Pages			Exhibit R-3 (PE 0708611F)			

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0708611F Support Systems Development (SSD)					PROJECT 3090	
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
<u>Support and Management Organizations</u>											
OO-ALC	N/A	N/A	N/A	N/A	937	0	0	0	0	0	937
<u>Test and Evaluation Organizations</u>											
Not applicable.											
Government Furnished Property:											
Not applicable.											
Identified as a source for SBIR											
Subtotal Product Development					6,901	1,651	2,262	2,384	2,373	Continuing	Continuing
Subtotal Support and Management					937	0	0	0	0	0	937
Subtotal Test and Evaluation					0	0	0	0	0	0	0
Total Project					7,838	1,651	2,328	2,384	2,373	Continuing	Continuing

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0708611F Support Systems Development (SSD)	PROJECT 3318
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
3318 Product Data Systems Modernization (PDSM)	4,141	1,339	1,367	3,738	2,414	2,454	2,505	2,558	Continuing	Continuing

(U) A. Mission Description
 This project implements digital product data management within the Air Force Integrated Weapon System Management infrastructure and ensures uninterrupted transition of functional capabilities of legacy systems to the new joint systems.

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

- (U) \$ 178 Manage AF technical data activities
- (U) \$ 18 Plan/participate/activate/sustain JEDMICS
- (U) \$ 137 Develop and maintain digital data templates for new acquisition technical orders
- (U) \$ 185 Plan/participate in JCALS to ensure AF requirements are met
- (U) \$ 288 Activate AF JCALS sites to ensure timely and accurate data is available and useable
- (U) \$ 137 Test digital data specifications/standards and represent AF at international standards activities
- (U) \$ 45 Provide direct support to weapon systems, Logistics and Product Centers, and MAJCOMs
- (U) \$ 3,153 Continue Automated Document Conversion System (ADCS)
- (U) \$ 4,141 Total

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

- (U) \$ 224 Manage AF technical data activities
- (U) \$ 12 Sustain JEDMICS
- (U) \$ 174 Develop and maintain digital data templates for new acquisition technical orders
- (U) \$ 234 Plan/participate in JCALS to ensure AF requirements are met
- (U) \$ 432 Activate AF JCALS sites to ensure timely and accurate data is available and useable
- (U) \$ 174 Test digital data specifications/standards and represent AF at international standards activities
- (U) \$ 51 Provide direct support to weapon systems, Logistics and Product Centers, and MAJCOMs
- (U) \$ 38 Identified as a source for SBIR
- (U) \$ 1,339 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0708611F Support Systems Development (SSD)	PROJECT 3318
<p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (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) \$ 183 Test digital data specifications/standards and represent AF at international standards activities - (U) \$ 58 Provide direct support to weapon systems, Logistics and Product Centers, and MAJCOMs - (U) \$ 1,367 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (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) \$ 499 Test digital data specifications/standards and represent AF at international standards activities - (U) \$ 147 Provide direct support to weapon systems, Logistics and Product Centers, and MAJCOMs - (U) \$ 3,738 Total <p>(U) B. <u>Project Change Summary - Description of Significant Changes:</u> An additional \$3.087 million was added in FY98 for the Automated Document Conversion System (ADCS).</p> <p>(U) C. <u>Other Program Funding Summary (\$ in Thousands)</u> Not applicable</p> <p>(U) D. <u>Acquisition Strategy:</u> All major contracts are awarded after full and open competition.</p> <p>(U) E. <u>Schedule Profile</u> Not applicable. This is a support and management level of effort program. All activities are ongoing.</p>		
Project 3318	<i>Page 9 of 16 Pages</i>	Exhibit R-2A (PE 0708611F)

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)		DATE February 1999		
BUDGET ACTIVITY	PE NUMBER AND TITLE			PROJECT
7 - Operational System Development	0708611F Support Systems Development (SSD)			3318
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>				
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) Manage AF technical data activities.	178	224	234	643
(U) Plan/participate/activate JEDMICS sites.	18	12	18	33
(U) Test digital data specifications/standards and represent AF at international standards activities.	137	174	183	499
(U) Develop and maintain digital data templates for new acquisition technical orders	137	174	183	499
(U) Plan/participate in JCALS to ensure AF requirements and schedules are met.	185	234	245	673
(U) Activate AF JCALS sites to ensure timely and accurate data is available and useable.	288	432	446	1,244
(U) Provide direct support to weapon systems, Logistics and Product Centers, and Major Commands (MAJCOMs).	45	51	58	147
(U) Automated Document Conversion System (ADCS)	3,153	0	0	0
(U) Identified as a source for SBIR		38		
(U) Total	4,141	1,339	1,367	3,738

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0708611F Support Systems Development (SSD)					PROJECT 3318	
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performin g Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR							38				
<u>Product Development Organizations</u>											
Not applicable.											
<u>Support and Management Organizations</u>											
RJO	ECRC	Var	N/A	N/A	6,684	305	401	423	1,153	Continuing	Continuing
LOGTEC	GSA	Var	N/A	N/A	10,027	500	659	685	1,893	Continuing	Continuing
BTAS	8a	Var	N/A	N/A	0	183	241	259	692	Continuing	Continuing
Various (ADCS)	Var	Var	N/A	N/A	0	3,153	0	0	0	0	3,153
<u>Test and Evaluation Organizations</u>											
Not applicable.											
Government Furnished Property:											
Not applicable.											
Identified as a source for SBIR							38				
Subtotal Product Development					0	0	0	0	0	0	0
Subtotal Support and Management					16,711	4,141	1,301	1,367	3,738	Continuing	Continuing
Subtotal Test and Evaluation					0	0	0	0	0	0	0
Total Project					16,711	4,141	1,339	1,367	3,738	Continuing	Continuing
Project 3318											

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0708611F Support Systems Development (SSD)	PROJECT 4654
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4654 Integrated Maintenance Data System (IMDS)*	0*	19,189	18,632	24,806	25,607	24,514	25,025	25,546	Continuing	Continuing

* IMDS FY 98 funds (\$19.660 million) reside within PE 0603108F. Beyond FY 98, all IMDS funds reside within PE 0708611F, project 4654.

(U) A. Mission Description

The IMDS program is an evolutionary acquisition program developing and fielding an Air Force standard maintenance information system. This program element integrates information systems supporting Air Force maintenance activities into a single open architecture modern decision support system. This enhanced decision support system will increase operational production capability and support system efficiency, while decreasing mobility infrastructure requirements and cost of operations. The IMDS System will be integrated with Global Combat Support System-Air Force (GCSS-AF) Program. IMDS provides a single virtual data repository for access by all Air Force command levels. Full IMDS capability is reached through multiple increments of the application software, each increment building on the previous one. The first increment entered test at Eglin AFB July 97 after one year of development. The second increment was delivered in Jul 98. Operational Test and Evaluation is scheduled for Mar 00 with fielding as soon as Jul 00. Increments 1-3 establish core capabilities as the retail level. Increment 4 starts to incorporate wholesale-level functionality as well as continued expansion of retail capabilities.

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

* IMDS FY 98 funds (\$19.660 million) reside within PE 0603108F. Beyond FY 98, all IMDS funds within PE 0708611F, project 4654.

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

- (U) \$ 15,875 IMDS System Contract Increment 3 – Base level core capabilities, expanded interfaces, DT&E, OT&E, Limited User Field Test and Test Bed Activities.
- (U) \$ 1,180 IMDS System Contract Increment 4 – Requirements definition activities.
- (U) \$ 1,465 Support Contractors (MITRE, TECOLOTE, TEMS, ITSP).
- (U) \$ 125 SPO Operations.
- (U) \$ 544 Identified as a source for SBIR
- (U) \$ 19,189 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE February 1999																						
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0708611F Support Systems Development (SSD)	PROJECT 4654																						
<p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 16,174 IMDS System Contract Increment 4 – PMEL/Base-Level AMMO migrated to IMDS. - (U) \$ 1,023 IMDS System Contract Increment 5 – Requirements definition activities. - (U) \$ 1,306 Support Contractors (MITRE, TECOLOTE). - (U) \$ 129 SPO Operations. - (U) \$ 18,632 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$ 22,298 IMDS System Contract Increment 5 – Selected Depot Maintenance Systems migrated to IMDS. - (U) \$ 1,086 IMDS System Contract Increment 6 – Requirements definition activities. - (U) \$ 1,272 Support Contractors (MITRE, TECOLOTE). - (U) \$ 150 SPO Operations. - (U) \$ 24,806 Total <p>(U) B. <u>Project Change Summary - Description of Significant Changes:</u> Not applicable.</p> <p>(U) C. <u>Other Program Funding Summary (\$ in Thousands):</u></p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 70%;"></th> <th style="text-align: center;"><u>FY 1998</u></th> <th style="text-align: center;"><u>FY 1999</u></th> <th style="text-align: center;"><u>FY 2000</u></th> <th style="text-align: center;"><u>FY 2001</u></th> <th style="text-align: center;"><u>FY 2002</u></th> <th style="text-align: center;"><u>FY 2003</u></th> <th style="text-align: center;"><u>FY 2004</u></th> <th style="text-align: center;"><u>FY 2005</u></th> <th style="text-align: center;"><u>To</u></th> <th style="text-align: center;"><u>Total</u></th> </tr> </thead> <tbody> <tr> <td>(U) Other Procurement AF, BA 3. P-1:55. IMDS (PE 0708611F).</td> <td style="text-align: center;">1,299</td> <td style="text-align: center;">956</td> <td style="text-align: center;">2,681</td> <td style="text-align: center;">2,646</td> <td style="text-align: center;">2,646</td> <td style="text-align: center;">2,605</td> <td style="text-align: center;">2,660</td> <td style="text-align: center;">2,720</td> <td style="text-align: center;"><u>Compl</u> Cont.</td> <td style="text-align: center;"><u>Cost</u> Cont.</td> </tr> </tbody> </table> <p>(U) D. <u>Acquisition Strategy:</u> All major contracts are awarded after full and open competition.</p>				<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To</u>	<u>Total</u>	(U) Other Procurement AF, BA 3. P-1:55. IMDS (PE 0708611F).	1,299	956	2,681	2,646	2,646	2,605	2,660	2,720	<u>Compl</u> Cont.	<u>Cost</u> Cont.
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To</u>	<u>Total</u>														
(U) Other Procurement AF, BA 3. P-1:55. IMDS (PE 0708611F).	1,299	956	2,681	2,646	2,646	2,605	2,660	2,720	<u>Compl</u> Cont.	<u>Cost</u> Cont.														
Project 4654	Page 13 of 16 Pages	Exhibit R-2A (PE 0708611F)																						

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0708611F Support Systems Development (SSD)	PROJECT 4654
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(U) **E. Schedule Profile**

	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) IMDS Beta Support (Increment 1)	*															
(U) Development (Increment 2)			*													
(U) IMDS Beta Support (Increment 2)				*												
(U) Beta Support Completed					*											
(U) Increment 3 Requirement								X								
Definition/Design																
(U) Development of IMDS core capability										X						
(U) OT&E Core (Increments 1, 2, & 3)											X					
(U) Fielding of Core System												X				
(U) Development of Increment 4														X		
* denotes completed event																
X denotes planned event																

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0708611F Support Systems Development (SSD)					PROJECT 4654	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1998*</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U)	IMDS System Contract				0	0	0	0			
	Increment 3				0	15,875	0	0			
	Increment 4				0	1,180	16,174	0			
	Increment 5				0	0	1,023	22,298			
	Increment 6				0	0	0	1,086			
(U)	Operations				0	0	0	0			
	Support Contractors (MITRE, Engineering Technical Support; TECOLOTE, Program Cost Analysis)				0	1,465	1,306	1,272			
	SPO Operations				0	125	129	150			
(U)	Identified as a source for SBIR					544					
(U)	Total				0	19,189	18,632	24,806			
* IMDS FY 98 funds (\$19.660 million) reside within PE 0603108F. Beyond FY 98, all IMDS funds reside within PE 0708611F, project 4654.											
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
Performing Organizations:											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998*	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR							544				
<u>Product Development Organizations</u>											
Andersen Consulting	CPAF	19 Jul 96	N/A	N/A	22,106	0	17,055	17,197	23,384	Cont	Cont
Various/Proof of Concepts/Prototypes	N/A	N/A	N/A	N/A	7,079	0	0	0	0	0	7,079

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999		
BUDGET ACTIVITY					PE NUMBER AND TITLE					PROJECT		
7 - Operational System Development					0708611F Support Systems Development (SSD)					4654		
<u>Support and Management Organizations</u>												
MITRE	N/A	Var	N/A	N/A	3,715	0	1,065	949	925	Cont	Cont	
TECOLOTE	N/A	Var	N/A	N/A	303	0	400	357	347	Cont	Cont	
TEMS	N/A	Var	N/A	N/A	4,111	0	0	0	0	0	4,111	
ESC/SSG	N/A	N/A	N/A	N/A	2,258	0	125	129	150	Cont	Cont	
<u>Test and Evaluation Organizations</u>												
Not applicable.												
Government Furnished Property:												
Not applicable.												
Identified as a source for SBIR												
							544					
Subtotal Product Development					29,185	0	17,055	17,197	23,384	Cont	Cont	
Subtotal Support and Management					10,387	0	1,590	1,435	1,422	Cont	Cont	
Subtotal Test and Evaluation					0	0	0	0	0	0	0	
Total Project					39,572	0	19,189	18,632	24,806	Cont	Cont	
* IMDS FY 98 funds (\$19.660 million) reside within PE 0603108F. Prior to and following FY 98, all IMDS funds reside within PE 0708611F, project 4654.												

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0901218F Civilian Compensation Program	PROJECT 4139
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4139 Security Require Determination	6,497	6,737	6,973	7,210	7,019	7,149	7,306	7,467	0	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

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.

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

- (U) \$6,497 Required to continue a program to compensate employees assigned to RDT&E facilities for worked-related injury or disease
- (U) \$6,497 Total

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

- (U) \$6,737 Required to continue a program to compensate employees assigned to RDT&E facilities for worked-related injury or disease
- (U) \$6,737 Total

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

- (U) \$6,973 Required to continue a program to compensate employees assigned to RDT&E facilities for worked-related injury or disease
- (U) \$6,973 Total

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

- (U) \$7,210 Required to continue a program to compensate employees assigned to RDT&E facilities for worked-related injury or disease
- (U) \$7,210 Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE February 1999				
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0901218F Civilian Compensation Program				PROJECT 4139			
(U) B. <u>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.											
(U) C. <u>Program Change Summary (\$ in Thousands)</u>											
		<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total</u>					
						<u>Cost</u>					
(U)	Previous President's Budget	6,285	6,756	6,973	7,210	TBD					
(U)	Appropriated Value	6,497	6,756								
(U)	Adjustments to Appropriated Value										
	a. Cong Gen Reductions	-212	-19								
	b. SBIR										
	c. Omnibus or Other Above Threshold Reprogram										
	d. Below Threshold Reprogramming	+212									
(U)	Adjustments to Budget Years Since FY 1998 PB										
(U)	Current Budget Submit/ FY 2000 PB	6,497	6,737	6,973	7,210	TBD					
(U)	Significant Program Changes: Not Applicable										
(U) D. <u>Other Program Funding Summary (\$ in Thousands)</u>											
		<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To</u>	<u>Total</u>
										<u>Compl</u>	<u>Cost</u>
(U)	Operation and Maintenance	21,562	22,355	22,679	23,528	25,245	25,759	26,789	27,860	0	TBD
(U) E. <u>Acquisition Strategy:</u>											
	N/A										
(U) F. <u>Schedule Profile:</u>											
	N/A										
Project 4139			Page 2 of 2 Pages				Exhibit R-2 (PE 0901218F)				

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 1001018F NATO JSTARS	PROJECT 0002
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COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
0002 NATO JSTARS	16,923	0	0	0	0	0	0	0	0	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	TBD

(U) A. Mission Description

NATO initiated the Alliance Ground Surveillance (AGS) program to provide NATO commanders near-real time surveillance and targeting information on moving and stationary ground targets (growth to maritime operations), slow moving rotary and fixed wing aircraft, and rotating antennas from airborne platforms. The US proposed it's 707 based JSTARS aircraft in a 'Fast Track' offer to meet the NATO AGS requirement. The November 1997 Conference of National Armaments Director's (CNAD) meeting rejected all offers, including 'Fast Track'. The CNAD then tasked the Provisional Project Structure (PPS) to search for 'fresh options' and acquisition options, giving due consideration to an air segment composed of NATO owned and operated capabilities and interoperable national assets; and a NATO-owned open architecture ground segment. During the December 1997 Steering Committee (SC) meeting the US proposed an AGS system based on it's advanced radar sensor (JSTARS Radar Technology Insertion Program (RTIP)) integrated onto an air platform of NATO's choice. The April 1998 CNAD endorsed the PPS's recommendation for conducting a Concept Definition Study lead by the Provisional Project Office (PPO). The Purpose of the study is to develop the information required by the CNAD for determining an approach to pursue a NATO owned and operated core AGS capability. The PPO will present findings of the Concept Definition Study during the May 1999 CNAD meeting. In support of the PPO led Concept Definition Study, the US is leading the air segment portion based on the US advanced radar sensor during the FY98/99 timeframe.

An evaluation of the tasks required to support the Government's ongoing efforts resulted in a contract change proposal to the NATO Phase IV Study, extending the period of performance through 30 September 1998, in lieu of January 1998. This contract change was necessary to continue our support of the PPO during the Concept Definition Study as well as continuation of NATO Consultation Command and Control Agency (NC3A) activities. A Phase V effort will be added 1 October 1998 to carry this tasking through the Spring 1999 CNAD.

(U) FY 1998 (\$ in Thousands)

- (U) \$ 2,786 NATO Studies
- (U) \$ 100 Provisional Project Office
- (U) \$ 2,037 Other Government Cost (ESC/JPO Support)
- (U) \$12,000 Above Threshold Reprogramming Source
- (U) **\$16,923 Total**

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)					DATE February 1999																																																																		
BUDGET ACTIVITY 7 - Operational System Development			PE NUMBER AND TITLE 1001018F NATO JSTARS		PROJECT 0002																																																																		
<p>(U) <u>FY 1999</u> (\$ in Thousands) - (U) \$0 Total (Note: Requirements are dependent upon a CNAD decision in May 1999)</p> <p>(U) <u>FY2000</u> - (U) \$0 Total (Note: Requirements are dependent upon results of a CNAD decision in May 1999)</p> <p>(U) <u>FY2001</u> - (U) \$0 Total (Note: Requirements are dependent upon results of a CNAD decision in May 1999)</p> <p>(U) B. <u>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) C. <u>Program Change Summary (\$ in Thousands)</u></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:40%;"></th> <th style="text-align: center;"><u>FY 1998</u></th> <th style="text-align: center;"><u>FY 1999</u></th> <th style="text-align: center;"><u>FY 2000</u></th> <th style="text-align: center;"><u>FY 2001</u></th> <th style="text-align: center;"><u>Total Cost</u></th> </tr> </thead> <tbody> <tr> <td>(U) FY 1999 President's Budget</td> <td style="text-align: right;">24,091</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: right;">26,061</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> <td></td> </tr> <tr> <td> a. Cong Gen Reductions</td> <td style="text-align: right;">-1,355</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> b. SBIR</td> <td style="text-align: right;">-619</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> c. Omnibus or Other Above Threshold Reprogram</td> <td style="text-align: right;">-164</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> d. Below Threshold Reprogramming</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> e. Rescissions</td> <td style="text-align: right;">-7,000</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Adjustments to Budget Years Since FY 1999 PB</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Current Budget Submit/FY 2000 PB</td> <td style="text-align: right;">16,923</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> </tbody> </table> <p>* A Below Threshold Reprogramming is expected to add 2,700 to FY99. Note: FY00 and out year requirements are dependent upon the CNAD decision in May 1999</p> <p>(U) Significant Program Changes: N/A</p>							<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>	(U) FY 1999 President's Budget	24,091	0*	0	0	TBD	(U) Appropriated Value	26,061					(U) Adjustments to Appropriated Value						a. Cong Gen Reductions	-1,355					b. SBIR	-619					c. Omnibus or Other Above Threshold Reprogram	-164					d. Below Threshold Reprogramming						e. Rescissions	-7,000					(U) Adjustments to Budget Years Since FY 1999 PB						(U) Current Budget Submit/FY 2000 PB	16,923	0	0	0	TBD
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>																																																																		
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Project 0002		Page 2 of 6 Pages		Exhibit R-2 (PE 1001018F)																																																																			

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 1001018F NATO JSTARS	PROJECT 0002
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(U) D. Other Program Funding Summary (\$ in Thousands)

Not Applicable

(U) E. Acquisition Strategy -The U.S. and other NATO nations are participating in a NATO AGS Provisional Project Office (PPO) led Concept Definition Study, giving due consideration to an air segment made up of both NATO-owned and national assets, and a NATO-owned ground segment. The results of the Concept Definition Study will be submitted to the May 1999 CNAD.

(U) F. Schedule Profile

	FY 1998			FY 1999			FY 2000			FY 2001		
	1	2	3	4	1	2	3	4	1	2	3	4
(U) Completion of Phase IV				*								
(U) Phase V Contract Award					*							
(U) CNAD Decision							X					

Legend:

- * - Denotes Completed Event
- X- Denotes Planned Event

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 1001018F NATO JSTARS	PROJECT 0002
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(U) A. Project Cost Breakdown (\$ in Thousands)

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) NATO Studies	2,786	0*	0	0
(U) Provisional Project Office (PPO)	100	0	0	0
(U) Other Government Costs	2,037	0	0	0
(U) Above Threshold Reprogramming Source	12,000			
(U) Total	16,923	0	0	0

* A Below Threshold Reprogramming is expected to add 2,700 to FY99.
 NOTE: FY99 and out year requirements are dependent upon the CNAD decision in May 1999.

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE	
BUDGET ACTIVITY 7 - Operational System Development										PROJECT 0002	
PE NUMBER AND TITLE 1001018F NATO JSTARS											
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)											
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 1998</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
Above Threshold Reprog. Source					0	12,000	0	0	0	0	12,000
<u>Product Development Organizations</u>											
Northrop Grumman	IDIQ	Apr 96	2,478	2,478	2,478	0	0	0	0	0	2,478
Rome Labs	Fixed Price	Sep 96	485	485	485	0	0	0	0	0	485
Northrop Grumman	IDIQ	Jan 97	3,992	3,992	3,992	0	0	0	0	0	3,992
Northrop Grumman	IDIQ	Jan 98	1,371	1,371	0	1,371	0	0	0	0	1,371
Northrop Grumman	IDIQ	Oct 98	1,415	1,415	0	1,415	0	0	0	0	1,415
<u>Support and Management Organizations</u>											
ESC (Provisional Project Office)			100	100	0	100	0	0	0	0	100
MITRE	Cost Plus Award Fee	Oct 94/ Jun 96			674	785	0	0	0	0	1,459
TEMS	IDIQ	Mar - May 96			683	1,082	0	0	0	0	1,765
Miscellaneous	Various Contracts		796	796	626	170	0	0	0	0	796
<u>Test and Evaluation Organizations</u> - N/A											
Government Furnished Property: None											
Project 0002											

UNCLASSIFIED

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)						DATE February 1999	
BUDGET ACTIVITY			PE NUMBER AND TITLE			PROJECT	
7 - Operational System Development			1001018F NATO JSTARS			0002	
	Total						
	Prior to	Budget	Budget	Budget	Budget	Budget to	Total
	<u>FY 1998</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
Above Threshold Reprogramming Source	0	12,000	0	0	0	0	12,000
Subtotal Product Development	6,955	2,786	0	0	0	0	9,741
Subtotal Support and Management	1,983	2,137	0	0	0	0	4,120
Subtotal Test and Evaluation	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<u>Total Project</u>	8,938	16,923	0	0	0	0	25,861



DEPARTMENT OF THE AIR FORCE

HEADQUARTERS AIR FORCE MATERIEL COMMAND
WRIGHT-PATTERSON AIR FORCE BASE OHIO

19 JAN 1999

MEMORANDUM FOR SAF/FMBIM

FROM: HQ AFMC/CEP
4225 Logistics Avenue, Room A-127
Wright-Patterson AFB OH 45433-5745

SUBJECT: Update to the FY 2000-2001 RDT&E Construction Program Budget Estimate (BES) Submission

1. We reviewed our initial FY 2000-2001 BES, 8 Sep 98, and have no changes to our previous submittal.

2. In accordance with Air Force Instruction (AFI) 65-601, Volume 1, Chapter 13, we are resubmitting for your review, Air Staff coordination, and congressional notification the AFMC FY 2000-2001 RDT&E Construction Program and changes to the FY99 President's Budget Investment Call.

<u>FY</u>	<u>Project #</u>	<u>Title</u>	<u>PE</u>	<u>(\$000)</u>	<u>Remarks</u>
1999	FSPM981305	Airborne Laser Complex Upgrade	6.33.19F	6,845	Moved from FY98
1999		Minor Construction	6.58.07F	350	New Start

<u>FY</u>	<u>Project #</u>	<u>Title</u>	<u>PE</u>	<u>(\$000)</u>	<u>Remarks</u>
2000		Minor Construction	6.27.02F	636	
2000		Minor Construction	6.58.07F	525.5	

<u>FY</u>	<u>Project #</u>	<u>Title</u>	<u>PE</u>	<u>(\$000)</u>	<u>Remarks</u>
2001		Minor Construction	6.27.02F	350	
2001		Minor Construction	6.58.07F	820	

Each of the projects has been reviewed and we find that they meet the RDT&E funding criteria as outlined in AFI 65-601. The RDT&E (Appn 3600) Minor Construction (MC) requirements are listed by Program Element (PE) but are line item listed by base on the attached DD Form 1391s.

2. Our point of contact for this effort is Mr. Art Rosenfelder, HQ AFMC/CEPD, DSN 787-7610.



THOMAS M. GRIFFITH, Colonel, USAF
Chief, Programs and Operations Division
Directorate of the Command Civil Engineer

Attachments:

1. DD Form 1391, FSPM981305
2. DD Forms 1391, Misc Minor Construction

cc:

HQ USAF/ILEC
HQ AFMC/FMA/DRS/DOR
HQ AFRL/DS

1. COMPONENT AIR FORCE		FY 1999 RDT&E FACILITY 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) 6,845.0		
9. COST ESTIMATES					
ITEM		U/M	QUANTITY	UNIT COST	COST (\$000)
AIRBORNE LASER COMPLEX UPGRADE					5,123.8
CONSTRUCT PAD PRESSURE RECOVERY SYSTEM		LS			(1,537.1)
INTERIOR SUPPORT AREA		LS			(768.6)
UPGRADE SYSTEM INTEGRATION LAB		LS			(2,818.1)
SUPPORTING FACILITIES					748.0
CONSTRUCT FUEL FARM		LS			(107.0)
CONSTRUCT NEUTRALIZATION SUBSYSTEMS		LS			(641.0)
SUBTOTAL					5,871.8
CONTINGENCY (10%)					587.2
TOTAL CONTRACT COST					6,459.0
SUPERVISION, INSPECTION AND OVERHEAD (6%)					387.5
TOTAL FUNDED COST					6,845.0
10. Description of Proposed Construction: Modify existing Birk Flight Test Facility (Bldg 151 and associated areas) and install necessary R&D equipment. Modifications include constructing concrete pad for pressure recovery system, upgrade Bldg 151 for installation of a system integration laboratory, other Bldg. 151 mods, construct a laser fuel farm, and a neutralization subsystem. All work required for a complete 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 which 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 and can accommodate the Boeing 747 400F. Modifications,					

1. COMPONENT AIR FORCE	FY 1999 RDT&E FACILITY 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	

however, are needed to support the weapon element of the PDRR ABL. No pad exists to mount a pressure recovery system designed to simulate PDRR ABL operating altitudes. Other Building 151 facility modifications are required to accommodate the uniqueness of testing and operating a high energy laser system. As an example, minor power and HVAC upgrades may be needed to support laboratory equipment in the system integration laboratory. Not having a laser fuel farm or a neutralization subsystem, areas will be prepared to construct a fuel farm and install equipment. A neutralization pond does not exist and may be required to handle expended chemicals from laser operations.

IMPACT IF NOT PROVIDED: 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. The program is currently on track to demonstrate lethality against boosting Theater Ballistic Missiles in the year 2003.

ADDITIONAL: 10 USC 2353 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. There is no criteria to scope for this project in Part II of Military Handbook 1190, "Facility Planning and Design Guide" and in AFH 32-1084, "Facility Requirements."

1. COMPONENT AIR FORCE (AFMC)		FY 1999 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 FY1999: Construct Joint Strike Force Harrier Pit		LS			350.0
10. DESCRIPTION OF PROPOSED WORK: Construct in-ground concrete test pit					
11. REQUIREMENT: As required.					
PROJECT: Construct Joint Strike Force Harrier Pit					
REQUIREMENT: A Harrier type pit 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.					
CURRENT SITUATION: There is no facility available to support this test requirement.					
IMPACT IF NOT PROVIDED: Lack of this mission critical capability will impede the successful testing of this state-of-the-art aircraft.					

1. COMPONENT AIR FORCE (AFMC)	FY 2000 MILITARY CONSTRUCTION PROJECT DATA (computer generated)	2. DATE
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3. INSTALLATION AND LOCATION ROME LAB, NEW YORK	4. PROJECT TITLE Minor Construction < \$1,000,000
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5. PROGRAM ELEMENT 62702F	6. CATEGORY CODE 610-281	7. PROJECT NUMBER ULDF93002P2	8. PROJECT COST (\$000) 636.0
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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			636.0

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.

11. REQUIREMENT:

PROJECT: Upgrade Research Engineering Area, Bldg 106

REQUIREMENT: Rome Research Site facilities require modern laboratory and professional office facilities to accomplish its mission.

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.

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

1. COMPONENT AIR FORCE (AFMC)		FY 2000 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
Multi Axis Thrust Stand (MATS) Pad 17				SF	8,000	
Supporting Facilities						423.0
Utilities				LS		(141.0)
Pavements				LS		(141.0)
Site Improvements				LS		(141.0)
Subtotal						423.0
Contingency (10%)						<u>42.3</u>
Total Contract Cost						465.3
Supervision, Inspection, and Overhead						<u>30.2</u>
Total Funded Cost						495.5
<p>10. DESCRIPTION OF PROPOSED WORK: Unspecified Minor Construction (13.15.4). Construct a stand for the Multi Axis Thrust Stand at Pad 17. Reinforce concrete, 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.</p>						
<p>11. REQUIREMENT: As required.</p> <p>PROJECT: Construct MATS at Pad 17</p> <p>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.</p> <p>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.</p> <p>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.</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	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						
11. REQUIREMENT:						
PROJECT: Commercial Water Connection						
REQUIREMENT: Provide reliable water source to test facility to support fire protection for high value equipment.						
CURRENT SITUATION: Test Facility is currently fed by a small 3/4 inch line from an existing well and has no fire protection.						
IMPACT IF NOT PROVIDED: Potential loss of high value equipment due to fire.						

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 < \$1,000,000			
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	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: 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
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3. INSTALLATION AND LOCATION EGLIN AIR FORCE BASE, FLORIDA	4. PROJECT TITLE Minor Construction < \$500,000
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5. PROGRAM ELEMENT 65807F	6. CATEGORY CODE Multi	7. PROJECT NUMBER Multi	8. PROJECT COST (\$000) 820.0
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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:

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.

COMBATING TERRORISM RESOURCES

Research, Development, Test and Evaluation, AF	FY97	FY98	FY99	FY00	FY01	FY02	FY03	FY04	FY05
BA: 5 - Engineering and Manufacturing Development PE: 0604617 Agile Combat Support	2.8	1.2	2.4	0.9	0.7	0	0	0	0
BA: 7 - Operational System Development PE: 0305128F Security & Investigative Activities	0	3.3	1.4	0.5	0.4	0.4	0.4	0.4	0.5
TOTAL COMPONENT	3.0	4.5	3.8	1.4	1.1	0.4	0.4	0.4	0.5