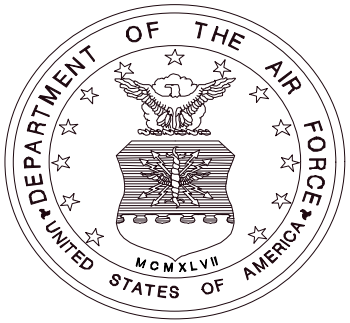
UNCLASSIFIED

DEPARTMENT OF THE AIR FORCE

FISCAL YEAR 2000/2001 BIENNIAL BUDGET ESTIMATES

RESEARCH, DEVELOPMENT, TEST AND EVALUATION

DESCRIPTIVE SUMMARIES



FEBRUARY 1999

VOLUME II

UNCLASSIFIED

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.

PROGRAM ELEMENT COMPARISON SUMMARY

INTRODUCTION AND EXPLANATION OF CONTENTS

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

PROGRAM ELEMENT COMPARISON SUMMARY

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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. Spectal sensing work in PE 0603605F, Project 3150 realigns to Project 3784. Launch vehicle technology realigns form 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

PROGRAM ELEMENT COMPARISON SUMMARY

INTRODUCTION AND EXPLANATION OF CONTENTS

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

PROGRAM ELEMENT COMPARISON SUMMARY

INTRODUCTION AND EXPLANATION OF CONTENTS

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

PROGRAM ELEMENT COMPARISON SUMMARY

INTRODUCTION AND EXPLANATION OF CONTENTS

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 0305144Fbeginning 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.

PROGRAM ELEMENT COMPARISON SUMMARY

INTRODUCTION AND EXPLANATION OF CONTENTS

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

DATE: **February 1999**

BUDGET ACTIVITY: **4 - Demonstration and Validation**

PE NUMBER AND TITLE: **0603260F Intelligence Advanced Development**

	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	4,298	4,602	4,534	4,442	4,493	4,584	4,680	4,777	Continuing	TBD
3479	Advanced Sensor Exploitation	806	819	803	786	823	823	841	857	Continuing	TBD
3480	Automated Imagery Exploitation	1,142	1,323	1,297	1,268	1,324	1,323	1,351	1,379	Continuing	TBD
3481	Knowledge Based Tech For Intelligence	1,234	1,342	1,324	1,299	1,355	1,364	1,392	1,422	Continuing	TBD
3482	Science & Tech Intelligence Methodology	1,116	1,118	1,110	1,089	991	1,074	1,096	1,119	Continuing	TBD
	Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

(U) Intelligence Advanced Development (IAD) demonstrates and validates advanced technology required to support warfighter needs for timely all source intelligence information. IAD research supports global awareness, consistent battlespace knowledge, precision information, and the execution of time critical missions. IAD projects provide better on-time information to the warfighter using new and existing data sources, streamline data analysis, reduce footprint required, extend life of sensors in place and enhance performance. Air Force Research Lab Rome Research Site (AFRL/IFE) works directly with users, employing a rapid prototyping evolutionary approach, integrating finished modules directly into the field. The programs are oriented toward specific shortfalls and deficiencies as documented by the major commands (MAJCOMS), unified commands, and intelligence organizations in their mission and function area plans. The goal of this program is to expedite technology transition from the laboratory to operational use via rapid prototyping. This is the only AF program focused on technology insertion to correct AF intelligence deficiencies at tactical or operation levels. This program bridges the transition of Advance Technology Demonstrations (ATDs) and supports Defense Technology Objectives (DTOs).

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603260F Intelligence Advanced Development

(U) B. Budget Activity Justification

The program is in Demonstration and Validation, Budget Activity 4, because it demonstrates and validates advanced technology which enhances information / intelligence systems capabilities and techniques**.**

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY99)	4,489	4,615	4,615	4,525	TBD
(U) Appropriated Value	4,738	4,615			
(U) Adjustments to Appropriated Value					
a. Cong Reductions	-156	-13			
b. Small Business Innovative Research	-93				
c. Omnibus and other Above Threshold Reprogrammings	-31				
d. BTR	-160				
(U) Adjustments to Budget Year Since 1999 PB			-81	-83	
(U) Current Budget Submit/FY2000 PB	4,298	4,602	4,534	4,442	TBD

(U) Significant Program Changes:

FY99: $125 identified as a source for SBIR

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603260F Intelligence Advanced Development
	PROJECT 3479

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
3479 Advanced Sensor Exploitation	806	819	803	786	823	823	841	857	Continuing	TBD

(U) A. Mission Description

(U) The project objectives are to develop, demonstrate and evaluate a near-real-time all source correlation/fusion capability by applying state-of-the-art data processing techniques for the receipt, correlation, templating and analysis of battlefield information. Capabilities will be developed in open systems architecture environment allowing for the greatest efficiency in terms of integrating or interfacing with other systems. There is an Air Force, DoD and Coalition need to correlate various sources of intelligence information (Communications Intelligence - COMINT, Electronic Intelligence - ELINT, Image Intelligence - IMINT) within seconds as opposed to hours with current manual methods. Project includes development of data correlation and predictive intelligence algorithms, target analysis and prioritization, air order of battle updates and tactical analysis techniques. This computerized approach will speed up the correlation of data from diverse sources of intelligence information, including COMINT, ELINT, and IMINT; providing faster situational awareness and threat assessment and replace manual systems with automated capabilities.

(U) FY 1998 ($ in Thousands):
- (U) $ 400 Continued Consistent Operational Picture Via Distributed Fusion for Global Awareness.
- (U) $ 200 Continued Enhanced Analytical Tools to Support Dynamic Situation Awareness.
- (U) $ 206 Initiated Predictive Fusion Algorithms to Support Dynamic Planning and Execution.
- (U) $ 806 Total

(U) FY 1999 ($ in Thousands):
- (U) $ 392 Continue Consistent Operational Picture Via Distributed Fusion for Global Awareness.
- (U) $ 192 Continue Enhanced Analytical Tools to Support Dynamic Situation Awareness.
- (U) $ 213 Continue Predictive Fusion Algorithms to Support Dynamic Planning and Execution.
- (U) $ 22 Identified as a source for SBIR
- (U) $ 819 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603260F Intelligence Advanced Development
	PROJECT 3479

(U) FY 2000 ($ in Thousands):
- (U) $ 212 Complete Consistent Operational Picture Via Distributed Fusion for Global Awareness.
- (U) $ 196 Complete Enhanced Analytical Tools to Support Dynamic Situation Awareness.
- (U) $ 395 Continue Predictive Fusion Algorithms to Support Dynamic Planning and Execution.
- (U) $ 803 Total

(U) FY 2001 ($ in Thousands):
- (U) $ 396 Complete Predictive Fusion Algorithms to Support Dynamic Planning and Execution.
- (U) $ 195 Initiate Data Fusion Architecture for Global Awareness.
- (U) $ 195 Initiate Dynamic Situational Analysis in support of Dynamic Planning and Execution.
- (U) $ 786 Total

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

(U) Not Applicable

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

(U) Not Applicable

(U) RELATED ACTIVITIES:

62720F C3I Exploratory Development: information exploitation (imagery/video/text), multi-sensor collaboration, global information base.
63789F C3 Advanced Technology Development: correlation, fusion algorithms, visualization.
63726F C3 Subsystem Integration: advanced information applications, advanced memory technology.
64750F Intelligence Equipment: modeling and simulation, foreign threat assessment.
31335F Intelligence Data Handling: enhances DoD Intelligence Information Systems (DoDIIS).

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603260F Intelligence Advanced Development
	PROJECT 3479

(U) D. Acquisition Strategy:

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

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) Predictive Fusion Algorithms Initiated				*												
(U) Consistent Operational Picture, Via Distributed Fusion Complete										X						
(U) Enhanced Analytical Tools Complete											X					
(U) Predictive Fusion Algorithms Complete														X		
(U) Data Fusion Architecture Initiated															X	
(U) Dynamic Situational Analysis Initiated																X

* - Denotes completed event
X - Denotes planned event

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603260F Intelligence Advanced Development
	PROJECT 3479

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Consistent Operational Picture via Distributed Fusion	400	392	212	
(U) Enhanced Analytical Tools	200	192	196	
(U) Predictive Fusion Algorithms	206	213	395	396
(U) Data Fusion Architecture				195
(U) Dynamic Situational Analysis				195
(U) Identified as a source for SBIR		22		
(U) Total	806	819	803	786

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)											DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation					PE NUMBER AND TITLE 0603260F Intelligence Advanced Development						PROJECT 3479

(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								22			
Product Development Organizations											
Electic Computing Concepts 96-C-0045	CPFF	Jan 97	N/A	N/A	350	400	392	212	0	Cont.	TBD
BTG, Inc 97-C-0341	CPFF	Aug 97	N/A	N/A	100	200	192	196	0	Cont.	TBD
BTG, Inc 97-C-0341	CPFF	Jul 98	N/A	N/A	0	206	213	395	396	Cont.	TBD
Contractor TBD	TBD	TBD	TBD	TBD	0	0	0	0	195	Cont.	TBD
Contractor TBD	TBD	TBD	TBD	TBD	0	0	0	0	195	Cont.	TBD
Support and Management Organizations - N/A											
Test and Evaluation Organizations - N/A											
Government Furnished Property: N/A											
Identified as a source for SBIR								22			
Subtotal Product Development					450	806	797	803	786	TBD	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					450	806	819	803	786	TBD	TBD

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603260F Intelligence Advanced Development
	PROJECT 3480

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
3480 Automated Imagery Exploitation	1,142	1,323	1,297	1,268	1,324	1,323	1,351	1,379	Continuing	TBD

(U) A. Mission Description

(U) This project demonstrates and validates the capability to more accurately and quickly interpret digital imagery and video by evaluating computer assisted techniques to manipulate and overlay imagery, cartographic data, signal intelligence (SIGINT), and on line intelligence data. The result of this effort will be more precise target locations and identifications, precise target reference scenes, and more accurate damage assessments; all developed for easy supportability on low cost commercially available computer workstations.

(U) FY 1998 ($ in Thousands):
- (U) $ 353 Continued Multi-Processor development for Automated Image Exploitation
- (U) $ 219 Initiated Speech Technology for Image Exploitation.
- (U) $ 219 Initiated Techniques for Secure Image Information Dissemination.
- (U) $ 351 Initiated Distributed Imagery Information Systems Integration in support of Information Superiority.
- (U) $1,142 Total

(U) FY 1999 ($ in Thousands):
- (U) $ 390 Complete Multi-Processor developmentfor Automated Image Exploitation.
- (U) $ 317 Complete Speech Technology for Image Exploitation.
- (U) $ 290 Continue Techniques for Secure Image Information Dissemination.
- (U) $ 290 Continue Distributed Imagery Information Systems Integration in support of Information Superiority.
- (U) $ 36 Identified as a source for SBIR
- (U) $1,323 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603260F Intelligence Advanced Development
PROJECT 3480	

(U) FY 2000 ($ in Thousands):

- (U) $ 432 Continue Distributed Imagery Information Systems Integration in support of Information Superiority.
- (U) $ 433 Continue Techniques for Secure Image Information Dissemination.
- (U) $ 432 Initiate Multi-Spectral / Hyper-Spectral Image Exploitation Applications.
- (U) $1,297 Total

(U) FY 2001 ($ in Thousands):

- (U) $ 484 Complete Distributed Imagery Information Systems Integration in support of Information Superiority.
- (U) $ 392 Complete Techniques for Secure Image Information Dissemination.
- (U) $ 392 Continue Multi-Spectral / Hyper-Spectral Image Exploitation Applications.
- (U) $1,268 Total

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

(U) Not Applicable

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

(U) Not Applicable

(U) RELATED ACTIVITIES:

62720F C3I Exploratory Development: information exploitation (imagery / video / text), multi-sensor collaboration, global information base.
63789F C3 Advanced Technology Development: correlation, fusion algorithms, visualization.
63726F C3 Subsystem Integration: advanced imagery/information applications, advanced memory technology.
64750F Intelligence Equipment: modeling and simulation, foreign threat assessment.
31335F Intelligence Data Handling: enhances DoD Intelligence Information Systems (DoDIIS).

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603260F Intelligence Advanced Development
	PROJECT 3480

(U) D. Acquisition Strategy:

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

(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) Speech Technology for Image Exploitation Initiated		*														
(U) Techniques for Secure Image Information Dissemination Initiated			*													
(U) Distributed Imagery Information System Integration Initiated				*												
(U) Multi Processors for Automated Image Exploitation Complete							X									
(U) Speech Technology for Image Exploitation Complete								X								
(U) Multi Spectral / Hyper Spectral Image Applications Initiated									X							
(U) Distributed Imagery Information System Integration Complete															X	
(U) Techniques for Secure Image Information Processing Complete																X

* - Denotes completed event
X - Denotes planned event

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603260F Intelligence Advanced Development
	PROJECT 3480

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Multi Processor for Automated Image Exploitation	353	390		
(U) Speech Technology for Image Exploitation	219	317		
(U) Secure Image Information Dissemination	219	290	432	392
(U) Distributed Imagery Information System Integration	351	290	433	484
(U) Multi Spectral / Hyper Spectral Image Applications			432	392
(U) Identified as a source for SBIR		36		
(U) Total	1,142	1,323	1,297	1,268

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603260F Intelligence Advanced Development
	PROJECT 3480

(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 source for SBIR								36			
Product Development Organizations											
Nichols Research 96-C-0083	CPFF	May 96	N/A	N/A	0	353	390	0	0	Cont.	TBD
State University of New York at Binghamton 97-C-0105	CPFF	Jun 96	N/A	N/A	0	219	290	432	392	Cont.	TBD
ITT Systems (MIPRed out)	CPFF	Feb 98	N/A	N/A	0	219	317	0	0	Cont.	TBD
PAR, Inc. 98-C-0166	CPFF	Jun 98	N/A	N/A	0	351	290	433	484	Cont.	TBD
TBD	TBD	TBD	N/A	N/A	0	0	0	432	392	Cont.	TBD

Support and Management Organizations - N/A

Test and Evaluation Organizations - N/A

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603260F Intelligence Advanced Development
	PROJECT 3480

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

Government Furnished Property: N/A

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
Identified as a source for SBIR						36				
Subtotal Product Development					1,142	1,287	1,297	1,268	TBD	TBD
Subtotal Support and Management					0	0	0	0	0	0
Subtotal Test and Evaluation					0	0	0	0	0	0
Total Project					1,142	1,323	1,297	1,268	TBD	TBD

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603260F Intelligence Advanced Development
	PROJECT 3481

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
3481 Knowledge Based Tech For Intelligence	1,234	1,342	1,324	1,299	1,355	1,364	1,392	1,422	Continuing	TBD

(U) A. Mission Description

(U) This project will improve Global Awareness, Dynamic Planning and Execution, providing knowledge bases and inference engines to exploit collected data to nine major commands on AF intelligence organizations. The development of the analytical aids is based on artificial intelligence techniques. The increased timeliness, efficiency and effectiveness derived will provide warning time and accuracy, allowing national/military authorities a greater range of options to avert, diminish or control a crisis.

(U) FY 1998 ($ in Thousands):
- (U) $ 353 Continued Enhancing Intelligence Analysts Productivity at AIA.
- (U) $ 381 Continued Machine Learning Prototype, expert system and neural network technologies to support real-time analysis of timelines.
- (U) $ 371 Continued Multimedia for Information Access for analysts at AIA and users of Imagery.
- (U) $ 129 Continued Intelligence Application Browser Interfaces for analysts at ACC and AIA.
- (U) $1,234 Total

(U) FY 1999 ($ in Thousands):
- (U) $ 290 Complete Enhancing Intelligence Analysts Productivity at AIA.
- (U) $ 320 Continue Machine Learning Prototype, expert system and neural network technologies to support real-time analysis of timelines.
- (U) $ 353 Continue Multimedia for Information Access for warfighters and analysts at AIA and users of Imagery.
- (U) $ 342 Continue Intelligence Application Browser Interfaces for warfighters and analysts at ACC and AIA.
- (U) $ 37 Identified as a source for SBIR
- (U) $1,342 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY: 4 - Demonstration and Validation	PE NUMBER AND TITLE: 0603260F Intelligence Advanced Development — PROJECT: 3481

(U) FY 2000 ($ in Thousands):
- (U) $ 492 Complete Machine Learning Prototype, expert system and neural network technologies to support real-time analysis of timelines.
- (U) $ 492 Continue Multimedia for Information Access for analysts at AIA and users of Imagery.
- (U) $ 340 Continue Intelligence Application Browser Interfaces for warfighters and analysts at ACC and AIA.
- (U) $1,324 Total

(U) FY 2001 ($ in Thousands):
- (U) $ 492 Complete Multimedia for Information Access for analysts at AIA and users of Imagery.
- (U) $ 492 Continue Intelligence Application Browser Interfaces for warfighters and analysts at ACC and AIA.
- (U) $ 315 Initiate Secure Information Delivery by developing a Broadsword trusted transfer agent.
- (U) $1,299 Total

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

(U) Not Applicable

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

(U) Not Applicable

(U) RELATED ACTIVITIES:

62720F C3I Exploratory Development: information exploitation (imagery/video/text), multi-sensor collaboration, global information base.
63789F C3 Advanced Technology Development: correlation, fusion algorithms, visualization.
63726F C3 Subsystem Integration: advanced information technology, advanced memory technology.
64750F Intelligence Equipment: modeling and simulation, foreign threat assessment.
31335F Intelligence Data Handling: enhances DoD Intelligence Information Systems (DoDIIS).

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603260F Intelligence Advanced Development
	PROJECT 3481

(U) D. Acquisition Strategy:

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

(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) Enhancing Intelligence Analysts Productivity Complete								X								
(U) Machine Learning Prototype Complete												X				
(U) Multimedia Information Access Complete															X	
(U) Secure Information Delivery Initiated																X

* - Denotes completed event
X - Denotes planned event

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603260F Intelligence Advanced Development
	PROJECT 3481

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Enhancing Intelligence Analysts Productivity	353	290		
(U) Machine Learning Prototype	381	320	492	
(U) Multimedia for Information Access	371	353	492	492
(U) Intelligence Applications Browser Interfaces	129	342	340	492
(U) Secure Information Delivery				315
(U) Identified as a source for SBIR		37		
(U) Total	1,234	1,342	1,324	1,299

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603260F Intelligence Advanced Development							PROJECT 3481

(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							37				
Product Development Organizations											
GTE											
96-C-0085	CPFF	May 96	N/A	N/A	200	381	320	492		Cont.	TBD
Booz Allen											
96-C-0092	CPFF	Jun 96	N/A	N/A	58	353	290			Cont.	TBD
Kaman Science											
97-C-0053	CPFF	May 96	N/A	N/A	0	371	353	492	492	Cont.	TBD
Synectics Corp											
97-C-0073	CPFF	Jul 96	N/A	N/A	0	129	342	340	492	Cont.	TBD
Contractor TBD	TBD	TBD	N/A	N/A	0	0	0	0	315	Cont.	TBD
Support and Management Organizations - N/A											
Test and Evaluation Organizations - N/A											
Government Furnished Property: N/A											
Identified as a source for SBIR							37				
Subtotal Product Development					258	1,234	1,305	1,324	1,299	TBD	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					258	1,234	1,342	1,324	1,299	TBD	TBD

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603260F Intelligence Advanced Development
	PROJECT 3482

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
3482 Science & Tech Intelligence Methodology	1,116	1,118	1,110	1,089	991	1,074	1,096	1,119	Continuing	TBD

(U) A. Mission Description

(U) Demonstrates and validates intelligence methodologies and techniques for operational employment of simulation models in support of Air Intelligence Agency (AIA) requirements. The methods and techniques will help AIA improve their analysis of current and future foreign weapon systems, and prevent technological surprises with regard to the capabilities of these systems.

(U) FY 1998 ($ in Thousands):
- (U) $ 400 Continued Applied Deception Techniques for Manipulative Deception of Foreign Signal Collection Systems
- (U) $ 400 Continued Intelligence Analyst Associate (Build 2) for Automated Information Extraction
- (U) $ 316 Initiated Reentry Vehicle Algorithm Enhancements for NAIC.
- (U) $1,116 Total

(U) FY 1999 ($ in Thousands):
- (U) $ 389 Complete Applied Deception Techniques for Manipulative Deception of Foreign Signal Collection Systems
- (U) $ 389 Continue Intelligence Analyst Associate (Build 2) for Automated Information Extraction
- (U) $ 310 Continue Reentry Vehicle Algorithm Enhancements for NAIC
- (U) $ 30 Identified as a source for SBIR
- (U) $ 1,118 Total

(U) FY 2000 ($ in Thousands):
- (U) $ 393 Continue Intelligence Analyst Associate (Build 2) for Automated Information Extraction.
- (U) $ 393 Continue Reentry Vehicle Algorithm Enhancements for NAIC.
- (U) $ 324 Initiate Decision Support System utilizing natural language understanding (data extraction) and data visualization for NAIC.
- (U) $1,110 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603260F Intelligence Advanced Development
	PROJECT 3482

(U) FY 2001 ($ in Thousands):

- (U) $ 393 Complete Intelligence Analyst Associate (Build 2) for Automated Information Extraction.
- (U) $ 393 Continue Reentry Vehicle Algorithm Enhancements for NAIC.
- (U) $ 303 Continue Decision Support System utilizing natural language understanding (data extraction) and data visualization for NAIC in support of warfighters.
- (U) $1,089 Total

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

(U) Not Applicable

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

(U) Not Applicable

(U) RELATED ACTIVITIES:

62720F C3I Exploratory Development: information exploitation(image/video/text), multi-sensor collaboration, global information base.
63789F C3 Advanced Technology Development: correlation, fusion algorithms, visualization.
63726F C3 Subsystem Integration: advanced information technology, advanced memory technology.
64750F Intelligence Equipment: modeling and simulation, foreign threat assessment.
31335F Intelligence Data Handling: enhances DoD Intelligence Information Systems (DoDIIS).

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603260F Intelligence Advanced Development
	PROJECT 3482

(U) D. Acquisition Strategy:

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

(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) Re-entry Vehicle Algorithm Enhancement Initiated				*												
(U) Applied Deception Techniques Complete								X								
(U) Decision Support Associate System Initiated												X				
(U) Intel Analyst Associate (Build 2) Complete																X

* - Denotes completed event
X - Denotes planned event

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603260F Intelligence Advanced Development
	PROJECT 3482

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Applied Deception Techniques	400	389		
(U) Intelligence Analysts Associate (Build 2)	400	389	393	393
(U) Reentry Vehicle Algorithm Enhancement	316	310	393	393
(U) Decision Support System			324	303
(U) Identified as a source for SBIR		30		
(U) Total	1,116	1,118	1,110	1,089

(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								30			
Product Development Organizations											
Calspan											
96-C-0108	CPFF	Sep 96	N/A	N/A	87	400	389	393	393	Cont.	TBD
E-Systems											
96-C-0194	CPFF	Sep 96	N/A	N/A	19	400	389	0	0	Cont.	TBD
Calspan											
96-C-0108	CPFF	Jul 98	N/A	N/A	0	316	310	393	393	Cont.	TBD
Contractor TBD	TBD	TBD	N/A	N/A	0	0	0	324	303	Cont.	TBD
Support and Management Organizations - N/A											

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)											DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603260F Intelligence Advanced Development							PROJECT 3482
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 - N/A											
Government Furnished Property: N/A											
Identified as a source for SBIR							30				
Subtotal Product Development					106	1,116	1,088	1,110	1,089	TBD	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					106	1,116	1,118	1,110	1,089	TBD	TBD

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

DATE: February 1999

BUDGET ACTIVITY: 4 - Demonstration and Validation

PE NUMBER AND TITLE: 0603319F Airborne Laser Program

PROJECT: 4269

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
4269 Airborne Laser	153,539	265,679	308,634	241,057	214,661	176,297	171,326	0	0	1,630,738*
Quantity of RDT&E Articles	1**	0	0	0	1**	0	0	0	0	2**

* The Total Cost reflects cost for Concept Design and Program Definition and Risk Reduction (PDRR) only and contains $99.545M in funds prior to FY 1998.
** This Qty is for the acquisition of commercial 747-400F freighter aircraft. These aircraft are incrementally funded beginning in the years identified.

(U) A. Mission Description:

The Airborne Laser (ABL) Program is an Acquisition Category 1D (ACAT 1D) program which will design, build and test a laser weapon system to acquire, track and kill Theater Ballistic Missiles (TBMs) in the boost phase. This weapon system integrates three major subsystems (Laser, Beam Control and Battle Management Command, Control, Communications, Computers and Intelligence (BMC4I)) into a modified commercial Boeing 747-400F aircraft. It also includes ABL-specific ground support. The program awarded the ABL PDRR contract to the Boeing/TRW/Lockheed-Martin team in November 1996, to design, fabricate, integrate, and test the half-power ABL system. An Authority-to-Proceed (ATP-1) decision point was successfully attained in FY98. The PDRR phase culminates in lethality (missile shoot-down) demonstrations against boosting TBM representative targets in FY 2003. The PDRR phase will integrate and test all key technologies needed for a fully operational system, allowing the Air Force to advance into EMD in FY 2004.

(U) FY 1998 ($ in Thousands):

- (U) $111,558 Continued Boeing/TRW/Lockheed-Martin PDRR contract effort for design, fabrication, integration, and test the ABL weapon system
- (U) $26,000 PDRR commercial aircraft payments
- (U) $4,581 Continued support for special studies, simulations and analyses, technical support, risk management, and an independent review team specializing in lasers, aircraft, and aircraft integration
- (U) $11,400 Continued support for atmospheric characterization tests, labor, training, Integrated Product Team (IPT) participation, and other government agencies
- (U) $153,539 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603319F Airborne Laser Program
	PROJECT 4269

(U) FY 1999 ($ in Thousands):

–	(U)	$197,727	Continue Boeing/TRW/Lockheed-Martin PDRR contract effort for design, fabrication, integration, and test the ABL weapon system, including mods to Birk facility at Edwards AFB, CA
–	(U)	$34,700	PDRR commercial aircraft payments
–	(U)	$4,310	Continue support for special studies, simulations and analyses, technical support, risk management, and an independent review team specializing in lasers, aircraft, and aircraft integration
–	(U)	$20,600	Continue support for atmospheric characterization tests (North Oscura Peak (NOP), star scintillometer) labor, training, Integrated Product Team (IPT) participation, and other government agencies; continue Government oversight of Contractor mods to Birk facility.
–	(U)	8,342	Identified as a source for SBIR
–	(U)	$265,679	Total

(U) FY 2000 ($ in Thousands):

–	(U)	$202,770	Continue Boeing/TRW/Lockheed-Martin PDRR contract effort for design, fabrication, integration, and test the ABL weapon system, including mods to Birk facility at Edwards AFB, CA
–	(U)	$83,800	Final PDRR commercial aircraft payment (aircraft delivery)
–	(U)	$3,465	Continue support for special studies, simulations and analyses, technical support, risk management, and an independent review team specializing in lasers, aircraft, and aircraft integration
–	(U)	$18,599	Continue support for labor, training, IPT participation, and other government agencies; continue Government oversight of Contractor mods to Birk facility, conduct overseas star scintillometer campaign
–	(U)	$308,634	Total

(U) FY 2001 ($ in Thousands):

–	(U)	$211,418	Continue Boeing/TRW/Lockheed-Martin PDRR contract effort for design, fabrication, integration, and test the ABL weapon system, including mods to Birk facility at Edwards AFB, CA
–	(U)	$3,505	Continue support for special studies, simulations and analyses, technical support, risk management, and an independent review team specializing in lasers, aircraft, and aircraft integration
–	(U)	$26,134	Continue support for labor, training, IPT participation, and other government agencies; continue Government oversight of Contractor mods to Birk facility.
–	(U)	$241,057	Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603319F Airborne Laser Program
	PROJECT 4269

(U) B. Budget Activity Justification

This program is in budget activity 4 (BAC-4) - Demonstration and Validation; ABL is a major defense acquisition program which was authorized to enter PDRR at the Milestone I, November 1996.

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY 1999 PB)	151,439	292,219	314,242	150,739	1,336,718
(U) Appropriated Value	157,136	267,219			
(U) Adjustments to Appropriated Value					
a. Congressional/General Reductions	-5,697	-1,540			
b. SBIR					
c. Omnibus or Other Above Threshold Reprogram					
d. Below Threshold Reprogramming	2,100				
(U) Adjustments to Budget Years Since FY 1999 PB			-5,608	90,318	
(U) Current Budget Submit/FY 2000 PB	153,539	265,679	308,634	241,057	1,630,738

(U) Significant Program Changes: FY 99 Congressional action reduced program funding by $25M in FY 99 and induced AF to add content for risk mitigation. This required a major program restructure, including renegotiation of existing contract. Restructure is still in progress and on-track for completion in Apr 99. Most program milestones moved one year, with associated funding adjustments in both RDT&E and procurement. Lethality demonstration slipped from FY02 to FY03, IOC from FY06 to FY07, and FOC from FY08 to FY09. The resultant program includes additional risk reduction efforts, increases to the test program, and incorporates lessons learned from laser testing. $8,342,000 in FY99 identified as a source for SBIR.

	DATE
	February 1999
BUDGET ACTIVITY **4 - Demonstration and Validation**	PE NUMBER AND TITLE **0603319F Airborne Laser Program**

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

(U) RELATED ACTIVITIES:

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost
RDT&E:										
(U) PE 0604350F Airborne Laser EMD*	0	0	0	0	0	0	242,466	419,942	420,800	1,083,208
Aircraft Procurement, AF (PE 0207150F):										
- P-1 Line Item ABL Adv Proc	0	0	0	0	0	0	0	134,168	417,498	551,666
- P-1 Line Item ABL Procurement	0	0	0	0	0	0	0	0	3,036,202	3,036,202
MILCON:										
(U) PE 0207150F Airborne Laser	0	0	0	0	0	0	0	59,758	52,627	112,385
Quantity**	0	0	0	0	0	0	0	0	7	7

NOTE - PE 0603605F, Advanced Weapons - supports ABL by developing technologies for potential performance enhancements above current requirements identified in ABL Operational Requirements Document (ORD).

***** Total Cost amount for EMD has decreased from the FY99 PB value by $25.935M due to combined effects of revised OSD inflation indices and the one year slip to the program resulting from the restructure.

** Quantity refers to production representative articles and includes retrofit of PDRR and EMD prototype ABLs to operational configuration

(U) E. Acquisition Strategy:

Milestone (MS) I decision was November 1996 authorizing entry into PDRR; MS II for EMD in FY 2004; MS III decision for Production in FY 2006. The PDRR program is structured to demonstrate technical risk reduction achievements at key junctures throughout the PDRR phase. The Air Force established reviews of the program at two key points: Authority-to-Proceed I and II (ATP-1 and ATP-2, respectively) during PDRR to ensure planned progress is attained. ABL successfully completed ATP-1 on 26 Jun 98. ATP-2 is now scheduled for September 2002. PDRR culminates in lethality (missile shoot-down) demonstrations against boosting theater ballistic missiles in FY 2003. RDT&E test articles will be refurbished to production representative articles using Procurement funds beginning in FY06.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE
	February 1999

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
4 - Demonstration and Validation	0603319F Airborne Laser Program	4269

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603319F Airborne Laser Program
	PROJECT 4269

(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) Milestone I (FY 1997)																
(U) Order PDRR "Green" Aircraft		*														
(U) Flight-weighted Laser Module Demo			*													
(U) Preliminary Design Review			*													
(U) Authority to Proceed (ATP) - 1			*													
(U) Beam Control Processor Demo					*											
(U) North Oscura Peak Tests							X		X							
(U) Star Scintillometer Tests							X									
(U) Star Scint Tests In Theater (FY 2000)									**TBD**							
(U) "Green" Aircraft Delivery										X						
(U) Critical Design Review											X					
(U) Laser Module Airworthiness Demo												X				
(U) Aircraft Modifications Complete															X	
(U) Turret Window Fabrication Complete															X	
(U) Systems Integration Lab Handover																X
(U) ATP-2 (FY 2002)																
(U) Lethality Demonstration (FY 2003)																
(U) Milestone II (FY 2004)																
(U) Milestone III (FY 2006)																
(U) IOC (FY 2007)																
(U) FOC (FY 2009)																

* = Completed event
X = Planned event

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603319F Airborne Laser Program
	PROJECT 4269

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Major Contracts (PDRR contract and Concept Design)	137,558	232,427	286,570	211,418
(U) Support Contracts (Technical Support, Analysis)	4,581	4,310	3,465	3,505
(U) Test/Other Government/Misc Support/Salaries/IPTs	11,400	20,600	18,599	26,134
(U) Identified as a source for SBIR		8,342		
(U) Total	153,539	265,679	308,634	241,057

(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 8,342							8,342				
Product Development Organizations											
Boeing Defense & Space Group Seattle, WA	CPAF	12 Nov 96	1,303,982*	1,373,046**	32,523	137,558	232,427	286,570	211,418	472,550	1,373,046
Concept Design Contract (Rockwell International, CA)	CPFF	9 May 94	22,071	22,071	22,071	0	0	0	0	0	22,071

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)											DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603319F Airborne Laser Program							PROJECT 4269
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
Concept Design Contract (Boeing Defense & Space Group, WA)	CPFF	9 May 94	21,689	21,689	21,689	0	0	0	0	0	21,689
Support and Management Organizations											
Technical Support Contracts	Various	Varies	N/A	N/A	10,884	4,581	4,310	3,465	3,505	11,838	38,583
Government In-House and Other External Support	Various	Varies	N/A	N/A	12,234	10,465	18,004	14,306	20,887	64,430	140,326
Test and Evaluation Organizations											
Air Force Flight Test Center (AFFTC) ***	MIPR	Varies	N/A	N/A	144	935	2,596	4,293	5,247	13,466	26,681

Government Furnished Property: The government is providing miscellaneous support equipment during the test phase of the PDRR program. In addition, the government is also providing hardware items to facilitate Infrared Search and Track (IRST) tests. The costs of these two categories of GFP fall below the $1M reporting threshold. In addition, targets for the PDRR test program will be provided as GFP. These targets will be called out separately when they become part of the GFP list on contract.

* The change to the Performing Activity EAC is the result of adding a year to the program in conjunction with the contract restructure.

** Project Office EAC includes program funds budgeted for risk mitigation identified during source selection and the program restructure.

***AFFTC is the single face to the customer for Test and Evaluation. AFFTC receives funding from the Program Office and controls the distribution of these funds within AFFTC, the White Sands Missile Range (WSMR) and the Western Test Range (WTR).

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)		DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603319F Airborne Laser Program	PROJECT 4269

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

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
Identified as a source for SBIR						8,342				8,342
Subtotal Product Development				76,283	137,558	232,427	286,570	211,418	472,550	1,416,806
Subtotal Support and Management				23,118	15,046	22,314	17,771	24,392	76,268	178,909
Subtotal Test and Evaluation				144	935	2,596	4,293	5,247	13,466	26,681
Total Project				99,545	153,539	265,679	308,634	241,057	562,284	1,630,738

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

DATE: **February 1999**

BUDGET ACTIVITY: **4 - Demonstration and Validation**

PE NUMBER AND TITLE: **0603430F Advanced EHF MILSATCOM**

PROJECT: **4050**

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
4050 Advanced MILSATCOM	37,249	54,150	97,066	248,587	524,223	474,549	263,868	175,716	273,000	2,231,640
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

Develop and acquire Advanced Extremely High Frequency (EHF) Military Satellite Communications (MILSATCOM) satellites and cryptography with necessary modifications to the mission control segment for survivable, jam-resistant, worldwide, secure communications for the strategic and tactical warfighter. Advanced EHF (AEHF) satellites will replenish the existing EHF system (Milstar) with additional capability and decreased launch costs. The program is utilizing as much commercial technology as possible and will ensure technology development sufficient for a medium launch vehicle-class satellite. The Advanced EHF capability will be available for first launch in 2006. Activities funded under this program element implement the Secretary of Defense's 1993 MILSATCOM Bottom Up Review decision to field a lower cost, advanced MILSATCOM satellite as a replenishment to Milstar. The DoD Space Architect in 1996 and OSD-led MILSATCOM Transition Team in 1997 reviewed the options for future EHF service and concluded this program is the best solution for those requirements. The Advanced EHF program implements the architecture defined by the DoD Space Architect and directed by the Joint Space Management Board and will address requirements in the MILSATCOM Capstone Requirements Document (24 Apr 98) and the Operational Requirements Document.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603430F Advanced EHF MILSATCOM
	PROJECT 4050

(U) FY 1998

- (U)$ 1,342 Continued Advanced EHF technology validation
- (U)$ 35,745 Continued processing Subsystem Engineering Model Program
- (U)$ 162 Advanced EHF (AEHF) Program Office Support activities
- (U)$ 37,249 Total

(U) FY 1999

- (U)$ 1,761 Continue Advanced EHF technology validation
- (U)$ 50,794 Continue processing Subsystem Engineering Model Program
- (U)$ 538 Continue AEHF Program Office Support
- (U)$ 1,057 Identified as source for SBIR
- (U)$ 54,150 Total

(U) FY 2000

- (U)$ 922 Continue Advanced EHF technology validation
- (U)$ 31,000 Complete Processing Subsystem Engineering Model Program
- (U)$ 34,290 Begin System Definition
- (U)$ 22,400 Satellite Cryptographic Development
- (U)$ 4,954 Continue AEHF Program Office Support Activities
- (U)$ 3,500 Joint Terminal Engineering Office (JTEO) Support
- (U)$ 97,066 Total

U) FY 2001

- (U)$ 11,050 Complete System Definition
- (U)$ 192,237 Begin EMD
- (U)$ 18,300 Continue Satellite Cryptographic Development
- (U)$ 23,500 Program Office Support - Continue AEHF Support, and Transition Overall MILSATCOM Joint Program Office Support from Milstar PE
- (U)$ 3,500 JTEO Support
- (U)$ 248,587 Total

(U) B. Budget Activity Justification

This program is in Budget Activity 4, Research Category Demonstration and Validation, since it funds Advanced EHF technology validation and modeling.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY: 4 - Demonstration and Validation	PE NUMBER AND TITLE: 0603430F Advanced EHF MILSATCOM / PROJECT: 4050

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total
(U) President's Budget (FY 1999PB)	38,307	54,413	52,326	234,315	4,024,943
(U) Appropriated Value	41,000	54,413			
(U) Adjustments to Appropriated Value					
a. Congressional General Reductions	-2,693	-263			
b. SBIR					
c. Omnibus and Other Above Threshold Reprogram	-254				
d. Below Threshold Reprogram	-804				
(U) Adjustments to Budget Years Since FY 1999 PB			34,740	14,272	
(U) Current Budget Submit/FY 2000 PB	37,249	54,150	97,066	248,587	2,231,640

(U) Significant Program Changes: FY00 and FY01 funding increases maintain FY06 first launch
Outyear funding realigned to finance satellite 3 and beyond in the procurement appropriation.
FY99: $1,057 identified as source for SBIR

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

Other Appropriations

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
(U) Missile Procurement	0	0	0	0	20,000	380,000	365,000	375,000	720,000	1,860,000

(U) Related RDT&E:
(U) PE 0604479F, Milstar LDR/MDR Satellite Communications
(U) PE 0604577N, EHF Satellite Communications
(U) PE 0603432F, Polar Satellite Communications Program (Polar Adjunct)
(U) PE 0303601F, MILSATCOM Terminals

(U) E. Aquisition Strategy: The Advanced MILSATCOM strategy is a competitive acquisition between two contractors for System Definition. One contractor will be selected to perform Engineering and Manufacturing Development and fabrication of five satellites. Advanced MILSATCOM will incorporate improvements from Milstar and commercial SATCOM practices into the next generation EHF military communication satellite system.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603430F Advanced EHF MILSATCOM
	PROJECT 4050

(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) Technology Project Awards/Renewals		*														
(U) Processing Subsystem Eng Model Completion												X				
(U) System Definition Contract Award									X							
(U) Milestone I DAB						X										
(U) Milestone II - DAB									X							
(U) EMD Contract Award															X	
(U) (First Launch - FY06)																

* = Completed Event
X = Planned Event

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

DATE: February 1999

BUDGET ACTIVITY: 4 - Demonstration and Validation

PE NUMBER AND TITLE: 0603430F Advanced EHF MILSATCOM

PROJECT: 4050

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) MILSATCOM Technology Validation Program	1,342	1,761	922	0
(U) Processing Subsystem Engineering Model	35,745	50,794	31,000	0
(U) Program Office Support	162	538	4,954	23,500
(U) System Definition	0	0	34,290	11,050
(U) Cryptographic Development			22,400	18,300
(U) Satellite EMD	0	0	0	192,237
(U) Joint Terminal Engineering Office (JTEO)	0	0	3,500	3,500
(U) Identified as source for SBIR		1,057		
(U) Total	37,249	54,150	97,066	248,587

(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
Product Development Organizations											
Identified as a source for SBIR 1,057							1,057				
NSA	MIPR	Dec 99	55,200	55,200	0	0	0	22,400	18,300	0	40,700
JTEO	PR	Continuing	95,644	95,644	2,000	0	0	3,500	3,500	86,645	95,645
MIT/LL	MIPR	Feb 95	11,110	11,110	7,085	1,342	1,761	922	0	0	11,110
Hughes	CPFF	May 97	66,851	66,851	8,100	17,292	25,746	16,523	0	0	67,661
TRW	CPFF	May 97	60,862	60,862	7,000	15,151	25,048	14,477	0	0	61,676
Various	Various	95-01	N/A	N/A	56,717	3,302		0	0	0	60,019
TBD	TBD	Oct FY00	TBD	TBD	0	0	0	34,290	11,050	0	45,340
TBD*	TBD	Apr FY01	TBD	TBD	0	0	0	0	192,237	1,498,665	1,690,902

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 4 - Demonstration and Validation					PE NUMBER AND TITLE 0603430F Advanced EHF MILSATCOM						PROJECT 4050

*3020 Funds are not included. The 3020 funding is found in Section D- Other Program Funding Summary

Support and Management Organizations											
Various	Various	2Q95	N/A	N/A	2,330	162	538	4,954	23,500	126,046	157,530

Government Furnished Property:
None

	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			1,057				1,057
Subtotal Product Development	80,902	37,087	52,555	92,112	225,087	1,585,310	2,073,053
Subtotal Support and Management	2,330	162	538	4,954	23,500	126,046	157,530
Subtotal Test and Evaluation	0	0	0	0	0	TBD	TBD
Total Project	83,232	37,249	54,150	97,066	248,587	1,711,356	2,231640

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

DATE: February 1999

BUDGET ACTIVITY: 4 - Demonstration and Validation

PE NUMBER AND TITLE: 0603432F Polar MILSATCOM (Space)

PROJECT: 4052

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
4052 Polar Satellite Communications	14,415	41,367	39,678	26,300	13,033	8,708	3,420	3,416	0	223,794
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

The program will provide protected communications services to U.S. forces operating in the northern polar region. In 1992, the Milstar program was restructured, and the requirement for Milstar to provide polar coverage was deleted. The Air Force was directed to find a more cost-effective solution to polar requirements. In Oct 94, the DoD identified an immediate need for protected polar communications, and in Jul 95, the Joint Requirements Oversight Council (JROC) validated the Polar MILSATCOM ORD which contained the interim requirements. In July 95, the Defense Acquisition Executive reviewed the Polar program and approved execution of an interim program to place a modified Extremely High Frequency (EHF) payload from the Navy's UHF Follow On (UFO) system onto a host satellite to provide limited requirements satisfaction while pursuing a long term solution. In Aug 96, the Joint Space Management Board (JSMB) addressed that long term solution by approving proposals from the DoD Space Architect to "sustain EHF Polar capability through about 2010 (24 hours)". The first package was launched on a classified host satellite in Nov 97.

(U) FY 1998 ($ in Thousands):
- (U) $14,415 Continued Polar package planning and design for the next generation payload, initiate parts procurement for Polar packages 2 and 3, and develop payload. (Through the classified host contract)
- (U) $14,415 Total

(U) FY 1999 ($ in Thousands):
- (U) $41,367 Continue parts buy and payload/integration development with host vehicle for Polar packages 2 and 3. (Through classified host contract)
- (U) $41,367 Total

(U) FY 2000 ($ in Thousands):
- (U) $39,678 Continue parts buy and payload/integration development with host vehicle for Polar packages 2 and 3. (Through classified host contract)
- (U) $39,678 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY: 4 - Demonstration and Validation	PE NUMBER AND TITLE: 0603432F Polar MILSATCOM (Space) / PROJECT: 4052

(U) FY 2001 ($ in Thousands):

- (U) $26,300 Continue payload development and integration development with host vehicle for Polar packages 2 and 3. (Through the classified host contract)
- (U) $26,300 Total

(U) B. Budget Activity Justification

The Polar Satellite Communications Program is in Budget Activity 4, Demonstration and Validation, based on a 30 Mar 95 USD(A&T) memorandum to pursue the interim hosted solution (Interim Polar).

(U) C. Program Change Summary ($ in Thousands)	FY 1998	FY 1999	FY 2000	FY 2001	Total
(U) Previous President's Budget (FY 1999 PB)	14,511	41,508	40,429	26,771	223,794
(U) Appropriated Value	15,000	41,508			
(U) Adjustments to Appropriated Value					
(U) a. Congressional General Reductions	-489	-141			
(U) b. SBIR					
(U) c. Omnibus/Other Above Threshold Reprogramming	-96				
(U) d. Below Threshold Reprogramming					
(U) Adjustments to Budget Years Since FY 1999 PB			-751	-471	
(U) Current Budget Submit/FY 2000 PB	14,415	41,367	39,678	26,300	223,794

(U) FY 00 and 01 adjustments made to fund higher priority Air Force programs.

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

PE 0302109N Navy SATCOM Ship Terminals.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE: February 1999
BUDGET ACTIVITY: 4 - Demonstration and Validation	PE NUMBER AND TITLE: 0603432F Polar MILSATCOM (Space) / PROJECT: 4052

(U) E. Acquisition Strategy: Provide funds to classified host program office to modify the host satellite system contract to include Polar EHF package.

(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
Hosted Interim Payload #1 Launched	x															
(Payloads 2 and 3 to launch in FYs 03 and 04)																

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE: February 1999
BUDGET ACTIVITY: 4 - Demonstration and Validation	PE NUMBER AND TITLE: 0603432F Polar MILSATCOM (Space) / PROJECT: 4052

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Packages 2 & 3 Planning, Design, and Parts Buy	14,415	0	0	0
(U) Packages 2 & 3 Payload/Integration Development	0	41,367	39,678	26,300
(U) Total	14,415	41,367	39,678	26,300

(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
Product Development Organizations											
Classified	Classified	June 95	Continuing	Continuing	73,457	14,415	41,367	39,678	26,300	28,577	223,794
Support and Management Organizations N/A											
Test and Evaluation Organizations N/A											
Government Furnished Property:											
Subtotal Product Development					73,457	14,415	41,367	39,678	26,300	28,577	223,794
Subtotal Support and Management					0	0	0	0	0	0	0
Subtotal Test and Evaluation					0	0	0	0	0	0	0
Total Project					73,457	14,415	41,367	39,678	26,300	28,577	223,794

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

DATE: February 1999

BUDGET ACTIVITY: 4 - Demonstration and Validation

PE NUMBER AND TITLE: 0603434F National Polar-orbiting Operational Environmental Satellite System (NPOESS) (Space)

PROJECT: 4056

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
4056 National Polar-orbiting Operational Env. Sat. Syst.	31,221	64,438	80,137	113,234	179,825	230,270	332,925	312,524	450,050	1,844,701
Quantity of RDT&E Articles	0	0	0	0	1*	0	0	0	1*	2*

* Initiation of RDT&E spacecraft bus build. ; + Total cost includes approximately $52.1 M in funds prior to FY98.

(U) A. Mission Description

The National Performance Review (NPR) and subsequent Presidential Decision Directive/NSTC-2 (May 1994) direct the Departments of Defense (DoD) and Commerce (DOC) and the National Aeronautics and Space Administration to establish a converged national weather satellite program. The converged program, the National Polar-orbiting Operational Environmental Satellite System (NPOESS), will combine the follow-on to DoD's Defense Meteorological Satellite Program (DMSP) and the DOC's Polar-orbiting Operational Environmental Satellite (POES) program. An integrated tri-agency program office was established on 1 Oct 94 to manage the acquisition and operations of the converged system. NPOESS will provide operational military commanders and civilian leaders timely, quality weather information to effectively employ weapon systems and protect national resources. The converged program will be the nation's single source of global weather data for operational DoD and DOC use. It will provide visible and infrared cloud cover imagery and other meteorological, oceanographic, and solar-geophysical information. At least two satellites will be required in sun synchronous 450 nm 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). The European Organization for the Exploitation of Meteorological Satellites (EUMETSAT) will provide a third satellite, which with the NPOESS satellites, will comprise the Joint Polar System. NPOESS successfully completed Milestone I on 17 March 1997. The NPOESS Executive Committee (EXCOM) has restructured the program twice since the Milestone I decision. The combined result of the EXCOM's decisions has delayed the availability of the first NPOESS satellites from January 2007 to July 2008. The first satellite will be available in time to fulfill the requirement to back-up the last of the DMSP or POES launches, whichever comes first. Both the DoD and DOC provide funding to the NPOESS Integrated Program Office (IPO).

(U) FY 1998 ($ in Thousands):

- (U) $ 553 Continued to support Program Definition and Risk Reduction efforts.
- (U) $ 3,000 Continued system architecture studies.
- (U) $ 4,530 Continued government-led risk reduction and technology development efforts.
- (U) $ 23,138 Continued critical sensor/algorithm development efforts and design for risk reduction missions.
- (U) $ 31,221 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY **4 - Demonstration and Validation**	PE NUMBER AND TITLE **0603434F National Polar-orbiting Operational Environmental Satellite System (NPOESS) (Space)**
	PROJECT **4056**

(U) FY 1999 ($ in Thousands):

–	(U) $ 560	Continue to support Program Definition and Risk Reduction efforts.
–	(U) $ 4,500	Complete system architecture studies.
–	(U) $ 4,250	Continue government-led risk reduction and technology development efforts.
–	(U) $ 53,105	Continue critical sensor/algorithm development efforts and design/fabrication for risk reduction missions.
–	(U) $ 2,023	Identified as a source for SBIR
–	(U) $ 64,438	Total

(U) FY 2000 ($ in Thousands):

–	(U) $ 600	Continue to support Program Definition and Risk Reduction efforts.
–	(U) $ 4,000	Continue government-led risk reduction and technology development efforts.
–	(U) $ 4,900	Continue system architecture studies.
–	(U) $ 70,637	Continue critical sensor/algorithm development efforts and design/fabrication for risk reduction missions.
–	(U) $ 80,137	Total

(U) FY 2001 ($ in Thousands):

–	(U) $ 650	Continue to support Program Definition and Risk Reduction efforts.
–	(U) $ 900	Continue government-led risk reduction and technology development efforts.
–	(U) $ 16,200	Initiate system definition contracts.
–	(U) $ 95,484	Continue critical sensor development efforts and design/fabrication for risk reduction missions.
–	(U) $113,234	Total

(U) B. Budget Activity Justification:

This PE is in Budget Activity 4 (Demonstration and Validation) because it currently supports sensor and satellite bus development.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603434F National Polar-orbiting Operational Environmental Satellite System (NPOESS) (Space)
	PROJECT 4056

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY 1999 PB)	31,438	64,732	95,646	132,260	1,884,336
(U) Appropriated Value	34,004	64,732			
(U) Adjustments to Appropriated Value					
a. Cong Gen Reductions	-1,929	-294			-2,223
b. SBIR	-641				-2,664
c. Omnibus or Other Above Threshold Reprogram	-213				-213
d. Below Threshold Reprogramming					
(U) Adjustments to Budget Years Since FY 1999 PB			-15,509	-19,026	-34,535
(U) Current Budget Submit/FY 2000 PB	31,221	64,438	80,137	113,234	1,844,701

(U) Significant Program Changes:

Funding: FY1999: $2,023 identified as a source for SBIR.
FY2000 and FY2001 funding adjustments are a result of program rebaselining by NPOESS EXCOM.

Schedule: Delayed system development and first satellite availability by 12 months from July 2007 to July 2008. Also delayed selected sensor developments.

Techical: Pursuing alternate risk reduction efforts in lieu of civil POES N' modifications for on-orbit testing of new NPOESS sensors. Most promising alternative involves joint IPO/NASA project.

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

Not Applicable.

Related RDT&E:

(U) PE #305160F, Defense Meteorological Satellite Program (DMSP)

(U) PE #305160N, DMSP (provides funds for the development of Navy unique sensors)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY **4 - Demonstration and Validation**	PE NUMBER AND TITLE **0603434F National Polar-orbiting Operational Environmental Satellite System (NPOESS) (Space)**
	PROJECT **4056**

(U) E. Acquisition Strategy

The guiding tenets for NPOESS acquisition include accomplishing substantial risk reduction with a focus on payload development, accelerating user satisfaction, deferring major system decisions as long as reasonable, and protecting maximum flexibility to ensure the best overall system design. The program pursues a significant investment in the development and on-orbit testing of selected payload sensors while deferring individual sensor selections among competing international, NASA, military, and industry alternatives to assess and determine the optimum technical performance potential of each candidate sensor. Overall system prime contractor selection is being deferred to minimize system level preliminary costs, allow sensor compliment maturation, and delay the commitment to full system acquisition until approximately seven years before the first satellite need date.

(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) Program Restructured	*															
(U) Program Rebaselined					*											
(U) Competitive Sensor Development Contracts Downselected							X	X				X	X			
(U) Complete System Architecture Studies												X				
(U) Competitively Award Multiple NPOESS System Definition Contracts													X			

* = Completed event
X = Planned event

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY **4 - Demonstration and Validation**	PE NUMBER AND TITLE **0603434F National Polar-orbiting Operational Environmental Satellite System (NPOESS) (Space)**
	PROJECT **4056**

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) System Architecture Studies/Definition	3,000	4,500	4,900	16,200
(U) Government Led Risk Reduction/ Technology efforts	4,530	4,250	4,000	900
(U) Sensor/Algoritm Development and Design/Fabrication for Risk Reduction Missions/Program Support	23,691	53,665	71,237	96,134
(U) Identified as a source for SBIR		2,023		
(U) Total	31,221	64,438	80,137	113,234

(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							2,023				
Product Development Organizations											
Syst. Arch. Studies	C/CPFF	Sep 96	22,220	22,220	9,820	3,000	4,500	4,900	0	0	22,220
Multiple System Def Contracts- Hughes Space/Com, Lock/Mart, TRW	TBD	1QFY01							16,200	6,700	22,900
Lockheed	C/CPAF	2QFY95	Comp	Comp	4,489	0	0	0	0	0	4,489
Raytheon	CPFF	Jul 97	22,407	22,407	1,402	7,005	9,000	5,000	0	0	22,407
Ball Aerospace	CPFF	Jul 97	26,733	26,733	1,402	2,096	9,235	14,000	0	0	26,733

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

DATE: February 1999

BUDGET ACTIVITY: 4 - Demonstration and Validation

PE NUMBER AND TITLE: 0603434F National Polar-orbiting Operational Environmental Satellite System (NPOESS) (Space)

PROJECT: 4056

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
ITT Aerospace	CPFF	Jul 97	22,407	22,407	1,402	7,005	9,000	5,000	0	0	22,407
Hughes Space and Communications	CPFF	Jul 97	24,774	24,774	701	1,373	8,700	14,000	0	0	24,774
Orbital Sciences	CPFF	Jul 97	2,425	2,425	702	723	1,000	0	0	0	2,425
SAAB Ericsson	FFP	Jul 97	2,386	2,386	701	1,685	0	0	0	0	2,386
Other PDRR & Follow-on efforts (Sensor Development Contracts awarded)	MISC	Various	TBD	TBD	1,735	3,251	16,170	32,637	95,484	1,486,829	1,636,106
Gov't Led Studies	Gov. Orgs.	MISC.	32,002	31,002	17,322	4,530	4,250	4,000	900	0	31,002
Support and Management Organizations											
Integrated Program Office (IPO) Support	Various	Various	N/A	N/A	12,419	553	560	600	650	12,070	26,852
Test and Evaluation Organizations											
TBD										TBD	TBD

Government Furnished Property:
Not Applicable.

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)						DATE February 1999	
BUDGET ACTIVITY **4 - Demonstration and Validation**			PE NUMBER AND TITLE **0603434F National Polar-orbiting Operational Environmental Satellite System (NPOESS) (Space)**				PROJECT **4056**
Identified as a source for SBIR			2,023				
Subtotal Product Development	39,676	30,668	61,855	79,537	112,584	1,493,524	1,817,849
Subtotal Support and Management	12,419	553	560	600	650	12,070	26,852
Subtotal Test and Evaluation							
Project Total	52,095	31,221	64,438	80,137	113,234	1,505,594	1,844,701

* Only includes the DOD(Air Force) share of funding for the listed efforts.

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

DATE: February 1999

BUDGET ACTIVITY: 4 - Demonstration and Validation

PE NUMBER AND TITLE: 0603438F Space Control Technology

PROJECT: 2611

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
2611 Technology Insertion Planning and Analysis	0	7,479	9,822	9,814	9,799	9,785	9,773	9,762	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

This program supports a range of activities including technology planning, development, demonstrations and prototyping, as well as modeling, simulations and exercises to support development of tactics and procedures in the Space Control mission area. The types of Space Control activities accomplished are protection, prevention, negation, and space surveillance. Protection includes active and passive defensive activities to protect U.S. and friendly space-systems assets, resources, and operations from enemy attempts to negate or interfere. Prevention limits or eliminates an adversary's ability to use U.S. space systems and services for purposes hostile to U.S. national security interests. Negation activities disrupt, deny, or degrade an adversary's space systems, or the information they provide, which may be used for purposes hostile to U.S. national security interests. Surveillance and Battle Management C4I, are the monitoring, detecting, identifying, tracking, assessing, verifying, categorizing, and characterizing objects and events in space for use in the Space Control mission area.

Congress directed SECDEF submit a report that describes the Secretary's plan for executing the space control technology funds and the plan for continuing these efforts in FY 2000 and beyond. This report, which is still in staffing, will provide additional details on the activities to be pursued within this program element.

(U) FY 1998 ($ in Thousands):
- (U) $ 0 Not Applicable

(U) FY 1999 ($ in Thousands):
- (U) $ 7,252 Technology planning, development, demonstrations, prototyping, modeling, simulation and exercises to support development of tactics and procedures in the Space control mission area.
- (U) $ 227 Identified as a source for SBIR
- (U) $ 7,479 Total

(U) FY 2000 ($ in Thousands):
- (U) $ 9,822 Technology planning, development, demonstrations, prototyping, modeling, simulation and exercises to support development of tactics and procedures in the Space control mission area.
- (U) $ 9,822 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY: 4 - Demonstration and Validation	PE NUMBER AND TITLE: 0603438F Space Control Technology
	PROJECT: 2611

(U) FY 2001 ($ in Thousands):

- (U) $ 9,814 Technology planning, development, demonstrations, prototyping, modeling, simulation and exercises to support development of tactics and procedures in the Space control mission area.
- (U) $ 9,814 Total

(U) B. Budget Activity Justification

This program is in budget activity 4 - Demonstration and Validation, Research Category 6.3B, because it supports the research, demonstration, and validation of Space Control technologies.

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY 1999 PB)	0	0	0	0	0
(U) Appropriated Value		7,500			
(U) Adjustments to Appropriated Value					
a. Cong Reductions		-21			
b. SBIR					
c. Omnibus or Other Above Threshold Reprogram					
d. Below Threshold Reprogramming					
(U) Adjustments to Budget Years Since FY 1999 PB	0	7,479	9,822	9,814	9,799
(U) Current Budget Submit (FY 2000 PB)	0	7,479	9,822	9,814	9,799

(U) Significant Program Changes:

FY99: $227 identified as a source for SBIR

Funding: FY00 and FY01 adjustments fund technology planning, development, demonstrations, prototyping, modeling, simulation and exercises to support development of tactics and procedures in the Space control mission area.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603438F Space Control Technology
	PROJECT 2611

(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
(U) Not Applicable										

(U) E. Acquisition Strategy

The SecDef will submit a report to the Congress on or before 15 February 1999. Following congressional review of this report the Air Force will implement an appropriate acquisition strategy that is consistent with the report and the results of the Air Force's modernization planning process.

(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) SecDef Report to Congress						X										

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603438F Space Control Technology
	PROJECT 2611

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Space Control technology insertion planning and analysis	0	7,252	9,822	9,814
(U) Identified as a source for SBIR		227		
(U) Total	0	7,479	9,822	9,814

(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						227					
Product Development Organizations											
TBD											
Support and Management Organizations											
TBD											
Test and Evaluation Organizations											
TBD											

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)		DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603438F Space Control Technology	PROJECT 2611

(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
None										
Product Development Property										
Support and Management Property										
Test and Evaluation Property										
Subtotal Product Development				N/A	N/A	TBD	TBD	TBD	Cont	Cont
Subtotal Support and Management				N/A	N/A	TBD	TBD	TBD	Cont	Cont
Subtotal Test and Evaluation				N/A	N/A	TBD	TBD	TBD	Cont	Cont
Total Project				N/A	N/A	7,479	9,822	9,814	Continuing	Continuing

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

DATE: February 1999

BUDGET ACTIVITY: 4 - Demonstration and Validation

PE NUMBER AND TITLE: 0603441F Space Based IR Arch (Dem/Val) (Space)

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	213,459	159,008	151,378	113,242	0	0	0	0	0	1,467,591
0007 SBIRS Low	210,703	159,008	151,378	113,242	0	0	0	0	0	1,433,025
0008 Cobra Brass	2,756	0	0	0	0	0	0	0	0	34,566
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

(U) The Space-Based Infrared System's (SBIRS) primary mission is to provide initial warning of a ballistic missile attack on the US, its deployed forces or its allies. SBIRS will incorporate new technologies to enhance detection; improve reporting of Intercontinental Ballistic Missiles (ICBM), Submarine Launched Ballistic Missiles (SLBM) and tactical ballistic missiles; and provide critical mid-course tracking and discrimination data for national and theater missile defense. This system will provide increased performance in order to meet requirements in US Space Command's Capstone Requirements Document and Operational Requirements Document. SBIRS will consist of satellites in Geosynchronous Orbits (GEO), Highly Elliptical Orbits (HEO) and Low Earth Orbits (LEO) and an integrated centralized ground station serving all SBIRS space elements and the Defense Support Program (DSP) satellites. PE #305911F funds DSP and PE #604441F funds SBIRS High EMD activities. Program Definition Contracts for the operational SBIRS Low system will be awarded in FY99 leading to a Milestone II decision in FY02 and Engineering, Manufacturing and Development (EMD) start in FY02. The Flight Demonstration System (FDS) and Low Altitude Demonstration System (LADS) programs have provided valuable lessons learned and risk reduction. Results of these demonstrations will support the Program Definition efforts for operational requirements trades/allocations and system concept development. This PE, combined with PE #604442F, funds the SBIRS Low Program Risk Reduction (PDRR) activities. SBIRS Low is the LEO component of SBIRS.

(U) On February 5, 1999 subsequent to the formulation of the FY 2000 President's Budget, the flight demonstration contracts were terminated and the program restructured to provide for an expanded PDRR phase. The FY 2000 and FY 2001 funds orginally budgeted in this program element to complete the flight demonstration contracts will be required for the expanded PDRR contracts to be funded in PE 64442F.

(U) B. Budget Activity Justification:

(U) This program is funded in Budget Activity 4, Demonstration and Validation, because it funds risk reduction and advanced technology demonstrations.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603441F Space Based IR Arch (Dem/Val) (Space)

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget FY 1999 PB	202,433	160,262	154,133	115,398	1,432,558
(U) Appropriated Value	217,401	160,262			
(U) Adjustments to Appropriated Value					
a. Cong Gen Reductions	-9,511	-1,254			
b. SBIR	-5,457				
c. Omnibus or Other Above Threshold Reprogram	+7,200				
d. Below Threshold Reprogramming	+3,826				
(U) Adjustments to Budget Years Since FY 1999 PB			-2,755	-2,156	
(U) Current Budget Submit/FY 2000 PB	213,459	159,008	151,378	113,242	1,467,591

(U) Significant Program Changes:

On 5 Feb 99, the Air Force terminated the SBIRS Low Flight Demonstration Programs. The funding orginally intended for these efforts will be used for an expanded Program Definition and Risk Reduction (PDRR) effort.

Funding: FY99 $5.261M identified as a source for Small Business Innovative Research (SBIR).
FY00 and FY01 budget changes due to a required adjusment.

Schedule: Program was restructured and first SBIRS Low launch delayed from 4QFY04 to 4QFY06.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY: 4 - Demonstration and Validation	PE NUMBER AND TITLE: 0603441F Space Based IR Arch (Dem/Val) (Space) / PROJECT: 0007

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
0007 SBIRS Low	210,703	159,008	151,378	113,242	0	0	0	0	0	1,433,025

(U) A. Mission Description

(U) SBIRS Low represents the Low Earth Orbit (LEO) component of the Space Based Infrared System (SBIRS). The objective SBIRS LEO constellation of low-earth orbiting satellites will provide global, below- and above-the-horizon access to strategic and tactical ballistic missiles in boost, post-boost, and midcourse phases of flight, and also track missile targets during reentry. LEO will support the four SBIRS mission areas: Missile Warning, Missile Defense, Technical Intelligence, and Battle Space Characterization.

(U) FY 1998 ($ in Thousands):
- (U) $ 114,034 Flight Demonstration System
- (U) $ 63,508 Low Altitude Demonstration System
- (U) $ 13,824 Program office activities.
- (U) $ 7,082 Technologies
- (U) $ 4,631 NMD Targets
- (U) $ 3,000 Long Range Planning
- (U) $ 2,724 FDS and LADS Support—Range support, launch services, TMD Targets
- (U) $ 1,900 Simulation / Discrimination
- (U) $ 210,703 Total

(U) FY 1999 ($ in Thousands):
- (U) $ 75,058 Flight Demonstration System
- (U) $ 37,392 Low Altitude Demonstration System
- (U) $ 15,278 Program office activities.
- (U) $ 5,081 BTR to PE 64442 for an expanded Program Definition and Risk Reduction (PDRR)
- (U) $ 5,261 Identified as a source for Small Business Innovative Research (SBIR)
- (U) $ 5,400 Simulation / Discrimination
- (U) $ 3,438 FDS and LADS Support—Range support, launch services, TMD Targets (includes termination costs)
- (U) $ 4,000 NMD Targets
- (U) $ 4,100 Technologies
- (U) $ 4,000 System of Systems

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603441F Space Based IR Arch (Dem/Val) (Space)
	PROJECT 0007

– (U) $159,008 Total

(U) FY 2000 ($ in Thousands):
- (U) $133,478 Risk reduction efforts for an expanded Program Definition and Risk Reduction (PDRR)
- (U) $ 14,800 Program Office Activities
- (U) $ 1,700 Technologies
- (U) $ 1,400 Simulation / Discrimination
- (U) $151,378* Total

*Will request realignment of funds to PE 644442F to fully fund an expanded PDRR phase during Congressional Budget Review

(U) FY 2001 ($ in Thousands):
- (U) $112,442 Risk reduction efforts for an expanded Program Definition and Risk Reduction (PDRR)
- (U) $ 800 Simulation / Discrimination
- (U) $113,242* Total

*Funding will be realigned to PE 64442F to fully fund an expanded PDRR phase during FY 2001 DoD budget review.

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

(U) Both SBIRS Low Demonstration programs, FDS and LADS, were terminated effective 5 Feb 99.

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

	FY 1998	FY1999	FY2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Total Cost
(U) PE #35922F - SBIRS Low Prod						33,100	101,400	328,390	3,999,500

Related RDT&E:
(U) PE #604441F - SBIRS High EMD
(U) PE #305911F - DSP
(U) PE #604442F - SBIRS Low EMD

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603441F Space Based IR Arch (Dem/Val) (Space)
	PROJECT 0007

(U) D. Acquisition Strategy:

(U) Cobra Brass and two SBIRS Low demonstrations provided significant risk reduction for the SBIRS Low program. SBIRS Low Program Definition will be conducted before moving into SBIRS Low EMD. The GEO component of SBIRS now in EMD is a pilot program for acquisition streamlining. The traditional Defense Acquisition Board (DAB) documentation for an ACAT ID program was consolidated into a Single Acquisition and Management Plan (SAMP) for the GEO component. The existing SBIRS SAMP includes the LEO component.

(U) Both the Flight Demonstration System (FDS) and Low Altitude Demonstration System (LADS) were terminated on 5 Feb 99 due to continued cost growth and schedule delays. These efforts managed to mitigate large portions of risk for the objective system, the Air Force decided to apply the remaining funding to other expanded Program Definition and Risk Reduction efforts.

(U) Program Definition (PD) activities will begin in FY99 with up to two Program Definition study contracts. The purpose of Program Definition is to develop specifications and designs for the SBIRS LEO EMD phase. This period will also be used to optimize the SBIRS HEO, GEO, LEO constellations and to revalidate the Air Force Space Command Operational Requirements Document. EMD contract will be competitively awarded in FY02. The same streamlined acquisition approach currently used for the GEO EMD will be used as a baseline for the LEO EMD. Deployment of the operational LEO constellation begins in 4QFY06.

(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
Program Definition Contract Award							X									
System Requirement Review												X				

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603441F Space Based IR Arch (Dem/Val) (Space)
	PROJECT 0007

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Flight Demonstration System	114,034	75,058	0	0
(U) Low Altitude Demonstration System (LADS)	63,508	37,392	0	0
(U) Technologies	7,082	4,100	1,700	0
(U) Targets	4,631	4,000	0	0
(U) Program office activities	13,824	15,278	14,800	0
(U) Simulation and Discrimination	1,900	5,400	1,400	800
(U) Long Range Planning	3,000	0	0	0
(U) Demo Support	2,724	3,438	0	0
(U) System of Systems		4,000	0	0
(U) Identified as a source for SBIR		5,261	0	0
(U) Realign funds to 64442F for an expanded PDRR		5,081	133,478	112,442
(U) Total	210,703	159,008	151,378	113,242

(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	FY 2000	FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR							5,261				
Product Development Organizations											
FDS - TRW	CPAF	May 95	TBD	686,951	497,859	114,034	75,058	0	0	0	686,951
LADS - Boeing	CPFF	Sep 96	TBD	208,136	107,236	63,508	37,392	0	0	0	208,136
Non-Flyer - RI	CPAF	May 95	130,643	130,643	130,643	0	0	0	0	0	130,643
Expanded PDRR	FFP	Various			0	0	5,081	133,478	112,442		251,001
Misc. Contracts	Various	Various	TBD	TBD	20,214	14,706	16,908	3,100	800	0	55,758

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

DATE: February 1999

BUDGET ACTIVITY: 4 - Demonstration and Validation

PE NUMBER AND TITLE: 0603441F Space Based IR Arch (Dem/Val) (Space)

PROJECT: 0007

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
Support and Management Organizations											
Aerospace		Various	N/A	N/A	24,707	9,200	10,134	10,000	0	0	54,041
SETA/SPO Support	Various	Various	N/A	N/A	18,035	4,624	5,144	4,800	0	0	32,603
Test and Evaluation Organizations											
NMD Targets						4,631	3,000	0	0	0	7,631
Government Furnished Property: Not Applicable.											
Identified as a source for SBIR							5,261	0	0	0	5,261
Subtotal Product Development					755,952	192,248	134,469	136,578	113,242	0	1,332,489
Subtotal Support and Management					42,742	13,824	15,278	14,800	0	0	86,644
Subtotal Test and Evaluation						4,631	4,000	0	0	0	8,631
Total Project					798,694	210,703	159,008	151,378	113,242	0	1,433,025

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY: 4 - Demonstration and Validation	PE NUMBER AND TITLE: 0603441F Space Based IR Arch (Dem/Val) (Space) / PROJECT: 0008

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
0008 Cobra Brass	2,756	0	0	0	0	0	0	0	0	34,566

(U) A. Mission Description

(U) The Cobra Brass (CB) Program was a DIA/CMO (Central MASINT Office) Research and Development program to explore the utility of staring, fast framing, multi-spectral electro-optical sensors. CB was combined with the SBIRS program as a result of the Feb 95 Defense Acquisition Executive review. This approach is a significant departure from the traditional approach of scanning, slow framing, single band sensors previously used for Tactical Warning and Attack Assessment (TW/AA).

(U) Previous CB sensors have demonstrated the ability of this technology to contribute to Theater Missile Defense (TMD), Technical Intelligence (TI), and Battlespace Characterization (BSC) missions. Major program emphasis is to increase the timeliness of sensor tasking and reporting. This will allow CB data to be processed in realtime through the existing theater infrastructure. CB will support the development of GEO and HEO component of the SBIRS.

(U) FY 1998 ($ in Thousands):
- (U) $1,634 Ground Station testing
- (U) $1,122 Payload pre-flight testing and checkout integration onto spacecraft
- (U) $2,756 Total

(U) FY 1999 ($ in Thousands):
- (U) $0 Not applicable

(U) FY 2000 ($ in Thousands):
- (U) $0 Not applicable

(U) FY 2001 ($ in Thousands):
- (U) $0 Not applicable

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

None

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603441F Space Based IR Arch (Dem/Val) (Space)
	PROJECT 0008

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

	FY 1998	FY1999	FY2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Total
(U) PE #35922F - SBIRS Low Prod						33,100	101,400	328,390	3,999,500

Related RDT&E:
(U) PE #604441F - SBIRS High EMD
(U) PE #305911F - DSP
(U) PE #604442F - SBIRS Low EMD

(U) D. Acquisition Strategy

(U) The CB was transferred on 1 October 94 to the Air Force from DIA/CMO as part of risk mitigation for the baselined SBIRS program and was included into the SBIRS Low PDRR program element. Sandia National Laboratory (SNL) is the Air Force's executing agent for CB. The Air Force is responsible for funding CB through sensor and ground segment development and integration with the host satellite. Responsibility for funding, sensor operation, and data exploitation will be performed by other government agencies once the satellite is on-orbit.

(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) CB Launch	*															

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603441F Space Based IR Arch (Dem/Val) (Space)
	PROJECT 0008

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Payload	0	0	0	0
(U) Ground Station Build	0	0	0	0
(U) Satellite Integration and Checkout	0	0	0	0
(U) Ground Station Testing	1,634	0	0	0
(U) MIPR to National Air Intelligence Center	1,122	0	0	0
(U) Total	2,756	0	0	0

(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	FY 2000	FY 2001	Budget to Complete	Total Program
Product Development Organizations											
Sandia Nat'l Labs	Various	Various			31,810	2,756	0	0	0	0	34,566
Support and Management Organizations											
Not Applicable											
Test and Evaluation Organizations											
Not Applicable											
Subtotal Product Development					31,810	2,756	0	0	0	0	34,566
Subtotal Support and Management											
Subtotal Test and Evaluation											
Project Total					31,810	2,756	0	0	0	0	34,566

Government Furnished Property: Not Applicable

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

DATE: **February 1999**

BUDGET ACTIVITY: **4 - Demonstration and Validation**

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

COST *($ In Thousands*)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	6,469	7,731	7,833	7,898	8,002	8,140	8,308	8,482	Continuing	TBD
2314 Tactical Air Surveillance	574	446	450	452	456	462	471	481	Continuing	TBD
2317 Tactical Air Information Production & Distribution	1,518	3,064	3,100	3,124	3,168	3,223	3,289	3,359	Continuing	TBD
2321 Tactical Battle Information Management	4,243	4,017	4,062	4,097	4,143	4,214	4,302	4,392	Continuing	TBD
3804 Tactical Air Forces Systems Integration	134	204	221	225	235	241	246	250	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description:

This program is designed to rapidly transition development efforts in the science and technology base directly to warfighting commands. Projects are directly responsive to operational requirements for improved battle management, communications, theater missile defense (TMD), and surveillance capability. This program takes advantage of advanced technology developments throughout the services and industry as well as off-the-shelf technology. The program also defines system architectures and develops communications technology for modernization and improving the Air Force portion of the Tri-Service communications networks which the Defense Information Systems Agency (DISA) oversees.

(U) B. Budget Activity Justification:

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

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY **4 - Demonstration and Validation**	PE NUMBER AND TITLE **0603617F Command Control & Communications Applications**

(U) Program Change Summary ($ in Thousands)

	FY 1998		FY 2000	FY 2001	Cost
(U) Previous Presidents Budget (FY 1999 PB)		7,770	7,975		TBD
(U) Appropriated Value		7,770			
(U) Adjustments to Appropriated Value					
	-273	-39			
	-145				
c. Omnibus/Other Above Threshold Reprogramming					
d. Below Threshold Reprogramming	-714				
(U) Adjustments to Budget Years Since FY 1999 PB			-142		
(U) Current Budget Submit/FY 2000 PB	6,469		7,833	7,898	

(U) Significant Program Changes:

FY99: $208 identified as a source for SBIR

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BUDGET ACTIVITY **4 - Demonstration and Validation**	PE NUMBER AND TITLE **0603617F Command Control & Communications Applications** PROJECT **2314**

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
2314 Tactical Air Surveillance	574	446	450	452	456	462	471	481	Continuing	TBD

(U) A. Mission Description :

Develops advanced technology and demonstrates equipment improvements to the Theater Air Control System (TACS) ground surveillance radars. Investigates non-radar and/or adjunct radar sensors to address the Combat Air Forces (CAF) surveillance, detection, and tracking requirements not satisfied by an active radar. Develops advanced surveillance technology in support of next generation sensors and sensor signal processing.

(U) FY 1998 ($ in Thousands):
- (U) $ 21 Initiate Track Before Detect for Theater Missile Defense (TMD) with adaptive elevation angle estimation
- (U) $ 140 Completed analysis of solid state versus tube based transmitter for AN/TPS-75 Radar Set
- (U) $ 413 Completed waveform and signal processor design and evaluation
- (U) $ 574 Total

(U) FY 1999 ($ in Thousands):
- (U) $ 263 Continue Track Before Detect for TMD
- (U) $ 171 Initiate Ground Theater Air Control System (GTACS) Bistatic/Electronic Support Measures (ESM) System Definition
- (U) $ 12 Identified as a source for SBIR
- (U) $ 446 Total

(U) FY 2000 ($ in Thousands):
- (U) $ 199 Continue Track Before Detect for TMD
- (U) $ 200 Complete GTACS Bistatic/ESM System Definition
- (U) $ 51 Initiate Target Identification for AN/TPS-75 radar set
- (U) $ 450 Total

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BUDGET ACTIVITY **4 - Demonstration and Validation**	PE NUMBER AND TITLE **0603617F Command Control & Communications Applications**

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BUDGET ACTIVITY **4 - Demonstration and Validation**	PE NUMBER AND TITLE **0603617F Command Control & Communications Applications**
	PROJECT **2314**

(U) FY 2001 ($ in Thousands):
- (U) $ 40 Complete Track Before Detect for TMD
- (U) $ 412 Continue Target Identification for AN/TPS-75 radar set
- (U) $ 452 Total

(U) B. Project Change Summary - Description of Significant Changes: Not applicable.

(U) C. 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
(U) RDT&E, AF (0603789F, Project 4072)	6,285	6,583	10,851	9,788	8,526	7,591	7,750	7,911	Cont	TBD
(U) RDT&E, AF (0207412F, Project 485L)	374	423	467	450	436	426	435	375	Cont	TBD

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY **4 - Demonstration and Validation**	PE NUMBER AND TITLE **0603617F Command Control & Communications Applications**
	PROJECT **2314**

(U) D. Acquisition Strategy:

All contracts in this project are awarded in full competition and are Cost Plus Fixed Fee (CPFF) or Cost Plus Award Fee (CPAF) as appropriate for advanced development.

(U) E. Schedule Profile

	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) Tube-based transmitter panel performance and R&M testing		*														
(U) Tube-based versus solid-state eval		*														
(U) Develop waveform signal processor				*												
(U) Track Before Detect for TMD														X		
(U) GTACS Bistatic/ESM System Definition												X				

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

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY **4 - Demonstration and Validation**	PE NUMBER AND TITLE **0603617F Command Control & Communications Applications**
	PROJECT **2314**

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Primary Hardware Development	559	359	374	374
(U) Government Engineering Support	10	60	60	61
(U) Travel	5	15	16	17
(U) Identified as a source for SBIR		12		
(U) Total	574	446	450	452

(U) B. 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							12				12
Product Development Organizations											
Hughes	C/CPFF	June 95	1,179	1,179	1,179	0	0	0	0	0	1,179
DSA	Tsk Ordr Agmt	Apr 97	905	905	502	403	0	0	0	0	905
Northrop-Grumman	Tsk Ordr Agmt	Aug 98	435	435	0	21	217	164	33	0	435
TBD	TBD	TBD	309	309	0	0	142	167	0	0	309
TBD	TBD	TBD	TBD	TBD	0	0	0	43	341	Cont	TBD
Support and Management Organizations											
AF Research Lab	In-house	n/s	N/A	N/A	6,419	75	75	76	78	Cont	TBD

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY **4 - Demonstration and Validation**	PE NUMBER AND TITLE **0603617F Command Control & Communications Applications** / PROJECT **2314**

Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Miscellaneous	Various	Various	N/A	N/A	0	75	0	0	0	Cont	TBD
Test and Evaluation Organizations - Not Applicable.											
					0	0	0	0	0	0	0

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

Government Furnished Property: Not Applicable.

	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR			12				
Subtotal Product Development	1,681	424	359	374	374	Cont	TBD
Subtotal Support and Management	6,419	150	75	76	78	Cont	TBD
Subtotal Test and Evaluation	0	0	0	0	0	Cont	TBD
Total Project	8,100	574	446	450	452	Cont	TBD

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

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BUDGET ACTIVITY: 4 - Demonstration and Validation

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

PROJECT: 2317

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
2317 Tactical Air Information Production & Distribution	1,518	3,064	3,100	3,124	3,168	3,223	3,289	3,359	Continuing	TBD

(U) A. Mission Description: Transitions advanced communications to the Theater Deployable Communications (TDC) program in support of Theater Battle Management (TBM) command and control enhancements. The goal is to reduce the risk of transitioning advanced government or commercial off-the-shelf technology into military communications systems. Capabilities developed include modular programmable radio technologies and improvements to survivability, deployability, interoperability, and control of communications networks. The SPEAKeasy program core technologies and concept were demonstrated and transitioned to support the Joint Tactical Radio System (JTRS) Joint Program Office (JPO) acquisition activities. This project will continue to develop and transition risk-reduced capabilities required for airborne platforms to effectively host the JTRS. Unmanned Airborne Vehicles (UAV)/Advanced Communications Node (ACN) platforms are intended to be the first so equipped, followed by other wider body aerospace platforms.

(U) FY 1998 ($ in Thousands):

- (U) $ 220 Completed Special Operations Command (SOCOM) analysis of tactical wideband user information services
- (U) $ 690 Expanded the Deployable Asynchronous Transfer Mode (ATM) capability at Langley AFB, VA to enable wartime bandwidth management
- (U) $ 140 Initiated airborne-transportable radio wideband/multi-band antenna developments
- (U) $ 446 Initiated electromagnetic interference/compatibility research and test for a communication UAV
- (U) $ 22 Initiated airborne-transportable radio wideband Power Amplifier (PA) development.
- (U) $1,518 Total

(U) FY 1999 ($ in Thousands):

- (U) $ 430 Continue airborne-transportable radio wideband/multi-band antenna developments
- (U) $ 800 Continue UAV radio electromagnetic interference/compatibility research and test for a communications UAV
- (U) $ 901 Continue airborne-transportable radio wideband Power Amplifier (PA) development.
- (U) $ 220 Initiate the transition of advanced development Project 2335 error mitigation hardware/software and deployable communications management software into deployable capability at Langley AFB, VA
- (U) $ 130 Initiate development of advanced, wideband suitcase satellite communications (SATCOM) capability
- (U) $ 500 Initiate effort to transition and demonstrate the (PROJ/4519/DARPA) On Board Switch (OBS) technologies for Tanker Relay and Phase 2 ACN applications
- (U) $ 83 Identified as a source for SBIR

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603617F Command Control & Communications Applications PROJECT 2317

– (U) $3,064 Total

(U) FY 2000 ($ in Thousands):

– (U) $ 123 Complete development of wideband/multiband antennas. Prepare for transition to Phase 2 ACN and Tanker Relay Platforms.
– (U) $ 450 Complete evaluation of antenna placement issues for ACN platform.
– (U) $ 476 Complete design of wideband PA and prepare for transition to Phase 2 ACN and Tanker Relay Platforms.
– (U) $ 742 Continue integration of technology to improve performance of commercial ATM over tactical media via error correction and channel management technologies
– (U) $ 59 Conduct field demonstration of suitcase SATCOM and assess suitability for airborne platforms.
– (U) $1,250 Integrate software programmable radios with OBS capability into Tanker Relay Demo.
– (U) $3,100 Total

(U) FY 2001 ($ in Thousands):

– (U) $ 940 Initiate effort to transition Reachback for the Warrior (Project 4216) capabilities into Air Mobility Command (AMC) Tactical Air Control Center.
– (U) $ 684 Initiate effort to transition the Multi Level Secure (MLS) Network Management (Project 2335) capabilities into the AMC Global Reach communications.
– (U) $1,000 Complete Tanker Relay Demo and transition capabilities to Theater Beyond Line of Sight (TBLOS) Program.
– (U) $ 500 Complete integration of Command and Control (C2) Network Managing Software at Deployable ATM Site.
– (U) $3,124 Total

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

With the transition of the SPEAKeasy Technology to the Joint Tactical Radio System (JTRS) System Program Office (SPO), the focus of this project has changed to address platform specific issues associated with putting multiband radios aboard an airborne platform. This platform was chosen by Aeropace Command and Control Agency (AC2A).

(U) C. 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
(U) RDT&E, AF (0602702F, Project 4519)	10,207	17,055	10,817	13,208	13,300	13,990	14,577	16,026	Cont	TBD
(U) RDT&E, AF (0603789F, Project 2335)	4,710	3,907	4,093	2,557	5,087	5,198	5,306	5,416	Cont	TBD

									DATE **February 1999**		
BUDGET ACTIVITY **4 - Demonstration and Validation**				PE NUMBER AND TITLE **0603617F Command Control & Communications Applications**							
(U) RDT&E, AF (0603789F, Project 4216)	1,320	2,316	2,458	2,640	2,687	2,752	2,809	2,868	Cont	TBD

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY **4 - Demonstration and Validation**	PE NUMBER AND TITLE **0603617F Command Control & Communications Applications**
	PROJECT **2317**

(U) D. Acquisition Strategy:

The Information Grid Division of the Air Force Research Laboratory's Information Directorate manages the acquisition of technology to be integrated into the Theater Deployable Communications (TDC) through a Memorandum of Understanding (MOU) with the TDC Program Office. All contracts are awarded under full competition and include Cost Plus Fixed Fee (CPFF) and Cost Plus Award Fee (CPAF) as appropriate for advanced development efforts. All contracts use Evolutionary Prototyping, with heavy user participation.

(U) E. Schedule Profile

	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) Secure Survivable Comm Net Phase II																
- Joint Demonstration				*												
- Demo for rapid deployment				*												
(U) Airborne-transportable Radio System Development																
- Planning		*														
- Antenna Development (Multiple Contracts)											X					
- Electro-magnetic Interference and Compatibility Research/Tests (Multiple Contracts)												X				
- Wideband power amplifier development												X				
(U) Theater BLOS Development																
- Planning					*											
- Integration UAV Technologies															X	
- Tanker Relay Demo																X

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

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY **4 - Demonstration and Validation**	PE NUMBER AND TITLE **0603617F Command Control & Communications Applications** / PROJECT **2317**

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Primary Hardware Development	1,218	2,681	2,775	2,764
(U) Government Engineering Support	60	60	65	75
(U) Travel	40	40	50	60
(U) Contractor Engineering Support	200	200	210	225
(U) Identified as a source for SBIR		83		
(U) Total	1,518	3,064	3,100	3,124

(U) B. 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							83				83
Product Development Organizations											
ESC	PD	Various	TBD	TBD	210	200	200	210	225	Cont	TBD
SOCOM	PD	Sept 96	592	592	392	200	0	0	0	0	592
TBD (Airborne-transportable radio support)	TBD	TBD	TBD	TBD	0	818	2,481	2,565	2,539	Cont	TBD
Support and Management Organizations											
AF Research Lab	In-house	N/A	N/A	TBD	12,153	300	300	325	360	Cont	TBD

Test and Evaluation Organizations - Not Applicable

	DATE
	February 1999

BUDGET ACTIVITY	PE NUMBER AND TITLE
4 - Demonstration and Validation	**0603617F Command Control & Communications Applications**

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

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY **4 - Demonstration and Validation**	PE NUMBER AND TITLE **0603617F Command Control & Communications Applications** / PROJECT **2317**

Government Furnished Property: Not Applicable

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

	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR			83				83
Subtotal Product Development	602	1,218	2,681	2,775	2,764	Cont	TBD
Subtotal Support and Management	12,153	300	300	325	360	Cont	TBD
Subtotal Test and Evaluation	0	0	0	0	0	Cont	TBD
Total Project	12,755	1,518	3,064	3,100	3,124	Cont	TBD

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

DATE: February 1999

BUDGET ACTIVITY: 4 - Demonstration and Validation

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

PROJECT: 2321

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
2321 Tactical Battle Information Management	4,243	4,017	4,062	4,097	4,143	4,214	4,302	4,392	Continuing	TBD

(U) A. Mission Description: Designs and integrates improvements to system software and Command Control and Communications (C3) applications modules via rapid prototyping and maximum user participation in all design activities. Current focus is the functional development and rapid prototyping of the Force Level Execution (FLEX) system and the Joint Defensive Planner (JDP), both of which have been designated by the Joint Staff (J6V) Joint Standards Air Operations Software Configuration Control Board as joint applications for use by all the Services. Both are being designed and developed as Defense Information Infrastructure (DII) Common Operating Environment (COE) compliant segments for integration into Theater Battle Management Core Systems (TBMCS). FLEX assists combat operations personnel in a Joint Air Operations Center (JAOC) to quickly replan or reallocate resources based on real-time threat inputs, including time critical targets (TCTs) and changes in the wartime scenario. JDP will provide the single theater air and missile defense automated system that aids air defense duty officers and the Area Air Defense Commander (AADC) and staff in planning the integrated employment of Defensive Counter-Air and Active and Passive Defenses in conjunction with Offensive Counter-Air, to destroy or neutralize enemy aircraft and theater missiles**.** Future efforts will focus on spiral development of Force Level capabilities responsive to evolving concepts advocated by the Aerospace Command and Control Agency (AC2A), such as the Configurable Aerospace Command Center.

(U) FY 1998 ($ in Thousands):
- (U) $2,974 Complete initial FLEX integration into TBMCS V1.0 and TBMCS remote terminals.
- (U) $1,169 Continue Joint Defensive Planner (JDP) software development
- (U) $ 100 Demonstrate FLEX airborne capabilities via TBMCS remote terminals (i.e., AWACS, JSTARS, ABCCC).
- (U) $4,243 Total

(U) FY 1999 ($ in Thousands):
- (U) $ 301 Initiate FLEX integration into TBMCS V1.1
- (U) $ 1,100 Begin development of coordinated FLEX replanning for TBMCS V2.0
- (U) $ 2,508 Initiate integration of Joint Defensive Planner (JDP) as TBMCS DII COE compliant segments
- (U) $ 108 Identified as a source for SBIR
- (U) $ 4,017 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY **4 - Demonstration and Validation**	PE NUMBER AND TITLE **0603617F Command Control & Communications Applications**
	PROJECT **2321**

(U) FY 2000 ($ in Thousands):
- (U) $ 1,158 Develop DII COE compliant automated FLEX Options Generation and initiate integration activity for TBMCS V2.0
- (U) $ 1,924 Continue Joint Defensive Planner (JDP) V2.0 software development
- (U) $ 980 Initiate integration activity for TBMCS V2.0
- (U) $ 4,062 Total

(U) FY 2001 ($ in Thousands):
- (U) $ 1,350 Complete FLEX development and integrate into TBMCS V3.0
- (U) $ 1,747 Complete JDP software development and integration into TBMCS V3.0
- (U) $ 1,000 Transition Configurable Aerospace Command Center Collaboration and Visualization segments to TBMCS
- (U) $ 4,097 Total

(U) B. Project Change Summary - Description of Significant Changes: Not applicable.

(U) C. 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
(U) RDT&E, AF (0603789F, Project 2335)	4,710	3,907	4,093	2,557	5,087	5,198	5,306	5,416	Cont	TBD
(U) RDT&E, AF (0207438F, Project 4287)	18,844	11,972	0	0	0	0	0	0	0	TBD
(U) RDT&E, AF (0207438F, Project 4790)	0	0	23,007	20,439	18,120	17,682	20,433	20,859	Cont	TBD

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY **4 - Demonstration and Validation**	PE NUMBER AND TITLE **0603617F Command Control & Communications Applications**
	PROJECT **2321**

(U) D. Acquisition Strategy:

The Systems Division of the Air Force Research Laboratory's Information Directorate manages the acquisition of technology to be integrated into the Theater Battle Management Core System (TBMCS) through a Memorandum of Understanding (MOU) entitled "Shared management of TBMCS Technology Development" with the TBMCS System Program Office (SPO). All contracts are awarded under full competition and include Cost Plus Fixed Fee (CPFF) and Cost Plus Award Fee (CPAF) as appropriate for advanced development efforts. All contracts use Evolutionary Prototyping, with heavy user participation from all the Services, and produce joint software applications, as designated by the JCS Joint Service Air Operations Software Configuration Control Board.

(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) TBM Systems Integration Evaluation				*												
(U) FLEX																
- TBMCS V1.0 integration					*											
- TBMCS V1.1 integration							X									
- TBMCS V2.0 integration											X					
- TBMCS V3.0 integration																X
- Airborne SPO demos (AWACS/JSTARS)				*												
(U) Joint Defensive Planner software development and integration																
- Evolutionary Prototype (EP) #1			*													
- EP #2						X										
- EP #3 (adv tech demo)								X								
- TBMCS V2.0 integration											X					
- Functional Validation Model #1											X					
- Functional Validation Model #2														X		
- TBMCS V3.0 integration																X

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

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY **4 - Demonstration and Validation**	PE NUMBER AND TITLE **0603617F Command Control & Communications Applications**
	PROJECT **2321**

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Software Development	3,236	2,925	3,026	2,997
(U) Government Engineering Support	707	659	686	700
(U) Travel	150	175	175	200
(U) Contractor Engineering Support	150	150	175	200
(U) Identified as a source for SBIR		108		
(U) Total	4,243	4,017	4,062	4,097

(U) B. 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							108				
Product Development Organizations											
Logicon	C/CPFF	June 94	11,696	11,696	6,686	2,390	899	771	1,053	0	11,799
PRB Assoc.	C/CPAF	Feb 97	7,104	7,104	650	846	2,026	2,255	1,023	304	7,104
TBD	TBD	Dec 01	TBD	TBD	0	0	0	0	921	Cont	TBD
Support and Management Organizations											
AF Research Lab	In-house	N/A	N/A	TBD	27,423	857	834	861	900	Cont	TBD
Miscellaneous	Various	Various	N/A	TBD	0	150	150	175	200	Cont	TBD
Test and Evaluation Organizations - Not Applicable											
					0	0	0	0	0	0	TBD

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY **4 - Demonstration and Validation**	PE NUMBER AND TITLE **0603617F Command Control & Communications Applications**
	PROJECT **2321**

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

Government Furnished Property: Not Applicable

	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR			108				108
Subtotal Product Development	7,336	3,236	2,925	3,026	2,997	Cont	TBD
Subtotal Support and Management	27,423	1,007	984	1,036	1,100	Cont	TBD
Subtotal Test and Evaluation	0	0	0	0	0	0	
Total Project	34,759	4,243	4,017	4,062	4,097	Cont	TBD

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY **4 - Demonstration and Validation**	PE NUMBER AND TITLE **0603617F Command Control & Communications Applications** PROJECT **3804**

COST *($ In Thousands*)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
3804 Tactical Air Forces Systems Integration	134	204	221	225	235	241	246	250	Continuing	TBD

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

(U) FY 1998 ($ in Thousands):
- (U) $ 80 Support analysis of TBMCS Theater Integration
- (U) $ 54 Evaluate Joint Defensive Planner Prototype
- (U) $ 134 Total

(U) FY 1999 ($ in Thousands):
- (U) $ 19 Evaluate Joint Defensive Planner advanced technology demonstration prototype
- (U) $ 90 Identify candidate prototypes for technology transition within Program Element (PE)
- (U) $ 90 Analyze candidate prototypes for technology transition within PE
- (U) $ 5 Identified as a source for SBIR
- (U) $ 204 Total

(U) FY 2000 ($ in Thousands):
- (U) $ 25 Begin analysis of system integration requirements in support of AC2A
- (U) $ 146 Continue detailed analyses of candidate prototypes for technology transition within PE
- (U) $ 50 Prioritize candidate prototypes for technology transition within PE
- (U) $ 221 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY **4 - Demonstration and Validation**	PE NUMBER AND TITLE **0603617F Command Control & Communications Applications**
	PROJECT **3804**

(U) FY 2001 ($ in Thousands):

- (U) $ 29 Continue analysis of AC2A requirements for implementation/integration in PE projects
- (U) $ 96 Conduct detailed analyses of technology transition requirements for selected prototypes in PE projects
- (U) $ 100 Conduct detailed analyses of technology integration requirements for selected prototypes in PE projects
- (U) $ 225 Total

(U) B. Project Change Summary - Description of Significant Changes: None

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

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY **4 - Demonstration and Validation**	PE NUMBER AND TITLE **0603617F Command Control & Communications Applications**
	PROJECT **3804**

(U) D. Acquisition Strategy:

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

(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) Analysis of TBM Core Systems theater integration				*												
-- TBM Force Level System prototype evaluations																
- AOC Combat Operations (FLEX)																
- Joint Operations	*															
- TBMCS Integration evaluation				*												
(U) Joint Defensive Planner Evaluation/ Integration into TBMCS																
- Evaluate JDP prototype(s)								X								

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

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
4 - Demonstration and Validation	0603617F Command Control & Communications Applications	3804

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Systems Engineering	120	0	0	0
(U) Government Engineering Support	14	25	25	29
(U) Contractor Engineering Support	0	174	196	196
(U) Identified as a source for SBIR		5		
(U) Total	134	204	221	225

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

(U) B. Budget Acquisition History and Planning Information ($ 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							5				5
Product Development Organizations - Not Applicable.					0	0	0	0	0	0	0
Support and Management Organizations											
MITRE	SS/TO&P	Various	N/A	TBD	2,138	120	0	0	0	Cont	2,258
AF Research Lab	In-house	N/A	N/A	TBD	132	14	25	25	29	Cont	TBD
Miscellaneous	Various	Various	N/A	TBD	0	0	174	196	196	Cont	TBD
Test and Evaluation Organizations - Not Applicable.					0	0	0	0	0	0	0

Government Furnished Property: Not Applicable.

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

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

	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				
Subtotal Product Development	0	0	0	0	0	0	TBD
Subtotal Support and Management	2,270	134	199	221	225	Cont	TBD
Subtotal Test and Evaluation	0	0	0	0	0	0	TBD
Total Project	2,270	134	204	221	225	Cont	TBD

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

DATE: **February 1999**

BUDGET ACTIVITY: **4 - Demonstration and Validation**

PE NUMBER AND TITLE: **0603742F Combat Identification Technology**

PROJECT: **2597**

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
2597 Noncooperative Identification Subsystems	1,317	6,158	7,393	8,529	9,092	11,598	17,204	20,260	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

*** Classified information can be provided upon request.**

(U) A. Mission Description

(U) U.S. Combat Air Forces have a critical requirement to positively identify enemy, friendly, and neutral aircraft and battlefield equipment. Timely and reliable Combat Identification (CID) reduces fratricide, and enables the battlefield commander to effectively manage and control the battle. Such consequences have fostered the following operational requirements for CID systems:

- High confidence of ID
- All weather capable
- Worldwide operations capable
- High probability of ID (friend, foe, and neutral)
- Day/night capable

The Combat ID Technologies program element develops, demonstrates, and transitions promising target identification technologies to meet the requirements cited above and conducts studies to quantify combat identification requirements. Project 2597 funds the Ultra-High Range Resolution (UHRR) radar program; a Non-Cooperative Target Recognition technique code named HAVE CENTAUR. Project 2597 also develops and demonstrates the most promising air-to-ground combat techniques such as the Enhanced Recognition and Sensing Ladar (ERASER) program which is transitioning from PE 0603203F.

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(U) FY 1998 ($ in Thousands):

- (U) $ 295 Conduct HAVE CENTAUR algorithm validation and data analysis, continue synthetic target database development and provide test support.
- (U) $ 205 Air-to-Ground (A/G) CID study and NATO Identification Data Combining Process (IDCP) algorithm work
- (U) $ 100 AIMS Program Office support of next generation IFF equipment integration with current IFF capabilities.
- (U) $ 717 CID Integrated Management Team and engineering support for integration and management of Air Force CID programs, conducting related studies/demos to increase warfighter's CID capabilities.
- (U) $ 1,317 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603742F Combat Identification Technology
PROJECT 2597	

(U) FY 1999 ($ in Thousands):

- (U) $ 2,880 Conduct HAVE CENTAUR algorithm validation, continue synthetic target database development, and provide test support.
- (U) $ 1,600 Continue development and demonstration planning of other promising air-to-ground and air-to-air identification techniques for reduced battlefield fratricide and enhanced mission performance including ERASER program transitioning from PE 63203F.
- (U) $ 480 Air-to-Ground (A/G) CID study. Analyze selected systems to determine mission effectiveness and optimal A/G CID system architecture.
- (U) $ 250 Funds AIMS Program Office support of next generation IFF equipment integration with current IFF capabilities.
- (U) $ 750 CID Integrated Management Team and engineering support for integration and management of Air Force CID programs, conducting related analysis to increase warfighter's CID capabilities.
- (U) $ 198 Identified as a source for SBIR
- (U) $ 6,158 Total

(U) FY 2000 ($ in Thousands):

- (U) $ 2,765 Conduct HAVE CENTAUR algorithm validation, continue synthetic target database development, and provide test support.
- (U) $ 3,600 Continue development demonstration planning of other promising air-to-ground and air-to-air identification techniques for reduced battlefield fratricide and enhanced mission performance, including ERASER program.
- (U) $ 250 Funds AIMS Program Office support of next generation IFF equipment integration with current IFF capabilities.
- (U) $ 778 CID Integrated Management Team and engineering support for integration and management of Air Force CID programs, conducting related studies/demos to increase warfighter's CID capabilities..
- (U) $ 7,393 Total

(U) FY 2001 ($ in Thousands):

- (U) $ 2,800 Conduct HAVE CENTAUR algorithm validation, continue synthetic target database development, and provide test support.
- (U) $ 4,590 Continue development demonstration planning of other promising air-to-ground and air-to-air identification techniques for reduced battlefield fratricide and enhanced mission performance, including ERASER program.
- (U) $ 250 Funds AIMS Program Office support of next generation IFF equipment integration with current IFF capabilities.
- (U) $ 889 CID Integrated Management Team and engineering support for integration and management of Air Force CID programs, conducting related studies/demos to increase warfighter's CID capabilities.
- (U) $ 8,529 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY: 4 - Demonstration and Validation	PE NUMBER AND TITLE: 0603742F Combat Identification Technology / PROJECT: 2597

(U) B. Budget Activity Justification:

This program is in Budget Activity 4 - The PE includes advanced technology demonstrations that help transition technologies from laboratory to operational use.

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY1999 PB)	1,276	6,177	6,428	6,491	Continue
(U) Appropriated Value	1,395	6,177			
(U) Adjustments to Appropriated Value					
a. Cong Reductions	-91	-19			
b. SBIR	-28				
c. Omnibus or Other Above Threshold Reprogram	-9				
d. Below Threshold Reprogramming	50				
e. Recissions					
(U) Adjustments to Budget Years Since FY 1999 PB			965	2,038	
(U) Current Budget Submit/FY2000 PB	1,317	6,158	7,393	8,529	Continue

FY99: $198 identified as a source for SBIR

(U) Significant Program Changes: FY00 through FY05 funding increase to augment Air Force combat identification transition activities.

(U) D. Other Program Funding Summary ($ in Thousands) None.

(U) E. Acquisition Strategy: The HAVE CENTAUR program development was awarded under a competitive bid process. Other combat identification efforts in project 2597 also focus on developing and demonstrating the most promising Air-to-Ground Combat ID techniques and will also be contracted for under a competitive Request For Proposal (RFP) process.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603742F Combat Identification Technology
	PROJECT 2597

(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
1. (U) Suite IV H/W and S/W Efforts																
Radar Enhancement Test Completion						X										
LRIP & Production Begins						X										
DT&E Completion												X				
OT&E Completion														X		
2. (U) Suite IV Classifier Dev/Qual																
Ground-to-Air Test RTF Complete		*														
Airborne Data Collection Complete					*											
Classifier/Target Library Complete						X										
Software Design Review				*												
Initial Flight Demo		*														
OFP Prel. Design Review					*											
OFP Critical Design Review						X										
3. (U) Follow-on Algorithm																
Airborne collection start for new class										X						
4. (U) ERASER																
Contract Award	*															
Systems Requirements Review					*											
Ground Based Demo of Flight H/W						X										
Flight Demo of 1.06 micron system									X							
Trade/Transition Studies Complete													X			
Ground test of ERASER pod start																X

* denotes completed events
X denotes planned events

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603742F Combat Identification Technology
	PROJECT 2597

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

	FY 1998	FY 1999	FY 2000	FY 2001
Data Synthesis, Algorithms, Database Support	215	740	1,250	1,250
Hardware/Software and Prime Mission Product	0	2,950	4,265	5,263
TEMS and Travel	752	947	978	1,091
Program Office Support/ IMT Training/SPO Ops	115	325	475	475
Analysis/Modeling and Simulation, Plans and Reports	235	855	255	297
Range Time	0	143	170	153
Identified as a source for SBIR		198		
Total	1,317	6,158	7,393	8,529

(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							198				
Product Development Org.											
Raytheon Co, El Segundo CA	CPFF	Sep 92	38,529	38,529	30,479	0	1,022	865	850	Continue	Cont
Westinghouse Elec Co	CPFF	Aug 93	1,780	1,780	1,780	0	0	0	0	0	1,780
McDonnell Douglas	AF616	Aug 94	3,550	3,550	3,550	0	0	0	0	0	3,550
Veridian (Veda), Dayton, OH	CPFF	Aug 94	12,221	12,221	12,221	0	0	0	0	0	12,221
Veridian (Veda) Dayton, OH	CPFF	Aug 98	13,000	13,000	0	215	800	800	800	Continue	Cont
National Air Intel Center	AF616	Annually	3,329	3,329	3,329	0	0	0	0	0	3,329
Northrop Grumman Corp	CPFF	FY00	TBD	TBD	0	0	300	300	350	Continue	Cont
USAF Wright Laboratory		N/A	4,000	4,000	2,332	50	275	475	500	Continue	Cont
Combat ID IMT Studies/Demos	Various	N/A	TBD	TBD		205	480			Continue	Cont
ERASER-Raytheon, Plano TX	CPFF	Dec 97	5,532	5,532	1	0	500	2,500	3,440	Continue	Cont
Patuxent River Naval Res	MIPR	Annually	TBD	TBD	0	0	100	50	50	Continue	Cont
Raytheon, SADL-JTIDS Gateway	MIPR	Annually	TBD	TBD	0	0	308	300	300	Continue	Cont
Demeco, Inc	CPFF	Aug 94	9,004	9,004	6,604	0	700	650	750	Continue	Cont

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603742F Combat Identification Technology PROJECT 2597

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
Support and Management Organizations											
Georgia Tech Res Inst. (GTRI)	CPFF	Aug 94	1,978	1,978	1,978	0	0	0	0	0	1,978
USAF Combat ID IMT and Engineering Support	Various	N/A	TBD	TBD		717	750	778	889	Continue	Cont
AIMS Program Office, WRALC	MIPR	Annual	TBD	TBD		100	250	250	250	Continue	Cont

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603742F Combat Identification Technology						PROJECT 2597	
Test and Evaluation Organizations											
3246th Test Wing, Eglin AFB, FL 544th Range Group, Nellis AFB, NV	Mixed, CPF, MIPRS	N/A	3,769	3,769	2,319	30	475	425	350	Continue	Cont
Government Furnished Equipment: None											
Identified as a Source for SBIR							198				
Subtotal Product Development					60,296	470	4,485	5,940	7,040	Continue	Cont
Subtotal Support and Mgt					1,978	817	1,000	1,028	1,139	Continue	Cont
Subtotal Test and Evaluation					2,319	30	475	425	350	Continue	Cont
Total Project					64,593	1,317	6,158	7,393	8,529	Continue	Cont

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

DATE: February 1999

BUDGET ACTIVITY: 4 - Demonstration and Validation

PE NUMBER AND TITLE: 0603790F NATO Cooperative Research and Development

PROJECT: NATO

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
NATO Nato Coop R&D	10,343	4,105	4,283	5,558	11,784	11,990	12,241	12,495	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

These funds will be used to help implement international cooperative research, development, and acquisition (ICRD&A) agreements with NATO and major non-NATO allies (Australia, Egypt, Israel, Japan, and Korea). The program implements the provisions of Title 10 U.S. Code, Section 2350a on NATO Cooperative Research and Development (R&D). The program was established to improve what Congress perceived as inadequate cooperation among NATO nations, and later major non-NATO allies, in research, development, and production. The legislation authorized funds to significantly improve US and allied conventional defense capabilities by leveraging the world's best defense technologies, eliminating costly duplication of research and development efforts, accelerating the availability of defense systems, and promoting US and allied interoperability or commonality. Starting in FY00 these funds will focus on implementing coalition warfare technology and demonstrations that address Air Force space, command, control, communications, and intelligence (C3I), modernization and readiness needs in support of the National Military Strategy, Joint Vision 2010, and the Air Force's Strategy of Global Engagement. The planned program is shown below. The final program will be reported separately as required by Title 10 U.S. Code, Section 2350a(f). This program element funds the implementation of Air Force ICRD&A agreements in (1) Basic Research (2) Applied Research (3) Advanced Technology Development (4) Demonstration and Validation (5) Engineering and Manufacturing Development and (6) RDT&E Management Support.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY **4 - Demonstration and Validation**	PE NUMBER AND TITLE **0603790F NATO Cooperative Research and Development**
	PROJECT **NATO**

(U) FY 1998 ($ in Thousands):

(U) Continuing Projects Initiated in FY95 and FY96 Under PE 0603790D:

– (U) $60 **Image Information Reformatter (IIR)** (Air Force Research Laboratory/France) - Cooperative project to define, develop and demonstrate an Advanced Development Model (ADM) - IIR for the purpose of demonstrating interoperability among allied tactical imagery reconnaissance collection and ground systems. In FY98 planning and coordination continued with the French for the cooperative Phase Two development of an ADM-IIR. The French program underwent significant financial and organizational reviews by the French Ministry of Defense. The US is planning to closely follow the French effort in order to maximize NATO interoperability initiatives and to emphasize extending the reformatting capability to address the US to NATO interface requirement.

– (U) $600 **Effects of the Ionosphere on Command, Control, Communications, and Intelligence (C3I) Systems** (Air Force Research Laboratory/United Kingdom) - Cooperative project to leverage complementary ionospheric sensors and data to develop capabilities for timely warning of ionospheric disturbances that disrupt C3I systems. In FY98 the project expanded the coverage area for which C3I system outage forecasts and alerts can be provided to include the South America and the Atlantic regions. In addition, the project initiated effortsto couple the sensor-driven Parameterized Ionosphere Specification Model (PRISM) to a United Kingdom analytic ray tracing code for radio wave propagation prediction applications; developed algorithms to couple Global Position System-Meteorological (GPS-Met) satellite data into PRISM; and began development of efficient techniques to fuse multiple sensor data and multiple battlespace environment models required for in-theater, real-time, specifications and forecasts of ionospheric and radio wave propagation conditions.

– (U) $150 **Single Mode Optical Fibers for Array Imaging and for Environmental Sensing** (Air Force Research Laboratory/United Kingdom) - Cooperative project to enhance the performance of single mode optical fibers for ultra-high angular resolution imaging in support of space surveillance needs. In FY98 the project completed acceptance tests on the multi-core single mode fibers (MCSMFs). Field test comparisons between the 4 cores Air Force prototype and the 3 and 6 core United Kingdom prototypes were also conducted. Drafted reports with analysis being prepared evaluating which prototype is the best in terms of cost, reliability, etc. MCSMFs offer the potential for transmitting light and images more efficiently.

– (U) $2,600 **Vista Warrior** (Air Force Research Laboratory/United Kingdom) - Cooperative project to develop and evaluate advanced helmet-mounted tracker and display (HMT/D) technologies, multi-sensory virtual interface concepts, and virtual display and control devices for incorporation into advanced aircraft. In FY98 the project demonstrated Helmet-Vehicle Interface (HVI) for binocular HMT/Ds; developed color image source technology for a monocular HMT/D for use in fast-jets for air-to-air and air-to-ground missions and evaluated the utility of color symbology; assessed technologies for a flight-worthy eye tracker for airborne eye pointing/targeting; completed development of global implicit situational awareness measurement system; and selected advanced, adaptive control and display concepts for simulator implementation, evaluation and later demonstration in aircraft.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY **4 - Demonstration and Validation**	PE NUMBER AND TITLE **0603790F NATO Cooperative Research and Development**
	PROJECT **NATO**

(U) Continuing Projects Initiated in FY97 Under PE 0603790F:

– (U) $1,500 **Dense Metal Case Penetrating Weapon (DMCPW)** (Air Force Research Laboratory/United Kingdom) - Cooperative project to develop and demonstrate technology for a dense metal penetrating warhead that is compatible with guidance kits such as PAVEWAY III and the Joint Deep Attack Munition (JDAM). This technology offers a two-fold increase in hard target defeat over current warhead case designs. The warhead will be compatible for carriage and release with future smaller aircraft, and stand-off weapons such as cruise missiles. Technology demonstration will be through subscale and full scale dynamic ground impact testing (sled and/or powder gun) with an option for flight demonstrations using PAVEWAY III guidance kits. In FY98 the project completed preliminary design of the DMCPW warhead and began scaling up the manufacturing processes. Other accomplishments in FY98 included completion of preliminary design of the US enhanced PAVEWAY III flight demonstration guidance kit and United Kingdom weaponization design studies.

– (U) $550 **Strengthening of Concrete Structures for Enhanced Structural Survivability Against Conventional and Terrorist Weapons** (Air Force Research Laboratory/Israel) - Cooperative project to develop rapid, inexpensive construction process to significantly increase the strength and resistance of existing or new conventional concrete and mason structures to terrorist vehicle bombs or tactical ballistic missile threats. Meets requirement to upgrade mission critical air base structures at both contingency and fixed bases, thereby reducing the need for new military construction. In FY98 the project evaluated and selected materials for further testing; test modules and components of structures under blast loading in the US and Israel; and conducted tests on complete structures in Israel. Systems validated on complete structures include masonry wall reinforcement with composite bonding, geotextile “catch” curtains, energy absorbing window frames, and sacrificial exterior panels. Report on data analysis completed to determine most effective methods for enforcing structural survivability.

– (U) $500 **Free Piston Shock Tunnel/High Enthalpy Goettingen Project** (Arnold Engineering and Development Center/Germany) - Cooperative project to significantly reduce the cost of acquiring technologies and ground test capabilities for the development of hypersonic flight systems by combining the complementary efforts of the US Free Piston Shock Tunnel (FPST) and Germany’s High Enthalpy Goettingen (HEG) facilities. In FY98 FPST facility calibration and blunt cone tests were done in the US FPST. HEG supplied the data from their blunt cone tests and preliminary computational fluid dynamics (CFD) comparisons were accomplished. Two new non-intrusive diagnostics techniques were made operational in the FPST. US engineers visited the HEG facility, taking a variety of non-intrusive diagnostics systems, and gathered data during an HEG test program. The data will be used to further the development of US diagnostics capabilities.

– (U) $750 **Programmable Integrated Ordnance Suite (PIOS)** (Air Force Research Laboratory/United Kingdom) - Cooperative project to develop and demonstrate integrated missile ordnance technologies, including imaging infrared target detection devices (TDD), mass-focused or directional warheads, and advanced initiation fireset. The primary goal is to improve counter-air lethality against advanced fighter, bomber, helicopter, and cruise missile targets. Technical risk areas identified in FY97 were subjected to more detailed engineering analyses in FY98 to identify design approaches that mitigate risk. Initiated the preliminary design of an integrated counter air ordnance suite with support engineering rationale and lethality performance predictions.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY **4 - Demonstration and Validation**	PE NUMBER AND TITLE **0603790F NATO Cooperative Research and Development**
	PROJECT **NATO**

(U) Continuing Projects Initiated in FY97 Under PE 0603790D:

– (U) $1,150 **Regional/Sector Air Operations Center (R/SAOC) Modernization Program** (Electronic Systems Center/Canada) - Cooperative project to modernize existing R/SAOC computing and display capabilities to better support designated North American Aerospace Defense (NORAD) Command missions. In FY98 the project continued integrating R/SAOC with the Theater Battle Management Core System (TBMCS), Global Command and Control System (GCCS), and the Defense Information Infrastructure/Common Operating Environment (DII/COE).

– (U) $50 **Aftbody/NozzleAeroacoustics Project (ANAP)** (Air Force Research Laboratory/United Kingdom) - Cooperative project to develop jet screech frequency and amplitude prediction capabilities. Goal is to combine state-of-the-art US modeling techniques with unique United Kingdom anechoic chamber data to develop a tool which can be used for analysis and design tradeoffs. Nozzle screech has been shown to destroy exhaust structural components, and is particularly damaging in twin-jet configurations. In FY98, efforts focused on obtaining twin-jet screech data in the United Kingdom, and extended the analysis capabilities of the screech tool to twin-jet configurations. When complete, this will represent the only twin-jet predictive capability available (numerical or analytical).

(U) New Projects:

– (U) $283 **Cooperative Research and Development Efforts in Imaging Spectrometer Development** (Arnold Engineering and Development Center/Canada) - Cooperative project to pool the spatial and spectral advances of both the US and Canada, and develop a high-resolution sensor system capable of characterizing signatures of rockets and aircraft, for drug interdiction, and identifying trace quantities of a broad spectrum of gases in the environment. In FY98 the project surveyed available components and state-of-the-art technology for focal plane arrays, interferometers, and data acquisition hardware; began the preliminary design for a high-resolution sensor system; and identified long lead components.

– (U) $100 **Metal Matrix Composites for Aerospace Applications** (Air Force Research Laboratory/United Kingdom) - Cooperative project to improve the properties and processing of silicon carbide (SiC) - reinforced Titanium (Ti) - alloy and Aluminum (Al) - alloy metal matrix composites (MMCs) for aerospace applications. In FY98, the United Kingdom produced and supplied SiC fiber with three experimental coatings to the Air Force for evaluation. The strength and stiffness of the three coatings has been determined, and the adhesion of the coatings to the SiC fiber has been determined. High resolution transmission electron microscopy has provided detailed information of the structure of the coating, and this information is being used to establish the relationships between the structure and the properties of the coating. Initial samples with controlled fiber spacing have been prepared by the Air Force from matrix-coated SiC fibers for transverse mechanical characterization.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY **4 - Demonstration and Validation**	PE NUMBER AND TITLE **0603790F NATO Cooperative Research and Development**
	PROJECT **NATO**

– (U) $450 **Integrated Tactical Aircraft Control (ITAC) Program** (Air Force Research Laboratory/France) - Cooperative project to develop, integrate and demonstrate critical flight control and flight management technologies that enable cooperative flight operations of a package comprised of manned and uninhabited combat air vehicles (UCAVs). The cooperative control architecture enables management and control of an integrated strike package by the aircrews in the combat aircraft. In FY98, the project initiated development of program documentation and technical definition to achieve a common understanding of system level requirements, tasks and major program deliverables. Established key agreements with other DoD organizations supporting out-year, cooperative US/French ITAC flight test activities.

– (U) $600 **Anthropometric Accommodation in Crew Systems** (Air Force Research Laboratory/The Netherlands) - Cooperative project to establish (a) a collection of three-dimensional (3-D) anthropometric data which accurately and consistently describes the variability of men and women in both Europe and the US (b) high quality methods for accommodation and interoperability assessment of crew systems and (c) methods for combining the data base with the assessment methods to assure accommodation and interoperability is achieved in the design process. In FY98 the project collected the first half of the 3-D data sets in the United States and initiated the aircraft measurements.

– U) $400 **Aging Aircraft Life Prediction /Extension** (Air Force Research Laboratory/Australia) - Cooperative project to investigate the damage that can degrade an aircraft's service life, and develop the technology to ensure the structural integrity of aging aircraft with such damage present. This project will focus on composite patch repairs of metallic structures, widespread fatigue damage including multiple-element damage and multiple site damage, techniques for predicting the effects of corrosion and the interaction with fatigue loads, and sensors for structural health monitoring. In FY98 the project began documentation of experience with widespread fatigue damage and composite patch repairs, initiated analysis techniques for corrosion/fatigue, and began evaluating composite patch repair analysis techniques.

– (U) $350 **Structural Integrity of Aging Aircraft** (Air Force Research Laboratory/Canada) - Cooperative project to investigate the damage that can degrade an aircraft's service life, and develop the technology to ensure the structural integrity of aging aircraft with such damage present. This project will focus on composite patch repairs for metallic structures, widespread fatigue damage, life extension techniques for metallic structures, corrosion and its interaction with fatigue, structural dynamics with emphasis on weapon bay acoustics, and structural health monitoring with emphasis on sensor development. In FY98 the project began documentation of experience with widespread fatigue damage and initiated evaluation of composite patch repair analysis techniques.

– (U) $250 **Airworthiness of Aging Aircraft** (Air Force Research Laboratory/United Kingdom) - Cooperative project to investigate the damage that can degrade an aircraft's service life, and develop the technology to ensure the structural integrity of aging aircraft with such damage present. This project will focus on composite patch repairs for metallic structures, techniques for predicting the effects of corrosion and the interaction with fatigue loads, and structural life extension techniques for metal structures, such as the fastener-hole cold expansion process. In FY98 the project initiated documentation of experience with corrosion/fatigue and composite patch repairs, started development of analysis techniques for life enhancement, and began evaluation of composite patch repair analyis techniques.

– (U) $10,343 Total

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(U) FY 1999 ($ in Thousands):

– (U) $139 Identified as a source for SBIR

(U) Continuing Projects Initiated in FY95 and FY96 under PE 0603790D:

– (U) $200 **Effects of the Ionosphere on Command, Control, Communications, and Intelligence (C3I) Systems** (Air Force Research Laboratory/United Kingdom) - Cooperative project to leverage complementary ionospheric sensors and data to develop capabilities for timely warning of ionospheric disturbances that disrupt C3I systems. In FY99 the project will expand the coverage area for which C3I system outage forecasts and alerts can be provided to include the North Africa/Middle East region and a gound-based, rapidly deployable, Space Weather Station will be assembled, employing multiple sensors and battlespace environment models to specify ionospheric and radio wave propagation conditions.

(U) Continuing Projects Initiated in FY97 under PE 0603790F:

– (U) $1,000 **Dense Metal Case Penetrating Weapon (DMCPW)** (Air Force Research Laboratory/United Kingdom) - Cooperative project to develop and demonstrate technology for a dense metal penetrating warhead, that is compatible with guidance kits such as PAVEWAY III and the Joint Deep Attack Munition (JDAM). This technology offers a two-fold increase in hard target defeat over current warhead case designs. The warhead will be compatible for carriage and release with future smaller aircraft, and stand-off weapons such as cruise missiles. Technology demonstration will be through subscale and full scale dynamic ground impact testing (sled and/or powder gun) with an option for flight demonstrations using PAVEWAY III guidance kits. In FY99 the project will complete the DMCPW warhead detailed design, development, and fabrication of full scale penetrators for the sled test program, which will be accomplished in FY00. In FY99 the enhanced PAVEWAY III guidance package will be flight tested using a MK-83 general purpose bomb equipped with a telemetry package.

– (U) $100 **Free Piston Shock Tunnel/High Enthalpy Goettingen Project** (Arnold Engineering and Development Center/Germany) - Cooperative project to significantly reduce the cost of acquiring technologies and ground test capabilities for the development of hypersonic flight systems by combining the complementary efforts of the US Free Piston Shock Tunnel (FPST) and Germany's High Enthalpy Goettingen (HEG) facilities. In FY99 all testing will be completed in the FPST and the HEG; final computational fluid dynamics analysis of the data and CFD code development will be accomplished; and the final report will be prepared.

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	PROJECT **NATO**

(U) Continuing Projects Initiated in FY98 under PE 0603790D:

– (U) $703 **Advanced Hybrid Propulsion Technologies Cooperative Research Project** (Air Force Research Laboratory/Japan) - Cooperative project to develop hybrid propulsion technology for air-to-air missiles. In FY99 the project will develop the subsystem components necessary to meet the overall project requirements of increased performance and safety, as well as providing energy management capability. The subsystem components include an injector, gas generator pressurization system, flow control valve, liquid oxidizer expulsion system, oxidizer chemistry development, and oxidizer tankage.

– (U) $1,000 **Advanced Crew Ejection Seat (ACES) II - Ejection Seat Cooperative Modification Project** (Human Systems Center/Japan) - Cooperative project to develop and design a modification kit that can be retrofitted to the ACES II ejection seat to increase the safety and survivability of light weight aircrew members by: increasing the stability of the seat; increasing the seat/accommodation range; and adding limb restraints. ACES II ejection seat improvements include a gender free operational capability that assures equally reduced mortality rates and serious injuries for both male and female aircrew members. The successful completion of this program is intended to reduce the number of fatalities and serious injuries for all weight classes during high speed ejections and increase anthropometric range for aircrew population requirements. Work to be accomplished in FY99 will include the purchase of the remaining seats and hardware for the upcoming tests. The design stages will be complete and the qualification program will be initiated.

(U) Continuing Projects Initiated in FY98 under PE 0603790F:

– (U) $250 **Cooperative Research and Development Efforts in Imaging Spectrometer Development** (Arnold Engineering and Development Center/ Canada) - Cooperative project to pool the spatial and spectral advances of both the US and Canada, and develop a high-resolution sensor system capable of characterizing signatures of rockets and aircraft, for drug interdiction, and identifying trace quantities of a broad spectrum of gases in the environment. In FY99 the project will investigate the data collection issues associated with imaging spectroscopy. Prototype data collection and analysis will be accomplished.

– (U) $100 **Metal Matrix Composites for Aerospace Applications** (Air Force Research Laboratory/United Kingdom) - Cooperative project to improve the properties and processing of silicon carbide (SiC) -reinforced Titanium (Ti) - alloy and Aluminum (Al) - alloy metal matrix composites for aerospace applications. In FY99, the relationships between the structure and properties of carbon coatings will be determined. Coating deposition parameters will be defined. Carbon coated SiC fibers will be produced by the United Kingdom and evaluated by the Air Force. Transverse testing of matrix-coated fibers will be completed and specification of matrix-coated fibers will be defined. A joint project to improve the mechanical properties of SiC-reinforced Al will be defined and initiated.

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	PROJECT **NATO**

– (U) $200 **Integrated Tactical Aircraft Control (ITAC) Program** (Air Force Research Laboratory/France) - Cooperative project to develop, integrate and demonstrate critical flight control and flight management technologies that enable cooperative flight operations of a package comprised of manned and uninhabited combat air vehicles (UCAVs). The cooperative control architecture enables management and control of an integrated strike package by the aircrews in the combat aircraft. In FY99 the project will complete system level definition and initiate detailed design. Core flight control algorithms, situation assessment methods, optimized flight management and health monitoring system architectures will be developed.

– (U) $300 **Anthropometric Accommodation in Crew Systems** (Air Force Research Laboratory/The Netherlands) - Cooperative project to establish (a) a collection of three-dimensional (3-D) anthropometric data which accurately and consistently describes the variability of men and women in both Europe and the US; (b) high quality methods for accommodation and interoperability assessment of crew systems; and (c) methods for combining the data base with the assessment methods to assure accommodation and interoperability is achieved in the design process. In FY99 the project will finish the United States 3-D data collection and the first half of the European and initiate the augmented reality assessment of the aircraft crewstations.

(U) <u>New Projects:</u>

– (U) $113 **Project Refractive Turbulence** (Air Force Research Laboratory/Australia) - Cooperative project to obtain accurate, statistically significant, world wide turbulence measurements. The turbulence data base is essential to support studies that evaluate atmospheric refraction propagation effects on the design/performance of the Airborne Laser (ABL). In FY99 the project will support data reduction and analyses of aircraft turbulence measurements in Korea/Japan area.

– (U) $4,105 Total

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	PROJECT **NATO**

(U) FY 2000 ($ in Thousands):

(U) Space:

– (U) $75 **Cooperative Space Measurements** (Air Force Research Laboratory/Germany) - Cooperative project to fly a Department of Defense developed space plasma detector aboard a German scientific spacecraft in 1999. Joint exchange and analysis of scientific data from this mission will be used to develop better descriptive and predictive models of the space environment, enhancing the reliability of space-based communications and navigation capabilities for the US and its allies.

– (U) $200 **Observations and Modeling for Space Weather** (Air Force Research Laboratory/Germany) - Cooperative project to forecast the global ionosphere and satellite drag using US and German satellite sensors and experiments to provide coordinated observations of solar impact on the space environment. In FY00 the project will begin improvements in the use of currently available sensor data to drive models of the space environment; launch the Ionospheric Occultation eXperiment (IOX); support on-orbit operations for and analyze data from IOX; and validate algorithms intended for future use with ultraviolet (UV) operational sensor data from the Defense Meteorological Satellite Program (DMSP).

– (U) $100 **Space Radiation Sensors** (Air Force Research Laboratory/United Kingdom) - Cooperative project to validate the performance of a key Air Force spacecraft instrument for the measurement of space environment radiation hazards. The instrument's capability of issuing real-time space hazard warnings will be tested under a variety of conditions encountered in space aboard a joint US/UK satellite mission. In FY00 the project will develop the preliminary space radiation data base using data from the US and UK instruments. Final verification of the US instrument's calibration will be performed using the preliminary data base.

(U) Command, Control, Communications, Intelligence (C3I):

– (U) $538 **Image Information Reformatter (IIR)** (Air Force Research Laboratory/France) - Cooperative project to define, develop and demonstrate an Advanced Development Model (ADM) - IIR for the purpose of demonstrating interoperability among allied tactical imagery reconnaissance collection and ground systems. In FY00 the cooperative effort to develop the ADM-IIR will emphasize the reformatting functionality and interfacing with sensor and exploitation systems. US activities will emphasize how the reformatting technology can be implemented in a computer software configuration which is portable to existing US equipments and architectures.

– (U) $200 **Effects of the Ionosphere on Command, Control, Communications, and Intelligence (C3I) Systems** (Air Force Research Laboratory/United Kingdom) - Cooperative project to leverage complementary ionospheric sensors and data to develop capabilities for timely warning of ionospheric disturbances that disrupt C3I systems. In FY00 a ground-based Space Weather Station, employing multiple sensors and multiple battlespace environment models to specify ionospheric and radio wave propagation conditions, will be deployed and operated in the United Kingdom to demonstrate its potential for future, in-theater, support of operational C3I systems.

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	PROJECT **NATO**

– (U) $150 **Solar Maximum Impacts on C3I Systems** (Air Force Research Laboratory/Australia) - Cooperative project will exchange data, deploy current sensors, develop improved sensors, and tailor current decision aids, including software, which relate to ionospheric phenomena and their effect on C3I systems. This project will provide the US critical access to data in regions of strategic interest in SouthEast Asia and the South Pacific where large ionospheric disturbances routinely occur. FY00 activities include the deployment of 1-2 sensors for monitoring scintillation on UHF Satellite Communication links at existing Australian sites. Real-time data retrieval will be implemented at these sites for ready data access and prototype operational support. Routine data collection will be initiated.

– (U) $250 **Air Command, Control, Communications and Intelligence Capabilities** (Electronic Systems Center/NATO Consultation, Command, and Control (C3) Agency) - Cooperative project to develop an operationally robust interface between the US Contingency Theater Automated Planning System/Theater Battle Management Core System (CTAPS/TBMCS) and NATO Initial Combined Air Operations Center (CAOC) Capability (ICC) as well as the future NATO Air Command and Control System (ACCS). This cooperative R&D effort will support air campaign planning and execution for joint and combined air operations. The scope of work to be accomplished includes advanced R&D into shared data environment, developing a concept of operation for the transfer of control between National and NATO C4I systems without interrupting combat operations; and the extension of a middleware/translator product needed for the successful prosecution of a combined/joint air operation.

– (U) $250 **Coalition C3 Demonstration Environment (CC3DE)** (Air Force Research Laboratory/Australia, Canada, United Kingdom) - Cooperative project to improve the efficiency of future coalition operations capabilities through the development of interoperable C3. This project will initially explore the effective management of information system resources in a coalition environment. It will develop a management architecture for the coalition environment, and develop the tools to implement this architecture. In particular, Asynchronous Transfer Mode (ATM) technology will be integrated into a Broadband-Integrated Services Digital Network (B-ISDN) in efforts to form a common international standard for networking.

– (U) $225 **Advanced Transmission Language and Allocation of New Technology for International Communication and Proliferation of Allied Waveforms (ATLANTIC PAW)** (Air Force Research Laboratory/France, Germany, United Kingdom) - Cooperative project to provide interoperability between newly fielded international radios and allow backward compatibility to existing radio systems. This will be accomplished by developing a common description language between participating countries which is interpretable by each nations programmable radio. This will allow new waveforms to be developed and integrated into each countries radio in an expedient and efficient manner. This methodology is synergistic with the current changing requirements of allied operations and communication. In FY00 the project will jointly create a description languagae which will be used to develop the definition parameters and their operation in communication assets.

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	PROJECT **NATO**

(U) Modernization:

– (U) $395 **Advanced Combustor Chamber Concepts Program** (Air Force Research Laboratory/France) - Cooperative project to develop and demonstrate a composite combustor structure suitable for use in advanced hypersonic weapon systems operation to Mach 8 on liquid hydrocarbon fuels. Resulting engines will be simpler, easier to cool, lower weight, and more durable than baseline metallic designs.

– (U) $300 **Anthropometric Accommodation in Crew Systems** (Air Force Research Laboratory/The Netherlands) - Cooperative project to establish (a) a collection of three-dimensional (3-D) anthropometric data which accurately and consistently describes the variability of men and women in both Europe and the US; (b) high quality methods for accommodation and interoperability assessment of crew systems; and (c) methods for combining the data base with the assessment methods to assure accommodation and interoperability is achieved in the design process. In FY00 the project will finish the European data collection, the augmented reality assessment of the aircraft crewstations, and perform accommodation effect assessments using US and European data sets.

– (U) $600 **Integrated Tactical Aircraft Control (ITAC) Program** (Air Force Research Laboratory/France) - Cooperative project to develop, integrate and demonstrate critical flight control and flight management technologies that enable cooperative flight operations of a package comprised of manned and uninhabited combat air vehicles (UCAVs). The cooperative control architecture enables management and control of an integrated strike package by the aircrews in the combat aircraft. In FY00 the project will proceed with system mechanization and verification, hardware and software integration, and the development and testing of critical subsystems and test criteria.

(U) Readiness:

– (U) $400 **Aging Aircraft Life Prediction/Extension** (Air Force Research Laboratory/Australia) - Cooperative project to investigate the damage that can degrade an aircraft's service life, and develop the technology to ensure the structural integrity of aging aircraft with such damage present. This project will focus on composite patch repairs of metallic structures, widespread fatigue damage including multiple-element damage and multiple site damage, techniques for predicting the effects of corrosion and the interaction with fatigue loads, and sensors for structural health monitoring. In FY00 the project will complete documenting experience with widespread fatigue damage and composite patch repairs, continue developing analysis techniques for corrosion/fatigue, continue evaluating composite patch repair analysis techniques, and perform in-service evaluation of corrosion sensor.

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– (U) $350 **Structural Integrity of Aging Aircraft** (Air Force Research Laboratory/Canada) - Cooperative project to investigate the damage that can degrade an aircraft's service life, and develop the technology to ensure the structural integrity of aging aircraft with such damage present. This project will focus on composite patch repairs for metallic structures, widespread fatigue damage, life extension techniques for metallic structures, corrosion and its interaction with fatigue, structural dynamics with emphasis on weapon bay acoustics, and structural health monitoring with emphasis on sensor development. In FY00 the project will develop analytical models for widespread fatigue damage and corrosion/fatigue, complete evaluation of composite patch repair analysis techniques, and identify in-service dynamics problems.

– (U) $250 **Airworthiness of Aging Aircraft** (Air Force Research Laboratory/United Kingdom) - Cooperative project to investigate the damage that can degrade an aircraft's service life, and develop the technology to ensure the structural integrity of aging aircraft with such damage present. This project will focus on composite patch repairs for metallic structures, techniques for predicting the effects of corrosion and the interaction with fatigue loads, and structural life extension techniques for metal structures, such as the fastener-hole cold expansion process. In FY00 the project will continue analysis techniques for corrosion/fatigue and continue developing analysis techniques for life enhancement and composite patch repairs.

– (U) $4,283 Total

(U) FY 2001 ($ in Thousands):

(U) Space:

– (U) $100 **Space Radiation Sensors** (Air Force Research Laboratory/United Kingdom) - Cooperative project to validate the performance of a key Air Force spacecraft instrument for the measurement of space environment radiation hazards. The instrument's capability of issuing real-time space hazard warnings will be tested under a variety of conditions encountered in space aboard a joint US/UK satellite mission. In FY01 the project will develop the final radiation data base.

– (U) $645 **Observations and Modeling for Space Weather** (Air Force Research Laboratory/Germany) - Cooperative project to forecast the global ionosphere and satellite drag using US and German satellite sensors and experiments to provide coordinated observations of solar impact on space environment. In FY01 the project will continue work to improve the use of operational sensor data to drive models of the space environment; launch the experiment; support on-orbit operations and analysis from the experiment; prepare for the flight of the Auto-Calibrating Extreme ultraviolet Spectrometers (ACES) instrument which will provide calibrated solar flux measurements; modify models to accept solar inputs; and upgrade algorithms used with ultraviolet data from the Defense Meteorological Satellite Program (DMSP) satellite.

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	PROJECT **NATO**

(U) Command, Control, Communications, Intelligence (C3I):

– (U) $563 **Solar Maximum Impacts on C3I Systems** (Air Force Research Laboratory/Australia) - Cooperative project will exchange data, deploy current sensors, develop improved sensors, and tailor current decision aids, including software, which relate to ionospheric phenomena and their effect on C3I systems. This project will provide the US critical access to data in regions of strategic interest in SouthEast Asia and the South Pacific where large ionospheric disturbances routinely occur. In FY01 data collection will continue and 1-2 additional sites will be brought on-line; characterization of ionospheric disturbances in the region and assessment of their impacts on space-based navigation, communication and surveillance systems will be conducted. An intensive multiple-diagnostic measurement campaign will be performed during active scintillation periods to enhance our understanding of the physical mechanisms leading to the development of severe equatorial disturbances.

– (U) $350 **Air Command, Control, Communications and Intelligence Capabilities** (Electronic Systems Center/NATO Consultation, Command, and Control (C3) Agency) - Cooperative project to develop a fieldable interface between the US Contingency Theater Automated Planning System (CTAPS)/TBMCS and NATO Initial CAOC Capability (ICC) and the future NATO Air Command and Control System (ACCS). This cooperative R&D effort will support air campaign planning and execution for joint and combined air operations. In FY01 work will focus on: 1. Productizing the C2 interface between the then fielded systems; 2. Harmonization of system data base structures as part of the shared data environment; and 3. Evaluating and implementing the reuse of appropriate functional modules from one system to the other.

– (U) $750 **Advanced Transmission Language and Allocation of New Technology for International Communication and Proliferation of Allied Waveforms (ATLANTIC PAW)** (Air Force Research Laboratory/France, Germany, United Kingdom) - Cooperative project to provide interoperability between newly fielded international radios and allow backward compatibility to existing radio systems. This will be accomplished by developing a common description language between participating countries which is interpretable by each nations programmable radio. This will allow new waveforms to be developed and integrated into each countries radio in an expedient and efficient manner. This methodology is synergistic with the current changing requirements of allied operations and communication. In FY01 the project will continue creating a description languagae which will be used to develop the definition parameters and their operation in communication assets.

– (U) $500 **Coalition C3 Demonstration Environment (CC3DE)** (Air Force Research Laboratory/Australia, Canada, United Kingdom) - Cooperative project to improve the efficiency of future coalition operations capabilities through the development of interoperable C3. This project will initially explore the effective management of information system resources in a coalition environment. It will develop a management architecture for the coalition environment, and develop the tools to implement this architecture. In particular, Asynchronous Transfer Mode (ATM) technology will be integrated into a Broadband-Integrated Services Digital Network (B-ISDN) in efforts to form a common international standard for networking.

– (U) $1,350 **Image Information Reformatter (IIR)** (Air Force Research Laboratory/France) - Cooperative project to define, develop and demonstrate an Advanced Development Model (ADM) - IIR for the purpose of demonstrating interoperability among allied tactical imagery reconnaissance collection and ground systems.

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(U) Modernization:

– (U) $200 **Refraction and Propagation Modeling for Microwave Systems** (Air Force Research Laboratory/Australia, United Kingdom) - Cooperative project to develop a methodology for evaluating refraction conditions expected to result in adverse performance of microwave systems by coupling airborne refraction measurements with parabolic equation methods of microwave propagation modeling.

– (U) $400 **Effects of Ionization on Hydrocarbon Combustion** (Air Force Research Laboratory/United Kingdom) - Cooperative project to investigate the effects of weak ionization on hydrocarbon-air mixture reaction time, and develop promising pilots/flameholders, including plasma ignitors which can be incorporated into scramjet engines. The research will investigate techniques to decrease the time for fuel ignition, and increase the rate of combustion to facilitate high speed propulsion. Other generic requirements to be addressed include extending the altitude range for airbreathing propulsion and providing physically smaller combustors to reduce the associated weight and cooling penalties.

(U) Readiness:

– (U) $200 **Engine Life Component Extension** (Air Force Research Laboratory/Australia) - Cooperative project to develop life extension techniques and strategies that can be applied to advanced military engines. The engines involved include the US Air Force F100, -220 and -229, and F101 and Australia's TF30, F404 and T700. Much of the technology will be generic and flow from one engine to another.

– (U) $500 **Distributed Mission Training (DMT) Technologies** (Air Force Research Laboratory/Canada) - Cooperative project to develop DMT technologies that will enhance allied simulator based training of US and Canadian fighter aircrews and demonstrate proof of concept. DMT refers to a shared training environment comprised of live, virtual, and constructive simulations allowing warfighters to train individually or collectively at all levels of war.

– (U) $5,558 Total

(U) B. Budget Activity Justification

This PE is designated in Budget Activity 4 because most of the ICRD&A projects support specific systems, include all efforts necessary to evaluate integrated technologies in as realistic an operating environment as possible to assess the performance or cost reduction potential of advanced technology and help expedite technology transition from the laboratory to operational use.

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget FY 1999 PB	10,414	11,117	11,291	11,913	
(U) Appropriated Value	11,000	4,117			
(U) Adjustments to Appropriated Value					
a. Cong Reductions	-381	-12			
b. SBIR	-206				
c. Omnibus or Other Above Threshold Reprogram	-70				
d. Below Threshold Reprogramming					
(U) Adjustments to Budget Years Since FY 1999 PB			-7,008	-6,355	
(U) Current Budget Submit/FY 2000 PB	10,343	4,105	4,283	5,558	

(U) Significant Program Changes:

FY 1999: $139 identified as a source for SBIR.

Change Summary Explanation: Realignment of FY00 and FY01 funds from NATO R&D PE into PEs supporting the cooperative project.

(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
(U) N/A										

Related RDT&E:
(U) This program element complements OSD NATO Cooperative R&D PE 0603790D which funds the first year only of any new DoD agreement. It also provides ICRD&A funds for USAF Laboratory 6.1 through 6.3 programs and USAF Product, Test, and Logistics Center 6.4 through 6.5 programs. Management support for Air Force NATO Cooperative R&D PE 0603790F is funded in Air Force International Activities PE 1001004F at the level of $300 per fiscal year.

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(U) E. Acquisition Strategy:

A principal goal of the NATO Cooperative R&D program is to effectively utilize the aggregate resources invested by the US and our allies in conventional defense R&D. This program element provides the critical funding incentive needed to pursue ICRD&A agreements and helps to (a) leverage USAF and allied resources through cost sharing and economies of scale; (b) exploit the best US and allied technologies for equipping coalition forces; (c) demonstrate areas of commonality or interoperability with our allies; and (d) accelerate the availability of defense technology and systems. Candidate projects are reviewed and approved by the USD(A&T). An international agreement defining project objectives, responsibilities and costs is required prior to release of funds. To obtain these funds and ensure service commitment, projects are selected from existing or new RDT&E programs funded in the Future Years Defense Plan (FYDP). Project offices must show matching funds and contributions from associated program elements and equitable allied funding. As appropriate, funding responsibility for out-year requirements and follow-on efforts are transferred to the project office and associated program elements. Most contracts are awarded after full and open competition.

(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) **Image/Information Reformatter (IIR)**																
(U) Concept definition activities	*			*												
(U) Request for proposal released									X							
(U) Contract award											X					
(U) Development and fabrication of Advanced Development Model IIR and interfaces											X					X
(U) **Vista Warrior**																
(U) Develop and demonstrate advanced technologies and interface concepts in labs and simulators						X										
(U) Demonstrate the technology developed on operational fast jet aircraft	*							X								
(U) Assess advanced head/helmet tracker technologies	*			*												
(U) Demonstrate advanced head/helmet tracker					X	X										

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	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) **Effects of the Ionosphere on C3I Systems**																
(U) UK provide the latest Ray-Tracing algorithms for use with the US Parameterized Ionosphere-Specification Model (PRISM)		*														
(U) Assess UK oblique sounder system	*															
(U) Expand C3I outage alert areas to include South American and Atlantic sectors		*														
(U) Couple ray- trace/ionospheric model					X											
(U) Assemble ground-based Space Weather Station (SWS)							X									
(U) Expand C3I outage alert coverage to include North Africa/Middle East sector								X								
(U) Deploy SWS to United Kingdom									X							
(U) Demonstrate use of SWS to support C3I systems operations												X				
(U) **Dense Metal Case Penetrating Weapon (DMCPW)**																
(U) Preliminary design						X										
(U) Detailed design, development, and ground testing						X				X						
(U) Final design and flight testing										X			X			
(U) US ground sled demonstration tests									X	X						
(U) US flight weapon demonstration tests													X			
(U) UK subscale full scale penetrator design and underground trials								X								
(U) System analyses and material tests													X			

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	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) **Cooperative Research and Development Efforts in Imaging Spectrometer Development**																
(U) Agreement signed				*												
(U) Preliminary design							X									
(U) Concept checkout								X								
(U) Interim report												X				
(U) Advanced design												X				
(U) **Free Piston Shock Tunnel/High Enthalpy Goettingen Project**																
(U) Calibration, fabrication of models, testing		*			X											
(U) Exchange consultations		*														
(U) Exchange instrumentation and diagnostic articles		*	*		X	X										
(U) Computational fluid dynamics code development and validation	*					X										
(U) Final report							X									
(U) **Programmable Integrated Ordnance Suite (PIOS)**																
(U) Model and evaluate concept ordnance suites	*															
(U) Perform preliminary design of selected ordnance suite concept		*		*												
(U) Perform detailed engineering design of fuze and warhead					X			X								

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PROJECT: NATO

	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) **Observations and Modeling for Space Weather**																
(U) Agreement signed									X							
(U) Exchange existing data									X							
(U) Analyze existing data										X			X			
(U) Test and upgrade models									X							X
(U) Prepare/launch satellite experiments									X	X				X	X	
(U) Support on-orbit operations									X							X
(U) Analysis of satellite data										X						X
(U) **Regional/Sector Air Operations Center (R/SAOC) Modernization Program**																
(U) Hardware & software procurement			*													
(U) Procure operator work stations				*												
(U) US Site 1 turned over											X					
(U) Canada Site 2 turned over								X				X				
(U) US Site 3 turned over														X		
(U) US Site 4 turned over															X	
(U) US Site 5 turned over																X
(U) **Strengthening of Concrete Structures for Enhanced Structural Survivability Against Conventional and Terrorist Weapons**																
(U) Materials evaluation and selection	*															
(U) Structural component evaluation		*														
(U) Full structure field tests	*			*												
(U) Data reduction/analysis/field manual				*		X										

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BUDGET ACTIVITY **4 - Demonstration and Validation**	PE NUMBER AND TITLE **0603790F NATO Cooperative Research and Development**
	PROJECT **NATO**

	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) **Cooperative Space Measurements**																
(U) Preliminary design	*															
(U) Detailed design	*		*													
(U) Development and test	*					X										
(U) Agreement signed						X										
(U) Delivery to spacecraft integrator						X										
(U) Spacecraft integration and test						X			X							
(U) Launch									X							
(U) Data collection									X							X
(U) **Project Refractive Turbulence**																
(U) Design probe supports	*															
(U) Build tail probe mounts			*													
(U) Install tail turbulence probes				*												
(U) Aircraft certification				*												
(U) Agreement signed						X										
(U) Test measuring systems on aircraft		*		*												
(U) Flight measurements				*		X		X								
(U) Field measurement reports					X	X		X								X
(U) Data reduction				*		X		X								
(U) Data analysis				*												X
(U) **Single Mode (SM) Optical Fibers for Array Imaging and for Environmental Sensing**																
(U) Test and evaluation of Multi-Core SM Fiber (MCSMF)	*			*												
(U) Construction of fiber sensor and prototype					X			X								

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BUDGET ACTIVITY: 4 - Demonstration and Validation

PE NUMBER AND TITLE: 0603790F NATO Cooperative Research and Development

PROJECT: NATO

	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) **Metal Matrix Composites (MMCs) for Aerospace Applications**																
(U) Agreement signed	*															
(U) Concept definition	*						X									
(U) Produce and evaluate MMCs	*							X								
(U) Specify improved MMCs						X		X								
(U) Produce and evaluate improved MMC									X							
(U) **Advanced Combustor Chamber Concepts Program**																
(U) Agreement signed		*														
(U) Material/fabrication sample tests		*		*												
(U) Combustor cooled panel design and fabrication		*					X									
(U) Cooled panel tests							X			X						
(U) Combustor chamber design and fabrication								X						X		
(U) Combustor chamber tests															X	
(U) **Integrated Tactical Aircraft Control (ITAC) Program**																
(U) Agreement signed	*															
(U) System definition				*	X											
(U) System design					X			X								
(U) Detailed design								X				X				
(U) System mechanization										X						X

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	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) **Anthropometric Accommodation in Crew Systems**																
(U) Agreement signed				*												
(U) Conduct anthropometric survey				*								X				
(U) Assess subjects in actual cockpits					X	X										
(U) Assess one model in the US and one model in The Netherlands							X	X								
(U) Augmented reality assessments								X			X					
(U) 3-D data reduction									X		X					
(U) Compare live subject, computer model, and augmented reality results											X	X				
(U) Comparison of data from The Netherlands with the US											X	X				
(U) **Aftbody/Nozzle Aeroacoustics Program (ANAP)**																
(U) US modeling and analysis activities					X	X										
(U) United Kingdom single jet hot/cold data	*															
(U) US/United Kingdom planning and data reduction	*			*		X										
(U) United Kingdom twin jet hot/cold data				*												
(U) Application of screech tool to target twin-jet fighter application				*	X											

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	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) **Structural Integrity of Aging Aircraft**																
(U) Agreement signed	*															
(U) Document widespread fatigue damage service experience				*												
(U) Develop widespread fatigue damage analytical models								X								
(U) Develop corrosion/fatigue analysis techniques						X										
(U) Evaluate existing composite patch analysis techniques for metallic structures				*												
(U) Identify candidate solutions for dynamic control								X								
(U) Develop health monitoring brassboard models							X									
(U) Identify fatigue life enhancement techniques								X								
(U) **Airworthiness of Aging Aircraft**																
(U) Agreement signed	*															
(U) Develop life enhancement analysis techniques							X									
(U) Conduct experiments								X								
(U) Document corrosion/fatigue service experience				*												
(U) Document composite patch service experience		*														
(U) Evaluate existing composite patch analysis techniques for metallic structures			*													

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	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 Aircraft Life Prediction/ Extension**																
(U) Agreement signed		*														
(U) Document widespread fatigue damage			*													
(U) Coordinate with US							X									
(U) Develop corrosion/fatigue analysis techniques				*												
(U) Document composite patch service experience		*														
(U) Evaluate exisitng composite patch analysis techniques for metallic structures		*														
(U) Identify health monitoring sensors		*														
(U) Prepare for flight tests				*												
(U) **Advanced Hybrid Propulsion Technologies Cooperative Research Project**																
(U) Agreement signed			*													
(U) Detail design	*															
(U) Oxidizer expulsion system	*							X								
(U) Controls	*	*			X		X									
(U) Injector		*				X	X									
(U) Pressurization system	*						X									
(U) Oxidizer development	*							X								
(U) Integrate subsystems									X	X						
(U) Determine suitability for integrated testing											X	X				
(U) Conduct integrated testing													X		X	
(U) Data analysis and reporting															X	X

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BUDGET ACTIVITY: 4 - Demonstration and Validation

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PROJECT: NATO

	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) **Advanced Crew Ejection Seat (ACES) II - Ejection Seat Cooperative Modification Project**																
(U) ACES II Preliminary design		*														
(U) Agreement signed		*														
(U) Engineering, manufacturing, development				*												
(U) Detailed design					X											
(U) Complete design							X									
(U) Qualification program								X								
(U) **Space Radiation Sensors**																
(U) Agreement signed							X									
(U) Calibration review							X		X							
(U) Preliminary data base										X		X				
(U) Verification of calibration												X		X		
(U)Final unified data base												X				

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	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) **Air Command, Control, Communications and Intelligence Capabilities**																
(U) Agreement Signed							X									
(U) Draft program and implementation plan								X								
(U) Contract change request released				*												
(U) Issue technical task descriptive					X											
(U) Program definition					X											
(U) Scope work effort to achieve shared data environment								X								
(U) Develop translator extensions					X				X							
(U) US/NATO Battle Lab verification and development test									X							
(U) Examine US/NATO Concept of Operations in coalition environment in terms of shared data environment				X		X		X								
(U) **Coalition C3 Demonstration Environment (CC3DE)**																
(U) Agreement Signed									X							
(U) Testbed Setup & Evaluation									X		X					
(U) Network management integration									X							X
(U) C3I application and integration demonstrations													X			

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	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) **Advanced Transmission Language and Allocation of New Technology for International Communication and Proliferation of Allied Waveforms (ATLANTIC PAW)**																
(U) Radio development							X									
(U) Compliance testing (Germany)							X									
(U) Compliance testing (United Kindgom)								X								
(U) Agreement signed								X								
(U) Initial meeting								X								
(U) Tool characterization											X					
(U) Interpreter characterization																X
(U) Allied waveform coding																X
(U) **Solar Maximum Impacts on C3I Systems**																
(U) Agreement Signed							X									
(U) Implement real-time data collection at existing sites									X							
(U) Deploy scintillation monitors										X						
(U) Correlate and calibrate data sets												X				
(U) Characterize local disturbance climatology														X		
(U) Campaign/complete data collection															X	
(U) Develop regional forecast algorithms															X	
(U) Report on regional scintillation and tailored products for C3I systems support																X

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BUDGET ACTIVITY **4 - Demonstration and Validation**	PE NUMBER AND TITLE **0603790F NATO Cooperative Research and Development**
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(U) A. Project Cost Breakdown ($ in Thousands)

Complete information regarding the use of NATO Cooperative R&D funds is not available for all proposed agreements, since some are still being negotiated or were recently signed. In addition, future funding for continuing agreeements is not available in all instances because the funds are used as needed to supplement a project office's related 6.1 through 6.5 RDT&E appropriations.

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Image Information Reformatter (IIR)	60	0	538	1,350
(U) Vista Warrior	2,600	0	0	0
(U) Effects of the Ionosphere on Command, Control, Communications, and Intelligence (C3I) Systems	600	200	200	0
(U) Single Mode Optical Fibers for Array Imaging and for Environmental Sensing	150	0	0	0
(U) Strengthening of Concrete Structures for Enhanced Structural Survivability Against Conventional and Terrorist Weapons	550	0	0	0
(U) Free Piston Shock Tunnel/High Enthalpy Goettingen Project	500	100	0	0
(U) Programmable Integrated Ordnance Suite (PIOS)	750	0	0	0
(U) Dense Metal Case Penetrating Weapon (DMCPW)	1,500	1,000	0	0
(U) Aftbody/Nozzle Aeroacoustics Program (ANAP)	50	0	0	0
(U) Regional/Sector Air Operations Center (R/SAOC) Modernization Program	1,150	0	0	0
(U) Cooperative Research and Development Efforts in Imaging Spectrometer Development	283	250	0	0
(U) Metal Matrix Composites for Aerospace Applications	100	100	0	0
(U) Cooperative Space Measurements	0	0	75	0
(U) Project Refractive Turbulence	0	113	0	0
(U) Advanced Combustor Chamber Concepts Program	0	0	395	0
(U) Integrated Tactical Aircraft Control (ITAC) Program	450	200	600	0

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	FY 1998	FY 1999	FY 2000	FY 2001
(U) Anthropometric Accommodation in Crew Systems	600	300	300	0
(U) Aging Aircraft Life Prediction/Extension	400	0	400	0
(U) Structural Integrity of Aging Aircraft	350	0	350	0
(U) Airworthiness of Aging Aircraft	250	0	250	0
(U) Advanced Hybrid Propulsion Technologies Cooperative Research Project	0	703	0	0
(U) Advanced Crew Ejection Seat (ACES) II - Ejection Seat Cooperative Modification Project	0	1000	0	0
(U) Air Command, Control, Communications and Intelligence Capabilities	0	0	250	350
(U) A Coalition Command, Control and Communications Demonstration Environment (CC3DE)	0	0	250	500
(U) Advanced Transmission Language and Allocation of New Technology for International Communications and Proliferation of Allied Waveforms (ATLANTIC PAW)	0	0	225	750
(U) Observations and Modeling for Space Weather	0	0	200	645
(U) Solar Maximum Impacts on C3I Systems	0	0	150	563
(U) Space Radiation Sensors	0	0	100	100
(U) Distributed Mission Training (DMT) Technologies		0	0	500
(U) Refraction and Propagation Modeling for Microwave Systems	0	0	0	200
(U) Engine Component Life Extension	0	0	0	200
(U) Effects of Ionization on Hydrocarbon-Air Combustion	0	0	0	400
(U) Identified as a source for SBIR	0	139	0	0
(U) Total	10,343	4,105	4,283	5,558

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	PROJECT **NATO**

(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					0	0	139	0	0	0	139
Product Development Organizations											
L3 Communications Salt Lake City, UT	CPFF	Sep 95			101	0	0	0	0	0	101
TBD	CPFF	TBD			0	0	0	538	1,350	0	1,888
Lockheed Martin Colorado Springs, CO	CPAF	Oct 95			1,078	0	0	250	350	TBD	TBD
AEM Inc. Denver, CO	FFFP	Jul 98			25	0	0	0	0	0	25
DRC Andover, MA	FFFP	Aug 98			19	0	0	0	0	0	19
KKP Corporation Nashua, NH	FFFP	Aug 98			129	0	0	0	0	0	129
Gateway Souix Falls, SD	FFFP	Aug 98			30	0	0	0	0	0	30

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BUDGET ACTIVITY 4 - Demonstration and Validation					PE NUMBER AND TITLE 0603790F NATO Cooperative Research and Development						PROJECT NATO
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
Logicon San Pedro, CA	CPFF	Jun 94			1,000	0	0	0	0	0	1,000
Boeing St Louis, MO	CPIF	May 94			1,450	900	0	0	0	0	2,350
Sytronics Dayton, OH	CPFF	Sep 93			2	600	300	300	0	0	1,202
Logicon San Pedro, CA	CPFF	Jan 94			1,246	1,060	0	0	0	0	2,306
Night Vision Corporation Lincolnwood, IL	CPFF	Jul 96			0	500	0	0	0	0	500
Boston College Boston, MA	CFSR	Mar 97			50	105	0	0	0	0	155
RADEX Bedford, MA	CPFF	Mar 97			190	195	100	100	0	0	585
Pacific Sierra Research Santa Monica, CA	CPFF	Mar 97			60	0	0	0	0	0	60
CPI Fairfax, VA	CPFF	Mar 97			75	85	0	0	0	0	160
University of Massachusetts Lowell, MA	CR	Apr 97			60	60	20	30	50	0	220
KEO Consultants Brookline, MA	CPFF	Mar 97			160	60	20	50	85	0	375

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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
Northwest Research Associates Bellevue, WA	CPFF	Apr 97			50	30	50	50	30	0	210
University of Texas Austin, TX	CPFF	May 97			25	0	0	0	0	0	25
Applied Research Lab, University of Texas Austin, TX	CPFF	May 97			40	40	0	0	0	0	80
Boston College Boston, MA	CPFF	Mar 99			0	0	0	0	40	0	40
RADEX Bedford, MA	CPFF	Feb 99			0	0	0	55	150	0	205
Scion Assoc Seattle, WA	CPFF	Aug 99			0	0	0	30	85	0	115
SRI, Intl Menlo Park, CA	CPFF	Aug 99			0	0	0	10	80	0	90
Rome Research Corporation Rome, NY	CPFF	Oct 96			600	0	0	0	0	0	600
Motorola Scottsdale, AZ	CPFF	Aug 96			287	750	0	0	0	0	1,037
Lockheed Martin Orlando, FL	CPFF	Sep 96			150	450	442	0	0	0	1,042

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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
Raytheon TI Systems Lewisville, TX	CPFF	Dec 97			50	900	200	0	0	0	1,150
Waterways Experiment Station (WES) Vicksburg, MS	MIPR	Jul 97			175	225	0	0	0	0	400
Applied Research Associates Panama City, FL	CPAF	Aug 97			175	225	0	0	0	0	400
Active Control Experts, Inc Cambridge, MA	CPFF	Sep 97			200	0	0	0	0	0	200
Litton Data Systems Division, Agoura Hills, CA	CPAF	Mar 97			0	1,150	0	0	0	0	1,150
Boeing Seattle, WA	CPFF	Jul 98			0	260	115	540	0	0	915
UES, Inc Dayton, OH	CPFF	Oct 97			0	100	100	0	0	0	200
NOAA/ATDD Oak Ridge, TN	MIPR	Oct 97			0	0	58	0	0	0	58
Amptek, Inc Bedford, MA	CPFF	Aug 96			0	0	0	75	0	0	75

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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
CPI Annandale, VA	CPFF	Feb 00			0	0	0	75	150	TBD	TBD
RADEX Bedford, MA	CPFF	Feb 00			0	0	0	75	120	TBD	TBD
University of Colorado Boulder, CO	CPFF	Feb 01			0	0	0	0	150	TBD	TBD
Boston College Newton, MA	CPFF	Mar 01			0	0	0	0	50	TBD	TBD
Aerospace Corp Los Angeles, CA	CPFF	Mar 00			0	0	0	50	75	TBD	TBD
Applied Physics Lab Laurel, MD	MIPR	May 00			0	0	0	0	100	TBD	TBD
Pratt & Whitney West Palm Beach, FL	CPFF	Jun 98			0	0	0	395	0	0	395
Boeing Long Beach, CA	CPFF	Jul 98			0	265	0	0	0	0	265
Boeing Seattle, WA	CPFF	Mar 98			0	200	0	0	0	0	200
Lockheed Marietta, GA	CPFF	Oct 98			0	325	0	200	0	0	525
Northrop Hawthorne, CA	CPFF	Oct 98			0	50	0	0	0	0	50
Selectech Dayton, OH	CPFF	Feb 98			0	50	0	300	0	0	350

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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
Boeing St Louis, MO	CPFF	TBD			0	0	0	250	0	0	250
TBD	TBD	TBD			0	0	0	250	0	0	250
Boeing (McDonnell Douglas) St Louis, MO	CPFF	Oct 98			0	0	900	0	0	0	900
Boeing (McDonell Douglas) St Louis, MO	CPFF	Dec 96			0	50	0	0	0	0	50
Thiokol Corp Elkton, MD	CPFF	Nov 97			0	0	703	0	0	0	703
Raytheon Mesa, AZ	CPFF	Jul 97			0	0	0	0	500	500	1,000
Air Force Research Laboratory Rome, NY					0	0	0	475	1,250	TBD	TBD
Support and Management Organizations											
Air Force Research Laboratory Rome, NY					189	60	0	0	0	0	249
Air Force Research Laboratory Rome, NY	AF 616	Jan 96			80	0	0	0	0	0	80

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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 Bedford, MA	MIPR	Jan 96			300	0	0	0	0	0	300
Electronic Systems Center, Hanscom AFB, MA					324	0	0	0	0	0	324
Air Force Research Laboratory WPAFB, OH					44	70	0	0	0	0	114
Air Force Research Laboratory Hanscom AFB, MA					85	25	10	125	543	TBD	TBD
45th Space Wing Patrick AFB, FL	AF 185	May 95			5	0	0	0	0	0	5
BMDO	MIPR				50	50	0	0	0	0	100
Rockwell Power Systems, NM	CPAF				70	70	0	0	0	0	140
Air Force Research Laboratory Kirtland AFB, NM					30	30	0	0	0	0	60

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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 Force Research Laboratory Hanscom AFB, MA					0	0	25	0	0	0	25
Worcester Polytech Institute Worcester, MA	IPA	Oct 97			0	0	30	0	0	0	30
Air Force Research Laboratory Eglin AFB, FL					308	60	58	0	0	0	426
Naval Air Warfare Center, CA	MIPR	May 97			115	0	0	0	0	0	115
Dynetics Fort Walton, FL	AFMC 277	Jun 97			40	0	0	0	0	0	40
Air Force Research Laboratory Tyndall AFB, FL					25	25	0	0	0	0	50
Pender Technology, TN	CR	Oct 97			0	50	50	0	0	0	100
Human Systems Center Brooks AFB, TX	MIPR	Oct 98			0	0	100	0	0	0	100

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)											DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation					PE NUMBER AND TITLE 0603790F NATO Cooperative Research and Development						PROJECT NATO
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 Force Research Laboratory WPAFB, OH					0	65	28	20	400	TBD	TBD
Veridian Dayton, OH					0	145	0	0	0	0	145
Antion Corp. Dayton, OH	CPFF	Dec 98			0	50	0	0	0	0	50
Test and Evaluation Organizations											
Air Force Research Laboratory Rome, NY	MIPR	Jan 97			100	0	0	0	0	0	100
Air Force Development Test Center, FL	PO	Jan 98			0	80	288	0	0	0	368
Air Force Seek Eagle Office, FL	PO	Jan 98			0	10	12	0	0	0	22
Air Force Research Laboratory Tyndall AFB, FL					75	75	0	0	0	0	150
Sverdrup Technology, Inc TN	CPAF	Sep 95			353	733	300	0	0	0	1,386

	DATE
	February 1999

BUDGET ACTIVITY	PE NUMBER AND TITLE
4 - Demonstration and Validation	**0603790F NATO Cooperative Research and Development**

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
Naval Air Warfare Center Point Mugu, CA	MIPR				0	40	57	40	0	0	137

*Not applicable. NATO Cooperative R&D funds supplement as needed a project office's 6.1 through 6.5 RDT&E appropriations for initiating international cooperative R&D agreements and exploiting favorable program and technological opportunities with major allied partners.

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	PROJECT NATO

(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
Product Development Property										
None										
Support and Management Property										
None										
Test and Evaluation Property										
Fora laser system	PO	Nov 97	Jan 98	147	0	0	0	0	0	147
Identified as a source for SBIR				0	0	139	0	0	0	0
Subtotal Product Development				7,427	8,705	3,008	4,098	4,615	Cont	Cont
Subtotal Support and Management				1,665	700	301	145	943	Cont	Cont
Subtotal Test and Evaluation				675	938	657	40	0	Cont	Cont
Total Project				9,767	10,343	4,105	4,283	5,558	Cont	Cont

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

DATE: February 1999

BUDGET ACTIVITY: 4 - Demonstration and Validation

PE NUMBER AND TITLE: 0603800F Joint Strike Fighter

PROJECT: 2025

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
2025 Joint Strike Fighter (JSF)	444,277	454,789	235,374	22,558	0	0	0	0	0	1,573,681
Quantity of RDT&E Articles	0	0	4	0	0	0	0	0	0	4

(U) A. Mission Description

The Joint Strike Fighter (JSF) Program will develop and field an affordable, highly common family of next generation strike fighter aircraft for the USN, USMC, USAF and allies. Current program emphasis is on facilitating the evolution of fully validated and affordable joint operational requirements, and demonstrating cost leveraging technologies and concepts to lower risk prior to entering Engineering and Manufacturing Demonstration (E&MD) in FY 2001. This is a joint program with no executive service. Navy and Air Force each provide approximately equal shares of annual funding for the program. The United Kingdom (UK) is a collaborative partner in this phase of the program and several other countries also participate.

(U) FY 1998 ($ in Thousands): (Breakout reflects Air Force, Navy, DARPA, UK, Multi-Lateral and Canadian funding)

- (U) $717,026 Continued Concept Demonstration efforts by Boeing, Lockheed Martin and Pratt & Whitney including company unique technology demonstrations and concept refinement for a tri-service family of aircraft.
- (U) $34,956 Continued the Alternate Engine Program.
- (U) $179,584 Continued technology maturation demonstrations and assessments in the areas of airframe, flight systems, manufacturing and producibility, propulsion, and mission systems. Continued systems engineering support for the Concept Demonstration Phase in the areas of system test, air vehicle analysis and integration, advanced cost estimating, survivability, integrated flight and propulsion control and carrier suitability.
- (U) $23,325 Continued technology maturation demonstrations and assessments in the area of prognostics and health management and supportability and training.
- (U) $20,642 Continued modeling and simulation activities to support strike warfare mission area analysis and requirements analysis efforts including Cost and Operational Performance Trades (COPT) to facilitate the Services' joint requirements definition.
- (U) $15,005 Continued mission support, including program office functions.
- (U) $990,538 Total

(U) FY 1999 ($ in Thousands): (Breakout reflects Air Force, Navy, UK, Multi-Lateral, Canadian and Italian Funding)

- (U) $670,284 Continue Concept Demonstration efforts by Boeing, Lockheed Martin and Pratt & Whitney inclluding company unique technology demonstrations, complete final design and continue build of Concept Demonstrator Aircraft (CDA) and continue concept refinement for a tri-service family of aircraft.

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- (U) $25,790 Continue the Alternate Engine Program.
- (U) $195,011 Continue technology maturation demonstrations and assessments in the areas of airframe, flight systems, manufacturing and producibility, propulsion, and mission systems. Complete approximately half of the demonstrations. Continue systems engineering support for the Concept Demonstration Phase in the areas of system test, air vehicle analysis and integration, advanced cost estimating, survivability, integrated flight and propulsion control and carrier suitability.
- (U) $28,009 Continue technology maturation demonstrations and assessments in the area of prognostics and health management and supportability and training.
- (U) $13,328 Continue modeling and simulation activities to support strike warfare mission area analysis and requirements analysis efforts including COPT to facilitate the Services' joint requirements definition. Complete requirements analysis in support of final requirements document. Continue modeling and simulationi support testing, training, and refinement of concept of operations for the weapons system (simulation based acquisition).
- (U) $15,174 Continue mission support, including program office functions.
- (U) $7,980 Anticipated General Reductions.
- (U) $11,003 Portion of extramural program reserved for Small Business Innovative Research (SBIR) assessment in accordance with 15 USC 638. (USN Only)
- (U) $11,219 Identified as a source for SBIR. (USAF only)
- (U) $977,798 Total

(U) FY 2000 ($ in Thousands): (Breakout reflects Air Force, Navy, UK, Multi-Lateral and Canadian Funding)

- (U) $357,791 Continue Concept Demonstration efforts by Boeing, Lockheed Martin and Pratt & Whitney including ground and flight demonstrations and concept refinement for a tri-service family of aircraft. Request proposals from contractors for their designs and EMD programs.
- (U) $33,000 Continue the Alternate Engine Program.
- (U) $76,000 Continue technology maturation demonstrations and assessments in the areas of airframe, flight systems, manufacturing and producibility, propulsion and mission systems. Continue systems engineering support for the Concept Demonstration Phase in the areas of system test air vehicle analysis and integration, advanced cost estimating, survivability, integrated flight and propulsion control and carrier suitability.
- (U) $22,438 Continue technology maturation demonstrations and assessments in the area of prognostics and health management and supportability and training.
- (U) $10,000 Continue modeling and simulation activities to support strike warfare mission area analysis and requirements analysis efforts including COPT to facilitate the Services' joint requirements definition. Support analysis as required for final Joint Operational Requirements Document (JORD) coordination and signature. Continue modeling and simulatioin support testing, training, and refinement of concept of operations for the weapons system (simulation based acquisition).
- (U) $11,183 Continue mission support, including program office functions.
- (U) $510,412 Total

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PROJECT 2025	

(U) FY 2001 ($ in Thousands): (Breakout reflects Air Force, Navy, UK, Multi-Lateral and Canadian Funding)

- (U) $20,092 Complete Concept Demonstration efforts by Boeing, Lockheed Martin and Pratt & Whitney including ground and flight demonstrations and concept refinement for a tri-service family of aircraft. Perform source selection evaluation to down-select for final design.
- (U) $0 Complete this phase of the Alternate Engine Program.
- (U) $13,303 Complete any remaining technology maturation demonstrations and assessments in the areas of airframe, flight systems, manufacturing and producibility, propulsion and mission systems. Continue systems engineering support for the Concept Demonstration Phase in the areas of system test, air vehicle analysis and integration, advanced cost estimating, survivability, integrated flight and propulsion control and carrier suitability. Support analyses required for Milestone II.
- (U) $11,945 Complete technology maturation demonstrations and assessments in the area of supportability and training.
- (U) $3,400 Complete modeling and simulation activities to support Milestone II analyses. Complete modeling and simulation support testing, training, and refinement of concept of operations for the weapons system (simulation based acquisition).
- (U) $1,880 Complete mission support, including program office functions
- (U) $50,620 Total

(U) B. Budget Activity Justification:

This program is funded under DEMONSTRATION & VALIDATION because it includes all efforts necessary to evaluate integrated technologies in as realistic an operating environment as possible to assess the performance of advanced technology.

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY 1999 PB)	432,277	456,137	239,659	22,988	1,567,744
(U) Appropriated Value	458,052	456,137			
(U) Adjustments to Appropriated Value					
a. Congressional/General Reductions	-15,086	-1,348			
b. SBIR	-10,749				
c. Omnibus or Other Above Threshold Reprogram					
d. Below Threshold Reprogramming	14,999				
(U) Adjustments to Budget Years Since FY 1999 PB	-2,939		-4,285	-430	-5,937
(U) Current Budget Submit/FY2000 PB	444,277	454,789	235,374	22,558	1,573,681

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(U) $11,219 thousand identified as a source for SBIR.

(U) Significant Program Changes: FY98 reduction of -$2,939 thousand resulted from USAF omnibus reprogramming. General reduction of -$1,348 in FY 99 reflects -$60 thousand for Administrative and Advisory Services and -$1,288 thousand for revised economic assumptions. FY00 reduction of -$4,285 thousand and FY 01 reduction of -$430 thousand reflects Inflation adjustment.

(U) D. Other Program Funding Summary ($ in Thousands): This is a joint program with no executive service. The United Kingdom is a full collaborative partner in this phase of the program, and several other countries also participate.

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost
(U) RDT&E 0603800N	448,236	468,509	241,238	25,762	0	0	0	0	0	1,635,252
(U) RDT&E 0603800E	20,925	0	0	0	0	0	0	0	0	118,006
(U) United Kingdom	55,000	34,000	26,000	0	0	0	0	0	0	200,000
(U) Multi-Lateral*	17,800	7,500	5,100	1,700	0	0	0	0	0	32,100
(U) Canada	4,300	3,000	2,700	600	0	0	0	0	0	10,600
(U) Italy		10,000								10,000

*** Netherlands, Norway and Denmark**

(U) Related Program Funding Summary ($ in Thousands): Milestone II for E&MD of the Joint Strike Fighter (JSF) is planned in FY 2001.

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost *
(U) RDT&E 0604800F	0	0	0	536,586	1,332,890	1,814,352	1,871,288	1,649,464	TBD**	TBD**
(U) RDT&E 0604800N	0	0	0	535,757	1,338,397	1,823,084	1,881,144	1,658,884	TBD**	TBD**

* Excludes anticipated foreign funding which is TBD.
** TBD pending completion of the December 1998 Selected Acquisition Report (SAR).

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(U) Related Procurement Funding:
Advanced Procurement for the Joint Strike Fighter (JSF) is planned in FY 2004.

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost
(U) Procurement 0207142F - JSF Squadrons	0	0	0	0	0	0	18,000	599,983	TBD	TBD
(U) Procurement 0204800N - JSF Squadrons	0	0	0	0	0	0	0	58,532	TBD	TBD

(U) E. Acquisition Strategy:

Program activities center around three distinct objectives that provide a sound foundation for the start of Engineering and Manufacturing Development (EMD) in 2001:

(1) facilitating the Services' development of fully validated, affordable operational requirements;
(2) lowering the risk by investing in and demonstrating key leveraging technologies that lower the cost of development, production and ownership; and
(3) demonstrating operational concepts.

Early warfighter and technologist interaction is an essential aspect of the requirements definition process, and key to achieving JSF affordability goals. To an unprecedented degree, the JSF program is using cost-performance trades early as an integral part of the weapon system development process. The Services are defining requirements through an iterative process, balancing weapon system capability against life cycle cost at every stage. Each iteration of the requirements is provided to industry. They evolve their designs and provide cost data back to the warfighters. The warfighters evaluate trades and make decisions for the next iteration. This process produced the Services' first Joint Initial Requirements Document (JIRD I) in 1995 and the second and third iterations in 1997 and 1998, respectively. The Services continue to refine their requirements through this process which will culminate in the Joint Operatioinal Requirements Document (JORD) in FY 2000 to support the Milestone II decision.

A sizable technology maturation effort is underway to reduce risk and life cycle cost (LCC) through technology maturation and demonstration. The primary emphasis is on technologies which have been identified as high payoff contributors to affordability, supportability, survivability and lethality. Numerous demonstrations have been accomplished and others are in process to validate performance and life cycle cost impact to component, subsystem and the total system.

A multi-year $2.2 billion JSF Concept Demonstration effort commenced in November 1996 with competitive contract awards to Boeing and Lockheed Martin for Concept Demonstration Programs. These competing contractors will build and fly concept demonstrator aircraft, conduct concept unique ground demonstrators, and continue refinement of their ultimate delivered weapon system concepts. Specifically, Boeing and Lockheed Martin will demonstrate commonality and modularity, Short Take Off/ Vertical Land (STOVL) hover and transition, and low speed handling qualities of their respective weapon system concepts. Pratt and Whitney is providing propulsion hardware and engineering support for both Boeing's and Lockheed Martin's on-going JSF Concept Demonstration efforts. The JSF Concept Demonstration approach has several benefits:

(1) Maintains the competitive environment prior to E&MD and provides for two different STOVL approaches and two different aerodynamic configurations.

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(2) Demonstrates the viability of a multi-service family of variants with high commonality and modularity between CTOL, CV and STOVL variants.
(3) Provides affordable and low risk technology transition to the JSF E&MD phase.

The JSF Alternate Engine Program, with General Electric, continues development of an alternate engine for production..

Downselect to a single prime weapon system contractor for E&MD and Milestone II are planned in FY 2001. JSF production is planned to begin in FY 2005.

(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) Commenced Concept Development Phase: Dec 94																
(U) Released RFP for Concept Demonstration Efforts: Mar 96																
(U) Designated a joint, DoD, Acquisition Category ID Program by USD(A&T): Apr 96																
(U) Competitively awarded Concept Demonstration Contracts to Boeing and Lockheed Martin: Nov 1996																
Complete Joint Operational Requirements Document (JORD) Approval: Dec 99									X							
(U) Milestone II for JSF E&MD: Mar 01														X		

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

Project Cost Categories:	FY 1998	FY 1999	FY 2000	FY 2001
(U) a. Weapon System Concept Demonstrations Contracts (including flying demonstrations)	717,026	670,284	357,791	20,092
(U) b. Alternate Engine Program	34,956	25,790	33,000	
(U) c. Technology Maturation and Systems Engineering Support Total	179,584	195,011	76,000	13,304
Breakout:				
Technology Maturation				
Airframe	1,442	1,228	1,500	
Flight Systems	29,867	37,107	9,842	
Manufacturing & Producibility	4,630	4,215	1,700	
Propulsion	36,316	23,037	3,600	
Mission Systems	61,596	90,625	24,340	8,848
Subtotal - Technology Maturation	133,851	156,212	40,982	8,848
Plus: Systems Engineering Support	45,733	38,799	35,018	4,456
(U) d. Prognostics and Health Management/ Supportability and Training	23,325	28,009	22,438	11,944
(U) f. Requirements:	20,642	13,328	10,000	3,400
(U) g. Mission Support	15,005	15,174	11,183	1,880
(U) h. Anticipated Service Reductions		7,980		
(U) i. Identified as candidate for SBIR (USN)		11,003		

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Project Cost Categories:	FY 1998	FY 1999	FY 2000	FY 2001
(U) j. Identified as candidate for SBIR (USAF)		11,219		
(U) Total	990,538	977,798	510,412	50,620
Funding Resources:				
0603800F	444,277	454,789	235,374	22,558
0603800N	448,236	468,509	241,238	25,762
0603800E	20,925	0	0	0
United Kingdom	55,000	34,000	26,000	
Multi-Lateral	17,800	7,500	5,100	1,700
Canada	4,300	3,000	2,700	600
Italy		10,000		
(U) Total	990,538	977,798	510,412	50,620

(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
Product Development Organizations:											
Strike Warfare Concept Studies (Total Prior to FY 2000)											
Miscellaneous	Various	Oct93 - Sep94	11,467	11,467	11,467						11,467
Technology Maturation Concept Exploration Phase (Total Prior to FY 2000)											

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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
Fld. Act.	Various	Oct93 - Sep94	3,432	3,432	3,432						3,432
Strike Warfare Systems Design Development(Total Prior to FY 2000)											
Boeing Seattle WA	C/CPFF	Dec 94	32,770	32,770	32,770						32,770
McAir St. Louis MO	C/CPFF	Dec 94	23,708	23,708	23,708						23,708
Northrop Pico Rivera CA	C/CPFF	Dec 94	21,358	21,358	21,358						21,358
Lockheed Fort Worth, TX	C/CPFF	Dec 94	28,311	28,311	28,311						28,311
Miscellaneous	Various	Various	1,121	1,121	1,121						1,121
Fld. Activ.	Various	Oct95-Sep96	8,322	8,322	8,322						8,322
SUBTOTAL			115,590	115,590	115,590						115,590
ASTOVL (Total Prior to FY 2000)											
Lockheed	SS/CPFF	Oct 94	16,416	16,416	16,416						16,416
Boeing	SS/CPFF	Jan 95	11,200	11,200	11,200						11,200
Miscellaneous	Various	Various	15,539	15,539	15,539						15,539
SUBTOTAL			43,155	43,155	43,155						43,155
Core Team Support (Total Prior to FY 2000)											
Fld. Activ.	Various	Oct 96-Sep 97	2,522	2,522	2,522						2,522
Weapon System Concept Demonstrations (including flying demonstrators and supporting propulsion efforts)											
Boeing	C/CPFF	Nov 96	644,852	644,852	72,208	195,527	223,734	142,491	10,892		644,852

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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
Lockheed	C/CPFF	Nov 96	701,850	701,850	105,900	215,900	231,950	139,100	9,000		701,850
Pratt & Whitney West Palm Beach FL	SS/CPAF	Nov 96	751,148	751,148	216,936	285,230	188,808	59,974	200		751,148
*includes government managed equipment											
Note: Pratt & Whitney Total Program excludes award fees reflected below.											
Award Fees											
Pratt & Whitney	C/CPFF		77,070	77,070	14,683	20,369	25,792	16,226			77,070
SUBTOTAL			2,174,920	2,174,920	409,727	717,026	670,284	357,791	20,092		2,174,920
Alternative Engine Program											
General Electric Cincinnati, OH	SS/CPFF	Nov 95	7,000	7,000	7,000						7,000
GE	SS/CPFF	Feb 97	118,746	118,746	25,000	34,956	25,790	33,000			118,746
SUBTOTAL			125,746	125,746	32,000	34,956	25,790	33,000			125,746
Technology Maturation											
Airframe											
McAir	SS/CPFF	Dec 94	19,240	19,240	19,240						19,240
Miscellaneous	Various	Various	2,985	2,985	1,885	100	500	500			2,985
Fld. Activ.	Various	Oct99-Sep00	5,964	5,964	2,894	1,342	728	1,000			5,964
SUBTOTAL			28,189	28,189	24,019	1,442	1,228	1,500			28,189
Flight Systems											
Lockheed	C/CPFF	Dec 94	50,748	50,748	31,386	10,129	7,731	1,502			50,748
McAir	C/CPFF	Dec 94	64,821	64,821	31,601	15,300	13,300	4,620			64,821
TBD	TBD	TBD					8,000				8,000
Miscellaneous	Various	Various	10,001	10,001	8,433	657	600	311			10,001

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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
Fld. Activ.	Various	Oct99-Sep00	24,136	24,136	9,798	3,693	7,356	3,289			24,136
SUBTOTAL			157,706	157,706	81,218	29,779	36,987	9,722			157,706
Manufacturing & Producibility											
Hughes Los Angeles CA	C/CPFF	Dec 94	5,065	5,065	5,065						5,065
Lockheed	C/CPFF	Dec 94	10,560	10,560	4,733	2,767	2,890	170			10,560
General Res. Corp. Huntsville AL	C/CPFF	Dec 94	1,945	1,945	1,945						1,945
Scaled Comp	C/CPFF	Jun 97	2,000	2,000	2,000						2,000
Lockheed	C/CPFF	Aug 98	700	700		700					700
Miscellaneous	Various	Various	1,613	1,613	1,008	335	270				1,613
Fld. Activ.	Various	Oct99-Sep00	5,871	5,871	2,458	828	1,055	1,530			5,871
SUBTOTAL			27,754	27,754	17,209	4,630	4,215	1,700			27,754
Propulsion											
Pratt/Whitney	C/CPFF	Dec 94	5,448	5,448	5,448						5,448
GE	SS/CPFF	Dec 94	5,681	5,681	5,681						5,681
Pratt/Whitney	SS/CPFF	Nov 95	30,000	30,000	30,000						30,000
GE	SS/CPFF	Feb 97	3,000	3,000	3,000						3,000
Pratt/Whitney	SS/CPFF	Feb 97	26,777	26,777	10,559	12,429	3,789				26,777
Pratt/Whitney	SS/CPFF	Mar 97	3,640	3,640	3,640						3,640
Pratt/Whitney	SS/TBD	Dec 97	8,200	8,200	2,400	4,600	1,200				8,200
NASA	NASA	Aug 98	700	700		700					700
Miscellaneous	Various	Various	12,895	12,895	12,895						12,895
Fld. Activ.	Various	Oct99-Sep00	46,132	46,132	5,897	18,587	18,048	3,600			46,132
SUBTOTAL			142,473	142,473	79,520	36,316	23,037	3,600			142,473

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)											DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603800F Joint Strike Fighter							PROJECT 2025
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
Mission Systems											
TI Plano TX	C/CPFF	Dec 94	2,464	2,464	2,464						2,464
Lockheed	SS/CPFF	Dec 95	6,856	6,856	5,256	1,600					6,856
McAir	SS/CPFF	Dec 95	6,524	6,524	4,924	1,600					6,524
Raytheon	C/CPFF	Dec 95	53,368	53,368	13,772	13,502	22,582	3,512			53,368
Northrop Grumman Baltimore MD	C/CPFF	Dec 95	46,915	46,915	12,448	13,498	19,272	1,697			46,915
Boeing	C/CPFF	Mar 96	32,864	32,864	4,174	11,000	16,700	990			32,864
Lockheed	C/CPFF	Mar 96	32,888	32,888	4,143	10,840	16,700	1,205			32,888
Boeing	C/CPFF	Jan 98	10,724	10,724		1,100	2,500	2,747	4,377		10,724
Lockheed	C/CPFF	Feb 98	10,563	10,563		1,100	2,500	2,747	4,216		10,563
Hughes	C/CPFF	Dec 94	3,681	3,681	3,681						3,681
Classified	Classified		3,000	3,000		2,000	1,000				3,000
Miscellaneous	Various	Various	27,855	27,855	19,783	314	3,114	4,644			27,855
Fld. Activ.	Various	Oct99-Sep00	34,992	34,992	17,528	4,755	5,956	6,498	255		34,992
SUBTOTAL			272,694	272,694	88,173	61,309	90,324	24,040	8,848		272,694
Systems Engineering Spt											
Miscellaneous	Various	Various	23,975	23,975	4,780	7,213	5,667	5,658	657		23,975
Fld. Activ.	Various	Oct99-Sep00	136,839	136,839	33,578	38,070	36,632	28,860	3,699		136,839
SUBTOTAL			160,814	160,814	38,358	45,283	38,299	34,518	4,356		160,814

										DATE	**February 1999**
BUDGET ACTIVITY					PE NUMBER AND TITLE						
4 - Demonstration and Validation					**0603800F Joint Strike Fighter**						
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
Prognostics and Health Management and Supportability and Training											
Boeing	C/CPFF	Jun 97	11,024	11,024	750	3,700	3,706	2,868			11,024
Lockheed	C/CPFF	Apr 97	13,047	13,047	2,050	3,000	5,350	2,647			13,047
Pratt/Whitney	C/CPFF	Jun 97	10,100	10,100	3,920	6,180					10,100
General Electric	C/CPFF		1,500	1,500			1,500				1,500
Classified											
Project 3	C/CPFF	Dec 94	8,576	8,576	5,262	2,564	750				8,576
Project 4	C/CPFF	Dec 94	5,549	5,549	3,563	1,236	750				5,549
Boeing	C/CPFF	Jun 97	3,387	3,387	1,000	1,375	1,012				3,387
Lockheed	C/CPFF	Jun 97	4,000	4,000	1,000	1,375	1,625				4,000
Boeing	C/CPFF	Dec 98	7,730	7,730			2,465	4,265	1,000		7,730
Lockheed	C/CPFF	Jan 99	7,730	7,730			2,465	4,265	1,000		7,730
New Contract	TBD	Mar 01	7,000	7,000					7,000		7,000
Miscellaneous	Various	Various	10,209	10,209	2,830	985	3,394	2,500	500		10,209
Fld. Activ.	Various	Oct99-Sep00	21,529	21,529	5,317	2,885	4,990	5,893	2,444		21,529
SUBTOTAL			111,381	111,381	25,692	23,300	28,007	22,438	11,944		111,381
Modeling and Simulation and Analysis, Threat, COPT and Core Support											
Miscellaneous	Various	Various	57,440	57,440	22,098	15,963	9,281	7,583	2,515		57,440
Fld. Activ.	Various	Oct99-Sep00	24,711	24,711	14,809	4,199	3,001	2,017	685		24,711

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603800F Joint Strike Fighter
	PROJECT 2025

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
SUBTOTAL			82,151	82,151	36,907	20,162	12,282	9,600	3,200		82,151
Mission Support											
Institute for Defense Anal	Grant	Jan 97	2,500	2,500	2,500						2,500
Fld. Activ.	Various	Oct99-Sep00	32,739	32,739	12,725	6,564	7,332	3,438	1,880		32,739
SUBTOTAL			35,239	35,239	15,225	6,564	7,332	3,438	1,880		35,239
Support and Management Organizations (CS):											
ANSER Arlington VA	SS/CPFF	Apr 94	28,981	28,981	14,821	4,720	4,720	4,720			28,981
Miscellaneous	Various	Various	26,023	26,023	11,236	5,051	5,091	4,345	300		26,023
SUBTOTAL			55,004	55,004	26,057	9,771	9,811	9,065	300		55,004

Test and Evaluation Organizations: (Included Above)

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

Government Furnished Property:

Not Applicable

	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Subtotal Product Development	1,024,214	980,767	937,768	501,347	50,320		3,494,416
Subtotal Support and Management	26,057	9,771	9,811	9,065	300		55,004
Services' General Reductions			7,980				
SBIR Assessment (USN)			11,003				
Identified as source for SBIR (USAF)			11,219				

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)		DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603800F Joint Strike Fighter	PROJECT 2025

Subtotal Test and Evaluation Subtotal Test and Evaluation (Included Above)						
Total Project	1,050,271	990,538	977,798	510,412	50,620	3,579,639

*Includes Air Force, Navy,DARPA, UK, Multi-Lateral, Canadian and Italian Funding
** $30,202 thousand represents General Services Reductions.

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

DATE: **February 1999**

BUDGET ACTIVITY: **4 - Demonstration and Validation**

PE NUMBER AND TITLE: **0603850F Integrated Broadcast Service**

PROJECT: **4778**

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
4778 Integrated Broadcast Service	0*	0*	24,446	24,706	17,291	20,437	10,314	10,565	TBD	TBD
Quantity of RDT&E Articles	0	2	5	4	1	4	5	0	TBD	TBD

**(U) ***FY 1998 IBS RDT&E funds are in USAF PE 0208019F, BPAC 674778.
*FY 1999 IBS funds (Procurement, RDT&E, O&M) are in USN PE0305972N.

(U) A. Mission Description

IBS provides warfighters with critical and highly perishable intelligence and information in a single, correlated picture via a near-real-time, integrated dissemination architecture. IBS consolidates existing intelligence broadcast systems into a common-format, common-terminal, theater-tailored architecture. The IBS design incorporates new functionality in broadcast and information management, a new message format, and a new receiver. It fields four Information Management Elements to geographic CINCs that perform requirements as set forth in the Joint Operational Requirements Document.

- Accept data from dissimilar, geographically-dispersed data sources including airborne, space-based, shipborne and ground SIGINT, radar and infrared sensors.
- Transmit intelligence and information to end users equipped with JTT or terminals which incorporate the CIBS-M.
- Disseminate theater oriented, based, and focused intelligence and information, based on user generated and CINC validated dissemination priorities.
- Disseminate intelligence and information over various communications paths, based on the communications available to the end user.

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

*FY 1998 IBS RDT&E funds are in USAF PE 0208019F, BPAC 674778

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

**FY 1999 IBS RDT&E funds are in Navy PE 0305972N

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603850F Integrated Broadcast Service
PROJECT 4778	

(U) FY 2000 ($ in Thousands):

- (U) $ 1,400 Maintain a Program Management Office, including program supervision, finance and acquisition strategy execution
- (U) $ 3,700 Systems Engineering, including development of message format, maintenance of architectures, and system configuration control
- (U) $ 11,419 Design and build second through fifth IMEs (Spiral #2)
- (U) $ 3,796 EFX/CUBE Battlelab development hardware
- (U) $ 3,555 Common Message Format (CMF) development
- (U) $ 576 Conduct OT&E on Spiral #2 IMEs before fielding to theater CINCs
- (U) $ 24,446 Total

(U) FY 2001 ($ in Thousands):

- (U) $ 1,700 Maintain a Program Management Office, including program supervision, finance and acquisition strategy execution
- (U) $ 3,715 Systems Engineering, including development of message format, maintenance of architectures, and system configuration control
- (U) $ 7,363 Continue design and build on fixed IMEs for fielding in FY 2001
- (U) $ 3,443 Design and build two transportable IMEs
- (U) $ 5,274 Spiral #3 development purchases (COE COTS licenses) for fielding in FY 2003
- (U) $ 1,736 CMF development
- (U) $ 1,475 Conduct OT&E
- (U) $ 24,706 Total

(U) B. Budget Activity Justification:

This program is in budget activity 4 because it includes demonstrating and validating the use of technologies to create an operational integrated broadcast service.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY: 4 - Demonstration and Validation	PE NUMBER AND TITLE: 0603850F Integrated Broadcast Service / PROJECT: 4778

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY 1999 PB)	0	0*	12,787	14,874	TBD
(U) Appropriated Value	0*	0**			TBD
(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			+11,659	+9,832	TBD
(U) Current Budget Submit/ FY 2000 PB	0*	0**	24,446	24,706	TBD

* FY 1998 IBS RDT&E funds are in USAF PE 0208019F, BPAC 674778; FY 1999 PB also reflects IBS funds in same PE

**FY 1999 IBS RDT&E funds are consolidated in USN PE 0305972N.

(U) Significant Program Changes:

- USAF added $47.4M (RDT&E) for FY 1999-2003 for a partial consolidation of IBS legacy systems' funding.
- USN received $24.9M in a Congressional transfer of IBS and IBS legacy funds in the FY 1999 budget: $14.580M in RDT&E, $10.271M in OPN.
- USAF added an additional $68.1M (RDT&E) in the FY 2000-2005 budget to the consolidation of IBS legacy funds under a single PE.

(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
(U) OPAF/PE0208019F	2,000								TBD	TBD
(U) OPN/PE0305972N		10,271							0	10,271
(U) RDT&E, N/PE0305972N		14,580							0	14,580

Navy funds in FY 1999 represent amount transferred to the Navy by Congress.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603850F Integrated Broadcast Service
	PROJECT 4778

(U) E. Acquisition Strategy

IBS will use a spiral development program to create a common dissemination architecture. Systems and technology will be contracted for under a competitive Request for Proposal (RFP) process.

(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) Master Acquisition Plan		*														
(U) Spiral 1																
(U) - Design				*												
(U) - Development					*											
(U) - Accreditation Efforts Begin					*											
(U) - CANX/CUBE Activities Begin					*											
(U) - Product Build						X										
(U) - PACOM Preparations						X										
(U) - PACOM Delivery							X									
(U) Spiral 2																
(U) - Concept						X										
(U) - Develop RFP						X										
(U) - Award Contract						X										
(U) - Delivery													X			
(U) Spiral 3																
(U) - Concept									X							
(U) - Develop RFP									X							
(U) - Award Contract										X						
(U) - Delivery (1QFY02)																

* - Denotes completed event
X - Denotes planned event

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603850F Integrated Broadcast Service
	PROJECT 4778

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Program Management	0	0	$1,400	$1,700
(U) System Engineering	0	0	$3,700	$3,715
(U) Information Management Element	0	0	$11,419	$16,080
(U) Test	0	0	$576	$1,475
(U) Architecture Development	0	0	0	0
(U) AMB Development	0	0	0	0
(U) Common Message Format Development	0	0	$3,555	$1,736
(U) EFX/CUBE/Battlelab Development Hardware	0	0	$3,796	0
(U) Total	0*	0**	$24,446	$24,706

* IBS RDT&E funds are in USAF PE 0208019F.
**FY 1999 IBS funds are in USN PE 0305972N

(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
Product Development Organizations											
Classified (AMB)	CPFF	Dec 93	TBD	TBD	0	0	0	0	0	0	$314
TBD (Spiral #2)	TBD	TBD	TBD	TBD	0	0	0	$18,770	$17,816	TBD	TBD
Support and Management Organizations											
MITRE	CPFF	Dec 97	TBD	TBD	0	0	0	$5,100	$5,415	TBD	TBD
Test and Evaluation Organizations											
JITC/46th OSS	Project Order	TBD	TBD	TBD	0	0	0	$576	$1,475	TBD	TBD

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603850F Integrated Broadcast Service
	PROJECT 4778

(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
Product Development Property										
TBD				0	0	0	0	0	TBD	TBD
Support and Management Property										
TBD				0	0	0	0	0	TBD	TBD
Test and Evaluation Property										
TBD				0	0	0	0	0	TBD	TBD
Subtotal Product Development				0	0	0	$18,770	$17,816	TBD	TBD
Subtotal Support and Management				0	0	0	$5,100	$5,415	TBD	TBD
Subtotal Test and Evaluation				0	0	0	$576	$1,475	TBD	TBD
Total Project				0	0*	0**	$24,446	$24,706	TBD	TBD

* IBS RDT&E funds are in USAF PE 0208019F
**FY 1999 IBS funds are in USN PE 0305972N

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

DATE: **February 1999**

BUDGET ACTIVITY: **4 - Demonstration and Validation**

PE NUMBER AND TITLE: **0603851F ICBM Dem/Val**

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	44,119	27,254	28,628	41,693	44,605	48,061	49,063	50,082	Continuing	Continuing
1020 ICBM Guidance Applications	14,822	4,265	10,160	16,309	18,346	20,412	20,837	21,270	Continuing	Continuing
1021 ICBM Propulsion Applications	178	184	181	178	1,680	1,660	1,694	1,729	Continuing	Continuing
1022 ICBM Reentry Vehicle Applications	11,209	9,331	15,884	22,720	21,718	23,161	23,644	24,135	Continuing	Continuing
1023 Rocket System Launch Program	15,371	10,998	32	34	32	33	34	35	Continuing	Continuing
1024 ICBM Command & Control (C2) Applications	844	184	181	178	442	437	447	456	Continuing	Continuing
4209 Long Range Planning (LRP)	1,695	2,292	2,190	2,274	2,387	2,358	2,407	2,457	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

(U) Efforts identify methods to reduce life cycle costs, improve nuclear safety and surety, support international arms control agreements and disengagement strategies, and ensure continued ICBM viability. Program includes demonstration and validation projects for ICBM guidance options, support reentry vehicles beyond original design life, provide an assessment of current and future ICBM propulsion systems, and develop enhancements to ensure command and control capabilities.

(U) B. Budget Activity Justification:

(U) This program is in Budget Activity 4 - Demonstration and Validation because the projects are demonstrating the general military utility and/or cost reduction potential of advanced technologies.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603851F ICBM Dem/Val

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY1999 PB)	46,372	29,360	34,149	47,487	Continuing
(U) Appropriated Value	49,337	27,337			
(U) Adjustments to Appropriated Value					
a. Cong Gen Reductions	-1,805	-83			
b. SBIR	-1,160				
c. Omnibus or Other Above Threshold Reprogram	-1,715				
d. Below Threshold Reprogramming	-538				
(U) Adjustments to Budget Years Since FY 1999 PB			-5,521	-5,794	
(U) Current Budget Submit/FY 2000 PB	44,119	27,254	28,628	41,693	Continuing

NOTE: In FY99, $910 identified as a source for SBIR.

(U) Significant Program Changes: FY98 reprogramming and FY00/01 adjustments funded higher priority Air Force and DOD priorities.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603851F ICBM Dem/Val	PROJECT 1020

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
1020 ICBM Guidance Applications	14,822	4,265	10,160	16,309	18,346	20,412	20,837	21,270	Continuing	Continuing

(U) A. Mission Description

(U) The ICBM Guidance Applications Project is required to meet on-going needs in applied strategic guidance systems and their subcomponents. This project ensures the continued readiness of our strategic deterrent forces in response to the Nuclear Posture Review, recommendations of the USSTRATCOM Strategic Advisory Group, CINCSTRATCOM guidance, and the Defense Science Board Task Force on Nuclear Deterrence. Efforts within this project are focused on current and future missions, disengagement strategies, reduced life cycle costs, and increased nuclear surety and safety. These activities leverage the efforts of the Science and Technology community. The efforts are coordinated with the Navy efforts so as to avoid duplication while realizing maximum return on the invested dollars. A key element of the Guidance Applications Project is the continued preservation of the minimum technical skills and capabilities needed to respond to major modifications to the Minuteman guidance system as well as any degradation of the aging hardware. These unique guidance efforts will demonstrate utility and cost savings potential.

(U) FY 1998 ($ in Thousands):

- (U) $290 Completed development of Gyro Stabilized Platform cost and options analysis (COA).
- (U) $6,398 Continued integration assessment of advanced inertial measurement unit (IMU) design into Minuteman weapon system.
- (U) $2,858 Completed advanced IMU concept prototype sled test and evaluated results.
- (U) $2,918 Continued advanced instrument prototype integration tests.
- (U) $2,358 Continued radiation hardened parts efforts.
- (U) $14,822 Total

(U) FY 1999 ($ in Thousands):

- (U) $2,338 Complete initial AF/Navy coordinated LN-195 guidance system pod flight testing using a high-performance aircraft platform.
- (U) $1,469 Conduct development and testing of a prototype thrust axis accelerometer concept for strategic guidance system applications.
- (U) $458 Continue radiation hardened parts efforts.
- (U) $4,265 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603851F ICBM Dem/Val
PROJECT 1020	

(U) FY 2000 ($ in Thousands):

- (U) $3,808 Continue development and test of thrust axis accelerometer prototype to improve performance, design brassboard electronics, and address radiation hardness environment impacts. Continue fiber optic gyroscope development for strategic advanced inertial measurement unit. Begin design of micromechanical electronics for common strategic guidance system.
- (U) $3,976 Continue development and test radiation hardened application-specific integrated circuits (ASICs) and a radiation hardened high throughput microprocessor for strategic weapon system requirements.
- (U) $2,376 Continue development of advanced inertial measurement unit (AIMU) concepts emphasizing mechanical, electrical, cooling, data interfaces, and inflight updates. Perform tests and design changes for meeting performance, cost, and compatibility goals.
- (U) $10,160 Total

(U) FY 2001 ($ in Thousands):

- (U) $4,233 Continue the design, test, and integration of thrust axis accelerometer and the fiber optic gyroscope.
- (U) $4,340 Continue development of radiation hard ASICs and high throughput microprocessor.
- (U) $3,036 Continue design and development of micromechanical electronics for common guidance system.
- (U) $2,450 Complete development and test of AIMU concepts.
- (U) $2,250 Develop and demonstrate initial concepts for common strategic guidance system technology.
- (U) $16,309 Total

(U) B. Project Change Summary - Description of Significant Changes: $9.0M Congressional reduction in FY99; $5.0M adjustment in both FY00 and FY01 to fund higher Air Force and DOD priorities.

(U) C. Other Program Funding Summary ($ in Thousands): None.

(U) D. Acquisition Strategy: Accomplish studies and analyses as well as limited engineering and pre-prototype hardware development. All efforts will be conducted under the ICBM Prime Integration Contractor unless other strategies are deemed more appropriate.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603851F ICBM Dem/Val
	PROJECT 1020

(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) Complete Gyro Stabilized Platform Phase 0 Activities (Started 1st Qtr FY96)				*												
(U) Complete Alternate IMU Prototype Development/Integration (Started 1st Qtr FY96)				*												
(U) Stop/Resume/Complete Advanced IMU Integration Assessments (Started 1st Qtr FY96)					* Stop				X Resume							X Comp
(U) Radiation Hardened Parts Analysis (Started 2nd Qtr FY97, On-Going)																
(U) Start New Systems Concepts Design Studies (On-going)													X			
(U) Inertial instrument technology development (Started 1st Qtr FY97, On-going)																

* - Completed Event
X - Planned Event

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603851F ICBM Dem/Val
	PROJECT 1020

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Contract System Engineering	8,268	4,205	10,095	16,239
(U) Labs/Agencies	6,196			
(U) Program Management Support	358	60	65	70
(U) Total	14,822	4,265	10,160	16,309

(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	FY 1998	FY 1999	FY 2000	FY 2001	Budget to Complete	Total Program
Product Development Organizations											
TRW (Prime)	C/CPAF	Dec 97	Continuing	Continuing	0	6,297	4,205	10,095	16,239	Continuing	Continuing
Litton	C/CPAF	Aug 91	18,500	18,500	16,448	1,971					18,419
Lockheed-Martin	C/CPAF	Aug 91	4,136	4,136	4,136						4,136
Draper Labs	C/CPAF/FFP	Nov 91	9,455	9,455	6,230	3,225					9,455
Support and Management Organizations											
TRW	SS/CPAF	Oct 95	1,556	1,556	1,532	24					1,556
Other Engineering Support	Various	Various	Continuing	Continuing	8,522	41	60	65	70	Continuing	Continuing
Test and Evaluation Organizations											
AF Research Lab	MIPR	Annual	2,455	2,455	155	2,361					2,516
Central Inertial Guidance Test Facility	PO	Annual	1,377	1,377	1,290	87					1,377

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

DATE: February 1999

BUDGET ACTIVITY: 4 - Demonstration and Validation

PE NUMBER AND TITLE: 0603851F ICBM Dem/Val

PROJECT: 1020

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	FY 1998	FY 1999	FY 2000	FY 2001	Budget to Complete	Total Program
Navy SSP	MIPR	Annual	816	816	0	816					816
Wright Labs	MIPR	Jan 97	200	200	200						200

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	26,814	11,493	4,205	10,095	16,239	Continuing	Continuing
Subtotal Support and Management	10,054	65	60	65	70	Continuing	Continuing
Subtotal Test and Evaluation	1,645	3,264					4,909
Total Project	38,513	14,822	4,265	10,160	16,309	Continuing	Continuing

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE: February 1999
BUDGET ACTIVITY: 4 - Demonstration and Validation	PE NUMBER AND TITLE: 0603851F ICBM Dem/Val	PROJECT: 1021

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
1021 ICBM Propulsion Applications	178	184	181	178	1,680	1,660	1,694	1,729	Continuing	Continuing

(U) A. Mission Description

(U) This applications project explores alternatives and improvements to the current ICBM propulsion systems capability and studies to assess future ICBM missile propulsion requirements.

(U) FY 1998 ($ in Thousands):

- (U) $178 Completed All Ordnance Destruct System capability study.
- (U) $178 Total

(U) FY 1999 ($ in Thousands):

- (U) $184 Conduct propulsion cost and performance studies for Ballistic Missile Replacement design concepts.
- (U) $184 Total

(U) FY 2000 ($ in Thousands):

- (U) $181 Conduct studies and assessment of technological developments in support of ICBM propulsion system(s).
- (U) $181 Total

(U) FY 2001 ($ in Thousands):

- (U) $178 Continue studies and assessment of technological developments in support of ICBM propulsion system(s).
- (U) $178 Total

(U) B. Project Change Summary - Description of Significant Changes: None

(U) C. Other Program Funding Summary ($ in Thousands): None

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603851F ICBM Dem/Val
	PROJECT 1021

(U) D. Acquisition Strategy: Studies and analyses will be accomplished. All efforts will be conducted under the ICBM Prime Integration Contractor unless other strategies are deemed more appropriate.

(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) Start/Complete Ordnance Studies		*		*												
(U) Conduct Reuse Studies and Technology Assessments (Started 1st Qtr FY99; On-going)					*											

* - Completed Event
X - Planned Event

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

DATE: February 1999

BUDGET ACTIVITY: 4 - Demonstration and Validation

PE NUMBER AND TITLE: 0603851F ICBM Dem/Val

PROJECT: 1021

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Contract System Engineering	167	180	177	173
(U) Program Management Support	11	4	4	5
(U) Total	178	184	181	178

(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	FY 1998	FY 1999	FY 2000	FY 2001	Budget to Complete	Total Program
Product Development Organizations											
TRW (Prime)	C/CPAF	Dec 97	Continuing	Continuing	0	167	180	177	173	Continuing	Continuing
Support and Management Organizations											
Atlantic Research	SS/CPAF	Annual	530	530	530						530
Prog Management	Various	Various	Continuing	Continuing	49	11	4	4	5	Continuing	Continuing

Test and Evaluation Organizations: None

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		167	180	177	173	Continuing	Continuing
Subtotal Support and Management	579	11	4	4	5	Continuing	Continuing
Subtotal Test and Evaluation						Continuing	Continuing
Total Project	579	178	184	181	178	Continuing	Continuing

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603851F ICBM Dem/Val PROJECT 1022

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
1022 ICBM Reentry Vehicle Applications	11,209	9,331	15,884	22,720	21,718	23,161	23,644	24,135	Continuing	Continuing

(U) A. Mission Description

(U) ICBM Reentry Vehicle (RV) Applications efforts are required to support the deployed Minuteman force with emphasis on implementing arms control treaties/initiatives directing the downloading of the Minuteman force to a single RV configuration, equipping the Minuteman force with the safest and most reliable RVs, and exploring options for satisfying future requirements. These efforts will support RVs beyond their original design life by addressing problems with operational reentry systems, meeting real on-going needs, and ensuring the availability of long-lead components/materials. This project will develop methods to better predict aging phenomena and identify life cycle cost reduction methods. Additionally, these efforts will maintain a minimum level of technical engineers and critical skills to respond to aging phenomena and future requirements. RV work conducted under this program will leverage the Science & Technology community investments and coordinate with Navy RV efforts to eliminate duplication and realize synergistic cost savings.

(U) FY 1998 ($ in Thousands):

- (U) $3,427 Continued evaluation of existing RV material subsystems and potential material replacements by performing applicable ground and flight tests.
- (U) $1,490 Continued design, development, and conduct of prototype testing of selected aging prediction techniques and tools.
- (U) $2,271 Continued design, development, and conduct of prototype testing of selected fuze assessment/measurement methodologies.
- (U) $2,173 Continued design, development, and conduct of prototype testing of selected sensors/instruments.
- (U) $475 Continued identifying and ground testing of potential replacement options for critical RV components.
- (U) $1,373 Continued evaluation of improved accuracy assessment measurement methodology.
- (U) $11,209 Total

(U) FY 1999 ($ in Thousands):

- (U) $4,173 Continue evaluation of RV material subsystems, materials aging, and material replacements by performing ground and flight tests.
- (U) $2,534 Continue design, development, and prototype testing of selected fuze assessment/measurement methodologies.
- (U) $712 Continue design, development, and prototype testing of selected sensors/instruments.
- (U) $692 Continue identifying and ground testing potential replacement options for critical RV components.
- (U) $1,220 Continue evaluation of improved accuracy assessment measurement methodology.
- (U) $9,331 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603851F ICBM Dem/Val
PROJECT 1022	

(U) FY 2000 ($ in Thousands):

- (U) $5,432 Continue evaluation of RV material subsystems, materials aging, and material replacements by performing ground and flight tests.
- (U) $3,463 Continue design, development, and prototype testing of selected fuze assessment/measurement methodologies.
- (U) $2,176 Evaluate advanced common RV designs, applications, and technologies.
- (U) $2,478 Develop and assess RV Test & Evaluation methodologies and subsystems.
- (U) $1,302 Continue identifying and ground testing potential replacement options for critical RV components.
- (U) $1,033 Continue evaluation of improved accuracy measurement and methodology.
- (U) $15,884 Total

(U) FY 2001 ($ in Thousands):

- (U) $5,543 Continue evaluation of RV material subsystems, materials aging, and material replacements by performing ground and flight tests.
- (U) $3,953 Evaluate alternate flight test experiment options.
- (U) $3,976 Continue design, development, and prototype testing of selected fuze assessment/measurement methodologies.
- (U) $3,772 Continue evaluation of advanced common RV designs, applications, and technologies.
- (U) $2,567 Continue development and assessment of RV Test & Evaluation methodologies and subsystems.
- (U) $1,704 Continue identifying and ground testing potential replacement options for critical RV components.
- (U) $1,205 Continue evaluation of improved accuracy measurement and methodology.
- (U) $22,720 Total

(U) B. Project Change Summary - Description of Significant Changes: $4.0M Congressional reduction in FY99.

(U) C. Other Program Funding Summary ($ in Thousands): None.

(U) D. Acquisition Strategy: Studies and analyses as well as limited engineering and pre-prototype hardware development will be accomplished. All efforts will be conducted under the ICBM Prime Integration Contractor unless other strategies are deemed more appropriate.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603851F ICBM Dem/Val
	PROJECT 1022

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)	Materials Aging Evaluation and Replacement Materials Design, Develop, and Test Selected Technologies (Started 1st Qtr FY96, On-Going)																
(U)	Aging Prediction Methodologies Complete Design, Develop, and Test Selected Technologies (Started 1st Qtr FY96)				*												
(U)	Fuze Assessment Design, Develop, and Test Measurement Tools (Started 1st Qtr FY96, On-going)																
(U)	Sensor/Instrumentation Integration Design, Develop, and Test Sensors and Instruments (Started 1st Qtr FY96, On-Going)																
(U)	Critical Components Design, Develop, and Test Replacement Options (Started 1st Qtr FY96, On-going)																
(U)	RV Test & Evaluation Methodologies Design, Develop, and Test Methods & Subsystems (Starts 1st Qtr FY00, On-going)									X							
(U)	Accuracy Assessment Methodology Evaluation of Accuracy Measurement Techniques (Started 1st Qtr FY96, On-going)																
(U)	Advanced Common RV Designs, Applications, & Technologies Identify & Evaluate Options (Start 1st Qtr FY00, On-going)										X						
(U)	Alternate Flight Test Options Identify, Develop, and Test Options (Starts 1st Qtr FY01, On-going)													X			

* - Completed Event
X - Planned Event

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603851F ICBM Dem/Val
	PROJECT 1022

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Contract Engineering Support	10,299	7,656	14,654	21,445
(U) Other Engineering Costs	387	100	330	375
(U) Labs/Agencies	523	1,575	900	900
(U) Total	11,209	9,331	15,884	22,720

(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	FY 1998	FY 1999	FY 2000	FY 2001	Budget to Complete	Total Program
Product Development Organizations											
Textron	C/CPAF	Various	8,916	8,916	4,666	4,250					8,916
Lockheed-Martin	C/CPAF	Various	13,529	13,529	8,164	5,365					13,529
Boeing-North American	C/CPAF	Various	280	280	0	280					280
TRW (Prime)	C/CPAF	Dec 97	Continuing	Continuing	0	404	7,656	14,654	21,445	Continuing	Continuing
Support and Management Organizations											
TRW	SS/CPAF	Oct 95	2,694	2,694	2,498	196					2,694
Other Engineering & Management Support	Various	Ongoing	Continuing	Continuing	464	191	100	330	375	Continuing	Continuing
Test and Evaluation Organizations											
Wright Lab	MIPR	Annual	Continuing	Continuing	619	67	675	500	500	Continuing	Continuing
AEDC	PO	Annual	Continuing	Continuing	558	405	400	400	400	Continuing	Continuing
Sandia	MIPR	As Required	Continuing	Continuing	32	51				Continuing	Continuing
Vandenberg AFB	PO	As Required	Continuing	Continuing			500			Continuing	Continuing

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

DATE: February 1999

BUDGET ACTIVITY: 4 - Demonstration and Validation

PE NUMBER AND TITLE: 0603851F ICBM Dem/Val

PROJECT: 1022

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	FY 1998	FY 1999	FY 2000	FY 2001	Budget to Complete	Total Program

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	12,830	10,299	7,656	14,654	21,445	Continuing	Continuing
Subtotal Support and Management	2,962	387	100	330	375	Continuing	Continuing
Subtotal Test and Evaluation	1,209	523	1,575	900	900	Continuing	Continuing
Total Project	17,001	11,209	9,331	15,884	22,720	Continuing	Continuing

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603851F ICBM Dem/Val	PROJECT 1023

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
1023 Rocket System Launch Program	15,371	10,998	32	34	32	33	34	35	Continuing	Continuing

(U) A. Mission Description

(U) This task supports studies/analysis on hardware for cost effective use of excess missile assets.

(U) FY 1998 ($ in Thousands):

- (U) $31 Studied the adoption of low cost front-end systems for use on deactivated missile assets.
- (U) $15,340 Continued developing capabilities for Conventional Ballistic Missile (CBM) Precision Delivery Advanced Concept Technology Demonstration (ACTD).
- (U) $15,371 Total

(U) FY 1999 ($ in Thousands):

- (U) $31 Continue on-going study/analysis for the adoption of low cost front-end systems for use on deactivated missile assets.
- (U) $10,057 Continue developing capabilities for CBM Precision Delivery ACTD.
- (U) $910 Identified as a source for SBIR
- (U) $10,998 Total

(U) FY 2000 ($ in Thousands):

- (U) $32 Continue on-going study/analysis for the adoption of low cost front-end systems for use on deactivated missile assets.
- (U) $32 Total

(U) FY 2001 ($ in Thousands):

- (U) $34 Continue on-going study/analysis for the adoption of low cost front-end systems for use on deactivated missile assets.
- (U) $34 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603851F ICBM Dem/Val
	PROJECT 1023

(U) B. Project Change Summary - Description of Significant Changes: $11.0M Congressional add in FY99.

(U) C. Other Program Funding Summary ($ in Thousands): None.

(U) D. Acquisition Strategy: Studies and analysis will be performed primarily in-house augmented with contractor SETA support as required.

(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) Start/Complete Annual Applications Studies/Analysis	*			*	*			X	X			X	X			X
(U) Continue CBM Advanced Concept Technology Demonstration (ACTD) (Started 2nd Qtr FY97)																
Critical Design Review							X									

* - Completed Events

X - Planned Event

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

DATE: February 1999

BUDGET ACTIVITY: 4 - Demonstration and Validation

PE NUMBER AND TITLE: 0603851F ICBM Dem/Val

PROJECT: 1023

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Studies/Analysis	31	31	32	34
(U) CBM ACTD	15,340	10,057		
(U) Identified as a Source for SBIR		910		
(U) Total	15,371	10,998	32	34

(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	FY 1998	FY 1999	FY 2000	FY 2001	Budget to Complete	Total Program
Product Development Organizations											
Textron	C/CPFF	Apr 97	4,900	4,900	4,900						4,900
Textron	C/CPIF	Aug 98	3,500	3,500	3,500						3,500
Textron	C/CPIF	Aug 98	19,359	19,359	0	12,205	7,154				19,359
AF Research Lab	MIPR	Mar 97	1,744	1,744	1,444	300					1,744
Wright Lab	MIPR	Mar 97	900	900	900						900
National Guard (FL)	MIPR	Jul 97	4,000	4,000	2,500		1,500				4,000
Various	Various	Various	n/a	n/a	1,860	135	653				2,648
Support and Management Organizations											
TRW	SS/T&M	Mar 97	4,077	4,077	1,527	1,800	750				4,077
Various	Various	Ongoing	Continuing	Continuing	517	31	31	32	34	Continuing	Continuing
Identified as a Source for SBIR							910				910
Test and Evaluation Organizations											
AEDC	MIPR	Feb 98	1,000	1,000	100	900					1,000

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

DATE: February 1999

BUDGET ACTIVITY: 4 - Demonstration and Validation

PE NUMBER AND TITLE: 0603851F ICBM Dem/Val

PROJECT: 1023

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	FY 1998	FY 1999	FY 2000	FY 2001	Budget to Complete	Total Program

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	15,104	12,640	9,307				37,051
Subtotal Support and Management	2,044	1,831	1,691	32	34	Continuing	Continuing
Subtotal Test and Evaluation	100	900					1,000
Total Project	17,248	15,371	10,998	32	34	Continuing	Continuing

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603851F ICBM Dem/Val	PROJECT 1024

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
1024 ICBM Command & Control (C2) Applications	844	184	181	178	442	437	447	456	Continuing	Continuing

(U) A. Mission Description

(U) Arms control treaties that reduce the number of reentry vehicles on ICBMs coupled with cutbacks in the overall number of nuclear weapons will reduce the incentive to attack individual ICBM silos. Therefore, the incentive to attack Minuteman launch control centers will increase unless steps are taken to lessen an aggressor's confidence in being able to prevent missile launch by simultaneously destroying all launch control centers. This program funds efforts to identify existing technologies (Ground Launch Cruise Missile, Small ICBM, Airborne Launch Control Centers, etc.) to increase the uncertainty of destroying Minuteman launch control center capabilities. The identification and use of existing military hardware, software, and system designs/documentation are principal concerns. Additionally, it is critical to explore ways of continuing assured connectivity to strategic forces. Study efforts will be conducted to ensure reliable and standardized communication links are maintained between the ICBM forces and higher authorities. Testing of existing low cost technology (fiber optic cable, telescoping antennas, etc.) under heightened states of alert in both simulated and actual readiness scenarios will be conducted. Methods to further disengagement strategies and achieve additional cost savings will also be pursued.

(U) FY 1998 ($ in Thousands):

- (U) $844 Examined Strategic Automated Command and Control System (SACCS) and other ICBM command, control, and communication (C3) systems.
- (U) $844 Total

(U) FY 1999 ($ in Thousands):

- (U) $184 Perform analysis for the Fiber Optic Link/Hardened Intersite Cable System (HICS) upgrade.
- (U) $184 Total

(U) FY 2000 ($ in Thousands):

- (U) $181 Study alternatives and future concepts for a command, control, and communications system architecture supporting ballistic missile applications.
- (U) $181 Total

(U) FY 2001 ($ in Thousands):

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	PROJECT 1024

– (U) $178 Continue to develop and refine alternatives and concepts for a command, control, and communications system architecture supporting ballistic missile applications.

– (U) $178 Total

(U) B. Project Change Summary - Description of Significant Changes: None.

(U) C. Other Program Funding Summary ($ in Thousands): None.

(U) D. Acquisition Strategy: Studies and analyses will be accomplished. All efforts will be conducted under the ICBM Prime Integration Contractor unless other strategies are deemed more appropriate.

(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) Start/Compete SACCS/Turn -of-Century Study and Analysis	*			*												
(U) Start/Complete Fiber Optics Link/HICS Upgrade Study					*			X								
(U) Start C3 System Architecture Study (On-Going)									X							

* - Completed Event

X - Planned Event

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

DATE: February 1999

BUDGET ACTIVITY: 4 - Demonstration and Validation

PE NUMBER AND TITLE: 0603851F ICBM Dem/Val

PROJECT: 1024

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Contract Engineering Support	834	177	173	170
(U) Program Management	10	7	8	8
(U) Total	844	184	181	178

(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	FY 1998	FY 1999	FY 2000	FY 2001	Budget to Complete	Total Program
Product Development Organizations											
GTE	SS/CPAF	Dec 95	878	878	878						878
TRW (Prime)	C/CPAF	Dec 97	Continuing	Continuing	0	819	177	173	170	Continuing	Continuing
Support and Management Organizations:											
Various	Various	Ongoing	n/a	n/a	667	25	7	8	8	Continuing	Continuing

Test and Evaluation Organizations: None

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	878	819	177	173	170	Continuing	Continuing
Subtotal Support and Management	667	25	7	8	8	Continuing	Continuing
Subtotal Test and Evaluation							
Total Project	1,545	844	184	181	178	Continuing	Continuing

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603851F ICBM Dem/Val	PROJECT 4209

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
4209 Long Range Planning (LRP)	1,695	2,292	2,190	2,274	2,387	2,358	2,407	2,457	Continuing	Continuing

(U) A. Mission Description

(U) The Long Range Planning (LRP) task analyzes ICBM systems to identify potential modifications required to meet user objectives relative to long term sustainment, technology insertion, employment, and force structure. The studies focus on system supportability, operability, reliability, and maintainability. Options/concepts generated by these studies are evaluated for feasibility, system impacts, and cost.

(U) FY 1998 ($ in Thousands):

- (U) $457 Continued support of Long Range Planning tasks to include development of the Systems Options Report and update of the Logistics Program Management Plan and the ICBM Master Plan.
- (U) $688 Continued feasibility and life extension studies.
- (U) $550 Continued technology insertion studies.
- (U) $1,695 Total

(U) FY 1999 ($ in Thousands):

- (U) $490 Continue support of Long Range Planning tasks, development of the Systems Options Report, and update of the Logistics Program Management Plan and the ICBM Master Plan.
- (U) $995 Continue to perform feasibility and life extension studies.
- (U) $807 Continue to perform technology insertion studies in support of changing ICBM environments.
- (U) $2,292 Total

(U) FY 2000 ($ in Thousands):

- (U) $500 Continue support of Long Range Planning tasks, development of the Systems Options Report, and update of the Logistics Program Management Plan and the ICBM Master Plan.
- (U) $926 Continue to perform feasibility and life extension studies.
- (U) $764 Continue to perform technology insertion studies in support of changing ICBM environments.
- (U) $2,190 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603851F ICBM Dem/Val
	PROJECT 4209

(U) FY 2001 ($ in Thousands):

- (U) $510 Continue support of Long Range Planning tasks, development of the Systems Options Report, and update of the Logistics Program Management Plan and the ICBM Master Plan.
- (U) $965 Continue to perform feasibility and life extension studies.
- (U) $799 Continue to perform technology insertion studies in support of changing ICBM environments.
- (U) $2,274 Total

(U) B. Project Change Summary - Description of Significant Changes: None

(U) C. Other Program Funding Summary ($ in Thousands): None.

(U) D. Acquisition Strategy: Studies and analyses will be accomplished. Efforts will be conducted using contracting strategies deemed most appropriate.

(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) Contract Award	*				*				X				X			
(U) Conduct Program Reviews		*	*			X	X			X	X			X	X	
(U) Receive Deliverable Reports				*				X				X				X

* - Completed Event
X - Planned Event

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

DATE: February 1999

BUDGET ACTIVITY: 4 - Demonstration and Validation

PE NUMBER AND TITLE: 0603851F ICBM Dem/Val

PROJECT: 4209

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Contractor Engineering Support	1,561	2,192	2,097	2,196
(U) Program Management Support	134	100	93	78
(U) Total	1,695	2,292	2,190	2,274

(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	FY 1998	FY 1999	FY 2000	FY 2001	Budget to Complete	Total Program
Product Development Organizations											
TRW	C/CPAF	Dec 97	n/a	n/a	0	780	490	500	510	Continuing	Continuing
TRW	SS/CPAF	Oct 95	n/a	n/a	5,840	790	1,702				8,332
TBD	TBD	TBD	n/a	n/a				1,585	1,654	Continuing	Continuing
Support and Management Organizations											
TRW	SS/CPAF	Oct 95	5,840	5,840	5,840						5,840
Various	Various	Ongoing	n/a	n/a	1,239	125	100	105	110	Continuing	Continuing

Test and Evaluation Organizations: None

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	5,840	1,570	2,192	2,085	2,164	Continuing	Continuing
Subtotal Support and Management	7,079	125	100	105	110	Continuing	Continuing
Subtotal Test and Evaluation							
Total Project	12,919	1,695	2,292	2,190	2,274	Continuing	Continuing

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

DATE: February 1999

BUDGET ACTIVITY: 4 - Demonstration and Validation

PE NUMBER AND TITLE: 0603854F Wideband MILSATCOM (Space)

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	70,224	69,376	53,344	97,756	190,236	90,216	102,518	294,019	1,338,021	2,357,206
2679 Global Broadcast Service (GBS) Phases 1 and 2	70,224	69,376	48,434	39,574	29,141	22,256	17,538	16,208	91,681	455,928
4811 Wideband Gapfiller	0	0	4,910	58,182	161,095	67,960	53,316	14,249	148,700	508,412
4812 Advanced Wideband	0	0	0	0	0	0	31,664	263,562	1,097,640	1,392,866
Quantity of RDT&E Articles		0	0	0	0	0	0	0	0	0

(U) A. Mission Description

Provide DoD with high data rate (wideband) MILSATCOM services in accordance with the Joint Requirements Oversight Council (JROC) and Joint Space Management Board approved MILSATCOM Architecture (Aug 96) and the MILSATCOM Capstone Requirements Document (CRD) approved by the JROC in Oct 97.

Global Broadcast Service (GBS) will provide efficient high data rate broadcast capability between many distributed information sources and warfighters who receive the broadcast directly on small, inexpensive users terminals. Broadcast data includes digitized imagery, logistics and weather data, maps, operational orders and video. The GBS program was established as a three phase program that was approved by the JROC in late 1995. Phase 1 was started in 1996 and uses commercial satellite leases to provide a Continental United States (CONUS)-based testbed for requirements definition and operational concept refinement. Phase 2 provides a near worldwide, limited capability at military frequencies hosted on the last three Navy Ultra High Frequency follow-on satellites. Phase 3 will provide a global capability integrated into a conceptual Advanced Wideband System. The Air Force was designated executive agent for the GBS Program by USD(A&T) on 27 Mar 96.

The JROC approved the OSD led transition to implement the MILSATCOM architecture in Sept 97. The transition includes 3 Wideband Gapfiller satellites to be launched in 2004/5. The Wideband Gapfiller System is intended to minimize the probability of a gap in wideband service between current and follow-on systems and incorporate the best commercial technology and practices available at the time. A worldwide constellation of Advanced Wideband satellites with launches starting in 2008 will replace current wideband systems and incorporate the latest in commercial capabilities. Both programs will include a broadcast space segment (GBS Phase 2 compatible, on Wideband Gapfiller; GBS Phase 3 on Advanced Wideband).

(U) B. Budget Activity Justification:

(U) Funding is in Budget Activity 4, Demonstration and Validation, since it supports Global Broadcast Service technology demonstration and validation.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY **4 - Demonstration and Validation**	PE NUMBER AND TITLE **0603854F Wideband MILSATCOM (Space)**

(U) C. Program Change Summary ($ in Thousands)	FY 1998	FY 1999	FY 2000	FY 2001	Total
(U) Previous President's Budget (FY 1999 PB)	54,089	70,147	54,315	134,817	2,267,104
(U) Appropriated Value	56,977	70,147			
(U) Adjustments to Appropriated Value					
a. Congressional General Reductions	-2,888	-771			
b. SBIR					
c. Omnibus and Other Above Threshold Reprogram	16,141				
d. Below Threshold Reprogram	-6				
(U) Adjustments to Budget Years Since FY 1999 PB			-971	-37,061	
(U) Current Budget Submit /FY 2000 PB	70,224	69,376	53,344	97,756	2,357,206

(U) Significant Program Changes:

FY99: $398K identified as a source for SBIR.

FY00: $971K used to support higher Air Force priorities.

FY01: Funding for the 2nd and 3rd Wideband Gapfiller satellites was realigned from the RDT&E to the Procurement appropriation.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603854F Wideband MILSATCOM (Space)
	PROJECT 2679

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
2679 Global Broadcast Service (GBS) Phases 1 and 2	70,224	69,376	48,434	39,574	29,141	22,256	17,538	16,208	91,681	455,928

(U) A. Mission Description

Acquires phases 1 and 2 of the GBS program to provide DoD with efficient, high data rate connectivity to many distributed information sources and warfighters who will receive the broadcast directly on small, inexpensive user terminals in accordance with the GBS Operational Requirements Document (ORD) validated by the Joint Requirements Oversight Council in Apr 95. Broadcast data includes digitized imagery, logistics and weather data, maps, operational orders (e.g., Air Tasking Order), and video. Phase 1 is a single channel leased through FY98 for initial testing and concept exploration. Phase 2 is the initial ground infrastructure for broadcast management, uplink and receive equipment. This ground infrastructure works with GBS packages hosted on three Navy UHF Follow-on (UFO) satellites providing near-worldwide service. (Note: Beyond Phase 2 capabilities will be integrated into the wideband segment of the Wideband Gapfiller System and Advanced Wideband System, and will incorporate requirements gleaned from use of Phase 2).

(U) FY 1998 ($ in Thousands):

- (U) $ 3,346 Testbed Transponder, Transition, and Lease
- (U) $ 2,189 Field Engineering and Demonstration Support
- (U) $ 42,749 System Development and Test
- (U) $ 1,163 Initial Communications Connectivity/Interface
- (U) $ 13,404 Phase 2 Government System Integration
- (U) $ 1,302 Field Survey and Integration
- (U) $ 6,000 Navy Terminals
- (U) $ 71 System Test & Eval Support
- (U) $ 70,224 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603854F Wideband MILSATCOM (Space)
	PROJECT 2679

(U) FY 1999 ($ in Thousands):
- (U) $ 41,837 System Development and Test
- (U) $ 5,781 Initial Comm Connectivity/Interface, CONUS Transponder Lease
- (U) $ 14,486 Phase 2 Government System Integration
- (U) $ 666 Field Survey and Integration
- (U) $ 6,000 Navy Terminals
- (U) $ 72 Joint Spectrum Center
- (U) $ 136 System Test & Eval Support
- (U) $ 398 Identified as a source for SBIR
- (U) $ 69,376 Total

(U) FY 2000 ($ in Thousands):
- (U) $ 16,081 System Development and Test
- (U) $ 5,675 Initial Comm Connectivity/Interface, CONUS Transponder Lease
- (U) $ 17,021 Phase 2 Government System Integration
- (U) $ 6,000 Navy Terminals
- (U) $ 131 Joint Spectrum Center
- (U) $ 26 System Test & Eval Support
- (U) $ 3,500 Joint Terminals Engineering Office (JTEO) Support
- (U) $ 48,434 Total

(U) FY 2001 ($ in Thousands):
- (U) $ 15,564 System Development and Test
- (U) $ 5,579 Initial Comm Connectivity/Interface, CONUS Transponder Lease
- (U) $ 12,274 Phase 2 Government System Integration
- (U) $ 6,000 Navy Terminals
- (U) $ 133 Joint Spectrum Center
- (U) $ 24 System Test & Eval Support
- (U) $ 39,574 Total

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

(U) None

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603854F Wideband MILSATCOM (Space)
	PROJECT 2679

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

Related RDT&E

(U) None

Other Appropriations

(U) Air Force GBS receive terminals. Included in BPAC 836780, line P-67 -- PE 33601, Milstar Satellite Comm Sys, Other Procurement, AF

(U) Navy SATCOM Ship Terminal Programs

(U) Army Ground Terminal Programs

(U) Navy UFO Program

(U) ARPA-DISA Bosnia Command and Control Augmentation Program (BC2A) and Joint Broadcast Service (JBS)

(U) ARPA Battlefield Awareness and Data Dissemination (BADD) Advanced Concept Technical Demonstration (ACTD)

(U) DISA Long Haul Communications

(U) D. Acquisition Strategy

(U) Evolutionary acquisition approach making maximum use of commercial technology and acquisition practices. Single integration contractor with total system performance responsibility. (Navy providing space segment for Phase 2 and adapting common receive terminal equipments for shipboard installation.)

(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) Phase 1 (96-98)																
(U) Joint Warfighter Interoperability Demos (JWID)				x												
(U) Lease Commercial Transponder	*	*	*	x												
(U) Phase 2 (98-00+)																
(U) Aquisition Milestone I/II	*															
(U) Launch UFO #8 (Mar 98)		*														
(U) Launch UFO #9 (Oct 98)					x											
(U) Launch UFO #10 (Feb/Mar 99)						x										
(U) Threshold System Operational Capability											x					

* = Completed Event; x = Planned Event

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603854F Wideband MILSATCOM (Space)
	PROJECT 2679

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Testbed Transponder,Transition, and Lease	3,346	0	0	0
(U) Field Engineering and Demonstration Support	2,189	0	0	0
(U) UFO GBS Payload	0	0	0	0
(U) System Development and Test	42,749	41,837	16,081	15,564
(U) Communication Connectivity/Interface	1,163	5,781	5,675	5,579
(U) Phase 2 Government System Integration	13,404	14,486	17,021	12,274
(U) Field Survey and Integration	1,302	666	0	0
(U) Navy Terminals	6,000	6,000	6,000	6,000
(U) Joint Spectrum Center	0	72	131	133
(U) System Test & Eval Support	71	136	26	24
(U) JTEO Support	0	0	3,500	0
(U) Identified as a source for SBIR		398		
(U) Total	70,224	69,376	48,434	39,574

(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							398				
Product Development Organizations											
Raytheon Sys Co.	CPAF	18 NOV 97	219,926	219,926	18,686	42,749	41,837	16,081	15,564	98,065	232,982
Government/TBD	TBD	TBD	N/A	N/A	16,139	13,404	14,486	17,021	12,274	26,658	99,982

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)											DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation					PE NUMBER AND TITLE 0603854F Wideband MILSATCOM (Space)						PROJECT 2679
Support and Management Organizations											
Various	Various	Various	N/A	N/A	17,033	14,000	12,519	15,306	11,712	51,388	121,958
Test and Evaluation Organizations											
Support for Development & Operational Test	TBD	TBD	N/A	N/A	36	71	136	26	24	315	608

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
Product Development Property- TBD										
Support and Management Property - TBD										
Test and Evaluation Property- TBD										
Identified as a source for SBIR						398				398
Subtotal Product Development				34,825	56,153	56,323	33,102	27,838	124,723	332,964
Subtotal Support and Management				17,033	14,000	12,519	15,306	11,712	51,388	121,958
Subtotal Test and Evaluation				36	71	136	26	24	315	608
Total Project				51,894	70,224	69,376	48,434	39,574	176,426	455,928

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603854F Wideband MILSATCOM (Space)
	PROJECT 4811

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
4811 Wideband Gapfiller	0	0	4,910	58,182	161,095	67,960	53,316	14,249	148,700	508,412

(U) A. Mission Description

Provide wideband communications to continue the Defense Satellite Communications System (DSCS) X-Band connectivity. Wideband Gapfiller will also provide a new point-to-point service using the Ka-band frequency, and will host a broadcast capability similar to GBS Phase 2. Launches are scheduled for FY2004/5 and the three satellite constellation will use maximum commercial practices and technology.

(U) FY 1998 ($ in Thousands):
- (U) $ 0 Not Applicable

(U) FY 1999 ($ in Thousands):
- (U) $ 0 Not Applicable

(U) FY 2000 ($ in Thousands):
- (U) $ 4,910 Begin Pre-Engineering and Manufacturing Development (EMD) activities
- (U) $ 4,910 Total

(U) FY 2001 ($ in Thousands):
- (U) $ 11,000 Combined Parts Purchase and Satellite Build
- (U) $ 33,844 Satellite Design
- (U) $ 3,500 JTEO Support
- (U) $ 9,838 Program Support
- (U) $ 58,182 Total

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

(U) FY01: Funding for the 2nd and 3rd Wideband Gapfiller satellites was realigned from the RDT&E to the Procurement appropriation.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603854F Wideband MILSATCOM (Space)
	PROJECT 4811

(U) C. 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
(U) AF Wideband Procurement, PE 33600F	0	0	0	60,000	250,000	210,000	0	0	0	520,000
(U) AF Terminals in PE 33601F, Other Procurement, AF										
(U) Navy terminals in other PEs										
(U) Army terminals in other PEs										

(U) D. Acquisition Strategy

Procure Gapfiller system making maximum use of commercial technology and practices by modifying commercial satellites to support unique military requirements.

(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) Defense Acquisition Board Prep									x	x	x	x				
(U) EMD Contract Award													x			
(U) EMD													x	x	x	x
(U) 1st of 3 launches (FY04 - 9 mo centers)																

x = planned event

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603854F Wideband MILSATCOM (Space)
	PROJECT 4811

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Pre-EMD Activities	0	0	4,910	0
(U) EMD Activities	0	0	0	44,844
(U) JTEO Support	0	0	0	3,500
(U) Program Support	0	0	0	9,838
(U) Total	0	0	4,910	58,182

(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
Product Development Organizations											
TBD	TBD	TBD	TBD	TBD	0	0	0	0	44,844	293,407	338,251
Support and Management Organizations											
JTEO	TBD	TBD	TBD	TBD	0	0	0	0	3,500	61,582	65,082
Various	TBD	TBD	TBD	TBD	0	0	0	4,910	9,838	90,331	105,079
Test and Evaluation Organizations											

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)		DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603854F Wideband MILSATCOM (Space)	PROJECT 4811

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
Product Development Property										
TBD										
Support and Management Property										
TBD										
Test and Evaluation Property										
TBD										
Subtotal Product Development				0	0	0	0	44,844	293,407	338,251
Subtotal Support and Management				0	0	0	4,910	13,338	151,913	170,161
Subtotal Test and Evaluation				0	0	0	0	0	0	0
Total Project				0	0	0	4,910	58,182	445,320	508,412

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603854F Wideband MILSATCOM (Space)	PROJECT 4812

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
4812 Advanced Wideband	0	0	0	0	0	0	31,664	263,562	1,097,640	1,392,866

(U) A. Mission Description

Provide the follow-on to DSCS/Wideband Gapfiller communications services starting in FY 2008. Includes continuation or replacement of DSCS X-band and Wideband Gapfiller Ka-band services. The Advanced Wideband System will also include the GBS Phase 3 broadcast space segment. Constellation will provide worldwide coverage and make maximum use of commercial practices and technologies.

(U) FY 1998 ($ in Thousands):
– (U) $ Not Applicable
0

(U) FY 1999 ($ in Thousands):
– (U) $ Not Applicable
0

(U) FY 2000 ($ in Thousands):
– (U) $ Not Applicable
0

(U) FY 2001 ($ in Thousands):
– (U) $ Not Applicable
0

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

(U) None

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

(U) AF Terminals in PE 33601F, Other Procurement, AF
(U) Navy terminals in other PEs

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY **4 - Demonstration and Validation**	PE NUMBER AND TITLE **0603854F Wideband MILSATCOM (Space)**
	PROJECT **4812**

(U) Army terminals in other PEs

(U) D. Acquisition Strategy

Provide Advanced Wideband capability, making maximum use of commercial technology and practices.

(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) 1st launch in FY 2008																

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603854F Wideband MILSATCOM (Space)
	PROJECT 4812

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) TBD				
(U) Total				

(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
Product Development Organizations											
TBD	TBD	TBD	TBD	TBD							
Support and Management Organizations											
TBD	TBD	TBD	TBD	TBD							
Test and Evaluation Organizations											
TBD	TBD	TBD	TBD	TBD							

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)		DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603854F Wideband MILSATCOM (Space)	PROJECT 4812

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
Product Development Property										
TBD	TBD	TBD	TBD							
Support and Management Property										
TBD	TBD	TBD	TBD							
Test and Evaluation Property										
TBD	TBD	TBD	TBD							
Subtotal Product Development										
Subtotal Support and Management										
Subtotal Test and Evaluation										
Total Project									1,392,866	1,392,866

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

DATE: February 1999

BUDGET ACTIVITY: 4 - Demonstration and Validation

PE NUMBER AND TITLE: 0603860F Joint Precision Approah and Landing Systems - Dem/Val

PROJECT: 4652

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
4652 Precision Landing Systems	0	21,456	16,488	18,253	9,799	13,307	10,261	9,566	TBD	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

The objective of the Joint Precision Approach and Landing System (JPALS) is to provide the next generation precision approach and landing system capability that will contribute to a joint operational capability for the United States (US) forces in order to perform assigned conventional and special operational missions from fixed base, tactical, shipboard and special mission environments under a wide range of meteorological conditions. Additionally, JPALS will ensure that DoD maintains civil interoperability with current and projected FAA and NATO member country landing systems. This effort will modernize the DoD precision landing architecture by replacing aging ship-board and ground precision landing systems (Instrument Landing System (ILS), Precision Approach Radar (PAR), and Instrument Carrier Landing Systems (ICLS) which are expected to end their useful life by 2005-2010 and address short-term precision landing deficiencies in the near term. JPALS will be rapidly deployable and have the ability to operate in adverse weather conditions whether by day or night. JPALS will facilitate DoD mission and training needs by enabling US forces to land on any surface worldwide (land and sea) under peacetime and hostile conditions. This effort may result in modification to avionics in over 6,000 Air Force aircraft and may include a ground segment. No existing system satisfies the mission need for worldwide deployment and interoperability between the Services and the Civil Reserve Air Fleet (CRAF).

(U) B. Budget Activity Justication

This program is in budget activity 4 - Demonstration and Validation, Research Category 6.4B because supportability and manufacturing process design considerations must be identified and integrated into the precision landing architecture.

(U) FY 1999 ($ in Thousands):

- (U) $ 2,999 Begin Architecture and Requirements Definition (ARD) activities
- (U) $ 1,900 Begin aircraft risk reduction studies and integration analyses
- (U) $ 5,061 Begin shipboard risk reduction studies and integration analyses
- (U) $10,793 Begin development of Local Area Differential Global Positioning System (LDGPS) prototypes
- (U) $ 703 Identified as a source for SBIR
- (U) $21,456 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY **4 - Demonstration and Validation**	PE NUMBER AND TITLE **0603860F Joint Precision Approah and Landing Systems - Dem/Val**
	PROJECT **4652**

(U) FY 2000 ($ in Thousands):

- (U) $ 860 Complete Architecture Definitions
- (U) $ 1,779 Continue aircraft risk reduction studies and integration analyses
- (U) $ 1,225 Complete shipboard risk reduction studies and integration analyses
- (U) $ 4,034 Continue development of Local Area Differential Global Positioning System prototypes
- (U) $ 8,590 Begin Aircraft Avionic Development
- (U) $16,488 Total

(U) FY 2001 ($ in Thousands):

- (U) $ 2,088 Continue aircraft risk reduction studies and integration analyses
- (U) $ 5,805 Continue development of Local Area Differential Global Positioning System prototypes
- (U) $ 10,360 Continue Aircraft Avionic Development
- (U) $ 18,253 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY **4 - Demonstration and Validation**	PE NUMBER AND TITLE **0603860F Joint Precision Approah and Landing Systems - Dem/Val**
	PROJECT **4652**

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY 1999 PB)	0	22,057	16,789	0	TBD
(U) Appropriated Value		22,057			
(U) Adjustments to Appropriated Value					
a. Cong Reductions		-601			
b. SBIR					
c. Omnibus or Other Above Threshold Reprogram					
d. Below Threshold Reprogramming					
e. Recissions					
f. Other					
(U) Adjustments to Budget Years Since FY 1999 PB			-301	18,253	TBD
(U) Current Budget Submit FY2000 PB	0	21,456	16,488	18,253	TBD

(U) Significant Program Changes: Program Element is new in FY99—previous efforts were funded under PE 35114F.

FY99: Identified as a source for SBIR ($703,000)
FY01: $10,800 of FY01 funding added to support aircraft and shipboard integration studies, ansurie joint service interoperability and continue development of avionic and local differential-GPS systems.

(U) D. Other Program Funding Summary ($ in Thousands): Not applicable

(U) E. Acquisition Strategy: Demonstration and Validation, multiple contracts, Fixed Price Incentive Fee (FPIF), Firm Fixed Priced contracts (FFP); no Non-Developmental Items (NDI)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY **4 - Demonstration and Validation**	PE NUMBER AND TITLE **0603860F Joint Precision Approah and Landing Systems - Dem/Val**
	PROJECT **4652**

(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) Acquisition Milestones:																
(U) Milestone 0 (3d Qtr, FY96)																
(U) Architecture and Requirements Definition Phase			*													
(U) Definition studies					X				X							
(U) Integration Analyses					X				X							
(U) Prototype/Avionic Development Contracts						X				X			X			

Milestone 0 was funded under PE35114F

* Architecture and requirements Definition Phase authorized by USD(A&T) by memorandum on 18 Sep 1998

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603860F Joint Precision Approah and Landing Systems - Dem/Val
	PROJECT 4652

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Prototype Development	0	10,793	12,624	16,165
(U) Integration Studies and Analyses	0	6,960	2,024	1,868
(U) Systems Engineering/Technical Support	0	2,632	1,600	
(U) Program Management Support	0	293	160	140
(U) Travel	0	75	80	80
(U) Identified as source for SBIR		703		
(U) Total		21,456	16,488	18,253

(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							703				
Product Development Organizations:											
TBD	Various	Various	TBD	TBD	0	0	17,753	14,648	16,165	TBD	TBD
Support and Management Organizations											
TBD	Various	Various	TBD	TBD	0	0	3,000	1,840	2,088	TBD	TBD
No contracts more than $1.0M											
Test and Evaluation Organizations											

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

DATE: February 1999

BUDGET ACTIVITY: 4 - Demonstration and Validation

PE NUMBER AND TITLE: 0603860F Joint Precision Approah and Landing Systems - Dem/Val

PROJECT: 4652

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
TBD			TBD	TBD	0	0	0	0	0	TBD	TBD

Government Furnished Property: N/A

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
Product Development Property										
N/A										
Support and Management Property										
N/A										
Test and Evaluation Property										
N/A										
Identified as a source for SBIR						703				
Subtotal Product Development						17,753	14,648	16,165	TBD	TBD
Subtotal Support and Management						3,000	1,840	2,088	TBD	TBD
Subtotal Test and Evaluation						0	0	0	TBD	TBD
Total Project						21,456	16,488	18,253	TBD	TBD

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

DATE: February 1999

BUDGET ACTIVITY: 4 - Demonstration and Validation

PE NUMBER AND TITLE: 0604237F Variable Stability In-Flight Simulation Test Aircraft

PROJECT: 3308

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
3308 Variable Stability In-Flight Simulation Test Aircraft	5,611	3,989	0	0	0	0	0	0	0	59,508
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description: This demonstration and validation program modifies an F-16D to create a versatile high-performance flying simulator to replace the NT-33A aircraft, which retired in May 1997. For the past 39 years, the research and development flight test community extensively employed the variable stability NT-33A for flight evaluation of fielded aircraft upgrades and new aircraft developments. Its success has been directly attributable to its relatively low-cost of operation, rapid response to customer needs, and high degree of credibility in the flight test community. VISTA was developed to replace the NT-33A because the NT-33A's performance was not representative of future aircraft (it was the oldest aircraft in the Air Force still actively flying). VISTA has the capability to simulate a wide range of air vehicles to verify crucial flight control and human factor designs, establish flying qualities specification criteria, and operate as a flying laboratory for flight control and cockpit display research. In addition, the Air Force Test Pilot School has used VISTA, as they have the NT-33A, to safely train test pilots to evaluate aircraft handling quality, avionics, and human factors designs in a realistic high-performance environment. Note: Congress added $6.0 million to this PE in FY 1998 and $4.0 million in FY 1999 for VISTA. There are no plans to request future funding in this PE to continue operating the VISTA aircraft.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY **4 - Demonstration and Validation**	PE NUMBER AND TITLE **0604237F Variable Stability In-Flight Simulation Test Aircraft**
	PROJECT **3308**

(U) FY 1998 ($ in Thousands):

- (U) $5,611 Continued upgrade program that provided electrical and mechanical interfaces for future installation of an F100-PW-299 engine with an existing axisymmetric thrust vectoring nozzle and a programmable display subsystem, and investigated flight control laws and performance characteristics of fielded aircraft upgrades, new aircraft developments, and test pilot training.
- (U) $5,611 Total

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

- (U) $3,854 Continue upgrade program that provides electrical and mechanical interfaces for future installation of an F100-PW-299 engine with an existing axisymmetric thrust vectoring nozzle and a programmable display subsystem, and investigate flight control laws and performance characteristics of fielded aircraft upgrades, new aircraft developments, and test pilot training.
- (U) $ 135 Identified as a source for SBIR.
- (U) $3,989 Total

(U) FY 2000: Not Applicable.

(U) FY 2001: Not Applicable.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY **4 - Demonstration and Validation**	PE NUMBER AND TITLE **0604237F Variable Stability In-Flight Simulation Test Aircraft**
	PROJECT **3308**

(U) B. Budget Activity Justification: This program is in Budget Activity 4, Demonstration and Validation, since it includes efforts necessary to evaluate integrated technologies in as realistic an operating environment as possible to assess performance or cost reduction potential.

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget/FY 1999 PB	5,650	0			0
(U) Appropriated Value	6,000	4,000			
(U) Adjustments to Appropriated Value					
a. Congressional/General Reductions	-196	-11			
b. SBIR	-154				
c. Omnibus/Other Above Threshold Reprogrammings	-39				
d. Below Threshold Reprogrammings					
(U) Adjustments to Budget Years Since FY 1999 PB					
(U) Current Budget Submit/FY 2000 PB	5,611	3,989			59,508

(U) Significant Program Changes: Not Applicable.

FY 1999: $135 identified as a source for SBIR.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0604237F Variable Stability In-Flight Simulation Test Aircraft
	PROJECT 3308

(U) D. Other Program Funding Summary:

(U) Related Activities:

- (U) PE 0602201F, Aerospace Flight Dynamics.
- (U) PE 0603245F, Flight Vehicle Technology Integration.
- (U) This project has been coordinated through the Project Reliance process to harmonize efforts and eliminate duplication.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0604237F Variable Stability In-Flight Simulation Test Aircraft PROJECT 3308

(U) E. Acquisition Strategy: Not Applicable.

(U) F. Schedule Profile: Not Applicable.

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

DATE: February 1999

BUDGET ACTIVITY: 4 - Demonstration and Validation

PE NUMBER AND TITLE: 0604327F Hardened Target Munitions

PROJECT: 4641

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
4641 (U) Hard and Deeply Buried Target Defeat System (HDBTDS)	4,083	2,549	4,910	0	0	0	0	0	0	11,539
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

The Hard and Deeply Buried Target Defeat System (HDBTDS) program is an effort designed to hold at risk those highest priority assets essential to the enemy's war fighting ability, which are heavily defended and protectively hardened. Hardening techniques include construction of facilities, many of which are deep underground with multiple layers of reinforced concrete, rock rubble, and/or earth overburden. Other hardened targets include operations within caves, tunnels, and mountains built using rapidly improving construction equipment exported by allies and adversaries on a large scale. (Examples include enemy command and control facilities, air defense facilities, facilities for the production, storage, and deployment of weapons including weapons of mass destruction, surface to surface missile launch sites, aircraft storage sites, artillery sites.) Potential solutions include (but are not limited to) Special Forces, conventional short or long range ballistic missiles (land or sea launched), cruise missiles, direct attack munitions, and standoff weapons.

An Analysis of Alternatives (AOA) is being conducted to evaluate the weapon concepts to determine the most promising concepts to move forward into a follow-on program. The potential weapon concepts have been narrowed down from 65 to 10, which are being evaluated in a campaign analysis. The results of the AOA will be presented to the Defense Acquisition Board at a Milestone I in 4th Quarter FY 1999.

(U) FY 1998 ($ in Thousands):
- (U) $2,002 Conducted Analysis of Alternatives (AOA) study effort.
- (U) $2,081 Stood up System Program Offices (SPOs).
- (U) $4,083 Total

(U) FY 1999 ($ in Thousands):
- (U) $1,083 Complete the Phase 0 AOA study effort. The Congressional Appropriations Conference Committee directed that $3.0M shall be available only for completion of a joint AOA (with the Navy) and planning efforts associated with establishing a joint hard and deeply buried target defeat program.
- (U) $1,397 Continue SPO activities (acquisition support and documentation) to support planning efforts.
- (U) $69 Identified as a source for SBIR
- (U) $2,549 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0604327F Hardened Target Munitions
	PROJECT 4641

(U) FY 2000 ($ in Thousands):

- (U) $1,870 Initiate Phase I activities. Preliminary AOA results have identified cost effective alternatives involving modifications to existing systems. The modifications will be explored, as well as other solutions that surface as a result of the AOA.
- (U) $1,580 Continue SPO activities (acquisition support to Phase I activities). Efforts will consist of follow-on analysis and surveys necessary to transition the potential solutions to development programs.
- (U) $1,460 Systems Engineering and Technical Analysis (SETA) will include design analysis and prototype evaluation of upgrades to legacy weapons.
- (U) $4,910 Total

(U) B. Budget Activity Justification:

This program is in budget activity 4 - Demonstration and Validation, because the program will develop a Hard Target Munitions capability to precisely hit and destroy hard and deeply buried targets not currently held at risk.

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY 1999)	4,716	9,803	0	0	4,981
(U) Appropriated Value	4,981	3,000			
(U) Adjustments to Appropriated Value					
a. Cong Reductions	- 163	- 451			
b. SBIR	- 103				
c. Omnibus Payback and Air Force Bill	-32				
d. Below Threshold Reprogramming	-600				
(U) Adjustments to Budget Years Since FY 1999 PB			4,910	0	
(U) Current Budget Submit /PB FY 2000	4,083	2,549	4,910	0	11,539

NOTE: $69 is identified in FY 1999 as a source for SBIR.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0604327F Hardened Target Munitions
	PROJECT 4641

(U) Significant Program Changes:

Funding: FY 1999 funding was reduced from $9.8M to $3.0M to the Air Force and from $9.8M to $3.0M to the Navy. This reduction eliminated ongoing parameter analysis and trade study efforts. All Air Force and Navy funding has been combined to complete the AOA analysis and conduct a Milestone I DAB. FY 2000 funding was added to initiate Phase I leading to a decision to fulfill the requirement either from ongoing systems or a new start.

Schedule: The AOA was extended to evaluate additional concepts and conduct a survivability analysis. The AOA is estimated to be completed in 4Q FY 1999.

(U) D. Other Program Funding Summary ($ in Thousands): Not Applicable

(U) E. Acquisition Strategy:

The contract to perform the Phase 0 AOA work is a modification to an existing Systems Engineering and Technical Assistance (SETA) support contract to the Ogden Air Logistics Center (OO-ALC) ICBM System Program Office (SPO) - a Cost Plus Award Fee (CPAF) contract filled by TRW (Colorado Springs). Hardened Target Munitions Program alternatives are being fully evaluated in the AOA. At the conclusion of the AOA, the Air Force will have the necessary information to support a Milestone I decision. Weapon systems providing required capability will be identified and considered at that time.

(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) Commence SPO Standup	*															
(U) Complete AOA								X								
(U) Milestone I								X								
(U) Conduct System Requirements Review									X							
(U) Start Preliminary Design									X							
(U) Conduct Preliminary Design Review												X				

* = Completed event
X = Planned event

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0604327F Hardened Target Munitions PROJECT 4641

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) AOA	2,002	1,083	0	0
(U) SPO(s) Standup and Continued Support	2,081	1,397	1,580	0
(U) SETA Contractors			1,460	0
(U) Phase I Contract			1,870	0
(U) Identified as a source for SBIR		69		
(U) Total	4,083	2,549	4,910	0

(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							69				69
Product Development Organizations											
TRW (CO Spgs)	SS/CPAF	Oct 96	8,794*	8,794*	3,800*	2,002	1,083	0	0	0	6,885
SETA Contractors	TBD	Oct 99	1,460	1,460	0	0	0	1,460	0	0	1,460
Phase I Contract TBD	TBD	Oct 99	1,870	1,870	0	0	0	1,870	0	0	1,870

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

DATE: February 1999

BUDGET ACTIVITY: 4 - Demonstration and Validation

PE NUMBER AND TITLE: 0604327F Hardened Target Munitions

PROJECT: 4641

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
NOTE: *This figure includes FY96/FY97 funds from PE 0603311F.											
Support and Management Organizations											
ASC/YG (Eglin)	MIPR	Oct 97	N/A	N/A	0	1,118	990	1,140	0	0	3,248
SMC/TE (Kirtland)	MIPR	Oct 97	N/A	N/A	0	943	172	0	0	0	1,115
AFMC/OAS Kirtland AFB	MIPR	Dec 97	N/A	N/A	0	20	10	0	0	0	30
TRW (McLean, VA)	SS/CPAF	Dec 98	N/A	N/A	0	0	225	440	0	0	665
Test and Evaluation Organizations : None											
Government Furnished Property: None											
Subtotal Product Development					0	2,002	1,083	3,330	0	0	6,415
Subtotal Support and Management					0	2,081	1,397	1,580	0	0	5,058
Subtotal Test and Evaluation					0	0	0	0	0	0	0
Identified as a source for SBIR							69				
Total Project					0	4,083	2,549	4,910	0	0	11,539

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0305176F Combat Survivor Evader Locator (CSEL)

PROJECT: 4522

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
4522 CSAR EMD	7,966	0	13,412	10,507	0	0	0	0	0	71,773
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

(U) The Combat Survivor Evader Locator (CSEL) is a joint program, with the Air Force as lead Service, that will provide enhanced Combat Search and Rescue (CSAR) communications and location capability by replacing antiquated survivor radios (PRC-90/112) with current and emerging technologies in a new end-to-end system. The CSEL system will be used by all the Services and DoD, and potentially non-DoD government agencies. CSEL system features include a new hand held radio which incorporates two-way, secure over-the-horizon (OTH) messaging, line-of-sight (LOS) voice, near real-time geopositioning, verification of evader identity and condition, low probability of intercept/detection (LPI/LPD), and the potential integration of commercial satellite systems capabilities.

(U) FY 1998

– (U) $ 3,851 CSEL Engineering and Manufacturing Development
– (U) $ 1,561 Government Test and Operational Assessment
– (U) $ 2,554 Other Government Support
– (U) $ 7,966 Total

(U) FY 1999

– (U) $ 0 Not Applicable (Note 1)

(U) FY 2000

– (U) $ 11,235 CSEL Engineering and Manufacturing Development
– (U) $ 150 Government Test and Operational Assessment
– (U) $ 2,027 Other Government Support
– (U) $ 13,412 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0305176F Combat Survivor Evader Locator (CSEL)
	PROJECT 4522

(U) FY 2001

– (U) $ 6,533 CSEL Engineering and Manufacturing Development
– (U) $ 1,176 Government Test and Operational Assessment
– (U) $ 2,798 Other Government Support
– (U) $ 10,507 Total

Note 1: The AF plans to reprogram $3.999M into the CSEL program in FY99 to continue development of the CSEL system.

(U) B. Budget Activity Justification:

This program is in Budget Activity (BA) 5, Engineering and Manufacturing Development (EMD) because it is in engineering and manufacturing development and has not received full-rate production approval.

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget: FY1999 PB	3,994	0	0	0	47,853
(U) Appropriated Value	4,315	0			
(U) Adjustments to Appropriated Value					
a. Cong Gen Reductions	-262				
b. SBIR	-59				
c. Omnibus and Other Above Threshold Reprogram	-27				
d. Below Threshold Reprogramming	3,999				
(U) Adjustments to Budget Years since FY1999 PB			+13,412	+10,507	+23,919
(U) Current Budget Submit (FY2000 PB)	7966	0	13,412	10,507	71,772

(U) Significant Program Changes: $3,999K BTR planned to be added to the program in FY99 to continue engineering and manufacturing development of the hand held radio components. Technical and schedule delays plus new requirements for Demand Assigned Multiple Access (DAMA) compatibility and Defense Information Infrastructure Common Operating Environment (DII COE) level 7 compliance required RDT&E extension into FY 2002, along with additional new funding requirements to complete the EMD program. Funding was transferred from program procurement in FY00/01 to complete the RDT&E.

	DATE **February 1999**
BUDGET ACTIVITY **5 - Engineering and Manufacturing Development**	PE NUMBER AND TITLE **0305176F Combat Survivor Evader Locator (CSEL)**

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0305176F Combat Survivor Evader Locator (CSEL)
	PROJECT 4522

(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
(U) Other Procurement, Air Force (PE 0305176F) (BA 63, P-70)	5,532	2,992	843	3,567	5,775	5,909	6,034	6,170	Continue	Continue

(U) Related Activities: None

(U) E. Acquisition Strategy:

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

(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) Government DT/OA			*								X	X			X	
(U) Option 1 (First Unit) Delivery							X									
(U) Production Option 2 Award (OPAF)									X							
(U) Option 2 (First Unit) Delivery													X			
(U) Production Option 3 Award (OPAF)															X	

* = completed event
X = planned event

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0305176F Combat Survivor Evader Locator (CSEL)
	PROJECT 4522

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) CSEL Engineering and Manufacturing Development	3,851	0	11,235	6,533
(U) Government Test and Operational Assessment	1,561	0	150	1,176
(U) Program Office Support				
SPAWAR (US Navy Ground Station Integration and Support	518	0	240	862
PRC/ARINC Contractor Support	460	0	475	481
FFRDC (MITRE/Aerospace) Support	1,372	0	1,062	1,205
Space and Missile Center	204	0	250	250
(U) Total	7,966	0	13,412	10,507

(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	FY 1998	FY 1999	FY 2000	FY 2001		Total Program
Product Development Organizations											
Boeing	CPAF	23 Feb 96	59,425	59,425	31,165	3,851	0	11,235	6,533		52,784
SMC (COBRA)	Multiple	Multiple	4,000	4,000	4,000	0				0	4,000
Support and Management Organizations											
Program Support					3,991	2,554	0	2,027	2,798	0	11,370
Test and Evaluation Organizations											
AFOTEC					54	250	0	0	0	0	304
746TS					678	1,311	0	150	1,176		3,315

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE: February 1999
BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE: 0305176F Combat Survivor Evader Locator (CSEL)						PROJECT: 4522

Government Furnished Property: Not Applicable.

Subtotal Product Development	35,165	3,851	0	11,235	6,533	0	56,784
Subtotal Support and Management	3,991	2,554	0	2,027	2,798	0	11,370
Subtotal Test and Evaluations	732	1,561	0	150	1,176	0	3,619
Total Project	39,888	7,966	0	13,412	10,507	0	71,773

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604012F Joint Helmet Mounted Cueing System (JHMCS)

PROJECT: 4789

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
4789 Joint Helmet Mounted Cueing System (JHMCS)	0	0	2,970	1,325	2,950	2,971	3,033	3,096	0	16,345*
Quantity of RDT&E Articles	0	0	22	0	0	0	0	0	0	22

Note: This new PE was realigned from PE 0604201F Project 2050. Total costs for this PE through FY 1999 are shown in PE 0604201F and costs for FY 2000 and later are shown in PE 0604012F.

* Total Air Force cost.
PE 0604201F: 46,178 (Total JHMCS. FY 1999 amount is 9,930)
PE 0604012F: 16,345

(U) A. Mission Description

This Joint program with the United States Navy (USN) will develop a helmet display system, capable of depicting aircraft heading data, pilot's viewing perspective, target indication graphics and digital information. Consolidating this information on the pilot's visor allows the pilot to quickly align sensors and weapons on targets and engage threats using high off-boresight angle weapons such as the AIM-9X. The JHMCS includes a helmet with a mounted visor display capability, a helmet-vehicle interface cable, and several other components.

(U) FY 1998 ($ in Thousands):
- (U) $0 Total

(U) FY 1999 ($ in Thousands):
- (U) $0 Total

(U) FY 2000 ($ in Thousands):
- (U) $2,270 Continue JHMCS Engineering and Manufacturing Development (EMD) Contract
- (U) $278 Continue Air Force Flight Test Center (AFFTC) Test Support
- (U) $422 Continue Program Management Support
- (U) $2,970 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604012F Joint Helmet Mounted Cueing System (JHMCS)
	PROJECT 4789

(U) FY 2001 ($ in Thousands):
- (U) $932 Initiate Pre-Planned Product Improvement Air to Ground Enhancements
- (U) $393 Continue Program Management Support
- (U) $1,325 Total

(U) B. Budget Activity Justification

This program is in budget activity 5 - EMD, Phase II, Research Category 6.4 because of the development nature of this program.

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY 1999 PB)	0	0	0	0	0
(U) Appropriated Value					
(U) Adjustments to Appropriated Value					
a. Congressional/General Reductions					
b. SBIR					
c. Omnibus or Other Above Threshold Reprogramming					
d. Below Threshold Reprogramming					
(U) Adjustments to Budget Years Since FY 1999 PB			2,970	1,325	
(U) Current Budget Submit/FY 2000 PB	*0	*0	2,970	1,325	16,345

(U) Significant Program Changes:

* FY 1998 and FY 1999 program funding are described in PE 0604201F Integrated Avionics Planning and Development.

FY 2000: Increase includes a $3.024M Zero Baseline Transfer (ZBT) from PE 0604201F to establish new JHMCS PE 0604012F and a $.054M decrease for an economic adjustment.

FY 2001: Increase includes a $1.350M ZBT from PE 0604201F to establish new JHMCS PE 0604012F and a $.025M decrease for an economic adjustment.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604012F Joint Helmet Mounted Cueing System (JHMCS)
	PROJECT 4789

(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
(U) RDT&E, BA 5, PE 0604201F, Integrated Avionics Planning and Development	13,640	9,930	0	0	0	0	0	0		46,178

(U) E. Acquisition Strategy

JHMCS is an ACAT III joint USAF/USN program (USAF - executive service). The contract structure is a Cost Plus Award Fee (CPAF) contract awarded in a competitive source selection environment. The CPAF contract is through Boeing - St. Louis for integration into the F-15 and F/A-18. Lockheed Martin will integrate JHMCS into the F-16 and F-22. Boeing has subcontracted to Vision Systems International (VSI) to provide JHMCS subsystems hardware/software. VSI is a partnership between Elbit (an Israeli company based in Ft Worth, TX) and Kaiser Electronics. The Joint Program Office is using a unique approach of developing common hardware as Contractor Furnished Equipment (CFE) to minimize platform integration risk. Milestone III Production Decision is scheduled for Mar 00.

(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) Production Decision										X						
(U) Pre-Planned Product Improvement													X	X	X	X

X - Planned event

Note - Efforts in FY 1999 and earlier are described in PE 0604201F

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604012F Joint Helmet Mounted Cueing System (JHMCS)
	PROJECT 4789

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) EMD Effort			2,270	0
(U) Pre-Planned Product Improvement			0	932
(U) Test Support (AFFTC)			278	0
(U) Program Management Support			422	393
(U) Total	0*	0*	2,970	1,325

* These costs are described in PE 0604201F

(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	FY 1998	FY 1999	Budget FY 2000	FY 2001	Budget to Complete	Total Program
Product Development Organizations											
MDA/LMTAS	CPAF	2/97	14,416	14,416	0	0	0	2,270	932	11,214	14,416
Support and Management Organizations											
Various	Various	2/97	1,651	1,651	0	0	0	422	393	836	1,651
Test and Evaluation Organizations											
Various	Various	2/97	278	278	0	0	0	278	0	0	278

Government Furnished Property: Not Applicable

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604012F Joint Helmet Mounted Cueing System (JHMCS)

PROJECT: 4789

Item Description	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Delivery Date	Total Prior to FY 1998	FY 1998	Budget FY 1999	Budget FY 2000	FY 2001	Budget to Complete	Total Program
Subtotal Product Development				0	0	0	2,270	932	11,214	14,416
Subtotal Support and Management				0	0	0	422	393	836	1,651
Subtotal Test and Evaluation				0	0	0	278	0	0	278
Subtotal Government Furnished Property										
Total Project				0	0	0	2,970	1,325	12,050	16,345

Note: Program funding for FY 99 and earlier is described in PE 0604012F

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

DATE: **February 1999**

BUDGET ACTIVITY: **5 - Engineering and Manufacturing Development**

PE NUMBER AND TITLE: **0604201F Integrated Avionics Planning and Development**

	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	14,769	10,643	723	718	0	0	0	0	0	69,360
2257	Standard Avionics & JSRC Initiatives	1,036	713	723	718	0	0	0	0	0	19,991
2258	Standard Inertial Navigation Unit	93	0	0	0	0	0	0	0	0	3,191
2050	Joint Helmet-Mounted Cueing System (JHMCS)	13,640	9,930	0	0	0	0	0	0	0	46,178
	Quantity of RDT&E Articles	18	21	0	0	0	0	0	0	0	39

Note - Project 2050 was realigned under new PE 0604012F Joint Helmet-Mounted Cueing System (JHMCS). Total costs for JHMCS through FY 99 are shown here and costs for FY 00 and later are shown in PE 0604012F.

* Total Air Force Cost
  PE 0604201F: 46,178
  PE 0604012F: 16,345

(U) A. Mission Description

This program element explores and develops integrated avionics architectures and components which will reduce acquisition and support costs, increase weapon system performance and availability, and foster weapons system interoperability with standard interfaces. This program element is devoted to the demonstration and Engineering and Manufacturing Development (EMD) of integrated avionics architectures and open systems. The scope is both domestic and international. Cost of ownership, Reliability and Maintainability (R&M) and deployment footprint play a major role in the identification of specific development efforts within this element. Joint avionics development efforts are pursued through participation in and support of the Joint Service Review Committee (JSRC).

(U) B. Budget Activity Justification

This is budget activity 5 - EMD, Research Category 6.4 because of the development nature of the effort.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY **5 - Engineering and Manufacturing Development**	PE NUMBER AND TITLE **0604201F Integrated Avionics Planning and Development**

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY 1999 PB)	15,406	10,762	3,760	2,081	80,056
(U) Appropriated Value	16,494	10,762			
(U) Adjustments to Appropriated Value					
a. Congressional / General Reductions	-681	-119			
b. SBIR	-409				
c. Omnibus or Above Threshold Reprogramming	-106				
d. Below Threshold Reprogramming	-529				
(U) Adjustment to Budget Year since FY 1999 PB			-3,037	-1,363	
(U) Current Budget Submit/FY 2000 PB	14,769	10,643	723	718	69,360

(U) Significant Program Changes:

FY 1999: $.348M identified as a source for SBIR.

FY 2000: Decrease of $3.037M includes a $3.024M transfer to establish new JHMCS PE 0604012F.

FY 2001: Decrease of $1.363M includes a $1.350M transfer to establish new JHMCS PE 0604012F.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604201F Integrated Avionics Planning and Development PROJECT 2257

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
2257 Standard Avionics & JSRC Initiatives	1,036	713	723	718	0	0	0	0	0	19,991

(U) A. Mission Description

This project identifies, demonstrates and/or develops candidate architecture standards and open system modular components for the Air Force and other services. Maintains/updates the common avionics database as a widely used avionics interoperability/standardization planning tool. Supports international avionics initiatives and standardization activities such as Global Air Traffic Management (GATM) Integrated Product Team. Develops an opportunity matrix for tactical and airlift programs to identify opportunities to leverage investments for aging avionics, parts obsolescence and avionics modernization. Common Avionics Modernization Planning is a Phase 0 (concept exploration) project that explores candidate avionics systems and designs for potential developmental efforts and aircraft interoperability initiatives. The Joint Service Review Committee (JSRC) coordinates avionics standardization projects between the Air Force, Army and Navy.

(U) FY 1998

- (U) $35 Continued Tri-Service Standardization / JSRC
- (U) $200 Continued Horizontal Avionics Modernization Planning (HAMP)
- (U) $184 Continued Avionics Planning Baseline
- (U) $315 Continued Logistics/ Initiative Planning & Support
- (U) $302 Continued Program Management Support
- (U)$1,036 Total

(U) FY 1999

- (U) $25 Continue Tri-Service Standardization / JSRC
- (U) $220 Continue HAMP
- (U) $170 Continue Avionics Planning Baseline
- (U) $106 Continue Logistics/Initiative Planning & Support
- (U) $169 Continue Program Management Support
- (U) $23 Identified as a source for SBIR
- (U) $713 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604201F Integrated Avionics Planning and Development
	PROJECT 2257

(U) FY 2000

–	(U) $100	Continue Tri-Service Standardization / JSRC
–	(U) $240	Continue HAMP
–	(U) $220	Continue Avionics Planning Baseline
–	(U) $25	Continue Logistics/Initiative Planning & Support
–	(U) $138	Continue Program Management Support
–	(U) $723	Total

(U) FY 2001

–	(U) $25	Continue Tri-Service Standardization / JSRC
–	(U) $260	Continue HAMP
–	(U) $175	Continue Avionics Planning Baseline
–	(U) $71	Continue Logistics/Initiative Planning & Support
–	(U) $187	Continue Program Management Support
–	(U) $718	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: These projects are in acquisition Phase 0 (concept exploration) and are accomplished through various prime contractors or Assistance & Advisory Support (A & AS) contracts. The contracts are awarded competitively and follow the most recent DoD acquisition guidelines using the integrated product development philosophy.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY **5 - Engineering and Manufacturing Development**	PE NUMBER AND TITLE **0604201F Integrated Avionics Planning and Development**
	PROJECT **2257**

(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) Tri-Service Standardization	*		*		*		X		X							
(U) HAMP		*			*				X							
(U) Publish Avionics Planning Baseline	*	*			*				X							
(U) Logistics/Initiative Planning	*	*	*	*	*	X	X	X	X	X	X	X	X	X	X	X
(U) Program Management Support	*	*	*	*	*	X	X	X	X	X	X	X	X	X	X	X

* = Completed event
X = Planned event

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604201F Integrated Avionics Planning and Development
	PROJECT 2257

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Tri-Service Standardization	35	25	100	25
(U) HAMP	200	220	240	260
(U) Avionics Planning Baseline	184	170	220	175
(U) Logistics / Initiative Planning and Support	315	106	25	71
(U) Program Management Support	302	169	138	187
(U) Identified as source for SBIR	0	23	0	0
(U) Total	1,036	713	723	718

(U) B. Budget Acquisition History and Planning Information ($ 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	FY 1998	FY 1999	Budget FY 2000	FY 2001	Budget to Complete	Total Program
Product Development Organizations:											
Not Applicable											
Support and Management Organizations:											
Support Contracts	FFP	Annual 1 Jan	15,776	15,776	13,405	734	521	585	531	0	15,776
Prgm Mgmt Support	Various	Annual 1 Jan	4,192	4,192	3,396	302	169	138	187	0	4,192
Test and Evaluation Organizations											
Not Applicable											

Government Furnished Property:
Not Applicable

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604201F Integrated Avionics Planning and Development

PROJECT: 2257

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	FY 1998	Budget FY 1999	FY 2000	FY 2001	Budget to Complete	Total Program
Subtotal Product Development			0	0	0	0	0	0	0	0	0
Subtotal Support and Management			19,968	19,968	16,801	1,036	713	723	718	0	19,991
Subtotal Test and Evaluation			0	0	0	0	0	0	0	0	0
Total Project			19,968	19,968	16,801	1,036	713	723	718	0	19,991

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604201F Integrated Avionics Planning and Development PROJECT 2258

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
2258 Standard Inertial Navigation Unit	93	0	0	0	0	0	0	0	0	3,191

(U) A. Mission Description

Developed DoD standard Embedded Global Positioning System (GPS)/ Inertial Navigation System (INS) (EGI) Precise Positioning System (PPS), (0.8 nm/h free inertial) Navigation System for Army's OH-58 Kiowa Warrior, Army Special Operations Helicopters, Apache AH-64A+ and AH-64 C/D Apache Longbow helicopters, Navy's AH-1W Super Cobra helicopter, F-14, F-18, EA-6B, and S-3 and Air Force A-10, F-15, F-16 and KC-135 aircraft and additional weapon systems as identified. Directly tied to the Congressionally mandated Minimum Avionics Requirement (MAR) capability for DoD aircraft and the Joint Chiefs of Staff (JCS) Radio Navigation Master Plan. Developed enhanced accuracy (0.3 nm/hr) Inertial Navigation Unit (INU) for the F-117A aircraft. Program developed INU depot Support Equipment (SE) for the Standard Ring Laser Gyro (RLG) program. Embedded GPS/INS efforts resulted from a tri-service acquisition plan. Program is in phase III (Production).

(U) FY 1998 ($ in Thousands):
- (U) $93 Completed Program Management Support
- (U) $93 Total

(U) FY 1999 ($ in Thousands):
- (U) $0 Total

(U) FY 2000 ($ in Thousands):
- (U) $0 Total

(U) FY 2001 ($ in Thousands):
- (U) $0 Total

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

Not Applicable

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

Not Applicable

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY **5 - Engineering and Manufacturing Development**	PE NUMBER AND TITLE **0604201F Integrated Avionics Planning and Development**
	PROJECT **2258**

(U) D. Acquisition Strategy: This program used two suppliers who competed to satisfy platform and production requirements using a competitive down select process. The two contracts were written with identical terms and conditions to facilitate the downselect process. The contract was restructured to continue EGI acquisition upgrades from FY 99 through FY 03 to accommodate platforms which are not yet in compliance with the Congressional mandate. Funding for FY 99 and later will be provided by the aircraft platforms. The delivery orders are managed in a government-contractor IPT environment with tri-service participation by the Air Force, Navy, and Army.

(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) Integrate GPS/INS on Aircraft	*	*	*	*												
(U) Complete Qualification, Testing, and Evaluation (QT&E)	*	*														

* = Completed event

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604201F Integrated Avionics Planning and Development

PROJECT: 2258

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Program Management Support	93	0	0	0
(U) Total	93	0	0	0

(U) B. Budget Acquisition History and Planning Information ($ 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	FY 1998	FY 1999	Budget FY 2000	FY 2001	Budget to Complete	Total Program
Product Development Organizations											
Honeywell	FFP/LOE	9/96	110	110	110	0	0	0	0	0	110
Litton	FFP/LOE	1/97	10	10	10	0	0	0	0	0	10
SA-ALC	MIPR	7/97	50	50	50	0	0	0	0	0	50
Support and Management Organizations											
Mission Support	LOE		3,021	3,021	2,928	93	0	0	0	0	3,021
Subtotal Product Development			170	170	170	0	0	0	0	0	170
Subtotal Support and Management			3,021	3,021	2,928	93	0	0	0	0	3,021
Subtotal Test and Evaluation			0	0	0	0	0	0	0	0	0
Total Project			3,191	3,191	3,098	93	0	0	0	0	3,191

Test and Evaluation Organizations: Not Applicable

Government Furnished Property: Not Applicable

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY **5 - Engineering and Manufacturing Development**	PE NUMBER AND TITLE **0604201F Integrated Avionics Planning and Development**
	PROJECT **2050**

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
2050 Joint Helmet-Mounted Cueing System (JHMCS)	13,640	9,930	0	0	0	0	0	0	0	46,178

Note - Project 2050 was realigned under new PE 0604012F Joint Helmet-Mounted Cueing System (JHMCS). Total costs for JHMCS through FY 99 are shown here and costs for FY 00 and later are shown in PE 0604012F.
* Total Air Force Cost

(U) A. Mission Description

This Joint program with the USN will develop a helmet display system, capable of depicting aircraft heading data, pilot's viewing perspective, target indication graphics and digital information. Consolidating this information on the pilot's visor allows the pilot to quickly align sensors and weapons on targets and engage threats using high off-boresight angle weapons such as the AIM-9X. The JHMCS includes a helmet with a mounted visor display capability, a helmet-vehicle interface cable, and several other components. JHMCS is currently in Phase II, Engineering & Manufacturing Development (EMD).

(U) FY 1998
- (U) $10,964 Continued JHMCS EMD contract
- (U) $ 1,914 Continued Air Force Flight Test Center (AFFTC) Test Support
- (U) $762 Continued Program Management Support
- (U) $13,640 Total

(U) FY 1999
- (U) $7,274 Continue JHMCS EMD contract
- (U) $1,616 Continue Test Support (AFFTC)
- (U) $715 Continue Program Management Support
- (U) $325 Identified as a source for SBIR
- (U) $9,930 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604201F Integrated Avionics Planning and Development
	PROJECT 2050

(U) FY 2000
– (U) $0 Total*

(U) FY 2001
– (U) $0 Total*
–

* These costs are described in PE 0604012F

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

Funding:
FY 2000: Funding realigned to establish new Joint Helmet Mounted Cueing System (JHMCS) PE 0604012F.
FY 2001: Funding realigned to establish new JHMCS PE 0604012F.
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(U) C. 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
(U) RDT&E, BA 5, PE 0604012F, JHMCS			2,970	1,325	2,950	2,971	3,033	3,096	0	16,345

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY **5 - Engineering and Manufacturing Development**	PE NUMBER AND TITLE **0604201F Integrated Avionics Planning and Development**
	PROJECT **2050**

(U) D. <u>Acquisition Strategy</u>: JHMCS is an ACAT III joint USAF/USN program (USAF - executive service). The contract structure is a Cost Plus Award Fee (CPAF) contract awarded in a competitive source selection environment. The CPAF contract is through Boeing - St. Louis for integration into the F-15 and F/A-18. Lockheed Martin will integrate JHMCS into the F-16 and F-22. Boeing has subcontracted to Vision Systems International (VSI) to provide JHMCS subsystems hardware/software. VSI is a partnership between Elbit (an Israeli company based in Ft Worth, TX) and Kaiser Electronics. The Joint Program Office is using a unique approach of developing common hardware as Contractor Furnished Equipment (CFE) to minimize platform integration risk. Milestone III Production Decision is scheduled for Mar 00.

(U) E. <u>Schedule Profile</u>

	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) System Integration Testing		*														
(U) Flight Test (F-15/F-18)					*	X										
(U) Functional Configuration Audit							X									
/Physical Configuration Audit																
(U) IOT&E								X								

* = Completed event
X = Planned event

**Efforts planned for FY 2000 and later
are described in PE 0604012F

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604201F Integrated Avionics Planning and Development
	PROJECT 2050

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) EMD Effort	10,964	7,274		
(U) Test Support (AFFTC)	1,914	1,616		
(U) Program Management Support	762	715		
(U) Identified as source for SBIR	0	325	0	0
(U) Total	13,640	9,930	*0	*0

* Program funding for FY 2000 and later is described in PE 0604201F

(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	FY 1998	FY 1999	Budget FY 2000	FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR							325				325
Product Development Organizations											
MDA/LMTAS	CPAF	2/97	38,962	38,962	20,724	10,964	7,274	0	0	0	38,962
Support and Management Organizations											
Various	Various	2/97	2,933	2,933	1,456	762	715	0	0	0	2,933
Test and Evaluation Organizations:											
Various	Various	2/97	3,958	3,958	428	1,914	1,616	0	0	0	3,958

Government Furnished Property: Not Applicable

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604201F Integrated Avionics Planning and Development

PROJECT: 2050

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	FY 1998	FY 1999	Budget FY 2000	FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR							325				325
Subtotal Product Development			38,962	38,962	20,724	10,964	7,274	0	0	0	38,962
Subtotal Support and Management			2,933	2,933	1,456	762	715	0	0	0	2,933
Subtotal Test and Evaluation			3,958	3,958	428	1,914	1,616	0	0	0	3,958
Total Project			45,853	45,853	22,608	13,640	9,930	0	0	0	46,178

Note: Program funding for FY 2000 and later is described in PE 0604012F

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604222F Nuclear Weapons Support

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	4,445	4,963	8,489	9,175	11,805	12,145	12,806	12,988	Continuing	Continuing
4236 Engineering Analysis	676	690	4,298	5,250	7,640	7,725	8,244	8,273	Continuing	Continuing
5708 Nuclear Weapons Support	3,769	4,273	4,191	3,925	4,165	4,420	4,562	4,715	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

Provides funds for maintaining core USAF nuclear weapon system expertise. Includes in-house technical capabilities, contractual efforts, supplies and equipment, travel and salaries of the USAF Nuclear Weapons Integration Division and the USAF Nuclear Weapons and Counterproliferation Agency civilian and military nuclear weapon and counterproliferation specialists at Kirtland Air Force Base. Provides technical and programmatic guidance for continued and improved weapons capability, interoperability, safety, surety, security, development, stockpile management and retirement, and counterproliferation assessments. Customers are: DoD (Air Force, Navy, Nuclear CINCs, Joint Staff, OSD and Defense Threat Reduction Agency [DTRA]), DOE and NATO. Supports US Strategic Command and Air Combat Command Required Operational Capability 16-71 (Peacekeeper), 12-76 (Air Launched Cruise Missile), 6-76 (B61 Strategic Bomb), 6-69 (B83 Modern Strategic Bomb), and SAC System Operational Requirements Document 13-82-III (Advanced Cruise Missile). Air Force representative for development and implementation of the Joint DoD-DOE Surety Plan, DOE Stockpile Stewardship Plan, DoD/DOE Long Range Planning Assessment and the DoD/DOE Annual Certification. These plans document nuclear weapon issues which benefit from the application of risk assessment, data collection, model development and effectiveness analysis. This work is tied to the DOE nuclear weapons development process independent of the DoD acquisition system. Weapons are continuously undergoing some form of RDT&E to assure safety, reliability and operational readiness as the DoD restructures the nation's nuclear stockpile. Therefore, USAF platforms require continuing engineering development and analysis to ensure compatibility and safety of nuclear systems. Counterproliferation efforts include identifying, evaluating and assessing current and projected counterproliferation systems operating in joint environments. Funding this element is essential to maintaining current safety and reliability levels in the US nuclear stockpile as well as assessing current and future USAF counterproliferation needs.

(U) B. Budget Activity Justification: The USAF Nuclear Weapons Integration Division and the USAF Nuclear Weapons and Counterproliferation Agency are responsible for all USAF nuclear weapons program management, development, systems engineering, nuclear surety engineering, engineering analyses and weapons support procedure changes. These efforts place this project in RDT&E research category/budget activity 5, Engineering and Manufacturing Development.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604222F Nuclear Weapons Support

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget FY 1999 PB	4,456	4,977	5,391	5,605	Cont
(U) Appropriated Value	4,782	4,977			
(U) Adjustments to Appropriated Value					
a. Congressional General Reductions	-157	-14			
b. SBIR	-99				
c. Omnibus or Other Above Threshold Reprogram	-81				
d. Below Threshold Reprogramming (BTR)					
(U) Adjustments to Budget Years Since FY 1999 PB			3,098	3,570	
(U) Current Budget Submit/FY 2000 PB	4,445	4,963	8,489	9,175	Cont

(U) **Significant Program Changes**: Changes in FY 2000 - 2001 reflect increase for Phase I Agent Defeat Weapon program and transfer of civilian positions for USAF Nuclear Weapons & Counterproliferation Agency, a new HQ USAF Field Operating Agency to PE 91212F and civilian pay/non-pay inflation. FY99: $3,000 identified as source for SBIR.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604222F Nuclear Weapons Support	PROJECT 4236

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
4236 Engineering Analysis	676	690	4,298	5,250	7,640	7,725	8,244	8,273	Continuing	Continuing

(U) A. Mission Description

Funds the engineering analysis performed on contract for all USAF nuclear weapons, delivery systems and counterproliferation counterforce efforts. Contractors provide technical expertise unavailable through organic resources in critical areas of nuclear weapons safety and security, nuclear operations and counterproliferation. Includes Agent Defeat Weapon (ADW) Phase I analysis and development activities beginning in FY 2000.

(U) FY 1998 ($ in Thousands):

- (U) $ 190 Nuclear Aircraft System Support. Revised and verified nuclear weapons loading, delivery, warhead mate and demate technical orders; completed Explosives Ordnance Disposal (EOD) technical orders and emergency response procedures; supported US Strategic Command's nuclear safe escape effort and the nuclear hardness database; performed aircraft software analysis; developed WE1841 Test Set software and procedures for surveillance testing of the B-2A; provided EOD technical support to DoD/DOE agencies; provided technical expertise for continued nuclear weapons integration on US and non-US aircraft systems; and provided logistics analysis and EOD technical support to counterproliferation study.
- (U) $ 270 Nuclear Weapons Program Support. Provided technical expertise to support development programs including flight and special pull-down testing toward meeting full B61-11 certification, alterations to B61 stockpile weapons, upgrading B61 reliability, W87 life extension program, W62 Cost, Benefit, Risk Study, W78 Joint life extension study, B83 spin rocket motor development plans, installation of B83-1/ALT 752 (new radar/height of burst), joint AF/DOE development test planning, and W84 dormant storage assessment; documented and supported weapon program actions, agreements, and program status including over 40 Project Officer Group reports, Annual Certification Reports, and B53 retirement storage; updated Stockpile-To-Target Sequence (STS) documents for new weapon environments, inactive stockpile plans for all systems and W56 dismantlement/aeroshell reuse plans; produced two major Military Characteristics (MCs) requirements reports; and completed W80 Hedge and Yield analysis studies.
- (U) $ 100 Nuclear Weapons/System Assessments. Provided technical assessments and support on nuclear safety analyses and limited special studies.
- (U) $ 116 Counterproliferation Assessments. Provided technical support for the Agent Defeat Weapon (ADW) AoA Study (DoD Phase 0) including technical expertise in the evaluation of nuclear, thermal, chemical, emitter and conventional systems identified as possible Agent Defeat concepts; performed laboratory experiments to enhance the Empirical Lethality Models (ELM); provided weapon effectiveness assessments of conventional, nuclear, and advanced technology systems. Continued assessment of countermeasures, battle damage assessment (BDA), target characterization, and operational planning; continued efforts for Validation, Verification and Accreditation (VV&A) of ADW codes and models for incorporation in USAF target planning tools; and provided other service expertise in the definition and development of issues related to ADW and counterproliferation.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604222F Nuclear Weapons Support	PROJECT 4236

– (U) $ 676 Total

(U) FY 1999 ($ in Thousands):

– (U) $ 100 Nuclear Aircraft System Support. Revise and verify nuclear weapons loading, delivery, warhead mate and demate, and Explosive Ordnance Disposal (EOD) technical orders; provide EOD technical support to DoD/DOE agencies; provide support on the nuclear hardness database, perform aircraft software analysis; provide technical expertise for continued nuclear weapons integration on US and non-US aircraft systems; and provide logistics analysis and EOD technical support, as required.

– (U) $ 265 Nuclear Weapons Program Support. Provide technical expertise to support development, fielding and updates of nuclear MC and STS documents; document and support all weapons safety analyses, program actions, and agreements; conduct special studies on stockpile related matters; provide technical analyses to support life extension options for B83 and ICBM warheads, W80 6.2/6.2A Study, inactive stockpile issues, use control, long term storage, and dismantlement issues to weapon Lead Project Officers.

– (U) $ 75 Nuclear Weapons/System Assessments. Provide technical assessments and support on nuclear safety analyses and limited special studies.

– (U) $ 250 Counterproliferation Assessments. Continue 1998 technical support for the ADW AoA Study (DoD Phase 0) including technical expertise in the evaluation of nuclear, thermal, chemical, emitter and conventional systems identified as possible Agent Defeat concepts; enhance the ELM; complete VV&A of ADW codes and models for incorporation in USAF target planning tools; and support final Intelligence Support Plan (ISP) requirements of ADW alternatives.

– (U) $ 690 Total

(U) FY 2000 ($ in Thousands):

– (U) $ 200 Nuclear Aircraft System Support. Revise and verify nuclear weapons loading, delivery, warhead mate and demate, and Explosive Ordnance Disposal (EOD) technical orders; provide EOD technical support to DoD/DOE agencies; provide support on the nuclear hardness database, perform aircraft software analysis; provide technical expertise for continued nuclear weapons integration on US and non-US aircraft systems; and provide logistics analysis and EOD technical support, as required.

– (U) $ 300 Nuclear Weapons Program Support. Provide technical expertise to support development, fielding and updates of nuclear weapon MC and STS documents; document and support all weapons safety analyses, program actions, and agreements; conduct special studies on stockpile related matters; provide technical analysis to support life extension options for B83, B61, W80 and ICBM warheads, inactive stockpile issues, use control, long term storage, and dismantlement issues to weapon Lead Project Officers.

– (U) $ 100 Nuclear Weapons/System Assessments. Provide technical assessments and support on nuclear safety analyses and limited special studies..

– (U) $ 276 Counterproliferation Assessments. Provide continued technical support for counterproliferation assessments and technical expertise in the areas of nuclear, advanced technology and conventional systems identified as possible counterforce technologies; battle damage assessment platforms; and target intelligence platforms. Support efforts in fusing mission planning, counterforce technologies and intelligence requirements for developing concepts of operations and operational requirements. Provide technical and programmatic support on counterproliferation matters to the Air Force Nuclear Weapons and Counterproliferation Agency (AFNWCA) and Headquarters USAF.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604222F Nuclear Weapons Support
	PROJECT 4236

– (U) $ 978 Technical support for transitioning the ADW Phase 0 approved recommendations to the Phase I effort. Includes development of the Operational Requirements Documents (ORD), Test & Evaluation Master Plan (TEMP), Capstone Requirements Document (CRD), C4-Intelligence Support Plan (C4ISP), and other required Milestone I documentation and continued development of analytical planning to support empirical based lethality models and their validation, verification and accreditation (VV&A).

– (U) $1,965 DoD Phase I and DOE Phase 1/2/2A Efforts. Provide post-Milestone I research, development and assessments of conceptual designs, approaches, and/or parallel technologies of ADW prototypes identified during the Phase 0, Concept Exploration Phase; develop early operational assessments and analytical weaponeering tools to support technology employment; and provide support for VV&A of Phase 0 codes and models.

– (U) $ 479 Development of the analytical target planning tools to support the Phase 0 approved technologies. This includes increasing the fidelity and evaluating the uncertainty of agent lethality evaluated in ELM and incorporating the Agent Release Model (ARM), Internal Dispersion and Venting (IDV) model, ELM and the Hot Effluent Rise Model (HER)) into the integrated code Simulated Environment and Response Program Execution Nesting Tool (SERPENT); and VVA of the individual ADW codes and models for incorporation in USAF target planning tools.

– (U) $4,298 Total

(U) FY 2001 ($ in Thousands):

– (U) $ 200 Nuclear Aircraft System Support. Revise and verify nuclear weapons loading, delivery, warhead mate and demate, and Explosive Ordnance Disposal (EOD) technical orders; provide support on the nuclear hardness database, perform aircraft software analysis; and provide technical expertise for continued nuclear weapons integration on US and non-US aircraft systems; and provided logistics analysis and EOD technical support, as required.

– (U) $ 300 Nuclear Weapons Program Support. Provide technical expertise to support development, fielding and updates of nuclear weapon MC and STS documents; document and support all weapons safety analyses, program actions, and agreements; conduct special studies on stockpile related matters, provide technical support on inactive stockpile issues, use control, long term storage, life extension and dismantlement issues to weapon Lead Project Officers.

– (U) $ 100 Nuclear Weapons/System Assessments. Provide technical assessments and support on nuclear safety analyses and limited special studies.

– (U) $ 250 Counterproliferation Assessments. Provide continued technical support for counterproliferation assessments and technical expertise in the areas of nuclear, advanced technology and conventional systems identified as possible counterforce technologies; battle damage assessment platforms; and target intelligence platforms. Support efforts in fusing mission planning, counterforce technologies and intelligence requirements for developing concepts of operations and operational requirements. Provide technical and programmatic support on counterproliferation matters to AFNWCA and Headquarters USAF.

– (U) $ 489 Technical support for execution and planning ADW Phase I efforts. Includes technology research and development, assessments, and demonstrations; continued development of SERPENT and ELM analytical planning tool efforts to support the most promising design(s) recommended during Phase 0; and analytic development and support for empirical based agent lethality models and their VV&A.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604222F Nuclear Weapons Support
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– (U) $2,933 DoD Phase I Efforts. Provide research, development and assessments of concept designs, approaches, and/or parallel technologies of ADW prototypes and development of operational assessments; develop analytical weaponeering tools to support technology employment; provide support for VV&A of Phase 0 codes and models.

– (U) $ 978 DOE Phase 1/2/2A Efforts. Provide assessments of concept designs, approaches and/or parallel technologies of ADW prototypes and development of operational assessments; continue development and evaluation of model uncertainty of empirical models for agent lethality.

– (U) $5,250 Total

(U) B. Project Change Summary - Description of Significant Changes: Funding begins in FY 2000 to support Milestone I decision based on Agent Defeat Weapon Analysis of Alternatives (AoA) recommendations.

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

(U) Not Applicable

(U) D. Acquisition Strategy: Multiple small, firm fixed price contracts for contractors and MIPRs to government labs for technical analyses and technical support in safety, operations and counterproliferation assessments. ADW Phase I activities are planning several firm/fixed price contracts and MIPRs to government labs for advanced analyses and development of selected Agent Defeat concepts.

(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) ADW AoA (Phase 0)	*	*	*	*	*	X	X	X	X							
(U) ADW Milestone I										X						
(U) ADW Phase I											X	X	X	X	X	X

* - Completed Event X - Planned Event

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604222F Nuclear Weapons Support
	PROJECT 4236

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Contractor Engineering Support	676	690	4,298	5,250
(U) Total	676	690	4,298	5,250

(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
Product Development Organizations											
Miscellaneous DOE/Albuquerque Ops, Albuquerque, NM TECH REPS, Inc., Albuquerque, NM Orion International, Albuquerque, NM Naval Air Warfare Center, Indianapolis, IN Silicon Graphics, Albuquerque, NM ITT Systems, Colorado Springs, CO Albuquerque Logistics, Albuquerque, NM	MIPR/FFP	1Q FY98	NA	NA	Cont	676	690	4,298	5,250	Cont	Cont
Support and Management Organizations											
None											
Test and Evaluation Organizations											
None											

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604222F Nuclear Weapons Support
	PROJECT 4236

(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
Product Development Property	None									
Support and Management Property	None									
Test and Evaluation Property	None									
Subtotal Product Development					676	690	4,298	5,250	Cont	Cont
Subtotal Support and Management					0	0	0	0	0	0
Subtotal Test and Evaluation					0	0	0	0	0	0
Total Project					676	690	4,298	5,250	Cont	Cont

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604222F Nuclear Weapons Support	PROJECT 5708

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
5708 Nuclear Weapons Support	3,769	4,273	4,191	3,925	4,165	4,420	4,562	4,715	Continuing	Continuing

(U) A. Mission Description Funds Air Force Nuclear Weapons Integration Division and the Air Force Nuclear Weapons & Counterproliferation Agency (AFNWCA) civilians at Kirtland AFB, New Mexico providing technical and engineering support for all USAF nuclear weapon systems and counterproliferation technical efforts.

(U) FY 1998 ($ in Thousands):

– (U) $1,030 Nuclear Aircraft System Support. Supported the US Strategic Command's nuclear safe escape effort; provided Explosive Ordnance Disposal (EOD) technical support to DoD/DOE agencies; directed aircraft compatibility testing on the B-2A and B-52H; issued AF Nuclear Compatibility Certification Statements for the F-16C/D, B-52H, B-2A and B-1B; continued the US Strategic Command's nuclear weapon system surveillance tests on F-16C/D, B-52H, and PA-200 systems; provided AFMC NWSSG Member and technical support required for Special Safety Study of Weapon Storage Vault (WSV) operations in USAFE; performed independent Technical Nuclear Safety Analysis (TNSA) for the WSV study; supported design, and compatibility design criteria, standards, specifications, and related requirements documents for all USAF nuclear capable aircraft weapons systems; managed the B-52H, F-15E, PA-200 and B-2A POGs and Nuclear Airlift POG; performed independent engineering analyses for nuclear safety and compatibility certification of B-2A, F-16C/D and F-15 software and hardware modifications; directed aircraft compatibility testing on B-2A and F-15E; performed engineering evaluations and supported testing required for nuclear weapon compatibility certification; updated AF nuclear weapons Technical Orders resulting from systems and weapons hardware/software changes; chaired Technical Order review, validation/verification, and technical content conferences.

– (U) $ 680 Nuclear Ground-Launched Missile (ICBM) Support. Provided nuclear surety design criteria, standards, specification, and related requirements documents for all USAF ground-launched missile systems; provided nuclear surety design guidance to ICBM program office/contractors for Minuteman III Guidance Replacement Program (GRP), the Minuteman III Propulsion Replacement Program, Airborne Launch Control System (ALCS) transition to Navy E6B Aircraft Program, Boeing Guidance Repair Center, modification required for Peacekeeper weapon Sustainment, SIOP and Targeting Application Computer system (STACS), and Minuteman III Re-entry System Test Set, Wing Code processing System Disk Drive Replacement Program; provided nuclear certification support; performed independent nuclear surety analyses for nuclear safety design certification of weapon system modifications and upgrade programs; supported the ICBM Nuclear Surety Working Group, provided the AFMC member, technical advisors and technical support to the NWSSG special safety study for the transition of the ALCS to the Navy E6B Aircraft Program and the ICBM Operational Safety Review; provided members on the Minuteman II Unauthorized Launch Analysis Working Group and Senior Steering Group.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604222F Nuclear Weapons Support
	PROJECT 5708

– (U) $ 700 Nuclear Weapons/Systems Assessments. Continued engineering support to Kirtland Underground Munitions Storage Complex for Blast Door maintenance, facility auxiliary battery power, and modification, test, and maintenance of Blast Containment System; defining present and future facility maintenance and support requirements for Base Civil Engineering/A-76 contract efforts; co-chairing an Intrusive Weapon Maintenance in Air Force Facilities Process Action Team (PAT) with Air Force Safety Center, supporting Lightning Protection System Working Group; provided technical support to B61 Project Officers Group (POG) by chairing the B61 POG Surety Subgroup; supporting final dynamic load and endurance test for the Type 204 munitions loading trailer; performed and submitted final evaluation for nuclear certifications; finalized and published the Strategic Earth Penetration Weapon (SEPW) study report; provided technical support on upgrade of the B52 Coded Control System.

– (U) $1,109 Nuclear Weapons Program Support. Completed nuclear weapon safety, reliability, mission analysis and compatibility studies including the 1998 Annual Certification Reports, 60-Day Special W87 Reentry Vehicle Study, W87 Life Extension Program planning and initial testing, W78 Joint Life Extension Study, and W80 Command Disable equipment test surveillance program; updated weapon use control analyses for B61 and ICBM warheads and W84 storage assessment; completed field installation of B61 alterations and changeouts of parts to upgrade the B61 reliability; extended the interim certification on the B61-11 modification program and supported flight and pull-down tests for final certification review; approved revisions to W80, B61 and B83 Military Characteristics and all Stockpile-to-Target Sequence (STS) documents; initiated W80 6.2/6.2A Joint Stockpile Life Extension Assessment, W80 Alternate Storage Container (ASC), and W80 Field Portable Gas Sampling Program; managed eight nuclear warhead Project Officer Groups; continued life extension assessments to develop, plan, schedule and execute programs for safety, security, reliability and operability actions for B61, B83, W80 and ICBM warheads; continued to develop reconfiguration and inactive stockpile plans; established the Air Force Nuclear Weapons and Counterproliferation Agency for USAF/XON.

– (U) $ 250 Counterproliferation Assessments. Provided technical guidance and support for the ADW Assessment of Alternatives (AoA) Study; provided overall program guidance and technical expertise in the areas of nuclear, thermal, chemical, emitter and conventional systems identified as possible Agent Defeat concepts; provided continued analytical assessments of nuclear, non-nuclear and advanced weapon system concepts; assessed unique ADW intelligence, countermeasure, and battle damage assessment (BDA) requirements; and conducted laboratory experiments to enhance the Empirical Lethality Models (ELM); provided program decision recommendation briefings to the Air Force Requirements Oversight Council (AFROC) and the Air Force Council (AFC).

– (U) $3,769 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604222F Nuclear Weapons Support
	PROJECT 5708

(U) FY 1999 ($ in Thousands):

– (U) $1,195 Nuclear Aircraft System Support. Continue FY 1998 level of effort: support the US Strategic Command's nuclear safe escape effort; update/expand nuclear hardness database; conduct nuclear aircraft weapon system surveillance test programs; provide technical support required by NWSSG action items, Special Safety Studies, and Operational Safety Reviews; perform independent nuclear safety analyses; support design, development, standardization and procurement of stores management systems for nuclear weapons command and control; provide nuclear surety and compatibility design criteria, standards, specifications, and related requirements documents for all USAF nuclear capable aircraft weapon systems; manage the B-52H, F-15E, B-2A, PA-200 and Nuclear Airlift POGs; direct nuclear weapon aircraft interface testing on delivery aircraft as required; perform independent engineering evaluations for nuclear safety design certification of nuclear weapon system modifications; perform engineering evaluations and support testing required for nuclear weapon compatibility certification; provide Aircraft Monitor and Control (AMAC) software analysis and technical expertise for continued nuclear weapons integration on US and Non-US aircraft systems; provide revision, changes updates and publication/distribution to nuclear weapon and Explosive Ordnance Disposal (EOD) Technical Orders resulting from system and weapon hardware/software changes; chair Technical Order review, validation/verification, and technical content conferences; provide EOD technical support to DoD/DOE agencies; provide unsatisfactory report (UR) responses for resolution issues.

– (U) $ 731 Nuclear Ground-Launched Missile (ICBM) Support. Continue FY 1998 level of effort: provide nuclear surety design criteria, standards, specifications, and related requirements documents for all USAF ground-launched missile systems; provide nuclear surety design guidance to ICBM program office/contractors for weapon system modifications and upgrade programs (Minuteman III re-entry System Test Set, Minuteman III propulsion replacement Program, ICBM Wing Code Processing System), perform independent nuclear surety analyses for nuclear safety design certification of weapon system modifications; provide nuclear certification support; complete nuclear safety analysis for nuclear safety design certification of the Minuteman III GRP Program; and support NWSSG action items and Special Safety Studies as required; conduct independent Technical Nuclear Safety Analysis for Phase IV of the ICBM Operational Safety Study; provide member to the ICBM Nuclear Surety Working Group

– (U) $ 740 Nuclear Weapons/Systems Assessments. Continue FY 1998 level of effort: continue application of joint DoD/DOE nuclear surety assessment methodology to abnormal nuclear environment analyses; conduct fault tree analyses of nuclear weapons and weapon systems; provide other special assessments as capable; continue technical/engineering support for Kirtland Underground Munitions Storage Center; continue technical/engineering support for weapons and weapons systems Project Officers Groups; perform nuclear surety assessment and/or studies of weapon and weapon systems in both normal and abnormal environments as required; develop methodologies to enhance assessments and studies; and provide logistics analysis and EOD technical support, as required.

– (U) $1,250 Nuclear Weapons Program Support. Continue FY 1998 level of effort: accomplish nuclear weapon safety, reliability, mission analysis and compatibility studies; support USAF nuclear weapon stockpile activities, weapon use control analyses; and environmental and intrinsic radiation studies; continue to develop, plan, analyze, schedule and execute nuclear weapon life extension programs for safety, security, reliability and operability actions for B61, B83, W80 and ICBM warheads; continue to develop reconfiguration and inactive stockpile plans; continue support to USAF, DoD and other agencies in all facets of nuclear arsenal.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604222F Nuclear Weapons Support
	PROJECT 5708

– (U) $ 354 Counterproliferation Assessments. Continue FY 1998 level of effort: Provide technical guidance and support for the ADW AoA Phase 0 Study leading to a Milestone I decision second quarter FY00; provide overall program guidance and technical expertise in the evaluation of nuclear, advanced technology and conventional systems identified as possible Agent Defeat concepts; provide technical support for current, proposed and future counterproliferation efforts of interest to the USAF.

– (U) $ 3 Identified as source for SBIR.

– (U) $4,273 Total

(U) FY 2000 ($ in Thousands):

– (U) $1,230 Nuclear Aircraft System Support. Continue FY 1999 level of effort: support the US Strategic Command's nuclear safe escape effort; update/expand nuclear hardness database; conduct nuclear aircraft weapon system surveillance test programs; provide technical support required by NWSSG action items, Special Safety Studies, and Operational Safety Reviews; perform independent nuclear safety analyses; support design, development, standardization and procurement of stores management systems for nuclear weapons command and control; provide nuclear surety and compatibility design criteria, standards, specifications, and related requirements documents for all USAF nuclear capable aircraft weapon systems; manage the B-52H, F-15E, B-2A, PA-200 and Nuclear Airlift POGs; direct nuclear weapon aircraft interface testing on delivery aircraft as required; perform independent engineering evaluations for nuclear safety design certification of nuclear weapon system modifications; perform engineering evaluations and support testing required for nuclear weapon compatibility certification; provide revisions, changes and updates to nuclear weapon Technical Orders, resulting from system and weapon hardware/software changes; chair Technical Order review, validation/verification, and technical content conferences.

– (U) $ 800 Nuclear Ground-Launched Missile (ICBM) Support. Continue FY 1999 level of effort: provide nuclear surety design criteria, standards, specifications, and related requirements documents for all USAF ground-launched missile systems; provide nuclear surety design guidance to ICBM program office/contractors for weapon system modifications and upgrade programs, perform independent nuclear surety analyses for nuclear safety design certification of weapon system modifications; provide nuclear certification support; and support NWSSG action items and Special Safety Studies as required.

– (U) $ 800 Nuclear Weapons/Systems Assessments. Continue FY 1999 level of effort: continue application of joint DoD/DOE nuclear surety assessment methodology to abnormal nuclear environment analyses; conduct fault tree analyses of nuclear weapons and weapon systems; provide other special assessments as capable.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604222F Nuclear Weapons Support
	PROJECT 5708

– (U) $1,010 Nuclear Weapons Program Support. Continue FY 1999 level of effort: accomplish nuclear weapon safety, reliability, mission analysis and compatibility studies; support USAF nuclear weapon stockpile activities, weapon use control analyses; and environmental and intrinsic radiation studies; continue to develop, plan, analyze, schedule and execute nuclear weapon life extension programs for safety, security, reliability and operability actions for B61, B83, W80 and ICBM warheads; continue to develop reconfiguration and inactive stockpile plans; continue support to USAF, DoD and other agencies in all facets of nuclear arsenal.

– (U) $ 351 Counterproliferation Assessments. Continue FY 1999 level of effort: Provide technical guidance and support for the ADW Phase I Study; provide overall program guidance and technical expertise in the evaluation of nuclear, advanced technology and conventional systems identified as possible Agent Defeat concepts, battle damage assessments and target intelligence platforms; provide technical direction and support for current, proposed and future counterproliferation efforts of interest to the USAF.

– (U) $4,191 Total

(U) FY 2001 ($ in Thousands):

– (U) $1,317 Nuclear Aircraft System Support. Continue FY 2000 level of effort: support the US Strategic Command's nuclear safe escape effort; update/expand nuclear hardness database; conduct nuclear aircraft weapon system surveillance test programs; provide technical support required by NWSSG action items, Special Safety Studies, and Operational Safety Reviews; perform independent nuclear safety analyses; support design, development, standardization and procurement of stores management systems for nuclear weapons command and control; provide nuclear surety and compatibility design criteria, standards, specifications, and related requirements documents for all USAF nuclear capable aircraft weapon systems; manage the B-52H, F-15E, B-2A and Nuclear Airlift POGs; direct nuclear weapon aircraft interface testing on delivery aircraft as required; perform independent engineering evaluations for nuclear safety design certification of nuclear weapon system modifications; perform engineering evaluations and support testing required for nuclear weapon compatibility certification; provide revisions, changes and updates to nuclear weapon Technical Orders, resulting from system and weapon hardware/software changes; chair Technical Order review, validation/verification, and technical content conferences.

– (U) $ 860 Nuclear Ground-Launched Missile (ICBM) Support. Continue FY 2000 level of effort: provide nuclear surety design criteria, standards, specifications, and related requirements documents for all USAF ground-launched missile systems; provide nuclear surety design guidance to ICBM program office/contractors for weapon system modifications and upgrade programs, perform independent nuclear surety analyses for nuclear safety design certification of weapon system modifications; provide nuclear certification support; and support NWSSG action items and Special Safety Studies as required.

– (U) $ 858 Nuclear Weapons/Systems Assessments. Continue FY 2000 level of effort: continue application of joint DoD/DOE nuclear surety assessment methodology to abnormal nuclear environment analyses; conduct fault tree analyses of nuclear weapons and weapon systems; provide other special assessments as capable.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604222F Nuclear Weapons Support
	PROJECT 5708

– (U) $ 726 Nuclear Weapons Program Support. Continue FY 2000 level of effort: accomplish nuclear weapon safety, reliability, mission analysis and compatibility studies; support USAF nuclear weapon stockpile activities, weapon use control analyses; and environmental and intrinsic radiation studies; continue to develop, plan, analyze, schedule and execute nuclear weapon life extension programs for safety, security, reliability and operability actions for B61, B83, W80 and ICBM warheads; continue to develop reconfiguration and inactive stockpile plans; continue support to USAF, DoD and other agencies in all facets of nuclear arsenal.

– (U) $ 164 Counterproliferation Assessments. Continue FY 2000 level of effort: Provide technical guidance and support for the ADW Phase I; provide program guidance and technical expertise in the evaluation of nuclear, advanced technology and conventional systems identified as possible Agent Defeat concepts, battle damage assessments and target intelligence platforms; provide technical direction and support for current, proposed and future counterproliferation efforts of interest to the USAF

– (U) $3,925 Total

(U) B. Project Change Summary - Description of Significant Changes: Reduction in funding beginning in FY00 due to transfer USAF Nuclear Weapons and Counterproliferation Agency civilian personnel to PE 91212F. FY99: $3,000 identified as source for SBIR.

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

(U) Not Applicable

(U) D. Acquisition Strategy: RDT&E funds primarily provide for Air Force technical civilian personnel providing nuclear weapon and weapon system management and development. These scientists and engineers interface with Headquarters USAF, Air Force nuclear weapon System Program Offices, operational commands and the Department of Energy, performing engineering development and analysis to ensure continued and improved weapon system safety, security, reliability and compatibility and managing/developing counterproliferation counterforce capabilities.

(U) E. Schedule Profile

(U) Not Applicable

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604222F Nuclear Weapons Support
	PROJECT 5708

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Program Management Personnel	239	240	200	120
(U) Research Personnel	2,926	3,014	2,650	2,120
(U) Travel	300	350	370	400
(U) Training Development	150	150	175	200
(U) Research Support Equipment Acquisition	125	125	200	200
(U) Miscellaneous	29	391	596	885
(U) Identified as source for SBIR		3		
(U) Total	3,769	4,273	4,191	3,925

(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 source for SBIR							3				
Product Development Organizations											
SA-ALC/NWI	N/A	N/A	N/A	N/A	Cont	3,769	2,666	2,830	3,035	Cont	Cont
AFNWCA	N/A	N/A	N/A	N/A	Cont	0	1,604	1,361	890	Cont	Cont

Support and Management Organizations
None

Test and Evaluation Organizations
None

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604222F Nuclear Weapons Support
	PROJECT 5708

(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
Product Development Property	None									
Support and Management Property	None									
Test and Evaluation Property	None									
Identified as source for SBIR						3				
Subtotal Product Development				Cont	3,769	4,270	4,191	3,925	Cont	Cont
Subtotal Support and Management				0	0	0	0	0	0	0
Subtotal Test and Evaluation				0	0	0	0	0	0	0
Total Project				Cont	3,769	4,273	4,191	3,925	Cont	Cont

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604226F B-1B

PROJECT: 4596

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
4596 Conventional Mission Upgrades	202,496	194,549	203,544	143,911	40,001	5,070	0	0	0	1,363,540
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

(U) This Program Element provides RDT&E funding for the B-1B Conventional Mission Upgrade Program (CMUP). The program improves the B-1's effectiveness in conventional operations by integrating advanced conventional weapons and enhancing survivability. Funding in the FYDP covers integration of the Joint Direct Attack Munition (JDAM), Wind Corrected Munitions Dispenser (WCMD), Joint Stand-Off Weapon (JSOW), Joint Air to Surface Stand-Off Missile (JASSM), and upgrades to the Electronic Counter Measures (ECM) suite. Parallel efforts include an upgrade to the avionics computers to enable simultaneous carriage of multiple weapon types (one type per bay), provide growth capability, and reduce support costs; development of an interface to the Air Force Mission Support System (AFMSS) for more effective employment of the B-1 in a theater scenario; and upgrades to the air crew and maintenance training systems to keep them concurrent with the aircraft's configuration. Also provides funding for preliminary engineering and planning studies for potential future weapon system enhancements (weapons, sensors, and avionics); and weapon system operational/safety, supportability, maintainability, reliability, and Total Ownership Cost (TOC) support improvements.

(U) FY 1998 ($ in Thousands):

- (U) $173,391 Continued Conventional Mission Upgrade Program (CMUP) contractual efforts
- (U) $3,690 Government Furnished Equipment (GFE)
- (U) $17,115 Government flight test, Live Fire Test & Evaluation and General Test Support
- (U) $3,611 Advisory and Assistance Services (A&AS)
- (U) $915 Modeling & Simulation / Studies & Analyses
- (U) $3,774 Program Management & Administration (PMA)
- (U) $202,496 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604226F B-1B
	PROJECT 4596

(U) FY 1999 ($ in Thousands):

- (U) $155,068 Continue Conventional Mission Upgrade Program (CMUP) contractual efforts
- (U) $4,683 Government Furnished Equipment (GFE)
- (U) $18,380 Government flight test, Live Fire Test & Evaluation and General Test Support
- (U) $3,762 Advisory and Assistance Services (A&AS)
- (U) $500 Modeling & Simulation / Studies & Analyses
- (U) $5,850 Program Management & Administration (PMA)
- (U) $6,306 Identified as a source for SBIR
- (U) $194,549 Total

(U) FY 2000 ($ in Thousands):

- (U) $145,561 Continue Conventional Mission Upgrade Program (CMUP) contractual efforts
- (U) $1,658 Government Furnished Equipment (GFE)
- (U) $46,352 Government flight test, Live Fire Test & Evaluation and General Test Support
- (U) $3,402 Advisory and Assistance Services (A&AS)
- (U) $750 Modeling & Simulation / Studies & Analyses
- (U) $5,821 Program Mangement & Administration (PMA)
- (U) $203,544 Total

(U) FY 2001 ($ in Thousands):

- (U) $100,122 Continue Conventional Mission Upgrade Program (CMUP) contractual efforts
- (U) $555 Government Furnished Equipment (GFE)
- (U) $34,642 Government flight test, Live Fire Test & Evaluation and General Test Support
- (U) $2,849 Advisory and Assistance Services (A&AS)
- (U) $950 Modeling & Simulation / Studies & Analyses
- (U) $4,793 Program Management & Administration (PMA)
- (U) $143,911 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604226F B-1B	PROJECT 4596

(U) B. Budget Activity Justification:

(U) The B-1 CMUP program is included in Budget Activity 5, Engineering and Manufacturing Development. The CMUP program provides new capabilities to the B-1B weapon system, including GPS, Precision Weapons, enhanced computers and upgraded ECM. These capabilities require significant software development and testing.

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY1999 PB)	208,222	195,385	204,749	136,850	1,363,041
(U) Appropriated Value	220,886	195,385			
(U) Adjustments to Appropriated Value					
a. Congressional/General Reductions	-7,609	-836			
b. SBIR	-5,085				
c. Omnibus or Other Above Threshold Reprogram	-1,415				
d. Below Threshold Reprogramming	-4,281				
(U) Adjustments to Budget Years Since FY 1999 PB			-1205	+7,061	
(U) Current Budget Submit / FY2000 PB	202,496	194,549	203,544	143,911	1,363,540

(U) Significant Program Changes:

(U) FY99: $6,306 identified as a source for SBIR

(U) Adjustments to FY01: Plus-up for the prime contractor's EMD contract of the Computer Upgrade and WCMD Integration.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604226F B-1B
	PROJECT 4596

(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
(U) Appn 10, PE 0101126F, B-1B, Aircraft Procurement BP11, Mods (CMUP-related only)	58,282	71,052	99,364	51,038	175,323	110,288	117,453	70,830	124,690	977,638
(U) Appn 10, PE 0101126F, B-1B, Aircraft Procurement BP19, Other Charges	0	0	0	15,083	0	0	0	0	0	47,083
(U) Appn 10, PE 0101126F, B-1B, Aircraft Procurement BP16, Initial Spares	16,052	24,221	31,801	20,606	11,211	6,011	10,323	11,165	0	131,390
(U) Appn 10, PE 0207442F, B-1B, EW Production (TDS/IDECM) BP11, Mods (CMUP-related only)	20425	0	0	6,309	7,867	6,918	7,099	7,244	7,749	89,713

Related RDT&E:

(U) Program Element 0205164F, Global Positioning System (GPS)
(U) Program Element 0207325F, Joint Air to Surface Standoff Missile (JASSM)
(U) Program Element 0604618F/N, Joint Direct Attack Munition (JDAM)
(U) Program Element 0604727F/N, Joint Stand-Off Weapon (JSOW)
(U) Program Element0604754F, Joint Tactical Information Distribution System (JTIDS)
(U) Program Element 0604600F, Wind Corrected Munitions Dispenser (WCMD)
(U) Program Element 0208006F, Air Force Mission Support System (AFMSS)
(U) Program Element 604270F, Electronic Warfare (EW) Development
(U) Program Element 305164F, Global Positioning System (GPS)

(U) E. Acquisition Strategy:

(U) Key elements of the overall CMUP acquisition strategy include: use of sole source contract with a prime/integrating contractor; assignment of Total System Installed Performance Responsibility (TSIPR) to the integrating contractor; use of cost plus award fee (CPAF) development contracts; and combining developmental upgrades with software sustainment blocks to minimize number of software releases, aircraft downtime and differences in fielded configurations.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604226F B-1B
	PROJECT 4596

(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
Defensive System Upgrade Program																
(U) Engineering Milestones																
(U) - PDR		*														
(U) - CDR				*												
(U) T&E Milestones																
(U) - Start subsystem qual test				*												
(U) - Complete subsystem qual test										X						
(U) - Flight Test Start										X						
Mission Planning System (MPS)																
(U) **Engineering Milestones**																
(U) - S/W Release 1.1 (GPS/COM/ JDAM) Design Review			*													
(U) - S/W Release 2.0 CDR (Computer/WCMD)							X									
(U) **T&E Milestones**																
(U) - S/W Release 1.1 (GPS/COM/ JDAM) Test Readiness Review / FQT					*											
(U) - S/W Release 2.0 Test Readiness Review/FQT										X						
(U) **Contract Milestones**																
(U) - S/W Release 1.1 Delivery						X										
(U) - S/W Release 2.0 Delivery											X					
(U) - S/W Release 2.1 (JSOW/JASSM) Contract Award						X										
(U) - S/W Release 2.1 Delivery															X	

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604226F B-1B

PROJECT: 4596

	FY 1998				FY 1999				FY 2000				FY 2001			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Training Systems																
(U) **Acquisition Milestones**																
(U) - Start JDAM/GPS EMD							X									
(U) - Start Computer/WCMD EMD											X					
(U) - Complete JDAM/GPS EMD															X	
Weapons																
(U) **Acquisition Milestones**																
(U) - JDAM/1760 MS III						X										
(U) - GPS/Comm/JDAM/1760 RAA					*											
(U) - JSOW/JASSM MS II						X										
(U) **Engineering Milestones**																
(U) - Computer/WCMD PDR	*															
(U) - Computer/WCMD CDR			*													
(U) - JSOW/JASSM CDR											X					
(U) **T&E Milestones**																
(U) - Complete GPS/Comm/ JDAM/1760 Flight Test				*												
(U) - Start JSOW/JASSM Flight Test															X	
(U) - Start Computer/WCMD Flight Test									X							
(U) - Complete Computer/WCMD Flight Test															X	
(U) **Contract Milestones**																
(U) - JSOW/JASSM EMD							X									

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604226F B-1B
	PROJECT 4596

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) CMUP contractual efforts	173,391	155,068	145,561	100,122
(U) Government flight test	17,115	18,380	46,352	34,642
(U) Government Furnished Equipment	3,690	4,683	1,658	555
(U) Advisory and Assistance Services (A&AS)	3,611	3,762	3,402	2,849
(U) Modeling & Simulation / Studies & Analyses	915	500	750	950
(U) Program Management & Administration (PMA)	3,774	5,850	5,821	4,793
(U) Identified as source for SBIR	0	6,306	0	0
(U) Total	202,496	194,549	203,544	143,911

(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) Identified as source for SBIR							6,306				6,306
Product Development Organizations											
(U) **DSUP**											
(U) BNA	SS/CPAF	May 93	30,228	30,228	30,228	0	0	0	0	0	30,228
(U) BNA	SS/CPAF	June 97	244,749	244,749	25,539	58,266	63,009	53,445	32,658	11,832	244,749
(U) **Mission Planning System**											
(U) Logicon	C/CPAF	Aug 94	1,178	1,178	391	140	252	146	149	100	1,178
(U) Lockheed-Sanders	CPAF	Dec 95	50,123	50,123	17,044	12,490	9,401	7,567	2,830	791	50,123

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)											DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development					PE NUMBER AND TITLE 0604226F B-1B						PROJECT 4596
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) **Training Systems**											
(U) Lockheed-Sanders	C/CPAF	Jun 94	55,166	55,166	11,265	2,821	10,040	8,156	8,351	14,533	55,166
(U) **Weapons**											
(U) BNA - CBUs	SS/CPFF	93	4,960	4,960	4,960	0	0	0	0	0	4,960
(U) BNA - CBUs	SS/CPFF	Jan 94	16,314	16,314	16,314	0	0	0	0	0	16,314
(U) BNA - FWEP	SS/T&M	Sep 98	2,501	2,501	1,876	625	0	0	0	0	2,501
(U) BNA-EFX	SS/T&M	Feb 98	5,889	5,889	5,596	293	0	0	0	0	5,889
(U) BNA- JDAM/ GPS Pre-EMD	SS/CPFF	Aug 93	72,223	72,223	72,223	0	0	0	0	0	72,223
(U) BNA- JDAM/ GPS EMD	SS/CPAF	Mar 95	272,088	272,088	231,450	38,755	1,883	0	0	0	272,088
(U) BNA-ACBM	SS/CPAF	Mar 98	1,900	1,900	0	1,900	0	0	0	0	1,900
(U) BNA-Wing Sweep	SS/T&M	Jul 97	1,203	1,203	403	450	350	0	0	0	1,203
(U) BNA-Computer	SS/CPAF	May96/Jan 97	195,881	195,881	48,871	44,133	46,241	34,557	22,079	0	195,881
(U) BNA-WCMD	SS/CPAF	May96/Jan 97	45,608	45,608	10,507	9,869	11,784	9,092	4,356	0	45,608
(U) BNA- JSOW/ JASSM	SS/CPAF	Apr 99	77,227	77,227	408	2,940	11,258	30,338	26,879	5,404	77,227
(U) Lockheed-Martin – JASSM	SS/T&M	Jan 99	3,972	3,972	0	259	300	1,190	1,560	663	3,972
(U) Raytheon - JSOW	SS/T&M	Jan 99	3,230	3,230	0	450	450	970	1,160	200	3,230
(U) TBD - Future CMUP Related EMD	TBD	TBD	400	400	0	0	100	100	100	100	400

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)											DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development					PE NUMBER AND TITLE 0604226F B-1B						PROJECT 4596
Support and Management Organizations											
(U) A&AS	Various	Annual	32,581	32,581	15,304	3,611	3,762	3,402	2,849	3,653	32,581
(U) Studies & Analyses / Modeling & Sim	Various	Various	18,610	18,610	14,845	915	500	750	950	650	18,610
(U) Program Mgmt & Admin	Various	Various	42,378	42,378	20,904	3,774	5,850	5,821	4,793	1,236	42,378
Test and Evaluation Organizations											
(U) **DSUP**											
(U) AFFTC	P.O.	Various	67,390	67,390	1,365	2,718	7,366	25,405	25,234	5,302	67,390
(U) **Weapons**											
(U) AFFTC	P.O.	Various	96,655	96,655	40,325	14,397	11,014	20,947	9,408	564	96,655

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development				PE NUMBER AND TITLE 0604226F B-1B						PROJECT 4596
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
Product Development Property										
(U) **DSUP**										
(U) Various	Various	Various	Various	3,092	13	308	293	300	0	4,006
(U) **Weapons**										
(U) Various	Various	Various	Various	1,059	3,677	4,375	1,365	255	43	10,774
Support and Management Property		N/A								
Test and Evaluation Property		N/A								
Identified as a source for SBIR						6,306				6,306
Subtotal Product Development				481,226	177,081	159,751	147,219	100,677	33,666	1,099,620
Subtotal Support and Management				51,053	8,300	10,112	9,973	8,592	5,539	93,569
Subtotal Test and Evaluation				41,690	17,115	18,380	46,352	34,642	5,866	164,045
Total Project				573,969	202,496	194,549	203,544	143,911	45,071	1,363,540

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

DATE: **February 1999**

BUDGET ACTIVITY: **5 - Engineering and Manufacturing Development**

PE NUMBER AND TITLE: **0604227F Distributed Mission Training (DMT)**

	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	5,575	1,896	3,835	3,816	3,793	3,771	3,850	3,930	Continuing	Continuing
2325	Simulator Development Activities	3,238	0	0	0	0	0	0	0	0	45,886
2769	Simulator Update Development	2,337	0	0	0	0	0	0	0	0	47,988
4673	Distributed Mission Training (DMT)	0	1,896	3,835	3,816	3,793	3,771	3,850	3,930	Continuing	Continuing
	Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description: This is a continuing program element for development of aircrew and maintenance training devices and techniques. Objectives are to adapt simulation technologies and standards developed by the AF laboratories and industry into prototype training devices in order to satisfy MAJCOM training requirements.

(**U)** Beginning in FY99, Distributed Mission Training (DMT) became this PE's only effort. DMT is an Air Force simulator modernization program that will network geographically separated, high fidelity aircraft simulators with other battlefield systems (AWACS, JSTARS, C3I, etc.) into a real-time synthetic battlefield. The envisioned end-state is a virtual network of training systems which will allow high-end training not possible in today's simulators and very difficult to accomplish even in the aircraft because of peacetime safety of flight limitations, today's high operations tempos, limited range availability, etc. DMT's focus is to provide AF warfighters a combat mission rehearsal training capability at their home stations. It is envisioned that these geographically separated, dissimilar aircraft simulators will be linked real time and thus be able to practice the complex maneuvers and the critical timing aspects for operations, such as, the first airstrike packages in future conflicts.

(U) B. Budget Activity Justification: This program element is included in Budget Activity 5 - Engineering and Manufacturing Development (EMD) because it is devoted to the EMD of aircrew and maintenance training systems.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604227F Distributed Mission Training (DMT)

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY1999 PB)	4,061	1,961	3,904	3,889	Continuing
(U) Appropriated Value	4,305				
(U) Adjustments to Appropriated Value					
a. Congressional/General Reductions	-209	-65			
b. SBIR	-32				
c. Omnibus Offset	-49				
d. Below Threshold Reprogramming	+1,560				
(U) Adjustments to Budget Years Since FY 1999 PB			-69	-73	
(U) Current Budget Submit/2000 PB	5,575	1,896	3,835	3,816	Continuing

(U) Significant Program Changes: Two of the programs in this PE were cancelled in FY98 (Simulator Development Activities and Simulator Update Development). The $1.56M was reprogrammed into this PE in FY98 to fund program shortfalls.

FY99: $13K identified as a source for SBIR

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604227F Distributed Mission Training (DMT)
	PROJECT 2325

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
2325 Simulator Development Activities	3,238	0	0	0	0	0	0	0	0	45,886

(U) A. Mission Description: This program was terminated in FY98. Previously, it supported engineering development of new aircraft and maintenance training technologies and standards. It also funded the development of training devices to satisfy the customer's training requirements. The majority of the funding shown here is for ongoing projects in support of aircraft simulator development. In FY99, funding for simulator development has moved into BPAC 4673.

(U) FY 1998 ($ in Thousands):
- (U) 100 Integrated Threat Environment Database Development
- (U) 50 AF Reserve Command (AFRC) Simulator Evaluation Study
- (U) 100 A-10 Simulator Networking Studies and Analyses
- (U) 98 Geometric Force Model Development
- (U) 100 Fighter Visual Cue Analysis
- (U) 99 Joint Fighter Systems Operation
- (U) 2,150 Operations & Integration (O&I) Phase I Contract
- (U) 30 SEI Support
- (U) 230 HLA Performance Evaluation
- (U) 280 Mission Support
- (U) 1 Omnibus Offset
- (U) $3,238 Total

(U) FY 1999 ($ in Thousands):
- (U) $0 Total

(U) FY 2000 ($ in Thousands):
- (U) $0 Total

(U) FY 2001 ($ in Thousands):
- (U) $0 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604227F Distributed Mission Training (DMT)
	PROJECT 2325

(U) B. Project Change Summary - Description of Significant Changes: This project was cancelled in FY98.

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

(U) D. Acquisition Strategy: Maximize the use of free and open competitive awards. Mission support efforts use a variety of contract vehicles. Specific programs use contract types appropriate to the work to be performed.

(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) Prototype Training System SMART 2000 and Visual Systems				*												
(U) Technology Roadmap				*												
(U) G-Suit/G-Seat Sensory Simulation																
(U) Visual and Radar Database Standards				*												

X Denotes milestone start
* Denotes milestone completion

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604227F Distributed Mission Training (DMT)
	PROJECT 2325

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Integrated Threat Environment Database Development	100	0	0	0
(U) AFRC Evaluation Study	50	0	0	0
(U) A-10 Networking Studies and Analyses	100	0	0	0
(U) Geometric Force Model Development	98	0	0	0
(U) Analysis of Improved Fighter Visual Cues	100	0	0	0
(U) Joint Fighter Systems Operation	99	0	0	0
(U) Operations & Integration (O&I) Network; Phase I Contract	2,150	0	0	0
(U) Technical Support	30	0	0	0
(U) HLA Performance Evaluation	230	0	0	0
(U) Mission Support	280	0	0	0
(U) Omnibus Offset	1	0	0	0
(U) Total	3,238	0	0	0

(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
Product Development Organizations											
Numerous	Various	Various	N/A	N/A	42,402	2,957	0			0	45,359

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)		DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604227F Distributed Mission Training (DMT)	PROJECT 2325

Support and Management Organizations

Training Systems Program Office, ASC, WPAFB	Various	Various	0	0	246	280	0	0	0	0	526

Test and Evaluation Organizations: Not Applicable

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
Subtotal Product Development				42,402	2,957	0	0	0	0	45,359
Subtotal Support and Management				246	280	0	0	0	0	526
Subtotal Test and Evaluation				0	0	0	0	0	0	0
Omnibus Offset				0	1	0	0	0	0	1
Total Project				42,648	3,238	0	0	0	0	45,886

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE: February 1999
BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE: 0604227F Distributed Mission Training (DMT)	PROJECT: 2769

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
2769 Simulator Update Development	2,337	0	0	0	0	0	0	0	0	47,988

(U) A. Mission Description This program was cancelled in FY98. Previously it had provided critical Training System Product Group (TSPG) support for user commands' products including F-16 Weapons System Trainer, B-1B conventional upgrade, Simulator for Electronic Combat Training (SECT), C-17 training suite, Universal Training Device, and C-141 Aircrew Training System. These support systems include a computer center, communications, Advisory and Assistance Services (A&AS) contracting, travel, supplies, specialized training, and equipment. Beginning in FY99, this support will be paid for from the various weapons systems program offices (SPOs).

(U) FY 1998 ($ in Thousands):
- (U) 475 Travel
- (U) 282 Mission Support
- (U) 32 Communications
- (U) 61 Training
- (U) 591 A&AS
- (U) 495 Management
- (U) 132 Supplies
- (U) 204 Equipment
- (U) 17 Miscellaneous
- (U) 48 Omnibus Offset
- (U) $2,337 Total

(U) FY 1999 ($ in Thousands):
- (U) $0 Total

(U) FY 2000 ($ in Thousands):
- (U) $0 Total

(U) FY 2001 ($ in Thousands):
- (U) $0 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604227F Distributed Mission Training (DMT)
	PROJECT 2769

(U) B. Project Change Summary - Description of Significant Changes: Program was cancelled in FY98.

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

(U) D. Acquisition Strategy: Not Applicable

(U) E. Schedule Profile: Not Applicable. Level of effort task.

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604227F Distributed Mission Training (DMT)
	PROJECT 2769

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Travel	475	0	0	0
(U) Mission Support	282	0	0	0
(U) Communications	32	0	0	0
(U) Training	61	0	0	0
(U) A&AS	591	0	0	0
(U) Management	495	0	0	0
(U) Supplies	132	0	0	0
(U) Equipment	204	0	0	0
(U) Miscellaneous	17	0	0	0
(U) Omnibus Offset	48	0	0	0
(U) Total	2,337	0	0	0

(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
Product Development Organizations: Not Applicable											
Support and Management Organizations											
Training System Program Office (SPO) ASC, WPAFB OH	Various	Various	N/A	N/A	45,651	2,337	0	0	0	0	47,988

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)											DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development					PE NUMBER AND TITLE 0604227F Distributed Mission Training (DMT)						PROJECT 2769
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: None											
Omnibus Reduction					0	48	0	0	0	0	48
Subtotal Product Development					0	0	0	0	0	0	0
Subtotal Support and Management					45,651	2,289	0	0	0	0	47,940
Subtotal Test and Evaluation					0	0	0	0	0	0	0
					45,651	2,337	0	0	0	0	47,988

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604227F Distributed Mission Training (DMT)

PROJECT: 4673

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
4673 Distributed Mission Training (DMT)	0	1,896	3,835	3,816	3,793	3,771	3,850	3,930	Continuing	Continuing

(U) A. Mission Description Distributed Mission Training (DMT) will revolutionize aerospace team training by implementing a "train the way we fight" philosophy -- as a team. The DMT program will share a synthetic environment of geographically separated aircraft simulators, linked real time to C3I assets and other battlefield systems and trainers into a synthetic battlefield environment. This will allow the Air Force to conduct mission rehearsal and most combat mission training, which today can only be done to a limited extent because of constraints on flying hours, platform and airspace availability, as well as environmental constraints. DMT will be funded principally with Operations and Maintenance funds. Engineering development efforts will focus on development, demonstration, and transitioning of enhancements of critical functions associated with the DMT network and linked simulators. Areas of emphasis include development and demonstration of network architectures, common databases and database interfaces, improved simulator fidelity, and integration with constructive simulations for C3I. The ultimate objective of the program is for DMT to be able to conduct full joint and combined forces mission rehearsals.

(U) FY 1998 ($ in Thousands):
- (U) $0 Total

(U) FY 1999 ($ in Thousands):
- (U) $ 1,461 Develop and implement the DMT network including standards development, multilevel security and latency management approaches.
- (U) $ 213 Develop and demonstrate a common environmental, terrain, and threat databases.
- (U) $ 209 Develop and demonstrate visual database interface technologies to improve image-generation fidelity.
- (U) $ 13 Identified as a source for SBIR
- (U) $ 1896 Total

(U) FY 2000 ($ in Thousands):
- (U) $ 1,590 Continued development and demonstration of common network standards, multilevel security and latency management approaches.
- (U) $ 1,838 Continued development and demonstration of common environmental, terrain, and threat databases.
- (U) $ 407 Continued development and demonstration of visual database interface technologies to improve image-generation fidelity.
- (U) $ 3,835 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604227F Distributed Mission Training (DMT)
	PROJECT 4673

(U) FY 2001 ($ in Thousands):

- (U) $ 1,092 Complete development and demonstration of common network standards
- (U) $ 2,270 Continued development and demonstration of common environmental, terrain and threat databases
- (U) $ 454 Continued development and demonstration of visual database interface technologies to improve image-generation fidelity
- (U) $ 3,816 Total

(U) B. Project Change Summary - Description of Significant Changes: Not Applicable

(U) C. Other Program Funding Summary ($ in Thousands): The O&M funding shown below resides in the respective weapons system PEs to pay for the DMT program.

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost
(U) PE 0207130F, F-15 Squadrons Appropriation: O&M, AF	0	23,162	34,687	28,308	29,752	40,097	41,044	41,902	cont	cont
(U) PE 0207417F, AWACS Squadron Appropriation: O&M, AF	200	575	3,519	3,605	3,609	3,707	3,788	3,872	cont	cont
(U) PE 0207133F, O&M, F-16 Squadron	0	104	10,205	17,507	14,008	12,712	4,714	3,017	cont	cont

(U) D. Acquisition Strategy: The lead program in the DMT program is the F-15C Commercial Training Simulation Service (CTSS). The F-15C CTSS acquisition strategy differs significantly from previous AF simulator procurements. It shifts from govt-procured simulators to a contractor-provided service. The contractor owns and provides the simulator equipment, maintains simulator concurrency with the weapons system, and has incentives to keep his equipment abreast with the latest simulator and network technologies.

(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) F-15 Four Ship Operations begin at Eglin AFB							X									
(U) F-15 Four Ship Operations begin at Langley AFB								X								
(U) DMT Integration &Operations begin						X										
(U) AWACS ops begin :Tinker AFB, OK									X							
(U) Training Device Models and Software	*															

* = completed event X = planned event

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604227F Distributed Mission Training (DMT)
	PROJECT 4673

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Identified as a source for SBIR		13		
(U) DMT Network Architecture Development	0	1,461	1,590	1,092
(U) Common database and interface integration	0	213	1,838	2,270
(U) Demonstration of improved simulator/network fidelity	0	209	407	454
(U) Total	0	1,896	3,835	3,816

(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 13							13				
Product Development Organizations											
TBD	CPAF/FPAT (for development) FFP/FPAT (for operations)	Jun 99 (estimated)	TBD	TBD	0	0	1,761	2,681	2,602	continuing	continuing

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)		DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604227F Distributed Mission Training (DMT)	PROJECT 4673

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
Support and Management Organizations											
Training Systems Product Group			N/A	N/A	0	0	122	834	864	continuing	continuing

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

Test and Evaluation Organizations:											
TBD	CPAF/FPAT	Jun 99	TBD	TBD	0	0	0	320	350	continuing	continuing
Government Furnished Property: Not Applicable											
Identified as a source for SBIR							13				13
Subtotal Product Development					0	0	1,761	2,681	2,602	continuing	continuing
Subtotal Support and Management					0	0	122	834	864	continuing	continuing
Subtotal Test and Evaluation					0	0	0	320	350	0	0
Total Project					0	0	1,896	3,835	3,816	continuing	continuing

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

DATE: **February 1999**

BUDGET ACTIVITY: **5 - Engineering and Manufacturing Development**

PE NUMBER AND TITLE: **0604233F Specialized Undergraduate Pilot Trng**

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	66,345	55,030	38,656	21,864	1,899	1,992	2,032	2,075	0	336,666
4102 Joint Primary Aircraft Training System (JPATS)	51,609	43,948	33,572	21,864	1,899	1,992	2,032	2,075	0	267,951
4288 T-3A Enhanced Flight Screener (EFS)	0	0	1,571	0	0	0	0	0	0	1,571
4376 T-38 Avionics Upgrade Program (AUP)	14,736	11,082	3,513	0	0	0	0	0	0	67,144
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	8/199,264

(U) Note: The quantity of RDT&E articles shown above includes the JPATS test aircraft (T-1) funded with FY95 through FY00 funds and three Ground Based Training System (GBTS) Aircrew Training Devices (ATD) funded with FY97 through FY01 funds ($161,571 thousand total). It also includes two T-38 AUP test aircraft and two ATDs ($37,693 thousand total).

(U) A. Mission Description

Supports Air Education and Training Command's (AETC) implementation of Specialized Undergraduate Pilot Training (SUPT) and the Department of Defense initiative for joint pilot training. The Joint Primary Aircraft Training System (JPATS) is a joint USAF/USN venture to replace the Services' fleets of primary trainer aircraft (T-37B and T-34C respectively) and associated Ground Based Training Systems (GBTS). The Air Force is the Executive Service. The T-3A Enhanced Flight Screener (EFS) effort will test a Ballistic Recovery System (BRS) on T-3A aircraft. This effort has been directed by the Chief of Staff of the Air Force to improve safety. The T-38 Avionics Upgrade Program (AUP) is an integrated modernization of the T-38A and AT-38B cockpits to support mission ready fighter training. Additionally, funds have been added to the T-38 project for the test of the J-85-5 spool rotor engine modification.

The Joint Primary Aircraft Training System (JPATS) is a joint USAF/USN venture to replace the Services' fleets of primary trainer aircraft (T-37 and T-34, respectively) and associated Ground Based Training Systems (GBTS). The JPATS T-6A aircraft and GBTS will be used to train entry-level student aviators in the fundamentals of flying so they can transition into advanced tracks leading to qualification as military pilots, navigators, and naval flight officers. The GBTS includes Aircrew Training Devices (ATD) and instructional courseware for the T-6A and a Training Integration Management System (TIMS) to be used at all USAF and USN flight training locations. The T-6A cannot be used as planned without the GBTS. In addition to the T-6A aircraft and GBTS, JPATS also includes Contractor Logistics Support. Funding reflects the requirements of the May 96 (Rev 1) Operational Requirements Document. In Jun 95, Raytheon (Beech) Aircraft was selected as the prime contractor. Resolution of protests and contract award occurred in Feb 96.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604233F Specialized Undergraduate Pilot Trng

(U) B. Budget Activity Justification:

This program is in Budget Activity 5, Engineering and Manufacturing Development, because it primarily involves the missionization of commercial derivative aircraft, equipment, and components.

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY1999 PB)	67,866	55,563	35,759	22,280	332,233
(U) Appropriated Value	72,238				
(U) Adjustments to Appropriated Value					
a. Congressional/General Reductions	-2,675	-533			
b. SBIR	-1,707				
c. Omnibus or Other Above Threshold Reprogram	-461				
d. Below Threshold Reprogramming	-1,050				
e. Rescissions					
(U) Adjustments to Budget Years Since FY1999 PB			+2,897	-416	
(U) Current Budget Submit/ FY 2000 PB	66,345	55,030	38,656	21,864	336,666

(U) Significant Program Changes: FY2000 includes a new start project to test a Ballistic Recovery System (BRS) on the T-3A and a development effort for T-38 J-85-5 spool rotor and engine modification. Changes from FY2000 through FY2005 are also the result of inflation rate changes.
FY99: $1,710 identified as a source for SBIR.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604233F Specialized Undergraduate Pilot Trng PROJECT 4102

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
4102 Joint Primary Aircraft Training System (JPATS)	51,609	43,948	33,572	21,864	1,899	1,992	2,032	2,075	0	267,951

(U) A. Mission Description

The Joint Primary Aircraft Training System (JPATS) is a joint USAF/USN venture to replace the Services' fleets of primary trainer aircraft (T-37 and T-34, respectively) and associated Ground Based Training Systems (GBTS). The aircraft and GBTS will be used to train entry-level student aviators in the fundamentals of flying so they can transition into advanced training tracks leading to qualification as military pilots, navigators, and naval flight officers. The program includes the purchase of aircraft, simulators, and other associated ground-based training devices, training integration management systems, instructional courseware, and logistics support. Funding reflects the requirements of the May 96 (Rev 1) Operational Requirements Document. In Jun 95, Raytheon (Beech) Aircraft was selected as the prime contractor. Resolution of protests and contract award occurred in Feb 96.

(U) FY 1998 ($ in Thousands):

- (U) 19,881 Continue development, fabrication, check-out, and test of Manufacturing Development aircraft; continue Aircraft Structural Integrity Program (ASIP) testing
- (U) 22,826 Continue Ground Based Training System (GBTS) management and development of Training Integration Management System (TIMS), Aircrew Training Devices (ATD), and Administration and Conversion Courseware
- (U) 637 Continue flight test program
- (U) 8,265 Mission Support and Government Test
- (U) $51,609 Total

(U) FY 1999 ($ in Thousands):

- (U) 5,340 Complete Manufacturing Development aircraft test; deliver Manufacturing Development aircraft (T-1)
- (U) 31,953 Continue GBTS management and development of TIMS, ATDs, and Administration and Conversion Courseware; complete GBTS Critical Design Review (CDR)
- (U) 420 Complete flight test program
- (U) 4,869 Mission Support and Government Test
- (U) 1,366 Identified as a source for SBIR
- (U) $43,948 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604233F Specialized Undergraduate Pilot Trng
PROJECT 4102	

(U) FY 2000 ($ in Thousands):
- (U) 1,346 Continue air vehicle related items for data, completion of ASIP, and Technical Manuals
- (U) 31,024 Continue GBTS management and development of TIMS, ATDs, and Administration and Conversion Courseware
- (U) 1,202 Mission Support and Government Test
- (U) $33,572 Total

(U) FY 2001 ($ in Thousands):
- (U) 118 Complete air vehicle related contract line items
- (U) 20,547 Continue GBTS development
- (U) 1,199 Mission Support and Government Test
- (U) $21,864 Total

(U) B. Project Change Summary - Description of Significant Changes: JPATS funding beyond FY03 increased due to additional GBTS outyear requirements

(U) C. 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
(U) Aircraft Procurement, Air Force, BA-3										
JPATS	73,327	105,885	88,232	97,214	210,115	246,867	255,923	264,256	173,960	1,672,337
JPATS, BA-6	0	0	0	0	0	60,509	23,522	24,164	15,193	123,399
(U) Military Construction, Air Force										
PE 0804741F, JPATS	2,488	0	0	0	0	3,200	0	3,600	4,100	13,388
(U) RDT&E, Navy, BA-7										
PE 0603208N, Training System Aircraft, H1150, JPATS	279	594	311	0	0	0	0	0	0	11,290
(U) Aircraft Procurement, Navy, BA-3										
JPATS	0	0	44,826	82,299	107,090	104,470	111,495	101,737	1,177,425	1,729,342
APN 6 Spares	0	0	0	0	0	11,398	2,995	3,422	43,060	60,875
(U) Military Construction, Navy	1,400	0	6,240	5,200	600	0	0	0	11,617	25,057

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604233F Specialized Undergraduate Pilot Trng
	PROJECT 4102

(U) D. Acquisition Strategy:

Each acquisition has been competitively awarded with the intent of maximizing the use of commercially available equipment and best commercial practices. The JPATS Program competitively awarded two contracts: a Firm Fixed Price Contractor Logistics Support (CLS) contract and a Fixed Price Incentive Firm manufacturing development (MD)/production contract with seven options.

(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) Aircraft T-1 First Flight				*												
(U) Begin Phase II QT&E				*												
(U) Delivery of Aircraft T-1						X										
(U) Delivery of Aircraft P-1						X										
(U) GBTS CDR								X								
(U) Multi-Service OT&E Complete								X								
(U) Planning for Rate Review									X							
(U) Milestone III										X						
(U) Reliability, Maintainability and Availability (RM&A) Verification Complete												X				
(U) TIMS, ATD, Courseware Delivery to Randolph AFB TX													X			
(U) System Level Formative Eval Complete															X	
(U) IOC Air Force																X
(U) IOC Navy 4Q03																

* Denotes completed milestone

X Denotes planned milestone

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604233F Specialized Undergraduate Pilot Trng
	PROJECT 4102

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Aircraft Missionization/Test and Evaluation	20,518	5,760	1,346	118
(U) Ground Based Training System (GBTS)	22,826	31,953	31,024	20,547
(U) Other Government Costs (OGC)	8,265	4,869	1,202	1,199
(U) Identified as a source for SBIR		1,366		
(U) Total	51,609	43,948	33,572	21,864

(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							1,366				
Product Development Organizations											
Raytheon Aircraft Company (RAC)	C/FPI	5 Feb 96	172,684	172,628	85,107	20,518	5,760	1,346	118	0	112,849*
Flight Safety Services Corp.	N/A**	26 Sep 97	N/A***	N/A***	5,749	22,826	31,953	31,024	20,547	7,998	120,097*
Support and Management Organizations											
Various	Various	Various	N/A	N/A	18,104	8,265	4,869	1,202	1,199	0	33,639

Test and Evaluation Organizations: Not Applicable

* RAC contract Total Program includes contract value, "to ceiling," Engineering Change Order (ECO), and Award Fee
** Subcontract to RAC
*** RAC EAC includes subcontracted GBTS effort, which is not individually reported

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604233F Specialized Undergraduate Pilot Trng
	PROJECT 4102

(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
Identified as a source for SBIR						1,366				1,366
Subtotal Product Development				90,856	43,344	37,713	32,370	20,665	7,998	232,946
Subtotal Support and Management				18,104	8,265	4,869	1,202	1,199	0	33,639
Subtotal Test and Evaluation				0	0	0	0	0	0	0
Total Project				108,960	51,609	43,948	33,572	21,864	7,998	267,951

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604233F Specialized Undergraduate Pilot Trng

PROJECT: 4288

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 T-3A Enhanced Flight Screener (EFS)	0	0	1,571	0	0	0	0	0	0	1,571

(U) A. Mission Description and Budget Item Justification

The T-3A EFS is used at the United States Air Force Academy (USAFA) CO and Hondo Field TX to conduct flight screening prior to entry in Specialized Undergraduate Pilot Training (SUPT). The Chief of Staff of the Air Force has directed the addition of a Ballistic Recovery System (BRS) to the T-3A for enhanced safety. This effort will test that modification.

(U) FY 1998 ($ in Thousands):
- (U) $0 Total

(U) FY 1999 ($ in Thousands):
- (U) $0 Total

(U) FY 2000 ($ in Thousands):
- (U) 1,571 Test Ballistic Recovery System in the T-3A EFS
- (U) $1,571 Total

(U) FY 2001 ($ in Thousands):
- (U) $0 Total

(U) B. Program Change Summary - Description of Significant Changes: This is a new start effort.

(U) C. 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
(U) Aircraft Procurement, Air Force										
PE 0804748F, Flight Screening, BP 1100	0	0	2,106	3,381	0	0	0	0	0	5,487

(U) D. Acquisition Strategy: To be determined.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604233F Specialized Undergraduate Pilot Trng PROJECT 4288

(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) Complete BRS test												X				

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604233F Specialized Undergraduate Pilot Trng PROJECT 4288

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Conduct test of the BRS	0	0	1,571	0
(U) Total	0	0	1,571	0

(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
Product Development Organizations: Not Applicable											
Support and Management Organizations: Not Applicable											
Test and Evaluation Organizations											
TBD	TBD	TBD	TBD	TBD	0	0	0	1,571	0	0	1,571

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

Government Furnished Property: None

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development				PE NUMBER AND TITLE 0604233F Specialized Undergraduate Pilot Trng						PROJECT 4288
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
Product Development Property										
Support and Management Property										
Test and Evaluation Property										
Subtotal Product Development				0	0	0	0	0	0	0
Subtotal Support and Management				0	0	0	0	0	0	0
Subtotal Test and Evaluation				0	0	0	1,571	0	0	1,571
Total Project				0	0	0	1,571	0	0	1,571

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604233F Specialized Undergraduate Pilot Trng PROJECT 4376

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
4376 T-38 Avionics Upgrade Program (AUP)	14,736	11,082	3,513	0	0	0	0	0	0	67,144

(U) A. Mission Description

The T-38 Avionics Upgrade Program (AUP) is an integrated modernization of the T-38A and AT-38B cockpits to support mission-ready fighter training. The modernized digital cockpit will include Global Positioning System (GPS), Head-Up Display (HUD), Inertial Navigation System (INS), Multi-Function Displays (MFDs), Data Transfer System (DTS), No-Drop Bombing System (NDBS), and Hands-On Throttle and Stick (HOTAS) switchology. HUD symbology will be the new USAF standard recently certified as a primary flight reference. Also included is the acquisition of two types of Aircrew Training Devices (ATDs) to replace the existing T-51 simulators. The program includes the design, integration, test, and installation of the cockpit prototype in aircraft, ATDs, and other training devices, as well as engineering services, studies, analysis and support to determine the feasibility of incorporating changes for purposes of making informed life-cycle cost business decisions. Additionally, funds have been added to FY2000 for the test of the J-85-5 spool rotor engine modification.

(U) FY 1998 ($ in Thousands):

- (U) 11,863 Continue EMD phase; complete modification of EMD aircraft numbers one and two; complete contractor testing; complete integration first flight; perform production planning; perform manufacturing lineproofing; conduct ATD design reviews; start ATD CLS and Training Software Support Center (TSSC) site assessments; conduct studies; start ATD testing
- (U 790 Conduct DT&E/IOT&E
- (U) 2,083 Other Government Costs
- (U) $14,736 Total

(U) FY 1999 ($ in Thousands):

- (U) 7,651 Complete DT&E/IOT&E, conduct Functional Configuration Audit (FCA); conduct Production Readiness Review (PRR); obtain production Milestone III approval; continue Aircrew Training Device (ATD) Contractor Logistics Support (CLS) and Avionics Support (AVS) Contractor Owned and Maintained Base Supply (COMBS) planning; build ATD prototypes and continue ATD testing; complete Training Software Support Center (TSSC) delivery; conduct studies
- (U) 490 Complete government flight test
- (U) 2,597 Other Government Costs
- (U) 344 Identified as a source for SBIR
- (U) $11,082 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604233F Specialized Undergraduate Pilot Trng
	PROJECT 4376

(U) FY 2000 ($ in Thousands):
- (U) 1,429 Complete ATD testing and ATD delivery; complete maintenance and ground support equipment; deliver final Technical Orders and drawings
- (U) 1,784 Develop and test J-85-5 spool rotor and engine modification
- (U) 300 Other Government Costs
- (U) $3,513 Total

(U) FY 2001 ($ in Thousands):
- (U) $0 Total

(U) B. Project Change Summary - Description of Significant Changes: No significant changes.

(U) C. 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
(U) Aircraft Procurement, Air Force										
PE 0804741F, T-38 Avionics Upgrade, BP 1100	0	34,627	85,664	89,112	84,066	107,637	109,249	55,608	27,806	593,676
(U) PE 0804741F, J-85-5 Engine Modification, BP 1100	0	0	0	55,900	59,427	59,529	59,777	59,683	381,973	676,289
(U) PE 0804741F, J-85-5 Engine Modification, BP 1600	0	0	0	4,830	4,832	4,840	4,860	4,852	26977	51,191

(U) D. Acquisition Strategy:

The T-38 AUP competitively awarded three contracts to a single prime: a) a cost plus award fee EMD contract with six firm fixed price production options; b) a firm fixed price CLS contract for avionics including Contractor Owned and Maintained Base Supply (COMBS); and c) a fixed price award fee maintenance contract for the current and new Aircrew Training Devices (ATDs). The J-85-5 engine modification will be a sole source addition to a current contract.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604233F Specialized Undergraduate Pilot Trng
	PROJECT 4376

(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) ATD Initial Design Review		*														
(U) ATD Final Design Review			*													
(U) First Flight				*												
(U) DT&E Complete						X										
(U) Functional Configuration Audit (FCA)						X										
(U) IOT&E Complete							X									
(U) Milestone III Production Decision							X									
(U) First Production ATD Delivered									X							
(U) First Production Aircraft Delivered											X					
(U) Initial Operational Capability (IOC)												X				
(U) Complete Engine Spool Rotor Development and Test												X				

* Denotes completed milestone

X Denotes planned milestone

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604233F Specialized Undergraduate Pilot Trng
	PROJECT 4376

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Avionics System Upgrade	4,613	2,751	0	0
(U) Aircrew Training Devices	4,552	2,354	829	0
(U) System Engineering/Program Management	1,750	1,118	300	0
(U) System Test and Evaluation	790	733	0	0
(U) Training	58	95	0	0
(U) EMD Data	94	234	0	0
(U) Mission Support Equipment	4	0	0	0
(U) Maintenance Support Equipment	2	0	0	0
(U) Award Fee	790	856	300	0
(U) Other Government Costs	2,083	2,597	300	0
(U) J-85-5 Spool Rotor and Engine Modification	0	0	1,784	0
(U) Identified as a source for SBIR	0	344	0	0
(U) Total	14,736	11,082	3,513	0

(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
Product Development Organizations											
The Boeing Corporation St. Louis MO	C/CPAF	31 Jul 96	47,448	48,800	31,533	11,988	6,228	1,429	0	0	51,178
ASC/YT WPAFB OH	Various	Annual	N/A	N/A	5,001	1,688	3,798	0	0	0	10,487

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604233F Specialized Undergraduate Pilot Trng

PROJECT: 4376

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
GE, Lynn MA	CPFF	Jan 00	1,784	1,784	0	0	0	1,784	0	0	1,784
ASC/LT, WPAFB OH	Various	Annual	N/A	N/A	0	0	0	200	0	0	200
Support and Management Organizations											
SA-ALC/LF Kelly AFB TX	Various	Quarterly	N/A	N/A	377	112	112	0	0	0	601
AETC Randolph AFB TX	Various	Quarterly	N/A	N/A	109	128	100	0	0	0	337
OO-ALC/LIR Ogden AFB UT	Various	Quarterly	N/A	N/A	340	130	20	100	0	0	490
Test and Evaluation Organizations											
445 FLTS Edwards AFB CA	PO	Annual	N/A	N/A	375	700	230	0	0	0	1,305
AFOTEC Kirtland AFB NM	PO	Annual	N/A	N/A	78	90	250	0	0	0	418
Identified as a source for SBIR							344				344
Subtotal Product Development					36,534	13,676	10,026	3,413	0	0	63,649
Subtotal Support and Management					826	270	232	100	0	0	1,428
Subtotal Test and Evaluation					453	790	480	0	0	0	1,723
Total Project					37,813	14,736	11,082	3,513	0	0	67,144

Government Furnished Property: None

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604239F F-22 EMD

PROJECT: 4069

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
4069 Advanced Tactical Fighter FSD	2,010,717	1,570,970	1,222,232	976,601	712,491	318,470			0	22,628,536*
Quantity of RDT&E Articles	1	0	4	3	0	0	0	0	0	

Unit cost of RDT&E articles not separately priced (NSP).

* Total Cost includes $3,779,811,000 of Demonstration and Validation funding prior to FY 1992 funded in PE 0603230F.

** Quantity of RDT&E Articles includes one EMD flight test aircraft delivered in FY 1997.

(U) A. Mission Description

The F-22 is designed to penetrate enemy airspace and achieve a first look, first kill capability against multiple targets. The F-22 is characterized by a low observable, highly maneuverable airframe, advanced integrated avionics, and aerodynamic performance that allows supersonic cruise without the use of afterburner. The F-22 is currently in the Engineering and Manufacturing Development (EMD) phase of acquisition. Additionally, long lead production funding has been released for the two Production Representative Test Vehicle (PRTV) aircraft in FY 1998.

The EMD phase effort includes delivery of nine flight test vehicles and two ground test vehicles (static and fatigue); delivery of 26 flight qualified engines; integration and test of the EMD avionics suite including air-to-surface provision; development and test of the F-22 weapons system support and training system; and updating the YF-22 Avionics Flying Laboratory with EMD assets and software to become an avionics integration Flying Test Bed (FTB).

All OSD-level and 1998 congressional program criteria for F-22 flight test completed successfully ahead of schedule. The flight test criteria for PRTV full contract award were completed on 10 Oct 98, the software criteria for PRTV full contract awards were completed on 23 Nov 98. One hundred eighty-three (183) flight test hours were completed by 23 Nov 1998 this allowed the Air Force to award the Lot-1 advanced buy contract on 30 Dec 98. A successful review by the Defense Acquisition Executive was held on 17 Dec 98. The DAE authorized PRTV full contract award and authorized Lot-1 Advanced Buy contract award following release of SECRETARY OF DEFENSE/DIRECTOR OPERATIONAL TEST and EVALUATION Reports to Congress.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604239F F-22 EMD
	PROJECT 4069

(U) FY 1998 ($ in Thousands):

– (U) $1,185,714 Air Vehicle
- Completed assembly of Engineering and Manufacturing Development (EMD) aircraft #2. (NSP)
- Continued assembly of EMD aircraft #3. (NSP)
- Initiated assembly of EMD aircraft #4-6. (NSP)
- Continued systems installations on Flying Test Bed (FTB) (NSP)
- Continued full scale pole model testing (NSP)
- Continued flight test and flight test support (NSP)

– (U) $525,691 Avionics
- Initiated Avionics Integration Laboratory (AIL) Block 1 integration (NSP)
- Continued incorporating Avionics hardware into the FTB (NSP)
- Continued DMS redesign activities for production incorporation (NSP)
- Initiated FTB flight testing. (NSP)

– (U) $206,612 Engine
- Continued production engine configuration development testing (NSP)
- Continued to deliver and support two additional flight test engines (7 total) (NSP)
- Continued verification of engine support system products (NSP)
- Continued to build and test additional flight test engines (NSP)

– (U) $92,700 Other Government Cost
- Initiated flight test and flight test support at Edwards AFB
- Continued support of engine testing
- Continued stores separation testing at Arnold Engineering Development Center
- Continued sled test program at Holloman AFB
- Continued aperture measurements at Rome Labs
- Continued avionics ground testing at various government test facilities
- Mission support of the SPO; travel, computer costs, misc contracts, etc.
- Procurement of required government furnished equipment (GFE)
- Continued Live Fire testing at Air Force Research Labs

- (U) $2,010,717 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	February 1999
BUDGET ACTIVITY	PE NUMBER AND TITLE **0604239F F-22 EMD**
	PROJECT **4069**

(U) _____:

– Air Vehicle
- Continue assembly of EMD aircraft #3-6. (NSP)

- Initiate static test. (NSP)
- Initiate fatigue tests. (NSP)

- Continue flight test and flight test support (NSP)

(U) $473,531

- Initiate AIL integration in preparation of Block 2 integration testing (NSP)
- Initiate delivery and installation of avionics hardware on the first avionics test aircraft (NSP)

- Complete (AIL) Block 1.0 integration (NSP)
- Continue DMS redesign, requalification and retesting activities (NSP)

– Engine
- Continue to deliver and support six additional flight test engines (13 total). (NSP)

- Continue verification of engine support system products (NSP)
- Continue building and test additional flight test engines (NSP)

– (U) $97,700 Other Government Cost

- Continue support of engine testing
- Continue aperture measurements at Rome Labs

- Mission support of the SPO; travel, computer costs, misc contracts, etc.
- Procurement of required GFE

- Continue live fire testing at Air Force Research Labs
- Continue stores separation testing at AEDC

– Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604239F F-22 EMD
	PROJECT 4069

(U) FY 2000 ($ in Thousands):

– (U) $689,694 Air Vehicle
- Complete static test (NSP)
- Conduct First Flight Readiness Review for aircraft #4. (NSP)
- Complete assembly of EMD aircraft #3-6 (NSP)
- Continue assembly of EMD aircraft #7-9 (NSP)
- Complete final production readiness review (NSP)
- Continue flight test and flight test support (NSP)
- Complete full scale pole model testing (RCS). (NSP)
- Complete first lifetime fatigue test (NSP)

– (U) $275,827 Avionics
- First flight of the first avionics test aircraft (NSP)
- Initiate AIL Block 3 integration (NSP)
- Continue incorporating avionics software/hardware into the FTB (NSP)
- Continue DMS redesign activities for production incorporation (NSP)
- Initiate avionics software block 3S flight testing (NSP)
- Initiate Block 3 FTB testing (NSP)

– (U) $140,111 Engine
- Continue production engine configuration development testing (NSP)
- Continue to deliver and support thirteen additional flight test engines (26 total) (NSP)
- Continue verification of engine support system products (NSP)
- Continue to build and test additional flight test engines (NSP)

– (U) $116,600 Other Government Cost
- Continue flight test and flight test support at Edwards AFB
- Continue support of engine testing at AEDC
- Continue aperture measurements at Rome Labs
- Continue avionics ground testing at various government facilities
- Mission support of the SPO; travel, computer costs, misc contracts, etc.
- Procurement of required GFE
- Continue sled test program at Holloman AFB
- Continue live fire testing at Air Force Research Labs

– (U) $1,222,232 Total

(U) _____

– (U) $582,164

- Complete assembly of EMD aircraft #7-9. (NSP)
- Continue flight test and flight test support. (NSP)

– (U) $184,599

- Initiate AIL Block 3.1 integration. (NSP)
- Complete flight testing on the Block 3.1 FTB. (NSP)

- Continue DMS redesign, requalification and retesting activities. (NSP)

– Engine

- Continue production engine configuration development testing. (NSP)

- Continue to build and test additional flight test engines. (NSP)

– Other Government Cost

- Continue engine testing at AEDC
- Continue avionics ground testing at various government facilities

- Procurement of required GFE
- Continue live fire testing at Air Force Research Labs

– Total

(U) B. _____

This program is in Budget Activity 5, Engineering and Manufacturing Development, because the F-22 Program is developing the next-generation air superiority fighter for the USAF to counter emerging worldwide threats.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604239F F-22 EMD PROJECT 4069

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY 1999 PB)	1,958,915	1,582,217	1,204,490	995,191	22,663,988
(U) Appropriated Value	2,077,234	1,575,417			
(U) Adjustments to Appropriated Value					
a. Congressional/General Reductions	-68,250	-4,447			
b. SBIR	-50,352				
c. Omnibus or other Above Threshold Reprogramming	60,202				
d. BTR	-8,117				
(U) Adjustments to Budget Years Since FY 1999 PB			17,742	-18,590	
(U) Current Budget Submit/FY 2000 PB	2,010,717	1,570,970	1,222,232	976,601	22,628,536

(U) Significant Program Changes:

- The FY 1998 Appropriations Act transferred $73.531M from FY97 Procurement (3010) to FY97 RDT&E (3600) to support redesign activities associated with Out-of-Production Parts (OPP). OSD transferred the $73.531M from FY97 RDT&E (3600) to FY98 RDT&E (3600) to ensure the Air Force maintained the full two fiscal year term to obligate the funds.

- $40,000 in FY 2000 includes a payback of a FY 1998 cut to Air Combat Simulator and funding to support Air Combat Command Block IV requirements for IOC (Helmet-mounted sight, AIM-9X, Project 3308 and Advanced Combat ID).

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 4069

Other Program Funding Summary ($ in Thousands)

	FY 1998		FY 2000	FY 2001		FY 2003	FY 2004		To Complete	Cost
(U) F-22 Squadrons (PE 0207138F)								*82,953	*TBD	
(U) Military Construction (PE 0604239F)	0		4,388	13,410		0	0		0	**38,829
	0	0		24,033	0		0	0		197,533
(U) Aircraft Procurement (PE 0207219F)	73,291		1,858,137	2,551,432		4,326,385	3,988,135		20,071,464	40,271,547
#003										
	0		1,398	2,747		6,455	9,587		58,404	92,938
(PE 0207219F)										

0207138F includes manpower authorizations, peculiar and common support equipment, necessary facilities and the associated costs specifically identified and measurable to the following: Operation, maintenance, and logistical support of the F-22 fighter aircraft. Excludes advanced flying training operation costs and base and

** Includes 21,040 of FY 1997 & prior funds.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604239F F-22 EMD	PROJECT 4069

(U) E. Acquisition Strategy: The EMD contract is Cost Plus Award Fee with Lockheed Martin Aeronautical Systems (LMAS) to produce the F-22 air vehicle and Pratt & Whitney (P&W) to produce the F119 engines. The engines are provided to LMAS as GFE.

(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) Aircraft Delivered (EMD Test Article)			*						X	X	2		X	X	X	
Program Milestones					*											
- Program Review, PRTV Award, Lot 1 LL																
- DAB MS III, 4QFY03																
Engineering Milestones																
- Final PRR												X				
- First Avionics Flight										X						
T&E Milestones																
- Dedicated IOT&E, 4QFY02																

EMD = Engineering & Manufacturing Development, DAB = Defense Acquisition Board, LRIP = Low Rate Initial Production, LL = Long Lead, MS = Milestone, DT&E = Developmental Test & Evaluation, IOT&E = Initial Operational Test & Evaluation

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Air Vehicle/Avionics	1,711,405	1,300,166	965,521	766,763
(U) Engine	206,612	173,104	140,111	54,638
(U) Government Cost				
- Government Test	68,600	78,500	99,400	139,200
- Mission Support	12,500	11,500	11,000	10,700
- HAZMAT	0	1,000	800	800
- GFE	11,600	6,700	5,400	4,500
(U) Total	2,010,717	1,570,970	1,222,232	976,601

(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
Product Development Organizations											
Lockheed (Air Veh)	C/CPAF	Aug 91	12,816,155	15,295,391	9,825,200	1,711,405	1,300,166	965,521	766,763	739,836	15,308,891
Pratt & Whitney	C/CPAF	Aug 91	2,197,900	2,472,734	1,830,944	206,612	173,104	140,111	54,638	67,325	2,472,734

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)											DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development				PE NUMBER AND TITLE 0604239F F-22 EMD							PROJECT 4069
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
Support and Management Organizations											
Support Contracts	Various	Various	N/A	N/A	10,155	2,247	3,303	2,600	2,300	1,500	22,105
In House Support	Various	Various	N/A	N/A	72,045	10,253	9,197	9,200	9,200	17,500	127,395
Test and Evaluation Organizations											
AEDC	PO		N/A	N/A	*135,833	19,175	12,250	10,100	100	0	177,458
AFFTC	PO		N/A	N/A	*103,842	44,666	52,700	76,100	113,500	195,900	586,708
All Other Tests	Various	Various	N/A	N/A	*26,825	4,759	13,550	13,200	25,600	8,900	92,834

Note: The Project Office EAC includes the following items not included in the Performing Activity (i.e., Contractor) EAC - Base Fee, Award Fee, SPO Planned CCPs not yet on contract, and other adjustments based on results of the restructured program.

* Total Prior to FY 1998 (Actuals) for Test and Evaluation Organizations have been restated to account for bookkeeping changes across the activities.

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
Product Development Property										
GFE	Various	Various	Various	32,400	11,600	6,700	5,400	4,500	0	60,600
Support and Management Property										

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604239F F-22 EMD

PROJECT: 4069

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
Not Applicable										
Test and Evaluation Property										
Not Applicable										
Subtotal Product Development				11,656,144	1,918,017	1,473,270	1,105,632	821,401	807,161	781,625
Subtotal Support and Management				114,600	24,100	19,200	17,200	16,000	19,000	210,100
Subtotal Test and Evaluation				266,500	68,600	78,500	99,400	139,200	204,800	857,000
Total Project				12,037,244	2,010,717	1,570,970	1,222,232	976,601	1,030,961	*18,848,725

* Total Program cost does not include $3,779,811 of Demonstration and Validation funding prior to FY 1992 funded in PE 0603230F.

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604240F B2 Advanced Technology Bomber

PROJECT: 3843

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
3843 B-2 Advanced Technology Bomber	434,890	131,038	201,765	72,443	24,679	13,173	13,487	13,764	0	24,878,741
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

The B-2 SPIRIT is America's most advanced long-range strike aircraft. This all-wing two crew member aircraft has twin weapons bays of over 20,000 pounds capacity each and employs a wide array of signature reduction technologies to greatly enhance both its ability to penetrate enemy defenses and its ability to survive in a highly defended target environment. The B-2 provides global force projection capability and the ability to influence an enemy regardless of the location of enemy assets or the availability of forward basing.

(U) FY 1998 ($ in Thousands):

(U) $ 14,202 Continued Developmental Test and Evaluation (Maintain minimal flight test infrastructure at Edwards AFB)
(U) $ 26,689 Continued support for Air Force Mission Support System (AFMSS)
(U) $ 17,531 Continued support for Labs and Facilities
(U) $ 376,468 Continued support for modification of EMD Aircraft and plus-up efforts (Alternate High Frequency Materials, Advanced Topcoat System, SATCOM/DAMA Integration)
(U) $ 434,890 Total

(U) FY 1999 ($ in Thousands):

(U) $ 12,200 Continue Developmental Test and Evaluation (Maintain minimal flight test infrastructure at Edwards AFB)
(U) $ 12,127 Continue support for Air Force Mission Support System (AFMSS)
(U) $ 9,275 Continue support for Labs and Facilities
(U) $ 93,351 Continue support for modification of EMD Aircraft; begin JASSM integration.
(U) $ 4,085 Identified as an additional source for SBIR
(U) $ 131,038 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE: 0604240F B2 Advanced Technology Bomber / PROJECT: 3843

(U) FY 2000 ($ in Thousands):

(U)	$ 13,000	Continue Developmental Test and Evaluation (Maintain minimal flight test infrastructure at Edwards AFB)
(U)	$ 5,150	Continue support for Air Force Mission Support System (AFMSS)
(U)	$ 8,717	Continue support for Labs and Facilities
(U)	$ 174,898	Continue support for modification of EMD Aircraft; continue JASSM integration; conduct B-2 EHF risk reduction study.
(U)	$ 201,765	Total

(U) FY 2001 ($ in Thousands):

(U)	$ 13,100	Continue Developmental Test and Evaluation (Maintain minimal flight test infrastructure at Edwards AFB)
(U)	$ 4,556	Continue support for Air Force Mission Support System (AFMSS)
(U)	$ 5,583	Continue support for Labs and Facilities
(U)	$ 49,204	Continue support for modification of EMD Aircraft; continue JASSM integration.
(U)	$ 72,443	Total

(U) B. Budget Activity Justification:

This program is in budget activity 5 - Engineering and Manufacturing Development - because of concurrency in developing, testing, producing, and deploying the B-2.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE: 0604240F B2 Advanced Technology Bomber — PROJECT: 3843

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY 1999 PB)	335,254	131,247	202,744	73,822	24,784,409
(U) Appropriated Value	355,750	131,247			
(U) Adjustments to Appropriated Value					
a. Congressional/General Reductions	-12,113	-580			
b. SBIR	-8,431				
c. Omnibus and Above Threshold Reprogramming	98,298				
d. Below Threshold Reprogramming	1,386	371			
(U) Adjustments to Budget Years Since FY 1999 PB			-979	-1379	
(U) Current Budget Submit FY2000 PB	434,890	131,038	201,765	72,443	24,878,741

(U) Significant Program Changes:

FY98: Reclassified $100,578 from Congressional Plus-up in Aircraft Procurement to RDT&E for Multi-Stage Improvement Program efforts, including Alternate High Frequency Materials, Advanced Topcoat, and UHF SATCOM Demand Access Multiple Assigned (DAMA).
FY99: $4,085 identified as an additional source for SBIR

(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 Complete	Total Cost
A/C Proc, AF, Combat A/C/BA01/B-2A	175,726	0	0	0	0	0	0	0	0	17,620,672
A/C Proc, AF, Post Prod Support/BA07	0	238,648	106,882	30,059	15,999	7,412	7,581	7,764	TBD	TBD
A/C Proc, AF, Modifications/BA05/B-2A	50,156	15,637	20,083	32,116	22,853	8,263	10,206	10,384	TBD	TBD
A/C Proc, AF, Cmn Spt Eq/BA07/Items<$2M	491	0	451	454	436	440	486	485	TBD	TBD
A/C Proc, AF, A/C Initial Spares/BA06/B-2A	12,912	55,351	60,841	35,166	25,744	16,979	12,308	12,148	0	1,214,922
Proc (Other), AF/BA 02,03, 04/B-2A	10,462	6,100	5,818	6,158	7,668	7,707	7,863	8,064	TBD	TBD
Military Construction/BA01	27,074	0	5,428	27,887	0	0	0	0	0	72,439

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604240F B2 Advanced Technology Bomber
	PROJECT 3843

(U) E. Acquisition Strategy:

Key elements of the overall acquisition strategy include: use of sole source contract with a prime/integrating contractor; use of cost plus award fee (CPAF) development contracts; and combining developmental upgrades with software sustainment blocks to minimize the number of software releases, aircraft downtime and differences in fielded configurations.

(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
Block-30 Nuclear Certification	*															
AV-2 Block-30 Delivery (1st Mod Line Delivery)	*															
Eighth Block-30 Delivery (Completes First Squadron)				*												
Full Operational Capability (FOC)							x									
A/V Final Delivery												x				

* = Completed event
x = Planned event

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604240F B2 Advanced Technology Bomber	PROJECT 3843

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Equipment Development & Evaluation	402,794	105,478	180,048	53,760
(U) Government Test	16,100	12,200	13,000	13,100
(U) Other Government Costs (OGC)	6,821	3,332	1,411	902
(U) Other	9,175	5,943	7,306	4,681
(U) Identified as an additional source for SBIR		4,085		
(U) Total	434,890	131,038	201,765	72,443

(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 an additional source for SBIR					4,085				4,085		
Product Development Organizations											
Air Vehicle - NG	CPIF/AF	Nov 1981	21,001,820	21,409,226	20,708,640	375,805	93,201	174,898	49,204	8,044	21,409,792
Aircrew Training	CPIF	Jul 1985	561,345	561,345	561,345	0	0	0	0	0	561,345
Mission Planning	Multiple	Multiple	347,711	347,711	297,189	26,689	12,127	5,150	4,556	2,000	347,711
Support and Management Organizations											
Other Govt Costs	N/A		973,104	973,104	933,187	15,996	9,275	8,717	5,583	346	973,104
Test and Evaluation Organizations											
Govt Test	N/A	N/A	888,937	888,937	779,824	16,100	12,200	13,000	13,100	54,713	888,937

	DATE
	February 1999

5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE	PROJECT
		3843

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

Support and Management Property:
None

None

Item	Contract Method/Type Vehicle	Award or Date	Delivery	Total Prior to	Budget FY 1998	FY 1999	Budget	Budget FY 2001	Complete	Total
Product Development Property										
Engines G.E.		Multiple	N/A		150	0		0	0	
AARL Boeing	FPIF		N/A	125,232		150	0		0	125,532
4,085										
Subtotal Product Development					402,794	105,478		53,760	10,044	
Subtotal Support and Management				933,187		9,275	8,717		346	973,104
				779,824	16,100		13,000	13,100		888,937
Total Project					434,890	131,038		72,443	65,103	

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604270F EW Development

	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	72,987	97,990	90,347	55,314	53,447	47,338	48,275	49,323	Continuing	Continuing
1011	Joint Service Electronic Combat Systems Tester	8,807	9,738	2,940	2,990	0	0	0	0	0	46,251
2462	Compass Call (CC)	1,205	777	749	827	2,576	2,604	2,659	2,714	Continuing	Continuing
3891	Advanced IR Counter Measures (AIRCM) (Includes CMWS, ASTE, LAIRCM and AAR-47)*	33,542	41,068	55,534	23,422	15,281	13,756	13,992	14,328	Continuing	Continuing
3945	RF Towed Decoy Systems	29,433	41,936	31,124	28,075	35,590	30,978	31,624	32,281	Continuing	Continuing
4832	Precision Location and Identification (PLAID)	0	4,471	0	0	0	0	0	0	0	4,471
	Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

* AIRCM includes four subprojects: Common Missile Warning System (CMWS), Advanced Strategic and Tactical Infrared Expendables (ASTE), Large Aircraft IRCM (LAIRCM), and software upgrade to AAR-47.

(U) A. Mission Statement:

This program element (PE) consolidates engineering development efforts related to Air Force Electronic Warfare (EW) requirements. It centralizes USAF funding and management of common EW systems development. These funds transition EW technologies to an installed operational capability. This PE executes projects to provide capabilities to deter, detect, deceive and counter enemy acquisition and tracking of DoD operational platforms plus enemy Radio Frequency (RF) information operations worldwide. These projects include Infrared (IR) and RF situational awareness and self protection systems, command and control warfare (C2W) electronic attack systems, and the test equipment needed to support them.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604270F EW Development

(U) B. Budget Activity Justification:

A key criterion for the included projects in this program element is the need for engineering and manufacturing developmental activities, therefore these programs are in Budget Activity 5 - Engineering and Manufacturing and Development.

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY1999 PB)	75,700	90,126	75,992	53,971	Continuing
(U) Appropriated Value	80,465	98,626			
(U) Adjustments to Appropriated Value					
a. General/Congressional Reduction	-2,935	-636			
b. SBIR	-1,840				
c. Omnibus/Other Above Threshold Reprogramming	-515				
d. Below Threshold Reprogramming	-2,188				
(U) Adjustments to Budget Years Since FY 1999 PB			14,355	1,343	
(U) Current Budget Submit/2000 PB	72,987	97,990	90,347	55,314	Continuing

(U) Significant Program Changes:

$4.5M was added in FY99 appropriation to transition PLAID to EMD.
$14.355M was added in FY00 to continue CMWS development
$1.343M was added in FY01 to continue development of ASTE flares
FY 99 $2.946M identified as a source for SBIR

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE: February 1999
BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE: 0604270F EW Development	PROJECT: 1011

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 Service Electronic Combat Systems Tester	8,807	9,738	2,940	2,990	0	0	0	0	0	46,251

(U) A. Mission Statement

(U) The Joint Service Electronic Combat Systems Tester (JSECST) will fill both an Air Force and Navy operational requirement for a small, adaptable, and highly mobile tester capable of verifying the system level performance of installed electronic countermeasures systems. Present maintenance concepts rely on the built-in-test (BIT) capabilities of the line replaceable units (LRUs) to verify system performance. However, BIT fails to detect faults in LRU interfaces and installed aircraft (Group A) hardware. Particular emphasis in the JSECST program will be placed on size and weight since the test set must deploy with the operational unit.

(U) FY 1998 ($ in Thousands)
- (U) $7,248 Continued Core Test Set Development
- (U) $501 Continued SPO Support
- (U) $852 Continued Test Program Set (TPS) Lab Support
- (U) $206 Continued Government Test
- (U) $8,807 Total

(U) FY 1999 ($ in Thousands)
- (U) $6,881 Complete Core Test Set Development
- (U) $847 Continue SPO Support
- (U) $1,302 Complete Test Program Set (TPS) Lab Support
- (U) $415 Continue Government Test
- (U) $293 Identified as a source for SBIR
- (U) $9,738 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604270F EW Development
	PROJECT 1011

(U) FY 2000 ($ in Thousands):
- (U) $2,540 Initiate Test Program Set (TPS) Engineering Manufacturing Development (EMD) Contract
- (U) $350 Continue SPO Support
- (U) $50 Continue Government Test
- (U) $2,940 Total

(U) FY 2001 ($ in Thousands):
- (U) $2,647 Continue Test Program Set (TPS) Development Contract
- (U) $268 Continue SPO Support
- (U) $75 Continue Government Test
- (U) $2990 Total

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

Not Applicable.

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

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
(U) Aircraft Procurement, AF PE 27442F (Common ECM Equipment), In Service Direct Ground Support Equipment, BP-12			7,472	18,285	33,788					TBD

(U) D. Acquisition Strategy:

The acquisition strategy is competitive, cost-plus contracts.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE: February 1999
BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE: 0604270F EW Development
	PROJECT: 1011

(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) Critical Design Review		*														
(U) Test Readiness Review					*											
(U) Developmental Test & Evaluation							X									
(U) Functional Configuration Audit									X							
(U) Initial Operational T&E (1Q-00)									X							
(U) Milestone III (May-00)											X					
(U) Production Lots award (June-00)											X					

* - Denotes a completed event
X - Denotes a planned event

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604270F EW Development
	PROJECT 1011

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) EMD Contract	7,248	6,881	2,540	2,590
(U) SPO Support	501	847	350	325
(U) Government Test	206	415	50	75
(U) TPS Lab Support	852	1,302	0	0
(U) Identified as a source for SBIR	0	293	0	0
(U) Total	8,807	9,738	2,940	2,990

(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							293				293
Product Development Organizations											
AAI	CPAF	Mar 96	28,236	28,236	13,340	7,248	6,881	0	0	0	27,469
Follow on TPS Contractor	TBD	Jun 00		5,241	0	0	0	2,540	2,590	0	5,130
Support and Management Organizations											
ASC/LNA, NAVAIR, Wright Labs		Various			8,141	1,353	2,149	350	325	0	12,318
Test and Evaluation Organizations											

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)		DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604270F EW Development	PROJECT 1011

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
AFDTC, Eglin AFB FL					588	206	415	50	75	0	1,334

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

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
Subtotal Product Development				13,340	7,248	6,881	2,540	2,590	0	32,599
Subtotal Support and Management				8,141	1,353	2,149	350	325	0	12,318
Subtotal Test and Evaluation				588	206	415	50	75	0	1,334
Identified as a source for SBIR				0	0	293	0	0	0	293
Total Project				22,069	8,807	9,738	2,940	2,990	0	46,544

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604270F EW Development	PROJECT 2462

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
2462 Compass Call (CC)	1,205	777	749	827	2,576	2,604	2,659	2,714	Continuing	Continuing

(U) A. Mission Statement:

(U) COMPASS CALL is DoD's airborne wide area coverage offensive counter information system. It denies, disrupts, degrades and deceives adversary voice and data communications, disrupting 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 system that will enable COMPASS CALL to remain viable in countering the next generation of deployed threats. Additionally, new target (class 6) countermeasures capability is under development. This effort funds the non-recurring efforts associated with TRACS development for COMPASS CALL. Production funding for TRACS is in PE 27253.

(U) FY 1998 ($ in Thousands):
- (U) $ 412 Continued TRACS Basic Prototype EMD
- (U) $ 320 Continued High Band Exciter (HBE) upgrade development
- (U) $ 473 Continued New signals countermeasures development
- (U) $1205 Total

(U) FY 1999 ($ in Thousands):
- (U) $250 Conduct TRACS-Basic prototype flight testing
- (U) $402 Continue new target class countermeasures development
- (U) $100 Conduct new target class countermeasures initial flight assessment (including range costs)
- (U) $25 Identified as a source for SBIR
- (U) $777 Total

(U) FY 2000 ($ in Thousands):
- (U) $449 Continued New target class countermeasures development
- (U) $150 Initiate Block 30 threat signal update
- (U) $150 Initiate Block 30 waveform update
- (U) $749 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604270F EW Development	PROJECT 2462

(U) FY 2001 ($ in Thousands):
- (U) $327 Continue New target class countermeasures development
- (U) $250 Continue New target class countermeasures operational flight test
- (U) $125 Continue Block 30 threat signal update
- (U) $125 Continue Block 30 waveform update
- (U) $827 Total

B. Project Change Summary - Description of Significant Changes:

Congress added $12.5M in FY99 for the Compass Call TRACS program. This increase has been applied to AF PE 27253F.

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

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Budget to Complete	Total Cost
(U) Compass Call (RDT&E), AF PE 27253F	0	12,419	4,908	5,886	3,919	3,913	3,908	0	Cont.	Cont.

(U) D. Acquisition Strategy:

CPIF/AF contracting will be employed for all activities.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604270F EW Development
	PROJECT 2462

(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) HBE Flight Test			*			X	X									
(U) TRACS Flight Test			*			X	X									
(U) TRACS PDR							X									
(U) New Countermeasures#			*	*	*	X	X	X	X	X	X	X	X	X	X	X
(U) New CM Flt Test							X	X			X	X				
(U) Block 30 Signals Update#									X	X	X	X	X	X	X	X
(U) Block 30 Waveform Update#									X	X	X	X	X	X	X	X

- New countermeasures development and Block 30 signals/wavefrom updates are a continuing effort to improve the existing system's ability to effectively counter emerging threats. Due to the dynamic nature of this platform's mission, this effort is an on-going level of effort.

* - Denotes a completed event
X - Denotes a planned event

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604270F EW Development
	PROJECT 2462

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) HBE/HBS	312	0	0	0
(U) TRACS-Basic	420	250	0	0
(U) New Threat (class 6) CM Development	473	502	449	577
(U) Block 30 Signals Update Development	0	0	150	125
(U) Block 30 Waveform Update Development	0	0	150	125
(U) Identified as a source for SBIR	0	25	0	0
(U) Total	1,205	777	749	827

(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							25				25
Product Development Organizations											
Sanders	SS/CPIF	1QFY99		TBD	26,206	893	402	749	577	Cont.	Cont.
Raytheon Ft Wayne	SS/CPIF	N/A		23,543	23,223	312	0	0	0	0	23,543
GTE	SS/CPIF	N/A		8,875	8,875	0	0	0	0	0	8,875

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
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(U) B. Budget Acquisition History and Planning Information Continued ($ in Thousands):

Performing Organizations: (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
Support and Management Organizations											
Misc (SPO, Labs)	Various	N/A			3,172	0	0	0	0	Cont.	Cont.
Test and Evaluation Organizations											
EPG, Ft. Huachuca NM	MIPR	2QFY99			500	0	250	0	125	Cont.	Cont.
WTR	616	2QFY99			500	0	100	0	125	Cont.	Cont.

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
Product Development Property										
Misc				1,594	0	0	0	0	Cont.	Cont.
Support and Management Property										
Not Applicable										
Test and Evaluation Property										
Not Applicable										

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604270F EW Development

PROJECT: 2462

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
Subtotal Product Development				59,898	1,205	402	749	577	Cont.	Cont.
Subtotal Support and Management				3,172	0	0	0	0	Cont.	Cont.
Subtotal Test and Evaluation				1,000	0	350	0	250	Cont.	Cont.
Identified as a source for SBIR				0	0	25	0	0	0	25
Total Project				64,070	1,205	777	749	827	Cont.	Cont.

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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
3891 Advanced IR Counter Measures (AIRCM) (Includes CMWS, ASTE, LAIRCM and AAR-47)*	33,542	41,068	55,534	23,422	15,281	13,756	13,992	14,328	Continuing	Continuing

* AIRCM includes four subprojects: Common Missile Warning System (CMWS), Advanced Strategic and Tactical Infrared Expendables (ASTE), Large Aircraft IRCM (LAIRCM), and software upgrade to AAR-47.

(U) A. Mission Statement:

The Advanced IR Countermeasure (AIRCM) project contains related aircraft self-protection efforts aimed at increasing aircraft survivability against the increasing threat of sophisticated surface to air (SAM) and air to air missiles (AAM), which may employ such features as next-generation electro-optics or dual infrared and radio frequency seekers. AIRCM consists of four efforts, the tri-service Common Missile Warning System (CMWS) , USAF/USN Advanced Strategic and Tactical Infrared Expendable (ASTE), USAF Large Aircraft IRCM (LAIRCM), and USAF/USN AAR-47 software upgrade. CWMS will provide timely warning of a threat missile attack and cue expendable countermeasures. ASTE will provide advanced IR expendable countermeasures. LAIRCM will demonstrate an advanced directed laser countermeasures suite for large signature aircraft as EMD risk reduction. The software upgrade to the AAR-47 is aimed at decreasing its false alarm rate. The CMWS program was formed in FY96 by combining the FY95 USA Advanced Threat Infrared Countermeasures (ATIRCM) program with the USAF/USN Advanced Missile Warning program and the Advanced Strategic and Tactical Infrared Expendables effort. USAF CMWS installation is planned for the F-16 and A-10 aircraft. ASTE flares will be functionally compatible with existing ALE-40, 45, and 47 dispenser systems and will be employed across multiple USAF and USN weapon systems. This project, managed as a consolidated AIRCM effort, is an integral part of a Joint Service IRCM program that will maximize commonality across Air Force, Navy, and Army aircraft.

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(U) FY 1998 ($ in Thousands)

(U) **CMWS Program:**

–	(U)	$9,921	Continued Common Missile Warning System Joint Program Costs
–	(U)	$3,580	Continued F-16 aircraft (Group A) EMD integration
–	(U)	$1,078	Continued A-10 aircraft (Group A) EMD integration
–	(U)	$7,047	Continued Test and Evaluation (AF only)
–	(U)	$300	Continued Modeling and Simulation (AF only)
–	(U)	$1,046	Continued Military Worth Study (formerly called AOA)
–	(U)	$543	Continued Mission Support
–	(U)	$23,515	CMWS Total

(U) **ASTE Program:**

–	(U)	$2,742	Continued ASTE Joint Program Costs
–	(U)	$5,574	Initiate C-17 Development
–	(U)	$429	Continued Test and Evaluation
–	(U)	$133	Continued Verification and Validation
–	(U)	$360	Continued Modeling & Analysis
–	(U)	$789	Continued Mission Support
–	(U)	$10,027	ASTE Total

(U) LAIRCM Program:

–	(U)	$0	LAIRCM Total

(U) **AAR-47 Program:**

–	(U)	$0	AAR-47 Total

(U)	$33,542	AIRCM Total

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(U) FY1999 ($ in Thousands)

(U) **CMWS Program:**

–	(U)	$18,718	Common Missile Warning System Joint Program Costs
–	(U)	$8,854	Continue F-16 aircraft (Group A) EMD integration
–	(U)	$1,868	Continue A-10 aircraft (Group A) EMD integration
–	(U)	$2,969	Continue Test and Evaluation (AF only)
–	(U)	$360	Continue Military Worth Study (formerly called AOA)
–	(U)	$680	Continue Mission Support
–	(U)		Identified as a source for SBIR $1,030
–	(U)	$34,479	CMWS Total

ASTE Program:

–	(U)	$0	ASTE Joint Program Cost
–	(U)		Continue C-17 Development $2,122
–	(U)		Continue Test and Evaluation $1,050
–	(U)	$400	Continue Modeling and Analysis
–	(U)		Continue Verification and Validation $100
–	(U)		Continue Mission Support $1,311
–	(U)		Identified as a source for SBIR $159
–	(U)		ASTE Total $5,142

LAIRCM Program:

–	(U)	$100	Initiate Installation Analysis
–	(U)	$141	Initiate Technology Transition & Affordability Analysis
–	(U)	$293	Initiate Flight Testbed Design

– (U) $141 Initiate Modeling and Simulation
– (U) $72 Initiate Mission Support
– (U) $24 Identified as a source for SBIR
– (U) $771 LAIRCM Total

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AAR-47 Program

– (U) $190 Initiate Data Collection
– (U) $465 Initiate Modeling and Analysis Study
– (U) $21 Identified as a source for SBIR
– (U) $676 AAR-47 Total

– (U) $41,068 AIRCM Total

(U) FY 2000 ($ in Thousands):

(U) **CMWS Program:**

– (U) $26,080 Common Missile Warning System Joint Program Costs
– (U) $11,983 Continue F-16 aircraft (Group A) EMD integration
– (U) $3,000 Continue A-10 aircraft (Group A) EMD integration
– (U) $7,725 Continue Test and Evaluation (AF only)
– (U) $0 Continue and complete Military Worth Study (formerly called AOA)
– (U) $750 Continue Mission Support
– (U) $49,538 CMWS Total

(U) **ASTE Program:**

– (U) $0 ASTE Joint Program Cost
– (U) $106 Continue C-17 Development
– (U) $700 Continue Test and Evaluation
– (U) $330 Continue Verification and Validation
– (U) $400 Continue Modeling and Analysis
– (U) $751 Continue Mission Support
– (U) $2,287 ASTE Total

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(U) **LAIRCM Program:**
- (U) $400 Complete Flight Testbed Design
- (U) $100 Initiate Affordability Study
- (U) $1,720 Initiate and Complete Testbed Fabrication
- (U) $200 Continue Modeling & Simulation
- (U) $137 Continue Mission Support
- (U) $400 Initiate Flight Test Support
- (U) $2,957 LAIRCM Total

(U) **AAR-47 Program:**
- (U) $200 Complete Modeling & Analysis
- (U) $280 Conduct and complete Algorithm Development
- (U) $272 Conduct and complete Verification & Validation
- (U) $752 AAR-47 Total

- (U) $55,534 AIRCM Total

FY 2001 ($ in Thousands):

(U) **CMWS Program:**
- (U) $3,370 Common Missile Warning System Joint Program Costs
- (U) $7,410 Continue F-16 aircraft (Group A) EMD integration
- (U) $2,000 Continue A-10 aircraft (Group A) EMD integration
- (U) $6,480 Continue Test and Evaluation (AF only)
- (U) $800 Continue Mission Support
- (U) $20,060 CMWS Total

(U) **ASTE Program:**
- (U) $796 Continue C-17 Flare Development
- (U) $500 Continue Test & Evaluation
- (U) $300 Continue Verification and Validation
- (U) $300 Continue Modeling & Simulation
- (U) $456 Continue Mission Support

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– (U) $2,352 ASTE Total

(U) **LAIRCM Program:**
– (U) $250 Initiate Testbed Integration
– (U) $100 Conduct Acceptance Tests
– (U) $410 Continue Flight Test Support
– (U) $50 Continue Modeling and Simulation
– (U) $100 Conduct reporting activities
– (U) $100 Continue Mission Support
– (U) $1,010 LAIRCM Total

(U) **AAR-47 Program:**
– (U) $ 0 AAR-47 Total

– (U) $23,422 AIRCM Total

(U) B. Project Change Summary - Description of Significant Changes:
$2.396M was added in FY01 to continue development of ASTE flares.

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

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
(U) Aircraft Procurement, AF, PE 27442F Mods, F-16/A-10 CMWS, BA-5	11	0	0	782	56,517	83,057	94,381	99,194	Cont.	Cont.
(U) Procurement of Ammunition, AF, PE 28030F ASTE flares, BA-1, Appn 3011	0	4,886	4,835	4,828	4,980	4,990	4,767	4,873	Cont.	Cont.
(U) RDT&E, AF, PE 63270F EO/IR Warning & Countermeasures, BA-3, BPAC 691X, Funds multiple EO/IR Science and Technology projects	12,809	8,855	10,497	12,858	10,700	10,683	11,057	11,337	Cont.	Cont.

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(U) D. Acquisition Strategy:

The planned acquisition strategy is competitive cost-plus award fee.

LAIRCM will use existing Laser Infrared Flyout Experiment (LIFE) contract option which is cost-plus fixed fee.

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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) Project 3891, AIRCM																
(U) CMWS Contr Qual Test Start				*												
(U) CMWS Platform Integration					*											
(U) CMWS DT&E												X				
(U) CMWS IOT&E													X			
(U) CMWS MSIII (Mar 03)																
(U) ASTE DT&E – Fighter							X									
(U) ASTE DT&E – Covert				*												
(U) ASTE OT&E - Fighter									X							
(U) ASTE OT&E – Covert						X										
(U) ASTE MS III - Fighter										X						
(U) ASTE MS III - Covert							X									
(U) ASTE PDR - Transport						X										
(U) ASTE CDR – Transport							X									
(U) ASTE DT&E-Transport									X							
(U) ASTE OT&E -Transport											X					
(U) ASTE PDR - B-1B (TBD)																
(U) LAIRCM Dev Acq Strategy												X				
(U) LAIRCM MS II Documentation													X			
(U) LAIRCM RFP														X		
(U) AAR-47 SW Upgrade Contract						X										
(U) AAR-47 Collect/Validate False Alarm Data						X										
(U) AAR-47 Analyze Data									X							

* - Denotes a completed event X - Denotes a planned event

NOTE: CMWS Program currently in restructure. Milestones for DT&E, IOT&E and MSIII will slip to 4QFY00 at the earliest

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604270F EW Development
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(U) A. Project Cost Breakdown ($ in Thousands)

	FY 1998	FY 1999	FY 2000	FY 2001
(U) CMWS Program				
(U) CMWS Joint Program Costs	9,921	18,718	26,080	3,370
(U) F-16 aircraft (Group A) EMD integration	3,580	8,854	11,983	7,410
(U) A-10 aircraft (Group A) EMD integration	1,078	1,868	3,000	2,000
(U) Test and Evaluation (AF only)	7,047	2,969	7,725	6,480
(U) Modeling and Simulation (AF only)	300	0	0	0
(U) Military Worth Study (formerly called AOA)	1,046	360	0	0
(U) Mission Support	543	680	750	800
(U) Identified as a source for SBIR	0	1,030	0	0
Sub-Total CMWS Total	23,515	34,479	49,538	20,060
(U) ASTE Program				
(U) ASTE Prime Contract Costs	8,316	2,122	106	796
(U) ASTE Government Test & Evaluation	429	1,050	700	500
(U) ASTE Verification & Validation	133	100	330	300
(U) ASTE Modeling and Analysis	360	400	400	300
(U) ASTE Mission Support	789	1,311	751	456
(U) Identified as a source for SBIR	0	159	0	0
Sub-Total (ASTE)	10,027	5,142	2,287	2,352

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	FY 1998	FY 1999	FY 2000	FY 2001
(U) LAIRCM Program				
(U) LAIRCM Installation Analysis	0	100	0	0
(U) LAIRCM Tech Transition/Affordability Planning	0	141	0	0
(U) LAIRCM Modeling and Simulation	0	141	200	50
(U) LAIRCM Development Mission Support	0	72	137	100
(U) Flight Testbed Design	0	293	400	0
(U) Affordability Analysis	0	0	100	0
(U) Testbed Fabrication	0	0	1,720	0
(U) Flight Test Support	0	0	400	410
(U) Testbed Integration	0	0	0	250
(U) Acceptance Tests	0	0	0	100
(U) Reporting	0	0	0	100
(U) Identified as a source for SBIR	0	24	0	0
Sub-Total (LAIRCM)	0	771	2,957	1,010
(U) AAR-47 Program				
(U) AAR-47 Data Collection	0	190	0	0
(U) AAR-47 Modeling & Analysis	0	465	200	0
(U) AAR-47 Algorithm Development	0	0	280	0
(U) AAR-47 Verification & Validation	0	0	272	0
(U) Identified as a source for SBIR	0	21	0	0
Sub-Total (AAR-47)	0	676	752	0
Total (CMWS, ASTE, LAIRCM, and AAR-47)	33,542	41,068	55,534	23,422

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)		DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604270F EW Development	PROJECT 3891

(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							1,234				1,234
Product Development Organizations											
CMWS Sanders	CAAF/CPFF	Sep 95		52,002	28,408	5,730	4,533	16,844	1,136	Cont.	Cont.
CMWS Upgrade	TBD	TBD		38,198	0	0	0	4,457	4,504	Cont.	Cont.
CMWS Integration	CPAF	Various		68,829	20,128	4,735	11,471	15,208	9,541	Cont.	Cont.
ASTE – Tracor	CPAF	Nov 95		Cont.	8,324	8,316	2,122	106	796	Cont.	Cont.
LAIRCM - Lockheed Martin Akron OH	CPFF	TBD		3,400	0	0	700	2,450	250	0	3,400
AAR-47 - GTRI	TBD	2Q99		0	0	0	655	752	0	0	1,407
Support and Management Organizations											
CMWS – CAS INC	CPFF	Sept 95		31,651	14,830	4,006	3,720	2,913	2,394	Cont.	Cont.
CMWS – MWS	T&M	Jun 97		4,190	927	1,046	1,092	1,125	0	0	4,190
CMWS – Mod & Sim	Various			2,596	2,296	300	0	0	0	0	2,596
CMWS -Misc	Various			22,298	5,644	500	3,537	3,655	1,885	Cont.	Cont.

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)											DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development				PE NUMBER AND TITLE 0604270F EW Development						PROJECT 3891	
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
ASTE M&A – SAIC	PR	Various		2,554	1,149	305	400	400	300	0	2,554
ASTE V&V – Mac B	PR	Various		1,089	226	133	100	330	300	0	1,089
ASTE – Misc	Various	Various		Cont.	35,460	844	1,311	751	456	Cont.	Cont.
LAIRCM Flight A/C Support - contractor TBD	TBD	June 99		1,416	0	0	47	507	760	Cont.	Cont.
Test and Evaluation Organizations											
ASTE – 46TW	Various	Various		2,897	750	147	800	700	500	Cont.	2,897
ASTE – Misc	Various	Various		Cont.	0	282	250	0	0	Cont.	Cont.
46TW/AFFTC/ Sanders Support	Various	Various		36,050	10,045	7,198	9,096	5,336	600	2,522	34,797

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BUDGET ACTIVITY 5 - Engineering and Manufacturing Development				PE NUMBER AND TITLE 0604270F EW Development					PROJECT 3891
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
Product Development Property: Not Applicable										
Support and Management Property: Not Applicable										
Test and Evaluation Property: Not Applicable										
Subtotal Product Development				56,860	18,781	19,481	39,817	16,227	Cont.	Cont.
Subtotal Support and Management				60,532	7,134	10,207	9,681	6,095	Cont.	Cont.
Subtotal Test and Evaluation				10,795	7,627	10,146	6,036	1,100	Cont.	Cont.
Identified as a source for SBIR				0	0	1,234	0	0	0	1,234
Total Project				128,187	33,542	41,068	55,534	23,422	Cont.	Cont.

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604270F EW Development

PROJECT: 3945

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
3945 RF Towed Decoy Systems	29,433	41,936	31,124	28,075	35,590	30,978	31,624	32,281	Continuing	Continuing

Note: RDT&E funds are used for integration, lab, and test assets. Hardware is purchased by component, not as a complete upgrade kit, therefore aircraft funding does not completely portray the ALE-50/IDECM Programs.

(U) A. Mission Statement:

(U) This project develops, integrates and tests radio frequency (RF) towed decoy systems on several aircraft. RF towed decoys are low cost countermeasures that provide increased survivability against monopulse, semi-active, and active RF missile threats during the terminal portion of an engagement. The program is developing two classes of decoy systems, the ALE-50 and the Integrated Defensive Electronic Countermeasures (IDECM). Both of these efforts are joint programs with the Navy as lead service. Air Force funding pays for unique Air Force development requirements and integration and test on Air Force platforms.

(U) ALE-50: The Air Force ALE-50 program is developing, integrating, and testing a modified version of the Navy's ALE-50 decoy system for the F-16 and B-1B. The components of the F-16 system include: the F-16 pylon assembly (modified 16S350 pylon), launcher/controller, magazines, canister, towline assembly, and the ALE-50 decoy called the Advanced Airborne Expendable Decoy (AAED). The major components of the B-1B system include: the Multi-Platform Launch Controller (MPLC), launcher, magazine, canister, towline assembly and the AAED.

(U) IDECM: The Air Force is participating in IDECM to jointly develop a common IDECM techniques generator (TG) and a high power Fiber Optic Towed Decoy (FOTD). Air Force funding pays for unique Air Force development costs under IDECM as well as integration and test on the F-15. The Defensive Suppression Upgrade Program (DSUP) program will fund integration and test of IDECM hardware on the B-1B.

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BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604270F EW Development	PROJECT 3945

(U) FY 1998 ($ in Thousands):
- (U) $1,156 Completed ALE-50 Common Launcher Development
- (U) $325 Completed ALE-50 Test Support
- (U) $1,195 Completed ALE-50 Mission Support
- (U) $23,072 Continued IDECM Common
- (U) $2,593 Continued IDECM F-15
- (U) $1,092 Continued IDECM Mission Support
- (U) $29,433 Total

(U) FY 1999 ($ in Thousands):
- (U) $21,425 IDECM Common
- (U) $17,750 Continue IDECM F-15
- (U) $1,501 Continue Mission Support
- (U) $1,260 Identified as a source for SBIR
- (U) $41,936 Total

(U) FY 2000 ($ in Thousands):
- (U) $2,236 IDECM Common
- (U) $27,362 Continue IDECM F-15
- (U) $1,526 Continue Mission Support
- (U) $31,124 Total

(U) FY 2001 ($ in Thousands):
- (U) $716 IDECM Common
- (U) $26,209 Continue IDECM F-15
- (U) $1,150 Continue Mission Support
- (U) $28,075 Total

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

In FY98 the ALE-50/B-1 integration went to a B-1 P3I program which freed up money for the ALE-50 common launcher, i.e., the Dual Compatible Launcher development effort. The F-15 program was rephased to accommodate the funding profile.

In FY99 and FY00 the F-15 program was rephased to accommodate the funding profile.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604270F EW Development
	PROJECT 3945

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

ALE-50	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
(U) Aircraft Procurement, AF PE 27442F										
(U) Mods (F-16 &B-1B), BP-11	$59,076									
(U) War Consumable (decoys), BP-17	$33,136	$25,533	$20,853	$32,283	$28,588	$50,538	$46,048	$47,084	Cont.	Cont.
(U) Aircraft Procurement, AF PE 27133F										
(U) Mods (F-16), BP-11		$18,662	$18,176	$18,334	$5,143	$1,426	$0	$9,741	Cont.	Cont.
(U) Aircraft Procurement, AF PE 11126F										
(U) Mods (B-1B), BP-11		$33,124	$35,954	$32,650	$29,421	$5,549	$3,368	$0	Cont.	Cont.

IDECM	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
(U) Aircraft Procurement, AF PE 27442F										
(U) War Consumable (decoys), BP-17	$0	$0	$0	$4,334	$17,705	$24,897	$52,557	$53,607	Cont.	Cont.
(U) Mods (B-1B), BP-11	$20,425	$0	$0	$6,306	$7,687	$6,914	$7,099	$7,244	Cont.	Cont.
(U) Mods (F-15), BP-11	$0	$0	$0	$0	$8,233	$21,670	$22,239	$22,692	Cont.	Cont.

(U) D. Acquisition Strategy:

The acquisition strategy for ALE-50 is sole source, cost-plus, or firm fixed price.
The acquisition strategy for IDECM is competitive, cost-plus.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604270F EW Development	PROJECT 3945

(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) B-1B ALE-50 Milestone III		*														
(U) 1x 4 Dual Compatible Launcher Production Decision						X										
(U) Integrated MPLC Joint Program Review						X										
(U) F-15/FOTD Integration Decision MSII		*														
(U) F-15/FOTD Integration Contract Award						X										
(U) IDECM DT/OT&E							X									
(U) IDECM DT2B						X										
(U) First USAF Subsystem Delivery (IDECM)						X										
(U) F-15/FOTD PDR									X							
(U) B-1B DSUP FTRR										X						
(U) F-15/FOTD CDR												X				
(U) F-15/FOTD TRR														X		
(U) B-1B DSUP DT/OT&E														X		
(U) F-15/FOTD DT/OT&E																X

Note: See Change Summary

* - Denotes a completed event
X - Denotes a planned event

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604270F EW Development PROJECT 3945

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) ALE-50 Common	1,156	0	0	0
(U) IDECM Common	23,072	21,425	2,236	716
(U) IDECM F-15	2,593	17,750	27,362	26,209
(U) Mission and Test Support	2,612	1,501	1,526	1,150
(U) Identified as a source for SBIR	0	1,260	0	0
(U) Total	29,433	41,936	31,124	28,075

(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							1,260				1,260
Product Development Organizations											
B-1 ALE-50 – Rockwell/ (Boeing North American)	CPAF	Apr 95	14,294	14,294	14,294	0	0	0	0	0	14,294

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)											DATE: February 1999
BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development					PE NUMBER AND TITLE: 0604270F EW Development						PROJECT: 3945
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
ESGD- Raytheon: USAF AN/ALE-50 EMD/ Support Contract – ESGD Raytheon	CPIF/FFP/ T&M	Jan 96	11,027	11,027	10,157	616	0	0	0	0	10,773
ALQ-184 (V)9 ESGD-Raytheon	CPFF	Jan 96	1,212	1,212	908	304	0	0	0	0	1,212
USAF IDECM: Development Sanders	CPAF	Nov 95	40,658	40,658	8,351	17,116	14,540	651	0	0	40,658
Development ESGD	CPIF	Jan 96	11,009	11,009	116	5,810	5,083	0	0	0	11,009
F-15 IDECM Integration- McAir/Northrop/ Lockheed Martin	CPFF	Aug 97	120,112	120,112	2,488	2,593	17,750	27,362	26,209	Cont.	Cont.
IDECM Misc Development Contracts	Misc		8,855	8,855	442	358	1,802	1,585	716	Cont.	Cont.
Total Prime					36,756*	26,797	39,175	29,598	26,925	Cont.	Cont.

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604270F EW Development

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
Support and Management Organizations											
ASC/SM/YF											
ALE-50	Misc	As required	N/A		1,250	1,195	0	0	0	0	2,445
IDECM	Misc	As required	N/A		1,250	1,092	1,501	1,526	1,150	Cont.	Cont.
Total Support and management					2,500*	2,287	1,501	1,526	1,150	Cont.	Cont.
Test and Evaluation Organizations											
AFOTEC			N/A		1,545	55	0	0	0	0	1,600
Edwards			N/A		10	146	0	0	0	0	156
ALQ-184 v(9) flight test			N/A	N/A	300	124	0	0	0	0	424
Total Test					1,855*	325	0	0	0	0	2,180

* The funding prior to FY98 includes only FY97. The funding prior to FY97 was transferred from a classified PE. The total program and EACs include funding from FY97 and out because of the classified PE in FY96 and prior.

(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
Product Development Property:										
Not Applicable										

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604270F EW Development

PROJECT: 3945

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
Support and Management Property: Not Applicable										
Test and Evaluation Property: Not Applicable										
Subtotal Product Development				36,756*	26,821	39,175	29,598	26,925	Cont.	Cont.
Subtotal Support and Management				2,500*	2,287	1,501	1,526	1,150	Cont.	Cont.
Subtotal Test and Evaluation				1,855*	325	0	0	0	0	2,180
Identified as a source for SBIR				0	0	1,260	0	0	0	1,260
Total Project				41,111*	29,433	41,936	31,124	28,075	Cont.	Cont.

* The funding prior to FY98 includes only FY97. The funding prior to FY97 was transferred from a classified PE. The total program and EACs include funding from FY97 and out because of the classified PE in FY96 and prior.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE: February 1999
BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE: 0604270F EW Development	PROJECT: 4832

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
4832 Precision Location and Identification (PLAID)	0	4,471	0	0	0	0	0	0	0	4,471

(U) A. Mission Statement

(U) PLAID will enhance aircrew situational awareness by providing precise on-board ground emitter location and Specific Emitter Identification (SEI). The improved situational awareness will allow combat pilots to effectively avoid RF SAM threats with minimal impact on mission goals. PLAID's emitter geolocation capability make it a candidate for SEAD targeting. PLAID goals include achieving precise geolocation and SEI at minimal cost by using existing aircraft RWR antennas and wiring (Group A hardware). By using the aircraft's radar warning receiver (RWR) antenna system, a 360 degree field view is achieved. PLAID development is currently focused on the ALR-69 RWR but PLAID technology can also be applied to other RWRs and platforms such as the ALR-56, ALR-67, and ERWE II as used on F-16s, F-15s, F-14s, and F/A-18s. PLAID has been identified as a critical technology for JSF, UCAVs, and advanced SEAD platforms. PLAID for ALR-69 RWR focuses on replacement of the ALR-69 frequency selectable receiver system (FSRS). The FSRS will be replaced with digital receiver assemblies, multi-channel receiver capability, and appropriate software. Techniques used include Doppler shift measurements, time of arrival measurements, high resolution signal measurement to collect unintentional modulation on pulse data, and coherent pulse processing.

(U) FY 1998 ($ in Thousands):
- (U) $0 Total

(U) FY 1999 ($ in Thousands):
- (U) $644 Establish Program Office
- (U) $2,193 Continue Lab Risk Reduction Efforts (Refine PLAID hardware and Software risk reduction activities, develop system specification)
- (U) $1,500 Military Worth Study (formerly called AOA)
- (U) $134 Identified as a source for SBIR
- (U) $4,471 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604270F EW Development
	PROJECT 4832

(U) FY 2000 ($ in Thousands):
– (U) $0 Total

(U) FY 2001 ($ in Thousands):
– (U) $0 Total

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

Funding: In response to a Congressionally directed increase, $4.5M was added to this program element to transition the program from an Advanced Technology Demonstrator (ATD) into a EMD program.

Schedule: This program is transitioning from Advanced Development to EMD in FY99. The first Doppler ranging flight demonstration was conducted in May 1995. An F-15 PLAID hardware, identification and ranging demonstration was successfully completed in April 1998. The final PLAID demonstration of the real-time location algorithms will be completed in Mar 99. A detailed schedule will be developed as the program moves into EMD.

Technical: Perform risk reduction activities to transition the PLAID system from a 6.3 advanced development to the Engineering and Manufacturing Development phase.

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

Not Applicable

(U) D. Acquisition Strategy

Acquisition strategy is being developed by the program transition team.

(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) PLAID Demonstration						X										

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE
	February 1999

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
5 - Engineering and Manufacturing Development	0604270F EW Development	4832

	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) PMD Approval						X										
(U) Establish Program Office						X										
(U) Begin Management Transition							X									

* - Denotes a completed event
X - Denotes a planned event

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604270F EW Development
	PROJECT 4832

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Establish Program Office	0	644	0	0
(U) Continue Lab Risk Reduction Efforts (Refine PLAID hardware and Software risk reduction activities, develop system specification)	0	2,193	0	0
(U) Military Worth Study (formerly called AOA)	0	1,500	0	0
(U) Identified as a source for SBIR	0	134	0	0
(U) Total	0	4,471	0	0

(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							134				134

Product Development Organizations
Not Applicable

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)		DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604270F EW Development	PROJECT 4832

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
Support and Management Organizations											
Not Applicable											
Test and Evaluation Organizations											
Not Applicable											

(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
Product Development Property										
Not Applicable										
Support and Management Property										
Not Applicable										
Test and Evaluation Property										
Not Applicable										
Subtotal Product Development				0	0	3,193	0	0		3,193
Subtotal Support and Management				0	0	644	0	0		644

					DATE	**February 1999**
BUDGET ACTIVITY **5 - Engineering and Manufacturing Development**	PE NUMBER AND TITLE **0604270F EW Development**					
Subtotal Test and Evaluation	0	0	500	0	0	500
Identified as a source for SBIR	0	0	134	0	0	134
Total Project			4,471			4,471

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604441F Space Based IR Arch (EMD) (Space)

PROJECT: 3616

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
3616 SBIRS High Element EMD	337,943	539,361	328,653	475,257	376,182	247,588	123,131	95,949	391,900	3,398,992
Quantity of RDT&E Articles	0	0	0	1	1	0	1	1	0	4

Notes: One each HEO sensor delivered in FY01 and FY02, one each GEO spacecraft delivered in FY04 and FY05

(U) A. Mission Description

(U) The Space-Based Infrared System's (SBIRS) primary mission is to provide initial warning of a ballistic missile attack on the US, its deployed forces or its allies. SBIRS will incorporate new technologies to enhance detection; improve reporting of ICBM, SLBM and tactical ballistic missiles; and provide critical mid-course tracking and discrimination data for national and theater missile defense. This will provide increased performance in order to meet requirements in US Space Command's Capstone Requirements Document and Operations Requirements Document. SBIRS will consist of satellites in Geosynchronous Orbits (GEO), Highly Elliptical Orbits (HEO) and Low Earth Orbits (LEO) and an integrated centralized ground station serving all SBIRS space elements and Defense Support Program (DSP) satellites. This Program Element funds the GEO & HEO portions of SBIRS with their associated ground elements.

(U) FY 1998

- (U) $322,243 Continue EMD contracts for Space and Ground segment development
- (U) $ 5,500 Continue System Program Office Support
- (U) $ 10,200 Technical analysis and independent verification and validation of contractor by FFRDC
- (U) $337,943 Total

(U) FY 1999

- (U) $504,714 Continue EMD contracts for Space and Ground segment development
- (U) $ 5,460 Continue System Program Office Support
- (U) $ 11,340 Technical analysis and independent verification and validation of contractor by FFRDC
- (U) $ 17,847 Identified as a source for Small Business Innovative Research (SBIR)
- (U) $539,361 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604441F Space Based IR Arch (EMD) (Space)
	PROJECT 3616

(U) FY 2000

–	(U) $311,253	Continue EMD contracts for Space and Ground segment development
–	(U) $ 5,850	Continue System Program Office Support
–	(U) $ 11,550	Technical analysis and independent verification and validation of contractor by FFRDC
–	(U) $328,653	Total

(U) FY 2001

–	(U) $457,357	Continue EMD contracts for Space and Ground segment development
–	(U) $ 5,930	Continue System Program Office Support
–	(U) $ 11,970	Technical analysis and independent verification and validation of contractor by FFRDC
–	(U) $475,257	Total

(U) B. Budget Activity Justification:

(U) This program is assigned to Budget Activity 5, Engineering and Manufacturing Development because it funds the EMD activities for the SBIRS High program.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604441F Space Based IR Arch (EMD) (Space)
	PROJECT 3616

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget(FY1999 PB)	316,467	538,438	564,239	395,905	2,801,661
(U) Appropriated Value	338,413	541,938			
(U) Adjustments to Appropriated Value					
a. Cong Gen Reductions	-13,580	-2,577			
b. SBIR	-8,366				
c. Omnibus or Other Above Threshold Reprogram	21,600				
d. Below Threshold Reprogramming	-124				
e. Rescissions					
(U) Adjustments to Budget Years Since FY1999 PB			-235,586	79,352	574,656
(U) Current Budget Submit/FY 2000 PB	337,943	539,361	328,653	475,257	3,376,317

(U) Significant Program Changes:

Funding: FY98: $21.600M Above Threshold Reprogramming approved by Congress.
FY99: $17.847M identified as a source for Small Business Innovative Research (SBIR).
FY00 and FY01 adjustments are due to program restructure.
FY01-FY05: Funding for GEO3 satellite has been changed from RDT&E to Procurement.

Schedule: The SBIR High program was restructured and the first SBIRS geosynchronous satellite launch delayed from 4QFY02 to 4QFY04.

(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 Complete	Total Cost
(U) Missile Procurement (PE 0305915F, BA-45, P-1-N/A)	0	0	0	12,000	24,000	174,350	225,908	188,220	Cont	Cont
(U) Other Procurement (PE 0305915F, BA-45, P-1-N/A)	0	0	0	0	31,208	0	0	0	0	31,208

Related RDT&E:

(U) PE 603441F - SBIRS Dem/Val
(U) PE 305911F - DSP
(U) PE 604442F - SBIRS Low EMD

(U) E. Acquisition Strategy:

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604441F Space Based IR Arch (EMD) (Space)
	PROJECT 3616

(U) SBIRS is a lead program for acquisition streamlining. The pre-EMD contracts were competed in full and open competition. Two contracts were awarded to Lockheed/Loral/Aerojet and Hughes/TRW for the pre-EMD phase. A single contract was awarded to Lockheed Martin for the EMD phase.

(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) High Orbiting Space Vehicle /Spacecraft Preliminary Design Review	X															
(U) Ground Inc-2 Preliminary Design Review	X															
(U) System Preliminary Design Review	X															
(U) Payload Critical Design Review*							X									
(U) Ground Inc-1- Consolidated DSP Stations*								X								
(U) Ground Inc.-2 Critical Design Review*								X								
(U) HEO Payload #1 Delivered																X
(U) HEO Payload #2 Delivery (FY02)																
(U) GEO Satellite #1 Delivery(FY04)																
(U) GEO Satellite #2 Delivery(FY05)																

* Items subject to change upon contractual implementation of the two year delay.

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604441F Space Based IR Arch (EMD) (Space)
	PROJECT 3616

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) EMD Contract	322,243	504,714	311,253	457,357
(U) System Program Office Support	5,500	5,460	5,850	5,930
(U) Aerospace Corp	10,200	11,340	11,550	11,970
(U) Identified as a source for SBIR		17,847		
(U) Total	337,943	539,361	328,653	475,257

(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							17,847				17,847
Product Development Organizations											
LMMS & TRW (Pre-EMD)	C/CPFF	Jul 95	217,880	217,880	217,880	0	0			0	217,880
LMMS (EMD)	C/CPAF	Nov 96			171,918	322,243	504,714	311,253	457,357	1,138,950*	2,906,435*
TBD(Technology)	Various	Sep 95	11,600	11,600	11,600	0	0			0	11,600
TBD(Phenom)	Various	Sep 95	17,350	17,350	17,350	0	0			0	17,350
Sandia Nat'l Lab (Cobra Brass)	Various	Sep 95	10,000	10,000	10,000	0	0			0	10,000
Support and Management Organizations											
Aerospace Corp	MORD	Sep 95	N/A	N/A	29,400	10,200	11,340	11,550	11,970	64,800	139,260
Prgm Mgmt Supt	Various	Sep 95	N/A	N/A	20,100	5,500	5,460	5,850	5,930	31,000	73,840
Test and Evaluation Organizations											
Not Applicable											

		DATE
		February 1999
BUDGET ACTIVITY **5 - Engineering and Manufacturing Development**	PE NUMBER AND TITLE **0604441F Space Based IR Arch (EMD) (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

*Subject to change upon negotiation of contract changes related to the schedule slip and the financing change for GEO 3.

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604441F Space Based IR Arch (EMD) (Space)
	PROJECT 3616

(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
Government Furnished Property: Not Applicable.											
Identified as a source for SBIR							17,847				17,847
Subtotal Product Development					428,748	322,243	504,714	311,253	457,357	1,138,950	3,163,265
Subtotal Support and Management					49,500	15,700	16,800	17,400	17,900	95,800	213,100
Subtotal Test and Evaluation					0	0	0			0	0
Adjustment (SBIRS Pre-EMD Contract Adjustments)					4,780						4,780
Total Project					483,028	337,943	539,361	328,653	475,257	1,234,750	3,398,992

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604442F Space Based Infrared Sys(SBIRS) Low

PROJECT: 4598

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
4598 SBIRS Low Element EMD	0	33,218	77,651	147,933	291,138	623,198	770,787	492,080	456,300	2,892,305
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	3	3

(U) A. Mission Description

(U) The Space-Based Infrared System's (SBIRS) primary mission is to provide initial warning of a ballistic missile attack on the US, its deployed forces or its allies. SBIRS will incorporate new technologies to enhance detection; improve reporting of ICBM, SLBM and tactical ballistic missiles; and provide critical mid-course tracking and discrimination data for national and theater missile defense. This system will provide increased performance in order to meet requirements in US Space Command's Capstone Requirements Document and Operations Requirements Document. SBIRS will consist of satellites in Geosynchronous Orbits (GEO), Highly Elliptical Orbits (HEO) and Low Earth Orbits (LEO) and an integrated centralized ground station serving all SBIRS space elements and Defense Support Program (DSP) satellites. This PE, combined with PE #603441F, funds the SBIRS Low Program Definition Risk Reduction (PDRR) activities and leads to Engineering , Manufacturing and Development (EMD). SBIRS Low is the LEO component of SBIRS.

(U) FY 1998 ($ in Thousands):
- (U) $0 Not Applicable

(U) FY 1999 ($ in Thousands):
- (U) $29,106 Program Definition
- (U) $ 3,000 Radiation Hardened Parts
- (U) $ 92 Program Office Activities
- (U) $ 1,020 Identified as a source for Small Business Innovative Research (SBIR)
- (U) $33,218 Total

(U) FY 2000 ($ in Thousands):
- (U) $ 74,651 Program Definition
- (U) $ 3,000 Radiation Hardened Parts
- (U) $ 77,651 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604442F Space Based Infrared Sys(SBIRS) Low
	PROJECT 4598

(U) FY 2001 ($ in Thousands):
- (U) $ 3,000 Radiation Hardened Parts
- (U) $ 17,804 Program Office Activities
- (U) 127,129 Program Definition
- (U) $147,933 Total

(U) B. Budget Activity Justification:

(U) This Program Element is in Budget Activity 5, Engineering and Manufacturing Development because it funds Program Definition efforts including initial system design and Engineering and Manufacturing Development activities for the LEO portion of the SBIRS program

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY 1999 PB)	0	33,328	79,064	148,749	2,760,563
(U) Appropriated Value	0	33,328			
(U) Adjustments to Appropriated Value					
a. Cong Gen Reductions		-110			
b. SBIR					
c. Omnibus or Other Above Threshold Reprogram					
d. Below Threshold Reprogram					
(U) Adjustments to Budget Years Since FY 1999 PB			-1,413	-816	131,742
(U) Current Budget Submit/FY 2000 PB	0	33,218	77,651	147,933	2,892,305

(U) Significant Program Changes:

Funding: FY99 $1.020M identified as a source for Small Business Innovative Research (SBIR).

Schedule: Program restructured and SBIRS Low first launch delayed from 4QFY04 to 4QFY06. EMD contract award is moved from 2QFY01 to 4QFY02.

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

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604442F Space Based Infrared Sys(SBIRS) Low
PROJECT 4598	

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY2003	FY 2004	FY 2005	Total Cost
(U) PE 35922F - SBIRS Low Prod						33,100	101,400	328,390	3,999,500

Related RDT&E:
(U) PE 0603441F - SBIRS Dem/Val
(U) PE 0305911F - DSP
(U) PE 0604441F - SBIRS High EMD

(U) E. Acquisition Strategy:
(U) The SBIRS program is managed through a single consolidated System Program Office (SPO) at the Space and Missile Systems Center, Los Angeles Air Force Base, CA. SBIRS Low will begin program definition activities in FY99 with award of up to two firm fixed price contracts. Program Definition will be followed by a competitive contract for EMD. The SBIRS Low EMD contract is scheduled for award in 4QFY02 with deployment of the SBIRS Low satellites begining in 4QFY06.

(U) F. Schedule Profile

	FY 1999				FY 2000				FY 2001			
	1	2	3	4	1	2	3	4	1	2	3	4
(U) Program Definition Contract Award			X									
(U) System Requirements Review								X				
(U) Preliminary Design Review (2QFY02)												
(U) EMD Contract Award (4QFY02)												
(U) EMD Critical Design Review (3QFY03)												
(U) SBIRS Low First Launch (4QFY06)												

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604442F Space Based Infrared Sys(SBIRS) Low

PROJECT: 4598

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Program Definition	0	$29,106	$74,651	$127,129
(U) Radiation Hardened Parts	0	$3,000	$3,000	$3,000
(U) Program Office Activities	0	$92	$0	$17,804
(U) Identified as a source for SBIR		1,020		
(U) Total	0	$33,218	$77,651	$147,933

(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							1,020				1,020
Product Development Organizations											
PDRR / EMD	Various	FY99			0	0	32,106	74,651	127,129	2,323,103	2,553,989
Rad Hard Parts	TBD	TBD			0	0	3,000	3,000	3,000	6,000	15,000
Support and Management Organizations											
Program Support	Various	Various	N/A	N/A	0	0	92	0	17,804	304,400	322,296
Test and Evaluation Organizations:											
Not Applicable											
Government Furnished Property:											
Not Applicable											
Identified as a source for SBIR							1,020				1,020
Subtotal Product Development					0	0	32,198	77,651	130,129	2,329,103	2,568,989
Subtotal Support and Management					0	0	92	0	17,804	304,400	322,296
Subtotal Test and Evaluation					0	0	0	0	0	0	0
Total Project					0	0	33,218	77,651	147,933	2,633,503	2,892,305

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604479F Milstar LDR/MDR Sat Comm (Space)

PROJECT: 5010

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
5010 Milstar Sat Comm Sys	609,676	546,509	361,308	225,757	108,616	52,537	1,466	1,465	0	9,540,386
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

Milstar is a joint service program to develop and acquire extremely high frequency (EHF) satellites; a satellite mission control segment; and new or modified Army, Navy, and Air Force communication terminals for survivable, jam-resistant, worldwide, secure communications to strategic and tactical warfighters. Milstar I Satellites 1 and 2 have a low data rate (LDR) payload that supports strategic and tactical forces with emphasis on highly survivable, minimum essential communications. Milstar II Satellites 3M-6 have both LDR and medium data rate (MDR) payloads with increased tactical capabilities, including higher data rates to mobile forces and "nulling" that will neutralize close-in enemy jammers. (Satellite 3M was originally a Milstar I satellite, but it is being retrofitted with a MDR payload to function as a Milstar II satellite.) Milstar Terminals are funded under Program Element 0303601F.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE: February 1999
BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE: 0604479F Milstar LDR/MDR Sat Comm (Space) / PROJECT: 5010

(U) FY 1998

–	(U)	$528,476	Milstar II
–	(U)		Completed Satellite 3M integration and test
–	(U)		Completed Satellite 4 LDR and MDR payload integration and test, and started satellite integration and test
–	(U)		Completed Satellite 5 LDR and MDR payload and bus component manufacturing
–	(U)		Started Satellite 5 LDR and MDR payload integration and test
–	(U)		Continued Satellite 6 LDR and MDR payload and bus manufacturing
--	(U)		Continued Milstar component integration support
–	(U)		Implemented ECPs as needed based on operational requirements
–	(U)		Continued Milstar II MCS software upgrade for mission planning
–	(U)		Continued Milstar software support
–	(U)		Developed and fielded operator training equipment
–	(U)	$27,030	Milstar I/II Satellite Engineering
–	(U)		Continued Satellite 3 technical pre-launch support
–	(U)		Continued Satellites 1 and 2 on-orbit operations support
–	(U)		Continued LDR and MDR technical support
–	(U)	$22,782	Automated Communications Management System
–	(U)		Delivered software build 1, increment 2
--	(U)		Continued software build 1, increment 3
--	(U)		Started software build 2 requirements development
–	(U)	$31,388	Basic Program Office support
–			
–	(U)	$609,676	Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE: 0604479F Milstar LDR/MDR Sat Comm (Space)
	PROJECT: 5010

(U) FY 1999

–	(U)	$443,390	Milstar II
–	(U)		Satellite 3M launch, perform on-orbit checkout, and begin on-orbit testing
–	(U)		Complete Satellite 4 integration and test
–	(U)		Complete Satellite 5 LDR and MDR payload integration and test, and start satellite integration and test
–	(U)		Continue Satellite 6 LDR and MDR payload and bus manufacturing
–	(U)		Continue Milstar component integration support
–	(U)		Implement ECPs as needed based on operational requirements
–	(U)		Continue Milstar II MCS software upgrade for mission planning
–	(U)		.Continue Milstar software support
–	(U)	$25,852	Milstar I/II Satellite Engineering
–	(U)		Satellites 3 and 4 technical launch and pre-launch support
–	(U)		Continue Satellites 1, 2, and 3 on-orbit operations support
–	(U)		Continue LDR and MDR technical support
–	(U)	$28,177	Automated Communications Management System
–	(U)		Complete software build 1, increment 3
–	(U)		Continue software build 2 development
–	(U)	$28,461	Basic Program Office support
–	(U)	$20,629	Identified as a source for SBIR
–	(U)	$546,509	Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604479F Milstar LDR/MDR Sat Comm (Space)
	PROJECT 5010

(U) FY 2000

–	(U)	$295,596	Milstar II
–	(U)		Complete Satellite 4 delivery
–	(U)		Satellite 4 launch, perform on-orbit checkout, and begin on-orbit testing
–	(U)		Complete Satellite 5 integration, test, and deliver
–	(U)		Complete Satellite 6 LDR and MDR payload integration and test, and start satellite integration and test
–	(U)		Continue Milstar component integration support
–	(U)		Implement ECPs as needed based on operational requirements
–	(U)		Continue Milstar II MCS software upgrade for mission planning
–	(U)		Continue Milstar software support
–	(U)	$25,000	Milstar I/II Satellite Engineering
–	(U)		Satellites 4 and 5 technical launch and pre-launch support
–	(U)		Continue Satellites 1, 2, 3 and 4 on-orbit operations support
–	(U)		Continue LDR and MDR technical support
–	(U)	$12,135	Automated Communications Management System
–	(U)		Continue software build 2 development
–	(U)		Continue maintenance of fielded software build 1
–	(U)	$28,577	Basic Program Office support
–	(U)	$361,308	Total

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604479F Milstar LDR/MDR Sat Comm (Space)
	PROJECT 5010

(U) FY 2001

–	(U)$179,673	Milstar II
–	(U)	Satellite 5 launch, perform on-orbit checkout, and begin on-orbit testing
–	(U)	Complete Satellite 6 integration, test and deliver
–	(U)	Continue Milstar component integration support
–	(U)	Implement ECPs as needed based on operational requirements
–	(U)	Continue Milstar software support
–	(U) $25,000	Milstar I/II Satellite Engineering
–	(U)	Satellites 5 and 6 technical launch and pre-launch support
–	(U)	Continue Satellites 1, 2, 3, 4 and 5 on-orbit operations support
–	(U)	Continue LDR and MDR technical support
–	(U) $8,759	Automated Communications Management System
–	(U)	Continue software build 2 development
–	(U)	Continue maintenance of fielded software
–	(U) $12,325	Basic Program Office support
–	(U)$225,757	Total

(U) B. Budget Activity Justification:

This program is in Budget Activity 5, Engineering and Manufacturing Development since it funds Milstar II development.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE: 0604479F Milstar LDR/MDR Sat Comm (Space) / PROJECT: 5010

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total
(U) Previous President's Budget (FY 1999 PB)	628,027	550,940	340,189	181,854	9,689,312
(U) Appropriated Value	676,690	550,940			
(U) Adjustments to Appropriated Value					
a. Congressional General Reductions	-27,829	-4,431			
b. SBIR	-20,953				
c. Omnibus or Above Threshold Reprogramming	-10,506				
d. Below Threshold Reprogramming (BTR)	-7726				
e. Rescissions					
(U) Adjustments to Budget Years Since FY 1999 PB			21,119	43,903	
(U) Current Budget Submit/FY 2000 PB	609,676	546,509	361,308	225,757	9,540,386

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(U) Significant Program Changes: 21.1M FY00 and 43.9M FY01 funding increases maintain Satellites 3-6 baseline launch schedules and funds system test tools and engineering support required to maintain low risk development and test program.
FY99: $20,629 identified as a source for SBIR

(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 Comp	Total
(U) Other Procurement, BP 83, Electronics and Telecommunications Equipment, Line Item P-69*	4,036	3,963	4,224	5,875	547	428	400	400	Cont	TBD

* PE 33601F (Other Procurement) funds Milstar AF-developed ground and airborne Command Post Terminals. PE 33601F also funds various AF MILSATCOM terminals.

(U) Related RDT&E:
(U) PE 0303601F, MILSATCOM Terminals
(U) PE 0603430F, Advanced MILSATCOM
(U) PE 0604577N, EHF Satellite Communications
(U) PE 0603432F, Polar Satellite Communications Program (Polar Adjunct)

	DATE **February 1999**
BUDGET ACTIVITY **5 - Engineering and Manufacturing Development**	PE NUMBER AND TITLE **0604479F Milstar LDR/MDR Sat Comm (Space)**

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE: February 1999
BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE: 0604479F Milstar LDR/MDR Sat Comm (Space) / PROJECT: 5010

(U) E. Acquisition Strategy:

Lockheed Martin was awarded a sole source contract to develop 6 Milstar protected communication satellites. The first two LDR satellites were launched in FY94 and FY95 and the last 4 LDR/MDR satellites will be launched in FY99, 00, 01, and 02.

(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) Milstar II (LDR/MDR)																
(U) Complete Sat 3M Integ and Test				*												
(U) Deliver ACMS Build 1, Inc 2			*													
(U) Satellite 3M Launch							x									
(U) Satellite 4 Launch										x						
(U) MDR IOT&E										x						
(U) IOC II													x			
(U) Satellite 5 Launch													x			
(U) Satellite 6 Launch - 1QFY02																
(U) FOC- 1QFY05																

*=completed event

x=planned event

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604479F Milstar LDR/MDR Sat Comm (Space)
	PROJECT 5010

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Milstar II	528,476	443,390	295,596	179,673
(U) Milstar I/II Satellite Engineering	27,030	25,852	25,000	25,000
(U) Automated Communications Management System	22,782	28,177	12,135	8,759
(U) Basic Program Office support	31,388	28,461	28,577	12,325
(U) Identified as a source for SBIR		20,629		
(U) Total	609,676	546,509	361,308	225,757

Note: The Project cost breakdown has been revised from the FY99 PB submission to align budget estimates with direct contract cost reporting. ACMS funding is broken out separately from Systems Engineering costs. Remaining Systems Engineering funding was combined with Milstar I & II Satellite costs. Mission Support costs are now reported as Satellite Engineering.

(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 20,629							20,629				
Product Development Organizations											
LMSC (Milstar I) [Sats 1,2,3L]	C/CPAF	Jun 83	2,181,587*	2,181,587*	4,727,752	0	0	0	0	0	4,727,752
LMSC (Milstar II) [Sats 3M, 4, 5, 6]	SS/CPAF	Oct 92/ Nov 94	3,364,483	3,364,483	2,376,400	499,284	424,153	266,129	155,738	51,647	3,773,351
LMSC (Satellite Engineering)	SS/CPAF	Sep 97	50,823	50,823	0	27,030	25,852	25,000	25,000	50,000	152,882
SPAWAR (ACMS)	SS/MIPR	Various			52,600	22,782	28,177	12,135	8,759	5,900	130,353

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604479F Milstar LDR/MDR Sat Comm (Space)

PROJECT: 5010

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
LINCOM	SS/CPAF	Various			18,692	4,122	3,903	3,955	2,495	3,804	36,971
Lincoln Lab	SS/MIPR	Various			20,489	4,000	3,800	3,800	1,000	1,000	34,089
Miscellaneous	Various	Various			190,719	21,070	11,534	21,712	20,439	32,292	297,766
Support and Management Organizations											
Aerospace	SS/CPFF/AF	Various			112,770	21,789	20,319	20,155	8,250	13,200	196,483
Miscellaneous	Various	Various			133,630	9,599	8,142	8,422	4,076	6,241	170,110

Test and Evaluation Organizations

None.

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604479F Milstar LDR/MDR Sat Comm (Space)
	PROJECT 5010

Government Furnished Property:

Product Development Property
None.

Support and Management Property
None.

Test and Evaluation Property
None.

Identified as a source for SBIR			20,629				20,629
Subtotal Product Development	7,386,652	578,288	497,419	332,731	213,431	144,643	9,153,164
Subtotal Support and Management	246,400	31,388	28,461	28,577	12,326	19,441	366,593
Subtotal Test and Evaluation	0	0	0	0	0	0	0
Total Project	7,633,052	609,676	546,509	361,308	225,757	164,084	9,540,386

* Due to the overrun on the Milstar I contract, an Over Target Baseline (OTB) was established in Jan 91 to provide a credible cost performance baseline for the remaining contractual effort. The EAC reflects the unclassified cost of remaining work scheduled after the Jan 91 rebaseline. The total program value includes all unclassified prior funding (approx $4 billion in FY82 - 92) and all unclassified fees & incentives.

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604480F Global Positioning System Block IIF (Space)

PROJECT: 0005

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
0005 NAVSTAR GPS BLOCK IIF	69,152	73,339	0	0	0	0	0	0	0	197,984
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

Note: GPS Block IIF development funding is consolidated into PE 35165F starting in FY00 in order to combine all Block IIF activities into a single PE.

(U) A. Mission Description

Activities include satellite design and development; control system, training simulator, and Mission Operation Support Center development and test; satellite upgrade design and development; control system, simulator and support center software upgrades; and R&D efforts to support NAVSTAR Global Positioning System (GPS) Block IIF deployment.

(U) FY 1998 ($ in Thousands):

- (U) $ 54,926 Continued Block IIF - System Sustainment Satellite System Development
- (U) $ 11,232 Continued Block IIF - System Sustainment Ground System/Simulator Development
- (U) $ 2,730 GPS Modernization Studies
- (U) $ 20 Clock Technology Development
- (U) $ 30 Launch Support
- (U) $ 214 Mission Support
- (U) $ 69,152 Total

(U) FY 1999 ($ in Thousands):

- (U) $ 30,025 Continue Block IIF - System Sustainment Satellite System Development
- (U) $ 3,390 Clock Technology Development
- (U) $ 27,153 Continue Block IIF - System Sustainment Ground System/Simulator Development
- (U) $ 10,230 GPS Modernization Studies
- (U) $ 90 Launch Support
- (U) $ 2,451 Identified as a source for SBIR
- (U) $ 73,339 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604480F Global Positioning System Block IIF (Space)
	PROJECT 0005

(U) FY 2000 ($ in Thousands): GPS Block IIF development funding is consolidated into PE 35165F starting in FY00

(U) B. Budget Activity Justification:

This PE is in Budget Activity 5 - Engineering and Manufacturing Development (EMD) and supports research and development of GPS Space and Control systems within the Block IIF Sustainment Program.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604480F Global Positioning System Block IIF (Space)
	PROJECT 0005

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY 1999 PB)	66,918	62,591	26,677	23,099	
(U) Appropriated Value	71,094	73,591			
(U) Adjustments to Appropriated Value					
a. Cong Gen Reductions	-2,354	-252			
b. SBIR	-1,832				
c. Omnibus or Other Above Threshold Reprogram					
d. Below Threshold Reprogramming	2,244				
e. Rescission					
(U) Adjustments to Budget Years Since FY 1999 PB			-26,677	-23,099	
(U) Current Budget Submit/FY 2000 PB	69,152	73,339	0	0	

(U) Significant Program Changes: $2,451K identified in FY 1999 as a source for SBIR. The FY 1998 reprogramming action and additional funds appropriated in FY 1999 were for GPS Modernization. FY 2000 through FY 2004 funds were transferred to PE 0305165F in order to consolidate all Block IIF efforts.

(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
N/A										

Related RDT&E:

(U) PE 0305165F, NAVSTAR GPS Space/Control

(U) PE 0305164F, NAVSTAR GPS User Equipment

(U) PE 0305913F Nuclear Detonation Detection System (NDS)

(U) PE 0305119F Space Boosters (Delta II)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604480F Global Positioning System Block IIF (Space)
	PROJECT 0005

(U) E. Acquisition Strategy: Single satellite development/production contract was competitively awarded in April 1996.

(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) GPS Modernization Studies Begin	*															
(U) Satellite Final Design Complete			*													
(U) GPS ORD Coordination Starts				*												
(U) GPS ORD Validation							X									
(U) GPS OIPT			*			X		X								
(U) GPS Program Review								X								

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604480F Global Positioning System Block IIF (Space)
	PROJECT 0005

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Satellite System Development	54,926	30,025		
(U) Clock Technology Development	20	3,390		
(U) Ground/Control System Development	11,232	27,153		
(U) Mission Support	214	0		
(U) GPS Modernization	2,730	10,230		
(U) Launch Support	30	90		
(U) Identified as a source for SBIR	0	2,451		
(U) **Total**	69,152	73,339		

(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							2,451				2,451
Product Development Organizations											
Block IIF Development, Boeing North America, Seal Beach, CA	FPAF/CPAF	Apr 96	Cont	Cont	55,267	68,590	67,498	0	0	0	191,355
Various	Various	Various	N/A	N/A	1,250	348	3,390	0	0	0	4,988
Support and Management Organizations											
Misc	Various	Various	N/A	N/A	1,427	214	0	0	0	0	1,641
Test and Evaluation Organizations											

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY **5 - Engineering and Manufacturing Development**	PE NUMBER AND TITLE **0604480F Global Positioning System Block IIF (Space)** PROJECT **0005**

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
N/A											
Government Furnished Property:											
N/A											
Identified as a source for SBIR							2,451				2,451
Subtotal Product Development					56,517	68,938	70,888	0	0	0	196,343
Subtotal Support and Management					1,427	214	0	0	0	0	1,641
Subtotal Test and Evaluation					0	0	0	0	0	0	0
Total Project					57,944	69,152	73,339	0	0	0	200,435

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

DATE: **February 1999**

BUDGET ACTIVITY: **5 - Engineering and Manufacturing Development**

PE NUMBER AND TITLE: **0604600F Munitions Dispenser Development**

PROJECT: **1015**

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
1015 Wind Corrected Munitions Dispenser (WCMD) Kit	17,605	7,315	0	0	0	0	0	0	0	144,149
Quantity of RDT&E Articles	6	0	0	0	0	0	0	0	0	173

(U) A. Mission Description

This project develops an inertially guided tail kit for CBU-87B, CBU-89B, and CBU-97B dispensers to provide corrections for the effects of wind transients and ballistic errors caused by wind when these munitions are released from medium to high altitudes. Wind Corrected Munitions Dispenser (WCMD) kit fitted weapons will improve effectiveness of both bombers and fighters and significantly contribute to Air Force war fighting capabilities. WCMD kit fitted CBU-97's dropped from bombers are key to stopping enemy armored forces.

(U) FY 1998 ($ in Thousands):

- (U) $12,312 Redesigned the tail kit to correct a control actuator assembly backdrive; completed subsystem design verification test
- (U) $1,384 Continued combined DT&E/IOT&E flight tests.
- (U) $2,159 Program management support; includes travel, program office supplies and equipment, training, and technical engineering support
- (U) $1,750 Completed integration on B-52 and continued integration on F-16 (Block 50)
- (U) $17,605 Total

(U) FY 1999 ($ in Thousands):

- (U) $3,456 Complete system level design verification testing to include contractor flight test mission
- (U) $117 Complete Development Testing/Operational Testing
- (U) $ 1,306 Program management support; includes travel, program office supplies and equipment, training, and technical engineering support
- (U) $2,300 Complete integration on F-16 (Block 50)
- (U) $136 Identified as a source for SBIR
- (U) $7,315 Total

(U) B. Budget Activity Justification:

This is funded in BA 5, Engineering and Manufacturing Development because it develops a weapon system.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE: 0604600F Munitions Dispenser Development — PROJECT: 1015

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

	FY1998	FY1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY 1999 PB)	17,519	7,559	0	0	144,720
(U) Appropriated Value	19,676	7,559			
(U) Adjustments to Appropriated Value					
a. Congressional General Reductions	-779	-244			
b. SBIR	-1,386				
c. Omnibus or Other Above Threshold Reprogram	-417				
d. Below Threshold Reprogramming	511				
(U) Adjustments to Budget Years Since FY 1999 PB					
(U) Current Budget Submit/FY 2000 PB	17,605	7,315	0	0	144,149

(U) Significant Program Changes:

FY99: $136 identified as a source for SBIR.

(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
(U) Procurement of Ammunition AF P-1 Line WCMD	7,829	13,816	48,875	99,181	106,517	79,035	78,489	70,826	0	504,568
(U) SEEK EAGLE, Procurement of Ammunition AF P-1 Line WCMD	4,012	0	0	0	0	0	136	0	0	4,148

(U) E. Acquisition Strategy:

A full and open competition in FY 1995 led to dual awards for a competitive development effort that included a competitive fly-off. The downselect to one contractor occured in Jan 1997. The Cost-Plus Award Fee (CPAF) Pilot Production contract awarded to Lockheed-Martin includes production options for five years on a Firm Fixed Price (FFP) basis.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604600F Munitions Dispenser Development PROJECT 1015

(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) Other Program Events																
DT/OT								X								
LRIP Decision				*												
LRIP Award 1/Award 2				*			X									
Milestone III								X								
FRP 1 Award										X						

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604600F Munitions Dispenser Development
	PROJECT 1015

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Major Contracts	12,312	3,456	0	0
(U) Support Contracts	1,623	768	0	0
(U) Program Office Support	536	538	0	0
(U) Test And Evaluation	1,384	117	0	0
(U) Aircraft Integration	1,750	2,300	0	0
(U) Identified as a source for SBIR	0	136	0	0
(U) Total	17,605	7,315	0	0

(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			N/A	N/A	0	0	136	0	0	0	136
Product Development Organizations											
Lockheed Martin	C/CPAF	Jan 99	81,620	81,620	65,852	12,312	3,456	0	0	0	81,620
Support and Management Organizations											
ASC/YH	N/A	various	N/A	N/A	4,189	536	538	0	0	0	5,263
Support Contracts	various	Oct 98	N/A	N/A	5,562	1,623	768	0	0	0	7,953

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)											DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development				PE NUMBER AND TITLE 0604600F Munitions Dispenser Development							PROJECT 1015
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											
46 OG/OGML	REO	Feb 99	N/A	N/A	6,882	1,384	117	0	0	0	8,383
Acft Integration	AF 616	Feb 99	N/A	N/A	28,170	1,750	2,300	0	0	0	32,220
(U) B. Budget Acquisition History and Planning Information Continued ($ in Thousands)											
Government Furnished Property:											
Product Development Property											
SFW/CEM/SE	FPIF	Apr 96	N/A	N/A	4,203	0	0	0	0	0	4,203
CMBRE	CPAF	Jul 97	N/A	N/A	4,371	0	0	0	0	0	4,371
Support and Management Property: Not Applicable											
Test and Evaluation Property: Not Applicable											
Identified as a source for SBIR					0	0	136	0	0	0	136
Subtotal Product Development					74,426	12,312	3,456	0	0	0	90,194
Subtotal Support & Management					9,751	2,159	1,306	0	0	0	13,216
Subtotal Test and Evaluation					35,052	3,134	2,417	0	0	0	40,603
TOTAL PROJECT					119,229	17,605	7,315	0	0	0	144,149

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

DATE: **February 1999**

BUDGET ACTIVITY: **5 - Engineering and Manufacturing Development**

PE NUMBER AND TITLE: **0604602F Armament Ordnance Development**

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	3,641	11,823	8,887	8,956	1,367	1,400	1,429	1,458	Continuing	Continuing
4696	Armament Standardization Program	1,040	1,157	1,184	1,206	1,234	1,264	1,288	1,312	Continuing	Continuing
3133	Bombs & Fuzes	2,473	10,536	7,568	7,618	0	0	0	0	Continuing	Continuing
5613	Containers	128	130	135	132	133	136	141	146	Continuing	Continuing
	Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

The Armament Ordnance Development program provides for initial and continuing development of munition equipment for support and operational use.

Armament Standardization/Control/Munitions Material Handling Equipment (MMHE): This continuing project develops and improves the standardization and commonality of munitions handling and armament equipment to preclude duplication. This project's efforts are limited to the study, design, and development, of MMHE and armament control systems. Procurement will be performed and funded by the applicable weapons system project.

Bombs and Fuzes: This project develops and improves conventional bombs and fuzes. It currently includes the development of the Joint Programmable Fuze (JPF) and the Hard Target Smart Fuze (HTSF). Miniaturized Munitions Capability (MMC) begins the Concept Exploration phase in this project. Initial MMC funding will be used to explore concepts to meet CAF MNS 304-97.

Containers: This project funds the operation of the tri-service Container Design Retrieval System (CDRS). This maintains a container database to preclude proliferation and duplication of munitions containers. It also supports organic container design, prototyping, and testing capabilities.

(U) B. Budget Activity Justification:

This program is in budget activity 5 - Engineering and Manufacturing Development because the projects support the EMD phase of several munitions related items and functions.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604602F Armament Ordnance Development

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY 1999 PB)	1,511	12,037	1,342	1,363	Continuing
(U) Appropriated Value	1,597	12,037			
(U) Adjustments to Appropriated Value					
a. Congressional/General Reductions	-56	-214			
b. SBIR	-30				
c. Omnibus or Other Above Threshold Reprogram	-10				
d. Below Threshold Reprogramming	2,140				
(U) Adjustments to Budget Years Since FY 1999 PB			7,545	7,593	
(U) Current Budget Submit/FY 2000 PB	3,641	11,823	8,887	8,956	Continuing

(U) Significant Program Changes:

FY98: $1,040 has been reprogrammed from PE 27590F BPAC 2784 to correctly align the MMHE project (PE 64602F BPAC 4696) in the same PE
$1,100 Below Threshold Reprogramming (BTR) to begin Hard Target Smart Fuze (HTSF) EMD.

FY99: $288 identified as a source for SBIR.

FY00 and FY01: Funding reprogrammed from HTSF Procurement in War Readiness Materials (WRM), PE 28030F, for HTSF EMD, extended due to Motorola leaving the fuze industry.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604602F Armament Ordnance Development
	PROJECT 4696

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
4696 Armament Standardization Program	1,040	1,157	1,184	1,206	1,234	1,264	1,288	1,312	Continuing	Continuing

(U) A. Mission Description

Armament Standardization/Control/Munitions Material Handling Equipment (MMHE): This continuing project develops and improves the standardization and commonality of improved munitions handling and armament equipment to preclude duplication and proliferation. This project's efforts are limited to the study, design, and development, of MMHE and armament control systems. Procurement will be performed and funded by the applicable weapons system project.

(U) FY 1998 ($ in Thousands):

- (U) $605 Designed, prototyped, and tested various MMHE projects, i.e., B-52 Yoke Handling Fixture, B-52 Pylon Transport Adapter, Alternate Mission Equipment (AME) Maintenance Stand, MHU-114 Stacking Fixture, Munitions Assembly Tools, All-Up-Round Container (AURC) Lift Adapter; complete evaluation of Ram Assembly, Rocket Module, B-2/B-52 Rotary Launcher Adapter, Munitions Assembly Conveyor (MAC) Containers, F-15 Pylon Storage Stand, International Storage Organization (ISO) Container Munitions Packaging, and Bottom Lift Forklift Projects
- (U) $175 Continued design/manufacture of Aluminum Rail Set and Next Generation Munitions Handler.
- (U) $100 Continued design, prototype, and test B-1B Rotary Launcher Adapter.
- (U) $160 Designed, prototyped, and tested MHU-83 Remote Control Upgrade and MJ-40 Hydraulics Upgrades.
- (U) $1,040 Total

(U) FY 1999 ($ in Thousands):

- (U) $604 Design, prototype, and test various MMHE projects, i.e. T-2 Pallet Lock Device, Tire Liner Inserts, Flare Assembly Fixture, Flightline Service Cart, M61 Gun Firing Stand, Universal Ammunition Loading System (UALS) Forklift Adapter, and One Stop Loading Adapter (OSLA) Upgrade; complete evaluation of B-52 Yoke Handling Fixture, B-52 Pylon Transport Adapter, AME Maintenance Stand, MHU-83 Remote Control Upgrade, MJ-40 Hydraulics Upgrade, and AURC Lift Adapter.
- (U) $175 Complete design and testing of Aluminum Rail Set and evaluation of Next Generation Munitions Handler.
- (U) $150 Initiate design of ISO Munitions Pallet and evaluation of Next Generation Munitions Trailer design.
- (U) $100 Complete evaluation of B-1B Rotary Launcher Adapter.
- (U) $100 Initiate design of MHU-110 Trailer Upgrade.
- (U) $28 Identified as a source for SBIR
- (U) $1,157 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604602F Armament Ordnance Development
	PROJECT 4696

(U) FY 2000 ($ in Thousands):

–	(U)	$509	Design, prototype, and test various MMHE projects, i.e., T-2 Pallet Lock Device, Flightline Service Cart, F-22 Pylon Load Adapter/AME Stand, and OSLA Upgrade; complete evaluation of Flare Assembly Fixture, Tire Liner Inserts, UALS Forklift Adapter, and M61 Gun Firing Stand.
–	(U)	$400	Initiate EMD for Next Generation Munitions Handler.
–	(U)	$125	Complete design and prototype of ISO Munitions Pallet and complete redesign of Next Generation Munitions Trailer.
–	(U)	$50	Complete design and prototype and initiate evaluation of MHU-110 Trailer Upgrade.
–	(U)	$100	Evaluate Mobile Bomb Renovation Plant.
–	(U)	$1,184	Total

(U) FY 2001 ($ in Thousands):

–	(U)	$ 531	Design, prototype, and test various MMHE projects as determined by HQ ACC/LGW or Program Offices; complete evaluation of T-2 Pallet Lock Device, Flightline Service Cart, F-22 Pylon Load Adapter/AME Stand, OSLA Upgrade, and ISO Munitions Pallet.
–	(U)	$ 400	Continue EMD for Next Generation Munitions Handler.
–	(U)	$ 150	Complete prototype and evaluation of Next Generation Munitions Trailer.
–	(U)	$ 25	Continue evaluation of MHU-110 Trailer Upgrade.
–	(U)	$ 100	Continue evaluation of Mobile Bomb Renovation Plant.
–	(U)	$1,206	Total

(U) B. Project Change Summary - Description of Significant Changes:
FY98: $1,040,000 has been reprogrammed from PE 27590F BPAC 2784 to correctly align the MMHE project (PE 64602F BPAC 4696) in the same PE
FY99: $28,000 identified as a source for SBIR

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

(U) D. Acquisition Strategy:
MMHE is a continuing effort program with activites contracted through Military Interdepartmental Purchase Requests (MIPR). Procurement will be performed and funded by the applicable equipment project.

(U) E. Schedule Profile:

	DATE **February 1999**
BUDGET ACTIVITY **5 - Engineering and Manufacturing Development**	PE NUMBER AND TITLE **0604602F Armament Ordnance Development**

Not Applicable. MMHE does not execute in accordance with standard acquisition milestones. Project activities are performed on a continuing basis.

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604602F Armament Ordnance Development
	PROJECT 4696

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Various MMHE Projects	605	604	509	531
(U) Aluminum Rail Set	75	75	00	00
(U) Next Generation Munitions Handler	100	100	400	400
(U) Next Generation Munitions Trailer	0	50	75	150
(U) ISO Munitions Pallet	0	100	50	0
(U) B-1B Rotary Launcher Adapter	100	100	0	0
(U) MHU-110 Trailer Upgrade	0	100	50	25
(U) MHU-83 Upgrade	120	0	0	0
(U) MJ-40 Upgrade	40	0	0	0
(U) Mobile Bomb Renovation Plant	0	0	100	100
(U) Identified as a source for SBIR	0	28	0	0
(U) Total	1,040	1,157	1,184	1,206

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)		DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604602F Armament Ordnance Development	PROJECT 4696

(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							28				28
Product Development Organizations											
Dept. of Energy/ NASA	MIPR	Oct 98	N/A	N/A	400	160	372	379	377	Cont.	Cont.
Support and Management Organizations											
TEAS/TAMS	MIPR	Oct 98	N/A	N/A	400	535	426	440	440	Cont.	Cont.
AFDTC/FM	MIPR	Oct 98	N/A	N/A	120	120	160	160	170	Cont.	Cont.
64SSUPS/LGS	MIPR	Cont.	N/A	N/A	50	50	30	35	35	Cont.	Cont.
WL/MN	MIPR	Cont.	N/A	N/A	40	40	29	50	64	Cont.	Cont.
Test and Evaluation Organizations											
46th Test Wing	MIPR	Cont.	N/A	N/A	115	135	112	120	120	Cont.	Cont.

Government Furnished Property:
Not Applicable.

Identified as a source for SBIR	0	0	28	0	0	0	28
Subtotal Product Development	400	160	372	379	377	Cont.	Cont.
Subtotal Support and Management	610	745	645	685	709	Cont.	Cont.
Subtotal Test and Evaluation	115	135	112	120	120	Cont.	Cont.
Total Project	1,125	1,040	1,157	1,184	1,206	Cont.	Cont.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604602F Armament Ordnance Development	PROJECT 3133

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
3133 Bombs & Fuzes	2,473	10,536	7,568	7,618	0	0	0	0	Continuing	Continuing

(U) A. Mission Description

Bombs and Fuzes: This project develops and improves conventional bombs and fuzes including the development of the Joint Programmable Fuze (JPF) and the Hard Target Smart Fuze (HTSF). The JPF is a multi-function time delay fuze which will be used with the Joint Direct Attack Munition (JDAM). The HTSF is a layer counting and void sensing fuze that will be used with air-to-ground penetrator weapons. Miniaturized Munitions Capability (MMC) begins the Concept Exploration phase in this project.

(U) FY 1998 ($ in Thousands):
- (U) $201 Completed JPF IOT&E Test
- (U) $922 Completed JPF/JDAM Integration Flight Test
- (U) $250 Completed JPF Functional Configuration Audit, Production Readiness Review, and Physical Configuration Audit
- (U) $1,100 Initiated HTSF Detailed Design
- (U) $2,473 Total

(U) FY 1999 ($ in Thousands):
- (U) $685 Conduct and complete HTSF System Requirements Review (SRR)
- (U) $734 Conduct and complete HTSF Preliminary Design Review (PDR)
- (U) $3,283 Complete HTSF Detailed Design
- (U) $1,175 Initiate HTSF contractor test and evaluation (CT&E)
- (U) $2,961 Conduct and complete MMC AOA Modeling and Analysis
- (U) $1,000 Conduct and complete MMC Concept Exploration Contracts
- (U) $442 Program Office Support
- (U) $256 Identified as a source for SBIR
- (U) $10,536 Total

(U) FY 2000 ($ in Thousands):
- (U) $ 4,531 Complete HTSF contractor test and evaluation (CT&E)
- (U) $ 3,037 Initiate HTSF developmental and operational test and evaluation

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604602F Armament Ordnance Development
	PROJECT 3133

– (U) $ 7,568 Total

(U) FY 2001 ($ in Thousands):
– (U) $1,786 Conduct and complete Hard Target Smart Fuze (HTSF) Functional Configuration Audit
– (U) $5,376 Complete HTSF developmental and operational test and evaluation (DT&E/IOT&E)
– (U) $ 456 Conduct and complete HTSF initial operational testing and evaluation (IOT&E)
– (U) $7,618 Total

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

FY98: $1,100 Below threshold Reprogramming (BTR) to begin Hard Target Smart Fuze (HTSF) EMD
FY99: $256 identified as a source for SBIR
HTSF Engineering and Manufacturing Development (EMD) extended through FY01 due to competition for full EMD program, as a result of Motorola no longer designing and producing fuzes.

(U) C. 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
(U) Procurement of Ammunition, Air Force, P-1 Line Item; Fuzes										
(U) Joint Programmable Fuze (JPF)	5,739	11,568	9,064	9,430	10,516	26,232	23,398	24,012	29,878	153,962
(U) Hard Target Smart Fuze (HTSF) funded by Defense Threat Reduction Agency (DTRA)										

(U) D. Acquisition Strategy:

The Hard Target Smart Fuze (HTSF) Acquisition Strategy was full and open competition for the EMD program with production options to meet performance specification requirements for current and future Hard Target munitions. The HTSF will be compatible with GBU-24, GBU-27, GBU-28, GBU-15, AGM-130, JDAM, JASSM, and future hard target munitions while providing increased reliability and emphasis on life cycle management. The HTSF program was augmented with Defense Threat Reduction Agency (DTRA) funding and requirements for additional HTSF applications and follow-on fuze procurement. The Joint Programable Fuze began Low Rate Initial Production in FY97.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604602F Armament Ordnance Development
	PROJECT 3133

(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) Joint Programmable Fuze (JPF)																
(U) Complete IOT&E				*												
(U) Hard Target Smart Fuze (HTSF)																
(U) Start HTSF Detailed Design				*												
(U) System Requirement Review (SRR)					*											
(U) Preliminary Design Review (PDR)						X										
(U) Start HTSF CT&E						X										
(U) Complete HTSF Detailed Design							X									
(U) Complete CT&E											X					
(U) Start DT&E/IOT&E												X				
(U) Complete FCA													X			
(U) Complete Combined DT&E/IOT&E														X		
(U) Start/Complete Dedicated IOT&E															X	
(U) Miniaturized Munitions Capability																
(U) Start Concept Exploration/AoA					*											
(U) Complete Concept Exploration/Analysis of Alternatives												X				

* = Event occurred
X = Event planned

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604602F Armament Ordnance Development
PROJECT 3133	

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) a. Contractor Total	1,931	5,474	4,580	1,506
(U) b. Government				
Testing	103	310	1,437	3,976
Contractor support	112	829	480	500
Management support	327	3,667	1,071	1,636
Government Total	542	4,806	2,988	6,112
(U) Identified as a source for SBIR	0	256	0	0
(U) Total	2,473	10,536	7,568	7,618

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)		DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604602F Armament Ordnance Development	PROJECT 3133

(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							256				256
Product Development Organizations											
Motorola (JPF)	SS/CPAF	Jul 93	21,357	21,357	20,526	831	0	0	0	0	21,357
Alliant (HTSF)	C/CPIF	Aug 98	16,010	16,010	0	1,100	4,474	4,580	1,506	Cont.	Cont.
Boeing (MMC)	FFP	Jan 99	250	250	0	0	250	0	0	0	250
Lockheed (MMC)	FFP	Jan 99	250	250	0	0	250	0	0	0	250
Raytheon (MMC)	FFP	Jan 99	250	250	0	0	250	0	0	0	250
Northrup (MMC)	FFP	Jan 99	250	250	0	0	250	0	0	0	250
Support and Management Organizations											
HTSF TEAS/ TEAMS	Various	Various	N/A	N/A	559	0	405	480	500	Cont.	Cont.
JPF TEAS/ TEAMS	Various	Various	N/A	N/A	400	112	0	0	0	0	512
MMC TEAS/ TEAMS	Various	Various	N/A	N/A	0	0	424	0	0	0	424
ASC/WMG (JPF, HTSF)	Various	Various	N/A	N/A	847	327	688	1,071	1,636	Cont.	Cont.
ASC/XRW & AAC/ENMS (MMC)	Various	Various	N/A	N/A	0	0	1,600	0	0	0	1,600
Other MMC	Various	Various	N/A	N/A	0	0	1,379	0	0	0	1179

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)											DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development					PE NUMBER AND TITLE 0604602F Armament Ordnance Development						PROJECT 3133
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											
46th Test JPF	Various	Mar 94	N/A	N/A	3,212	103	0	0	0	0	3,315
46th Test HTSF	Various	Mar 94	N/A	N/A	0	0	310	1,437	3,976	Cont.	Cont.

(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
Government Furnished Property: Not Applicable											
Identified as a source for SBIR					0	0	256	0	0	0	256
Subtotal Product Development					20,526	1,931	5,474	4,580	1,506	Cont.	Cont.
Subtotal Support and Management					1,806	439	4,496	1,551	2,136	Cont.	Cont.
Subtotal Test and Evaluation					3,212	103	310	1,437	3,976	Cont.	Cont.
Total Project					25,544	2,473	10,536	7,568	7,618	Cont.	Cont.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)			DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604602F Armament Ordnance Development		PROJECT 5613

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
5613 Containers	128	130	135	132	133	136	141	146	Continuing	Continuing

(U) A. Mission Description

Containers: This project funds the operation of the tri-service Container Design Retrieval System (CDRS). This system includes the maintenance of a container database to preclude proliferation and duplication of munitions containers. It also supports organic container design, prototyping, and testing capabilities. This project's efforts are limited to study, design, and development of container systems. The project also provides world wide acquisition transportation support and participates in Tri-Service groups and organizations for packaging, handling, logistic and transportation. Any procurement will be performed and funded by the applicable weapons system project.

(U) FY 1998 ($ in Thousands):
- (U) $5 Initiated/continued/completed design/development of various CDRS projects, including a modular mobility container system, and special projects.
- (U) $5 Provided container design expertise, management, and technical support to programs such as AIM-9X, JASSM, AMRAAM, AGM-142, JDAM, AGM-130, and WCMD.
- (U) $118 Managed and operated the CDRS data base and support service.
- (U) $128 Total

(U) FY 1999 ($ in Thousands):
- (U) $5 Initiate/continue/complete design/development of various CDRS projects, including a modular mobility container system, and special projects.
- (U) $5 Provide container design expertise, management, and technical support to programs such as AIM-9X, JASSM, AMRAAM, AGM-142, JDAM, AGM-130, and WCMD.
- (U) $116 Manage and operate the CDRS data base and support service.
- (U) $4 Identified as a source for SBIR
- (U) $130 Total

(U) FY 2000 ($ in Thousands):
- (U) $5 Initiate/continue/complete design/development of various CDRS projects, including a modular mobility container system, and special projects.
- (U) $5 Provide container design expertise, management, and technical support to programs such as AIM-9X, JASSM, AMRAAM, AGM-142, JDAM, AGM-130, and WCMD.
- (U) $125 Manage and operate the CDRS data base and support service.
- (U) $135 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604602F Armament Ordnance Development
PROJECT 5613	

(U) FY 2001 ($ in Thousands):

–	(U)	$5	Initiate/continue/complete design/development of various CDRS projects, including a modular mobility container system, and special projects.
–	(U)	$5	Provide container design expertise, management, and technical support to programs such as AIM-9X, JASSM, AMRAAM, AGM-142, JDAM, AGM-130, and WCMD.
–	(U)	$122	Manage and operate the CDRS data base and support service.
–	(U)	$132	Total

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

FY99: $4 identified as a source for SBIR

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

Not Applicable

(U) D. Acquisition Strategy:

Not applicable

(U) E. Schedule Profile:

Not Applicable. The Containers project does not execute in accordance with standard acquisition milestones. Design and support efforts are performed on a continuing basis.

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604602F Armament Ordnance Development
	PROJECT 5613

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Travel/Transportation	70	66	72	70
(U) Supplies/Equipment	48	50	53	52
(U) Mission Support	10	10	10	10
(U) Identified as a source for SBIR	0	4	0	0
(U) Total	128	130	135	132

(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							4				4
Product Development Organizations											
Not Applicable											
Support and Management Organizations											
Sverdrup (TEAS)	Various	Oct 93	N/A	N/A	1,455	0	0	0	0	Cont.	Cont.
ASC/YHS	Various	Various	N/A	N/A	568	10	10	10	10	Cont.	Cont.
Other	Various	Various	N/A	N/A	451	118	116	125	122	Cont.	Cont.
Test and Evaluation Organizations											
46th Test Wing	Various	Various	N/A	N/A	190	0	0	0	0	Cont.	Cont.

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)		DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604602F Armament Ordnance Development	PROJECT 5613

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

Government Furnished Property:
Not Applicable

Identified as a source for SBIR	0	0	4	0	0	0	4
Subtotal Product Development	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Subtotal Support and Management	2,474	128	126	135	132	Cont.	Cont.
Subtotal Test and Evaluation	190	0	0	0	0	Cont.	Cont.
Total Project	2,664	128	130	135	132	Cont.	Cont.

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604604F Submunitions

PROJECT: 3166

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
3166 Joint Smart Munition Test and Evaluation Program	4,716	4,791	4,798	4,817	4,822	4,762	4,861	4,963	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

This PE provides support for smart munitions and related technologies test and evaluation (T&E) activities, including T&E support for programs in engineering and manufacturing development. Project 3166 is a joint US Air Force/US Army project which provides RDT&E support for developmental smart munitions acquisition programs. Project 3166 (project Chicken Little) evaluates developmental smart munitions and related emerging technology with applications against vehicle targets and Theater Air Defense units by determining performance against actual foreign targets in realistic environments and in the presence of countermeasures. Data gathered is used to meet developmental decision points requiring highly reliable, realistic performance data. The project is a major focal point for joint Air Force and Army target signature collection and dissemination for development and exploitation purposes. Phase IV (FY96-98) emphasized providing best value test and evaluation support for submunition development and weaponization studies, and Phase V (FY99-01) will provide modeling and simulation capabilities to augment a limited number of measurement and open air tests of smart weapons and related technologies.

(U) FY 1998 ($ in Thousands):

- (U) $1,168 Completed Phase IV of the weapon effectiveness evaluation
- (U) $458 Developed models and simulation tools to support engagement simulations
- (U) $530 Continued maintenance and expansion of vulnerability/lethality and signature database
- (U) $1,154 Planned and conducted captive carry flight tests and signature collection for seeker/sensor evaluations and algorithm development
- (U) $706 Conducted advanced warhead effectiveness evaluations
- (U) $700 Continued vulnerability analysis of Suppression of Enemy Air Defense (SEAD) and Theater Missile Defense (TMD) targets
- (U) $4,716 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604604F Submunitions
PROJECT 3166	

(U) FY 1999 ($ in Thousands):

–	(U)	$1,174	Initiate Phase V of the weapon effectiveness evaluation
–	(U)	$495	Develop and validate improved models and simulation for assessment of alternatives and force on force studies
–	(U)	$495	Increase utility of lethality/vulnerability and signature database through conversion to migration system and addition of new threat system data
–	(U)	$1,287	Plan and conduct captive carry flight tests and signature collection for seeker/sensor evaluations and algorithm development
–	(U)	$594	Characterize performance of advanced and programmable warheads to access potential for increasing lethality of weapons
–	(U)	$698	Perform vulnerability analysis of upgraded/advanced Suppression of Enemy Air Defense (SEAD) and Theater Missile Defense (TMD) targets
–	(U)	$48	Identified as a source for SBIR
–	(U)	$4,791	Total

(U) FY 2000 ($ in Thousands):

–	(U)	$982	Continue Phase V of the weapon effectiveness evaluation
–	(U)	$491	Develop, validate, and accredit improved models and simulation for assessment of alternatives and force on force studies
–	(U)	$491	Increase utility of lethality/vulnerability and signature database through addition of moderm threat systems and secure datalink
–	(U)	$1,325	Plan and conduct captive carry flight tests and signature collection for seeker/sensor evaluations and algorithm development
–	(U)	$723	Characterize performance of advanced and programmable warheads to access potential for increasing lethality of weapons
–	(U)	$786	Perform vulnerability analysis of upgraded/advanced Suppression of Enemy Air Defense (SEAD) and Theater Missile Defense (TMD) targets
–	(U)	$4,798	Total

(U) FY 2001 ($ in Thousands):

–	(U)	$980	Continue Phase V of the weapon effectiveness evaluation
–	(U)	$490	Develop, validate, and accredit improved models and simulation for assessment of alternatives and force on force studies
–	(U)	$490	Increase utility of lethality/vulnerability and signature database through addition of moderm threat systems and secure datalink
–	(U)	$1,345	Plan and conduct captive carry flight tests and signature collection for seeker/sensor evaluations and algorithm development
–	(U)	$726	Characterize performance of advanced and programmable warheads to access potential for increasing lethality of weapons
–	(U)	$786	Perform vulnerability analysis of upgraded/advanced Suppression of Enemy Air Defense (SEAD) and Theater Missile Defense (TMD) targets
–	(U)	$4,817	Total

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

This program is funded in BA 5 - Engineering and Manufacturing Development because this program supports development programs prior to production decision.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604604F Submunitions	PROJECT 3166

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY 1999 PB)	4,748	4,805	4,886	4,909	Continuing
(U) Appropriated Value	4,956	4,805			
(U) Adjustments to Appropriated Value					
a. Congressional/General Reductions	-162	-14			
b. SBIR	-46				
c. Omnibus or Other Above Threshold Reprogram	-32				
d. Below Threshold Reprogramming					
(U) Adjustments to Budget Years Since FY 1999 PB			-88	-92	
(U) Current Budget Submit/FY 2000 President's Budget	4,716	4,791	4,798	4,817	Continuing

(U) Significant Program Changes:

FY99: $48 identified as a source for SBIR.

(U) D. Other Program Funding Summary ($ in Thousands):
Not Applicable.

(U) E. Acquisition Strategy:
Funds are executed organically in support of test and evaluation activities including studies, analyses, flight tests, model building and simulation. There are several small contracts supporting the program office.

(U) F. Schedule Profile:
Project 3166, Joint Smart Munition Test and Evaluation Program (Project Chicken Little) does not execute in accordance with established acquisition milestones. Chicken Little is a continuing test effort (target/warhead evaluation/analysis, signature tests, captive carry flight tests, are ongoing throughout the year and continue through the FYDP). This project is also funded by the Army and others Services on a case by case basis. The type of activities is given in Section A but the timing, duration and level of effort is decided at the semi-annual Steering Committee meetings.

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604604F Submunitions

PROJECT: 3166

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Program Support	1,114	1,120	1,132	1,137
(U) Target Support	460	463	468	470
(U) Warhead Range Operations	308	308	313	313
(U) Captive Flight Tests	584	588	595	596
(U) Database Support (MILES)	265	268	270	271
(U) Vulnerability/Effectiveness Analysis	622	625	632	638
(U) Warhead Evaluation	335	338	342	342
(U) Target Signature Tests	570	573	580	582
(U) Models and Simulation Tools	458	460	466	468
(U) Identified as a source for SBIR	0	48	0	0
(U) Total	4,716	4,791	4,798	4,817

(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			N/A	N/A	0	0	48	0	0	0	48
Product Development Organizations: Not Applicable											
Support and Management Organizations											
Sverdrup	C/CPIF	Jun 96	N/A	N/A	7,825	1,195	1,255	1,317	1,320	Cont	Cont
ANSTEC	C/FFP	Apr 96	N/A	N/A	1,035	189	197	201	204	Cont	Cont
46 OG/OGML	N/A	Annual	N/A	N/A	4,766	532	572	610	618	Cont	Cont
Test and Evaluation Organizations											
46 OG/OGML		Annual	N/A	N/A	64,816	2,800	2,719	2,670	2,675	Cont	Cont

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604604F Submunitions PROJECT 3166

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

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
Government Furnished Property: Not Applicable										
Identified as a source for SBIR					0	48	0	0	0	48
0										
Subtotal Product Development					0	0	0	0	Cont	Cont
0										
Subtotal Support and Management					1,916	2,024	2,128	2,142	Cont	Cont
13,626										
Subtotal Test and Evaluation					2,800	2,719	2,670	2,675	Cont	Cont
64,816										
Total Project					4,716	4,791	4,798	4,817	Cont	Cont
78,442										

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604617F Agile Combat Support

PROJECT: 2895

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
2895 Air Base Operability	1,251	2,485	946	674	0	0	0	0	0	149,788
Quantity of RDT&E Articles	0	0	0	0	0	0			0	0

(U) A. Mission Description and Budget Item Justification

This Program Element provides capabilities to rapidly deploy, defend and sustain airfield operations and command and control activities. These activities are prerequisites to establishing air superiority. These systems provide beddown for aircraft, support equipment, and forces at both main operating bases and contingency operating locations, which may have only a runway and a water source. They also offer crucial utilities, runway stabilization and repair, explosive ordnance disposal (EOD), and security and reconnaissance capabilities to support aircraft deployment, launch, recovery and regeneration. Lighter-weight, rapidly deployable equipment has become essential in supporting numerous global contingencies such as DESERT SHIELD/DESERT STORM, Provide Comfort, Restore Hope, and Joint Endeavor for security, base defense, relief efforts, and special operations throughout the world. Agile Combat Support capabilities being developed include: power generation and distribution systems to reduce airlift; medium shelters; systems to repair runway damage; and Joint Service (Army-led) test, evaluation and acquisition of protective vehicles to be used by Air Force EOD technicians for reconnaissance and mine clearing missions.

(U) FY 1998 ($ in Thousands):
- (U) $485 Initiated Commercial Item Performance Evaluation (CIPE) for Medium Shelter Systems.
- (U) $558 Continued CIPE for Deployable Power Generation and Distribution System (DPGDS).
- (U) $208 Continued other technical support.
- (U) $1,251 Total

(U) FY 1999 ($ in Thousands):
- (U) $686 Complete CIPE for Medium Shelter Systems.
- (U) $551 Complete CIPE for DPGDS.
- (U) $761 Initiate CIPE for All-purpose Remote Transport System (ARTS).
- (U) $448 Continue other technical support.
- (U) $39 Identified as a source for SBIR
- (U) $2,485 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604617F Agile Combat Support	PROJECT 2895

(U) FY 2000 ($ in Thousands):
- (U) $415 Initiate CIPE for EOD Support Equipment.
- (U) $275 Continue CIPE for ARTS.
- (U) $256 Continue other technical support.
- (U) $946 Total

(U) FY 2001 ($ in Thousands):
- (U) $310 Complete CIPE for EOD Support Equipment.
- (U) $160 Complete CIPE for ARTS.
- (U) $204 Complete other technical support.
- (U) $674 Total

(U) B. Budget Activity Justification

The Air Base Operability program is in RDT&E budget activity 5 - Engineering and Manufacturing Development (EMD) because it supports development, testing and evaluation of materials and equipment for contingency basing, detection and handling of explosive ordnance, and tactical shelters.

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY1999 PB)	1,260	2,503	2,563	2,587	153,384
(U) Appropriated Value	1,424	2,503			
(U) Adjustments to Appropriated Value					
a. Congressional/General Reductions	-133	-57			
b. SBIR	-31				
c. Omnibus or Other Above Threshold Reprogram	-9				
d. Below Threshold Reprogramming					
(U) Adjustments to Budget Years Since FY 1999 PB			-1,617	-1,913	
(U) Current Budget Submit/FY2000 PB	1,251	2,446	946	674	149,788

(U) Significant Program Changes:

Funding: Reductions in FY00 and FY01 made to fund higher priority AF programs.

FY99: $39 identified as a source for SBIR.

Schedule: Changes caused by funding cuts and need to redirect programs to satisfy user requirements.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604617F Agile Combat Support
	PROJECT 2895

(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
(U) Other Procurement, AF, Other Base Maintenance and Support Program:										
Mobility Equipment (0208031F) (WSC 845420)	25,267	35,883	46,865	50,513	27,742	27,173	20,461	19,687	Cont	Cont
Air Base Operability (0208028F) (WSC 845100)	4,069	5,363	4,483	2,036	0	0	0	0	0	18,703

(U) E. Acquisition Strategy

Many of the projects funded in the PE employ a streamlined acquisition approach, instead of traditional EMD. Whenever practical, commercial items are tested and evaluated as candidates for solutions to user needs. Instead of EMD, this approach uses a Commercial Item Performance Evaluation (CIPE) phase to determine if off-the-shelf equipment is adequate for military purposes. Initiation of the CIPE phase includes all 6.4 activities leading up to contract award and subsequent test and evaluation culminating in a Milestone III production decision.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604617F Agile Combat Support PROJECT 2895

(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
MEDIUM SHELTER SYSTEMS																
- Milestone I/II Decision			*													
- Release RFP				*												
- CIPE Contract Award					*											
- Complete IOT&E								X								
- Milestone III Decision								X								
- Award Production Option									X							
DEPLOY POWER GEN & DISTRO SYS																
- Award Phase I Contract	*															
- Award Phase II Contract						X										
- Complete QOT&E										X						
- Milestone III Decision										X						
- Award Production Option										X						
ALL-PURPOSE REMOTE TRANSPORT SYSTEM II																
- Milestone I/II Decision					*											
- CIPE Contract Award						X										
- Complete IOT&E								X								
- Milestone III Decision								X								
- Award Production Option								X								
- Complete test of FY00 ARTS tools											X					
- Complete test of FY01 ARTS tools															X	
EOD SUPPORT EQUIPMENT																
- Initiate CIPE of FY00 Equipment										X						
- Complete CIPE of FY00 Equipment											X					
- Initiate CIPE of FY01 Equipment													X			
- Complete CIPE of FY01 Equipment															X	

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604617F Agile Combat Support
	PROJECT 2895

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Contracts	350	1305	0	0
(U) Administrative and &Analytic Support (A&AS)	202	385	640	420
(U) Other Government Agencies	418	308	120	50
(U) Materials/Equipment	29	0	0	0
(U) Other Technical Support	252	448	186	204
(U) Identified as a source for SBIR	0	39	0	0
(U) Total	1,251	2,485	946	674

(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	FY 1998	FY 1999	FY 2000	FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR							39				39
Product Development Organizations											
Medium Shelter Systems - A&AS	FFP	Feb 98	1,050	1,050	0	500	686	0	0	0	1,186
Deployable Power - Radian	FFP	May 98	2,238	2,238	842	499	551	0	0	0	1,892
ARTS - A&AS	FFP	Feb 98	2,800	2,800	0	0	761	295	160	0	1,216
EOD Support Equipment - A&AS	FFP	Feb 00				0	0	465	310	0	775

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604617F Agile Combat Support
	PROJECT 2895

(U) B. Budget Acquisition History and Planning Information (Continued) ($ 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	FY 1998	FY 1999	FY 2000	FY 2001	Budget to Complete	Total Program
Support and Management Organizations											
Various	Various	Various	N/A	N/A	N/A*	252	448	186	204	0	N/A*
Test and Evaluation Organizations											
None											N/A
Government Furnished Property:											
None											N/A
Identified as a source for SBIR							39				39
Subtotal Product Development					N/A*	999	1,998	760	470	0	N/A*
Subtotal Support and Management					N/A*	252	448	186	204	0	N/A*
Subtotal Test and Evaluation					N/A*	0	0	0	0	0	N/A*
Total Project					N/A*	1,251	2,485	946	674	0	N/A*

* Basket Program Element with twenty plus years of projects, prior years breakout not available.

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604618F Joint Direct Attack Munitions

PROJECT: 3890

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
3890 Joint Direct Attack Munitions	21,054	11,954	1,385	1,169	1,578	0	0	0	0	292,541
Quantity of RDT&E Articles	233/$6459*	38/$1053*	8/$222*	0	0	0	0	0	0	517/$14331

*Quantity of RDT&E Articles reflect assets by delivery year and can not be reconciled to the dollar amounts (incremental funding) shown in any one year.

(U) A. Mission Description

Operation DESERT STORM confirmed the need for a more accurate weapon delivery capability in adverse weather conditions from medium/high altitudes. Failure to satisfy this requirement will allow the enemy to continue to take advantage of the sanctuary of weather and/or prevent US air power from prosecuting a conflict on its terms. The Joint Direct Attack Munition (JDAM) is a joint Air Force and Navy munitions program to correct these shortfalls, with the Air Force as the executive service. JDAM will upgrade the existing inventory of general purpose bombs (Mk-84, BLU-109, and Mk-83/BLU-110) by integrating them with a guidance kit consisting of a Global Positioning System aided Inertial Navigation System (INS/GPS). JDAM will provide an accurate (13 meters) adverse weather capability. JDAM threshold aircraft are B-52H, F-22, A/V-8B and F/A-18C/D, and JDAM objective aircraft are B-2, B-1B, F-16, F-15E, and other aircraft. JDAM development is a two-phased Engineering and Manufacturing Development (EMD) effort. EMD Phase I emphasized competitive design and manufacturing processes. This phase completed 10 Oct 95. EMD Phase II emphasizes full scale hardware build and flight test to verify system performance and will support OT&E. JDAM is an Air Force Acquisition Category (ACAT) ID program. JDAM Low Rate Initial Production (LRIP) began in FY97.

(U) FY 1998 ($ in Thousands):

- (U) $10,491 Continued Engineering and Manufacturing Development (EMD) prime contractor activities for F/A-18, B-1, B-52, and B-2 aircraft integration. Continued development and test of the baseline friction brake BLU-109 and MK-83 tailkits. Initiated parallel redesign of MK-84 tail assembly system to eliminate F/A-18C/D low altitude, high speed flight restrictions. Initiated integration of new tail assembly system into BLU-109 and MK-83 variants for commonality. Initiated Mk-83 integration on AV-8B. Began Mk-83 testing on F-16.
- (U) $2,491 Continued support and management tasks to define and coordinate the program activities of the prime contractor and various government development and test organizations.
- (U) $8,072 Completed development flight test of baseline friction brake MK-84 and BLU-109 on B-52 and F/A-18C/D. Continued B-2 and B-1 aircraft flight test. Continued F-16 aircraft guided flight tests. Initiated MK-83 ground and flight development testing.
- (U) $21,054 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE: February 1999
BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE: 0604618F Joint Direct Attack Munitions	PROJECT: 3890

(U) FY 1999 ($ in Thousands):

–	(U) $ 3,973	Complete EMD prime contractor activities for F/A-18, B-1, B-52 aircraft. Complete operational test of baseline friction brake MK-84 and BLU-109. Complete development and operational test of flight restriction-free tail assembly on MK-84 and BLU-109. Continue development flight testing and integration of restriction-free tail assembly on MK-83. Continue Mk-83 AV-8B integration and F-16 testing.
–	(U) $ 2,843	Continue support and management tasks to define and coordinate the program activities of the prime contractor and various government development and test organizations.
–	(U) $ 4,932	Complete F/A-18C/D, B-52, B-2, and B-1 aircraft flight testing. Complete operational test of baseline MK-84 and BLU-109. Start and complete development and operational test of restriction-free tail assembly for MK-84 and BLU-109. Start development flight test of the MK-83 with restriction-free tail assembly. Continue F-16 aircraft guided flight tests.
–	(U) $ 206	Identified as a source for SBIR
–	(U) $11,954	Total

(U) FY 2000 ($ in Thousands):

–	(U) $985	Complete MK-83 development activities. Support AV-8B integration with MK-83. Fabricate hardware for F-22 Integration. Start consolidation of multiple flight software packages as a result of parallel integration on F/A-18 C/D, B-52, B-1, F-16 and B-2.
–	(U) $250	Provide test support for completion of operational test activities and flight software consolidation. Support MK-83 Operational Evaluation (OPEVAL) on AV-8B.
–	(U) $150	Provide support and management tasks to coordinate the program activities of the prime contractor and various test and aircraft organizations. Note: F-15E and F-22 integration is funded through the aircraft program offices.
–	(U) $1,385	Total

(U) FY 2001 ($ in Thousands):

–	(U) $789	Complete consolidation and test of flight software. Support F-22 integration analysis and testing. Complete Mk-83 OPEVAL on the AV-8B.
–	(U) $250	Provide flight test support for flight software consolidation. Support F-22 integration testing.
–	(U) $130	Provide support and management tasks to coordinate the program activities of the prime contractor and various test and aircraft organizations. Note: F-15E and F-22 integration for the JDAM prime contractor is funded through the aircraft program offices.
–	(U) $1,169	Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE: February 1999
BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE: 0604618F Joint Direct Attack Munitions	PROJECT: 3890

(U) B. Budget Activity Justification:

This program is funded in Budget Activity 5, EMD, due to its focus on devising an affordable design and manufacturing process.

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY 1999 PB)	21,896	12,204	1,410	1,191	293,935
(U) Appropriated Value	24,553	12,204			
(U) Adjustments to Appropriated Value					
a. Congressional/General Reductions	-944	-250			
b. SBIR	-2,035				
c. Omnibus or Other Above Threshold Reprogram	-520				
d. Below Threshold Reprogramming					
(U) Adjustments to Budget Years Since FY 1999 PB			-25	-22	
(U) Current Budget Submit/FY 2000 PB	21,054	11,954	1,385	1,169	292,541

(U) Significant Program Changes: FY99: $206 identified as source for SBIR.
Milestone III for the 2000 lb tailkit was moved to 1Q FY2000 due to the delay of Operational Testing start.

(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
(U) Procurement of Ammunition, Air Force, P-1 Line Item JDAM	39,189	45,991	125,605	240,813	211,554	205,476	210,130	166,752	93,549	1,361,820

(U) E. Acquisition Strategy:

The JDAM contract for Engineering and Manufacturing Development (EMD) Phase II is Cost Plus Award Fee. In addition, there are two Firm Fixed Price contract options for Procurement Lots 1 and 2 (LRIP). Procurement Lots 3 (LRIP), 4, and 5 have a Procurement Price Committment agreement to ensure a low unit cost.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE: February 1999
BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE: 0604618F Joint Direct Attack Munitions — PROJECT: 3890

(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) LRIP (Lot 2) Option			*													
(U) LRIP (Lot 3)							X									
(U) Milestone III (2000 lb)									X							
(U) Milestone III (1000 lb)																X
(U) MK-84 Schedule																
(U) Development and Operational Test (DT/OT) Start/Finish				*		X										
(U) Initial Operational Test & Eval (IOT&E) Start/Finish					*		X									
(U) BLU-109 Schedule																
(U) DT/OT Start/Finish				*		X										
(U) IOT&E Start/Finish					*		X									
(U) MK-83 Schedule																
(U) DT Flight Tests Start/Finish		*					X									
(U) DT/OT Start/Finish										X	X					
(U) IOT&E Start/Finish												X	X			
(U) A/C Integration																
(U) Threshold Fighter/Bomber																
(U) -- 2000 lb Complete				*												
(U) -- 1000 lb Start	*															
(U) -- 1000 lb Finish - 2st Qtr FY03																

* = Event occurred
X = Event planned

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604618F Joint Direct Attack Munitions
	PROJECT 3890

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Primary Hardware Development	10,491	3,973	985	789
(U) Test & Evaluation	8,072	4,932	250	250
(U) Engineering & Prog Mgt Support	2,491	2,843	150	130
(U) Identified as a source for SBIR	0	206	0	0
(U) Total	21,054	11,954	1,385	1,169

(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				206
Product Development Organizations											
Prime Contractors Boeing (St Louis, MO) Lockheed Martin	C/CPAF	Oct-95	166,971*	166,971*	149,805	10,491	3,973	985	789	928	166,971
FY94/95 Only Conceptual Studies	Various	Various	N/A	N/A	22,428	0	0	0	0	0	22,428

* Performing Activity EAC and Project Office EAC include increase of contract scope for redesign of MK-84 tail assembly system to eliminate F/A-18C/D low altitude, high speed flight restrictions.

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE: February 1999
BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE: 0604618F Joint Direct Attack Munitions — PROJECT: 3890

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
Support and Management Organizations											
Engineering Spt.	CPAF	Oct 96	12,843	12,843	11,078	900	865	0	0	0	12,843
TAMS	CPAF	Oct 96	4,432	4,432	3,587	659	186	0	0	0	4,432
Contractor Program Office	Various	Various	N/A	N/A	14,775	932	1,792	150	130	400	18,179
Test and Evaluation Organizations											
Aircraft SPO/PMA Supt.	Various	Various	N/A	N/A	12,631	365	400	250	250	250	14,146
Flight Testing	Various	Various	N/A	N/A	27,554	7,377	4,507	0	0	0	39,438
Ground Testing	Various	Various	N/A	N/A	9,258	330	25	0	0	0	9,613
GFE	Various	Various	N/A	N/A	4,285	0	0	0	0	0	4,285

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

Government Furnished Equipment:
Not Applicable

Identified as a source for SBIR	0	0	206	0	0	0	206
Subtotal Product Development	172,233	10,491	3,973	985	789	928	189,399
Subtotal Support and Management	29,440	2,491	2,843	150	130	400	35,454
Subtotal Test and Evaluation	53,728	8,072	4,932	250	250	250	67,482
Total Project	255,401	21,054	11,954	1,385	1,169	1,578	292,541

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

DATE: **February 1999**

BUDGET ACTIVITY: **5 - Engineering and Manufacturing Development**

PE NUMBER AND TITLE: **0604703F Aeromedical Systems Development**

PROJECT: **2866**

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
2866 Aeromedical/Casualty Care Systems Dev	2,964	3,104	7,135	5,982	2,058	2,054	2,247	2,342	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

The Program Element provides tactical, strategic, and covert aeromedical evacuation systems and medical treatment equipment to meet unique Air Force medical readiness and operational requirements.

(U) FY 1998 ($ in Thousands):

- (U) $63 Transportable Blood Transshipment Center (TBTC) - Performed Program/Engineering Support for production.
- (U) $1036 Spinal Cord Injury Transport System (SCITS) - Initiated EMD.
- (U) $324 Chemically Hardened Air Transportable Hospital/Chemically Hardened Air Management Plant (CHATH/CHAMP) - Completed operational test and evaluation (OT&E), obtained Milestone III decision approval and exercised production option to meet initial operational capability (IOC).
- (U) $98 Civil Reserve Air Fleet-Aeromedical Evacuation Ship Sets (CRAF-AESS) - Supported production decision and IOC for the Patient Loading System.
- (U) $326 Theater Medical Information Program-Air Force (TMIP-AF) - Conducted program definition and risk reduction activities to identify and support validated user operational needs. Developed acquisition strategy for EMD effort in FY99.
- (U) $45 Aeromedical Systems Analysis - Conducted foundational studies and analyses, requirements analyses, and product demonstrations to meet operational needs, and defined acquisition strategies and baselines for potential system solutions to Air Force Medical Service materiel needs identified through the Air Force Surgeon General's modernization planning process.
- (U) $1,072 Provided support for Human Systems Center, System Program Office, and Technical Engineering and Management Support contractor.
- (U) $2,964 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604703F Aeromedical Systems Development
	PROJECT 2866

(U) FY 1999 ($ in Thousands):

- (U) $ 1,166 SCITS - Conduct OT&E and continue EMD.
- (U) $ 251 CHATH/CHAMP - Provide Program/Engineering support for production.
- (U) $ 557 TMIP-AF - Award EMD integration contract to design, develop a prototype, and conduct development and operational tests. Update acquisition strategy for production, fielding, deployment, and operational support (PFD/OS) effort in FY00. Obtain Milestone III decision/approval and award PFD/OS contract.
- (U) $ 15 CRAF-AESS - Support production of the Patient Loading System (PLS).
- (U) $ 33 Aeromedical Systems Analysis - Conduct foundational studies and analyses, requirements analyses, and product demonstrations to meet operational needs, and define acquisition strategies and baselines for potential system solutions to Air Force Medical Service materiel needs identified through the Air Force Surgeon General's modernization planning process. Prepare RFP for Advanced Hybrid Oxygen System - Medical (AHOS-M).
- (U) $ 1,007 Provide support for Human Systems Center, System Program Office, and Technical Engineering and Management Support contractor. Initiate transition from research and explore potential technologies for EMD of the Advanced Hybrid Oxygen System - Medical (AHOS-M).
- (U) $75 Identified as a source for SBIR
- (U) $ 3,104 Total

(U) FY 2000 ($ in Thousands):

- (U) $ 500 SCITS - Complete EMD and support production.
- (U) $ 344 CHATH/CHAMP - Provide Program/Engineering support for production.
- (U) $ 717 TMIP-AF - Initiate medical information infrastructure deployment per user fielding plan. Integrate and test pre-planned product improvement (P3I) for Air Transportable Hospitals (ATHs), integration of Composite Health Care System (CHCS) II software improvements, and communications and security upgrades.
- (U) $ 3,057 AHOS-M - Begin EMD.
- (U) $ 365 Aeromedical Systems Analysis - Conduct foundational studies and analyses, requirements analyses, and product demonstrations to meet operational needs, and define acquisition strategies and baselines for potential system solutions to Air Force Medical Service materiel needs identified through the Air Force Surgeon General's modernization planning process.
- (U) $ 2,152 Provide support for Human Systems Center, System Program Office, and Technical Engineering and Management Support contractor. Begin transition from research and explore potential technologies for future EMD efforts.
- (U) $ 7,135 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604703F Aeromedical Systems Development
	PROJECT 2866

(U) FY 2001 ($ in Thousands):

- (U) $ 100 SCITS - Support Production
- (U) $ 550 TMIP-AF - Continue to execute medical information infrastructure deployment per user fielding plan. Integrate and test pre-planned product improvements relative to block releases of the DoD-Level TMIP software, and communications and security upgrades.
- (U) $ 2,407 AHOS-M - Conduct test and evaluation and continue EMD.
- (U) $ 757 Aeromedical Systems Analysis - Conduct foundational studies and analyses, requirements analyses, and product demonstrations to meet operational needs, and define acquisition strategies and baselines for potential system solutions to Air Force Medical Service materiel needs identified through the Air Force Surgeon General's modernization planning process.
- (U) $ 2,168 Provide support for Human Systems Center, System Program Office, and Technical Engineering and Management Support contractor. Initiate transition from research and explore potential technologies for future EMD efforts.
- (U) $ 5,982 Total

(U) B. Budget Activity Justification:

This program is in budget activity 5 - Engineering and Manufacturing Development because it supports development of systems for treatment, evacuation, and prediction of wartime casualties in a conventional or non-conventional warfare environment.

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY 1999 PB)	3,907	3,336	564	95	Cont
(U) Appropriated Value	4,354	3,336			
(U) Adjustments to Appropriated Value					
a. Congressional/General Reductions	-373	-232			
b. SBIR	-74				
c. Omnibus or Other Above Threshold Reprogram	-26				
d. Below Threshold Reprogramming					
(U) Adjustments to Budget Years Since FY 1999 PB	-917	0	+6,571	+5,887	
(U) Current Budget Submit/FY 2000 PB	2,964	3,104	7,135	5,982	Cont

(U) Significant Program Changes:

- Funds added in FY2000 and FY2001 because of changes in the aeromedical evacuation mission.
  FY99: $75 identified as a source for SBIR.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604703F Aeromedical Systems Development PROJECT 2866

(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
(U) Other Procurement, AF, PE 28038F, Other Base and Maintenance Support, Medical/Dental Equipment	10,178	8,614	14,543	17,450	15,863	14,320	14,752	15,088	Cont	Cont

(U) E. Acquisition Strategy

All major projects within this Program Element are awarded under full and open competition.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604703F Aeromedical Systems Development
	PROJECT 2866

(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
TRANSPORTABLE BLOOD TRANSSHIPMENT CENTER																
- FOC			*													
SPINAL CORD INJURY TRANSPORT SYS																
- Begin EMD				*												
- Begin OT&E								X								
- Milestone III Decision									X							
- Begin Production										X						
CHATH/CHAMP																
- Complete OT&E		*														
- Milestone III Decision		*														
- Begin Production		*														
- Complete Production support											X					
CRAF AES																
- IOT&E for PLS		*														
- IOC for PLS						X										
- FOC for PLS							X									
AHOS-M																
- Prepare RFP							X									
- Begin EMD										X						
- Conduct Test and Evaluation													X			
TMIP-AF																
- Complete Program Definition						X										
- Milestone III Decision						X										
- Begin EMD.							X									
- Complete DT&E/IOT&E										X						
- Milestone III Decision											X					
- Integrate and Test P3I Solutions											X					

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604703F Aeromedical Systems Development
	PROJECT 2866

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Engineering and Manufacturing Development	902	1,394	4,274	2,901
(U) Development/Operational Test and Evaluation	36	115	642	584
(U) Contractor Engineering Support	1,258	941	1,500	1,500
(U) Miscellaneous (System Program Office Operations)	185	165	250	250
(U) Mission Support/Supplies	583	414	469	747
(U) Identified as a source for SBIR	0	75	0	0
(U) Total	2,964	3,104	7,135	5,982

(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							75				75
Product Development Organizations											
TBTC-A.D. Little	CPAF/FFP	Mar 91	11,033	13,289	13,134	0	0	0	0	0	13,134
CHATH/CHAMP Ph I-EASI/Guild	CPFF	Dec 94	2,989	2,989	2,989	0	0	0	0	0	2,989
CHATH/CHAMP Phase II-ERDEC	CPFF	Aug 95	3,853	3,853	3,609	0	0	0	0	0	3,609
SCITS	TBD	TBD	3,040	3,040	400	872	995	466	0	0	2733
AHOS--M	TBD	TBD	TBD	TBD	0	0	57	2,793	1,644	1,047	5,541
TMIP-AF	Various	Various	TBD	TBD	2,078	30	342	650	500	Cont	Cont
THREAT-BDM	CPFF	Aug 94	1,453	1,453	1,308	0	0	0	0	0	1,308

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604703F Aeromedical Systems Development PROJECT 2866

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							75				75
New Business-	Various	Various			17,477	0	0	365	757	Cont	Cont

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

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
Mission Support	Various	Various			532	557	414	469	747	Cont	Cont
Support/Mgmt Organizations											
TEAMS-OpTech, McDonald Tech, MTC	Delivery Order	Various			3,061	1,258	941	1,500	1,500	Cont	Cont
SPO Operations	Various	Various			3,767	211	165	250	250	Cont	Cont
Test and Evaluation Organizations											
Aberdeen Prov. Grnd					2	36	115	0	0	Cont	Cont
Other					138	0	0	642	584	Cont	Cont

Government Furnished Property:
None

						DATE **February 1999**	
BUDGET ACTIVITY **5 - Engineering and Manufacturing Development**	PE NUMBER AND TITLE **0604703F Aeromedical Systems Development**						
Identified as a source for SBIR			75				75
Subtotal Product Development	41,527	1,459	1,808	4,743	3,648	Cont	Cont
Subtotal Support and Management	6,828	1,469	1,106	1,750	1,750	Cont	Cont
Subtotal Test and Evaluation	140	36	115	642	584	Cont	Cont
Total Project	48,495	2,964	3,104	7,135	5,982	Cont	Cont

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604706F Life Support Systems

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	4,155	6,108	6,135	8,388	4,740	641	0	0	0	58,915
4803 Ejection Seat*	967	0	0	0	0	0	0	0	0	967
412A Life Support Systems**	3,188	6,108	6,135	8,388	4,740	641	0	0	0	57,948
Quantity of RDT&E Articles	48/571K***	0	0	0	0	0	0	0	0	101

* FY 98: $ 1M Congressional Add for the enhancement of ejection seat technology erroneously directed to this PE. BPAC created for special S&T effort in conjunction with the Crew Systems and Personnel Protection Program. $ 1M reduced by congressional adjustments.
** FY99: $2.5M Congressional Add only for engineering and manufacturing development (EMD) efforts to incorporate inflatable restraints. Total Cost includes funding prior to FY1998.
*** FY 98: (45) Advanced Technology Anti-Gravity Suit (ATAGS) at $ 6K per item. (3) Advanced Concept Ejection Seat (ACES) II at $ 100.4K per item (full-scale configuration).

(U) A. Mission Description:

This program provides for Engineering and Manufacturing Development (EMD) of life support equipment and subsystems to satisfy operational command requirements for improved life support equipment. There are three main projects in this PE. The Advanced Concept Ejection Seat (ACES) II Cooperative Improvement Program develops modifications for ACES II to accommodate lightweight aircrew members and high speed ejection. The Advanced Technology Anti-Gravity Suit (ATAGS) replaces the current G-suit, enabling aircrew members to endure the high G-forces of modern aircraft. The Laser Eye Protection project that will provide aircrews with eye protection against a variety of laser devices which could cause a permanent loss of vision. This PE also provides for the continuing development of life support items and subsystems such as the following: flight helmets, oxygen breathing equipment for aviators, survival radios, night vision devices, active/passive noise reduction devices, and parachute releases. Program management support includes tasks to assess deficiencies of currently fielded equipment, provide for the transition of new technology into EMD, and to support all current life support projects.

(U) B. Budget Activity Justification:

Program is in Budget Activity 5 because several projects are in Acquisition Phase II, EMD

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604706F Life Support Systems

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY 1999 PB)	4,301	3,744	3,747	3,848	44,925
(U) Appropriated Value	4,726	6,244			
(U) Adjustments to Appropriated Value					
a. Congressional /General Reduction	-330	-136			
b. Small Business Innovative Research (SBIR)	-96				
c. Omnibus & Other Above Threshold Reprogramming	-54				
d. Below Threshold Reprogramming (BTR)	-91				
(U) Adjustments to Budget Years since FY 1999 PB			2,388	4,540	
(U) Current Budget Submit/FY 2000 PB	4,155	6,108	6,135	8,388	58,915

FY 1999 $132 identified as a source for SBIR.

(U) Significant Program Changes:

FY 1998 Congress added $1M to this Program Element for the enhancement of ejection seat research.
FY 1999 Congress added $2.5M to this Program Element only for the EMD of ejection seat inflatable restraints.
FY 1999 NATO Cooperative R&D, PE 0603790, funds transferred to Life Support Systems for ACES II CIP, $388 FY00, $1.34M FY01
FY 2000 Initiate Laser Eye Protection EMD phase of the Laser Eye Protection effort.

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604706F Life Support Systems

PROJECT: 4803

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
4803 Ejection Seat*	967	0	0	0	0	0	0	0	0	967

* FY 98: $ 1M Congressional Add for the enhancement of ejection seat technology erroneously directed to this PE. BPAC created for special S&T effort in conjunction with the Crew Systems and Personnel Protection Program. $ 1M reduced by congressional adjustments.

(U) A. Mission Description:

This project made use of a congressional add of $1M in FY98 to enhance ejection seat research. A special Science and Technology effort was made to research the technologies needed to enhance US ejection seats and evaluates and integrates Russian K-36 ejection seat technology.

(U) FY 1998 ($ in Thousands):

- (U) $967 Reduced the technical risks associated with adapting the lightweight Russian ejection seat technologies to U.S. aircraft.
  - Assessed ejection seat interfaces with aircraft cockpits.
  - Verified compatibility with current Air Force/Navy personal equipment.
  - Explored low-cost ballistic cartridges and propulsion systems as a joint effort with the U.S. Navy.
  - Analyzed life cycle and logistics support concept improvements.
  - Defined manufacturing concepts and technologies for production in the U.S.
- (U) $967 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604706F Life Support Systems PROJECT 412A

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
412A Life Support Systems**	3,188	6,108	6,135	8,388	4,740	641	0	0	0	57,948

** FY99: $2.5M Congressional Add only for engineering and manufacturing development (EMD) efforts to incorporate inflatable restraints. Total Cost includes funding prior to FY1998.

(U) A. Mission Description

This program provides for Engineering and Manufacturing Development (EMD) of life support equipment and subsystems to satisfy operational command requirements for improved life support equipment. There are three main projects in this PE. The Advanced Concept Ejection Seat (ACES) II Cooperative Improvement Program develops modifications for ACES II to accommodate lightweight aircrew members and high speed ejection. The Advanced Technology Anti-Gravity Suit (ATAGS) replaces the current G-suit, enabling aircrew members to endure the high G-forces of modern aircraft. The Laser Eye Protection project that will provide aircrews with eye protection against a variety of laser devices which could cause a permanent loss of vision. This PE also provides for the continuing development of life support items and subsystems such as the following: flight helmets, oxygen breathing equipment for aviators, survival radios, night vision devices, active/passive noise reduction devices, and parachute releases. Program management support includes tasks to assess deficiencies of currently fielded equipment, provide for the transition of new technology into EMD, and to support all current life support projects.

(U) FY 1998 ($ in Thousands):

- (U) $629 Continued F-22 Life Support Equipment Integration Evaluation
- (U) $312 Completed Night Vision Systems (NVS) EMD contract, DT&E (combined with IOT&E) and product support costs.
- (U) $1,216 Initiated Air Force funded EMD program to continue development for Advanced Concept Ejection Seat (ACES) II Cooperative Improvement Program (CIP) - follow-on work to FY97 Congressional Add
- (U) $602 Continued Advanced Technology Anti-G Suit (ATAGS) EMD
- (U) $429 Program Management/Technical Support/Travel/Test & Evaluation potential AF Life Support Systems including, but not limited to: MAC 10/100 Anti-Exposure Suit, Joint Strike Fighter (JSF) program, Oxygen Generating Systems (OGS), Panoramic Night Vision Goggles (PNVGs), Joint Helmet Mounting Cueing System (JHMCS), Integrated Chin-Nape Strap (ICNS), Active Noise Reduction (ANR), Universal Water Activated Release Systems (UWARS), Low Profile Parachute (LPP), Female Aircrew Member Bladder Relief Capability (FAMBRC), Combat Survivor Evader Locator (CSEL), Automatic Life Preserver, Joint Aircrew Survival Vest (AIRSAVE), Visually Coupled Targeting and Acquisition System (VCATS), HGU-55P Lightweight Helmet, Laser Eye Protection (LEP), Advanced Recovery Sequencer (ARS)
- (U) $3,188 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604706F Life Support Systems	PROJECT 412A

(U) FY 1999 ($ in Thousands):

–	(U) $3,511	Continue Advanced Concept Ejection Seat (ACES) II Cooperative Improvement Program (CIP) Engineering and Manufacturing Development
–	(U) $2,392	Congressional add for EMD of ejection seat inflatable restraints
–	(U) $ 132	Identified as a source for SBIR
–	(U) $43	Complete Advanced Technology Anti-G Suit (ATAGS) EMD and production support costs
–	(U) $30	Program Management/Technical Support/Travel/Test & Evaluation in support of potential AF Life Support Systems including, but not limited to: Anti-Exposure Suit, Joint Strike Fighter (JSF) program, Oxygen Generating Systems (OGS), Panoramic Night Vision Goggles (PNVGs), Joint Helmet Mounting Cueing System (JHMCS), Integrated Chin-Nape Strap (ICNS), Low Profile Parachute (LPP), Female Aircrew Accommodations, Automatic Life Preserver, F-22 Integration of Current Life Support Systems Evaluation, Joint Aircrew Survival Vest (AIRSAVE), Visually Coupled Targeting and Acquisition System (VCATS), HGU-55P Lightweight Helmet, Laser Eye Protection (LEP)
–	(U) $6,108	Total

(U) FY 2000 ($ in Thousands):

–	(U) $1,961	Initiate Laser Eye Protection EMD
–	(U) $4,152	Continue ACES II CIP EMD
–	(U) $22	Program Management/Technical Support/Travel/Test & Evaluation in support of potential AF Life Support Systems including, but not limited to: Anti-Exposure Suit, Joint Strike Fighter (JSF) program, Oxygen Generating Systems (OGS), Panoramic Night Vision Goggles (PNVGs), Joint Helmet Mounting Cueing System (JHMCS), Integrated Chin-Nape Strap (ICNS), Low Profile Parachute (LPP), Female Aircrew Accommodations, Automatic Life Preserver, F-22 Integration of Current Life Support Systems Evaluation, Joint Aircrew Survival Vest (AIRSAVE), Visually Coupled Targeting and Acquisition System (VCATS), HGU-55P Lightweight Helmet
–	(U) $6,135	Total

(U) FY 2001 ($ in Thousands):

–	(U) $3,127	Continue Laser Eye Protection EMD
–	(U) $5,246	Complete ACES II CIP EMD
–	(U) $15	Program Management/Technical Support/Travel/Test & Evaluation in support of potential AF Life Support Systems including, but not limited to: Anti-Exposure Suit, Joint Strike Fighter (JSF) program, Oxygen Generating Systems (OGS), Panoramic Night Vision Goggles (PNVGs), Joint Helmet Mounting Cueing System (JHMCS), Integrated Chin-Nape Strap (ICNS), Low Profile Parachute (LPP), Female Aircrew Accommodations, Automatic Life Preserver, F-22 Integration of Current Life Support Systems Evaluation, Joint Aircrew Survival Vest (AIRSAVE), Visually Coupled Targeting and Acquisition System (VCATS), HGU-55P Lightweight Helmet
–	(U) $8,388	Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604706F Life Support Systems
	PROJECT 412A

(U) B. Project Change Summary - Description of Significant Changes: Not Applicable

(U) C. 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
NATO Cooperative R&D PE 0603790D (OSD funded) ACES II CIP	500	0	0	0	0	0	0	0	0	500
NATO Cooperative R&D PE 0603790F (AF funded) ACES II CIP	0	1000	0	0	0	0	0	0	0	1000
Item Less Than $5M (Safety Equipment) BPAC 842990, P-1 Line 86 Advanced Technology Anti-G Suit (ATAGS) FY99 Laser Eye Protection (LEP) FY02 - FY05	0	0	500	0	300	2620	3320	1400	0	8140

(U) D. Acquisition Strategy: Acquisition strategy is carried out at the project level. Advanced Concept Ejection Seat (ACES) II is a joint project with Japan, who is responsible for improved limb restraints and accommodations for lightweight aircrew and the US is responsible for improved seat stability. The US contracts are Sole Source with the Enhanced Drogue Chute and seat modifications engineered by MDA through a Cost Plus Fixed Fee Contract. The Engineering and Manufacturing Development (EMD) effort is to be performed by Boeing through a Cost Plus Fixed Fee contract and Cost Plus Incentive Fee Contract. The ATAGS project consists of three Sole Source contracts with KRUG, Mustang, and SRL, respectively. The first two are Firm Fixed Price contracts with a Cost Plus Fixed Fee contract for SRL to conduct Direct Testing and Evaluation (DT&E) Support.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604706F Life Support Systems PROJECT 412A

(U) E. Schedule Profile

	FY1998				FY1999				FY 2000				FY 2001			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) NVS Completed Government Conducted DT&E / IOT&E	*															
(U) NVS Completed contract, May 98		*														
(U) ACES II Started Pre-EMD		*														
(U) ACES II CIP EMD award					X											
(U) ACES II Complete detail design							X									
(U) ACES II Sled Test Completion															X	
(U) ACES II OT&E Completed																X
(U) ATAGS Complete IOT&E						X										
(U) ATAGS Production Award								X								
(U) ATAGS First Production Delivery										X						
(U) LEP EMD Contract Award										X						
(U) LEP CDR													X			
(U) LEP Complete DT&E																X
(U) LEP Begin IOT&E																X

* = completed event
X = planned event

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604706F Life Support Systems PROJECT 412A

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Contracts	1,121	1,962	3,729	4,582
(U) Technical Engineering Support	498	964	1,491	1,933
(U) Travel	234	99	140	117
(U) Government Testing	1,544	298	399	1,352
(U) Program Management/Technical Support and Misc.	758	261	376	398
(U) Government Furnished Property	0	0	0	6
(U) Congressional Add	0	2,392	0	0
(U) Identified as a source for SBIR	0	132	0	0
(U) Total	4,155	6,108	6,135	8,388

(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	FY 1998	FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Identified as source for SBIR							132				132
Product Development Organizations											
ITT-NVS	C/CPIF	18 Jan 93	14,081	14,081	13,900	181	0	0	0	0	14,081
KRUG-ATAGS	SS/FFP	7 July 97	424	424	424	0	0	0	0	0	424
Mustang-ATAGS	SS/FFP	Aug 97	499	499	271	228	0	0	0	0	499
LEP - (AL/Navy)	C/CPFF	Jun 97	4,552	4,552	4,552	0	0	0	0	0	4,552
MDA-Enhanced Drogue	SS/CPFF	Jun 97	1,130	1,130	1,130	0	0	0	0	0	1,130
MDA-ACES II Seats	SS/FFP	Sept 97	150	150	0	150	0	0	0	0	150

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604706F Life Support Systems

PROJECT: 412A

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	FY 1998	FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
SRL-ATAGS DT&E Support	SS/CPFF	Dec 97	150	150	150	0	0	0	0	0	150
Boeing-ACES II Pre-EMD	SS/CPFF	Feb 98	250	250	0	250	0	0	0	0	250
Brooks AFB, Supply	Supply Reqt	Feb 98	301	301	0	301	0	0	0	0	301
Contax	SS/FFP	Apr 98	11	11	0	11	0	0	0	0	11
Boeing-ACES II EMD	SS/CPIF	Nov 98	6,608	6,608	0	0	1,962	2,108	2,538	0	6,608
Dayton T Brown	TBD	Dec 99	29	29	0	0	0	29	0	0	29
Pax River	AF 185	Nov 99	33	33	0	0	0	33	0	0	33
Holloman AFB	AF 185	Nov 99	75	75	0	0	0	75	0	0	75
EME Corp	FFP	Nov 99	100	100	0	0	0	100	0	0	100
LEP, TBD	C/CPFF	Jan 00	6,355	6,355	0	0	0	1,384	2,044	2,927	6,355

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)											DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development					PE NUMBER AND TITLE 0604706F Life Support Systems						PROJECT 412A
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	FY 1998	FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Support and Management Organizations											
Program Management Support			4,273	4,273	2,132	758	261	376	398	348	4,273
Travel			1,100	1,100	347	234	99	140	117	163	1,100
Tech Eng & Acq			8,833	8,833	2,560	498	964	1,491	1,933	1,387	8,833
Test and Evaluation Organizations											
AFFTC		Proj Ord-Various	3,146	3,146	3,103	43	0	0	0	0	3,146
AL/CF		Various	179	179	179	0	0	0	0	0	179
Holloman		Various	2,763	2,763	0	164	298	399	1,352	550	2,763
AFRL (incl. Ejection Seat Effort)		Various	1,337	1,337	0	1,337	0	0	0	0	1,337
(U) B. Budget Acquisition History and Planning Information Continued ($ in Thousands)											
Government Furnished Property:											
LEP		TBD	12	12	0	0	0	0	6	6	12
Congressional Add		TBD	0	0	0	0	2,392	0	0	0	2,392
Identified as a source for SBIR							132				132
Subtotal Product Development			34,748	34,748	20,427	1,121	1,962	3,729	4,582	2,927	34,748
Subtotal Support and Management			14,206	14,206	5,039	1,490	1,324	2,007	2,448	1,898	14,206
Subtotal Test and Evaluation			7,425	7,425	3,282	1,544	298	399	1,352	550	7,425
Government Furnished Property			12	12	0	0	0	0	6	6	12
Congressional Add			0	0	0	0	2,392	0	0	0	2,392
Total Project			56,391	56,391	28,748	4,155	6,108	6,135	8,388	5,381	58,915

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

DATE: **February 1999**

BUDGET ACTIVITY: **5 - Engineering and Manufacturing Development**

PE NUMBER AND TITLE: **0604708F Civil, Fire, Environmental, Shelter**

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	2,510	2,682	2,719	2,770	2,806	2,854	2,914	2,974	TBD	Continuing
2505	Aircraft Firefighting Suppression And Rescue	2,323	2,498	2,539	2,584	2,618	2,663	2,719	2,776	TBD	Continuing
2674	Tactical Shelters	187	184	180	186	188	191	195	198	TBD	Continuing
	Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

This program funds the development, testing and evaluation of materials, equipment and procedures in the following areas:

(1) Aircraft Fire Fighting, Suppression and Rescue and Civil Engineer (CE) Readiness, and (2) Tactical Shelters. Overall CE readiness is supported by multimedia training systems for Fire Fighting, CE readiness (Disaster Preparedness, Chem/Bio) and Force Protection (Explosive Ordnance Disposal (EOD)) by developing interactive training scenarios which simulate hazardous situations, allows both training and testing of response capabilities, and complements field training while reducing time, cost and direct exposure to hazards. Develops new concepts and technology applications for fire fighting, suppression and rescue to provide rapidly deployable capabilities to support bare base, contingency operating areas or main operating bases, and to reduce fire risks to personnel and resources.

(2) Tactical Shelters is the USAF portion of a tri-service effort to develop standardized, low maintenance, highly survivable shelters and shelter accessories that are easily mobilized and compatible with air, sea and land transport systems. These products will effectively support high mobility aircraft support, command and control, communications, medical, and data processing units for the tactical and strategic forces. These shelters also optimize the latest enhancements of force protection technology.

(U) B. Budget Activity Justification:

This program is in budget activity five, Engineering and Manufacturing Development, because it takes emerging technologies and concepts and develops them for Air Force use.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604708F Civil, Fire, Environmental, Shelter

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget	2,526	2,715	2,768	2,824	Continuing
(U) Appropriated Value	2,682	2,715			
(U) Adjustments to Appropriated Value					
a. Cong/General Reductions	-120	-33			
b. SBIR	-52				
c. Omnibus or Other Above Threshold Reprogram					
d. Below Threshold Reprogramming					
(U) Adjustments to Budget Years Since FY 1999 PB			-49	-54	
(U) Current Budget Submit/FY2000 PB	2,510	2,682	2,719	2,770	Continuing

(U) Significant Program Changes:

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604708F Civil, Fire, Environmental, Shelter
	PROJECT 2505

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
2505 Aircraft Firefighting Suppression And Rescue	2,323	2,498	2,539	2,584	2,618	2,663	2,719	2,776	TBD	Continuing

(U) A. Mission Description

Develops improved civil engineering, fire fighting suppression and rescue equipment, materials, and methods to increase fire protection, readiness, force protection, mobility, and disaster preparedness effectiveness and training.

(U) FY 1998 ($ in Thousands):
- (U) $1,938 Continued courseware development of CE/MTS (Civil Engineer/Multimedia Training Systems).
- (U) $ 137 Continued commercial technology exploitation.
- (U) $ 248 Other technical support.
- (U) $2,323 Total

(U) FY 1999 ($ in Thousands):
- (U) $2,099 Continued courseware development of CE/MTS.
- (U) $ 144 Continued commercial technology exploitation.
- (U) $ 255 Other technical support.
- (U) $2,498 Total

(U) FY 2000 ($ in Thousands):
- (U) $2,224 Continued courseware development of CE/MTS.
- (U) $ 140 Continued commercial technology exploitation.
- (U) $ 175 Other technical support.
- (U) $2,539 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604708F Civil, Fire, Environmental, Shelter
	PROJECT 2505

(U) FY 2001 ($ in Thousands):

- (U) $2,295 Continued courseware development of CE/MTS (Civil Engineer/Multimedia Training Systems).
- (U) $ 150 Continued commercial technology exploitation.
- (U) $ 139 Other technical support.
- (U) $2,584 Total

(U) B. Project Change Summary - Description of Significant Changes: N/A

(U) C. Other Program Funding Summary ($ in Thousands) N/A

(U) D. Acquisition Strategy: Courseware materials will continue to be developed, tested, modified and readied for production and procurement by field units.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604708F Civil, Fire, Environmental, Shelter
	PROJECT 2505

(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
CE Multimedia Training Systems																
Complete C-130/KC-135	*															
Complete F-117/767			*													
Complete Confined Space Rescue							X									
Complete CRAF/F-22/HAZMAT							X									
Complete FY00 Priority List												X				
Complete FY01 Priority List																X
Fire Commercial Technology																
Complete Fire Fighter Cooling Vest	*															
Complete XL Computing				*												
Complete Smart Coat				*												
Complete Lifeguard				*												
Complete Mobile Fire Training System							X									
Complete AIM Safety Detectors							X									
Complete Help Mate Telephone System							X									
Complete FD On-Scene							X									
Complete FY00 AFOTEC Evaluation											X					
Complete FY01 AFOTEC Evaluation															X	

* = Completed Milestone
X = Planned Milestone

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604708F Civil, Fire, Environmental, Shelter
	PROJECT 2505

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Contracts	1,357	1,627	1,664	1,680
(U) A&AS Support	406	437	460	515
(U) Other Government Agencies	277	164	190	195
(U) Materials/Equipment	35	15	50	55
(U) Other Technical Support	248	255	175	139
(U) Total	2,323	2,498	2,539	2,584

(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
Product Development Organizations											
Multimedia Training Sys	Mult	Cont	14,500	14,500	498	1,938	2,099	2,224	2,295	TBD	Continues
Fire Commercial Technology Exploitation	Mult	Cont	1,500	1,500	250	44	40	30	35	TBD	Continues
Subtotal			16,000	16,000	2,598	1,982	2,139	2,254	2,330	TBD	Continues
Support and Management Organizations											
Various			1,950	1,950	442	248	255	175	139	TBD	Continues
Test and Evaluation Organizations											
Various			750	750	70	93	104	110	115	TBD	Continues

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604708F Civil, Fire, Environmental, Shelter
	PROJECT 2505

Government Furnished Property: None

(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
Subtotal Product Development					2,598	1,982	2,139	2,254	2,330	TBD	Continues
Subtotal Support and Management					442	248	255	175	139	TBD	Continues
Subtotal Test and Evaluation					70	93	104	110	115	TBD	Continues
Total Project					3,110	2,323	2,498	2,539	2,584	TBD	Continues

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604708F Civil, Fire, Environmental, Shelter
	PROJECT 2674

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
2674 Tactical Shelters	187	184	180	186	188	191	195	198	TBD	Continuing

(U) A. Mission Description:

Provides reliable, cost effective tactical shelters required to ensure the success of Air Force missions, provides Air Force membership in the DOD Tactical Shelter Program, and provides technology insertion for shelter development.

(U) FY 1998 ($ in Thousands):

- (U) $ 75 Continue research, development and acquisition of the Modular Extendible Ridged Wall Shelter (MERWS)
- (U) $102 Establish capability to evaluate shelter design and performance and perform system integration analysis
- (U) $ 10 Provide direct feedback and ensure Air Force requirements identified to Joint Committee for Tactical Shelters (JOCOTAS) and American Society of Testing Materials (ASTM)
- (U) $187 Total

(U) FY 1999 ($ in Thousands):

- (U) $ 72 Continue research, development and acquisition of the Modular Extendible Ridged Wall Shelter (MERWS)
- (U) $102 Establish capability to evaluate shelter design and performance and perform system integration analysis
- (U) $ 10 Provide direct feedback and ensure Air Force requirements identified to JOCOTAS and ASTM
- (U) $184 Total

(U) FY 2000 ($ in Thousands):

- (U) $ 66 Continue research, development and acquisition of composite tactical shelter.
- (U) $ 102 Establish capability to evaluate shelter design and performance and perform shelter integration analylsis.
- (U) $ 12 Provide direct feedback and ensure Air Force requirements are identified to JOCOTAS and ASTM.
- (U) $ 180 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604708F Civil, Fire, Environmental, Shelter
	PROJECT 2674

(U) FY 2001 ($ in Thousands):

- (U) $ 73 Continue research, development and acquisition of composite tactical shelter.
- (U) $ 102 Establish capability to evaluate shelter design and performance and perform shelter integration analylsis.
- (U) $ 11 Provide direct feedback and ensure Air Force requirements are identified to JOCOTAS and ASTM.
- (U) $ 186 Total

(U) B. Project Change Summary - Description of Significant Changes: N/A

(U) C. Other Program Funding Summary ($ in Thousands) N/A

(U) D. Acquisition Strategy: Tactical shelters development will continue to support Initial Deployable Kitchen (IDK) Program

(U) E. Schedule Profile N/A

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604708F Civil, Fire, Environmental, Shelter
	PROJECT 2674

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) MERWS (modular extendible ridged wall shelter) program	75	72		
(U) Composite Shelter Development	0	0	66	73
(U) Shelter design, performance and analysis	102	102	102	102
(U) JOCOTAS program	10	10	12	11
(U) Total	187	184	180	186

(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
Product Development Organizations											
MERWS Pgm	Multiple	Multiple			*	75	72	0	0	TBD	Continues
Composite Shelter Dev	Multiple	Multiple			*	0	0	66	73	TBD	Continues
Shelter design, performance and analysis	Multiple	Multipe			*	102	102	102	102	TBD	Continues
JOCOTAS Pgm	Multiple	Multiple			*	10	10	12	11	TBD	Continues
Support and Management Organizations											
N/A					*	0	0	0	0	N/A	

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)		DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604708F Civil, Fire, Environmental, Shelter	PROJECT 2674

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					*	0	0	0	0	N/A	N/A
N/A											

(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
Subtotal Product Development				16,310	187	184	180	186	TBD	Continues
Subtotal Support and Management				0	0	0	0	0	TBD	Continues
Subtotal Test and Evaluation				0	0	0	0	0	TBD	Continues
Total Project				16,310	187	184	180	186	TBD	Continues

* = Prior year funding was not aggregated in these categories and therefore only Subtotal/Total can be shown for "Prior to FY1998."

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604727F Joint Standoff Weapons Systems

PROJECT: 1000

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
1000 Joint Standoff Weapons Systems	21,458	14,756	10,307	1,512	0	0	0	0	0	193,771
Quantity of RDT&E Articles	8	**	0	0	0	0	0	0	0	27

(U) A. Mission Description

The Joint Standoff Weapon (JSOW) is an air-to-ground weapon designed to attack a variety of targets during day, night, and adverse weather conditions. JSOW will enhance aircraft survivability as compared to current interdiction weapon systems by providing the capability for launch aircraft to standoff outside the range of enemy point defenses. The JSOW accuracy and launch-and-leave capability will allow several target kills per aircraft sortie. Integration of the JSOW baseline weapon, the AGM-154A (BLU-97 Combined Effects Bomblets), and the JSOW anti-armor weapon, the AGM-154B (BLU-108 submunition), with the threshold F-16C/D Block 50 aircraft is also included. The program provides for development and test of a dispenser design for the AGM-154B variant which employs a Sensor Fuzed Weapon (SFW) BLU-108 submunition payload. Future integration (objective aircraft) is planned for the B-1B, F-16C/D Block 40, and F-15E. B-2 and B-52 integration is currently underway; B-2 is funding its own integration while B-52 integration is being funded by both JSOW and the Joint Air-to-Surface Standoff Missile (JASSM). The program also includes the development of JSOW Common Munitions Built-In Test (BIT) Reprogramming Equipment (CMBRE) software which is a tester for JSOW, Joint Direct Attack Munition (JDAM), Wind Corrected Munitions Dispenser (WCMD), and future smart weapons. The JSOW mission planning module continues to be developed concurrently with Air Force Mission Support System (AFMSS) Aircraft/Weapons/Electronics (AWE) development. Finally, this program element contains funding for the development of the BRU-57*, a MIL-STD-1760 dual-carriage ejector rack capable of carrying smart munitions. BRU-57 will allow the F-16C/D to carry four smart weapons including JSOW (a JSOW threshold requirement), 1000 lb JDAM, and WCMD. JSOW is a joint Air Force/Navy program; Navy is the lead service with the Air Force funding development of the AGM-154B. JSOW is an ACAT I[C/D] program.

(U) FY 1998 ($ in Thousands):

- (U) $11,395 Continued AGM-154B development and associated Systems Engineering and Program Management (SEPM); continued F-16 and B-52 aircraft integration support; continued development/test of AFMSS module and JSOW CMBRE software
- (U) $136 Government Furnished Equipment (GFE)--BLU-108 refurbishment
- (U) $508 Completed JSOW Developmental Test & Evaluation (DT&E) flight testing; completed captive carry flights; continued F-16 Block 50 T5 integration
- (U) $4,238 Continued engineering support, program office support, Navy technical support at China Lake, and other government support
- (U) $4,472 Continued BRU-57 development, integration, and flight testing
- (U) $709 AGM-154B advanced component buy for Initial Operational Test & Evaluation (IOT&E) assets
- (U) $21,458 Total

* BRU-55 nomenclature changed to BRU-57 during FY98

** AF currently reprogramming funds to procure 10 IOT&E test assets. $3,200 JSOW procurement funds are being reprogrammed to another procurement program in exchange for receiving $3,200 RDT&E funds to purchase the test assets. Reference JSOW P-40 exhibit (February 1999).

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604727F Joint Standoff Weapons Systems
	PROJECT 1000

(U) FY 1999 ($ in Thousands):

–	(U)	$9,500	Complete AGM-154B development; continue development and test of B-52 AFMSS module; continue integration and planning support for B-1B and F-15E; conduct design-to-cost initiatives to make AGM-154B more reliable/cost effective and allow increased performance to comply with Office of the Secretary of Defense directives; correct B-1 and B-2 explosive atmosphere issue with JSOW missile and perform software maintenance
–	(U)	$1,393	Telemetry instrumentation kits for IOT&E
–	(U)	$1,067	Continue engineering support, program office support, and Navy technical support at China Lake, and other government support
–	(U)	$1,777	Complete BRU-57 flight and ground tests; complete BRU-57 Engineering and Manufacturing Development (EMD); continue F-16 Operational Flight Program (OFP) software development
–	(U)	$615	Conduct F-16/50T5 JSOW self-targeting/F-16 production OFP verification/Operational Analysis 2 (OA2) testing
–	(U)	$404	Identified as a source for SBIR
–	(U)	$14,756	Total

(U) FY 2000 ($ in Thousands):

–	(U)	$6,967	Continue design-to-cost initiatives; continue JSOW software maintenance; complete development/testing of AFMSS module. Initiate new Joint Mission Planning Systems (JMPS)
–	(U)	$1,730	Complete F-16 OFP Smart Rack development
–	(U)	$1,360	Continue engineering support, program office support and Navy technical support at China Lake, and other government support
–	(U)	$250	AGM-154B IOT&E flight tests
–	(U)	$10,307	Total

(U) FY 2001 ($ in Thousands):

–	(U)	$1,400	Complete new JMPS mission planning interface and design-to-cost initiatives
–	(U)	$112	Continue program office support
–	(U)	$1,512	Total

(U) B. Budget Activity Justification

The RDT&E program element is in Budget Activity 5, EMD, because it supports the development of Air Force JSOW and BRU-57 and associated software, flight testing, and other developmental efforts.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604727F Joint Standoff Weapons Systems	PROJECT 1000

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY 1999 PB)	21,992	15,134	10,495	1,540	196,388
(U) Appropriated Value	24,676	15,134			
(U) Adjustments to Appropriated Value					
a. Congressional/General Reductions	-853	-378			
b. SBIR	-1,841				
c. Omnibus or Other Above Threshold Reprogram	-524				
d. Below Threshold Reprogramming					
(U) Adjustments to Budget Years Since FY 1999 PB			-188	-28	
(U) Current Budget Submit/FY 2000 PB	21,458	14,756	10,307	1,512	193,771

(U) Significant Program Changes: FY99: $3,200 is being reprogrammed to purchase 10 IOT&E assets; $404 identified as a source for SBIR.

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

Appropriation:	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost
(U) Missile Procurement, AF										
P-1 Line Item 4, JSOW										
JSOW	20,155	41,724	78,831	97,251	65,890	74,563	128,491	174,249	1184,100	1865,254
SEEK EAGLE	1,112	10,243	1,150	0	1,033	3,293	1,286	1,286	Cont.	Cont.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604727F Joint Standoff Weapons Systems
	PROJECT 1000

(U) E. Acquisition Strategy

JSOW awarded a joint service contract to Raytheon for EMD. A Cost Plus Incentive Fee (CPIF) contract was awarded for AGM-154A Low Rate Initial Production (LRIP) I. For AGM-154A LRIP II, a Fixed Price Incentive Fee (FPIF) contract was awarded. Both LRIP contracts were conducted in a sole source environment. A sole source AGM-154A Full Rate Production (FRP) and AGM-154B LRIP contract (FFP) was awarded on Dec 98.

(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
Acquisition Milestones																
BRU-57 Critical Design Review	*															
BRU-57 Development/Testing Completion						*										
BRU-57 Production Contract Award							X									
AGM-154A Prod Award (LRIP 2/First AF buy)	*															
AGM-154A Milestone III/FRP					*											
AGM-154B LRIP Decision					*											
USAF JSOW Required Assets Available												X				
AGM-154B Milestone III/FRP													X			
T&E Milestones																
AGM-154B DT&E (Start/Comp)			*													
AGM-154B System Qual Test (Start/Comp)		*														
BRU-57 Qualification and Reliability (Start/Comp)			*			*										
AGM-154B OA2								X								
AGM-154B IOT&E (Start/Comp)										X	X					

* = Completed Event
X = Planned Event

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604727F Joint Standoff Weapons Systems

PROJECT: 1000

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Major Contracts	12,104	10,893	6,967	1,400
(U) Support Contracts	2,095	166	549	0
(U) Program Office Support/Other Government Support	2,143	901	811	112
(U) Test and Evaluation	508	615	250	0
(U) Government Furnished Equipment	136	0	0	0
(U) BRU-57	4,472	1,777	1,730	0
(U) Identified as a source for SBIR	0	404	0	0
TOTAL	21,458	14,756	10,307	1,512

(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							404				404
Product Development Organizations											
Raytheon Sys. Co.	SS/CPIF	Jun 95	134,698	134,698	104,802	12,104	10,893	6,967	1,400	0	134,698
Lockheed	FP/CPIF	Feb 95	16,980	16,980	9,700	4,050	1,500	1,730	0	0	16,980
M Tech	FP/CPIF	Oct 95	7,465	7,465	7,245	220	0	0	0	0	7,465
Support and Management Organizations											
China Lake NWC	MIPR	Apr 97	N/A	N/A	3,548	550	400	100	0	0	4,648
ASC/YH & Other			N/A	N/A	10,877	3,688	667	1,260	112	0	18,325
Test and Evaluation Organizations											
AFDTC, Eglin AFB	REO	Apr 97	N/A	N/A	5,586	508	615	250	0	0	7,135
BRU-57 Misc.	REO/Other		N/A	N/A	0	202	277	0	0	0	479

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604727F Joint Standoff Weapons Systems PROJECT 1000

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

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
Product Development Property										
Textron	FPIF	Mar 96	Various	3,980	136	0	0	0	0	4,116
Support and Management Property										
Not Applicable										
Test and Evaluation Property										
Not Applicable										
Identified as a Source for SBIR				0	0	404	0	0	0	404
Subtotal Product Development				125,727	16,510	12,393	8,697	1,400	0	163,259
Subtotal Support and Management				14,425	4,238	1,067	1,360	112	0	22,973
Subtotal Test and Evaluation				5,586	710	892	250		0	7,135
Total Project				145,738	21,458	14,756	10,307	1,512	0	193,771

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604735F Combat Training Ranges

PROJECT: 2286

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
2286 Combat Training Range Equipment	18,998	13,999	6,220	12,670	13,235	13,289	14,963	15,275	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

This program develops the electronic telecommunications, and instrumentation equipment/systems for training ranges worldwide. These systems provide real-time monitoring and control of aircrew air-to-air, air-to-ground, and electronic warfare training along with the ability to record events for crew debriefing and analysis. The future developmental effort is a rangeless air combat training system, which consists of ground subsystems and airborne subsystems. The Air Force/Navy are currently involved in a technical evaluation to determine which system best fits the services' needs. This rangeless system will provide aircrews with a rangeless training capability and provide a ground monitoring and control capability of training activity when a training range is instrumented with appropriate ground components. The system will have a modular design, which will maximize the use of state of the art technology, commercial off the shelf (COTS) equipment, and non-developmental items (NDI) to provide for future expansion capabilities. Another effort is to develop the advanced threat Mini-(MUTES) Multiple Threat Emitter System Modification Program (M3P) to satisfy Air Force Electronic Warfare training capability requirements. The required system modifications will enable Mini-MUTES to incorporate the latest, most lethal advanced threats. This program element also funds aircraft/pod interfaces, software interoperability among service ranges and the encryption of range/aircraft data links.

(U) FY 1998 ($ in Thousands):

- (U) $5,369 Continued Combat Training Ranges (CTR) basic operating support, and system acquisition and engineering support for range and threat systems
- (U) $3,246 Completed Nellis Air Combat Training System (NACTS) Engineering and Manufacturing Development (EMD)
- (U) $1,593 Continued interoperability improvements with existing Navy ranges to include software upgrades and weapons simulation development
- (U) $623 Continued development of aircraft interfaces with aircraft/Pod integration for range applications with aircraft program offices and aircraft manufacturers
- (U) $6,497 Continued Mini-MUTES Modification Program (M3P) Advanced Threats
- (U) $1,095 Continued ASSET [ACTS (Air Combat Training System) Software Support Evaluation and Test] efforts
- (U) $575 Continued Joint Tactical Combat Training System (JTCTS) development with emphasis on Alpena Range
- (U) $18,998 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604735F Combat Training Ranges
	PROJECT 2286

(U) FY 1999 ($ in Thousands):

–	(U)	$3,473	Continue Combat Training Ranges (CTR) basic operating support, and system acquisition and engineering support for range and threat systems
–	(U)	$1,710	Continue interoperability improvements with existing Air Force and Navy ranges to include software, upgrades, and weapons simulation development
–	(U)	$1,000	Continue Joint Tactical Combat Training System (JTCTS) development
–	(U)	$926	Continue development of aircraft interfaces with aircraft/Pod integration for range applications with aircraft program offices
–	(U)	$4,175	Continue Mini-(MUTES) Multiple Threat Emitter System Modification Program (M3P) Advanced Threats
–	(U)	$2,252	Continue ASSET [ACTS (Air Combat Training System) Software Support Evaluation and Test] efforts
–	(U)	$463	Identified as a source for SBIR
–	(U)	$13,999	Total

(U) FY 2000 ($ in Thousands):

–	(U)	$3,995	Continue CTR basic operating support, and system acquisition and engineering support for range and threat systems
–	(U)	$317	Continue interoperability improvements with existing Air Force and Navy ranges to include software, upgrades, and weapons simulation development
–	(U)	$205	Continue development of aircraft interfaces with aircraft/Pod integration for range applications with aircraft program office
–	(U)	$1,703	Continue ASSET efforts
–	(U)	$6,220	Total

(U) FY 2001 ($ in Thousands):

–	(U)	$3,962	Continue CTR basic operating support, and system acquisition and engineering support for range and threat systems
–	(U)	$1,892	Continue interoperability improvements with existing Air Force and Navy ranges to include software, upgrades, and weapons simulation development
–	(U)	$1,007	Continue development of aircraft interfaces with aircraft/Pod integration for range applications with aircraft program office
–	(U)	$3,964	Continue M3P Advanced Threats
–	(U)	$1,845	Continue ASSET efforts
–	(U)	$12,670	Total

(U) B. Budget Activity Justification:

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604735F Combat Training Ranges
	PROJECT 2286

This program is in budget activity 5 - Engineering and Manufacturing Development because the Combat Training Ranges (CTR) Program directly contributes to the effectiveness and survivability of US combat forces by developing range instrumentation and training systems to increase the effectiveness of the training spectrum from individual aircrew skill training to large-scale exercises.

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (1999 PB)	19,131	14,581	12,984	14,011	Cont
(U) Appropriated Value	20,331	14,581			
(U) Adjustments to Appropriated Value					
a. Congressional/General Reductions	-690	-582			
b. SBIR	-513				
c. Omnibus or Other Above Threshold Reprogram	-130				
d. Below Threshold Reprogramming					
(U) Adjustments to Budget Years Since FY 1999 PB			-6,764	-1,341	
(U) Current Budget Submit/ FY 2000 PB	18,998	13,999	6,220	12,670	Cont

(U) Significant Program Changes:
FY00 reduced $5,551 to better align expenditure and reduced by $1,213 for higher Air Force priorities.
FY01 reduced by $1,341 for higher Air Force priorities.
FY99 $463 identified as a source for SBIR.

(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
(U) PE27429F: Appropriation: Other Procurement, AF (OPAF) Program Title: Combat Training Ranges	15,557	24,024	19,569	31,038	28,738	27,980	34,919	33,486	Cont	Cont

	DATE
	February 1999

BUDGET ACTIVITY	PE NUMBER AND TITLE
5 - Engineering and Manufacturing Development	**0604735F Combat Training Ranges**

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost
(U) PE27429F: Appropriation: Aircraft Procurement, AF (APAF), Program Title: Combat Training Ranges	9,751	454	17,410	19,409	19,880	20,473	20,597	21,017	Cont	Cont

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604735F Combat Training Ranges
	PROJECT 2286

(U) E. Acquisition Strategy:

The acquisition strategy is competitive, with cost plus contracts.

(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) Nellis Air Combat Training System (NACTS)																
(U) Operational Fielding						X										
(U) Initial Operational Capability (IOC) (Without Encryption Option)							X									
(U) Advances Threats Development																
(U) Initiate New Acquisition	*															
(U) Contract Award			*													
(U) Preliminary Design Review (PDR)					*											
(U) Critical Design Review (CDR)							X									
(U) Field Testing											X					
(U) Production Decision												X				
(U) IOC																X
(U) Joint Service Range Software Interoperability																
(U) Joint Service AMRAAM 5.1 Software Upgrade						X										
(U) Joint Service Tracking Instrumentation Subsystem Emulator (TISM) Program						X										
(U) Digital Display System (DDS) Replacement with Advanced DDS (ADDS) Displays						X										
(U) Joint Service Common Computational Computer System (CCS) Platform													X			

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604735F Combat Training Ranges

PROJECT: 2286

	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) Joint Tactical Combat Training System (JTCTS)																
(U) Begin Technical Evaluation							X									
(U) ASSET Facility																
(U) ADDS 4.0 AF/Navy Integration						X										
(U) ADDS 3.2 Beta Block 6 Development									X							
(U) DDS Upgrade Air National Guard (ANG)									X							

* = Completed event
X = Planned event

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604735F Combat Training Ranges PROJECT 2286

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Nellis Air Combat Training System (NACTS)	3,246	0	0	0
(U) Aircraft Interface Development	623	926	205	1,007
(U) Advanced Threat Development	6,497	4,175	0	3,964
(U) Joint Service Interoperability Improvements	1,593	1,710	317	1,892
(U) ACTS (Air Combat Training System) Software Support Evaluation and Test (ASSETS) Efforts	1,095	2,252	1,703	1,845
(U) Joint Tactical Combat Training Ranges (JTCTS)/Alpena Development	575	1,000	0	0
(U) Combat Training Ranges Program Office Support	5,369	3,473	3,995	3,962
(U) Identified as a source for SBIR		463		
(U) Total	18,998	13,999	6,220	12,670

(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
											463
Identified as a source for SBIR							463				
Product Development Organizations											
Cubic Defense (NACTS)	C/CPAF/FFP	Mar 95			31,149	3,246	0	0	0	0	34,395
Raytheon (JTCTS)	Navy Contr	Mar 95			2,500	575	1,000	0	0	0	3,075
ASI (ASSET)	CPAF	Sep 96			2,385	1,095	2,252	1,703	1,845	Cont	Cont

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)											DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development					PE NUMBER AND TITLE 0604735F Combat Training Ranges						PROJECT 2286
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
											463
Harris Corp (Advanced Threats)	C/CPAF/FFP	May 98			380	6,497	4,175	0	3,964	Cont	Cont
Joint Interoperability	Navy Contract	Mar 97			3,429	1,593	1,710	317	1,892	Cont	Cont
Aircraft Interface	Through MOAs with ALCs & Aircraft SPO Contractors	Jun 96			1,035	623	926	205	1,007	Cont	Cont
Lockheed Martin (AMODSM)	Navy Contractor	FY95			2,880	0	0	0	0	0	2,880
Support and Management Organizations											
ASC/WMR, Eglin AFB, FL	Various				8,576	5,045	3,173	3,695	3,662	Cont	Cont
NAWC, China Lake, CA	Various				113	113	0	0	0	0	226
Test and Evaluation Organizations											
ASC/WMR, Eglin AFB, FL	Various				1,405	100	100	100	100	Cont	Cont
46 Test Wing, Eglin AFB, FL	Various				640	111	200	200	200	Cont	Cont

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)		DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604735F Combat Training Ranges	PROJECT 2286

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

Government Furnished Property: Not Applicable

	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR			463				
Subtotal Product Development	43,758	13,629	10,063	2,225	8,708	Cont	Cont
Subtotal Support and Management	8,689	5,158	3,173	3,695	3,662	Cont	Cont
Subtotal Test and Evaluation	2,045	211	300	300	300	Cont	Cont
Total Project	54,492	18,998	13,999	6,220	12,670	Cont	Cont

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604740F Computer Resources Mgt Tech

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	3,796	2,194	196	216	235	254	274	293	Continuing	Continuing
2522 Advanced Computer Technology Transition	676	0	0	0	0	0	0	0	0	4,381
2523 Architectural Implementation	684	2,194*	196	216	235	254	274	293	Continuing	Continuing
2524 Reuse and Component Support (RCS)	2,436	0	0	0	0	0	0	0	0	12,259
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

* Congress added an additional $2.0 million in FY99 for the National Product Line Asset Center (NPLACE). These funds were inadvertently placed in project 2523 as opposed to project 2524. Funds will be transferred to project 2524 at the earliest opportunity.

(U) A. Mission Description

A major restructuring of this program into an Integrated Command and Control Applications (IC2A) program in support of Command and Control Centers is currently in process. The goal of this program is to dramatically reduce the development time, costs, and risks associated with the acquisition and development of warfighting command and control (C2) systems by using families of pre-defined product lines to enhance common application use and reuse. As part of this, Project 2522 was merged and funding was transitioned to Project 2523, to be renamed Command and Control Product Lines (CCPL). The CCPL project minimizes development cost and time by using pre-defined product line architectures with tested, reusable software components from mature programs. The use of common product line designs during development can improve software quality and reliability while reducing fielding times and overall life cycle costs. Project 2524, Reuse and Component Support (RCS) identifies, tests, and provides reusable software components and products to the IC2A program. The RCS project developed a software reuse strategy for the DoD; and is developing a National Product Line Asset Center (NPlace) Software Reuse Repository to manage a command center product line based on primarily commercial off-the-shelf (COTS) products. The IC2A program has determined that over 80% of the functionality of any command center software is common to all command centers. For programs using product line concepts, average savings of 56% in development costs and 66% in development time can be realized.

(U) B. Budget Activity Justification:

This program is in budget activity 5 - Engineering and Manufacturing Development, due to the nature of the effort.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604740F Computer Resources Mgt Tech

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget FY 1999 PB	4,159	200	0	0	Continuing
(U) Appropriated Value	4,459	2,200			
(U) Adjustments to Appropriated Value					
a. Cong Reductions	-146	-6			
b. SBIR	-109				
c. Omnibus or Other Above Threshold Reprogram	-11				
d. Below Threshold Reprogramming	-397				
(U) Adjustments to Budget Years Since FY 1999 PB			196	216	
(U) Current Budget Submit/FY 2000 PB	3,796	2,194	196	216	Continuing

(U) Significant Program Changes:
Funding was restored to FY00 - FY05 to facilitate the restructuring of this program into a Integrated Command and Control Applications (IC2A) program.
FY99: SBIR $70 identified as source.

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604740F Computer Resources Mgt Tech

PROJECT: 2522

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
2522 Advanced Computer Technology Transition	676	0	0	0	0	0	0	0	0	4,381

(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. As part of a major restructuring of this program, this project was transferred to project 2523 after FY 98.

(U) FY 1998 ($ in Thousands):
- (U) $ 180 Continued development of technology transition infrastructure within the Air Force
- (U) $ 320 Update to existing architecture to accommodate new technologies
- (U) $ 176 Upgrade to existing component structure to allow for new technologies
- (U) $ 676 Total

(U) FY 1999 ($ in Thousands):
- (U) $ 0 Total (Project 2522 transitioned to Project 2523)

(U) FY 2000 ($ in Thousands):
- (U) $ 0 Total (Project 2522 transitioned to Project 2523)

(U) FY 2001 ($ in Thousands):
- (U) $ 0 Total (Project 2522 transitioned to Project 2523)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604740F Computer Resources Mgt Tech
	PROJECT 2522

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

Project 2522 transitioned to Project 2523

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

Not applicable.

(U) D. Acquisition Strategy:

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

(U) E. Schedule Profile

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

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604740F Computer Resources Mgt Tech	PROJECT 2522

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Continued development of technology infrastructure within the Air Force.	180	0	0	0
(U) Update to existing architecture to accommodate new technologies.	320	0	0	0
(U) Upgrade to existing component structure to allow for new technologies.	176	0	0	0
(U) Total	676	0	0	0

(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
Product Development Organizations											
Universal SCA	CP	Dec 94	N/A	N/A	75	0	0	0	0	0	75
AGCS	CP	Jan 95	N/A	N/A	50	0	0	0	0	0	50
Martin Marietta	FFP	22 Oct 94	N/A	N/A	213	0	0	0	0	0	213
Hughes Aircraft	CPFF	19 Dec 92	N/A	N/A	282	220	0	0	0	0	502
Raytheon Co.	CPFF	19 Dec 92	N/A	N/A	891	200	0	0	0	0	1,091
Unisys	CPFF	29 Sep 93	N/A	N/A	660	0	0	0	0	0	660
TRW	CPFF	20 Feb 97	N/A	N/A	0	256	0	0	0	0	256
Lockheed Martin	CP	Var	N/A	N/A	0	0	0	0	0	0	0

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)											DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development					PE NUMBER AND TITLE 0604740F Computer Resources Mgt Tech						PROJECT 2522
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
Support and Management Organizations											
OO-ALC	N/A	Var	N/A	N/A	157	0	0	0	0	0	157
SENCOM	N/A	Jan 95	N/A	N/A	25	0	0	0	0	0	25
MOSAIC (TEMS)	CP	Jan 95	N/A	N/A	415	0	0	0	0	0	415
JLC	N/A	Var	N/A	N/A	230	0	0	0	0	0	230
SEI	FFRDC	Var	N/A	N/A	185	0	0	0	0	0	185
Sterling	N/A	Var	N/A	N/A	0	0	0	0	0	0	0
ATTI	N/A	Var	N/A	N/A	0	0	0	0	0	0	0
ESC	N/A	N/A	N/A	N/A	522	0	0	0	0	0	522
Test and Evaluation Organizations Not applicable.											
Government Furnished Property: Not applicable.											
Subtotal Product Development					2,171	676	0	0	0	0	2,847
Subtotal Support and Management					1,534	0	0	0	0	0	1,534
Subtotal Test and Evaluation					0	0	0	0	0	0	0
Total Project					3,705	676	0	0	0	0	4,381

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604740F Computer Resources Mgt Tech PROJECT 2523

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
2523 Architectural Implementation	684	2,194*	196	216	235	254	274	293	Continuing	Continuing

* Congress added an additional $2.0 million in FY99 for the National Product Line Asset Center (NPLACE). These funds were inadvertently placed in project 2523 as opposed to project 2524. Funds will be transferred to project 2524 at the earliest opportunity.

(U) A. Mission Description

As part of the restructuring of this program (see page 1), this project will be renamed Command and Control Product Lines (CCPL). The CCPL project forms a vital component of the Integrated Command and Control Applications (IC2A) program by providing pre-defined product line architectures with tested, reusable software components to build Command and Control (C2) systems. Using rapid prototyping techniques, a CCPL contractor can quickly tailor a product line to the warfighter's needs and deliver an integrated, combat-ready system. All product lines and components are based on Defense Information Infrastructure Common Operating Environment (DII COE) principles; make maximum use of open system architectures, industry standards, Commercial Off-the Shelf (COTS) products, and government furnished equipment; and incorporate multilevel security (MLS) features. CCPL minimizes development risks by reusing proven software components from mature programs and by continuously testing new products and technologies against the product line designs to ensure integration and interoperability. The CCPL contractors develop and maintain the C2 product line infrastructure in a collaborative, synergistic environment using validated, mature software engineering processes to help ensure the quality of the designs and components. Proven product line designs and tested software components reduce development costs, risks, and time for the user. New technologies, capabilities, and incremental developments are assessed and integrated into the designs as part of the product line development process to minimize any impact to the user.

(U) FY 1998 ($ in Thousands):
- (U) $ 340 Qualify components for CCPL
- (U) $ 344 Integrate products into CCPL
- (U) $ 684 Total

(U) FY 1999 ($ in Thousands):
- (U) $ 200 Qualify components for CCPL
- (U) $ 360 Identify Enterprise Wide Assets (From COTS, GOTS, Product line engineering centers).
- (U) $ 1,320 Perform suitability testing against product line architectures, assets, criteria, and design.
- (U) $ 244 Maintain repository/distribute product line architecture, assests, criteria, and design.
- (U) $ 70 Identified as a source for SBIR.
- (U) $ 2,194 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604740F Computer Resources Mgt Tech
	PROJECT 2523

(U) FY 2000 ($ in Thousands):
- (U) $ 196 Qualify components for CCPL
- (U) $ 196 Total

(U) FY 2001 ($ in Thousands):
- (U) $ 216 Qualify components for CCPL
- (U) $ 216 Total

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

Funding was restored to FY00 - FY05 to facilitate the restructuring of this program. Congress added an additional $2.0 million into the FY99 program for the National Product Line Asset Center (NPLACE).

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

Not applicable.

(U) D. Acquisition Strategy:

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

(U) E. Schedule Profile

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

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604740F Computer Resources Mgt Tech PROJECT 2523

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) CCPL Component Qualification	340	200	196	216
(U) CCPL Product Integration	344	0	0	0
(U) Identify Enterprise Wide Assets	0	360	0	0
(U) Perform Suitability Testing	0	1,320	0	0
(U) Maintain Repository/Distribute Product Line	0	244	0	0
(U) Identified as a source for SBIR	0	70	0	0
(U) Total	684	2,194	196	216

(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					0	0	70	0	0	0	70
Product Development Organizations											
Hughes	CPFF	19 Dec 92	N/A	N/A	453	458	65	65	72	Continuing	Continuing
Raytheon	CPFF	19 Dec 92	N/A	N/A	1,000	0	64	66	72	Continuing	Continuing
AGCS	CPFF	Dec 94	N/A	N/A	50	0	0	0	0	0	50
TRW	CPFF	12 Feb 97	N/A	N/A	0	190	65	65	72	Continuing	Continuing
Unisys	CPFF	29 Sep 93	N/A	N/A	30	0	0	0	0	0	30
WVA High Tech	NPLACE	18 Nov 96	N/A	N/A	0	0	1,732	0	0	0	1,732
Raytheon/Hughes /TRW	CPFF	20 Feb 97	N/A	N/A	0	0	192	0	0	0	192

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604740F Computer Resources Mgt Tech

PROJECT: 2523

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
Support and Management Organizations											
MOSAIC (TEMS)	N/A	Var	N/A	N/A	178	0	0	0	0	0	178
ATTI	N/A	Var	N/A	N/A	22	0	0	0	0	0	22
ESC	N/A	N/A	N/A	N/A	247	36	0	0	0	Continuing	Continuing
Test and Evaluation Organizations											
Not applicable.											
Government Furnished Property:											
Not applicable.											
Identified as source for SBIR					0	0	70	0	0	0	70
Subtotal Product Development					1,533	648	2,124	196	216	Continuing	Continuing
Subtotal Support and Management					447	36	0	0	0	Continuing	Continuing
Subtotal Test and Evaluation					0	0	0	0	0	0	0
Total Project					1,980	684	2,194	196	216	Continuing	Continuing

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604740F Computer Resources Mgt Tech PROJECT 2524

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
2524 Reuse and Component Support (RCS)	2,436	0	0	0	0	0	0	0	0	12,259

* Congress added an additional $2.0 million in FY99 for the National Product Line Asset Center (NPLACE). These funds were inadvertently placed in project 2523 as opposed to project 2524. Funds will be transferred to project 2524 at the earliest opportunity.

(U) A. Mission Description

This project was renamed the Comprehensive Approach for Reusable Defense Software (CARDS) program. CARDS developed a reuse blueprint for DoD and established a reuse library. CARDS is a Congressional special interest item for which Congress has added funds in every FY since FY92 with the exception of FY97. CARDS identifies, tests, and provides reusable software components and products to the CCPL program. CARDS developed a software reuse strategy for the DoD; and is developing a Product Line Asset Center Software Reuse Repository to manage a command center product line based primarily on commercial off-the-shelf (COTS) products through the National Product Line Asset Center (NPLACE) contract vehicle.

(U) FY 1998 ($ in Thousands):
- (U) $ 440 Identify Enterprise Wide Assets (From COTS, GOTS, Product line engineering centers).
- (U) $ 1,699 Perform suitability testing against product line architectures, assets, criteria, and design.
- (U) $ 297 Maintain repository/distribute product line architecture, assets, criteria, and design.
- (U) $ 2,436 Total

(U) FY 1999 ($ in Thousands):
- (U) $ 0 Total

(U) FY 2000 ($ in Thousands):
- (U) $ 0 Total

(U) FY 2001 ($ in Thousands):
- (U) $ 0 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604740F Computer Resources Mgt Tech
	PROJECT 2524

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

Congress added $3.0 million to the FY98 program as part of the FY98 appropriation for the Central Archive for Reusable Defense Software (CARDS) program and an additional $2.0 million into the FY99 program for the National Product Line Asset Center (NPLACE).

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

Not applicable.

(U) D. Acquisition Strategy

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

(U) E. Schedule Profile

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

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604740F Computer Resources Mgt Tech
	PROJECT 2524

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Identify Enterprise Wide Assets	440	0	0	0
(U) Perform Suitability Testing	1,699	0	0	0
(U) Maintain Repository/Distribute Product Line	297	0	0	0
(U) Total	2,436	0	0	0

(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
Product Development Organizations											
Lockheed Martin	CPFF	May 97	N/A	N/A	0	30	0	0	0	0	30
Support and Management Organizations											
Unisys	CPFF	29 Sep 93	N/A	N/A	5,638	0	0	0	0	0	5,638
AGCS	CR	Dec 94	N/A	N/A	270	0	0	0	0	0	270
WVA High Tech	NPLACE	18 Nov 96	N/A	N/A	1,700	2,006	0	0	0	0	3,706
Raytheon/Hughes/TRW	CPFF	20 Feb 97	N/A	N/A	38	400	0	0	0	0	438
ATTI	N/A	N/A	N/A	N/A	253	0	0	0	0	0	253

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)											DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development				PE NUMBER AND TITLE 0604740F Computer Resources Mgt Tech							PROJECT 2524
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.											
Subtotal Product Development					0	30	0	0	0	0	30
Subtotal Support and Management					7,899	2,406	0	0	0	0	10,305
Subtotal Test and Evaluation					0	0	0	0	0	0	0
Total Project					7,899	2,436	0	0	0	0	10,335

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

DATE: **February 1999**

BUDGET ACTIVITY: **5 - Engineering and Manufacturing Development**

PE NUMBER AND TITLE: **0604750F Intelligence Equipment**

PROJECT: **2053**

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
2053 National Air Intel Center	1,174	1,296	1,345	1,311	1,326	1,350	1,377	1,406	Cont	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

Intelligence Equipment (IE) provides continuing development and upgrades of threat analysis capabilities of the National Air Intelligence Center (NAIC) and Air Force Information Warfare Center (AFIWC). Both organizations are tasked with providing detailed foreign technology intelligence information to a variety of DOD and non-DOD customers. In the past few years, customers' requirements have been more sophisticated, dictating more detailed and timely intelligence not only in the technology regime but also in the economic, world crisis, and political arenas. IE provides NAIC and AFIWC with the tools necessary to produce timely intelligence of foreign weapon systems and develops the tools to model and assess foreign airborne and aerospace systems. This is the only AF program developing new, or upgraded analysis, modeling and simulation tools focused on intelligence production in support of AF developmental and operational functions.

(U) FY 1998 ($ in Thousands):

- (U) $ 172 Completed Model Synthesis Interface
- (U) $ 96 Initiated Advanced Communication Network Modeling
- (U) $ 154 Initiated Computer Requirements Model for Payload Study (CRMPS) I/O Modeling
- (U) $ 350 Continued Radio Frequency Weapons Modeling
- (U) $ 336 Completed Advanced Infrared Countermeasures Assessment
- (U) $ 66 Completed Virtual Laboratory/Model Testbed
- (U) $1,174 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604750F Intelligence Equipment
	PROJECT 2053

(U) FY 1999 ($ in Thousands):
- (U) $ 265 Complete Advanced Communication Network Modeling
- (U) $ 295 Complete CRMPS I/O Modeling
- (U) $ 265 Complete Radio Frequency Weapons Modeling
- (U) $ 155 Initiate Comm Network Modeling Tool Upgrade
- (U) $ 155 Initiate Adv Infrared Countermeasures Systems Assessment Model (AIRSAM) Update
- (U) $ 53 Initiate Radio Frequency Weapons Modeling Improvements (HEIMDALL-2+)
- (U) $ 75 Initiate High Speed Propulsion/Pulsed Detonation Engine Model
- (U) $ 33 Identified as a source for SBIR
- (U) $1,296 Total

(U) FY 2000 ($ in Thousands):
- (U) $ 266 Complete Comm Network Modeling Tool Upgrade
- (U) $ 297 Continue Adv Infrared Countermeasures Systems Assessment Model (AIRSAM) Update
- (U) $ 342 Continue RFW Modeling Improvements (HEIMDALL-2+)
- (U) $ 96 Complete High Speed Propulsion/Pulsed Detonation Engine Model
- (U) $ 142 Initiate/Complete H.S. Propulsion/Air-Turbo Ramjet Engine Model
- (U) $ 142 Initiate/Complete H.S. Propulsion/Turbo-Ramjets Engine Model
- (U) $ 60 Initiate Missile System/Booster & Post Booster Upgrades for MiTAS
- (U) $1,345 Total

(U) FY 2001 ($ in Thousands):
- (U) $ 65 Complete Adv Infrared Countermeasures Systems Assessment Model (AIRSAM) Update
- (U) $ 61 Complete Radio Frequency Weapons Modeling Improvements (HEIMDALL-2+)
- (U) $ 302 Complete Missile System/Booster & Post Booster Upgrades for MiTAS
- (U) $ 257 Intiate Integrated I/O Modeling Environment
- (U) $ 226 Initiate/Complete IVIEW 2000 Upgrade
- (U) $ 256 Initiate Advanced Analysis Capability: Integrated Avionics System Model
- (U) $ 144 Initiate DIODE Objectives Model
- (U) $1,311 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604750F Intelligence Equipment	PROJECT 2053

(U) B. Budget Activity Justification:

This effort is Budget Activity 5, Engineering & Manufacturing Development, because the program develops and inserts new technology into existing systems and models to keep existing systems current.

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

	FY 1998	FY1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY1999)	1,223	1,300	1,369	1,336	TBD
(U) Appropriated Value	1,287	1,300			
(U) Adjustments to Appropriated Value					
a. Cong Reductions	-42	-4			
b. Small Business Innovative Research (SBIR)	-23				
c. Omnibus and other Above Threshold Reprogramming	-8				
d. Below Threshold Reprogramming (BTR)	-40				
(U) Adjustment to Budget Years Since FY1999 PB			-24	-25	
(U) Current Budget Submit/FY2000 PB	1,174	1,296	1,345	1,311	TBD

(U) Significant Program Changes: None

FY99: $33 identified as a source for SBIR

(U) Other Program Funding Summary ($ in Thousands)

(U) Not Applicable.

(U) Related Activities—None.

(U) D. Acquisition Strategy:

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

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604750F Intelligence Equipment
	PROJECT 2053

(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) Model Synthesis Interface	*			*												
(U) Adv Communication Network Modeling Tool	*							X								
(U) CRMPS I/O Modeling				*				X								
(U) Radio Frequency Weapons Modeling	*							X								
(U) Advanced IRCM Assessment Model	*			*												
(U) Virtual Laboratory Model Testbed				*	*											
(U) Communication Network ModelingTool Upgrade					*						X					
(U) Advanced IRCM Systems Assessment Model (AIRSAM) Update					*								X			
(U) Radio Frequency Weapons Modeling Improvements (HEIMDALL-2+)								X					X			
(U) High Speed Propulsion / Pulsed Detonation Engine Model								X		X						
(U) High Speed Propulsion / Air-Turbo Ramjet Engine Model									X	X						
(U) High Speed Propulsion / Turbo-Ramjets Engine Model									X	X						
(U) Missile System / Booster & Post Booster Upgrades for MiTAS												X				X
(U) Integrated I/O Modeling Environment													X			
(U) IVIEW 2000 Upgrade													X		X	
(U) Advanced Analysis Capability: Integrated Avionics System Model													X			
(U) DIODE Objectives Model															X	

* denotes completed event

	DATE **February 1999**
BUDGET ACTIVITY **5 - Engineering and Manufacturing Development**	PE NUMBER AND TITLE **0604750F Intelligence Equipment**

X denotes planned event

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604750F Intelligence Equipment
	PROJECT 2053

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Model Synthesis Interface	172			
(U) Adv Com Network Modeling Tool (CNMT)	96	264		
(U) CRMPS I/O Modeling	154	295		
(U) Radio Frequency Weapons Modeling	350	266		
(U) Adv IRCM Assessment Model	336			
(U) Virtual Laboratory Model Testbed	66			
(U) Com Network Modeling Tool (CNMT) Upgrade		155	266	
(U) Adv IRCM Systems Assessment Model(AIRSAM) Update		155	297	65
(U) Radio Frequency Weapon Modeling Improvements (HEIMDALL-2+)		54	342	61
(U) High Speed Propulsion: Pulsed Detonation Engine Model		74	96	
(U) High Speed Propulsion:Air-Turbo Ramjet Engine Model			142	
(U) High Speed Propulsion: Turbo-Ramjet Engine Model			142	
(U) Missile System: Booster & Post Booster Upgrades for MiTAS			60	302
(U) Integrated I/O Modeling Environment				257
(U) IVIEW 2000 Upgrade				226
(U) Advanced Analysis Capability: Integrated Avionics System Model				256
(U) DIODE Objectives Model				144
(U) Identified as a source for SBIR		33		
(U) Total	1,174	1,296	1,345	1,311

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604750F Intelligence Equipment PROJECT 2053

(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							33				
Product Development Organizations											
GRCI 93-C-0261/0	CPFF	30 Sep 93	N/A	N/A	683	115				Cont	TBD
GRCI 93-C-0261/25	CPFF	30 Sep 93	N/A	N/A	153					Cont	TBD
Planning Research Corp/Litton 95-C-0048	CPFF	31 Jul 98	N/A	N/A		125	215			Cont	TBD
TBD 99-C-00xx	CPFF	Oct 98	N/A	N/A			125	156		Cont	TBD
Harris Corp 94-D-0055/10	CPFF	15 May 97	N/A	N/A	225	270				Cont	TBD
Applied Sciences Laboratory 97-C-0036	CPFF	16 Jul 97	N/A	N/A	100	288	217			Cont	TBD
Applied Sciences Laboratory 99-C-00xx	TBD	Dec 98	N/A	N/A			45	213	33	Cont	TBD
Planning Research Corp/Litton 95-C-0048	CPFF	31 Jul 98	N/A	N/A		68	245			Cont	TBD

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)											DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development				PE NUMBER AND TITLE 0604750F Intelligence Equipment							PROJECT 2053
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
Pattern Analysis Recognition (PAR) Corp											
98-C-0261 Sterling Software, Inc.	FFP	5 Aug 98	N/A	N/A		48				Cont	TBD
98-D-0318/003 TBD (for the 3 High Speed Propulsion	CPFF	Oct 98	N/A	N/A			125	177	37	Cont	TBD
projects	TBD	TBD	N/A	N/A			23	193		Cont	TBD
TBD (for MiTAS)	TBD	TBD	N/A	N/A				37	181	Cont	TBD
TBD (for Integ I/O Modeling Environ)	TBD	TBD	N/A	N/A				141	360	Cont	TBD
TBD(for IVIEW 2000 upgrade)	TBD	TBD	N/A	N/A					132	Cont	TBD
TBD (for Adv Analysis Capability: Integ Avionics System Model	TBD	TBD	N/A	N/A				141	147	Cont	TBD
TBD (for DIODE Model)	TBD	TBD	N/A	N/A				93	221	Cont	TBD
AFRL (Rome Site)			N/A	N/A		260	268	194	200	Cont	TBD

Support and Management Organizations - N/A

Test and Evaluation Organizations - N/A

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604750F Intelligence Equipment PROJECT 2053

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
Product Development Property - N/A										
Support and Management Property - N/A										
Test and Evaluation Property - N/A										
Identified as a source for SBIR						33				
Subtotal Product Development				1,161	1,174	1,263	1,345	1,311	Cont	TBD
Subtotal Support and Management				0	0	0	0	0		
Subtotal Test and Evaluation				0	0	0	0	0		
Total Project				1,161	1,174	1,296	1,345	1,311	Cont	TBD

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604754F Joint Tactical Information Distribution System

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	7,318	7,087	8,705	8,822	8,933	9,236	9,428	9,624	TBD	TBD
P771 JTIDS	590	574	618	610	0	0	0	0	0	266,145*
4749 Link 16 System Integration	6,728	6,513	8,087	8,212	8,933	9,236	9,428	9,624	TBD	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

* Note: Prior to FY98 all JTIDS and Link 16 System Integration funds were combined into the single P771 Project. Therefore, the total cost figure for Project P771 includes all the funding for this PE prior to FY98, at which time the PE was converted into two projects.

(U) A. Mission Description

Joint Tactical Information Distribution System (JTIDS) is a secure, jam-resistant, high-capacity data link for use in a tactical combat environment. JTIDS broadcasts Link 16 (TADIL J) messages, free text, imagery and voice. It provides interoperability, local and global connectivity, and situational awareness to the user when operating under rapidly changing operational conditions. JTIDS is used by the Air Force, Army, Navy, and Marine Corps Theater Command and Control (C2) elements, weapons platforms, and sensors.

The number of Air Force platforms hosting Link-16 is expanding, from C2 aircraft (E-3, E-8, etc.) into the fighter, bomber, sensor, tanker, and other tactical fleets (F-15, F-16, RJ, ABCCC, B-2, B-52, etc.). Utilization of Link-16 in a joint environment requires the integration of terminals into these host platforms, and interoperability of Link-16 nets across all deployed joint and allied platforms. Cross-platform activities performed by the Link 16 System Integration Office (SIO) include: integration efforts encompassing hardware, software, operational, and logistics development, certification of individual Link-16 implementations to joint and allied standards, establishment of Service-wide net management procedures and operations, and test and sustainment activities.

The JTIDS project office provides the user with JTIDS 2/2H terminals, as well as all of the acquisition support, technical assistance and integration necessary to operationally field, retrofit, and assist all of the platforms.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604754F Joint Tactical Information Distribution System

(U) B. Budget Activity Justification

This program is in budget activity 5 (Engineering Manufacturing and Development) because it supports development, integration solutions, fielding, operational support activities, and support of special projects.

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY99)	7,374	7,956	8,863	8,989	TBD
(U) Appropriated Value	8,557	7,956			
(U) Adjustments to Appropriated Value					
a. Cong Reductions	-991	-869			
b. SBIR	-193				
c. Omnibus or Other Above Threshold Reprogram	-50				
d. Below Threshold Reprogramming	-5				
(U) Adjustments to Budget Years Since FY 1999 PB			-158	-167	
(U) Current Budget Submit/FY2000 PB	7,318	7,087	8,705	8,822	TBD

(U) Significant Program Changes: None
FY99: $189 identified as a source for SBIR

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY **5 - Engineering and Manufacturing Development**	PE NUMBER AND TITLE **0604754F Joint Tactical Information Distribution System**
	PROJECT **P771**

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
P771 JTIDS	590	574	618	610	0	0	0	0	0	266,145*

*** Note:** Prior to FY98 all JTIDS and Link 16 System Integration funds were combined into the single P771 Project. Therefore, the total cost figure for Project P771 includes all the funding for this PE prior to FY98, at which time the PE was converted into two projects.

(U) A. Mission Description

Joint Tactical Information Distribution System (JTIDS) is a secure, jam-resistant, high-capacity data link for use in a tactical combat environment. JTIDS broadcasts Link 16 (TADIL J) messages, free text, imagery and voice. It provides the interoperability, local and global connectivity, and situational awareness to the user when operating under rapidly changing operational conditions. JTIDS is used by the Air Force, Army, Navy, and Marine Corps Theater Command and Control (C2) elements, weapons platforms, and sensors.

The JTIDS project office provides the user with JTIDS 2/2H terminals, as well as all of the acquisition support, technical assistance and integration necessary to operationally field, retrofit, and assist all of the platforms.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY **5 - Engineering and Manufacturing Development**	PE NUMBER AND TITLE **0604754F Joint Tactical Information Distribution System**
	PROJECT **P771**

(U) FY 1998 ($ in Thousands):

– (U) $ 200 Acquisition Support
- -- (U) Write, execute and administer contracts for multiple platforms
- -- (U) Command and Control Terminal Acquisition Support
- -- (U) Ongoing technical and programmatic support for JTIDS users

– (U) $ 340 Technical Support
- -- (U) Technical Improvements
  - -- Technical support to AF platforms for the purpose of integrating and executing product improvements
- -- (U) Assist in technical trouble shooting, hardware availability, and support equipment for interoperability certifications
- -- (U) Manage Pre-Operational support of Class 2/2H hardware
- -- (U) Develop and coordinate terminal usage schedules for platforms developing JTIDS capability

– (U) $ 50 Diminishing Manufacturing Resources
- -- (U) Identify problem electrical parts, assess impacts, develop, and implement resolution plans

– (U) $ 590 Total

(U) FY 1999 ($ in Thousands):

– (U) $ 268 Acquisition Support
- -- (U) Write, execute and administer contracts for multiple platforms
- -- (U) Command and Control Terminal Acquisition Support
- -- (U) Ongoing technical and programmatic support for JTIDS users

– (U) $ 306 Technical Support
- -- (U) Technical Improvements
  - -- Technical support to AF platforms for the purpose of integrating and executing product improvements
  - -- Technology Updates (e.g., advanced hardware and software) to ensure the system remains interoperable throughout it's life
- -- (U) Assist technical trouble shooting, hardware availability, and support equipment for interoperability certifications and jointexercises
- -- (U) Manage Pre-Operational support of Class 2/2H hardware
- -- (U) Develop and coordinate terminal usage schedules for platforms developing JTIDS capability

– (U) $ 574 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY **5 - Engineering and Manufacturing Development**	PE NUMBER AND TITLE **0604754F Joint Tactical Information Distribution System**
	PROJECT **P771**

(U) FY 2000 ($ in Thousands):

– (U) $ 268 Acquisition Support
- -- (U) Write, execute and administer contracts for multiple platforms
- -- (U) Command and Control Terminal Acquisition Support
- -- (U) Ongoing technical and programmatic support for JTIDS users

– (U) $ 300 Technical Support
- -- (U) Technical Improvements
  - -- Technical support to AF platforms for the purpose of integrating and executing product improvements
  - -- Technology Updates (e.g., advanced hardware and software) to ensure the system remains interoperable throughout it's life
- -- (U) Assist technical trouble shooting, hardware availability, and support equipment for interoperability certifications and joint exercises
- -- (U) Manage Pre-Operational support of Class 2/2H hardware
- -- (U) Develop and coordinate terminal usage schedules for platforms developing JTIDS capability

– (U) $ 50 Diminishing Manufacturing Resources
- -- (U) Identify problem electrical parts, assess impacts, develop, and implement resolution plans

– (U) **$** 618 Total

(U) FY 2001 ($ in Thousands):

– (U) $ 268 Acquisition Support
- -- (U) Write, execute and administer contracts for multiple platforms
- -- (U) Command and Control Terminal Acquisition Support
- -- (U) Ongoing technical and programmatic support for JTIDS users

– (U) $ 292 Technical Support
- -- (U) Technical Improvements
  - -- Technical support to AF platforms for the purpose of integrating and executing product improvements
  - -- Technology Updates (e.g., advanced hardware and software) to ensure the system remains interoperable throughout it's life
- -- (U) Assist technical trouble shooting, hardware availability, and support equipment for interoperability certifications and joint exercises
- -- (U) Develop and coordinate terminal usage schedules for platforms developing JTIDS capability

– (U) $ 50 Diminishing Manufacturing Resources
- -- (U) Identify problem electrical parts, assess impacts, develop, and implement resolution plans

– (U) **$** 610 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604754F Joint Tactical Information Distribution System
	PROJECT P771

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

No Changes

(U) C. 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
(U) Other Proc AF, 83410, AWACS	25	0	0	0	0	0	0	0	0	47,225
(U) Other Proc AF, 10E08B, JSTARS	0	0	0	0	0	0	0	0	0	15,800
(U) Other Proc AF, 8038010, MCE	100	0	0	0	0	0	0	0	0	106,900
(U) Other Proc AF, 19RCON, AIA	4,000	1,600	0	0	0	0	0	0	0	18,500

* Other Program Funding reflects procurement of JTIDS terminals only. There are other USAF programs (F-15, F-16) that are budgeted to procure MIDS terminals in the FY98-FY05 timeframe.

(U) Related RDT&E:

(U) Program Element 0604770F / 0207581F E-8 (Joint STARS)
(U) Program Element 0207417F E-3 (AWACS)
(U) Program Element 0207412F Modular Control Equipment (MCE)
(U) Program Element 0207419F Airborne Battlefield Command and Control Center (ABCCC)
(U) Program Element 0305154F AIA

(U) D. Acquisition Strategy

The JTIDS program office continues to manage the acquisition for the JTIDS Class 2/2H terminals for the Air Force , Navy, and Marine Corps. The Class 2M terminal is now the responsibility of the Army program office. Future acquisition of the Link 16 communications component (MIDS family) is now the responsibility of the Navy's Multifunctional Information Distribution System (MIDS) Joint International Program Office. Host platforms program and budget for JTIDS, MIDS (Fighter Data Link (FDL) and Low Volume Terminal derivatives) production terminals and for installation into operational units.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY **5 - Engineering and Manufacturing Development**	PE NUMBER AND TITLE **0604754F Joint Tactical Information Distribution System**
	PROJECT **P771**

(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) New Software Releases (Yearly event)	*					X				X				X		
(U) Contract Milestones																
- FY 99 Exercise 1-yr procurement option FRP-2 contract									X							
- FY 00 Exercise 1-yr procurement option to FRP-2													X			
(U) EFX99								X								
(U) Host Platform Integration Start																
- B-1B JTIDS Class 2										X						
(U) Command and Control Platforms																
- AWACS Link 16 Qual Complete								X								
- JSTARS Complete Baseline Integration							X									
- MCE (P3I)																
Installation Start			*													
Installation Complete												X				

X denotes planned event
* denotes completed event

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY **5 - Engineering and Manufacturing Development**	PE NUMBER AND TITLE **0604754F Joint Tactical Information Distribution System**
	PROJECT **P771**

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Acquisition Support	200	268	268	268
(U) Technical Support	340	306	300	292
(U) Diminishing Manufacturing Resources	50	0	50	50
(U) Total	590	574	618	610

(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
Product Development Organizations											
GEC-MARCONI	FFP	DEC 85	80,727	80,727	80,727	0	0	0	0	0	80,727
LOCKHEED	FFP	JUN 93	6,761	6,761	6,761	0	0	0	0	0	6,761
GEC-MARCONI	FFP	JUN 93	1,123	1,123	850	0	83	95	95	0	1,123
CACD	FFP	JUN 93	1,616	1,616	1,072	0	166	188	190	0	1,616
MCAIR	CPFF	MAR 94	2,434	2,434	2,434	0	0	0	0	0	2,434
RADC	PO/616	Various	3,067	3,067	3,067	0	0	0	0	0	3,067
WR-ALC	PO/616	Various	2,966	2.966	2,966	0	0	0	0	0	2,966
NADEP	MIPR	Various	1,030	1,030	795	235	0	0	0	0	1,030
ACSI	FFP	SEP 94	492	492	492	0	0	0	0	0	492
VIASAT, INC.	FFP	Various	815	815	815	0	0	0	0	0	815
AF Platforms	PO/616	Various	169	169	169	0	0	0	0	0	169
NORTHROP GR	FFP	AUG 97	500	500	500	0	0	0	0	0	500

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604754F Joint Tactical Information Distribution System

PROJECT: P771

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
ROCKWELL	FFP	Various	2,080	2,080	2,080	0	0	0	0	0	2,080
HUGHES	FFP	Various	133	133	133	0	0	0	0	0	133
DRC	FFP	MAY 97	213	213	213	0	0	0	0	0	213
MIDSCO, Inc	MIPR	Various	4,251	4,251	4,251	0		0	0		4,251
MOTOROLA INC	FFP	Various	1,800	1,800	1,800	0	0	0	0	0	1,800
ALLIED SIGNAL	CPFF	Various	75	75	75	0	0	0	0	0	75
MCDONNEL DG	FFP	Various	2,582	2,582	2,582	0	0	0	0	0	2,582
BOEING	FFP	Various	869	869	869	0	0	0	0	0	869
Support and Management Organizations											
ESC	Various	Various	21,875	21,875	21,425	54	132	132	132	0	21,875
CONTRACTOR SUPPORT	Various	Various	42,863	42,863	42,548	201	38	38	38	0	42,863
MITRE	FPLOE	Various	85,319	85,319	84,959	0	120	120	120	0	85,319
Test and Evaluation Organizations											
MT HOME AFB	PO/616	Various	416	416	416	0	0	0	0	0	416
EGLIN AFB	PO/616	Various	1,969	1,969	1,754	100	35	45	35	0	1,969

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604754F Joint Tactical Information Distribution System
	PROJECT P771

(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
Product Development Property										
N/A										
Support and Management Property										
N/A										
Test and Evaluation Property										
N/A										
Subtotal Product Development				112,651	235	249	283	285	0	113,703
Subtotal Support and Management				148,932	255	290	290	290	0	150,057
Subtotal Test and Evaluation				2,170	100	35	45	35	0	2,385
Total Project				263,753	590	574	618	610	0	266,145

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604754F Joint Tactical Information Distribution System
	PROJECT 4749

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
4749 Link 16 System Integration	6,728	6,513	8,087	8,212	8,933	9,236	9,428	9,624	TBD	TBD

(U) A. Mission Description

Joint Tactical Information Distribution System (JTIDS) is a secure, jam-resistant, high-capacity data link for use in a tactical combat environment. JTIDS broadcasts Link 16 (TADIL J) messages, free text, imagery and voice. It provides the interoperability, local and global connectivity, and situational awareness to the user when operating under rapidly changing operational conditions. JTIDS is used by the Air Force, Army, Navy, and Marine Corps Theater Command and Control (C2) elements, weapons platforms, and sensors.

The number of Air Force platforms hosting Link-16 is expanding, from C2 aircraft (E-3, E-8, etc.) into the fighter, bomber, sensor, tanker, and other tactical fleets (F-15, F-16, RJ, ABCCC, B-2, B-52, etc.). Utilization of Link-16 in a joint environment requires the integration of terminals into these host platforms, and interoperability of Link-16 nets across all deployed joint and allied platforms. Cross-platform activities performed by the Link 16 System Integration Office (SIO) include: integration efforts encompassing hardware, software, operational, and logistics development, certification of individual Link-16 implementations to joint and allied standards, establishment of Service-wide net management procedures and operations, and test and sustainment activities. In addition, the SIO is supporting the integration of Link 16 into the Icelandic Air Defense System; charged with building the Air Force's architecture to control information management to the warfighter; and has management responsibility for the Air Force's Air Defense System Integration systems.

(U) FY 1998 ($ in thousands)

– (U) $ 4,436 LINK-16 INTEGRATION: Efforts associated with hardware and software integration of Link 16 terminals into Air Force platforms.
  -- (U) On-going Engineering Integration Support to Platforms; Technical Improvements; Field Support; Technical Assistance to Link 16 Demonstration Programs; Support CAF/Joint Certification Testing, Operational Contingencies, Multi-Service Operational Tests, Exercises, and Evaluations; Communication Support; Link-16 Gateways/Interfaces.

– (U) $ 2,292 LINK-16 EMD SUPPORT: Efforts associated with fielding terminals.
  -- (U) Support Operations Support Working Group; Maintain Developmental Equipment; Test Support; Fielding/Non-Recurring Training; Network Support; Crypto Support; Spectrum Support.

– (U) $ 6,728 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604754F Joint Tactical Information Distribution System
	PROJECT 4749

(U) FY 1999 ($ in thousands)

– (U) $ 4,137 LINK-16 INTEGRATION: Efforts associated with hardware and software integration of Link 16 terminals into Air Force platforms.
-- (U) On-going Engineering Integration Support to Platforms; Technical Improvements; Field Support; Technical Assistance to Link 16 Demonstration Programs; Support CAF/Joint Certification Testing, Operational Contingencies, Multi-Service Operational Tests, Exercises, and Evaluations; Communication Support; Link-16 Gateways/Interfaces.

– (U) $ 2,187 LINK-16 EMD SUPPORT: Efforts associated with fielding terminals.
-- (U) Support Operations Support Working Group; Maintain Developmental Equipment; Test Support; Fielding/Non-Recurring Training; Network Support; Crypto Support; Spectrum Support.

– (U) $ 189 Identified as a source for SBIR

– (U) $ 6,513 Total

(U) FY 2000 ($ in Thousands)

- (U) $ 5,527 LINK-16 INTEGRATION: Efforts associated with hardware and software integration of Link 16 terminals into Air Force platforms.
-- (U) On-going Engineering Integration Support to Platforms; Technical Improvements; Field Support; Technical Assistance to Link 16 Demonstration Programs; Support CAF/Joint Certification Testing, Operational Contingencies, Multi-Service Operational Tests, Exercises, and Evaluations; Communication Support; Link-16 Gateways/Interfaces.

- (U) $ 2,560 LINK-16 EMD SUPPORT: Efforts associated with fielding terminals.
-- (U) Support Operations Support Working Group; Maintain Developmental Equipment; Test Support; Fielding/Non-Recurring Training; Network Support; Crypto Support; Spectrum Support.

- (U) $ 8,087 Total

(U) FY 2001 ($ in Thousands)

- (U) 5,644 LINK-16 INTEGRATION: Efforts associated with hardware and software integration of Link 16 terminals into Air Force platforms.
-- (U) On-going Engineering Integration Support to Platforms; Technical Improvements; Field Support; Technical Assistance to Link 16 Demonstration Programs; Support CAF/Joint Certification Testing, Operational Contingencies, Multi-Service Operational Tests, Exercises, and Evaluations; Communication Support; Link-16 Gateways/Interfaces.

- (U) 2,568 LINK-16 EMD SUPPORT: Efforts associated with fielding terminals.
-- (U) Support Operations Support Working Group; Maintain Developmental Equipment; Test Support; Fielding/Non-Recurring Training; Network Support; Crypto Support; Spectrum Support.

- (U) $ 8,212 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY **5 - Engineering and Manufacturing Development**	PE NUMBER AND TITLE **0604754F Joint Tactical Information Distribution System**
	PROJECT **4749**

(U) B. Project Change Summary ($ in Thousands)
No significant changes

(U) C. Other Program Funding Summary ($ in Thousands)
None

(U) D. Acquisition Strategy
The Air Force Link 16 System Integration Office (SIO) provides for common development of integration and interoperability across all Air Force platforms and ensures that Link 16 is procured and maintained as a joint, end-to-end, command and control system. Host platforms program and budget for JTIDS or MIDS (Fighter Data Link (FDL) and Low Volume Terminal derivatives) production terminals and for installation into operational units.

(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) FDL Testing																
- Initial Operational Assessment		*														
- QT&E/QOT&E Complete				*												
- Flight QOT&E Complete						X										
(U) Contract Milestones																
- Link 16/VMF Gateway Complete								X								
- Time Slot Reallocation Complete								X								
- Enhanced Throughput Complete								X								
- FDL Pilot Production Start		*														
- FDL Initial Rate Production								X								
- FDL Full Rate Production										X						
- LVT - F-16 production											X					

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604754F Joint Tactical Information Distribution System

PROJECT: 4749

	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) Host Platform Integration Start																
- F-15E (thru FY01)	*															X
- F-15C/D Installation/Training (start)								X								X
- F-16 (thru FY04)	*															
- Compass Call (thru FY02)							X									
- Airborne Laser (ABL)	*															
(U) Command and Control Platforms																
- AWACS Link 16 Qual Complete								X								
- JSTARS Complete Baseline Integration							X									
- MCE (P3I)																
Installation Start						X										
Installation Complete												X				
-IADS (thru FY07)																X

* Denotes completed events

X Denotes planned events

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604754F Joint Tactical Information Distribution System
	PROJECT 4749

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Link-16 Integration	4,436	4,137	5,527	5,644
(U) EMD Activities	2,292	2,187	2,560	2,568
(U) Identified as a source for SBIR		189		
(U) TOTAL	6,728	6,513	8,087	8,212

(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							189				
Product Development Organizations											
MIDSCO, Inc	MIPR	TBD			0	114	577	600	624	Continue	TBD
Support and Management Organizations											
ESC	Various	Various			0	521	157	193	200	Continue	TBD
CONTRACTOR SUPPORT	Various	Various			0	1,076	1,405	2,642	2,575	Continue	TBD
MITRE	FPLOE	Various			0	4,165	3,985	4,652	4,813	Continue	TBD

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)						DATE February 1999	
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development			PE NUMBER AND TITLE 0604754F Joint Tactical Information Distribution System				PROJECT 4749

Test and Evaluation Organizations								
EGLIN AFB	PO/616	Various	0	852	200	0	0	Continue	TBD
Government Furnished Property: Not Applicable								
Identified as a source for SBIR					189			
Subtotal Product Development			0*	114	577	600	624	Continue	TBD
Subtotal Support and Management			0*	5,762	5,547	7,487	7,588	Continue	TBD
Subtotal Test and Evaluation			0*	852	200	0	0	Continue	TBD
Total Project			0*	6,728	6,513	8,087	8,212	Continue	TBD

* Note: Prior to FY98 all JTIDS and Link 16 System Integration funds were combined into the single P771 Project. Therefore, any Link 16 System Integration funds executed prior to FY98 are reflected in the project P771 documentation.

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

DATE: **February 1999**

BUDGET ACTIVITY: **5 - Engineering and Manufacturing Development**

PE NUMBER AND TITLE: **0604762F Common Low Observable Verification System (CLOVerS)**

PROJECT: **4683**

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
4683 Common Low Observable Verification System	500	4,882	5,893	11,723	2,096	0	0	0	0	25,094
Quantity of RDT&E Articles	0	0	0	1	0	0	0	0	0	1

(U) A. Mission Description

Common Low Observable Verification System (CLOVerS) is intended as an easily deployable flightline system to evaluate surface anomalies on low observable (stealth) aircraft. It will allow maintenance personnel to determine if a repair is needed, or if the repair performed was successful in restoring the low observable characteristic of the aircraft. CLOVerS is intended for use with the B-2, F-117, F-22, as well as future aircraft such as the Joint Strike Fighter, and the Darkstar Unmanned Aerial Vehicle. Key capabilities required include the ability to detect, locate, and resolve small surface defects, reduced measurement time (compared to existing verification methods), operation under less restrictive security measures, and a small deployment footprint.

(U) FY 1998 ($ in Thousands):
- (U) $275 Awarded and Completed Risk Reduction Study Contract
- (U) $225 Program Office Support
- (U) $500 Total

(U) FY 1999 ($ in Thousands):
- (U) $3,992 Award Development Contract
- (U) $500 Initiate Development Contract Award Fee
- (U) $300 Program Office Support
- (U) $90 Identified as a source for SBIR
- (U) $4,882 Total

(U) FY 2000 ($ in Thousands):
- (U) $4,813 Continue Development Contract
- (U) $722 Continue Development Contract Award Fee
- (U) $358 Program Office Support
- (U) $5,893 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604762F Common Low Observable Verification System (CLOVerS)
	PROJECT 4683

(U) FY 2001 ($ in Thousands):
- (U) $9,813 Continue Development Contract
- (U) $438 Program Office Support
- (U) $1,472 Continue Development Contract Award Fee
- (U) $11,723 Total

(U) B. Budget Activity Justification:

(U) This program is in budget activity 5 - Engineering and Manufacturing Development, Research Category 6.4 because this program develops the Common Low Observable Verification System (CLOVerS).

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY1999 PB)	0	4,901	2,440	972	8,313
(U) Appropriated Value	0	4,901			
(U) Adjustments to Appropriated Value					
a. Congressional/General Reductions		-19			
b. SBIR					
c. Omnibus or Other Above Threshold Reprogram					
d. Below Threshold Reprogramming	500				
(U) Adjustments to Budget Years Since FY 1999 PB			3,453	10,751	
(U) Current Budget Submit/ FY 2000 PB	500	4,882	5,893	11,723	25,094

(U) Significant Program Changes:
FY98 Below Threshold Reprogramming increase for Risk Reduction Study and Program Office Support
FY00 and FY01 funding increased because of improved program cost estimates.
FY99 $90 identified as a source for SBIR.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604762F Common Low Observable Verification System (CLOVerS)
	PROJECT 4683

(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
(U) PE27145F:Appn: Aircraft Procurement, AF (APAF) Budget Activity: Aircraft (A/C) Procurement/Common Support Equipment, Program Title: Common Low Observable Test Equipment	0	0	0	0	4,728	4,869	677	222	Cont	Cont

(U) E. Acquisition Strategy:

All major contracts within this program element will be awarded using full and open competition. Engineering and Manufacturing Development (EMD) contract type will be Cost Plus Award Fee. Production contract will be Fixed Price Incentive for Low Rate Initial Production.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY **5 - Engineering and Manufacturing Development**	PE NUMBER AND TITLE **0604762F Common Low Observable Verification System (CLOVerS)**
	PROJECT **4683**

(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) Risk Reduction Contract Award			*													
(U) Milestone I Decision					*											
(U) RFP Release					*											
(U) Milestone II Decision						X										
(U) Contract Award							X									
(U) Begin Hardware/Software Integration											X					
(U) DT&E																X
(U) OT&E - FY02																
(U) LRIP Production - FY02-03																
(U) System Delivery - FY02-03																

* = Completed event
X = Planned event

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604762F Common Low Observable Verification System (CLOVerS)
	PROJECT 4683

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Risk Reduction Contract	275			
(U) CLOVerS Development Contract		3,992	4,813	9,813
(U) CLOVerS Development Contract Award Fee	225	500	722	1,472
(U) Program Office Support		300	358	438
(U) Identified as a source for SBIR		90		
(U) Total	500	4,882	5,893	11,723

(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							90				90
Product Development Organizations											
Contract not Awarded	CPAF/FPIF	Apr 99	TBD	23,003	0	0	4,492	5,535	11,285	1,691	23,003
Support and Management Organizations											
ASC/SMD, WPAFB OH	Various				0	500	300	358	438	405	2,001
Test and Evaluation Organizations											

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY **5 - Engineering and Manufacturing Development**	PE NUMBER AND TITLE **0604762F Common Low Observable Verification System (CLOVerS)** PROJECT **4683**

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							90				90
					0	0	0	0	0	0	0

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

Government Furnished Property: Advanced Diagnostic Analysis Package (ADAP) and Radar Diagnostic Expert Equipment (RDES) software will be available to the contractor

	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			90				90
Subtotal Product Development	0	0	4,492	5,535	11,285	1,691	23,003
Subtotal Support and Management	0	500	300	358	438	405	2,001
Subtotal Test and Evaluation	0	0	0	0	0	0	0
Total Project	0	500	4,882	5,893	11,723	2,096	25,094

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

DATE: **February 1999**

BUDGET ACTIVITY: **5 - Engineering and Manufacturing Development**

PE NUMBER AND TITLE: **0604779F Joint Interoperability Tactical Command/Control**

PROJECT: **2189**

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
2189 JINTACCS	4,738	5,687	5,837	5,877	5,939	6,035	6,160	6,288	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

JINTACCS is a Joint Staff directed program for the development and maintenance of tactical information exchange configuration items (CIs) and operational procedures. This program enables and ensures tactical command and control (C2)/weapons systems to be interoperable within an Air Force (AF), a joint (two or more US services or agencies) or combined (US and allied) environment. The program entails the compatibility and interoperability of C3 systems including tactical intelligence for joint or combined operations through the development and management of a joint architecture, tactical information exchange requirements process, interface definitions, message text formats (MTFs), Tactical Digital Information Links (TADILs), Variable Message Formats (VMF), and other combat data link standards. This includes the coordination of all combat data link and MTF certification testing and configuration management of message standard CIs under one program element. This project ensures C3/weapons system interoperability among all the CINCs, DoD agencies, and the Services. Interoperability certification testing is a pre-production requirement in accordance with DoDD 4630.5 and DoDI 4630.8. The JINTACCS program includes: joint development, interoperability certification, message standard implementation, and configuration management (CM) of US Message Text Formatting (USMTF) CIs; joint development, interoperability certification, message standard implementation, and CM. Link 11A/B, 4, 16, etc. (TADILs A/B, C, J, etc.). Air Force platforms/systems participating in this program include: Airborne Warning and Control System (AWACS); Airborne Battlefield Command and Control Center (ABCCC); Modular Control Element (MCE); Air Operations Center (AOC); Joint Surveillance Target Attack Radar System(JSTARS); F-15C/D; F-15E; F-16; F-22; RC-135; Regional/Sector Operations Control Center (R/SOCC), Caribbean Basin Radar Network (CBRN); Command & Control Information Processing System (C2IPS); Space Based Infrared System (SBIRS); Iceland Air Defense System (IADS); Air Support Operations Center (ASOC); and Tactical Air Control Parties (TACP). Air Force JINTACCS supports the Assistant Secretary of Defense (ASD) directive on harmonization of US and NATO messages (e.g., ATO and ACO), and fulfills the Link 16 General Officer Steering Group direction to develop and manage the Air Force JINTACCS CM Plan for TADIL (LINK) and MTF Message Standards (AFJCMP-TMMS).

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY **5 - Engineering and Manufacturing Development**	PE NUMBER AND TITLE **0604779F Joint Interoperability Tactical Command/Control**
	PROJECT **2189**

(U) FY 1998 ($ in thousands)

–	(U) $ 1,132	Interoperability Certification - CAF Certification planned for the MCE P3I, E-3, F-15C, CSCS, and ADSI - Joint Certification planned for the JSTARS, E-3, and ABCCC
–	(U) $ 1,260	Message Text Formats
–	(U) $ 2,346	TADIL Management -Support multiple multi TADIL & VMF meetings and working groups - Consultations regarding implementation and interoperability with the F-16, E-8, AOC, and the ABL. - Consultations regarding software updates and interoperability with the F-15C.
–	(U) $ 4,738	Total

(U) FY 1999 ($ in thousands)

–	(U) $ 1,064	Interoperability Certification - CAF Certification planned for JSTARS, and E-3. - Joint Certification planned for MCE P3I, JSTARS, E-3, F-15C, and ADSI.
–	(U) $ 1,641	Message Text Formats
–	(U) $ 2,822	TADIL Management - Support multiple multi TADIL & VMF meetings and working groups - Consultations regarding implementation and interoperability with the F-16, and the E-8. - Consultations regarding software updates and interoperability with the E-3.
–	(U) $ 160	- Identified as a source for SBIR
–	(U) $ 5,687	Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604779F Joint Interoperability Tactical Command/Control
	PROJECT 2189

(U) FY 2000 ($ in thousands)

– (U) $ 1,229 Interoperability Certification
- Specific platforms for FY00 will be determined based on initial Link 16 message implementation, software upgrade, and system modification schedules.

– (U) $ 2,995 Message Text Formats

– (U) $ 1,613 TADIL Management
- Support multiple multi TADIL & VMF meetings and working groups
- Consultations regarding implementation and interoperability with the F-16.
- Consultations regarding software updates and interoperability with the F-15C, E-3, E-8, ABCCC, CRC/CRE, AOC, and the F-15E.

– (U) $ 5,837 Total

(U) FY 2001 ($in thousands)

– (U) $ 489 Interoperability Certification
- Specific platforms for FY01 will be determined based on initial Link 16 message implementation, software upgrade, and system modification schedules.

– (U) $ 1,886 Message Text Formats

– (U) $ 3,502 TADIL Management
- Support multi TADIL & VMF meetings and working groups
- Consultations regarding implementation and interoperability with the F-16.
- Consultations regarding software updates and interoperability with the F-15C, E-3, E-8, ABCCC, CRC/CRE, AOC, F-15E and the ABL.

– (U) $ 5,877 Total

(U) B. Budget Activity Justification:

This program is in budget activity 5 - Engineering and Manufacturing Development, because it is designed to improve the interoperability of Tactical Command and Control (C2) Systems used in support of joint operations.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604779F Joint Interoperability Tactical Command/Control
	PROJECT 2189

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY1999)	4,972	5,823	5,943	5,988	TBD
(U) Appropriated Value	5,929	5,823			
(U) Adjustments to Appropriated Value					
a. General Congressional Reduction	-827	-136			
b. Small Business Innovative Research	-130				
c. Omnibus and other Above Threshold Reprogramming	-34				
d. Below Threshold Reprogramming	-200				
(U) Adjustments to Budget Years Since FY99 PB			-106	-111	
(U) Current Budget Submit/ FY2000 PB	4,738	5,687	5,837	5,877	TBD

(U) Significant Program Changes: None
FY99: $160 Identified as a source for SBIR

(U) D. Other Program Funding Summary ($ in Thousands) Not Applicable

(U) E. Acquisition Strategy:
As the Air Force lead agent for a jointly directed program, JINTACCS provides level of effort technical support for increasing interoperability of AF programs through message text and data link standards implementation.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY **5 - Engineering and Manufacturing Development**	PE NUMBER AND TITLE **0604779F Joint Interoperability Tactical Command/Control**
	PROJECT **2189**

(U) F. Schedule Profile

Support for platform implementation is an ongoing activity. For each platform, support begins as indicated below and continues based on expected message changes and software upgrades.

	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) Platform Message Implementation																
F-16 - Begin continuing consultations on baseline Implementation/Interoperability			*													
E-8 - Begin continuing consultations on baseline Implementation/Interoperability	*															
AOC - Begin continuing consultations on baseline Implementation/Interoperability	*															
ABL - Begin continuing consultations on baseline Implementation/Interoperability	*															
F-15C - Interoperability consultation for Software upgrades.			*						X				X			
F-16 - Interoperability consultation for Software upgrades.				*							X					
E-3 - Interoperability consultation for Software upgrades.						*				X				X		
E-8 - Interoperability consultation for Software upgrades.											X				X	
ABCCC - Interoperability consultation for Software upgrades.												X				X
CRC/CRE - Interoperability consultation for Software upgrades.									X				X			
AOC - Interoperability consultation for Software upgrades.										X				X		
F-15E - Interoperability consultation for Software upgrades.											X				X	
ABL - Interoperability consultation for Software upgrades.													X			

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604779F Joint Interoperability Tactical Command/Control

PROJECT: 2189

	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) Interoperability Certification																
(Passed Joint and CAF Interoperability)																
- MCE P3I																
CAF						*										
Joint						X										
- JSTARS																
CAF					*											
Joint		*					X									
- E-3 AWACS																
CAF		*			*											
Joint			*			X										
- F-15C																
CAF		*														
Joint							X									
- CSCS																
CAF		*														
- ABCCC																
Joint			*													
- ADSI																
Joint						X										
(U) OPFAC INSTALL/INTEGRATION																
- F-15E																
Begin		*														
Complete							X									
- JSTARS																
Complete			*													

* Denotes completed event

X Denotes planned event

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604779F Joint Interoperability Tactical Command/Control
	PROJECT 2189

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Certification Testing	1,132	1,064	1,229	489
(U) Message Text Formats	1,260	1,641	2,995	1,886
(U) TADILs Management	2,346	2,822	1,613	3,502
(U) Identified as a source for SBIR		160		
(U) Total	4,738	5,687	5,837	5,877

(U) B. Budget Acquisition History and Planning Information ($ 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
Identified as a source for SBIR							160				
Product Development Organizations											
None					0	0	0	0	0	0	0
Support and Management Organizations											
MITRE	CPAF	OCT 72			32,950	2,278	2,626	2,626	3,075	Cont	TBD
B3H	CPFF	MAY 97			1,162	1,332	1,564	1,647	1,978	Cont	TBD
COMPTEK	CPAF	OCT 92			3,166	562	0	0	0	Cont	TBD
HTI	CPAF	OCT 94			1,300	0	0		0	0	1,300
Prog Office	Various	Various			243	0	273	335	335	Cont	TBD
AF Participating Test Unit (PTU)	PO/616	OCT 97			676	566	1,064	1,229	489	Cont	TBD
Test and Evaluation Organizations											
None					0	0	0	0	0	0	0

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604779F Joint Interoperability Tactical Command/Control
	PROJECT 2189

(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
Product Development Property										
N/A										
Support and Management Property										
N/A										
Test and Evaluation Property										
N/A										

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)						DATE February 1999	
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604779F Joint Interoperability Tactical Command/Control						PROJECT 2189
Identified as a source for SBIR							
Subtotal Product Development	0	0	160	0	0	0	0
Subtotal Support and Management	39,497	4,738	5,527	5,837	5,877	Cont	TBD
Subtotal Test and Evaluation	0	0	0	0	0	0	0
Total Project	39,497	4,738	5,687	5,837	5,877	Cont	TBD

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604805F Commercial Operations and Support Savings Initiative (COSSI)

PROJECT: 4771

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
4771 Commercial Operations and Support Savings Initiative (COSSI)	0	15,892	30,485	30,434	30,159	30,077	30,702	31,341	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description: COSSI aims at achieving Operations and Support (O&S) savings through insertion of commercial products and processes into fielded military systems. These savings are expected to result by reducing the costs of parts and maintenance, reducing the need for specialized equipment, increasing reliability, and increasing efficiency of subsystems. COSSI projects will be performed in two stages. In Stage I, each competitively selected, flexible cost share proposal will create the Non-Recurring Engineering (NRE) required to create a kit that can be used in a fielded military system and perform the testing needed to verify that inserted kits will produce O&S cost savings while at least maintaining the current system level of performance of the fielded system. Based on the results of a Stage I project, the Air Force will decide whether to proceed to Stage II. The goal in Stage II is to purchase a reasonable production quantity of kits without recompetition. This will be based on a fair and reasonable price (i.e., the value of the kits vice the cost of the kits to the Air Force under a Federal Acquisition Regulation (FAR) vehicle). Dual use technology was previously funded by the Defense Advanced Research Projects Agency (DARPA), first under the Technology Reinvestment Program (TRP) and then under the Dual Use Application Program (DUAP). In FY 1997, the decision was made to begin transferring responsibility for DUAP from DARPA to the Services. The two existing DUAP efforts, DUAP Science and Technology and COSSI, were split and transferred into Service 6.2 and 6.4 PEs, respectively, beginning in FY 1999. This PE is the COSSI effort for the Air Force.

(U) FY 1998: Not Applicable.

(U) FY 1999 ($ in Thousands):

- (U) $8,000 Leverage commercial object-oriented software to swap existing military processors with form, fit, and function replacements. Benefits are increased reliability, obsolescence avoidance, and software commonality.
- (U) $5,000 Reduce inventory requirements, maintenance turn times, and mobility deployment footprints through insertion of reliable commercial items.
- (U) $2,398 Reduce technical manual and training costs through automation and use of commercial hardware and software.
- (U) $494 Identified as a source for SBIR.
- (U) $15,892 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY **5 - Engineering and Manufacturing Development**	PE NUMBER AND TITLE **0604805F Commercial Operations and Support Savings Initiative (COSSI)**
	PROJECT **4771**

(U) FY 2000 ($ in Thousands):

- (U) $17,000 Leverage commercial object-oriented software to swap existing military processors with form, fit, and function replacements. Benefits are increased reliability, obsolescence avoidance, and software commonality.
- (U) $10,000 Reduce inventory requirements, maintenance turn times, and mobility deployment footprints through insertion of reliable commercial items.
- (U) $ 3,485 Reduce technical manual and training costs through automation and use of commercial hardware and software.
- (U) $30,485 Total

(U) FY 2001 ($ in Thousands):

- (U) $17,000 Leverage commercial object-oriented software to swap existing military processors with form, fit, and function replacements. Benefits are increased reliability, obsolescence avoidance, and software commonality.
- (U) $10,000 Reduce inventory requirements, maintenance turn times, and mobility deployment footprints through insertion of reliable commercial items.
- (U) $ 3,434 Reduce technical manual and training costs through automation and use of commercial hardware and software.
- (U) $30,434 Total

(U) B. Budget Activity Justification: This program is in Budget Activity 4, Demonstration and Validation, since it includes efforts necessary to evaluate integrated technologies in as realistic an operating environment as possible to assess performance or cost reduction potential.

	DATE **February 1999**
BUDGET ACTIVITY **5 - Engineering and Manufacturing Development**	PE NUMBER AND TITLE **0604805F Commercial Operations and Support Savings Initiative (COSSI)**

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604805F Commercial Operations and Support Savings Initiative (COSSI)
	PROJECT 4771

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget/FY 1999 PB	0	27,937	31,040	31,013	Continuing
(U) Appropriated Value	0	15,937			
(U) Adjustments to Appropriated Value					
a. Congressional/General Reductions		-45			
b. SBIR					
c. Omnibus/Other Above Threshold Reprogrammings					
d. Below Threshold Reprogrammings					
(U) Adjustments to Budget Years Since FY 1999 PB			-555	-579	
(U) Current Budget Submit/FY 2000 PB	0	15,892	30,485	30,434	Continuing

(U) Significant Program Changes: Funding shifted from DARPA to the Services beginning in FY 1999.

FY 1999: $494 identified as a source for SBIR.

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

(U) Related Activities:
- (U) PE 0602805F, Dual Use Application Program (DUAP).

(U) E. Acquisition Strategy: Funding will be released to the System Program Directors (SPDs) for those projects for which they are the Office of Primary Responsibility (OPR) that year. Other Transactions (OTs) for prototypes will be used during Stage I. OTs offer more flexibility and fewer regulatory requirements than a typical Federal Acquisition Regulation (FAR) contract. The authority to use OT was given by Section 804 of the Fiscal Year 1997 Defense Authorization Act and is due to expire at the end of FY 1999.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY **5 - Engineering and Manufacturing Development**	PE NUMBER AND TITLE **0604805F Commercial Operations and Support Savings Initiative (COSSI)**
	PROJECT **4771**

(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) Call for Concept Papers		X														
(U) Request For Release (RFP) Release					X				X				X			
(U) Contract Awards							X	X			X	X			X	X

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY **5 - Engineering and Manufacturing Development**	PE NUMBER AND TITLE **0604805F Commercial Operations and Support Savings Initiative (COSSI)**
	PROJECT **4771**

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Leverage commercial object-oriented software to swap existing military processors with form, fit, and function replacements.	0	8,000	17,000	17,000
(U) Reduce inventory requirements, maintenance turn times, and mobility deployment footprints through insertion of reliable commercial items.		5,000	10,000	10,000
(U) Reduce technical manual and training costs through automation and use of commercial hardware and software.		2,398	3,485	3,434
(U) Identified as a source for SBIR.	0	494	0	0
(U) Total	0	15,892	30,485	30,434

(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
Product Development Organizations:											
Identified as a source for SBIR							494				
TBD	TBD	TBD	TBD	TBD	0	0	15,398	30,485	30,434	Cont	Cont

Support and Management Organizations: Not Applicable.

Test and Evaluation Organizations: Not Applicable.

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604805F Commercial Operations and Support Savings Initiative (COSSI)

PROJECT: 4771

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.											
Product Development Organization: Not Applicable.											
Support and Management Organizations: Not Applicable.											
Test and Evaluation Organizations: Not Applicable.											
Identified as a source for SBIR							494				
Subtotal Product Development					0	0	15,398	30,485	30,434	Cont	Cont
Subtotal Support and Management					0	0	0	0	0	0	0
Subtotal Test and Evaluation					0	0	0	0	0	0	0
Total Project					0	0	15,398	30,485	30,434	Cont	Cont

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

DATE: **February 1999**

BUDGET ACTIVITY: **5 - Engineering and Manufacturing Development**

PE NUMBER AND TITLE: **0604851F ICBM EMD**

	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	142,648	81,205	38,804	30,388	33,427	12,524	0	0	0	986,275
3085	Guidance Replacement Program (GRP)	76,650	20,492	0	0	0	0	0	0	0	554,993
4210	Propulsion Replacement Program (PRP)	65,998	60,713	30,063	0	0	0	0	0	0	346,202
4788	PSRE Life Extension Program	0	0	8,741	18,448	19,500	12,524	0	0	0	59,213
4823	ECS Replacement Program	0	0	0	11,940	13,927	0	0	0	0	25,867
	Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

(U) ICBM modernization efforts will extend the operational life of the Minuteman ICBM weapon system. The Guidance Replacement Program (GRP) will replace failing Minuteman guidance system electronics. The Propulsion Replacement Program (PRP) will remanufacture all three Minuteman solid fuel stages to correct age-related degradations and maintain existing weapon system reliability. The Propulsion System Rocket Engine (PSRE) Life Extension Program will refurbish the Minuteman post-boost vehicle (PBV) to correct age-related degradations and maintain operational effectiveness. The Environmental Control System (ECS) Replacement Program will refurbish, update, and/or replace components of the Minuteman ECS in the Launch Facilities (LFs) and Missile Alert Facilities (MAFs). Requirements for maintaining the Minuteman Weapon System are defined and validated in current defense planning guidance documentation.

(U) B. Budget Activity Justification:

(U) This program is in Budget Activity 5 - Engineering and Manufacturing Development because the projects are being developed for the Air Force but have not received production approval. Program control is exercised at the project level.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604851F ICBM EMD

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY 1999 PB)	143,913	81,546	38,418	0	911,432
(U) Appropriated Value	152,944	81,546			
(U) Adjustments to Appropriated Value					
a. Cong Gen Reductions	-5,433	-341			
b. SBIR	-3,598				
c. Omnibus or Other Above Threshold Reprogram	-978				
d. Below Threshold Reprogramming	-287				
(U) Adjustments to Budget Years Since FY 1999 PB			386	30,388	
(U) Current Budget Submit/FY 2000 PB	142,648	81,205	38,804	30,388	986,275

NOTE: In FY99, $2,577 identified as a source for SBIR.

(U) Significant Program Changes:

(U) FY98 reprogrammings funded higher priority Air Force requirements.

(U) FY00 and FY01 increases funded two new projects: Propulsion System Rocket Engine (PSRE) Life Extension starting in FY00 and Environmental Control System (ECS) Replacement starting in FY01.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604851F ICBM EMD PROJECT 3085

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
3085 Guidance Replacement Program (GRP)	76,650	20,492	0	0	0	0	0	0	0	554,993

(U) A. Mission Description

(U) Ongoing upgrades are required to extend the service life of the Minuteman weapon system. The Joint Requirements Oversight Council validated the Mission Need Statement for a Future Guidance System for Intercontinental Ballistic Missiles (ICBM) on 5 November 1992. GRP replaces failing guidance system electronics, and preserves the option to configure the missiles with the Peacekeeper Mk 21 reentry vehicle and an advanced inertial measurement unit. The Engineering and Manufacturing Development (EMD) contract was awarded to Rockwell International in August 1993. GRP includes the EMD, production, and installation of replacement guidance components to extend the life of the operational Minuteman force. Funding reflected here is for EMD.

(U) FY 1998 ($ in Thousands):

- (U) $48,075 Continued hardware/software development.
- (U) $5,072 Continued Nuclear Safety Cross Check Analysis and Independent Validation and Verification.
- (U) $315 Completed ICBM codes development.
- (U) $1,507 Completed systems engineering and technical support.
- (U) $6,102 Continued labs and support agencies efforts.
- (U) $1,629 Continued testing and other engineering support activities. Two flight tests successfully flown.
- (U) $13,950 Mk 21 activities.
- (U) $76,650 Total

(U) FY 1999 ($ in Thousands):

- (U) $13,935 Complete hardware/software development.
- (U) $1,400 Complete Nuclear Safety Cross Check Analysis and Independent Validation and Verification.
- (U) $160 Complete labs and support agencies efforts.
- (U) $2,420 Complete testing and other engineering support.
- (U) $2,577 Identified as a source for SBIR
- (U) $20,492 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604851F ICBM EMD	PROJECT 3085

(U) FY 2000 ($ in Thousands):

- (U) $0 EMD Completed in FY99.
- (U) $0 Total

(U) FY 2001 ($ in Thousands):

- (U) $0 EMD Completed in FY99.
- (U) $0 Total

(U) B. Project Change Summary - Description of Significant Changes: For this submission, the FY98 Budget Item Justification was restructured to show specifically how the Congressional add was spent. Funding in FY00 previously identified in FY99 PB submission no longer required to complete RDT&E; funds reallocated to meet other AF needs.

(U) C. 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
(U) APPN 14, Missiles - AF, BA 3, P-013, MM III Modifications (PE 0101213F, Minuteman Squadrons)	97,323	110,059	146,460	151,097	149,124	167,769	154,139	138,067	623,003	1,807,676

(U) D. Acquisition Strategy: An EMD contract was awarded in Aug 93 to develop, test, and replace selected guidance electronics and software. This cost plus-award-fee (CPAF) contract was issued following full and open competition. Low Rate Initial Production (LRIP) contract was awarded in March 1998. The GRP contract will transfer to the Prime Integration Contractor at award of the Full Rate Production (FRP) contract planned for FY00.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604851F ICBM EMD PROJECT 3085

(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) Program Milestones																
Milestone III AFSARC									X							
(U) T&E Milestones																
Combined DT&E/IOT&E			*	*	*	X	X									
First Flight Test			*													
Second Flight Test				*												
(U) Contract Milestones																
EMD Contract Completed							X									
Low Rate Initial Production (Start/Complete)		*						X								
Full Rate Production (FRP) Contract Award									X							

* - Completed Event

X - Planned Event

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604851F ICBM EMD
	PROJECT 3085

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Hardware/Software Development	48,075	13,935		
(U) ICBM Codes Contract	315	0		
(U) Nuclear Safety Cross Check Analysis Contract	5,072	1,400		
(U) Labs/Agencies	5,943	160		
(U) SETA	1,507	0		
(U) Mk 21 Activities	13,950			
(U) Other Engineering Support & Testing	1,788	2,420		
(U) Identified as a Source for SBIR		2,577		
(U) Total	76,650	20,492		

(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
Product Development Organizations											
Boeing-North American	C/CPAF	Aug 93	437,147	437,147	379,918	45,439	11,790				437,147
Boeing-North American	C/CPAF	Sep 94	4,662	4,662	4,347	315	0				4,662
TRW (Prime)	C/CPAF	Dec 97	3,996	3,996	0	1,931	2,065				3,996

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604851F ICBM EMD

PROJECT: 3085

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
Support and Management Organizations											
NSCCA/IV&V	SS/CPAF	Mar 94	20,381	20,381	13,909	5,072	1,400				20,381
TRW (SETA)	SS/CPAF	Jan 94	42,072	42,072	40,565	1,507	0				42,072
CSDL	SS/FFP	Jun 94	5,264	5,264	5,264	0	0				5,264
Other Engineering Support	Various	Aug 93	28,540	28,540	9,756	16,443	2,500				28,699
Identified as a Source for SBIR							2,577				2,577
Test and Evaluation Organizations											
AGMC	PO	Annual	173	173	173	0	0				173
White Sands	PO	Annual	649	649	524	125	0				649
Missile Range											
Vandenberg AFB	PO/MIPR	Annual	6,714	6,714	1,688	5,026	0				6,714
Maxwell AFB	MIPR	Annual	27	27	27	0	0				27
Sandia	MIPR	Annual	2,542	2,542	1,633	749	160				2,542
Physics Int	MIPR	Annual	22	22	22	0	0				22
Little Mountain	PO	Annual	68	68	25	43	0				68

Government Furnished Property: None.

	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Subtotal Product Development	384,265	47,685	13,855				445,805
Subtotal Support and Management	69,494	23,022	6,477				98,993
Subtotal Test and Evaluation	4,092	5,943	160				10,195

		DATE
		February 1999
BUDGET ACTIVITY **5 - Engineering and Manufacturing Development**	PE NUMBER AND TITLE **0604851F ICBM EMD**	

Total Project	457,851	76,650	20,492	554,993

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604851F ICBM EMD PROJECT 4210

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
4210 Propulsion Replacement Program (PRP)	65,998	60,713	30,063	0	0	0	0	0	0	346,202

(U) A. Mission Description

(U) The Propulsion Replacement Program will remanufacture all three solid fuel stages to correct age-related degradations, maintain existing weapon system reliability, and support Minuteman life extension. Any of the degradations (propellant cracking, case corrosion, liner deterioration, inhibitor deterioration, and liner debond) can cause catastrophic motor failure and, in turn, mission failure. RDT&E efforts will identify replacement materials that are no longer available or which have become environmentally unacceptable, reduce life cycle costs, and identify corrections to age-related degradations. This project incorporates only changes that can be demonstrated in an appropriate time frame to ensure the Minuteman propulsion system continues to meet existing performance capabilities and remains viable and supportable. The project entered Phase 2 (Engineering and Manufacturing Development) in FY94.

(U) FY 1998 ($ in Thousands):

- (U) $51,776 Continued component reuse and materials replacement studies, continued stage design and development to include refurbishment. Continued fabrication, tooling, and waste disposal for change verification motor (CVM) testing. Successfully fired six Stage I, five Stage II, and three Stage III CVMs. Conducted Critical Design Review (CDR).
- (U) $8,260 Continued integration of program activities such as system engineering, program management, range support, Arnold Engineering Development Center (AEDC) testing, booster disassembly/assembly, booster transportation.
- (U) $4,038 Continued software modification.
- (U) $1,924 Continued ordnance development effort.
- (U) $65,998 Total

(U) FY 1999 ($ in Thousands):

- (U) $39,316 Continue component reuse and materials replacement studies, continue stage design and development to include refurbishment. Continue fabrication, tooling, and waste disposal for qualification motor testing.
- (U) $17,005 Continue integration of program activities such as system engineering, program management, range support, AEDC testing, booster disassembly/assembly, booster transportation.
- (U) $3,887 Continue software modification.
- (U) $505 Complete ordnance development effort.
- (U) $60,713 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604851F ICBM EMD
	PROJECT 4210

(U) FY 2000 ($ in Thousands):

– (U)	$19,762	Complete component reuse and materials replacement studies, continue stage design and development to include refurbishment. Continue fabrication, tooling, and waste disposal for qualification motor testing.
– (U)	$8,681	Complete integration of program activities such as system engineering, program management, range support, AEDC testing, booster disassembly/assembly, booster transportation.
– (U)	$1,620	Complete software modification.
– (U)	$30,063	Total

(U) FY 2001 ($ in Thousands):

– (U)	$0	EMD Completed in FY00.
– (U)	$0	Total

(U) B. Project Change Summary - Description of Significant Changes: None

(U) C. 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
(U) APPN 14, Missiles - AF, BA 3, P-013, MM III Modifications (PE 0101213F, Minuteman Squadrons)			93,667	140,674	254,881	262,136	269,626	264,573	559,270	1,844,827

(U) D. Acquisition Strategy: Planned acquisition will consist of all hardware and software modifications; integration and flight test support; delivery of remanufactured Stage I, II, and III motors; nuclear certification analysis tasks; and independent software certification. The PRP contracts (with the exception of NSCCA and independent software certification) have transferred to the Prime Integration Contractor.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604851F ICBM EMD
	PROJECT 4210

(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) Program Milestones																
Milestone III AFSARC												X				
(U) Engineering Milestones																
CDR				*												
(U) T&E Milestones																
Motor Qualification Tests	*	*	*	*	*	X	X	X								
Combined DT&E/IOT&E Flight									X							
Dedicated IOT&E Flight										X						
(U) Contract Milestones																
Low Rate Initial Production									X							
Full Rate Production												X				

* - Completed Event

X - Planned Event

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604851F ICBM EMD
	PROJECT 4210

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Technology Insertion	56,593	54,330	19,762	
(U) Software	4,038	3,887	1,620	
(U) Other Program Costs	3,352	2,496	8,681	
(U) SETA	2,015	0	0	
(U) Total	65,998	60,713	30,063	

(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
Product Development Organizations											
Thiokol	SS/CPAF	Aug 94	56,382	56,382	47,681	8,701	0				56,382
Aerojet	SS/CPAF	Jul 94	51,985	51,985	43,602	8,383	0				51,985
CSD	SS/CPAF	Jul 94	71,009	71,009	55,073	15,936	0				71,009
Thiokol	C/CPAF	Feb 97	2,364	2,364	1,304	1,060	0				2,364
Boeing North American	C/CPAF	Oct 96	2,217	2,217	1,399	818	0				2,217
Logicon	C/CPAF	Oct 96	3,015	3,015	1,482	720	581	232			3,015
GTE	C/CPAF	Oct 96	1,814	1,814	522	505	505	282			1,814
TRW (Prime)	C/CPAF	Dec 97	98,169	98,169	0	25,915	51,616	20,638			98,169

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604851F ICBM EMD PROJECT 4210

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
Support and Management Organizations											
TRW (SETA)	SS/CPAF	Oct 94	21,020	21,020	19,005	2,015					21,020
Program Integration			n/a	7,314	884	510	5,690	230			7,314
Other			n/a	15,515	15,515	155					15,670
Test and Evaluation Organizations											
AEDC	PO	Periodic	n/a	8,641	2,946	1,201	2,247	2,247			8,641
Vandenberg AFB	PO	Nov 99	n/a	6,587	0	79	74	6,434			6,587
AF Research Lab	PO	As Required	n/a	15	15	0	0				15

Government Furnished Property: None.

	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Subtotal Product Development	151,063	62,038	52,702	21,152			286,955
Subtotal Support and Management	35,404	2,680	5,690	230			44,004
Subtotal Test and Evaluation	2,961	1,280	2,321	8,681			15,243
Total Project	189,428	65,998	60,713	30,063			346,202

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604851F ICBM EMD	PROJECT 4788

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
4788 PSRE Life Extension Program	0	0	8,741	18,448	19,500	12,524	0	0	0	59,213

(U) A. Mission Description and Budget Item Justification

(U) The Propulsion System Rocket Engine (PSRE) Life Extension Program will refurbish the Minuteman post-boost propulsion system. This refurbishment will correct age-related degradations, maintain existing weapon system reliability, reduce life cycle costs, and support Minuteman life extension. Deficiencies identified (e.g., relief valve aging, titanium pressure sensing (PC) tube cracking, and fuel flex line cracks) may cause system failure/loss of performance and, in turn, potential mission failure. Other deficiencies (e.g., staging connector aging and actuator motor performance) will impact weapon system availability in addition to reducing system performance. RDT&E efforts will identify replacement materials for those no longer available or which have become environmentally unacceptable. The program will then design/develop components and manufacturing processes necessary to correct the identified deficiencies.

(U) FY 1998 ($ in Thousands):

- (U) $0 EMD begins in FY00.
- (U) $0 Total

(U) FY 1999 ($ in Thousands):

- (U) $0 EMD begins in FY00.
- (U) $0 Total

(U) FY 2000 ($ in Thousands):

- (U) $4,877 Begin design/development of components requiring refurbishment or replacement.
- (U) $3,864 Begin design/development of necessary support equipment.
- (U) $8,741 Total

(U) FY 2001 ($ in Thousands):

- (U) $7,545 Continue component design/development of components requiring refurbishment or replacement.
- (U) $5,664 Continue support equipment design/development of necessary support equipment.
- (U) $5,239 Begin test and evaluation efforts.
- (U) $18,448 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604851F ICBM EMD
	PROJECT 4788

(U) B. Program Change Summary - Description of Significant Changes: New start initiated with this President's Budget submission and beginning in FY00.

(U) C. 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
(U) APPN 14, Missiles - AF, BA 3, P-013, MM III Modifications (PE 0101213F, Minuteman Squadrons)						8,961	20,379	20,700	79,523	129,563

(U) D. Acquisition Strategy: . The PSRE Life Extension Program will be conducted under the ICBM Prime Integration Contractor unless other strategies are deemed more appropriate.

(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) Engineering Milestones																
PDR									X							
CDR																X
(U) T&E Milestones																
Re-certification																(FY02)
(U) Contract Milestones																
EMD Contract Award									X							

* - Completed Event

X - Planned Event

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604851F ICBM EMD
	PROJECT 4788

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Component Design/Development			4,877	7,545
(U) Support Equipment Design/Development			3,864	5,664
(U) System Test and Evaluation				5,239
(U) Total			8,741	18,448

(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
Product Development Organizations											
TRW (Prime)	C/CPAF	Oct 99	TBD	53,113				8,591	16,963	26,372	51,926
Support and Management Organizations											
SPO Support	TBD	TBD	TBD	993				150	301	542	993
Test and Evaluation Organizations											
AEDC	PO	As Required	TBD	6,294					1,184	5,110	6,294

Government Furnished Property: None

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)		DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604851F ICBM EMD	PROJECT 4788

	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Subtotal Product Development				8,591	16,963	26,372	51,926
Subtotal Support and Management				150	301	542	993
Subtotal Test and Evaluation					1,184	5,110	6,294
Total Project				8,741	18,448	32,024	59,213

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604851F ICBM EMD PROJECT 4823

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
4823 ECS Replacement Program	0	0	0	11,940	13,927	0	0	0	0	25,867

(U) A. Mission Description and Budget Item Justification

(U) The Minuteman Environmental Control System (ECS) provides cooling airflow to launch-critical ICBM ground equipment. The ECS was deployed in the 1960s. Key ECS components include brine chillers, fans, and pneumatic control systems. The brine chillers were renovated in the mid-1980s; however, those units and the pneumatic control systems have reached the end of their design life and need to be replaced. Aging and obsolete ECS components are adversely affecting weapon system availability, and operating and support costs, due to increased failure rates, non-availability of replacement parts, inefficient diagnostic capabilities, and related supportability and system performance problems. This program will fix the existing ECS in all Minuteman Launch Facilities (LFs) and Missile Alert Facilities (MAFs) as well as test equipment and trainers to benefit from updated technologies to support Minuteman life extension.

(U) FY 1998 ($ in Thousands):

- (U) $0 EMD begins in FY01.
- (U) $0 Total

(U) FY 1999 ($ in Thousands):

- (U) $0 EMD begins in FY01.
- (U) $0 Total

(U) FY 2000 ($ in Thousands):

- (U) $0 EMD begins in FY01.
- (U) $0 Total

(U) FY 2001 ($ in Thousands):

- (U) $3,940 Develop engineering design for replacement of existing brine chillers with state-of-the-art brine chillers.
- (U) $3,701 Design digital control system to replace existing pneumatic control system.
- (U) $1,075 Design new digital technology remote monitoring system.
- (U) $3,224 Develop engineering design to correct age-related supportability and performance deficiencies with ECS components including LF emergency air conditioner, launch tube heater and instrument air compressor, and resolve launch control center air quality problems.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604851F ICBM EMD
	PROJECT 4823

– (U) $11,940 Total

(U) B. Program Change Summary - Description of Significant Changes: New start initiated with this President's Budget Submission which will begin in FY01.

(U) C. 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
(U) APPN 14, Missiles - AF, BA 3, P-013, MM III Modifications (PE 0101213F, Minuteman Squadrons)						18,333	46,173	57,506	145,842	267,854

(U) D. Acquisition Strategy: The ECS Replacement Program will be conducted under the ICBM Prime Integration Contractor unless other strategies are deemed more appropriate.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604851F ICBM EMD PROJECT 4823

(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) Contract Milestones																
EMD Contract Award													X			
(U) Engineering Milestones																
PDR															X	
CDR (3rd Qtr, FY02)																

* - Completed Event

X - Planned Event

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604851F ICBM EMD
	PROJECT 4823

A. Project Cost Breakdown ($ in Thousands)

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Contractor Engineering Support				11,740
(U) Program Management Support				200
(U) Total				11,940

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)		DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604851F ICBM EMD	PROJECT 4823

(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
Product Development Organizations											
TRW (Prime)	C/CPAF	Oct 00	n/a	25,467					11,740	13,727	25,467
Support and Management Organizations											
Various	Various	Oct 00	n/a	400					200	200	400

Test and Evaluation Organizations: None

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604851F ICBM EMD PROJECT 4823

Government Furnished Property: None

	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Subtotal Product Development					11,740	13,727	25,467
Subtotal Support and Management					200	200	400
Subtotal Test and Evaluation							
Total Project					11,940	13,927	25,867

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0604853F Evolved Exp Launch Veh - EMD (Space)

PROJECT: 0004

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
0004 Evolved Expendable Launch Vehicle	23,252	259,143	324,803	307,502	239,540	14,502	0	0	0	1,168,742
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 mission of the EELV program 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 serviced by Titan II, Delta II, Atlas II, and Titan IV. Evolved from current expendable launch systems or components thereof, EELV will support military, intelligence, and civil mission requirements.

(U) FY 1998 ($ in Thousands):
- (U) $20,400 Continued system development/analysis
- (U) $2,621 Continued Systems Engineering
- (U) $231 Continued program management and other support costs
- (U) $23,252 Total

(U) FY 1999 ($ in Thousands):
- (U) $228,400 Continue system development/analysis
- (U) $ 12,485 Systems Engineering
- (U) $ 10,559 Program management and other support costs
- (U) $7,699 Identified as a source for SBIR
- (U) $259,143 Total

(U) FY 2000 ($ in Thousands):
- (U) $298,600 Continue system development/analysis
- (U) $12,870 Systems Engineering

– (U) $13,333 Program management and other support costs
– (U) $324,803 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604853F Evolved Exp Launch Veh - EMD (Space)
	PROJECT 0004

(U) FY 2001 ($ in Thousands):
- (U) $280,089 Continue system development/analysis
- (U) $12,901 Systems Engineering
- (U) $14,512 Program management and other support costs
- (U) $307,502 Total

(U) B. Budget Activity Justification: This program element is in Budget Activity 5, Engineering and Manufacturing Development, because it supports engineering and manufacturing development of the EELV concept leading to deployment of a lower cost expendable launch vehicle system.

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY 1999 PB)	26,572	280,297	338,319	305,557	1,210,017
(U) Appropriated Value	28,376	260,297			
(U) Adjustments to Appropriated Value					
a. Congressional General Reductions	- 1,132	-1,154			
b. Small Business Innovative Research	- 676				
c. Omnibus or other above threshold reprogramming	-181				
d. Below Threshold Reprogramming	- 3,135				
e. Rescissions					
(U) Adjustments to Budget Years Since FY99 PB			-13,516	+1,945	
(U) Current Budget Submit/FY 2000 President's Budget	23,252	259,143	324,803	307,502	1,168,742

(U) Significant Program Changes: USD (A&T) approved a revised acquisition strategy approach for the development effort in November 1997. The original strategy was to downselect from two contractors to one contractor. The revised strategy allowed for awarding more than one Other Transaction Agreement (OTA) for development and more than one Initial Launch Services (ILS) contract for commercial launch services. The acquisition strategy change delayed contract awards and made $7.6M available in FY98 to finance FY99 efforts and $7.6M available in FY99 to finance FY00 efforts. The FY00 program was reduced $7.6M to consider funds carried forward from FY99. The remaining FY00 adjustments ($5.9M) were as a result of funds being redirected to finance higher priority Air Force efforts. The FY01 increase continues the development effort. Completion of this national dual-use EELV system will allow the government to competitively procure commercial launch services that successfully deliver National Mission Model (NMM) payloads, validate a reduction of at least 25% in the recurring cost of space launch, and maintain the EELV standard payload interface. This acquisition strategy change resulted in an approximate $.5B reduction for the government-funded (FY98-FY02) development effort. Development OTAs were awarded on 16 October 1998 to The Boeing Company and Lockheed Martin Astronautics for $500M each. FY99: $7.7M identified as a source for SBIR.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604853F Evolved Exp Launch Veh - EMD (Space)
	PROJECT 0004

(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 Comp	Total
(U) NRO (non-AF budget) *	4,200									95,100
(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) DARPA (Non-AF budget) (PE 0603226E)**										9,845
Related RDT&E:										
(U) EELV Demonstration and Validation (PE 0603853F)***	63,904								0	176,634
(U) EELV Operational System Development (PE 0305953F)		3,305							0	3,305

* Total includes funding in FY96 and FY97.
** Total includes funding in FY94.
*** Total includes funding in FY95, FY96 and FY97.

(U) E. Acquisition Strategy:

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. Four initial contracts were awarded for the Low Cost Concept Validation (LCCV) phase in August 1995. The Air Force downselected to two contractors – Lockheed Martin and Boeing (originally McDonnell Douglas) – for the Pre-Engineering and Manufacturing Development (Pre-EMD) phase in December 1996. On 16 Oct 1998, two $500M Other Transaction Agreements (OTA) were awarded to The Boeing Company and Lockheed Martin Astronautics for the development effort. The contractors will contribute additional funds of their own, as necessary, to bring their national launch operational capability on line. It is estimated that each contractor is investing approximately $1B. During the development effort, each contractor's progress will be measured by the use of discrete contractual Milestone Payments associated with major development accomplishments. When a contractor completes a milestone on time, and the government agrees the milestone accomplishment criteria have been successfully met, the government is obligated to pay in the fiscal year in which the funds were budgeted. Simultaneous with the award of the development effort, an Initial Launch Services (ILS) contract was awarded to Boeing for $1.38B (19 missions) and an ILS contract was awarded to 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.

	DATE **February 1999**
BUDGET ACTIVITY **5 - Engineering and Manufacturing Development**	PE NUMBER AND TITLE **0604853F Evolved Exp Launch Veh - EMD (Space)**

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604853F Evolved Exp Launch Veh - EMD (Space)
	PROJECT 0004

(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
Development Module																
(U) Defense Acquisition Board - Milestone II					*											
(U) Development OTAs awarded					*											
(U) Tailored Critical Design Review completed No Later Than Dec 99									X							

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604853F Evolved Exp Launch Veh - EMD (Space)
	PROJECT 0004

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) System development	20,400	228,400	296,868	280,089
(U) Systems Engineering	2,621	12,485	12,870	12,901
(U) Program management and other support costs	231	10,559	15,065	14,512
(U) Identified as a source for SBIR	0	7,699	0	0
(U) Total	23,252	259,143	324,803	307,502

(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							$7,699				
Product Development Organizations											
Prime Contractor Boeing	OTA	Oct 98	500,000	500,000	0	10,200	114,200	149,300	140,044	159,950	573,694
Prime Contractor Lockheed Martin	OTA	Oct 98	500,000	500,000	0	10,200	114,200	149,300	140,045	159,949	573,694
Support and Management Organizations											
SPO Mission Spt	Various	Various	N/A	N/A	0	231	8,950	11,675	12,520	17,776	51,152
FFRDC	SS/CPAF	Annual	N/A	N/A	0	2,621	12,485	12,870	12,901	13,790	54,667
Other Cntr Spt	Various	Various	N/A	N/A	0	0	1,609	1,658	1,992	2,577	7,836

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)											DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development					PE NUMBER AND TITLE 0604853F Evolved Exp Launch Veh - EMD (Space)						PROJECT 0004
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					0	0	0	0	0	0	0
Government Furnished Property: Not Applicable											
Subtotal Product Development					0	20,400	228,400	298,600	280,089	219,899	1,047,388
Subtotal Support and Management					0	2,852	23,044	26,203	27,413	34,143	113,655
Identified as a source for SBIR					0	0	7,699	0	0	0	7,699
Subtotal Test and Evaluation					0	0	0	0	0	0	0
Total Project					0	23,252	259,143	324,803	307,502	254,042	1,168,742

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

DATE: February 1999

BUDGET ACTIVITY: 5 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0605011F RDT&E FOR AGING AIRCRAFT

PROJECT: 4685

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
4685 Aging Aircraft	0	4,887	4,889	14,310	28,451	42,427	43,311	44,213	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(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: This is a new program element in FY1999, but not a new start program as efforts were previously funded in PE 0708026F, Productivity/Reliability/Availability/Maintainability (PRAM).

(U) FY 1998: Not Applicable.

(U) FY 1999 ($ in Thousands):

- (U) $2,609 Develop improved capabilities for corrosion abatement, prevention, and control to reduce the associated maintenance burden. Improve corrosion detection capabilities to decrease inspection times and/or detect corrosion earlier. Develop and integrate software and analytical tools for more effective fleet corrosion management.
- (U) $1,016 Develop improved non-destructive inspection techniques that will reduce the time required to detect flaws and damage, such as fatigue cracking, corrosion, disbonds, and trapped moisture, and/or allow the damage to be found earlier, thus allowing for less extensive or costly repairs.
- (U) $1,119 Develop technologies to ensure the continued structural integrity of aging weapon systems, thus ensuring continued flight safety.
- (U) $143 Identified as a source for SBIR.
- (U) $4,887 Total

	DATE **February 1999**
BUDGET ACTIVITY **5 - Engineering and Manufacturing Development**	PE NUMBER AND TITLE **0605011F RDT&E FOR AGING AIRCRAFT**

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0605011F RDT&E FOR AGING AIRCRAFT
	PROJECT 4685

(U) FY 2000 ($ in Thousands):

- (U) $2,750 Continue work in corrosion abatement, prevention, and control to reduce the associated maintenance burden. Continue work on improved corrosion detection capabilities to decrease inspection times and/or detect corrosion earlier. Continue the development and integration of software and analytical tools for more effective fleet corrosion management.
- (U) $1,028 Continue work on improved non-destructive inspection techniques that will reduce the time required to detect flaws and damage, such as fatigue cracking, corrosion, disbonds, and trapped moisture, and/or allow the damage to be found earlier, thus allowing for less extensive or costly repairs.
- (U) $1,111 Continue work on technologies to maintain the structural integrity of aging weapon systems, thus ensuring continued flight safety.
- (U) $4,889 Total

(U) FY 2001 ($ in Thousands):

- (U) $5,200 Continue work in corrosion abatement, prevention, and control to reduce the associated maintenance burden. Continue work on improved corrosion detection capabilities to decrease inspection times and/or detect corrosion earlier. Continue the development and integration of software and analytical tools for more effective fleet corrosion management.
- (U) $4,550 Continue work on improved non-destructive inspection techniques that will reduce the time required to detect flaws and damage, such as fatigue cracking, corrosion, disbonds, and trapped moisture, and/or allow the damage to be found earlier, thus allowing for less extensive or costly repairs.
- (U) $4,560 Continue work on technologies to maintain the structural integrity of aging weapon systems, thus ensuring continued flight safety.
- (U) $14,310 Total

(U) B. Budget Activity Justification: This program is in Budget Activity 5, Engineering and Manufacturing Development, because projects/capabilities will be developed in this program, then made available for procurement by already operational systems.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 EXHIBIT)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0605011F RDT&E FOR AGING AIRCRAFT
	PROJECT 4685

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget/FY 1999 PB	0	4,901	4,978	14,583	Continuing
(U) Appropriated Value		4,901			
(U) Adjustments to Appropriated Value					
a. Congressional/General Reductions		-14			
b. SBIR					
c. Omnibus/Other Above Threshold Reprogrammings					
d. Below Threshold Reprogrammings					
(U) Adjustments to Budget Years Since FY 1999 PB			-89	-273	
(U) Current Budget Submit/FY 2000 PB	0	4,887	4,889	14,310	Continuing

(U) Significant Program Changes: This is a new program element, but not a new start program as efforts were previously funded in PE 0708026F, Productivity/Reliability/Availability/Maintainability (PRAM).

FY 1999: $143 identified as a source for SBIR.

(U) D. Other Program Funding Summary:

(U) Related Activities:
- (U) PE 0708026F, Productivity/Reliability/Availability/Maintainability.

(U) E. Acquisition Strategy: Funding will be released to the Air Logistics Centers for the projects for which they are the Office of Primary Responsibility (OPR) that year. OPR will determine the most appropriate contract vehicle, Design Engineering Program (DEP) contract or full and open competition, to accomplish the project.

(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) Project Screening			X				X				X				X	
(U) Request For Proposal Release					X				X				X			
(U) Contract Awards						X	X	X		X	X	X		X	X	X

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0605011F RDT&E FOR AGING AIRCRAFT
	PROJECT 4685

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Corrosion prevention and control techniques	0	2,609	2,750	5,200
(U) Improved non-destructive inspection capabilities	0	1,016	1,028	4,550
(U) Technologies to enhance structural integrity	0	1,119	1,111	4,560
(U) Identified as a source for SBIR	0	143	0	0
(U) Total	0	4,887	4,889	14,310

(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	To Complete	Total Program
Product Development Organizations											
Identified as a source for SBIR							143				
Numerous	Various	Various	None	None	0	0	4,744	4,889	14,310	Cont	Cont
Support and Management Organizations - In-House Support.											
Test and Evaluation Organizations - Not Applicable.											
Government Furnished Property - Not Applicable.											
Identified as a source for SBIR							143				
Subtotal Product Development					0	0	4,744	4,889	14,310	Cont	Cont
Subtotal Support and Management					0	0	0	0	0	0	0
Subtotal Test and Evaluation					0	0	0	0	0	0	0
Total Project					0	0	4,887	4,889	14,310	Cont	Cont

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

DATE: February 1999

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0603402F Space Test Program (Space)

PROJECT: 2617

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
2617 Free-Flyer Spacecraft Missions	35,918	0	0	0	0	0	0	0	0	0
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

Note: Space Test Program (Space) funding is in PE 0605864F starting in FY99.

(U) A. Mission Description

(U) The Space Test Program (STP) conducts space test missions to fly the maximum number of DoD experiments consistent with priority, opportunity, and funding. STP supports the DoD space research community by centrally financing acquisition of a host satellite or launch vehicle, the launch, and initial operations costs for experiments with military relevance whose scope ranges from basic research to advanced development. STP missions are the most cost effective way to flight test new space systems technologies, concepts and designs, providing an inexpensive way to:

- Demonstrate the feasibility of new space systems and technologies
- Improve operational design by characterizing the space environment, event, or sensor physics proposed for an operational system/system upgrade
- Provide early operational capabilities to evaluate usefulness or quickly react to new developments
- Perform operational risk reduction through direct flight test of prototype components
- Develop the knowledge base from which to plan new and improved operational systems and system upgrades
- Develop and test advanced small launch vehicle technology and capabilities.

(U) This DoD program provides the primary spaceflight capability to perform fly-before-buy, risk-reducing demonstrations of advanced technologies in operational space environments. The Secretary of Defense issued a policy statement in November 1995 reaffirming STP's role as the primary provider of spaceflight for the entire DoD space research community. The Air Force requires a stable funding level and the flexibility necessary to take advantage of whatever means of spaceflight is deemed to be most cost-effective for a given experiment or complement of experiments. This flexibility is essential to take advantage of inexpensive "target of opportunity" space hardware, including operational spacecraft, where margin is usually firmly identified during the later stages of spacecraft development. This assures the greatest amount of DoD space research is accomplished with the limited funds available. This funding provides DoD's most successful and cost-effective capability to launch and test new technologies prior to their incorporation into our nation's very expensive and demanding operational space systems. Insufficient funding would force each of the Services and DoD agencies to create individual launch capabilities in an attempt to duplicate STP's current low-cost, risk-mitigating capability. Such a redundancy would result in the loss of the contractual economy of scale that a single space test organization provides, as well as the filtering function of the DoD Space Experiments Review Board in assuring quality experiments and minimum duplication.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY: 6 - Management and Support	PE NUMBER AND TITLE: 0603402F Space Test Program (Space) / PROJECT: 2617

(U) FY 1998 ($ in Thousands):

–	(U) $ 7,454	Piggyback/secondary payload missions, mission planning, Aerospace Corp support, mission and program support
–	(U) $23,724	Complete Advanced Research and Global Observation Satellite (ARGOS); ARGOS launch/operations support; continue Multispectral Thermal Imager (MTI) Taurus launch vehicle procurement, TSX-5, STEP-Mission 4
–	(U) $ 3,105	Space Shuttle payload engineering, analysis, pre- and post-launch processing, and launch support
–	(U) $ 1,635	Initiate reusable upper stage/bus development activities for spaceflight of Space Experiments Review Board approved experiments
–	(U) $35,918	Total

(U) FY 1999 ($ in Thousands):

–	(U) $ 0	Funding is in PE 0605864F

(U) FY 2000 ($ in Thousands):

–	(U) $ 0	Funding is in PE 0605864F

(U) FY 2001 ($ in Thousands):

–	(U) $ 0	Funding is in PE 0605864F

(U) B. Budget Activity Justification: STP is in Budget Activity 6 RDT&E Management and Support because it supports RDT&E satellite launches.

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY1999 PB)	38,696				
(U) Appropriated Value	42,241				
(U) Adjustments to Appropriated Value					
a. Cong Gen Reductions	-2,556				
b. SBIR	-989				
c. Omnibus or Other Above Threshold Reprogram	-763				
d. Below Threshold Reprogramming	-2,015				
e. Rescission					
(U) Adjustments to Budget Years Since FY1999 PB					
(U) Current Budget Submit/FY2000 PB	35,918				

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0603402F Space Test Program (Space)
	PROJECT 2617

(U) Significant Program Changes:
(U) STP funding is in PE 0605864F starting in FY99.
(U) Below threshold reprogramming for higher Air Force priorities caused six month delay in STP flight test support for upper stage/bus demonstration vehicle.

(U) D. Other Program Funding Summary ($ in Thousands): Not Applicable

Related RDT&E:
(U) PE 0305119F, Medium Launch Vehicles
(U) PE 0305144F, Titan Space Boosters
(U) PE 0305953F, Evolved Expendable Launch Vehicle
(U) PE 0605864F, STP funding for FY99 and beyond

(U) Experiments are funded by many Science and Technology (S&T) PEs in Air Force, Army, Navy, Defense Advanced Research Projects Agency (DARPA), Ballistic Missile Defense Organization (BMDO), Department of Energy (DoE), National Aeronautics and Space Administration (NASA), and other programs.

(U) E. Acquisition Strategy
(U) Various service laboratories and DoD agencies justify, develop, finance, and deliver the space research experiments supported by STP. These experiments have a common goal to improve DoD's current and future operational space systems' performance. The DoD Space Experiments Review Board (SERB), an independent board composed of Air Force, Army, Navy, NRO, BMDO, and other representatives, annually prioritizes experiments for spaceflight. The Board gives the prioritized list of experiments to STP, who then seeks out the most cost-effective means of spaceflight to maximize the number of experiments flown within the constraints of priority, opportunity and available funding. The most common spaceflight opportunities include piggybacking on military or commercial satellites and using the various payload modes of the Space Shuttle and International Space Station. For experiments with requirements that cannot be satisfied with these "secondary" opportunities, STP procures dedicated spacecraft and launch vehicle hardware within the constraints of available funding and according to experiment requirements. These include small and medium launch vehicle-class satellites, as well as small launch vehicle-class boosters (such as Pegasus XL, Taurus, and Athena). Medium launch vehicle-class boosters from PE 35119F, PE 35144F, and PE 35953F provide medium launch as required. If a service fails to adequately fund a particular experiment, if STP deems the experiment impractical to fly, or if the appropriate spaceflight opportunity becomes unavailable, STP shifts remaining resources to provide spaceflight support for the next highest priority experiment.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0603402F Space Test Program (Space)
	PROJECT 2617

(U) F. Schedule Profile These are actual FY98 launch dates.

	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) STEP4-EMPE, OOAM, DIDM (P95-1)	*															
(U) STS-87 MSX, SIMPLEX	*															
(U) POAM III (SPOT IV) (S96-2)		*														
(U) STS-89 CREAM, MSX, SIMPLEX		*														
(U) STS-91 CREAM, MSX, SIMPLEX			*													

* = completed event

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

DATE: **February 1999**

BUDGET ACTIVITY: **6 - Management and Support**

PE NUMBER AND TITLE: **0604256F Threat Simulator Development**

	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	52,267	34,086	32,391	36,848	38,260	40,293	43,025	43,914	Continuing	TBD
3321	Electronic Warfare Ground Test Resources	50,796	32,189	28,062	28,724	29,324	31,167	33,656	34,329	Continuing	TBD
2907	Electronic Combat Intel Support	1,471	1,897	1,939	1,985	1,898	1,930	2,053	2,075	Continuing	TBD
7500	Foreign Materiel Acquisition/Exploitation	0	0	2,390	6,139	7,038	7,196	7,316	7,510	Continuing	TBD
	Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description: This PE provides funding for the elements necessary to support the AF Electronic Warfare (EW) Test Process. This test process provides a scientific methodology to ensure the effective disciplined and efficient testing of AF EW and avionics systems. Each capability or facility improvement is pursued in concert with the others so as to avoid duplicate capabilities while at the same time producing the proper mix of test resources needed to support the AF EW Test Process. This PE provides funding for the management and technical oversight of implementation activities, the Air Force-led tri-Service effort to establish a common modeling and simulation architecture, development and improvement of digital EW models, measurement facilities operation and improvements, hardware in the loop test facilities operation and improvements, installed system test facility improvements, and development and improvement of open air threat simulators for flight testing. This PE also provides funding for planning, management, budgetary, and technical support to the Air Force for corporate-level implementation of the Electronic Warfare (EW) Test Process and for improvement and modernization (I&M) and application of the test and evaluation (T&E) infrastructure. Support includes requirements definition and analysis, project planning, programming and budgeting, technical oversight, and application of T&E facility I&M. Products include studies, analyses, and related documentation. This PE provides funding to support the acquisition and exploitation efforts of the Foreign Materiel Program, as well as to support EW intelligence efforts, beginning in FY 00. In FY 98, Projects 6510, Flight Test Resources, and 2900, RATSCAT Upgrade, were combined into Project 3321, Electronic Warfare Test Resources, as part of consolidation and simplification efforts in T&E investment accounts. Contracts funded from this program are predominately awarded on the basis of full and open competition. This Program Element is in Budget Activity 6, Management and Support, because it is a Research and Development (R&D) effort for Improvement and Modernization of EW related T&E capabilities at Air Force Test Centers.

(U) B. Budget Activity Justification: This Program Element is in Budget Activity 6, Management Support, because it is a Research and Development (R&D) effort for Improvement and Modernization of EW related T&E capabilities at Air Force Test Centers.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0604256F Threat Simulator Development

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY 1999 PB)	51,501	32,582	37,400	39,561	Continuing
(U) Appropriated Value	54,346	34,582			
(U) Adjustments to Appropriated Value					
a. Cong Adjustments	-3,200	-497			
b. SBIR	0				
c. Omnibus or Other Above Threshold Reprogram	-346				
d. Below Threshold Reprogramming	4,312				
(U) Adjustments to Budget Years Since FY 1999 PB			-5,009	-2,713	
(U) Current Budget Submit/FY 2000 PB	52,267	34,086	32,391	36,848	Continuing

(U) Significant Program Changes: FY 2000 and FY 2001 reductions to fund other Air Force or DoD requirements and realignment of funds from this PE to PE 27601F to support transition of JMASS.

(U) FY99: $679 has been idenfied as a source for SBIR.

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

DATE: February 1999

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0604256F Threat Simulator Development

PROJECT: 3321

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
3321 Electronic Warfare Ground Test Resources	50,796	32,189	28,062	28,724	29,324	31,167	33,656	34,329	Continuing	TBD

(U) A. Mission Description: The AF requires a comprehensive set of test facilities to implement the Air Force Electronic Warfare (EW) Test Process. In order that program risk can be managed effectively throughout the weapon system acquisition process, and test and evaluation (T&E) be conducted effectively and efficiently, a spectrum of T&E capabilities from modeling and simulation through open-air ranges is required. The EW Test Process Support task provides for investment management, coordinated technical oversight, and application of EW T&E facilities, including studies, analyses, and related documentation. The Joint Modeling and Simulation System (JMASS) is an Air Force-led, tri-service project to establish a common, DoD-wide, digital simulation architecture and set of models in support of T&E. The current JMASS program supports model development to meet the needs of the B-1B Defensive System Upgrade Program (DSUP). The JMASS program currently includes development of a limited set of threat and environment models to support acquisition and test of multiple programs including the B-1B, F-22, and Joint Strike Fighter (JSF). Included in the JMASS program, the EW T&E M&S project develops threat models specifically to support T&E requirements. In FY99 the Joint Program Office will be established for JMASS and in FY00 the funding for the JMASS architecture and software development will transition to PE 27601F and the JMASS compliant, digital EW model development activities required to support T&E customers will remain in this PE. The Radar Target Scatter (RATSCAT) upgrade project provides improvements to the RATSCAT measurement facility at Holloman AFB, NM to support radar cross section (RCS) measurement requirements of DoD customers with either conventional or stealth systems. The Hardware in the Loop (HITL) test facilities evaluate electronic support and countermeasures effectiveness prior to installation on the aircraft. Together, the two AF HITL facilities, the Air Force Electronic Warfare Evaluation Simulator (AFEWES) and the Real Time Electromagnetic Digitally Controlled Analyzer and Processor (REDCAP), provide the ability to realistically evaluate hardware components against manned hardware threat representations early enough to affect final system design. FY98 was the last year of T&E infrastructure funding for operations at the government-owned-contractor-operated REDCAP facility in Buffalo, NY. In subsequent years, REDCAP test functions will transition to the Digital Integrated Air Defense System (DIADS) HITL at Edwards AFB, CA. The Electronic Combat Integrated Test (ECIT) project upgrades the AF Installed System Test Facility (ISTF) at Edwards AFB, CA. This ISTF consists of a large, instrumented, anechoic chamber which provides for evaluation of an EW system when installed on its host aircraft, both prior to and throughout the flight test program. The goal of the ECIT upgrade is to integrate coherent EW threat stimulators into the ISTF. The Advanced Airborne Interceptor Simulator (AAIS), a project to develop an advanced signal system to represent airborne threats for EW open-air testing, was terminated in FY98 because of the availability of Foreign Material Acquisition assets capable of meeting primary customer requirements. Also in FY 98, Projects 6510, Flight Test Resources, and 2900, RATSCAT Upgrade, were combined into Project 3321, Electronic Warfare Test Resources.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0604256F Threat Simulator Development
PROJECT 3321	

(U) FY 1998 ($ in Thousands):

- (U) $1,825 EW Test Process Support. Conducted requirements analyses and other studies in support of Air Force investments in EW test infrastructure. Provided systems engineering/technical assistance (SETA) support for Air Force implementation of the EW Test Process, including improvement and modernization (I&M) of the EW test infrastructure.
- (U) $12,489 JMASS. Prepared to initiate development of a joint version of the JMASS software. Adapted JMASS to a wider variety of computer platforms, including personal computers (PC). Increased JMASS efficiency by optimizing the architecture. Adapted commercial off-the-shelf (COTS) tools for front-end model development and post-processing viewing and analysis. Operated and maintained EW model library. Began development and implementation of JMASS compliant models of surface-to-air missiles (SAMs), Air-to-Air Missiles (AAMs) and Airborne Interceptors (AIs) to support acquisition and test of multiple programs, including the B-1, F-22, and Joint Strike Fighter (JSF). The EW Test and Evaluation Modeling and Simulation (EW T&E M&S) continued developing threat models required by DoD customers to support the EW Test Process.
- (U) $1,973 RATSCAT Upgrades. Integrated mobile Bistatic Coherent Measurement System (BICOMS) radar with BICOMS control and instrumentation infrastructure. Procured and began integration of RATSCAT Advanced Measurement System (RAMS) radar replacement hardware.
- (U) $3,525 AFEWES Operation and Upgrade. Continued AFEWES operation in support of Air Force, Army, Navy, and non-DoD test customers. Continued Advanced RF (SAM-E) and IR/UV HITL simulator modifications. Upgraded the RF clutter environment to better simulate the open air range and integrate a semi-active SAM simulation (SAM-C1) in AFEWES.
- (U) $4,912 REDCAP/DIADS. Transitioned Integrated Air Defense System (IADS) HITL capability from REDCAP, Buffalo, NY, to the Air Force Flight Test Center (AFFTC) and established Digital IADS (DIADS) HITL capability for support of Air Force, Army, Navy and non-DoD test customers. Completed development of Airborne Warning Model and Advanced C^3 Upgrade, and began development of additional IADS configurations. Began integration with ECIT.
- (U) $22,144 ECIT. Continued development of infrastructure and generic test capabilities (I&GTC) for EW and avionics installed system testing. Conducted Critical Design Review (CDR) of major I&GTC subsystems including Network and Controls, Simulation, Radio Frequency (RF) Generation and Injection, RF Free Space Excitation, and Instrumentation.
- (U) $3,928 AAIS. Paid termination costs of canceled program.
- (U) $50,796 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE
BUDGET ACTIVITY 6 - Management and Support	0604256F Threat Simulator Development 3321

FY 1999 ($ in Thousands):

EW Test Process Support. Conduct requirements analyses and other studies in support of Air Force investments in EW test infrastructure.

- (U) $8,149

software, which affords compatibility with the DoD High-Level Architecture (HLA). Complete transition of JMASS to PCs and other computer

compliant SAM, AAM, and AI models to support the needs of a single customer. The EW Test and Evaluation Modeling and Simulation (EW

Specifically EW T&E M&S will complete development of the JMASS RF enviornment model, complete development of the SADS 2b/f, begin

- (U) $1,863

upgrade range charactorization and mainsite UHF/VHF upgrade.

AFEWES Operation. Continue AFEWES operation in support of Air Force, Army, Navy, and non-DoD test customers. Continue development

- (U) $6,191

required to achieve IOC of DIADS baseline. Begin development of external linking and BLUE IADS capabilities.

ECIT. Complete the infrastructure and generic test capabilities (I&GTC), which provides RF generation capability in support of F-22

and the CTEIP-funded Generic Radar Target Generator (GRTG), Infrared Sensor Simulator (IRSS), and Communications-Navigation-

- (U) $ 641

-(U)$32,189

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0604256F Threat Simulator Development
	PROJECT 3321

(U) FY 2000 ($ in Thousands):

- (U) $ 884	EC Test Process Support. Conduct requirements analyses and other studies in support of Air Force investments in EW test infrastructure. Provide systems engineering/technical assistance (SETA) support for Air Force implementation of the EW Test Process, including improvement and modernization (I&M) of the EW test infrastructure.
- (U) $4,037	EW Test and Evaluation Modeling and Simulation (EW T&E M&S). Develop JMASS compliant, digital threat models required by DoD customers to support the EW Test Process. Continue development of SADS-10B digital model. Complete development of SADS-3 model.
- (U) $2,003	RATSCAT Upgrades. Achieve FOC for RAMS Pylon. Complete industry partnership efforts with first major EW supplier. Continue range characterization and mainsite UHF/VHF upgrade.
- (U) $5,908	AFEWES. Continue AFEWES operation in support of Air Force, Army, Navy, and non-DoD test customers. Complete development of Advance Simulator Modifications (SAM-C2), and begin development of advanced RF semi-active SAM simulations (SAM-D).
- (U) $2,835	DIADS. Continue support to Air Force, Army, Navy, and non-DoD test customers. Continue development of external linking via HLA and BLUE IADS capabilities. Begin support of major OT customers with RED IADS scenario generation and execution.
- (U) $12,395	ECIT. Complete Test Control and Integration (TC&I) sub-system to be integrated into the Integration Facility for Avionics Systems Test (IFAST). This effort includes integration of the CTEIP-funded Generic Radar Target Generator (GRTG), Infrared Sensor Stimulator (IRSS), and Communications-Navigation-Identification (CNI) simulator into IFAST to support F-22 requirements.
-(U) $28,062	Total

(U) FY 2001 ($ in Thousands):

- (U) $ 903	EC Test Process Support. Conduct requirements analyses and other studies in support of Air Force investments in EW test infrastructure. Provide systems engineering/technical assistance (SETA) support for Air Force implementation of the EW Test Process, including improvement and modernization (I&M) of the EW test infrastructure.
- (U) $3,989	EW Test and Evaluation Modeling and Simulation (EW T&E MS). Develop JMASS compliant, digital threat models required by DoD customers to support the EW Test Process. Complete development of SADS-10B digital model.
- (U) $1,705	RATSCAT Upgrades. Enhance efficiency of operations and accuracy of measurements. Expand partnerships with major industry EW suppliers. Complete updated range charactorization effort. Continue mainsite UHF/VHF upgrade.
- (U) $7,940	AFEWES. Continue AFEWES operation in support of Air Force, Army, Navy, and non-DoD test customers. Complete development of advanced simulator modifications (SAM-C2). Continue development of advanced RF semi-active SAM simulations (SAM-D), and begin development of a second advanced RF semi-active SAM simulation (SAM-F). Begin development of advanced IR SAM.
- (U) $3,478	DIADS. Continue support to Air Force, Army, Navy, and non-DoD test customers. Continue development of external linking via HLA and BLUE IADS capabilities. Continue support of major OT customers with RED IADS scenario generation and execution. Begin integration with M&S air warfare mission simulations.
- (U) $10,709	ECIT. Integrate the Test Control and Integration (TC&I) sub-system with the Benefield Anechoic Facility (BAF) Installed System Test Facility (ISTF). This effort includes integration of the CTEIP-funded Generic Radar Target Generator (GRTG), Infrared Sensor Stimulator (IRSS), and Communications-Navigation-Identification (CNI) simulator into the BAF to support F-22 requirements.

-(U) $28,724 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0604256F Threat Simulator Development 3321

B. _____

(U) Significant Program Changes: FY 2000 and FY 2001 reductions to fund other Air Force or DoD requirements.

(U) C. _____

Appropriation: RDT&E	FY 1998	FY 2000	FY 2002	FY 2004	To	Total
Program Title: Central Test and Evaluation	39,643				N/A	

Related RDT&E:

(U) PE 0604735F, Combat Training Ranges

(U) Acquisition Strategy
(U)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0604256F Threat Simulator Development
	PROJECT 3321

(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) JMASS 3.2 Release	*															
(U) Establish JMASS JPO					X											
(U) ECIT Infrastructure and Generic Test Capability (I&GTC) IOC							X									
(U) ECIT SIL Integration									X							
(U) ECIT BAF Integration															X	
(U) Digital Integrated Air Defense System Baseline IOC							X									
(U) AAIS Program Terminated	*															
(U) AFEWES SAM-C Upgrade										X						
(U) AFEWES SAM-E Dev Complete												X				
(U) AFEWES SAM-F Dev Complete																X
(U) EW T&E M&S Threat Models Complete		*	*	X		X			X			X				X
(U) BICOMS Mobile Radar IOC				X												
(U) RAMS Replacement Radar IOC					X											
(U) RAMS Pylon Full Operational Capability (FOC)								X								
(U) RATSCAT - Upgrade Range Charactorization						X								X		
(U) RATSCAT Mainsite UHF/VHF Upgrade							X									+

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY: 6 - Management and Support	PE NUMBER AND TITLE: 0604256F Threat Simulator Development / PROJECT: 2907

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
2907 Electronic Combat Intel Support	1,471	1,897	1,939	1,985	1,898	1,930	2,053	2,075	Continuing	TBD

(U) A. Mission Description This project provides funding to support Foreign Materiel Operational Test and Evaluation (FMOT&E), which ensures the ability of operational commands to test and develop effective Electronic Attack/Electronic Protection (EA/EP) and tactics. Funds are required for: deployment of blue systems to test facilities, travel for personnel to the test sites to evaluate and validate test results real-time, reimbursement for range and laboratory costs; costs for instrumentation of blue systems; contracted engineering support for the conduct of tests and subsequent reporting. Funding for this program is required to prevent future aircraft losses due to improper and ineffective aircrew tactics (e.g., lack of evasive action or proper tactics training to avoid missile attack).

(U) FY 1998 ($ in Thousands):
- (U) $1,180 Funded fighter and bomber testing for foreign material operational exploitation. Extensive evaluations and reporting was accomplished.
- (U) $ 250 Funded transport aircraft for foreign material operational exploitation. Extensive evaluations and reporting was accomplished.
- (U) $ 41 Funded classified operational assessments for foreign material operational exploitation. Extensive evaluations and reporting was accomplished.
- (U) $1,471 Total

(U) FY 1999 ($ in Thousands):
- (U) $1,508 Funds fighter and bomber testing for foreign material operational exploitation. Extensive evaluations and reporting to be accomplished.
- (U) $ 290 Funds transport aircraft for foreign material operational exploitation. Extensive evaluations and reporting to be accomplished.
- (U) $ 61 Funds classified operational assessments for foreign material operational exploitation. Extensive evaluations and reporting to be accomplished.
- (U) $ 38 Identified as source for SBIR
- (U) $1,897 Total

(U) FY 2000 ($ in Thousands):
- (U) $1,557 Funds fighter and bomber testing for foreign material operational exploitation. Extensive evaluations and reporting to be accomplished.
- (U) $ 319 Funds transport aircraft for foreign material operational exploitation. Extensive evaluations and reporting to be accomplished.
- (U) $ 63 Funds classified operational assessments for foreign material operational exploitation. Extensive evaluations and reporting to be accomplished.
- (U) $1,939 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	2907

FY 2001 ($ in Thousands):

- (U) $1,570
- (U) $ 344 Funds transport aircraft for foreign material operational exploitation. Extensive evaluations and reporting to be accomplished.
  Funds classified operational assessments for foreign material operational exploitation. Extensive evaluations and reporting to be accomplished.
- (U) $1,985

(U) B. _____:

Significant Program Changes:

(U) C. Other Program Funding Summary ($ in Thousands) None.

(U) Acquisition Strategy:

(U) E. Schedule Profile Not applicable.

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

DATE: February 1999

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0604256F Threat Simulator Development

PROJECT: 7500

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
7500 Foreign Materiel Acquisition/Exploitation	0	0	2,390	6,139	7,038	7,196	7,316	7,510	Continuing	TBD

(U) A. Mission Description: This project is established for the specific purpose of supporting the USAF Foreign Materiel Program in the acquisition and exploitation of foreign materiel. Items considered for these Foreign Materiel Acquisition and Exploitation (FMA&E) funds are included in the prioritized Air Force Foreign Materiel Acquisition (FMA) list established each year. The USAF FMA list is established annually by Major Command representatives using specific criteria and a well-established process. The draft list is then approved by each Major Command, and final approval comes from the Air Force Vice Chief of Staff. Exploitations are based on and driven by acquisitions.

(U) FY 1998 ($ in Thousands): Not applicable.

(U) FY 1999 ($ in Thousands): Not applicable.

(U) FY 2000 ($ in Thousands):
- (U) $ 1,792 Funds the acquisition of Foreign Materials IAW the prioritized Air Force Foreign Material Acquisition list; subject to assets availability.
- (U) $ 359 Funds the exploitation of acquired Foreign Materials IAW prioritized lists and specific exploitation plans.
- (U) $ 239 Funds the operations and maintenance of the specialized Foreign Material assets.
- (U) $2,390 Total

(U) FY 2001 ($ in Thousands):
- (U) $4,604 Funds the acquisition of Foreign Materials IAW the prioritized Air Force Foreign Material Acquisition list; subject to assets availability.
- (U) $ 957 Funds the exploitation of acquired Foreign Materials IAW prioritized lists and specific exploitation plans.
- (U) $ 578 Funds the operations and maintenance of the specialized Foreign Material assets.
- (U) $6,139 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0604256F Threat Simulator Development
	PROJECT 7500

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

(U) Significant Program Changes: FY 2000 reductions to fund other Air Force requirements.

(U) C. Other Program Funding Summary ($ in Thousands) None.

(U) D. Acquisition Strategy: Not applicable

(U) E. Schedule Profile: Not applicable.

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

DATE: February 1999

6 - Management and Support | **0604258F Target Systems Development** | **2459**

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
2459 Target Payloads	4,250	6,572	192	192	194	195	1,860	1,871	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

Aerial Targets are used to determine air-to-air weapons effectiveness and mission proficiency of our tactical systems against enemy aircraft. The overall objective is to improve air-to-air weapons systems accuracy and reliability by developing improved aerial target systems for Air Force weapons system test and evaluation. The program develops full-scale and subscale aerial targets and target control systems. Specialized target payload subsystems are developed for full-scale and subscale targets for missile scoring, electronic and infrared (IR) countermeasures, and radar and IR signature augmentation. Electronic countermeasures and infrared countermeasures being developed include chaff and flare dispenser systems. The Drone Radio Frequency (RF) Electronic Enhancement Mechanism (DREEM) is being developed to provide subscale radar cross section (RCS) enhancement to replicate full size threat aircraft.

(U) FY 1998 ($ in Thousands):

- (U) $1,413 Continued Program Definition and Risk Reduction (PDRR) for DREEM
- (U) $865 Conducted Vector Doppler Scorer (VDOPS) Airborne Sensor Upgrade
- (U) $268 Conducted Integrated Flight Controller Hardware in the Loop (IFC HWIL) Autopilot Simulation
- (U) $122 Conducted DREEM Feasibility Study (Near Field)
- (U) $32 Conducted Super Subscale Demonstration Gulf Range Drone Control System (GRDCS) Support
- (U) $137 Completed Integrated Flight Controller (IFC) Advanced Maneuvers GRDCS Integration
- (U) $67 Completed Electronic Countermeasures Pod Upgrade GRDCS Integration
- (U) $1,062 Continued Support & Management
- (U) $284 Conducted DREEM Demonstration Validation Testing
- (U) $4,250 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0604258F Target Systems Development
PROJECT 2459	

(U) FY 1999 ($ in Thousands):

– (U) $492 Continue Contractor - Support & Management
– (U) $295 Continue Travel, Training and Second Destination Transportation - Support & Management
– (U) $232 Continue Management Information Systems, Communications and Assessment - Support & Management
– (U) $586 Complete DREEM Demonstration Validation Testing
– (U) $4,818 Army Big Crow program
– (U) $149 Identified as a source for SBIR
– (U) $6,572 Total

(U) FY 2000 ($ in Thousands):

– (U) $192 Continue Support & Management
– (U) $192 Total

(U) FY 2001 ($ in Thousands):

– (U) $192 Continue Support & Management
– (U) $192 Total

(U) B. Budget Activity Justification:

This program is in budget activity 6 - Management Support because it provides overall support to research and development activities.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY: 6 - Management and Support	PE NUMBER AND TITLE: 0604258F Target Systems Development / PROJECT: 2459

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY 1999 PB)	4,491	1,666	195	196	Cont
(U) Appropriated Value	4,780	6,666			
(U) Adjustments to Appropriated Value					
a. Cong Reductions	-228	-94			
b. SBIR	-62				
c. Omnibus or Other Above Threshold Reprogram	-30				
d. Below Threshold Reprogramming	-210				
(U) Adjustments to Budget Years Since FY 1999 PB			-3	-4	
(U) Current Budget Submit/ FY 2000 PB	4,250	6,572	192	192	Cont

(U) Significant Program Changes:
FY99 Congressional action increased $5M for the Army Big Crow program. Big Crow program did not have a program element (PE) number. Air Force Target Systems Development PE used. FY99 funds to go to the Army for Big Crow test support aircraft.
FY99 $149 identified as a source for SBIR

(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
(U) PE35116F: Appropriation: Missile Procurement, AF Budget Activity: 14 Program Title: Target Drones										
WSC MQM107 (MQM-107E)	6,665	3,821	0	0	0	0	0	0	Cont	Cont
WSC: M04AQF (QF-4)	17,176	21,761	0	0	0	0	0	0	Cont	Cont
Spares: BQM-34, QF-4, MQM-107	726	2,561	0	0	0	0	0	0	Cont	Cont
Total	24,567	28,143								
(U) PE35116F: Appropriation: Aircraft Procurement, AF Budget Activity: 10 Program Title: Target Drones										
WSC: 10TRGT	0	0	36,152	37,448	37,727	38,257	48,009	40,061	Cont	Cont
Spares: 16TRGT	0	0	885	604	725	968	972	970	Cont	Cont
Total			37,037	38,052	38,452	39,225	48,981	41,031	Cont	Cont

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0604258F Target Systems Development
	PROJECT 2459

(U) E. Acquisition Strategy:

The acquisition strategy is competitive, cost plus contracts.

(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) Full-Scale Aerial Target Systems																
(U) QF-4																
- First Delivery (Lot 3)			*													
- Follow-on QF-4 Production Options		*				X				X				X		
(U) Target Payloads																
(U) DREEM																
- Contract Award 3/96																
- Factory Testing		*		*												
- Ground Testing				*	*											
- Flight Testing						X										

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999	
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0604258F Target Systems Development	PROJECT 2459

(U) Subscale Aerial Target Systems							
(U) MQM-107E							
- First Delivery		X					
- IOC			X				
(U) Non Developmental Item (NDI) SSAT							
- RFP	*						
- Contract Award			X				
- First Delivery					X		
- IOC					X		
(U) Dual Role SSAT (AFSSAT)							
- RFP				X			
- Contract Award						X	
- First Article							X

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

DATE: February 1999

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0604759F Major Test And Evaluation Investment

PROJECT: 4597

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
4597 (U) Air Force Test Investments	53,000	40,416	47,334	56,238	51,568	51,798	65,089	77,396	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

This program element provides planning, improvements, and modernization for test capabilities at three Air Force Test Centers: Air Armament Center (AAC), Arnold Engineering Development Center (AEDC), and Air Force Flight Test Center (AFFTC). The purpose is to help test centers keep pace with emerging weapon system technologies. For example, advances in missile seeker technology and capabilities drive the requirement for improvement in missile seeker test capabilities such as the Guided Weapon Evaluation Facility (GWEF) and the Seeker T&E projects; advances in the Global Positioning System (GPS), providing greater time-space-position accuracy, will be integrated into the ranges at Eglin and Edwards Air Force Bases; and advances in computer capabilities, which will enhance efficiencies in data collection, analysis, and distribution, will be exploited in the Data Acquisition and Processing System (DAPS) and Computer Aided Modernization Project (CMP) projects. Test investment activities are also funded at the Space and Missile Systems Center Test Directorate (SMC/TE) and the Joint Program Office (JPO) for Test and Evaluation (T&E). The fluctuations in the funding at these locations are due to changing priorities in the improvement and modernization requirements as defined through the AF Test Investment Planning & Programming Process. Also, all projects have been reviewed through the tri-Service Reliance effort (to communicate AF efforts to the other Services and avoid unwarranted duplication of effort) and are documented in the Test Capability Master Plans. Further, each project has its own planning, development, equipment acquisition/facility construction, equipment installation, and checkout phases which often requires significant differences in funding from one year to the next. As such, the changes in funding from year to year do not necessarily indicate program growth but rather a planned phasing of improvement and modernization efforts. The test capabilities at these centers enable testing through all phases of weapon system acquisition from system concept exploration through component and full scale integrated weapon system testing to operational testing. These three test centers have over $10 billion worth of unique test facilities/capabilities. They are a national asset operated and maintained by the Air Force for DoD test and evaluation missions, but they are available to others having a requirement for their unique capabilities.

AAC, located at Eglin AFB, FL, conducts and supports developmental test and evaluation and operational test and evaluation of non-nuclear air armaments, C^4I systems, and target acquisition and weapon delivery systems; provides a climatic simulation capability; and determines target/test item spectral signatures. The Guided Weapon Evaluation Facility (GWEF) provides a full spectrum, multifunctional seeker/sensor laboratory test capability for all guided weapons. Common Airborne Instrumentation System (CAIS) Integration provides standardized airborne test instrumentation to enhance interoperability and commonality. Global Positioning System (GPS) Range Systems will provide a major improvement for Time-Space-Position-Information (TSPI) at all Major Range and Test Facility Bases (MRTFB) and specifically at the Eglin Ranges for munitions testing. Command, Control, Communications, Computers and Intelligence (C^4I) Test Capabilities Upgrade will provide connectivity to existing capabilities and add needed networks and hardware to develop a C^4I test bed. The Preflight Integration of Munitions and Electronic Systems (PRIMES) facility conducts preflight test and evaluation of total integrated weapon systems in a secure anechoic chamber. The Armament Systems Test Environment (ASTE) Range Systems effort upgrades instrumentation of the major data collection systems supporting open air testing. Mission Control/Data Analysis provides for real-

time central mission control and analysis. Multispectral Missile Engagement Hardware-in-the-Loop (HITL) Test provides a capability to support multiple and wide field-of-view missile engagements incorporating multispectral stimulators. The Santa Rosa Island Reconstitution effort will provide hardware-in-the-loop equipment for three focus sites to support armament/munitions and C^4I testing. Seeker T&E will upgrade unique Electro-Optics/Infrared/Milimeter Wave (EO/IR/MMW) field measurement capabilities to support tri-Service smart weapons development. These projects ensure test center technology is compatible with weapon systems to be tested such as AMRAAM, JDAM, ASRAAM, AGM-130, JTIDS, JSTARS, Combat Talon, etc.

AEDC, located at Arnold AFB, TN, provides ground environmental test support for DoD aeronautical, missile, and space programs. The center has 53 test facilities providing: aerodynamic testing of scale model aircraft, missile, and space systems; testing of large and full-scale satellites, sensors, and space vehicles in a simulated space environment; altitude environmental testing for aircraft, missile, and spacecraft propulsion systems; and testing of large-scale models such as space boosters together with their propulsion systems. The AEDC Data Acquisition and Processing System (DAPS) provides processing capability for advanced turbine engine testing on programs like the F-22. This effort also upgrades data systems for the arc heaters and hypervelocity gun facility for Theater High Altitude Air Defense (THAAD) testing. Inefficiencies in these current data systems result in increased program costs and schedule delays. The Computer Aided Modernization Project (CMP) will provide increased capability for data processing and storage and provide wider availability of workstations. The Propulsion Wind Tunnel (PWT) Upgrades project sustains long-term operation of tunnels 16T and 16S to meet transonic/supersonic test needs. The Improve Turbine Engine Structural Integrity project will provide new state-of-the-art structural test monitoring and data analysis systems to support turbine engine structural tests to detect and analyze high cycle fatigue. The Hypersonic Capability Development project provides for the studies and analysis of the hypersonic wind tunnel requirements definition and program planning.

AFFTC, located at Edwards AFB, CA conducts and supports developmental test and evaluation and operational test and evaluation of aircraft and aircraft systems, aerospace research vehicles, uninhabited aerial vehicles, cruise missiles, parachutes delivery/recovery systems, and cargo handling systems. The AF Common Airborne Instrumentation System (CAIS) Integration & Support (I&S) supports DoD objectives for interoperability/commonality. The goal of CAIS I&S is to integrate CAIS equipment and supporting instrumentation equipment and systems to provide a full airborne instrumentation operational capability. The Advanced Data Acquisition and Processing Systems (ADAPS) project provides an integrated capability to satisfy real-time, first generation, post-test data processing, archival, and display requirements of the next decade. The developmental approach is directed towards providing a high degree of interoperability between systems and components adherence to Air Force and DoD guidelines. The technologies being developed under ADAPS have the potential to satisfy data processing and display needs at various multi-Service test ranges. The Space Based Data Relay (SBDR) project provides the capability for Advanced Range Instrumentation Aircraft (ARIA) to fulfill customer needs for real time, high-speed data, and greatly improve the range data relay capability. The Flight Simulation Modernization project will upgrade the Test and Evaluation Modeling and Simulation (TEMS) facility to meet future man-in-the loop simulator requirements. The Modeling and Simulation T&E Resources (MASTER) project will provide the Test and Evaluation Modeling and Simulation (TEMS) facility with subsystem models to build future simulations and the tools to validate real-time modeling with ground tests and open-air range flight test. The Linked Interactive T&E Networking (LITENING) project will provide the network infrastructure to support inter-range simulations and support the efficient transmission of flight test data to various facilities for processing and analysis. The Advanced Range Telemetry (ARTM) Integration project will procure and integrate improved range telemetry systems to provide greater efficiencies in telemetry frequency utilization.

SMC/TE located at Kirtland AFB, NM is responsible for test planning and implementation for all space and ballistic missile systems. The Combined Space Test Task Force project will provide the capability to develop and test new satellites and ground control systems.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0604759F Major Test And Evaluation Investment
	PROJECT 4597

(U) FY 1998 ($ in Thousands):

Air Armament Center

– (U) $4,881 CAIS Integration. Continued integration, procured production units, and continue procurement of support equipment.

– (U) $1,838 C^4I Test Capabilities Upgrade. Continued the acquisition of workstations, network connections, and processing hardware/software. Began secure facility upgrades.

– (U) $3,453 GWEF. Continued development of the expanded radar simulator and the midwave infrared simulator. Began aircraft/munitions modeling and simulation.

– (U) $1,113 GPS Range Integration. Continued GPS integration on the range and Central Control Facility. Began acquisition of a translator/processor system.

– (U) $1,632 PRIMES. Acquired a Communication-Navigation-Identification(CNI) simulator, upgraded the GPS simulator and began the munitions interface simulations.

– (U) $1,359 ASTE Range Systems. Began upgrades to TSPI systems, timing, telemetry, microwave, communications, arenas, gun test, photo-optics, and fiber optics.

– (U) $9,300 Santa Rosa Island Reconstitution. Began development of three focus sites to provide open air Hardware-in-the-Loop (HITL) capability.

Arnold Engineering Development Center

– (U) $2,231 AEDC DAPS. Continued acquisition and installation of additional workstations/processors in engine test cells. IOC of C1/C2 test cells.

– (U) $1,294 CMP. Continued purchase of CMP workstations (design fourth increment). Continued to implement the AEDC Reengineering Computer Base.

– (U) $8,270 PWT Upgrades. Began design and procurement of PWT data acquisition and processing systems. Started requirements planning for flow quality and electric motor repower improvements.

- (U) $1,890 Hypersonic Capability Development. Issued study contracts for requirements definition and program planning.

Air Force Flight Test Center

– (U) $6,037 CAIS I&S development. Purchased CAIS components for AFFTC use. Continued Test Instrumentation Management System (TIMS) development with automated setup of systems, automated diagnostics, and simulation capability. Began development of an on-board processing capability.

– (U) $3,346 ARIA SBDR. Completed the communications portion of the SBDR program for three aircraft. Continued hardware/software integration of the SBDR subsystems upgrades for a three-aircraft fleet.

– (U) $6,034 ADAPS. Continued integration of ADAPS with ground test simulation capabilities. Began marketing capabilities to support multiple flight test missions including tri-Service Operational flight tests. Developed capability to increase test data flow throughput and decreased flight test mission turnaround time. IOC of AFFTC Post Test Analysis System and Auxiliary Processing and Analysis System.

Other Projects

– (U) $ 322 Joint Program Office for T&E support.

– (U) $53,000 Total

(U) FY 1999 ($ in Thousands):

Air Armament Center

– (U) $2,050 CAIS Integration. Continue integration, procure production units, and continue procurement of support equipment.
– (U) $ 666 C^4I Test Capabilities Upgrade. Continue the acquisition of workstations, network connections, and processing hardware/software. Complete secure facility upgrades.
– (U) $2,349 GWEF. Complete the expanded radar simulator and midwave IR simulator. Begin development of the multispectral man-in-the-loop and the active laser simulator. Continue aircraft/munitions modeling and simulation.
– (U) $3,011 GPS Range Integration. Continue integration and complete the acquisition of translator/processor system.
– (U) $1,524 PRIMES. Begin the aircraft/munitions interface simulations. Complete the CNI simulator data link and acquire an F-15/APG 63-V1 radar interface.
– (U) $1,646 ASTE Range Systems. Continue upgrades to TSPI systems, telemetry, microwave, communications, arenas, gun test, and photo-optics.
– (U) $ 969 Mission Control/Data Analysis. Begin procurement of data acquisition equipment and real-time TM equipment, and a 3-D terrain generation/visualization capability.
– (U) $1,862 Multispectral Missile Warning System Test Capability. Begin acquisition of a high off boresight angle flight motion simulator, a target generator and development of target and clutter models.
– (U) $2,500 Santa Rosa Island Reconstitution. Continue development of three focus sites to provide open air Hardware-in-the-Loop (HITL) capability.
– (U) $1,250 EC Operational Test and Training. Provide for the operations and maintenance of range assets required by AFSOC to test and train aircrews at the Eglin location.

Arnold Engineering Development Center

– (U) $ 997 AEDC DAPS. Complete installation of the J4 rocket test cell DAPS. IOC of J1/J2 test cell portion of DAPS.
– (U) $ 992 CMP. Continue purchase of CMP workstations. Continue to implement the AEDC Reengineering Computer Base.
– (U) $4,560 PWT Upgrades. Continue installation of data acquisition and processing system in 16T and 16S tunnels. Complete installation of the on-cart data acquisition and processing system in the 16T wind tunnel and the pre-test check out system in the 16T/16S wind tunnels. Begin design of plant control systems.
– (U) $ 801 Improve Turbine Engine Structural Integrity. Begin design and procurement of Non-Intrusive Stress Monitoring System (NSMS) hardware. Install dynamic data acquisition and processing system.
– (U) $2,800 Hypersonic Capability Development. Continue study contracts for requirements definition and program planning.

Air Force Flight Test Center

– (U) $3,514 CAIS I&S development. Finish rehost of TIMS to Windows NT platform and improve TIMS with automated setup of systems, automated diagnostics, and simulation capability. Continue development of an on-board processing capability. Begin development of an advanced solid state recorder.

– (U) $5,126 ADAPS. Continue to integrate simulation system with real-time data analysis capability. Begin development of desktop simulation capability. Continue to provide the traditional structures & flutter post-test analysis capability in near real-time in the Ridley Mission Control Rooms. Begin installation of post test analysis capabilities for flight testing. Provide avionics data processing in near real-time in the Ridley Mission Control Rooms. Ensure Y2K compliance of all systems under development.

– (U) $1,127 Flight Simulation Modernization. Upgrade of the TEMS facility with hardware and software interfaces for the first two of four reconfigurable man-in-the-loop Air Warfare Mission Simulator (AWMS) cockpits.

– (U) $ 718 LITENING. Begin development of AFFTC high-speed network to link test capabilities such as Electronic Combat Integrated Test (ECIT) Facility and the Ridley Mission Control Center. Develop connectivity to the Defense Research Engineering Network (DREN) which will link Edwards AFB with other T&E facilities.

Other Projects

– (U) $ 247 Joint Project Office for T&E support.

– (U) $ 902 Combined Space Test Task Force. Begin procurement of hardware and software to complete evaluations of on-orbit R&D satellites and technologies. Begin development of a satellite command and control database and models.

– (U) $ 805 Identified as a source for SBIR.

– (U) $40,416 Total

(U) FY 2000 ($ in Thousands):

Air Armament Center

– (U) $2,927 CAIS Integration. Continue integration, procure mini-CAIS hardware, and continue procurement of support equipment for CAD/CAM and preflight quick-look capability.

– (U) $1,792 C^4I Test Capabilities Upgrade. Continue acquisition of workstations, network connections, and processing hardware/software. Begin upgrades to the JTIDS OPFAC.

– (U) $1,744 GPS Range Integration. Continue acquisition of Advanced Range Data System (ARDS) pods, S/W improvements, and ground vehicle instrumentation.

– (U) $1,902 PRIMES. Continue development of aircraft/munitions interface simulations for AIM 9-X, JDAM, and F-15. Continue advanced signature generator upgrades.

– (U) $2,719 ASTE Range Systems. Continue upgrades to telemetry, TSPI systems, communications and arenas. Begin upgrades to gun ranges, microwave, fuze test, and range instrumentation systems. Acquire a Forward Looking Infrared (FLIR) system, video phototheodolites, and coherent tracking capability.

– (U) $1,259 Mission Control/Data Analysis. Continue procurement of data acquisition equipment and 3-D terrain generation/visualization capability. Begin acquisition of H/W and S/W for “near” real-time data processing.

– (U) $1,660 Multispectral Missile Warning System Test Capability. Complete the high off boresight angle flight motion simulator (FMS) and target generation simulator acquisition. Continue development of target/clutter models.

– (U) $3,747 GWEF. Continue acquisition of the multispectral man-in-the-loop and active laser simulator capabilities. Continue development of aircraft/munitions modeling and simulation.

-- (U) $1,369 Seeker T&E. Begin upgrades to the MMW measurement systems. Acquire a shortwave and a midwave focal plane array (FPA) imaging radiometers.

Arnold Engineering Development Center

– (U) $2,361 CMP. Add increment five worksystems. Complete the Aircraft Systems Test Operations Pilot (Design-Build-Install). Integrate the Product Data Manager application software packages. Complete the migration of real-property drawings and designs to a raster format.

– (U) $9,761 PWT Upgrades. Complete installation of data acquisition and processing system in the 16T wind tunnel. Design the 16S wind tunnel data acquisition and processing system. Begin installation of 16S wind tunnel data acquisition and processing system. Begin installation of 16T/16S wind tunnel plant control systems. Begin planning/design for electric motor repower upgrades. Begin planning for flow quality improvements.

– (U) $1,047 Improve Turbine Engine Structural Integrity. Procure/install Non-Intrusive Stress Monitoring System (NSMS). Install additional channels for the dynamic data acquisition and processing system.

Air Force Flight Test Center

– (U) $3,680 CAIS I&S. Complete development and implementation of an internet-based instrumentation management information system. Procure additional airborne Solid State Recorder. Procure bandwidth efficient telemetry transmitters and demodulators. Begin the development of a virtual test bench to support end-to-end data checkout of airborne instrumentation systems. Provide the capability to support new airborne instrumentation capabilities including: on-board processing innovations, optical bus monitoring units, and high data rate decommutation and recording.

– (U) $2,829 ADAPS. Integrate real-time systems across the flight test center to replace older systems. Begin distribution of full capability for post test analysis system. Evaluate and activate first prototypes of modeling and simulation integration of real-time operations. Complete final Y2K readiness testing on all systems.

– (U) $3,393 Flight Simulation Modernization. Upgrade TEMS facility with the hardware and software interfaces for the third and fourth configurable man-in-the-loop AWMS cockpits, one helmet mounted display with a controller, and one 360 degree out-the-window projection system. Start development of real-time threat environment, radar, and FLIR models.

– (U) $2,169 LITENING. Expand the Asynchronous Transfer Mode (ATM) Network to the Combined Test Forces and critical Range Support buildings. Begin development on the ATM Network Operations Center and base-wide network services.

– (U) $1,679 MASTER. Develop the repository for models and data using established procedures to validate them with data collected during ground and flight test. The models and the data will be used to support man-in-the-loop simulator testing and training, which will support configurable simulations for the AWMS cockpits. Existing models will be converted to Joint Modeling & Simulation System (J-MASS) real-time compatible models.

Other Projects

– (U) $ 337 Joint Project Office for T&E support.
– (U) $ 959 Combined Space Test Task Force. Begin development and acquisition of expert systems to support operations and testing of future technology for R&D satellites. Evaluate effectiveness of these systems and their value to support warfighter needs.
– (U) $47,334 Total

(U) FY 2001 ($ in Thousands):

Air Armament Center

– (U) $3,052 CAIS Integration. Complete integration and required support equipment acquisition.
– (U) $1,785 C4I Upgrade. Complete the acquisition of workstations, connectivity, HW/SW upgrades, and JTIDS OPFAC upgrades. Acquire test analysis equipment and M&S tools.
– (U) $3,073 GWEF. Complete the multispectral man-in-the-loop and the active laser simulator developments. Continue aircraft/munition M&S efforts. Acquire an environmental generator.
– (U) $1,740 GPS Range Integration. Complete acquisition of ARDS pods, S/W improvements, and ground vehicle instrumentation.
– (U) $1,704 PRIMES. Complete the aircraft/munitions interface simulations and acquire a synthetic aperture radar target simulator.
– (U) $1,934 ASTE Range Systems. Complete acquisition of instrumentation/equipment for infrastructure upgrades in such areas as TSPI, microwave, TM, fiber optics/communications, arena test, gun ranges, high speed video, and fuze test.
– (U) $1,429 Mission Control/Data Analysis. Complete procurement of data acquisition equipment, near real-time data processing equipment, and a 3-D terrain generation/visualization capability.
– (U) $ 850 Seeker T&E. Complete upgrades to the MMW measurement system and acquire a high speed digital data recorder, a longwave length FPA imaging radiometer, and a midwave length FPA FLIR system. Upgrade the Airborne Seeker Evaluation Test System (ASETS) instrumentation.

Arnold Engineering Development Center

– (U) $ 3,812 CMP. Procure/Install increment six worksystems. Complete Product Data Manager integration with application software packages. Upgrade older worksystems to the state-of-the-art PC hardware configuration. FOC of CMP systems.
– (U) $20,319 PWT Upgrades. Complete installation of 16S wind tunnel data acquisition and processing system. Complete installation of plant control systems in 16T/16S wind tunnels. Initiate procurements for electric motor upgrades. Begin design of flow quality improvements.
– (U) $ 894 Improve Turbine Engine Structural Integrity. Complete installation of the dynamic data acquisition and processing system and the NSMS. Begin planning/design of the Structural Dynamic Response Analysis Capability.

Air Force Flight Test Center

– (U) $2,687 CAIS I&S. Complete the development of the virtual test bench for hardware-in-the-loop simulation for instrumentation unit troubleshooting. Provide interactive data acquisition command and control, including control link setup and checkout from the ground to test vehicle. Provide data compression and on-board processing operational capability developed under the ARTM program.
– (U) $2,625 ADAPS. Complete integration of the post test analysis capability at the Combined Test Force level. Complete post test analysis development. Complete the installation of common data systems throughout the Flight Test Center. Complete development of the real-time/postflight capability. Complete integration of modeling and simulation with real-time operations.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0604759F Major Test And Evaluation Investment
	PROJECT 4597

– (U) $3,923 Flight Simulation Modernization. Procure computers for the second and third man in the loop stations. Provide display capability for the third man in the loop station. Purchase cockpit displays for second and third man in the loop station.

– (U) $2,343 LITENING. Improve the reliability and transmission capability of range support facilities. Develop the Network Operations Center to monitor and manage network traffic loads. Expand secure network links to allow classified test data to be transferred between integrated secret, compartmentalized facilities.

– (U) $2,021 MASTER. Convert and validate flying qualities and avionics models acquired from System Program Offices into J-MASS compatible models. Arnold AFB will begin to convert propulsion, weapons, and airframe interaction models.

– (U) $ 775 Advanced Range Telemetry (ARTM) Integration. Initiate procurement of airborne and ground telemetry equipment developed through OSD funded ARTM. New equipment will provide capability to increase test data throughput, resulting in more efficient open air testing.

Other Projects

– (U) $ 321 Joint Project Office for T&E support.

– (U) $ 951 Combined Space Test Task Force. Continue development and evaluation of expert systems to support operations and testing of future technology R&D satellites. Implement lessons learned and transition technical advancements to operational users.

– (U) $56,238 Total

(U) B. Budget Activity Justification: . This Program Element is in Budget Activity 6, Management and Support, because it is a Research and Development (R&D) effort for Improvement and Modernization of T&E capabilities at Air Force Test Centers.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY: 6 - Management and Support	PE NUMBER AND TITLE: 0604759F Major Test And Evaluation Investment — PROJECT: 4597

(U) C. Program Change Summary - Description of Significant Changes:

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY 1999PB):	53,364	34,518	48,180	57,295	Continuing
(U) Appropriated Value	56,336	41,068			
(U) Adjustments to Appropriated Value					
a. Cong Reductions	-2,197	-652			
b. SBIR	-780				
c. Omnibus or Other Above Threshold Reprogram	-359				
d. Below Threshold Reprogramming					
(U) Adjustments to Budget Years Since FY 1999PB			-846	-1,057	
(U) Current Budget Submit/FY 2000 PB	53,000	40,416	47,334	56,238	Continuing
(U) Significant Program Changes:					

FY1999: $805 identified as a source for SBIR.

The following projects were funded by congressional plus up: Santa Rosa Island Reconstitution -- $10M (FY98), $2.5M (FY99)
Hypersonic Capability Development -- $2M (FY98), $2.8M (FY99)
EC Operational Test and Training -- $1.25M (FY99)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0604759F Major Test And Evaluation Investment
	PROJECT 4597

(U) D. Other Program Funding Summary ($ in Thousands): None

Related RDT&E:
(U) PE 0604256F, Threat Simulator Development
(U) PE 0604940D, Central Test and Evaluation Investment Program

(U) E. Acquisition Strategy:

This program element uses several different contracting strategies to provide the most cost effective T&E investment solutions. The main acquisition strategy is to use full and open competition wherever possible to improve and modernize existing test capabilities.

(U) F. Schedule Profile: This PE contains multiple schedule profiles which are available upon request.

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

DATE: February 1999

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605101F RAND Project Air Force

PROJECT: 1110

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
1110 Project Air Force	20,607	19,991	20,560	20,294	20,526	20,953	21,403	21,768	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

This program provides for continuing analytical research across a broad spectrum of aerospace issues and concerns. The Project AIR FORCE (PAF) research agenda is focused primarily on mid- to long-term problems; in addition, PAF provides quick response assistance for senior Air Force officials on high priority, near term issues. Results and analytical findings directly impact senior management deliberations on major issues. The Air Force Steering Group, chaired by the Vice Chief of Staff, reviews, monitors, and approves PAF annual research efforts. Each project is initiated, processed, and approved IAW PAF Sponsoring Agreement which requires General Officer (or SES equivalent) sponsorship and involvement on a continuing basis.

(U) PAF is organized in three primary research program areas: strategy and doctrine, force modernization and employment, and resource management and system acquisition. Integrative research projects are also conducted at the division level with direct support assistance provided through the most applicable program. Research programs address organizational cross-cutting issues as defined by specific research themes approved by the Air Force Steering Group. These research themes encompass a wide spectrum of topics including external challenges to national security, integration of air and space operations, implementation of the Air Expeditionary Force, tailoring and reducing infrastructure and improved weapon system costing.

(U) In FY 98, principal research efforts included studies on Chinese defense modernization and the USAF, change and adaptation in NATO: implications for the USAF, integrating USAF space operations, implications of unmanned air vehicles for the future shape of the Air Force, enhancing the effectiveness of air expeditionary forces, exploiting commercial communication systems, implementation of lean logistics and agile combat support, improved Air Force contracting for support services, improved weapon system cost analysis, and improved ways of measuring and forecasting air force readiness. Two major force modernization efforts included: fielding and employing an effective halt force as a follow-on to earlier analysis conducted during the Quadrennial Defense Review (QDR), and an examination of fighter and bomber force structure options for future military operations.

(U) During FY99 and FY00, research undertaken by Project AIR FORCE (PAF) will be driven by specific focus areas developed through the USAF long-range planning process, QDR / NDP (national defense panel) initiatives, and enduring areas of concern to USAF leadership. The research agenda for FY99 extends work defined as part of a specific 2-year, FY98/99, strategy. This 2-year strategy established major research activities in support of themes which focus on major external challenges and opportunities affecting USAF operations; institutionalization of the USAF vision and strategic plan, implementation of the Air Expeditionary Force concept; integration of air and space operations; power projection forces; and, force mix and infrastructure. These themes are expected to endure in FY00; specific research topics will be tailored to major questions being examined for the QDR in FY01.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605101F RAND Project Air Force
PROJECT 1110	

(U) For FY00 and FY01, the current research themes which guide the PAF research agenda will be adjusted as necessary, primarily to reflect the major questions that will be addressed during QDR 2001. Questions of interest will likely be maturation of the AEF concept of operations, continued use of commercial sources and methods and long term modernization of the aerospace force.

(U) PAF research spans functional and organizational boundaries and is managed in a manner to facilitate independence and freedom from organizational bias thereby providing perspectives and insights to senior Air Force leaders free from parochial spins not necessarily in the best interest of the Air Force at large.

(U) Benefits of independent non-Department of Defense analysis of complex present day and emerging issues are shared beyond the immediacy of the Air Force. PAF study results are given wide dissemination within the DOD on a routine basis and deposited with the Defense Technical Information Center available to a broad range of qualified government and commercial individuals and activities.

(U) FY 1998 ($ in Thousands):
- (U) $4,300 Strategy and Doctrine
- (U) $7,037 Force Employment and Modernization
- (U) $6,770 Resource Management and Systems Acquisition
- (U) $2,500 Integrative Research / Direct Support
- (U) $20,607 Total

(U) FY 1999 ($ in Thousands):
- (U) $3,966 Strategy and Doctrine
- (U) $6,500 Force Modernization and Employment
- (U) $6,583 Resource Management and Systems Acquisition
- (U) $2,267 Integrative Research/Direct Support
- (U) $ 675 Identified as a source for SBIR
- (U) $19,991 Total

(U) FY 2000 ($ in Thousands):
- (U) $4,027 Strategy and Doctrine
- (U) $6,973 Force Employment and Modernization
- (U) $7,203 Resource Management and Systems Acquisition
- (U) $2,357 Integrative Research / Direct Support

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605101F RAND Project Air Force
	PROJECT 1110

– (U) $20,560 Total

(U) FY 2001 ($ in Thousands):
– (U) $3,925 Strategy and Doctrine
– (U) $6,870 Force Employment and Modernization
– (U) $7,242 Resource Management and Systems Acquisition
– (U) $2,257 Integrative Research / Direct Support
– (U) $20,294 Total

(U) B. Budget Activity Justification:

This program is in budget activity 6 - Management and Support, because it funds RAND Project AIR FORCE (PAF), the only Air Force Federally Funded Research and Development Center for studies and analyses.

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget FY1999 PB	18,370	21,168	20,934	20,680	Continuing
(U) Appropriated Value	21,768	21,168			
(U) Adjustments to Appropriated Value					
a. Cong Reductions	-3,398	-1,177			
b. SBIR					
c. Omnibus or Other Above Threshold Reprogram					
d. Below Threshold Reprogramming	2,237				
(U) Adjustments to Budget Years Since FY 1999 PB			-374	-386	
(U) Current Budget Submit/FY 2000 President's Budget	20,607	19,991	20,560	20,294	Continuing

(U) Significant Program Changes:

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605101F RAND Project Air Force
	PROJECT 1110

FY99: $675 was identified as a source for SBIR

(U) D. Other Program Funding Summary ($ in Thousands) Not Applicable

(U) E. Acquisition Strategy: The RAND Project Air Force contract is a 5 year (base + 4 option yrs) Cost Plus / Award Fee contract

(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) Execute FY98 Research Plan	*	*	*													
(U) Draft FY99 Research Plan			*													
(U) Approve FY99 Research Plan				*												
(U) Adjust FY99 Research Plan						X										
(U) Program-Wide Evaluation – FY99							X	X								
(U) Draft FY00/01 Research Plan							X									
(U) Approve FY00/01 Research Plan								X								
(U) Annual Evaluation FY00											X					
(U) Draft FY01 Research Plan											X	X				
(U) Approve FY01 Research Plan												X				
(U) Adjust FY01 Research Plan														X		

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

DATE: **February 1999**

BUDGET ACTIVITY: **6 - Management and Support**

PE NUMBER AND TITLE: **0605306F Ranch Hand II Epidemiology Study**

PROJECT: **2767**

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
2767 Ranch Hand II Epidemiology Study	10,216	4,273	4,510	4,554	11,434	11,014	4,903	5,033	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description: This RDT&E Management Support program was directed in 1980 by the Assistant to the President of the United States for Domestic Affairs and Policy upon the recommendation of the Interagency Working Group on the Possible Long-Term Effects of Phenoxy Herbicides and Contaminants. As a result of this Presidential direction, PE 0605306F was established to conduct a 20-year epidemiology investigation of approximately 1,200 Air Force personnel who were involved with aerial spraying of herbicides in Vietnam from 1962 to 1971 (Operation Ranch Hand). The objective of this investigation is to determine whether long-term health effects exist and can be attributed to occupational exposure to phenoxy herbicides and their associated dioxins. Dioxins are an unwanted by-product from numerous current manufacturing processes and a major health concern of the EPA and other government agencies.

This project involves a 20-year study, which was initiated in 1982, that compares United States Air Force (USAF) Ranch Hand personnel to a control group of USAF crew members and support personnel who were not exposed to herbicides while serving in Vietnam. Approximately 20,000 individuals (exposed personnel group plus control group) are participating in the annual mortality study, with approximately 2,200 (exposed personnel group plus control group) of these participating in the detailed morbidity study during each physical examination cycle. The detailed physical examination cycle includes follow-up health examinations at the 3-, 5-, 10-, 15-, and 20-year time periods. The study includes examination of the possible occurrence of birth defects in children as determined from children's medical records and family medical histories. The Congressionally-established Ranch Hand Advisory Committee has directed that all study findings be reported to the scientific community as peer-reviewed journal articles.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605306F Ranch Hand II Epidemiology Study
	PROJECT 2767

(U) FY 1998 ($ in Thousands):

- (U) $ 6,933 Completed fifth cycle of physical examinations, questionnaires, and participant data base.
- (U) $ 700 Analyzed laboratory specimens to include serum dioxin assays and initiated fat biopsy analyses as well as conducted statistical research studies to include producing a mathematical model to integrate mortality and morbidity data for analysis.
- (U) $ 2,583 Processed and documented examination data to include continuing to verify the physical examination database; conducted medical records coding; performed the annual mortality analysis of approximately 1,200 Ranch Hand personnel and 19,000 comparison personnel; and conducted data analysis for articles to be submitted to peer-reviewed journals as directed.
- (U) $10,216 Total

(U) FY 1999 ($ in Thousands):

- (U) $ 1,401 Complete examination data base and conduct statistical analyses of examination data.
- (U) $ 229 Analyze laboratory specimens to include serum dioxin assays and completion of fat biopsy analyses as well as conduct statistical research studies to include completion of a mathematical model to integrate mortality and morbidity data for analysis.
- (U) $ 2,565 Continue to process and document examination data to include updating of the participant database; conduct medical records coding; perform the annual mortality analysis of approximately 1,200 Ranch Hand personnel and 19,000 comparison personnel; and conduct data analysis for articles to be submitted to peer-reviewed journals as directed.
- (U) $ 78 Identified as a source for SBIR.
- (U) $ 4,273 Total

(U) FY 2000 ($ in Thousands):

- (U) $ 1,147 Complete statistical analysis of examination data. Document all analyses and findings in 4,000 page, fifth cycle final report. Conduct analyses as directed by the Congressionally-established Ranch Hand Advisory Committee. Analyses are based on current morbidity data trends and findings.
- (U) $ 386 Conduct other agency/university studies supporting scientific effort; start Center for Disease Control study to test for the presence of other forms of dioxin than that found in Agent Orange; conduct morbidity and mortality mathematical modeling; conduct dioxin half-life and serum dioxin analyses.
- (U) $ 2,977 Continue to process and document examination data to include updating of the participant database; conduct medical records coding; perform the annual mortality analysis of approximately 1,200 Ranch Hand personnel and 19,000 comparison personnel; and conduct data analysis for articles to be submitted to peer-reviewed journals as directed.
- (U) $ 4,510 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605306F Ranch Hand II Epidemiology Study
	PROJECT 2767

(U) FY 2001 ($ in Thousands):

- (U) $ 1,115 Conduct analyses as directed by the Congressionally-established Ranch Hand Advisory Committee. Analyses are based on current morbidity data trends and findings. Conduct process review prior to final examination cycle to determine potential participation rates, requirements for in-house or regional examination sites and statistical, schedule, and cost implications of the aging study population.
- (U) $ 567 Conduct other agency/university studies supporting scientific effort; complete Center for Disease Control study to test for the presence of other forms of dioxin than that found in Agent Orange; complete morbidity and mathematical modeling; complete dioxin half-life and serum dioxin analyses; start semen DNA study.
- (U) $ 2,872 Continue to process and document examination data to include updating of the participant database; conduct medical records coding; perform the annual mortality analysis of approximately 1,200 Ranch Hand personnel and 19,000 comparison personnel; and conduct data analysis for articles to be submitted to peer-reviewed journals as directed.
- (U) $ 4,554 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY: 6 - Management and Support	PE NUMBER AND TITLE: 0605306F Ranch Hand II Epidemiology Study / PROJECT: 2767

(U) B. Budget Activity Justification: This program is in Budget Activity 6, Management and Support, since it includes research and development efforts directed towards support of installations or operations required for general research and development use.

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget/FY 1999 PB	10,285	4,408	4,527	4,570	Cont
(U) Appropriated Value	10,933	4,408			
(U) Adjustments to Appropriated Value					
a. Congressional/General Reductions	-451	-135			
b. SBIR	-198				
c. Omnibus/Other Above Threshold Reprogrammings	-68				
d. Below Threshold Reprogrammings					
(U) Adjustments to Budget Year Since FY 1999 PB			-17	-16	
(U) Current Budget Submit/FY 2000 PB	10,216	4,273	4,510	4,554	Cont

(U) Significant Program Changes: Not Applicable.

FY 1999: $78 identified as a source for SBIR.

(U) D. Other Program Funding Summary: Not Applicable.

(U) E. Acquisition Strategy: Not Applicable.

(U) F. Schedule Profile: Not Applicable.

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

DATE: **February 1999**

BUDGET ACTIVITY: **6 - Management and Support**

PE NUMBER AND TITLE: **0605712F Initial Operational Test & Eval**

PROJECT: **0191**

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
0191 Initial Operational Test & Eval	27,388	27,294	23,819	28,689	29,513	30,028	30,653	31,292	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description: Initial Operational Test and Evaluation (IOT&E) is conducted to determine the operational effectiveness and suitability of systems undergoing research and development (R&D) efforts. It is an evaluation of a system's performance when the complete system is tested and evaluated against operational criteria by personnel with the same qualifications as those who will operate, maintain and support the system when deployed. In general, IOT&E is performed on new systems in development, major modifications and other systems as directed. This PE funds Congressionally mandated IOT&E to support major weapon system acquisition decisions beyond low-rate initial production (LRIP), Milestone III, fielding, and declaration of initial operational capability (IOC). For major systems designated for use in combat, the law requires IOT&E be completed under realistic field conditions before proceeding beyond low rate initial production. This PE funds operational test and evaluation (OT&E)-related activities such as Operational Utility Evaluations (OUE), Early Operational Assessments (EOA) and Operational Assessments (OA), and independent IOT&E which support major milestones and decision points prior to Milestone III, fielding, or declaration of IOC. IOT&E programs are identified in five categories: Aircraft/Support; Space; Missile/Munitions; Command, Control, Communications, Computers, and Intelligence (C4I); and General. This PE funds the costs of the test (e.g., planning, evaluation, reporting, etc.). Air Force Operational Test and Evaluation Center (AFOTEC) obtains general support services from contracts awarded after employing full and open competition contracting strategies.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY: 6 - Management and Support	PE NUMBER AND TITLE: 0605712F Initial Operational Test & Eval / PROJECT: 0191

(U) FY 1998 ($ in Thousands):

(U) $ 9,679 (U) Category: Aircraft/Support. Conducted IOT&E on the F-22; Joint Strike Fighter (JSF); F-15 Tactical Electronic Warfare System (TEWS); B-1B Conventional Mission Upgrade Program (CMUP) BLK D; B-1B CMUP BLK E; B-1B CMUP BLK F; CV-22; Airborne Laser (ABL) and other numerous systems.

- F-22: Implemented OA plan and reporting results to LRIP. Finalized Roll-up Methodology Model and F-15C Comparison Test Plan and coordinated required range and aircraft requirements.
- JSF: Developed, coordinated with USN/USMC, and gained approval of EOA Plan. Prepared resource requirement plan and initiated resource acquisition.
- F-15 TEWS: Conducted suitability assessment and Type 1 training
- B-1B CMUP Block D: Conducted IOT&E testing.
- B-1B CMUP Block E: Conducted advance planning, contractor support, Modeling and Simulation (M&S).
- B-1B CMUP Block F: Conducted advance planning, contractor support, fuze model development, Joint Modeling and Simulation System (JMASS), and end-game interface work.
- CV-22: Conducted operational testing (OT) with Navy and Marines.
- ABL: Conducted advanced planning for combined Developmental Test/Operational Test (DT/OT), prepared DT/OT M&S plan, incorporated major Operational Requirements Document (ORD) update changes into test documentation (e.g., Test and Evaluation Master Plan) and test plans, and developed test target requirements.

– (U) $ 5,708 (U) Category: Space. Conducted IOT&E on Cheyenne Mountain Upgrade (CMU); ICBM-Minuteman III Guidance Program (ICBM-MMIII GRP); MILSTAR; Evolved Expendable Launch Vehicle (EELV); National Missile Defense (NMD); Space Based Infrared System-High (SBIRS-High); Space Based Infrared System-LOW (SBIRS-LEO); Theater Missile Defense (TMD) and other numerous systems.

- CMU: Finished air mission testing, and Cheyenne Mountain testing.
- ICBM GRP: Conducted M&S, range support, and guidance replacement testing.
- MILSTAR: Participated in combined DT/OT.
- EELV: Conducted OA, IOT&E pre-test planning, M&S
- NMD: Observed and participated in DT/OT flight and ground tests in preparation for the FY00 Deployment Readiness Review.
- SBIRS-High: M&S, Validation Verification and Accreditation (VV&A) Effectiveness models, ground and space segment survivability analysis, operational assessment of ground consolidation, hardware/software integration, and planning for FY99 IOT&E.
- SBIRS-LEO: OT&E Program Readiness Assessment, M&S, Test and Evaluation Planning; and pre-test planning.
- TMD: Supported and participated in Patriot Advanced Capability-3 (PAC-3) IOT&E Family of Systems, Hardware-in-the-Loop M&S event, and System Integration Testing.

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– (U) $ 3,207 (U) Category: Missile/Munitions. Conducted IOT&E on Joint Direct Attack Munitions (JDAM); Joint Standoff Weapon (JSOW); AIM-9X; and Joint Air-to Surface Stand-OFF Missile (JASSM).
- JDAM: Conducted IOT&E testing, contractor support, and range support.
- JSOW: IOT&E testing, phase II test planning and contract support.
- AIM-9X: Data Reduction, DMAP production and M&S.
- JASSM: Completed OT&E Test Plan; developed and provided program introduction document to test ranges; completed and briefed Milestone II OA; finalized combined DT/OT plan with the Joint Program Office (JPO) and contractors, range costs including simulator initial checkout and simulator deployments.

– (U) $ 3,332 (U) Category: Command, Control, Communications, Computers, and Intelligence (C4I). Conducted IOT&E on Region/Sector Air Operations Center (R/SAOC); Global Air Traffic Management (GATM); Global Transportation Network (GTN); Joint Simulation System (JSIMS); National Air Space Model (NASM) and Joint Precision Approach and Landing System (JPALS); Theater Battle Management Core Systems (TBM-CS) and other numerous systems.
- R/SAOC (formerly R/SOCC): Concept development and test plan developments.
- GTN: Conducted two Operational Field Tests on incremental software releases.
- JPALS: Conducted OT, contractor support, data analysis, data reduction, and range support.
- TBM-CS: Planned and conducted OT on Version 1 including combined DT/OT with developer and government DT and operational field testing.
- JSIMS: Participated in Build 1-Technical Demonstration of Core Capability, contractor support, and develop assessment plans for FY00.
- NASM: Conducted limited OT for Build 2 and planned for full OT during Build 3, contractor support, and developed IOT&E plan for FY01.

– (U) $ 5,462 (U) Category: General. Conducted IOT&E on Wind Corrected Munitions Dispenser (WCMD) and other numerous systems.
- WCMD: IOT&E test continues at Eglin AFB FL, and Utah Test and Training Range. Dedicated IOT&E will employ inert munitions to evaluate multiple-weapon deliveries and to measure Circular Error Probable (CEP) to an 80% confidence level.

– (U) $27,388 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY: 6 - Management and Support	PE NUMBER AND TITLE: 0605712F Initial Operational Test & Eval — PROJECT: 0191

(U) FY 1999 ($ in Thousands):

– (U) $ 9,207 (U) Category: Aircraft/Support. Conduct IOT&E on the F-22; Joint Strike Fighter (JSF); F-15C/E Tactical Electronic Warfare System (TEWS); B-1 Conventional Mission Upgrade Program (CMUP) BLK E; B-1B CMUP BLK F; CV-22 and other numerous systems.
- F-22 : Conduct F-15C Comparison Test open-air Testing; Conduct OA to Support Certification Ready for IOT&E.
- JSF: Conduct EOA.
- F-15 TEWS: Conduct IOT&E testing.
- B-1B CMUP Block E: Advance planning, contractor support, and M&S.
- B-1B CMUP Block F: Advance Planning, contractor support, and fuze model development.
- CV-22: Contractor support for operational evaluation (OPEVAL)

– (U) $ 5,429 (U) Category: Space. Conduct IOT&E on Cheyenne Mountain Upgrade (CMU); MILSTAR; Evolved Expendable Launch Vehicle (EELV) and other numerous systems.
- CMU: Complete Cheyenne Mountain Testing.
- MILSTAR: Participate in combined DT/OT.
- EELV: Conduct OA #2.

– (U) $ 5,029 (U) Category: Missile/Munitions. Conduct IOT&E for Joint Standoff Weapon (JSOW); AIM-9X and Joint Air-to Surface Stand-OFF Missile (JASSM) and other numerous programs
- JSOW: Conduct IOT&E testing, phase II testing planning, and contractor support.
- AIM-9X: Conduct data reduction, DMAP Production, and M&S.
- JASSM: Participate and accomplish combined DT/OT; prepare for IOT&E (planned start Feb). Provide manpower and equipment, and range cost including possible simulator deployment and early combined DT/OT testing.

– (U) $ 2,813 (U) Category: Command, Control, Communications, Computers, and Intelligence (C4I). Conduct IOT&E on Region/Sector Air Operation Center (R/SAOC) and other numerous systems.
- R/SAOC (formerly R/SOCC): Conduct IOT&E testing

– (U) $ 4,816 (U) Category: General. Conduct IOT&E on Casualty Care Systems; Base Intrusion Security Systems (BISS); Chemical Warfare Defense, Next Generation Generators and External Control Unit and other numerous systems.
- CCS: Test all newly developed flyaway transportable medical care systems.
- BISS: Conduct on-going tests of various commercial off-the-shelf and other personnel and asset protection techniques.
- CWD: AF focus of chemical protection programs.
- Next Generation Generator and External Control Units: Support the Airbase Operability Concept.

– (U) $27,294 Total

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(U) FY 2000 ($ in Thousands):

– (U) $12,196 (U) Category: Aircraft/Support. Conduct IOT&E on F-22; Airborne Laser (ABL); CV-22; B-1B Conventional Mission Upgrade Program (CMUP) BLK E; B-1B CMUP BLK F and numerous other systems.
- F-22: Continue with F-15C comparison test using open-air and full mission simulator, and conducting OA.
- ABL: Conduct advanced planning for combined DT/OT and dedicated IOT&E, prepare for EOA-2, begin incorporating OT requirements into
M&S code per the combined DT/OT M&S plan, and continue test target requirements.
- CV-22: Participate in Navy Operational Test and Evaluation Force (OPTEVFOR)-led MV-22 OPEVAL.
- B-1B CMUP BLK E: Completing OA, write report and start IOT&E.
- B-1B CMUP BLK F: Completing OA and write report.

– (U) $3,105 (U) Category: Space. Conduct IOT&E on Theater Missile Defense (TMD); National Missile Defense (NMD); Space Based Infrared System-High (SBIRS-High); Space Based Infrared System-Low (SBIRS-LEO) and numerous other systems
-TMD: Continue support in Patriot Advanced Capability-3 (PAC-3) IOT&E, participate in hardware-in-the-Loop M&S Testing and planning with Commander, Operational Test and Evaluation Force (COMPOPTEVFOR) for TMD IOT&E and, if necessary, execution.
- NMD: Continue to observe and participate in DT/OT fight and ground tests and conduct EOA to support Deployment Review.
- SBIRS-High: Performing operational utility evaluations (OUEs) to support upgrade acceptance of ground systems.
- SBIRS-LEO: Performing OA to support downselect decision at Milestone II.

– (U) $3,533 (U) Category: Missile/Munitions. Conduct IOT&E on Joint Standoff Weapon (JSOW); AIM-9X; Joint Air-to-Surface Stand-off Missile (JASSM) and numerous other programs.
- JSOW: Complete IOT&E and published final report.
- AIM-9X: Prepare for and assist DT in performing combined DT/OT.
- JASSM: Continue combined DT/OT testing and preparation for IOT&E.

– (U) $1,356 (U) Category: Command, Control, Communications, Computers, and Intelligence (C4I). Conduct IOT& E on Global Transportation Network (GTN); Joint Simulation System (JSIMS); National Air Space Model (NASM); Theater Battle Management Core Systems (TBM-CS) and numerous other systems.
- GTN: Conduct three operational field tests (OFT) on incremental software releases.
- JSIMS: Conduct limited OT during Build 2, conduct full OT during Build 3 and develop IOT&E Plan for FY01.
- NASM: Conduct limited OT during Build 2, conduct full OT Build 3 and develop IOT&E Plan for FY01.
- TBM-CS: Plan and conduct OT on Version 2 including combined DT/OT with developer and government and operational field testing.

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– (U) $3,629 (U) Category: General. Conduct IOT&E on Joint Helmet Mounted Cueing System (JHMCS); Hard Target Smart Fuse (HTSF); Common Low Observable Verification System (CLOVers) and numerous other systems.
- JHMCS: Conduct IOT&E in preparation for a Milestone III decision.
- HTSF: Prepare for and conduct OT for a fielding decision.
- CLOVers: Performing development verification testing (DVT) and preparing for combined DT/OT starting in FY01.

– (U) $23,819 Total

(U) FY 2001 ($ in Thousands):

– (U) $13,991 (U) Category: Aircraft/Support. Conduct IOT&E on the F-22; Airborne Laser (ABL); CV-22; B-1B Conventional Mission Upgrade Program (CMUP) BLK E; B-1B CMUP BLK F and numerous other systems.
- F-22: Continuing F-15C comparison testing using open-air and full mission simulator, conducting OA, and planning for IOT&E.
- ABL: Conduct advanced planning for combined DT/OT and dedicated IOT&E, conduct EOA-2, continue incorporating OT requirements into
M&S code per combined DT/OT M&S plan, refine OT measures, and continue to test target requirements.
- CV-22: Combined DT/OT will start with the Navy at Edwards AFB.
- B-1B CMUP BLK E: Continuing conducting and completing IOT&E and writing final test report
- B-1B CMUP BLK F: Prepare for and conduct IOT&E.

– (U) $3,658 (U) Category: Space. Conduct IOT&E on the Theater Missile Defense (TMD); National Missile Defense (NMD); Space Based Infrared System-High (SBIRS-High) and numerous other systems.
- TMD: Participate and perform analysis on Navy Area Theater Ballistic Missile Defense (TBMD) OT&E, planning for System Integration Test (SIT 02), and plan and participate, if necessary in ABL IOT&E.
- NMD: Continue to observe and participate in DT/OT and prepare to conduct OAs.
- SBIRS-High: Continue to perform OUEs to support ground system upgrades.

– (U) $7,623 (U) Category: Missile/Munitions. Conduct IOT&E for the AIM-9X; Joint Air-to-Surface Stand-off Missile (JASSM); Small Smart Bomb, and numerous other programs.
- AIM-9X: Perform IOT&E including live firing of 22 missiles.
- JASSM: Complete IOT&E and publish final test report.
- Small Smart Bomb: Observation and planning for future IOT&E.

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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605712F Initial Operational Test & Eval PROJECT 0191

– (U) $1,233 (U) Category: Command, Control, Communications, Computers, and Intelligence (C4I). Conduct IOT&E on the Global Transportation Network (GTN); Joint Simulation System (JSIMS); National Air Space Model (NASM) and numerous other systems.
- GTN: Continue operational field tests (OFTs) on incremental software releases.
- JSIMS: Conduct OA , contractor and remote site support, and advanced planning and execution for combined DT/OT and dedicated IOT&E.
- NASM: Conduct OA , contractor and remote site support, and advanced planning and execution for combined DT/OT and dedicated IOT&E.

– (U) $2,184 (U) Category: General. Conduct IOT&E on Common Low Observable Verification System (CLOVers); Joint Chemical Agent Detector (JCAD); Joint Service Lightweight Stand-off Chemical Agent Detector (JSLSCAD) and numerous other systems.
- CLOVers: Conducting combined DT/OT and preparing for and starting dedicated IOT&E which will be completed in FY02.
- JCAD: Prepare and conduct IOT&E using C-130 Aircraft as a test bed.
- JSLSCAD: Prepare and conduct IOT&E and write final report for a fielding determination.

– (U) $28,689 Total

(U) B. Budget Activity Justification: This program element is in Budget Activity 6, RDT&E Management Support, because it funds weapon system IOT&E tests conducted to evaluate a system's operational effectiveness and suitability and to identify any operational deficiencies or need for modifications in support of the acquisition process.

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

DATE: February 1999

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605712F Initial Operational Test & Eval

PROJECT: 0191

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY 1999 PB)	27,153	24,541	28,244	29,228	Cont
(U) Appropriated Value	28,319	29,541			
(U) Adjustments to Appropriated Value					
a. Congressional/General Reductions	-1,166	-2,247			
b. SBIR					
c. Omnibus or Other Above Threshold Reprogramming	-180				
d. Below Threshold Reprogramming	415				
(U) Adjustment to Budget Years Since FY 1999 PB			-4,425	-539	
(U) Current Budget Submit/FY 2000 PB	27,388	27,294	23,819	28,689	Cont

(U) **Significant Program Changes:**

- FY98: omnibus reprogramming reduction of $180; below threshold reprogramming of $415 for Precision Landing System Receiver (PLSR) IOT&E.
- FY00 Adjustment of $4.0M due to higher priority Air Force requirements.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605712F Initial Operational Test & Eval
	PROJECT 0191

(U) D. Other Program Funding Summary ($ in Thousands): N/A.

(U) E. Acquisition Strategy: N/A

(U) F. Schedule Profile: IOT&E is not an acquisition program. There are dozens of IOT&E programs in any one fiscal year. The AFOTEC automated test resource plan database does not provide quarterly IOT&E test schedules. However, specific IOT&E schedules can be made available on a case-by-case basis through the appropriate AFOTEC test resource management office.

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

DATE: **February 1999**

BUDGET ACTIVITY: **6 - Management and Support**

PE NUMBER AND TITLE: **0605807F Test And Evaluation Spt**

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	366,928	353,531	392,104	380,635	380,382	392,602	400,641	407,932	Continuing	TBD
06TS Test and Evaluation Support	345,934	333,434	370,751	359,956	357,728	369,523	377,066	383,747	Continuing	TBD
06TG 46 Test Group	20,994	20,097	21,353	20,679	22,654	23,079	23,575	24,185	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description and Budget Item Justification: Test facilities, capabilities and resources operated through this program include wind tunnels, rocket and jet engine test cells, limited space environmental simulation chambers, armament test ranges, climatic test facilities, avionics test facilities, aircraft testbeds, dry lakebed landing sites, instrumented test ranges, maintenance and repair of test facilities, civilian payroll, and contractor services. It also provides resources for maintaining Air Force Materiel Command (AFMC) assigned test and test support coded aircraft. No acquisition contracts are funded from this program; test support contracts for services and supplies and equipment are predominantly awarded on the basis of full and open competition. Beginning in FY00, the justification narratives within each center have been modified to include standardized categories which better explain the nature of the test and evaluation infrastructure support activities.

(U) B. Budget Activity Justification: This program element is in Budget Activity 6, RDT&E Management Support, because it funds infrastructure resources (civilians, aircraft, facilities and ranges) to operate the Air Force test activities which are included in the Department of Defense (DoD) Major Range and Test Facility Base (MRTFB).

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605807F Test And Evaluation Spt

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY 1999 PB)	372,496	370,168	393,523	375,245	Cont
(U) Appropriated Value	387,848	363,168			
(U) Adjustments to Appropriated Value					
a. Congressional/General Reductions	-14,939	-9,637			
b. SBIR					
c. Omnibus or Other Above Threshold Reprogram	-1,188				
d. Below Threshold Reprogramming	-4,793				
(U) Adjustments to Budget Years Since FY 1999 PB			-1,419	5,390	
(U) Current Budget Submit/FY 2000 PB	366,928	353,531	392,104	380,635	Cont

(U) Significant Program Changes: None

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

DATE: February 1999

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605807F Test And Evaluation Spt

PROJECT: 06TS

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
06TS Test and Evaluation Support	345,934	333,434	370,751	359,956	357,728	369,523	377,066	383,747	Continuing	TBD

(U) A. Mission Description: This project provides resources to operate the Air Force test activities which are included in the Department of Defense (DoD) Major Range and Test Facility Base (MRTFB). Test facilities/capabilities operated through this program include wind tunnels, rocket and jet engine test cells, limited space environmental simulation chambers, armament test ranges, climatic test facilities, avionics test facilities, aircraft testbeds, dry lakebed landing sites, instrumented test ranges, and test aircraft maintenance. Test and Evaluation (T&E) Support funds test infrastructure overhead activities including: Command and supervisory staffs; supply stocks; maintenance, repair, and replacement of worn or obsolete test equipment and facilities; test infrastructure for data collection, transmission, reduction, and analysis; civilian salaries; temporary duty travel; support contract costs for hardware and software engineering and maintenance; and minor improvement and modernization projects. It also funds overhead test aircraft depot level maintenance such as: Programmed Depot Maintenance (PDM), the calendar-based cyclic scheduling of aircraft into depots for update/inspection; modifications and any other depot level repairs required by the aircraft System Program Directors (SPD); engine overhauls; depot-provided area assistance; and assorted ground support equipment overhauls. Three major Air Force test centers are supported by this project: (1) Arnold Engineering and Development Center (AEDC), located at Arnold Air Force Base (AFB), TN, whose test infrastructure overhead supports operations for the largest complex of ground test facilities in the free world (includes transonic, supersonic, and hypersonic wind tunnels; rocket motor and turbine engine test cells; space environmental test chambers, hyperballistic ranges; and other specialized facilities). (2) Air Force Flight Test Center (AFFTC), located at Edwards AFB, CA, whose test infrastructure overhead supports weapons system development and operational test and evaluation for aircraft, aircraft subsystems and aircraft weapon systems, aerospace research vehicles, unmanned miniature vehicles, cruise missiles, parachute delivery/recovery systems, cargo handling systems, and Electronic Warfare (EW) systems for DoD and allied forces. The AFFTC mission includes the United States Air Force (USAF) Test Pilot School. (3) Air Armament Center (AAC) (formerly Air Force Development Test Center (AFDTC) directed by Special Order GA-19, effective 1 Oct 98), located at Eglin AFB, FL, is comprised of 724 square miles of land area, and approximately 123,000 square miles of water space. AAC provides the test infrastructure and overhead required for the conduct of developmental and operational test and evaluation of non-nuclear air armaments (including aircraft guns, ammunition, bombs, and missiles); Command, Control, Communications, Computers and Intelligence (C4I) systems; target acquisition and weapon delivery systems; a multi-service climatic simulation capability, and determines target/test item spectral signatures for DOD and allied forces. AAC provides a scientific test process that supports the development and enhancement of munitions systems that support tri-service smart weapons development. AAC technology is compatible with weapon systems to be tested such as Advanced Medium Range Air-to-Air Missile (AMRAAM), Joint Direct Attack Munition (JDAM), AGM-130, Advanced Short Range Air-to-Air Missile (ASRAAM), Joint Tactical Information Distribution System (JTIDS), Joint Surveillance Target Attack Radar System (JSTARS), Combat Talon, etc. T&E support services contracts are awarded on the basis of full and open competition.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605807F Test And Evaluation Spt
PROJECT 06TS	

(U) FY 1998 ($ in Thousands):

Arnold Engineering and Development Center

–	(U) $101,976	Continued test infrastructure overhead support to enable ground testing for classified programs, and unclassified programs (F-22, JDAM, F-15, F-16, Joint Strike fighter (JSF), B-1B, B-2, C-130, AMRAAM, AIM 9X, Minuteman, Evolved Expandable Launch Vehicle (EELV), Titan IV and F-18), F404, F414, and F119. Began test infrastructure overhead support for Tunnel 9 that was transferred from the Navy to the USAF effective 1 Oct 97.
–	(U) $ 13,331	T&E specific Base Operating Support (BOS) requirements
–	(U) $ 15,922	Maintenance, repair and minor construction for test infrastructure requirements.
–	(U) $ 15	Federal Workforce Restructuring Act (FWRA) payment

Air Force Flight Test Center

–	(U) $105,103	Continued to provide test infrastructure overhead support enabling testing of the B-1B, B-2, F-16, F-15, F-15E, F-22, Advanced Fighter Technology Integration (AFTI)/F-16, C-17, Avionics Test and Integration Complex (ATIC), Advanced Range Instrumentation Aircraft (ARIA), Electronic Combat Countermeasures (ECCM), EW (B-1B ALQ-161, F-16 AN/ASQ-213, C-130 ALQ-172, etc.), and classified programs.
–	(U) $ 18,352	USAF Test Pilot School operating costs.
–	(U) $ 3,187	T&E specific BOS requirements
–	(U) $ 8,257	Programmed Depot Maintenance and engine overhauls for aircraft assigned to AFFTC.
–	(U) $ 1,460	Maintenance, repair and minor construction for test infrastructure requirements.
–	(U) $ 145	Federal Workforce Restructuring Act (FWRA) payment

Air Armament Center

–	(U) $ 66,212	Continued test infrastructure overhead support for non-nuclear air armaments (AMRAAM, SEEK EAGLE, Theater Missile Defense (TMD), JDAM, Joint Stand-Off Weapon (JSOW), Wind Corrected Munitions Dispenser (WCMD), etc.); C4I (JTIDS, Base and Installation Security System (BISS), TMD), and aircraft software upgrades.
–	(U) $ 7,066	T&E specific BOS requirements
–	(U) $ 3,220	Programmed Depot Maintenance and engine overhauls for aircraft assigned to AAC.
–	(U) $ 1,582	Maintenance, repair and minor construction for test infrastructure requirements.
–	(U) $ 106	Federal Workforce Restructuring Act (FWRA) payment
–	(U) $345,934	Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605807F Test And Evaluation Spt
	PROJECT 06TS

(U) FY 1999 ($ in Thousands):

Arnold Engineering and Development Center

- (U) $103,675 Continue test infrastructure overhead support to enable ground testing for classified programs, and unclassified programs (F-22, JDAM, F-15, F-16, JSF, B-1B, B-2, C-130, AMRAAM, AIM 9X, Minuteman, EELV, Titan IV, F-18, F404, F414, F119, and Tunnel 9).
- (U) $ 13,436 T&E specific BOS requirements
- (U) $ 16,376 Maintenance, repair and minor construction for test infrastructure requirements.

Air Force Flight Test Center

- (U) $ 95,451 Continue to provide test infrastructure overhead support enabling testing of the B-1B, B-2, F-16, F-15, F-15E, F-22, AFTI/F-16, C-17, ATIC, ARIA, ECCM, EW (B-1B ALQ-161, F-16 AN/ASQ-213, C-130 ALQ-172, etc.) and classified programs.
- (U) $ 19,200 USAF Test Pilot School operating costs.
- (U) $ 11,456 Programmed Depot Maintenance and engine overhauls for aircraft assigned to AFFTC.
- (U) $ 3,569 T&E specific BOS requirements
- (U) $ 1,760 Maintenance, repair and minor construction for test infrastructure requirements.

Air Armament Center

- (U) $ 57,086 Continue test infrastructure support for non-nuclear air armaments (AMRAAM, SEEK EAGLE, TMD, JDAM, JSOW, WCMD, Joint Air-to-Surface Stand-Off Missile (JASSM) etc.); C4I/Command and Control Consolidated Test Force (C2CTF) (JTIDS, BISS, TMD,Theater Battle Management Core System (TBMCS), and aircraft software upgrades (Air Force Mission Support System (AFMSS)).
- (U) $ 2,462 Programmed Depot Maintenance and engine overhauls for aircraft assigned to AAC.
- (U) $ 7,273 T&E specific BOS requirements
- (U) $ 1,690 Maintenance, repair and minor construction for test infrastructure requirements.
- (U) $333,434 Total

Beginning in FY00, the justification narratives within each center have been modified to include standardized categories which better explain the nature of the test and evaluation infrastructure support activities.

(U) FY 2000 ($ in Thousands):

Arnold Engineering and Development Center

- (U) $ 6,878 Continue test infrastructure overhead support to enable ground testing for classified programs, and unclassified programs (F-22, JDAM, F-15, F-16, JSF, B-1B, B-2, C-130, AMRAAM, AIM 9X, Minuteman, EELV, Titan IV, F-18, F404, F414, F119, and Tunnel 9).
- (U) $ 23,533 Utilities and maintenance and repair for test unique infrastructure
- (U) $107,896 Contractor Services (in-house contract support activities)
- (U) $ 12,208 T&E Civilian Pay

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605807F Test And Evaluation Spt
	PROJECT 06TS

– (U) $ 250 NATO Cooperative Research and Development (R&D) efforts in Imaging Spectrometer Development (AEDC/Canada). Continue effort to pool the spatial and spectral advances of both the US and Canada, and develop a high-resolution sensor system capable of characterizing signatures of rockets and aircraft, for drug interdiction, and identifying trace quantities of a broad spectrum of gases in the environment. Previously funded in PE 0603790F, NATO Cooperative R&D.

Air Force Flight Test Center

– (U) $ 25,247 Continue to provide test infrastructure overhead support enabling testing of the B-1B, B-2, B-52, F-16, F-15, F-15E, F-22, F-117, AFTI/F-16, C-17, ATIC, ARIA, ECCM, EW (B-1B ALQ-161, F-26 AN/ASQ-213, C-130 ALQ-172, etc.), and classified programs.
– (U) $ 5,323 Utilities and maintenance and repair for test unique infrastructure
– (U) $ 30,894 Contractor Services (in-house contract support activities)
– (U) $ 59,326 T&E Civilian Pay
– (U) $ 22,092 Aircraft flying hour costs (to include USAF Test Pilot School) for pilot proficiency for sustained readiness to include programmed depot maintenance, engine overhauls, petroleum, oils and lubricants (POL), depot level reparables (DLR) and related support.

Air Armament Center

– (U) $ 14,572 Continue test infrastructure overhead support for non-nuclear air armaments (AMRAAM, SEEK EAGLE, TMD, JDAM, JSOW, WCMD, etc.); C4I (JTIDS, BISS, TMD), and aircraft software upgrades.
– (U) $ 2,919 Utilities and maintenance and repair for test unique infrastructure
– (U) $ 6,624 Contractor Services (in-house contract support activities)
– (U) $ 42,848 T&E Civilian Pay
– (U) $ 10,141 Aircraft Support (Includes programmed depot maintenance; engine overhauls; petroleum, oils and lubricants (POL); and related support)
– (U) $370,751 Total

(U) FY 2001 ($ in Thousands):

Arnold Engineering and Development Center

– (U) $ 6,066 Continue test infrastructure overhead support to enable ground testing for classified programs, and unclassified programs (F-22, JDAM, F-15, F-16, JSF, B-1B, B-2, C-130, AMRAAM, AIM 9X, Minuteman, EELV, Titan IV, F-18, F404, F414, F119, and Tunnel 9).
– (U) $ 24,036 Utilities and maintenance and repair for test unique infrastructure
– (U) $103,969 Contractor Services (in-house contract support activities)
– (U) $ 11,928 T&E Civilian Pay

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605807F Test And Evaluation Spt
	PROJECT 06TS

– (U) $ 250 NATO Cooperative Research and Development (R&D) efforts in Imaging Spectrometer Development (AEDC/Canada). Continue effort to pool the spatial and spectral advances of both the US and Canada, and develop a high-resolution sensor system capable of characterizing signatures of rockets and aircraft, for drug interdiction, and identifying trace quantities of a broad spectrum of gases in the environment. Previously funded in PE 0603790F, NATO Cooperative R&D.

Air Force Flight Test Center

– (U) $ 29,955 Continue to provide test infrastructure overhead support enabling testing of the B-1B, B-2, B-52, F-16, F-15, F-15E, F-22, F-117, AFTI/F-16, C-17, ATIC, ARIA, ECCM, EW (B-1B ALQ-161, F-26 AN/ASQ-213, C-130 ALQ-172, etc.), and classified programs.
– (U) $ 4,972 Utilities and maintenance and repair for test unique infrastructure
– (U) $ 28,505 Contractor Services (in-house contract support activities)
– (U) $ 54,086 T&E Civilian Pay
– (U) $ 21,207 Aircraft flying hour costs (to include USAF Test Pilot School) for pilot proficiency for sustained readiness to include programmed depot maintenance, engine overhauls, petroleum, oils and lubricants (POL); and related support)

Air Armament Center

– (U) $ 11,812 Continue test infrastructure overhead support for non-nuclear air armaments (AMRAAM, SEEK EAGLE, TMD, JDAM, JSOW, WCMD, etc.); C4I (JTIDS, BISS, TMD), and aircraft software upgrades.
– (U) $ 3,005 Utilities and maintenance and repair for test unique infrastructure
– (U) $ 6,657 Contractor Services (in-house contract support activities)
– (U) $ 42,857 T&E Civilian Pay
– (U) $ 10,651 Aircraft Support (includes programmed depot maintenance; engine overhauls; petroleum, oils and lubricants (POL); and related support)
– (U) $359,956 Total

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

(U) Significant Program Changes: None.

(U) C. Other Program Funding Summary ($ in Thousands): Not applicable.

Related RDT&E:
(U) PE 0604759F, Major T&E Investment (Technical capability improvement and modernization)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605807F Test And Evaluation Spt
	PROJECT 06TS

(U) PE 0604256F, Threat Simulator Development
(U) PE 0604940D, Central Test & Evaluation Improvement Program (T&E investments for new tri-service test capabilities)

(U) D. Acquisition Strategy: Not applicable.

(U) E. Schedule Profile: Most T&E test infrastructure overhead requirements are continuous and are not driven by discrete start/end dates.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605807F Test And Evaluation Spt	PROJECT 06TG

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
06TG 46 Test Group	20,994	20,097	21,353	20,679	22,654	23,079	23,575	24,185	Continuing	TBD

(U) A. Mission Description: This project funds test infrastructure overhead support including: Command and supervisory staffs; supply stocks; upkeep, refurbishment, repair, and replacement of non-repairable or obsolete test equipment; test infrastructure for data collection, transmission, reduction, and analysis; civilian salaries, utilities, temporary duty travel, support contract costs for hardware and software engineering and maintenance. Project infrastructure support is provided for the unique capabilities of the 46th Test Group (TG) facilities: Central Inertial Guidance Test Facility (CIGTF), the High Speed Test Track (HSTT), and the Radar Target Scatter (RATSCAT) facility. CIGTF provides independent assessments of inertial components, aircraft navigation systems, and missile guidance systems. HSTT capabilities include full-scale testing in flight environments, realistic live-fire simulations, test item and target fragment recovery, and precision trajectory analysis and high speed photography. RATSCAT provides radar cross section (RCS) monostatic and bi-static amplitude and phase measurements, antenna pattern measurements, glint and near field measurements for low observable targets. The 46th TG support services contracts are awarded on the basis of full and open competition.

(U) FY 1998 ($ in Thousands):

- (U) $ 3,960 Central Inertial Guidance Test Facility (CIGTF): Provide infrastructure test support for programs such as Advanced Inertial Concepts (AICON), continued Global Positioning System-Joint Program Office (GPS-JPO) Responsible Test Organization (RTO) responsibilities, Project 2000 integration support, GPS jamming and electronic countermeasures, NAVWAR, Federal Aviation Administration (FAA), Wide Area Augmentation System, GPS integrated and embedded INS programs, aircraft navigation systems, including B-2 and F-22, munitions navigation systems such as JDAM and other programs.
- (U) $ 4,420 Holloman High Speed Test Track (HHSTT) : Provide infrastructure test support for the F-22A Ejection System, Russian K-36 Derivative Ejection Seat, Standard Missile (SM) 2 Seeker, SM 2 Forward Looking Fuze, SM-2 Live Fire T&E (LFT&E), Patriot Advanced Capability (PAC) 3 LFT&E, Theater High Altitude Area Defense (THAAD) LFT&E, Army Tactical Infrared Countermeasure System (ATIRCMS) Phase II, Long-Range Fiber Optic Guided (LONGFOG) missile, and other programs.
- (U) $ 4,754 Radar Target Scatter (RATSCAT) facility: Provide infrastructure test support for programs such as static RCS testing for stores, low observable testbeds, and other classified programs.
- (U) $ 7,860 46th Test Group Headquarters (46TG). Provide command guidance, resource management, plans and programs, protection services, information systems, logistics, liaison support and scheduling for White Sands Missile Range (WSMR) airspace, photo and safety chase, support of air-to-air and air-to-ground live fire, life support equipment services, and aerospace ground equipment support.
- (U) $ 20,994 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605807F Test And Evaluation Spt
	PROJECT 06TG

(U) FY 1999 ($ in Thousands):

- (U) $ 3,584 Central Inertial Guidance Test Facility (CIGTF): Provide infrastructure test support for programs such as AICON, continued GPS-JPO RTO responsibilities, Project 2000 integration support, GPS jamming and electronic countermeasures, NAVWAR, FAA Wide Area Augmentation System, GPS integrated and embedded INS programs, aircraft navigation systems, including B-2 and F-22, munitions navigation systems such as JDAM, GPS Y2K testing and other programs.
- (U) $ 4,607 Holloman High Speed Test Track (HHSTT): Provide infrastructure test support (including full-scale testing simulating in-flight environments, realistic live-fire simulations, test item and target fragment recovery, and precision trajectory analysis and high speed photography) for the F-22A Ejection System, Advanced Concepts Escape system (ACES) II Continuous Improvement Program (CIP), Standard Missile (SM) 2 Seeker, SM 2 LFT&E, SM 3 LFT&E, Patriot Advanced Capability (PAC) 3 Live Fire T&E (LFT&E), Theater High Altitude Area Defense (THAAD) LFT&E, and other programs.
- (U) $ 4,459 Radar Target Scatter (RATSCAT) facility: Provide infrastructure test support for programs such as static RCS testing for stores, low observable testbeds, and other classified programs.
- (U) $ 7,447 46th Test Group Headquarters (46TG). Provide command guidance, resource management, plans and programs, protection services, information systems, logistics, liaison support and scheduling for WSMR airspace, photo and safety chase, support of air-to-air and air-to-ground live fire, life support equipment services, and aerospace ground equipment support.
- (U) $ 20,097 Total

Beginning in FY00, the justification narratives within each center have been modified to include standardized categories which better explain the nature of the test and evaluation infrastructure support activities.

(U) FY 2000 ($ in Thousands):

- (U) $ 6,963 Continue test infrastructure overhead support to enable testing for unclassified program such as AICON, continued GPS-JPO RTO responsibillities, Project 2000 integration support, GPS jamming and electronic countermeasures, NAVWAR, FAA Wide Area Augmentation System, GPS integrated and embedded INS programs, aircraft navigation systems, including B-2 and F-22, munitions navigation systems such as JDAM, the F-22A Ejection Seat, Standard Missile (SM) 2 Seeker, SM 2 forward Looking Fuze, SM-2 Live Fire T&E (LFT&E) , Patriot Advanced Capability (PAC) 3 LFT&E, Theater High Altitude Area Defense (THAAD) LFT&E, Army Tactical Infrared Countermeasure system (ATIRCMS) Phase II, Long-Range Fiber Optic Guided (LONGFOG) missile, static RCS testing for stores, low observable testbeds, as well as multiple classified programs..
- (U) $ 7,158 Contractor Services (in-house contract support activities)
- (U) $ 7,232 T&E Civilian Pay
- (U) $21,353 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605807F Test And Evaluation Spt
PROJECT 06TG	

(U) FY 2001 ($ in Thousands):

- (U) $6,144 Continue test infrastructure overhead support to enable testing for unclassified program such as AICON, continued GPS-JPO RTO responsibilities, Project 2000 integration support, GPS jamming and electronic countermeasures, NAVWAR, FAA Wide Area Augmentation System, GPS integrated and embedded INS programs, aircraft navigation systems, including B-2 and F-22, munitions navigation systems such as JDAM, the F-22A Ejection Seat, Standard Missile (SM) 2 Seeker, SM 2 forward Looking Fuze, SM-2 Live Fire T&E (LFT&E) , Patriot Advanced Capability (PAC) 3 LFT&E, Theater High Altitude Area Defense (THAAD) LFT&E, Army Tactical Infrared Countermeasure system (ATIRCMS) Phase II, Long-Range Fiber Optic Guided (LONGFOG) missile, static RCS testing for stores, low observable testbeds, as well as multiple classified programs..
- (U) $ 7,158 Contractor Services (in-house contract support activities)
- (U) $ 7,377 T&E Civilian Pay
- (U) $20,679 Total

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

(U) Significant Program Changes: None.

(U) C. Other Program Funding Summary ($ in Thousands): Not applicable.

Related RDT&E:
(U) PE 0604759F, Major T&E Investment (Technical capability improvement and modernization)
(U) PE 0604256F, Threat Simulator Development
(U) PE 0604940D, Central Test & Evaluation Improvement Program (T&E investments for new tri-service test capabilities)

(U) D. Acquisition Strategy: Not applicable.

(U) E. Schedule Profile: 46TG infrastructure support operations are continuous and are not driven by discrete start/end dates.

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

DATE: February 1999

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605808F Development Planning

PROJECT: 3361

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
3361 Mission & System Planning	4,194	4,053	5,696	5,751	5,832	5,972	6,095	6,222	TBD	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description and Budget Item Justification

This Program Element (PE) supports the Air Force Modernization Planning Process (MPP), which receives front-end guidance from Air Force Strategic Planning. Consistent with DoD 5000 series direction, the PE enables rigorous identification and substantiation of current/future operational deficiencies and needed capability, as well as associated migration plans. Such modernization planning efforts can be categorized according to three phases. First, a "strategies-to-task", Mission Area Assessment (MAA) is conducted to identify operational tasks. These operational tasks must relate directly to currently assigned or future Air Force roles and missions as derived from a number of sources including the Air Force Vision and Strategic Plan. Second, a Mission Needs Analysis (MNA) is conducted to assess current and programmed force capabilities against operational tasks and ultimately identify specific deficiencies and needs. The third phase of the MPP is Mission Solution Analysis (MSA), which identifies potential cost effective, non-materiel (i.e. doctrine, tactics, training) and materiel alternatives that address the deficiencies/needs, or simply represent new organizational, operational, and/or technological opportunities.

(U) FY 1998 ($ in Thousands):

- (U) $441 Completed study to support MNA for AF Special Operation Command's (AFSOC) Provide Mobility in Denied Territory mission area.
- (U) $121 Completed effort to identify opportunities to streamline, consolidate, and automate AF Modernization Planning processes.
- (U) $967 Continued surveillance and reconnaissance mission area study to identify architecture alternatives to support the battlefield commander.
- (U) $1,128 Continued analysis of optimized space and missile capabilities, and force structure trades across all space mission areas.
- (U) $647 Completed effort to analyze integration and interdependencies of land and sea transportation to allow determination and optimal mix of mobility resources.
- (U) $890 Continued efforts to base line and forecast operations and support, modernization and infrastructure costs for combat aircraft and training systems.
- (U) $4,194 Total

(U) FY 1999 ($ in Thousands):

- (U) $453 Analyze operational concepts and identify technology needs for future non-lethal Suppression of Enemy Air Defenses (SEAD)
- (U) $289 Initiate effort to asess AF Special Operations Forces (SOF) Aircraft multi-spectral survivability for various SOF mission areas
- (U) $579 Quantify the impact of Weapons of Mass Destruction on air mobility operations in contingencies
- (U) $940 Conduct effort to analyze campaign and mission-level space force deficiency/capability through use and upgrade of detailed campaign models

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605808F Development Planning
	PROJECT 3361

- (U) $289 Assess the capabilities of existing and planned weather data collection sensors, and identify the most effective strategy to support warfighter
- (U) $241 Initiate effort to improve Combat Forces Assessment Model for direct evaluation of SEAD effectiveness against Integrated Air Defenses
- (U) $203 Initiate simulation and analysis to assess the operational utility and impact of using non-lethal weapons for AF SOF missions
- (U) $723 Initiate mission solution analysis, including campaign level analyses, for future long-range conventional strike aircraft
- (U) $213 Initiate effort to develop and implement a common analytical framework and tool set to assess the military utility of air and space capabilities
- (U) $123 Identified as a source for SBIR
- (U) $4053 Total

(U) FY 2000 ($ in Thousands):

- (U) $300 Complete effort to assess SOF aircraft multi-spectral survivability for various SOF mission areas
- (U) $285 Complete simulation and analysis to assess the operational utility and impact of using non-lethal weapons for SOF missions
- (U) $500 Develop roadmap identifying cockpit enhancements and upgrades, as well as their cost-effective integration, into strike aircraft
- (U) $600 Build roadmap and technology development plan for the next-generation close air support weapon and associated sub-systems
- (U) $575 Conduct MNA for US space systems exposed to electronic, directed energy, physical, and information operations attack
- (U) $900 Conduct MSA for Space Operations Vehicle and Conventional Ballistic Missiles as force applications platforms within an EAF
- (U) $400 Conduct MNA for launch facility physical security systems
- (U) $175 Conduct MNA and MSA for visualization tools in support of information warfare
- (U) $800 Conduct MNA and MSA for protection of the future AF information infrastructure
- (U) $546 Continue effort to develop and implement a common analytical framework and tool set to assess the military utility of air and space capabilities
- (U) $615 Conduct MNA an MSA for personnel recovery and location identification
- (U) $5696 Total

(U) FY 2001 ($ in Thousands):

- (U) $5751 Initiate/continue specific efforts in support of AF Modernization Planning per Program Element mission description
- (U) $5751 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605808F Development Planning
	PROJECT 3361

(U) B. Budget Activity Justification:

This program is in budget activity 6, Management Support, because supported studies and analyses provide inputs for Air Force Mission Area and/or Support Plans and future Air Force investment decisions. However, Phase 0 concepts studies and Analysis of Alternatives (AOAs) are not normally conducted in this program element

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY 1999) PB	4,270	6,075	5,800	5,860	Continuing
(U) Appropriated Value	4,549	4,075			
(U) Adjustments to Appropriated Value					
a. Cong Reductions	-171	-22			
b. SBIR	-108				
c. Omnibus or Other Above Threshold Reprogram	-29				
d. Below Threshold Reprogramming (BTR)	-47				
(U) Adjustments to Budget Years Since FY 1999 PB			-104	-109	
(U) Current Budget Submit/FY 00 PB	4,194	4,053	5,696	5,751	Continuing

(U) Significant Program Changes:

FY 99: $123K identified as a source for SBIR

(U) D. Other Program Funding Summary ($ in Thousands) NONE.

(U) E. Acquisition Strategy

Annually (in February), an Air Force-wide corporate board reviews, prioritizes, and screens proposed studies to definitize the program, ensuring relevance and no unnecessary duplication of effort.

(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

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

DATE: February 1999

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605808F Development Planning

PROJECT: 3361

	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) Execute projects																
- "Mobility in Denied Territory"	*				X(C)											
- "Streamline Mod Planning Processes"	*				X(C)											
- "Surveillance and Reconnaissance Architectures Alternatives"	*				X(C)											
- "Space/Missile Capabilities Analysis"	*				X(C)											
- "Optimal Mix of Mobility Resources"	*					X(C)										
- "Baseline/Forecast Cost for Aircraft/ Trng Systems"	*				X(C)											
- "Conops and Technology for Future Non-lethal SEAD"					X(I)					X(C)						
- "SOF Aircraft Multi-spectral Survivability"					X(I)									X(C)		
- "WMD Impact on Air Mobility Ops"					X(I)					X(C)						
- "Upgrade/use Detailed Campaign Model for Space Force Deficiency Analysis"					X(I)									X(C)		
- "Weather Data Collection Study"					X(I)					X(C)						
- "Improve Combat Forces Assessment Model"					X(I)					X(C)						
- "Non-lethal Weapons for SOF Missions"					X(I)									X(C)		
- "Future Long-Range Conventional Strike Aircraft"					X(I)					X(C)						
- "Common Analytical Framework for Air and Space Capability"					X(I)									X(C)		

* Completed Event - Task Initiation
X(I) -Planned Task Initiation
X(C) - Planned Task Completion

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

DATE: February 1999

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605854F Pollution Prevention

PROJECT: 1007

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
1007 Pollution Prevention	5,322	5,144	2,553	2,566	2,695	2,757	2,814	2,873	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

For FY97-98 this program element funded pollution prevention efforts required to accomplish the objectives and subobjectives of the Air Force Pollution Prevention Strategy to include installation level programs at Air Force Material Command Major Range and Test Facility bases (Eglin, Arnold, and Edwards AFBs) and cross-cutting weapons systems pollution prevention tools. It also funded efforts to validate and qualify environmentally acceptable materials and processes to replace existing common hazardous materials and processes. The account provides funds for Class 0 (recurring work to keep the gates open) and Class 1 (work required to eliminate dependence on ozone depleting chemicals, work to correct current non-compliance with federal, state or local environmental laws, and work required to satisfy pollution prevention Executive Orders). Typical services and projects included: eliminating ozone depleting chemicals and hazardous materials; reducing the generation of hazardous waste, air emissions, and solid wastes; establishing and operating recycling and composting programs; and establishing and operating hazardous material pharmacies and centralized hazardous material tracking programs.

Beginning in FY99, all funds for Test Facility base operations support (RDT&E) were transferred to operations and maintenance. Remaining RDT&E funds are for development and test efforts to validate and qualify environmentally acceptable materials and processes to replace existing common hazardous materials and processes, cross-cutting weapons systems pollution prevention tools, and management and support costs in direct support of development efforts to meet compliance problems.

For FY00-01, funds will be used to target efforts that demonstrate and validate alternative aircraft painting/depainting, maintenance processes which reduce the compliance burden associated with National Emissions Standard for Hazadous Air Pollutants(NESAAP), Clean Air Act and other environmental requirements. Specifically, funds will target pollution prevention technologies, including replacement of chromate conversion coating on aluminum and magnesium based metals, nonchromated primers to replace zinc chromate, and environmentally safe replacement for cadmium plating.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605854F Pollution Prevention
	PROJECT 1007

(U) FY 1998 ($ in Thousands):

–	(U) $	516	Manpower and Education and Training
–	(U) $	692	Class 0 Projects: Opportunity assessments, contractor support, management action plan updates, computer support, hazardous material pharmacy supplies and equipment, and community awareness activities.
–	(U) $	183	Resource Conservation and Recovery Act (RCRA) Subtitle C - Hazardous Waste
–	(U) $	43	Resource Conservation and Recovery Act (RCRA) Subtitle D - Solid Waste
–	(U) $	129	Clean Air Act
–	(U) $	11	Clean Water Act
–	(U) $	636	Hazardous Material Reduction
–	(U) $	44	Other
–	(U) $	3,068	Class I Dem/Val Projects: Validation and qualification of commercially available material, equipment, and processes to support the Montreal Protocol and Air Force Pollution Prevention Strategy objectives and subobjectives in accordance with the Environmental Research and Development Strategic Plan. The demonstration/validation phase is system specific and includes advanced technology demonstrations that help expedite technology transition from the laboratory to operational use to meet compliance problems
–	(U)$	5,322	Total

(U) FY 1999 ($ in Thousands):

–	(U) $	294	Resource Conservation and Recovery Act (RCRA) Subtitle C - Hazardous Waste
–	(U) $	75	Resource Conservation and Recovery Act (RCRA) Subtitle D - Solid Waste
–	(U) $	294	Clean Air Act
–	(U) $	100	Clean Water Act
–	(U) $	621	Hazardous Material Reduction
–	(U) $	160	Identified as a source for SBIR
–	(U) $	100	Other
–	(U) $	3,500	Dem/Val of Advanced Low Pollution Coating Technologies
–	(U) $	5,144	Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605854F Pollution Prevention
	PROJECT 1007

(U) FY 2000 ($ in Thousands):

- (U) $ 405 Resource Conservation and Recovery Act (RCRA) Subtitle C - Hazardous Waste
- (U) $ 262 Resource Conservation and Recovery Act (RCRA) Subtitle D - Solid Waste
- (U) $ 837 Clean Air Act
- (U) $ 235 Clean Water Act
- (U) $ 549 Hazardous Material Reduction
- (U) $ 265 Other
- (U) $ 2,553 Total

(U) FY 2001 ($ in Thousands):

- (U) $ 418 Resource Conservation and Recovery Act (RCRA) Subtitle C - Hazardous Waste
- (U) $ 262 Resource Conservation and Recovery Act (RCRA) Subtitle D - Solid Waste
- (U) $ 837 Clean Air Act
- (U) $ 235 Clean Water Act
- (U) $ 549 Hazardous Material Reduction
- (U) $ 265 Other
- (U) $ 2,566 Total

(U) B. Budget Activity Justification:

This program is in Budget Activity 6, Management and Support, because the majority of funding is directed toward support of test facilities required for general research and development use. Beginning in FY99, all O&M funds for test facility operations were transferred to O&M accounts. Action to change to BA 4, Demonstration and Validation, is on-going, because the remaining funds in this account are primarily for RDT&E dem/val of pollution prevention technologies.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY: 6 - Management and Support	PE NUMBER AND TITLE: 0605854F Pollution Prevention / PROJECT: 1007

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY1999 PB)	9,251	1,673	2,600	2,615	TBD
(U) Appropriated Value	9,880	5173			
(U) Adjustments to Appropriated Value					
a. Congressional General Reductions	-441	-29			
b. SBIR	-188				
c. Omnibus or Other Above Threshold Reprogram	-3929				
d. Below Threshold Reprogramming					
Adjustments to Budget Years since FY1999 PB			-47	-49	
(U) Current Budget Submit/FY 2000 President's Budget	5,322	5,144	2,553	2,566	TBD

FY1999: $160 identified as a source for SBIR.

(U) Significant Program Changes:

A $3.869M FY98 realignment of RDT&E (3600) funds to O&M (3400) funds was accomplished in support of the Installation Restoration Program (IRP). FY98 Congress added $4.0M (less general reductions) to program element 0605854F in support of a computerized ground water monitoring system. DoD policy requires 3400 (O&M) Environmental Restoration Funds be used for this requirement.

The change in FY99 is due to a $3.5M congressional add for Advanced Low Pollution Coating Technology Pollution Prevention Dem/Val efforts.

(U) D. Other Program Funding Summary ($ in Thousands) Not Applicable

(U) E. Acquisition Strategy: Not applicable

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605854F Pollution Prevention PROJECT 1007

(U) F. Schedule Profile All funds except for the Congressional Add are associated with many projects in other acquisition (appropriations) programs, thus management of project schedules is not accomplished within this PE. These funds are used to ensure pollution prevention applications are developed during other Air Force acquisition programs. The schedule for the new congressional add, $3.5M Advanced Low Pollution Coating Technology dem/val efforts, is as follows:

	FY99/QTR				FY00/QTR			
	1	2	3	4	1	2	3	4
(U) Contract Award of ALPCT Efforts				X				
(U) Prototype Development					X			
(U) Demonstration/Validation						X	X	
(U) Contract Completion								X

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

DATE: February 1999

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605860F Rocket System Launch Program (Space)

PROJECT: 1023

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
1023 Rocket System Launch Program (RSLP)	26,163	14,496	7,913	7,976	8,083	8,230	8,402	8,577	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

(U) Rocket System Launch Program (RSLP) is tasked to provide Research, Development, Test and Evaluation (RDT&E) launch vehicle support to DoD and other government agencies using excess ballistic missiles assets. RSLP mission was established by the Secretary of Defense in 1972. It provides mission planning, payload integration, launch support, booster storage and disposal, maintenance and logistics support for selected DoD RDT&E launches. Costs directly attributable to a specific launch or program are paid by the user (Air Force, Navy, Army, Ballistic Missile Defense Organization (BMDO), etc.). RSLP directly supports deactivation of Minuteman II by providing storage of these and other assets. RSLP performs research and development support operations required for general rocket system launch research and development use.

(U) FY 1998 ($ in Thousands):

- (U) $6,013 Provided storage and refurbishment of deactivated Minuteman and other missile flight test assets.
- (U) $1,821 Performed annual aging surveillance-related activities on stored motors; performed analyses/studies and evaluated potential safety-related issues affecting stored motors.
- (U) $18,329 Continued development of atmospheric interceptor technology (AIT).
- (U) $0 Provided launch assets and technical assistance for DoD RDT&E launches. (Funded by users.)
- (U) $26,163 Total

(U) FY 1999 ($ in Thousands):

- (U) $6,023 Continue storage and refurbishment of deactivated Minuteman and other missile flight test assets.
- (U) $1,842 Continue performing aging surveillance-related activities on stored motors; continue performing analyses/studies to identify and evaluate potential safety-related issues affecting stored motors.
- (U) $6,513 Perform Advanced Solid Axial Stage (ASAS) development and related activities.
- (U) 118 Identified as a source for SBIR
- (U) $0 Continue providing launch assets and technical assistance for DoD RDT&E launches. (Funded by users.)
- (U) $14,496 Total

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	PROJECT 1023

(U) FY 2000 ($ in Thousands):

- (U) $6,157 Continue storage and refurbishment of deactivated Minuteman and other missile flight test assets.
- (U) $1,756 Continue performing aging surveillance-related activities on stored motors; continue performing analyses/studies to identify and evaluate potential safety-related issues affecting stored motors.
- (U) $0 Continue providing launch assets and technical assistance for DoD RDT&E launches. (Funded by users.)
- (U) $7,913 Total

(U) FY 2001 ($ in Thousands):

- (U) $6,228 Continue storage and refurbishment of deactivated Minuteman and other missile flight test assets.
- (U) $1,748 Continue performing aging surveillance-related activities on stored motors; continue performing analyses/studies to identify and evaluate potential safety-related issues affecting stored motors.
- (U) $0 Continue providing launch assets and technical assistance for DoD RDT&E launches. (Funded by users.)
- (U) $7,976 Total

(U) B. Budget Activity Justification: This program is in Budget Activity 6 - Management and Support because RSLP provides research and development effort and/or operations support for general research and development use.

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY 1999 PB)	26,348	7,865	8,057	8,128	Continuing
(U) Appropriated Value	28,013	14,865			
(U) Adjustments to Appropriated Value					
a. Cong Gen Reductions	-1,006	-369			
b. SBIR	-659				
c. Omnibus or Other Above Threshold Reprogram	-181				
d. Below Threshold Reprogramming	-4				
(U) Adjustments to Budget Years Since FY 1999 PB			-144	-152	
(U) Current Budget Submit/FY 2000 PB	26,163	14,496	7,913	7,976	Continuing

NOTE: In FY99, $118 identified as a source for SBIR.

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BUDGET ACTIVITY **6 - Management and Support**	PE NUMBER AND TITLE **0605860F Rocket System Launch Program (Space)**
	PROJECT **1023**

(U) Significant Program Changes: $7M was appropriated in FY99 above the request for Advanced Solid Axial Stage (ASAS) development and related activities. FY98 reprogramming and FY00/01 adjustments funded higher Air Force and DOD priorities.

(U) D. Other Program Funding Summary ($ in Thousands): None.

(U) E. Acquisition Strategy: Not applicable.

(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) Storage/Refurbishment (On-Going)																
(U) Aging Surveillance (On-Going)																
(U) Flight Tests (AIT Project)					*			X								
(U) ASAS Hot Firing									X							

* - Completed Event
X - Planned Event

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

DATE: February 1999

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605864F Space Test Program (Space)

PROJECT: 2617

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
2617 Free-Flyer Spacecraft Missions	0	45,439	51,658	49,389	48,504	54,162	55,290	56,442	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

Note: This is not a new start. Space Test Program (Space) PE 0603402F changes to PE 0605864F in FY99 to more accurately reflect its function. Prior year funding is in PE 0603402F.

(U) A. Mission Description

(U) The Space Test Program (STP) conducts space test missions to fly the maximum number of DoD experiments consistent with priority, opportunity, and funding. STP supports the DoD space research community by centrally financing acquisition of a host satellite or launch vehicle, the launch, and initial operations costs for experiments with military relevance whose scope ranges from basic research to advanced development. STP missions are the most cost effective way to flight test new space systems technologies, concepts and designs, providing an inexpensive way to:

- Demonstrate the feasibility of new space systems and technologies
- Improve operational design by characterizing the space environment, event, or sensor physics proposed for an operational system/system upgrade
- Provide early operational capabilities to evaluate usefulness or quickly react to new developments
- Perform operational risk reduction through direct flight test of prototype components
- Develop the knowledge base from which to plan new and improved operational systems and system upgrades
- Develop and test advanced small launch vehicle technology and capabilities

(U) This DoD program provides the primary spaceflight capability to perform fly-before-buy, risk-reducing demonstrations of advanced technologies in operational space environments. The Secretary of Defense issued a policy statement in November 1995 reaffirming STP's role as the primary provider of spaceflight for the entire DoD space research community. The Air Force requires a stable funding level and the flexibility necessary to take advantage of whatever means of spaceflight is deemed to be most cost effective for a given experiment or complement of experiments. This flexibility is essential to take advantage of inexpensive "target of opportunity" space hardware, including operational spacecraft, where margin is usually firmly identified during the later stages of spacecraft development. This assures that the greatest amount of DoD space research is accomplished with the limited funds available. This funding provides DoD's most successful and cost-effective capability to launch and test new technologies prior to their incorporation into our nation's very expensive and demanding operational space systems. Insufficient funding would force each of the Services and DoD agencies to create individual launch capabilities in an attempt to duplicate STP's current low-cost, risk-mitigating capability. Such a redundancy would result in the loss of the contractual economy of scale that a single space test organization provides, as well as the filtering function of the DoD Space Experiments Review Board in assuring quality experiments and minimum duplication.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605864F Space Test Program (Space)
	PROJECT 2617

(U) FY 1998 ($ in Thousands):

–	(U) $ 0	Funding is in 0603402F

(U) FY 1999 ($ in Thousands):

–	(U) $ 8,858	Piggyback/secondary payload missions, mission planning, Aerospace Corp support, mission and program support
–	(U) $ 3,060	Space Shuttle payload engineering, analysis, pre- and post-launch processing, and launch support
–	(U) $ 8,540	Initiate space experiment missions from 1999 SERB list, reusable upper stage/bus development, C/NOFS
–	(U) $23,582	Continue STP medium-class launch vehicle missions-Coriolis, TSX-5 and ARGOS launch/operations, Multi-spectral Thermal Imager (MTI)
–	(U) $ 1,399	Identified as a source for SBIR
–	(U) $45,439	Total

(U) FY 2000 ($ in Thousands):

–	(U) $ 9,499	Piggyback/secondary payload missions, mission planning, Aerospace Corp support, mission and program support
–	(U) $ 3,100	Space Shuttle payload engineering, analysis, pre- and post-launch processing, and launch support
–	(U) $ 2,578	Initiate space experiment missions from 2000 SERB list
–	(U) $36,481	Continue space experiment missions from 1999 and prior SERB lists-Coriolis, C/NOFS, ARGOS and TSX-5 operations
–	(U) $51,658	Total

(U) FY 2001 ($ in Thousands):

–	(U) $ 9,320	Piggyback/secondary payload missions, mission planning, Aerospace Corp support, mission and program support
–	(U) $ 3,200	Space Shuttle payload engineering, analysis, pre- and post-launch processing, and launch support
–	(U) $14,619	Initiate space experiment missions from 2001 SERB list
–	(U) $22,250	Continue space experiment mission from 2000 and prior SERB lists-C/NOFS
–	(U) $49,389	Total

Note: Funding reflects current (Coriolis, ARGOS, TSX-5, MTI) and new (C/NOFS) missions. New missions and funding priorities evolve as spaceflight opportunities,
budget, and DoD experiment rankings change.

(U) B. Budget Activity Justification: STP is in Budget Activity 6 RDT&E Management and Support because it supports RDT&E satellite launches.

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	PROJECT 2617

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY1999 PB)	0	45,933	55,099	56,520	Continuing
(U) Appropriated Value		45,933			
(U) Adjustments to Appropriated Value					
a. Cong Gen Reductions		-494			
b. SBIR					
c. Omnibus or Other Above Threshold Reprogram					
d. Below Threshold Reprogramming					
(U) Adjustments to Budget Years Since FY1999 PB			-3,441	-7,131	
(U) Current Budget Submit/FY2000 PB	0	45,439	51,658	49,389	Continuing

(U) Significant Program Changes:
(U) Two STP satellites were scheduled to launch on the Evolved Expendable Launch Vehicle (EELV) in FY02; one was redirected to fly on a Titan II launch vehicle, the second launch vehicle was canceled to pay higher Air Force priorities.
(U) Additional reductions in FY 2000-2002 for higher Air Force priorities delay the Communication/Navigation Outage Forecasting System (C/NOFS) mission 6-18 months, cancel one space control demonstration, and delay another space control new start by 12 months.
(U) FY99 $1,399 identified as a source for SBIR
(U) Space Test Program (Space) is funded in PE 0605864F starting in FY99. Prior year funding is in PE 0603402F.

(U) D. Other Program Funding Summary ($ in Thousands): Not Applicable

Related RDT&E:
(U) PE 0305119F, Medium Launch Vehicles
(U) PE 0305144F, Titan Space Boosters
(U) PE 0305953F, Evolved Expendable Launch Vehicle
(U) PE 0603402F, Prior year STP funding

Experiments are funded by many Science and Technology (S&T) PEs in Air Force, Army, Navy, DARPA, BMDO, DoE, NASA, and other programs.

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BUDGET ACTIVITY: 6 - Management and Support	PE NUMBER AND TITLE: 0605864F Space Test Program (Space) / PROJECT: 2617

(U) E. Acquisition Strategy

(U) Various service laboratories and DoD agencies justify, develop, finance, and deliver the space research experiments supported by STP. These experiments have a common goal to improve DoD's current and future operational space systems' performance. The DoD Space Experiments Review Board (SERB), an independent board composed of Air Force, Army, Navy, NRO, BMDO, and other representatives, annually prioritizes experiments for spaceflight. The Board gives the prioritized list of experiments to STP, who then seeks out the most cost-effective means of spaceflight to maximize the number of experiments flown within the constraints of priority, opportunity and available funding. The most common spaceflight opportunities include piggybacking on military or commercial satellites and using the various payload modes of the Space Shuttle and International Space Station. For experiments with requirements that cannot be satisfied with these "secondary" opportunities, STP procures dedicated spacecraft and launch vehicle hardware within the constraints of available funding and according to experiment requirements. These include small and medium launch vehicle-class satellites, as well as small launch vehicle-class boosters (such as Pegasus XL, Taurus, and Athena). Medium launch vehicle-class boosters from PE 35119F, PE 35144F, and PE 35953F provide medium launch as required. If a service fails to adequately fund a particular experiment, if STP deems the experiment impractical to fly, or if the appropriate spaceflight opportunity becomes unavailable, STP shifts remaining resources to provide spaceflight support for the next highest priority experiment.

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DATE: February 1999

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605864F Space Test Program (Space)

PROJECT: 2617

(U) F. Schedule Profile These are anticipated launch dates. (Current projection. Schedule evolves as spaceflight opportunities, budget, and DoD experiment rankings change).

	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) STS-88 - MightySat 1, SIMPLEX					*											
(U) STS-95 CRYOTSU, MSX, MEMS, CCM-A, PANSAT, SIMPLEX, TASBE					*											
(U) ARGOS (Delta II)- ESEX, USA, GIMI, CIV, SPADUS, HIRAAS, HTSSE II, EUVIP, CERTO (P91-1)						*										
(U) STS-93 STL-B, CCM-C, MSX, LFSAH, SIMPLEX, MEMS						X										
(U) TSX-5 (Pegasus XL)- STRV II, CEASE (P95-2)							X									
(U) STS-96** - TBD							X									
(U) POGS-II (S92-1)								X								
(U) CHAWS-LD** (OSP) (S99-1)								X								
(U) PICOSat (TBD LV)- PBEX, IOX, CERTO, OPPEX (P97-1)									X							
(U) MTI/HXRS** (Taurus) (P97-3)									X							
(U) CEASE, CERTO PLUS (STRV1 C/D) (S97-1, S97-2)									X							
(U) SINDRI/MightySat II.1** (TBD LV) (P99-1)										X						
(U) ISS-13A** ACESE															X	
(U) ISS-15A** CREAM																X
(U) Coriolis** (Titan II) (P98-2)																1QFY02
(U) C/NOFS** (TBD LV) (P99-a)																3QFY02

* = completed event
X = planned event
**New spaceflight opportunity since FY99PB

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

DATE: February 1999

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 1001004F International Activities

PROJECT: 4645

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
4645 International Cooperative Research & Development	3,567	3,598	3,750	3,807	3,857	3,896	3,978	4,060	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

The mission of this program is to gain access to our Allies' best defense technologies, eliminate costly duplication of research and development efforts, accelerate availability of defense systems, and to deploy and sustain common or interoperable USAF and Allied equipment through international cooperative research and development.

The USAF is party to multiple international cooperative agreements to solve common US and Allied military scientific and technological problems and to develop materiel solutions to harmonize coalition requirements. This program funds the Department of the Air Force to support, develop, process, negotiate, implement, and manage these international cooperative agreements and projects in compliance with statutory reporting provisions and exacting legal statutes, fiscal constraints, technology transfer controls, intellectual property rights, third party transfer provisions, quid-pro-quo criteria, industrial base factors, and political-military interests. Included in this budget are domestic and international technology assessment teams; specialized working groups; long-term technology project developments; support for cooperative opportunity assessments; developing, processing, and negotiating international agreements; oversight of International Cooperative Research and Development (ICR&D) projects; overseas R&D liaison and coordination offices; bilateral and multilateral staff talks; and the Engineering and Scientist Exchange Program (ESEP). Funds US participation in the NATO Air Force Armaments Group (NAFAG) and NATO Research and Technology Organization (RTO).

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY: 6 - Management and Support	PE NUMBER AND TITLE: 1001004F International Activities / PROJECT: 4645

(U) FY 1998

- (U) $110 **NATO C3 Agency (NC3A)** - Funded the US R&D Coordination Office and administrative support for the assigned US Engineering and Technical professionals and cooperative research and development activities assigned to the NC3A.
- (U) $253 **Engineer and Scientist Exchange Program (ESEP)** - Funded the Air Force execution and the management oversight of ESEP. Funded approximately nine field level military and civilian scientists from Air Force Research Laboratory, in two year tours at selected European and Asian Government Research Laboratories or other Technical Institutions. ESEP Memoranda of Understanding are in place with 16 countries.
- (U) $1,040 **International Cooperative Research and Development (ICR&D)** - Funded USAF overseas R&D liaison offices. Funded management support and oversight of USAF Foreign Comparative Test Program and NATO Cooperative R&D Program. Funded USAF participation at the NATO Four-power Council, NATO Air Force Armaments Group (NAFAG), and its six subgroups to promote NATO harmonization of requirements, standardization, and new cooperative R&D programs. Funded USAF participation at the US-Japan Systems and Technology Forum, its four sub-groups and the USAF participation in international Continuous Acquisition Lifecycle Support (CALS). Funded expanded technology acquisition contracts and follow-on cooperative opportunities with Russia, Ukraine, and Eastern Europe. Partially funded technical assessments and international agreements negotiation start-up costs associated with promising cooperative R&D programs. Funded preliminary and negotiation costs associated with USAF AWACS NATO cooperative R&D funded programs and support for the NATO AWACS Board of Directors. Funded International Cooperative Opportunities Group (ICOG) efforts to harmonize Four-power requirements and initiate agreements to explore these opportunities.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 1001004F International Activities
	PROJECT 4645

– (U) $268 **Air Force International Program Support Agency (AFIPSA)** - Fully funded AFIPSA and USAF to process proposals for International Cooperative R&D Agreements. The following is a list of candidate agreements that were either signed or under development in FY98: **Argentina**: Seismic and Infrasonic Monitoring Agreement, Environmental Technologies, **Australia**: Air Breathing Propulsion Technology, Project Refractive Turbulence, Navigation Warfare, Aging Aircraft Life Prediction/Extension, High Altitude Endurance Unmanned Aerial Vehicle Cooperative Development and Technical Demonstration; **Bolivia**: Seismic Monitoring Agreement; **Botswana**: Seismic Monitoring Agreement; **Brazil**: Ionospheric Experiments, Engineer and Scientist Exchange Program (ESEP), External Stores Flight Testing Methods and Techniques, Seismic and Infrasonic Monitoring Agreement; **Central African Republic**: Seismic Monitoring Agreement; **Chile**: Ionospheric Research Project, Infrasonic Monitoring Agreement; **China**: Seismic Monitoring Agreement; **Cote D'Ivoire**: Seismic Monitoring Agreement; **Egypt**: Seismic Monitoring Agreement, TRDP; **Ethiopia**: Seismic Monitoring Agreement; **Four Powers**: Air Refueling Technologies, Precision Airdrop Improvements; **France**: Effects of the Ionosphere on Communications and Surveillance Systems, Cooperative Development and Evaluation of Ducted Rockets, Advanced Oscillators, Long Range Missile Guidance Inertial Sensors, Advanced Resonators and Oscillators, Advanced Combustor Chamber Concepts Program, Integrated Tactical Aircraft Control Program; **Germany**: Observations and Modeling for Space Weather, Cooperative Space Measurements, Hard Target Defeat Technologies, ESEP, Infrasonic Monitoring Agreement; **Israel**: Nonlinear Frequency Conversion Materials, Thulium-Holmium Energy Transfer Modeling; **Italy**: Technology Research and Development Projects; **Japan**: ESEP, Advanced Hybrid Tactical Propulsion, Advanced Crew Ejection Seat (ACES-II), Robotics; **Kazakstan**: Seismic Monitoring Agreement; **Korea**: Seismic Monitoring Agreement, Modeling and Simulation of Multichip Avionics; **Morocco**: Seismic Monitoring Agreement; **NATO/Multilateral**: Exchange of Research & Development Information, Subminiature Data Acquisition and Telemetry Systems, Joint Airborne Navigation and Attack Technology Demonstration Program, Joint Strike Fighter Requirement Validation Cooperation, NATO AEW&C Mid-term Modernization, NATO Joint Stars Cooperative Acquisition Program, Environmental Effects of Component & Equipment Reliability, Air Command/ Control/Communication and Intelligence Capabilities, Trilateral Technology R&D Program, Multiple Warhead System, Effects on Global Positioning Systems, Agent Defeat Weapon; **Namibia**: Infrasonic Monitoring Agreement; **The Netherlands**: Anthropometric Accommodation in Crew Systems; **New Zealand**: Infrasonic Monitoring Agreement; **Norway**: ESEP; **Oman**: Seismic Monitoring Agreement; **Pakistan**: Seismic Monitoring Agreement; **Paraguay**: Seismic Monitoring Agreement; **Poland**: ESEP; **South Africa**: Seismic Monitoring Agreement; **Sweden**: Automatic Ground Collision Avoidance for Fighter Aircraft, Administrative and Professional Exchange Program; **Turkey**: Seismic Monitoring Agreement; **Turkmenistan**: Seismic Monitoring Agreement; **United Kingdom**: Air Worthiness of Aging Aircraft, Non-Acoustic Technologies, Aero Engine Altitude Testing, Development and Production of a Directional Infrared Countermeasures System, Weather Impact Decision Aids, Cosmic Radiation Environment and Activation Monitor, Air Battle Management, Metal Matrix Composites for Aerospace Applications, Joint Development and Evaluation of Electro-Optic Protection Measures, Active Control Technology and Aircraft Flying Qualities for Military Aircraft, Flight Simulation of Combat Aircraft Sensors, Visual Scenes, and Motion, Covert All Weather Landing Guidance Technology.

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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 1001004F International Activities
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–	(U) $500	**NATO Research & Technology Organization (RTO) -** Funded US National Delegates participation in the NATO R&T Board and USAF, industry, and academia participation in the RTO aerospace related panel activity. The FY98 program of work consisted of studies, technical exchanges, and reports in the following areas: (1) Presentation of the Probable Changes in Information Management and Technology, (2) Hypersonic Experimental and Computational Capabilities, (3) Aeromedical Support issues in Contingency Operations, (4) Advanced Aerodynamic Measurement Technology, (5) Virtual Manufacturing, (6) Numerical Unsteady Aerodynamics and Aeroelastic Simulation, (7) Thermal Barrier Coatings, (8) Advances in Soft Computing Technologies Application in Mission Systems, (9) Effect of Rain, Icing and Deicing Systems on Wing Performance, (10) Turbulence in Compressible Flows, (11) Flight Test Instrumentation, (12) Current Concepts and New Developments in Impact and Escape System Dummy Specifications and Instrumentation, (13) Structural Optimization. Continues Partnership for Peace initiative through the R&T outreach program incorporating new scientists and engineers from Central Europe.
–	(U) $1,396	**AFMC -** Fully funded Air Force Materiel Command activities to identify, assess, develop and report International Cooperative Agreements as required by statute for new and existing projects. Supported Materiel Command activities for the USAF Foreign Comparative Test, and NATO Cooperative R&D Programs. Funded USAF participation in panel meetings of the Technical Cooperation Program, Air Standardization Coordinating Committee, Standard NATO Agreements Working Groups, and other NATO forums. Funded periodic bilateral meetings to define new areas of possible cooperation, and exploratory visits to France, Germany, Israel, United Kingdom, Canada, and other countries on new technology exchange projects. Funded the project engineers at centers and Air Force Research Laboratory (AFRL) in identifying, creating and staffing new international cooperative agreements. Funded MAJCOM staff to support and promote international research and development cooperation throughout AFMC. Funded support for the Air force Technology Booth at International Forums. Funds small contracts in support of technology initiatives. This program funded the support, management and documentation of these ICR&D efforts.
–	(U) $3,567	Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 1001004F International Activities
	PROJECT 4645

(U) FY 1999

– (U) $110 **NATO C3 Agency (NC3A) -** Funds the US R&D Coordination Office and administrative support for the assigned US Engineering and Technical professionals and cooperative Research and Development activities assigned to the NATO C3 Agency.

– (U) $253 **ESEP** - Funds the Air Force execution and the management oversight of ESEP. Funds approximately eight field level military and civilian scientists from Air Force Research Laboratory, Product Centers, Test Centers and Air Logistics Centers in two year tours at selected European and Asian Government Research Laboratories or other Technical Institutions. ESEP Memoranda of Understanding expected to be in place with 18 countries.

– (U) $1,256 **ICR&D** - Funds USAF overseas R&D liaison offices. Funds management support and oversight of USAF Foreign Comparative Test Program and NATO Cooperative R&D Program. Funds USAF participation at the NATO Four-power Council, NAFAG, and its subgroups to promote NATO harmonization of requirements, standardization, and new cooperative R&D programs. Funds USAF participation at the US-Japan Systems and Technology Forum, its four sub-groups and USAF participation in international CALS. Funds expanded technology acquisition contracts and follow-on cooperative opportunities with Russia, Ukraine, and Eastern Europe. Partially funds technical assessments and international agreements negotiation start-up costs associated with promising cooperative R&D programs. Funds USAF portion of the DoD international Agreements Management System. Funds preliminary and negotiation costs associated with USAF NATO cooperative R&D funded programs and support for the NATO AWACS Board of Directors. Funds International Cooperative Opportunities Group (ICOG) efforts to harmonize Four-power requirements and initiate agreements to explore these opportunities.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY: 6 - Management and Support	PE NUMBER AND TITLE: 1001004F International Activities / PROJECT: 4645

– (U) $269 **AFIPSA** - Fully funds AFIPSA and USAF to process proposals for International Cooperative R&D Agreements. Work will continue on agreements developed during FY98 but not signed and work will be initiated on the following and other new agreements: **Argentina**: Seismic and Infrasonic Monitoring; **Australia**: Air Breathing Propulsion Technology; Data Fusion for over the Horizon Radar, Detection and Tracking of Targets in Clutter, Structural Integrity of Aging Aircraft, Air Command, Control, Communications and Intelligence (C3I) Capabilities, Virtual Air Commander, Refractive Turbulence; **Bolivia**: Seismic Monitoring; **Brazil**: Materials, Structures and Non-Destructive Evaluation, Seismic Monitoring, ESEP; **Central African Republic**: Seismic Monitoring; **Chile**: Ionoshperic Research, Infrasonic Monitoring; **Canada**: Space Based Surveillance and Space Systems, Imaging Spectrometer, TRDP; **Czech Republic**: ESEP; **Egypt**: TRDP, Nuclear Test Seismic Monitoring Array; **Ethiopia**: Seismic Monitoring; **Four Powers**: Distributed Simulation Technologies, Unmanned Air Vehicles for Offensive Missions, Aging Aircraft, Air Refueling Technologies; France: Effects of Ionosphere on Communications and Surveillance; **Germany**: Cooperative Space Measurements, Observations and Modeling for Space Weather, Non-Linear Optics, Head Mounted Display; **Israel**: Aircraft and Battle Damage Repair; **Italy**: ESEP, Real-Time Information in the Cockpit, TRDP; **Japan**: ESEP; **Korea**: , Seismic Monitoring, Three Dimensional (3D) Integrated Circuits, Modeling and Simulation of C3I Systems; **LTTP**: Coalition Command Control and Communications Demonstration Environment; **NATO/Multilateral**: C-130 Integrated Data Environment, Joint Airborne Navigation and Attack (JOANNA) II, Laser Radiation and Material Interaction; **Netherlands**: Vacuum and Solid State Electronics and high Voltage/Current Power Supply; **Norway**: ESEP, Toxic Effects of Jet Fuels; **Paraguay**: Seismic Monitoring; **Poland**: ESEP; **Sweden**: ESEP, Command and Control; **Turkey**: Seismic Monitoring; **South Africa**: Seismic Monitoring; **United Kingdom**: Effects of Ionization of Hydrocarbon-Air combustion, Effects of Meteor Metals on Communication and Guidance, PIOS Phase II/III, Mass and Performance Estimation Methodology, Turbine Engine Technology, Wind Tunnel Testing, Weather Impact Design Aids, Flight Simulation for Combat Research and Training, Multiple Event Hard Target Fuse.

– (U) $250 **NATO Research and Technology Organization (RTO)** - Funds USAF participation in the NATO Research and Technology Board and RTO panel activity. The FY99 program of work will consist of studies, technical exchanges, and reports in the following areas: (1) Computational Unsteady Aerodynamic Codes, (2) Multi-facility Wind Tunnel Testing for CFD Validation, (3) Deterministic Spectral Gust Methods, (4) Screening Protocol for Aeromedical Medications, (5) Human Consequences of Superagility, (6) Aeromedical Lessons from Acceleration and Positive Pressure Breathing Research, (7) Aircraft Weapon Compatibility, (8) Flight Control law Development, (9) Ice Accretion and Simulation Evaluation test, (10) Nonlinear Stability and Transition of Swept-Wing Boundary layers, (11) Sensor data Fusion and Integration of Human Element, (12) Integrated Mission Systems Concepts, (13) Gas Turbine Engine Combustion, Emissions and Alternative Fuels, (14) Aging and Surveillance of Solid Gun Propellants, (15) Frequency Assignment, Sparing and Conservation. Continues Partnership for Peace initiative through the R&T outreach program with scientists and engineers from the Former Soviet Union and Central Europe.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 1001004F International Activities
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– (U) $1,425	**AFMC** - Fully funds Air Force Materiel Command activities to identify, assess, develop, and report International Cooperative Agreements as required by statute for new and existing projects. Supports Materiel Command activities for the USAF Foreign Comparative Test, and NATO Cooperative R&D Programs. Funds USAF participation in panel meetings of The Technical Cooperation Program, Air Standardization Coordinating Committee, NATO Working Groups, and other NATO forums. Funds periodic bilateral/multilateral meetings to define new areas of possible cooperation and exploratory visits to France, Germany, Israel, United Kingdom, Canada, and other countries on new technology exchange projects. Funds the project engineers at centers and AFRL in identifying, creating and staffing new international cooperative agreements. Funds MAJCOM staff to support and promote international research and development cooperation throughout AFMC. Funds support for the Air Force Technology Booth at International Forums. Funds small contracts in support of technology initiatives. This program will, in addition, fund the support, management and documentation of these ICR&D efforts.
– (U) $35	Identifed as source for SBIR
– (U) $3,598	Total
(U) FY 2000	
– (U) $281	**ESEP** - Funds the Air Force execution and the management oversight of ESEP. Funds approximately ten field level military and civilian scientists from Air Force Research Laboratory, Product Centers, Test Centers and Air Logistics Centers in two year tours at selected European and Asian Government Research Laboratories or other Technical Institutions. ESEP Memoranda of Understanding expected to be in place with 20 countries.
– (U) $1,450	**ICR&D** - Funds USAF overseas R&D liaison offices. Funds management support and oversight of USAF Foreign Comparative Test Program and NATO Cooperative R&D Program. Funds USAF participation at the NATO Four-power Council, NAFAG, and its subgroups to promote NATO harmonization of requirements, standardization, and new cooperative R&D programs. Funds USAF participation at the US-Japan Systems and Technology Forum, its four sub-groups and USAF participation in international CALS. Funds expanded technology acquisition contracts and follow-on cooperative opportunities with Russia, Ukraine, and Eastern Europe. Partially funds technical assessments and international agreements negotiation start-up costs associated with promising cooperative R&D programs. Funds continued development/ upgrades to the DoD International Agreements Management System. Funds preliminary and negotiation costs associated with USAF NATO cooperative R&D funded programs and support for the NATO AWACS Board of Directors. Funds International Cooperative Opportunities Group (ICOG) efforts to harmonize Four-power requirements and initiate agreements to explore these opportunities.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY: 6 - Management and Support	PE NUMBER AND TITLE: 1001004F International Activities / PROJECT: 4645

– (U) $344	**AFIPSA** - Fully funds AFIPSA and USAF for processing the rapidly increasing number of proposals for International Cooperative R&D. Work will continue on agreements developed, but not signed, during FY99 and work will be initiated on the following areas of interest and others resulting from prior year technology assessments: **Asia**: Unmanned Aerial Vehicles, Early Warning Systems, Theater Missile Defense, Satellites, Command, Control, Communication, Computer, Information and Intelligence, Effects on Global Positioning Systems; **Europe**: Distributed Simulation Technology, Unmanned Aerial Vehicles, Aging Aircraft, Programmable Integrated Ordinance Suite, Agent Defeat Weapon, Joint Targeting Tool, Satellites, Space, Environmental Issues; **Middle East**: Intelligence, Sensors, Monitoring of Chemical/Biological Warfare; **Central and South America**: Monitoring of Chemical/Biological Warfare, Satellites, Space, Environmental Issues.
– (U) $225	**NATO Research and Technology Organization (RTO)** - Funds USAF participation in the NATO Research and Technology Board and RTO panel activity. The FY00 program of work will consist of studies, technical exchanges, and reports in the following areas: (1) Application of Unmanned Air Vehicles, (2) System Concepts for Targets and Camouflage and Decoys, (3) High Power Microwaves, (4) Electronic Warfare Warning Systems, (5) Flight Test Measurement Techniques, (6) Electromagnetic Compatibility, (7) Hypersonic Propulsion, (8) Wind Tunnel Technology, (9) Screening for Aero Medical Medications, (10) Human Factors in Virtual Reality Applications. Continues Partnership for Peace initiative through the R&T outreach program with scientists and engineers from the former Soviet Union and Central Europe.
– (U) $1,450	**AFMC** - Fully funds Air Force Materiel Command activities to identify, assess, develop, and report International Cooperative Agreements as required by statute for new and existing projects. Supports Materiel Command activities for the USAF Foreign Comparative Test, and NATO Cooperative R&D Programs. Funds USAF participation in panel meetings of The Technical Cooperation Program, Air Standardization Coordinating Committee, NATO Working Groups, and other NATO forums. Funds periodic bilateral/multilateral meetings to define new areas of possible cooperation and exploratory visits to France, Germany, Israel, United Kingdom, Canada, and other countries on new technology exchange projects. Funds the project engineers at centers and AFRL in identifying, creating and staffing new international cooperative agreements. Funds MAJCOM staff to support and promote international research and development cooperation throughout AFMC. Funds support for the Air Force Technology Booth at International Forums. Funds small contracts in support of technology initiatives. This program will, in addition, fund the support, management and documentation of these ICR&D efforts.
– (U) $3,750	Total
(U) FY 2001	
– (U) $290	**ESEP** - Funds the Air Force execution and the management oversight of ESEP. Funds approximately ten field level military and civilian scientists from Air Force Research Laboratory, Product Centers, Test Centers and Air Logistics Centers in two year tours at selected European and Asian Government Research Laboratories or other Technical Institutions. ESEP Memoranda of Understanding are expected to be in place with 20 countries.

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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 1001004F International Activities
	PROJECT 4645

–	(U) $1,482	**ICR&D** - Funds USAF overseas R&D liaison offices. Funds management support and oversight of USAF Foreign Comparative Test Program and NATO Cooperative R&D Program. Funds USAF participation at the NATO Four-power Council, NAFAG, and its subgroups to promote NATO harmonization of requirements, standardization, and new cooperative R&D programs. Funds USAF participation at the US-Japan Systems and Technology Forum, its four sub-groups and USAF participation in international CALS. Funds expanded technology acquisition contracts and follow-on cooperative opportunities with Russia, Ukraine, and Eastern Europe. Partially funds technical assessments and international agreements negotiation start-up costs associated with promising cooperative R&D programs. Funds continued development/ upgrades to the DoD International Agreements Management System. Funds preliminary and negotiation costs associated with USAF NATO cooperative R&D funded programs and support for the NATO AWACS Board of Directors. Funds International Cooperative Opportunities Group (ICOG) efforts to harmonize Four-power requirements and initiate agreements to explore these opportunities.
–	(U) $360	**AFIPSA** - Fully funds AFIPSA and USAF to continue work on developing, processing, and negotiating the increasing number of cooperative programs by field activities. This will include completing agreements started in FY 00 and initiating new cooperation efforts resulting from prior year technology assessments.
–	(U) $200	**NATO Research and Technology Organization (RTO)** - Funds USAF participation in the NATO Research and Technology Board and RTO panel activity. The FY01 program of work will consist of studies, technical exchanges, and reports in the following areas: (1) Operational and Technical Studies and Analysis, (2) Modeling and Simulation, (3) Advanced System Concepts, Integration and Engineering Techniques Across the Spectrum of Platforms and Operating Environments, (4) Affordable Electronics, (5) Active and Passive Sensors, (6) Information Warfare Systems, (7) Communication and Networks, (8) Improved Performance, Affordability, and Safety of Vehicle, Platform, Propulsion, and Power Systems, (9) Optimize Performance, Health, Well Being and Safety of the Human in Operational Environments with consideration of Affordability. Continues Partnership for Peace initiative through the R&T outreach program with scientists and engineers from the former Soviet Union and Central Europe.
–	(U) $1,475	**AFMC** - Fully funds Air Force Materiel Command activities to identify, assess, develop, and report International Cooperative Agreements as required by statute for new and existing projects. Supports Materiel Command activities for the USAF Foreign Comparative Test, and NATO Cooperative R&D Programs. Funds USAF participation in panel meetings of The Technical Cooperation Program, Air Standardization Coordinating Committee, NATO Working Groups, and other NATO forums. Funds periodic bilateral/multilateral meetings to define new areas of possible cooperation and exploratory visits to France, Germany, Israel, United Kingdom, Canada, and other countries on new technology exchange projects. Funds the project engineers at centers and AFRL in identifying, creating and staffing new international cooperative agreements. Funds MAJCOM staff to support and promote international research and development cooperation throughout AFMC. Funds support for the Air Force Technology Booth at International Forums. Funds small contracts in support of technology initiatives. This program will, in addition, fund the support, management and documentation of these ICR&D efforts.
–	(U) $3,807	Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 1001004F International Activities
	PROJECT 4645

(U) B. Budget Activity Justification:

This program is in Budget Activity 6, Management and Support, because it provides for general Research & Development Management support for all aspects of International Research & Development in the USAF.

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget FY 1999 PB	3,591	3,752	3,818	3,880	
(U) Appropriated Value	3,715	3,752			
(U) Adjustments to Appropriated Value					
a. Congressional Reductions	-121	-154			
b. SBIR	-3				
c. Omnibus or Other Above Threshold Reprogram	-24				
d. Below Threshold Reprogramming					
(U) Adjustments to Budget Years Since FY 1999 PB			-68	-73	
(U) Current Budget Submit/FY2000 PB	3,567	3,598	3,750	3,807	

FY99: $35 has been identified as source for SBIR.

(U) Significant Program Changes:

(U) This program provides for USAF management oversight of the NATO Cooperative R&D funded by DoD (PE 603790D) and USAF (PE 603790F) and DoD funded Foreign Comparative Test (FCT) (PE 0605130D) programs. It also provides international agreement support for 6.1 through 6.3 programs for the Air Force Research Laboratory and for 6.4 through 6.5 programs for USAF Product and Logistics Centers.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 1001004F International Activities
	PROJECT 4645

(U) D. Acquisition Strategy:

This program element is the only source of USAF funds to identify and initiate opportunities for international armaments cooperation to (a) deploy and support common or interoperable equipment with our allies; (b) leverage USAF resources with our allies through cost sharing and economies of scale; and (c) exploit the best US and allied technologies for equipping coalition forces. We obtain these benefits only after international cooperative opportunities are identified, explored, developed, assessed and after the international agreements are negotiated and concluded. This PE provides funds to execute up-front armaments cooperation responsibilities, rationalize cooperative opportunities, assess allied technologies, and generate sound, cost-effective cooperative programs between the USAF and our international partners. Once these initiatives and programs are started as international efforts they are transferred to the appropriate technology or systems program office and are funded in their own program elements.

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

DATE: February 1999

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 1001004F International Activities

PROJECT: 4645

(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)																
-NATO C3 Agency Program Review				*				X								
-NATO Research & Technology Board	*		*		X		X		X		X		X		X	
-Aerospace Applications Studies Committee	*	*	*													
-Bilateral Technology R&D Projects MOUs	*	*	*	*	X	X	X	X	X	X	X	X	X	X	X	X
-Cooperative R&D Projects	*	*	*	*	X	X	X	X	X	X	X	X	X	X	X	X
-Foreign Comparative Testing Prioritization Board		*				X				X				X		
-NATO Cooperative R&D Prioritization Board				*			X				X				X	
-R&D Loans of Defense Equipment	*	*	*	*	X	X	X	X	X	X	X	X	X	X	X	X
-Systems & Technology Forum (JA)	*		*		X		X		X		X		X		X	
-Other Bilateral forums (CA, BZ, IS, SW, FR)	*	*	*	*	X	X	X	X	X	X	X	X	X	X	X	X
-Data/Information Exchange Annexes	*	*	*	*	X	X	X	X	X	X	X	X	X	X	X	X
-Engineer and Scientist Exchanges	*			*		X		X		X		X		X		X
-NATO Air Force Armaments Group	*		*		X		X		X		X		X		X	
-Four-Power Air Senior National Representatives	*		*		X		X		X		X		X		X	
-Four-Power Long-Term Technology Working Group		*		*		X		X		X		X		X		X

* = Completed event
X = Planned event

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

DATE: February 1999

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0101113F B-52 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	6,112	6,418	32,139	39,240	5,486	0	9,771	24,398	TBD	TBD
4370	Advanced Weapons Integration (AWI)	2,332	3,681	0	0	0	0	0	0	0	9,755
4401	Air Force Mission Support System (AFMSS)	881	2,737	2,684	0	0	0	0	0	0	14,430
4402	Electronic Counterneasures Improvement (ECMI)	2,899	0	0	0	0	0	0	0	0	7,717
4810	Avionics Midlife Improvement (AMI)	0	0	29,455	39,240	5,486	0	9,771	24,398	TBD	TBD
	Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

Note: RDT&E articles are not separately priced.

(U) A. Mission Description

The B-52 is the primary nuclear roled bomber in the USAF inventory. It provides the only Air Launch Cruise Missile carriage in the USAF. The B-52 also provides theater CINCs with a long range strike capability. The B-52 is undergoing a Conventional Enhancement Modification which allows it to carry MIL-STD 1760 weapons. The current service life of the aircraft extends to 2040. The Advanced Weapons Integration (AWI) program supports the conventional enhancement of the B-52 through the addition of the Wind Corrected Munitions Dispenser (WCMD), Joint Direct Attack Munition (JDAM), Joint Stand-off Weapon (JSOW), and the Joint Air-to-Surface Stand-off Missile (JASSM). The Air Force Mission Support System supports the Air Force movement of all mission planning to a common system. Electronic Countermeasures Improvement program improves supportibility, increases memory, allows reprogrammability, and adds a new display for improved situational awareness and system control. The B-52's Avionics Midlife Improvement program is a new start that will replace insupportable mission critical parts of the Offensive Avionics System that control navigation and weapons delivery on the B-52. The B-52 program management is provided by Air Force Material Command's Oklahoma Air Logistics Center. The prime contractor for these projects is Boeing, McDonnell Defense in Wichita Kansas.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0101113F B-52 Squadrons

(U) B. Budget Activity Justification:

This program is in budget activity 7 - Operational System Development, because it supports a currently operational system.

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget FY 1999 PB	3,235	6,436	2,733	0	TBD
(U) Appropriated Value	3,427	6,436			
(U) Adjustments to Appropriated Value					
a. Cong Reductions	-112	-18			
b. SBIR	-81				
c. Omnibus or Other Above Threshold Reprogram	-22				
d. Below Threshold Reprogramming	2,900				
(U) Adjustments to Budget Years Since FY 1999 PB			29,406	39,240	
(U) Current Budget Submit/ FY 2000 PB	6,112	6,418	32,139	39,240	TBD

(U) Significant Program Changes:

FY1999: $199 identified as a source for SBIR.

(U) One new project initiated with this submission: Avionics Midlife Improvement (AMI) starting in FY00. See individual project description (Exhibits R-2/R-3) for details.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE: February 1999
BUDGET ACTIVITY: 7 - Operational System Development	PE NUMBER AND TITLE: 0101113F B-52 Squadrons	PROJECT: 4370

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
4370 Advanced Weapons Integration (AWI)	2,332	3,681	0	0	0	0	0	0	0	9,755

(U) A. Mission Description

The requirement exists for the integration of near precision and precision guided MIL-STD 1760 weapons on the B-52. This includes the Wind Corrected Munitions Dispenser (WCMD), Joint Direct Attack Munition (JDAM), Joint Stand-off Weapon (JSOW), and the Joint-Air-to-Surface Stand-off Missile (JASSM). The B-52 is designated as the threshold bomber test platform for WCMD, JDAM, and JASSM with the objective of meeting aircraft integration and weapon testing requirements. To provide complete understanding of the program and its funding, the following schedule information in section C will reflect the money received from the WCMD, JDAM, and JASSM program elements for weapons integration on the B-52.

(U) FY 1998 ($ in Thousands):
- (U) $622 Continue Software development for JSOW and JASSM
- (U) $241 Continue Hardware development for JSOW and JASSM
- (U) $1,469 Initiate Flight/Ground Testing
- (U) $2,332 Total

(U) FY 1999 ($ in Thousands):
- (U) $2,380 Continue Software development for JSOW and JASSM
- (U) $114 Identified as a source for SBIR
- (U) $1,187 Flight/Ground Testing
- (U) $3,681 Total

(U) FY 2000 ($ in Thousands):
- (U) $0 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0101113F B-52 Squadrons PROJECT 4370

(U) FY 2001 ($ in Thousands):
- (U) $0
- (U) $0 Total

(U) B. Project Change Summary - Description of Significant Changes: Not applicable

(U) C. 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
(U) Aircraft Procurement (PE 11113F)	5,304	1,096	479	964	0	0			0	13,048

(U) Related Activities

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost
(U) RDT&E (WCMD - PE 27600F)	310	0	0	0	0	0	0	0	0	9,800
(U) RDT&E (JDAM - PE 27583F)	1,500	0	0	0	0	0	0	0	0	4,000
(U) RDT&E (JASSM - PE 27160F)	6,800	3,457	6,220	0	0	0	0	0	0	24,977
(U) TDT&E (JSOW - PE27324F)	250	0	0	0	0	0	0	0	0	250

(U) D. Acquisition Strategy

The AWI program placed Boeing Military Programs – Wichita Division, on a Cost-Plus-Fixed-Fee contract as the Product Development Organization supported by OC-ALC/LH. Due to a short notice requirement, interface development and initial software requirements definition was accomplished under the B-52 fleet support contract; a time and materials contract. AWI development is in two phases. The first phase supports WCMD and JDAM Stores Management Overlay (SMO) development, interface hardware development and Development Test and Evaluation (DT&E). The second phase supports JSOW and JASSM SMO development and DT&E. Due to the need for early Required Assets Availability and Initial Operational Capability, the Single Acquisition and Management Plan (SAMP) authorized concurrent development of software as the interface hardware (MIL-STD 1760 umbilicals and pylon attachments) transitioned to production. Although, development of SMOs for JSOW and JASSM will continue after the hardware design has been developed, the hardware design will be complete and compatible with all advance weapons.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0101113F B-52 Squadrons
	PROJECT 4370

(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) JDAM/WCMD SMO																
(U) Software/hardware Req DT&E	X				*											
(U) Test Planning	X				*											
(U) Technical data development	X				*											
(U) Ground/flight testing	X					*										
(U) AFMSS module DT&E	X					*										
(U) Program office support	X					*										
(U) JSOW/JASSM SMO																
(U) Contractor Interface Development	X							*								
(U) Software/hardware Req DT&E	X												*			
(U) Test planning	X												*			
(U) Technical data development	X															*
(U) Ground/flight testing	X															*
(U) AFMSS module DT&E	X															*
(U) Program support office	X															*

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0101113F B-52 Squadrons PROJECT 4370

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Software/hardware requirements	2,332	3,567	0	0
(U) Identified as a source for SBIR		114		
(U) Total	2,332	3,681	0	0

(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							114				
Product Development Organizations											
Boeing, ISDS, Wichita, KS	CPFF	4 Sep 97	5,254	0	2608	266	2,380	0	0	0	5,254
88CG/SCCVO	Project Order	13 Mar 96	2	0	2	0	0	0	0	0	2
Support and Management Organizations											
OC-ALC/LH	PMA	1 Oct 96	0	242	172	20	50	0	0	0	242
OC-ALC/LAS	Project Order	16 Jul 97	1327	0	750	577	0	0	0	0	1327
AEDC/DOF	Project Order	3 Jun 97	48	0	48	0	0	0	0	0	48
PEO/PMA-201	MIPR		75	0	0	0	75	0	0	0	75

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

DATE: February 1999

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0101113F B-52 Squadrons

PROJECT: 4370

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											
419 FLTS	Project Order	31 Jan 96	2,683	0	152	1,469	1,062	0	0	0	2,683
49 Tests	AF Form 616	31 Aug 96	10	0	10	0	0	0	0	0	10
Government Furnished Property: None											
Identified as a source for SBIR			114				114				114
Subtotal Product Development			5,256	0	2,610	266	2,380	0	0	0	5,256
Subtotal Support & Management			1,450	242	970	597	125	0	0	0	1,692
Subtotal Test and Evaluation			2,693	0	162	1469	1,062	0	0	0	2,693
Total Project			9,513	242	3,742	2,332	3,681	0	0	0	9,755

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

DATE: February 1999

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0101113F B-52 Squadrons

PROJECT: 4401

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
4401 Air Force Mission Support System (AFMSS)	881	2,737	2,684	0	0	0	0	0	0	14,430

(U) A. Mission Description

B-52 Air Force Mission Support System (AFMSS) was previously funded out of the AFMSS program element prior to FY98. The project develops aircraft/weapons/electronic (A/W/E) countermeasures modules to be used in conjunction with the core software modules to provide a Mission Planning Environment for planning B-52 missions. AFMSS is the replacement system for the current Mission Data Preparation System (MDPS), the legacy system used for B-52 SIOP capability. Block 1 provided the capability to plan conventional gravity missions at the unit level. Block 2 is Y2K compliant and provides the capability to plan JDAM and WCMD missions. It also adds IU/TRS capability. Block 3 adds planning capability for AGM-84 and AGM-86C. Block 4 provides TRICOMS mission data import capability and allows the retirement of MDPS. Plus, it includes capability to plan the AGM-142, JSOW and JASSM. Block 5 will enable migration of the mission planning capability to the Joint Mission Planning System (JMPS).

(U) FY 1998 ($ in Thousands):
- (U) $601 Initiate Block 3 operational software
- (U) $280 Complete Block 2 operational software
- (U) $881 Total

(U) FY 1999 ($ in Thousands):
- (U) $85 Identified as a source for SBIR
- (U) $427 Complete operational test and installation of Block 2 software
- (U) $1,125 Initiate Block 4 operational requirements
- (U) $1,100 Continue Block 3 operational software
- (U) $2,737 Total

(U) FY 2000 ($ in Thousands):
- (U) $583 Initiate Block 5 operational requirements for migration to JMPS
- (U) $800 Complete Block 3 operational software test and installation
- (U) $1,301 Complete Block 4 operational software test and installation
- (U) $2,684 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0101113F B-52 Squadrons
	PROJECT 4401

(U) FY 2001 ($ in Thousands):
– (U) $0 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
The AFMSS program is organically conducted at OC-ALC/LAS. Previously funded by the AFMSS program element.

(U) E. Schedule Profile
The B-52 peculiar mission planning software development is accomplished and delivered incrementally. Each work package within a block build is treated as a mini-development with its own analysis, design, and test. The work package are integrated with one another and with the AFMSS core.

	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) Complete Block 2 development	*															
(U) Software development Block 3	X					*										
(U) Contract award Block 4					X											
(U) Software development Block 4					X						*					
(U) Contract award Block 5									X							
(U) Software development Block 5									X							

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0101113F B-52 Squadrons
	PROJECT 4401

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Identified as a source for SBIR		85		
(U) Software development	836	2,560	2,610	0
(U) System Program Office support	45	92	74	0
(U) Total	881	2,737	2,684	0

(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							85				
Product Development Organizations											
Oklahoma ALC/LAS	Project Order	26 Mar 97	10,786	0	4,780	836	2,560	2,610	0	0	10,786
Support and Management Organizations											
OC-ALC/LH	Project order	Oct 97	0	411	200	45	92	74	0	0	411
OC-ALC/LAP	Project order	Jun 97	3,053	0	3,053	0	0	0	0	0	3,053
Test and Evaluation Organizations											
419th	DT&E	11 Dec 96	95	0	95	0	0	0	0	0	95

Government Furnished Property: None

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

DATE: February 1999

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0101113F B-52 Squadrons

PROJECT: 4401

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			85				85				85
Subtotal Product Development			10,786	0	4,780	836	2,560	2,610	0	0	10,786
Subtotal Support & Management			3,053	411	3,253	45	92	74	0	0	3,464
Subtotal Test and Evaluation			95	0	95	0	0	0	0	0	95
Total Project			14,019	411	8,128	881	2,737	2,684	0	0	14,430

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE: February 1999
BUDGET ACTIVITY: 7 - Operational System Development	PE NUMBER AND TITLE: 0101113F B-52 Squadrons	PROJECT: 4402

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
4402 Electronic Counterneasures Improvement (ECMI)	2,899	0	0	0	0	0	0	0	0	7,717

(U) A. Mission Description

The electronic countermeasures of the B-52 ALQ-172 ECM suite must be improved to cover a requirement identified during DESERT STORM. The improvement consists of engineering change proposal 93 (ECP 93) which provides for an increased memory capability and reprogrammability to handle advanced threats, and incorporation of a new controls and display unit (CDU) for increased situational awareness and greater systems control. The modification also improves two common core Line-Replaceable-Units. Normal circuit cards are replaced with circuit cards holding erasable PROMs and gate array modules. Memory is increased 400% and Mean-Time-Between-Failure is increased. Flight testing will be funded with 3010 money as it is operational testing not development testing. Development test has already been accomplished via another platform (AC-130). Articles are not separately priced.

(U) FY 1998 ($ in Thousands):
- (U) $640 Complete CDU development
- (U) $1,213 Complete ECP 93 development
- (U) $1,046 Flight test contractor and range support
- (U) $2,899 Total

(U) FY 1999 ($ in Thousands):
- (U) $0 Total

(U) FY 2000 ($ in Thousands):
- (U) $0 Total

(U) FY 2001 ($ in Thousands):
- (U) $0 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0101113F B-52 Squadrons
	PROJECT 4402

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

(U) $2,899,000 reprogrammed from 3010 to 3600 funds in FY98

(U) Program cancelled in FY00 POM, but may be re-instated in the FY01 POM pending recommendation from bomber roadmap

(U) C. 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
(U) Aircraft Procurement (PE 11113F)	1,750	4,845	5,732	0	0	2,400	2,400	0	104473	121,600

(U) D. Acquisition Strategy

The ECM Improvement program placed Boeing, McDonnell Wichita, KS and ITT Avionics Nutley, NJ on Firm-Fixed-Price contracts as Product Development Organizations. Boeing, McDonnell provides the aircraft specific integration expertise, while ITT provides expertise on the ALQ-172 system. They are supported by OC-ALC/LH and WR-ALC/LNR.

(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) CDU development	X				X											
(U) ECP 93 kit development	X							X								

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0101113F B-52 Squadrons PROJECT 4402

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Developmental kit	2,749	0	0	0
(U) System Program Office support	150	0	0	0
(U) Total	2,899	0	0	0

(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
Product Development Organizations											
Boeing Wichita, ITT Avionics	FFP	Oct 96	5,875	0	4,085	1790	0	0	0	0	5,875
Support and Management Organizations											
OC-ALC/LH	PMA	Oct 96	0	234	84	150	0	0	0	0	234
HQ ACC/LGF52	AF Form 616	03 Dec 96	49	0	25	24	0	0	0	0	49
WR-ALC/LNRB	AF Form 616	03 Dec 96	50	0	20	30	0	0	0	0	50
HQ ACC/DOIE	AF Form 616	18 Nov 96	9	0	4	5	0	0	0	0	9
Test and Evaluation Organizations											
36 ETS			1,500	0	600	900	0	0	0	0	1,500

Government Furnished Property: None

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

DATE: February 1999

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0101113F B-52 Squadrons

PROJECT: 4402

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
Subtotal Product Development			5,875	0	4,805	1,790	0	0	0	0	5,875
Subtotal Support & Management			108	234	133	209	0	0	0	0	342
Subtotal Test and Evaluation			1,500	0	600	900	0	0	0	0	1,500
Total Project			7,483	234	4,818	2,899	0	0	0	0	7,717

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0101113F B-52 Squadrons PROJECT 4810

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
4810 Avionics Midlife Improvement (AMI)	0	0	29,455	39,240	5,486	0	9,771	24,398	TBD	TBD

(U) A. Mission Description

The current B-52H Offensive Avionics System (OAS) contains several subsystems which must be replaced. The Inertial Navigation System (INS) includes a spinning mass gyro based on 1960's technology which will soon be unsupportable. The Avionics Control Unit (ACU) is an aging computer system with limited processing capability and memory. The Data Transfer Unit Cartridges (DTUCs) are bulky, unreliable and also based on old technology. The AMI program will use existing technology to replace these systems and the associated software to significantly increase OAS reliability, maintainability, and supportability while increasing capability and reducing operating costs.

(U) FY 1998 ($ in Thousands):
- (U) $0 Total

(U) FY 1999 ($ in Thousands):
- (U) $0 Total

(U) FY 2000 ($ in Thousands):
- (U) $12,800 Design and development of Group A Hardware
- (U) $16,655 Design and development of replacement software
- (U) $29,455 Total

(U) FY 2001 ($ in Thousands):
- (U) $29,540 Design and development of replacement software
- (U) $9,700 Ground and flight test
- (U) $39,240 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0101113F B-52 Squadrons
	PROJECT 4810

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

New start project beginning FY00.

(U) C. 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
(U) Aircraft Procurement (BP1100)					26,839	22,808	14,513	15,624	1,600	81,384

(U) D. Acquisition Strategy

The AMI program will contract with Boeing Wichita for aircraft hardware integration and software development of the Flight Management System and the Stores Management Overlays. Specific vendors will be selected to provide hardware for use during EMD. The Government will contract with these vendors for production hardware to support the aircraft installations.

(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) Contract Award										X						
(U) Interface Development										X		*				
(U) Software Development										X						
(U) Test Planning										X				*		
(U) Group A Design										X		*				
(U) Group A Fabrication												X		*		
(U) Trial Install														X		
(U) Flight Test														X		
(U) Program Office Support										X						

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0101113F B-52 Squadrons PROJECT 4810

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Prototype Hardware	0	0	4,500	0
(U) Non-recurring Engineering	0	0	23,955	28,490
(U) Ground/Flight Test	0	0	0	9,750
(U) System Program Office Support	0	0	1,000	1,000
(U) Total	0	0	29,455	39,240

(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
Product Development Organizations											
Boeing, McDonnell Defense	TBD	FY00	TBD	0	0	0	0	28,385	33,180	TBD	TBD
Support and Management Organizations											
OC-ALC/LH	PMA	Oct 99	0	TBD	0	0	0	1,000	1,000	TBD	TBD
WR/ALC	AF616	TBD	TBD	0	0	0	0	30	30	TBD	TBD
HQ ACC/DRPB	AF616	TBD	TBD	0	0	0	0	30	30	TBD	TBD
Test and Evaluation Organizations											
419 FLTS	Project Order	TBD	TBD	0	0	0	0	10	5,000	TBD	TBD

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0101113F B-52 Squadrons	PROJECT 4810

Government Furnished Property: TBD

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
Subtotal Product Development				0	0	0	28,385	33,180	TBD	TBD
Subtotal Support and Management				0	0	0	1,060	1,060	TBD	TBD
Subtotal Test and Evaluation				0	0	0	10	5,000	TBD	TBD
Total Project				0	0	0	29,455	39,240	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: 0101120F Advanced Cruise Missile

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	2,314	0	688	785	980	783	684	586	Continuing	Continuing
3844 Advanced Cruise Missile	2,314	0	0	0	0	0	0	0	0	2,314
4798 Life Extension Study	0	0	688	785	980	783	684	586	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

(U) The Advanced Cruise Missile (ACM) is a low-observable, air-launched, strategic missile with significant improvements over the Air Launched Cruise Missile B version (ALCM-B) in range, accuracy, and survivability. Armed with a W80 warhead, it is designed to evade air and ground-based defenses in order to strike heavily defended, hardened targets at any location within any enemy's territory. The ACM is designed for B-52H external carriage. Missile procurement is complete. Service Life Extension Plan (SLEP) calls for fuel bladder replacement starting in FY00.

(U) B. Budget Activity Justification

(U) These programs are in budget activity 7, Operational System Development, depot development and life extension studies. AF Long Range Plan requires ACM to extend beyond design life (FY02). SLEP requires studies to determine what components can be sustained or need to be replaced to extend to FY30.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0101120F Advanced Cruise Missile

(U) C. Program Change Summary

	FY 1998	FY 1999	FY 2000	FY 2001	Total Costs
(U) Previous President's Budget	2,314	0	0	0	2,314
(U) Appropriated Value	2,393				
(U) Adjustments to Appropriated Value					
(U) a. Cong Reductions	-79				
(U) b. SBIR					
(U) c. Omnibus or Other above Threshold Reprogram	-15				
(U) d. Below Threshold Reprogramming					
(U) Adjustments to Budget Years Since FY 1999		0	688	785	1,473
(U) Current Budget Submit/FY 2000 PB	2,314	0	688	785	1,473

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0101120F Advanced Cruise Missile	PROJECT 3844

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
3844 Advanced Cruise Missile	2,314	0	0	0	0	0	0	0	0	2,314

((U) A. Mission Description

(U) Develop Aging and Hardness Maintenance/Surveillance Capabilities at Depot. This project will evaluate the four critical components of ACM for aging and nuclear hardness to develop predicted life cycle replacement and repairs. Hardness Maintenance/Hardness Surveillance Program is scheduled for completion in 2nd Qtr FY00. The Hardness Maintenance/Hardness Surveillance Program includes the design, test, manufacture and demonstration of Automated Test Equipment (ATE) and Test Program Sets (TPS) to be in accordance with the Objective and Requirements Document (TIES 97-022). The TPSs will determine the condition of the Survivability/Vulnerability (S/V) components within the AGM-129 Umbilical Assy. and AFT Avionics Unit**. The Aging Surveillance project interrupted in FY98 due to lack of funding for completion.** The Aging and Surveillance Program is currently in the developmental phase and is an analytical type inspection process that will provide the necessary engineering tool to predict age out. This concept is designed to provide sufficient advanced notice to implement field retrofits prior to unacceptable degradation of the weapon system reliability and safety.

(U) FY 1998 ($ in Thousands):

– (U) Develop Aging and Hardness Maintenance/Surveillance Capabilities at Depot
$2,314

– (U) Total
$2,314

(U) FY99-02 ($ in Thousands):

(U) B. Project Change Summary

(U) Project completion reliant upon future funding. Project would be completed in FY02 is successfully funded in the FY02 – 05 POM.

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

DATE: February 1999

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0101120F Advanced Cruise Missile

PROJECT: 3844

(U) C. 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
(U) Weapon System Funding										
(U) Missile Procurement, AF										
(U) Aeronautical Vehicle (missile)	814	1395	1050	2024	2042	2061	2059	2188		
(U) Missile Modifications	0	0	2950	3435	3815	4096	4384	4578	23,258	23,258
(U) Replen + Spare Parts	450	0	319	324	333	351	360	370	cont	cont
(U) Initial Spares	0	0	0	1433	1594	2584	2893	458	8,962	8,962

(U) D. Acquisition Strategy: Prime contract number: F41608-98-C-0485 modification P00006, sub-contract number: SB0681-98-802059 will be used to complete the acquisition of the AGM-129A (ACM) Aging and Surveillance program. The final step that will be accomplished involves the set up of a maintenance and surveillance capability for nuclear aging and hardness at the depot .

((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) Depot Actions																
(U) Aging Programs Completion																1 yr upon funds reciept
(U) Hardness Programs Completion										X						

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0101120F Advanced Cruise Missile
	PROJECT 3844

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

	FY1998	FY1999	FY2000	FY2001
(U) Depot Activation				
(U) Surveillance	2,299	0	0	
(U) Total	2,299	0	0	

(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
Product Development Organizations											
Hughes MSC Tucson, AZ	SS/FPIF	May 92	16,914	16,914	15,946	0	0	0	0	0	16,914
Kearfott Wayne, NJ	SS/FPIF	Aug 93	8,077	8,077	6,200	0	0	0	0	0	8,077
Rockwell Newark, OH	SS/CPAF	Jul 96	0	0	519	0	0	0	0	0	519
OC-ALC	Organic/PO Contact	Oct 94/ Dec 96	0	0	3,135	0	0	0	0	0	3,135
OC-ALC/SA-ALC Engineering Spectrum	Organic/PO Contact	Apr 98 Dec 98	TBD	TBD	0	2,299	0	0		0	2,299

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0101120F Advanced Cruise Missile	PROJECT 3844

Support and Management Organizations: Not Applicable

Test and Evaluation Organizations: Not Applicable

Subtotal Product Development	
Subtotal Support and Management	
Subtotal Test and Evaluation	
Total Project	2,299

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

DATE: February 1999

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0101120F Advanced Cruise Missile

PROJECT: 4798

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
4798 Life Extension Study	0	0	688	785	980	783	684	586	Continuing	Continuing

(U) A. Mission Description

(U) Based on the Air Force Long Range Plan, a Service Life Extension Plan (SLEP) was developed for the ACM. SLEP is to identify and evaluate risks in extending service life of ACM to 2030. Focus will be on the laser doppler and Inertial Navigation Equipment. Laser Doppler is two years from mandatory replacement unless it is determined to have extended life span. Navigation system replacement, if required, will be tied to ALCM development in this area.

(U) FY98-99 ($ in Thousands):
- (U) $0
- (U) $0 Total

(U) FY 2000 ($ in Thousands):
- (U) $688 Research and evaluate ACM components for age sensitivities
- (U) $688 Total

(U) FY 2001 ($ in Thousands):
- (U) $785 Continuing
- (U) $785 Total

(U) B. Project Change Summary

(U) New program start, based on AF Long Range Plan decision to maintain ACM beyond design life. SLEP studies and evaluation are required to determine other actions on critical components. Without SLEP studies AF will be unable to meet warfighter requirements.

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

DATE: February 1999

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0101120F Advanced Cruise Missile

PROJECT: 4798

(U) C. 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
(U) Missile Procurement, AF										
(U) Aeronautical Vehicle (missile)	814	1395	1050	2024	2042	2061	2059	2188		
(U) Missile Modifications	0	0	2950	3435	3815	4096	4384	4578	23,258	23,258
(U) Replen + Spare Parts	450	0	319	324	333	351	360	370	cont	cont
(U) Initial Spares	0	0	0	1433	1594	2584	2893	458	8,962	8,962

(U) D. Acquisition Strategy: This is a Depot level effort being accomplished at the Prime Contractor facility. The Prime Contractor is Raytheon. Prime Contract number: F34601-96-C-0775, assignment number ACM-EA-99-06-R0-583. The Senor Guidance set is being studied for service life extension and/or referbishing by Boeing Guidance Repair Center. Contract number: F42630-95-D-0686 (FY99 Taskings).

(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) Contract Milestones																
(U) Service Life Extension Mod									X							
(U) Other Program Events																
(U) Start SLEP Studies									X							
(U) Continue SLEP Phase III (Implementation)													X			

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0101120F Advanced Cruise Missile
	PROJECT 4798

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Life Extension Study	0	0	688	785
(U) Total	0	0	688	785

(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
Product Development Organizations	Not Applicable										
Support and Management Organizations											
OC-ALC	MIPR		TBD	TBD	0	0	0	688	785	Cont	Cont
Test and Evaluation Organizations	Not Applicable										

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0101120F Advanced Cruise Missile	PROJECT 4798

(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
Product Development Property	Not Applicable									
Support and Management Property	Not Applicable									
Test and Evaluation Property	Not Applicable									
Subtotal Product Development										
Subtotal Support and Management										
Subtotal Test and Evaluation										
Total Project							688	785		

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

DATE: February 1999

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0101122F Air Launched Cruise Missile

PROJECT: 4797

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
4797 Flight Testing & Navigation Enhancement	0	0	5,344	6,514	6,407	5,380	0	0	0	23,645
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

(U) The Air Launched Cruise Missile (ALCM) AGM-86B is subsonic, air-to-surface strategic nuclear missile, operational since 1982. Armed with a W80 warhead, it is designed to evade air and ground-based defenses in order to strike targets at any location within any enemy's territory. The ALCM is designed for B-52H internal and external carriage. Missile procurement is complete. To meet AF requirement in Long Range Plan to extend to FY20, a service life extension plan was developed. Initial assessment requires acquisition of new payload doors, replace current obsolete navigation system, replace OT&E hardware and software. This is a new start project for ALCM, based on decision to maintain this weapon system beyond its current design life. Flight test payload doors, containing range transponder and battery, is required to be replaced due to Department of Energy (DOE) range safety requirements and lack of current payload door assets. The current navigation system has parts without spares or suppliers, parts that are becoming obsolete, and has been identified as the ALCM item with largest number of unscheduled maintenance hours.

(U) FY 2000 ($ in Thousands):
- (U) $3,172 Begin design/development of flight test payload door and flight termination software
- (U) $2,172 Begin design/development of Inertial Navigational Element (INE)
- (U) $5,344 Total

(U) FY 2001 ($ in Thousands):
- (U) $1,857 Finalize design of flight test payload door and flight termination software
- (U) $4,657 Finalize design of INE
- (U) $6,514 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY: 7 - Operational System Development	PE NUMBER AND TITLE: 0101122F Air Launched Cruise Missile / PROJECT: 4797

(U) B. Budget Activity Justification

(U) These programs are in budget activity 7, Operational System Development, flight test development and navigation replacements.

(U) C. Program Change Summary

(U) This is a new program for ALCM, based on AF decision to maintain this weapon system beyond its current design life. Flight test payload doors, containing range transponder and battery, is required to be developed due to redesigned DOE payload and lack of current payload doors. Current navigation system is suffering due to obsolescence and unsupportablity. Flight test termination software will be developed to replace the current antiquated system. Software will be developed for the new navigation system.

(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
(U) Weapon System Funding										
(U) Missile Procurement, AF										
(U) Missile Modifications	0	0	0	10084	12149	14961	23526	28304	27812	93902
(U) Replen + Spares/Spare Parts	172	145	215	748	943	1239	1010	461	3076	3076
(U) Other Procurement (BP 83) (Electronic & Telecommunications Equipment)	1270	1297	1304	1324	1339	1342	1370	1401	N/A	N/A

(U) E. Acquisition Strategy: These acquisitions will address two of ALCM's Service Life Extension Program areas of concern: Replacement of the INE, which will start RDT&E in FY00 and complete production in FY07. Flight Test Payload, RDT&E starting in FY00 and production completing in FY06.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE
	February 1999

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational System Development	0101122F Air Launched Cruise Missile	4797

((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) Payload Door Development Milestones																
(U) PDR										X						
(U) CDR														X		
(U) Navigation System Development Milestones																
(U) PDR										X						
(U) CDR														X		
(U) Contract Milestones																
(U) Contract Award – Payload Doors									X							
(U) Contract Award – INE									X							

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE: February 1999
BUDGET ACTIVITY: 7 - Operational System Development	PE NUMBER AND TITLE: 0101122F Air Launched Cruise Missile
	PROJECT: 4797

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Flight test door and termination software development	0	0	3,172	1,857
(U) INE development			2,172	4,657
(U) Total	0	0	5,344	6,514

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE: February 1999
BUDGET ACTIVITY: 7 - Operational System Development	PE NUMBER AND TITLE: 0101122F Air Launched Cruise Missile — PROJECT: 4797

(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
Product Development Organizations											
Boeing	SS/CPIF	TBD	TBD	TBD	0	0	0	5,344	6,514	11,787	23,645
Support and Management Organizations											
Test and Evaluation Organizations											
Product Development Property											
Support and Management Property											
Test and Evaluation Property											
Subtotal Product Development								5,334	6,514	11,787	23,645
Subtotal Support and Management								0	0	0	0
Subtotal Test and Evaluation								0	0	0	0
Total Project					0	0	0	5,334	6,514	11,787	23,645

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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: **0102325F Joint Surveillance System**

PROJECT: **2996**

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
2996 FAA/AF Radar Replacement (FARR)	1,687	2,099	0	0	0	0	0	0	0	23,362
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

The Joint Surveillance System (JSS) provides command, control and communications (C3) capability in support of CINC NORAD's (North American Aerospace Defense) Atmospheric Tactical Warning and Attack Assessment (ATW/AA) air sovereignty, and air defense requirements. The FAA/Air Force Radar Replacement (FARR) program replaces 39 existing JSS radars and 1 log set radar with solid-state, three-dimensional ARSR-4 radars to improve mission performance and reduce operation and maintenance costs. The ARSR-4 radars provide three-dimensional (range, azimuth, and height) digital data on aircraft targets within a 200+ nautical mile radius.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0102325F Joint Surveillance System
PROJECT 2996	

(U) FY 1998 ($ in Thousands):
- (U) $ 335 Provided program office support
- (U) $ 20 Continued test support for FARR Joint Program Office (JPO)
- (U) $ 632 Continued installation, test and system checkout
- (U) $ 700 Continued interoperability evaluations and commissioning support
- (U) $ 1,687 Total

(U) FY 1999 ($ in Thousands):
- (U) $ 522 Provide program office support
- (U) $ 720 Continue test and system checkout
- (U) $ 800 Continue interoperability evaluations and commissioning support
- (U) $ 57 Identified as a source for SBIR
- (U) $ 2,099 Total

(U) FY 2000 ($ in Thousands):
- (U) $ 0 No further funding in this project

(U) FY 2001 ($ in Thousands):
- (U) $ 0 No further funding in this project

(U) B. Budget Activity Justification:

This program is in budget activity 7 - Operational System Development because it provides funding for the modernization of a currently existing and operating system.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY: 7 - Operational System Development	PE NUMBER AND TITLE: 0102325F Joint Surveillance System / PROJECT: 2996

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget	1,831	2,175	0	0	23,771
(U) Appropriated Value	2,020	2,175			
(U) Adjustments to Appropriated Value					
a. Cong /General ReductionS	-168	-76			0
b. SBIR	-21				
c. Omnibus or Other Above Threshold Reprogram	-82				
d. Below Threshold Reprogramming	-62				
(U) Adjustments to Budget Year Since FY 1999 PB					
(U) Current Budget Submit/FY2000 PB	1,687	2,099	0	0	23,362

(U) Significant Program Changes:

FY99: $57 identified as a source for SBIR.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0102325F Joint Surveillance System PROJECT 2996

(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
(U) Other Procurement AF, WSC 86190A	849	739	192	62	28	0	0	0	TBD	TBD

(U) E. Acquisition Strategy:

The Federal Aviation Administration (FAA) is the lead acquisition agency for the FAA/AF Radar Replacement Program in accordance with a 19 November 1984 sub-agreement (as amended by Amendment 1, dated 1 September 1988) to FAA/AF National Agreement (NAT) 711. The FAA and the Air Force have established a joint Program Office at HQ, FAA, Washington, DC for this procurement. Northrup Grumman Corporation, Linthicum, MD is the prime contractor for the FARR program.

(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) FARR last operational readiness date						x										
(U) FARR follow-on support including baselining/commissioning before FAA final acceptance								x								

* Denotes completed event
x Denotes planned event

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0102325F Joint Surveillance System
	PROJECT 2996

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Systems engineering	700	800		
(U) Contractor engineering support	140	150		
(U) Installation/Test/Checkouts	512	570		
(U) Program Office support	335	522		
(U) Identified as a source for SBIR		57		
(U) Total	1,687	2,099		

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

DATE: February 1999

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0102325F Joint Surveillance System

PROJECT: 2996

(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
Product Development Organizations											
None											
Support and Management Organizations											
MITRE	Various		N/A	N/A	4,399	700	800			0	5,899
TEMS	Various		N/A	N/A	1,669		150			0	1,819
Martin Marietta	Various		N/A	N/A	6,199	140				0	6,339
Program Office Support	Various		N/A	N/A	1,514	335	522			0	2,371
Test and Evaluation Organizations											
Various					5,795	512	570			0	6,877
Government Furnished Property: None											
Identified as a source for SBIR							57				57
Subtotal Product Development					0	0	0			0	0
Subtotal Support and Management					13,781	1,175	1,472			0	16,428
Subtotal Test and Evaluation					5,795	512	570			0	6,877
Total Project					19,576	1,687	2,099			0	23,362

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

DATE: February 1999

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0102326F Region/Sector Operations Control Center

PROJECT: 4592

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
4592 Region/Sector Operations Modernization Center (R/SAOC)	18,586	21,428	13,239	6,611	5,818	5,866	5,995	6,127	Continuing	TBD
Quantity of RDT&E Articles	1	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

The Region and Sector Air Operations Center (R/SAOC) Modernization program will provide a modernized C4I system with enhanced capability to integrate data from existing and future civil and military defense surveillance systems into a comprehensive recognized air picture to enhance CINC NORADS's (North American Aerospace Defense Command) capability to conduct peacetime air sovereignty, transition and conventional warfare in the event of aggression toward the North American Continent. The current system has reached saturation in its capability to receive, process, display, exchange, and employ air surveillance data from current sensor systems. In some cases, it has exceeded processing and displaying capacity, thus contributing to delayed C4I decisions. The outdated technology has become increasingly difficult and costly to maintain.

(U) FY 1998 ($ in Thousands):
- (U) $ 15,273 Continuation of Prime Contract
- (U) $ 1,655 Systems Engineering Support
- (U) $ 1,625 Program Management and Technical Support
- (U) $ 33 Program Office Support
- (U) $ 18,586 Total

(U) FY 1999 ($ in Thousands):
- (U) $15,510 Continuation of Software Development/Modification for COC and Prepare for Install of New Equipment at First Site
- (U) $1,600 Systems Engineering Support
- (U) $2,709 Program Management and Technical Support
- (U) $ 921 Program Office Support
- (U) $ 688 Identified as a source for SBIR
- (U) $21,428 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0102326F Region/Sector Operations Control Center
	PROJECT 4592

(U) FY 2000 ($ in Thousands):
- (U) $9,209 Continuation of Software Development/Modification for COC and Threshold
- (U) $1,792 Systems Engineering Support
- (U) $2,098 Program Management and Technical Support
- (U) $ 140 Program Office Support
- (U) $13,239 Total

(U) FY 2001 ($ in Thousands):
- (U) $2,945 Continuation of Software Development/Modification for COC and Threshold
- (U) $1,410 Systems Engineering Support
- (U) $2,096 Program Management Technical Support
- (U) $ 160 Program Office Support
- (U) $6,611 Total

(U) B. Budget Activity Justification:

This program is in budget activity 7 - Operational System Development because it provides funding for the modernization of a currently existing and operating system.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0102326F Region/Sector Operations Control Center
	PROJECT 4592

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget	19,233	13,592	8,739	3,811	TBD
(U) Appropriated Value	20,512	21,792			TBD
(U) Adjustments to Appropriated Value					
a. Cong /General Reductions	-872	-364			
b. SBIR	-382				
c. Omnibus or Other Above Threshold Reprogram	-135				
d. Below Threshold Reprogramming	-537				
(U) Adjustments to Budget Years Since FY 1999 PB			4,500	2,800	
(U) Current Budget Submit/FY2000 PB	18,586	21,428	13,239	6,611	TBD

(U) Significant Program Changes:

FY99: $688 identified as a source for SBIR.

Due to program restructure during FY 1998, the Appropriations Committees transferred OPAF funds to RDT&E, as requested by the AF, to fund additional development activities. The AF re-phased program funding and added funds in FY 2000 and 2001 to support the program restructure.

(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
(U) Other Procurement AF, WSC 834340, R/SAOC Modernization	0	0	2,871	9,277	4,756	4,955	5,060	5,174	Cont	TBD

NOTE 1:
Both Appropriations Committees zeroed out the FY99 procurement budget at the request of the AF. Due to program restructure in FY 1998, the procurement requirements were deferred from FY 1999 to FY 2000 and FY 2001. FY 2000 and FY 2001 funding has been rephased to support this program restructure.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0102326F Region/Sector Operations Control Center
	PROJECT 4592

(U) E. Acquisition Strategy:

Management for the R/SAOC Modernization is by ESC, AFMC, Hanscom AFB MA. The R/SAOC Modernization acquisition is being pursued through an evolutionary acquisition approach to develop a modular, open systems architecture, Defense Information Infrastructure (DII) Command Operating Environment (COE) compliant system through incremental software release and periodic hardware and commercial software refresh. Initial development focuses on system to provide an initial, basis capability designated as the Core Operating Capability (COC). Prime Contract was awarded in March 1997 to Litton Data Systems Division, Agoura Hills, CA.

(U) F. Schedule Profile

	FY 1998				FY 1999				FY 2000				FY 2001				FY 2002			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) Site Hardware & COTS Software Procurement				*																
(U) Procure Operator Work Stations				*																
(U) Software Version 2.0b Complete						x														
(U) Software Version 2.0c Complete								x												
(U) Software Version 2.0d Complete									x											
(U) DT&E (COC)										x										
(U) IOT&E (COC)											x									
(U) CONUS 1 (SEADS) Installed (COC)										x										
(U) CANR Installed (COC)												x								
(U) CONUS 2 (WADS) Installed (COC)														x						
(U) Alaska Site Installed (COC)															x					
(U) Hawaii Site Installed (COC)																x				
(U) CONUS 3 (NEADS) installed (COC)																	x			

* Denotes completed event
x Denotes planned event

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational System Development	0102326F Region/Sector Operations Control Center	4592

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) System Engineering Support	1,655	1,600	1,792	1,410
(U) Program Office Support	33	921	140	160
(U) Program Management and Technical Support	1,625	2,709	2,098	2,096
(U) Development/Modification of Software for COC	15,273	15,510	9,209	2,945
(U) Identified as a source for SBIR		688		
(U) Total	18,586	21,428	13,239	6,611

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0102326F Region/Sector Operations Control Center PROJECT 4592

(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
Product Development Organizations											
LITTON	CPAF	14 Mar 97	Cont	Cont	5,969	15,273	15,510	9,209	2,945	Cont	TBD
Support and Management Organizations											
MITRE	Various		N/A	N/A	1,118	1,655	1,600	1,792	1,410	Cont	TBD
TEMS	Various		N/A	N/A	1,452	1,212	1,440	1,499	1,536	Cont	TBD
Program Office Support	Various		N/A	N/A	382	396	2,025	528	513	Cont	TBD

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)			DATE: February 1999
BUDGET ACTIVITY: 7 - Operational System Development	PE NUMBER AND TITLE: 0102326F Region/Sector Operations Control Center		PROJECT: 4592

Test and Evaluation Organizations							
46th Test Wing/Other Test Act		50	165	211	207	Cont	TBD

Government Furnished Property: None

Identified as a source for SBIR			688				
Subtotal Product Development	5,969	15,273	15,510	9,209	2,945	Cont	TBD
Subtotal Support and Management	2,952	3,263	5,065	3,819	3,459	Cont	TBD
Subtotal Test and Evaluation	0	50	165	211	207	Cont	TBD
Total Project	8,921	18,586	21,428	13,239	6,611	Cont	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: **0102411F North Atlantic Defense System (NADS)**

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
North Atlantic Defense System (NADS)	2,064	569	0	0	0	0	0	0	0	61,731
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

This program provides improvements to command, control, and communications (C3) and air surveillance capabilities in Iceland. The Control Reporting Center (CRC) and air surveillance radars support air defense requirements in the strategically important Greenland-Iceland-Norwegian gap. The program is a joint program with NATO funding infrastructure while the US funds cryptographic capabilities, system engineering and integration activities. The Joint Formal Acceptance Inspection (JFAI), a NATO required technical inspection of the entire system, is complete Once both the JFAI and a NATO required financial audit are completed and any noted discrepancies corrected, the system will be turned over to NATO/Iceland.

NATO has recently approved up to $1.2M in "Advanced Planning Funds," within the current NADS NATO authorization, to complete a Type B Cost Estimate for a potential Link 16 capability for NADS in Iceland. This will be presented to the NATO Working Group in March and May 1999 for authorization of a full program of $40M. It is anticipated that a final decision will be made before September 1999, at which time, if approved, NATO would provide the infrastructure funding for the Link 16 task, and the US would fund system engineering and integration activities.

(U) FY 1998 ($ in Thousands)

- (U) $ 924 Provide program office support
- (U) $1,140 Provide systems engineering support for NADS
- (U) $2,064 Total

NOTE: Program is nearing completion, requiring only engineering support and program management.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0102411F North Atlantic Defense System (NADS)

(U) FY 1999 ($ in Thousands)
- (U) $ 269 Provide program office support
- (U) $ 283 Provide systems engineering support for NADS
- (U) $ 17 Identified as a source for SBIR
- (U) $ 569 Total

NOTE: Program is nearing completion requiring only engineering support and program management

(U) FY 2000 ($ in Thousands)
- (U) $0 No further funding in this project

(U) FY 2001 ($ in Thousands)
- (U) $0 No further funding in this project

(U) B. Budget Activity Justification:

The program is in Budget Activity 7 since it supports improvements to currently operational systems.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0102411F North Atlantic Defense System (NADS) PROJECT

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY 1999 PB)	1,257	615	0	0	60,970
(U) Appropriated Value	1,442	615			
(U) Adjustments to Appropriated Value					
a. Congressional General Reduction	-183	-46			
b. SBIR	-29				
c. Omnibus or Other Above Threshold Reprogram	-3				
d. BelowThreshold Reprogramming	837				
(U) Adjustment to Budget Years Since FY 1999 PB					
(U) Current Budget Submit/FY 2000 PB	2,064	569	0	0	61,731

(U) Significant Program Changes:

FY99: $17 identified as a source for SBIR.

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

Not Applicable

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0102411F North Atlantic Defense System (NADS)

(U) E. Acquisition Strategy: The acquisition of hardware has been completed. Current funding provides engineering support during the NATO Operational Review known as the JFAI (Joint Formal Acceptance Inspection). The JFAI is a NATO technical and financial audit. Any discrepancies must be corrected to satisfy NATO. This requires engineering and technical support to perform this function. NATO also requires On-Island Support to provide technical, management, logistics, and system support services. NATO is deliberating on the funding of Link 16 requirement for NADS. If NATO provides the infrastructure funding for Link 16, the US will fund system engineering and integration activities. NATO has approved up to $1.2M in "Advanced Planning Funds," within the current NADS NATO authorization, to complete a Type B Cost Estimate for a potential Link 16 capability for NADS in Iceland. This will be presented to the NATO Working Group in March and May 1999 for authorization of a full program of $40M. It is anticipated that a final decision will be made before September 1999, at which time, if approved, NATO would provide the infrastructure funding for the Link 16 task, and the US would fund system engineering and integration activities. Advanced Planning Funds will cover activities through FY99.

(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) FOC		*														
(U) Preparation for JFAI				*												
(U) CI-13 Install				*												
(U) JFAI					*											
(U) NATO Financial Audit						x										
(U) Program residuals						x										

* Denotes completed event
x Denotes planned event

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0102411F North Atlantic Defense System (NADS) PROJECT

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Engineering Support	1,140	283	0	0
(U) Program Support	924	269		
(U) Identified as a source for SBIR		17		
(U) Total	2,064	569	0	0

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0102411F North Atlantic Defense System (NADS) PROJECT

(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
Product Development Organizations											
					0	0	0			0	0
Support and Management Organizations											
MITRE	Various	Oct 94	N/A	N/A	36,677	1,140	283			0	38,100
TEMS	Various	Jun 94	N/A	N/A	15,862	721	205			0	16,788
Program Office Support	Various		N/A	N/A	3,181	203	64			0	3,448
Test and Evaluation Organizations											
Various					3,378	0	0			0	3,378
GFP/GFE:	None										
Government Furnished Property: None											
Identified as a source for SBIR							17				17
Subtotal Product Development					0	0	0			0	0
Subtotal Support and Management					55,720	2,064	552			0	58,336
Subtotal Test and Evaluation					3,378	0	0			0	3,378
Total Project					59,098	2,064	569			0	61,731

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

DATE: February 1999

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0207027F Air Space Command & Control Agency

PROJECT: 4814

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
4814 Expenditionary Force Experiment (EFX)	0	0	2,946	0	0	0	0	0	TBD	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

The Expeditionary Force Experiment (EFX) is a Chief of Staff of the Air Force (CSAF) sponsored warfighter experiment. The experiment is part of a broader effort to implement Joint Vision 2010 and exploit the revolution in command and control operational capability by using spiral development. EFX combines live-fly and simulation to evaluate new operational concepts and technologies, and demonstrate the value of emerging aerospace capabilities in support of the Joint Force Commander. The experiment is designed to explore how advanced command and control capabilities and new operational processes enable modern aerospace forces to decisively halt an invading force anywhere in the world. The focus for EFX 00 is Focused Logistics, incorporating the sub-elements of Global Attack, Agile Combat Support, Command and Control and Technological Innovations. In FY 00, EFX is a new start for this program element. EFX 98 and 99 are planned and executed with existing command and control and space program elements. Funding for FY 01 and beyond is currently in internal coordination.

(U) FY 1998 ($ in Thousands):
- (U) $0 Total

(U) FY 1999 ($ in Thousands):
- (U) $0 Total

(U) FY 2000 ($ in Thousands):
- (U) $ 250 Command and Control Center Communication Development Upgrades
- (U) $ 400 Software Development Licenses with Upgrades
- (U) $1946 Initiatives from Government & Industry
- (U) $ 350 Development of Systems Architecture for the Experiment
- (U) $2946 Total

(U) FY 2001 ($ in Thousands):
- (U) $0 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207027F Air Space Command & Control Agency
	PROJECT 4814

(U) B. Budget Item Justification

This effort is Budget Activity 7, Operational System Development, because the program will develop and implement software for operational computer applications.

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Previous President's Budget (FY 1999 PB)	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			+2946	
(U) Current Budget Submit/FY 2000 BES	0	0	2946	0

(U) Significant Program Changes:

FY00: New prorgam funding. Funding in 01 and beyond is currently in internal coordination.

(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
(U) Theater Battle Management (PE 27438F)	4600								TBD	TBD
(U) Airborne Warning & Control Sys (PE 27417F)	950								TBD	TBD

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207027F Air Space Command & Control Agency
	PROJECT 4814

(U) E. Acquisition Strategy

Electronics Systems Center (ESC), Hanscom AFB, MA will manage the overall EFX program acquisition and development, using the spiral development system. The spiral development system was created to help field new and emerging technologies quickly using commercial and government "off-the-shelf" equipment

One of the tenets of the streamlined acquisition philosophy is to provide new capability through maximum reuse of existing reusable software components. EFX provides the opportunity to demonstrate new capability to provide decisive air and space power by identifying existing DII components and other software that can be integrated to further advance operational effectiveness. Research and development funding will be used to develop this integrating or "glue" code. In addition, funds will be used to develop enhancements to existing capability necessary to demonstrate how emerging products can enhance the warfighter's effectiveness.

The annual experiment runs on an 18 month rapid acquisition cycle, forcing overlap in the planning and execution of consecutive experiments. Mini-spirals within the 18 month acquisition cycle allow deficiencies to be identified and considered for future mini-spirals as well as the next experiment.

(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) Call for Initiatives								X								
(U) Initiative Selection									X							
(U) Spiral I										X						
(U) Spiral II											X					
(U) Spiral III												X				
(U) EFX 00 Experiment												X				
(U) Assessment													X			

* Denotes Completed Event
X Denotes Planned Event

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207027F Air Space Command & Control Agency
	PROJECT 4814

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Backbone Infrastructure Installation			250	
(U) Communications Infrastructure			400	
(U) Software Licenses & S/W support			1946	
(U) Initiatives			350	
(U) Total	0	0	2946	0

(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
Product Development Organizations											
(U) ESC	various	various	N/A	N/A	0	0	0	2946	0	TBD	TBD
Support and Management Organizations											
(U) MITRE					0	0	0	0	0	TBD	TBD
Test and Evaluation Organizations											
None					0	0	0	0	0	0	0

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207027F Air Space Command & Control Agency PROJECT 4814

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

Government Furnished Property: N/A

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
Subtotal Product Development					0	0	0	2946	0	TBD	TBD
Subtotal Support and Management					0	0	0	0	0	TBD	TBD
Subtotal Test and Evaluation					0	0	0	0	0	TBD	TBD
Total Project					0	0	0	2946	0	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: **0207131F A-10 Squadrons**

PROJECT: **4809**

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
4809 A-10 Squadrons	0	2,305	8,108	9,085	4,308	10,280	44,847	9,271	TBD	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description:

The primary mission of the A/OA-10 is to provide close air support (CAS) for friendly land forces and to act as the forward air controller (FAC) to coordinate and direct friendly air forces in support of land forces. The A/OA-10 has a secondary mission of supporting search and rescue (SAR) and special forces operations. It also possesses a limited capability to perform certain types of interdiction. All of these missions may take place in a high- or low-threat environment. The A-10 System Program Office (SPO) is directed to upgrade and modernize the A/OA-10 aircraft to enhance its ability to support CAS and interdiction mission requirements. The Integrated Flight and Fire Control Computer (IFFCC), formerly known as the Low Altitude Safety and Targeting Enhancement (LASTE) computer upgrade, will enhance the computer memory, throughput, and system architecture to allow the aircraft to integrate advanced weapons and accommodate a situational awareness display, a data-link capability, an Electronic Warfare Management System, and the Digital Terrain System.

(U) RDT&E funds are executed in developing improved capability, maintenance, and safety modification development efforts. Without continuing avionics, airframe and weapon systems upgrades, the A/OA-10 will have difficulty adhering to the regional CINCs requirement for a Close Air Support platform.

(U) FY 1998 ($ in Thousands):
(U) $0 Total

(U) FY 1999 ($ in Thousands):
(U) $2,298 Software development and updates for Integrated Flight and Fire Control Computer (IFFCC)
(U) 7 Identified as a source for SBIR
(U) $2,305 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE: February 1999
BUDGET ACTIVITY: 7 - Operational System Development	PE NUMBER AND TITLE: 0207131F A-10 Squadrons / PROJECT: 4809

(U) FY 2000 ($ in Thousands):

(U) $4,181	Continued software update/conversion and hardware development for the Integrated Flight and Fire Control Computer (IFFCC)
(U) $ 3,927	Initiate software development and integration for Situational Awareness Data Link (SADL)
(U) $8,108	Total

(U) FY 2001 ($ in Thousands):

(U) $200	Develop and integrate the Airborne Data Recorder (ADR)
(U) $4,411	Complete hardware development and modification of the Integrated Flight and Fire Control Computer (IFFCC)
(U) $4,474	Begin software and hardware development for the Digital Terrain System (DTS)
(U) $9,085	Total

(U) B. Budget Activity Justification:

The A/OA-10 RDT&E program is in budget activity 7 - Operational System Development because it supports an operational system.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207131F A-10 Squadrons	PROJECT 4809

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

	FY 1998	FY 1999	FY2000	FY2001	Total Cost
(U) Previous President's Budget (FY1999 PB)	0	2,312	6,956	6,761	TBD
(U) Appropriated Value	0	2,312			
(U) Adjustments to Appropriated Value					
a. Congressional/General Reduction		-7			
b. SBIR					
c. Omnibus or Other Above Threshold Reprogramming					
d. Below Threshold Reprogramming					
(U) Adjustments to Budget Years Since FY1999 PB			1,152	2,324	TBD
(U) Current Budget Submit/FY2000 PB	0	2,305	8,108	9,085	

(U) Significant Program Change
FY99: 7 Identified as a source for SBIR

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE
	February 1999

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational System Development	0207131F A-10 Squadrons	4809

(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
(U) Aircraft Procurement, BP-11 (PE 27131F)	21,163	31,000	24,360	44,086	19,898	26,323	38,750	74,322	TBD	TBD
(U) RDT&E (PE 64270F)	1,078	2,200	3,000	2,000	1,000	0			TBD	15,678

(U) E. Acquisition Strategy:

The Integrated Flight and Fire Control Computer (IFFCC), Airborne Data Recorder (ADR), Digital Terrain System (DTS), On-Board Oxygen Generating System (OBOGS), Digital Data Link (DDL), and 1760 BUS development will be conducted under the A-10 Prime Contract which was awarded in March 1998 on a full-and-open basis. CPAF contract awarded for specific modernization efforts.

(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) Integrated Flight and Fire Control Computer (IFFCC) upgrade RDT&E						X										
(U) Airborne Data Recorder (ADR)													X			
(U) Digital Terrain System (DTS)													X			
(U) Situational Awareness Data Link (SADL)									X							

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE: February 1999
BUDGET ACTIVITY: 7 - Operational System Development	PE NUMBER AND TITLE: 0207131F A-10 Squadrons
	PROJECT: 4809

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Integrated Flight and Fire Control Computer (IFFCC)	0	2,298	4,181	4,411
(U) Airborne Data Recorder (ADR)	0	0	0	0,200
(U) Digital Terrain System (DTS)	0	0	0	4,474
(U) Situational Awareness Data Link (SADL)	0	0	3,927	0
(U) Identified as a source		7		
(U) Total	0	2,305	8,108	9,085

	DATE
	February 1999
BUDGET ACTIVITY **7 - Operational System Development**	PE NUMBER AND TITLE **0207131F A-10 Squadrons**

(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
Product Development Organizations											
Identified as a source for SBIR							7				
Lockheed Martin Federal Systems	Integrated Flight and Fire Control Computer (IFFCC) A-10 Prime Contract/ CPAF	2Q99	10,000	10,897	0	0	2,298	4,181	4,411	0	10,897
	Airborne Data Recorder (ADR) A-10 Prime Contract/ CPAF	1Q01	TBD	0,200	0	0	0	0	200	0	200

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

DATE: February 1999

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0207131F A-10 Squadrons

PROJECT: 4809

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
	Digital Terrain System (DTS) A-10 Prime Contract/ CPAF	1Q01	TBD	9,437	0	0	0	0	4,474	4,963	9,437
	On-Board Oxygen Generating System (OBOGS) A-10 Prime Contract/ CPAF	1Q02	TBD	1,747	0	0	0	0	0	1,747	1,747
	Digital Data Link (DDL) A-10 Prime Contract/ CPAF	1Q03	TBD	50,014	0	0	0	0	0	51,014	51,014

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

DATE: February 1999

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0207131F A-10 Squadrons

PROJECT: 4809

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
	1760 BUS A-10 Prime Contract/ CPAF	1Q04	TBD	12,000	0	0	0	0	0	12,000	12,000
	SADL A-10 Prime Contract/ CPAF *SADL requires additional 6.0M in FY01	1Q00	TBD	9,927				3,927			9,927

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE: February 1999
BUDGET ACTIVITY: 7 - Operational System Development	PE NUMBER AND TITLE: 0207131F A-10 Squadrons
	PROJECT: 4809

Support and Management Organizations
Not Applicable

Test and Evaluation Organizations
Not Applicable

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)		DATE: February 1999
BUDGET ACTIVITY: 7 - Operational System Development	PE NUMBER AND TITLE: 0207131F A-10 Squadrons	PROJECT: 4809

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
Identified as a source for SBIR				`		7				
Subtotal Product Development				0	0	2,298	6,717	4,655	59,979	59,979
Subtotal Support and Management				0	0	0	891	330	7,056	7,056
Subtotal Test and Evaluation				0	0	0	500	4,100	21,169	21,169
Total Project						2,305	8,108	9,085	88,204	88,204

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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: 0207133F F-16 Squadrons

PROJECT: 2671

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
2671 F-16 Squadrons	94,631	139,631	112,520	93,058	53,961	40,992	66,341	98,259	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

The F-16 fighter aircraft program satisfies the need for modernization of the USAF and allied multimission tactical fighter forces. The F-16 is a single-engine, single-seat, multirole tactical fighter with full air-to-air and air-to-surface combat capabilities. The F-16 complements the F-15 in counter-air missions and is the primary aircraft in the surface attack role. The F-16C/D program develops, integrates, and qualifies systems to enhance the overall performance of the F-16 mission.

The F-16 program develops enhanced combat capability in both the air-to-ground and air-to-air role. Several modifications to improve the F-16's combat capabilities have been combined into a single modification known as the Common Configuration Integration Program (CCIP) to save significant costs during the production phase. CCIP will modify all Block 40 and Block 50 F-16 aircraft. CCIP integrates several programs under one umbrella and allows incorporation of AIM-9X onto the F-16:

a. The main driver for CCIP will be the Link 16 program. Link 16 is a data link that connects main components of a battle arena to maintain awareness and to share battle management data. The Link 16 program designs the appropriate Group A (hardware mounted permanently on aircraft) to incorporate existing Group B (hardware that is easily removed from airplane) developed by the Multifunctional Information Distribution System (MIDS) Office and adapted for use on the F-16.

b. To enhance the display of the Link 16 data, the current black and white display will be changed out with the Color Multifunction Display (CMFD) used by the European Participating Air Force's (EPAF) F-16s. Block 50 is developing the CMFD integration kit to meet USAF requirements. Block 40 will follow the Block 50 program.

c. To have sufficient computing power in the Block 40/50 aircraft to operate Link16 and to allow the cost savings of using a common Operational Flight Program, the Modular-Mission Computer (MMC) has to be upgraded. The MMC is based on the computer that was developed for the EPAF Mid-life Update program. The Block 50 F-16 is developing the MMC for USAF requirements. Block 40 will follow the Block 50 program. The MMC will extend the cost effective life of the F-16 through replacement of three Line Replaceable Units and the addition of significant memory and processing growth provisions.

d. The Joint Helmet Mounted Cueing System (JHMCS) incorporates a man-mounted, ejection capable helmet mounted display system, with capability to cue and verify cueing of high off-axis sensors and weapons. The F-16 JHMCS program will integrate the following government furnished equipment with the F-16: flight helmet with display optics, image source, helmet tracker transducer w/attached cable, graphics processor/video hardware and software to drive the display, helmet tracker hardware and software. The integration will interface with aircraft computers, weapons and sensor hardware and will provide software to integrate the JHMCS functions with other onboard systems.

e. CCIP will also incorporate the previously developed On-Board Oxygen Generation System (OBOGS). However, OBOGS has been removed from the CCIP program for budgetary reasons.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207133F F-16 Squadrons PROJECT 2671

Other modifications which are being or will be developed during the FYDP:

a. Advanced Weapons Integration will integrate Joint Direct Attack Munition (JDAM), Joint Stand-off Weapon (JSOW) and Wind Corrected Munition Dispenser (WCMD) smart weapons into the Block 40 and Block 50 F-16.

b. Improved Airborne Video Tape Recorder (IAVTR) for Block 50 aircraft will replace the current black and white 30 minute recording capability with a two hour color capability.

c. Efforts are underway to upgrade the Improved Data Modem (IDM) data link capability on the Block 50 aircraft with the latest version of the High Speed Anti-Radiation Missile (HARM).

d. Adding IDM to the Block 42 will improve the Air Force's capability to provide Close Air Support (CAS) for the Army.

e. Global Positioning System (GPS) Integration adds GPS capability to the Block 30 and supports testing of GPS changes to other F-16 Blocks.

The F-16C/D development efforts are complemented by comprehensive Operational Flight Program (OFP) upgrades and flight tests.

The F-16, which received Milestone III approval in FY 1977, is an operational aircraft.

(U) FY 1998 ($ in Thousands):

- (U) $7,428 Initiated Link 16 Development/Integration Block 40/50
- (U) $1,080 Initiated AIM-9X Development/Integration (Includes Block 40/50 Joint Helmet Mounted Cueing System (JHMCS))
- (U) $2,500 Completed Color Display Development/Integration for Block 50; Started Block 40
- (U) $6,400 Completed Multi-Mission Computer (MMC) on Block 50; Started MMC Block 40
- (U) $2,296 Completed 600 Gallon Tank Flight Test
- (U) $1,712 Completed Government Test/Support and Eval; CCIP Intg Eval, ALR-56 Support, Radar Eval, Y2K Demo, Halon Eval
- (U) $4,264 Continued Unit Training Devices
- (U) $27,244 Continued OFP Updates
- (U) $1,375 Continued Advanced Weapons Integration
- (U) $3,375 Continued Block 30 GPS
- (U) $36,957 Continued Flight Tests DT&E
- (U) $94,631 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207133F F-16 Squadrons
	PROJECT 2671

(U) FY 1999 ($ in Thousands):
- (U) $20,567 Continue Link 16 Block 40/50
- (U) $4,982 Continue Joint Helmet Mounted Cueing System (JHMCS) Block 40/50 (formely AIM-9X development)
- (U) $4,042 Continue Block 40 Color Display Development/Integration
- (U) $11,280 Continue Modular-Mission Computer (MMC) Block 40
- (U) $3,928 Continue Unit Training Devices
- (U) $38,107 Continue OFP Updates
- (U) $1,215 Complete Advanced Weapons Integration
- (U) $2,731 Continue Block 30 GPS Integration Activities
- (U) $35,285 Continue Flight Tests DT&E
- (U) $14,100 Initiate F-16A/B Service Life Extension Program (Congressional direction)
- (U) $3,394 Identified as a source for SBIR
- (U) $139,631 Total

(U) FY 2000 ($ in Thousands):
- (U) $14,472 Complete Block 50 Link 16, Continue Block 40
- (U) $10,270 Complete Block 50 JHMCS, Continue Block 40
- (U) $586 Continue Block 40 Color Display Development/Integration
- (U) $8,286 Continue Block 40 MMC
- (U) $5,789 Continue Unit Training Devices
- (U) $43,166 Continue OFP Updates
- (U) $588 Complete Block 30 GPS Integration Activities
- (U) $29,363 Continue Flight Tests DT&E
- (U) $112,520 Total

(U) FY 2001 ($ in Thousands):
- (U) $5,000 Complete Block 40 Link 16
- (U) $4,300 Complete Block 40 JHMCS
- (U) $1,500 Complete Block 40 Color Display Development/Integration
- (U) $5,000 Complete Block 40 MMC
- (U) $11,351 Continue Unit Training Devices
- (U) $32,660 Continue OFP Updates

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207133F F-16 Squadrons
	PROJECT 2671

– (U) $32,647 Continue Flight Tests DT&E
– (U) $600 Initiate Joint Tactical Combat Training System (JTCTS)
– (U) $93,058 Total

(U) B. Budget Activity Justification:

Since the development activities in this PE support an operational aircraft, these development activities are funded in the Operational System Development budget activity 7.

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

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget (FY 1999 PB)	95,333	125,076	119,522	95,498	Continuing
(U) Appropriated Value	100,233	140,076			
(U) Adjustments to Appropriated Value					
a. Cong Reductions	-3,327	-445			
b. SBIR	-1,582				
c. Omnibus and other Above Threshold Reprogram	1,557				
e. Below Threshold Reprogramming	-2,500				
(U) Adjustments to Budget Years Since FY 1999 PB			-7,002	-2440	
(U) Current Budget Submit/FY 2000 PB	94,631	139,631	112,520	93,058	Continuing

(U) Significant Program Changes:

FY99: $3,394 identified as a source for SBIR
$15,000 Congressional Plus-UP for F-16 A/B Service Life Extension Program (SLEP).

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

DATE: February 1999

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0207133F F-16 Squadrons

PROJECT: 2671

(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
(U) Aircraft Procurement (3010F), Line Item 7; F-16 C/D (MYP)	79,006	29,915	252,610	0	266,513	270,452	0	0	Continuing	Continuing
(U) Aircraft Procurement (3010F), Line Item 30, F-16 Mods *	165,965	238,440	246,598	268,105	240,318	198,638	205,360	201,150	Continuing	Continuing
(U) Aircraft Procurement (3010F), Line Item 67, Post Production Support	36,775	37,054	29,141	23,765	13,606	14,691	12,690	13,141	Continuing	Continuing

* 3010F, Line Item 7 Program Funding for FY00, FY02-03, is a plus-up for 10 A/C for each respective year.

(U) E. Acquisition Strategy: The procurement of 30 additional Blk 50 aircraft, 10 FY00/10 FY02/10 FY03, for the active force will enable the AF to replace the Blk 15 F-16 A/B aircraft of two Air National Guard (ANG) Air Defense Fighter (ADF) squadrons with newer, more capable Blk 30 F-16 C/D aircraft from the active fleet. RDT&E funds will primarily be executed in developing improved capability, maintenance and safety mods. Operational Flight Program (OFP) software will be continuously updated to complement mod development efforts. The approach to contracting varies by individual project. Lockheed Martin Tactical Aircraft Systems (LMTAS) is the prime contractor on all systems except the simulator/trainer (Hughes Co.) and the 229 Engines (Pratt & Whitney). Contract types are CPIF, CPFF, FFP.

(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) CONTRACT MILESTONES																
(U) Link 16			*													
(U) JHMCS			*													
(U) MMC			*													
(U) Color Display			*													
(U) Digital Terrain System							X									
(U) Blk 30 GPS Integration Activities												X				
(U) Advanced Weapons Integration Dev								X								
(U) Blk 30 Fire Control Computer Mod						X										

* = Completed Event
X = Planned Event

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207133F F-16 Squadrons	PROJECT 2671

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

	FY 1998	FY 1999	FY 2000	FY 2001
(U) Link 16 Block 50	5,628	15,115	9,186	0
(U) Link 16 Block 40	1,800	5,452	5,286	5,000
(U) MMC Block 40	2,500	11,280	8,286	5,000
(U) MMC Block 50	3,900	0	0	0
(U) Color Display Block 50	650	0	0	0
(U) Color Display Block 40	1,850	4,042	586	1,500
(U) AIM-9X Development/Integration:				
- (U) JHMCS Block 50	450	3,760	5,135	0
- (U) JHMCS Block 40	450	1,222	5,135	4,300
- (U) JHMCS Integration Eval	120	0	0	0
- (U) AIM-9X Development/Integration	60	0	0	0
(U) Unit Training Devices	4,264	3,928	5,789	11,351
(U) Advanced Weapons Integration	1,375	1,215	0	0
(U) Block 30 GPS Integration	3,375	2,731	588	0
(U) 600 Gallon Tank Tests	2,296	0	0	0
(U) Government Test/Support and Eval:				
- (U) CCIP Integration (Time and Material)	303			
- (U) ALR-56M Support	239	0	0	0
- (U) Radar Eval	280	0	0	0
- (U) Halon Replacement Eval	40	0	0	0
- (U) Y2K Demonstration (F-16)	850			
(U) OFP Updates	27,244	37,477	43,166	32,660
(U) Block 42 IDM Integration	0	630	0	0
(U) Flight Tests DT&E	36,957	35,285	29,363	32,647
(U) F-16 A/B SLEP	0	14,100	0	0
(U) Joint Tactical Combat Training System	0	0	0	600
(U) Identified as a source for SBIR	0	3,394		
(U) Total	94,631	139,631	112,520	93,058

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207133F F-16 Squadrons
	PROJECT 2671

(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							3,394				3,394
Product Development Organizations											
CCIP (LMTAS)	T&M	Feb 97	6,200	6,200	5,081	303	0	0	0	0	5,384
Link 16 Blk 50 (LMTAS)	SS/CPFF	Apr 98	32,500	32,500	0	5,628	15,115	9,186	0	0	29,929
Link 16 Blk 40 (LMTAS)	SS/CPFF	Apr 98	15,524	15,524	0	1,800	5,452	5,286	5,000	0	17,538
MMC Blk 50 (LMTAS)	SS/CPIF	Jan 92	269,700	269,700	168,630	3,900	11,280	0	0	0	183,810
MMC Blk 40 (LMTAS)	SS/CP	Apr 98	27,500	27,500	0	2,500	0	8,286	5,000	0	15,786
Color Display Blk 50 (LMTAS)	SS/CPFF	Apr 98	8,069	8,069	0	650	0	0	0	0	650
Color Display Blk 40 (LMTAS)	SS/CPFF	Apr 98	8,069	8,069	0	1,850	4,042	586	1,500	0	7,978
JHMCS Blk 50 (LMTAS)	SS/CPFF	Apr 98	1,100	1,100	0	450	3,760	5,135	0	0	9,345
JHMCS Blk 40 (LMTAS)	SS/CPFF	Apr 98	1,100	1,100	0	450	1,222	5,135	4,300	0	11,107
JHMCS Int Study (LMTAS)	SS/CPFF	Apr 98	1,100	1,100	3,373	120	0	0	0	0	3,493

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

DATE: February 1999

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0207133F F-16 Squadrons

PROJECT: 2671

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
AIM/9X (LMTAS)	CPAF	Apr 98	32,360	32,360	55	60	0	0	0	0	115
Trainer (Hughes)	FFP	Apr 97	44,979	44,979	10,399	4,264	3,928	5,789	11,351	0	35,731
Smart Wpns (LMTAS)	CPIF	Dec 95	TBD	TBD	7,325	1,375	1,215	0	0	0	9,915
GPS Integration (Various)	Various	Jul 97	20,200	20,200	11,856	3,375	2,731	588	0	0	18,550
OFP Updates (LMTAS)	CPIF/T&M	Dec 95	TBD	TBD	86,763	27,244	37,477	43,166	32,660	Continuing	Continuing
IDM Blk 42 (LMTAS)	FP	Nov 98	670	670	0	0	630	0	0	0	630
JTCTS (TBD)	TBD	TBD	TBD	TBD	0	0	0	0	600	1,200	1,800
F-16 A/B SLEP	TBD	TBD	TBD	TBD	0	0	14,100	0	0	Continuing	Continuing
Support and Management Organizations											
ALR-56M Support					208	239	0	0	0	0	447
Radar Eval					0	280	0	0	0	0	280
Halon Eval						40	0	0	0	0	40
Test and Evaluation Organizations											
600 Gallon Tank					0	2,296	0	0	0	0	2,296
Flight Tests			TBD	TBD	86,034	36,957	35,285	29,363	32,647	Continuing	Continuing
F-16 Y2K Demo			TBD	TBD		850					850

	DATE **February 1999**
BUDGET ACTIVITY **7 - Operational System Development**	PE NUMBER AND TITLE **0207133F F-16 Squadrons**

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207133F F-16 Squadrons
	PROJECT 2671

Government Furnished Equipment/Property:

Not Applicable

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

	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			3,394				3,394
Subtotal Product Development	293,482	53,969	100,952	83,157	60,411	Continuing	Continuing
Subtotal Support and Management	248	559	0	0	0	0	807
Subtotal Test and Evaluation	86,034	40,103	35,285	29,363	32,647	Continuing	Continuing
Total Project	379,764	94,631	139,631	112,520	93,058	Continuing	Continuing

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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.

FY	Project #	Title	PE	($000)	Remarks
1999	FSPM981305	Airborne Laser Complex Upgrade	6.33.19F	6,845	Moved from FY98
1999		Minor Construction	6.58.07F	350	New Start

FY	Project #	Title	PE	($000)	Remarks
2000		Minor Construction	6.27.02F	636	
2000		Minor Construction	6.58.07F	525.5	

FY	Project #	Title	PE	($000)	Remarks
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.

/ signed

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	FY 1999 RDT&E FACILITY PROJECT DATA (computer generated)	2. DATE
AIR FORCE		

3. INSTALLATION AND LOCATION	4. PROJECT TITLE
EDWARDS AIR FORCE BASE, CALIFORNIA	AIRBORNE LASER COMPLEX UPGRADE

5. PROGRAM ELEMENT	6. CATEGORY CODE	7. PROJECT NUMBER	8. PROJECT COST($000)
6.33.19F	311-114	FSPM981305	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 installion 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	FY 1999 RDT&E FACILITY PROJECT DATA (computer generated)	2. DATE
AIR FORCE		

3. INSTALLATION AND LOCATION	
EDWARDS AIR FORCE BASE, CALIFORNIA	
4. PROJECT TITLE	5. PROJECT NUMBER
AIRBORNE LASER COMPLEX UPGRADE	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	FY 1999 MILITARY CONSTRUCTION PROJECT DATA (computer generated)	2. DATE
AIR FORCE (AFMC)		

3. INSTALLATION AND LOCATION	4. PROJECT TITLE
EDWARDS AIR FORCE BASE, CALIFORNIA	Minor Construction < $500,000

5. PROGRAM ELEMENT	6. CATEGORY CODE	7. PROJECT NUMBER	8. PROJECT COST ($000)
65807F	116-665	FSPM982523	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.

Atch 2

1. COMPONENT	FY 2000 MILITARY CONSTRUCTION PROJECT DATA (computer generated)	2. DATE
AIR FORCE (AFMC)		

3. INSTALLATION AND LOCATION	4. PROJECT TITLE
ROME LAB, NEW YORK	Minor Construction < $1,000,000

5. PROGRAM ELEMENT	6. CATEGORY CODE	7. PROJECT NUMBER	8. PROJECT COST ($000)
62702F	610-281	ULDF93002P2	636.0

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
Minor Construction using RDT&E funds for FY2000:				
Upgrade Research Engineering Area, Bldg 106	LS			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	FY 2000 MILITARY CONSTRUCTION PROJECT DATA (computer generated)	2. DATE
AIR FORCE (AFMC)		

3. INSTALLATION AND LOCATION	4. PROJECT TITLE
EDWARDS AIR FORCE BASE, CALIFORNIA	Minor Construction < $500,000

5. PROGRAM ELEMENT	6. CATEGORY CODE	7. PROJECT NUMBER	8. PROJECT COST ($000)
65807F	211-183	FSPM992502	495.5

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
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%)				42.3
Total Contract Cost				465.3
Supervision, Inspection, and Overhead				30.2
Total Funded Cost				495.5

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.

11. REQUIREMENT: As required.

PROJECT: Construct MATS at Pad 17

REQUIREMENT: Construct a test stand capable of hoisting a test vehicle up to 50' above ground, with a capacity of 60 tons. A new control cab made of concrete masonry units to be placed near the pad. Concrete pad must be reinforced to withstand the weight and thrust of multiple test vehicles with no restrictions. A remotely operated system will monitor the system supplying fuel, electrical, and computer modeling information as testing progresses.

CURRENT SITUATION: A MATS stand exists at NASA AMES that is not being used. The stand could be transferred to Pad 17, where Dryden Flight Research Facility (DFRF), NASA or Joint Strike Fighter Task Force could utilize the facility in testing the new composite vehicles.

IMPACT IF NOT PROVIDED: Costs incurred in research and development will continue to rise. Benefits of knowledge gained from a multi-dimensional thrust exhaust nozzle could reduce costs following information gained utilizing the MATS stand at Pad 17.

1. COMPONENT	FY 2000 MILITARY CONSTRUCTION PROJECT DATA (computer generated)	2. DATE
AIR FORCE (AFMC)		

3. INSTALLATION AND LOCATION	4. PROJECT TITLE
EGLIN AIR FORCE BASE, FLORIDA	Minor Construction < $500,000

5. PROGRAM ELEMENT	6. CATEGORY CODE	7. PROJECT NUMBER	8. PROJECT COST ($000)
65807F	312-477	FTFA901200	30.0

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
Minor Construction using RDT&E funds for FY2000:				
FTFA901200 Commercial Water	LS			30.0

10. DESCRIPTION OF PROPOSED WORK: Install water line and fire hydrants

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 ¾ 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	FY 2001 MILITARY CONSTRUCTION PROJECT DATA (computer generated)	2. DATE
AIR FORCE (AFMC)		

3. INSTALLATION AND LOCATION	4. PROJECT TITLE
ROME LAB, NEW YORK	Minor Construction < $1,000,000

5. PROGRAM ELEMENT	6. CATEGORY CODE	7. PROJECT NUMBER	8. PROJECT COST ($000)
62702F	610-281	ULDF950076	350.0

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
Minor Construction using RDT&E funds for FY2001:				
Upgrade Research Engineering Area, Bldg 104	LS			350.0

10. DESCRIPTION OF PROPOSED WORK: This is a quality of life improvement for the Sensors Directorate offices of the Photonics Center. Improvements include: The demolition of existing offices in the South end of the building, the construction of new perimeter partitions, replacement of obsolete building systems including electrical distribution, lighting, suspended ceilings, fire detection, and protection systems and the incorporation of systems furniture.

11. REQUIREMENT:

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	FY 2001 MILITARY CONSTRUCTION PROJECT DATA (computer generated)	2. DATE
AIR FORCE (AFMC)		

3. INSTALLATION AND LOCATION	4. PROJECT TITLE
EGLIN AIR FORCE BASE, FLORIDA	Minor Construction < $500,000

5. PROGRAM ELEMENT	6. CATEGORY CODE	7. PROJECT NUMBER	8. PROJECT COST ($000)
65807F	Multi	Multi	820.0

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
Minor Construction using RDT&E funds for FY2001:				
FTFA880252 Upgrade Test Project Building	LS			400.0
FTFA971041 Construct Munitions Test Facility	LS			420.0
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