

## UNCLASSIFIED

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

DATE

February 2003

## BUDGET ACTIVITY

**04 - Advanced Component Development and Prototypes  
(ACD&P)**

## PE NUMBER AND TITLE

**0603430F Advanced (EHF MILSATCOM (Space)**

## PROJECT

**4050**

COST (\$ in Thousands)	FY 2002 Actual	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	Cost to Complete	Total Cost
4050 Advanced MILSATCOM	459,631	822,477	778,078	573,652	402,398	317,428	189,563	130,898	142,100	4,310,915
Quantity of RDT&E Articles	0	0	0	0	0	1	1	0	0	2

(U) **A. Mission Description**

Develop and acquire Advanced Extremely High Frequency (AEHF) Military Satellite Communications (MILSATCOM) satellites, mission control segment and cryptography for survivable, anti-jam, worldwide, secure communications for the strategic and tactical warfighter. Advanced EHF (AEHF) satellites will replenish the existing EHF system (Milstar) at much higher capacity and data rate capability. Additionally, this program focuses on leveraging commercial technology to the maximum extent possible. On 10 October 2001, a Milestone B decision was approved by the Defense Acquisition Executive to enter the System Development and Demonstration (SDD) phase. The SDD letter contract was awarded in Nov 01 and was definitized in Aug 02. The program is a sole source acquisition to a contractor team comprised of Lockheed Martin (prime/integrator) and Northrup-Grumman (provider of satellite payload). Satellites 1 and 2 will be funded with RDT&E funds and satellite 3 will be funded with procurement funds. AEHF is a cooperative program that includes International Partners: Canada, the United Kingdom, and The Netherlands.

(U) **FY 2002 (\$ in Thousands)**

(U) \$0 Accomplishment/Planned Program

(U) \$397,284 Began SDD of the AEHF satellites and Mission Control Segment (MCS) and began build of Satellite Engineering Development Models and Brassboards

(U) \$33,990 Continued Satellite Cryptographic Development

(U) \$25,000 Continued Program Office and other related support activities

(U) \$3,357 Continued Joint Terminal Engineering Office (JTEO) Support

(U) \$459,631 Total

(U) **FY 2003 (\$ in Thousands)**

(U) \$0 Accomplishment/Planned Program

(U) \$750,787 Continue SDD of the AEHF satellites and MCS, continue build of Satellite Engineering Development Models and Brassboards, and complete initial software increments for bus, payload and MCS

(U) \$23,690 Continue Satellite Cryptographic Development

Project 4050

Page 1 of 6 Pages

Exhibit R-2 (PE 0603430F)

## UNCLASSIFIED

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

DATE

February 2003

## BUDGET ACTIVITY

**04 - Advanced Component Development and Prototypes  
(ACD&P)**

## PE NUMBER AND TITLE

**0603430F Advanced (EHF MILSATCOM (Space)**

## PROJECT

**4050**

(U) **A. Mission Description Continued**(U) **FY 2003 (\$ in Thousands) Continued**

(U) \$25,500 Continue Program Office and other related support activities  
 (U) \$3,500 Continue JTEO Support (Starting in FY04, the JTEO effort will transfer to PE 0303601F, MILSATCOM Terminals)  
 (U) \$19,000 Qualification and productization of Radiation-Hardened components for USAF/DOD space programs  
 (U) \$822,477 Total

(U) **FY 2004 (\$ in Thousands)**

(U) \$0 Accomplishment/Planned Program  
 (U) \$717,064 Continue SDD of the AEHF satellites and MCS, begin build of Satellite 1 and 2 flight hardware, and begin Intermediate Software increments for bus, payload and MCS  
 (U) \$16,390 Continue Satellite Cryptographic Development  
 (U) \$25,624 Continue Program Office and related support activities  
 (U) \$19,000 Qualification and productization of Radiation-Hardened components for USAF/DOD space programs  
 (U) \$778,078 Total

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

This program is in Budget Activity 4, Advanced Component Development and Prototypes, since it funds Advanced EHF technology validation and modeling.

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

	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>Total Cost</u>
(U) Previous President's Budget	479,659	825,783	617,688	3,837,743
(U) Appropriated Value	479,659	844,783		
(U) Adjustments to Appropriated Value				
a. Congressional/General Reductions	-2,244	-12,836		
b. Small Business Innovative Research	-17,784			
c. Omnibus or Other Above Threshold Reprogram		-9,470		
d. Below Threshold Reprogram				
e. Rescissions				
(U) Adjustments to Budget Years Since FY 2003 PBR			160,390	160,390

Project 4050

Page 2 of 6 Pages

Exhibit R-2 (PE 0603430F)

## UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE <b>February 2003</b>																																																																																								
BUDGET ACTIVITY <b>04 - Advanced Component Development and Prototypes (ACD&amp;P)</b>					PE NUMBER AND TITLE <b>0603430F Advanced (EHF MILSATCOM (Space)</b>			PROJECT <b>4050</b>																																																																																								
<p>(U) <b><u>C. Program Change Summary (\$ in Thousands) Continued</u></b></p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;"></th> <th style="text-align: right; width: 10%;"><u>FY 2002</u></th> <th style="text-align: right; width: 10%;"><u>FY 2003</u></th> <th style="text-align: right; width: 10%;"><u>FY 2004</u></th> <th style="text-align: right; width: 20%;"><u>Total Cost</u></th> </tr> </thead> <tbody> <tr> <td>(U) Current Budget Submit/FY 2004 PBR</td> <td style="text-align: right;">459,631</td> <td style="text-align: right;">822,477</td> <td style="text-align: right;">778,078</td> <td style="text-align: right;">4,310,915</td> </tr> </tbody> </table> <p>(U) <b><u>Significant Program Changes:</u></b> FY04 funding increased due to revised cost estimates and increased funding for qualification and productization of Radiation-Hardened components for USAF/DOD space programs.</p> <p>(U) <b><u>D. Other Program Funding Summary (\$ in Thousands)</u></b></p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 20%;"></th> <th style="text-align: right; width: 5%;"><u>FY 2002</u></th> <th style="text-align: right; width: 5%;"><u>FY 2003</u></th> <th style="text-align: right; width: 5%;"><u>FY 2004</u></th> <th style="text-align: right; width: 5%;"><u>FY 2005</u></th> <th style="text-align: right; width: 5%;"><u>FY 2006</u></th> <th style="text-align: right; width: 5%;"><u>FY 2007</u></th> <th style="text-align: right; width: 5%;"><u>FY 2008</u></th> <th style="text-align: right; width: 5%;"><u>FY 2009</u></th> <th style="text-align: right; width: 10%;"><u>Cost to Complete</u></th> <th style="text-align: right; width: 10%;"><u>Total Cost</u></th> </tr> <tr> <th></th> <th style="text-align: center;"><u>Actual</u></th> <th style="text-align: center;"><u>Estimate</u></th> <th style="text-align: center;"><u>Estimate</u></th> <th style="text-align: center;"><u>Estimate</u></th> <th style="text-align: center;"><u>Estimate</u></th> <th style="text-align: center;"><u>Estimate</u></th> <th style="text-align: center;"><u>Estimate</u></th> <th style="text-align: center;"><u>Estimate</u></th> <th></th> <th></th> </tr> </thead> <tbody> <tr> <td>(U) Related Proc:</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>(U) MPAF, PE 0303604F, Advanced EHF</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: right;">95,000</td> <td style="text-align: right;">377,055</td> <td style="text-align: right;">0</td> <td style="text-align: right;">11,758</td> <td style="text-align: right;">15,058</td> <td style="text-align: right;">16,043</td> <td style="text-align: right;">514,914</td> </tr> <tr> <td>(U) RDT&amp;E, PE 0603854F, Wideband MILSATCOM (Space), Project #4870, CCS-C</td> <td style="text-align: right;">16,543</td> <td style="text-align: right;">11,836</td> <td style="text-align: right;">36,686</td> <td style="text-align: right;">20,350</td> <td style="text-align: right;">8,292</td> <td style="text-align: right;">7,013</td> <td style="text-align: right;">5,704</td> <td style="text-align: right;">6,347</td> <td style="text-align: right;">0</td> <td style="text-align: right;">122,318</td> </tr> <tr> <td>(U) OPAF, PE 03033600F Wideband Gapfiller System, Project #836780, CCS-C</td> <td style="text-align: right;">0</td> <td style="text-align: right;">5,543</td> <td style="text-align: right;">8,109</td> <td style="text-align: right;">2,135</td> <td style="text-align: right;">289</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: right;">16,076</td> </tr> <tr> <td>(U) RDT&amp;E, PE 0303601F, MILSATCOM Terminals, BA-7, R-174</td> <td style="text-align: right;">38,751</td> <td style="text-align: right;">71,293</td> <td style="text-align: right;">173,831</td> <td style="text-align: right;">241,906</td> <td style="text-align: right;">238,037</td> <td style="text-align: right;">174,566</td> <td style="text-align: right;">218,886</td> <td style="text-align: right;">229,486</td> <td></td> <td style="text-align: right;">TBD</td> </tr> </tbody> </table> <p>(U) <b><u>E. Acquisition Strategy</u></b> The Advanced MILSATCOM, also known as Advanced EHF (AEHF), program is a sole source acquisition to a contractor team comprised of Lockheed Martin (prime/integrator) and Northrup-Grumman (provider of the satellite payload). This team will perform the System Development and Demonstration (SDD) of three satellites and associated mission command and control ground capabilities under Cost Plus Award Fee line items on the contract. AEHF will incorporate lessons learned and improvements from Milstar and commercial SATCOM practices into the next generation EHF secure, anti-jam military communication satellite system.</p>											<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>Total Cost</u>	(U) Current Budget Submit/FY 2004 PBR	459,631	822,477	778,078	4,310,915		<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>Cost to Complete</u>	<u>Total Cost</u>		<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>			(U) Related Proc:											(U) MPAF, PE 0303604F, Advanced EHF	0	0	0	95,000	377,055	0	11,758	15,058	16,043	514,914	(U) RDT&E, PE 0603854F, Wideband MILSATCOM (Space), Project #4870, CCS-C	16,543	11,836	36,686	20,350	8,292	7,013	5,704	6,347	0	122,318	(U) OPAF, PE 03033600F Wideband Gapfiller System, Project #836780, CCS-C	0	5,543	8,109	2,135	289	0	0	0	0	16,076	(U) RDT&E, PE 0303601F, MILSATCOM Terminals, BA-7, R-174	38,751	71,293	173,831	241,906	238,037	174,566	218,886	229,486		TBD
	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>Total Cost</u>																																																																																												
(U) Current Budget Submit/FY 2004 PBR	459,631	822,477	778,078	4,310,915																																																																																												
	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>Cost to Complete</u>	<u>Total Cost</u>																																																																																						
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>																																																																																								
(U) Related Proc:																																																																																																
(U) MPAF, PE 0303604F, Advanced EHF	0	0	0	95,000	377,055	0	11,758	15,058	16,043	514,914																																																																																						
(U) RDT&E, PE 0603854F, Wideband MILSATCOM (Space), Project #4870, CCS-C	16,543	11,836	36,686	20,350	8,292	7,013	5,704	6,347	0	122,318																																																																																						
(U) OPAF, PE 03033600F Wideband Gapfiller System, Project #836780, CCS-C	0	5,543	8,109	2,135	289	0	0	0	0	16,076																																																																																						
(U) RDT&E, PE 0303601F, MILSATCOM Terminals, BA-7, R-174	38,751	71,293	173,831	241,906	238,037	174,566	218,886	229,486		TBD																																																																																						
Project 4050					Page 3 of 6 Pages			Exhibit R-2 (PE 0603430F)																																																																																								

## UNCLASSIFIED

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

DATE

February 2003

BUDGET ACTIVITY

**04 - Advanced Component Development and Prototypes  
(ACD&P)**

PE NUMBER AND TITLE

**0603430F Advanced (EHF MILSATCOM (Space)**

PROJECT

**4050**

(U) F. Schedule Profile

	<u>FY 2002</u>				<u>FY 2003</u>				<u>FY 2004</u>			
	1	2	3	4	1	2	3	4	1	2	3	4
(U) Milestone B - DAB	*											
(U) Milestone C (KDP-C)											X	
(U) Award SDD Contract	*											
(U) Start build of Engineering Development Models	*											
(U) Complete Ground Software System Design						X						
(U) Begin build of satellites 1 and 2 flight hardware									X			
(U) Cryptographic Unit Deliveries												X
(U) System Critical Design Review (CDR)											X	
(U) First Launch - (FY07)												

\* = Completed Events      X = Planned Events

Note: System CDR slipped from 4th Qtr FY03 to 3rd Qtr FY04 due to the impact of incorporation of the NSA-directed Dual Key design and revised cost estimates.

## UNCLASSIFIED

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2003				
BUDGET ACTIVITY					PE NUMBER AND TITLE				PROJECT		
04 - Advanced Component Development and Prototypes (ACD&P)					0603430F Advanced (EHF MILSATCOM (Space)				4050		
(U) A. Project Cost Breakdown (\$ in Thousands)											
					FY 2002		FY 2003		FY 2004		
(U) Program Office Support					25,000		25,500		25,624		
(U) Cryptographic Development					33,990		23,690		16,390		
(U) Satellite SDD					397,284		750,787		717,064		
(U) Joint Terminal Engineering Office (JTEO)					3,357		3,500		0		
(U) Radiation Hardened parts program					0		19,000		19,000		
(U) Total					459,631		822,477		778,078		
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)											
(U) Performing Organizations:											
<u>Contractor or Government</u>		<u>Contract Method/Type or Funding Vehicle</u>	<u>Award or Obligation Date</u>	<u>Performing Activity EAC</u>	<u>Project Office EAC</u>	<u>Total Prior to FY 2002</u>	<u>Budget FY 2002</u>	<u>Budget FY 2003</u>	<u>Budget FY 2004</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Organizations</u>											
NSA		MIPR	Dec 99	105,522	105,522	34,692	33,990	23,690	16,390	0	108,762
JTEO		PR	Continuing	15,491	15,491	8,634	3,357	3,500	0	0	15,491
MIT/LL		MIPR	Feb 95	4,988	4,988	4,988	0	0		0	4,988
Hughes		CPFF	May 97	67,175	67,175	67,175	0	0		0	67,175
TRW		CPFF	May 97	62,083	62,083	62,083	0	0		0	62,083
Various		Various	95-01	N/A	N/A	66,659	0	0		0	66,659
Lockheed Martin (Pre-EMD)		FFP	Oct 00	225,011	225,011	225,011	0	0		0	225,011
Hughes		FFP	Oct 00	0	0	0	0	0		0	0
SDD Contractor (Lockheed Martin)		CPAF	Oct 01	3,360,604	3,360,604	0	397,284	750,787	717,064	1,495,469	3,360,604
Radiation Hardened parts developers		Various	03-09	143,205	143,205	0	0	19,000	19,000	105,205	143,205
Project 4050											
					Page 5 of 6 Pages			Exhibit R-3 (PE 0603430F)			

## UNCLASSIFIED

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 2003				
BUDGET ACTIVITY					PE NUMBER AND TITLE				PROJECT			
04 - Advanced Component Development and Prototypes (ACD&P)					0603430F Advanced (EHF MILSATCOM (Space)				4050			
(U) <u>Performing Organizations Continued:</u>												
<u>Support and Management Organizations</u>												
Various		Various		Continuing	N/A	N/A	25,448	25,000	25,500	25,624	155,364	256,936
<u>Test and Evaluation Organizations</u>												
(U) <u>Government Furnished Property:</u>												
<u>Contract</u>												
<u>Method/Type</u>		<u>Award or</u>										
<u>or Funding</u>		<u>Obligation</u>		<u>Delivery</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>		
<u>Description</u>		<u>Vehicle</u>		<u>Date</u>	<u>Date</u>	<u>to FY 2002</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>Complete</u>	<u>Program</u>	
<u>Product Development Property</u>												
None												
<u>Support and Management Property</u>												
None												
<u>Test and Evaluation Property</u>												
None												
					<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>		
<u>Subtotals</u>					<u>to FY 2002</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>Complete</u>	<u>Program</u>		
Subtotal Product Development					469,242	434,631	796,977	752,454	1,600,674	4,053,978		
Subtotal Support and Management					25,448	25,000	25,500	25,624	155,364	256,936		
Subtotal Test and Evaluation												
Total Project					494,690	459,631	822,477	778,078	1,756,038	4,310,914		
Project 4050												
Page 6 of 6 Pages												
Exhibit R-3 (PE 0603430F)												