PE NUMBER: 0603845F
PE TITLE: Transformational SATCOM (TSAT)

Exhibit R-2, RDT&E Budget Item Justification	DATE February 2005
BUDGET ACTIVITY 04 Advanced Component Development and Prototypes (ACD&P)	PE NUMBER AND TITLE 0603845F Transformational SATCOM (TSAT)

	Cost ($ in Millions)	FY 2004 Actual	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	Cost to Complete	Total
	Total Program Element (PE) Cost	325.123	467.163	835.769	1,068.213	1,928.836	2,389.979	2,462.753	1,917.356	Continuing	TBD
4944	ADVANCED WIDEBAND SYSTEM	325.123	467.163	835.769	1,068.213	1,928.836	2,389.979	2,462.753	1,917.356	Continuing	TBD

(U) A. Mission Description and Budget Item Justification

The Transformational Satellite Communications (TSAT) System will provide DoD with high data rate Military Satellite Communications (MILSATCOM) and Internet-like services as defined in the Transformational Communications Architecture (TCA). TSAT is key to global net-centric operations. As the spaceborne element of the Global Information Grid (GIG), it will extend the GIG to users without terrestrial connections providing improved connectivity and data transfer capability, vastly improving satellite communications for the warfighter. The TSAT's Internet Protocol (IP) routing will connect thousands of users through networks rather than limited point-to-point connections. Additionally, TSAT will enable high data rate connections to Space and Airborne Intellligence, Surveillance, and Reconnaissance (SISR, AISR) platforms.

The TSAT program consists of a five satellite constellation (a sixth satellite is being procured to ensure mission availability), TSAT satellite operations centers (TSOC) for on-orbit control, TSAT Mission Operations Systems (TMOS) to provide network management, and ground gateways.

The TSAT portion of the TCA will incorporate radio frequency (RF) and laser communications links to meet defense and intelligence community requirements for high data rate, protected communications. The space segment will make use of key technology advancements where feasible to achieve a transformational leap in SATCOM capabilities. These technologies include but are not limited to: single and multi-access laser communications (to include wide field-of-view technology), packet switching, bulk and packet encryption/decryption, communications-on-the-move antennas, dynamic bandwidth and resource allocation techniques, and protected bandwidth efficient modulation. Technology maturation activities are on schedule with the prime contractors and numerous directed technology development contractors. FY06 will verify with subsystem hardware testing in a space-like environment, that technologies are mature. If a technology fails to mature, less-capable technology off-ramps exist and can be used to preserve schedule. Even the technology off-ramps will significantly enhance warfighter capabilities, and the advanced technology can be spiraled into a later spacecraft. First launch is scheduled for 2QFY13.

An Interim Program Review was held 22 Oct 2004; the Milestone Decision Authority (MDA) directed the TSAT program to continue as planned to achieve the Advanced Extremely High Frequency (AEHF) Full Operational Capability-equivalency with the delivery, launch, and on-orbit checkout of the first TSAT satellite. In Sept 2004, at the Senior Warfighters Forum (SWarF), the Combatant Commanders gave unanimous support for TSAT as a critical enabler for the warfighting community.

In order to ensure interoperability with the GIG integrated architecture, the TSAT program will participate in the GIG end-to-end test bed and systems engineering activities. TSAT will interoperate with elements of the net-centric GIG including, but are not limited to, Information Assurance, Network Operations, and Information Dissemination Management.

Exhibit R-2, RDT&E Budget Item Justification	DATE February 2005
BUDGET ACTIVITY 04 Advanced Component Development and Prototypes (ACD&P)	PE NUMBER AND TITLE 0603845F Transformational SATCOM (TSAT)

Funds are in Budget Activity 4, Advanced Component Development and Prototypes, since it funds TSAT technology development and engineering design activities including risk reduction and system definition.

(U) B. Program Change Summary ($ in Millions)

		FY 2004	FY 2005	FY 2006	FY 2007
(U)	Previous President's Budget	335.430	774.836	1,192.437	1,346.687
(U)	Current PBR/President's Budget	325.123	467.163	835.769	1,068.213
(U)	Total Adjustments	-10.307	-307.673		
(U)	Congressional Program Reductions		-307.673		
	Congressional Rescissions				
	Congressional Increases				
	Reprogrammings				
	SBIR/STTR Transfer	-10.307			

(U) Significant Program Changes:

A $300M FY05 Congressional reduction resulted in a first launch delay from FY12 to FY13. In response to the Congressional reduction, the Air Force adjusted the FY06/07 budget.

Exhibit R-2a, RDT&E Project Justification			DATE: February 2005
BUDGET ACTIVITY: 04 Advanced Component Development and Prototypes (ACD&P)	PE NUMBER AND TITLE: 0603845F Transformational SATCOM (TSAT)	PROJECT NUMBER AND TITLE: 4944 ADVANCED WIDEBAND SYSTEM	

	Cost ($ in Millions)	FY 2004 Actual	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	Cost to Complete	Total
4944	ADVANCED WIDEBAND SYSTEM	325.123	467.163	835.769	1,068.213	1,928.836	2,389.979	2,462.753	1,917.356	Continuing	TBD
	Quantity of RDT&E Articles	0	0	0	0	0	0	0	0		

(U) A. Mission Description and Budget Item Justification

The Transformational Satellite Communications (TSAT) System will provide DoD with high data rate Military Satellite Communications (MILSATCOM) and Internet-like services as defined in the Transformational Communications Architecture (TCA). TSAT is key to global net-centric operations. As the spaceborne element of the Global Information Grid (GIG), it will extend the GIG to users without terrestrial connections providing improved connectivity and data transfer capability, vastly improving satellite communications for the warfighter. The TSAT's Internet Protocol (IP) routing will connect thousands of users through networks rather than limited point-to-point connections. Additionally, TSAT will enable high data rate connections to Space and Airborne Intellligence, Surveillance, and Reconnaissance (SISR, AISR) platforms.

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Funds are in Budget Activity 4, Advanced Component Development and Prototypes, since it funds TSAT technology development and engineering

Exhibit R-2a, RDT&E Project Justification		DATE: February 2005
BUDGET ACTIVITY: 04 Advanced Component Development and Prototypes (ACD&P)	PE NUMBER AND TITLE: 0603845F Transformational SATCOM (TSAT)	PROJECT NUMBER AND TITLE: 4944 ADVANCED WIDEBAND SYSTEM

design activities including risk reduction and system definition.

	B. Accomplishments/Planned Program ($ in Millions)	FY 2004	FY 2005	FY 2006	FY 2007
(U)	Continue System Definition (FY04 only) and technology development for key areas to include laser communications (including enhanced wide field-of-view multi access laser comm), antenna design, encryption technologies, dynamic bandwidth and resource allocation, bandwidth efficient modulation, network operations, and networking protocols (FY04-07).	163.854	113.673	143.298	134.053
(U)	Provide Technical Support	24.669	28.988	33.071	37.108
(U)	Provide Program Support	7.356	8.400	9.915	10.800
(U)	Initiated engineering design activities including risk reduction and system definition for the first TSAT satellite.	129.244	240.992		
(U)	Continue engineering design activities including risk reduction, and complete system design for the first TSAT satellite.			519.177	
(U)	Develop preliminary design of the TSAT satellite system.			12.500	644.528
(U)	Acquire the TSAT Mission Operations System ground segment and network management/operations management software.		39.500	77.848	198.574
(U)	Continue systems engineering and integration support		35.610	39.960	43.150
(U)	Total Cost	325.123	467.163	835.769	1,068.213

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

		FY 2004 Actual	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	Cost to Complete	Total Cost
(U)	RDT&E, AF										
(U)	PE 0603854, Project 644870, CCS-C, R-52	35.621	20.119	3.917	7.010	5.742	6.392	6.485	6.555	Continuing	TBD
(U)	PE 0603854, Project 644811, WGS, R-52		49.267	89.941	30.662						333.310
(U)	Other APPN										
(U)	MPAF, PE 0303600F, WGS, P-19,20	21.848	40.155	72.517	325.680	245.308	48.857	22.548	14.794	Continuing	TBD
(U)	MPAF, PE 0303602F, TSAT							156.749	1031.789	Continuing	TBD
(U)	OPAF, PE 0303602F, TSAT						26.058				26.058
(U)	OPAF, PE 0303600F, CCS-C	8.203	1.664	0.290							15.477
(U)	OPAF, PE 0303600F, WGS	11.622				21.515	7.169				55.448
(U)	MILCON, PE 0303602F,					2.847	26.086				28.933

Exhibit R-2a, RDT&E Project Justification		DATE February 2005
BUDGET ACTIVITY 04 Advanced Component Development and Prototypes (ACD&P)	PE NUMBER AND TITLE 0603845F Transformational SATCOM (TSAT)	PROJECT NUMBER AND TITLE 4944 ADVANCED WIDEBAND SYSTEM

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

TSAT

(U) D. Acquisition Strategy

In Jun 03, the acquisition strategy for TSAT and Advanced Polar System (APS) was approved, as stated in the FY05 PB justification. Since that time, the APS requirements document was not validated by the Joint Requirements Oversight Council, and the program has been cancelled due to affordability/user requirements issues and replaced by additional enhanced polar hosted packages. On 20 Jan 04, the TSAT program entered Phase B, Risk Reduction and Design Development. Phase B space segment contracts (Cost Plus, Fixed Fee) were awarded to Lockheed Martin and Boeing in late Jan 04. In late FY05 the results of a full and open competition to select the final TSAT Mission Operations System segment development contractor will be announced. In late FY06 the results of a full and open competition to select the final space segment development contractor will be announced.

Exhibit R-3, RDT&E Project Cost Analysis

DATE: February 2005

BUDGET ACTIVITY: 04 Advanced Component Development and Prototypes (ACD&P)

PE NUMBER AND TITLE: 0603845F Transformational SATCOM (TSAT)

PROJECT NUMBER AND TITLE: 4944 ADVANCED WIDEBAND SYSTEM

(U) Cost Categories (Tailor to WBS, or System/Item Requirements) ($ in Millions)	Contract Method & Type	Performing Activity & Location	Total Prior to FY 2004 Cost	FY 2004 Cost	FY 2004 Award Date	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost to Complete	Total Cost	Target Value of Contract
(U) Product Development														
Architecture Studies	CPAF	Various	14.900										14.900	
Lockheed Martin: Technology Maturation/Risk Reduction & Program System Definition	CPFF	Sunnyvale, CA		42.180	Jan-04	120.496	Oct-04	259.588	Nov-05				422.264	
Boeing: Technology Maturation/Risk Reduction & Program System Definition	CPFF	El Segundo, CA		42.180	Jan-04	120.496	Oct-04	259.588	Nov-05				422.264	
Space Design Development Contract	TBD	TBD						12.500	Sep-06	644.528	Nov-06	Continuing	TBD	
Booz Allen Hamilton: System Engineering & Integration	Time & Materials w/ IF	El Segundo, CA	0.850	26.555	Oct-03	35.610	Oct-04	39.961	Nov-05	43.150	Nov-06	Continuing	TBD	
TMOS PRDAs	FFP	Various	0.850	18.329	Oct-03	37.890	Oct-04						57.069	
TMOS Contract	TBD	TBD				1.610	Sep-05	77.848	Nov-05	198.574	Nov-06	Continuing	TBD	
Risk Reduction: Technology Maturation	Various	Various	80.504	108.552	Oct-03	113.673	Oct-04	143.298	Nov-05	134.053	Nov-06	Continuing	TBD	
Risk Reduction: Technology Maturation (Space Segment) Lockheed Martin	CPFF	Sunnyvale, CA		27.651	Jan-04								27.651	
Risk Reduction: Technology Maturation (Space Segment) Boeing	CPFF	El Segundo, CA		27.651	Jan-04								27.651	
Subtotal Product Development			97.104	293.098		429.775		792.783		1,020.305		Continuing	TBD	0.000
Remarks:														
(U) Support														
Technical Support	Various		9.316	24.669		28.988		33.071	Nov-05	37.108	Nov-06	Continuing	TBD	
Program Support	Various		4.400	7.356		8.400		9.915	Nov-05	10.800	Nov-06	Continuing	TBD	
Subtotal Support			13.716	32.025		37.388		42.986		47.908		Continuing	TBD	0.000
Remarks:														
(U) Test & Evaluation														
None													0.000	
Subtotal Test & Evaluation			0.000	0.000		0.000		0.000		0.000		0.000	0.000	0.000
Remarks:														
(U) Management														
None													0.000	
Subtotal Management			0.000	0.000		0.000		0.000		0.000		0.000	0.000	0.000
Remarks:														
(U) Total Cost			110.820	325.123		467.163		835.769		1,068.213		Continuing	TBD	0.000

Exhibit R-4, RDT&E Schedule Profile		DATE February 2005
BUDGET ACTIVITY 04 Advanced Component Development and Prototypes (ACD&P)	PE NUMBER AND TITLE 0603845F Transformational SATCOM (TSAT)	PROJECT NUMBER AND TITLE 4944 ADVANCED WIDEBAND SYSTEM

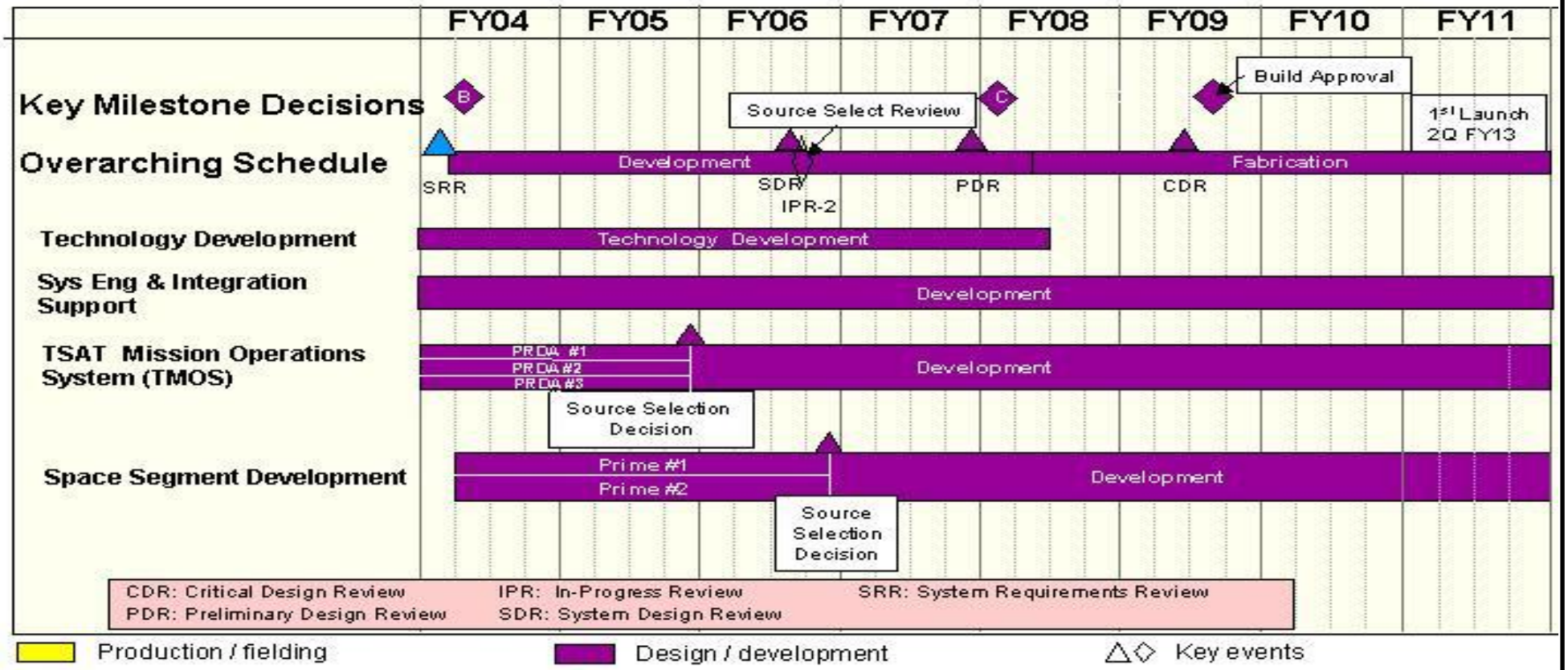

Exhibit R-4a, RDT&E Schedule Detail			DATE: February 2005
BUDGET ACTIVITY: 04 Advanced Component Development and Prototypes (ACD&P)	PE NUMBER AND TITLE: 0603845F Transformational SATCOM (TSAT)	PROJECT NUMBER AND TITLE: 4944 ADVANCED WIDEBAND SYSTEM	

(U) Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007
(U) Key Decision Point B	2Q			
(U) Space Segment Risk Reduction & System Def Contract Award	2Q			
(U) Interim Program Review I		1Q		
(U) TMOS Segment Design Development Contract Award		4Q		
(U) System Design Review			3Q	
(U) Interim Program Review II			3Q	
(U) Space Segment Design Development Contract Award			4Q	
(U) Preliminary Design Review				4Q