PE NUMBER: 0303601F
PE TITLE: MILSATCOM Terminals

Exhibit R-2, RDT&E Budget Item Justification

DATE: May 2009

BUDGET ACTIVITY: 07 Operational System Development

PE NUMBER AND TITLE: 0303601F MILSATCOM Terminals

	Cost ($ in Millions)	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost to Complete	Total
	Total Program Element (PE) Cost	362.676	334.182	257.693	0.000	0.000	0.000	0.000	0.000	Continuing	TBD
2487	MILSATCOM Terminals	362.676	334.182	257.693	0.000	0.000	0.000	0.000	0.000	Continuing	TBD

(U) A. Mission Description and Budget Item Justification

The Military Satellite Communications (MILSATCOM) Terminals program develops equipment enabling users to communicate via Milstar, Advanced Extremely High Frequency (AEHF), Ultra High Frequency (UHF) Follow-On (UFO), Wideband Global SATCOM (WGS), Defense Satellite Communication System (DSCS), Enhanced Polar Systems (EPS), and other military and commercial satellites, to support tactical Air and Space Expeditionary Force requirements and maintain essential connectivity for strategic forces. Program RDT&E currently includes the following program operations and support efforts:
1) Concept development work to identify commercial/military technology solutions to improve MILSATCOM terminal capabilities for the warfighters. Focus includes, but is not limited to, increasing throughput, facilitating sustainability, reducing footprint on user platform and supporting the network.

2) The Family of Advanced Beyond Line-of-Sight Terminals (FAB-T) Increment 1 program will provide Extremely High Frequency (EHF) voice and data MILSATCOM for nuclear and conventional forces as well as airborne and ground command posts with connectivity to Milstar and Advanced EHF satellites. FAB-T Increment 1 terminals will also support the command and control (C2) of Milstar and AEHF satellites. Increment 2 will provide robust secure 2-way Ku/Ka wideband SATCOM capability (274 Megabits per second - Mbps) on Intelligence, Surveillance, and Reconnaissance (ISR) and other aircraft (e.g., the Global Hawk Unmanned Aerial Vehicle). Increment 2 funds in FY10 are for Risk Reduction efforts.

3) The High Data Rate - Radio Frequency (HDR-RF) Ground Terminal program will provide the high data rate SATCOM needed to support the Intelligence, Surveillance and Reconnaissance (ISR) community with High Bandwidth High Throughput (HBHT) capability. HDR-RF Ground Terminals will be used for Command & Control, Intelligence, Surveillance and Reconnaissance (C2ISR), and will support the full spectrum of operations from humanitarian support/disaster relief to a major theater war. HDR-RF Ground Terminals will provide up to 274 Mbps capability via Wideband Global SATCOM beginning with flight 4 and will be interoperable with FAB-T Increment 2 Air Intelligence Surveillance Reconnaissance (AISR) platforms. HDR-RF Ground Terminals will include an HBHT Software Communications Architecture (SCA) compliant modem and will provide quad band C-, X-, Ku- and Ka-band SATCOM. HDR-RF Ground Terminals will be interoperable with legacy tactical terminals and operate worldwide with existing military and commercial spacecraft. The user of HDR-RF Ground Terminals is the Global Hawk Ground Mission Control Element (MCE). HDR-RF funds in FY10 are for Risk Reduction efforts.

4) Joint Terminal Engineering Office (JTEO) provides tri-service coordination of terminal development, acquisition and fielding activities.

5) Global Broadcast Service (GBS) provides for development, systems engineering and integration, test, Transmission Security (TRANSEC) compliance development, and program office support of Receive Suites.

This effort is funded in Budget Activity 7, Operational System Development because some of its programs have completed Milestone C reviews and are in production.

Exhibit R-2, RDT&E Budget Item Justification	DATE May 2009
BUDGET ACTIVITY 07 Operational System Development	PE NUMBER AND TITLE 0303601F MILSATCOM Terminals

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

		FY 2008	FY 2009	FY 2010
(U)	Previous President's Budget	384.652	337.098	257.831
(U)	Current PBR/President's Budget	362.676	334.182	257.693
(U)	Total Adjustments	-21.976	-2.916	
(U)	Congressional Program Reductions		-2.007	
	Congressional Rescissions		-0.909	
	Congressional Increases			
	Reprogrammings	-10.000		
	SBIR/STTR Transfer	-11.976		

(U) Significant Program Changes:

FY10 adds funding for development of GBS Portable Receive Suites.

Exhibit R-2a, RDT&E Project Justification			DATE: May 2009
BUDGET ACTIVITY: 07 Operational System Development	PE NUMBER AND TITLE: 0303601F MILSATCOM Terminals	PROJECT NUMBER AND TITLE: 2487 MILSATCOM Terminals	

Cost ($ in Millions)		FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost to Complete	Total
2487	MILSATCOM Terminals	362.676	334.182	257.693	0.000	0.000	0.000	0.000	0.000	Continuing	TBD
	Quantity of RDT&E Articles	0	0	0	0	0	0	0	0		

(U) A. Mission Description and Budget Item Justification

The Military Satellite Communications (MILSATCOM) Terminals program develops equipment enabling users to communicate via Milstar, Advanced Extremely High Frequency (AEHF), Ultra High Frequency (UHF) Follow-On (UFO), Wideband Global SATCOM (WGS), Defense Satellite Communication System (DSCS), Enhanced Polar Systems (EPS), and other military and commercial satellites, to support tactical Air and Space Expeditionary Force requirements and maintain essential connectivity for strategic forces. Program RDT&E currently includes the following program operations and support efforts:
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3) The High Data Rate - Radio Frequency (HDR-RF) Ground Terminal program will provide the high data rate SATCOM needed to support the Intelligence, Surveillance and Reconnaissance (ISR) community with High Bandwidth High Throughput (HBHT) capability. HDR-RF Ground Terminals will be used for Command & Control, Intelligence, Surveillance and Reconnaissance (C2ISR), and will support the full spectrum of operations from humanitarian support/disaster relief to a major theater war. HDR-RF Ground Terminals will provide up to 274 Mbps capability via Wideband Global SATCOM beginning with flight 4 and will be interoperable with FAB-T Increment 2 Air Intelligence Surveillance Reconnaissance (AISR) platforms. HDR-RF Ground Terminals will include an HBHT Software Communications Architecture (SCA) compliant modem and will provide quad band C-, X-, Ku- and Ka-band SATCOM. HDR-RF Ground Terminals will be interoperable with legacy tactical terminals and operate worldwide with existing military and commercial spacecraft. The user of HDR-RF Ground Terminals is the Global Hawk Ground Mission Control Element (MCE). HDR-RF funds in FY10 are for Risk Reduction efforts.

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This effort is funded in Budget Activity 7, Operational System Development because some of its programs have completed Milestone C reviews and are in production.

Exhibit R-2a, RDT&E Project Justification		DATE: May 2009
BUDGET ACTIVITY: 07 Operational System Development	PE NUMBER AND TITLE: 0303601F MILSATCOM Terminals	PROJECT NUMBER AND TITLE: 2487 MILSATCOM Terminals

	B. Accomplishments/Planned Program ($ in Millions)	FY 2008	FY 2009	FY 2010
(U)	Continue concept/prototype demo/MILSATCOM Terminals roadmap/SATCOM funding	3.948	3.931	4.647
(U)	Continue Family of Advanced Beyond Line-of-Sight Terminals (FAB-T) development	326.757	304.550	210.450
(U)	Continue High Data Rate (HDR) RF Ground Terminal development	9.984	6.688	3.500
(U)	Continue Joint Terminal Engineering Office (JTEO) Support	7.388	5.257	5.361
(U)	Global Broadcast Service Terminal Development			3.536
(U)	Program Support and Other related activities	14.599	13.756	30.199
(U)	Total Cost	362.676	334.182	257.693

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

	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost to Complete	Total Cost
(U) Aircraft Procurement, Air Force, Project 119992 (Budget Activity 5, P-27 and P-61, PE 0303601F only) (1)	0.000	0.000	72.872	0.000	0.000	0.000	0.000	0.000	Continuing	TBD
(U) Other Procurement, Air Force, 'MILSATCOM Space', Project 836780 (Budget Activity 3, P-66, PE 0303601F only) (1)	105.408	105.704	108.644	0.000	0.000	0.000	0.000	0.000	Continuing	TBD

(1) Spares Included

NOTE: Related RDT&E costs for MILSATCOM satellite systems to which terminal development is linked can be found in RDT&E Budget Item Justification Sheets for the following Program Elements (PEs):

PE 0303110F Defense Satellite Communication System (Space)
PE 0603430F Advanced EHF MILSATCOM (Space)
PE 0603845F Transformational SATCOM (TSAT)
PE 0603432F Polar MILSATCOM (Space)
PE 0603854F Wideband SATCOM (RDT&E) Space
PE 0604479F Milstar LDR/MDR SATCOM (Space)
PE 0604240F B-2 (RDT&E)
PE 0101113F B-52 (RDT&E)
PE 0305207F RC-135 (RDT&E)

Exhibit R-2a, RDT&E Project Justification		DATE May 2009
BUDGET ACTIVITY 07 Operational System Development	PE NUMBER AND TITLE 0303601F MILSATCOM Terminals	PROJECT NUMBER AND TITLE 2487 MILSATCOM Terminals

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

PE 0603840F Global Broadcast Service (GBS) (RDT&E)

(U) D. Acquisition Strategy

FAB-T provides a Family of Beyond Line-of-Sight (BLOS) satellite communications (SATCOM) and Line-of-Sight (LOS) terminals with an open architecture to satisfy the requirements identified in the Advanced Wideband Terminal (AWT) and Command Post Terminal (CPT) Operational Requirements Documents (ORDs) and FAB-T Inc 1 Capability Development Document (CDD).

Increment 1 provides the layered architecture which enables support for evolving and new communication capabilities and technologies. Capabilities include transmission and reception of voice, data, imagery, and video as well as broadcast reception over protected and wideband SATCOM and LOS systems. Increment 1 also provides the capability for air and ground communications using the Milstar Extremely High Frequency (EHF) and Advanced Extremely High Frequency (AEHF) waveforms. Increment 1 terminals are planned for the B-2, B-52, and RC-135 aircraft and to upgrade the existing Command Post Terminals (CPTs) located on the ground (fixed and transportable) and airborne on the E-4 and E-6 aircraft.

Increment 2 will provide Analysis of Alternatives and solutions to transponded Ka band communications over Wideband Global SATCOM (WGS), transponded Ku band communications over commercial satellites and LOS capabilities using Multi-Platform Common Data Link (MP-CDL) capabilities.

The program strategy is to procure future increments using the open system architecture and adding functionality as funding becomes available and when requirements are identified. These increments may include providing SATCOM capability combinations of AEHF, Global Broadcast Service (GBS), and commercial wideband video and data services to over fifty-seven additional aircraft/platform types that are identified in the AWT Operational Requirements Document (ORD).

The HDR-RF Ground Terminal Program consists of three Phases. Phase 1, the Ground Modem Application Demonstration phase, consists of multiple contractors developing an SCA version 2.2.1 compliant, HDR-RF Ground HBHT modem, which will port/run a Government provided test waveform. This phase culminates in a demonstration/test of the vendor's modem hardware and facilitates HBHT SCA modem availability when the FAB-T Inc 2 developed operational waveform is complete. Phase 2 consists of porting and demonstrating of the FAB-T Increment 2 developed operational waveform, and qualifying the modem. Phase 3 consists of integrating/qualifying the HDR-RF ground modem into an existing quad band SATCOM terminal, obtaining appropriate certifications, producing, and fielding the system to communicate over the Wideband Global SATCOM using transponded Ka-band satellite communications.

GBS provides warfighters with a worldwide, seamless, high throughput broadcast information service to support today's and tomorrow's mission. The Receive Suite (RS) development will satisfy the portable receive suite requirements identified in the GBS Operational Requirements Document. (ORD) III Block-3. RS provides Special Operations use of GBS in operational areas; capabilities include reception of voice, data, imagery and video. The RS shall be manpackable and fit into a single rucksack with a weight limit of 20 pounds. The progam strategy is to design, develop, and test a RS for special operation use and testing and integration to fulfill the GBS TRANSEC requirement.

Exhibit R-3, RDT&E Project Cost Analysis

DATE: May 2009

BUDGET ACTIVITY: 07 Operational System Development

PE NUMBER AND TITLE: 0303601F MILSATCOM Terminals

PROJECT NUMBER AND TITLE: 2487 MILSATCOM Terminals

(U) Cost Categories (Tailor to WBS, or System/Item Requirements) ($ in Millions)	Contract Method & Type	Performing Activity & Location	Total Prior to FY 2008 Cost	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	FY 2010 Cost	FY 2010 Award Date	Cost to Complete	Total Cost	Target Value of Contract
(U) Product Development												
FAB-T Development	CPAF	Boeing Corp., Huntington Beach, CA	684.252	308.954	Jan-08	268.875	Jan-09	178.169	Jan-10	Continuing	TBD	
FAB-T	Various	Various	28.380	6.838	Jan-08	29.825	Jan-09	32.281	Jan-10	Continuing	TBD	
High Data Rate (HDR) RF Ground Terminal Development	FFP	Comtech, Tempe, AZ	1.614	3.379	Jan-08					Continuing	TBD	
High Data Rate (HDR) RF Ground Terminal Development	FFP	Raytheon, Marborough, MA	2.985	3.380	Jan-08					Continuing	TBD	
High Data Rate (HDR) RF Ground Terminal Development	FFP	L3 Comm, Hauppauge, NY				2.700	Jan-09				2.700	
High Data Rate (HDR) RF Ground Terminal Development	TBD	3 contracts									0.000	
High Data Rate (HDR) RF Air Terminal Development (merged with FAB-T beginning in FY06)	CPAF	Boeing Corp., Huntington Beach, CA	13.787								13.787	
Lasercom Terminal Development Studies	FFP	Various	30.395								30.395	
Global Broadcast Service (GBS)	Various	Various						3.536	Feb-10		3.536	
Subtotal Product Development			761.413	322.551		301.400		213.986		Continuing	TBD	0.000
Remarks:												
(U) Support												
Systems Engineering Support	CPAF	MITRE, Bedford MA	220.335	20.426	Jan-08	16.183	Jan-09	18.438	Jan-10	Continuing	TBD	
Systems Engineering/Functional/Financial Support	Various	Various	232.151	12.168	Jan-08	11.676	Jan-09	14.481	Jan-10	Continuing	TBD	
Miscellaneous	Various	Various	32.112	2.431	Jan-08	2.080	Jan-09	5.218	Jan-10	Continuing	TBD	
											0.000	
Subtotal Support			484.598	35.025		29.939		38.137		Continuing	TBD	0.000
Remarks:												
(U) Test & Evaluation												
Various Programs	Various	AF Research Lab	25.018	5.100	Sep-08	2.843	Jan-09	5.570	Jan-10	Continuing	TBD	
Miscellaneous T&E	Various	Various	26.187							Continuing	TBD	
											0.000	
Subtotal Test & Evaluation			51.205	5.100		2.843		5.570		Continuing	TBD	0.000
Remarks:												
(U) Management												
											0.000	

Exhibit R-3, RDT&E Project Cost Analysis

DATE: May 2009

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT NUMBER AND TITLE
07 Operational System Development	0303601F MILSATCOM Terminals	2487 MILSATCOM Terminals

	Subtotal Management	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Remarks:							
(U)	Total Cost	1,297.216	362.676	334.182	257.693	Continuing	TBD	0.000

Exhibit R-4, RDT&E Schedule Profile		DATE May 2009
BUDGET ACTIVITY 07 Operational System Development	PE NUMBER AND TITLE 0303601F MILSATCOM Terminals	PROJECT NUMBER AND TITLE 2487 MILSATCOM Terminals

MILSATCOM Terminals Schedule RDoc

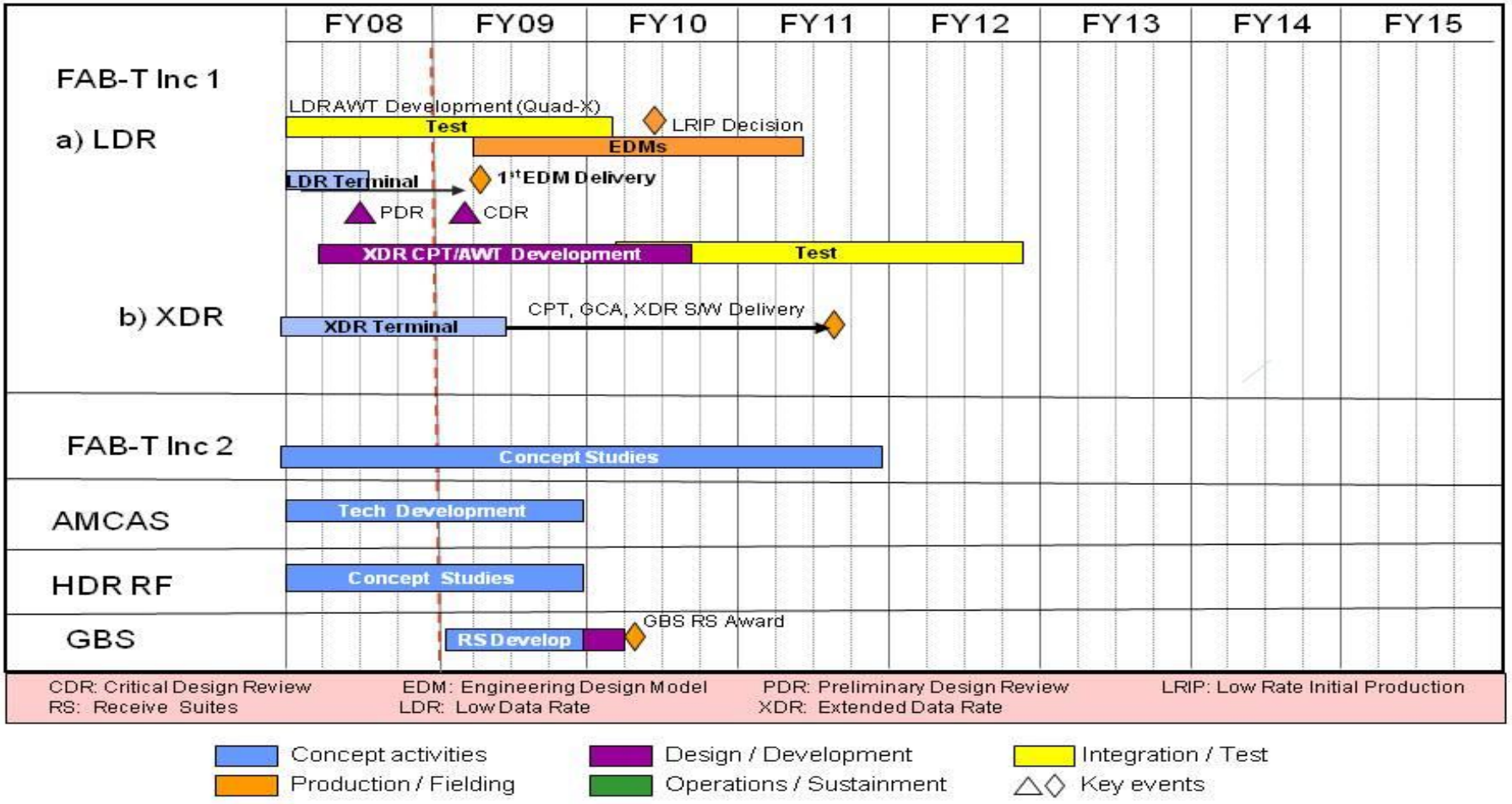

Exhibit R-4a, RDT&E Schedule Detail		DATE May 2009
BUDGET ACTIVITY 07 Operational System Development	PE NUMBER AND TITLE 0303601F MILSATCOM Terminals	PROJECT NUMBER AND TITLE 2487 MILSATCOM Terminals

(U) Schedule Profile	FY 2008	FY 2009	FY 2010
(U) FAB-T (Inc 1) Extended Data Rate (XDR) Preliminary Design Review (PDR)	3Q		
(U) FAB-T (Inc 1) System CDR		1Q	
(U) FAB-T 1st Engineering Development Model (EDM) Delivery of LDR terminal		2Q	
(U) FAB-T Inc 2 Concept Studies	1-4Q	1-4Q	1-4Q
(U) GBS Receive Suite Award			2Q

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