BUDGET ACTIVITY: 7 **PROGRAM ELEMENT: 0303109N**
PROGRAM ELEMENT TITLE: Satellite Communications (Space)

(U) Cost ($ in Thousands)	FY 2001 ACTUAL	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	FY 2006 ESTIMATE	FY 2007 ESTIMATE	COST TO COMPLETE	TOTAL COST
X0728 EHF SATCOM Terminals	8,786	12,111	48,708	51,607	35,417	17,579	10,522	CONT.	CONT.
X0731Fleet Satellite Comm	3,346	4,554	669	783	1,818	1,838	1,842	CONT.	CONT.
X2472 Mobile User Segment	27,133	37,033	60,526	296,671	253,551	167,137	8,814	CONT.	CONT.
X9122 Advanced Wideband System			6,000	13,000	19,000	37,000	72,000	CONT	CONT.
Total PE Cost	39,265	53,698	115,903	362,061	309,786	223,554	93,178	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

(U) The Navy Extremely High Frequency (EHF) Satellite Communications (SATCOM) Program (NESP) provides for the development and production of terminals to provide anti-jam, low probability of intercept/detection communications capability for Command and Control of the fleet. NESP operates with Fleet Satellite (FLTSAT) EHF Packages (FEP), Ultra High Frequency (UHF) Follow On (UFO), and Milstar I/II Satellite Packages. The Milstar program is comprised of satellites, control stations, and aircraft, ship, and ground terminals to provide assured worldwide, secure, anti-jam, survivable communications for the National Command Authority, CINCs, and operational commanders. The Advanced EHF (AEHF) Operational Requirements Document (ORD) was validated by the Joint Requirements Oversight Council (JROC) on 22 Mar 99. AEHF development cost estimates are included in the budget.

(U) The Navy Super High Frequency (SHF) Satellite Communications (SATCOM) program provides for the development and production of terminals to provide high capacity reliable, low probability of intercept (LPI), secure, and jam resistant communications to Joint and Allied Forces. SHF SATCOM operates with the Defense Satellite Communication System (DSCS), DSCS Service Life Extension Program (SLEP), Wideband Gapfiller Satellite (WGS) System, and the Advanced Wideband System (AWS) satellites. The SHF SATCOM system is comprised of satellites, ground stations, and aircraft, ship and ground terminals to provide assured worldwide access to services such as Defense Information Systems Network (DISN), Global Command and Control System (GCCS), Plain Old Telephone Service (POTS), Secure Telephone Unit III (STU III) Secure Communications Service, Internet Protocol Routed Networks, and other digital services. The satellite systems SHF SATCOM operate over are transitioning from old technology DSCS III satellites to the more advanced DSCS SLEP and WGS satellites beginning in FY 99 and continuing through FY 05. The population of Navy SHF SATCOM terminals is also growing at a rapid pace. In order to meet the communication requirements of Navy users, advanced communication technologies for SHF SATCOM terminals must be developed to take full advantage of the capabilities of the new satellites in an efficient manner.

(U) Fleet Satellite Communications includes Sensitive Compartmented Information (SCI) Networks (formerly SCI Automated Digital Network System (ADNS)) which provides real time indications and warning communications support and enhanced SCI interoperability with other services, agencies, and allies permitting a level of integration not available with current systems.

(U) The SATCOM Systems Integration (SSI) initiative will expand upon the collaborative development capabilities between fleet systems and the C4ISR systems integration and production environment at SSC Charleston, and will provide a medium for direct warfighter involvement in the development process. The SSI initiative provides a developmental transport medium for more effective transition of advanced technologies into fleet C4ISR systems. The SSI initiative will support the integration and

evaluation of network-centric applications employed by the military services and national agencies in an effort to map an integration strategy for these applications agencies in an effort to map an integration strategy for these applications into wireless SATCOM systems. SSC Charleston will procure equipment, integrate systems, and establish connectivity between communications labs to create a new end-to-end capability for the development, integration, test and evaluation across a range of SATCOM technologies.

(U) The Joint Tactical Radio System-Maritime (JTRS-M) will provide tactical joint interoperable UHF satellite communications. The Digital Modular Radio (DMR) has been identified as the candidate for modification to JTRS compliance. DMR is software programmable, modular in hardware and software design, and backward compatible with legacy radios and cryptographic devices. Per CJCSI 6251.01, JTRS-M/F will replace all non-compliant, mostly 1970's design radios and multiplexers, with a software programmable radio that meets present and future requirements in a cost effective and forward thinking manner. JTRS-M/F initial baseline provides the framework for meeting the planned future SATCOM and Line of Sight (LOS) communications requirements in the 20MHz to 2 GHz spectrum. The modification of DMR to be compliant with the JTRS hardware and software architecture will allow the fielding of an initial set of JTRS compliant waveforms (via modified DMR) that satisfy the JTRS-M/F requirements. Beginning in FY03, JTR-M transfers to PE 0604280N Project X3073.

(U) The Mobile User Objective System (MUOS) program provides for the development of the next generation DoD advanced narrowband communications satellite constellation. The current UHF Follow-On (UFO) constellation is expected to degrade below acceptable availability parameters by FY08 and will require phased replacement starting at that time. In addition, new user requirements have been identified and strategies have been modified to incorporate new concepts and technologies. The joint MUOS Integrating Integrated Product Team (IIPT) has developed an acquisition strategy to address the exponential growth of narrowband communications demands, which has resulted in identifying the need to explore new approaches to acquiring satellite based communications capabilities. This program builds on state of the art technologies and commercial practices to develop a totally responsive joint warfighter system.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for the upgrade of an existing, operational system.

(U) The Navy Advanced Wideband Integrated Terminal Satellite Communications (SATCOM) program provides for the development and production of terminals to provide high capacity reliable, low probability of intercept (LPI), Anti-Jam (AJ), communications capability to the fleet. Terminals will support multiple data streams over Q-band, Ka-band, and X-band. The terminals will also support mesh networking without the need for gateway terminals.

B. (U) PROGRAM CHANGE:

(U) Funding:

FY 2001: -$278K Section 8086 .7% Pro-Rata Reduction; -$87K Government-Wide Rescission; -$945K SBIR reduction; -$12K Federal Technology Transfer; +$2,000K Space Activities; +$809K MUOS Offload Demo.

FY2002: -$479K Section 8123 Management Reform Initiative: -$53K Section 8032 FFRDC.

BUDGET ACTIVITY: 7 **PROGRAM ELEMENT: 0303109N**
PROGRAM ELEMENT TITLE: Satellite Communications (Space)

(U) Schedule:

FY 2002: MUOS Program Milestone A moved from 2nd Qtr 02 to 3rd Qtr 02. Award of two MUOS CAD contracts moved from 2nd Qtr 02 to 3rd Qtr 02. (X2472). DTIUI-D moved from 7/02 to 8/02. OT-IIB moved from 9/02 to 10/02. Milstar II Launch (Flight 5) moved from 2/2 to1/02.

EXHIBIT R-3, FY 2003 RDT&E, N PROJECT COST ANALYSIS **DATE: FEBRUARY 2002**

BUDGET ACTIVITY: 7 **PROGRAM ELEMENT: 0303109N** **PROJECT NUMBER: X0728**
PROGRAM ELEMENT TITLE: Satellite Communications (Space) **PROJECT TITLE: EHF SATCOM Terminal**

PROJECT NUMBER& TITLE	FY 2001 ACTUAL COST	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	FY 2006 ESTIMATE	FY 2007 ESTIMATE	COST TO ESTIMATE	TOTAL COMPLETE
X0728 EHF SATCOM Terminals	8,786	12,111	48,708	51,607	35,417	17,579	10,522	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

(U) Navy Extremely High Frequency (EHF) Satellite Communications (SATCOM) Program provides for the development and production of terminals to provide anti-jam (A/J), low probability of intercept (LPI)/detection communications capability for Command and Control of the fleet. The terminals will provide physical and electromagnetically survivable, worldwide communications in the current and projected electromagnetic and nuclear threat environments. Navy EHF terminals are interoperable with Army and Air Force terminals and will operate with Milstar as well as EHF packages on-board Ultra High Frequency (UHF) Follow-On (UFO) Satellites 4 through 11 and FLTSATCOM Satellites 7 and 8. The increased capability provided by EHF terminals is accomplished by use of the wider bandwidths available at extremely high frequencies, narrow antenna bandwidths, spread spectrum techniques, on-board satellite processing, and advanced signal processing technology.

(U) The Navy Super High Frequency (SHF) Satellite Communications (SATCOM) program provides for the development and production of terminals to provide high capacity reliable, low probability of intercept (LPI), secure, and jam resistant communications to Joint and Allied Forces. SHF SATCOM operates with the Defense Satellite Communication System (DSCS), DSCS Service Life Extension Program (SLEP), Wideband Gapfiller Satellite (WGS) System, and the Advanced Wideband System (AWS) satellites. The SHF SATCOM system is comprised of satellites, ground stations, and aircraft, ship and ground terminals to provide assured worldwide access to services such as Defense Information Systems Network (DISN), Global Command and Control System (GCCS), Plain Old Telephone Service (POTS), Secure Telephone Unit III (STU III) Secure Communications Service, Internet Protocol Routed Networks, and other digital services. The satellite systems SHF SATCOM operate over are transitioning from old technology DSCS III satellites to the more advanced DSCS SLEP and WGS satellites beginning in FY 99 and continuing through FY 05. The population of Navy SHF SATCOM terminals is also growing at a rapid pace. In order to meet the communication requirements of Navy users, advanced communication technologies for SHF SATCOM terminals must be developed to take full advantage of the capabilities of the new satellites in an efficient manner.

(U) The EHF Medium Data Rate (MDR) upgrade program is near development completion and provides increased bandwidth by providing higher data rates [4.8 kilobits per second (Kbps) – 1.544 megabits per second (Mbps)] when communicating with Milstar II satellites.

(U) The Navy EHF Communications Controller (NECC) provides automated, netted tactical data information exchange over jam resistant EHF LDR satellite links. The NECC will provide for load and channel sharing, resource management, communications management and planning, network control and monitoring, and packet switching.

(U) The EHF Time Division Multiple Access (TDMA) Interface Processor (TIP) will support wide area network (WAN) implementation through reliable, efficient, netted data exchange using MDR services. The MDR TIP combines support for general-purpose internet protocol (IP) data delivery and high speed, rapid delivery of tactical data within a single system architecture. TIP supports single-beam, multi-beam, and multi-satellite networks.

BUDGET ACTIVITY: 7 **PROGRAM ELEMENT: 0303109N** **PROJECT NUMBER: X0728**
PROGRAM ELEMENT TITLE: Satellite Communications (Space) **PROJECT TITLE: EHF SATCOM Terminal**

(U) Advanced EHF is the follow-on satellite communications system and will provide worldwide, secure, survivable satellite communications to U.S. and International Partners strategic and tactical forces during all levels of conflict. The AEHF system provides an increase in single service capability from 1.5 Mbps to 8 Mbps, increases the number of coverage areas and retains A/J, LPI protection characteristics. It is compatible with today's Navy LDR/MDR terminals and will sustain the MILSATCOM architecture by providing connectivity across the spectrum of mission areas, to include land, air and naval warfare, special operations; strategic nuclear operations; strategic defense, theater missile defense; and space operations and intelligence. The AEHF system will replenish and improve on the capabilities of the Milstar system. The Milstar System is projected to begin degrading by FY 2003. The new system will equip the warfighters with the assured, jam resistant, secure communications as described in the ORD for the joint AEHF Satellite Communications System. The AEHF system will provide crosslinks within the AEHF constellation as well as between AEHF satellites and Milstar satellites in the backwards compatible mode. Mission requirements specific to Navy operations, including threat levels and scenarios, are contained in the AEHF ORD.

(U) The Challenge Athena Program requires the following enhancements: (a) Satellite Doppler Buffer Fill Meter. A "gauge" on the GUI that indicates the current level of fill of the satellite Doppler buffer. The terminal operator will be able to determine if the buffer is close to an overflow/underflow condition. With this indicator, he can then better plan when to re-center it without losing critical communications. (b) Channel Interleave Option for MIL-STD-188-165 Modes. A mode that allows the channel interleaver to be enabled without the additional bandspreading required for framing and Reed-Solomon FEC that provides handover and EMI protection (c) Higher Data Rates. Increase the maximum provided data rate of the MD-1030B(V) 9 Modem to 4.096 Mb/s with QPSK modulation. Higher available data rates in the MD-1030B(V)9 modem will allow the customer to achieve its near term throughput needs without putting up additional carriers. (d) Shore Handover Error Burst. The MD-1030B(V)9 modem maintains its Bit Count Integrity (BCI) both at ship and shore based installations through shipboard antenna handover events. In addition, the MD-1030B(V)9 achieves virtual error free performance for ship's received data.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 2001 ACCOMPLISHMENTS:

   (U) ($1,018) Completed MDR Modem and MDR Satellite Simulator (SATSIM) upgrade and performed Over the Air (OTA) MDR communications testing and LDR regression testing. Provided software corrections as necessary.

   (U) ($1,896) Continued development of TIP/NECC modifications and performed OTA testing to verify performance in multi-terminal configuration.

   (U) ($3,350) Initiated identification of Advanced EHF terminal upgrade specification. Initiated system engineering studies and analysis. Performed waveform simulation and analysis. Participated in satellite to terminal interface requirements studies and analysis.

   (U) ($1,624) Participated in Milstar on Orbit test and checkout of Milstar flight 4 (MST 8000). Conducted MDR Developmental Test and Operational Test (DT/OT) for ship and shore systems. Participated in joint interoperability communications with Army SMART-T MDR terminal.

   (U) ($898) Continued terminal development engineering analysis and management.

BUDGET ACTIVITY: 7 **PROGRAM ELEMENT: 0303109N** **PROJECT NUMBER: X0728**
PROGRAM ELEMENT TITLE: Satellite Communications (Space) **PROJECT TITLE: EHF SATCOM Terminal**

2. (U) FY 2002 PLAN:

(U) ($2,025) Complete development of TIP/NECC Increment 3 modifications.

(U) ($6,797) Continue AEHF system engineering studies and analysis, perform terminal upgrade design and development, develop test procedures, begin development of terminal and satellite simulators, and perform initial ground based testing.

(U) ($306) Participate in Milstar on Orbit test and checkout of Milstar flight 5 and 6 (MST 8000). Continue to participate in joint interoperability communications with Army SMART-T MDR terminal.

(U) ($1,033) Continue terminal development engineering analysis and management.

(U) ($1,650) Develop advanced SHF modems for Wideband Gapfiller Satellite system and AN/WSC-6 terminal upgrades.

(U) ($300) Develop Satellite Doppler Buffer Fill meter, Channel Interleave Option for MIL-STD-188-165 Modes, Higher Data Rates, and Shore Handover Error Burst.

3. (U) FY 2003 PLAN:

(U) ($2,130) Continue development of an advanced modem system and AN/WSC-6 Wideband Gapfiller system terminal upgrades and to conduct follow on test and evaluation.

(U) ($15,162) AEHF Development, First Phase: Continue first phase of AEHF development for System Development and Demonstration for ship, shore and submarine platforms, contract awarded in FY 2002. Risk reduction phase necessary to demonstrate waveform interface compatibility testing between AEHF terminal and Lincoln Lab SATSIM and demonstrate payload-to-terminal on-orbit backward compatibi8lity with existing Milstar constellation. Estimated completion in Q1 FY 2004.

(U) ($15,162) AEHF Development, First Phase: Complete development of AEHF Engineering Development Model (EDM) software such as operator interface, Terminal Control Processor, Modem Control Processor, Antenna Pointing Unit, and associated firmware. Software development also includes access control protocols, terminal Built In Testing (BIT)/BITE Adaptation Data Recorder, and LPI software.

(U) ($7,669) AEHF Development, First Phase: Continue development of a high-level test plan to ensure requirements are decomposed and the key modeling and analysis demonstrates acquisition, tracking, communications antenna checkout, antenna handover, motion, anti-jam, low probability of intercept, low probability of detection, link budgets, multiband/multimode feed/modem development etc.

(U) ($7,085) Continue terminal development engineering analysis and management of existing programs and first phase of AEHF terminal Development.

(U) ($1,500) EHF POLAR software development and systems engineering.

BUDGET ACTIVITY: 7 **PROGRAM ELEMENT: 0303109N** **PROJECT NUMBER: X0728**
PROGRAM ELEMENT TITLE: Satellite Communications (Space) **PROJECT TITLE: EHF SATCOM Terminal**

B. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars In Thousands)

	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	TO COMPLETE	TOTAL PROGRAM
OPN SHIP 321000								
OPN SHIP &Shore* 321500	63,321	63,974	83,331	41,071	113,371	119,585	CONT.	CONT.
OPN SHORE* 322000								

*Includes EHF terminal installation costs.
(U) Related RDT&E:
(U) PE 0303603F, Milstar
(U) PE 0303601F, Air Force Satellite Communications
(U) PE 0303142A, Army Extremely High Frequency Communications Terminal

C. (U) ACQUISITION STRATEGY:

	FY 2001	FY 2002	FY 2003
Program Milestones	Milstar II Launch (Flight 4) 2/01	Milstar II Launch (Flight 5) 1/02 DSCS SLEP Launch 5/02	DSCS SLEP Launch 5/03
Engineering Milestones	N/A	N/A	N/A
T&E Milestones	MST 8000 (Flight 4) 3/01	MDR FOT&E 11/01 MST 8000 (Flight 5) 3/02 AN/WSC-6 (V)9 FOT&E 8/02	Lincoln Lab SATSIM Interface Compatibility Testing 6/03
Contract Milestones	N/A	AEHF Awd 04/02	N/A

D. (U) SCHEDULE PROFILE: N/A

EXHIBIT R-3, FY 2003 RDT&E, N PROJECT COST ANALYSIS **DATE: FEBRUARY 2002**

BUDGET ACTIVITY: 7 **PROGRAM ELEMENT: 0303109N** **PROJECT NUMBER: X0728**
PROGRAM ELEMENT TITLE: Satellite Communications (Space) **PROJECT TITLE: EHF SATCOM Terminal**

Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	FY 03 Cost	FY 03 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Prime Mission Equipment	SS/CPFF	Raytheon Marlborough, MA	41,601	5,420	12/00	9,334	2/02	36,456	12/02	CONT.	CONT.	
Prime Mission Equipment	WX	SSC SD	12,392	360	11/00	642	12/01	3,912	12/02	CONT.	CONT.	
Prime Mission Equipment	Various	Other	7,228	344	12/00	337	2/02	889	12/02	CONT.	CONT.	
Subtotal Product Development			61,221	6,124		10,313		41,257		CONT.	CONT.	
Remarks:												
Support Cost/Management Services												
Program Management	WX	SSC SD	6,771	171	12/00	73	12/01	395	12/02	CONT.	CONT.	
Program Management	WX	NUWC	5,305	286	12/00					CONT.	CONT.	
Program Management	Various	Other	4,478	128	12/00	510	12/01	2,252	12/02	CONT.	CONT.	
Subtotal Support			16,554	585		583		2,647		CONT.	CONT.	
Remarks												

EXHIBIT R-3, FY 2003 RDT&E, N PROJECT COST ANALYSIS **DATE: FEBRUARY 2002**

BUDGET ACTIVITY: 7 **PROGRAM ELEMENT: 0303109N** **PROJECT NUMBER: X0728**
PROGRAM ELEMENT TITLE: Satellite Communications (Space) **PROJECT TITLE: EHF SATCOM Terminal**

Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	FY 03 Cost	FY 03 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Test & Evaluation												
Test & Evaluation	Various	Various	6,010	2,077	12/00	1,215	12/01	4,804	12/02	CONT.	CONT.	
Subtotal T&E			6,010	2,077		1,215		4,804		CONT.	CONT.	
Remarks												
Management Services												
Subtotal Management												
Remarks												
Total Cost			83,785	8,786		12,111		48,708		CONT.	CONT.	
Remarks												

BUDGET ACTIVITY: 7 **PROGRAM ELEMENT: 0303109N** **PROJECT NUMBER: X0731**
PROGRAM ELEMENT TITLE: Satellite Communications (Space) **PROJECT TITLE: FLTSATCOM**

PROJECT NUMBER & TITLE	FY2001 ACTUAL	FY2002 ESTIMATE	FY2003 ESTIMATE	FY2004 ESTIMATE	FY2005 ESTIMATE	FY2006 ESTIMATE	FY 2007 ESTIMATE	COST TO COMPLETE	TOTAL COST
X0731 Fleet Satellite Communications	3,346	4,554	669	783	1,818	1,838	1,842	CONT.	CONT.

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

(U) The Sensitive Compartmented Information (SCI) Networks (formerly SCI Automated Digital Network Systems (ADNS)) implements the Integrated Special Intelligence Communications portion of the ADNS architecture, to provide services for transfer of Special Intelligence (SI) information between ships and shore activities in support of joint and combined operations. SCI Networks has been combined into the SI communications architecture and will provide real time indications and warning support to joint and component commanders through reliable high-speed transfer of sensor data and intelligence information. Enhanced interoperability with other services, agencies, and allies will permit a level of integration of SI operations not achievable with current systems.

(U) The SATCOM Systems Integration (SSI) initiative will expand upon the collaborative development capabilities between fleet systems and the C4ISR systems integration and production environment at SSC Charleston, and will provide a medium for direct warfighter involvement in the development process. The SSI initiative provides a developmental transport medium for more effective transition of advanced technologies into fleet C4ISR systems. The SSI initiative will support the integration and evaluation of network-centric applications employed by the military services and national agencies in an effort to map an integration strategy for these applications agencies into wireless SATCOM systems. SSC Charleston will procure equipment, integrate systems, and establish connectivity between communications labs to create a new end-to-end capability for the development, integration, test and evaluation across a range of SATCOM technologies.

(U) The Joint ultra high frequency (UHF) Military Satellite Communications Network Integrated Control System (JMINI) Control system will provide dynamic centralized control of joint 5-kHz and 25kHz UHF military satellite communications (MILSATCOM) voice and data resources (channels and Time Division Multiple Access (TDMA)) time slots via a globally integrated system of four control stations to be located at each of the three Naval Computer and Telecommunications Area Master Station (NCTAMS) sites plus Naval Computer and Telecommunications Station (NCTS) Guam.

(U) The Joint Tactical Radio System-Maritime (JTRS-M) will serve as the JMINI Control System Channel Controller and will provide tactical Joint interoperable UHF satellite communications per CJCSI 6251.01. JTRS-M/F will replace all non-compliant, mostly 1970's design radios and multiplexers, with a software programmable radio that can meet present and future requirements in a cost effective and forward thinking manner. The JTRS-M/F will be evolutionary in development beginning with a modification of the Digital Modular Radio (DMR) to be compliant with JTRS hardware and software. When complete, the modified DMR (renamed as JTRS-M/F Block I) will meet narrowband requirements of the Navy tactical communications. Beginning in FY03, JTRS-M transfers to PE 0604280N project X3073.

BUDGET ACTIVITY: 7 **PROGRAM ELEMENT: 0303109N** **PROJECT NUMBER: X0731**
PROGRAM ELEMENT TITLE: Satellite Communications (Space) **PROJECT TITLE: FLTSATCOM**

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 2001 ACCOMPLISHMENTS:

   (U) ($2,000) Established developmental Systems Integration Environment (SIE) laboratory connectivity across a range of wireless SATCOM technologies. Established a new end-to-end laboratory capability for development, integration, test and evaluation across these systems and technologies.

   (U) ($1,346) Continued integration and implementation of SCI Networks and associated Special Intelligence Communication capabilities. Performed developmental testing of upgrades, OT&E, FOT&E, Functional Configuration Audit (FCA) and Physical Configuration Audit (PCA) of SCI Networks.

2. (U) FY 2002 PLAN:

   (U) ($749) Continue integration and implementation of SCI Networks and associated Special Intelligence Communication capabilities. Developmental Testing of upgrades, OT&E, FOT&E, FunctionalConfiguration Audit (FCA) and Physical Configuration Audit (PCA) of SCI Networks will be accomplished.

   (U) ($3,205) Initiate modification of the Digital Modular Radio (DMR), identified as the Joint Tactical Radio System (JTRS) candidate radio, to be compliant with JTRS software architecture. This effort will continue in Program Element 0604280N, Project Number X3073 JTRS-M/F in FY03.

   (U) ($600) Initiate development of contract package for JTRS-M/F Block II as the follow-on to the modified DMR. This effort will continue in Program Element 0604280N, Project Number X3073 JTRS-M/F in FY03.

3. (U) FY 2003 PLAN:

   (U) ($669) Continue integration and implementation of SCI Networks and associated Special Intelligence Communication capabilities. Continue to perform Developmental Testing of upgrades, OT&E, FOT&E, Functional Configuration Audit (FCA) and Physical Configuration Audit (PCA) of SCI Networks.

BUDGET ACTIVITY: 7 **PROGRAM ELEMENT: 0303109N** **PROJECT NUMBER: X0731**
PROGRAM ELEMENT TITLE: Satellite Communications (Space) **PROJECT TITLE: FLTSATCOM**

B. (U) OTHER PROGRAM FUNDING SUMMARY. (Dollars In Thousands)

NUMBER / TITLE	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Complete	Total Program
OPN COMM AUTO* 305000		0	7,049	4,977	567	559	5,517	5,890	CONT.	CONT.
OPN SATCOM 321500		10,353	13,460							
O&M,N		1,553	2,213	2,039	1,979	1,936	1,993	2,096	CONT.	CONT.

*Includes terminal installation costs.

(U) Related RDT&E: N/A

BUDGET ACTIVITY: 7 **PROGRAM ELEMENT: 0303109N** **PROJECT NUMBER: X0731**
PROGRAM ELEMENT TITLE: Satellite Communications (Space) **PROJECT TITLE: FLTSATCOM**

C. (U) ACQUISITION STRATEGY:

	FY2001	FY2002	FY2003
Program Milestones		SCI NETWORKS MS-IIIA 10/01 DMR MS-III DMR IOC	SCI NETWORKS MS-IIIB 02/03
Engineering Milestones	N/A	N/A	N/A
T&E Milestones	SCI NETWORKS OT-IIA 5/01	SCI NETWORKS DT II-D 08/02 DMR DT-IIIB DMR OT-IIIA, OT-IIIB	OT-IIB 10/02
Contract Milestones	N/A	N/A	N/A

Notes:
1) SCI Networks DT-IIC was accomplished in FY00.
2) Original SCI Networks program schedule included DT-II and OT-II tests leading to a single MS III event. Further testing for the submarine variant and messaging (DMS) included DT-III and OT-III tests. COMOPTEVFOR directed a program schedule change to a series of DT-II and OT-II events leading to separate MS-III decisions for the basic system, the submarine variant, and messaging support.
3) DMR R&D program transfers to PE 0604280N Project X3073 in FY03.

D. (U) SCHEDULE PROFILE: (See Paragraph C.)

BUDGET ACTIVITY: 7 **PROGRAM ELEMENT: 0303109N** **PROJECT NUMBER: X0731**
PROGRAM ELEMENT TITLE: Satellite Communications (Space) **PROJECT TITLE: FLTSATCOM**

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	FY 03 Cost	FY 03 Award Date	Cost To Complete	Total Cost	Target Value of Contract
1.1.1 Prime Mission Product	FPI	Titan	6,309	0		0				CONT.	CONT.	
1.1.1 Prime Mission Product	FFP	SRC	18,505	0		0				CONT.	CONT.	
1.1.1 Prime Mission Product	PD	NAVSUP/ SRC	5,223	0		0				CONT.	CONT.	
1.1.1 Prime Mission Product	VAR	VAR	11,594	806	12/00	564	12/01			CONT.	CONT.	
Engineering Support	Various	Various						227	12/02			
Subtotal Product Development			41,631	806		564		227		CONT.	CONT.	
Remarks:												
1.1.1 Prime Mission Product	CPFF	CSC	3,588	0		0				CONT.	CONT.	
1.1.1 Prime Mission Product	PD	NAVAIR/I SC	1,176	0		0				CONT.	CONT.	
1.1.1 Prime Mission Product	VAR	VAR	9,344	0		0				CONT.	CONT.	
1.1.1 Prime Mission Product	FFP	Motorola	0	0		2,750	TBD			CONT.	CONT.	
GFE												
Subtotal Support			14,108	0		2,750		0		CONT.	CONT.	
Remarks												

EXHIBIT R-2a, FY 2003 RDT&E, N PROJECT JUSTIFICATION: DATE: FEBRUARY 2002

BUDGET ACTIVITY: 7 **PROGRAM ELEMENT: 0303109N** **PROJECT NUMBER: X0731**
PROGRAM ELEMENT TITLE: Satellite Communications (Space) **PROJECT TITLE: FLTSATCOM**

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	FY 03 Cost	FY 03 Award Date	Cost To Complete	Total Cost	Target Value of Contract
1.2.5 System T&E	N/A	SSC SD	675	460	12/00	789	12/01	83	12/02	CONT.	CONT.	
1.2.5 System T&E	N/A	OPTEVFOR	129	49	12/00	60	12/01			CONT.	CONT.	
1.2.5 System T&E	VAR	VAR	9,296									
1.2.5 System T&E	N/A	SSC Chas	0	1,671	12/00							
1.2.5 System T&E	Various	Various	N/A	0	N/A			145	12/02	CONT	CONT	
Subtotal T&E			10,100	2,180		849		228		CONT.	CONT.	
Remarks:												
1.1.3 Program Management	CPFF	CSC	3,588							CONT.	CONT.	
1.1.3 Program Management	PD	NAVAIR/ISC	1,176							CONT.	CONT.	
1.1.3 Program Management	N/A	ACS	674							CONT.	CONT.	
1.1.3 Program Management	VAR	VAR	9,344	60	12/00	132	12/01	64	12/02	CONT.	CONT.	
1.1.3 Program Management	VAR	VAR	0			259	12/01			CONT.	CONT.	
1.1.3 Program Management	N/A	SSC Chas	0	300	12/00							
1.1.3 Program Management	Various	Various	N/A					150	12/02	CONT	CONT	
Subtotal Management			14,782	360		391		214		CONT.	CONT.	
Remarks:												
Total Cost			80,621	3,346		4,554		669		CONT.	CONT.	

EXHIBIT R-2a, FY 2003 RDT&E, N PROJECT JUSTIFICATION: DATE: FEBRUARY 2002

BUDGET ACTIVITY: 7 **PROGRAM ELEMENT: 0303109N** **PROJECT NUMBER: X2472**
PROGRAM ELEMENT TITLE: Satellite Communications (Space) **PROJECT TITLE: FLTSATCOM**

(U) Cost ($ in Thousands)

PROJECT NUMBER & TITLE	FY 2001 ACTUAL COST	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	FY 2006 ESTIMATE	FY 2007 ESTIMATE	TO ESTIMATE	TOTAL COMPLETE
X2472 Mobile User Segment	27,133	37,033	60,526	296,671	253,551	167,137	8,814	CONT.	CONT.

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

(U) This program provides for the development of the next generation DoD narrowband communications satellite constellation, the Mobile User Objective System (MUOS).

(U) The current UFO constellation is expected to degrade below acceptable availability parameters and will require phased replacement by FY 08. In addition, new user requirements have been identified and strategies have been modified to incorporate new concepts and technologies. The joint MUOS Integrating Integrated Product Team (IIPT) has developed an acquisition strategy to address the exponential growth of narrowband communications demands, which has resulted in identifying the need to explore new approaches to acquiring satellite based communications capabilities. This program builds on state of the art technologies and commercial practices to develop a comprehensive joint warfighter system.

(U) This RDT&E effort supports the program objectives by assisting in identifying the most effective way to field a new system by FY 08. Multiple Concept Exploration (CE) contracts were awarded in early FY 00. Additional CE contracts were awarded in FY 01, along with commercial demonstrations, to support a MS A Defense Acquisition Board (DAB) in 3rd Qtr FY02. Two Component Advanced Development (CAD) contracts will be awarded after the DAB. The CAD contracts will continue through FY 02 into FY 03. In FY 04, a single System Design and Development (SDD) contract will be awarded with an option for production.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 01 ACCOMPLISHMENTS:

   (U) ($25,851) Awarded multiple contracts for MUOS and conducted demonstrations to evaluate commercial services viability in satisfying requirements.
   (U) ($1,282) Funded required independent Analysis of Alternatives for MUOS.

2. (U) FY 02 PLAN:

   (U) ($37,033) Award MUOS contracts and associated engineering tasks.

BUDGET ACTIVITY: 7 **PROGRAM ELEMENT: 0303109N** **PROJECT NUMBER: X2472**
PROGRAM ELEMENT TITLE: Satellite Communications (Space) **PROJECT TITLE: FLTSATCOM**

(U) FY 03 PLAN

(U) ($60,526) Fully fund MUOS contracts and associated system engineering tasks.

B. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars In Thousands)

NUMBER / TITLE	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Complete	Total Program
(U)WPN Line 243300 Fleet Satellite Communication Follow-On	0	0	0	31,226	534,859	573,878	606,205	CONT.	CONT.

C. (U) ACQUISITION STRATEGY:

(U) Concept Exploration contracts were awarded in early FY 00 and completed in late FY 01. Two Component Advancement Development (CAD) contracts will be awarded in 3Q FY 02. A System Development and Demonstration (SDD) contract will be awarded in early FY04 with production option in FY 05 and first launch in 2008.

D. (U) SCHEDULE PROFILE:

MUOS 2001	FY 2001	FY 2002	FY 2003
Program Milestones		3Q MS A	
Engineering Milestones	N/A		4Q - SDR
Milestones T&E	N/A	N/A	N/A
Contract Milestones		3Q-CAD Contracts Awarded	

EXHIBIT R-3, FY 2003 RDT&E, N PROJECT COST ANALYSIS **DATE: FEBRUARY 2002**

BUDGET ACTIVITY: 7 **PROGRAM ELEMENT: 0303109N** **PROJECT NUMBER: X2472**
PROGRAM ELEMENT TITLE: Satellite Communications (Space) **PROJECT TITLE: FLTSATCOM**

Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	FY 03 Cost	FY 03 Award Date	Cost To Complete	Total Cost	Target Value of Contract
MUOS Contracts And Demos	COM/FP	Various	7,100	18,684		34,018	06/02	55,526	TBD	CONT.	CONT.	CONT.
UFO Digital Receiver			18,200								18,200	18,200
AoA for MUOS	MIPR	Various	1,500	1,282							2,782	2,782
Government Studies	Various	Various		711							CONT.	CONT.
Subtotal Product Development			26,800	20,677		34,018		55,526		CONT.	CONT.	CONT.
Remarks:												
Support Cost												
Program Support	Various	Program Support	4,450	6,456		3,015		5,000		CONT.	CONT.	CONT.
Subtotal Support Cost			4,450	6,456		3,015		5,000		CONT.	CONT.	CONT.
Remarks:												
Total Cost			31,250	27,133		37,033		60,526		CONT.	CONT.	CONT.

EXHIBIT R-3, FY 2003 RDT&E, N PROJECT COST ANALYSIS **DATE: FEBRUARY 2002**

BUDGET ACTIVITY: 7 **PROGRAM ELEMENT: 0303109N** **PROJECT NUMBER: X9122**
PROGRAM ELEMENT TITLE: Satellite Communications (Space) **PROJECT TITLE: Advanced Wideband Sys**

PROJECT NUMBER& TITLE	FY 2001 ACTUAL COST	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	FY 2006 ESTIMATE	FY 2007 ESTIMATE	COST TO ESTIMATE	TOTAL COMPLETE
X9122 Advanced Wideband System			6,000	13,000	19,000	37,000	72,000	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

(U) The Navy Advanced Wideband Integrated Terminal Satellite Communications (SATCOM) program provides for the development and production of terminals to provide high capacity reliable, low probability of intercept (LPI), Anti-Jam (AJ), communications capability to the fleet. Terminals will support multiple data streams over Q-band, Ka-band, and X-band. The terminals will also support mesh networking without the need for gateway terminals.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 2001 ACCOMPLISHMENTS:

   (U) Not applicable.

2. (U) FY 2002 PLAN:

   (U) Not applicable.

3. **(U) FY 2003 PLAN:**

   (U) ($6,000) Begin development of wideband tactical, protected tactical, and broadcast terminals to operate with Advanced Wideband System (AWS). Begin development of strategic terminals that will operate with the protected satellite in mid-latitude and polar regions. Development will include concept exploration and systems engineering studies and analysis. These studies and analysis will determine optimum methods to implement software programmable, modular, reconfigurable, and upgradeable SATCOM terminals. They will also investigate multi-band feed and phased array options. Terminal Modem concepts will also be explored. Risk areas will be explored and documented. Terminal designs will be explored to mitigate these risk areas.

EXHIBIT R-3, FY 2003 RDT&E, N PROJECT COST ANALYSIS **DATE: FEBRUARY 2002**

BUDGET ACTIVITY: 7 **PROGRAM ELEMENT: 0303109N** **PROJECT NUMBER: X9122**
PROGRAM ELEMENT TITLE: Satellite Communications (Space) **PROJECT TITLE: Advanced Wideband Sys**

B. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars In Thousands)

	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	TO COMPLETE CONT.	TOTAL PROGRAM CONT.
OPN Ship & Shore 321500	N/A	N/A	N/A	N/A	N/A	N/A	CONT.	CONT.

C. (U) ACQUISITION STRATEGY:

	FY 2001	FY 2002	FY 2003
Program Milestones	N/A	N/A	Milestone A (Concept and Technical Development)
Engineering Milestones	N/A	N/A	N/A
T&E Milestones	N/A	N/A	N/A
Contract Milestones	N/A	N/A	N/A

EXHIBIT R-3, FY 2003 RDT&E, N PROJECT COST ANALYSIS **DATE: FEBRUARY 2002**

BUDGET ACTIVITY: 7 **PROGRAM ELEMENT: 0303109N** **PROJECT NUMBER: X9122**
PROGRAM ELEMENT TITLE: Satellite Communications (Space) **PROJECT TITLE: Advanced Wideband Sys**

D. (U) SCHEDULE PROFILE: N/A

Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	FY 03 Cost	FY 03 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Support Cost/Management Services												
Engineering Studies	WX	SSCSD						1,000	10/02	CONT.	CONT.	
Engineering Studies	MIPR	MITRE						1,000	10/02	CONT.	CONT.	
Concept Exploration	COMPETITIVE OTA							3,000	TBD	CONT.	CONT.	
Program Management	TDL	PMTO						1,000	10/02			
Subtotal Support								6,000		CONT.	CONT.	
Remarks:												

Total								6,000		CONT.	CONT.	
Remarks:												