

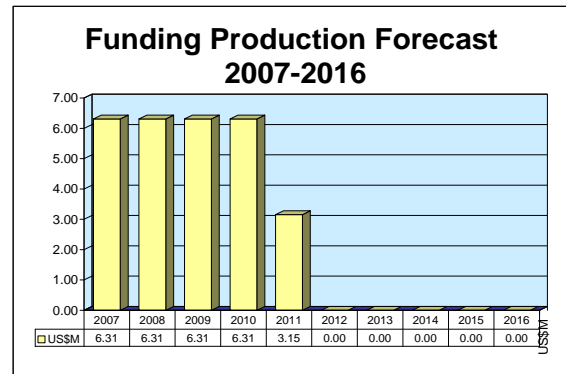
ARCHIVED REPORT

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USC-38/LDR/MDR EHF SATCOM Terminals - Archived 02/2008

Outlook

- Raytheon Technical Services awarded USC-38 logistics support contract
- Production of USC-38 terminals should end in May 2006
- All USC-38 terminals will be phased out and replaced by Navy Multi-band Terminals (NMTs)
- Baring further activity, Forecast International will archive this report in February 2008



Orientation

Description. Extremely high frequency (EHF) satellite communications terminals designed for U.S. naval ships, submarines, and shore stations.

Sponsor

Space and Naval Warfare Systems Command
 4301 Pacific Hwy
 San Diego, CA)92110-3127
 USA
 Web site: <http://enterprise.spawar.navy.mil>

Status. In service and ongoing maintenance.

Total Produced. As of January 2007, approximately 356 USC-38 terminals had been delivered to the U.S.

Navy. This number is from FY07 U.S. Navy budget documentation.

Application. The USC-38 is used on board U.S. Navy ships and submarines and at shore stations to provide survivable, secure, jam-resistant satellite communications.

Price Range. According to U.S. budget documentation, the unit cost of the USC-38 ranges between \$986,000 and \$1.8 million, depending on variant and quantity purchased.

Contractors

Prime

<p>Raytheon Command & Control Systems (C2S)</p>	<p>http://www.raytheon.com/businesses/rncs/businesses/c2s/, 1001 Boston Post Rd, Marlborough, MA 01752-3789 United States, Tel: + 1 (508) 490-1000, Fax: + 1 (508) 490-2822, Prime</p>
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Raytheon Technical Services	http://www.raytheon.com/businesses/rts/ , 12160 Sunrise Valley Dr, Suite 500, Reston, VA 12160 United States, Tel: + 1 (703) 295-2535, Email: Stephen_S_Teel@raytheon.com, Program Participant (Logistics Support)
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Comprehensive information on Contractors can be found in Forecast International's "International Contractors" series. For a detailed description, go to www.forecastinternational.com (see Products & Samples/Governments & Industries) or call + 1 (203) 426-0800.

Contractors are invited to submit updated information to Editor, International Contractors, Forecast International, 22 Commerce Road, Newtown, CT 06470, USA; rich.pettibone@forecast1.com

Technical Data

Design Features. As part of the Navy EHF SATCOM Program (NESP), the USC-38 provides voice, data, and information-exchange communications with anti-jam, low-probability-of-intercept, low-probability-of-detection, and anti-scintillation capabilities. The NESP terminal is interoperable with Air Force and Army terminals deployed with EHF packages on Fleet Satellite, UFO, and MILSTAR satellites.

The USC-38 is designed to accommodate a variety of command and control communications (i.e., secure

voice, teletype, data, and Fleet broadcast systems). Under the NESP program, the USC-38 terminal had been developed, produced, and installed to provide the Fleet with hard-core communications capabilities for worldwide command and control communications. USC-38 terminals currently have physical and electromagnetic survivability, are resistant to jamming and electromagnetic interference, and have low-probability-of-intercept detection capabilities against the current and projected threats at data rates of 75 to 2,400 bits per second (bps).

U.S.

Dimensions

High power amplifier	54 in x 18.75 in x 24 in
Communications equipment group	67.5 in x 24 in x 24 in

Performance

Uplink frequency	44.5 GHz
Uplink bandwidth	2.0 GHz
Downlink frequency	20.7 GHz
Downlink bandwidth	1.0 GHz
RF amplifier	250 W coupled cavity TWT
Waveforms	FEP/MILSTAR compatible
Data rates	75-2,400 bps up to 12 active channels
Prime power	
HPA	2,600 W
CEG	2,310 W (ship) 1,625 W (sub) 2,100 W (shore)

Variants/Upgrades

The USC-38 comes in three variants: (V1) submarines, (V2) ships, and (V3) shore terminals.

LDR/MDR EHF SATCOM Terminal. The LDR/MDR is a Follow-On Terminal (FOT) that replaced the legacy terminals. This upgraded capability increased protected (jam resistant and low probability of

interception and detection) MDR communications from 4.8 kilobits per second (Kbps) to 1.544 megabits per second (Mbps). The first article production unit was delivered to the government in August 1999 and MDR patches were procured and retrofitted into existing LDR terminals.

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Program Review

Background. In 1982, the Harris Corp and Raytheon were awarded contracts to build six full-scale engineering development prototype USC-38 satellite terminals. By 1986, Raytheon had emerged as the victor of this competition. Low-rate initial production of the USC-38(V) began in 1990 when Raytheon was awarded an \$83.7 million contract for the production of 21 units. Full production approval was granted in the spring of 1993. Raytheon supplied an additional 60 USC-38(V) terminals to equip surface ships, submarines, and shore sites under a \$75.7 million contract modification. These terminals operate with both MILSTAR and EHF communications packages on Fleet satellites.

In April 2000, *Defense Daily* reported that the U.S. Navy had exercised first-year production options for the delivery of a replacement SATCOM system for the USC-38(V): the LDR/MDR EHF SATCOM terminal. The first contract for the USC-38(V) replacement was awarded in 1998. This FOT replaces legacy LDR

terminals. Approximately 89 LDR/MDR EHF SATCOM terminals were ordered: 63 to be used aboard ships, 10 for shore stations, and 16 designed for submarines. The number was not firm at contract award because the cost of installing the terminals on older ships had not been determined. Deliveries began in March 2002. The Navy also purchased MDR appliqué for older terminals and those installations were completed in 2003. In the U.S. Navy's FY06/07 procurement budget estimates, the production of USC-38 terminals is shown to continue through May 2006.

NMT to Replace USC-38

Two contracts were awarded in November 2003: one to Raytheon and one to Harris Corp for the development of a Navy Multi-band Terminal (NMT). This terminal replaces several current SATCOM terminals used by the U.S. Navy. Approximately 300 NMT units are to be produced by 2010.

Funding

	U.S. FUNDING, NAVY							
	Prior QTY	Prior AMT	FY05 QTY	FY05 AMT	FY06 QTY	FY06 AMT	FY07 QTY	FY07 AMT
Satellite Com Sys								
EHF Terminals								
USC-38- Ship	286	509.8	AE	2.2	AE	1.3	0	0
USC-38-Shore	70	106.0	0	0	0	0	0	0
MDR Appliqués -Ship	61	35.8						
	FY08 QTY	FY08 AMT	FY09 QTY	FY09 AMT	FY10 QTY	FY10 AMT	FY11 QTY	FY11 AMT
EHF Terminals								
USC-38	0	0	0	0	0	0	0	0

All \$ are in millions.

Source: Department of the Navy FY07 Budget Estimates: Justification of Estimates, February 2006, Other Procurement, Navy

AE = ancillary equipment only

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Contracts/Orders & Options

<u>Contractor</u>	<u>Award (\$ millions)</u>	<u>Date/Description</u>
Raytheon	56.0	Apr 2000 – The U.S. Navy exercised first-year production options for the delivery of approximately 89 LDR/MDR EHF SATCOM terminals: 63 to be installed on ships, 10 at shore stations, and 16 to be used aboard submarines. Deliveries began in April 2001 and ended in May 2002.
Raytheon	26.9	Mar 2004 – The U.S. Navy exercised a production option for the delivery of approximately 41 NESP EHF SATCOM terminals. Deliveries were to be completed by May 2006.
Raytheon	14.5	Sep 2005 – The U.S. Navy was awarded a not-to-exceed, cost-plus-incentive-fee contract for a two-phase effort for the design, development, test, production, and requisite training of a military X-band kit for the EHF LDR/MDR FOT submarine and Virginia class variants. This contract includes options which, if exercised, would bring the cumulative value of this contract to an estimated \$25 million. Work will be performed in Marlborough, MA, and is expected to be completed by September 2007 (September 2009 if all options are exercised).
Raytheon Technical Services	31.6	Jun 2006 – U.S. Navy contract for logistics support of the USC-38 satellite communications system. Work is expected to be completed by June 2011. (N00104-06-D-ZD31)

Timetable

<u>Year</u>	<u>Major Development</u>
1982	Engineering and development contracts awarded to Harris Corp and Raytheon
1986	Raytheon emerges as the victor of USC-38 competition
1990	LRIP of the USC-38(V) begins
1993	Full-rate production approved
2000	Contract for approximately 89 USC-38 LDR/MDR FOTs awarded
2004	Contract for approximately 41 USC-38 LDR/MDR FOTs awarded
2005	Contract for X-band kits for the USC-38 LDR/MDT FOT awarded
2006	Final USC-38 LDR/MDR FOT to be delivered and installed
2011	End of logistics support for the USC-38

Worldwide Distribution/Inventories

The only known customer of the USC-38 is the **United States Navy**.

Forecast Rationale

According to Department of the Navy FY07 budget estimates, the last USC-38 terminal was scheduled to be delivered in May 2006.

Raytheon Technical Services was recently awarded a \$31.6 million logistics support contract for the USC-38

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satellite communications system. Work under the contract is to be completed by 2011.

NMT to Replace USC-38

In June 2005, the Deputy Chief Engineer for Navy AEHF Communications stated that all USC-38 terminals will be phased out and replaced with Navy Multi-band Terminals (NMTs). Competing contracts for NMT development were issued in November 2003

to Raytheon and Harris Corp. A NMT Critical Design Review (CDR) was conducted in early 2005, and a contract for the engineering, manufacture, and development of the NMT is expected to be awarded in June 2007. Since the NMT program leverages other technologies, this program should avoid costly delays and overruns. The NMT program should ultimately prove successful, and anything other than a minor buy of USC-38 terminals appears unlikely.

Ten-Year Outlook

ESTIMATED CALENDAR YEAR O&M FUNDING (in millions US\$)												
Designation or Program	High Confidence					Good Confidence			Speculative			Total
	Thru 2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	
Raytheon Technical Services												
USC-38 LDR/MDR EHF SATCOM United States Navy Logistics Contract												
	3.15	6.31	6.31	6.31	6.31	3.15	.00	.00	.00	.00	.00	28.39
Total	3.15	6.31	6.31	6.31	6.31	3.15	.00	.00	.00	.00	.00	28.39