

ARCHIVED REPORT

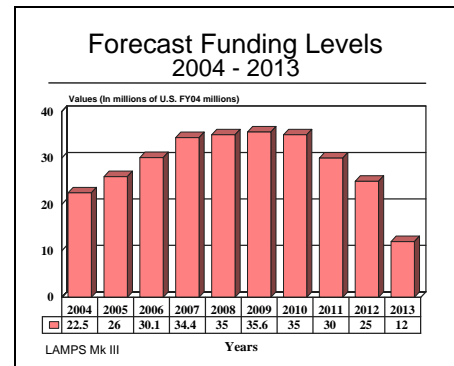
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LAMPS Mk III - Archived 1/2005

Outlook

- The U.S. Navy is projected to spend some \$285.60 million over the next decade on LAMPS Mk III Tactical Common Data Link (TCDL) suites
- Look for the U.S. Navy to increase its use of the LAMPS Mk III for search-and-rescue operations



Orientation

Description. The Lightweight Airborne Multipurpose System (LAMPS) Mk III is a reconnaissance suite of sensors, radar, and communications gear. The LAMPS Mk III is used by U.S. Navy helicopters.

Sponsor

U.S. Navy
Naval Air Systems Command (NAVAIR)
47123 Buse Road
B2272 Unit IPT
Patuxent River, Maryland (MD) 20670-1547
USA
Tel: +1 301 757 1487

Contractors

Lockheed Martin Corporation
6801 Rockledge Drive
Bethesda, Maryland (MD) 20817
USA
Tel: +1 301 897 6000
Fax: +1 301 897 6406
Web site: <http://www.lockheedmartin.com>
(Prime, avionics integration)

Raytheon Company
870 Winter Street
Waltham, Massachusetts (MA) 02451-1449
USA
Tel: +1 781 522 5111
Fax: +1 781 522 5878
Web site: <http://www.raytheon.com>

(IR receiver/transmitter converters & FLIRs)

Harris Corporation
1025 West NASA Boulevard
Melbourne, Florida (FL) 32919
USA
Tel: +1 321 727 9100
Fax: +1 321 724 3973
Web site: <http://www.harris.com>
(LAMPS Hawklink Ku-band datalink system)

BAE Systems
Building 20A-1, Southmead Road, Filton, Bristol
BS34 7RP, United Kingdom
Tel: +44 (0) 117 936 4438
Fax: +44 (0) 117 936 4462
Web site: <http://www.baesystems.com>
(LAMPS Hawklink Ku-band datalink system)

Sensytech Inc
8419 Terminal Road, P.O. Box 1430
Newington, Virginia (VA) 22122-1430
USA
Tel: +1 703 550 7000
Fax: +1 703 550 7470
Web site: <http://www.sensytech.com>
(SRQ-4 LAMPS Mk III Radio Terminal Set subassemblies)

Radstone Technology
Water Lane, Towcester
Northants NN12 6JN, United Kingdom

Tel: +44 (0) 1327 359444
 Fax: +44 (0) 1327 359662
 Web site: <http://www.radstone.com>
 (Octegra Image and Graphics Processor)

Status. In procurement.

Total Produced. Through 2003, two LAMPS Mk III Tactical Common Data Link (TCDL) suites have been produced.

Application. The LAMPS Mk III is used to conduct anti-submarine and anti-surface warfare operations.

Price Range. The LAMPS Mk III avionics suite is composed of numerous subsystems. Prices will vary as they are modified or replaced at various stages of the upgrade process.

Technical Data

Operational Characteristics. The following are brief descriptions of key original LAMPS Mk III subsystems.

ALQ-142. This electronic support measures (ESM) system, produced by Raytheon Systems Company, detects radar signals and identifies their point of origin. The system provides 360-degree coverage of the E/F, G/H, I/J, and K-bands. Information gathered by the ALQ-142 is datalinked to the SLQ-32 electronic warfare system. Threat bearing is measured on each pulse, and emitter identification is determined by matching the received signal parameters against data stored in the AYK-14 system computer. Emitter identification and bearing are displayed on the SLQ-32 operator console.

APS-124. The APS-124 radar system, produced by Raytheon Systems Company (formerly Texas Instruments), is housed in a flat radome under the Seahawk's cockpit, with a low-profile, linear-array antenna providing the helicopter with 360-degree coverage. Its unique fast-scan antenna and advanced digital scan converter facilitate accurate scan-to-scan integration for optimum detection of surface targets, even in inclement weather. Principal features include high transmit energy and the ability to detect small surface targets in high-sea states.

ARQ-44 Datalink. Operating in the C-band, this airborne datalink terminal provides data telemetry for the host ship's Combat Information Center (CIC) ASW operators. It is produced by the Sierra Research Division of Sierra Technologies Inc, along with the SRQ-4 shipboard terminal.

ARR-75 Sonobuoy Receivers. The ARR-75 radio receiving set is for the operation and management of anti-submarine sonobuoys. The equipment consists of the OR-75/AAR-75 receiver group assembly, which includes the power supply, receiver modules, and chassis. The second major assembly is the C-8658/ ARR-75 or C-10429/ARR-75 radio set control unit. The system has 31 channels and is manufactured by Flightline Electronics Inc.

ASQ-81(V)4 MAD. The ASQ-81 Magnetic Anomaly Detection (MAD) system is used to refine the position plot and confirm classification of below-surface targets. The ASQ-81 operates on the atomic properties of optically pumped metastable helium atoms to detect variations in total magnetic field intensity. It consists of the C-6983 detecting set control and AM-4535 amplifier and power supply. The system employs a TB-623 magnetic detecting towed body that is controlled by the C-6984 reel control.

ASQ-164 Control Indicator Set (CIS). The ASQ-164 CIS, made by the Fairchild Defense division of Orbital Sciences Corp, is an avionics system designed to furnish control for the airborne tactical operator (ATO) and the sensor operator (SO). The CIS, which utilizes micro-processor technology, consists of two separate units: the C-10487/ASQ-164 Control Indicator for the ATO's use and the C-10486/ASQ-164 Control Indicator used by the SO.

ASQ-165 Armament Control Indicator Set. The Fairchild Defense ASQ-165 ACIS controls a variety of equipment, including Mk 46 Mod 0/1/2 torpedoes, Practice Multiple Bomb Racks with Sound Underwater Sources, and air-launched sonobuoys. Inventory usage, functional status, and built-in testing are controlled by a microprocessor, while the jettison function is handled by hard-wired circuits. In addition, jettison functions are redundant and designed so that no single circuit failure will result in the inadvertent release of stores or inability to jettison stores. The set consists of a C-10488/ ASQ-165 Armament Control Indicator and a CV-3531/ASQ-165 Armament Signal Data Converter.

AYK-14(V) Airborne Digital Computer. Offered by Lockheed Martin and Ceridian Corp's Computing Devices International, the AYK-14(V) is a variable-configuration, general-purpose 16-bit computer featuring a performance range of up to 2.3 million instructions per second (MIPS). It has a high degree of functional and mechanical modularity, and is designed for flexible growth and extensive hardware commonality. The AYK-14 has various applications, including air-, sea-, and land-based uses as a general-purpose processor,

emulator, controller, dedicated processor, or algorithm unit.

UYS-1 Advanced Signal Processor. The UYS-1, originally produced by IBM (and now by Lockheed Martin), is designed to perform multisensor acoustic analysis with much more accuracy and efficiency than

was possible by its predecessor, the AQA-7. It is used with ASW sonobuoys, sonars, and towed arrays for detection and other localization functions. The system can handle analog or digital sensor inputs at a computational speed of 20 million operations per second.

Variants/Upgrades

New LAMPS Mk III sensors and associated electronics are being upgraded on an ongoing basis.

Program Review

Background. The LAMPS Mk III program began in 1974 when the U.S. Navy decided to proceed with the development of an anti-submarine warfare (ASW) electronics suite prior to the selection of the SH-60 helicopter as the airframe. The U.S. Navy selected IBM as prime contractor for sensors development and integration in April 1974.

The U.S. Navy began the initial production phase of the LAMPS Mk III program in 1982. A decision on full-scale production was made in April 1982. The first LAMPS Mk III reconnaissance suite was delivered in March 1983.

In March 1999, the United States Navy announced plans to redesign the LAMPS system. The LAMPS system's interference, on the electromagnetic spectrum, with the U.S. Navy's Cooperative Engagement Capability (CEC) was the reason given for the decision to redesign. The updated LAMPS system will eliminate this interference problem with the CEC. The new LAMPS system will also negate the possibility of displacement by a likely commercial bandwidth auction. The LAMPS system redesign project is currently under way.

In January 2001, the U.S. Navy selected the team of Harris Corporation and BAE Systems to complete development of the Hawklink Ku-band datalink system. The system supports the Navy's fleet of ship-based LAMPS helicopters. The Hawklink will upgrade LAMPS' C-band analog datalink with equipment operating at a higher data rate, and at a higher Ku-band frequency. The Hawklink improvement will enable data, imagery, electronic support measures, communications, and radar information that is gathered by the

helicopter's sensors to be transmitted to the host ship via the Ku-band link.

In October 2002, Harris Corporation and BAE Systems successfully completed the U.S. Navy's Critical Design Review (CDR) of the Hawklink Replacement Ku-band datalink system. The successful completion of the CDR paves the way for production contracts that will equip as many as 460 helicopters and their host surface ships with the tactical common datalink (TCDL)-compliant Hawklink equipment.

Also in October 2002, Lockheed Martin delivered five helicopters carrying the LAMPS Mk III reconnaissance suite to the U.S. Navy for final delivery to the Spanish Armada fleet. The deliveries are part of a US\$55.4 million program to provide Spain with helicopters equipped with the LAMPS system.

Recent Developments. In May 2003, the U.S. Naval Air System Command's Multi-Mission Helicopter Program Office delivered the last of six LAMPS system equipped helicopters (SH-60B Seahawk helicopters) ordered by the Spanish Navy. Spain is the only Foreign Military Sales customer for the LAMPS Mk III reconnaissance suite.

In July 2003, Sensytech, Incorporated received a contract from the U.S. Navy to manufacture, assemble, test, and deliver the SRQ-4 LAMPS Mk III Radio Terminal Set subassemblies. Look for Sensytech to complete work under this contract sometime in 2007.

As mentioned earlier, the LAMPS system is currently being redesigned. Look for the LAMPS system redesign project to be complete sometime in 2007.

Funding

U.S. FUNDING

	<u>FY03</u>		<u>FY04(Req)</u>		<u>FY05(Req)</u>			
	<u>QTY</u>	<u>AMT</u>	<u>QTY</u>	<u>AMT</u>	<u>QTY</u>	<u>AMT</u>	<u>QTY</u>	<u>AMT</u>
Procurement (U.S. Navy)								
LAMPS Mk III								
Shipboard Equipment	-	5.4	-	22.5	-	26.0		
	<u>FY06(Req)</u>		<u>FY07(Req)</u>		<u>FY08(Req)</u>		<u>FY09(Req)</u>	
	<u>QTY</u>	<u>AMT</u>	<u>QTY</u>	<u>AMT</u>	<u>QTY</u>	<u>AMT</u>	<u>QTY</u>	<u>AMT</u>
Procurement (U.S. Navy)								
LAMPS Mk III								
Shipboard Equipment	-	30.1	-	34.4	-	35.0	-	35.6

All US\$ are in millions.

Source: U.S. Department of the Navy Fiscal Year 2004/2005 Procurement Budget

Recent Contracts

<u>Contractor</u>	<u>Award (\$ millions)</u>	<u>Date/Description</u>
Harris Corporation & BAE Systems	100.00	Jan 2001 – Harris Corporation teamed with BAE Systems Inc to complete development of the Hawklink Ku-band datalink system supporting ship-based LAMPS helicopters. The potential value of the contract is approximately US\$100 million over eight years. The U.S. Navy awarded the contract.
Sensytech Incorporated	21.3	Jul 2003 – The U.S. Naval Sea Systems Command awarded Sensytech Inc a contract to fabricate, assemble, test, and deliver the SRQ-4 LAMPS Mk III Radio Terminal Set subassemblies. The contract runs through 2007.

Timetable

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
	1973	Mk III avionics RFPs issued
Apr	1974	IBM Corp selected as prime avionics contractor
Sep	1977	SH-60B selected as LAMPS Mk III vehicle
	1982	U.S. Navy begins initial production phase of the LAMPS Mk III program
	1989	U.S. Navy considers upgrading the SH-60 helicopters, combining the SH-60B LAMPS III and the SH-60F CV Helo capabilities into one helicopter type
	1990	SH-60B Block I improvements introduced to production line
	1992	SH-60B Block II improvements begin
Aug	1993	Block II EMD initiated with contract award to IBM
	1995	Block II Critical Design Review; retrofit work begins for Block I upgrade
	1996	First redelivery of Block I SH-60B
	1997	Change of frequency proposed for LAMPS Mk III datalink
	1998	Procurement of airborne low-frequency sonar for LRIP test articles
Mar	1999	U.S. Navy announces redesign of the LAMPS system
Jan	2001	U.S. Navy selects the team of Harris Corporation and BAE Systems to complete development of the Hawklink Ku-band datalink system

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
Oct	2002	Lockheed Martin delivers five helicopters carrying the LAMPS Mk III reconnaissance suite to the U.S. Navy for final delivery to the Spanish Armada fleet
Jul	2003	Sensytech Incorporated receives a contract from the U.S. Navy to manufacture, assemble, test, and deliver the SRQ-4 LAMPS Mk III Radio Terminal Set subassemblies
	2007	Completion of LAMPS system redesign project expected

Worldwide Distribution

The **U.S. Navy** and the **Spanish Navy** employ the LAMPS Mk III as a reconnaissance suite.

Forecast Rationale

The Lightweight Airborne Multipurpose System (LAMPS) Mk III is a reconnaissance suite of sensors, radar, and communications gear used by United States Navy helicopters. Undersea warfare (USW) is the primary mission of the LAMPS Mk III. The suite also performs anti-surface warfare, electronic warfare, and a variety of secondary missions.

As indicated by the **Ten-Year Outlook** chart, Forecast International projects that the U.S. Navy will spend some US\$285.60 million over the next decade on

LAMPS Mk III Tactical Common Data Link (TCDL) suites.

United States Navy helicopters use the LAMPS Mk III reconnaissance suite to detect, classify, locate, and intercept U.S. enemies, over thousands of miles of ocean. The LAMPS Mk III suite is also critical to U.S. Navy search-and-rescue missions. Forecast International will continue to analyze and report LAMPS Mk III developments as they occur.

Ten-Year Outlook

ESTIMATED CALENDAR YEAR FUNDING (\$ in millions)													
Designation	Application	Thru 03	<u>High Confidence Level</u>				<u>Good Confidence Level</u>				<u>Speculative</u>		Total 04-13
			04	05	06	07	08	09	10	11	12	13	
LAMPS MK III	RECONNAISSANCE (U.S. NAVY)	1016.10	22.50	26.00	30.10	34.40	35.00	35.60	35.00	30.00	25.00	12.00	285.60