

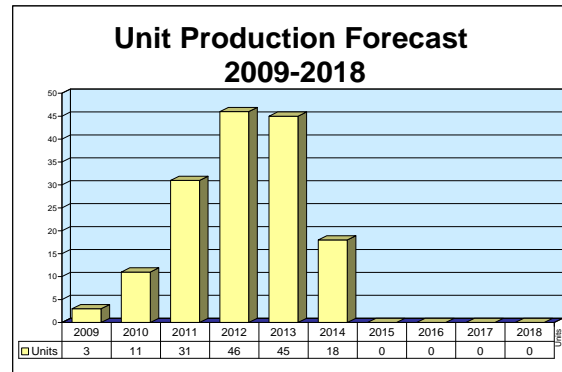
ARCHIVED REPORT

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Light Airborne Multipurpose System (LAMPS) Hawklink

Outlook

- Hawklink has two components: the ARQ-58 airborne terminal and the SRQ-4 shipboard terminal
- U.S. Navy held CDL Hawklink Industry Day in August 2008
- Hawklink contract award is anticipated in the 3Q-FY09 timeframe
- U.S. Navy requirement for MH-60R helicopters, the Hawklink platform, is approximately 300 units



Orientation

Description. Common Data Link (CDL) Hawklink is a Ku-band system that transmits tactical video, radar, acoustic, and other sensor data from Light Airborne Multipurpose System (LAMPS) Mk III MH-60 helicopters to LAMPS-capable ships.

Sponsor

U.S. Navy
 Naval Air Systems Command (NAVAIR)
 47123 Buse Rd, B2272 Unit 1PT
 Patuxent River, MD 20670-1547
 USA
 Tel: +1 (301)757-1487
 Web site: <http://www.navair.navy.mil>

Status. In development.

Total Produced. Forecast International estimates that two or three prototype terminals have been produced.

Application. The CDL Hawklink is composed of two components: the ARQ-58 Radio Terminal Set (RTS), which will be installed on MH-60 helicopters; and the SRQ-4 (Ku) RTS, which will be installed on LAMPS-capable surface ships such as the DDG-51, FFG-7, and CG-47.

Price Range. Forecast International estimates the price range of the CDL Hawklink to be between \$800,000 and \$4.5 million. The range is highly speculative. The lower price would be for a large quantity of airborne units (ARQ-58). The \$4.5 million price tag would be for a single buy of a SRQ-4 (Ku) RTS. This range was determined using U.S. Navy budget documents and published contract data. Cost depends on several factors such as the variant selected (ship dependent), the amount of technical support and training provided, and the scope of the installation and maintenance package.

Contractors

Prime

Harris Government	http://www.harris.com , 1000 Charles J. Herbert Dr, Palm Bay, FL 32905 United States,
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Communications Systems Division	Tel: + 1 (321) 727-9100, Fax: + 1 (321) 727-5789, Email: gcsdweb2@harris.com, Prime
BAE Systems Electronics & Integrated Solutions, Network Systems	http://www.baesystems.com, 164 Totowa Rd, Wayne, NJ 07474-0975 United States, Tel: + 1 (973) 633-6000, Consortium Member

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

	<u>Metric</u>	<u>U.S.</u>
<u>ARQ-58</u>		
Dimensions		
<i>Multiplexer</i>	21.6 cm h x 25.8 cm w x 49.7cm d	8.5 "h x 10.15"w x 19.56"d
<i>Electronic frequency converter</i>	21.6 cm h x 39.14 cm w x 49.7 cm d	8.5" h x 15.41"w x 19.56"d
<i>Directional array</i>	32.8 cm h x 26.7 cm w x 26.7 cm d	12.9"h x 10.5 " w x 10.5" d
<i>RF amplifier</i>	11.4 cm h x 30.6 cm w x 40.7 cm d	4.50"h x 12.03"w x 16.02"d
Weight	<65.8 kg	<145 lb
Data Rate – Selectable	200 kb/s, 10.71 Mb/s and 21.42 Mb/s	
Power	1710 VA and 140 Wdc	
<u>SRQ-4</u>		
Weight		
Receiver/Transmitter Processor Group	451.3 kg	995 lb
Directional antenna/RF amplifier	83 kg	183 lb
Omni antenna	1.36 kg	3 lb
Data Rate – Selectable	200 kb/s, 10.71 Mb/s and 21.42 Mb/s	
Ku-band Frequency Ranges		
<i>Uplink</i>	15.15-15.35 GHz	
<i>Downlink</i>	14.53-14.93 GHz	
Power	1670 W, 115 V, 60 Hz	

Design Features. The LAMPS Hawklink is a high-speed air-to-surface, digital datalink that transmits data, imagery, electronic support measures, communications, and radar information gathered by a helicopter's sensors. The information is transmitted at a rate of 10.71 and 21.42 megabits per second to the host ship via the Ku-band datalink. The transmission is received in near real-time via an above/below deck terminal system, down-converted from Ku-band to required baseband levels and distributed throughout the ship for analysis.

Operational Characteristics. The LAMPS Hawklink has two main components: the ARQ-58 Radio Terminal is the airborne component replacing the legacy ARQ-44 on the MH-60 helicopter. The SRQ-44 (Ku) Radio Terminal is the shipboard component for LAMPS-capable vessels such as the CG-47, DDG-51, and FFG-7. The hardware features open system architecture and is expandable to accommodate next-generation technology.

Program Review

Background. The CDL Hawklink evolved from a DARPA (Defense Advanced Research Projects Agency)-sponsored Tactical Common Data Links (TCDL) program. The DARPA work led to a research and development effort for Hawklink sponsored by the

U.S. Navy PMA 299. PMA 299 under NAVAIR supports the H-60 helicopter program.

Upgrading C-Band to Ku

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In November 1999, Harris announced that the company and teammate Marconi Aerospace (now BAE Systems) were awarded a two-year, multi-million-dollar development and demonstration program to replace the communications links between Navy helicopters and ships. The new system would upgrade existing C-band datalinks with equipment operating at a higher data rate and Ku-band frequency. The ARQ-58 Radio Terminal is the airborne component replacing the legacy ARQ-44. The SRQ-44 (Ku) Radio Terminal is for shipboard use, replacing an older C-band model. The design would be Common Data Link (CDL) compliant in order to provide interoperability with other CDL systems.

At the same time, a similar contract was awarded to L-3 Communications.

Hawklink

In January 2001, Harris and BAE Systems started work on the CDL Hawklink design for the Light Airborne Multipurpose System (LAMPS) MH-60R helicopters and their complement of surface ships such as the DDG-51, FFG-7, DD-963, and CG-47. The work took place at the Harris Government Communication Systems Division (GCS) and BAE System Electronics & Integrated Solutions (EIS) Network Systems, located in Wayne, New Jersey.

According to a February 2001 article in Helis, the helicopter history Web site, the value of the development contract, combined with the potential follow-on production awards for up to 460 platforms (helicopters and ships), could boost the contract value to \$100 million over the next eight years. The article also stated that the Navy selected the Harris/BAE Systems team after a head-to-head competition. It is assumed that L-3 Communications was the other contender.

The Hawklink would enable data, imagery, electronic support measures, communications, and radar information gathered by the helicopter's sensors to be multiplexed and transmitted to the host ship via the Ku-Band link. The transmission is received, in near

real-time, by the ship via an on-deck terminal, down-converted from Ku-Band to baseband signals, and finally distributed throughout the ship for further review and exploitation.

Harris and BAE Systems successfully completed the Hawklink Critical Design Review (CDR) in 2002.

Contract Awarded

In April 2005, Harris was awarded a one-year, \$7.5 million limited-rate initial production (LRIP) contract for SRQ-4 systems for forward-fit ships, SRQ-4 upgrade kits to retrofit ships, and ARQ-58 Radio Terminals for MH-60 aircraft.

According to Harris, the CDL Hawklink can transmit over 100 nautical miles at data rates exceeding 21 megabits per second, will eliminate interference with the Cooperative Engagement Capability (CEC), improve fleet interoperability communications, improve bandwidth capability of the LAMPS system, and facilitate the transition to a network-centric architecture as the baseline for fleet CDL interoperability.

Harris speculated in April 2005 that two additional awards totaling more than \$60 million were anticipated in the next 10 months. Harris estimated that the total potential value of the program will be \$350 million by 2015 if the Navy exercises all of its options to support up to 350 aircraft and their host surface ships.

In June 2007, Harris awarded EMS Defense & Space Systems (D&SS) a contract to develop the Hawklink antenna. This contract has a potential \$22 million value to EMS over the life of the program and calls for EMS to develop and deliver up to 500 units. The antennas will feature slot-array technology, unique composite positioner designs, and a second-generation design with improved microwave performance. Each MH-60R helicopter will be fitted with two antennas – one to the front and one to the back – for full situational visibility. EMS was scheduled to complete the Engineering Development Model (EDM) by July 2008, but details regarding that are not available.

Funding

FUNDING, U.S. Navy

	FY09 QTY	FY09 AMT	FY10 QTY	FY10 AMT	FY11 QTY	FY11 AMT	FY12 QTY	FY12 AMT
MH-60R Armed Block I Upgrade (OSIP 001-06)								
<i>Ku-band kits</i>	6	6.6	18	14.9	18	13.9	9	7.2
SH-60B Datalink (Ku-band) (OSIP 0008-09)								

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<i>Common Data Link (CDL)</i>	10	2.8	14	3.9	6	1.7
	<u>FY13</u>	<u>FY13</u>	<u>Total</u>	<u>Total</u>		
	<u>QTY</u>	<u>AMT</u>	<u>QTY</u>	<u>AMT</u>		
MH-60R (OSIP 001-06)						
<i>Ku-Band kits</i>	18	14.0	69	56.6		
SH-60B (OSIP 0008-09)						
<i>CDL</i>			30	8.3		

All \$ are in millions.

Source: Department of the Navy, FY2009, Budget Estimates, Feb 2008, Aircraft Procurement, Navy, Volume II, Budget Activity 5.

FUNDING, U.S. Navy

	<u>FY08</u>	<u>FY08</u>	<u>FY09</u>	<u>FY09</u>	<u>FY10</u>	<u>FY10</u>	<u>FY11</u>	<u>FY11</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>
BA3 – Aviation Support Equipment								
PE 425500 LAMPS Mk III								
Shipboard Equipment								
<i>Installation kits</i>	6	14.8	11	19.6	11	17.7	10	15.6
	<u>FY12</u>	<u>FY12</u>	<u>FY13</u>	<u>FY13</u>	<u>Finish</u>	<u>Finish</u>	<u>Total</u>	<u>Total</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>
PE 425500 LAMPS Mk III								
Shipboard Equipment								
<i>Installation kits</i>	10	15.3	10	15.1	44	57.2	102	155.27

All \$ are in millions.

This program provides for non-recurring engineering (NRE) and procurement of SRQ-4 (Ku) field install kits.

Source: Department of the Navy, FY2009, Budget Estimates, Feb 2008, Other Procurement, Navy, Budget Activity 3.

Contracts/Orders & Options

<u>Contractor</u>	<u>Award</u> <u>(\$ millions)</u>	<u>Date/Description</u>
Harris Government Communications Systems Division (GCSD)	1.388	Oct 1999 – A \$1.388 million increment of a \$15.4 million modification to a Section 845 prototype agreement for additional TCDL prototype terminals, Sensor Interface Definition tasking and development of the LAMPS Hawklink Ku-band prototype. Work was completed Oct 2001. DARPA is the contracting agency. (MDA972-97-C-0803 Mod 0009)
L-3 Communications	1.382	Oct 1999 – A \$1.382 million increment of a \$13 million modification to a Section 845 prototype agreement for additional TCDL prototype terminals, Sensor Interface Definition tasking and development of the LAMPS Hawklink Ku-band prototype. Work was completed Oct 2001. DARPA is the contracting agency. (MDA972-97-C-0804 Mod 0007)
Harris GCSD	7.5	Mar 2005 – FFP contract for non-recurring efforts to establish production for SRQ-4 (Ku) field kits to retrofit ships, complete SRQ-4 (Ku) for forward-fit ships, and ARQ-58 sets for MH-60 aircraft. Work was to be completed Feb 2006. The Naval Air Systems Command, Patuxent River, MD, is the contracting agency. (N00019-04-C-0130)

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<u>Contractor</u>	<u>Award (\$ millions)</u>	<u>Date/Description</u>
Harris GCSD	82	Nov 2006 – A cost-plus-award-fee/cost-plus-incentive fee (CPAF/CPIF) mod to a previously awarded FFP contract for testing of the MH-60R CDL Hawklink systems, including integrated logistics support and analysis, sustaining engineering, training, non-recurring and recurring engineering changes, and technical, administrative, and financial data. This modification provides for an option for the procurement of three ARQ-58 and three SRQ-4(Ku) systems. Work is expected to be completed in Jan 2009. The Naval Air Systems Command, Patuxent River, MD, is the contracting agency. (N00019-04-C-0130)
EMS Technologies	Potentially 22	Jun 2007 – A contract from Harris to develop the Hawklink common data link terminal antenna and deliver up to 500 antenna systems. EMS will complete the Engineering Development Model (EDM) within 13 months with future production lots being delivered on an annual basis.
Harris GCSD	7.99	Mar 2008 – A CP/IF mod to a previously awarded FFP contract for production test equipment in support of the MH-60 CDL Hawklink system. Work is expected to be completed in Jun 2009. The Naval Air Systems Command, Patuxent River, MD, is the contracting agency. (N00019-04-C-0130)
Lockheed Martin	5.8	May 2008 – Mod to a previously awarded CP/IF contract for non-recurring efforts associated with integration of the Ku-band Hawklink (CDL) on the MH-60R Block I upgrade. Work was expected to be completed in Dec 2008. The Naval Air Systems Command, Patuxent River, MD, is the contracting agency. (N00019-05-C-0076)
Harris GCSD	53	Aug 2008 – A CP/IF mod to a previously awarded FFP contract for 11 ARQ-58 Aircraft Terminal Equipment (ATE) sets and 3 ARQ-58 spare ATE sets for the MH-60R helicopter program, and 5 SRQ-4 (Ku) radio shipboard terminal sets for surface combatant ship classes CG-47, DDG-51, and FFG-7. Work is expected to be completed in Aug 2011. The Naval Air Systems Command, Patuxent River, MD, is the contracting agency. (N00019-04-C-0130)

Timetable

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
Oct	1999	DARPA awards Harris \$1.39 million for additional TCDL prototype terminals
Apr	2005	Harris awards LRIP contract for CDL Hawklink
Aug	2008	U.S. Navy holds Hawklink Industry Day
3Q	FY09	CDL Hawklink contract award anticipated
Jun	2011-2014	Hardware deliveries under production contract

Worldwide Distribution/Inventories

This is a **United States Navy** program.

Light Airborne Multipurpose System (LAMPS) Hawklink

Forecast Rationale

Industry Day & Future Contracts

The U.S. Navy CDL Hawklink program held an Industry Day in August 2008 as a forum to provide industry representatives with a program status update, information on program requirements and completion timeline, and to answer questions. Afterwards, the U.S. Navy issued a final RFP (Request for Proposals) for the program, and the Naval Air Systems Command Web site stated that a CDL Hawklink contract award is anticipated in the 3Q-FY09 timeframe. The award is expected to be a fixed-price contract for base production with options for two production year contracts. Contract details are listed below:

Base	FY09	36 ARQ-58, 10 SRQ-4 (Ku)
Option 1	FY10	36 ARQ-58, 9 SRQ-4 (Ku)
Option 2	FY11	36 ARQ-58, 8 SRQ-4 (Ku)

The desired delivery schedule is for three ARQ-58 units to be delivered per month starting 24 months after the contract award. The desired delivery schedule for the SRQ-4 (Ku) units is for the first lot of three units to be delivered 24 months following the contract award. After the first lot is delivered, the U.S. Navy wants the

manufacturer to deliver one SRQ-4 (Ku) terminal each month. Vendor bids in response to the RFP were due in January 2009.

The August 2008 Industry Day indicates that there is interest in the Hawklink program from companies other than Harris/BAE Systems. When this report went to press, it was unknown how many vendor bids were submitted in response to the Navy RFP.

U.S. Navy Seahawk Requirements

The "Sikorsky SH/MH-60 Seahawk" report located in Tab G of Forecast International's *Aircraft Forecast* states that the U.S. Navy requirement for MH-60R helicopters is up to 298 units. This supports information from Harris in April 2005 that the total potential program value is estimated to be \$350 million by 2015 if the Navy exercises all of its options to support equipment for up to 350 aircraft and their host surface ships.

The winning Hawklink team should have business for some time supporting U.S. Navy demand for this system.

Ten-Year Outlook

ESTIMATED CALENDAR YEAR UNIT PRODUCTION												
Designation or Program	High Confidence					Good Confidence			Speculative			Total
	Thru 2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
Harris Government Communications Systems Division												
ARQ-58 <> CDL Hawklink <> United States <> Navy <> MH-60 R												
	0	2	8	4	0	0	0	0	0	0	0	14
SRQ-4 (Ku) <> CDL Hawklink <> United States <> Navy <> Ship												
	0	1	3	1	0	0	0	0	0	0	0	5
Subtotal	0	3	11	5	0	0	0	0	0	0	0	19
MFR Not Selected												
ARQ-58 <> CDL Hawklink <> United States <> Navy <> MH-60 R												
	0	0	0	18	36	36	18	0	0	0	0	108
SRQ-4 (Ku) <> CDL Hawklink <> United States <> Navy												
	0	0	0	8	10	9	0	0	0	0	0	27
Subtotal	0	0	0	26	46	45	18	0	0	0	0	135
Total	0	3	11	31	46	45	18	0	0	0	0	154

Light Airborne Multipurpose System (LAMPS) Hawklink

ESTIMATED CALENDAR YEAR RDT&E FUNDING (in millions \$)												
Designation or Program	High Confidence					Good Confidence			Speculative			Total
	Thru 2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
Harris Government Communications Systems Division												
Hawklink CDL Engineering & Support Efforts <> United States <> Navy <> MH-60 R												
	98.55	3.42	.00	.00	.00	.00	.00	.00	.00	.00	.00	3.42
Total	98.55	3.42	.00	.00	.00	.00	.00	.00	.00	.00	.00	3.42

ESTIMATED CALENDAR YEAR COMMINGLED FUNDING (in millions \$)												
Designation or Program	High Confidence					Good Confidence			Speculative			Total
	Thru 2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
Hawklink CDL Production Test Equipment <> United States <> Navy <> MH-60 R												
	3.99	3.99	.00	.00	.00	.00	.00	.00	.00	.00	.00	3.99
Total	3.99	3.99	.00	.00	.00	.00	.00	.00	.00	.00	.00	3.99