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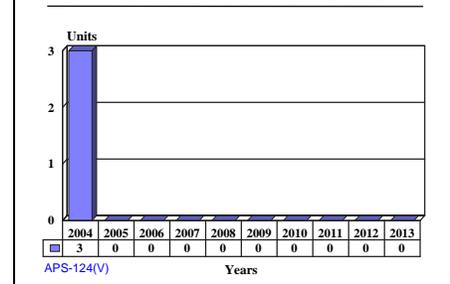
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APS-124(V) - Archived 12/2005

Outlook

- Radar on original U.S. SH-60B LAMPS III and export anti-submarine helicopters
- Used for periscope detection in heavy sea conditions
- Replaced by the APS-147(V) multimode radar in LAMPS Mk III
- Block II upgrade, production winding down

10 Year Unit Production Forecast
2004 - 2013



Orientation

Description. Airborne sea search and periscope detection radar.

Sponsor

United States Navy
 Naval Air Systems Command
 NAVAIR HQ
 47123 Buse Road Unit IPT
 Patuxent River, Maryland (MD) 20670-1547
 USA
 Tel: +1 301 342 3000
 Web site: <http://www.nawcad.navy.mil>

Status. In production, in service; ongoing logistics support.

Total Produced. Through 2003, an estimated 372 kits had been produced.

Application. SH-60B LAMPS Mk III and S-70B export helicopters.

Price Range. Unit cost is estimated at US\$2.3 million.

Contractors

Raytheon Network Centric Systems, <http://www.raytheon.com/static/node2777.html>, 2501 West University Dr, McKinney, TX 75071 United States, Prime

Technical Data

	<u>Metric</u>	<u>U.S.</u>
Dimensions		
Weight	95 kg	210 lb
Antenna size	74.5 x 30.5 cm	72 x 12 in

Characteristics

Frequency	6.2 -10.9 GHz
Peak power	350 kW
Pulse width	0.5, 1, 2 μ sec
PRF	470, 940, 1885 pps
Range (max)	160 nm (long-range) 40 nm (short-range)
Detection	16 nm (1 m ² target)
Scan rate	6, 12, 120 rpm
LRUs	
Antenna	AS-4035/APS-124(V)
Transmitter units	T-1308/APS-124(V) C-9889/APS-124(V)
Signal data converter	CV-3204/APS-124(V)
Converter control	C-9643/APS-124(V)
Receiver/synchronizer	R-1979/APS-124(V)

Design Features. The APS-124(V) airborne search-and-detect radar was designed for the SH-60B/F Light Airborne Multi-Purpose Systems (LAMPS) Mk III helicopter. Operating from cruisers, destroyers, and frigates, the SH-60B provides extended anti-submarine warfare (ASW) capabilities while complementing other sea-based and land-based ASW operations.

The LAMPS Mk III avionics suite is a sophisticated system that integrates the aircraft's sensors and provides the onboard tactical commander with a variety of pertinent data. The APS-124(V) radar is housed in a flat radome under the Sea Hawk's cockpit, with a low-profile linear-array antenna providing 360-degree coverage. The unique fast-scan antenna and advanced digital scan converter facilitate accurate scan-to-scan integration optimum detection of surface targets, even in heavy weather. Principal features include high transmit-energy and small-surface target detection in high sea states.

There are three basic operational modes:

Mode 1. Long-range search uses a long pulse width (2 μ sec), low PRF (470 pps) transmission, and slow antenna scan (6 rpm). Display ranges are selectable out to 160 nautical miles (296 km).

Mode 2. Medium-range search uses a pulse width of 1 μ sec, PRF of 940 pps, and scan rate of 12 rpm.

Mode 3. Short-range search reduces operational characteristics to a pulse width of 0.5 μ sec, PRF of 880 pps, and antenna scan of 120 rpm. Display ranges are selectable to 40 nautical miles (74 km).

Operational Characteristics. The APS-124(V) was designed to detect periscopes in heavy sea conditions. Target information and other sensor data are transmitted to LAMPS-equipped ships for further evaluation and integration into other command systems. The link communicates with various onboard equipment or with other similarly equipped aircraft. A short-pulse, rapid-scan mode is available for operations in inclement weather.

LAMPS extends the ASW operational range of a ship beyond its horizon-limited line of sight. The sensor suite combines multiple detection and tracking capabilities. The APS-124(V) is particularly advantageous in detecting submarines, but the radar also enhances the ship's overall situational awareness by providing location data on surface contacts within range.



SH-60B showing APS-124(V) radar dome

Source: U.S. Navy

Variants/Upgrades

No specific variants have been identified.

Program Review

In 1970, the U.S. Navy tactic was to counter the growing Soviet submarine threat by using frigate-sized ships with an over-the-horizon ASW capability. ASW helicopters were placed aboard smaller ships. The Light Airborne Multi-Purpose System (LAMPS Mk I) was fitted to the Kaman SH-2 Seasprite helicopter.

By the end of 1971, the LAMPS Mk I suite was operational with the Fleet. A version with improved and more sophisticated ASW avionics, the LAMPS Mk II, was produced from 1971 to 1974. The Seasprite remained the platform for the newer LAMPS.

In 1973, a LAMPS Mk III version was developed, and the system moved to a larger platform. Based on the S-70 design, Sikorsky developed the SH-60B Sea Hawk in 1974. The Navy decided to proceed with development of the ASW electronics suite prior to the selection of the airframe. Sikorsky's SH-60B was selected as the LAMPS Mk III platform in 1977.

The APS-124(V) entered full-scale engineering development in the late 1970s. Production began in 1982, with first deliveries in October 1983. Initial Operational Capability was achieved in 1984.

In 1993, (then) IBM Federal Systems selected (then) Telephonics Inc to develop and supply an upgraded avionics suite for the U.S. Navy LAMPS Mk III Block II upgrade. The new equipment would include a new APS-147(V) multi-mode, inverse synthetic aperture radar, periscope detection modes, and an integral Identification Friend or Foe (IFF) capability.

The new system would interface with electronic support measures (ESM) equipment to perform passive detection and targeting of radar sources not detectable with the current LAMPS, and feature improved flexibility and a low-probability-of-intercept. The suite includes intercommunications and radio-management systems.

The SH-60B and selected SH-60Fs are being remanufactured into zero-flight-hour aircraft and receiving the LAMPS III Block II avionics Service Life Extension Program modifications. The first remanufactured helicopter was rolled out in August 1999.

A December 7, 2000, *Commerce Business Daily* carried an announcement of a solicitation for a Requirements Contract with a two-year base period and three one-year

options. The requirement was for the repair of various components of the SH-60 APS-124(V) and the P³ FLIR systems. Because these were highly specialized parts, and because of the unavailability of drawings, only Raytheon TI Systems was solicited.

Parts and repair solicitations continue to be posted on the *Federal Business Opportunities* Web site.

Funding

Funding for the APS-124(V) is included in the platform lines and Foreign Military Sales (FMS) programs.

Recent Contracts

No recent contracts over US\$5 million have been recorded.

Timetable

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
	1977	Prototype LAMPS III aircraft developed
Feb	1978	First aircraft delivery
Dec	1979	First flight
May	1983	Full-production contracts awarded
Oct	1983	First production aircraft delivered
Jun	1985	IOC
	1993	Telephonics selected to develop upgraded MMR for the LAMPS III Block II upgrade
	1996	Estimated initial production start of MMR
	FY97	LAMPS III Block II upgrade start, CDR
	FY99	LAMPS III Block II DT/OT
Aug	1999	First SH-60R rolled out
2Q	FY00	LAMPS III Block II LRIP
4Q	FY02	LAMPS III Block II IOC
1Q	FY03	LAMPS III Block II Milestone III

Worldwide Distribution

Identified users:

Spain. Used on six SH-60B helicopters.

Thailand. Ordered for six APS-124(V)-equipped S-70B helicopters.

United States. Used on SH-60B helicopters in service.

Forecast Rationale

Anti-submarine operations are still a Navy priority, with radar an important sensor. Efforts to reduce the ability of radar to detect periscopes are prompting both the increased use of non-radar technologies and a continuing effort to improve the detection capability of ASW radar.

The APS-124(V) airborne radar is carried by the Sikorsky SH-60B LAMPS Mk III ASW helicopter and

provided for new-production airframes. To ensure that fleet capability is optimized, however, the APS-147(V) MMR is being installed on new-production Block II aircraft, and as part of the MH-60R remanufacturing effort.

The export market for the APS-124(V) is limited to the export S-70B version of the SH-60B.

Ten-Year Outlook

ESTIMATED CALENDAR YEAR PRODUCTION

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
APS-124	Prior Prod'n	198	0	0	0	0	0	0	0	0	0	0	0
APS-124 (HPS-124)	Prior Prod'n	92	0	0	0	0	0	0	0	0	0	0	0
APS-124(V)	S-70B (EXPORT)	82	3	0	0	0	0	0	0	0	0	0	3
Total Production		372	3	0	0	0	0	0	0	0	0	0	3