ARCHIVED REPORT

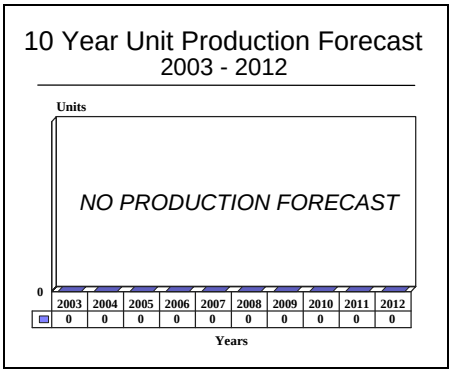
For data and forecasts on current programs please visit

www.forecastinternational.com or call +1 203.426.0800

ASQ-81(V)/ASQ-208(V) - Archived 02/2004

Outlook

- No further production likely, future efforts may focus on sensor package upgrades
- MAD sales likely from competitor CAE Electronics with the ASQ-504 series
- This report will be archived next year, 2004



Orientation

Description. The ASQ-81(V) Anti-Submarine Warfare (ASW) Magnetometer is a magnetic anomaly detection system. The ASQ-208(V) is a digital MAD system and is a derivative of the ASQ-81(V).

Sponsor

US Navy
Naval Air Systems Command
Arlington, Virginia (VA)
USA

Contractors

Raytheon Systems Co
(formerly Texas Instruments Inc)
Surveillance & Ocean Control Division
PO Box 660246
Dallas, Texas (TX) 75266
USA
Tel: +1 214 575 6908
Web site: http://www.raytheon.com
(Original producer)

Century Electronics
5701 Lindero Canyon Road 1-100
Westlake Village, California (CA) 91362
USA
Fax: +1 818 706 8826
Web site: http://www.centuryele.com
(ASQ-208 support)

Status. Both systems are in operational service with several of the world's navies. The US Navy completed its ASQ-81 procurement in 1995 and had been upgrading to the digital ASQ-208. No further production is anticipated; if anything, only sensor package upgrades are possible.

Total Produced. A combined rough estimate of 1,585 ASQ-81(V)s and ASQ-208(V)s had been produced through the year 2002.

Platforms. P-3C, S-3B, S-76N, SH-2D, SH-3F/H and SH-60B LAMPS III aircraft.

Application. These non-acoustic anti-submarine ASW sensors are mounted aboard helicopters and fixed-wing aircraft, and are used to locate a submarine through the vessel's magnetic signature.

Price Range. Per unit cost of the ASQ-81(V) was US$350,000 to US$360,000 (in 1991 US dollars based on contract cost averaging).

Technical Data

Designed as a submarine detector, the Raytheon Systems (formerly Texas Instruments) ASQ-81(V) magnetic anomaly detection (MAD) system is capable of detecting submarines at extreme depths. The system is able to detect variations in the intensity of the local magnetic field, indicating the presence of a submarine's hull. To be effective, a MAD unit must maintain an altitude of 100 feet above the water. Since the sweep area has a radius of only 900 meters (3,000 feet), more than one pass is required over the target area. The ASQ-81 operates on the atomic properties of optically pumped metastable helium atoms to detect variations in total magnetic field intensity.

The current model in this series, The ASQ-208(V), uses digital electronic and advanced microprocessor technology to achieve aircraft compensation. Two subvariants of this system are available: one for inboard use and the other for towed installations. The system offers enhanced performance and reduces to three the number of weapon replaceable assemblies (WRA) required to make up the total system. The system is compatible with MIL-STD-1553B databus standards, and uses the same wiring as the (V) model. Only one cable change is necessary for vector sensing.

Raytheon Systems produced four configurations of the ASQ-81(V). The ASQ-81(V)1, is mounted internally aboard land-based Lockheed P-3C aircraft. The unit is housed in a fixed tail boom that extends a short distance from the aircraft. The ASQ-81(V)3 is installed in the carrier-based Lockheed S-3A Viking, where it is extended on a boom, or sting. The ASQ-81(V)2 is a towed system used aboard the SH-2F/G and SH-3H. Another towed variant of this system, the ASQ-81(V)4, is used aboard the US Navy's Sikorsky SH-60B LAMPS Mk III helicopters. All versions of the ASQ-81(V) have the same C-6983 detecting set control, AM-4535 amplifier, and power control unit. The ASQ-81(V)1 and the ASQ-81(V)3 use a DT-323 magnetic detector, while the ASQ-81(V)2 and the ASQ-81(V)4 use a TB-633 magnetic detecting body. Both systems are self-compensating to correct for the magnetic properties of the ASW aircraft. The towed version is controlled by the C-6984 reel control, which works the RL-305 magnetic detector launching and reeling system.

Lockheed-Martin P-3C Orion maritime patrol aircraft of US Navy is one of the primary platforms carrying the ASQ-81/ASQ-208 MAD system

Source: US Navy

Variants/Upgrades

ASQ-208(V). The ASQ-208(V) is a digital version of the ASQ-81(V). It utilizes the aircraft's existing ASQ-81(V) wiring for installation, but significantly increases signal recognition. As with the older system, the ASQ-208(V) automatically detects targets with the addition of providing a range/confidence estimate. Both inboard and towed versions of the ASQ-208(V) are available.

Program Review

Background. The US Navy began a modification program in 1982 to update P-3C aircraft already equipped with the ASQ-81(V). A compensation group adapter (CGA) was installed to enhance the MAD's ability to compensate for the magnetic properties of the platform. A total of 155 aircraft were equipped, along with an additional 47 P-3C aircraft that were flying with the obsolete ASQ-10 system. This program was completed in 1987 at cost of over US$49.3 million.

The SH-3 Service Life Extension Program extended the service life of this helicopter past the year 2000. The program is composed of Kit A, Kit B, and Kit C. Kits A and C provide for the airframe and hardware improvements. Kit B is responsible for improvements on the avionics suite such as the APQ-107 altimeter, the ARN-118 TACAN, and the ASQ-81(V).

To counter the increasing submarine capabilities, Raytheon TI Systems updated the ASQ-81(V) with the ASQ-208(V), a digital-technology derivative of the analog-configured ASQ-81(V). The update incorporated microprocessor technology to enhance the reliability of the system. The US Navy underwent major transitioning from the ASQ-81(V) to the ASQ-208(V).

Raytheon Leaves MAD Market. In a September 18, 1998, letter to the US Navy, Raytheon informed the service it may stop building MAD sensors due to a severely receding market – unless the US Department of Defense (DoD) comes up with more orders. According to a story published in *Inside Defense* by Christopher J. Castellie (October 16, 1998 issue), Raytheon's plan to exit the MAD market after some 50 years was purely a business decision based on the declining DoD budgets for non-acoustic ASW and an eroding MAD business base. However, Raytheon had been reported as saying it would continue MAD efforts if the DoD committed to increasing spending by US$5 million to US$8 million annually.

The US Navy never did give a clear answer, and while Raytheon agreed to honor existing contracts, it stated that no new orders would be accepted after March 31, 1999. Raytheon's departure most likely impacts the US Navy's P-3 Orion ASW aircraft, the classified Beartrap ASW program, and SH-60B ASW helicopters. (The SH-60R helicopters are more prone to using a dipping sonar than a MAD system.) Little additional news on the issue has been forthcoming. By all accounts, Raytheon seems to have exited the magnetic anomaly detection market. Calls to the company have produced only more questions than answers. Part of the problem probably lies with the confusion generated by Raytheon's acquisitions and mergers. No one seems to know who does what anymore; even determining the current name of divisions has become tricky. For all practicality, unless another company bought out the product line, ASQ-81 and ASQ-208 production appears to have ended with only pre-existing contracts being run until completion. The only possible sales seen at this time could be sensor package upgrades to keep existing systems operational.

Funding

No specific funding identified. These systems are likely to be funded under various aircraft modification efforts.

Recent Contracts

No recent contracts over US$5 million have been identified. Very little detailed open-source contract information has been released for the ASQ-81 or ASQ-208.

Contractor	Award ($ millions)	Date/Description
Raytheon (formerly Texas Instruments)	0.358	Sep 1998 – Contract for ASQ-208 spare parts (Beartrap) IPT264. Contract completed by September 1999. (N00421-98-C-1264)

Timetable

Month	Year	Major Development
	1970	First contract with US Navy for P-3C units, and first deliveries
	1972	Incorporated in LAMPS Mk I on SH-2D
	1978	Japan Self-Defense Force procures six units from Texas Instruments
Jul	1979	MAD GCA and ASQ-81 obtain approval for service use
	1982	GCA modifications begun
		US Navy selects ASQ-81(V)3 for SH-60B LAMPS III helicopters; first GCA units installed in US Navy P-3Cs
	1987	GCA modifications complete
	1992	Texas Instruments awards US Navy contract to upgrade MAD on SH-60B LAMPS to ASQ-208(V)
	1995	ASQ-81(V) procurement ends for US Navy
	1996	US Navy starts upgrade from ASQ-81(V) to ASQ-208(V) for ASW operations
Sep	1998	Raytheon announces plan to possibly end involvement in MAD system market

Worldwide Distribution

The major **US Navy** ASQ-81(V) applications are found on ASW aircraft, namely the SH-60B LAMPS Mk III, SH-60F, and most recently SH-60R helicopters, as well as the P-3C and S-3B. FMS ASQ-81(V) applications cover SH-2, SH-60, and P-3C ASW aircraft in **Australia**, **Egypt**, the **Netherlands**, **New Zealand**, **Norway**, **Portugal**, and **Spain**. **Taiwan** has also procured the system for its McDonnell Douglas 500MD ASW helicopters. Newer applications include SH-60B sales to **Japan** and **Spain**, as well as Japanese P-3Cs.

Forecast Rationale

There has been no indication of further sales for the ASQ-81(V) or ASQ-208(V) magnetic anomaly detection (MAD) systems. Any related sales involving the ASQ-81(V) are likely to be limited to small export orders to markets in the Middle East (to combat Iraq's Russian Kilo class submarines) and sales to some Pacific Rim countries that may be growing wary of China's expanding submarine fleet. The ASQ-208(V) has better sales potential internationally than the ASQ-81(V); however, since the system is in active service with the US Navy – which tends to feel a bit uncomfortable allowing in-service ASW technology on the open market – sales may be restricted to selected US-approved nations, if allowed at all.

Barring a sudden surge in activity, this report will be archived next year, 2004.

Ten-Year Outlook

No further production or sales foreseen at this time. The forecast chart has been omitted. This report will be archived next year, 2004, barring any sudden surge in market activity.

* * *