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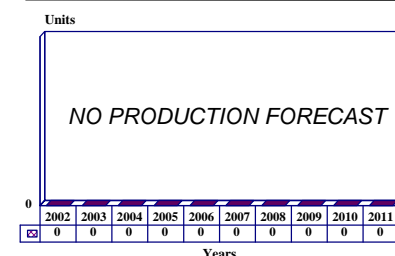
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## AQA-7(V) – Archived 01/2003

### Outlook

- No additional AQA-7(V) sales expected at this time
- IEER tested, AEER in development
- Barring a sudden surge in activity, this report will be archived next year (2003)

10 Year Unit Production Forecast  
2002 - 2011



### Orientation

**Description.** The AQA-7(V) is an airborne anti-submarine warfare (ASW) acoustic sonobuoy signal processor.

#### Sponsor

US Navy  
Naval Air Systems Command  
Washington, DC  
USA

#### Contractors

Ultra Electronics Holdings plc  
Undersea Sensor Systems Inc, USA  
(formerly Raytheon Co,  
formerly Hughes Electronics Corp,  
formerly Magnavox Electronic Systems Co)  
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Columbia City, Indiana (IN) 46725-8869  
USA  
Tel: +1 219 248 3500  
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Web site: <http://www.ultra-electronics.com>  
(Manufacturer)

**Status.** Production believed completed. System in service, but being replaced. Those units not being replaced on reserve aircraft have undergone major modifications over the last few years.

**Total Produced.** Approximately 1,325 AQA-7(V) systems have been produced. No further production expected.

**Platform.** Orion P-3A/B/C Maritime Patrol Aircraft.

**Application.** The AQA-7 sonobuoy signal processor is used to process the information received from the SSQ-53 and the SSQ-77 Direction Finding and Ranging (DIFAR) sonobuoys.

**Price Range.** The price was estimated to be between US\$350,000 and US\$400,000 per unit, with the average per unit cost approximately US\$375,000 (1992 US dollars based on contract cost averaging).

### Technical Data

The AQA-7(V) is an airborne acoustic sonobuoy signal processor used in conjunction with the SSQ-53B

DIFAR sonobuoy, as well as the SSQ-62B DICASS and SSQ-77A VLAD sonobuoys. Low-frequency sounds

produced by submarines are detected by hydrophones suspended from free-floating sonobuoys. The sonobuoys then transmit the data to a receiver on board the aircraft. This system processes the signals and provides information on submarine position, speed, and direction on electro-sensitive paper. Later versions of the system (AQA-7(V)8) also present data to the operator on a multipurpose display screen and through digital read-outs.

The AQA-7(V) system consists of a CP-983 computer, an MU-557 digital memory, an MX-8841 digital interface, a C-8249 control unit, a C-8245 bearing frequency

control, a C-8246 directional listening control, an RD-965 demultiplexer, an MX-8439 multiple-frequency storer, a PP-6307 power supply, an MX-8440 spectrum analyzer, an IP-981 bearing frequency indicator, an RO-373 signal data recorder, an SG-862 mounting, and a J-3356 junction box.

The ASA-76 CASS signal generator is an airborne signal source and control element for command active sonobuoys also manufactured by Hughes (formerly Magnavox). It works in conjunction with the AQA-7(V) and is used to search for, detect, locate, and identify submarines at short ranges.



Lockheed-Martin P-3C Orion maritime patrol aircraft of US Navy is an AQA-7(V)-equipped ASW platform

Source: US Navy

## Variants/Upgrades

**IPADS.** The Improved Processing and Display System (IPADS) is a low-cost digital upgrade that doubles the sonobuoy processing capacity of the AQA-7(V) from

16 to 32. IPADS also provides system growth and can offer up to 99 radio frequency channels.

## Program Review

**Background.** The Navy commenced its operational improvement program for the AQA-7(V) in 1979. Under the program, the AQA-7(V) was updated with a Triple Vernier, a DICASS system, an improved control panel, and an upgraded bearing computer. This program was completed in 1983.

**PE#0604221N P-3 Modernization Program.** Program work conducted under Project H1152 P-3 Sensor Integration is applicable to the AQA-7(V). Under that

project, the P-3C's aircraft systems were upgraded to enhance the aircraft's surface and subsurface tracking, classification and attack capability. This effort involved improving the acoustic software to process data from more advanced active and passive sonobuoys, and increasing the operational capability of the P-3C UPDATE III Acoustic System through the addition of advanced algorithms. In an ongoing effort, hardware

and software configurations are being integrated with advanced sonobuoys and detection algorithms.

The following is a brief history of this program:

An effort to decode and debug the Tactical Mission Software (TMS) (software version A4.8) and the Broadband (software version C4.8) began in FY94 and was completed by the end of FY95. The integration of the TMS and Broadband was then started, and was completed during FY96, with developmental testing immediately following. The integration of the Improved Extended Echo Ranging (IEER) system was also initiated during this time period.

TMS operational testing was conducted in FY98. Leftover funding was applied to the IEER integration effort.

Efforts were made to properly integrate new sensors during FY99. Also, both the Preliminary Design Review and Critical Design Review were conducted. The FY00 and FY01 agendas called for continuing the work in progress during FY99.

In FY02, efforts will focus on upgrading the P-3 sensor. IEER integration work is to be completed, followed by Fleet delivery and continued flight testing. In addition,

Advanced Explosive Echo Ranging (AEER) software development will be initiated.

The AQA-7(V) itself reportedly was replaced by late 1998 with the UYS-1 Proteus Acoustic Sensor System as part of the P-3C Update III Block Upgrade Program. Rumors were circulating in the industry that the US Navy had given somewhat halfhearted approval to upgrading the existing AQA-7 units via the IPADS upgrade effort. The upgrade is thought to be complete, with possibly a little software debugging left here and there.

**Note:** For information on the P-3C aircraft platform, please refer to the report titled "Lockheed P-3 Orion" in the *Aircraft* and *Military Aircraft* binder services.

Ultra Electronics Acquires Raytheon Sonobuoy Division. In late 1998, the United Kingdom-based aerospace and defense electronics company, Ultra Electronics, acquired Raytheon's sonobuoy product line. This acquisition (coupled with its previous buyout of Hermes in Canada) in a defense industry full of takeovers and mergers should offer Ultra Electronics a significant expansion capability into the North American, specifically US, sonobuoy market.

## Funding

No funding information specific to the AQA-7(V) is available. However, under the P-3 Modernization Program, P-3C aircraft systems are upgraded to enhance surface and subsurface tracking, classification and attack capabilities. Moreover, under the program's P-3C Sensor Integration Project, software is developed for the integration of advanced sensors into embedded P-3C Update III computer systems.

### US FUNDING

	FY00		FY01		FY02		FY03	
	QTY	AMT	QTY	AMT	QTY	AMT	QTY	AMT
RDT&E (US Navy)								
PE#0604221N								
P-3 Modernization:								
Projects H1152								
P-3 Sensor								
Integration	-	10.5 <sup>(a)</sup>	-	7.3	-	3.2	-	N/A

All US\$ are in millions.

Source: US Department of the Navy FY2002 RDT&E Budget Item Justification (R-2).

<sup>(a)</sup> FY00 budget reflects Congress add-on for APS-137 radar upgrades.

## Recent Contracts

No recent contracts have been specifically identified for the AQA-7.

## Timetable

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<u>Month</u>	<u>Year</u>	<u>Major Development</u>
	1966	Development begun
	1975	Concept development begun
	1977	The AQA-7(V) receives its ASU (approval for service use)
	1978	Initial procurement contract awarded
	1982	Major systems upgrade initiated
	1983	DICASS update completed
	1989	AQA-7(V) IPADS flight tested
	1991	Magnavox continues work on AQA-7(V) IPADS upgrade
Nov	1992	Magnavox awarded contract to modify IPADS on P-3B
	1995	Sensor improvement and integration software coding and debugging
	1996	TMS software developmental testing
	1997	Improved Extended Echo Ranging integration initiated
	1998	IPADS upgrade completed. TMS operational testing scheduled
	2001	IEER demonstration and testing
	2001	IEER demonstration and testing scheduled
	2002	AEER software development

## Worldwide Distribution

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The AQA-7(V) is equipped on board Lockheed P-3 ASW aircraft operated by the **US Navy**, the **Netherlands**, **Norway**, **Spain**, **Japan**, **Australia**, **New Zealand**, and **Portugal**. **Iran** also has P-3 ASW aircraft, but the status of the aircraft is unknown at this time.

## Forecast Rationale

Time and technology development have now turned against the AQS-7(V). Future markets for the AQA-7(V), either primary or secondary, seem doubtful at this time, as there are a number of newer and technologically better acoustic sonobuoy signal processing systems on the market. Some of the older AQA-7(V)

units uninstalled from US Navy P-3C aircraft may be farmed out to second- and third-tier navies as “gifts” under the Foreign Military Sales program, which in turn could create a minor spares and support market. Do not expect anything substantial, however.

## Ten-Year Outlook

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AQA-7(V) efforts were completed at end of 1998. No additional production is expected at this time, although there may be some spare and maintenance activity over the next several years. **The forecast chart has been omitted. Barring a sudden surge of activity, this report will be archived next year, January 2003.**

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