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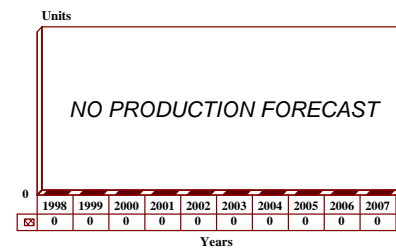
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AWARE - Archived 9/99

Outlook

- All orders have been completed as of 1996
- Believed to be in service with British Army Air Corps and Dutch Navy
- **THIS REPORT WILL BE DROPPED IN 1999 BARRING A PROGRAM RESTART**

10 Year Unit Production Forecast
1998-2007



Orientation

Description. Lightweight radar warning receiver intended primarily for deployment on helicopters, but also suitable for marine and ground-based applications.

Sponsor

Ministry of Defense
Procurement Executive
Room 614
St Georges Court
14 New Oxford Street
London WC1A 1EJ
United Kingdom
Tel: +44 171 637 3633

Contractors

GEC-Marconi Radar and Defence Systems Limited
Radar Systems Division
Eastwood House
Glebe Road
Chelmsford
Essex
CM 1 1QW
Tel: +44 1245 702702
Fax: +44 1245 702700

Licensee. No known production licenses have been granted.

Status. In service with the British Army Air Corps and the Dutch Navy.

Total Produced. It is estimated that approximately 350 AWARE systems have been produced through 1997. The majority (up to 334 systems) went to the British Army Lynx and Gazelle helicopter fleet.

Application. AWARE is a lightweight radar warning receiver intended primarily for deployment on helicopters, but also suitable for marine and ground-based applications. It is tasked with providing the platform with advanced warning and unambiguous indication of hostile radar scans.

Price Range. Initial cost of the systems was approximately US\$125,000 for the AWARE-3 and approximately US\$582,500 for the AWARE-4 (all prices in 1992 dollars).

Technical Data

Characteristics	<u>Metric</u>	<u>US</u>
Weight:	13 kg	28.5 lb
Coverage:	E to J-bands (provision for expansion)	
Power supply:	Pulse, pulse-Doppler and CW 28V dc, 120 W	

Design Features. AWARE-3 is composed of four planar spiral antennas, a hand-portable program loading unit, two dual crystal video receivers (CVR), an instantaneous frequency measuring (IFM) receiver, a signal/processor threat library and a control box. The system is designed to unambiguously detect and identify pulse, pulse-Doppler, continuous wave and intermittent continuous wave signals in the E- to J-bands. AWARE is specifically designed to operate in an environment containing peak pulse densities of several hundred thousand pulses per second radiated by many simultaneous emitters.

The system antennas are mounted in mutually orthogonal azimuth directions with the received signals being fed into the CVRs. These units provide controlled radio frequency outputs to the IFM receiver. Data from the IFM unit is digitized and fed into the signal processor. This determines direction of arrival and matches characteristics against those stored in the software threat library. Threat type, range and bearing are displayed in simplified plan form on a 3-in cockpit display. Interfaces are available to handle input/output from a laser warning system, chaff/flare dispensers and to integrate directly with the platform mission management system via a 1553B databus.

Variants/Upgrades

ARI-23491. Rewarder. British Army nomenclature for the AWARE-3 system.

AWARE-4. has increased versatility and will identify the individual radar sources and present the data in a format for recording and post-flight analysis.

AWARE-5. is designed for use in light strike aircraft such as the BAe Hawk 100/200 series and displays threat information via the platform's head-up display.

AWARE-6. is aimed at the light/medium fixed-wing maritime patrol aircraft market and marries the basic AWARE receiver chain to an enlarged display console equipped with an operator keyboard.

Program Review

Background. Ferranti entered the highly competitive radar warning receiver market in 1985 with the announcement of the DATAR RWR. This system was developed in partnership with E-Systems. DATAR was designed to provide helicopter crews with warning of illumination by surveillance radar at long range before the radar is capable of detecting the helicopter.

In January 1988 the British Army issued General Staff Requirement (GSR) 3811. This specified a lightweight off-the-shelf radar warning system requiring only minimal ongoing development to qualify it for installation on the Lynx/Gazelle fleet. Invitations to tender were sent to AEG-Telefunken, British Aero-

space, Racal, Marconi, Plessey, Thorn EMI, General Instrument, Loral, Singer, Litton and Thomson CSF.

It is understood that the original contract value envisaged for GSR 3811 was US\$42 million. This was subsequently reduced in scope to a planned expenditure of US\$30 million. In January 1989 it was announced that Ferranti had been awarded the production contract under GSR 3811 at a US\$16 million bid price. This contract is believed to cover the production and installation of approximately 130 systems.

The British Army presently operates 120 Lynx helicopters in assorted battlefield roles and approximately 160 Gazelles assigned similarly. Although specific

details of the existing order are classified, it is believed that a total of 130 systems are included. This is barely sufficient to equip the Lynx fleet and implies that follow-on orders will be placed to equip the remainder of the Gazelle and Lynx fleet. This is reinforced by the fact that the current order accounts for half the expenditure planned under GSR 3811. A repeat order for an equivalent number of systems would be sufficient to equip those remaining helicopters requiring RWR capability.

Although no official confirmation is available, it would now appear that planning envisaged that the British helicopter EW fit would be standardized upon AWARE-3 RWR, the British Aerospace Infrared Jammer and the Plessey laser warning system. This fit would have been installed in the Lynx/Gazelle force. It was likely to be extended to the Chinook and EH-101 fleet. If the British finally decided to procure the AH-64 Apache, this too would be a certain prospect for AWARE.

These plans were severely disrupted during Operation Grandby (the British build-up in the Arabian Gulf prior to Operation Desert Storm). A major expansion of the EW capabilities of British helicopters was instituted with particular emphasis on improving anti-missile defenses. All Lynx and Chinook helicopters were fitted with Sky Guardian RWRs and Loral ALQ-157 infrared jammers, while Pumas were equipped with Sky Guardian and the BAe IRJS. It is believed that AWARE was not ready for installation on this scale and was replaced by Sky Guardian which was available in sufficient quantities. This reflects an ongoing problem with European defense equipment procurement - production is usually on such low levels that the industrial infrastructure does not exist for surge production to meet unexpected demands.

The first production examples of AWARE-3 were delivered to the British Army early in 1992. The British AWARE requirement was at least 400 systems at that time but has since been reduced. Following the successful conclusion of the AWARE trials in August 1992, the system was certified for service use under the designation ARI-23491/1. It was given the common-use name of Rewarder. Following an extended trials and evaluation process, AWARE-3 received operational clearance in March 1995.

In April 1991, Ferranti introduced AWARE-4, a much more sophisticated version aimed at equipping surface ships. This was followed in December 1991 by two

additional new variants of the AWARE system. Designated AWARE-5 (for light strike aircraft) and AWARE-6 (for light/medium maritime reconnaissance aircraft), these two systems are intended to fill out the range of platforms for which the AWARE system is suitable. The Ferranti strategy was to turn AWARE into a complete modular range of radar warning receivers capable of competing with the GEC-Marconi Sky Guardian system.

The new variants received their launch orders in October 1992, when the Royal Netherlands Navy placed a US\$5 million order for AWARE-3 systems to equip their 22 Lynx helicopters and AWARE-4 to equip two combat support vessels.

The whole future of the AWARE systems was thrown into confusion in November 1993 when the Ferranti International group was forced into receivership. Ferranti's financial position had been precarious for some time as a result of the losses it suffered as a result of the International Signals Corporation fraud and, in the final analysis, these losses were too great for the company to withstand.

An attempted purchase of the group by GEC was thwarted following obstruction by a small shareholder group and Ferranti was left with no option but to be placed in receivership. Subsequently GEC did purchase the majority of the Ferranti defense interests from the receivers.

The initial purchases did not include the AWARE system but this equipment was included in a second purchase some months later. An industry assumption was that this would result in the rapid elimination of the system in favor of Sky Guardian, yet the equipment has been maintained in the GEC-Marconi Defense Systems product portfolio. According to a GEC-Marconi spokesman, AWARE turned out to have some very interesting features.

In late 1995 it was confirmed that almost 70 percent of the British Army Gazelle and Lynx helicopter force had received its AWARE radar warning systems. These reports reiterated the successful performance of the system. The system has also been subjected to deployment under combat conditions during operations over Bosnia.

In 1997, the South Korean Navy had expressed an interest in the AWARE-4 system. As of mid-1998 no known orders had been placed.

Funding

AWARE-3 was developed by Ferranti from its earlier DATAR system during the period 1985-1988. This development was corporate funded. DATAR was developed as a joint venture with E-Systems of the United States.

Recent Contracts

No known contracting activity has occurred since 1992.

Timetable

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
Sep	1985	DATAR introduced
Jan	1988	Ferranti submit AWARE-3 to British Army
Jan	1989	AWARE-3 selected as British Army helicopter RWR
Oct		Preproduction units delivered
May	1990	System seen on Gazelle helicopters in N. Ireland
Jul		Deployment on Chinook helicopters revealed
Dec		Sky Guardian employed on emergency upgrades to British helicopters sent to Saudi Arabia
Apr	1991	AWARE-4 introduced
Oct		AWARE-5 and AWARE-6 introduced
Nov	1993	Ferranti placed in receivership
Jun	1994	GEC-Marconi purchase Ferranti
	1995	Over 70 percent of UK order delivered
	1996	UK order believed to have been completed

Worldwide Distribution

Netherlands. 12 AWARE-3 deployed on Lynx helicopters of the Netherlands Navy; 2 AWARE-4 on Poolster class AORs

UK. Up to 334 AWARE-3 systems for deployment on British Army Lynx and Gazelle helicopters

Forecast Rationale

The AWARE system is a family of radar warning receivers (RWRs) developed initially for helicopter applications (the AWARE-3) in the late 1980's. By 1991 additional systems designated AWARE-4, -5, and -6 had been developed for use on ships, light strike aircraft, and light/medium maritime reconnaissance aircraft, respectively. These systems were initially designed to go head-to-head with the GEC-Marconi Sky Guardian which was another whole family of RWRs.

When GEC-Marconi acquired Ferranti, the original manufacturer of the AWARE system, it was in the uncomfortable position of having two mutually competitive products in its portfolio. While GEC finished off Ferranti's contracts from the UK and the Netherlands, it should be noted that GEC has apparently

downplayed AWARE in favor of Sky Guardian; nevertheless the AWARE system has been maintained within GEC's product portfolio.

GEC had stated that they had kept AWARE as a product due to some interesting technology which has most probably been added to the Sky Guardian system. This can be confirmed in a roundabout manner due to a substantially improved and upgraded derivative of Sky Guardian, Sky Guardian 2000, which was unveiled after the AWARE acquisition. This new system will compete directly for the helicopter/light strike market.

However, no known orders have been placed for the system since the 1992 contract to supply the UK with at least 130 AWARE sets for the British Army helicopter

fleet. It is believed that up to 310 systems could have been procured to equip each Lynx and Gazelle in inventory through 1996.

In late 1997, South Korea was known to have been looking at the AWARE-4 system for installation on unspecified ship(s). It is probable that these would not

be combatant vessels, but rather fleet support ships such as oilers, replenishment, etc. As of mid-1998, neither South Korea nor GEC-Marconi has given any indication as to the status of this request.

The ten-year forecast indicates the belief that the production of AWARE has effectively ceased.

Ten-Year Outlook

No production is forecast for this system. **THIS REPORT WILL BE DROPPED IN 1999 BARRING A PROGRAM RESTART**

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