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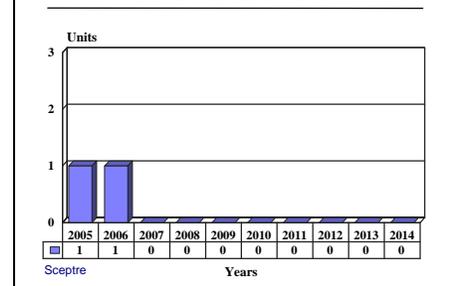
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Sceptre - Archived 07\2006

Outlook

- Last known production – for Swedish surface vessel upgrade program – drawing to a close
- Barring any future activity, this report will be archived next year, July 2006

10 Year Unit Production Forecast
2005 - 2014



Orientation

Description. Sceptre is a surface ship derivative of the Manta naval electronic support measures system designed for surface craft.

Status. In production and service.

Total Produced. An estimated 42 Sceptre systems had been manufactured through 2004.

Application. Sceptre is designed for generating prior warning of hostile radar emissions and providing targeting data based on such intercepts.

Platform. Sceptre is intended for all types of surface warships.

Price Range. Contract averaging suggests a probable unit cost between \$1.5 million and \$2.5 million (in FY04 dollars).

Contractors

Thales, HQ, <http://www.thalesgroup.com>, 45, rue de Villiers, Paris, 92526 France, Tel: + 33 1 57 77 80 00, Fax: + 33 1 57 77 86 59, Prime

Technical Data

Characteristics

Frequency range	D- to J-band (2-18 GHz)
Dynamic range	60 dB
Azimuth coverage	360 degrees
Elevation coverage	-10 to 30 degrees
Signal polarization	Horizontal, vertical, and LH/RH circular
Bearing accuracy	6 degrees RMS
PRF range	100 Hz-300 KHz
Pulse width range	50 ns to 100 us
Mission library	2,000 emitter modes
Threat warner	24 emitters @ 6 modes
Operator library	100 emitter modes

Design Features. Sceptre and its related system, Manta, is an advanced electronic support measures (ESM) system. They were developed for protection of surface ships and submarines operating at periscope depth by intercepting, analyzing, classifying, and identifying hostile radar emissions of all types.

Providing options for extended frequency coverage and accurate bearing measurement, different antenna modules are utilized. Digital processing modules can extend pulse-density capacity and library capacity, output data to tape or hard copy, and interface with central data handling and action information systems.

Operational Characteristics. The antenna of Sceptre can be installed on a special ESM mast, providing 360-degree instantaneous coverage. Hostile radar emissions are analyzed and simultaneously displayed on the operational consoles along with the radar type and threat significance.

Threat data are transmitted to the ship's central data-handling system, giving the commander maximum time to initiate evasive maneuvers and defensive measures.



Swedish Minelayer Carlskrona

Source: Swedish Armed Forces

Variants/Upgrades

Sceptre's modular nature makes upgrading the basic system to match changes in the electromagnetic environment relatively simple. Such upgrades will then, most likely, be aimed at improving the ability of the system to detect stealthy and low-probability-of-intercept (LPI) radars.

Sceptre O. A surface ship derivative of Manta O intended for fast attack craft and offshore patrol vessels.

Sceptre X. A surface ship derivative of Manta X that provides long-range ESM capability for frigates, destroyers, and major surface combatants.

Sceptre XL. An enhanced and improved derivative of Sceptre X with extremely long-range detection capability, radically upgraded display and processing

facilities, larger threat libraries, and significant, fully passive over-the-horizon targeting capabilities.

Sceptre-Lens. The adoption of a Luneberg Lens array using electronic scanning provides for very fine ESM cuts on contacts (reportedly less than a quarter of a degree) and for multiple target tracking with a high level of precision.

Outfit UAT. The U.K. Royal Navy designation of the Type 23 frigate version of Sceptre XL. It differs from Sceptre XL in retaining the Outfit UAF antenna arrays and has further advanced target acquisition capabilities. Unofficial reports suggest that Outfit UAT offers significantly improved bearing accuracy over the 1.5 to 0.5 degrees obtained with Outfit UAA-2.

Program Review

Sceptre's parent system, Manta, was originally developed in the early 1980s by MEL (acquired by Racal Defence Electronics Ltd, now Thales) from the Signaal-designed RAPIDS project. Announced in 1983, Sceptre was shown in public for the first time two years later. The Swedish Navy selected the system to equip its two new A-19 class boats, and Spain chose Sceptre to refit its Agosta boats.

In 1986, a surface ship derivative of Manta/Sceptre was introduced. This derivative was made available in three versions: Sceptre O, for fast attack craft and offshore patrol vessels; Sceptre X, to provide long-range ESM capability for frigates, destroyers, and major surface combatants; and Sceptre XL, which has enhanced capabilities.

An initial order was placed for a single Sceptre XL system to equip the Swedish minelayer KSS *Carlskrona*. This was followed by orders for four Sceptre XL systems to equip the Gotesborg class corvettes as a replacement for the originally specified Argo Carol system. This system combined the Sceptre technology with a Swedish-developed Luneberg Lens to form the variant Sceptre-Lens.

Philips decided to withdraw from the defense market in 1989 and sell off those divisions operating in that sector. Signaal was sold to French Thomson-CSF (now Thales), and MEL was sold to Thorn-EMI to become part of the Thorn-EMI Sensors group.

The significant breakthrough came with the U.K. Royal Navy's order to replace Outfit UAF, followed by its adoption for the ANZAC frigate program. In March 1990, Thorn-EMI Sensors was awarded a \$40 million contract to supply advanced long-range electronic surveillance systems for the second batch of Type 23 frigates. Designated Outfit UAT, the new system was derived from Sceptre XL and provided advanced warning and electronic intelligence data using the latest transputer and parallel processing techniques. It retained the existing Outfit UAF antenna arrays. The new order was apparently for only three systems for Type 23 frigates.

In September 1990, Thorn-EMI was awarded a \$30.5 million contract by the Australian shipbuilders AMECON to supply the Sceptre XL system for installation in ANZAC frigates. Eight systems have been ordered for the Australian ships and two for the New Zealand frigates, with New Zealand also taking options on a further two systems.

Thorn-EMI was bidding Sceptre O to meet the U.S. Navy SLEWS requirement and was in a position to

offer either Sceptre XI or Outfit UAT to meet the U.S. Navy SLQ-54 requirement. The SLEWS project was later dropped, however.

In late 1993, the Swedish Navy announced two new naval construction programs, both of which used experience gained with the low observable technology testbed KSS *Smyge*. Designated the YSM-2000 and YSB programs at the time, they provided for the construction of four medium-sized missile corvettes (YSM-2000, the Visby class) and 12 minehunters and coastal patrol craft (YSB, the Styrösö class). The Visby class was to be fitted with the Sceptre-Lens system, while the Styrösö design was to receive the simpler Sceptre O.

GEC-Marconi (now BAE Systems) supposedly put in a bid to buy the defense interests of Thorn-EMI in 1993. These negotiations broke down in 1994 over disputes about the financial aspects of the acquisition. Thorn-EMI then entered into negotiations with Racal Defence Systems. These ended in May 1995 with Racal's purchase of the Thorn-EMI Sensors Division for \$26 million. Racal-Thorn Defence Systems (now Thales) was then formed, consolidating the electronic warfare expertise of the two groups.

The U.K. Royal Navy launched a program to develop a successor to its Outfit UAA-2 and Outfit UAF ESM systems. An across-the-board replacement program of the ESM systems was created to achieve fleet-wide standardization. The same basic system was to act as a building block for the fully integrated EW system later to be installed on the Project Horizon Common New Generation Frigate.

Although a significant number of companies bid for this requirement, the leading contenders were reported to be Thorn-EMI with an enhanced version of Outfit UAT, GEC-Marconi Defense Systems with a version of Outfit UAG, and ArgoSystems with APECS-III. Racal then placed its weight behind the Outfit UAT-based bid. The contract was awarded to Racal-Thorn Defence Systems and involved the use of UAT technology for the upgrade.

The contract was for 16 shipsets of equipment for fits on eight Type 42 destroyers and 10 Type 22 frigates. This suggests that a repeat order for additional ship- and shore-based systems was contemplated. Although the new system has been reported as having the designation Outfit UBB(1), this does not fit the U.K. Royal Navy standard nomenclature, and a more probable designation is either Outfit UAA(3) or Outfit UAW, depending on the extent of the modifications involved.

In June 2000, Thomson-CSF (now Thales) acquired Racal Defence Electronics. Despite the dearth of new information regarding current procurement, it can be safely assumed that work on all previously awarded

contracts is proceeding as scheduled. Thales is the largest non-U.S. defense electronics manufacturer in the world, and its enormous international market reach may generate renewed interest in the Sceptre family.

Funding

Sceptre and related systems were developed by Thorn-EMI Sensors (now Thales Defense Ltd) as a corporate venture. Modifications to U.K. Royal Navy requirements were funded by the U.K. Ministry of Defence.

Recent Contracts

No new contracts have been publicly announced since 1996.

Timetable

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
	1990	Sceptre XL ordered for ANZAC frigates
Dec	1993	Sceptre-Lens and Sceptre O specified for the Swedish YSM-2000 and YSB programs
	1995	Thorn-EMI purchased by Racal
	1996	Sceptre ordered by U.K. Royal Navy as Outfit UAA-2 replacement
	1997	Deliveries for UAA-2 reportedly begun
Apr	1999	Racal awarded Project Definition study for U.K.'s Common New Generation Frigate's EWS
	2000	Horizon project canceled
	2000	Racal acquired by Thomson-CSF (now Thales)
	2002	Production for Australia's Sceptre XL ends
	2006	Production likely to end

Worldwide Distribution

Sceptre is reportedly in service in **Australia, New Zealand, Sweden,** and the **U.K.**

Forecast Rationale

Over the next few years, only limited numbers of the Sceptre naval electronic support measures (ESM) system are expected to be produced. This work will complete the last known order for the systems under a Swedish surface vessel upgrade program. It is possible that orders for the system have been placed in recent years which were simply not publicly announced.

However, it is more likely that newer, more advanced systems have taken over the market.

In light of the dearth of new information on the system, the forecast for any future Sceptre production must be viewed as speculative. In all likelihood this report will be archived next year.

Ten-Year Outlook

ESTIMATED CALENDAR YEAR PRODUCTION

Designation	Application	High Confidence Level				Good Confidence Level				Speculative				Total 05-14
		Thru 04	05	06	07	08	09	10	11	12	13	14		
SCEPTRE LENS	YSM-2000/YSB (SWEDEN)	11	1	1	0	0	0	0	0	0	0	0	0	2
SCEPTRE O	Prior Prod'n:	2	0	0	0	0	0	0	0	0	0	0	0	0
SCEPTRE XL	Prior Prod'n:	29	0	0	0	0	0	0	0	0	0	0	0	0
Total Production		42	1	1	0	0	0	0	0	0	0	0	0	2