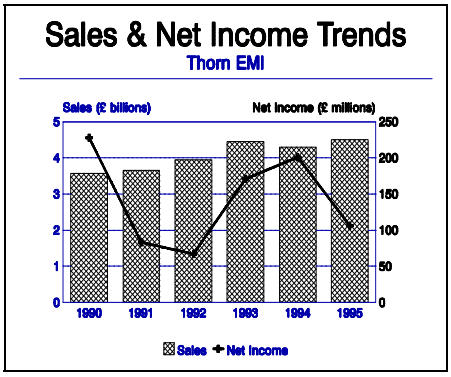
Thorn EMI Plc - Archived 6/97

Outlook

- Follwing its failed attempt to sell its Electronics and Security unit as whole unit, Thorn has begun to sell the unit piecemeal.
- Thorn has lined up Racal for its sensor unit and Thomson-CSF for its missile electronics and electro-optics operations.
- With the completion of these sales Thorn will exit defense manufacturing and concentrate on music and consumer electronics.



Headquarters

Thorn EMI plc
4 Tenterden St
Hanover Square
London W1A 2AY United Kingdom
Telephone: (44 0171) 355 48 48

Thorn Electrical Industries Ltd was formed in 1928, and the firm became a public company in 1936. The company was established in its current form when Thorn Electrical Industries merged with EMI in 1979.

In 1994, Thorn began divesting itself of its defense-oriented units. Originally, Thorn EMI Electronics was put on the market in 1989 as an entire unit but no buyers were interested. With the operation continuing to lose money, Thorn has sought and found several buyers interested in select operations of the Electronics unit. For details on these sales please refer to the Mergers, Acquisitions and Divestitures section in this report.

Even with these divestitures, Thorn EMI plc remains an international company with operations in 40 countries, and its common stock is traded on the exchanges of London, Frankfurt, Düsseldorf, and Paris. The company is now focused on three areas of operations: Rental, Music, and Other (the latter includes the Security & Electronics operations which is in the process of being disposed). In 1995, Thorn EMI employed approximately 33,000 persons. Thorn EMI plc is audited by Ernst & Young, London, England.

Structure And Personnel

Board of Directors

Colin Southgate
Chairman
Sir Peter Walters
Non-Executive Deputy Chairman
Michael Metcalf
Chief Executive, Thorn Group
James Fifield
President and Chief Executive, EMI Music
Simon Duffy
Group Finance Director
Sir Graham Day
Non-Executive Director
Dr. Harald Einsmann
Non-Executive Director
Lord Griffiths of Ffoerstfach
Non-Executive Director
Eric Nicoli
Non-Executive Director

Product Area

In July 1995, Thorn sold its last defense-related piece. The company now manages its remaining operations in the following manner.

1. Rental
2. Music
3. HMV Group

The **Rental Group** is involved in overseeing the consumer electronics, appliances, and durable goods rentals of the group, in addition to administering the retail operations and Rumbelows electrical and electronics retailing operations.

The **Music Group** is one of the "Top Three" companies in the worldwide music business, due to its strength in both recorded music and music publishing. EMI Music handles many world famous artists.

HMV Group. This is Thorn's music retailing unit, operating numerous music "superstores."

Subsidiaries. Thorn subsidiary companies as of May 1995 are as follows (wholly owned unless otherwise indicated by a percentage share of ownership):

THORN

THORN UK Ltd
UK Rental Division
THORN High Street Properties Ltd
Thorn EMI International A/S (Denmark)
THORN EMI (Australia) Ltd
Radio Rentals Division
THORN Svenska AB (Sweden)
THORN Americas Inc (USA)
Visea THORN EMI S.A. (France)
Remco America Inc (USA)
Consumer Electronics Insurance Company Ltd

EMI Music

EMI Records Ltd
EMI Music Publishing Ltd
Capitol-EMI Music Inc (USA)
EMI Entertainment World, Inc (USA)
EMI France S.A. (France)
EMI Italiana SpA (Italy)
EMI Electrola GmbH (Germany)
THORN EMI (Australia) Ltd
EMI Records Division
Chrysalis Records Ltd
Capitol Records Inc (USA)
Virgin Records Ltd
Virgin Records America Inc (US)
Virgin Schallplatten GmbH (Germany)
Groupe Virgin Disques SA (France)
Toshiba-EMI Ltd (Japan) (55 percent)

Other businesses

THORN EMI Home Electronics (UK) Ltd
HMV Division
Dillons the Bookstore Division
THORN EMI Electronics Ltd

Facilities

Thorn EMI plc, 4 Tenterden St, Hanover Square, London W1A 2AY, Telephone: (71) 355 48 48. Thorn EMI plc is headquartered in London.

Corporate Overview

Thorn EMI's basic strategy is to focus on businesses with world-class competitive strengths. The company's major operations, EMI Music and Thorn EMI Rental, account for over 80 percent of Thorn EMI's operating profit. The company's business interests are concentrated in three primary areas: Rental, Music, and Other. Thorn has recently completed the process of disposing of its defense operations and is now focusing on its music and rental businesses.

New Products and Services

No new defense or aerospace products have been announced due to the company's exit from defense manufacturing.

Plant Expansion/Organization Update

Spin-Off Under Consideration. In early 1996, Thorn EMI announced its intent to spin off into two separate companies, Thorn, comprising the rental business, and

EMI consisting of everything else in the current group. The move still needs to meet with approval from regulators in the US and UK before final approval.

Restructuring. In February 1992, the Rumbelows stores were transferred to Rental-UK in a move aimed at achieving substantial infrastructure economics. Much of Rumbelows' previously separate service, distribution and head office functions have been eliminated. The two Danish rental businesses, Fona and DER, have merged. Each retains its separate brand identity, but both are now backed by a single management and support structure.

Thorn Security & Electronics (TSE) Formed. Thorn Security & Electronics (TSE) was formed to seek to transfer some of the company's defense technology and expertise to the civil sector. TSE's Transaction Security unit logged an important sale when selected to supply automatic fare collection systems for the Seoul Metro System in the Republic of Korea.

Mergers/Acquisitions/Divestitures

Microwave Devices Sold. In July 1995, Thorn sold its last defense-related piece, Thorn Microwave Devices Ltd, to a management buyout for an undisclosed sum. The unit produces microwave tubes, power supplies and associated equipment for the radar, electronic warfare and communications markets.

Racal Acquires Sensor Unit. In April 1995, Racal Electronics plc acquired the sensors group of Thorn EMI for £17.5 million ($26.8 million). The sensors unit produces airborne, naval, and ground radar systems; electronic warfare systems, airborne training and command support equipment. Racal was begun to integrate the group with its Radar and Defence Systems operation.

Thomson CSF Buys Missile Electronics and Electro Optics Operations. In July 1994 Thomson-CSF purchased Thorn EMI's missile electronics and electro-optics businesses. Thomson said that by acquiring these Thorn units it will be able to double its business in this area and dominate the European sector for such work. Financial terms of the deal were not disclosed.

THORN Security Group Sold. In May 1994, Thorn EMI sold is Thorn Security group to a management buyout vehicle led by John Nixon, Managing Director of the THORN Security Group, with backing from Hambro European Ventures Limited. Thorn EMI retained a 40 percent equity interest in the new company, which it intends to hold as an investment. The deal was valued at £38.6 million.

Electron Tubes Unit Sold. In January 1994, Thorn EMI sold its Electron Tubes division for £6.6 million to a management buyout team headed by director and general manager Jan Frederiksen. Electron Tubes was part of Thorn's defense electronics operations.

Thorn/GEC Defense Talks Collapse. In August 1993, Thorn EMI broke off talks with GEC over the sale of its defense business. The breakdown is believed to have come after GEC refused to agree to the asking price, which was rumored to be in the range of £150-200 million. Thorn confirms that it is still interested in selling its defense operations, but notes that it will not be pressured into a quick sale. However, following the collapse of the sale, Thorn EMI closed the Victoria Road plant in Feltham, near London, and transferred the work to three nearby sites, resulting in the loss of 400 jobs out of a workforce of 1,000. The company blames the cutbacks largely on the cancellation of the multinational MLRS Phase 3 program and deferment of a major overseas fuze contract.

Thorn Lighting Sold. In June 1993, Thorn EMI sold its Thorn Lighting division for an estimated £162 million. The sale is part of Thorn's overall strategy to concentrate on its music and rentals business.

Thorn EMI Software Ltd Sold. In January 1991, the company sold Thorn EMI Software Ltd (TECS Division) to the US company Pilot Executive Software, Inc. Thorn EMI is to receive additional shares in the financial control and decision support systems software company, increasing its interest to 30 percent; terms of the sale were not disclosed.

Teaming/Competition/Joint Ventures

These arrangements are believed to have followed the individual units after their divestiture.

IBM. In November 1993, Thorn EMI Electronics Ltd teamed with IBM Aerospace Systems Integration Corp of Portsmouth, to bid for the British Defense Ministry's ASTOR airborne battlefield radar surveillance program.

OMI. In October 1993, Thorn EMI's Electro-Optics division signed a teaming agreement with Opto Mechanik Inc (OMI) of Melbourne, Florida, to market and produce Thorn's lightweight thermal imager.

Condor Systems. In September 1993, Thorn EMI Electronic's EW division in the UK teamed with US firm Condor Systems to meet the British Army's Project Monocle requirement for a mobile, integrated tactical electronic intelligence system. Project Monocle, valued at £30-40 million, is to replace the Barbican radar intercept and analysis system.

COBRA. As a member of the Euro-ART consortium which includes Thomson-CSF, and General Electric and Siemens, Thorn EMI is involved in development of a new Counter Battery Radar (COBRA). The British, French and German armies have requirements for 10, 15, and 28 units,

respectively, with first deliveries planned for the late 1990s. Italy may also elect to participate in this multinational project. Future German participation may be questionable, but this could be offset should a potential US Army purchase reach fruition.

Eurofirst Consortium. With partners FIAR (Italy), Eltro (Germany) and Eurotronica (Spain), Thorn EMI participates in the Eurofirst consortium's bidding for the contract to provide the IRST system for the next generation, multirole European Fighter Aircraft (EFA). The Eurofirst design draws heavily upon Thorn EMI's experience in the development of the Air Defense Alerting Device (ADAD); specifications for the IRST (infrared search and tracking) were drawn up using data from Thorn EMI's background model, resulting from ADAD tests. With the recent restructuring of the EFA project, now designated Eurofighter 2000, the outlook for Eurofirst participation remains to be seen.

Ferranti International. Under a Royal Navy contract awarded in mid-1992, Thorn EMI and Ferranti International are conducting the project definition of an Electronic Warfare Control Processor (EWCP). The EWCP will initially be developed for the Invincible class carriers, but eventually will be integrated into the EW systems of other vessels. The EWCP will coordinate all the EW systems aboard a ship, including electronic support measures, ECM, chaff and decoys. Data from a variety of sensors will permit the EWCP to provide planning information, which will speed workloads while improving information transfer.

Hunting Engineering.Thorn EMI and Hunting have teamed to offer the Smart Weapon Anti-Armour Thorn Hunting Engineering (SWATHE) to fill a Royal Air Force requirement for an air-launched short-range anti-armor weapon. SWATHE would mate Hunting's BL755 casing with the Multiple Launch Rocket System (MLRS) Phase 3 terminally guided submunition.

MLRS. Thorn EMI had collaborated with Martin Marietta, Thomson-CSF and Diehl on the Multiple Launch Rocket Systems Phase III program for the US Army Missile Command. The UK partner was the seeker integrator for the project; its responsibilities in the seeker front end included the antenna servo system, the inertial instruments, the terminally guided submunitions radome, fuze electronics, and trials telemetry and instrumentation. The US pulled out of the Phase III program in 1991, leaving its future in question.

NH90 Helicopter Radar. Thorn EMI is promoting a further updated variant of its Searchwater airborne surveillance radar, designated Searchwater NH, for the planned multinational NH90 helicopter program. Thorn EMI will team with French, German and Italian companies (which are yet to be selected), to develop a new antenna and transmitter to be integrated with the UK company's standard receiver and processor. Thorn EMI's partners would also handle some licensed production of Searchwater NH.

SATEL Consortium. SATEL is a joint venture involving Thorn EMI, SAT of France, and Eltro of Germany. The consortium is developing new thermal imaging sights for the TRIGAT anti-tank missile. The UK partner is responsible for developing the telescope, digital electronics, converters and logistics pack of the Condor imager, which will be used with the long-range variant of TRIGAT, and will provide scanners, converters, video electronics, Joule-Thomson cryogenics, batteries and logistics pack for the Tiger night sight intended for the medium-range TRIGAT.

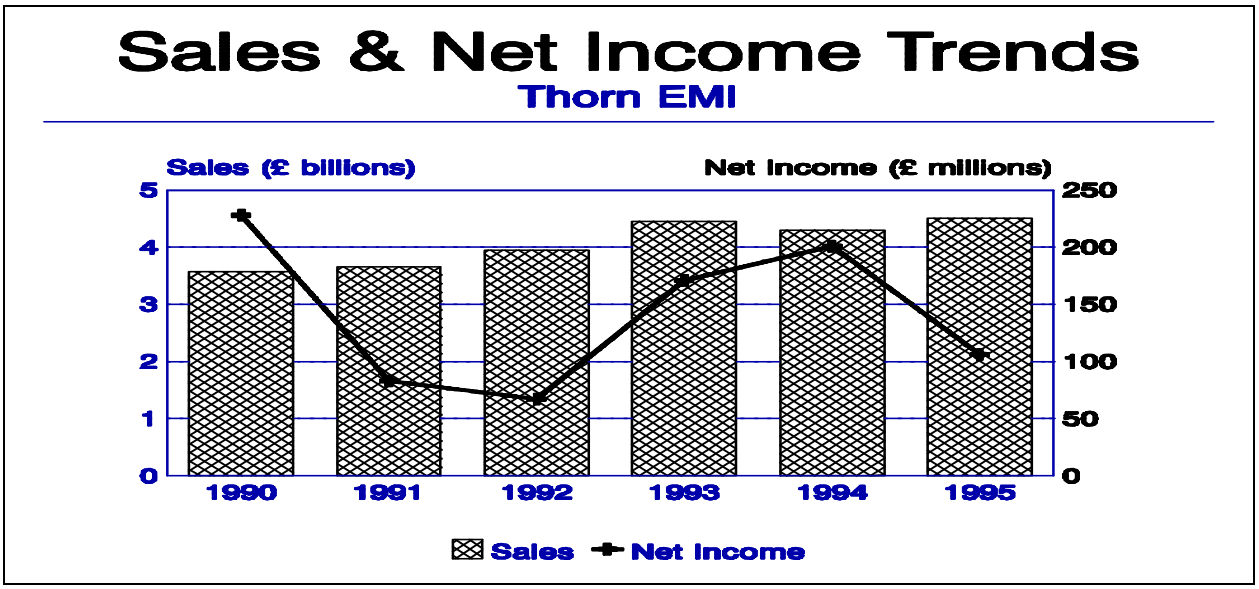
Toshiba-EMI. Thorn's EMI Music has formed a joint venture company with Toshiba of Japan, known as Toshiba-EMI. Toshiba-EMI manufactures compact laser discs and engages in recorded music production and distribution.

Financial Results/Corporate Statistics

Thorn EMI's net sales for 1995 totaled £4.5 billion, up from the £4.29 billion recorded in 1994. Net income dropped to £106.7 million from £201.8 million in the previous year. The latest full-year statistics are given below.

US dollar figure translated as 1995 average at the rate of £1=US$1.5316

Y/E March 31	**1991**	**1992**	**1993**	**1994**	**1995**	**1995**
(£ millions)						**US$**
Sales	3660.3	3954.4	4452.3	4292.1	4507.3	6903.3
Net Income	83.7	67.8	171.6	201.8	106.7	163.4



Industry Segments

A breakdown of Thorn EMI's sales and profits by major market segment, for the past two years, is given below.

SALES	1994	1995
(£ millions)		
EMI Music	1760.5	2189.0
Thorn	1484.2	1589.4
HMV	403.9	503.2
Other	181.3	47.4
Discontinued	462.2	178.3
TOTAL	4,292.1	4,507.3

OPERATING INCOME	1994	1995
(£ millions)		
EMI Music	246.1	294.9
Thorn	129.2	152.4
HMV	6.1	14.0
Other	4.5	-2.8
Discontinued	-3.4	-3.1
TOTAL	382.5	455.4

Strategic Outlook

Following its failure to sell Thorn EMI Electronics and Security Ltd (TSE) as a whole unit, Thorn has begun to sell the unit's operation piecemeal. As of early 1995, Thorn has sold its Security Group and has lined buyers for its missile electronics and electro-optics operations (Thomson-CSF) and its sensor unit (Racal). Thorn EMI's insistence on a high price for its defense unit chased away prospective buyer GEC and forced the company to break the unit up in order to divest it. GEC would only offer Thorn £40 million for the troubled unit, and Thorn, originally asking £160 million, would go no lower than £100 million. Following the collapse of the sale, Thorn restructured the unit, closing one plant and laying off nearly a third of its 1,000-employee strong workforce. This was followed by the sale of the first price of the group, the Electron Tubes division, to a management buyout, in January 1994.

With the sale of two of its major remaining defense operations complete, Thorn has exited defense manufacturing and is now concentrating on its core capabilities of music and consumer electronics. As this now brings the company outside the scope of this service, this report will no longer be updated.

Prime Award Summary

No current information available.

Program Activity

Business Interests. Thorn EMI plc was involved in the following ares of business:

- Rental of consumer electronics, appliances and durable goods
- Music publishing
- Recording
- Manufacture of music goods
- Music and video development, production and management
- Airborne radar systems
- Battlefield radar systems
- Electro-optical systems
- Target sensors
- Fuzes
- Electronic warfare
- Signature measure and control
- Naval data processing and distribution
- Naval overhaul and modernization
- Communications systems
- Support services

These programs have since been be acquired by the companies detailed in the Mergers/Acquisitions/Divestiture section. They are reprinted here for historical reference.

Airborne Radar Systems

Thorn EMI produced the Searchwater (ARI 5980) long-range maritime surveillance and AEW radar, fitted to RAF Nimrod maritime patrol aircraft and Sea King helicopters operated by the Royal Navy and Spanish navy. Searchwater is currently the only carrier-based AEW radar produced outside the United States. The company has since developed the Skymaster AEW pulse-Doppler radar, intended for defense against low level targets over land, from the Searchwater. Skymaster has been fitted to a Pilatus Britten-Norman Defender aircraft. Building upon this expertise, Thorn also offered Searchwater 2, combining the ASW and anti-shipping capabilities of the original Searchwater (at approximately half the size and weight), while incorporating Skymaster's AEW performance.

The company has produced technology demonstration radars for the two alternative concepts for the UK Ministry of Defence's Airborne Stand-Off Radar (ASTOR) project. In one concept, synthetic aperture radar techniques are being evaluated in a Canberra testbed aircraft, while the alternative approach incorporates a Skymaster radar which has been flight-tested aboard a Pilatus Britten-Norman Islander aircraft.

The acquisition of MEL brought the Marec II and Super Marec maritime surveillance radar programs into the Thorn EMI fold. The Marec II was designed as a small, low-cost yet efficient means of providing coastal surveillance/patrol, oil-rig protection, search-and-rescue and pollution control. The Super Marec derivative adds a scan converted color TV display to increase the operator's tactical navigation facilities and reduce his workload on long patrols. India's Coast Guard is fitting Super Marec systems to its indigenously produced fleet of Dornier 228 aircraft.

Battlefield Radar Systems

Thorn EMI's Man-Portable Surveillance and Target Acquisition Radar (MSTAR) entered service with the British Army in 1990, and the company has licensed MSTAR technology to INISEL for use in the Spanish Army's ARINE battlefield radar program. MSTAR is a lightweight system (less than 80 pounds), intended for the forward artillery observation and medium reconnaissance roles, and is also available in a vehicle-mounted configuration. Approximately 100 systems are expected to be procured to equip variants of the British army's Warrior armored fighting vehicle.

Thorn EMI has supplied more than 400 lightweight, rugged Cymbeline weapon-locating radars to 19 nations, and is presently developing an upgraded Cymbeline Mk 3 variant as a private venture. The Mk 3 will offer a 50 percent increase in both the scanned sector and the range of the current model, as well as incorporating clutter-suppression features to improve its performance in snow and rain.

Thorn EMI is a member of the Euro-ART consortium which includes Thomson-CSF, Siemens and General Electric, and which is developing the new Counter Battery Radar (COBRA) for the British, French and German armies. Intended to locate hostile artillery and monitor incoming rounds, COBRA is expected to enter service during the late 1990s. COBRA is seen as complementing rather than replacing Thorn's Cymbeline systems, which will continue to be operated farther forward on the

battlefield. Continued German participation may be questionable in light of that country's budgetary constraints. The US Army is seen as a potential customer for up to 75 units.

Surveillance, Fire Control And Tracking Systems

Thorn is a member of the multinational SATEL consortium (which includes SAT of France and Eltro of Germany), developing new thermal imaging sights for the TRIGAT anti-tank missile. The Condor imager will be used with the long-range version of TRIGAT, while the Tiger sight is intended for the medium-range TRIGAT. Thorn EMI is responsible for the telescope, digital electronics, converters and logistics pack of the Condor imager, and will provide the scanner, converters, video electronics, Joule-Thomson cryogenics, batteries and logistics pack for the Tiger sight.

Thorn EMI received a UK MoD contract in 1987 to develop the Air Defense Alerting Device (ADAD), seen as the first in a family of IR search and track sets for land-based, naval and airborne applications. ADAD is a passive alerting device which detects and indicates target bearing data on low-flying aircraft, to be used with shoulder-launched, close-air defense weapons such as Starstreak, Javelin, Stinger, Mistral and the RBS70. ADAD may serve as a standalone alerting device, or can be used to complement a laser and/or radar rangefinder to cue an associated radar to perform IFF interrogation and to provide range information. Texas Instruments has an agreement with Thorn EMI, whereby it would handle ADAD marketing in the United States.

Thorn has developed a series of Thermal Imaging Common Modules (TICMs) from its Multi-Role Thermal Imager (MRTI), which entered service in 1982 and saw service in the Falklands conflict that same year. Based on this experience, the company developed the substantially lighter weight Hand Held Thermal Imager (HHTI), also known as Spyglass, a 12-pound unit which entered British Army service in 1986 and has been ordered by 17 countries.

The company's Naval Thermal Imaging System (NTIS) variant has been installed aboard two classes of Royal Navy patrol vessels, while a Thermal Imaging Security System (TISS) version has been designed to provide security at sensitive installations such as air bases. In this role, the imager is co-mounted with a low-light-level TV camera and can be triggered by other perimeter sensors.

Other MRTI family members include the Steerable Stabilized Thermal Imager (SSTI), used by Flight Refuelling in its unmanned Raven air vehicle, and the developmental Extended Range Thermal Imager (ERTI) which will be fitted with a 7x telescope.

The company has worked with the Royal Navy and the Admiralty Research Establishment (ARE) in exploration of IRST roles and technology for naval/maritime applications. Thorn EMI built an experimental system as part of the ARE Reconfigurable IR Scanner Equipment (ARISE) research program initiated in 1987; evaluation of this system has permitted the Royal Navy to evaluate a number of IRST configurations, and to examine different scan formats.

In another collaboration with ARE, Thorn EMI has carried out a prefeasibility study of potential shipboard IRST applications. The company's emphasis was on systems aspects such as the ability of an IRST to increase the ship's survivability against aircraft and missiles, and to interface with aspects of the vessel in order to optimize overall performance.

Thorn EMI is a member of the Eurofirst consortium, and was to provide the IR search and track system for the multinational European Fighter Aircraft (EFA). Other members are FIAR of Italy, Eltro of Germany, and Eurotronica of Spain. The Eurofirst IRST was to be the first such design to provide multitarget tracking capabilities, and was to draw heavily upon Thorn EMI's experience with ADAD. In light of the recent restructuring of the EFA project into the less ambitious Eurofighter 2000 program, Eurofirst's participation remains to be seen.

Electronic Warfare/Electronic Support Measures Systems

In mid-1992, Thorn EMI and Ferranti International received a Royal Navy contract for the project definition phase for an Electronic Warfare Control Processor (EWCP). The EWCP will initially be developed for the Invincible-class carriers, but eventually will be integrated into the EW systems of other vessels. The EWCP will coordinate all the EW systems aboard a ship, including electronic support measures, ECM, chaff and decoys. Data from a variety of sensors will permit the EWCP to provide planning information, which will speed workloads while improving information transfer.

Thorn EMI's Type 765(2) ECM system, an I/J-band jammer providing area and point defense against multiple threats, entered Royal Navy service in 1988. The company is currently promoting an export variant of this system, known as Guardian, primarily to NATO navies. Both the Type 675(2) and Guardian systems can be containerized, permitting transfer among ships during refits. Thorn EMI also played a major role in the development of the Royal Navy's UAA(1) electronic support measures suite, which interfaces with the Type 675(2) ECM system. The UAA(1) suite is presently being upgraded to the UAA(92) standard.

As a private venture, Thorn EMI Electronics has developed the Corvus, a "smart" ELINT/ESM system which incorporates the company's EP-4220 channelized receiver and its EP-4210 advanced pulse analyzer to provide a high degree of mobility. Corvus consists of a complete shelter-based, transportable installation which can be mounted on a four-ton truck. Corvus has been employed in the ELINT measurement roles, such as detecting residual radiation from emitters that are nominally switched off, but which actually are left on with the antenna being switched off and power fed into a dummy load.

Thorn EMI has also developed the Wavefinder system, which provides multirole ESM capabilities and may be ground-based or fitted to ships or aircraft. Wavefinder's capabilities include ELINT data gathering, passive sensing of target emitters in cluttered radar environments, jammer location and identification, and general surveillance. This system can accommodate a threat library 10 to 15 times larger than that of a conventional ESM system.

With its purchase of MEL, the company has acquired the latter's Microwave Analysis Threat Indicator and Launch Direction Apparatus (MATILDA) system, a low-cost shipboard radar warning unit operating in conjunction with short-range chaff systems to counter anti-ship missiles. Produced for the Royal Navy as the Outfit UAR, MATILDA has also been installed aboard Finland's Helsinki class fast attack vessels, Egypt's October class of ships, and a number of merchant ships.

Target Sensing, Weapon Seeking, Fuzes

While it provides no figures, Thorn EMI believes that its research and development spending on active IR and radar fuzing is the highest of any single company in the world. The company feels that MMW radar technology will be a major market of the future and is accordingly investing heavily in this area.

The company provided active radar fuzes for the British Aerospace point defense Seawolf and area defense Sea Dart missiles, and is studying a family of MMW radar fuzes for future area defense missiles. Among other applications, Thorn EMI is eyeing an update of Seawolf and the UK MoD's VSRAD 2000 very short-range air defense program.

Thorn EMI was selected to provide fuzes for the Further Improved TOW (FITOW) anti-tank missile program for the British army, and is also marketing this upgrade package to other TOW operators. The company is also providing an active IR fuze, derived from that developed for FITOW, to Hughes Aircraft for use in the latter's TOW 2B missile. In addition to the new fuze, Thorn EMI provides the Magnetometer which complements the IR fuze by confirming that the target is actually a steel mass rather than an inflatable dummy or similar decoy.

The company developed and is producing the active IR fuze for the Mk 2 missile, which will be used in the British Aerospace Rapier 2000 low-level air defense system. The use of a proximity fuze and blast-fragmentation warhead, instead of the impact-fuzed, semi-armor-piercing payload of the original Rapier, is expected to greatly increase performance against smaller targets such as missiles and RPVs.

Thorn EMI provides magnetic fuzes for the British Army mine projects, and is now combining efforts on magnetics and active IR for potential use in future European missile programs. The company also provides magnetic fuzes for naval mines. It has developed a version featuring increased bandwidth for an unidentified customer; similar technology is incorporated into the strapdown heading sensor for such applications as the Phoenix unmanned air vehicle, deployed by the British army. By adding attitude information to the magnetic input, the unit acts as a secondary compass. Thorn EMI also supplies the compass for Plessey's version of the Barra sonobuoy, in which it replaces the original, Australian-designed card compass.

Signature Measurement and Control

Thorn EMI initially developed scale modeling techniques for fuze applications, and began producing MMW radars for test-range applications during the 1950s. The company and the Royal Signals and Radar Establishment jointly operate the UK National Radar Target Modelling Center, which consists of eight radar ranges operating at frequencies between 3 GHz and 890 GHz.

The company has delivered the first of its MS90 third-generation transportable degaussing ranges to the Royal Navy, and has targeted approximately 20 additional sales prospects in Europe, North America and the Pacific Rim. As compared with Thorn EMI's earlier systems, the MS90 is easier to use, is less costly and more accurate, and can be set up and operated more quickly. The new system also requires only two seabed sensors to operate, compared with 12-18 previously required. Design features include a 20-year life and very low maintenance.

Thorn EMI also produces a land-range version of the MS90, which is used to measure and treat magnetic signatures of equipment, such as engines for mines-weeping vessels. This type of range can operate in a shipyard during a vessel's construction, and subsequently be relocated to the ship's operational base for in-service support. The Royal Norwegian Navy has purchased an MS90 land range.

The company provides on-board degaussing equipment, such as its new CC2 fully automatic system suitable for nearly all steel vessels. The CC2's control unit incorporates technology derived from Thorn EMI's D3 data distribution equipment, and is regarded as unique in that it uses a

geomagnetic map to calculate the ambient field in the area of operations.

Thorn has sold its Submarine Mounted Underwater Tracking System (SMUTS) to the US, German and Royal navies; in service with the latter, the system is designated Sonar 2067. SMUTS is a dual-mode acoustic tracking system which evaluates underwater weapon systems. The system provides high resolution three-dimensional tracking at ranges of up to 300 meters, operating on a frequency of 125 MHz, and at lower acoustics out to 4,800 meters at a frequency of 20 MHz.

The company provides its SoundTrak ASW target simulator to the French and Royal navies (the latter operates it as the Sonar 2058). SoundTrak consists of an acoustic generator, which is towed behind a surface ship, and an inboard signal generator. SoundTrak is used to provide continuous training of sonar operators, as well as for performance evaluations of platforms and weapon systems.

Thorn EMI has exported underwater tracking ranges for purposes of weapon evaluation to China, Germany, Italy, Japan and the United States.

Naval Data Processing/Distribution Systems

Thorn EMI has provided more than 400 distributions systems to the navies of some 24 nations. The present D3 system has been adopted for virtually all current production Royal Navy combat vessels. In typical operation aboard a Type 23 frigate, the D3 system passes data from sensors (compass, log and anemometer) to approximately 100 users throughout the ship in several information formats.

The company is now moving into the role of prime contractor for integrated navigation systems based on its D3 modules. Thorn EMI is participating in the modernization of Canada's Tribal class destroyers, in which role the company provides a distributed system based on six units — four remote terminals and a pair of bus-controller units.

Another development is the company's Ruggedized Data Processor (RDP) which consists of a 21-slot VME bus card frame in a shock-mounted chassis. The RDP can serve as a building block for a range of shipboard data processing uses.

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