

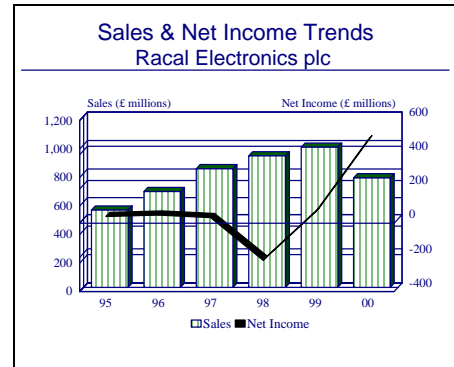
# ARCHIVED REPORT

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## Racal Electronics plc - Archived 12/2001

### Outlook

- In June 2000, Thomson-CSF completed its acquisition of Racal Electronics in a transaction valued at £1.32 billion (\$2.17 billion)
- One of Racal's most attractive features was that it already had an established position in the US defense market
- The purchase complements Thomson's desire to broaden its electronic activities into non-defense growth areas, such as industrial electronics and telecommunications



### Headquarters

Racal Electronics plc  
Western Road, Bracknell  
Berkshire RG12 1RG  
England, United Kingdom  
Telephone: (44 1344) 481-222  
Web sites: <http://www.racal.com>  
<http://www.thomson-csf-racal.com>

Racal Electronics plc is a major manufacturer of telecommunications and electronics systems and security equipment and services. Incorporated as Racal Electronics Ltd in the 1950s, the name Racal is derived from the first names of the company's founders Ray Brown and Calder Cunningham. It adopted its present name in 1982. The parent company is a holding company for Racal's international network of operating companies, each responsible for its own product development and profitability. Racal maintains over 100 subsidiaries across Europe, the United States, Canada, Africa, the Pacific Rim, and Asia.

In June 2000, Thomson-CSF acquired Racal in a deal valued at £1.32 billion. The resulting company has been named Thomson-CSF Racal. According to company officials, the acquisition will strengthen systems capabilities across the whole spectrum of defense electronics and add commercial businesses entirely complementary to those of Thomson-CSF.

The defense electronics operations of Racal have been merged with the UK defense operations of Thomson into Thomson Racal Defence. Racal's commercial electronics operations continue to operate under the Racal Electronics name.

Prior to the acquisition, Racal employed approximately 10,000 people. Total employment for the new Thomson-CSF Racal is about 65,000 worldwide.

### Structure and Personnel

Lord Freeman  
Chairman, Thomson-CSF Racal plc  
Richard Moon  
Chief Executive, Thomson Racal Defence Ltd  
Sir Colin Chandler  
Chairman, Racal Electronics plc

Brigitte Bouquet  
Director and Company Secretary

Alex Dorian  
 Non-executive director  
 Lord Freeman  
 Non-executive director  
 Antoine Lagomarsino

Financial director  
 José Massol  
 Acting chairman, Industrial Electronics and  
 Transportation Services Groups

## Product Area

Thomson Racal Defence is a subsidiary of Thomson-CSF Racal, Thomson-CSF's holding company in the UK. The company organizes its business in the following manner:

### Thomson-CSF Racal

1. Thomson Racal Defence
  - 1.1 Air Defence
  - 1.2 Avionics
  - 1.3 Communications
  - 1.4 Naval Systems
  - 1.5 Optronics
  - 1.6 Sensors

**Thomson Racal Defence** has been formed by the merger of both Racal's and Thomson-CSF's extensive UK defense activities. The unit's activities encompass radar and electronic warfare, command information systems, communications, navigation, optronics, and missiles. This operation represents about 55 percent of Thomson-CSF Racal's UK business.

*Please note that the ultimate structure of the newly merged Thomson-CSF Racal has yet to be finalized. The information presented above and in the remainder of this report was current as of the publication date.*

## Facilities

Thomson-CSF UK, Thomson-CSF Corporate Communications, Nations House, 103 Wigmore Street, London W1H 9AB, England, UK. Telephone: (44 20) 7408-9503.

Thomson Racal Defence, PO Box 3621, Western Road, Bracknell, Berks RG12 1RN, England, UK. Telephone: (441344) 387 000. Web site: <http://www.defence.thomsoncsf-racal.com> Headquarters and tactical, paramilitary and strategic radio communications; communications EW systems.

Thomson Racal Defence, Manor Royal, Crawley, West Sussex RH10 2PZ, England, UK. This facility's product lines center on electronic warfare, including ELINT, ESM, and ECM systems; ground-based surveillance radars; and command and control for fixed-wing and rotary-wing aircraft, ground-based sites, surface ships, and submarines.

Thomson Racal Defence, Wookey Hole Road Wells, Somerset BA5 1AA, England, UK. This is part of the former Thorn Sensors division which was acquired from Thorn in 1995.

Thomson Racal Avionics Ltd, 88 Bushey Road, London SW20 0JH, England, UK. Web site: <http://www.ravl.co.uk> Formed from the acquisition of Decca Ltd in 1980, Thomson Racal Avionics specializes in airborne navigation, flight management, and surface surveillance radars for airport and marine applications. The company is a major supplier of Doppler navigation systems.

Racal Corporate Communications Centre, PO Box 3620, Western Road Bracknell Berkshire RG12 1WL, England, UK, Telephone: (44 1344) 388-000. Corporate center for public relations and marketing activities.

The Racal Corporation, 1601 North Harrison Parkway, Sunrise, FL 33323 USA. Telephone: (800) 863-1578. Corporate headquarters for administration, business development, and marketing activities for Racal North American-based subsidiaries.

Racal Acoustics Ltd, Waverly Industrial Park, Hailsham Drive, Harrow, Middlesex HA1 4TR, England, UK. Web site: <http://www.racal-acoustics.co.uk> This company specializes in the design and production of electro-acoustic equipment for defense, civil and industrial applications. The product range covers headsets, communications helmets, handsets, microphones, field telephones, and audio control and warning systems.

Racal Antennas Ltd, First Avenue, Millbrook Trading Estate, Southampton SO1 0LJ, England, UK. Web site: <http://www.racal-antennas.com> Design and manufacture of radio antenna, masts, and ancillary equipment with particular emphasis on tactical hardware for mobile use and rapid deployment. Antennas are available for various frequency ranges including low-power, adjustable HF tactical dipole kits; broadband HF systems; HF, VHF, and UHF devices; and special-purpose units.

Racal Instruments Ltd, 480 Bath Road, Slough, Berks SL1 6BE, England, UK. Web site: <http://www.racalinst.com> Established in 1985, Racal Instruments designs and manufactures automatic test equipment and computer-aided fault-finding systems.

Racal-MESL Ltd, Lochend Industrial Estate, Newbridge, Midlothian EH28 8PL, England, UK. Web site: <http://www.racal-mesl.com> Racal Microwave & Electronic Systems Ltd (MESL) was formed in 1979 when Racal acquired the independent concern MESL, which itself was established in 1964. The company is a supplier of microwave components and subsystems for use in radars and related electronic equipment.

Racal Survey Ltd, Compass House Davis Road, Chessington Surrey KT9 1TB, England, UK. Web site: <http://www.racal-survey.com> This operation produces hydrographic survey systems, mine countermeasures systems, precise positioning systems, and terrestrial and satellite positioning systems.

Racal Recorders, Hardley Industrial Estate, Hythe, Southampton, Hants SO45 3ZH. Web site: <http://www.racalrecord.com> This unit produces communications and instrumentation recording devices.

## Corporate Overview

Thomson Racal Defence was created through the merger of Racal's and Thomson-CSF's extensive UK defense operations. The combined company has increased critical mass with the necessary program management, systems engineering and integration skills to win major contracts as a prime contractor. Further, the operation offers the British government a viable alternative to home-grown giant BAE Systems when awarding defense electronic contracts.

### New Products and Services

**Soothsayer.** In August 2000, Thomson Racal Defence was awarded a £5 million contract by the UK Ministry of Defence (MoD) to assess the requirements for the Soothsayer program. Planned to enter service in 2006, the nearly £100 million Soothsayer system will fulfill the UK MoD's major ground-based Communications and Non-Communications Electronic Warfare (EW) requirement. This land EW capability will act as a key ISTAR element (Intelligence, Surveillance, Target Acquisition and Reconnaissance) within the digitized battlespace. Necessitating a highly maneuverable system and including the provision of a comprehensive EW Management Information System, it will facilitate operations within a Joint and Combined forces framework and integration with other strategic and tactical systems.

**EGNOS and Galileo.** In September 1999, Racal was awarded production contracts totaling some £10 million for its role in the development of the EGNOS (European Geostationary Navigation Overlay Service) and Galileo satellite navigation systems. EGNOS will enter service in 2003 and is the European equivalent of the US WAAS (Wide Area Augmentation System). Galileo, to be developed by the European Commission and the European Space Agency (ESA), will enter service in 2008, and is an independent worldwide

multimodal satellite navigation system providing performance equivalent to modernized GPS.

**PodSAR.** In April 1999, Racal was selected to design the technology demonstrator imaging radar – Pod SAR. The technology demonstrator program is part of an MoD Applied Research program for a podded SAR (Synthetic Aperture Radar) and G-MTI (Ground Moving Target Indicator) mode radar, providing penetrating reconnaissance capabilities for Tornado aircraft and the Eurofighter Typhoon. Once procured, the podded SAR system will satisfy the UK's operational requirement to provide detailed battlefield reconnaissance at long range in areas where stand-off or other more vulnerable systems cannot see.

**Bowman.** This is a man-portable and vehicle-mounted combat-net radio to replace the existing Clansman combat net radio used by the British Army. In March 1997, the Yeoman and Crossbow consortiums joined efforts to produce the Bowman radio under the name Archer Communications Systems Ltd. The Archer consortium (the only bidder left in the running) won a US\$1.6 billion contract from the UK MoD that could ultimately be worth up to US\$3.1 billion. A deal was formally inked between Archer and the UK MoD in August 1997.

In October 1998, Racal Radio was selected by Archer Communications Systems Limited to provide the UK Armed Forces with the next-generation Local Area Subsystem (LAS) which will be at the heart of the Ministry of Defence's Bowman communications program. The selection will be worth an estimated £250 million. The LAS will provide the full range of multimedia services – voice, image, video and data – through networks running within and between vehicles and Command Headquarters, and will provide a major extension in the communications capability of the British Armed Forces when it enters service in 2002.

A major blow to Racal was delivered in February 2000, when ACS selected ITT Industries to supply 40,000 vehicle, portable and man-pack VHF radios in a US\$320 million contract. The US company was to set up a UK manufacturing plant to fulfill production. However, the British Ministry of Defence fired the Archer Communications Systems consortium in mid-2000. According to the MoD, they were not convinced that the consortium could “deliver a communication system that meets our requirement in the time required, or that it represents value for money.”

The program is now expected to be recompleted, and Thomson Racal Defence may decide to submit a bid as an alternative prime contractor, rather than remain part of Archer.

### **Plant Expansion/Organization Update**

Thomson-CSF Reorganizes UK Activities. In mid-2000, following its successful acquisition of Racal Electronics plc, Thomson-CSF initiated a reorganization of its activities in the UK. Under the plan, Lord Freeman will continue to chair the UK holding company, since renamed Thomson-CSF Racal plc, which will group together all subsidiaries in the UK. Sir Colin Chandler will continue as Chairman of Racal Electronics plc while the offer process proceeds, after which he will advise in a non-executive capacity.

An integrated British defense company, named Thomson Racal Defence Ltd, has been formed from Racal's defense activities and the existing Thomson-CSF defense subsidiaries in the UK. Richard Moon, former Chief Executive of Racal Defence Electronics, is chief executive of the new company, which is headquartered in Bracknell.

The industrial electronics and transportation services businesses of Racal will be integrated into the IT & Services business area with the aim of maximizing synergies, boosting opportunities for growth, and capitalizing on dual technologies within a global organizational structure.

Defense Electronics Unit Formed. In June 1999, Racal restructured the group's defense radar and radio communications activities within a single organization, Racal Defence Electronics Ltd. This new company will operate in three main business divisions: Communications, Electronic Warfare (EW), Radar, and Command Information Systems (CIS).

Announcing the formation of Racal Defence Electronics Limited, Richard Moon, its Chief Executive, said: “The company now has the critical mass, project management and integration skills to enable it to compete successfully in major defense contracts. With a

streamlined structure and strengthened management, the divisions will be better positioned to maintain dominance in their market sectors whilst exploiting new business opportunities.”

### **Mergers/Acquisitions/Divestitures**

Thomson-CSF Acquires Racal. In June 2000, Thomson-CSF completed its acquisition of Racal Electronics in a transaction valued at £1.32 billion (\$2.17 billion). The acquisition of Racal represents an important milestone for Thomson-CSF, significantly reinforcing the group's market position worldwide. Combined global revenues of Thomson-CSF Racal are close to EUR8 billion. The new company employs 64,500 people worldwide; 50 percent are based outside France with 15,000 in the UK, effectively doubling the group's size in the United Kingdom and boosting UK turnover to EUR2 billion. According to the companies, the merger of Thomson-CSF and Racal is expected to deliver substantial synergies, both industrially and financially. The addition of Racal's expertise in defense, industrial electronics and transportation services reinforces Thomson-CSF's number one position in Europe and as a global leader in professional electronics. It also enhances its range of products, systems and services in three core markets: defense, aerospace, and information technology and services. Thomson-CSF initiated the merger in January 2000.

Racal Telecom Sold. In December 1999, Racal completed the sale its Telecom business to the American communications group, Global Crossing, for £1 billion. The sale will leave Racal to focus on its defense electronics, industrial electronics and transportation services. The deal was originally announced in October 1999.

### **Teaming/Competition/Joint Ventures**

Thomson-CSF. In September 1998, Racal Radio and Thomson-CSF Communications announced the signing of a comprehensive agreement for the formation of a joint venture company to specifically address the major new global market for military digital access networks. The venture will be responsible for the development, manufacture, marketing and provision of through-life support of access network systems for integration with tactical communications products worldwide. This team was subsequently awarded the £250 million UK MoD Bowman LAS (Local Area Subsystem) contract in October 1998. The joint venture is called MBN Ltd and is headquartered in Bracknell, Berkshire, in the United Kingdom.

**Archer Communications Systems Ltd.** In March 1997, the Yeoman and Crossbow consortiums joined efforts to produce the Bowman radio under the name "Archer Communications Systems Ltd." This unexpected solidarity followed the UK MoD announcement in 1996 that the contract award date had been pushed back from 1997 to 1998. Both teams agreed that the cost of maintaining the competition was too expensive and counterproductive to the development process. Consolidating their efforts would cut short the bidding process and pressure the MoD into making a decision. The strategy worked, and Archer won the US\$1.6 billion Bowman contract.

Racal Radio had formerly been part of the Yeoman Consortium which included Siemens-Plessey Military Communications Ltd, SAIC, and Rockwell-Collins. The former competitor, now partner, was the Crossbow consortium led by ITT Defense Ltd.

**EURO-ART.** The EURO-ART Consortium is composed of Thomson-CSF, Siemens AG, Lockheed-Martin, and Racal Radar Defence Systems. EURO-ART is currently developing the Cobra multifunctional 3D phased array radar.

**Aerospatiale.** Racal Instrumentation Group and the Avionics and Systems Division of Aerospatiale have entered into an agreement to jointly develop a new range of automatic test equipment based on VXibus technology, SMART system software and the ARINC 608 interface standard.

**Honeywell.** In December 1989, Racal Avionics Ltd and Honeywell's Commercial Flight Systems Group joined together to develop and market ARINC 741-compatible

satellite communications systems for commercial aircraft. The agreement also covered joint marketing of Racal's Satfone satellite telephone system, which is already available. KLM Royal Dutch Airlines became the first to operate the Racal/Honeywell Satfone equipment on two Boeing 747-400s in the fall of 1990. Racal is collaborating with Honeywell on the production of a satellite-based, multichannel, in-flight telephone and data-communications system ("Satcom") for use in commercial aircraft. As of March 1993, Racal Electronics plc had commitments from a total of 20 international airlines which, if realized, would give Racal sales of more than 300 systems. In 1994, the companies received a multimillion-pound contract from British Airways to supply Satcoms for the airline's long-haul fleet.

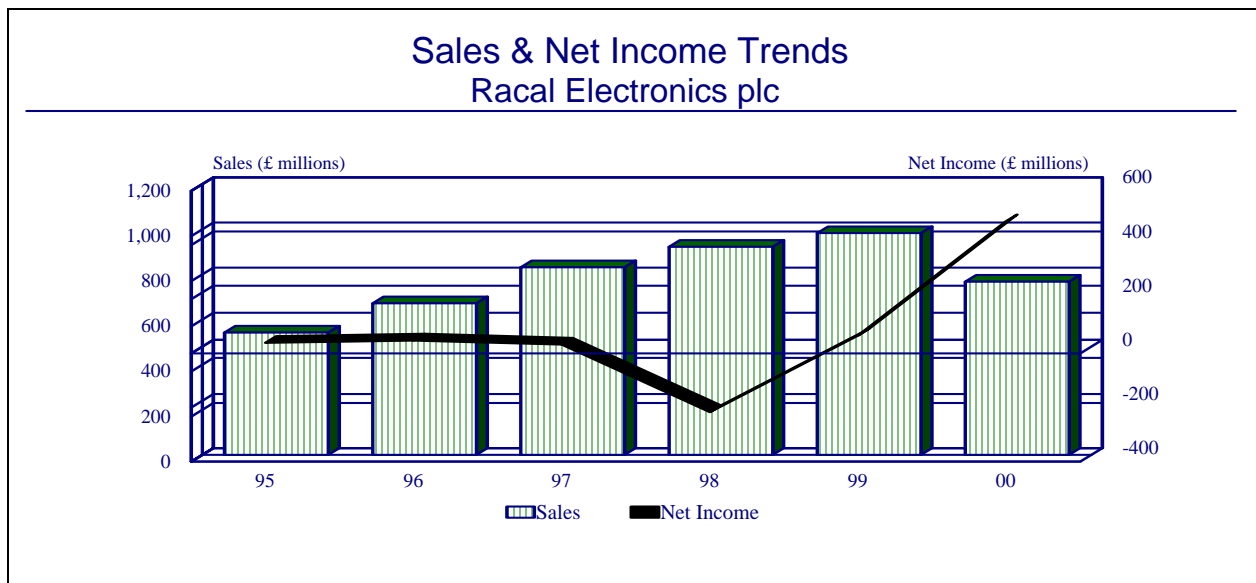
**Computing Devices Company.** The Canadian Tactical Command, Control, and Communications System (TCCCS), also known as IRIS, will replace outdated communications equipment in service with Canada's armed forces. In October 1990, the Canadian government selected equipment based on Racal Tacticom (UK's) Jaguar family of tactical radios. Racal's Canadian partner is Computer Devices Company, the Canadian subsidiary of Control Data Corp (US). The C\$1 billion IRIS program will involve delivery of more than 12,000 Jaguar radios.

**Serco Systems.** Racal Instruments Ltd and program-prime Serco Systems Ltd will supply the British MoD with replacement automatic test equipment to support the Mk 24 torpedo program. The systems incorporate Racal's advanced ATE instrumentation, switching and control techniques.

## Financial Results/Corporate Statistics

Racal posted 2000 sales of £767.9 million, compared with 1999 sales of £982.8 million. The decrease was attributed to the disposal of the telecommunications segment during the year. The company posted a gain of £488 million compared with £66.3 million in 1999. The lower sales and big jump in income for 2000 was attributed to the sale of Racal Telecom during the year. The loss for 1998 was due to exceptional losses amounting to £224.5 million related to the company's exit from the Data Communications segment. Latest year statistics are provided below. Results have not been restated to the company's current presentation. US dollar figure translated as a 1999 average at the rate of £1=\$1.6182.

Y/E March 31	1996	1997	1998	1999	2000	2000
(£ millions)						US\$
Net Sales	672.0	831.9	922.2	982.8	767.9	1242.6
Net Income	47.4	32.3	-217.1	66.3	488.0	789.7



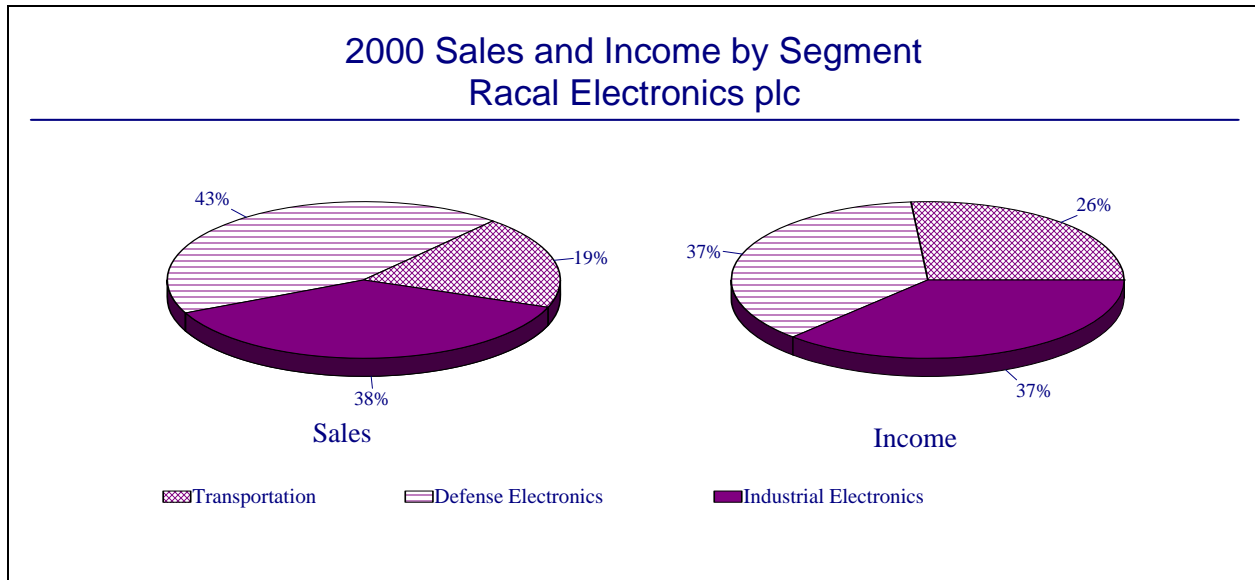
### Industry Segments

A breakdown of Racal's sales and operating income by major market segment for the past year is given below. Totals may not add due to rounding.

<b>SALES</b>	<b>2000</b>
(£ millions)	
Defense Electronics	340.9
Industrial Electronics	297.0
Transportation	151.3
Sales to discontinued operations	-20.2
<b>TOTAL</b>	<b>769.0</b>

<b>OPERATING INCOME</b>	<b>2000</b>
(£ millions)	
Defense Electronics	23.7
Industrial Electronics	23.9
Transportation	17.0
<b>TOTAL</b>	<b>64.6</b>



### Strategic Outlook

In a year that saw the formation of BAE Systems and the European Aeronautics Defense and Space (EADS) company, Thomson-CSF risked being left out of the rapid consolidation trend in Europe. But the company's strategy was a bit different from that of its erstwhile competitors.

While many European companies have been forming up across local borders, Thomson has been securing footholds in a number of markets around the globe through investments and acquisitions. To date, Thomson has acquired full control of its South African affiliate ADS; purchased a 50 percent stake in Australia's leading defense company ADI; and gained a 50 percent stake in South Korea's Samsung aerospace and defense operation.

Now, by seizing control of Racal, Thomson has strengthened its presence in Britain and solidified its position as Europe's number one defense electronics firm. In addition, the acquisition is expected to help Thomson clinch elusive Pentagon contracts, as Britain by far has an easier time accessing the US market. The Pentagon, always careful with contracts to foreign firms, has been particularly wary of French companies because of France's traditionally individualistic approach to military affairs.

With this deal, which has seen Thomson fold its UK operations into the old Racal, the new Thomson Racal Defence becomes almost more British than French.

That fact alone should help the new company as it seeks to sell and partner across the Atlantic. One of Racal's most attractive features was that it already had an established position in the US defense market, providing radio systems and data recorders to the military.

Further, the purchase complements Thomson's desire to broaden its electronic activities into non-defense growth areas, such as industrial electronics and telecommunications. Thomson has already restructured its own industrial electronics operations and it appears that Racal's business will complement the existing unit nicely. The ultimate goal is to push non-defense revenues to almost 30 percent of sales.

In the near term, Thomson is expected to quickly sell some of Racal's non-core assets, including a stake in the UK lottery operator and its transportation services unit. Cash raised from these sales will help the company pay down some of the debt incurred in financing the acquisition.

The bottom line is that the deal is an excellent one for all parties involved. Thomson expands its presence into key UK and US markets, the new Thomson Racal Defence gains enough mass to make it a viable competitor to BAE Systems, and the combined company as whole becomes even more formidable on world markets.

## Prime Award Summary

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Unavailable

### Program Activity

Some important aerospace and government programs currently under way at Racal are listed below. The briefs are intended to provide a listing of programs that are of major importance to the company. For detailed information or analysis of specific aerospace and defense programs or equipment, please refer to the appropriate *Forecast International* binder (for example, AIRCRAFT, MILITARY VEHICLES, WARSHIPS, MISSILES, ELECTRONICS SYSTEMS, and GAS TURBINES). The following are company's business interests:

- Defense Electronics
- C<sup>3</sup>I Systems
- Electronic Warfare
- Radar
- Sensors

### Electronic Programs

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#### (Tactical Communications)

#### ASTOR

The Airborne Stand-Off Radar (ASTOR) is a program to produce long-range battlefield surveillance radars for the UK Army and Royal Air Force, incorporating synthetic aperture radar (SAR) and moving target indicator (MTI) technology in this role. The ASTOR program is intended to provide corps commanders with primary intelligence in and beyond the immediate battle area. The primary tactical role of ASTOR will be to deny surprise to an enemy and to assist in the organization of effective defenses in threatened areas. All solutions must provide considerable out-of-area capability.

#### Clansman

Clansman is an integrated family of manpack and vehicle-mounted combat net radios. The Clansman family is composed of eight members: Siemens-Plessey Military Communications is responsible for the UK/PRC-320 and UK/PRC-344; Racal Tacticom Ltd built the UK/PRC-349, UK/PRC-350, and UK/PRC-351; Thorn-EMI-Sensors developed and produced the UK/VRC-321 and UK/VRC-322; and Marconi Defence Systems Secure Radio Division produced the UK/VRC-353.

#### Jaguar H

The Jaguar H tactical radio set is an SSB system because its intermittently greater spectral occupancy requires a very low bandwidth to access the few holes in the HF communications spectrum. The unit divides the 2-30 MHz spectrum into 280,000 channels. The hopping rate is 10-50 hops per second across a 400 kHz segment of the HF band.

#### Next-Generation Jaguar V

The contract for the supply of Jaguar to Canada to fulfill the IRIS requirement calls for the development of an improved version of Jaguar V. This will be smaller and lighter than the existing Jaguar V while incorporating NATO-compatible crypto and an extended frequency range of 30-108 MHz. This improved system will replace the existing version of Jaguar V.

#### Jaguar U

The Jaguar U is similar to the V in having a 225-400 MHz frequency range, but hops within 19.2 MHz widebands to give more channels (7,000 total) for greater anti-jam protection. The Jaguar U is a high-technology transceiver designed to interoperate with existing airborne UHF radios in fixed-frequency mode, but with the capability of utilizing frequency hopping to defeat electronic countermeasures (ECM).

#### Caracal

In 1987, Racal introduced the PRM-4740 Caracal. This was claimed to be the first pocket-size fully militarized VHF-FM frequency-hopping radio. The Caracal extends the Jaguar family by bringing it to the section or squad level, with other applications including special forces, police, and paramilitary units. Caracal shares many features of the Jaguar family, the exceptions being precluded by size constraints. A major advance is that the electronic counter-countermeasures (ECCM) module occupies only 30 percent of the volume without loss of capability.

#### (Electronic Warfare)

#### ULQ-19(V) Racjam

The ULQ-19(V) is basically Racal's RJS3100 tactical communications jammer adapted in certain minor ways for use by the US armed forces. It was designed to be a



ugged, high-quality, versatile battlefield jammer capable of rapid deployment in the most adverse military environment, and to meet the need for fully automatic, mobile jammer systems covering the 20-30 MHz band for ECM applications in the forward combat zone. The system is in production.

### **Cutlass/Cygnus**

Cygnus is an I/J-band noise and deception jamming system tasked with countering missile and acquisition radars. Cutlass is a naval electronic support measures (ESM) system. These two systems are almost invariably found operating as part of an integrated EW suite. The Cutlass and Cygnus systems, together with their close variants, are suitable for installation on frigates, fast attack craft and other small vessels. Known platforms include the first batch of Type 23 frigates, the TNC 45 fast attack craft (FAC), and Flyvefisken offshore patrol vessels.

### **Kestrel**

An electronic intelligence gathering system designed for all scales of electronics intelligence (ELINT) operations. Airborne electronic support measures are tasked with gathering information on hostile radars. Their deployment and movement are at long range without the hazards associated with other reconnaissance techniques. Kestrel is installed on Lynx helicopters operated by the Royal Danish Navy. It has also been proposed for installation on McDonnell Douglas 530MG Defender and MBB BK.117-A3M helicopters. Kestrel has been selected for installation on the Royal Navy EH-101 Merlin helicopter.

### **Manta/Sceptre**

These are naval radar warning and electronic surveillance systems to provide submarines and surface craft with prior warning of hostile radar emissions, and to provide targeting data based on such intercepts. Manta and Sceptre form a family of advanced ESM systems tasked with protecting surface ships and submarines operating at periscope depth by intercepting, analyzing, classifying and identifying hostile radar emissions of all types. Manta is suitable for deployment on nuclear and conventional submarines. Versions of Sceptre are available for surface warships of all types from FAC to aircraft carriers. Racal is the prime contractor.

### **Philax/Protean**

These are missile decoy chaff and flare dispensing systems. The systems are produced by Celsius Tech and Racal, respectively. The two brands are formally not associated with each other: Protean is being sold in

the Middle and Far East by Racal, while Philax is mainly sold in the Nordic area, including to the Royal Swedish Navy.

### **Prophet**

Prophet is a lightweight radar warning receiver for helicopters and fixed-wing aircraft designed to provide rapid warning of imminent attack by locked-on pulsed and CW radar threats, with octantal indication of the threat direction. Known platforms include Royal Navy Sea King Commando helicopters and unidentified Middle Eastern MiG-21 aircraft. Prophet is also specified as the baseline radar warning system for the BAe Hawk series. Racal indicates that over 100 Prophet systems have been sold.

### **(C³I)**

### **NATO ACCS**

NATO ACCS an automated airspace command and control system designed for Western European airspace in support of European air operations. It will also have a battle management function, directing both offensive and defensive air operations in NATO airspace. NATO ACCS is intended to replace the NATO Air Defense Ground Environment (NADGE) coordinating radar systems in NATO's European airspace. The ASM Consortia, of which Racal is a part, is the prime contractor for this program.

### **Outfit DNA**

Outfit DNA is an integrated naval command system using distributed architecture and 12 operator workstations tasked with controlling ASW and AAW operations aboard Royal Navy Type 23 frigates and Fort Victoria class AORs. The SSCS consoles and video distribution system for this system are being produced by Racal Radar Defence Systems. The program is in production.

### **(Radar)**

### **Cobra**

This is a multifunctional 3D phased array radar with an active gallium arsenide antenna tasked with the detection of enemy artillery, rockets and mortar rounds at long range; the classification of the round; and the localization of the firing unit. The EURO-ART Consortium is the prime contractor. Work share between the partners will be Thomson-CSF (30 percent: prime contractor), Siemens AG (30 percent), Lockheed Martin (25 percent) and Racal Radar Defence Systems (15 percent). In March 1998, Racal won a major contract, as part of the EURO-ART Consortium, worth about £85 million for the production phase of the COBRA.

**Cymbeline**

This is an I/J-band mortar detection, location and counter-battery artillery fire adjustment radar. Cymbeline Mk 1 and Mk 3 are towed systems mounted on a specially built trailer. In British Army service the Land Rover acts as prime mover. Cymbeline Mk 2 is configured for deployment aboard the FV 432 in British Army service. Racal Radar Defence Systems is responsible for development and manufacture, with Raychem Limited the harness supplier. In April 1997, Racal received a contract worth \$6.4 million from Arab International Optronics to refurbish and upgrade 12 Cymbeline radars now in service with the Egyptian Army. This contract represents the largest amount of activity this program has generated in the last 10 years.

**MSTAR**

This is a lightweight pulse-Doppler J-band radar to replace the ZB-298 for the detection of moving targets, including helicopters, vehicles and men, in all weathers at ranges in excess of 20 kilometers. MSTAR is called Radar GS No 14 Mk 1 in British Army service. MSTAR is man-portable or deployed on board the Warrior Mechanized Artillery Observation Party Vehicle (MAOPV). Racal is the prime contractor on MSTAR.

**Searchwater**

Searchwater is a surface surveillance radar originally designed to equip the Royal Air Force Nimrod MR.2 long-range maritime patrol/ASW aircraft. It is tasked with anti-submarine, anti-shipping, standoff attack and sea control. It has subsequently been modified for airborne early warning (AEW) duties and deployed onboard the Sea King helicopter. The Searchwater 2000 variant has been selected by the Royal Air Force for the Replacement Maritime Patrol Aircraft (a highly modified and upgraded Nimrod MR.2) and is being supplied to the Royal Navy for the Sea King AEW Radar System Update.

**Super Searcher**

The Super Searcher naval radar is a prime sensor in the detection of surface targets for maritime patrol, detection of surface running submarines or periscopes in ASW, prosecution of Anti Surface Vessel (ASV) attacks with ASMs, over-the-horizon targeting (OTH-T) for surface platform missiles, and sub-hunter/killer group C<sup>3</sup>I in ASW. In addition, tactical display of MAD and sonar data can be carried out in ASW. Racal is the prime contractor on this system.

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