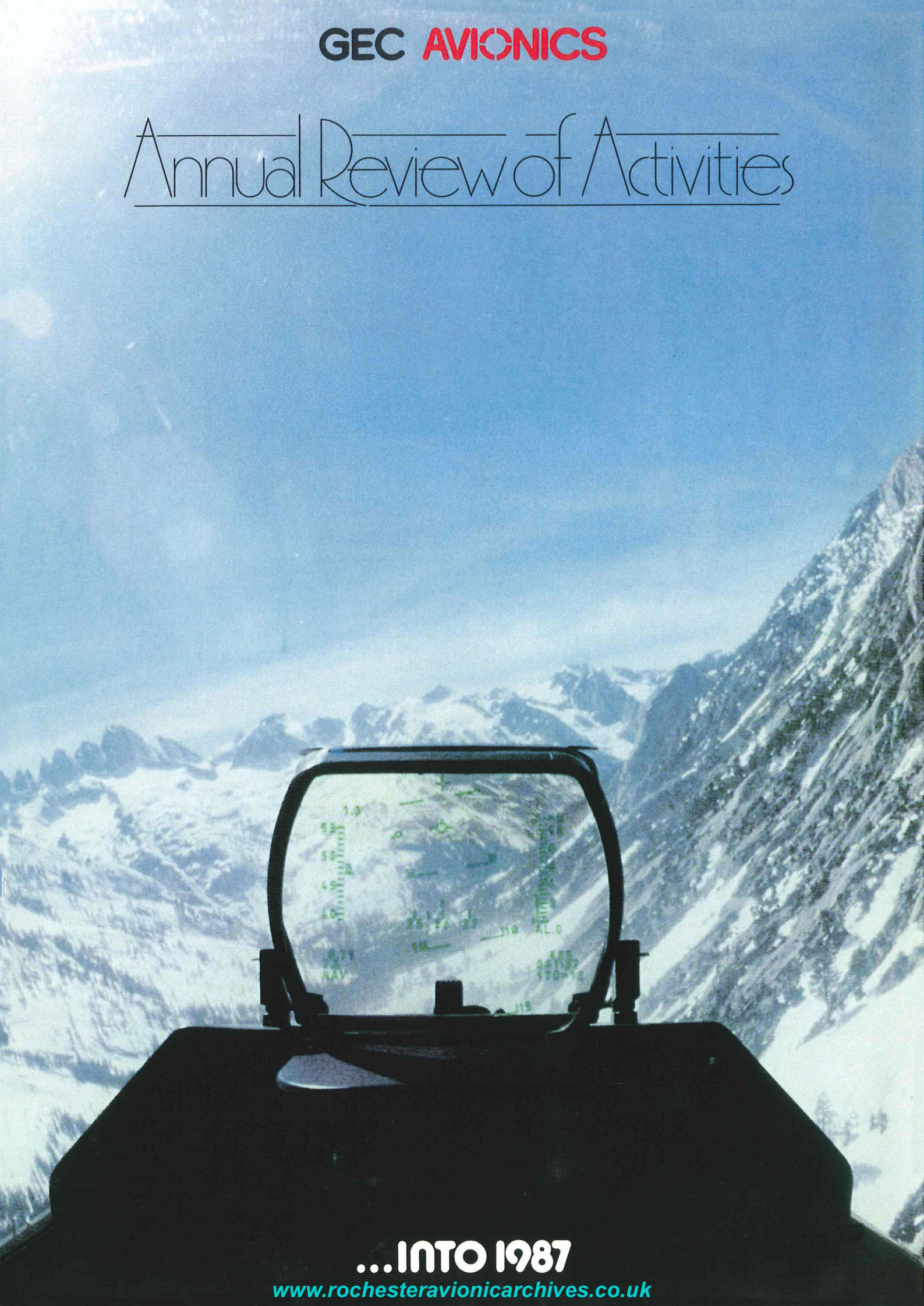


**GEC AVIONICS**

# Annual Review of Activities



**...INTO 1987**

[www.rochesteravionicarchives.co.uk](http://www.rochesteravionicarchives.co.uk)

# Welcome on Board!



Sir Michael Beetham



Jack Pateman



Rhys Williams

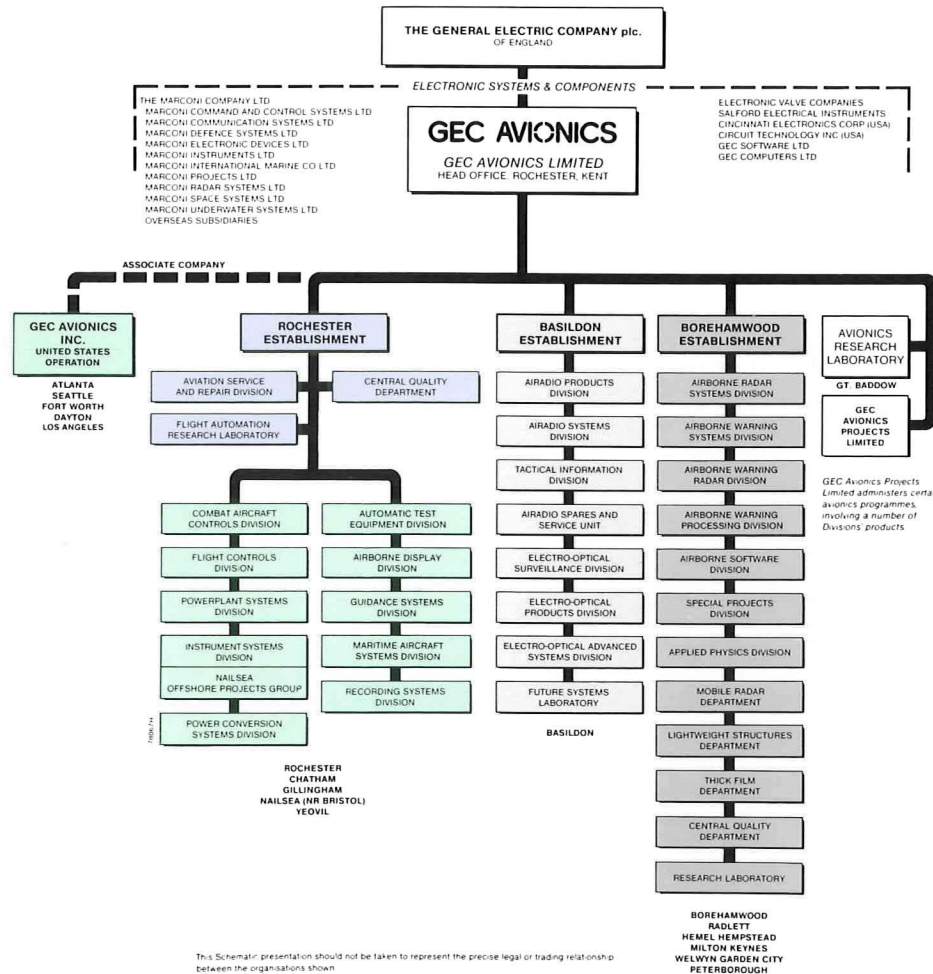
1986 brought new appointments to the GEC Avionics Board: Marshal of the Royal Air Force Sir Michael Beetham is now our Chairman and William Alexander our Managing Director.

GEC Avionics invited Sir Michael to join the Board in January 1984 to help strengthen links with Air Forces at home and abroad. He has since brought a wealth of experience in dealing at senior level with aviation and defence organisations around the world.

Bill Alexander was Assistant Managing Director since 1972, responsible for all the company's activities at Rochester. As Managing Director he is now the chief executive responsible for the whole of GEC Avionics.

Jack Pateman, our former Managing Director, was made a Deputy Chairman of our company and of the Marconi Company Limited, having also been appointed a Main Board Director of GEC.

Rhys Williams, Chairman of Marconi, was also appointed a Deputy Chairman of GEC Avionics and Dr Ian MacBean, Managing Director of Marconi, joined our Board as a Director.



# Managing Director's Report

As we look forward to 1987 I am pleased to report that our business is in good health. Our order book is almost three times the present level of annual sales which is a clear indication of increased sales to come. We continue to invest in new equipment to increase our productivity, but most parts of the business will require more people again next year.

I am particularly pleased that a good proportion of this large order book is for exports. Our company is now responsible for about half of the nation's avionics exports. Another promising sign is that the range of products in our export sales continues to widen and the whole company shares in these successes, as can be seen in the following reports by Peter Hearne, Ron Howard, Derek Jackson and Walter Paterson.

The home market, especially for the Ministry of Defence, continues to become even more competitive. Certainly our most difficult problem at present is the competition between our AEW Nimrod and the Boeing AWACS. Since being given full control of the project, impressive technical progress has been made in a very short timescale and this has greatly increased our chances of success. All the work force concerned are to be congratulated on their tremendous efforts.

We now look forward to a new European collaborative programme, the European Fighter Aircraft (EFA). We already have much equipment on the Experimental Aircraft Programme (EAP) but it will still be a very tough competition to establish our products on the EFA. I feel confident however that we have the best team in the world to do it.



*William H. Alexander*

W H Alexander OBE  
Managing Director  
GEC Avionics Limited

# 1986 - A Year of Fulfilment

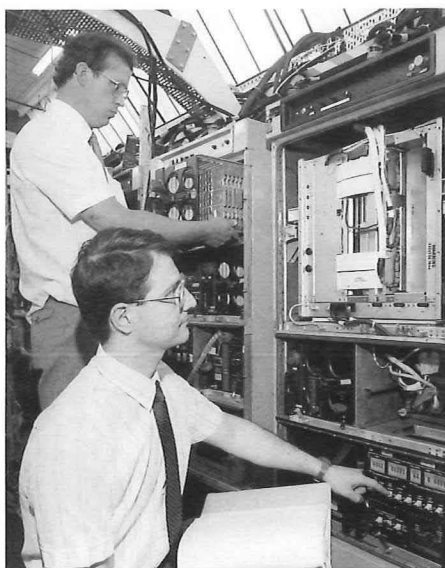
Right across the company, we have successfully met challenges to our leadership in avionics production and exports. As these brief highlights of the year illustrate, we are still by far the UK's leading exporter of aviation electronics. About half the nation's avionics exports are produced by us and we remain the foremost avionics contributor to aerospace programmes worldwide.

We announced in the past financial year export orders worth over £300 million: an all time record for a British avionics company. Those announced in 1986 included avionics for China, bringing the

The company also invested heavily in Britain's AEW Nimrod system, matching the government's payment equally, in order to solve the earlier problems with the aircraft's early warning radar and mission systems. In return we were given full management responsibility for the project, even for the airframe work of British Aerospace. Within six months, we had demonstrated clear, uncluttered radar plots over land and sea, proving that our system now performs correctly. Designed to fit many other airframes than Nimrod, it is also part of the Lockheed-Georgia Company's C-130 AEW system based on the widely-used Hercules aircraft. This is proving cost-effective in an export market worth over £2 billion for our company and our many UK subcontractors. During the year we have given six in-depth briefings to the world's press showing them exactly what we have done to make the AEW Nimrod by far the most cost-effective system for Britain. These and other briefings for MPs, Government Officials, Trade Unions and others throughout industry have helped to replace earlier bad impressions with the true facts about our system.

The company's heavy investment in Britain's avionics future was exemplified by our financial support for the Experimental Aircraft Programme EAP, which performed brilliantly at Farnborough with our avionics, with a sparkling performance later over our Rochester factory. Having put our own resources and skill into this programme, we are urging the government to exploit this effort for the European Fighter Aircraft, as a successor to Tornado.

total there to £85 million, Air Data Computers for the USA worth \$100 million, antisubmarine systems for Italy's French-built Atlantic aircraft, radio navigation systems for Dutch helicopters, Head-Up Displays for the latest McDonnell Douglas cargo plane, the flight control system for the US Navy's new trainer and, on top of that, Boeing selected us to develop a new high reliability computer to compete for a place on its next airliner, the 7J7. Our infra red imaging systems, now a standard equipment for RAF Harriers and US Marine Corps AV-8Bs, continued to gain major orders for air, sea and land use.



AEW Nimrod's new computer in the systems rig at Hemel Hempstead



EAP flew over Rochester in November

Other important announcements included 'stealth avionics' which we are testing in the UK and the United States, to enable aircraft to navigate and operate undetected.

1986 was also GEC's Centenary Year and many of the company's workforce were able to visit the special exhibition at Wembley, given by GEC companies for their customers.

Altogether, 1986 has been quite a fulfilling year!

# Rochester Establishment

covers Rochester, Nailsea and Yeovil

**Flight Group enters 1987 with strong and increasing orders and rapidly expanding sales and exports.**

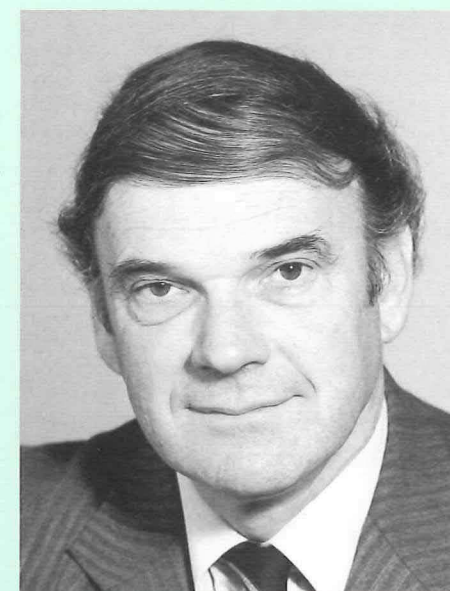
**August 1986 saw the first flight of the Experimental Aircraft Programme (EAP) aircraft, with substantial Group equipment on board including CACD's highly advanced digital Fly-by-Wire (FBW) system, PSD's Maintenance Data Panels, Flowmeters and Engine Instruments and ISD's Air Data Computers. CACD began AM-X equipment production for Italy and Brazil and also made a breakthrough into the United States flight controls market on the T-45 trainer.**

**FCD is making good progress on the Phoenix programme with a series of successful flights, and much of the prototype equipment in the ground vehicles is now installed and being demonstrated. Airbus Slat and Flaps computers continue to show remarkable reliability in service and first production deliveries for A320 have been made. Also on the civil side, FCD has been chosen by**

**Combat Aircraft Controls Division** enjoyed a year of 'firsts', heralding future success. The first flight of EAP, followed within days by impressive displays at Farnborough '86, demonstrated excellent stable manoeuvring of this advanced aircraft with our flight control system, underlining its superiority for the European Fighter Aircraft. The T-45A Yaw Damper contract marked a breakthrough into the competitive US combat flight controls market, and the first AM-X production orders were commenced. Most recently, successful handover of the first Tornado ADV Semi Automatic Ground Equipment (SAGE) occurred.

**Flight Controls Division.** 1986 has seen considerable expansion in the Division's activities. Major advances have included continued on-schedule progress of the Phoenix surveillance system for the British Army with A-model air vehicles and many other system elements undergoing trials, and first deliveries of Fly-by-Wire computers for Slat and Flap control of the A320 Airbus. The Falconet Target System has been accepted onto the Hebrides range, and the Division has been selected as one of two suppliers of pre-production computers for the primary flight control of the new Boeing 7J7 airliner.

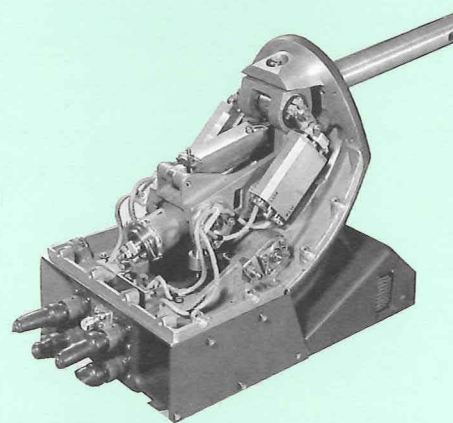
**Powerplant Systems Division** has been commended on the superb performance of its Maintenance Data Panels, Engine Speed and Temperature



Foreword by RW Howard

Director and General Manager of GEC Avionics Limited and chief executive responsible for CACD, FCD, ISD, OPG, PCSD and PSD.

Indicators, Fuel Flow and Tyre Temperature Measurement Systems. As PSD's reputation has grown, so has its workload with contracts received for Fuel Flow on Transall aircraft and the V2500 international gas turbine engine, Engine Management on Phoenix, and a major export order for Engine Test/Trim Automated Systems. The Division looks forward to a busy year.



The EAP Pilot's Stick Sensor Assembly, vital link between pilot and Fly-by-Wire control computer

**Instrument Systems Division** has won a second order from the US Government for Standard Central Air Data Computers, bringing the SCADC order book to 2847 units. Meanwhile, production of other air data computers, including the highly successful helicopter low airspeed system,

**Boeing to compete in the final stage for the prestigious 7J7 airliner's Fly-by-Wire computing system, recognising our long successful record in safe control.**

**ISD's impressive progress with SCADC production has already brought the highest rate per month for advanced airborne computers in the history of this Company and probably for Europe.**

**PSD continues to build up its business with the receipt of a new USA engine test system contract and with the electronic engine control system for Phoenix.**

**PCSD continues its strong support to systems divisions while expanding its capability to deliver Power Supplies outside.**

**Group prospects remain extremely good and we are continuing to invest substantial sums in computers, workstations and sophisticated test equipment and to recruit high quality staff.**

continues. The Tornado stores management system remains a major activity, boosted by export sales of the aircraft, and the new modular SMS has gained its first success with a US Navy contract for system evaluation.

**Offshore Projects Group** supported sea trials of the Dragonfly ROV and a successful programme recorded 67 dives, to a maximum of 550 feet depth, operating from the MSV 'Stena Seaspread' in the North Sea. A remote subsea data monitoring system for the Occidental 'SCAPA' oil production template has been designed, built and installed in a record time of 9 months. The dramatic fall and subsequent stabilising of oil prices has inevitably affected business prospects and the military ROV business has yet to yield results.

**Power Conversion Systems Division** has seen a year of steady growth with increasing production output on a number of major programmes including SCADC and F-16 C/D. Progress on the development of power converters for the AQS 903 and Harpoon Missile programmes has continued during the year, with new development orders being received for ADD's EH101 Common Waveform Generator and FCD's Phoenix Flight Control Computer. Active marketing has continued throughout the year both at home and abroad aimed at attracting new business.

During 1986, the Navigation Group continued to increase the order book for existing products. Major production orders were received for inertial systems which include the manufacture of the Attitude Reference Platform and associated inertial gyros for the major NATO MLRS programme. Additionally, substantial production orders were placed with Airborne Display Division for Head-Up Displays for America, China and the Middle East, and Maritime Aircraft Systems Division continued to acquire additional export sales for its world beating AQS902 system, the latest being for the Grumman S-2 aircraft.

On the development front, Airborne Display Division were successful in obtaining the development contract for the new failure-survival Head-Up Display system for the McDonnell



Foreword by P A Hearne

Director and General Manager of GEC Avionics Limited and chief executive responsible for ADD, ATED, GSD, MASD, RSD and GAv Inc.

Airborne Display Division continues to be heavily involved in producing Head-Up Displays for important overseas customers, in particular for the F-16 aircraft. The new British EAP carries our HUD. Other significant programmes were HUD trials on F-4 Phantom and A-6 aircraft. The award of the C-17 Head-Up Display to ADD will generate long term work and the Division's product range has been successfully extended to include Night Vision Goggles and Helmet Mounted Displays.



Holographic HUD, to be installed in General Dynamics F-16 C fighters

Guidance Systems Division has won major production contracts for the Control Sensors Unit for Sting Ray torpedoes and also for the Inertial Platform System for the NATO Multi-Launch Rocket System. A major research programme has started with T<sup>2</sup>A (Total Terrain Avionics System) flying on a US Navy aircraft, aimed at the development of an integrated 'stealthy' avionics package. Strong customer interest is apparent in other Divisional

products, both the Land Navigation System and the START Gyro which is now approaching production.

#### Maritime Aircraft Systems Division.

Export sales of AQS902 continue with orders for the Italian Atlantic Mk1 refit and selection by Grumman Aerospace for the S-2 Tracker update. An invitation has been received from the US Navy to submit AQS902 for the Foreign Weapons Evaluation programme. Home sales continue with 145 systems for the Royal Navy's Sea King VI fleet; this together with the existing AQS903 development programme has demanded a significant expansion of the Division's resources.

#### Automatic Test Equipment Division

received important orders for ORION ATE for factory and in-service testers associated with the EH101 and other ASW aircraft. ORION plays an integral part in the production of TICM, SCADC and HUDs, being increasingly used in the support role for the USAF. All these applications have export potential. ATED were joint winners of the Haskett Trophy for the development of MIL-STD-1553B test equipment (a forerunner of the ORION 9000) used on the Experimental Aircraft Programme.

#### Recording Systems Division.

This year saw the introduction of RSD's first new recording product, the miniature, acoustic data, 'snapshot' recorder being supplied for RN Sea King ASW helicopters. Significant product improvements have been developed for the existing range of

Douglas C-17 military transport, as well as substantial amounts of work on new installations for retrofits into existing USAF aircraft.

Of particular interest, the collaborative work between Airborne Display Division, Guidance Systems Division and the Electro-Optical Group at Basildon has initiated the flight development of 'stealth' type avionics systems based on terrain reference principles, an area of vital importance for future military aircraft and missiles. Later versions of this system will use the new ruggedised optical disk products which are a feature of current work in Recording Systems Division.

GEC Avionics Inc. Atlanta benefitted substantially from the growth in sales of Navigation Group products and their order book at the end of the year was the highest yet recorded.

Mission Data Recorders and Torpedo Test Data Recorders, to relaunch them for new applications. Development of the Crash-Survivable Solid-state Flight Recorder and the Airborne Optical Store is continuing, and new products are now being offered.



1553B Integration Facility with EAP at BAe Warton.

#### United States

GEC Avionics Inc. continues manufacture of HUDs for A-4, A-7 and F-16 A/B aircraft and co-production of F-16 C/D systems has been successfully initiated. Ongoing product support activities included flight trials support and establishment of a maintenance capability for SCADC. Development of Operational Test Program Sets and CO<sub>2</sub> laser systems are major engineering activities; of special significance has been the acquisition of the first HUD contract (shared with ADD) under the US Foreign Military Sales Scheme. Overall, the growing order book has been matched by expansion.

#### Aviation Service and Repair Division.

Major support programmes continue for Tornado equipments and F-16 HUDs. The Division is preparing for A320 launch support; a full Category 3 retrofit programme has been completed for British Caledonian's BAC One-Elevens and a similar exercise is in progress for British Airways. The Customer Training School has again needed expansion to meet the increased demand for services from throughout the Company. New postings of technical representatives are in Egypt and Nigeria and preparation is being made to support Saudi Tornado.

#### Flight Automation Research Laboratory

is active in new developments in Software Engineering, IKBS (Intelligent Knowledge Based Systems) applications, Colour HDDs, Binocular Helmet Displays, Digital Data Base Map generation, Hybrid navigation, and Distributed Processing systems for flight control applications. It is also active in VLSI design, High Speed Data Buses, Fibre-optic Sensors, Holographic HUD design, and new avionics packaging techniques and surface mounted device technology. The Stereo Underwater Viewing System in North Sea trials has demonstrated the value of stereo viewing for remote manipulative tasks.

#### Central Quality Department

which provides facilities for environmental test, mechanical, electrical and environmental calibration, has expanded its capabilities for electrical calibration up to 1.2GHz, pulsed random gun-fire shock tests in compliance with MIL-STD-8100, and the commissioning of a mobile screened room and antennas for testing large equipment offsite. Establishment QA procedure and practices have been continuously reviewed.

#### Computing Services

continues to enhance its services and resources and extend its co-ordinating role. A site hardware maintenance agreement for DEC equipment is now in place and a multiple supplier presence exists in the Information Centre. 1987 will see the realisation of the 1986 developments in areas such as Purchasing, Drawing Office documentation, Management Accounting, Personnel and Time/Attendance recording. CS will also be progressing the integration of Engineering, Manufacturing and Financial Systems enabling more distributed information to be available.

Works Engineering Services. Activity on new projects has continued at a high

level throughout the year. The new telephone system went into service in May and has significantly improved communications on the Rochester site. The refurbished ex-Fisher Controls area has been completed; three Divisions have occupied the new air conditioned accommodation - GSD, ADD and MASD. The two-storey development in the 40 ft hangar for FCD and CACD, including a footbridge linking the Phase III building, has also been completed.

#### Accounts Department's

main progress has been developing further programs on the two micro-computers which are now installed in the department. Applications ranging from invoice preparation to expense records have been introduced, and benefits in the form of improved staff skills and labour savings have been significant. Mainframe systems have been further updated, in particular the new version of UNIPAY has resulted in an improved payroll system.

#### Central Manufacturing Services

continues to make a significant contribution to the Company's manufacturing success. The Division has been deeply involved in all the major projects at Rochester, and has supplied bonded modules to Borehamwood and Basildon. The new 100 ton Power Press has proved invaluable in the manufacture of covers etc for the SCADC programme.

#### Personnel Department.

Recruitment has again been a major activity with over 870 people joining the Site. Appraisal schemes are being introduced into all Divisions. The career counselling service has allowed employees to discuss their future career development. Industry Year activities included computing and electronics training for teachers. 180 graduates and 240

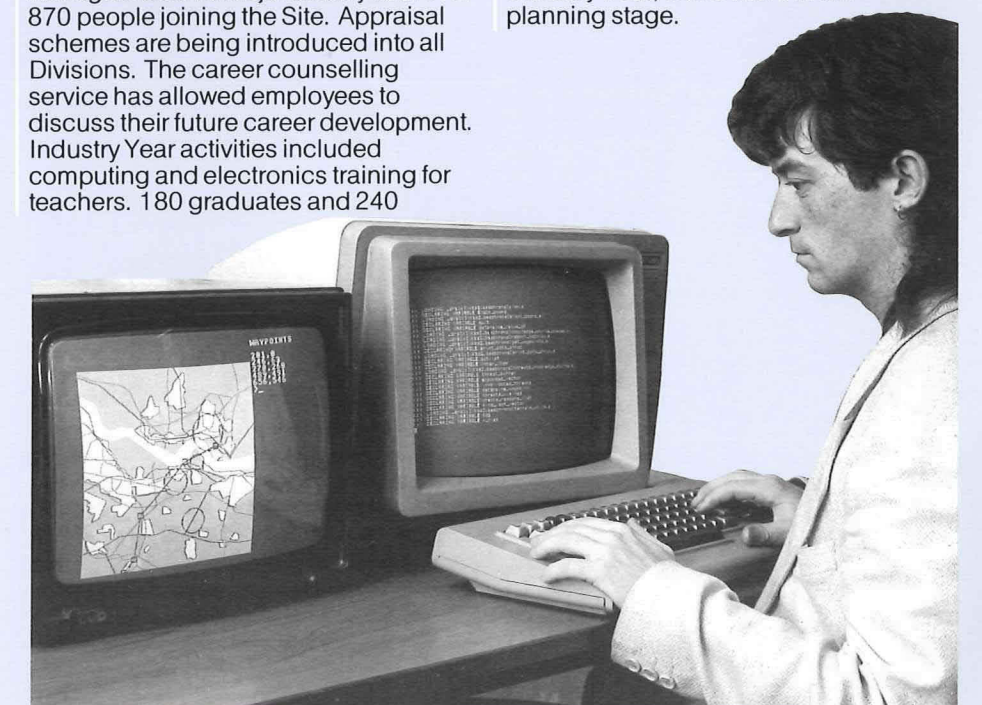
trainees were inducted. 10 trainees successfully completed our first commercial graduate training scheme. Courses in Marketing, and for 'Occam' language and transputers extended our adult training provision. At the GAv/BP Kent Club premises at Hoo, restaurant and kitchen facilities are under construction, for which an opening date will be announced in January.

#### GEC Avionics Research Laboratory,

Great Baddow, undertakes company research in microwave techniques, lasers, holography, infrared (IR) systems, signal processing for IR and radar and stabilisation and servo control. Current programmes include investigating computer generated holograms for more compact HUDs and for IR optics, integrated avionics systems, novel microwave radar techniques and a new design of compact synthetic aperture radar. The Laboratory also carries out future studies and supports long-term avionics-related university research.

#### Audio Visual Unit

has produced 27 video programmes of varying complexity. Major programmes included Basildon's High Velocity Missile, another for Basildon in Arabic, a Production Readiness Review for ADD, and many marketing support programmes. Facilities at the Unit now include a 3-machine edit suite and a digital effects controller, which will greatly extend production capabilities. Current projects include programmes for FARL, Personnel Department and for Industry Year, with 8 more in the planning stage.



Artificial Intelligence - FARL's application of IKBS to automatic route planning

# Borehamwood Establishment

covers Borehamwood, Radlett, Hemel Hempstead, Welwyn Garden City, Milton Keynes and Peterborough

**1986 has been a year of great endeavour, aimed at both consolidating our present programmes and securing future business.**

**On the Nimrod AEW project, the Group demonstrated its ability to make very rapid progress, when in March, for the first time, it was given total responsibility to manage the overall programme, including the British Aerospace airframe work.**

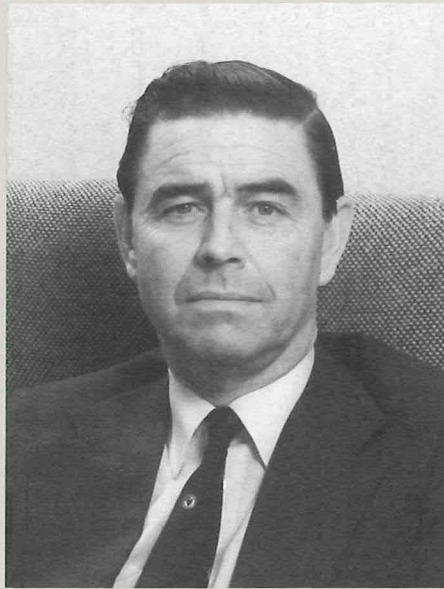
**Nimrod has been a long and difficult development, and has suffered more than most UK Government programmes from delayed decisions and funding difficulties. However, the system is now working well which gives confidence for a final go-ahead to complete the programme.**

**In anticipation of this decision, we have recently strengthened the**

**Airborne Warning Systems Division** has made tremendous progress in diagnosing the causes of the earlier performance shortfalls of the Nimrod AEW system and in designing and demonstrating technical solutions. Within the six month period agreed with the Ministry of Defence, we incorporated and flew in the Development Trials aircraft a vehicle rejection correlator, an improved faster main computer, a high reliability transmitter, a receiver and digitiser with extended dynamic range, and have demonstrated that the system is now capable of fully meeting the RAF's specification. We have made our proposals for completion of the project and confidently await the Ministry of Defence's decision.

**Airborne Software Division** continues full and active involvement with Nimrod AEW and Foxhunter programmes, including the supporting projects of computer based test equipment, mission simulation and analysis. New work this year includes involvement with the Indian Sea King project and software for the GEC Private Mobile Radio system. Alvey collaborative work is progressing steadily and consultancy is playing an increasing role with particular emphasis on CCIS (Command Control and Information Systems).

**Airborne Radar Systems Division** has joined forces with AEG and other European partners to propose the Emerald radar for the European Fighter Aircraft (EFA). Emerald is an improved



Foreword by DI Jackson  
Chief Executive of the Borehamwood  
Establishment of GEC Avionics Limited.

**management of the project by the formation of three Divisions, Airborne Warning Radar Division, Airborne Warning Processing Division and Airborne Warning Systems Division, who together with an overall Project Office will run the programme.**

**We can feel proud that our AEW system is increasingly being seen as a potential world-beater, and our co-operative efforts with Lockheed on the C-130 Hercules and Aeritalia on the G222 are continuing with the aim of securing launch export orders in the next two years.**

**In the Airborne Combat Radar area, the Foxhunter radar is in full production and we have received an order for further Skyranger radars. We are also involved in co-operative efforts to offer a radar system for the European Fighter Aircraft and for other fighter aircraft.**

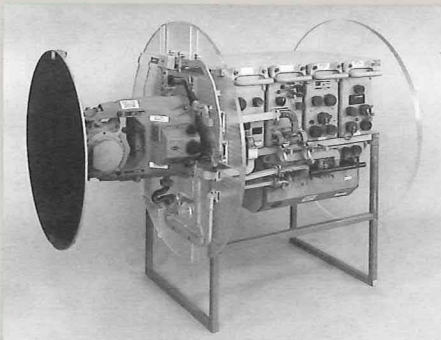
business growth is planned to come from successful developments in the Laser group. Laser development has continued at an encouraging rate and there are now several major products which are nearing production status. Notable among these are developments of the Division's CO<sub>2</sub> TEA lasers which are gaining increased recognition in the USA via GEC Avionics Inc. in Atlanta.

derivative of the Hughes radar from the F-18 and a very sound way of fulfilling the EFA's requirements with a minimum of development and within the timescale and budgetary constraints of the EFA Programme. The production of Foxhunter radars has hit a new record level. On entry into Service with the RAF they are proving very reliable. Further large export orders for Foxhunter and Skyranger radars have been received.



Radar overhaul on AEW Nimrod DB2

**Applied Physics Division.** Whilst neutron generator products and development continue to support the Division's growing level of sales, future



Mock-up of the proposed multi-national EMERALD radar for EFA

**Special Projects Division's** volume business is moving towards export with further increases in both orders and opportunities. Current generation sonar engineering work is beginning to slow with the successful completion of the integral tracking system for Sonar 2026 and is being replaced by PV and Government funded work on next generation sonars. Recent success in diverse applications of narrow band acoustic signal processing technology is resulting in marketing and engineering activities to expand the business area.

**Mobile Radar Department** successfully completed the competitive MSTAR Project Definition Study and produced the only radar to work satisfactorily throughout the British Army trial. We are confident that we will win the main contract, and this should enable a considerable export market to be developed. The Hermes Remote Ground Sensor System is now in production with sales made to a number of countries. The Civil Security product range is being rationalised to take maximum advantage of the continuing upsurge in demand.

**Research Laboratory.** The Laboratory has a number of projects in development and prototype stages covering microwave, laser, signal processing and mechanical engineering techniques. Recent examples include the Reconfigurable Signal Processor for multi-mode radars, a far infrared Laser Obstacle and Cable Warning Sensor, an ultra lightweight microwave scanning aerial for the Phoenix RPV and a fast nose-radar scanner for future fighter aircraft. Such hardware activities are fully supported by systems study and software development.

**Central Machine Shop.** The Department's major customers are the AEW and AI projects. Continued refinement in the use of CNC technique and its extension into the disciplines of sheet metal fabrication and turning are being pursued. The interface of CNC with CAD remains a longer term objective.

**Central Quality Department** has continued to develop its facilities and services. The Environmental Test Laboratory has extended its vibration testing capability to include gunfire, tracked vehicle and helicopter simulations. The Central Calibration Laboratory has computerised its call-in, progress and record systems in support of the calibration of the Company's test equipment. The Component Engineering Section has continued the development of the database which will enable engineers within the Establishment to access relevant information and data concerning components and materials. The Department continues a wide range of activities in support of the projects and contracts undertaken by the Divisions.

**Lightweight Structures Department** are now in full production of the new carbon fibre antenna for the AEW Nimrod, using a new low cost and consistently accurate tooling technique.

Manufacture of the Phoenix ground station antenna also exploits this exciting technology. Volume production of Cassegrain antennas for the Foxhunter radar and Sea Eagle missile continues, whilst the Department's aircraft interiors business is gaining momentum. Successful development of ultra lightweight carbon fibre waveguide should generate production orders during 1987.

**The Model Shop** supports the Research Laboratory and all Divisions in Hertfordshire and Buckinghamshire in the manufacture of Mechanical/Electrical Prototypes and small batch production, and has made a substantial contribution to products now in production.

**Thick Film Department** has continued to expand and consolidate its business both within the Company and externally, particularly with the Ministry of Defence who have placed further development and production orders with us. Work has also progressed in automating more of our processes in order to improve our competitiveness in the market place.

**Publications Unit** is now back on the main Elstree Way site and can now offer a more convenient service to its customers. At the same time all its facilities have been brought together in one place. These include: illustrating and design; word processing, editing and photo typesetting; printing, photography, 35mm and 16mm microfilming and preparation of slides and overhead projector transparencies. The Unit is looking ahead to extend and improve its services over the coming years.

**Site Services Department** has continued to maintain the various premises at Hemel Hempstead, Milton Keynes, Peterborough, Radlett and Welwyn, and to implement major layout projects to meet the requirements of occupying Divisions. In addition, a new digital telephone exchange has been installed at Hemel Hempstead, and the inter-site data communications network has been extended. Since assuming responsibility for the Borehamwood Goods Inwards facility, Site Services has introduced a twice-daily goods delivery service between Borehamwood and the other local sites.

**Accounts Department.** The major preoccupation at Borehamwood has been with the Nimrod AEW programme, and the Accounts Department has played its part in supporting this important project. During the summer the Department moved into its new home in Bay 9; the relocation has helped in bringing most sections together and we are now happily settled. Further system developments have been implemented together with taking on responsibility for the Borehamwood Site Services Accounting.

**Personnel Department.** This year saw the successful recruitment of 133 graduates, all of whom were placed on their individual graduate development programmes. YES (the Young Engineers Section of the Sports & Social Club) had an extraordinarily active first year with innumerable trips - dry skiing, treasure hunts etc., and they now publish their own Newsheets to a membership of 150. The Apprentice Association was equally active and arguably more adventurous. Other recruitment activities have concentrated upon specialist scarce skills.



100 SAAB SF.340 Interiors have now been supplied by LSD.

# Basildon Establishment

Basildon's achievements centred on meeting important programme milestones. Significant was the delivery of the first engineering model of our night vision equipment for the AV-8B, followed by a very successful Critical Design Review. The new contract for the Mini TICM based night sight on the Warrior vehicle gets us into the land vehicle systems business. The one to win was the Sting Ray SPU production order for 2000 equipments. EOASD won it.

APD's AD3500 wideband radio successfully passed flight tests and confirmed its place on the GR5. Looking forward to the European Fighter Aircraft, the Airadio divisions and their international partners are putting together sound proposals. TID took a step forward when chosen for JTIDS software support activity. ASD has been supporting the Company's effort to secure the AEW Nimrod programme while continuing to deliver Secure Speech Systems.

**Airadio Systems Division.** The first production Nimrod MR Mk2 Speech Systems were delivered to MoD(PE) on 27th February 1986. In conjunction with Marconi Defence Systems, the Division is on contract to RAE to develop an advanced airborne speech recogniser. Development of the EH101 communications sub-system is continuing. The Division is engaged in government funded studies to update the communications system and provide a data link in RAF Reconnaissance aircraft. Army helicopters are being surveyed for Secure Speech.

**Airadio Products Division.** The first order for APD's new lightweight TACAN was recently secured for the RAF's new Tucano trainer, closely followed by orders for British Army and Royal Dutch Air Force Helicopters. Orders for Tornado TACAN continued to come in. In international competition, a multi-million pound contract has been won to supply advanced AD3500 ECM-resistant radios for RAF GR5 Harriers. On a new front, work will soon start on 150 speed sensors for British Rail Electra Locomotives.

**Tactical Information Division** continues to consolidate its JTIDS (Joint Tactical Information Distribution System) activities. The Depot made major deliveries to BAe for the Tornado programme and has provided valuable Systems Engineering support for



Foreword by W R Paterson

Director and General Manager of GEC Avionics Limited and chief executive for the Basildon Establishment.

This year we introduced a new business to Basildon. The company has developed a new radar technique which originated in the Avionics Research Laboratory at Great Baddow and is being transferred to Basildon. I congratulate the staff involved in the trials and thank them for their dedication and commitment.

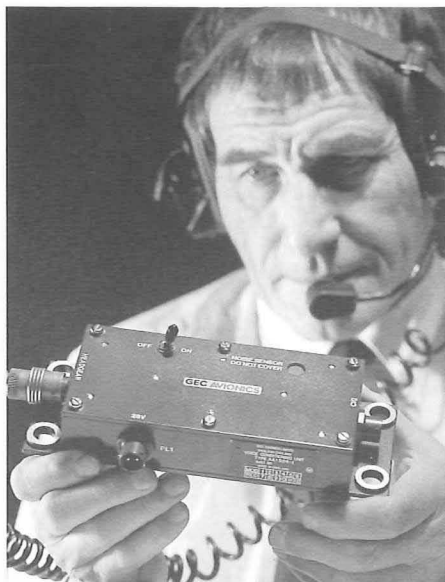
Work is going on to develop export opportunities. Many require equipment demonstrations. Our people have conducted successful trials throughout the world in 1986. To succeed in overseas territories we must be competitive. The traumas of the introduction of MECCA are hopefully behind us; we must now seek to keep administration costs down while investing in new manufacturing facilities. The quality of our work has to be high. This year the Basildon site was successfully assessed by an MoD team to the new AQAPI defence standard.

international collaboration during 1986. Orders covering the total requirement for signal processors on the UK lightweight Sting Ray torpedo were won against stiff competition assuring continuity of production employment. The Division has been selected, with its French and German partners, for an important sector of the proposed European TRIGAT missile programme which, together with development contracts at the 'cutting edge' of technology, carry it into 1987 and beyond.



Tactical Air Navigation systems (TACAN) being assembled for the Shorts Tucano trainer aircraft

**Electro-Optical Advanced Systems Division** has thrust ahead in order intake, advancing technology and



APD's AD150 Voice Conditioning Unit is being installed in British Army vehicles



EOASD Sting Ray Processor on final test

### Electro-Optical Products Division.

Additional orders for V3800 Naval Thermal Imagers have been received from overseas navies. The Javelin camera is a main production item. Two Javelin cameras configured as a Target Missile Gather/Guidance Unit are proposed for naval applications. Hybrid chips for these cameras are being produced by our own plant which is of service to other Divisions. A new development in conjunction with a major Sight manufacturer has produced a Thermal Imaging Sight which has been supplied to MoD to fit Warrior.

### Electro-Optical Surveillance Division

continues to deliver Thermal Imaging Common Modules for UK defence programmes and has won the competitive third production order for MoD. Major contracts are well under way to provide passive FLIR (Forward-Looking Infra Red) aids to night and poor visibility flying for the Tornado and Harrier aircraft together with passive identification devices for the Royal Navy's Lynx helicopters. Successful trials of a 10" dia FLIR pod have taken place in the USA and Holland on F-16 aircraft.

### Airborne Radar Systems Division.

The continued success of the Tornado aircraft has resulted in a very healthy order book and work for the next five years. In September ARSD delivered its 1000th unit for the terrain-following radar fitted to the IDS Tornado. During the same month the first production batch of fifty sets of units for the Foxhunter radar was completed, and both programmes have continued on schedule during the rest of the year.

**Future Systems Laboratory.** The predominant activities continue to be systems studies and operational research in support of the Electro-Optical Group of Divisions. New technology includes a 64 by 64 element focal plane array sensor for evaluation by the MoD, the design of VLSI signal processing modules, and enhancements to the passive ranging system following its successful flight trials. The FSL Image Processing facility is being extensively expanded to cope with new projects.

### Central Machine Shop

now incorporates the Development Machine Shop enabling the Division to widen its manufacturing base offering from 'one off' to full production facilities. Among orders received were several of large quantity, with deliveries spread over several years. Further investment in an NC Lathe and a Twin Pallet NC Machining Centre is part of the current and future developments in modern technology at which the Division is aiming, to accommodate the needs of its Customers.

### Accounts Department

has assumed responsibility for communications, post and reception. Introductions into PCs include the Contract Ledger and Analysis, and a project (Phase I) for the Maintenance Department, now linked to the network. Planned developments are Cash Book and Phase II for Maintenance. An electronic time and attendance system will shortly be introduced across the site. EOASD successfully operate our stock, engineering, MRP etc MECCA modules. The mainframe accounting systems are currently under review, including WIP numbers.

### Personnel and Training Department.

The main recruitment thrust in 1986 has been in the production areas and the total now employed at Basildon exceeds 2600. Applications for registration of all 'Personal Data' held on computers at Basildon have been accepted on to the Register by the Data Protection Registrar. In addition to maintaining all normal training programmes, the Training Department has responded magnificently to the wide range of demands to participate in activities with local schools as part of the Industry Year initiative.

### Central Quality Department

continues to provide an independent Quality Assurance service for the Site. The activities cover product assurance,

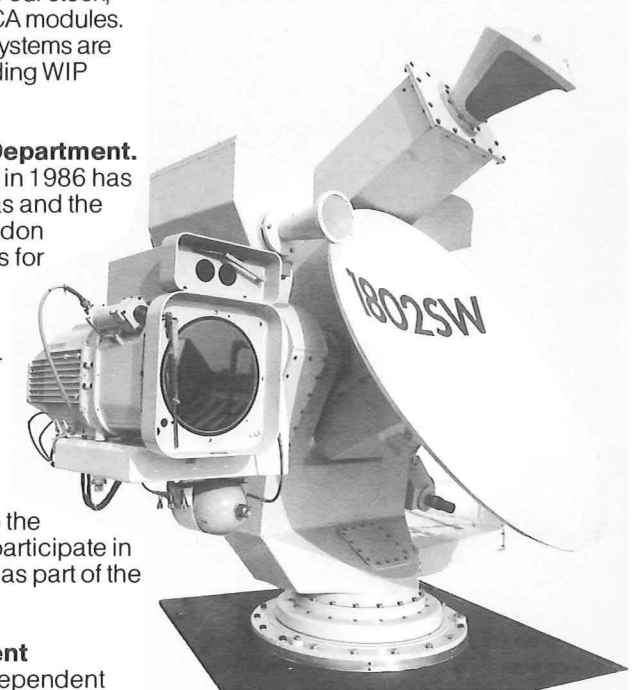
mainly comprising system and product audits and vendor assessments, Software QA and control, Standards, Calibration and Repair services and engineering standards and manuals. Capabilities and the facilities for calibration services are continually being enhanced to meet the requirements of the Site.

### Services Control

provides for the Site's requirements for non-production purchases, transport, goods inwards, despatch and stores for maintenance, consumables, stationery and overall services. Rationalisation has permitted a more efficient service to Divisions despite increasing activity. Further re-organisation is planned to cope effectively with the processing of all incoming goods. Since its establishment in 1985 the staff shop continues to expand the range of products offered to our employees.

### Works Engineering Department.

The conversion of 'K' building (129,000 sq.ft., ex-Carreras) has proceeded rapidly and by year end some 60% will be ready for occupation. This progress has helped to permit the relocation of Airadio Spares and Service Unit from Stanmore to refurbished premises within 'F' building at Basildon. Previously housed in three buildings totalling 19,000 sq.ft. they are now concentrated into an integrated unit of 13,500 sq.ft., all completed within three months and without any significant disruption to customer requirements.



V3800 with TMGGU fitted to MRSR radar.

## DIRECT TO YOU

This publication has been compiled and edited at company head office on a standard word processor and for the first time transmitted electronically, direct to AS&R Division's Video Composing equipment. Of course some newspapers are produced this way but only with expensive and specialised equipment. What this publication demonstrates is that now, any type of word processor or computer which we use anywhere in the world, and at any time of day or night, can be made to send text direct to the word processor. The data is then interfaced to the Xenotron page make-up system and final composition artwork produced which is ready for printing. An important feature is the capability of reformatting disc storage mediums between any types of word processor or computer. This offers greater efficiency in printing the brochures, reports and sales proposals which help us all to compete for business.

It is appropriate that the first major publication to apply the technique should be this one, which goes to every GEC Avionics employee. It contains information furnished by all Divisions and other Departments throughout the company, whose cooperation is gratefully acknowledged. So is the work of those who have made this important innovation possible.

**For advice on inter-computer data transfer, you are welcome to phone Gerry Colwell, Computing Services at Rochester, (0634) 826061 or 44400 extension 3509. For information on direct line typesetting and compositing, you can phone Henry Stedman, Aviation Service & Repair Division at Rochester, (0634) 44400 extension 3973.**

# GEC AVIONICS



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