MARCONI
AVIONICS

Review of Activities 1981

Cover pictures.

Front cover:

1 *Thermal imaging common modules equipment under test at Basildon.*

2 *Part of the new computer-aided engineering facility at Rochester.*

3 *AEW Nimrod systems rig at Radlett.*

4 *Microprocessor controls produced for the A-310 Airbus.*

Back cover:

1 *'Heli-Tele' airborne television system*

2 *New COMPACTα automatic test equipment.*

3 *Discrete-input hybrid micro circuit.*

4 *Pilot's display unit of the new LANTIRN head up display.*

This publication is based on data furnished by all Divisions of Marconi Avionics, and other departments, whose participation is gratefully acknowledged.

Managing Director's Report

It will come as no surprise to most of you that 1981 has been a very difficult year for us. In common with many other British companies we face problems due to the economic recession in this country and I expect most of you will have read of the threatened cuts in defence expenditure. Fortunately our continued heavy investment, both in capital equipment and in advanced research and development, have enabled us to ride this storm a good deal better than most. So far as I can judge, we should be able to maintain the present level of employment throughout 1982 unless there are quite exceptional reductions in Government expenditure on defence over and above those which we have taken into account.

During the year we have invested well over £1M in computer assisted design facilities, mainly in Basildon and Rochester. These facilities, which are now as up to date as any in the world, will I hope enable us to offer a continuously improving standard of design to our customers, which should help us in the difficult business of obtaining new orders.

Substantial Research and Development in new products and new programmes, largely paid for by the company, have already had results. One of these is the acquisition of the Standard Air Data Computer System contract for Rochester. This contract calls for the development and production of a range of Standard Air Data Computers which are to replace a great number of systems already fitted to existing U.S. Air Force and U.S. Navy aircraft. Some 10,000 aircraft are likely to be involved so this contract should, provided we all do the right things, help to keep us with work on the production shop floor for a number of years. Similar development work, which is being done at Borehamwood and Basildon, seems likely to result in sales of lasers, and infra-red and other equipments, to the United States in the forthcoming year and our sales engineers are finding themselves more and more heavily deployed on these projects.

Largely because of investments of this nature we are able to hold our employment constant, despite being in the middle of a substantial recession. At the same time, we are improving our industrial efficiency and it is a great credit to those who implement the investment decisions, and to those who put that investment to good use, that we are able to maintain this situation.

J.E. Pateman CBE
Managing Director
Marconi Avionics Limited

10th December 1981

1981 – A year of achievement

In a company as big and active as Marconi Avionics, achievements are continually made, by teams and individuals. As often as practical, the company releases news about these achievements, with the cooperation of the people concerned. By this means we seek to promote business and a better understanding of our company by customers, other organisations and our neighbours.

In 1981 we made these announcements:

MACHAN goes airborne ...	A new shape took to the sky in February, the MACHAN unmanned research aircraft. The company's first aircraft venture of its own, the 12 foot wingspan aircraft is testing avionic equipment made at Basildon and Rochester.
New appointments ...	With the transfer of Jim Luck, to become Managing Director of GEC Traffic Automation. Ltd. at Borehamwood, Bob Ruggles was appointed Divisional Manager of ATE Division, Rochester. Two senior marketing appointments announced this year were Simon Frost Marketing Manager ISD Rochester and Tom Morgan, Marketing Executive at Nailsea.
"Fail-Safe" Electronics for Oil Wells ...	The world's oilmen took a keen interest in Nailsea's electronic controls for subsea oil wells, which were exhibited in Houston Texas. These automatically survive failures, using techniques derived from our automatic flight control system on Concorde.
Thermal Imager demonstrated for export ...	E-OSD at Basildon with Rank Taylor Hobson, are responsible for the UK "Thermal Imaging Common Modules" programme, equipment for which was convincingly demonstrated to defence attaches in London.
Engineers' skills ...	David Fosberry and Joe Cardwell of FARL, Rochester, applied avionics skills to equipment to help study meteors.
Return on Gyroscope investment ...	A major order, for the Sky Flash missile, further justified the company's investment in a world-leading American gyroscope design, to ensure its production in Britain. They are made by Gyro Division, Rochester.
Paris Air Show – Technology on sale ...	Most Divisions involved in avionic systems exhibited, and highlights announced were, from Borehamwood Divisions, the AEW Nimrod Mission System Avionics and Tornado AI radar; from Basildon, a new radio communications and navigation system, thermal imaging and cockpit television; and from Rochester, flight and powerplant controls, head up displays, instrument systems and maritime aircraft systems.
New Civil Avionics offered for Military Exports ...	APD's new AD 1550 Communications Control System for the BAe 146 airliner and BAe 125 business jet was offered for a wide market.
Birthday Honours ...	Bill Alexander, Assistant Managing Director of the company and chief executive for the Rochester Establishment, was awarded the OBE.
Avionics outwit Submarines ...	A novel kind of on-board training aid from MASD was successfully put into service on RAF Nimrod Mk2 aircraft.
Success for Britain's Air Defence Radar ...	ARSD's Foxhunter radar entered weapons system proving phase on the RAF's new fighter, the Tornado ADV.
"Spin Off" at Aberdeen Oil Exhibition ...	New applications for our technology, for the international oil market, which we showed the world at Aberdeen, included Nailsea's subsea electrical connectors, E-OPD's flameproof TV camera and CQD's mobile service to suppress radio interference on oil rigs.
Fly-by-wire...	First flight of "Fly-by-wire" Jaguar took place with CACD's advanced integrated flight control system.
Key US Order for Aircraft Computers ...	A $5 million order to create a new range of standard central air data computers, which could equip up to 10,000 US aircraft, was won by ISD.
Radar for Coal Mines ...	Borehamwood's MRD delivered a new radar to the National Coal Board for detecting the level of coal in underground storage bunkers.
New Computer Aid facility ...	A £¾ million computer-aided engineering facility, the key to production potentially worth several hundred million pounds, was opened at Rochester.
MAv Director of Personnel ...	John Bradley was appointed MAv Director of Personnel.
Heli-Tele Exports double...	E-OSD's helicopter TV surveillance system achieved record export sales.
Accolade for our Managing Director ...	Mr Pateman was awarded the R Ae S British Gold Medal for his outstanding achievement in building up Britain's leadership in avionics.

Rochester Establishment

Foreword by W.H. Alexander, Assistant Managing Director of MAv and the company's chief executive for the Rochester establishment.

In 1981 we at Rochester have had another successful year. The rate of output required on our new major production programmes has been achieved and these equipments are now performing well in service. They include all of the Tornado IDS systems and the Sonics Systems.

We have continued to improve the facilities required for our business, CACD and FCD are now fully installed in their new building, the new conference suite and canteen improvements are finished and our fine new factory at Nailsea is now being occupied.

Whilst concentrating on our own business we have not neglected the problems of other people in our local community, particularly the young people who are unemployed and those who are disabled and we have taken part in the Job Experience Scheme of the Youth Opportunities Programme and also received a "Fit For Work" Award from the Manpower Services Commission.

Once again we have succeeded in maintaining the strength of our Order Book and in particular have acquired some very useful export orders. One notable order was from the United States Department of Defense for the development of Standard Central Air Data Systems (SCADS). If this programme is successful, it could lead to substantial production in future. These export contracts have a special significance in the light of the uncertainties surrounding future projects from our own Ministry of Defence.

I should like to thank all of our team for their efforts in this past year and ask for even better in the difficult year which lies ahead.

Airborne Display Division has had another very successful year, with production facilities fully utilised for the manufacture of head-up and head-down displays, for a number of programmes, and of electronic computers for others. During the year preparation for production of the latest holographic technology HUD, for the US Air Force LANTIRN programme, continued with many critical milestones passed and assembly of first pre-production models well under way.

A notable success occurred during the year, when F-16s equipped with the Division's production HUDs achieved top marks in a tactical weapons competition.

Combat Aircraft Controls Division has seen the first flight of two of its products in 1981. The historic maiden flight of the Jaguar 'fly-by-wire' on October 20th was accomplished faultlessly. A new 3 axis autostabiliser, purchased by two European aircraft companies also went through its flight test phase with considerable success. Production of Tornado AFDS, CSAS and SPILS systems has proceeded steadily with the impact of customer changes being absorbed. A significant expansion in the company's Computer Aided Design facilities has been achieved with the installation of the latest type of 8-station system, with colour displays.

A service is being provided to all Rochester divisions and CACD is itself now even better equipped to compete for future business. Marketing efforts are being concentrated on maintaining the leading position in Europe and exploiting the advanced 'fly-by-wire' technology in the USA.

A year of solid achievement by the Division provides the necessary basis for future progress.

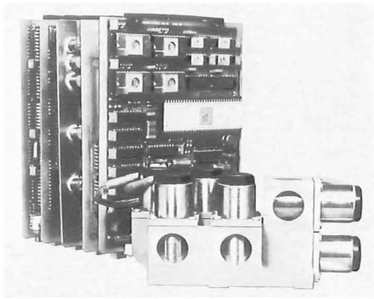
Inertial Navigation Division has a very healthy order book for the supply of current products and services. Export orders for Navigation and Weapon Aiming Systems continue to be received. Production of proprietary computers, for land-based applications, has now reached the required delivery rate. Great interest continues to be shown by overseas customers in the Naval Compass Stabiliser.

The Engineering Department is now actively engaged in the demonstration phase of a new product which will become the basis of a new range of equipments for manufacture in high volume.

Powerplant Systems Division having undergone a readjustment, Production now being in the Towers and other departments going to New Road, is well into all product manufacturing programmes. They include Supervisory Controllers for RB211-535 engines of the Boeing 757, which enters service early in 1983, fuel flow metering systems for Tornado, Harrier, export Hawk and the new McDonnell-Douglas AV8B, and Automated Powerplant Test Systems for use in the UK and Italy for the Tornado's RB199 engines.

Gyro Division continues to produce rate, vertical, azimuth and anti-circling gyros and accelerometers, for such varied programmes as Harrier, Lynx, Sea Dart, Sky Flash and Tigerfish.

The Sting Ray Control Sensors Unit is soon entering a new production phase. Preparations to produce the GI-G6 rate integrating gyro will enhance future business, particularly in "Strapdown" systems, such as the Attitude and Heading Reference systems, due to be flight tested in 1982, being developed for the new heavyweight torpedo, and for aircraft, UMA and missiles.



"Strapdown" Attitude and Heading reference system.

Aviation Service and Repair Division's depot maintenance transfer schemes, customer support methods pioneered by the Division, are now successfully established for UK and overseas operators of Jaguar, Lynx and Tornado aircraft.

Customer demand for logistics engineering is growing and the Division is successfully managing Life Cycle Cost, Spares Programme and Reliability Incentive warranties for many Company products.

The Customer Training School is busy meeting new requirements whilst retaining the ability to satisfy continuing requests for training on older equipments.

Flight Controls Division delivered the first aircraft set and other equipment for the A310 Airbus Slats and Flaps control system, on schedule, and pre-flight qualification testing is under way.

Production of Boeing 747 automatic throttle control systems continues in conjunction with MAv Inc. and 110 new and 68 retrofit units have been completed.

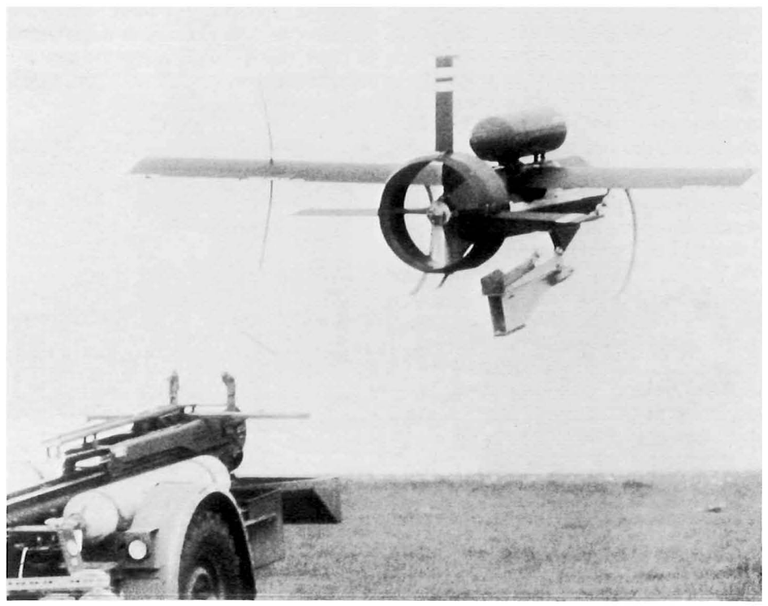
Flight trials of the Mk4 Jindivik are complete and those for ASAT (Advanced Subsonic Aerial Target) start shortly. Equipment for the Sea Vixen drone is in production. Lynx AFCS production continues and a substantial new order has been received, for Rapier "blind fire" radar actuators.

Flight Automation Research Laboratory activities included successful trials of the MACHAN unmanned aircraft, design and development of the MIL-STD-1750A computer for LANTIRN, a "two LSI chip" design of the MIL-STD-1553B multiplexed data transmission Remote Terminal, using HRC/MEDL's new "Silicon on Sapphire" technology, demonstration of underwater viewing systems and launching a demonstrator programme to produce a flightworthy "Direct Voice Input Control" system using the latest automatic speech recognition techniques.

Automatic Test Equipment Division's first pre-series LF ATE, part of the Tornado automatic test system (ATS), completed Luftwaffe acceptance tests at Kaufbeuren Germany. COMPACT factory acceptance test equipment (FATE) for Tornado is now operational with Aeritalia Turin, British Aerospace Warton and CACD. On the Nimrod Mk2 ATS, the RAF can now test 10 different unit types.

Orders for FATE based on a newly-introduced COMPACTα digital card tester have been received for a major defence programme.

Instrument Systems Division's Low Airspeed Systems for United States Cobra helicopters continued at around 25 per month while Tornado Stores Management Systems and Triplex Transducer Units reached 10 and 12 per month, respectively.



New-style launch for MACHAN unmanned aircraft.

Two export air data systems are for 1982 production and a key contract was won to create new Standard Central Air Data Computers, to re-equip 27 variants of 10 different USAF and US Navy aircraft. ISD's expanded accommodation, on-line computerised stock control, new ATE and automatic assembly equipment were winning factors, plus growing Computer-Aided Engineering facilities. Despite vigorous marketing, other potential contracts are delayed for funds.

Maritime Aircraft Systems Division continues to deliver world-leading AQS 901 ASW system for RAF Nimrod Mk2 and further orders are likely. Deliveries for the RAAF are complete and a follow-on order to equip a second P-3C squadron is imminent.

A new Data Conditioning Unit and associated software are in hand for system enhancement. The novel Airborne Crew Trainer (ACT 1) is now proving its value as an RAF in-flight training aid. The lightweight acoustic processor LAPADS has proved extremely successful in RN Sea King helicopters and enhancements in display media and sonobuoy repertoire are in hand. To support these achievements, advanced processor developments are continuing.

Nailsea is now manufacturing control systems for the offshore oil industry. Electronic sub-systems have been delivered to BP for installation on subsea wellheads 600 feet deep in the Magnus oilfield, 150 km NE of the Shetland Islands. Marketing of such systems, to the world's offshore oil industry is very active.

The power supply team is providing a design and manufacturing service on low voltage power supplies to a number of MAv divisions and production activity is increasing.

The entire 170 strong Nailsea team will move to the new factory building early in 1982.

Central Quality Department has significantly updated its facilities to handle the latest technology, in its Calibration, Environmental/EMC Engineering and Qualification Testing services to Divisions.

Component Test can now check many latest "state of the art" devices, recently-installed equipment in Mechanical Standards permits accurate checking of complex fixtures, computerised test routines are improving the integrity of EMC testing and the Environmental Test Laboratory's new temperature/altitude chamber gives a unique capability for more stringent climatic testing.

Electronic Data Processing department has continued developing new systems and upgrading existing ones, mainly for accounting and production management.

A new purchase ledger system is operational, as is the IMAGES Stock Control System in ISD and work has advanced on other elements of the MAPLE Production Information System.

The ICL 2904 computer has been upgraded to handle the increased work load and a further ICL 7502 terminal with six screens for data entry has been installed in Accounts Department.

Accounts Department has embarked on a programme of further computerisation, to extend and improve its services. The first step was implementing a new Purchase Ledger System using video display units, with Rochester's computer linked to the Great Baddow computer centre. This has brought improvements in speed, accuracy and presentation.

Future plans include a new payroll programme and rationalising the costing system.

Novel training aid for Nimrod aircrew.

Central Machine Shop has continued to gear its work to the commercial and design activities of product Divisions.

The manufacture of box assemblies for line replaceable units continues to be a major item and CMS enables design engineers to choose riveting, dip brazing, spot welding or redux bonding. The redux bonding facility also provides a service to other Establishments of the Company.

Works Engineering has continued to provide the product Divisions with a variety of services throughout 1981 including Electrical, Mechanical and Civil Engineering projects, operating the Incoming Goods, Despatch, Transport, Telecommunication and Postal Services. These services now extend to ten different locations with a site area in excess of 150 acres and over one million sq. ft. of factory buildings.

1981 has seen the satisfactory completion of some major projects and a very active 1982 is forecast.

The Personnel Department's recruitment considerably diminished, focussing attention on training. This September 128 trainees joined, including 80 craft and technician apprentices, bringing full-time trainees to 620. Technological training for experienced technologists, technicians, supervisors and managers, was a major development, 15 courses on avionics principles, microprocessors and software are offered and more advanced courses are being developed.

An MAv team won the National Engineering Technician Apprentice Award, presented by Lord Weinstock. Of sixty young Work Experience trainees, 27 subsequently joined the company. Belief in equal opportunities for disabled people was recognised by the "Fit for Work" award.

Report from the United States:

Marconi Avionics Inc, with its main base in Atlanta Georgia, continues to make sales and profit growth from products and services for US defence programmes.

Much work derives from, or is collaborative with, the UK company, in which regard A-7 and F-16 head up display systems are still major production programmes. An ability to manufacture CO_2 lasers has been established. Significant and strengthening business opportunities, for this and related technology are being actively pursued.

Borehamwood Establishment

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

Foreword by
Mr. P.F. Mariner, Assistant Managing Director of Marconi Avionics Ltd and the company's chief executive for the Borehamwood Establishment.

The exploitation of new technology in high speed processing and software programming, and the development of new products is fundamental to the contribution that this year will make to the future. The new products, the Foxhunter radar and the AEW Mission System, have this year passed through the first stages towards production and there are already encouraging signs of export interest. The application of new technology to these products will enhance their capability to capture the new lightweight combat aircraft market and research is being directed to achieve this objective. The application of new technology which caused us to be chosen for the Army surveillance programme will result in a new battlefield radar to continue our fifteen years of export successes with ZB 298. In addition to these new activities aimed at our future home and overseas markets we have been consolidating our existing programmes.

Throughout this year we have had to concentrate on the fulfilment of the multitude of detailed design tasks necessary for the realisation and proving in their totality of the final designs for production of our two major airborne radar systems, and our shipborne sonar processing systems. By purposeful and sustained efforts on the part of many of our employees throughout the year we have made impressive and gratifying headway, but there still remains a need for this dedication to be continued over the coming months before the task of bringing these extensive systems from concept to production is completed and we can reap the benefits in recognition, prestige and further business that will follow.

The new premises we moved into last year at Milton Keynes were soon fully occupied and pressure on space is already building up with the increasing breadth of activities which must be undertaken as our major development projects mature, and the requirements of production and support have to be implemented. Three new premises have been acquired this year at Welwyn Garden City to accommodate the growing manufacturing tasks on naval acoustic signal processing systems.

Some people will see the outcome of their own efforts mentioned explicitly in the divisional reports. I would like also to give recognition to the vital contribution of the many other employees who provide the supporting service to the 'front line' activities and to the many engineers and production staff engaged in the other important activities which have not been singled out for mention this year.

Airborne Warning Systems Division has supplied and commissioned development model AEW Nimrod Mission System Avionics (MSA) in the Integration Rig at Woodford and in the Reliability Rig. Systems have been fitted to two aircraft, soon to start flight trials. The first service model MSA is in the Hemel Hempstead Rig.

Orders for RAF Mission Simulator, Handling Aids and MSA Test Equipment have started significant new activity. Microwave and transmitter expertise has been applied to the prototype and pre-production TR units of the company's new lightweight low cost radar.

Airborne Radar Systems Division is currently occupied with development and production of the Foxhunter interception radar of the Tornado Air Defence Variant and is making radar sub-systems for the Interdiction/Strike version. Foxhunter development trials in a Buccaneer aircraft have been followed by Tornado F2 preliminary system trials, with a prototype radar. The first pre-production radar is delivered and further models are nearing completion.

The Division is also systems manager for a complete avionics package for small fighters and makes the lightweight low cost radar. Other such radars with greater facilities are being designed for export.

Mobile Radar Division, having successfully commissioned a large perimeter security system at a West German nuclear site, has won further contracts for security work, including the supply of military surveillance equipment to the Middle East, with the prospect of further business there.

Although an advanced battlefield surveillance radar was selected for the British Army, after years of competition, funds are not immediately available to start the project and the design is meanwhile being advanced for export.

Airborne Software Division provided new issues of software for successful flight trials of the Foxhunter radar. The AEW Mission System software is currently operating in the Woodford Integration Rig and will soon be working in flight in the AEW Nimrod prototype. Development, testing and commissioning of such operational software systems have required many important items of supporting software.

Direct access to the Division's GE4080 computer installation is now available at Borehamwood, Radlett, Hemel Hempstead and Milton Keynes.

Special Projects Division is developing a series of acoustic signal processors for its major customer, the Royal Navy, embodying the most advanced digital electronics and displays. Prototypes, in the early trials stage, will shortly be at sea.

During the year continuing orders were received and contracts for pre-production and production of sonar equipments are confidently expected. Overseas interest is germinating in the Division's products and an export order should be forthcoming next year.

Neutron Division is supplying its range of High Intensity X-ray generators and instruments to all parts of the world. Deliveries of major equipments to France, Germany, the Netherlands, Italy, Iraq, India, Australia and the United States of America have been made this year.

Development work on CO_2 lasers, to achieve a substantial increase of peak power output and pulse repetition rates, is being successfully executed and will extend a world leadership in this field.

A development model of the AEW Aerial and Scanner undergoing vibration tests

Thick Film Department has expanded its activities in producing Thick Film circuits for Borehamwood and Rochester divisions. Significant orders have also been fulfilled over the year for external commercial and Government customers, and further repeat orders are now expected.

The production phase of the BS9450 Capability Programme has now been completed and approval is expected early in 1982.

The Central Machine Shop provides machining, sheet metal and surface finishing facilities to implement all existing equipment designs.

Major radar projects are moving into the production phase when further machining facilities will be needed, particularly in the numerical control field. The operation has recently moved into new premises in Borehamwood with new painting and plating facilities installed

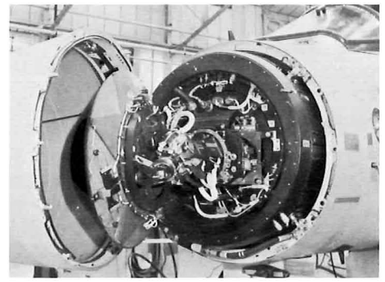
Central Quality Department services in support of Company's projects include environmental testing, calibration, component testing, quality audit, vendor quality assessment and the production of quality standards and procedures.

The recently procured 30,000 lb thrust vibration facility, with digital random control and a large scale integration component test system, have both enhanced the department's capabilities. Work of particular interest during the year includes the environmental testing of development models for the AI radar and AEW systems.

Lightweight Structures Department at Radlett has overcome the numerous technical problems involved in putting a number of lightweight aerial systems into production. The facilities, experience and expertise acquired, are unrivalled for the development and manufacture of high performance precision composite structures, in particular lightweight aerials, and full technical back up and testing service is provided.

The Research Laboratory supports all these activities in the technologies needed for current and potential business. It advances techniques and expertise, undertakes feasibility studies, initiates advance development and acts as a centre of expertise and information for systems design, engineering, manufacturing and marketing.

Some 35 items of Research and Development currently in progress include ultra low power consumption signal and display processing for battlefield radars, compact frequency analysers, coherent detection systems for a new generation of laser radars, radar technology and system studies for future combat aircraft, and new techniques for the 3mm waveband.



Prototype Foxhunter radar in Tornado F2 prototype aircraft (DB2)

The Model Shop at Borehamwood, Radlett and Milton Keynes, supports the Research Laboratory and all Divisions by the manufacture of mechanical and electronic prototypes. During the year it has contributed substantially to the AEW Nimrod, the Tornado ADV and the lightweight low cost radar projects.

Central Publications Department has enhanced its capabilities in reprographics, illustrating, photography and word processing. Worthy of special note are the acquisitions of another off-set litho printer, an interchangeable series of word processor systems providing on-site services to each Division as well as a central service, OCR input (Tele-typewriter) and new platemaking and bookbinding machines. The department has taken on responsibility for stationery purchase and distribution, and the 9200 Xerox printer service.

A micrographics department is being created to provide a top-quality, fast, in-house service for 35 and 16mm microfilming and printing.

Accounts Department has faced a multitude of problems arising from the rapid growth of the Borehamwood establishment both in business and workforce, and in the number and geographic spread of its sites. To solve these, new and complex computer routines have been introduced, for the major activities within the department, which are now successfully bedding down.

Personnel Department has made steady advances in such employee-related work as Training and Welfare.

The Training Department has for the first time run a full programme of Support Technology seminars and Skill Development courses for all new graduates. The Training Centre at Kenwood House is having a major impact on the staff training opportunities available. A wide range of management, supervisory, electronic skills and specialist health and safety courses have successfully been completed.

A major task begun in 1981 is career development for new members of staff at Milton Keynes.

Increased welfare activities have particularly involved members of staff approaching retirement. Several pre-retirement courses have been run and a new section of the Sports & Social Club now caters for many retired employees' interests.

In response to growing youth unemployment in South Hertfordshire and Buckinghamshire, the Company's Work Experience Programme is now giving a number of young school leavers their first taste of employment.

Basildon Establishment

– covers Basildon and Stanmore

Foreword by W.R. Paterson, Director and General Manager of MAv and the chief executive for the Basildon Establishment.

1981 at Basildon has been a year of change, with many successes and a few disappointments.

Throughout the year significant changes have been taking place including the occupation of 'J' Building, now nearly complete. The site has now gone over to computerised buying, invoice clearance and production control. During the year we saw the commissioning and use of a new computer aided design facility in APD and the commissioning and use of the GEC 4065 computer, together with the new "Intellect" facilities for fast picture processing in EOASD.

Among the successes, the AD3400 multi-mode transmitter/receiver was selected for a major UK programme. Important new orders were obtained for Heli-Tele. FAA certification of the AD660 doppler was achieved. In September, the government decided to develop the new Heavyweight torpedo in the UK with all its potential ramifications for work at Basildon.

Disappointments included the galling experience of beating all competition with our SHORSTAS proposals, only to see funds withdrawn from this UK programme.

Significant milestones during the year include the completion of a scene-matching demonstrator; jam-resistant communications equipment was delivered for evaluation, the first assembled modules for the A.I. Radar were delivered to Milton Keynes and our new SACLOS system was successfully tested, resulting in an order for full development.

These achievements and many others besides are the result of the skills and commitment of our workforce which has shown a willingness to respond to new challenges and problems which beset us. Improved communications have played their part and although there is still room for further improvement, 1981 saw the introduction of several new techniques including the Company news sheet, 'Insite', a successful Open Day and local on-site exhibitions of a specialised kind.

Success in the business areas at Basildon owes much to the back-up services provided by Personnel, Training, Medical, Safety and Accounts departments, the Central Machine Shop, Works Engineering, Transport, Telephonists, Goods In, Packing & Despatch, Central Purchasing and Reprographics.

With Company support, the MAv Club (Basildon) is committed to erecting a Club House on the new sports field in use for the first time this year.

Electro-Optical Advanced Systems Division is transferring its production department to the new Pipps Hill premises where administrative and technical departments are already installed. The signal processor team for the successful Sting Ray project is now working on the new heavyweight torpedo. New developments cover navigation and sensor and processing systems for missiles and submunitions and an industrial, robotic, visual inspection system.

The future systems laboratory continues image processing developments and new work includes underwater inspection, with North Sea potential.

Airadio Systems Division has made excellent progress in the production phase of the AEW Nimrod Communications System and is developing a ground training simulator for the entire system. A substantial spares order has been received.

Work on the communications system for the Sea King replacement helicopter has scope for expansion due to military and civil variants under the EH101 programme.

Secure communications systems for Naval and RAF aircraft and JTIDS contracts provide continuing major business.

Overseas opportunities, including secure communications, data link and integrated control, are being followed up in Italy, South America and the Middle East.

Electro-Optical Surveillance Division continued producing Thermal Imaging Common Modules for which it is the UK contractor and acknowledged leader, with Rank Taylor Hobson as partner. Work continued on thermal imaging sensors for unmanned aircraft and high-resolution FLIR (forward-looking infra-red) systems.

Heli-Tele's £2 million exports more than doubled last year's. For small and medium helicopters and adaptable for day and night operations, Heli-Tele has sold to the UK, Continental Europe and the Middle East. A mobile long-range ground station now gives greater versatility.

The Central Machine Shop has continued to invest in the latest machines, having acquired a second Horizontal CNC Mill, bringing the total of NC/CNC machines to ten. Current and all future work will be controlled by the mini computer, which is now fully programmed, using three VDU's positioned in the Workshop and Office areas. The process area, associated with the new paint shop, is now being refurbished.

Close liaison has been maintained on potential new projects at most MAv sites and the size of the team has been constant.

Costs, time-scales and quality remain challenges which CMS cannot ignore if it is to retain its share of orders.

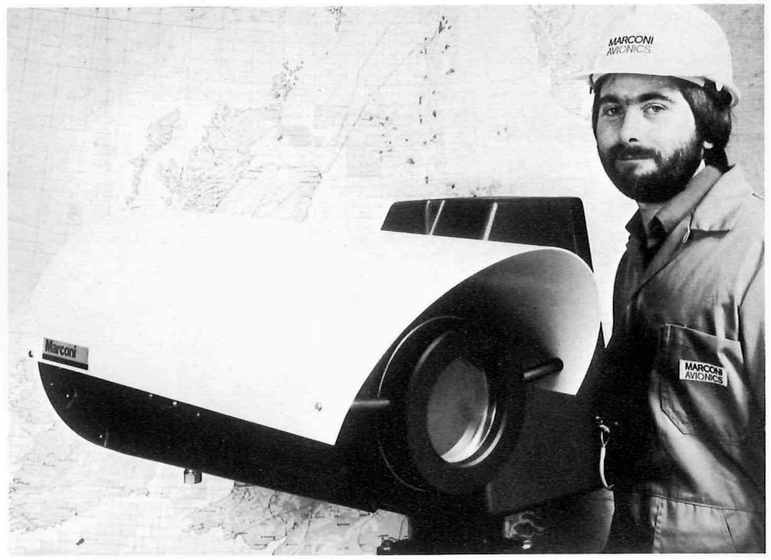
Electro-Optical Products Division has successfully developed new business across a very wide product range and has fulfilled important industrial and military orders. Television system successes included V330 radiation-resistant equipment for CEGB nuclear power stations and V327 "flameproof" systems for Statfjord oil production platforms, both of which are now UK market leaders. Exports included security surveillance systems. Military systems included a television and communications complex for the British Army and the development of a new guidance system for missiles.

Airborne Radar Systems Division's team at Basildon manufactures line replaceable units (LRU) of Tornado aircraft radars. For the IDS (strike) version, several companies contribute to the terrain-following radar. The Division's batch of 53 transmitters and power supply units was the first to be delivered – well ahead of schedule. Work has also started on the Marconi Avionics advanced Foxhunter radar for the RAF's air defence variant of Tornado, six LRU for which will be made at Basildon.

Airadio Products Division's continued supply and support of a wide range of airborne radio products included ADF, alone selling over £1 million. New efforts to market AD660 Doppler systems (now FAA and CAA certified), particularly in the USA, are expected to yield major orders. With development nearly complete, export deliveries of AD3400 Multimode radios start soon and an important UK order has also been won.

New developments include a Communications Management Unit for helicopters, applying aircraft equipment to trains and tanks and a new airborne speech enhancement system for high noise environments.

New AD 1550 Communications Control System.



V327 Safe flameproof camera for oil rigs.

Services Control's team of fifty people provide Transport, Packing, Telex, Telephone, Post, Reception, Goods In, Stationery Stores, Maintenance Stores, Overalls and Central Purchasing services. They dealt with 500,000 telephone calls, 250,000 letters and 30,000 telex messages, and placed orders worth over £1.5 millions. Goods Inwards handled 40,000 consignments, and 45,000 were despatched. Over 250,000 miles were travelled in delivering and collecting.

The Plant Engineering Department has a Site Maintenance Unit, a Project Design Group and a Security Force, serving 9 buildings in 18 acres with a gross floor space exceeding 400,000 sq. ft. 40,000 sq. ft. has been re-organised or uprated. 12 Portakabins have been returned to the hirer and the occupants rehoused.

The conversion of 69,000 sq. ft. of building shell, to house a fully integrated electronics business, was commissioned on schedule. Some 42,000 sq. ft. is currently occupied.

A new electrical sub-station has been completed to meet the increased load mainly attributable to environmental test chamber requirements. The coal-fired heating installation at 'J' building is being carefully observed to confirm its cost effectiveness.

Central Accounts Department services comprise Cashiers, Data Preparation, Invoice Clearance, Control Accounts, Management Accounts, Stock Checkers, Electronic Data Processing and Credit Control.

Wages were paid to 2,350 employees, and approximately 1,000 invoices were cleared per week.

Personnel and Training Although Personnel numbers at Basildon increased over the first half of the year to 2,350, including 200 Apprentices, recruitment has been very carefully controlled throughout the year resulting in an overall reduction in numbers from this time last year. Despite the difficult economic climate, the Apprentice intake in 1981 was maintained, 70 Apprentices and Trainees being recruited. The site also increased the number of young people undertaking work experience at Basildon. Contacts with local schools and universities have been increased to try and improve the quality of young applicants seeking engineering careers.

Considerable attention has been devoted to improving employee communications at Basildon. The first Open Day and Exhibition was held for employees and their families, a site newspaper was introduced and regular quarterly meetings were established with senior representatives from all unions, on future workload and manning.

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A GEC-Marconi Electronics Company

Printed in England

PL 0123