

INTO THE 80'S



GEC

PRODUCTS FOR THE 80'S

GEC's new products are usually developed by teams of technicians in the factories with support from the various central research establishments of the Company.

The central research laboratory at Wembley is able to provide facilities for a wide range of work. Here we report on three research projects leading to new products now under evaluation by potential customers, and most likely to establish themselves as successful parts of the GEC range during the 80's.

DIGITAL TELEPHONE

Your telephone at home and at work probably uses analogue signals. But if it were digital, it could do much more than it does now. A digital telephone provides one speech and two data channels, so you could if you wanted simultaneously talk on it, operate the Post Office's Prestel service and write a message for instant transmission to some far away destination. It could work a fire or burglar alarm and read your meters.



GEC's digital telephone

Britain's Post Office will be studying the system soon and potential customers abroad are already asking for demonstrations.

When the electronic engineers at Wembley set to work on a digital telephone, the problem facing them was that a telephone operates on only two wires — and small ones at that. They overcome this with the Burst Mode (or "Ping Pong") digital system. The telephone they have developed works with other digital equipment

(including the new System X electronic telephone exchanges which GEC is making) and will also co-exist with analogue equipment for as long as it continues to be used.

SOLID STATE CAMERA

All today's television cameras use electronic tubes as the picture sensors. But it has been known for some time that a solid-state device would make possible a small camera which would be tougher and



The CCD camera. Its compactness is made possible by the use of the semiconductor device (held above it) instead of an electronic tube (in the foreground).

longer lasting. The invention of the charge-coupled device, a type of silicon chip, gave the Wembley scientists a solid-state technology which enabled them to produce a camera using a chip instead of a tube. The miniature TV camera has progressed through the 150-line and 300-line stages and on to the present device which has the resolution necessary for Britain's 625-line TV system by including nearly 250,000 picture points.

Competitors in the USA and Japan, whose television systems scan fewer lines, have not had to tackle the same complexities as the Wembley team, whose work should give the British camera a lead in all 625-line system countries, and particularly in Europe.

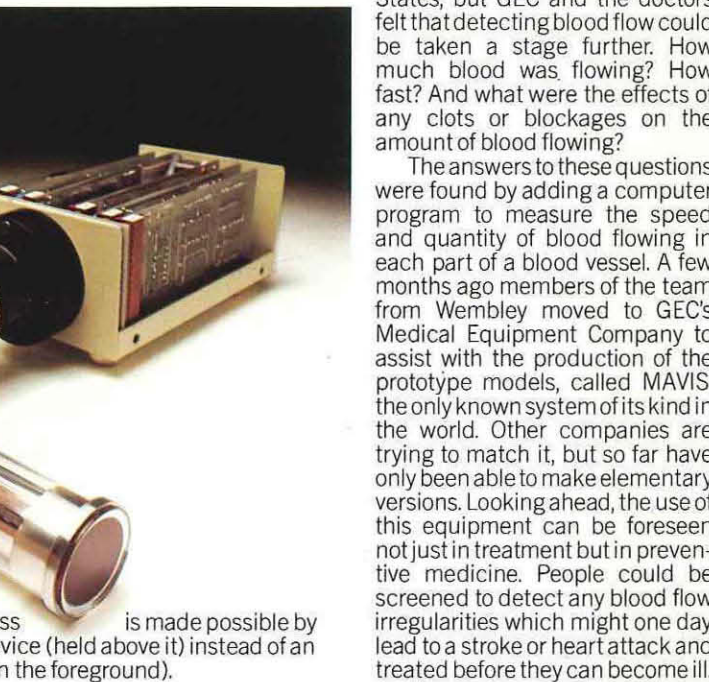
The 625-line CCD camera is being evaluated in a variety of industrial, professional and military applications. Because of its low voltage (less than 20 volts), the camera is of considerable interest to industries such as oil refining and coal mining for surveillance in the presence of inflammable vapours.

With further development, the camera could be used for the home video market, for electronic newsgathering and, eventually, in the TV studio itself.

ARTERY & VEIN IMAGING SYSTEM - MAVIS

Until recently, the only way to examine blood vessels has been to

inject a chemical into the bloodstream and take X-ray photographs as it circulates around the body. This method produces a picture of the blood vessels, and can show if there is a clot or blockage. But it does not show anything about the way the blood flows. It



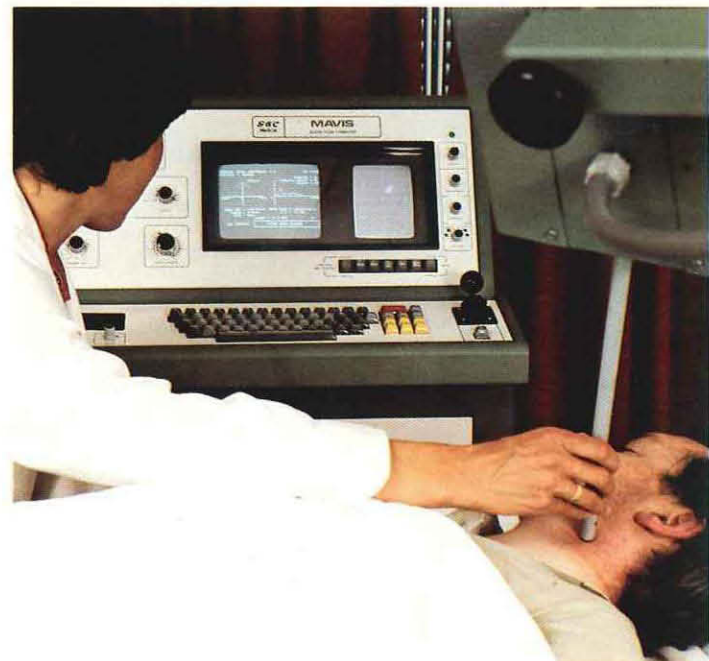
MAVIS being used by a doctor in the examination of a patient at Bristol Royal Infirmary.

work involves the use of a special technique called the Doppler principle, something GEC knows about because of its use in radar systems.

Ten machines were produced for evaluation in specialist hospitals, including one in the United States, but GEC and the doctors felt that detecting blood flow could be taken a stage further. How much blood was flowing? How fast? And what were the effects of any clots or blockages on the amount of blood flowing?

The answers to these questions were found by adding a computer program to measure the speed and quantity of blood flowing in each part of a blood vessel. A few months ago members of the team from Wembley moved to GEC's Medical Equipment Company to assist with the production of the prototype models, called MAVIS, the only known system of its kind in the world. Other companies are trying to match it, but so far have only been able to make elementary versions. Looking ahead, the use of this equipment can be foreseen not just in treatment but in preventive medicine. People could be screened to detect any blood flow irregularities which might one day lead to a stroke or heart attack and treated before they can become ill.

The first computer version of MAVIS was sold in the spring to King's College Hospital; six more systems have been ordered in Britain and two for clinical trials in the US. Accompanying one of the US machines was a physicist from King's College, helped with a bursary from GEC. He has now completed his task, and a doctor from Northwick Park Hospital, Middlesex, is taking over to continue the clinical work.



MAVIS being used by a doctor in the examination of a patient at Bristol Royal Infirmary.

THE INNOVATORS

Innovation takes many forms. It may mean a new product, a new system, a new market or a new way of manufacturing existing products. Here are some recent innovations in GEC which are already contributing to the company's prosperity.

STING RAY

A notable first in defence technology was achieved by GEC with the development of Sting Ray.

Described by Lord Strathcona, Minister of State for Defence, as "A very considerable achievement for British industry," this anti-submarine torpedo was the result of several years' concentrated research and development by a team of Marconi Space and Defence Systems and is unique in being the first weapon of its kind to carry a programmable computer which allows Sting Ray to act for itself in the selection and tracking of targets.

MSDS started work on the project about eight years ago which resulted in a development contract worth in excess of £200 million being received in November 1979. This is one of the largest single development orders won by GEC. Production of Sting Ray over the next decade should exceed £750 million including exports.



John Beeston, leader of the GEM 80 design team with Kim Cheang, a software engineer.

cross-channel link to extend the connection between the British and French electricity grids.

GEM 80

"Silicon chips" and "microprocessors" are buzz words these days. But GEC has been using these

techniques. Our customers like it; orders so far exceed all expectations. Half the orders are for export, including one worth over half a million pounds.

COMPUTER-AIDED ENGINEERING

GEC believes it can claim to be the biggest user of computer-aided design in Britain. The technique is in use in the majority of GEC's factories mostly in limited form such as in the design of printed circuit boards. But in some sites, particularly our electronics factories, there is computer-aided design and computer-aided manufacturing. The two are linked so that designs are passed directly to manufacturing machines.

In years to come, computer-aided engineering will come into its own. This means computers linked together will integrate design, manufacture and other factory activities such as production planning and stock control.

REDRING'S KETTLE

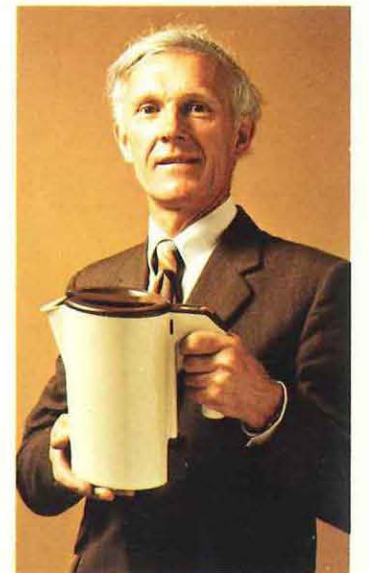
Not all GEC's products need to be as sophisticated as the ones we have already described. At the beginning of 1980, Redring introduced a new automatic electric kettle. It was an instant success and the company has been selling them at the rate of 10,000 each month since then.

The Autoboil is the first major change in the concept of kettles for 280 years (it is shaped like a jug and has a pistol grip handle on the side).

It was made possible because plastics suitable for kettles had just become available. This meant greater freedom for the designer.

The kettle is virtually unbreakable, its shape means that you have to heat only as much water as you actually need, thus saving money and energy. The pistol grip means that the kettle is easier to fill and when pouring your hand is away from the steam.

It will also be safer and easier to use for blind, handicapped and elderly people.



Max Byrd the engineer who developed Redring's new automatic electric kettle.

WE DON'T WIN 'EM ALL

But GEC has its disappointments too. Marconi Radar (with Plessey) spent five years trying to establish a cost-effective system for the Civil Aviation Authority's radar replacement programme. In the event, the CAA specification was such that no single supplier could meet its requirements. And because of its timescales, resulting from the years lost in discussion, the CAA resorted to a hybrid solution — German antennas, Dutch transmitters and other parts of the system bought from three British suppliers including advanced monitoring and control from Marconi Radar.

Marconi Radar's lost opportunities did not end there. Having spent £10 million developing its Martello three-dimensional radar, the company offered it for the first stage of general modernization of the British air defence radar system. The order in the end went to an American company, which put in the lowest bid, helped by the fact that its development cost had already been covered through sales to the US Government, whereas Marconi's price had to reflect the cost of the new development paid for out of private funds.

There are more radar orders to be placed. Marconi Radar will keep on trying.

NEWS OF THE YEAR

The year got off to a flying start with the launch of the Ariel 6 satellite, built for the Science Research Council by Marconi Space and Defence Systems. With three main scientific experiments on board, it is hoped that Ariel 6 will greatly extend current knowledge on high energy astrophysics.

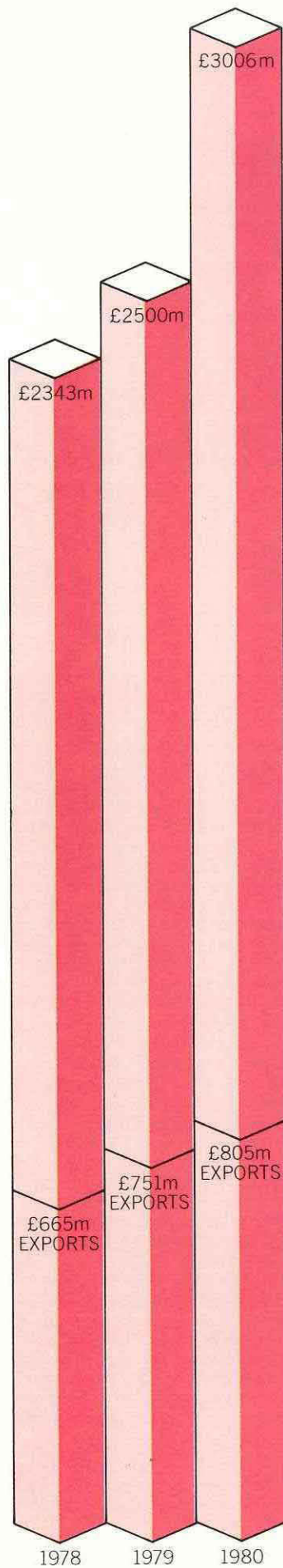
Then GEC Turbine Generators secured one of the largest ever orders to be won by a UK company for turbine generator plant. It was a £100m contract from Hong Kong's Kowloon Electricity Supply Company for the second phase of their Castle Peak power station which will greatly enhance the generating capacity of one of the fastest growing communities in the world. The year saw the start, ahead of schedule, of the Duvha power station in South Africa and the commissioning of a 660MW machine at Peterhead, Scotland.

And subsequent to our year end, just a week before receiving the Queen's Award for Export Achievement for the second time, the company won a £200m contract to supply turbine generators to the new South African Tutuka power station. At a time when the UK turbine generator industry is suffering from a severe shortage of home orders, export contracts of this kind are essential for its survival. GEC has won more than 95 per cent of all export power plant orders awarded to UK companies since GEC Turbine Generators last won the Queen's Award in 1977—a total export value for Britain of over £700m in three years.



Marconi Radar Systems too rounded off the year with a Queen's Award for Export. The company has almost trebled its export sales in the last three years, with an increase of 68 per cent in the past year alone.

SALES TO CUSTOMERS



Some Marconi companies have massive order books and in some areas are constrained only by the need to attract more highly skilled people. New factories are being opened at various locations.

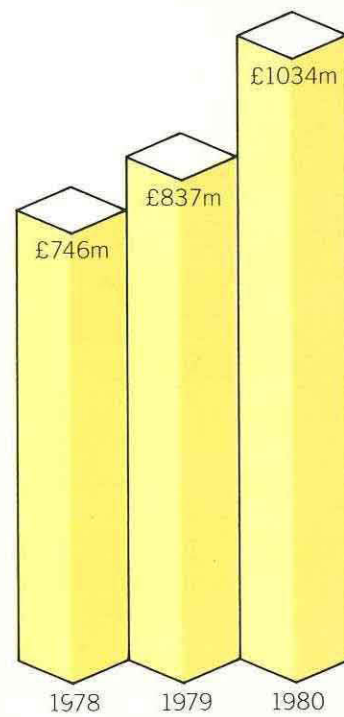
Ruston Gas Turbines of Lincoln and GEC Electrical Projects, Rugby, were also particularly suc-

cessful with overseas customers. Ruston won more orders for gas turbine-driven crude oil pump sets from the Mexican state oil company valued at nearly 18m US dollars. And GEC Electrical Projects is to provide £14m worth of drive systems to be installed into a Yugoslavian steel mill complex.



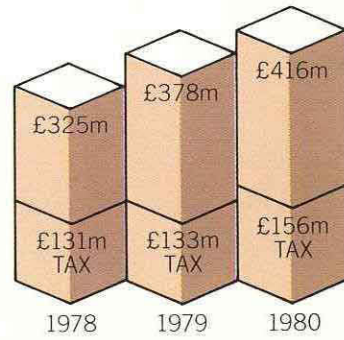
Part of a new System X telephone exchange now being built for the Post Office (inset) contrasted with part of a Strowger electromechanical exchange, which System X is replacing in Britain's telephone system.

WAGES AND SALARIES INCLUDING NATIONAL INSURANCE & GEC CONTRIBUTION TO PENSIONS



In Geneva GEC was well represented at Telecom '79, a major international telecommunications exhibition. Managers and employee representatives from GEC Telecommunications flew to Geneva to see the launch of System X, Britain's revolutionary electronic telephone exchange system in the design and production of which GEC is playing a major rôle, and they were also able to familiarise themselves with products of the company's international competitors.

PROFIT AFTER HISTORICAL COSTS AND BEFORE TAX



NEWS OF THE YEAR

MY MESSAGE TO OUR EMPLOYEES

Our results for the year show that where we can achieve high efficiency and excellent design, we can sell our goods and services to demanding customers, even when the economic climate is unfavourable. It may not be easy, but that, to the best of our abilities is what we all have to do.

I realise that you want to know more about the performance and prospects of your own local GEC unit, so this year we are making particular efforts to provide what you want.

We have made a film about GEC and hope everyone will take the opportunity to see it. If you will take the trouble to watch the film, read this report and go through the "Review of Activities", you will be much better briefed to discuss with management the affairs of your particular unit and, not to be overlooked, its place and yours in the GEC group.

Arnold Weinstock

Exhibitions provided an important platform for GEC companies during the year. GEC had one of the largest stands at the British Energy Exhibition held in Peking in June 1979. Some 50 engineers were there to explain our equipment at one of the group's most ambitious displays outside the UK.

The year saw the opening of the Hong Kong Mass Transit Railway, in which GEC Rectifiers and GEC Traction played leading parts. Rectifiers provided a complete fail-safe power system, and Traction were main sub-contractors for the drive motors and vehicle control equipment. GEC High Voltage Switchgear, GEC Transformers, AEI Cables and GEC Hong Kong also contributed to the project.



Hong Kong's Mass Transit Railway

Fans of the Bob Monkhouse 'Family Fortunes' TV show have, probably unknowingly, been tuning in to the expertise of the English Electric Valve Company and GEC Semiconductors. The show's display board was designed and assembled by EEV, and GEC also supplied the keyboard control console.

The expected rapid application of industrial robots led to the GEC's acquisition of Hall Automation, Watford, the leading UK producer of these machines. Established in 1974, most of the company's main product lines are export winners and annual sales are shortly expected to reach £1 million.

The fast expanding GEC electronics sector led to 1650 new jobs being created in GEC-Marconi Electronics during the year with more to come. AEI Semiconductors has sited a new factory in Lincoln which will provide 150 new jobs and help meet the growing worldwide demand for semiconductor products for power and microwave applications.

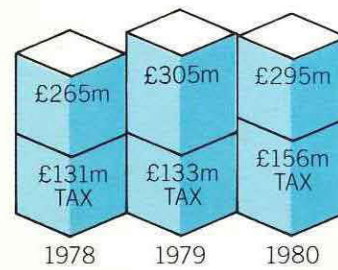
At Nailsea, near Bristol, approximately 1,000 new jobs are to be provided by Marconi Avionics which intends to establish a base for the design, development and production of control systems for the offshore oil industry.

Marconi Space and Defence Systems achieved a major success with a £200m government contract for the final development and initial production of the Sting Ray anti-submarine torpedo. Workers at Marconi factories in Stanmore, Portsmouth, Frimley, Rochester, Kidsgrove, Basildon and Hillend will benefit.

At home, Averys finally joined GEC. Best known for its scales and weighing machines, Averys has some 12,000 employees and a turnover of nearly £120m. Its products are wide ranging — petrol pumps, food packaging equipment and office furniture to name but a few. Averys' reputation and products are important and a welcome addition to GEC.

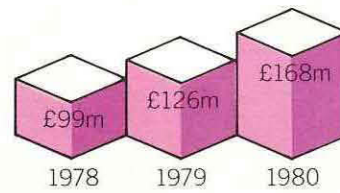
CURRENT COST PROFIT

Part of the profit as shown in the brown columns is treated as being required to offset some of the effects of inflation. Notably there is extra depreciation to recognize the rising prices of the plant and buildings used in the business. To replace something bought five or ten years ago is going to cost much more money than when it was bought originally. Similarly there is the extra cost of replenishing raw materials and components used in producing goods.

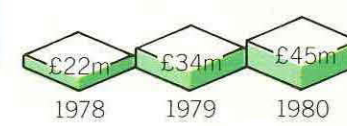


NEW INVESTMENT BY GEC

In addition to the £168 million, shown below, which GEC invested in new factories, machinery and equipment, GEC paid a total of £150 million to buy AB Dick, Averys and Hall Automation, making total New Investment of £318 million.



DIVIDENDS ON SHARES



Devising better and more efficient methods of manufacture, and developing new products which will secure business and provide job security; these were GEC's intentions at the beginning of the year. It can be reasonably claimed that they were achieved.

After the end of the financial year GEC and Fairchild Camera and Instrument Corporation of California, after a thorough review, decided not to continue their joint venture in "standard" semiconductors. GEC acquired the Fairchild interest in the joint venture company and a new factory being built by the joint venture company in Neston, Cheshire. GEC will complete the factory, which is in the Merseyside Special Development Area, and it will be used by Marconi Space and Defence Systems for the Sting Ray underwater anti-submarine missile programme. Marconi expects to employ 400 people and there are prospects of further jobs as the programme develops.

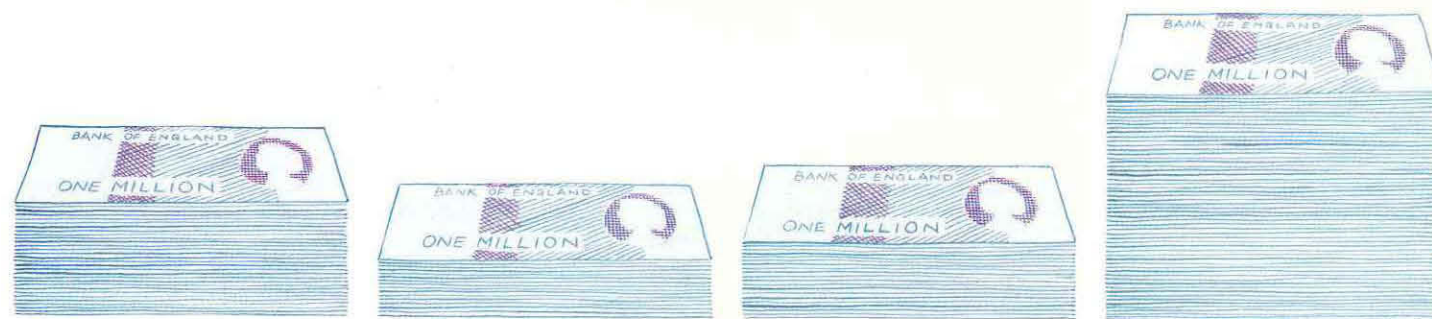
GEC meanwhile is reorganising and strengthening its activities in semiconductors (including large-scale integrated circuits) which are custom-designed for equipment manufacturers inside and outside the GEC group.

One of the first steps has been to sign an agreement with Mitel Corporation of Canada to obtain their advanced ISO-CMOS integrated circuit technology which has been very successfully applied in the telecommunications industry. The Mitel technology will also be applied and developed for many other applications. Full scale production will be undertaken at Lincoln.



In parallel with the Mitel licence, GEC will continue with its research and development work on the silicon-sapphire process already established at GEC's Hirst Research Centre.

WHAT CAME IN & WHERE IT WENT



SALES IN UK

EXPORTS FROM UK

OVERSEAS COMPANIES' SALES

TOTAL TURNOVER

£1834m + £805m + £915m = £3554m

The year's sales in the UK by GEC units, including sales of components and other products between GEC units at arm's length prices, and GEC's share of associated companies sales.

Sales from the UK by GEC units.

Sales made by GEC units based overseas, and GEC's share of sales of its overseas associated companies.

Turnover is sales to outside customers (£3006 million), together with sales at arm's length to other GEC units at home and abroad (£205 million) and GEC's share of the sales of its associated companies (£343 million).



PURCHASES

VALUE ADDED FROM OPERATIONS

INTEREST AND INVESTMENT INCOME

TOTAL VALUE ADDED

- £2056m = £1498m + £74m = £1572m

Purchases of raw materials, components, goods and services (electricity, rates, etc.) including those bought from other GEC units.

The difference between GEC's turnover and what we had to pay for purchases is the value which was added by our own efforts in converting raw materials and components into products which can be sold.

Interest and Income earned on GEC's cash savings and investments which are invested in companies, deposited with banks (net of interest on overdrafts) and loaned to Governments.

The total amount of the value added by our efforts in operating GEC units and associated companies, together with the interest and investment income earned from GEC's cash and investments.



TOTAL VALUE ADDED

WAGES AND SALARIES

TAXATION

INTEREST ON LOANS

£1572m went on **£1034m** and **£156m** and **£41m**

The following columns show how we spent it.

Employees: In wages, salaries, National Insurance and GEC's contribution to Pensions for its **153,000 Employees in the UK** and **35,000 Employees overseas**.

Governments: Company taxes payable to UK and other Governments; (actually paid in the year, £132 million).

Providers of Loans: To lenders to GEC of £350 million.



DIVIDENDS ON SHARES

DEPRECIATION

RETAINED PROFIT

NEW ACQUISITIONS

and **£45m** leaving **£82m** and **£214m** **£150m**

Providers of Capital: To 160,000 shareholders with funds in GEC of £1,357 million.

Retained in the Business: Set aside for renewal of buildings, plant and machinery based on their original cost. Because replacement costs have risen and because it is updating and improving its assets, **GEC actually spent £168 million on new property, machinery and equipment.**

Retained in the Business: Besides providing £86 million towards the £168 million spent on new property, machinery and equipment retained profit was also used to increase working capital by £125 million – more stocks and inventory of materials and components, more credit given to customers on higher sales after taking into account higher credit received from suppliers and other sources of cash. This left less than £5 million. **But GEC spent £150 million on buying companies. Where did this other £145 million come from?**

Of the **total cost of £150 million for acquiring companies** (AB Dick, Averys, Hall Automation etc.) GEC paid £135 million in cash and issued almost £15 million of loan notes. After taking into account the balance of the retained profit in the year and minor sales of assets, etc, **GEC used about £130 million of cash out of savings.**

FOR DETAILED NEWS OF THE PERFORMANCE OF GEC'S PRINCIPAL OPERATING UNITS AND ASSOCIATED COMPANIES, SEE THE REVIEW OF ACTIVITIES

YOUR QUESTIONS ANSWERED

Your response to our invitation last year to ask questions proved even more popular than in the previous year.

We received over 400 forms or letters from employees and shareholders. Most people asked more than one question so in the end we were asked over 1,000 questions. We answered every one.

Here are some of the more popular questions and summaries of the answers:

Q We keep hearing that British industry needs more engineers at the top if we are to continue improving the design and quality of our products. How many engineers are on the Board of GEC?

A We certainly do have engineers on our Board including: Lord Nelson of Stafford MA, F Eng, F Inst P, FIEE, FIEEE, F R AeS, FR Ae S.

Sir Robert Clayton MA, Hon D Sc (Aston), Hon D Sc (Salford), F Eng, F Inst P, FIEE, FIEEE, F R AeS, FIERE.

Mr J W H Morgan B Sc (Eng), F Eng, FI Mech E, FIEE.

Mr W D Morton MA (Hons Cantab), F Eng, FI Mech E.

Sir Robert Telford MA (Cantab), F Eng, FIEE, FI Prod E.

Mr A J R Veale AMCT, F Eng, FI Mech E, FI Prod E.

Amongst the other directors there are two qualified accountants and one solicitor.

Q Why don't you send out pre-paid and addressed proxy cards to shareholders for GEC's Annual General Meeting? Most public companies try to encourage shareholders involvement, not make it more difficult.

A We do not pay or contribute to the expenses of shareholders who attend the Annual General Meeting, and we do not feel we should pay the postage incurred by those shareholders who prefer to vote by proxy and do not attend the meeting.

Q Now that tax incentives have been changed, are you likely to introduce a concessionary scheme for GEC employees to buy shares in their company?

A Although GEC does not regard the existing limited and restrictive tax concessions as a suitable basis, for the introduction of a scheme for the purchase of shares by employees, the subject is constantly under review in the light of changing legislation.

NB The further changes in legislation since this was written do not alter the position. Tax incentives have been improved only marginally and it is still necessary for shares to be held by trustees for a minimum period of four years to obtain any income tax advantage, and for a period of seven years to obtain full income tax relief. Any gain on the shares is still subject to Capital Gains Tax. Also, and this is in our view even more important, it

is not possible to relate the benefits to each employee's own recognisable efforts or to the success achieved by an individual unit or company in the Group. These disabilities enormously reduce the potential attraction of an employee share ownership scheme and destroy its value as an incentive.

Q Engineering has traditionally been a man's world. How many women does GEC employ; what proportion of your managers are female and what are you doing to encourage this proportion to rise?

A The percentages of women in managerial, professional and supervisory jobs in GEC are as follows: (at 31 March 1980 GEC employed 41,500 women) managers 0.35%; scientists and technologists 3%; technicians, technical engineers, and draughtsmen 4.5%; administrative and professional staff 16%; supervisors and foremen 10%.

Most of our senior people are qualified engineers with many years' experience in industry. But now that more women are training as engineers, we expect that the proportion of women in senior positions in GEC will rise considerably over the years.

Our operating companies are responsible for ensuring equality of opportunity. However, GEC Headquarters circulates to all our companies a list of points for guidance and consideration. We also have a small working party of experienced people which meets from time to time to consider how we can encourage equality of opportunity. The subject is also discussed with the trade unions at national level.

Q As a shareholder and employee I wonder why GEC keeps such a large cash sum sitting just earning interest? Like the EEC butter mountain, it does not seem to be much use. If GEC won't invest it in the present business or in any other businesses, why not give the cash back to the shareholders, who would find it useful?

A We are constantly seeking suitable opportunities to use our cash reserves for expansion and new investment, in the UK and overseas. Our acquisition of A B Dick Company in the USA at the beginning of this financial year, at a cost of over £50 million, has given the Group access to new products and markets, and in the UK the recent purchase of Averys for almost £100 million is a firm indication of the Group's interest in gaining access to new sales and service outlets for the products of its factories. Of course, with Group sales exceeding £2,500 million in the year to March, 1979 (in 1980 over £3,000 million), very substantial cash balances are required to cover trading variations during the year and for tax payments, capital expenditure, repayments of Loan Stock and so on.

NB Since this was written, the wisdom of maintaining substantial cash reserves in the present climate of inflation and economic stringency must now be obvious to all. At a time when many companies are having to borrow money at high interest rates just to stay in business – thus cutting their profits and reducing the likelihood of their being able to invest in new machinery – GEC is very much more secure. So, this year, new investment in GEC has again reached a record level of £168 million. And GEC is still keen to invest further in Britain and abroad.

Q How many disabled people do you employ and do you make a point of subcontracting work to work centres for the disabled?

A We cannot tell you the exact number because since GEC is decentralised records of this nature are kept at each factory and not centrally. We encourage all our operating units to employ disabled people as far as possible. Wherever work centres for the disabled have been set up by local authorities, local GEC units will subcontract any available work.

Q How does GEC compare in manpower with nationalised industries?

A We are the largest private employer with 153,000 employees in 1979, in the UK. Of the nationalised industries, the Post Office 430,000, the Coal Board 288,000 and British Rail 244,000, employ more. BL 140,000, British Steel 138,000, British Aerospace 72,000, Central Electricity Generating Board 62,000, Atomic Energy Authority 14,000 and the British National Oil Corporation 1,600, employ less. These figures are the most recently published employment levels.



Send this coupon or a letter to The Secretary, The General Electric Company Ltd, 1 Stanhope Gate, London W1A 1EH

ANY QUESTIONS?
Please answer the following questions about GEC

* I am a shareholder/an employee
My name and address is

* Delete where inapplicable