

## The General Electric Company PLC

### History and development

2.1. GEC owes its origins to the General Electric Apparatus Company which was formed in the mid-1880s and whose business in the manufacture of electrical fittings and telephones was transferred to GEC when it was incorporated as a private company in 1889. By the end of the 19th century GEC employed 3,000 people and had overseas agencies as far afield as Calcutta, Johannesburg, Sydney and Tokyo. In 1900 the company was made public by flotation on the Stock Exchange.

2.2. The First World War greatly increased demand for electrical goods and as a result GEC expanded dramatically. The inter-war years and the Second World War saw further growth in the company. After the Second World War GEC considerably expanded its range of domestic electrical equipment. GEC is one of the major United Kingdom manufacturing and exporting companies. The present size and shape of the group has been built upon its acquisition of Associated Electrical Industries Ltd (AEI) in 1967 and the merger with The English Electric Company Limited (English Electric) in 1968.

2.3. The GEC/English Electric merger was strongly supported by the Industrial Re-organisation Corporation (IRC) in preference to a rival Plessey bid for English Electric. The IRC encouraged the merger because it considered it would lead to the necessary rationalisation of the heavy electrical engineering concerns and because the enlarged group would add to the United Kingdom capability in electronics. As a result of the mergers as well as over-capacity in its electrical engineering activities the combined group had a considerable overlap of products. GEC carried out a programme of reorganisation and restructuring which integrated the various businesses into a series of operating units with their own manufacturing development and marketing facilities. The process was largely accomplished by March 1972. One hundred and fifty-five separate operating activities were reduced to 64 units. Of 171 major locations, GEC has told us only 29 were unaffected by rationalisation measures; 49 were closed down and 10 went to companies outside GEC on disposal of the businesses. GEC told us that in view of the extensive over-capacity on the engineering side there was inevitably a substantial reduction in the workforce. The total pre-merger workforce of GEC, AEI and English Electric of 241,000 had by 1972-73 been reduced to 170,000, achieved wherever possible by voluntary redundancy and natural wastage.

2.4. At the end of the 1970s GEC made two major acquisitions: AB Dick Company of Chicago which manufactures and distributes duplicators, copiers and word processing equipment and is also involved in non-impact automated identification, coding and industrial marking; and Averys Ltd, the leading United Kingdom company engaged in the manufacture, sale and servicing of weighing and measuring equipment.

2.5. In 1978 GEC entered into a joint venture with Fairchild Instrument and Camera Corporation of the United States of America (Fairchild) for the production of integrated circuits (ICs) in Liverpool. GEC told us that shortly after it entered into the joint venture Fairchild was acquired by an American company, Schlumberger. Schlumberger's management was less enthusiastic about the joint venture and commissioned a consultant's report which indicated that the venture would not be viable. Although this did not correspond with GEC's own view, GEC accepted that it would not be right to continue with the venture with an unwilling partner. The joint venture was therefore terminated. GEC acquired the factory which was put to alternative use.

2.6. In 1981 the group acquired three American companies: Circuit Technology Inc which designs and produces hybrid circuits; Picker International Inc, a major United States manufacturer of medical diagnostic imaging equipment; and Cincinnati Electronic Corporation which designs and manufactures electronic equipment and components for military radio communications and aerospace projects. In 1985 GEC bought Yarrow Shipbuilders Ltd.

2.7. The expansion in the sales and trading profits of the GEC group in the past 15 years is shown in Table 2.1.

TABLE 2.1 GEC sales and trading profits, 1971 to 1985

		£ million			
Year ended 31 March	Sales*	Sales revalued by RPI (year ended March 1985 = 100)	Trading profits* (before interest and tax)	Trading profits revalued by RPI (year ended March 1985 = 100)	Profit as % of sales
1971	924	4,414	77	368	8.3
1972	975	4,263	86	376	8.8
1973	1,023	4,177	119	486	11.6
1974	1,144	4,229	132	488	11.5
1975	1,406	4,409	141	442	10.0
1976	1,752	4,409	184	463	10.5
1977	2,055	4,486	231	504	11.2
1978	2,343	4,487	294	563	12.5
1979	2,501	4,422	328	580	13.1
1980	3,006	4,590	360	550	12.0
1981	3,462	4,544	381	500	11.0
1982	4,190	4,933	431	507	10.3
1983	4,626	5,086	462	508	10.0
1984	4,800	5,043	501	526	10.4
1985	5,222	5,222	529	529	10.1

Source: MMC study.

\* Excludes share of sales and profits of associated companies and intra-group sales.

Note: GEC's output prices have not moved in line with the RPI and the trend in sales revalued with reference to the RPI therefore cannot necessarily be interpreted as a measure of changes in the volume of output.

### GEC's businesses

2.8. The activities of GEC can be divided into the following eight broad categories:

*Electronic systems and components* is the largest area of the group operations and, based on 1984-85 figures, contributes one-third of total sales and one-third of its exports from the United Kingdom. It includes an extensive range of defence equipment and systems produced by GEC Avionics Ltd and the

Marconi Group of companies covering such fields as avionics, radar, guided weapons, communications, space and underwater systems. In addition communications, broadcasting, satellite payload and electronic testing and control systems are produced for a wide variety of users including the civil aviation market. Further products include automatic test equipment, image intensifiers for military and civil use, coal-cutting guidance systems and thermal cameras used in fire-fighting.

*Telecommunication and business systems* covers GEC's operation supplying public and private telecommunication markets in the United Kingdom and overseas including the production and distribution of telephone switching, transmission and subscriber equipment and telephone cabling. In addition this category includes GEC's involvement in office communications and information technology systems including word processors and office workstations, and the businesses of AB Dick Company referred to in paragraph 2.4.

*Automation and control* consists of automation and control equipment and systems for a wide range of industrial and commercial uses including steel plant automation, mine winding equipment, ship position control systems, airport lighting, energy management systems and protective relays. GEC Industrial Controls Ltd's range of microprocessor-based controllers have been installed in factories throughout the world and have won orders from the USA. This category includes the measurement and weighing equipment business of the Avery companies and GEC Measurements Ltd.

*Medical equipment* comprises the business of Picker International.

*Power generation* embraces a wide range of large steam turbines, gas turbines, diesel engines, generators, nuclear reactor equipment and energy systems.

*Electrical equipment* includes comprehensive power transmission systems and the manufacture of switchgear, transformers, traction equipment and wires and cables. In addition this category covers the production of lifts and railway signalling equipment.

*Consumer products* includes the Hotpoint range of washing machines, driers, and refrigerators; Cannon gas cookers and fires; Redring electric kettles, Xpelair extractor fans and lamps and lighting.

*Distribution and trading* consists mainly of overseas companies that largely act as agents and distributors of products made by other units in the GEC group.

2.9. A breakdown of GEC's sales and trading profits for the last five financial years into the eight categories set out in paragraph 2.8 is shown in Table 2.2. Table 2.2 also analyses turnover between United Kingdom customers and overseas customers. GEC told us that its main growth areas are electronic systems and components, telecommunications and business systems and automation and control equipment.

## **Organisation and management**

2.10. The main Board of GEC comprises 19 directors of whom six are non-executive. The Group Managing Director (Lord Weinstock) has overall responsibility for the running of the group supported by two Deputy Managing Directors. In April 1985 GEC set up a United Kingdom Board of Management.

TABLE 2.2 GEC: analysis of turnover and operating profit by activity

	£ million									
	1980-81		1981-82		1982-83		1983-84		1984-85	
	Turnover	Operating profit	Turnover	Operating profit	Turnover	Operating profit	Turnover	Operating profit	Turnover	Operating profit
Telecommunications	336.6	65.7	417.0	101.0	449.8	103.8	447.3	92.0	455.0	62.9
AB Dick, Videojet, Scriptomatic	202.3	6.7	243.1	1.7	267.4	(16.6)	267.2	0.9	276.4	17.7
Total telecommunications and business systems	538.9	72.4	660.1	102.7	717.2	87.2	714.5	92.9	731.4	80.6
Electronic systems and components	928.4	107.2	1,104.4	136.9	1,265.4	158.4	1,422.8	196.9	1,660.2	234.6
Automation and control	342.7	31.7	379.8	36.9	403.2	47.2	419.8	52.1	436.9	48.5
Medical equipment	13.8	0.9	334.8	6.4	410.0	16.4	433.1	24.1	469.1	29.3
Power generation	645.0	91.1	685.1	95.7	707.1	72.6	626.0	49.9	634.1	55.6
Electrical equipment	494.2	48.5	507.4	43.7	574.3	51.6	659.3	49.3	713.2	41.8
Consumer products	292.6	14.6	283.8	12.1	288.4	19.7	274.0	23.7	288.4	26.7
Distribution and trading	196.5	10.4	224.1	15.6	251.3	13.0	240.6	14.2	275.8	13.7
Other activities	9.9	3.9	10.2	(18.6)	8.6	(4.5)	10.2	(1.9)	13.3	(1.9)
Total	3,462.0	380.7	4,189.7	431.4	4,625.5	461.6	4,800.3	501.2	5,222.4	528.9
United Kingdom customers	1,822.0	N/A	1,914.0	N/A	2,052.5	N/A	2,171.8	N/A	2,407.3	N/A
Overseas customers	1,640.0	N/A	2,275.7	N/A	2,573.0	N/A	2,628.5	N/A	2,815.1	N/A
	3,462.0	380.7	4,189.7	431.4	4,625.5	461.6	4,800.3	501.2	5,222.4	528.9

Source: GEC.

N/A = not available.

This brought together the senior group executives with the supervisory directors of the main areas of the group's activities. The Board of Management meets to exchange ideas and examine matters such as GEC's research capability on a group-wide basis.

2.11. The GEC group is organised on a decentralised basis. Its policy is to establish its businesses as separate operating units, each of which has a high degree of autonomy. Much responsibility rests on the Managing Directors of the individual units, but their performance is subject to careful monitoring and evaluation. The group has no large central organisation, nor does it have a complex structure of divisions or subsidiary boards.

2.12. There are currently 177 operating units in GEC. There is no strict rule as to optimum size and the units range in size from substantial international operations such as GEC Avionics Ltd to smaller United Kingdom operations such as Redring Electric Ltd. Some units are structured as subsidiary companies whereas others are divisions of a company. Each operating unit is headed by a Managing Director (or equivalent), assisted by a management team comprising Operations Directors, responsible for sales, marketing, finance, technical, production and personnel. Most of the unit Managing Directors report to one of the 'Supervisory' Directors, each of whom has overall responsibility for a number of units. The grouping of the units generally reflects their field of activity (eg telecommunications), but it may also be influenced by the commercial expertise or location of the individual supervisory director.

2.13. The units operate as self-contained trading enterprises. Each is expected to make a profit and trading between units is carried out on an arm's length basis. At the same time the units benefit from centralised GEC group facilities including research, computer services and training.

#### **Financial planning and control**

2.14. In December of each year each unit submits to Group Head Office its budget for the next financial year, accompanied by a detailed assessment of the longer-term prospects for the unit's business. The assessment takes into account changes in technology, new products, future development and capital investment plans. Each unit Managing Director discusses his budget submission first with his supervisory director, and then individually with the Group Managing Director at Group Head Office in London during the period from January to March. There is no formal budgetary approval; instead, the approach is to probe, and question, with the objective of achieving higher standards of performance.

2.15. During the year, the units submit monthly management reports to Group Head Office. The reports comprise management accounting information, including sales, exports, profit and loss accounts and capital employed trends (all shown as against the previous year and budget), together with a commentary from the unit Managing Director. The latter gives a description of trading conditions, product development and technology and any other items of special interest. These reports are reviewed by the Group Managing Director and other senior Head Office management. If a unit Managing Director wishes to incur major capital expenditure in excess of the budget, he is expected to consult Group Head Office in advance.

TABLE 2.3 GEC: summarised balance sheet

	<i>£ million</i>									
	<i>Year ended 31 March</i>									
	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Tangible fixed assets	262	280	318	351	480	552	611	672	697	764
Investments	98	87	85	177	187	194	225	243	126	105
Stock, contracts in progress and debtors less liabilities (other than borrowings)	370	299	289	322	476	546	518	487	538	719
Capital employed	730	666	692	850	1,143	1,292	1,354	1,402	1,361	1,588
Cash and marketable securities*	231	470	617	730	599	689	1,075	1,350	1,570	1,455
Borrowings	(128)	(301)	(300)	(345)	(350)	(313)	(286)	(263)	(166)	(75)
Customers' deposits	N/A	N/A	N/A	N/A	N/A	N/A	(64)	(67)	(26)	(40)
Net tangible assets	833	835	1,009	1,235	1,392	1,668	2,079	2,422	2,739	2,928
Capital and reserves	723	681	845	1,056	1,188	1,441	1,793	2,098	2,239	2,389
Minority interests	29	33	32	42	46	52	61	72	54	79
Provisions	81	121	132	137	158	175	225	252	446	460
	833	835	1,009	1,235	1,392	1,668	2,079	2,422	2,739	2,928

Source: MMC based on GEC's published accounts.

Gearing (borrowings and customers' deposits net of cash/capital, reserves and minority interests) is negative.

\* Cash and marketable securities for the years 1976 to 1980 are shown net of bank overdrafts.

N/A = not available.

TABLE 2.4. GEC: summarised profit and loss accounts

	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	£ million 1984-85
Turnover	1,752	2,055	2,343	2,501	3,006	3,462	4,190	4,626	4,800	5,222
Operating profit	184	231	294	328	360	381	431	462	501	529
Associated companies	14	18	14	22	27	31	40	36	28	20
Investment income and interest (net)	9	29	17	28	29	64	113	172	141	176
Profit on ordinary activities before taxation	207	278	325	378	416	476	584	670	671	725
Taxation on profit on ordinary activities	(105)	(144)	(167)	(133)	(156)	(172)	(219)	(270)	(268)	(299)
Minority interests	(3)	(3)	(3)	(7)	(9)	(5)	(8)	(12)	(13)	(19)
Extraordinary items								4	21	8
Dividends	(18)	(20)	(22)	(34)	(46)	(56)	(70)	(82)	(95)	(107)
Profit retained	81	111	133	204	205	243	287	310	316	308
Operating profit as a % of turnover	10.5	11.2	12.5	13.1	12.0	11.0	10.3	10.0	10.4	10.1

Source: MMC based on GEC's published accounts.

TABLE 2.5 GEC: historical cost financial statistics

	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85
Average capital employed* in the business (£ million)	698	679	771	997	1,218	1,323	1,378	1,382	1,475
Profit before finance charge and income from other investments (£ million)	249	308	345	387	412	471	498	529	549
Return on average capital employed (%)	35.7	45.4	44.7	38.8	33.8	35.6	36.1	38.3	37.2
Average shareholders' funds and minority interests* (£ million)	834	922	1,122	1,314	1,530	1,874	2,251	2,581	2,834
Profit on ordinary activities before tax (£ million)	278	325	378	416	476	585	670	670	725
Return on average shareholders' funds and minority interests (%)	33.3	35.2	33.7	31.7	31.1	31.2	29.8	26.0	25.6
Earnings per ordinary share (pence)	24.1	28.3	43.4	45.7	54.5	65.2	14.2†	15.0	15.2

Source: MMC based on GEC's published accounts.

\* The figures for capital employed and shareholders' funds and minority interests are simple averages of the amounts at the beginning and the end of each year.

† Ordinary shares of 25p each were sub-divided into 5 ordinary shares of 5p each on 29 October 1982.

## Financial information

2.16. Table 2.3 summarises GEC's balance sheet as at 31 March for each of the last 10 financial years. During the financial year ended 31 March 1985 and with the authority of the shareholders the company purchased on the Stock Exchange 73 million of its shares having a nominal value of approximately £3.7 million and the called up share capital as at the end of the financial year stood at £133.6 million divided into 2,673 million ordinary shares of 5p each.

2.17. Table 2.4 summarises GEC's historical cost profit and loss accounts for each of the last 10 financial years.

2.18. Table 2.5 brings together a number of historical cost financial statistics which illustrate GEC's overall financial position and performance for the past nine years. The return on average capital employed used in operating activities has risen over the period from 35.7 per cent to 37.2 per cent but the return on average shareholders' funds and minority interests shows a decline from 33.3 per cent to 25.6 per cent over the same period. Based on the 1984-85 figures, average capital employed in operating activities represented some 52 per cent of the average shareholders' funds and minority interests.

2.19. GEC's tangible fixed assets as at 31 March 1985 are shown in Table 2.6 and a summary of GEC's source and application of funds for the last five financial years is at Appendix 2.1.

TABLE 2.6 GEC: tangible fixed assets at 31 March 1985

	<i>At costs</i>	<i>Depreciation</i>	<i>£ million</i> <i>Net book value</i>
Land and building			
Freehold	270	83	187
Long leasehold	41	9	32
Short leasehold	17	8	9
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	328	100	228
Plant and machinery	842	493	349
Fixtures, fittings, tools and equipment	323	166	157
Payments on account and assets under construction	30	—	30
	<hr/>	<hr/>	<hr/>
	1,523	759	764

Source: GEC.

Note: All tangible fixed assets are recorded at historical cost less Government grants, and depreciated on a straight line basis over their estimated useful lives. Freehold land does not bear depreciation where the original cost of purchase was separately identified.

## Employment

2.20. In 1985-86 the GEC group had an average of 165,705 employees in its 177 operating units, of whom 127,809 worked in the United Kingdom. Many of the activities of GEC are concerned with products with which Plessey is not directly concerned, such as power generation equipment and shipbuilding. GEC told us that approximately 18,000 of its employees in the United Kingdom were science and engineering graduates and that in 1986 it intended to recruit

in the United Kingdom. 1,500 graduates now completing degree or high diploma courses. GEC considered that the record of industrial relations within the group was good and that relations with the trade unions were cordial.

## Exports

2.21. Over the past 15 years GEC's exports from the United Kingdom have grown from £214 million in 1970-71 to £1,235 million in 1984-85; currently equivalent to 45 per cent of group sales in the United Kingdom. A breakdown of GEC's exports by area of activity is given in Table 2.7.

TABLE 2.7 GEC's exports by area of activity

Area of activity	Financial year ended 31 March				
	1981	1982	1983	1984	1985
Electronic systems and components	275.5	377.0	358.7	410.9	411.3
Telecommunications and business systems	49.6	50.3	42.1	40.5	31.5
Automation and control	77.0	95.0	109.5	121.3	110.7
Medical equipment	5.4	5.7	5.9	11.5	14.3
Power generation	372.6	388.7	432.8	358.6	366.5
Electrical equipment	153.3	155.2	169.4	239.2	277.0
Consumer products	27.7	21.5	19.7	23.5	21.5
Distribution and trading	1.7	2.2	2.5	2.5	2.2
<b>Total</b>	<b>962.8</b>	<b>1,095.6</b>	<b>1,140.6</b>	<b>1,208.0</b>	<b>1,235.0</b>

Source: GEC.

## Research and development

2.22. The GEC group's expenditure on R & D is set out in Table 2.8. GEC pointed out that its own expenditure on R & D had nearly doubled in the past five years and that the decrease in customer funding resulted from the changed policies of BT and the MOD.

TABLE 2.8 GEC group research

	£ million				
	1980-81	1981-82	1982-83	1983-84	1984-85
Total R & D	414	453	532	546	619
Own funded	116	128	174	179	229
Own funded (%)	28	28	33	33	37

Source: GEC.

2.23. R & D work is carried out in part within the operating units but GEC also maintains a central research operation, GEC Research Ltd, which comprises four laboratories:

- the Hirst Research Centre at Wembley;
- the Marconi Research Centre at Great Baddow; and
- the Engineering Research Centre Laboratories at Stafford and Whetstone.

GEC told us that GEC Research Ltd is now the largest industrial electronic research facility in the United Kingdom. It has an integrated programme employing 2,400 people. GEC's total research activity covers both exploratory

research, strategic research on the relevant enabling technologies and applied research on demonstrator projects. One of the two Deputy Managing Directors of GEC, who was a former Director of Research at GEC Research Centre, is in overall charge of research in the GEC group.

2.24. GEC told us that to promote the transfer of research information and technical knowledge within the group, GEC Research is in regular contact with the operating units. An abstract of each laboratory report is sent to the Technical Director of every unit and twice a year the GEC Research Laboratories produce a comprehensive Research Report. Staff from the Operating Units are sent to work on secondment in GEC Research on specific projects, and as part of their career progression the scientists and engineers at GEC Research are encouraged to move to production units. GEC also maintains a Central Technical Directorate of Senior Executives. Each of the GEC Assistant Technical Directors is primarily concerned with a particular area of technology, and together they keep under review the R & D needs and achievements of the various operating units. The Directorate has established and operates a series of Technology Exchange Groups which currently exist in the areas of micro-electronics; computer-aided engineering; software engineering; manufacturing technology; quality engineering; and materials and analytical techniques. GEC plays a prominent role in the Alvey, JOERS and ESPRIT collaborative research programmes in information technology (see Appendix 2.2).