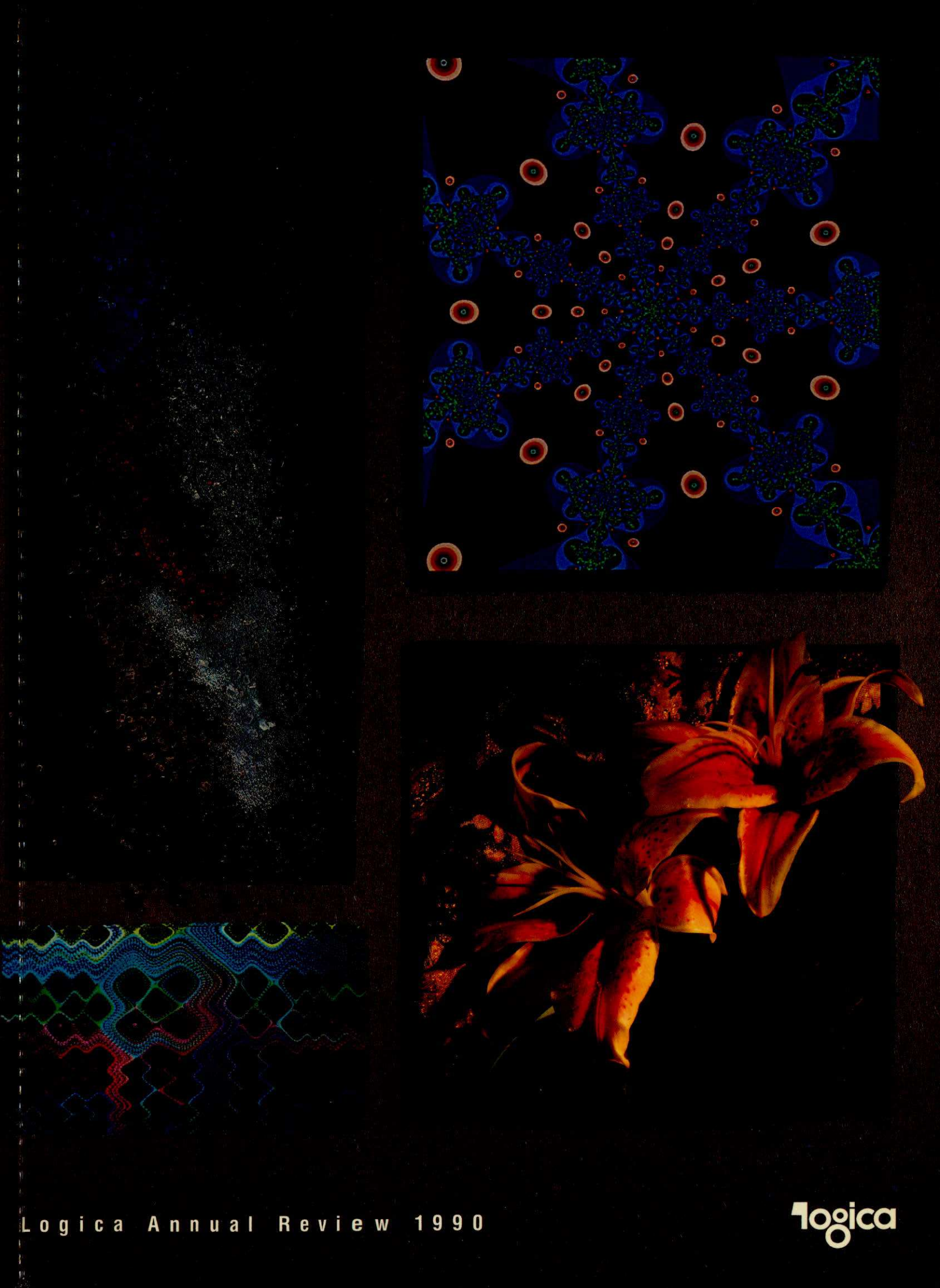

Logica Annual Review 1990

Logica

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Cover: *Many natural phenomena, from lightning to leaves, and from shells to shorelines, exhibit chaotic, non linear behaviour. Advances in the application of complex mathematics through the use of powerful computers have generated graphic models and simulations of some of these natural processes. Here natural examples of branching and crystalline formation are juxtaposed with a selection of related computer images.*

10.1990

LOGICA IS A LEADING international computer systems, software and consultancy company with some 3700 staff working from offices in twelve countries. We have a global client base covering a diverse range of market sectors and are dedicated to the provision of high quality, state of the art information technology solutions.

Our work revolves around the skill of our own computer specialists in harnessing the power of the computer to meet client needs, to enable systems to operate more effectively and efficiently.

In the scientific world, the rapidly increasing speed and power of computers has made possible enormous advances in the application of complex mathematical theories to the world at large. We have taken as the visual theme of this year's Annual Review the extraordinary images generated as part of this work. The study of dynamic systems with complex, non linear properties has given an extra dimension to our understanding of processes and structures in the physical, biological and social worlds, and has enabled the accurate modelling, prediction and manipulation of these systems.

In particular we have focused on the mathematics of chaos and non linear dynamics, a paradoxical combination of randomness and order which offers a mathematical framework for understanding subjects ranging from art to economics, from biological rhythms to traffic jams and from waterflow to weather systems. Work in this area has given rise to special techniques of using computers and particular kinds of graphic images. Known in the language of chaos as fractal geometries these pictures capture an amazing perpetuating complexity and have contributed greatly in opening up a profound subject to a wider audience.

The scale of research now taking place into non linear dynamics is immense. What began with a handful of scientists is now a rapidly growing international movement which has branched into almost every conceivable discipline. Many major universities and corporate research centres are undertaking research into chaotic and non linear systems. The scope of this work is reflected in the variety of our chosen images, which in turn largely relate to our own market sectors.

Although in this limited space we can only scratch the surface of what is a wide ranging and complex subject, there is no doubt that the pictures provide a stimulating, thought provoking backdrop for this review of our activities. We are grateful to the many contributors of material, some of which has never been published before.

Review of the year

PERFORMANCE

Logica has an excellent record of profit, revenue and staff growth over its 21 years. It is therefore particularly disappointing to report a year of poor performance. This has been caused by a combination of adverse market conditions, low sales levels in parts of the company and some contract overruns. Firm actions have been taken to strengthen management, reduce the cost base and generally review and reposition activities around the world, and these actions have led to the exceptional costs and extraordinary items detailed below. The company is now well positioned to improve performance.

Turnover for the year was £187.5 million compared with £179.5 million for the previous year. Profit before tax and exceptional costs was £10.9 million. After adjustment for exceptional costs, associated with business restructuring, profit before tax was £9.0 million compared with £18.8 million for the previous year. Extraordinary items of £1.7 million were incurred through the closure of the Danish office and of the UK management consultancy subsidiary. Earnings per share were 9.0p compared with 20.0p for the previous year. Improved cash management resulted in positive cash flow and net cash balances at year end stood at £18.6 million.

The directors are recommending a final dividend of 2.3p per share net, making 3.4p per share net for the full year, an increase of 10% over the previous year.

ACTIVITIES

Logica is engaged in a range of international business activities across the nine broad market sectors described in this Annual Review. The three main types of business – consultancy, systems development and integration, and software products – reinforce each other. Technical consultancy can lead to systems supply. Products often form part of total systems. Client projects can lead to the development of new services and products. Both product design and systems integration provide the first hand experience to strengthen our consulting capability. This combination of business activities is one of the company's greatest strengths.

In reviewing our operations in the light of changing market conditions it was decided to close the separate management consultancy business in the UK. The great majority of the staff in that operation were redeployed into the other operating subsidiaries. The increasing specialization of IT by market sector required this altered approach. Consultancy – ranging from feasibility and requirement studies through to market reports and quality audits – continues as an essential aspect of our overall service, and accounted for a quarter of revenues during the year.

The design, building and integration of systems is our largest business activity. Revenues from custom software increased by a healthy 15%. There was a reduction in revenue from special purpose hardware and from the pass through of standard equipment from vendors, reflecting client preferences for direct procurement in many of the systems integration contracts we undertake. This trend does not generally affect profitability as the company has agreements with the main hardware vendors who pay us commission on such sales.

Product sales were weak in telecommunications in North America and in the finance sector generally. Nevertheless they contributed substantially to revenue, not only in licence fees but also as the core of many large systems integration projects. Some major product developments were undertaken and completed, and distribution agreements signed for products developed by others.

Fixed price projects represented 38% of revenues, a level we have seen in previous years but a marginal increase over the last three years. Although it was necessary in the past year for the company to provide for significant expenditure on some large fixed price projects, such contracts have proved historically to be a successful and essential part of the company's business. Our recognized ability to win and manage fixed price contracts well continues to be a major factor in the growth of our business in many fast expanding sectors such as energy and utilities.

OPERATIONS

The most difficult area for the company has been the performance of our operations in North America where we were not able to replace projects running down by the planned level of professional service business, and where we encountered weakness in product sales. As a result, revenues from operations in North America decreased by 11% in US dollar terms, resulting in a loss for the year. Vigorous actions have been taken to reduce the cost base and considerable effort devoted to formulate strategies for developing the business. Changes in the management and the structure have been made in order to maximize the position of the company in its various geographical and vertical markets.

The setbacks in this area have in no way diminished our commitment to our strategic objective of building a substantial business in North America, based primarily in the telecommunications and finance sectors. Steady progress is now being made in addressing key areas of these markets. Exports from North America, particularly to Japan and to Australia, were very good during the year, and further export marketing is in hand.

Review of the year

Outside North America the revenues of the operations increased by 13%.

In the UK, overall growth was depressed by the slowness of sales in some sectors, and we have taken actions to reduce operational costs, primarily through staff reductions and more efficient use of offices. There were very positive developments in many areas and we secured some important contract wins for a number of long term clients. In particular, our energy and utilities work has thrived through the provision of integrated systems for the privatized water industry, and we can also point to significant new work in electricity, oil and gas. In manufacturing, we built upon our expertise in the automation of both process and discrete control systems, and developed our strategic support role with Ford Motor Company. Business in defence, after finance our largest UK sector, increased marginally in a weak market. There was good growth in other business for government, where just after year end we won our biggest ever contract in any sector. In the transport sector, Logica has announced the formation in Autumn 1990 of a strategically important joint venture with British Airways, Speedwing Logica, to capitalize on the developments in the international air transport industry.

The finance sector and computer vendors are significant areas of work for us around the world, and in both we have felt the effect of worldwide economic conditions which have led some clients to delay major investment. Our work on large scale developments for the computer vendors continues in the UK, but at a lower level. The finance sector in the UK grew relatively well. Significant highlights included the sale of the new Logica Transaction Director® (LTD) product to Lloyds Bank, further major projects for the International Stock Exchange and new work for building societies and insurance companies. After the year end, we launched a new Modular Security Architecture which enables security functionality to be added to systems simply and cost effectively. A number of large financial organizations are already considering the architecture as a platform for their future security requirements.

Across continental Europe, our ability to win large implementation contracts was enhanced by a high level of intercompany support and collaboration through our network of offices. Large scale systems implementation projects such as those for Nederlandse Gasunie, Bremer Lagerhaus-Gesellschaft and the Swiss Stock Exchange employ large multidisciplined teams often drawn from several countries. To provide continuity and support for our work for the Swiss Stock Exchange, we have established an office in Zürich, which will also act as a springboard for us to pursue additional opportunities in Switzerland. There was particularly strong growth in business for clients in the Netherlands, with significant new contracts in the oil sector. Several important distribution and logistics networks were completed in Germany and the Netherlands. In Italy, where 25% of our worldwide manufacturing industry revenues are earned, we carried out new contracts for Wagner Indumat Systems and Fiat.

Business for clients in Australia has increased. Prominent sectors are computing, energy and finance, where we continued our work for ANZ Bank, and made our first sale worldwide of the new Teknekron◇ product to the State Bank of New South Wales. In Hong Kong and Malaysia, our ON/2* product enjoyed sustained success and work continued in the areas of telecommunications, transport and finance.

BOARD CHANGES

A number of changes to the board have been announced since the last Annual Review. Philip Hughes, a founder and chairman of Logica since 1972, will be stepping down in November 1990. Over 21 years, he has had a significant impact on the company's culture and business direction. The directors are pleased that he has agreed to remain as a non-executive director. Following the Annual General Meeting Paul Bosonnet will assume the role of non-executive chairman. He is deputy chairman of the BOC Group plc and a non-executive director of British Telecom plc, and has sat on the board of Logica since 1986.

In April, Andrew Given joined the Logica main board as director of planning and finance. Following restructuring of the central departments, it was announced after year end that Graham Moore would be leaving the Logica board and the company by mutual consent on 30 September. It was also announced that Martin Cooperstein and Norman Zachary would cease to be a director and alternate member of the Logica plc board from that date. After the appointment of a new president/chief executive officer for Logica Data Architects, announced in autumn 1990, they also retire from their executive positions with the subsidiary, as envisaged when Data Architects was acquired by Logica in 1988. They will have a continuing involvement with the subsidiary as non-executive directors and consultants.

Pierre Vinken, chairman of the Dutch publishing group Elsevier, was elected to the main board as a non-executive director. He has been a member of the supervisory board of Logica's Dutch subsidiary since 1985, and is also a non-executive director of Pearson and the Economist in the UK.

Review of the year

STAFF

Staff numbers at year end were 3660. It was with great regret that the company decided that, as part of the cost reduction programme, it was necessary to make jobs redundant in some parts of the company. Several areas underwent substantial reorganization, and it is a credit to the staff that we were able to contain difficulties towards the end of the year and continue to build our business base.

Our business is growing in many areas, and we still require a good flow of new joiners. It is therefore gratifying that in an intensely competitive recruitment environment, approaching 1800 UK graduates applied to us this year, of which around 200 joined the company.

One of the attractions for potential staff in the UK is our Professional Development Scheme. Certified by the British Computer Society (BCS) this enables people to achieve recognized professional qualifications as chartered engineers. In the first year of operation, Logica's scheme won an award from the BCS, and has already attracted over 200 of our UK staff to enter the programme.

During the year the company marked its 20th anniversary through the joint sponsorship of a major exhibition, The Art of Photography, and local events around the world. As well as affording a valuable marketing opportunity, the exhibition and associated events provided a memorable setting for staff celebrations.

PROSPECTS

Many of the systems and products we install for clients are designed to help businesses operate more profitably and to optimize investment in computer systems.

Increasingly the nature and scale of this investment demands a well developed understanding of business. In recognition of this, many of our clients are seeking strategic partnerships to ensure continuity and consistency in software systems support. Maintaining mutually beneficial relationships with clients is key to our business development. We are therefore placing increased emphasis on developing account management initiatives at all levels of the company.

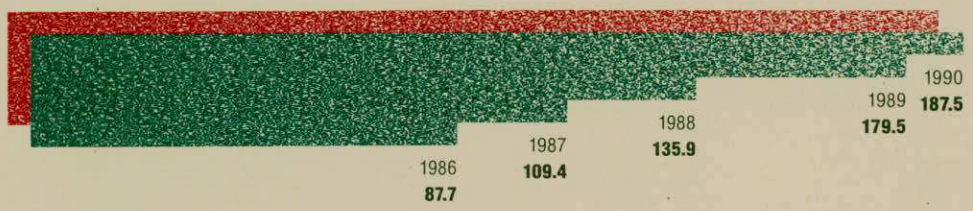
The computing services industry is now of such a size and global scale that it cannot be immune to difficult worldwide economic conditions. Against this backdrop, Logica has experienced particular problems in the past year which have necessitated the corrective actions mentioned above. The prime task in the next year is to continue working on the return to profit margins that are high by the standards of the industry. The directors are confident that Logica is well placed to achieve this and to exploit the substantial growth opportunities in its markets worldwide. As ever, the continuing commitment of our tremendously talented and experienced staff will be fundamental to fulfilling these objectives.

Five-year record

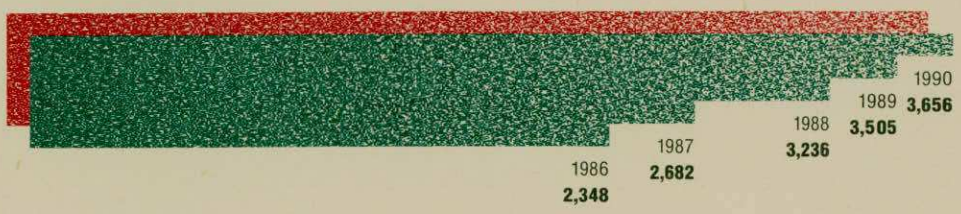
	1990 £'000	1989 £'000	1988 £'000	1987 £'000	1986 £'000
Turnover	**187489**	**179505**	**135936**	**109367**	**87652**
Operating profit	9079	17440	13866	10545	7457
Interest	1858	1395	872	778	(649)
Exceptional costs	(1926)	—	—	—	—
Profit on ordinary activities before tax	**9011**	**18835**	**14738**	**11323**	**6808**
Taxation on ordinary activities	(3550)	(6750)	(5400)	(4210)	(2574)
Profit on ordinary activities after tax	**5461**	**12085**	**9338**	**7113**	**4234**
Extraordinary items	(1727)	—	—	—	—
Shareholders' funds	**53061**	**52662**	**43046**	**29013**	**22831**
Earnings per share	**9.0p**	**20.0p**	**18.1p**	**14.4p**	**10.1p**
Dividends per share (net)	3.4p	3.1p	2.3p	1.7p	1.0p
Staff numbers at year end	**3656**	**3505**	**3236**	**2682**	**2348**

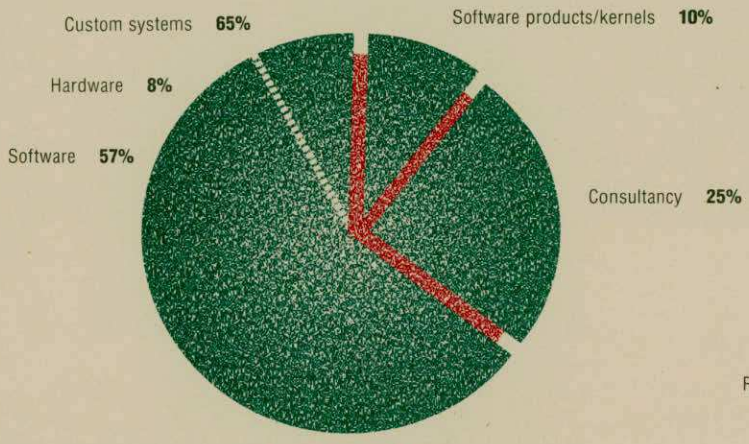
Business analysis

TURNOVER (£MILLIONS)

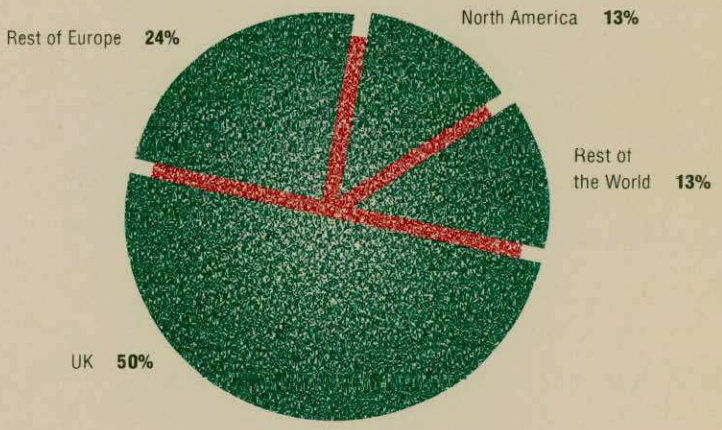


STAFF NUMBERS

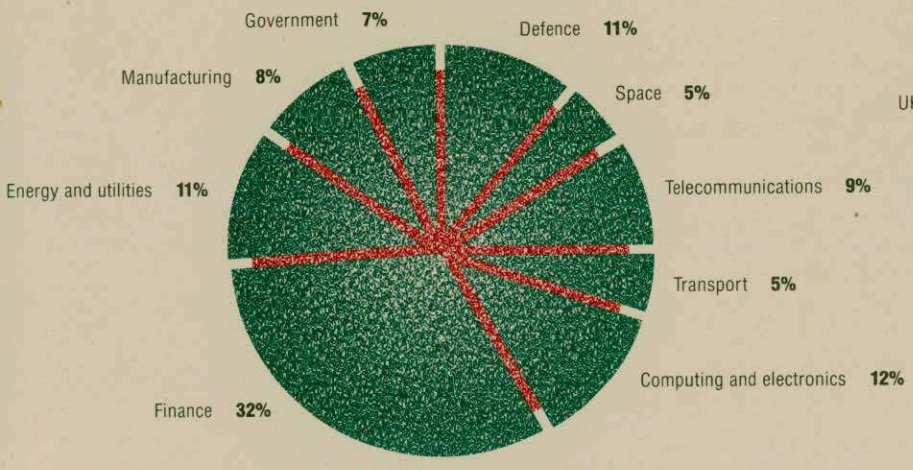




ANALYSIS BY ACTIVITY



ANALYSIS BY CLIENT LOCATION



ANALYSIS BY MARKET SECTOR

Research and development

LOGICA'S INVESTMENT IN research and development supports two main areas: firstly, the development of skills and expertise in new technologies which we see as important for the future of our business, and secondly the development of products and kernels, which form a basis for much of our systems implementation business, particularly in finance, telecommunications and energy and utilities.

A high proportion of the work on new technologies comes from our Cambridge-based research facility, which has built up a tremendous reputation since it was established five years ago. Specialist teams develop new tools, techniques and skills in four key technologies – advanced software engineering (ASE), human computer interaction (HCI), knowledge based systems (KBS) and speech and language. Our research activities centre on collaboration with partners through a number of leading UK and European wide research initiatives, and include a growing number of projects with associates from British industry and academia.

Software engineering is a key growth area and we are involved in research into several aspects of this discipline which we believe will have a major impact over the next few years, including formal specification methods, transformational techniques, object oriented and logic programming, and integrated project support environments. Formal methods are important in safety critical systems, found in situations where undetected errors or failures would cause a risk of life, breach of security or mission failure. The use of mathematically based notations to specify and design systems dramatically reduces the number of specification inconsistencies and provides a basis for acceptance of specification prior to design and implementation. Our work with the Royal Signals and Radar Establishment into the design of a safe compilation architecture will provide the first mathematically designed environment compatible with a subset of the Ada†† language, suitable for the development of practical real time computer systems.

Increased use of computer systems in the world at large has led to a greater need for effective human computer interfaces to ensure user organizations derive maximum benefit from their computer systems. Logica's complete user interface design service encompasses HCI requirements, analysis, design and prototyping through to feasibility studies, design manual definition and user training courses.

KBS, a development arising from research in Artificial Intelligence resulting in systems which capture and use human problem solving knowledge, is one of the fastest growing areas of advanced technology. We have been at the forefront of its development and implementation since the early 1980s. Our work on numerous collaborative research projects in the government, industry, space, defence, finance and transportation sectors confirms that many large international organizations are becoming convinced of the value of KBS and looking to install it widely. Logica has taken a lead in establishing LINNET, a neural network technology transfer club for businesses which aims to develop the application of neural networks within commerce and industry.

Speech and language technology, by contrast, is at a relatively early stage of exploitation and we are involved in longer term research projects such as SUNDIAL (Speech UNderstanding and DIALogue) in which we are leading a consortium of 12 partners across Europe to develop computer systems that can be accessed by speech over the telephone. In Australia, we form part of the GLASS (Generalized Language And Speech System) consortium which runs in parallel.

Throughout this Review there are examples which illustrate the transfer of Cambridge based technologies into studies and implementation projects across many market sectors. In some cases, the added value of our research capability has been a decisive factor in winning important new business.

Within Logica, significant effort is devoted to ensure the availability of quality software methods and tools to support all activities of the software development life-cycle, and to promote the best possible software engineering practice for the benefit of our clients. A comprehensive internal programme supports this effort, through training, software engineering consultancy and the production of customized methods and tools.

By far the largest proportion of Logica's R & D investment is in product development. Such development takes place in the context of client projects, jointly with partners, and as a discrete activity within Logica. Many of the company's products are mentioned in the following market sectors, and some developments are detailed below.

The Logica Transaction Director (LTD) software product, has been the subject of considerable product development activity. Developed originally in a project for Merrill Lynch in New York, LTD is a Tandem based systems integration product which transparently interconnects host computers, end user devices and applications. The secure transmission of limitless numbers of messages between dispersed systems and users can be handled by LTD, regardless of the computing technology, application function or network. In addition LTD allows clients to integrate current and future technologies into a cohesive network, forming a bridge between the SNA, OSI and non standard worlds, with little change to existing applications. A further contract with Lloyds Bank described in the Finance section provided the basis to develop further functionality. We believe there is good potential for the product across all business sectors.

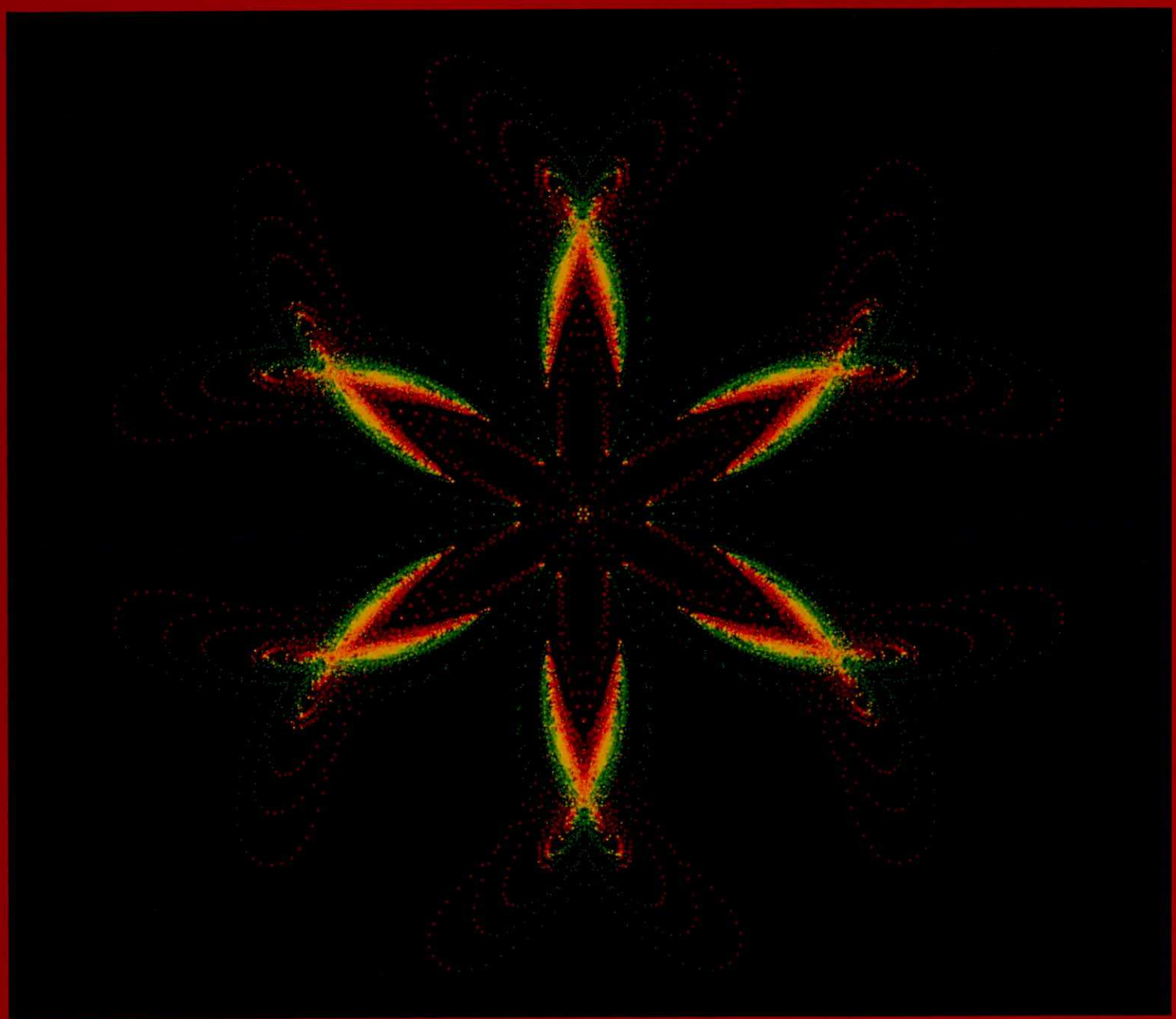
In financial systems products, development work has continued on BESS®, our modular global funds transfer system. The latest upgrade, Release 9.0, takes BESS a long way towards the goal of becoming a single version product, with clients now offered higher reliability of the initial software, simplified installation and greater functionality. Additional functions include automated help facilities, common screen entry for SWIFT 2 and telex, and a broader test work capability. Logica will also benefit from significant productivity gains through easier installation and maintenance.

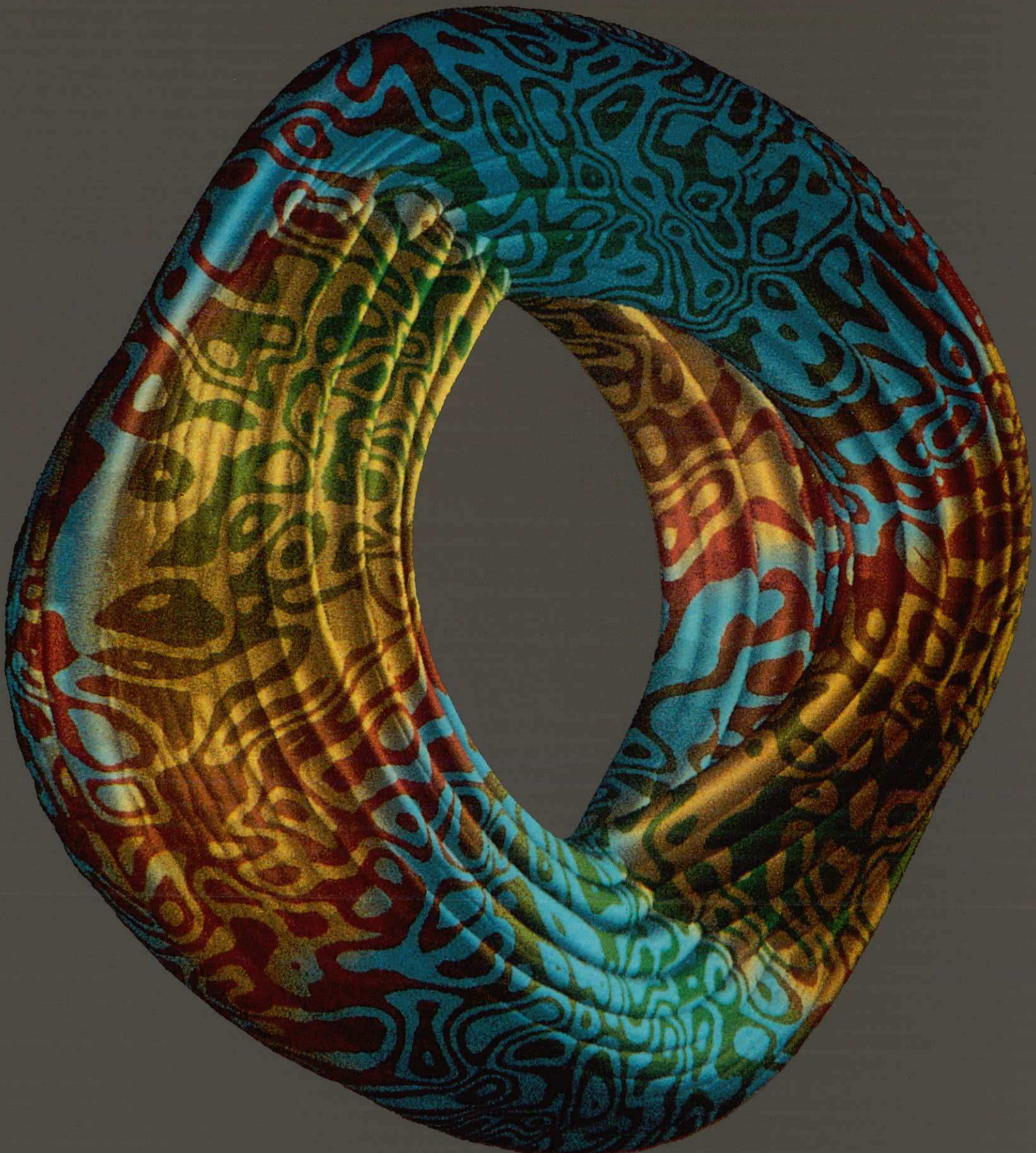
Our successful personnel movements tracking product, TRACE™, has undergone both technological and functional enhancements. It is able to run on IBM and Digital mainframes and uses relational database technology. Upgrades to the features of the product, which provides fast and efficient planning and recording of personnel movements to and within offshore installations, include improved information on safety procedures and safety training records.

A new product, CARDS™, has been developed to address the specialist manpower planning and colliery management requirements of the coal industry and is now operational in the UK. The CARDS system is based on three software modules covering attendance recording, computer assisted deployment and safety checking.

During the year, we have developed PLAYOUT 8000™, a new product for broadcasters which automates the transmission of station output by the control of robotic video tape, libraries, switchers, still stores and caption generators. PLAYOUT 8000 enables clients to make the most cost effective and time efficient use of station equipment. The first sale of PLAYOUT 8000 has already been made and the product is due for installation in the UK at the end of 1990.

Right: *The speech waveform is a very irregularly shaped signal which can be studied using fractal mathematics. Evidence of individual phase portrait signatures for the basic building blocks of speech has provided a new focus in the area of acoustics, phonetics and speech recognition. The image opposite is a graphic representation of an "AHH" sound.*





Finance

ALTHOUGH GROWTH IN the finance sector slowed from previous very high rates, revenues increased by 6% over 1989 levels and the sector continues to offer substantial prospects for new business. Our broad range of clients in finance covers banks, brokerages, exchanges, building societies, insurance companies and retail organizations. Many of the companies operating in the market are large global players, who continue to invest heavily in information technology, which they see as the key enabler in providing enhanced 24 hour customer service networks.

Much of our work in the finance sector is based around the development, distribution, installation and integration of our wide range of financial products. In an industry which operates within recognized international standards, products can offer a cost effective way of achieving competitive advantage.

Sales of ON/2, our financial transaction processing system have been made to the Equitable Bank Corporation in the Philippines, the Bank of China and Lippobank of Indonesia. We have also established an ON/2 switch called Megalink between four of the Philippines' major banks, and by the year end, ON/2 installations in the Far East totalled nine.

Logica Transaction Director (LTD), our systems integration product running on Tandem NonStop□□ computers was launched during the year. Seen as strategic to the needs of financial service organizations, it has already achieved several sales.

We have also acquired the exclusive marketing rights in four countries for the Teknekron Trading System, an integrated digital dealing room system. Dealers using the product are able to convert financial data into easily assimilated information which can be shared with other users. Teknekron allows existing as well as new applications to be connected in a straightforward way. This ability to streamline applications development when entering new markets will provide the key to competitive advantage for many of our clients.

Several large projects built around products have been completed or continue to progress well. A joint National Westminster Bank/Logica team has successfully developed and implemented a replacement gateway for the Bank. The 18 month development, based on Logica's communications and funds transfer product BESS is designed to cope with increases in electronic traffic passing between the Bank's internal systems and external networks such as SWIFT.

The other main aspect of our work in the finance sector is in the provision of major custom systems, often working as part of a joint team either with the client or fellow supplier, and often for clients with whom we have developed long term partnerships. Projects for the International Stock Exchange in London, and for the Swiss Association Tripartite Bourses which will link the three exchanges in Zürich, Basle and Geneva are good examples. Work for ANZ Bank in Australia on the Hogan*** for Retail project is progressing. The project, which will enable ANZ to enhance its financial products range, employs a joint team of over 100 users and technical staff drawn from ANZ and from Logica companies in Australia and the US.

We have been appointed by SWIFT Service Partners to develop the software specifications for a new value added SWIFT service ACCORD, which exchanges confirmations for foreign exchange and money market deals.

Throughout the last year, we have been working to broaden our activities in the finance sector and have made particular progress in developing business with building societies in the United Kingdom and, via our work for the New York Life Insurance Company, in the insurance market.

Left: *A spectacular example of the visualization of five dimensional data using state of the art computer graphics. Three variables generate the overall 3D shape whilst the other two are represented by the coloured patterns on the surface. This technique has been used to clarify the origin of chaotic motion in complex systems, such as stock market price movements, traffic flow and military logistics.*

CLIENTS THIS YEAR INCLUDE

AMERICAN EXPRESS COMPANY
AMSTERDAM STOCK EXCHANGE
AURIGA AB
BANK OF MONTREAL
BANQUE BRUXELLES LAMBERT
BARCLAYS BANK
CHEMICAL BANK
COMMERCIAL UNION
COMMONWEALTH BANK OF AUSTRALIA
CREDIT BANK, ATHENS
CREDITO ITALIANO
EUROMOBILIARE
GÉNÉRALE DE BANQUE
GERRARD & NATIONAL
INTERGAMMA
J SAINSBURY PLC
LOMBARD NORTH CENTRAL PLC
MERRILL LYNCH
MIDLAND GROUP
NATIONAL BANK OF GREECE
NORWICH UNION INSURANCE GROUP
POSTBANK
RABOBANK
STANDARD CHARTERED BANK
STATE GOVERNMENT INSURANCE COMMISSION OF SOUTH AUSTRALIA
THE STOCK EXCHANGE OF HONG KONG
TSB
TULLET & TOKYO
VITTORIA ASSICURAZIONI
WOOLWORTHS

PROJECTS

Logica's first Teknekron Trading System sale has been made to the STATE BANK OF NEW SOUTH WALES in Australia. The Bank has chosen Teknekron as the core component to support its treasury applications and information distribution and is to be incorporated into the State Trader treasury project which will progressively redevelop front and back office systems.

The project, in which Logica was already involved, forms part of the Bank's long term IT strategy for treasury operations which includes development of innovative software for front end deal capture, credit and position monitoring systems. It will give the Bank a decisive technological and trading edge in treasury markets.

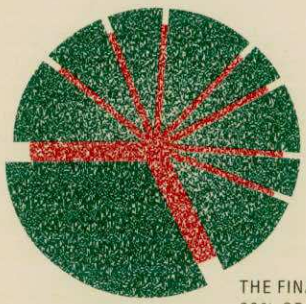
Teknekron will provide the base for in house development of a wide range of integrated financial software applications. The product's ability to integrate with existing software systems and its compatibility with the Bank's architecture for treasury systems were key factors in the Bank's decision.

Logica and Tandem Computers Ltd won a contract worth £4 million to supply LLOYDS BANK with the central switching hub of their Electronic Banking Service (EBS).

Based on a Tandem four processor Cyclone mainframe, EBS will be a major new customer service initiative, enabling the Bank's corporate clients to access different banking application services from one single point of entry, while maintaining flexible security at all levels. The Logica Transaction Director (LTD) software product will sit at the heart of the EBS, facilitating the integration of existing information from diverse hardware and software systems into one unified network.

By supporting links from customers' own PCs to the Bank's systems, delivery channels and gateways (including S.W.I.F.T. and CHAPS) the LTD high performance switch will permit a variety of transactions and electronic mail in both directions. The high performance switch gives authorized customers the ability to make payments and forward messages. Initially EBS will enable authorized clients to make sterling and international payments.

The LTD component of EBS will allow the Bank to meet long and short term needs, providing a framework for introducing new products with the minimum of upheaval and impact on existing operating systems. Future phases will incorporate advanced management information and EDI facilities.



THE FINANCE MARKET REPRESENTS 32% OF OUR ANNUAL BUSINESS

Having delivered the SEQUAL trade confirmation system to the INTERNATIONAL STOCK EXCHANGE (ISE) on time and to budget in 1989, we have been awarded a contract to build a new system to replace the current news service provided by the ISE. Due to go live at the end of 1990, the Regulatory News Service (RNS) will ensure that all its subscribers receive price sensitive, regulatory news items simultaneously and promptly. Separately, the Commercial Company News Service (CCNS), a subscriber to RNS, will onward vend the news, and provide a range of value added services.

GRUPO FONDIARIA is a leading European insurance organization, which aims to standardize systems and procedures for all the business and administrative activities throughout its numerous companies. Logica has assisted the company in its core system replacement, to define a modern and advanced client based information technology system. Logica has prepared a functional and technical specification defining methodology and standards, recommending software engineering tools to be used in the implementation of the project. Work on the development phase of the project, expected to go live in Spring 1991, began in mid-1990.

In the UK the NATIONAL & PROVINCIAL BUILDING SOCIETY (N&P) has chosen Logica's transaction processing system ON/2 to provide support for the portfolio of products and services offered via its national Automated Teller Machine (ATM) network.

ON/2 is designed to support a wide range of banking and retail services generated from ATMs, Point of Sale terminals and manned tellers. This particular application will enable N&P to provide customers with fast, reliable and secure services around the clock, while automatically updating central databases. ON/2's modular design will also afford N&P the flexibility to offer new services and products which may be required in future to maintain the competitive edge.

Energy and utilities

OVER THE PAST year, Logica has continued to build strong relationships with clients in the water, gas and electricity industries, and has won significant new business in the oil sector. The award of a £1 million contract from British Gas South Eastern, added to the work already in progress with the Northern, North Eastern, North Western and Eastern regions, brings the total value of current contracts for regional gas control systems to over £6 million. We are also working on the software production phase of our contract with Nederlandse Gasunie to implement the next generation of the Dutch national gas pipeline management system, one of the largest fixed price contracts in the Netherlands.

We have played a significant role in supporting the UK's newly privatized water industry in meeting the twin challenges of tackling increasingly high profile environmental issues and providing high quality, cost effective customer services. Having established the fundamental telemetry platforms to control and monitor plant, our three main clients in the water sector - Yorkshire Water, North West Water and Anglian Water - are beginning to integrate these with data management and digital mapping schemes which facilitate faster detection of faults and control of natural assets, thus ensuring a higher level of customer service.

With Yorkshire Water, we have entered into a cooperative business agreement to promote joint IT skills, ranging from consultancy through to implementation, to the water industry worldwide. We are already working with Yorkshire Water to provide region wide operations management systems, based on our MASTER CONTROL™ systems kernel. MASTER CONTROL is also the foundation for a similar system for North West Water which will provide an infrastructure to integrate remote control, telemetry and automation schemes with other management information and operations support systems.

The impending privatization of the UK electricity industry will bring a plethora of challenges for the distribution and generating companies alike. Having supported the information technology requirements of the water industry through its privatization process Logica is able to seize the opportunities presented by the electricity industry and has already demonstrated its ability to meet the new requirements of the industry through the installation of a computerized system for PowerGen's Energy Management Centre.

In the oil sector, we have won significant new work for BP and continued to increase sales of MASTER CONTROL for pipelines and TRACE (our personnel movements monitoring system) which has been implemented for Total Oil Marine plc and sold to Amerada Hess and Chevron. We are also seeing a trend within the oil sector towards investment in retail automation systems, where we have been able to exploit proven retail products such as Storenet/2.

CLIENTS THIS YEAR INCLUDE

BALFOUR BEATTY

BRITISH COAL

COLNE VALLEY WATER COMPANY

ELECTRICITY RESEARCH AND DEVELOPMENT CENTRE

ESSO AUSTRALIA

EASTERN ELECTRICITY BOARD

GEMEENTELIJK ENERGIEBEDRIJF DELFLAND

HAMILTON BROTHERS OIL AND GAS LIMITED

KONIKLIJKE SHELL EXPLORATIE EN PRODUKTIE LABORATORIUM

MARATHON INTERNATIONAL PETROLEUM (GB) LIMITED

MOBIL OIL AUSTRALIA

MOBIL OIL COMPANY LIMITED

NATIONAL RIVERS AUTHORITY

NORTHUMBRIAN WATER

PETROLEUM DEVELOPMENT OMAN

ROTTERDAM ANTWERPEN PIJPLEIDING MAATSCHAPPIJ

ROTTERDAM-RIJN PIJPLEIDING MAATSCHAPPIJ

SHELL INTERNATIONALE PETROLEUM MAATSCHAPPIJ

SHELL NEDERLAND CHEMIE

SHELL NEDERLAND VERKOOPMIJ

SHELL SVENSKA AB

SOUTHERN WATER

PROJECTS

Logica is developing the first phase of a project to implement a Regional Operations Database (ROD) for YORKSHIRE WATER SERVICES (YWS). The system, a central coordinated repository for quality, quantity and biological data, will improve YWS's ability to monitor the performance of all its operations across the Yorkshire Region. ROD will also help YWS to comply with the rigorous legislation enforced by bodies such as the European Community and the UK's National Rivers Authority to protect the environment.

The ROD supports enquiry on the performance of YWS's assets which include impounding and service reservoirs, bore holes, river intakes, major treatment and sewage works, as well as 29,500 km of water mains and 26,500 km of sewers. In addition, it maintains details of non physical assets such as water abstraction licences and legislation governing pollution control. The main sources of data for the ROD will be YWS's Regional Telemetry Scheme, currently being implemented by Logica, its laboratory management system, and data input manually or using data loggers by field biologists, scientists and engineers. The system will create and maintain a record of quality, enabling comparison to be made between actual and desired asset performance.

Energy and utilities

continued

In this first phase of the project, Logica is initially developing the infrastructure for creating, updating and maintaining data, including the interface with the Regional Telemetry System.

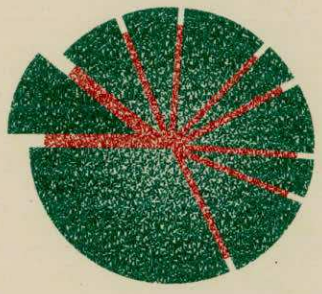
Working as a subcontractor to Digital, Logica has implemented a computerized system for POWERGEN's Energy Management Centre. PowerGen is one of the three generating companies created from the Central Electricity Generating Board through the privatization of the electricity industry. Operating from Solihull, the new Energy Management Centre provides PowerGen with the ability to monitor and plan electricity production. This information allows the company to maximize its revenues from trading electricity into the supply pool run by the National Grid Company.

The project was completed within the very tight government deadlines leading to privatization. Logica is continuing to work directly for PowerGen implementing further phases of the Energy Management Centre.

Logica has continued its long association with the ELECTRICITY COMMISSION OF NEW SOUTH WALES providing information technology support to enhance the Commission's own internal capability.

The Commission has embarked on an ambitious Plant Information Management System (PIMS) which will embrace all aspects of construction, plant maintenance, refurbishment and operational planning for both generating and transmission plant. This will ensure that the six power stations and associated transmission networks can be operated and maintained in the most efficient manner. Logica has provided consultancy advice on IT strategies for both short term implementation goals and longer term integration, and evaluated environmental software and end user tools which will be used as part of the tool set for application development.

THE ENERGY AND UTILITIES MARKET REPRESENTS 11% OF OUR ANNUAL BUSINESS

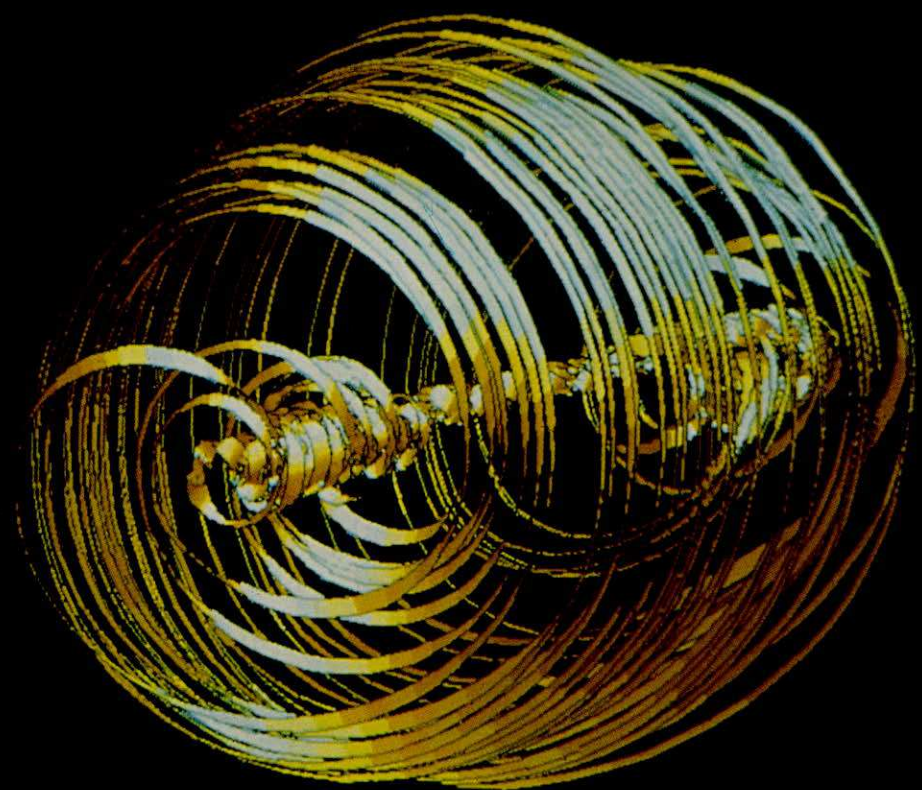


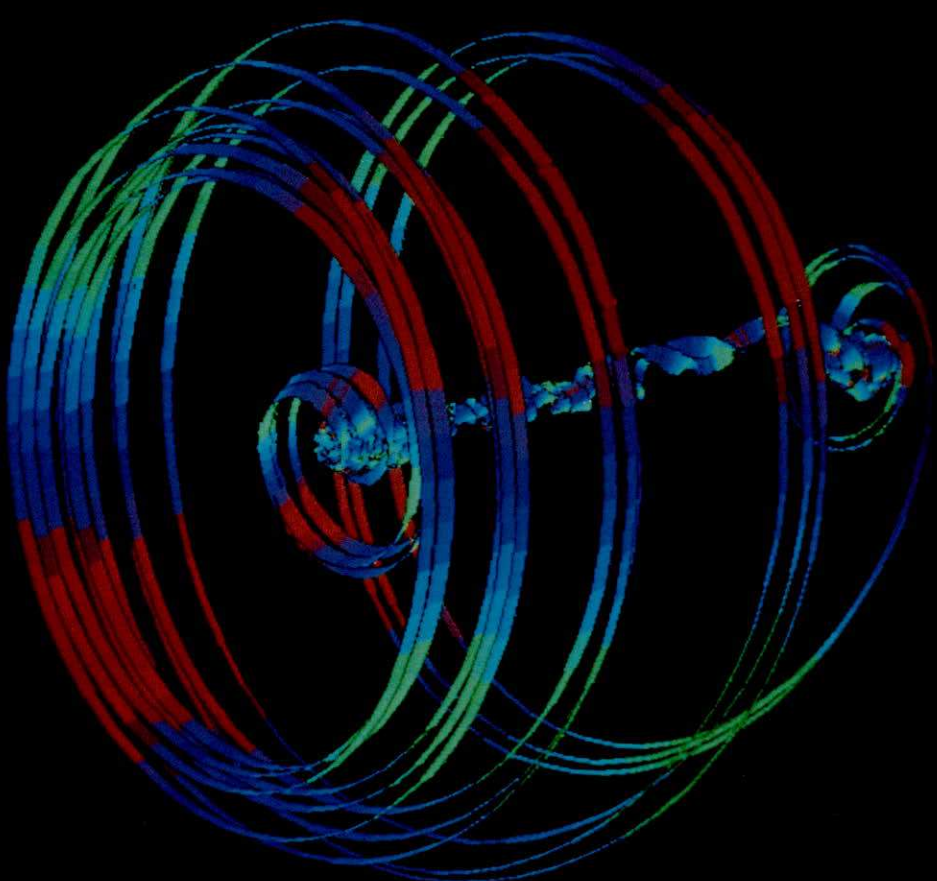
A Retail Communications System based on Logica's Storenet/2* product will help BP OIL UK LTD - operator of the UK BP retail network - to ease credit card payment operations and enhance the flow of management information from company managed sites.

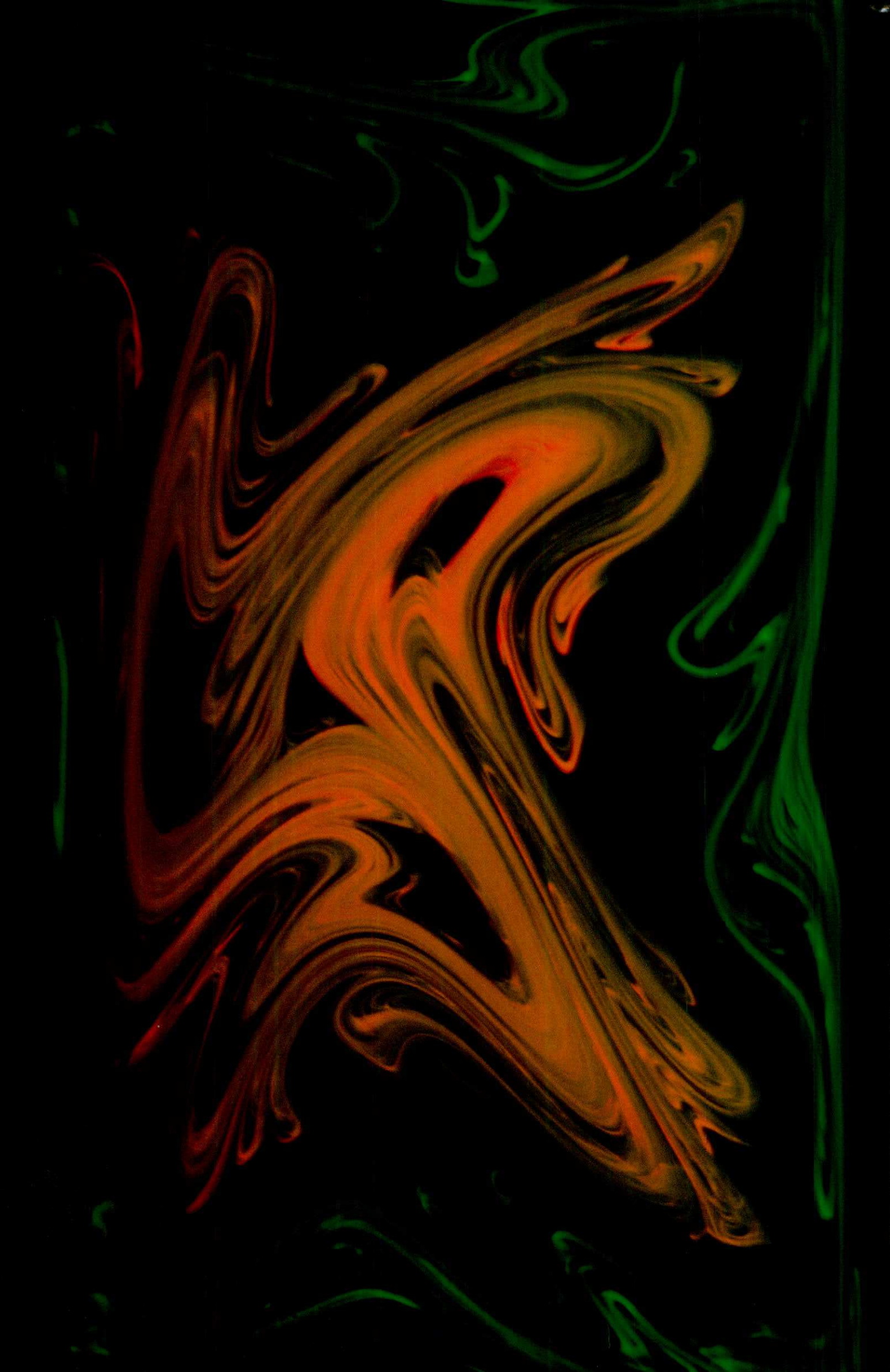
Storenet/2, a new addition to Logica's retail finance product portfolio, is an electronic point of sale terminal networking product already used by retailers worldwide. In this application, it will network existing electronic point of sale terminals and personal computers to facilitate the overnight transfer of electronic payment and business data from over 1,800 petrol stations, for central processing.

The system will enable BP Oil UK to reduce the costs of plastic card transactions at BP branded sites across the retail network and to exercise greater control over stock and operations at selected sites. In the first phase of the project, the system will handle data from around 150 BP owned and managed sites.

Right: *Fluid flow is a prime example of complex physical behaviour with turbulence exemplifying chaotic patterns. These illustrations represent experiments on oil flowing between rotating cylinders at high speed, where chaotic behaviour is just beginning to appear. They are "phase portraits" showing how the situation of the fluid changes in time. In the top example, a small change in the shape of the cylinders means the flow is much closer to chaotic, with patterns remaining. In the bottom example, a generally stable flow pattern eventually is disturbed and becomes unstable.*







Manufacturing

THE CHALLENGES FACING manufacturing industry are highly demanding and the rate of global economic and political change adds greater complexity to decision making. As industry looks forward to the end of the century, competition will be viewed increasingly on a worldwide basis and companies will strive to achieve and sustain world class manufacturing status. Within the European Community the creation of the single market and the resulting interdependence is likely to have a profound impact on the nature of competition. This should act as a spur for growth both from internal trade and the resulting repositioning of European firms on a scale more able to compete in world markets.

In meeting the various challenges, manufacturers have the opportunity to use a wide range of technical advances in information technology to help achieve strong competitive positions. Logica is increasingly involved in establishing strategic approaches with customers to ensure the control, analysis and management of information to meet business needs. Our experience and understanding of long term trends in emerging technology and manufacturing philosophies is also being heavily applied in the achievement of effective project implementations. Our international network of companies is also becoming of greater interest to many companies whose own operations are taking on a more global perspective.

We have implemented a number of automated systems for the paper industry. Following our work with Wiggins Teape to link process monitoring and CIM systems into one of the most advanced mill wide systems in Europe, we have produced a study for Empire Fine Papers to upgrade the barcoding and labelling of paper at factory floor stage.

We have worked with leading international companies, who recognize the value in working with IT specialists who can offer expertise over the full range of activities from consultancy to systems implementation, in building their seamless IT operations. For example, our strategic partnership with the Ford Motor Company built up over the past five years, combines Ford's manufacturing expertise with Logica's project management, software development and systems integration experience. Since 1986 we have collaborated with Ford on ten major projects aimed at the integration of its production, finance, distribution and supply activities Europe wide. With the export group of Unilever, we are assisting in the development of an IT strategy specifically related to the control and management of their network of worldwide purchasing, merchandising, shipping and documentation.

Our broad expertise has led to our appointment as an approved industrial systems integrator (AISI) by IBM United Kingdom Limited, to work closely with the company in the marketing, design, implementation and support of computer integrated industrial systems.

Left: *Mixing plays a central role in modern technology. Chemical engineers rely on mixing to ensure that substances react properly, but in spite of it being a key part of many processes, mixing is only imperfectly understood. Researchers at the University of Massachusetts have sought to characterize the flows in order to understand and improve mixing as a part of industrial processes. The picture shows the mixing of two different passive substances in a time periodic cavity flow. Both substances undergo chaos, but the two chaotic regions do not mix.*

CLIENTS THIS YEAR INCLUDE

AKZO COATINGS
ALDEL
ANSALDO
BLOXWICH ENGINEERING LIMITED
BOC GROUP
BRITISH STEEL STAINLESS
DANIELI
DOUWE EGBERTS
DUNLOP LIMITED
FIAT
GILLARDINI
INCLIMAT SYSTEMS
JAGUAR CARS LIMITED
MW KELLOG
NESTLÉ AUSTRALIA
NPBI
PFIZER LIMITED
ROLLS-ROYCE PLC
RTZ CONSULTANTS
SCLAVO
VERENIGDE BLOEMENVEILINGEN AALSMEER
WAGNER INDUMAT SYSTEMS
WELLCOME RESEARCH FOUNDATION LIMITED

PROJECTS

Working in partnership with the procurement division of TECHNICAL AND PROCUREMENT SERVICES LIMITED (TECHPRO) - one of the UK's largest purchasing agencies - Logica is developing a computerized procurement system to help increase efficiency and reduce complex, time consuming paperwork.

TECHPRO requisitions, orders and ships on a range of goods and equipment throughout the world, and currently uses various stand alone computer systems and paper based procedures to manage and track the numerous, complicated transactions.

Logica was contracted to help develop an integrated system to provide total visibility and centralized control of the various elements of the procurement process. The implementation of the system will be carried out in several phases to enable partial operation at an early stage.

BRITISH FERMENTATION PRODUCTS (BFP) is a major UK manufacturer of yeast and related food products for the baking and allied industries. As a vital part of BFP's IT strategy for the future Logica has recently completed a study recommending a

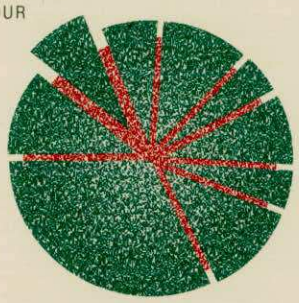
sales order processing and distribution system to replace the existing system which was implemented by Logica in 1984. The enhancement will move BFP towards greater operational efficiency through online processing of company sales and stock positions, inter-depot transfer requirements and customer profiles throughout its 21 strong network of national depots.

As a follow on, we are undertaking a further study reviewing BFP's manufacturing systems requirements to evaluate the way forward in streamlining and standardizing production processes across its manufacturing sites.

FORD MOTOR COMPANY LIMITED is a stage closer to its goal of employing common vehicle accounting practices across Europe following the completion by a joint Ford/Logica team, on time and within budget, of the first phase of a major system reimplementation to convert local systems in Ford's 15 European National Sales Offices to a single unified system running on IBM machines with a DB2 central database. The system covers all aspects of vehicle accounting including vehicle pricing, dealer invoicing, delivery documentation, cost and revenue accounting and final dealer payment.

In the first phase, worth over £1 million, a feasibility study and pilot project to prove the approach were followed by implementation of the first operational system for Ireland. Work has already started on the next phase to implement the system in the UK, with the final phase extending the system to Ford's remaining European sales offices.

THE MANUFACTURING MARKET REPRESENTS 8% OF OUR ANNUAL BUSINESS



Logica has developed a computerized stock processing system for BRITISH SHOE to control the picking of stock for delivery to retail outlets throughout the UK.

Logica's system provides the interface between British Shoe's central mainframe computer, which controls order processing, and new automated sorter equipment which has been installed in the company's central warehouse in Leicester. Replacement stock can now be scheduled directly onto the high speed sorting equipment to maximize throughput and meet the departure timetable of British Shoe's delivery vehicles.

The new sortation system, which covers an area the size of a football field, is capable of handling up to 35,000 items per hour - compared to the 20,000 handled manually. Staff place the stock for sorting onto the main sorter channels where it is identified by bar code readers and distributed into designated destination lanes. The new system is capable of dealing with up to 1.5 million pairs of shoes each week - allowing staff to pick for 150 branches simultaneously.

We have completed the implementation of a customer complaints handling database, for PWA GRAPHISCHE PAPIERE GmbH, one of Europe's leading paper manufacturers. The system enables customer complaints to be logged, analysed and processed more quickly, leading to improved customer service and reduced costs. Preformulated texts are used to produce a report explaining each complaint and all information can be archived and recalled. PWA will also use the database to increase manufacturing efficiency through statistical analysis and modelling which relates complaint patterns to specific areas of the production cycle, allowing refinements and improvements to be made where necessary.

Government

LOGICA HAS SUPPLIED a variety of systems to government departments worldwide, and forged links with organizations in Australia, Belgium, the Netherlands, UK and the United States, all of whom have differing priorities and requirements. The complex procurement processes make selling to government a highly competitive environment demanding a particular brand of expertise in securing and implementing contracts. The development of long term strategic partnerships is one way of ensuring we gain a thorough understanding of clients' business.

At the beginning of the year we signed an agreement with Her Majesty's Custom and Excise (HM C&E) for long term IT collaboration over an initial four year period, the first time a government body has initiated a structured relationship of this type for IT support. Logica provides specialist software and systems skills in the development of new systems and the maintenance of existing ones. At the year end, we were working on projects covering five different aspects of HM C & E business, and anticipate assisting at a greater level as the various projects move to more advanced stages of the lifecycle.

Government projects predominantly consist of large, complex administration systems. Our combined skills in project management and the implementation of advanced, often innovative technology in the execution of such projects has built us a strong reputation in this area.

The implementation of a TRAiNing and SITuations vacant (TRANSIT) system to the Northern Ireland Training and Employment Agency is an example of such a project. It facilitates the linkage of 29 Employment Service Offices through a Belfast based central site and allows faster advertisement of vacancies and more rapid turnaround for interviews and placement. For the UK Department of Social Security (DSS) we are applying our expertise in knowledge based systems (KBS) in a study to consider the role KBS could play in advanced local office systems and in supporting complex decision making.

The approach of the single European market and all the opportunities associated with it has created a demand from the European governing bodies for integrated computer systems to administer the new operating cultures. Our network of European offices and resources makes us well placed to support the Commission of European Communities (CEC) in preparing to measure and control the regulating of standards across Europe. The total number of contracts we had undertaken for the CEC totalled around 20 by the year end.

CLIENTS THIS YEAR INCLUDE

BESTUUR VOOR ELEKTRICITEIT EN ELEKTROMECHANICA

BIRMINGHAM CITY COUNCIL

BUILDING RESEARCH ESTABLISHMENT

THE COMMISSIONER OF BANKING - HONG KONG GOVERNMENT

DEPARTMENT OF ECONOMIC DEVELOPMENT (NORTHERN IRELAND)

DEPARTMENT OF INDUSTRY AND ECONOMIC PLANNING, VICTORIA, AUSTRALIA

DIENST VOOR PROGRAMMATIE, INFORMATIE EN STATISTIEK

HER MAJESTY'S STATIONERY OFFICE

HM COASTGUARD

MINISTERIE VAN BINNENLANDSE ZAKEN

MINISTERIE VAN JUSTITIE

MINISTERIE VAN ONDERWIJS EN WETENSCHAPPEN

NSW ATTORNEY GENERAL'S DEPARTMENT

NSW DEPARTMENT OF INDUSTRIAL RELATIONS AND EMPLOYMENT

ROYAL HONG KONG POLICE

STATELINK SOUTH AUSTRALIA

UK CENTRAL COMPUTING AND TELECOMMUNICATIONS AGENCY

UK DEPARTMENT OF HEALTH

UK DEPARTMENT OF SOCIAL SECURITY

UK FOREIGN AND COMMONWEALTH OFFICE

UK GOVERNMENT COMMUNICATIONS HEADQUARTERS

UK HOME OFFICE

UK NATIONAL HEALTH SERVICE

WANDSWORTH BOROUGH COUNCIL

PROJECTS

Logica was awarded a substantial turnkey contract to provide office automation and information management facilities within the UK CABINET OFFICE, following competitive proposals and technical design phases. The facilities are based on Digital equipment, giving an X-windows interface to DEC write and related packages. Logica's CPLEX.400™ software, improved to conform with CCITT X.400 (1988) OSI standards, will support communications services.

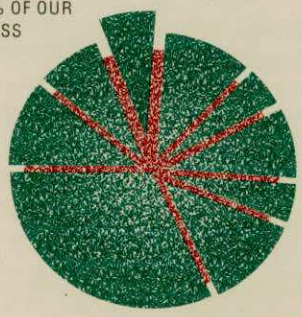
We are continuing our association with RIMNET, the UK's national radioactive incident monitoring network, with three substantial additions being made to the current operational system. RIMNET, a network of 46 radiation monitoring stations throughout the UK operated by HER MAJESTY'S INSPECTORATE OF POLLUTION (HMIP) monitors radiation levels to detect any abnormal increases. In the event of any unusual rises being confirmed, information is fed immediately to other Government departments for action. The latest work provides a major upgrade to the existing central database facility (CDF) in London allowing the direct entry and retrieval of raw data from the CDF. The link is being used by other government departments to secure access to CDF information.

Government continued

The second contract, with the SCOTTISH OFFICE, is an enhancement to a system supplied by Logica in 1988 which currently enables staff to collect and analyse supplementary data on, for example, agricultural produce and water supplies. The additional facilities provide further analysis capability and the ability to link the system with HMIP's CDF, allowing the transfer of data between the two sites. A third contract with the WELSH OFFICE has implemented a system which permits the capture and analysis of supplementary radiation data.

Logica and HM CUSTOMS AND EXCISE (HM C&E) have combined to produce a Seizure Documentation System (SDS) which, when fully operational, will increase the productivity of drug detection units by reducing the amount of time customs officers need to spend on administrative procedures associated with drugs seizures. At present a customs officer making a drugs seizure must complete a number of complex forms which can take the officer away from duty for up to eight hours. In addition the officer making the drugs discovery is also responsible for the control of goods from seizure through secure storage to court hearings. The SDS will enable basic information to be entered into the system at the time of seizure. The system can then complete all forms and other documents automatically, prompting the operator for further information where necessary. Work has commenced on the next phase which will bring the same administrative benefits to seized revenue goods.

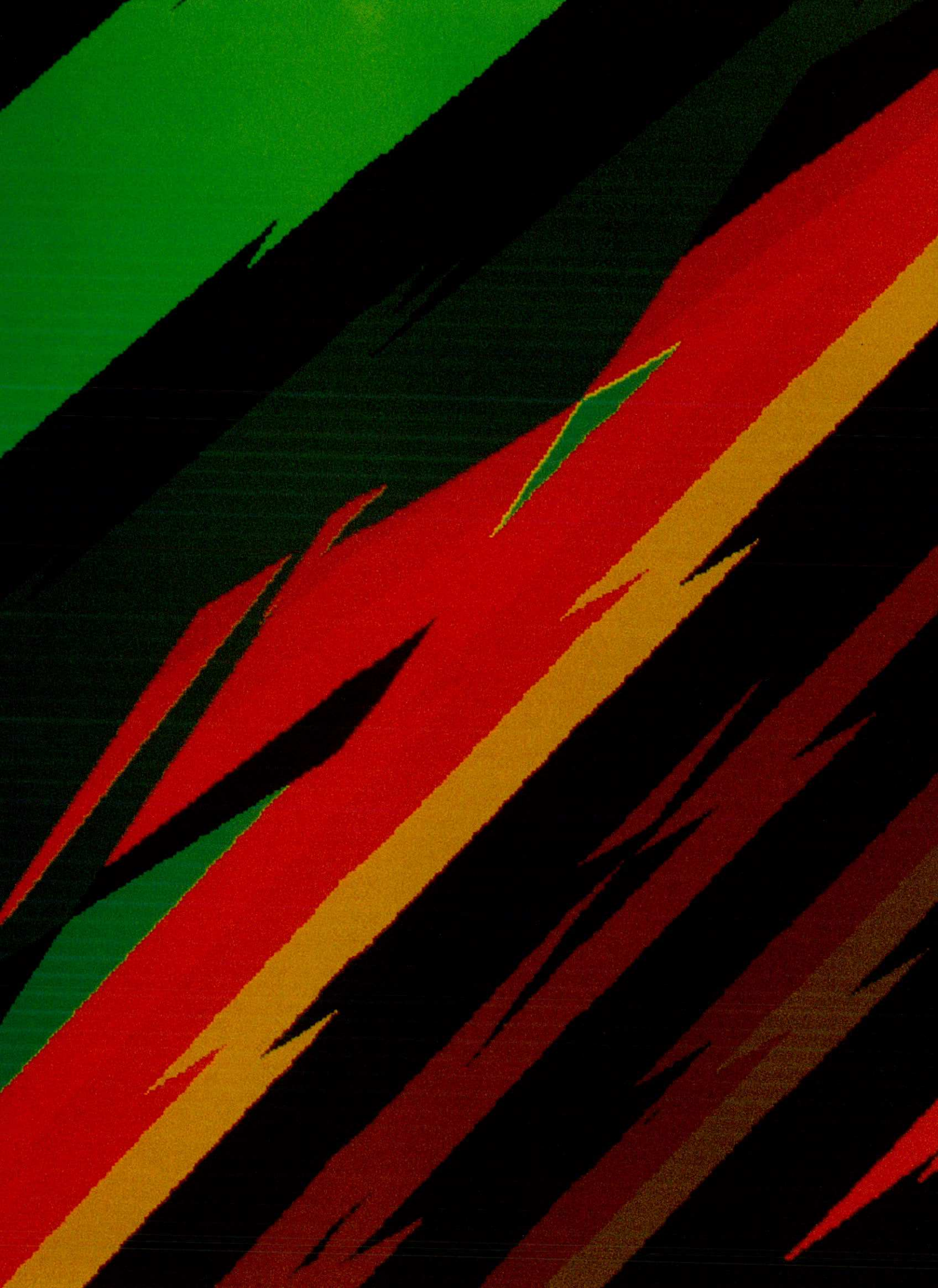
THE GOVERNMENT MARKET REPRESENTS 7% OF OUR ANNUAL BUSINESS



Logica has, since 1988, carried out a number of strategic studies for the European Institutions including IT studies for the Court of Auditors and the Court of Justice. As a follow up to our study for the COURT OF JUSTICE we have been awarded a pilot project to install an integrated system to automate the dissemination of information from court decisions. When a decision is made the outcome is edited into the nine community languages. and circulated in the European Community. The new system will speed up the circulation of information and also facilitate access to the information required by the Court to prepare decisions. The project makes extensive use of a range of computer aided software engineering tools, and places great emphasis on the human computer interface, particularly its multifunctional and multilingual aspects.

We have also carried out an IT strategy study for the DIRECTORATE GENERAL IX PERSONNEL AND ADMINISTRATION (DG/IX/PA) aimed at defining an IT master plan to integrate all the Directorate's administration activities. The DG/IX/PA is the largest Directorate General of the CEC and employs around 2,000 people to provide manpower support, office facilities, administrative resources and associated services to the 15,000 employees of the CEC. The study reviewed the mandates, functions and objectives of each working unit, and defined information architecture requirements, infrastructure development, resource needs and a recommended implementation plan.

Right: *Fractal geometries can be applied using powerful computers to simulate the growth of cities which exhibit clear properties of self similarity. This technique has been used to simulate a satellite view of London. These ideas have far reaching implications for the study of geography, as they lead to better ways of describing spatial systems and of understanding the processes which generate morphologies.*



Defence

THE DEFENCE INDUSTRY has undergone profound changes within a relatively short timescale. The dramatic developments in Eastern Europe, the INF treaty, cuts in Soviet, US and UK defence budgets and personnel, and the reduction in nuclear warheads have radically altered the priorities and considerations of defence organizations.

The resulting pressures are compounded by environmental concerns such as pollution and wastage, and demographic trends indicating reduced numbers of potential recruits. Priorities now focus on more effective utilization of smaller forces, with increasing emphasis on flexible, responsive and sophisticated defence systems. We are engaged in a number of feasibility studies on behalf of defence establishments to assess the practicality, benefits, risks and costs associated with the integration of advanced software systems into a variety of military hardware.

There is a growing trend towards the use of information technologies in weapons and platforms to make them cleverer and more self sufficient, reflecting the emergence of improved surveillance, intelligence, targeting and command and control systems. Obtaining the highest possible performance from electronic equipment is a key requirement. Our work in areas of knowledge based systems, artificial intelligence, advanced software engineering and human computer interaction has contributed to the development of systems which encourage better performance from the fewer operatives of computerized military systems and reduces the threat to effectiveness of the potential manpower shortfall.

The increasing computer dependence of weapons systems has introduced the need for tighter controls on safety and reliability for computer controlled environments. To this end, we have completed a study for the Royal Signals and Radar Establishment into the design of a safe compilation architecture to provide the first mathematically designed environment for use in the development of defence equipment and other applications which require a high level of reliability.

As part of the UK Government defence industry's preparation for agency status, business practices are being harmonized across numerous divisions, enabling administrative, engineering and scientific establishments to run more effectively. Logica's work in applying information technology to streamline these operations includes a contract from the Admiralty Research Establishment to complete the financial modules of the Management Information System, AREMIS.

Military establishments are also conscious of the damaging impact of manoeuvres on the environment where mock battles involving large numbers of troops and hardware could potentially destroy large tracts of countryside. Logica has worked with a number of Ministry of Defence clients on the development of computer based exercises, which are now seen as an equally effective way to maintain operational readiness without resorting to costly and destructive ground and air manoeuvres.

Left: *Analytic solutions have been found to the battle management equations known as Lanchester Equations analysing the effect of troop reinforcements on the outcome of a battle. These solutions indicated unexpectedly extreme sensitivity to initial conditions. In the image opposite the vertical axis represents the initial number of red troops and the horizontal axis represents the initial number of opponent troops. For two allowed reinforcements of 25 troops, the fraction of forces lost by the winner is colour coded.*

CLIENTS THIS YEAR INCLUDE

AERITALIA
ATOMIC WEAPONS ESTABLISHMENT
BROWN ROOT VICKERS
CHEMICAL DEFENCE ESTABLISHMENT
DEFENCE SCIENTIFIC AND TECHNICAL ORGANIZATION AUSTRALIA
DEVONPORT MANAGEMENT LIMITED
EASAMS
GEC MARCONI
HAWKER SIDDELEY
HUNTING ENGINEERING
NATO
PILKINGTON OPTRONICS BARR AND STROUD
ROYAL AEROSPACE ESTABLISHMENT
ROYAL ARMAMENT RESEARCH AND DEVELOPMENT ESTABLISHMENT
ROYAL DANISH NAVY
SCIENCE AND ENGINEERING RESEARCH CENTRE
SIEMENS PLESSEY
THORN EMI ELECTRONICS
VICKERS SHIPBUILDERS AND ENGINEERING LIMITED
WESTLAND HELICOPTERS

PROJECTS

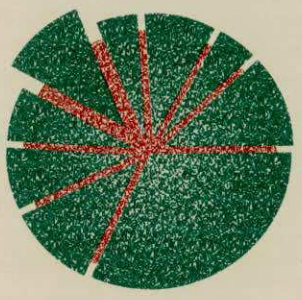
We are working on a number of projects aimed at exploiting the software capability of both fixed and rotary wing aircraft. Under contract to the UK NAVAL AIRCRAFT MATERIALS LABORATORY (NAML) Logica is developing an engine health database to automate the detection of engine and gear box failure in the helicopters of the Fleet Air Arm and selected units of the Army Air Corps.

NAML previously obtained data through the spectrometric analysis of oil composition. The new easily accessible database will remove much of this time consuming manual work and give NAML the ability to predict optimum component replacement times, reduce misinterpretation of data and institute regular safety checks on the aircraft, all of which will ultimately lead to increased levels of safety and performance.

Logica has developed application software as part of a programme to link additional sensors and associated facilities to the Central Tactical System (CTS) on board the updated Royal Navy Lynx helicopter. The work was carried out under contract to RACAL AVIONICS, whom we have already assisted with the original specification and implementation phases of the CTS.

Defence continued

THE DEFENCE MARKET REPRESENTS 11% OF OUR ANNUAL BUSINESS



The new sensor is to be linked to the Passive Identification Device (PID), an infra red camera which is deployed at night, in fog or other low visibility conditions to detect and track the position of objects such as ships and aircraft. Logica developed the software to provide all control and monitoring functions for the PID, including a menu structured man machine interface and a facility to display PID video images and tactical information graphically on the CTS colour monitor.

In a contract awarded by the UK MINISTRY OF DEFENCE we also conducted a study into the feasibility of updating the CTS of the Nimrod Maritime Reconnaissance Mark II aircraft, identifying the design and cost options in updating the software, hardware and systems architecture. The CTS allows the plane to operate efficiently in its dual role as maritime reconnaissance aircraft and coordinator of air sea rescue operations. The upgraded system is necessary to improve mission capability, heighten the aircraft's capability to handle a wide range of sensors, streamline the workload of the crew and allow cheaper and easier maintenance of equipment.

Logica has completed the development, testing and installation of a management system for the ROYAL AIR FORCE (RAF) Support Management which will control and manage the movement of Britain's military aeroengines for maintenance purposes. The Supply Aeroengine Record Office system will control the disposition of aeroengines for the fixed wing aircraft of the RAF, the Royal Navy and the British Army. The system will keep track of aeroengines on a day to day basis, controlling their movement to and from maintenance facilities, both within the Ministry of Defence and at private contractors. The system will also be used by the RAF to model the movement and repair of engines and their components, so that optimum spares levels can be maintained.

Logica successfully concluded a contract, awarded by the UK DIRECTORATE NAVAL SHORE TELECOMMUNICATIONS AUTHORITY (DNSTA), to develop and install a new operational connectivity management system for the shore end of the Royal Navy's ship-shore-ship communications network.

The DNSTA is responsible for providing shore end communications, including a network of private wires linking nationwide locations. When a fault occurs in the network, the likelihood of message transmission breaking down is increased and alternative routes must be found to bypass the problem. Using the new system, should a fault be detected, a central standalone database of national connectivity makes an automatic recommendation on the alternative transmission paths available. This increases the speed, efficiency and reliability of communications between Naval commanders ashore and the ships at sea, ensuring that the network is restored quickly.

The previous system relied on manual effort at various countrywide locations to recommend and initiate alternative routes. The system was designed using Yourdon, a structured design methodology, and supported by Logica's MacCadd™ software tool, an intelligent software diagram editor.

A Logica led team carried out a study for the UK MINISTRY OF DEFENCE to design and plan the implementation of the Portable Common Tool Environment (PCTE+) and an integrated set of software tools. The study forms part of a coordinated European programme of work aimed at assessing PCTE+.

PCTE+ provides a definition of a kernel on which Integrated Project Support Environments can be constructed, providing a basis for software tool builders to construct tools which can intercommunicate. The PCTE+ programme is aimed at defining an interface acceptable to all NATO nations which is suitable for both military and civil application, and at promoting its use for all NATO's software development.

Space

COMPLEX SATELLITE SYSTEMS in earth orbit and beyond are applied to a variety of end user services including telecommunications, navigation, broadcasting, remote sensing, meteorology and defence. They also further our knowledge of planetary and solar sciences and permit manned exploration of space. Logica has continued to contribute to major international space projects in many of these fields. We produce software and systems for applications ranging from ground control operations through onboard systems development to satellite based control systems. Our clients include most of the European prime contractors and space agencies, as well as civil and military arms of the UK Government and international satellite organizations.

As a result of the UK Government's decision to focus its contributions on selected European Space Agency (ESA) initiatives, we have sought to expand our business in continental Europe, particularly in Belgium and Italy where we have won important new contracts during the year. In the United States, we are developing our market position by building on our work for INTELSAT.

Our reputation as a leading contributor to the space industry has been reinforced through the renewal of a five year contract to work as an ESA approved contractor. This lead position was further emphasized by Logica's hosting of the Consultative Committee for Space Data Systems, formed to investigate and improve space data systems. Attended by key members of ESA, NASA and representatives from Europe, Japan, Brazil and Canada the conference affirmed the widespread commitment to international space collaboration.

In ground control, with our chief sub contractor Alcatel Espace, we achieved operational acceptance of the Telemetry Command and Ranging (TCR) system for the European telecommunication satellite organization's EUTELSAT II series of satellites, the first of which was launched in late August 1990.

We are contributing significantly to onboard software development projects. Specific activities are underway for the European Polar Platform mission and the Anthrorack Payload. A study for the European Space Operations Centre of approaches to onboard software maintenance is also in progress.

Our involvement with the Hipparcos programme spans eight years with teams working on both the ground and onboard software. After the satellite failed to achieve geostationary orbit, Logica staff played a valuable role within the team responsible for the recovery operation which enabled the mission to continue successfully.

The space industry demands rigorously high standards of reliability and performance from software systems. The complexity of technology involved is such that the development life cycles usually stretch over ten or more years and operational effectiveness of a mission relies heavily on optimum interaction between ground and onboard information systems. The application of our skills in software engineering, human computer interaction, knowledge based systems, speech technology, data processing and image enhancement to ensure maximum usability and responsiveness of systems, is a key factor in some of the project examples covered in this Annual Review.

Space technology has set the pace in the study of the global environment, a first step in understanding the future of the Earth's natural resources. Logica has worked in a consortium carrying out facilities development for the UK Earth Observation Data Centre for which the ERS 1 satellite, to be launched in 1991, will produce important information on ocean and ice monitoring.

CLIENTS THIS YEAR INCLUDE

AÉROSPATIALE
BRITISH NATIONAL SPACE CENTRE
DORNIER GmbH
ESTEC
EUROPEAN SPACE RESEARCH AND TECHNOLOGY CENTRE
EUROPEAN SPACE RESEARCH INSTITUTE
INMARSAT
MARCONI SPACE SYSTEMS
MATRA ESPACE
MBB/ERNO
MUSC
NATO
SELENIA SPAZIO
TELESPAZIO
TRW

PROJECTS

Logica has been retained by INTELSAT, to undertake the design and implementation of an Operational Planning System to assist satellite planners in coping with the increasing demand and complexity of the satellite control and maintenance enhancement. The system will provide workstation support that will integrate tasks performed by individual planners and provide a means to transfer tasks between areas of responsibility. An artificial intelligence shell is being used to combine the heuristic and intuitive roles to improve timeliness of the allocation and optimization process. The system employs a distributed architecture using IBM PS/2® workstations under OS/2®, utilizing IBM's Presentation Manager,® a file server under ORACLE with individual workstations linked together by a token ring network.

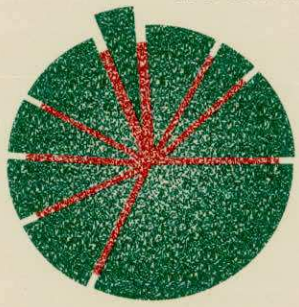
Space continued

The Spacelab mission planned for April 1992 will involve several software systems developed by Logica. ESA is developing the Anthrorack facility to support experimentation into human physiology under microgravity, for flight on Spacelab. Logica has devised a special purpose language, EDL, to be used for the description of Anthrorack experiments. The language is directly interpreted by a processor and allows the mission preparation team to detail at any point the actions required in an experiment, with the inclusion of prompt and help pages to guide the astronauts in their activities. We have also worked on the development of mission preparation and integration checkout software and overall onboard software, developed a man machine interface (MMI) prototype and refined the MMI specification based on use of the prototype by astronauts, experimenters and space engineers.

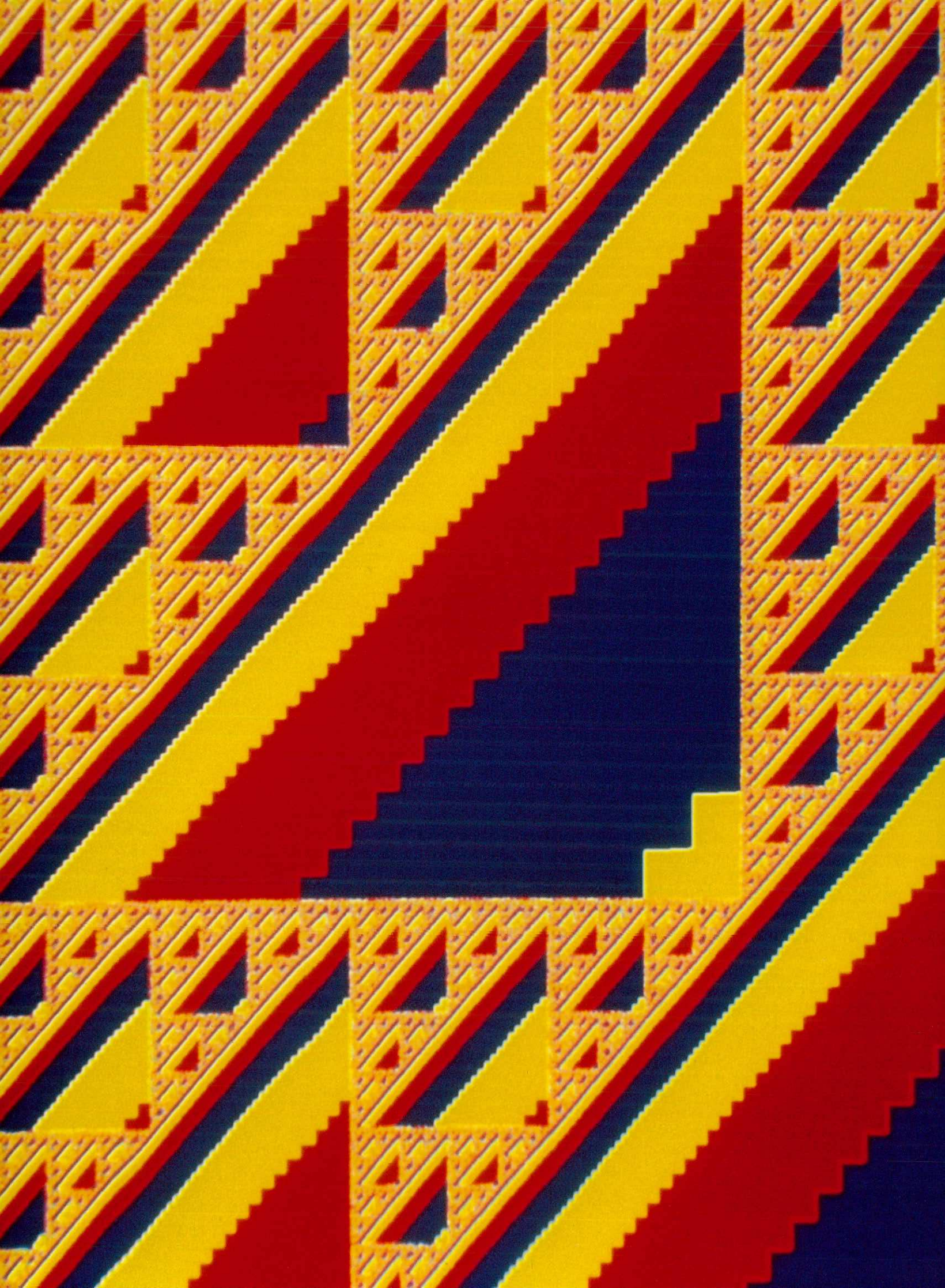
Logica has, since 1987, participated in each of the four phases of the ground segment definition of the Polar Platform, part of the ESA Earth Observation Programme. This work has been managed by the Space Department of the ROYAL AEROSPACE ESTABLISHMENT, and was funded by the British National Space Centre. The Polar Platform, due for launch in 1997, will host a variety of payloads for applications such as earth observation, meteorology and space science. The Polar Platform will collect data which will be provided to a variety of different users such as weather centres, scientific bodies, petro chemical industries and agricultural bodies to aid their predictions and planning processes. We are leading a joint UK/Norwegian team in a study which addresses the requirements for platform control, payload coordination and data dissemination, including the facilities required to provide an operational service for the multidisciplinary and global user community.

On the Polar Platform space segment, Logica is subcontracted to BRITISH AEROSPACE to provide system software support. Additionally we have developed and implemented a multi purpose satellite mission model, which supports the future development of both the space and ground segments of the Polar Platform.

THE SPACE MARKET REPRESENTS 5% OF OUR ANNUAL BUSINESS



Right: *Results described by the chaotic equations graphically represented here have been measured in the earth's ionosphere. A solution to the Zakharov equations describes the electric field intensity in the ionosphere due to electromagnetic driving by the Arecibo antenna. Time is plotted on the horizontal axis, and spatial coordinate is the other axis. The electric field intensity is colour coded in the vertical direction.*



Telecommunications

THE TELECOMMUNICATIONS INDUSTRY is in a period of rapid change and growth. The liberalization of the regulatory environment in many countries coupled with technological change has opened up a wide variety of new opportunities. Telecommunications companies are facing the challenge to provide better customer service as well as extra, value added services to both their private and corporate customers. In many cases this involves the addition of high performance computer systems to the switch network or the provision of sophisticated customer facing systems.

Logica has substantial expertise in applying software technology to meet these needs. We have carried out projects providing support services, network management, message services, mobile radio networks, communications satellites and intelligent networks infrastructure and applications.

PTTs world-wide are among Logica's biggest and most longstanding clients. We have worked intensively with the Dutch PTT Telecom to develop the SAGITTA network and Tradeserver system to enable increased information exchange and are now working on further public and private systems. One such system is the Telegate Beta System for Rotterdam Teleport, an organization set up by PTT Telecom and the Rotterdam Port Authority to develop information systems for the port community. Telegate provides rapid access to a wide range of transport logistics-related databases.

Our £1 million project for the States of Jersey Telecommunications Authority to develop and install a customer administration and billing system was completed during the year. The system holds all customer information on a single integrated database, providing a central point of contact for customers. The system is now being marketed as a product, FROST™, aimed at the smaller telecommunications authorities.

Mobile communications is one of the sector's fastest growing business areas, and we have contributed software support services in several major projects, examples of which are highlighted overleaf.

Worldwide communications are increasingly made possible via satellite technology. We are making a major contribution to some of the world's largest satellite operations through the transfer of expertise gained in space applications combined with our skills in telecommunications work.

In the postal services sector, where complex logistics govern the efficient collection, processing and delivery of mail and related goods, we have continued our ten year association with Australia Post. This year we completed the functional specification for a Mail Processing Analysis System. This system will assist Australia Post to achieve its goal of continued productivity and service performance improvements for its mail products. We have also been providing strategic advice on a range of automation issues for PTT Post in the Netherlands.

The broadcasting industry has provided us with further product sales and the growth of satellite television is throwing up new opportunities. We have recently produced the main collection and forwarding element for a comprehensive one way VSAT system. The system is designed to utilize the extra bandwidth available from Direct-to-Home broadcasts using the MAC/Packet television standard, in order to provide point to multipoint data transmission via satellite. Following the successful installation of a GALLERY 2000™ stills library system for the BBC's News and Current Affairs department in Television Centre, a further five GALLERY systems have been sold to the Sport department and four regional broadcasting centres.

Left: *In spite of their complexity, fractal images have a low information content and can be specified with a small number of bits. This has already paid dividends in the area of image processing, where a novel approach has been developed using fractal algorithms to achieve compression ratios of over 10,000 to 1. The technique can be combined with conventional algorithms to achieve compression of up to 1 million to 1. The applications of such technology are legion. Hours of video could be packed onto a CD, and image archives would require a fraction of the memory currently needed.*

CLIENTS THIS YEAR INCLUDE

ALCATEL
BRITISH SATELLITE BROADCASTING
BRITISH TELECOM
BRITISH TELECOM INTERNATIONAL
BYPS
CELLNET
COGNITO
COMPUTASIA LIMITED
FERNMELDETECHNISCHES ZENTRALAMT
FRANCE TELECOM
GPT
ITALCABLE
MICROTEL
PACIFIC TELESIS
PHILIPS RADIO COMMUNICATIONS SYSTEMS
RAI
SIP
TELECOM AUSTRALIA
TELEVERKET
US SPRINT
VISNEWS

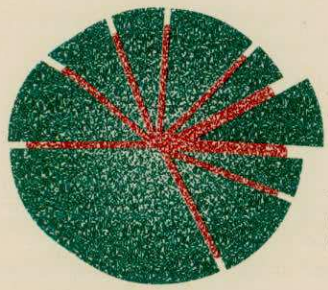
PROJECTS

As part of a ten year US$32 million project Logica has been awarded a contract, as subcontractor to the Harris Corporation's Government Electronic Systems Division, to provide a network management system for the TENNESSEE VALLEY AUTHORITY (TVA). The system will manage voice and data communications between the Emergency Operations Center in Chattanooga and nuclear plants in Tennessee and Alabama.

Logica is building the database software for the TVA's new Nuclear Telecommunications System Control Center on an AT&T platform. The system is based on Logica's C3 software product which enables privately owned telecommunications networks to be monitored, controlled and administered from a central site. The new network will also incorporate Integrated Services Digital Network (ISDN) technology, fibre optics and high speed local area networks.

Telecommunications

continued



THE TELECOMMUNICATIONS MARKET REPRESENTS 9% OF OUR ANNUAL BUSINESS

Logica has signed an international cooperative marketing agreement with TANDEM TELECOMMUNICATIONS SYSTEMS INC (TTSI) under which the two companies will work together to provide the telecommunications industry with highly flexible systems that can respond quickly to changing customer requirements. The agreement covers the TTSI-NET products: TSCP-1000 Service Control Point; TSMS-1000 Service Management System; and TSCE-1000 Service Creation Environment, a set of application development tools. Both companies will pursue business opportunities in the Intelligent Network market which includes 0800 Freephone services, virtual private networks, alternate bill services and the support of emergency response services.

The agreement is the latest initiative in a twelve year relationship with Tandem, and has already yielded two contracts, one with Telesphere and the other with Cable and Wireless.

Logica has also given substantial support to the HONG KONG TELECOM GROUP, which has embarked on a major programme of systems replacement. The Hong Kong Telecom International tariffs and traffic accounting system, being implemented by Logica, maintains data on all international telecommunications traffic sent and received, maintains the tariff rates of all carriers and provides all necessary accounting information to the ledger system.

In addition, Logica is to provide systems for Hong Kong Telephone, another Hong Kong Telecom company, which interface directly with digital exchanges from NEC and Fujitsu and maintain a comprehensive database of the network's configuration.

We have supported the FERRANTI CREDITPHONE LIMITED Zonephone service through the design and development of a customer administration, billing and sales ledger system to combat the logistical problems of instant credit checking, on line customer registration and billing cycles. The introduction in 1991, by European telecommunications administrations and network operators, of a pan-European all digital cellular network will allow portable handsets and car phones purchased in one country to be used anywhere in Europe. Logica has worked with ROHDE AND SCHWARZ to develop an approved system to test network signalling capacity to Groupe Speciale Mobile technical recommendations.

The SWEDISH POST OFFICE distributes 3.4 billion letters per year, with close to half that volume generated by the 250 largest senders in the country. This group of senders, predominantly large organizations, generally operate automated methods of preparing large quantities of information for distribution.

Conventional sorting procedures are being upgraded to provide a service which links with users' computers. Logica has developed plans for the system, which is built around the EPX (Electronisk Postbox), where each addressee has a unique EPX-ID. The sender has the option to select criteria for distribution, such as different postage rates while the addressee has a facility to select which services to subscribe to. By 1993 it is expected that the new EPX system will distribute 200 million letters per year.

Computing and electronics

THE COMPUTING AND electronics sector has always been an important one for Logica, and one which has provided perhaps the greatest challenges to our skills in complex product development. Over the year we have dedicated considerable effort to building closer relationships with the key computer manufacturers, and to extending these relationships worldwide. As computer vendors grow to appreciate the value of systems integration in establishing competitive edge they are moving towards alliances which can offer total solutions. In many cases they take the form of focused partnerships, when shared interest and experience in particular markets allows us to work more effectively together and maximize our respective strengths. In other cases, Logica's market and industry knowledge has been brought to bear at an early stage in the product development lifecycle, working with the computer vendor to define the requirements, then going on to design, develop and supply successive releases for delivery to end clients, and providing continuity of support.

The factors critical to our success in this sector are our skills in creating quality product software, our understanding of industry needs and our international presence spanning the world's three most important markets of Europe, the United States and the Pacific Rim.

In Italy we are working for Digital on a Branch Stock Control System, and additionally undertaking a number of contracts for Olivetti. A point of sale product for use at supermarket checkouts has been developed for Olivetti in Germany, whilst in Belgium we have worked for Siemens on several applications using INFORMIX◊◊ and SINIX◊◊◊. In conjunction with the Australian IBM Programming Centre a Logica team completed additional components for the NetView□ range of products and is now working on other product developments.

Logica's global capability is an important factor in our ability to deliver a high level of service, support and continuity in projects such as the International Funds Transfer System (IFTS) for IBM. The IFTS product, which runs on IBM fault tolerant System/88 interfacing with telex services, SWIFT, CHIPS and Fedwire networks, was developed and managed in three different locations, thousands of miles apart, supported by our skills bases in the United Kingdom and the United States.

Another important element in our partnerships with computer vendors is the joint marketing of Logica's own portfolio of products. For instance FASTWIRE 2000, our message switching product is supported by Digital throughout Europe, the funds transfer product BESS represents a key software product for Tandem, while ON/2 and Storenet/2 are important solutions on IBM and Stratus hardware.

CLIENTS THIS YEAR INCLUDE

ARTHUR ANDERSEN
BRITISH OLIVETTI
BULL
CARLO GARAZZI
COMPUTACENTRE
ERICSSON RADIO SYSTEMS AB
I.T.S.
ICL
ITT PUBLINET
NCR
NOMURA COMPUTER SYSTEMS EUROPE
PLESSEY SEMICONDUCTORS
RANK XEROX
SONY (UK)
SIAB (JV OLIVETTI-BULL)
STRATUS
TELETHON
UNISYS
VG INSTRUMENTS

PROJECTS

We were pleased this year to achieve a number of related sales from HITACHI LIMITED. These sales are important in their own right but also presage a long term relationship with Hitachi across Europe. Logica is providing knowledge of the European environment to Hitachi to allow it to meet the needs of its customers as they develop their own European business. In addition we are developing major components for two Hitachi systems targeted at the financial information market.

In the first project Logica is developing software to allow Reuters and Telerate digital feed to be accepted by a networked platform offering based on Hitachi UNIX** workstations. In the second, software is being developed to allow SEAQ data to be included in a historical database of quotation information held on a Hitachi mainframe. In both cases Logica teams in London are working alongside Hitachi teams in Japan to deliver the complete system.

Logica and TANDEM are currently developing an X.400 software product for use with the full range of Tandem NonStop systems. The new Tandem product will be based on Logica's CPLEX.400 message handling system and will comply with 1988 X.400 standards. CPLEX.400 provides message handling, extensions for accommodating future services and modifications, and a software bridge between custom systems and services.

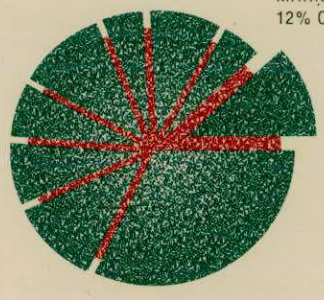
Logica has been working with IBM for over two years on the development of its DataTrade□ product, a key element of IBM's Wholesale Banking Design Principles. Staff from Logica's North American subsidiary are porting DataTrade from an IBM RT (6150)□ running AIX to the System 88 environment. This fixed price contract is being carried out at IBM's premises in Tampa, Florida, where DataTrade development is centred.

DataTrade will enable financial institutions to develop systems for information exchange, independent of the type of computer, operating system or network used. Developers of trading system software will be able to create products that combine data from outside sources, such as Reuters and Dow Jones, with in house databases.

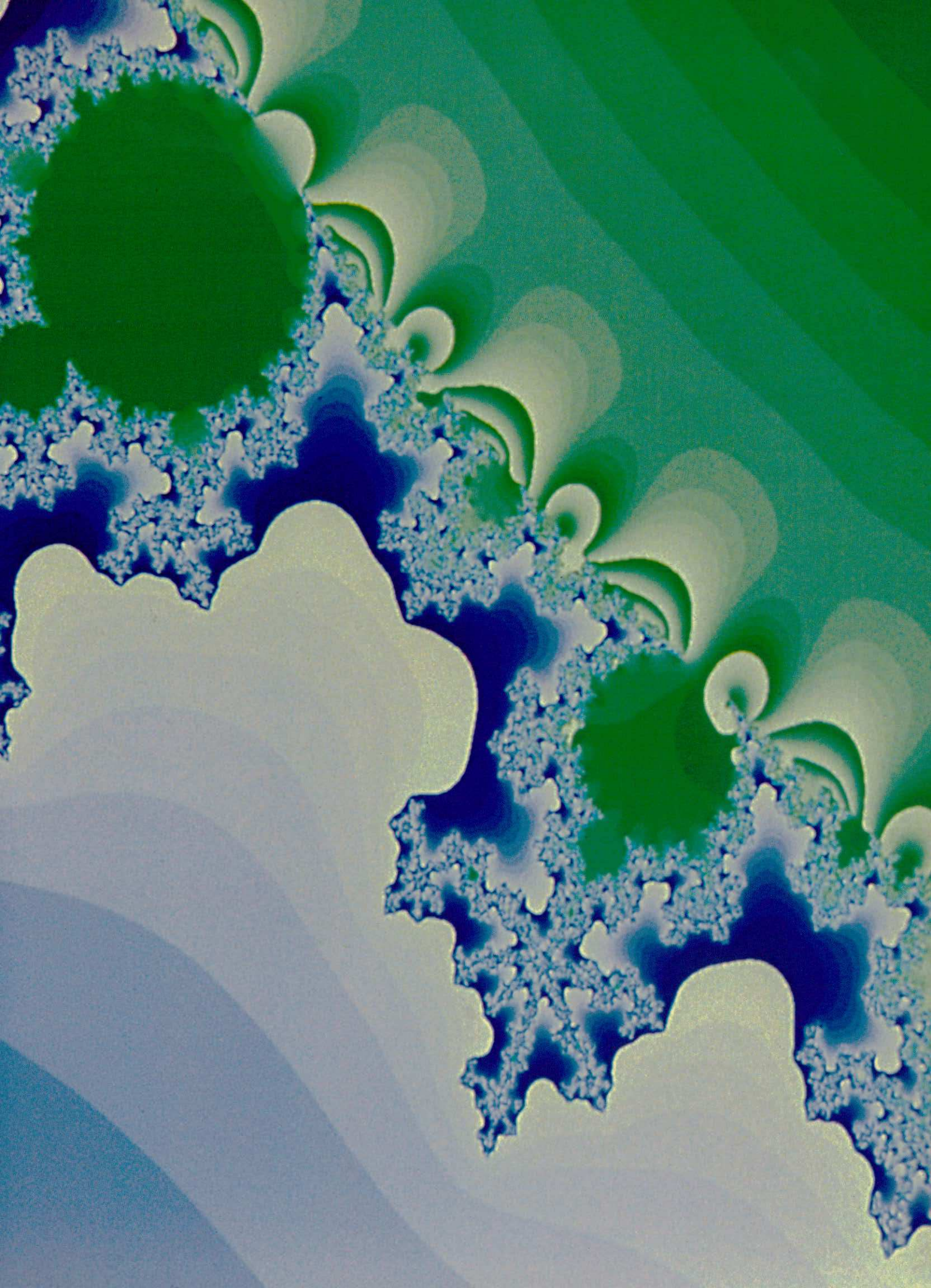
An application programming interface allows data to be transferred between distributed applications running on different IBM environments. Applications programmers can then develop software without having to write code specifically for different types of computer. At first the product will support applications running on IBM's RISC System/6000□, PS/2 and System/88, with future plans to support IBM's Enterprise System/370□ and AS400□ as well as equipment from other manufacturers.

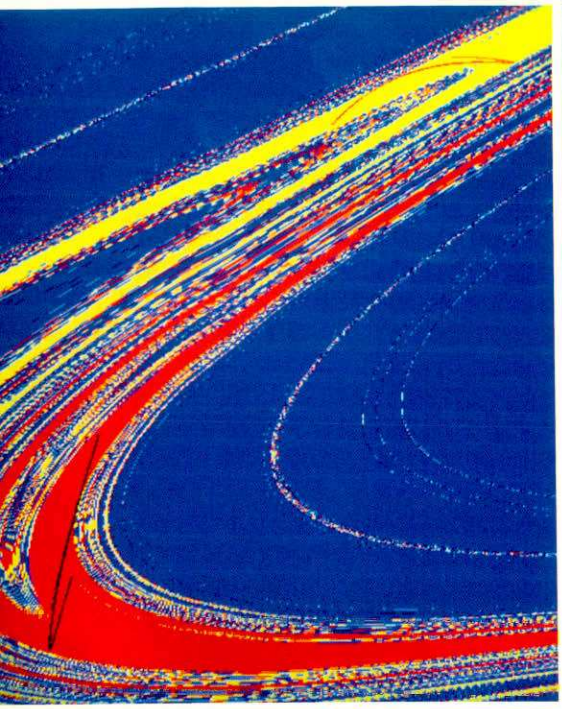
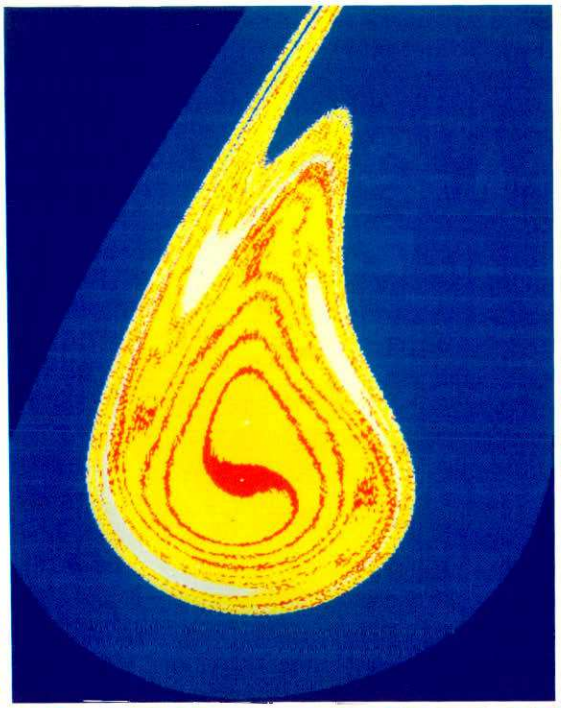
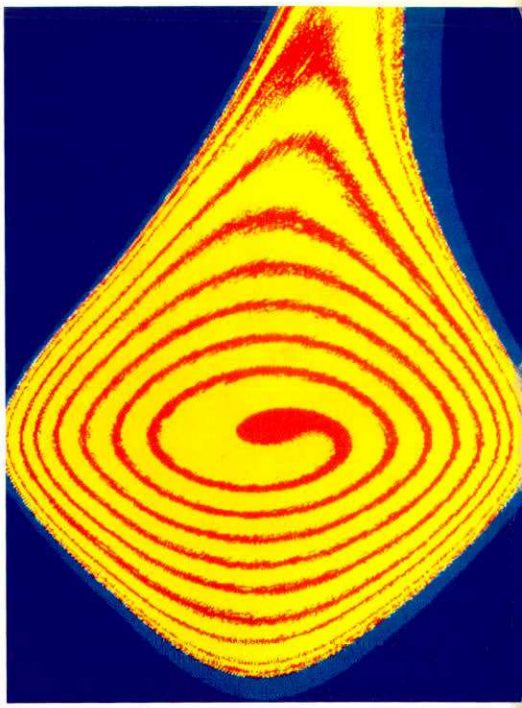
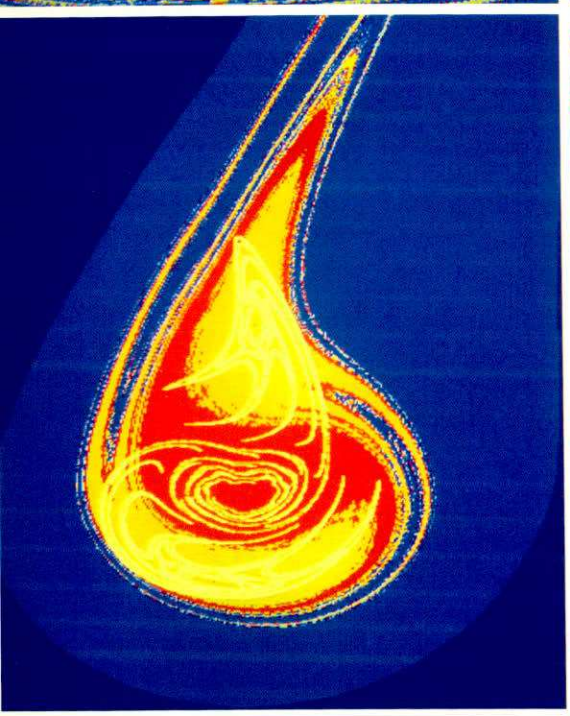
The Logica development team combined experience in software product development with industry and application skills from the finance sector. DataTrade operates with workstations connected to IBM Token Ring Local Area Networks using Advanced Program-to-Program Protocol (APPC) or Ethernet networks running Transaction Control Protocol/Internet Protocol (TCP/IP). Information can be transmitted point to point or broadcast from point to multiple points.

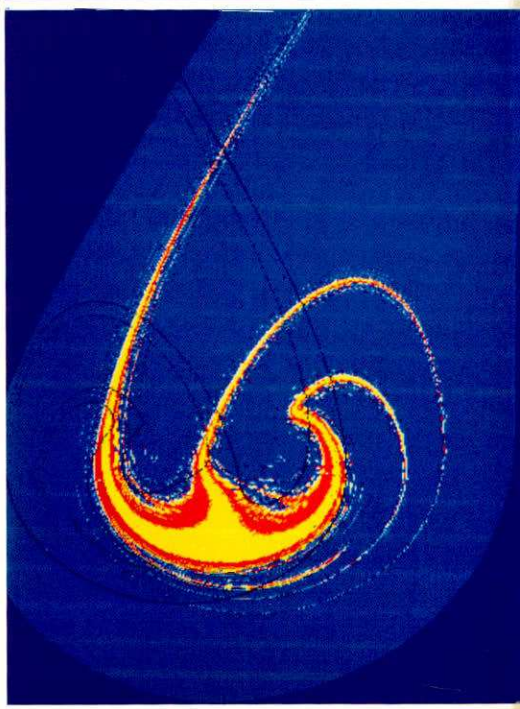
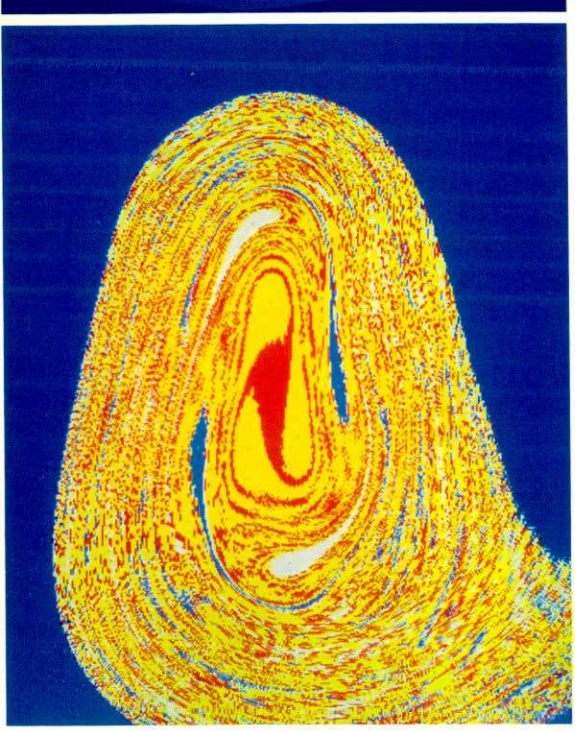
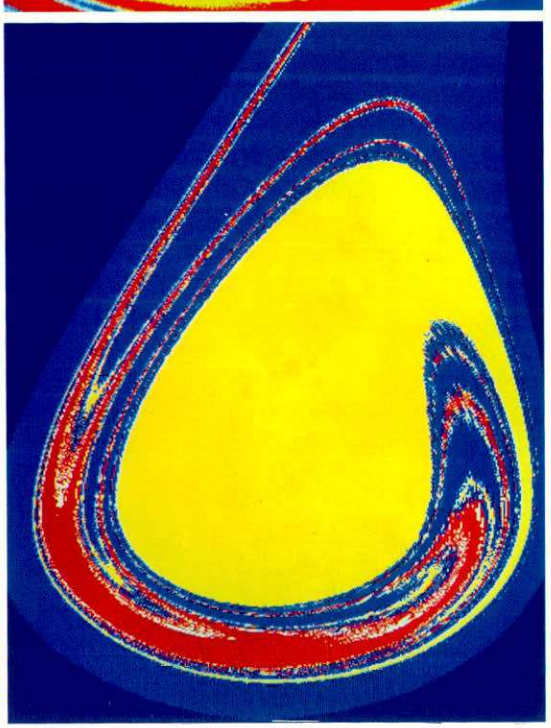
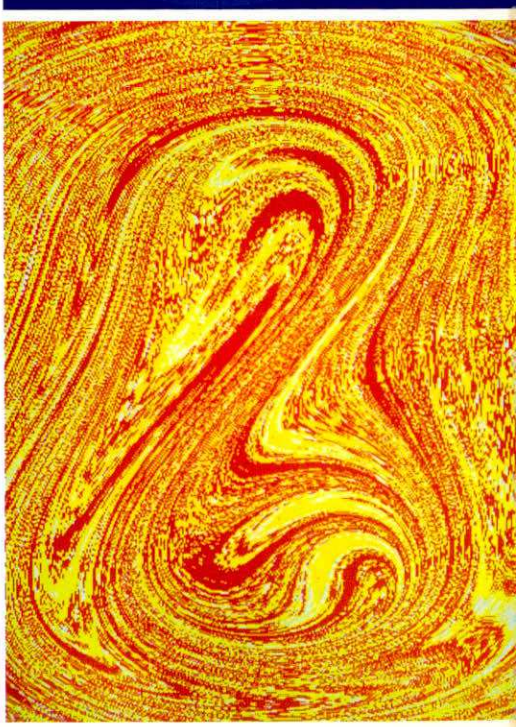
THE COMPUTING AND ELECTRONICS MARKET REPRESENTS 12% OF OUR ANNUAL BUSINESS



Right: *In the creation of Mandelbrot and Julia Sets the power of the computer has enabled art and science to meet in the visualization of fantastic and complex designs. Fractals are objects which exhibit increasing detail with increasing magnification, images which are equally complex in their details as in their overall form. If any piece of a fractal is magnified it will look like the whole of which it is a part.*



Transport

CLIENTS THIS YEAR INCLUDE

ALISARDA
AUTOSTRADE
AUSTRALIAN AIRLINES
BRITISH AIRWAYS
COMPUTER CAB COMPANY
EMO
EUROCONTROL
GALILEO
GEC TRAFFIC AUTOMATION
HOGG ROBINSON
INTERNATIONAL LEISURE GROUP
INTIS
LINJEFLYG
MINISTERIE VAN VERKEER EN WATERSTAAT
SAS
SMART AB
STATENS JÄMRÄGAR
TRANSMANCHE LINK LIMITED
UK DEPARTMENT OF TRANSPORT

TRANSPORT AUTHORITIES ARE under increasing pressure to provide the capacity for goods and people to be moved from place to place more quickly, more frequently and over greater distances. This burgeoning mobility has culminated in greater congestion and decreasing safety levels on the roads, at sea and in flight as tracking and predicting traffic movements becomes more complex. In addition the commitment to combat the growing environmental hazards of harmful vehicle emissions is gathering momentum.

To solve these problems transport authorities are turning to information technology to optimize the capability and capacity of infrastructure development, particularly in urban environments where the opportunity for the expansion of transport networks is severely limited. The introduction of toll routes and road pricing systems is seen as the way forward to control usage of already saturated highways. We developed an experimental road pricing system in Hong Kong, which automatically interrogated electronic number plates passing over toll stations and charged the owner's account based on the location and time of journey. We see an increasing market for the application of this type of system.

Organizations with global transport operations have a requirement for coherent communications strategies which will accommodate future growth and development. We have recently completed a study for Orient Overseas Container Lines Ltd in Hong Kong, aimed at improving the efficiency of terminal operation, distribution and management of container inventory and related vessel, tracking and railroad usage.

The majority of projects in this sector are characterized by the increased control that software systems have brought to the management of transport networks. This enhanced precision improves the safety and efficiency of transport systems and is particularly evident in work we have undertaken to automate port operations. Our work for Bremer Lagerhaus-Gesellschaft to automate the receipt, storage and delivery of land and waterside containers has been followed by two important contracts for large port authorities to control and track vessel movements. This is an area set to provide further opportunities.

Our 1989 Annual Review highlighted the potential for the application of information technology within the airline industry. To capitalize on this, just after the year end we established a joint venture with British Airways. Speedwing Logica Limited will provide applications software services in areas such as revenue accounting for passengers and air mail, treasury, roster, technical and crew planning, baggage tracking, slot allocation, stand allocation and scheduling to the airline industry worldwide.

With European airports rapidly approaching maximum capacity, we have strengthened our expertise in state of the art Air Traffic Control (ATC) systems, with work on several important contracts. Having completed a study for the Civil Aviation Authority (CAA) to identify ATC staff user requirements at Prestwick Airport's Oceanic Control Centre, our specialist human computer interface team is producing detailed designs for seven different user workstations, to ensure high levels of functionality. Using intelligent training system architecture we have also developed an aerodrome control simulator to train cadets in air traffic control procedures.

Left: *"Transient phenomena" – unsteady motion which has not settled to a regular pattern – has chaotic characteristics. Significant research effort has been devoted to understand, explain and prevent the occurrence of engineering dynamic instabilities, such as those which cause vessels to capsize. In the series of pictures, the colour blue represents escape from a potential capsize, while yellow and red represent safe regions. The boundary between safe and unsafe motions is fractal, leading to a necessary predictability in the eventual system behaviour.*

PROJECTS

In a project designed to increase the safety and efficiency of vessel movements along the Schelde river – the main waterway linking Antwerp with other ports in Belgium, the Netherlands and the North Sea – Logica completed the Information Processing Systems (IVS) for the Schelde Radar Chain (SRK). This involved close liaison over a three year period with HOLLANDSE SIGNAALAPPARATEN (Signaal) who is responsible to Philips and Project Bureau Schelderadar for the overall system. IVS represents one of the largest fixed price software projects in Benelux and its on-time delivery marked a major milestone in the development of the SRK.

IVS maintains a wealth of information covering the number and type of vessels using the river, including where they are going, pilot details and any exceptional cargoes they are carrying. It holds data for 45,000 seagoing vessels. IVS is integrated with the existing

radar tracking, hydro meteo information and lock planning systems to provide traffic controllers with the information they need. When fully operational the system will enhance the efficient utilization of locks, the flow of shipping and the usage of pilot service, and will increase safety on the river.

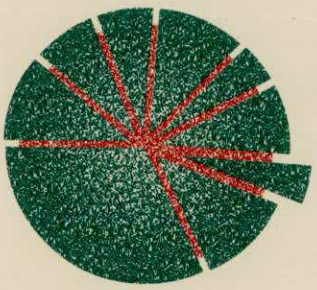
The PORT OF LONDON AUTHORITY (PLA) has awarded Logica a contract to develop an information system supporting vessel traffic management on the River Thames.

The system will extract movement data from PLA's Norcontrol computerized radar system, which monitors all shipping movements, and combine it with other essential voyage information such as vessel size and cargo details. This will provide comprehensive details of commercial vessel movements and support pilotage operations on the river. Although all information is currently received by conventional means such as radio, telex and telephone, in the longer term the system will allow information to be shared by the London Port Community via Electronic Data Interchange (EDI) facilities. The system will run on Stratus fault tolerant hardware, ensuring a high level of availability.

Logica is subcontracted to HOLLANDSE SIGNAALAPPARATEN (Signaal) to supply software systems for the new air traffic control tower currently under construction at Amsterdam's Schiphol International Airport. Signaal is responsible for all air traffic control systems in the new tower, and is working under contract to Rijksluchtvaartdienst, the Netherlands Department of Civil Aviation (DCA). The system will provide tower controllers with a highly reliable, distributed and flexible solution to the demanding functional and performance requirements of the DCA.

The new system replaces part of the existing Signaal Automatic Radar Processing (SARP II) system, giving controllers' increased flexibility and functionality to process the increased number of landings, departures and ground movements at Schiphol.

Logica is designing seven advanced software components which collate, process and route data from a number of remote systems such as radar and instructions from the controller positions.



THE TRANSPORT MARKET REPRESENTS 5% OF OUR ANNUAL BUSINESS

A revenue data collection and accounting system supplied to the TENDERED UNIT OF LONDON TRANSPORT (LT) will process the revenue data from over 100 bus routes no longer operated directly from LT. The continuing growth in the number of routes and depots operated in this way has created a need for a more powerful computer system which will process data collected electronically from on-bus ticket machines and accumulated in depot microcomputers.

From there it is transferred to a central computer supplied by Logica which accumulates the revenue and other ticket data and extracts from it accounting information and associated management reports. The system will provide valuable information to LT's group planning office to enable them to study, predict and respond to travel patterns and trends.

Company information

Logica plc

DIRECTORS DURING THE YEAR ENDED 30 JUNE 1990

P A B Hughes	(chairman)
D W Mann	(managing director)
M Cooperstein	(resigned, effective 30 September 1990)
A F Given	
A L Karney	
I Macleod	
B V Martin	
G G Moore	(resigned, effective 30 September 1990)
C S F Preddy	
C G Rowland	
P D C Stevenson	
N Zachary	(alternate to M Cooperstein - resigned, effective 30 September 1990)
P G Bosonnet	(non-executive)
C R Hollick	(non-executive)
L A Taylor	(non-executive)
P J Vinken	(non-executive)

Following changes announced on 20 September 1990 the main board directors and their roles were:

EXECUTIVE CHAIRMAN (until 7 November 1990)

Philip Hughes, 54

Before establishing Logica he worked for Shell and Scicon. As one of Logica's founders, he was first managing director and then chairman from 1972. He will retire as chairman after the Annual General Meeting in November and will become a non-executive director from that date.

NON-EXECUTIVE CHAIRMAN (from 7 November 1990)

Paul Bosonnet, 58

He joined the board as non-executive director in 1986, and will assume the role of chairman following the Annual General Meeting in November. He is also deputy chairman of the BOC Group plc and a non-executive director of British Telecom.

MANAGING DIRECTOR AND CHIEF EXECUTIVE

David Mann, 46

He joined Logica from Scicon in 1969. Having served on the board since 1976 and as deputy managing director since 1982, he took over the role of managing director in 1987.

EXECUTIVE DIRECTORS

Andrew Given, 42

He joined Logica in March 1990, to take up the new position of director of planning and finance. He was group finance controller with Plessey, and previously spent eleven years with Northern Telecom in North America.

Andrew Karney, 48

He has been with Logica since 1973, and on the board since 1986. He has responsibility for corporate development activities including new ventures, vendor relations activities and development of international business in a number of sectors.

Ian Macleod, 46

He came to Logica in 1978 and joined the board in 1986. As head of corporate development he is responsible for the overall coordination of international business development activities.

Brian Martin, 52

Having joined Logica in 1980, he has served on the board since 1986. He has regional responsibility for Logica's North American operations.

Cliff Preddy, 43

He joined Logica in 1969 and was appointed to the board in 1987. In his role as director of UK operations he has overall responsibility for the UK based operating companies.

Colin Rowland, 46

Having joined in 1971, he has served on the board since 1982. As head of operations he has responsibility for all the operations of the subsidiaries and joint ventures worldwide.

Steve Stevenson, 46

Appointed to the board in 1987 after fourteen years with the company, he has regional responsibility for continental Europe.

NON-EXECUTIVE DIRECTORS

Clive Hollick, 45

He joined the board as a non-executive director in 1987. Managing director of MAI plc, he is also a non-executive director of Hambros Bank Ltd and a member of the National Bus Company.

Len Taylor, 55

One of Logica's founders in 1969, he retired as managing director and became a non-executive director in 1987. He continues to undertake consultancy assignments for the company's management.

Pierre Vinken, 62

Having served as chairman of the board of directors of Logica BV since 1985, he joined the board of Logica plc in 1990. He is chairman of Elsevier, and his other positions include director of Pearson plc and director of The Economist Newspaper.

REGISTERED OFFICE

68 Newman Street
London W1A 4SE

REGISTRARS

Stentiford Close Registrars Ltd
Broseley House
Newlands Drive
Witham
Essex
CM8 2UL

Report of the Directors

The directors present their report together with the accounts of the Company and its subsidiaries for the year ended 30 June 1990. These will be laid before the shareholders at the Annual General Meeting to be held on 7 November 1990.

PRINCIPAL ACTIVITIES

The business undertaken by Logica companies throughout the year included:

the marketing, design, production and maintenance of custom built software and associated hardware systems

consultancy and project management in the field of information technology

the design, development, implementation and marketing of software products and the reusable elements of applications software, called systems kernels.

RESULTS AND DIVIDENDS

Turnover amounted to £187.5 million, compared with £179.5 million for the previous year. Profit before tax and exceptional costs was £10.9 million. After adjustment for exceptional costs, associated with business restructuring, profit before tax was £9.0 million compared with £18.8 million for the previous year. Extraordinary items of £1.7 million were incurred through the closure of the Danish office and of the UK management consultancy subsidiary. Earnings per share on ordinary activities, after exceptional costs but before extraordinary items, were 9.0p (1989 – 20.0p).

Improved cash management resulted in a positive cash flow and net cash balances at year end stood at £18.6 million.

The directors are recommending a final dividend of 2.3p per share, making 3.4p per share net for the whole year, up 10% on the previous year. If approved, the final dividend will be paid on 8 November 1990 to eligible shareholders on the register at close of business on 11 October 1990.

BUSINESS REVIEW

A review of the development of the business during the year is given on pages 2 to 24. Included in the review are references to Logica's future prospects.

RESEARCH AND DEVELOPMENT

During the year Logica invested £8.2 million on research and development (1989 – £7.5 million). These figures are net of funding by European research institutions and other clients. No development costs have been capitalized. Further details of the research and development activities are given on page 6.

DIRECTORS

Since 1 July 1989, there have been the following changes in the composition of the board:

Andrew Given and Pierre Vinken were appointed to the board on 1 April 1990. On 13 March 1990, Philip Hughes announced his intention to step down as chairman after the Annual General Meeting on 7 November 1990. He will remain on the board as a non-executive director. Paul Bosonnet will become non-executive chairman as from that date.

On 20 September 1990, it was announced that, with effect from 30 September 1990, Graham Moore and Martin Cooperstein would be leaving the board and Norman Zachary would cease to be an alternate director.

The interests of the directors in the shares of the Company are shown below:

	30 June 1990		30 June 1989	
	Beneficial	Non-Beneficial	Beneficial	Non-Beneficial
P A B Hughes	2051600	601375	2051600	601375
D W Mann	482400	135708	482400	135708
A L Karney	40446	0	42196	0
I Macleod	24866	0	24866	0
B V Martin	36761	0	36761	0
G G Moore	10250	0	10250	0
C S F Preddy	30575	0	30575	0
C G Rowland	103337	135708	110337	135708
P D C Stevenson	125500	0	125500	0
N Zachary	5000	0	5000	0
L A Taylor	1400000	200112	1500000	200112
Employee Shareholder Trust	0	0	0	42840

The Employee Shareholder Trust's shares were held by P A B Hughes, L A Taylor and D W Mann acting as trustees.

Options to subscribe for ordinary shares of the Company granted to the directors are shown below:

	Options held at 1 July 1989	Options granted during year at 295p	Options held at 30 June 1990
P A B Hughes	35000	0	35000
D W Mann	69966	46220	116186
M Cooperstein	12500	0	12500
A F Given	0	30000	30000
A L Karney	49966	25000	74966
I Macleod	45000	30000	75000
B V Martin	45000	25000	70000
G G Moore	40403	13720	54123
C S F Preddy	44966	25000	69966
C G Rowland	54966	31220	86186
P D C Stevenson	49808	25000	74808
N Zachary	12500	0	12500

No options were exercised by directors during the year.

Options outstanding are exercisable at prices between 149p and 405p.

Report of the Directors

There have been no changes in the directors' interests in the shares of the Company or in share options granted by the Company to the directors between the end of the financial year and the signing of the report and accounts.

None of the directors offering themselves for re-election has a service contract with an unexpired period of more than one year.

None of the directors had a material interest in any contract of significance to which the parent Company or a subsidiary was a party during the financial year.

SUBSTANTIAL HOLDINGS

The directors' interests are described above. In addition, at 20 September 1990, the Company had been notified that the following were interested in 3% or more of the Company's share capital:

Name	No of shares	Percentage
Scottish Amicable Investment Managers Ltd	4354370	7.15
CIN Venture Nominees Ltd	4035880	6.62
Morgan Grenfell Group Plc	3378000	5.54
The Foreign & Colonial Investment Trust Plc	2646046	4.34
Abbey Life Investment Services Ltd	2534332	4.16
Prudential Corporation plc	2400534	3.94
British Airways Pension Fund	1863888	3.06

DISABLED PERSONS

It is Logica's policy to give full and careful consideration to applications for employment from disabled persons, to continue wherever possible the employment of members of staff who become disabled, and to ensure that their training and career development are encouraged.

EMPLOYEE PARTICIPATION

It is Logica's policy regularly to hold meetings with staff when matters concerning them and their area of business are discussed. All staff receive the annual report and accounts.

EMPLOYEE SHARE OWNERSHIP PLAN TRUST

The Company has operated several employee share schemes for staff within and outside the UK for a number of years. The board regards these schemes as a valuable means of recruiting, motivating and retaining talented people who are key to the success of the Company.

In September 1990 the Company established, for the benefit of all Logica employees other than main board directors, a discretionary trust ("the ESOP") with an independent, professional trustee. The trust is currently financed by the Company and its subsidiaries and will purchase Logica shares in the market. The Company will grant options over the shares held by the trust, to both UK and non-UK employees, in accordance with new "all employee" and "discretionary" share option schemes.

These arrangements have been discussed with the Investment Committee of the Association of British Insurers and account has been taken of their comments made in relation to employee share ownership plans generally. In particular, it is intended that the annual cost of the ESOP will not exceed 5% of the Group's pre-tax profits and at no time will the ESOP hold more than 5% of the Company's ordinary capital.

FIXED ASSETS

The changes in the fixed assets of the Company and its subsidiaries are disclosed in notes 11 and 12 to the accounts.

AUDITORS

Price Waterhouse have expressed their willingness to continue in office. A resolution will be proposed at the Annual General Meeting for their re-appointment as auditors and authorizing the directors to fix their remuneration.

DIRECTORS' FEES

The Articles of Association of the Company limit the aggregate fees to directors to £50,000 per annum and require the shareholders in General Meeting to approve any additional fees in excess of this limit. As this figure has not been increased since 1983, the board believes that it is desirable to increase the upper limit to £150,000, particularly having regard to the strengthening of the Board by the addition of more non-executive directors. A Special Resolution to this effect is proposed as Resolution No 7 in the Notice of the forthcoming Annual General Meeting.

AUTHORITY TO ALLOT SECURITIES

Under Section 89 of the Companies Act 1985 equity securities in the Company may not be allotted for cash (otherwise than in respect of an employee share scheme) without first being offered pro rata to existing shareholders, unless the prior approval of the shareholders in General Meeting is given. The directors consider that it is in the best interests of the Company that the relevant authority given at the Annual General Meeting in 1989 should be renewed in similar terms. Accordingly a Special Resolution to this effect is proposed as Resolution No 9 in the Notice of the forthcoming Annual General Meeting. The proposed authority expires at the date of the 1991 Annual General Meeting and permits the directors during this period to issue equity securities up to an aggregate nominal value of £300,000 (just under 5% of the issued share capital) without first offering them to existing shareholders.

By order of the board

D C Walker
Secretary
20 September 1990

Consolidated profit and loss account

For Years Ended 30 June	Note	1990 £'000	1989 £'000
TURNOVER	1	**187489**	**179505**
Adjustment to exclude turnover of related company		(8444)	(7772)
Consolidated turnover		179045	171733
OPERATING PROFIT	2	**9079**	**17440**
Interest	4	1858	1395
PROFIT BEFORE EXCEPTIONAL COSTS AND TAXATION		**10937**	**18835**
Exceptional costs	5	(1926)	—
PROFIT ON ORDINARY ACTIVITIES BEFORE TAXATION		**9011**	**18835**
Taxation on ordinary activities	6	(3550)	(6750)
PROFIT ON ORDINARY ACTIVITIES AFTER TAXATION		**5461**	**12085**
Extraordinary items	7	(1727)	—
PROFIT FOR THE YEAR		**3734**	**12085**
Dividends paid and proposed	8	(2075)	(1882)
Retained profit for the year	20	1659	10203
EARNINGS PER SHARE ON ORDINARY ACTIVITIES	10	**9.0p**	**20.0p**
DIVIDENDS PER SHARE	8	**3.4p**	**3.1p**

Consolidated balance sheet

At 30 June	Note	1990 £'000		1989 £'000	
FIXED ASSETS					
Tangible assets	11	19783		17324	
Investments	12	1083		1033	
			20866		**18357**
CURRENT ASSETS					
Debtors	14	49275		55505	
Cash and bank balances		26162		19170	
		75437		74675	
CREDITORS DUE WITHIN ONE YEAR					
Bank loans and overdrafts		(7563)		(1420)	
Other	15	(35063)		(37273)	
		(42626)		(38693)	
NET CURRENT ASSETS			**32811**		**35982**
TOTAL ASSETS LESS CURRENT LIABILITIES			**53677**		**54339**
Creditors due after more than one year	16	(567)		(712)	
Deferred taxation	17	(49)		(965)	
			(616)		(1677)
NET ASSETS			**53061**		**52662**
CAPITAL AND RESERVES					
Share capital	19		6094		6077
Share premium account	20		10259		9965
Special reserve	20		3267		3267
Other reserves	20		2804		2773
Profit and loss account	20		30637		30580
SHAREHOLDERS' FUNDS			**53061**		**52662**

P A B Hughes
D W Mann

Directors
20 September 1990

Consolidated source and application of funds

For Years Ended 30 June	1990 £'000	1989 £'000
FUNDS GENERATED FROM TRADING:		
Operating profit	9079	17440
Exceptional costs	(1926)	—
Related company profits less dividends received	(88)	(43)
	7065	17397
CHANGES IN WORKING CAPITAL:		
Debtors – decrease/(increase)	2030	(8317)
Creditors – increase	2538	2877
	4568	(5440)
CHANGES IN FIXED ASSETS:		
Purchases of tangible assets	(6956)	(5015)
Depreciation	4034	3256
Sales of tangible assets	202	376
Purchase of trade investments	0	(78)
Sales of trade investments	0	263
	(2720)	(1198)
CASH FLOW FROM OPERATIONS	**8913**	**10759**
Interest	1858	1395
Miscellaneous items, including exchange	(75)	216
Extraordinary items before taxation	(2530)	—
Tax paid	(5679)	(7978)
Dividends paid to shareholders	(1949)	(1574)
CASH FLOW AFTER FINANCING COSTS AND TAX	**538**	**2818**
Shares issued (net of expenses)	311	458
Acquisition of business	0	(700)
NET INFLOW OF FUNDS	**849**	**2576**
NET FUNDS		
Net funds at beginning of year	17750	15174
Net inflow of funds	849	2576
Net funds at end of year	18599	17750

Movements in net funds represent the differences between amounts shown in the opening and closing balance sheets. Movements in other items do not correspond to the change in balance sheet amounts due to the effects of retranslating the opening net assets of overseas subsidiaries at closing exchange rates.

Company balance sheet

At 30 June	Note		1990 £'000		1989 £'000
FIXED ASSETS – Investments	12		**43947**		**43669**
CURRENT ASSETS					
Debtors	14	3839		2520	
Cash and bank balances		92		1161	
		3931		3681	
CREDITORS DUE WITHIN ONE YEAR	15	(3066)		(2880)	
NET CURRENT ASSETS			865		801
NET ASSETS			**44812**		**44470**
CAPITAL AND RESERVES					
Share capital	19		6094		6077
Share premium account	20		10259		9965
Special reserve	20		23261		23261
Profit and loss account	20		5198		5167
SHAREHOLDERS' FUNDS			**44812**		**44470**

P A B Hughes
D W Mann

Directors
20 September 1990

Notes to the accounts

1 TURNOVER

	1990 £'000	1989 £'000
Turnover by location of client was as follows:		
United Kingdom	93405	85816
Rest of Europe	44966	38571
North America	23592	36264
Rest of World	25526	18854
	187489	**179505**
Adjustment to exclude related company	(8444)	(7772)
Consolidated turnover	**179045**	**171733**

2 OPERATING PROFIT

Turnover	179045	171733
Materials and other external charges	34713	31666
Staff costs	99289	88678
Depreciation	4034	3256
Auditors' remuneration and expenses	253	221
Hire of plant and machinery	872	604
Operating lease rentals	11305	9655
Other operating charges	19712	20292
Operating charges	170178	154372
	8867	17361
Share of profit of related company	212	79
Operating profit	**9079**	**17440**

3 STAFF

Staff Numbers

Staff employed at 30 June were based as follows:

	Number	Number
United Kingdom	2050	2025
Outside the United Kingdom	1606	1480
Total including related company	**3656**	**3505**

The average number of staff employed worldwide during the year, excluding related company, was 3,419 compared with 3,188 in 1989.

Staff Costs	£'000	£'000
Wages and salaries	87614	78861
Social security costs	7976	6835
Other pension costs	3699	2982
	99289	**88678**

There are voluntary pension schemes in the UK, Netherlands, Belgium, Hong Kong and Australia, all of which are defined contribution schemes. The defined contributions consist of a fixed percentage and voluntary contributions. There are no unfunded liabilities in these schemes.

Notes to the accounts

Directors	1990 £	1989 £
Directors' emoluments including employer's pension contributions and benefits in kind	1487911	1356402
Included in the above are the emoluments, excluding pension contributions, of:		
the chairman	48746	57712
the highest paid director	116067	100862

The table shows the number of directors (other than the chairman, the highest paid director and those who worked wholly or mainly outside the United Kingdom during the year) whose remuneration excluding pension contributions was within the bands stated.

	1990	1989
£0- £5000	1	—
£5001- £10000	—	1
£10001- £15000	2	3
£15001- £20000	1	—
£30001- £35000	1	—
£65001- £70000	—	2
£70001- £75000	1	2
£75001- £80000	2	1
£80001- £85000	1	1
£95001-£100000	1	—

4 INTEREST

	1990 £'000	1989 £'000
Receivable	2372	1584
Payable	(514)	(189)
	1858	**1395**

5 EXCEPTIONAL COSTS

The exceptional costs are in respect of redundancy and office closure costs in connection with the restructuring of Logica's continuing business.

6 TAXATION

Charge to UK corporation tax at 35% (1989 - 35%)	2834	3608
Overseas taxation	930	2535
Relief for overseas taxation	(35)	(35)
Deferred taxation	(410)	143
	3319	6251
Underprovision in respect of prior years	194	462
Related companies	37	37
	3550	**6750**

There are unutilized tax losses in the Group amounting to approximately £3 million which may be available for the relief of the profits of certain subsidiaries in future years.

7 EXTRAORDINARY ITEMS

The extraordinary items are the costs of closing Logica Consultancy Limited and the Danish operation. The costs of £1,727,000 are after tax relief of £803,000.

8 DIVIDENDS PAID AND PROPOSED

	1990 £'000	1989 £'000
Interim dividend of 1.1p (1989 – 1.0p)	673	606
Final dividend of 2.3p (1989 – 2.1p)	1402	1276
Total net dividend	**2075**	**1882**

9 PROFIT ATTRIBUTABLE TO MEMBERS OF THE HOLDING COMPANY

Dealt with in the accounts of the Company	2106	2077

As allowed by Section 228(7) of the Companies Act 1985, the Company has not presented its own profit and loss account.

10 EARNINGS PER SHARE

Earnings per share of 9.0p are based on the profit after tax of £5,461,000 and on a weighted average of 60,862,001 shares. Last year's earnings per share of 20.0p were based on the profit after tax of £12,085,000 and on a weighted average of 60,551,434 shares.

11 TANGIBLE ASSETS

	Freehold land and buildings £'000	Short leaseholds £'000	Equipment and plant £'000	Total £'000
Cost				
1 July 1989	3013	5626	21685	30324
Translation differences	0	(63)	(521)	(584)
Additions	68	2285	4603	6956
Disposals	0	(340)	(1488)	(1828)
30 June 1990	3081	7508	24279	34868
Depreciation				
1 July 1989	304	1768	10928	13000
Translation differences	0	(43)	(280)	(323)
Provided	21	566	3447	4034
Released on disposals	0	(188)	(1438)	(1626)
30 June 1990	325	2103	12657	15085
Net book value at 30 June 1990	**2756**	**5405**	**11622**	**19783**
Net book value at 30 June 1989	2709	3858	10757	17324

The net book value of tangible assets includes capitalized finance leases of £613,000 comprising costs of £1,896,000 and depreciation thereon of £1,283,000. The depreciation charge for the year in respect of capitalized leases was £362,000 and the finance charges were £71,000.

12 INVESTMENTS IN RELATED COMPANY AND TRADE INVESTMENTS

Consolidated

	Related Company				
	Shares at cost £'000	Retained profits £'000	Total £'000	Trade investments £'000	Total £'000
1 July 1989	624	302	926	107	1033
Translation differences	0	8	8	(8)	0
Share of retained profit for the year	—	50	50	—	50
30 June 1990	**624**	**360**	**984**	**99**	**1083**

No dividends were received from the related company. All investments are unlisted.

The Company

	Group companies				
	Shares £'000	Loans £'000	Total £'000	Company £'000	Related Total £'000
Cost					
1 July 1989	14245	35249	49494	624	50118
Additions	0	278	278	0	278
30 June 1990	14245	35527	49772	624	50396
Provisions					
1 July 1989	(787)	(5662)	(6449)	0	(6449)
Provided in the year	0	0	0	0	0
30 June 1990	(787)	(5662)	(6449)	0	(6449)
Net book value at 30 June 1990	**13458**	**29865**	**43323**	**624**	**43947**
Net book value at 30 June 1989	13458	29587	43045	624	43669

13 CAPITAL COMMITMENTS

	1990 £'000	1989 £'000
Capital expenditure authorized and contracted	371	1574
Capital expenditure authorized but not contracted	808	358

14 DEBTORS

Consolidated		
Amounts recoverable on contracts	16534	13710
Trade debtors	25779	32109
Amounts owed by related company	204	250
Other debtors	1875	1854
Prepayments and accrued income	3886	4077
Taxation recoverable	530	3080
Advance corporation tax	467	425
	49275	**55505**
Amounts recoverable on contracts include attributable profit of	1023	2040
The Company		
Amounts owed by subsidiary companies	1975	838
Other debtors	1397	1257
Advance corporation tax	467	425
	3839	**2520**

15 CREDITORS

Due within one year		
Consolidated		
Payments received on account	2935	5517
Trade creditors	8924	6533
Accruals and other creditors	11475	9713
Amounts owed to related company	23	6
Finance lease liabilities	250	367
Taxation and other state creditors	9362	13234
Advance corporation tax	692	627
Dividends proposed	1402	1276
	35063	**37273**

	1990 £'000	1989 £'000
The Company		
Amounts owed to subsidiary companies	19	24
Accruals and other creditors	953	953
Advance corporation tax	692	627
Dividends proposed	1402	1276
	3066	**2880**

16 CREDITORS

Due after more than one year		
Bank loans repayable over one and under five years	0	23
Finance lease liabilities over one and under five years	467	503
Other creditors	100	186
	567	**712**

17 DEFERRED TAXATION

Provision is made in the accounts for deferred taxation at the full potential liability as follows:

Accelerated capital allowances	322	375
Other short term timing differences	(77)	(95)
Foreign subsidiaries	(196)	685
	49	**965**
1 July 1989	965	732
Translation differences	(50)	90
(Release)/Provision in respect of current year	(866)	143
30 June 1990	**49**	**965**

18 OTHER FINANCIAL COMMITMENTS

There were annual commitments under operating leases as follows:

	1990		1989	
	Land and Buildings £'000	Other £'000	Land and Buildings £'000	Other £'000
Expiring within one year	770	1266	1069	1011
Expiring in the second to fifth years	4165	3581	4021	2904
Expiring after five years	5868	0	5819	12
	10803	**4847**	**10909**	**3927**

19 CALLED UP SHARE CAPITAL

	1990 £'000	1989 £'000
Authorized share capital		
80,000,000 Ordinary Shares of 10p each	8000	8000
Called up share capital		
60,940,833 Ordinary Shares of 10p each	6094	6077

During the year 172,430 shares were issued under share option schemes as follows:

Granted	Exercise price (pence)	Exercised
1984	405	5240
1985	149	6375
1985	165	10905
1985	248	625
1986	155	85000
1986	186	11947
1986	206	30000
1986	207	17390
1987	149	2895
1987	248	53
1988	240	2000
		172430

During the year 936,197 options were granted under employee share option schemes at 295p each and exercisable from 1992 to 2000.

At 30 June 1990 there were 3,600,804 options which had been granted under employee share option schemes at prices ranging from 149p to 382p and exercisable from 1990 to 2000.

20 SHARE PREMIUM ACCOUNT AND RESERVES

	Share premium account £'000	Special reserve £'000	Other reserves £'000	Profit and loss account £'000
Consolidated				
1 July 1989	9965	3267	2773	30580
Exchange difference on translation of net assets at 1 July 1989			(17)	(1554)
Increase in share premium account	294			
Retained profit for the year				1659
Transfers to other reserves			48	(48)
30 June 1990	**10259**	**3267**	**2804**	**30637**
The Company				
1 July 1989	9965	23261	0	5167
Increase in share premium account	294			
Retained profit for the year				31
30 June 1990	**10259**	**23261**	**0**	**5198**

21 CONTINGENT LIABILITIES

Subsidiaries have provided indemnities to their bankers in support of performance bonds and guarantees amounting to £4,410,000 (1989 - £3,811,000).

The Company has guaranteed the borrowings of a subsidiary up to a limit of £1,429,000 (1989 - nil).

22 PRINCIPAL OPERATING SUBSIDIARIES

Logica UK Limited (Great Britain)
Logica Aerospace and Defence Limited (Great Britain) – formerly Logica Space and Defence Systems Limited
Logica Cambridge Limited (Great Britain)
Logica Communications Limited (Great Britain) - formerly Logica Communications and Electronic Systems Limited
Logica Finance Limited (Great Britain) - formerly Logica Financial Systems Limited
Logica Industry Limited (Great Britain) - formerly Logica Energy and Industry Systems Limited
Logica BV (Netherlands)
Logica GmbH (West Germany)
Logica SA (Belgium)
Logica Svenska AB (Sweden)
Logica Data Architects Inc (USA)
Logica Pty Limited (Australia)
Logica Technology Services Limited (Hong Kong)
Logica Technology Services Sdn Bhd (Malaysia)

These companies are all wholly owned.

23 RELATED COMPANY

Logica General Systems SpA (Italy)
The Company holds 49.8% of the 793,550 ordinary shares of 1,000 lire each and 51.3% of the 204,350 preference shares of 1,000 lire each of Logica General Systems SpA. The business activities of this company are similar to those undertaken by the other Logica companies.

Speedwing Logica Limited
On 3 August 1990 Logica and British Airways announced an agreement to establish a joint venture, Speedwing Logica Limited, which will provide software services to the air transport industry worldwide. Speedwing Logica Limited will be owned 51% by British Airways and 49% by Logica.

Accounting Policies

1 BASIS OF ACCOUNTING AND CONSOLIDATION

The accounts are prepared under the historical cost convention in accordance with the Companies Act 1985. They are the result of the consolidation of the accounts of the Company and its subsidiaries and also include the relevant share of the results of related companies. The group accounting policies conform with UK accounting standards and, when necessary, adjustment is made to the statutory accounts of overseas subsidiaries in order to present the group accounts on a consistent basis.

2 TURNOVER

Turnover represents the value of work done for clients including attributable profit and after adjusting for all foreseeable future losses.

3 RECOGNITION OF PROFITS

Profit on contracts for the supply of professional services at pre-determined rates is taken as and when the work is billed irrespective of the duration of the contract.

Profit is taken on fixed price contracts whilst the contract is in progress, having regard to the proportion of the total contract which has been completed at the balance sheet date. Provision is made for all foreseeable future losses.

4 AMOUNTS RECOVERABLE ON CONTRACTS

Amounts recoverable on contracts represent turnover which has not yet been invoiced to clients. Such amounts are separately disclosed within debtors.

The valuation of amounts recoverable on fixed price contracts is adjusted to take up profit to date or foreseeable losses in accordance with the accounting policy for recognition of profits.

Other amounts recoverable on contracts are valued at cost or at estimated net realizable value if lower.

Cost comprises:

— professional amounts recoverable valued at the cost of salaries and associated payroll expenses of employees engaged on assignments and a proportion of attributable overheads;

— unbilled expenses incurred and equipment purchased for clients in connection with specific contracts.

5 RESEARCH AND DEVELOPMENT

Research costs are written off in the year in which they are incurred unless they are to be reimbursed by third parties. Development costs are also written off in the year in which they are incurred unless they are to be reimbursed by third parties or they result in the production of an identifiable, saleable product.

6 DEPRECIATION

Depreciation is provided at rates calculated to write down the cost of all tangible fixed assets over their estimated useful lives on a straight-line basis. The annual rates of depreciation used are as follows:

Leaseholds	equally over life of lease
Office equipment	10%
Computer equipment	20%
Motor cars	25%
Plant	20%

7 FOREIGN CURRENCY TRANSLATION

The assets, liabilities and trading results of foreign subsidiaries are translated into sterling at the rate of exchange ruling at the date of the balance sheet.

Differences arising on restatement of the net investment in foreign subsidiaries and related net foreign currency borrowings are dealt with as adjustments to reserves.

All other differences on exchange arising in the year are taken to the profit and loss account.

8 DEFERRED TAXATION

Provision is made for deferred taxation to take account of timing differences between the treatment of certain items for accounts purposes and their treatment for tax purposes. The provision is maintained to the extent that timing differences are not expected with reasonable probability to continue into the foreseeable future.

Accounting Policies

9 TANGIBLE FIXED ASSETS

Tangible fixed assets are shown at cost. Cost in this context includes the initial capitalized values of assets funded by finance leases.

Assets financed by leasing agreements that give rights approximating to ownership are treated as if they had been purchased outright. The amount capitalized is the present value of the minimum lease payments payable during the lease term. The corresponding leasing commitments are shown as obligations to the lessor. Lease payments are treated as consisting of capital and interest elements and the interest is charged to the profit and loss account on a constant periodic rate of charge basis.

10 GOODWILL

Purchased goodwill is written off against reserves in the year of acquisition.

11 RELATED COMPANY

A related company is a legal entity, not being a subsidiary, in which the group has an interest of between 20 per cent and 50 per cent and over whose commercial and financial policy decisions the group exercises significant influence. The group's share of the profits less losses of all significant related companies is included in the group's profit and loss account on the equity accounting basis. The results are calculated from the latest available audited accounts adjusted to incorporate unaudited results for more recent periods.

Report of the Auditors

Report of the Auditors to the Members of Logica plc.

We have audited the financial statements set out on pages 38 to 49 in accordance with Auditing Standards.

In our opinion the financial statements give a true and fair view of the state of affairs of the company and the group at 30 June 1990 and of the profit and source and application of funds of the group for the year then ended and have been properly prepared in accordance with the Companies Act 1985.

Price Waterhouse
Chartered Accountants
London

20 September 1990

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Right: *Julia Sets are fractal boundaries that emerge from the iteration of the quadratic transformation z^2-c. Non linear fractals such as the Julia Set can be created using an appropriately designed multiple reduction copying machine. Two lens systems bend, distort and shrink a distinctive initial image, such as the Logica logo, and graphically reverse the quadratic transformation which defines the Julia Set.*

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