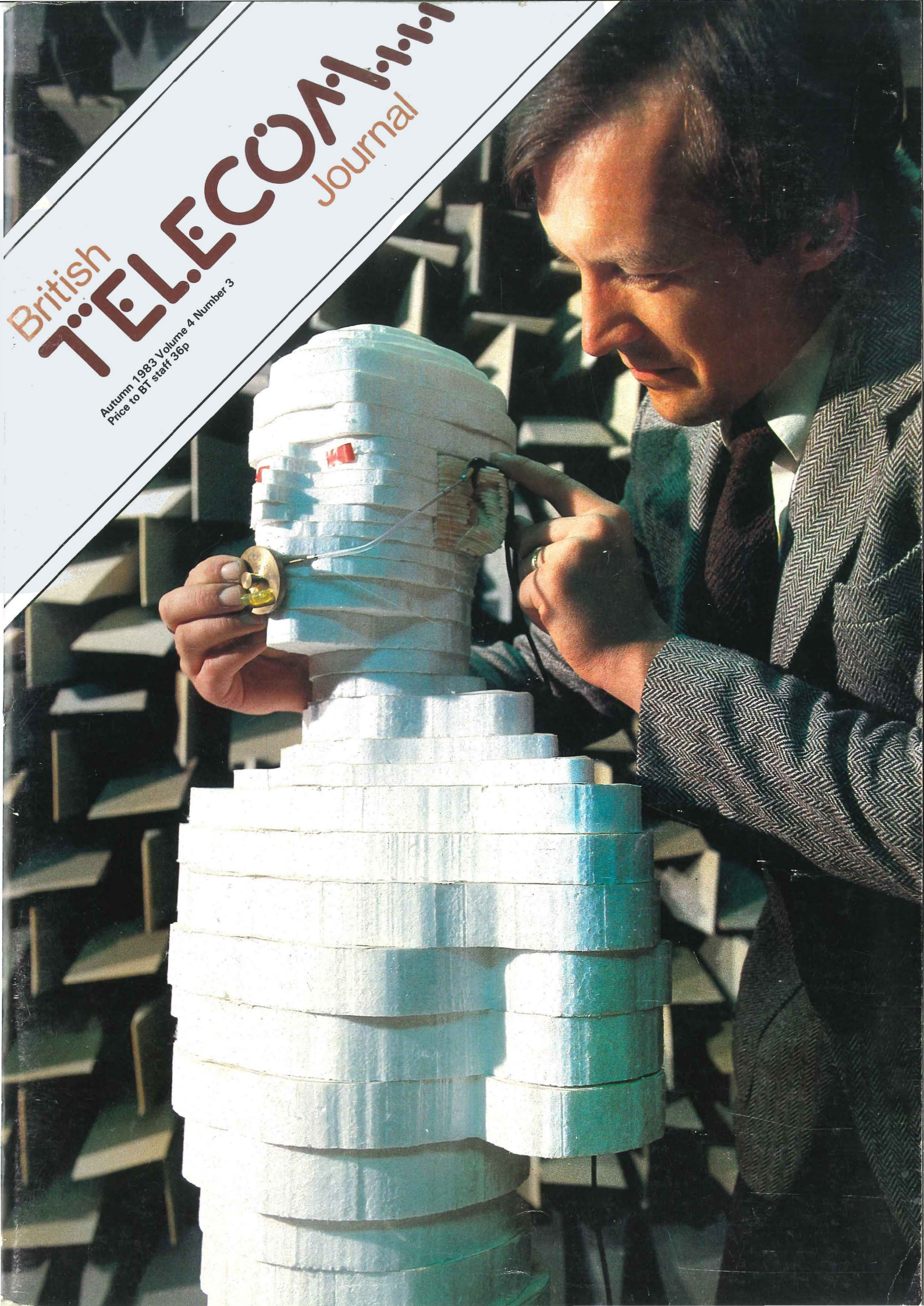

British TELECOM Journal

Autumn 1983 Volume 4 Number 3
Price to BT staff 36p

Making light conversation on the phone.

Working at the speed of light is nothing new for Plessey.

Plessey scientists, designers and engineers have been developing new fibre optic telephone transmission for over a decade, combining the technologies of digital multiplexing, line systems, opto-electronic devices and optical fibre connectors to create optical fibre transmission systems second to none.

Plessey was responsible for the first optical fibre test route in Britain–between Maidenhead and Slough.

And completed the 17km cable for British Rail between Birmingham International and Coventry in 1981 –the first UK optical link operating along electrified track to meet international telecommunications standards.

In 1982 they opened the longest link in Britain – the 204km between London and Birmingham.

258 systems, or more than 55 per cent of all optical fibre systems ordered by British Telecom for installation in the UK public network, have been awarded to Plessey Telecommunications Limited. 14 have already been completed and are carrying traffic.

And in Saudi Arabia, Plessey has been awarded the subcontract for the supply of 34MBit/s terminal and line equipment to the central region of the Saudi Consolidated Electric Company.

To find out more, contact: Transmission Division, Plessey Telecommunications Limited, Beeston, Nottingham, United Kingdom, NG9 1LA.
Tel: Nottingham (0602) 254831, Ext. 3542. Telex: 37201.

PLESSEY
telecommunications

Cableways

TEP – 1 (E) Equipment Practice Rack Installation Parts:

Part Number		Description
1-2/D	500001	Plate
1-2/D	500002	Plate
1/D	500003	Plate
1/D	500004	Bracket
1/D	500005	Bracket
1/D	500006	Cable Finger
1/D	500007	Cable Mesh
1/D	500008	Cable Mesh Tray
1/D	500009	Cable Mesh
1/D	500010	Nut Special
1/D	500011	Screw MI2
1/D	500012	Washer
1/D	500013	Channeling
1/D	500014	Channeling
1/D	500015	Saddle Bracket
1/D	500016	Clamp
1/D	500017	Base Plate
1/D	500018	Angle Bracket
1/D	500019	Plate
1/D	500022	Clamp
1/D	500023	Bracket
1/D	500024	Baffle
1/D	500025	Bracket

Part Number		Description
1/D	500026	Cable Mesh
1/D	500027	Bracket
1-2/D	500028	Plate
1/D	500029	Temporary Support Base Plate
1/D	500030	Packing Piece
1/D	500031	Bracket
1/D	500032	Half Saddle Bracket
1/D	500033	Suite Earth Bar
1/D	500034	Bracket EQMT Fuse 80 MTG
1/D	500035	Plate
1/D	500036	Clip
1/D	500037	Closure Strips
1/D	500038	Bracket
1/D	500039	'T' Plate
1/D	500040	Adaptor Bush
1/D	500041	Bracket
1/D	500042	'L' Plate
1/D	500043	'U' Bracket
1/D	500044	Cable Support Bracket
1/D	500045	Cable Mesh Tray (M/RDF)
1/D	500046	Clamp (M/RDF)
1/D	500047	Saddle Clip
1/D	500048	End Cap

Mr G Streets
Sales Director
Cableways Limited
Oldends Lane
Stonehouse
Glos
GL10 3RQ

Tel: (045 382) 4341
Telex: 43456

Cableways

NAME

ADDRESS

Cableways have BT approval for this service and authorised release for this equipment.

BT4

'Soon there will be just two kinds of company, those with, and those struggling along without.'

Pericom

A VDU terminal with single or multi-host emulation, graphics work-station, stand-alone micro or complex network – the building blocks of information technology tailored to your needs.

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Manufacturers of Microcomputers,
Graphics Terminals and VDU's
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Milton Keynes, MK14 5LJ.
Tel: (0908) 614242. Telex: 826442.

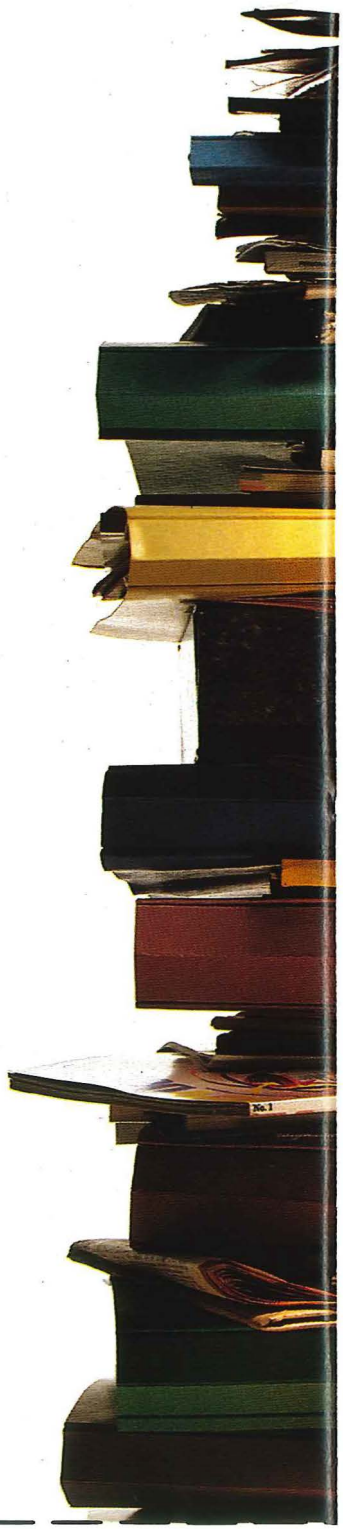
If you're asked to plan a computing system for your company, don't imagine you'll get away with a bit of light reading and conceptualising.

You'll soon have enough brochures, files, cuttings, notes and doodles to warrant an office of their own.

So our Distributed Resource System should prove quite a weight off your mind.

It's an office system you don't have to plan: designed to meet the local requirements of offices, yet still be flexible enough to meet the diverse needs of the company as a whole; to be economical enough to be bought from local budgets when necessary, yet still be capable of

A word of advice to anyone planning an office system. Don't.



DRS MODEL 10
An intelligent workstation which can be integrated in a DRS MICROLAN local network, accessing and manipulating data.

DRS MODEL 20
A desk-top workstation with twin 1 Mbyte integral discs that can run alone or be linked via MICROLAN. It can also communicate via Wide Area Networks with ICL and IBM mainframes.

DRS MODEL 25
Shares the same features as a Model 20, with integral fixed and floppy discs of 10 and 1 Mbyte. It can also form its own local network, supporting two Model 20s or Model 10s.

DRS MODEL 50
A desk-style unit with the systems cabinet housing a 1 Mbyte discette and a single fixed disc of 16 or 27 Mbytes. It can support any mix of Model 10, 20, 25, 40 and 50 systems.

communication as part of a network.

Because every piece of equipment in the Distributed Resource System can operate as a personal computer in its own right, or share the resources of any other work station, at any time.

At a stroke, the problems of incompatible micros, and choosing between central or decentralised information processing, no longer exist: the Distributed Resource System grows organically to reflect the particular needs of your company.

So start as you mean to go on. Send for our brochure, and the only thing you'll be up to your eyes in is Thank You memos.

DRS 8800 SERIES
It can function as a stand-alone word processor. Or it can function as one of a number of secretarial workstations, supported by the DRS Document Storage System.

For more information, dial 100 and ask for Freefone ICL. Or send coupon to ICL Infopoint, ICL House, Putney, London SW15 1SW.

OM5/1

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Company_____

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We should be talking to each other.

ICL

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A NEW ADDITION TO THE ROYALE FAMILY

THE ROYALE SX20 . . . PERFECT FOR THE COMPANY REQUIRING UP TO 10 EXCHANGE LINES/PRIVATE CIRCUITS AND UP TO 72 EXTENSIONS.

THE SX20'S FACILITIES INCLUDE:

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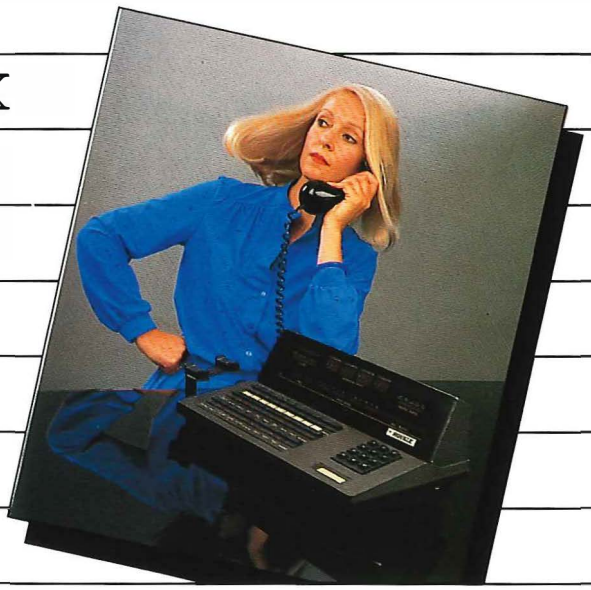


All these features–plus many many more–

are part of the impressive Royale package.

Find out more about the new Norton Royale SX20 by completing and sending the coupon below to:

Norton Telecommunications Ltd, FREEPOST, Norton House, Bilton Way, Luton, Beds, LU1 1BR.

Please send me details of the Norton Royale SX20

Name

Company Address

Phone

S/1412/23 BT C/020691 APPROVED for use with telecommunication systems run by British Telecom in accordance with the conditions in the instructions for use.

NORTON

Norton Telecommunications Ltd, Tel: Luton (0582) 425067 Telex: 826955

Put the world's most powerful communication tool to work for you.

"It uses no petrol. It gets decisions from 4, 6 even 12-15 people every hour. It's never sick. It says exactly what you want. It works."

It's called the telephone. Companies like IBM, Time-Life, Leyland Trucks, BP and Allied Breweries already know what it can do.

And today, British Telecom's Telemarketing Division is ready to show you what can be achieved.

The power of the telephone is startling. For instance: when did you last stop a meeting to read an ad? Or run downstairs to pick up a letter? Or rush out of the kitchen to watch a commercial?

WE CAN HELP YOU IN MORE WAYS THAN YOU CAN IMAGINE.

Business-To-Business	Consumer
Product sale	Selective sampling
List building	Research
Lead screening	Subscription renewal
Appointment setting	Agency re-activation
Distributor traffic generation	Agency order stimulation
Selling disposables	Load up
Retail stocking	Cross selling
Selective sampling	Member reactivation
Seminar attendance	Mail/Press/TV/Radio conversion
Selling Add-ons	Product sale
Customer service	Customer service
Research	Distributor traffic generation
Credit jog	Appointment setting
Servicing marginal accounts	
Mail/Press/TV/Radio conversion	

But for the telephone you drop everything. It has the power to command – *quite automatically* – the undivided attention which most other media have to fight to get.

A NEW APPROACH TO TELEPHONE MARKETING.

Until recently the phone aroused pictures of fast-talking sales-pitches you wouldn't want to be associated with.

But today companies of all sizes have found that polite, carefully planned phone prospecting and selling is welcomed by busy people who don't have time to see salesmen or read long letters.

And two people helped them to do it.

UNRIVALLED EXPERTISE PLUS TELECOM BACKING.

Robert Leiderman has worked for nearly 14 years in telemarketing, the last 3 with Donnelley Telemarketing Services as Managing Director. He brings a breadth of experience to the business few can match.

SimonRoncoroni has 11 years all round marketing experience. His understanding of where the telephone fits in your marketing mix can be crucial. Add to their commercial acumen the substantial resources only British Telecom commands, and you have a formidable combination.

WE CAN HELP YOU IN MORE WAYS THAN YOU CAN IMAGINE.

If you face any problem in marketing, sales, customer service, market research or related areas, send for our free brochure and find out how we can help.

But to start your mind working, consider these three examples:

✻Sometimes large segments of your prospect list are just not worth reaching with salesmen.

Telephone can be the answer – as a major drugs company discovered.

✻Do you have key customers who are prime prospects? A major store telephoned prospects like this to offer a "sneak preview" of a new perfume range...and sold out on day one.

✻Launching a new product? One major FMCG marketer asked prospects to ring in for free samples. Whilst a U.S. car manufacturer spent millions on ringing hot prospects offering a test drive of a new car.

There are very few areas of business where the telephone cannot make a contribution. Either outbound telemarketing or inbound.

Inbound is the speciality of our sister company Telecom TAN. Between us we provide a complete service.

The potential is only limited by your imagination.

A MEDIUM WITH ITS OWN PARTICULAR STRENGTHS.

Telephone marketing is not a panacea. It is a medium with its own strengths. For instance, the message you are now reading is more suited to print media.

But when you are completely aware of those strengths, you may well find they provide the solution to a problem you face right now.

Your copy of "A direct line to new profits" is waiting for you. Pick up your telephone, dial 100 and ask the operator for Freefone Telemarketing. Why not do it now?

British TELECOM

Telecom Telemarketing, 95 Ebury Bridge Road, London SW1W 8RL. Tel: 01-730 9461.

"In the U.S. for every $3 spent on direct mail, $2 is spent on the phone."

John Adams, President Dial America Inc., speaking at the World Direct Marketing Congress, Manila, 1982.

Although the telephone may appear more expensive to use than the post, used properly, it can end up cheaper. Indeed, it often produces results as much as five times higher. It all depends on how carefully it is planned. That's where we come in.

Agency: Trenear-Harvey, Bird & Watson Limited

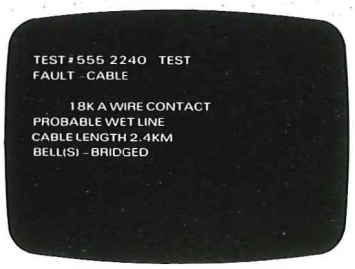
How World PTT's And Phone Companies Will Find Faults Before Their Customers Do

The latest automatic testing technology from Teradyne, including the 4TEL and SCOT test systems.

The Series III 4TEL system
automatically tests every line every night and provides powerful diagnostic testing for fault finding every day. The Series III 4TEL System includes:

- ★ Advanced system refinements based on many years of user experience.
- ★ The latest technology in microprocessors and communications.
- ★ New testing features designed for the needs of European PTT's.
- ★ Testing from the field with computer generated voice response.

4TEL immediately permits major improvements in quality of service through more efficient responsive and preventive maintenance.



4TEL: The world's fastest and most accurate automated subscriber line test system.

SCOT
tests Strowger exchanges locally or from a maintenance centre.
SCOT measures the quality of service as the customer sees it by end to end routining of the switch and reporting details of incomplete calls.
Analysis of SCOT results focuses maintenance attention firstly on problem exchanges and then on the specific areas within the switch.
SCOT also helps technicians to troubleshoot faults quickly and restore service to target levels.
SCOT measures service and helps to improve it.

4TEL and SCOT from Teradyne, one of the world's leading manufacturers of computer controlled test systems, have been field proven in rural and urban environments and are testing millions of lines now.

TERADYNE

Teradyne Ltd.
Clive House Queens Road
Weybridge Surrey KT13 9XB ENGLAND
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WE'VE GOT A WINNING HAND OF JACKS

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Pressac range of line jacks and plugs

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THE ECONOMIC ALTERNATIVE

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Telephone: 06076 60141. Telex: 37381.

Designers and manufacturers of plugs and sockets, interconnection systems, rigid and flexible printed circuits, electrical, electro-mechanical and electronic components and assemblies.

Integrating networks for the future.

Communication networks must talk and work together. That's a need which Plessey interfaces up to.

To enable this network integration, Plessey uses every modern telecoms technology – plus new technologies it's developing itself.

Analogue to analogue. Analogue to digital. Digital to digital. Plessey can link one network to another. And another, and another, and another.....

It has the interworking skills in switching and transmission to marry one generation of equipment to the next, irrespective of the make.

With its own new generation of digital systems and equipment, Plessey is spearheading this communications evolution.

In Britain's System X, in satellite and cable, in fibre optics and broadband, Plessey is committed.

In private business exchanges, data networks, telex, teletext and integrated office systems, Plessey involvement is complete. Plessey works around the world, in more than eighty countries.

It's helping to provide the unified services for voice, text and data that business and nations require.

Interfacing, integrating, interworking.

To find out more, contact John Pollard, Plessey Telecommunications & Office Systems Limited, Beeston, Nottingham NG9 1LA. Telephone: Nottingham (0602) 254831 Ext. 4251. Telex: 37201.

PLESSEY

telecommunications & office systems

Ahead in business communications.

"Auralite telephone headsets mean maximum efficiency, comfort and mobility."

"We cannot settle for less."

David Hardman, Deputy Managing Director, Godfrey Davis Europcar.

Godfrey Davis Europcar is Britain's biggest car rental company and relies on efficient communications. Its Central Reservations office receives hundreds of car rental reservations by telephone every day, and personnel morale and comfort are essential in maintaining the high standards of speed and efficiency which both the company and its customers expect.

That's why David Hardman sees that all of the Godfrey Davis Europcar tele-sales assistants in the Reservations office at their head office in Bushey, Herts are equipped with Auralite telephone headsets.

"The tele-sales assistants' task is a demanding one" says David Hardman. "The ultralight headsets reduce fatigue. Their superior sound quality is very much better than that of a carbon headset and, as it conveys sound direct to the ear, surrounding sounds do not confuse the listener."

If the telephone plays a significant role in your business, Auralite headsets can make it more efficient, your clients happier, and your personnel a lot more comfortable.

Don't settle for less. Find out how Auralite headsets can make a real difference. Auralite headsets are available from your local British Telecom Sales Office, or telephone Richard Parsons at the address below for further information.

PHILIPS Business Systems

TMC Limited

A Division of Philips Business Systems

Swindon Rd, Malmesbury, Wiltshire, England SN16 9NA.
Tel: Malmesbury (06662) 2861. Telex: 44208.

APPROVED for use with telecommunication systems run by British Telecommunications in accordance with the conditions in the instructions for use.

B.T. Approval No. S/1000/GF/1981/PR

TEST FACTS FROM THE TEST LEADER

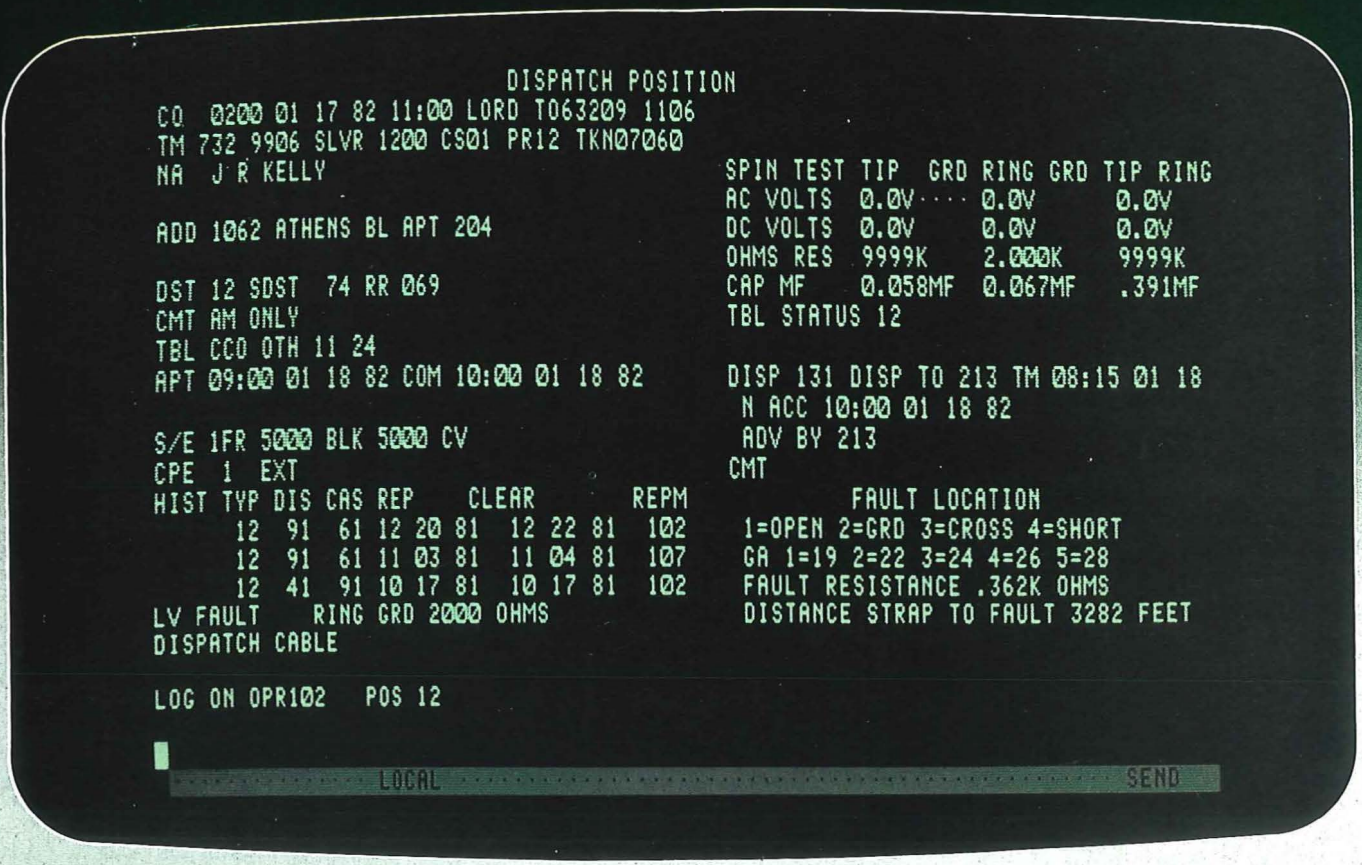
Porta Systems is the world leader in Line Testing; the first company to offer Line Condition Reporting systems and the most experienced, serving more than twenty telephone operating companies and authorities.

Our advanced LCR 2000 automates every phase of Repair Service Centre Operation. It instantly tests individual lines, identifying faults as they are reported and determining their precise location. Additionally, it performs overnight test routines of the complete area

subscriber network. And, it mechanizes the posting, filing and retrieval of line records for faster response to enquiries and improved subscriber service.

LCR 2000 is highly flexible, readily adaptable to any Repair Service Centre operating procedures, and is simple to use, requiring minimal operator training.

For the complete facts on LCR 2000, and more information on the benefits of automated Repair Service operations, contact: Philip G. Moore, Director of Systems Sales, Porta Systems Ltd., The Parade Frimley Surrey GU 16 5HY. Telephone (0276) 683140



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Leaders in Test Technology.

When you've admired our clean, good looks . . . marvelled at our range of features . . . been absolutely amazed by our prices . . . what else can we say about our new range?

Terminals to access Prestel, other viewdata systems, Telecom Gold etc.

Smart modems to put communications on your micro.

And more.

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Tandata Marketing Limited
Albert Road North
Malvern, Worcs. WR14 2TL
Telex: 337617 Prestel*799#
Telecom Gold: TAN 001

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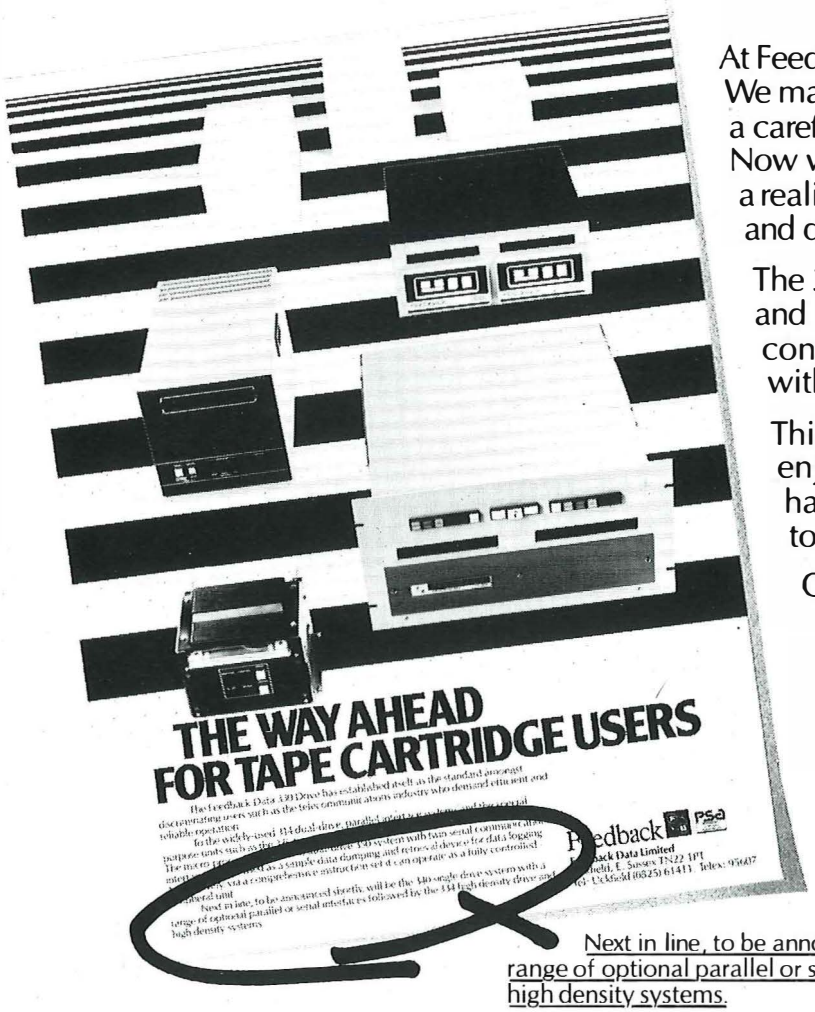


At Feedback Data, we don't make promises lightly. We make them based on our known capability and a carefully planned development programme. Now we've turned the promise made in 1982 into a reality – the introduction of a new series of single and quad density systems.

The 340/344 single or quad density data dump and retrieval units plus the 350/351 interface controllable units provide tape cartridge users with equipment for a wider range of applications.

This means that many more people can start to enjoy the benefits of the Feedback quality that has given us a position as the leading supplier to the telecommunications industry.

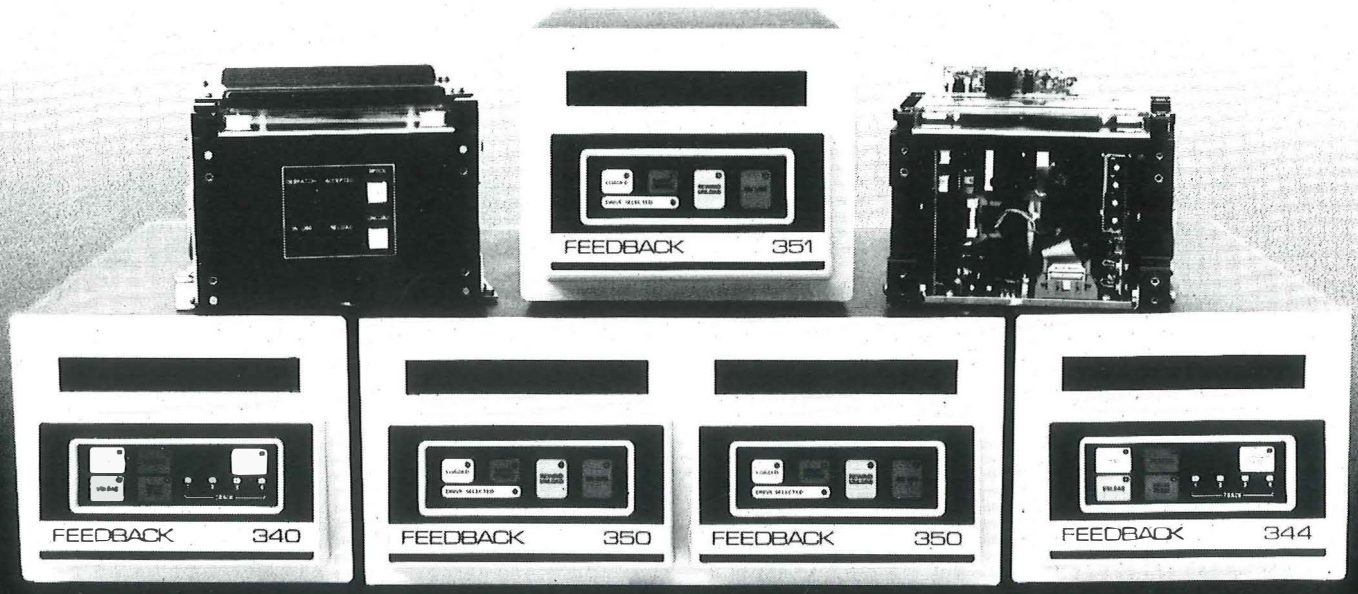
Call us today and we'll show you the way ahead.

Feedback

Feedback Data Limited
Uckfield, E. Sussex TN22 1PT
Tel: Uckfield (0825) 61411. Telex: 95607.

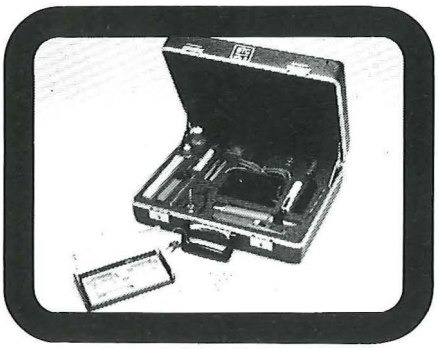
Next in line, to be announced shortly, will be the 340 single drive system with a range of optional parallel or serial interfaces followed by the 334 high density drive and high density systems.

PROGRESS ALONG THE WAY AHEAD

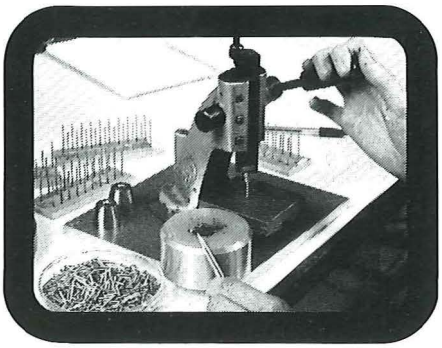


STC Today's Fibre Optics For Tomorrow

OFR3



OFTKO6



Assembly of Jewelled Ferrule Termination

STC pioneered the commercial use of Fibre Optics and is still a leader in research, design and manufacturing of top quality systems and components for the professional telecommunications, military and industrial markets.

Capability

Our Opto-Electronics unit at Leeds offers a complete Fibre Optics capability with DEFSTAN 05-21 approval. The production facility at Leeds is supported by a strong engineering team with extensive laboratory facilities and a comprehensive knowledge of both the theory and practical use of the technology.

Test Equipment

The advent of Fibre Optics technology, particularly in the area of communications, has prompted the need for specially designed measuring and test equipment for use with the systems and components.

STC has called upon all its experience to develop a range of instruments which are recognised as being amongst the most advanced in the world. Continuous development work is being carried out to provide regularly up-dated additions to our range.

We can now offer Splicing Kits, a Termination Kit, Test Set and sophisticated Optical Time Domain Reflectometers for accurate location of faults and to provide a complete attenuation of the fibre.

Components for Professionals

We can provide a broad range of products for use in a Fibre Optic system, including - MODULES - Analogue, Pulse Frequency Modulation, Digital and Plug-in; - COUPLERS - a wide range of devices for use in multi-terminal data transmission systems; - SPECIAL PURPOSE CABLES - incorporating a wide variety of fibre types which have been comprehensively tested both for optical performance and ruggedness in operational environments; - CONNECTORS - the well-proven Jewelled Ferrule was developed at our unit in Leeds and forms the basis of our range of single and multiway connectors.

As with our instruments, continuous development work enables us to provide regular additions to our range of components.

We also supply special purpose tools for use in the assembly and repair of optical links.

Technical Resources

No-one knows more about Fibre Optics and the way the technology can be put to work than STC. Our skill and experience is freely available to anyone interested in using Fibre Optics and we can advise you on the design of a system and follow through by helping you build it.

If you are planning to use Fibre Optics, let us help you to communicate.

We have one of the world's widest ranges of Fibre Optics components and sub-systems. They are described in our summary catalogues and our brochure.

Send for your copies.
Write to us or call us at:

STC Components
Opto-Electronics Unit
Westfield Mill
Broad Lane
Leeds LS13 3HA
Tel: (0532) 577261
Telex: 818746

STC Components

Pick up the phone from the future.

This phone will do things most of us never dreamed possible. It will even transmit data on to a VDU. It will be very much at home in tomorrow's electronic office.

And it exists now.

But even a phone as advanced as this will one day become obsolete. Nobody quite knows when. Nobody quite knows what will replace it. Nobody knows for certain what telecommunication equipment will be like in the office of the '90's and beyond.

All of which brings us to this phone's greatest attribute of all. The part you don't see.

The system behind it.

Called MD 110, it is far and away the most sophisticated telecommunication system available. And it has one priceless advantage.

It has the ability to accept any communications equipment. Either in use today, or even beyond the foreseeable future.

Obsolescence is just not part of its vocabulary.

It is digital. It will handle voice and data transmission simultaneously. It can operate as a single system in one location, or as a multi-location system spread across the country.

Distance makes no difference.

It undertakes all internal and external communication and it is cost effective from as few as 150 extensions, to as many as 12,500.

It is endlessly adaptable to change – expansion, relocation, computerization – any change in voice or data transmission needs.

You simply cannot outgrow it.

It can be phased into an existing system without disruption. Even accommodating existing telephones.

No company can afford to ignore the importance of communication. But the pace of change is such that most of today's telephone systems are out-dated before they can be installed. MD 110 changes all that – at the same time providing substantial savings in cost and time.

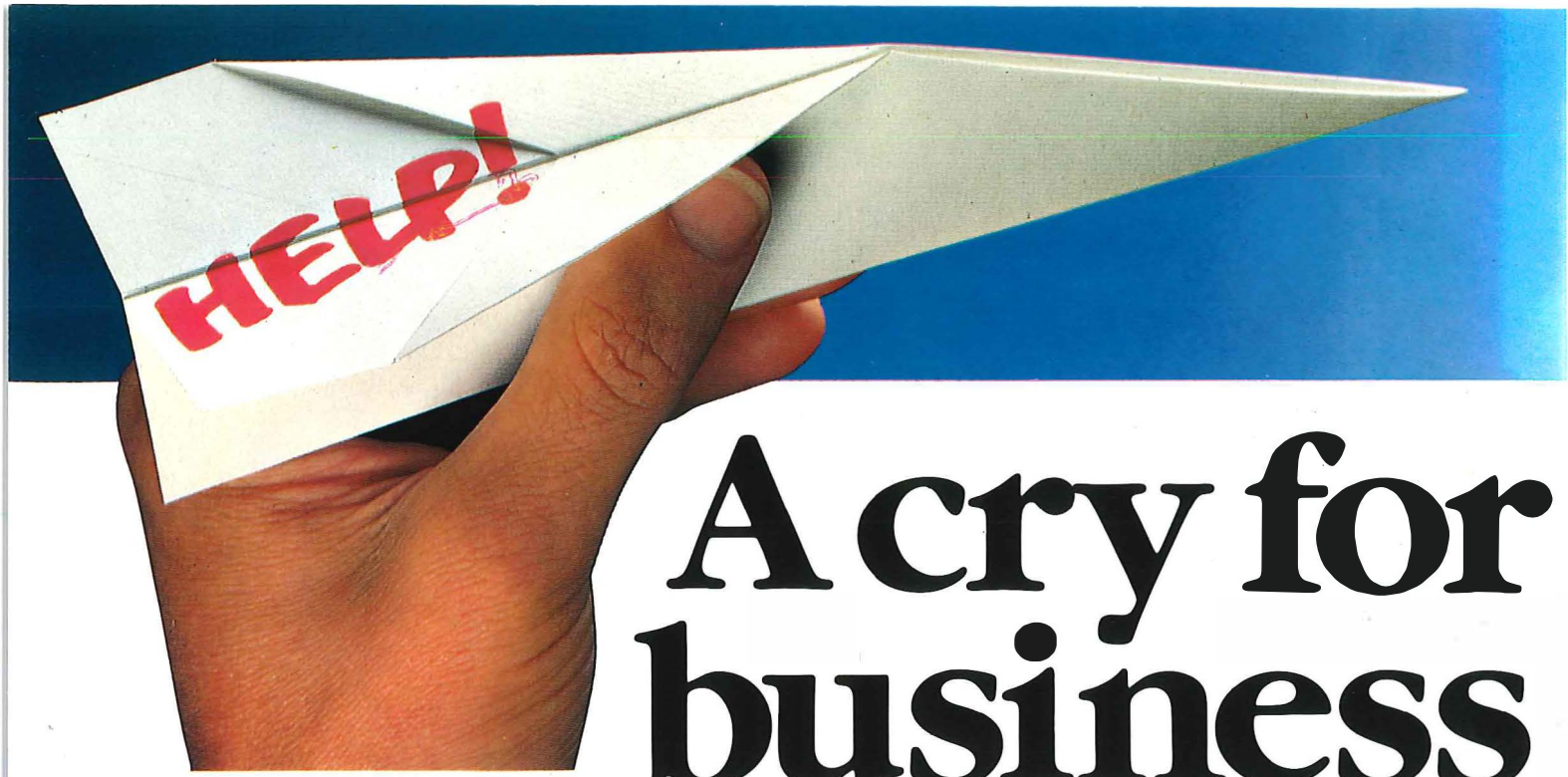
It is the single most effective step yet in taking business communications into the future.

Think about your company's needs over the next few years – for the next few decades. Then let us show you what MD 110 can do. Your present phone system can put you in touch with us.

But that is where any similarity ends.

THORN ERICSSON
Partners in Communication
THORN EMI ERICSSON

Viking House, Foundry Lane, Horsham, West Sussex. Tel: (0403) 64166



A cry for business information?

Getting fast, efficient business information is a big problem in many offices.

A problem that HiNet™ was designed specifically to answer.

There are over 400 HiNet systems on order or installed within BT being used for multi-user or general computing applications.

The HiNet computer system puts each person in touch with what everyone else in the office is doing, instantly. It can run word processing and data processing simultaneously on the same network. It lets you run CP/M compatible application software, and soon MSDOS, throughout your entire network, so you can use hundreds of different packages such as accounting, word processing, stock control, solicitors, production, material costing, insurance, personnel records and many more. We can even offer true multi-user and data base management packages.

All this in one reliable system. A system that is a great deal less expensive than the traditional computer system.

A system that is unbelievably simple. A system that can start small, with as little as one workstation, and gradually build up to 31 stations in your network.

FREE SEMINARS!

There are special seminars being held by us on HiNet and its application with BT. Phone for details or return the coupon.

A system that not only lets you share information with other departments, but also lets you share the more expensive elements such as disk storage and printers.

A system that talks to ICL, IBM and Sperry Univac mainframes as well as the telex network.

Post the coupon. Now.

For full details, contact us now. And throw your business information problems out the window. Please send me further information ☐
Please arrange a demonstration for me ☐ Please send me details of your free seminars ☐ Tick appropriate box.

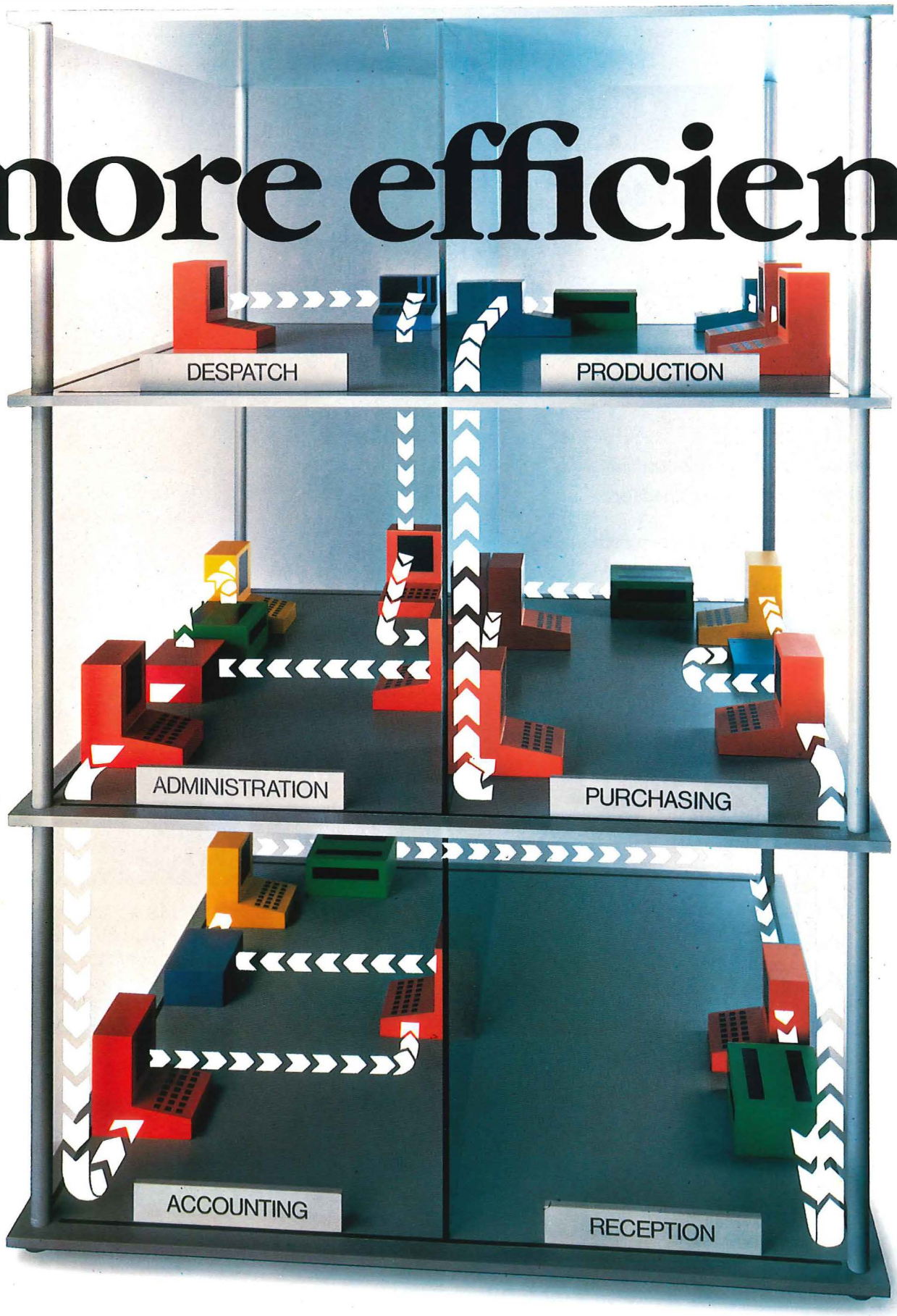
Name_____
Company_____
Position_____
Adddress_____
_____ Tel. No._____

DMS Digital Microsystems™ Limited

Digital Microsystems Ltd., Molly Millars Bridge, Molly Millars Lane, Wokingham, Berkshire RG11 2PQ. Tel: (0734) 793131. Telex: 849925.
An Extel Group plc company.

BTJ10

more efficient



NOW YOU CAN HAVE IT BOTH WAYS- EITHER WAY!

TELE-NIROS 707
— the compact hand-held mobile radio

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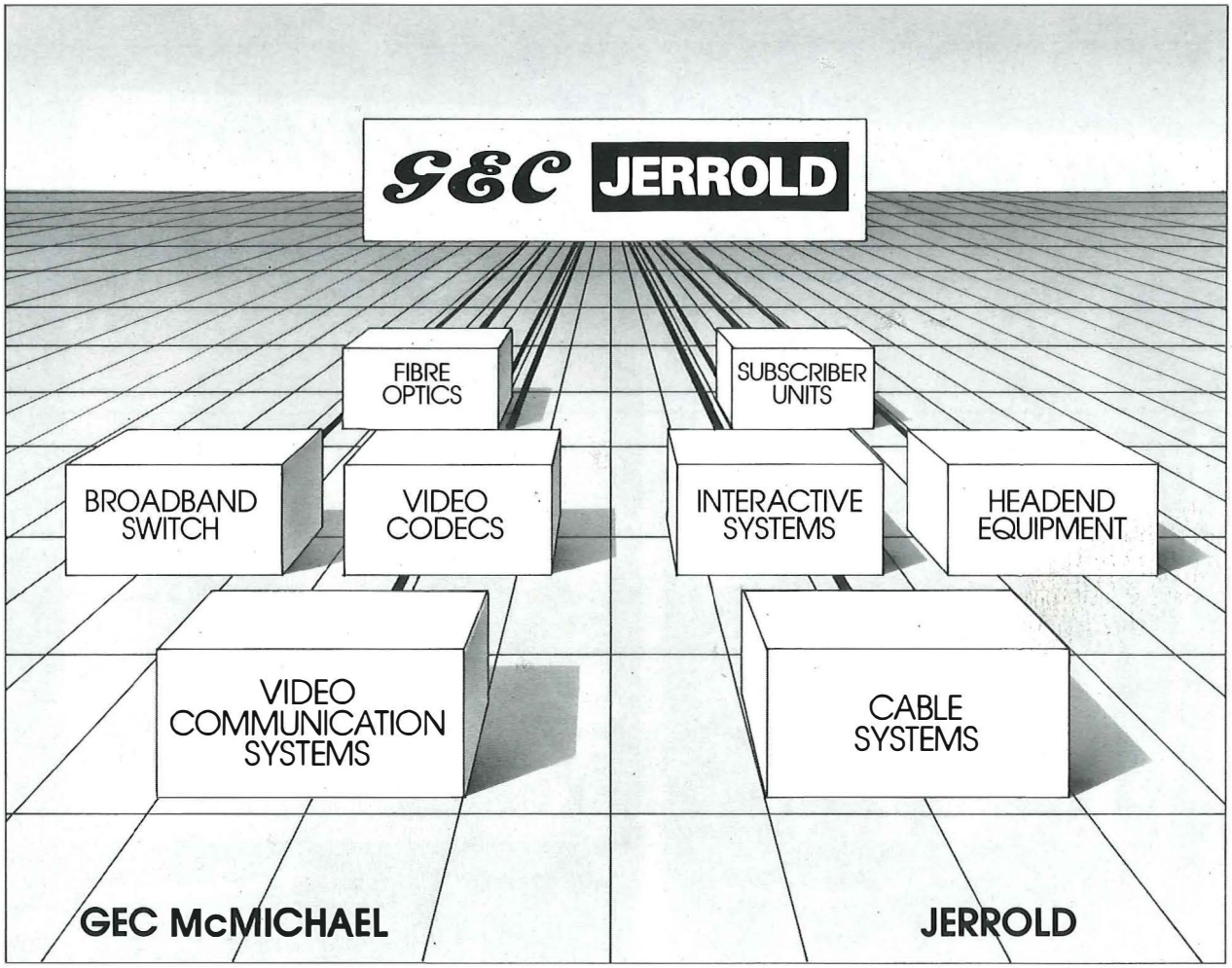

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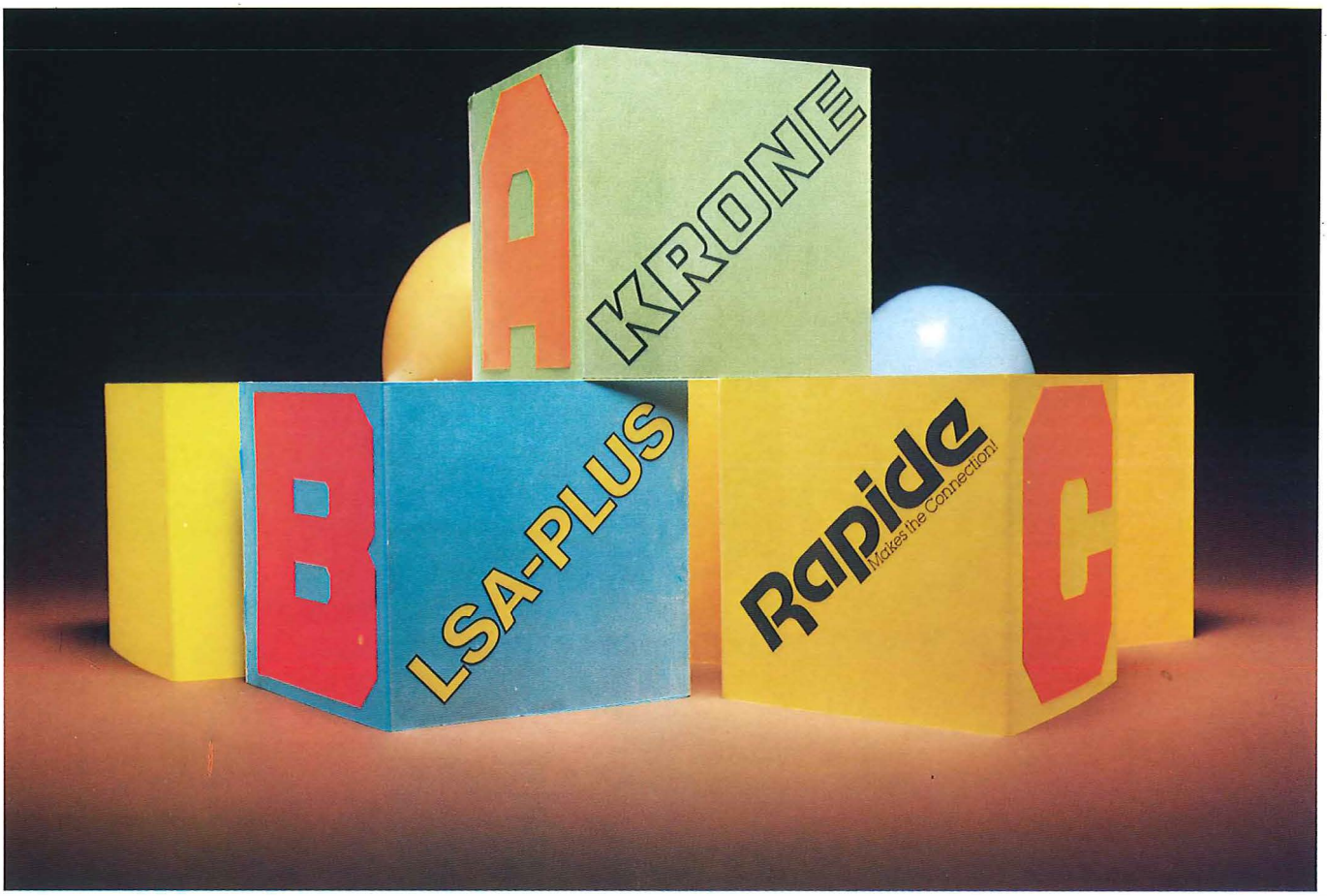

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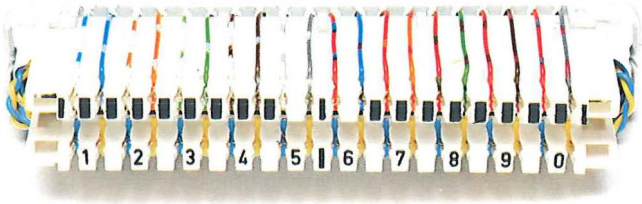

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British Telecom Journal
Autumn 1983 Volume 4 Number 3

Published by British Telecom to promote and extend knowledge of the operation and management of telecommunications.

Cover: Kevin Welsby uses a specially-designed 'model' – nicknamed the Mekon – to test sound levels in the anechoic chamber at British Telecom's Martlesham Research Laboratories. As sound waves projected at the model bend round him, they are evaluated to help measure the performance of telephone hand and headsets.

British Telecom Journal cost 36p per issue for staff. External subscribers pay £10 for two years including post and packaging. Full details on page 45.

System X advances

The city of Coventry has recovered from the devastation inflicted on it during the last war and with its new cathedral and commercial and cultural centre, faces the future with confidence.

It is perhaps appropriate, therefore, that the first in a new generation of the world's most advanced electronic telephone exchanges – System X – has been handed over to British Telecom in the city. It is a trunk exchange which uses a new highly sophisticated computer control system and which has been supplied by GEC – itself a Coventry-based company. Following extensive commissioning it will be working by the end of the year.

This latest development follows the introduction of three local System X exchanges already in service at Woodbridge, Arrington and Hale.

Chairman of British Telecom, Sir George Jefferson, is confident of Coventry's success. Speaking at a British Telecom award ceremony at which two top technologists behind the System X programme – Roy Harris and John Martin – were presented with the Martlesham Medal, Sir George said that the new telephone exchange represented a great achievement. It was the result of a huge co-operative endeavour by a 1,400-strong team drawn from industry and British Telecom.

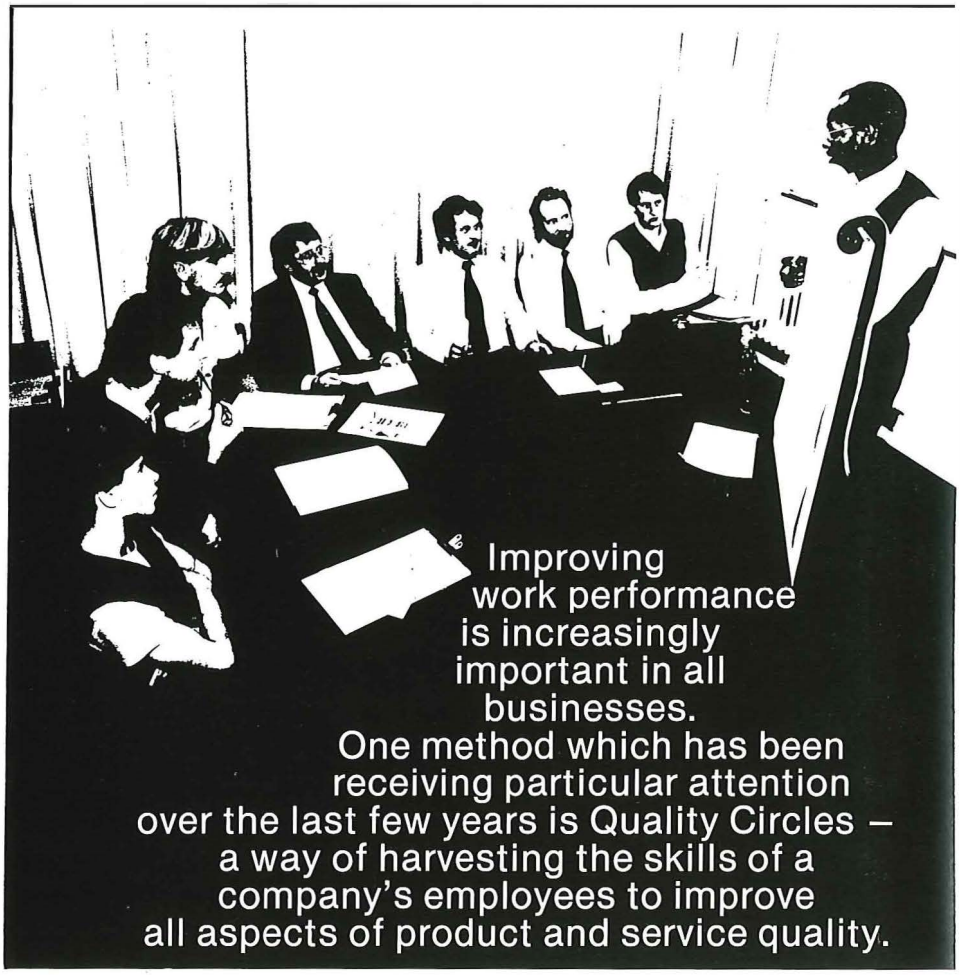
And hard on the heels of this achievement comes the news that production of System X is forging ahead. Twelve more trunk exchanges handling calls to and from other parts of the UK are due to come into service next year in major centres around Britain. By 1986, the figure will have grown to 30 and by 1988, to 60. This will mean an all-digital UK trunk network two years earlier than originally planned. Meanwhile more and more local System X exchanges are being introduced. Some 200 have already been ordered this year and by about 1986, British Telecom expects to have two million customers connected to the System X network.

These developments do not only augur well for British Telecom. System X is essential for Britain and will contribute to improved productivity. Britain's business community will also benefit. System X will provide the advanced communications services which UK companies need if they are to compete effectively in the market place with the rest of the world.

And because it is digitally-based, System X can, of course, offer high-speed data transmission services as well as new telephone services including call diversion, short-code calling, call waiting, reminder calls, three-way calling, call barring and repeat last call. It can also log calls for itemised billing.

Digital communications are vital for the prosperity of the nation and as in many other areas of telecommunications development, Britain has established itself as a world leader. It is now up to customers – particularly business communities – to take advantage of the opportunities that British Telecom's digital programme offers.

PROBLEM SOLVING WITH QUALITY CIRCLES



John Luff
and
Kathy Sullivan

A quality circle is a small group of staff working for the same supervisor. The circle meets regularly and voluntarily to identify, analyse and consequently solve work problems. The theory was developed in the UK and the USA in the 1940s and early 1950s but it was the Japanese who implemented it and refined it as a technique now used by ten million Japanese employees.

In the UK practical development of quality circles goes back no further than a few years and major companies involved include British Leyland, Ford, ITT, Imperial Tobacco, Marks & Spencer, Rolls-Royce and Wedgwood as well as British Telecom. The TUC recently estimated that more than one hundred UK companies used the system which can be applied in service departments, accounts, sales, engineering and so on.

In British Telecom, quality circles are running well in Cardiff Telephone Area and Birmingham Factories. They have also recently started in Reading. In Cardiff the group has made an important contribution in improving working practices in customer installations as well as providing increased job satisfaction for the members. The leaders of the four circles are engineering inspectors who have benefited from the experience to the extent that they were able to address audiences of senior managers at seminars held in Newcastle and London.

Quality circle philosophy is based on certain assumptions. Nearly everyone, for example, has the ability to solve problems at work in an imaginative and creative way but the full potential of most people is only partially used. The basis of a successful group is that its members are trained and should be self-organising. A major advantage is that the group has the necessary knowledge, expertise, ability and, above all, motivation to solve any problem it faces.

It is, however, management's responsibility to set up quality circles and every assistance should be given to encourage their formation. Quality circle members are not elected. Leaders are chosen by higher management and members are invited to join by the leader. Membership is voluntary and each circle is usually five to ten strong. Meetings are held regularly during working time. Members' jobs are closely associated but not always in the same section although they have a common supervisor.

The circle sets about identifying problems, analysing them and finding a solution systematically based on earlier training. But it does not make management decisions. The circle presents a suggested solution and it is for management to decide upon implementation. If the suggestion is adopted, the circle should be involved throughout the implementation.

Before a circle can be set up there are certain basic requirements. It is important that those responsible for overseeing the project should have a thorough understanding of the quality circle concept. They should have the answers to questions about resources, time, availability and so on to determine the feasibility of quality circles within their unit and management should give approval before implementation as stopping a quality circle programme halfway can be disastrous to both industrial relations and motivation. It is also essential to make a similar presentation to unions.

Once the go-ahead is given the team leader needs to be identified and trained.

Left: Birmingham Factory production manager and quality circle organiser Ossie Williams leads a discussion among members of the electronic servicing group on how to improve customer relations.

Right: Forming a quality circle of their own at a recent London seminar are (left to right) Ossie Williams, Kathy Sullivan, John Luff, quality circle adviser and Colin McKenzie and Ken Burfitt from Cardiff Area.

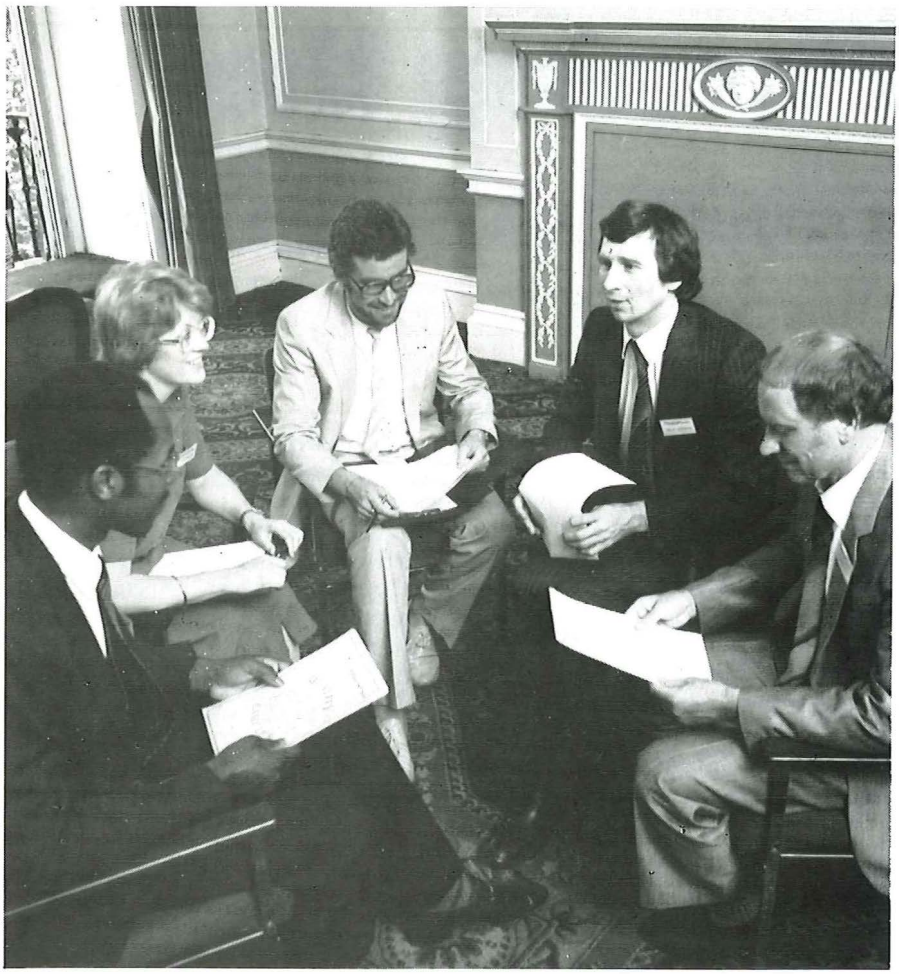
Training usually takes two or three days and up to six leaders can be trained at once. Ideally all quality circle members should be volunteers although not all volunteers would necessarily make suitable members. Similar presentations as given to management and unions should be given to staff.

Quality circle introduction and initial training should include history and concepts, organisation, team-working, brainstorming, data collection and working examples. Training is concurrent with introduction.

A first step for the circle should be to select a simple problem to increase the chances of a successful first attempt. The circle tackles the problem step-by-step to ensure that bad habits are not formed. The circle presents its solution to management which either accepts or rejects. Reasons for rejection should be given or further work on the problem suggested so that a successful conclusion is eventually reached.

The quality circle then reviews its work and it is at this stage that outside comment or objective criticism can be useful. The quality circle action group at BTHQ can carry out this role which must be carefully handled to avoid discouraging the group.

The action group can also provide further information about the formation of quality circles and lend training materials as well as providing the necessary expertise. Contact points are John Luff on 01-380 2283 or Kathy Sullivan on 01-272 7799 x212. Ⓣ



Right: During the seminar in London, Ossie Williams explained the value of quality circles to regional representatives.

Mr J. Luff is a psychologist in occupational psychology division.

Mrs K. Sullivan is a quality circle adviser at British Telecom's Management College, Manor Gardens, north London.

Phoning the phantom office

Remote call forwarding, a new business telephone service which is likely to have a considerable impact on the way companies organise their business, is to be launched this autumn.

Ken Cox

For many years, British Telecom customers have been able to use a special telephone service to a given number to be answered at a distant office, often hundreds of miles away, with the caller paying only the cost of a local call. This little-publicised service has provided the business customer with a 'phantom' local branch office, with accompanying marketing and customer service benefits but with massive savings in accommodation and staff costs. The service is provided using a standard facility known as an out-of-area exchange line.

An out-of-area line is an exchange line where the customer's telephone is connected, via discrete pairs in the local, junction and trunk network, to a 'foreign' exchange outside the customers 'home' exchange area. Take the example of a London customer renting an out-of-area line connected to an exchange in Leeds. Customers in the north east would dial the local Leeds office but in fact would be answered in London without incurring any extra charge.

Out-of-area lines have been used successfully for many years by many companies, and typical applications include the hotel and travel industry for accommodation and seat bookings; mail order houses for local call charge telephone ordering; credit card companies – to encourage credit verification – and manufacturing and retailing to stimulate sales from outlying areas.

Research shows that there is a large

Author Ken Cox and Karen Bagley cut a specially-recorded announcement tape to a remote call forwarding service customer's own specification.

suppressed demand for out-of-area lines, but companies are deterred by, what on the face of it, seems high cost. An out-of-area line from London to Leeds, would currently cost more than £400 a year to rent which is a fixed charge regardless of how many calls are made. For customers such as mail order houses where the volume of calls is more than 50 every day, the cost per phone call compares favourably with normal network call charges and so the out-of-area line is cost effective. For companies who anticipate no more than 20 calls a day, however, the out-of-area line tariff can be prohibitive.

Recognising the customers' need for a cheaper type of remote exchange line service, British Telecom, with the co-operation of large and small business users, has been carrying out extensive product trials of a new service known as remote call forwarding (RCF). This service is similar to out-of-area lines in that it, too, can provide 'phantom' office facilities.

The RCF service uses newly-developed microprocessor-controlled exchange-based call diversion equipment which is installed in a nominated telephone exchange in the town where the customer wants to establish his 'phantom' office. The customer rents a telephone number associated with the equipment and arranges publication of the number in standard directories, Yellow Pages, company directories or trade journals.

Calls to the published number are intercepted by the diversion equipment which automatically dials out a second call to a predetermined distant answering point which can be anywhere in the world provided it can be directly dialled. While the call is being forwarded the caller hears a recorded announcement saying what is happening to the call.

For many applications, a standard message asking the caller to 'hold while the call is diverted' is all that is required, but some customers may not wish their callers to be aware that the call is being re-routed. In these cases the message can simply advise the caller to 'hold while being connected'.

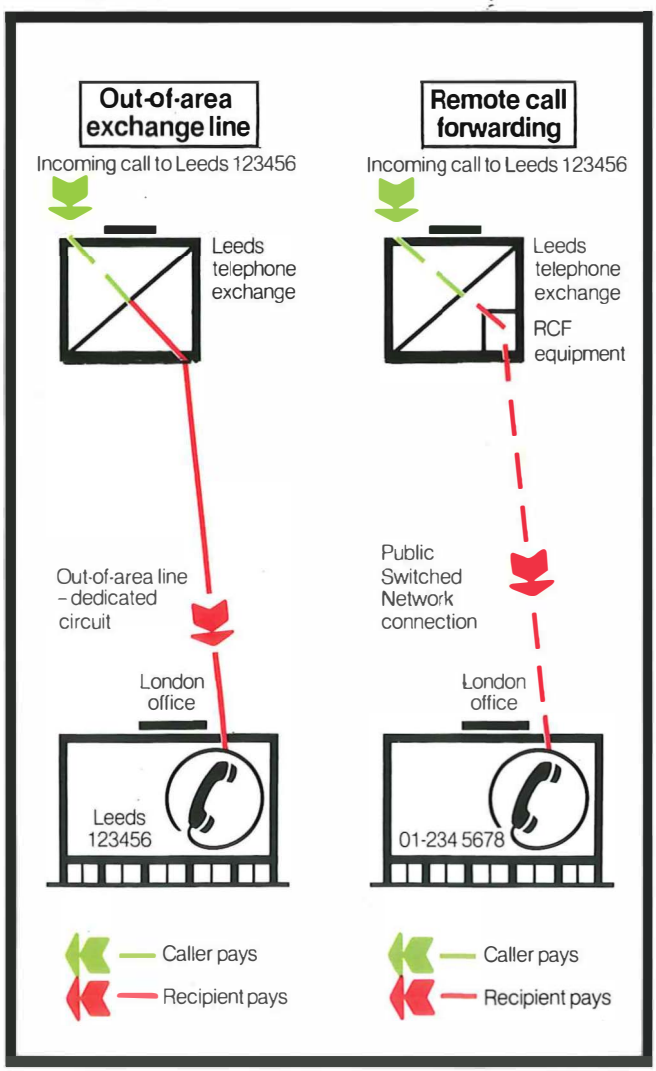
As far as charges are concerned, the caller pays the anticipated charge for the call to the published number with the renter of the RCF service paying for the forwarded portion at the appropriate directly-dialled rate according to distance, duration and time of day.

Much emphasis has been put on getting the service right for the customer. Attention to tones, announcements, charging arrangements, calls from payphones and general quality of service has enabled a high level of user-friendliness to be achieved.

The product trials during the development phase involved more than 80 customers using 300 call diverters installed in about 100 telephone exchanges with all regions and more than 50 telephone areas having taken part. The objectives of the trials were to conduct an effective engineering assessment of the equipment under live field conditions and to make a low-key but positive entry into the market place.

The pool of trial equipment was used to meet unsolicited demand for service wherever it was needed, subject to

How the new service compares with an out-of-area exchange line.



'Divert-a-call' equipment at Mayfair (629) exchange is tested by maintenance technical officer Peter Bruce.

availability. Although more difficult to control, this approach resulted in the best possible feedback on customer acceptability of the product, including pricing, and provided a realistic assessment of how the product can be applied.

The trial, however, was not without its problems, and there were various RCF equipment difficulties. But close co-operation maintained between the manufacturers Dynamic Logic, the product management team and field staff enabled these to be ironed out with minimum interruption to service. The long-standing problem of transmission standards with call diversion was also encountered. This arises when two public switched network calls 'A–B' and 'B–C' are bridged by the call diversion equipment and the performance of the resulting tandem-connected 'A–C' call falls below British Telecom's established transmission standards.

To provide call diversion services in the existing analogue switched network, this transmission problem has to be tackled and in the new RCF service, two design factors considerably reduce the risk of an unacceptable transmission path being established. By installing the diversion equipment in the local exchange, the weakest links – the local lines connecting the customers' premises to and from the exchange – are removed. Secondly, the call diversion equipment incorporates a hybrid amplifier which helps compensate for transmission loss. These facilities enable RCF service to be provided from anywhere in the UK to anywhere in the world with a good chance of operating at an acceptable level of transmission.

Trials have proved highly successful in generating substantial follow-on orders from companies taking part and there is continuing interest from customers who are keenly awaiting product launch. RCF service will be offered alongside out-of-area exchange line service and customers will be able to choose which best suits their needs.

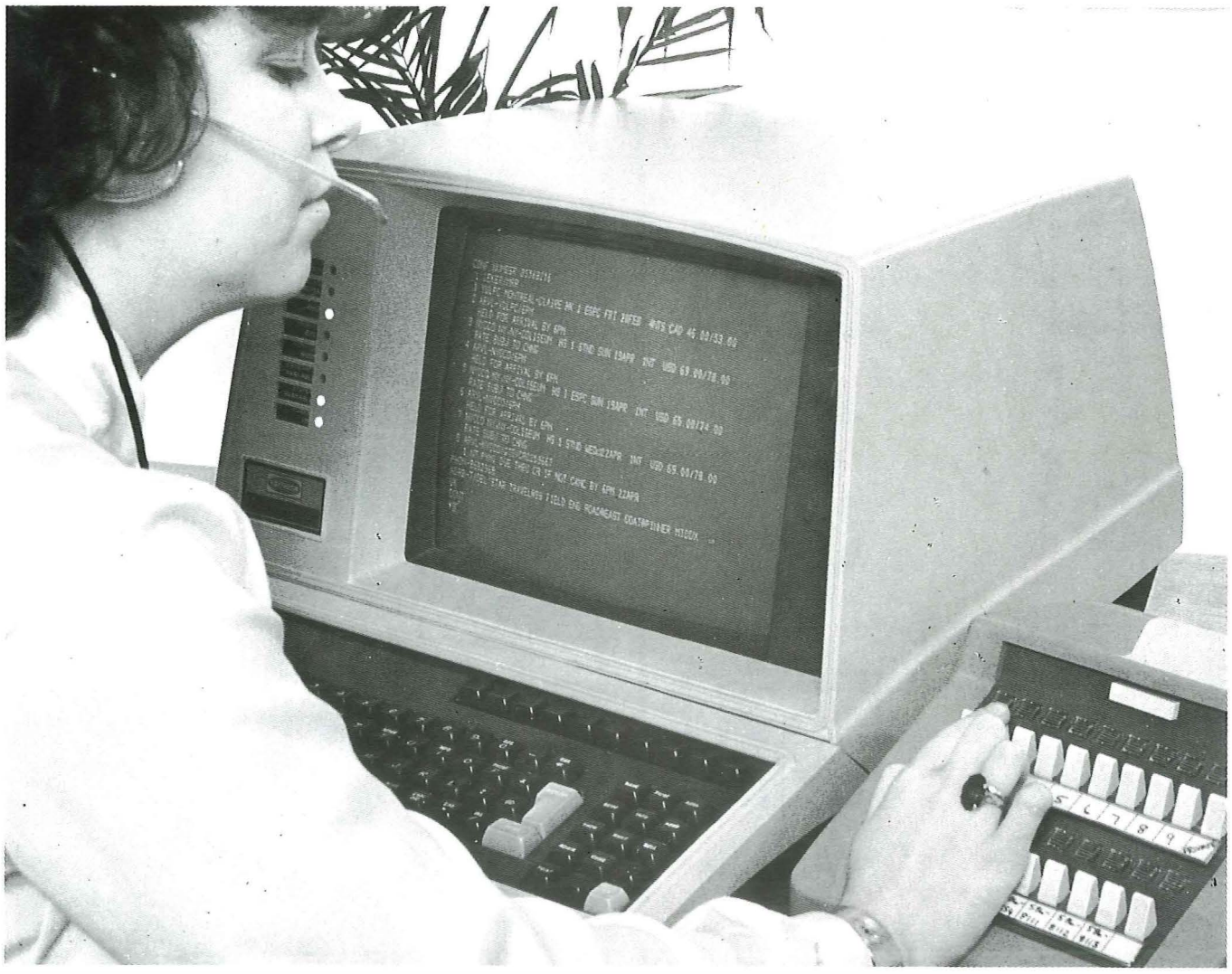
As well as being used to establish a 'phantom' office to open-up and test new markets, RCF is a useful service in helping business rationalisation and office relocation programmes. In any situation which involves the closing of an office but retention of the business or, in the case of a straightforward office move, RCF installed on the long-established telephone number can enable the change to take place with minimum interruption to the business.

Market applications for RCF are wide and varied, with all main business categories showing a keen interest. The potential of the product is virtually limitless and the fast spreading knowledge of how the service can be used to open new markets, centralise field operations, stimulate calls and promote sales, and improve customer relations, guarantees it a buoyant future.

Mr K. J. Cox is call forwarding marketing manager in Local Communications Services Division.

British Telecom Journal, Autumn 1983

Holiday Inns were the first hotel group to join the trial. Here reservations supervisor Rosemary McNulty answers a call from one of four major cities linked to the service.



From ideas to purchasing

The third article in our review of British Telecom's major divisions looks at Development and Procurement whose responsibilities range from the creation of new concepts to the buying of modern equipment.

Development and Procurement Division, until this summer known as Major Systems, comprises two Executives – Technology and Procurement. Technology Executive's role is to research into, identify and exploit major new openings. Procurement Executive, with a budget of £1,200 million, is responsible for British Telecom's modernisation programme as well as for its engineering stores and equipment.

Formerly part of the Engineer-in-Chief's office, Technology Executive employs 2,500 staff, mainly in research and system evolution and standards, most of whom are based at the British Telecom Research Laboratories at Martlesham Heath near Ipswich.

The pace of technological change throughout the world is without precedent and continues to increase at an alarming rate. As the communications needs of society grow and diversify, increasing attention has to be paid to the way in which networks and systems can evolve and to the generation of the techniques and standards for new applications.

British Telecom is the major user and provider of communications and information technology in the UK and needs powerful research and development support to remain in the forefront of this technological revolution. In recognising this need, the Board invests about three per cent of its annual turnover into research and development, which this year amounts to about £200 million. Of this, about £170 million is funded by sponsors from the other major divisions while the remaining £30 million is corporately funded.

The advanced technology group of divisions with their surgically-clean rooms and highly complex equipment ensure that the latest microelectronic devices used by British Telecom are acceptable in performance and reliability. Computer-aided design (CAD) and testing feature extensively in making devices so small that several thousand can be accommodated on a single four-millimetre square silicon chip.

Work on components ranges from the profitable manufacture of proven transistor devices used in submarine cable amplifiers with a guaranteed operational life of 20 years, to the fabrication of pin-head sized lasers and opto-electronic devices for optical fibre cable systems. And through its advanced technology, British Telecom is in a strong position to advise its contractors and obtain from them, devices and equipment appropriate to its needs.

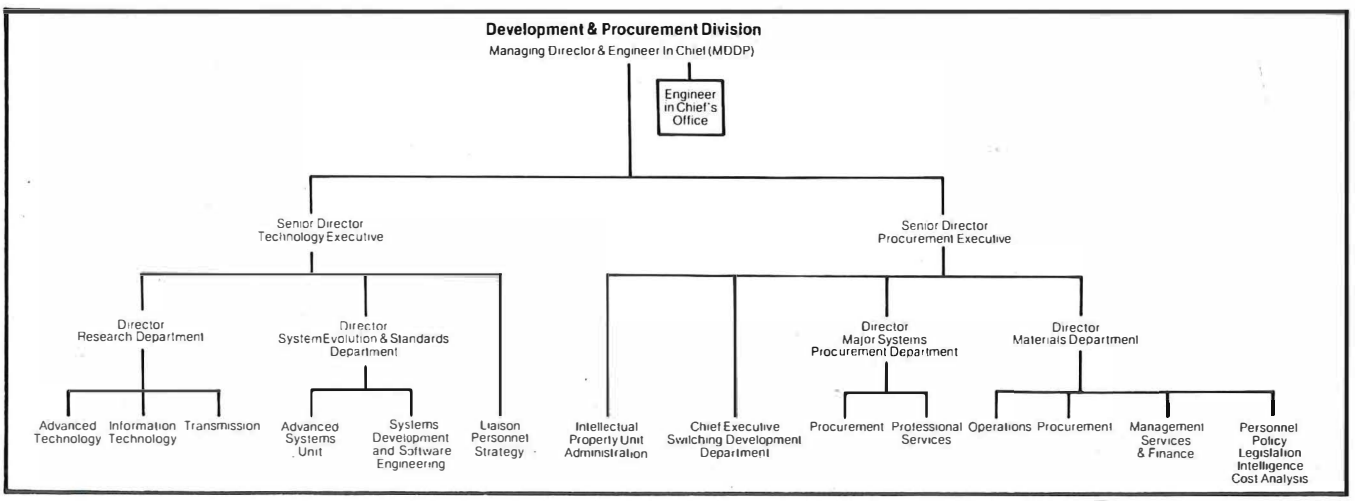
The new grouping of the information technology divisions will strengthen British Telecom's position and enable it to keep ahead. Information technology includes development of terminals and systems for residential and business application and ranges from simple electronic telephones to multi-function teletex machines which can use a variety of networks and can form the basis of an automated office.

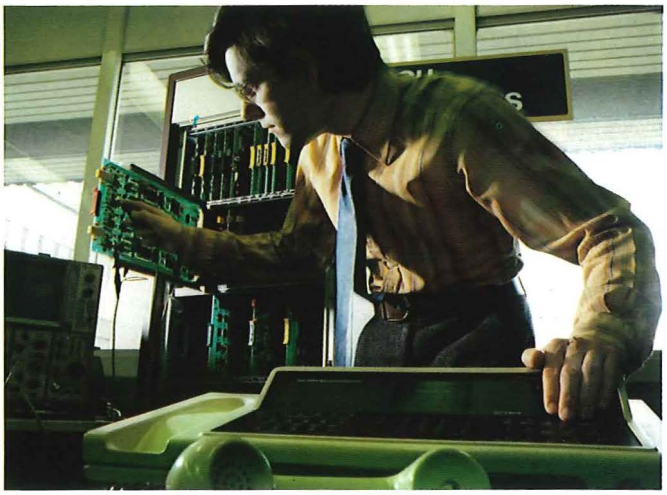
Staff in these divisions engaged on cable television, local area networks and broadband local systems are combined to enable British Telecom to operate successfully with other firms in the cable television market. Speech recognition by machine and speech synthesis – talking machines – will have increasing impact and the new System X exchanges will use computer-generated voice guidance announcements to help customers use facilities such as alarm calls.

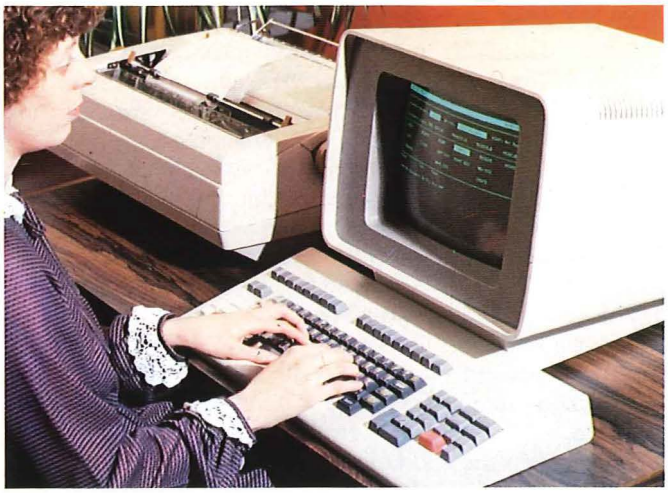
Transmission work includes development of submarine optical fibre cable and equipment, terrestrial microwave radio relay systems using digital techniques for inland telephony, data and television transmission, and aerials and equipment for satellite communication. A broadband optical fibre submarine cable system for transatlantic use (TAT8) has been developed with STC against strong international competition.

British Telecom cable research means more than high technology. Tools have been developed to recover cable from the seabed and a typical example is a novel cut-and-hold grapnel weighing many tons. Current radio systems being researched include cordless telephones and various microwave line-of-sight systems whose potential uses include local broadband distribution.

As digitilisation of the trunk microwave radio network nears completion, greater emphasis is being placed on satellite systems, especially those for business use. Television uses as much bandwidth as 1,000 telephone channels and means







Top: Much of the pioneering work on System X was undertaken by British Telecom staff.
Above: Teletex is a continuing part of information technology development.

Top: Testing of the Monarch 120 PABX was undertaken at Martlesham.
Above: A cut and hold grapnel for recovering cable from the sea bed is assembled at Martlesham.

that for the picturephone concept to become economical, a great deal more work on coding picture signals into smaller bandwidth is needed. Some novel work in compressing video signals into about one-fiftieth of the usual digital bit rate makes it possible to propose a relatively cheap video conferencing system suitable for use almost anywhere.

But all this high-technology work is of little consequence unless people can use the systems and services. That is why human factors division works to ensure that where man meets machine, British Telecom services and equipment are well designed and user friendly.

Switching Development Department (SDD) is responsible for ensuring that British Telecom has the right designs of public telephone exchange available. These must satisfy existing and anticipated customer requirements for services and facilities using the latest techniques such as processor control and large-scale integrated microelectronic devices resulting in lower cost, less floor space and energy, and less maintenance as well as new services and facilities.

The System X family of telephone exchanges is aimed at all these targets and represents most of the work of the Department, although the actual development is carried out largely by Plessey as the prime contractor with GEC as principal contractor. Since the development programme of several hundred million pounds is funded by British Telecom, SDD has to see that the product meets all the relevant requirements and standards.

As each development phase is completed, the particular exchange type undergoes final testing at a 'captive' installation on British Telecom premises. These installations, operated by SDD are identical to public exchanges but have no real customers or traffic circuits connected. They are located at Martlesham and known as field support units. Investment in these field support units is substantial but as they are on a single site they can share sophisticated testing equipment such as a pair of computer-controlled, high performance artificial traffic generators, developed by the Department.

System X exchanges are processor-controlled and so rely on software for their operation. One responsibility of SDD is to develop and maintain a software master library containing a copy of the software used on each exchange type. It is from this library that the software is drawn for the final testing on the field support unit and for subsequent public exchanges.

The main role of the System Evolution and Standards Department is to lay the foundations for the next stages of the telecommunications network. Development of modern switching systems is a major undertaking requiring large teams of skilled engineers to work on the component parts of the system. But because of the size of the network, evolution can take place only slowly.

Such an undertaking must be based on a programme of theoretical and experimental research exploring technological and architectural options. A major recent example was the definition of developments required for implementation of the integrated services digital network. Much of the work on encoding that led to

Top: A relatively cheap videoconferencing system was made possible by compressing video signals.
Above: The cordless telephone is the result of concentrated research at Martlesham.

Top: Scrap cable is stored at Crayford depot before being sold.
Above: Refurbishment of telephone handsets is an important aspect of factories work.

the all digital exchanges in the System X family was pioneered in the department and the unit has also played a major part in the Monarch digital PABX and the small UXD5 exchange.

The stored program control (SPC) digital exchanges now being introduced into the network will provide a basis for many new services but further evolution is required to achieve a network that is capable of carrying all telecommunications services (including those not yet conceived).

Experimental wideband switching systems have been developed and through the introduction of a variable bit-rate switching system, transmission capacity would be allocated dynamically on demand to each communication channel. A future network should include multiple connections (conferencing and selective broadcast) and the ability to communicate with mobile terminals.

Applications for telecommunications continue to multiply. Word processing for example leads to a need for fast transfer of text between office; computerised banking leads to the transfer of financial information between banks and from points of sale; information services lead to new opportunities in the domestic market.

The potential impact of these new applications are being studied to guide the way in which networks evolve both to meet the new demands and take advantage of new technology. Although it is hard to plan ahead accurately, a clear network strategy provides a valuable reference for co-ordinating diverse activities and planning research and development in an uncertain and changing environment.

Reliability plays an important part in switching systems and two studies are being conducted, one looking at techniques for improving the intrinsic reliability of equipment and the other at developing self-healing properties, enabling systems to continue working when faults occur.

The existence of the worldwide telecommunications network depends on agreed standards. There are striking examples of situations that have developed badly because of lack of agreement on standards but there is increasing recognition of the need to develop a comprehensive set of internationally-agreed standards.

Software forms a large part of research and development and there is a widespread need for software skills and considerable scope for the introduction of software design and development to improve efficiency and product quality. Systems software engineering centres have been established in Belfast and Newcastle.

Materials Department and Major Systems Procurement Department emerged in their present form in 1980 when the former Purchasing and Supply Departments were reorganised. Materials Department became completely responsible for stores provisioning, warehousing and distribution, and married those activities with the corresponding stores contract work of the former Purchasing Department with other purchasing work such as computers and motor transport.

Materials Department employs 4,000 staff and comprises the procurement

divisions responsible for provisioning, purchasing and other contracts work and the operations divisions responsible for holding and distributing the stores. These are supported by specialist finance, cost analysis, management services and procedures units. Its budget is about £400 million, used mainly to perform its main function – the supply of some 24,000 engineering stores items used throughout British Telecom.

Currently, the engineering stores items in heaviest demand – other than those issued direct from suppliers – are held at seven depots strategically sited around the country to provide a reliable service to every area. Slower moving items and strategic stocks are held in one of two depots only. The Department's own motor vehicle fleet is capable of handling everything up to the largest cable drums.

The warehousing and distribution network for engineering stores is being reviewed in the light of area reorganisation and to achieve staff savings and cost reductions, Materials Department is pursuing a programme of technical developments in the depots. Currently, narrow aisle racking and high-level order pickings are being introduced using specially-designed trucks steered by a wire guidance system through storage racking placed much closer together and extending to a higher level than in traditional stores. This doubles the useable storage area and represents a substantial saving.

Another important activity in Materials Department depots is the recovery of old, unwanted or obsolete stores from areas. These are refurbished at British Telecom factories and re-issued if there is still demand. If not they are sold as scrap. In the case of scrap at Crayford depot, a trial contract has been arranged with a specialist scrap processor who is able to grind items down and separate the basic materials in a granular form, thus improving the value realised. British Telecom shares in the profits of this operation as well as obtaining a fair market price for the scrap.

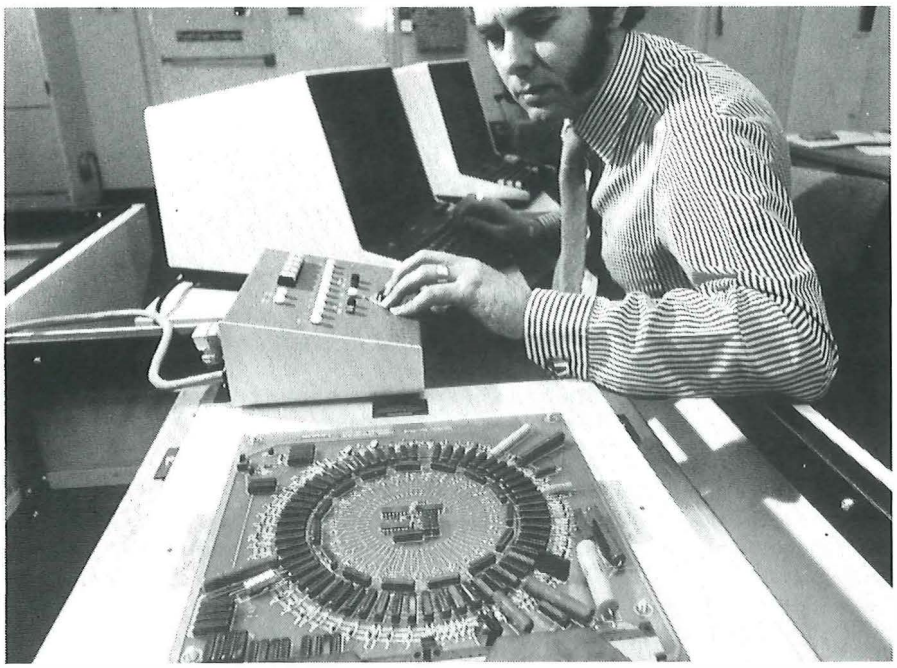
Apart from engineering stores, Materials Department is also responsible for supplying stationery and general (non-engineering) stores, clothing and the storage and distribution of out-of-area telephone directories. These activities are being transferred from the Materials Department depot at Swindon (now a Post Office depot), the former to Edinburgh and the latter to Northallerton. The Department also includes a specialist reprographics unit which prints most of British Telecom's drawings, specifications, forms and instructions.

The Major Systems Procurement Department is the procurement arm for British Telecom's modernisation programmes, and most of its capital investment is in new equipment and systems. It spends about £800 million a year covering British Telecom's switching requirements, including System X, transmission equipment and optical fibre cables, earth stations and submarine cables for British Telecom International, and other network systems such as cellular radio, SPC telex, and packet switched networks.

As well as its professional procurement staff who negotiate major contracts with most of the larger telecommunication suppliers throughout the world, the department also has a large professional engineering expertise. This includes procurement services, quality assurance assessment and monitoring and engineering surveillance of the performance and capacity of the supply industry. It also carries a staff of accountants and technical costs experts.

A recent development has been the setting up of a materials and components centre whose aim is to provide a comprehensive service to other parts of British Telecom on component specification, reliability, and performance as well as a range of materials science services through two major laboratories situated in London and Birmingham. Calibration and engineering support services are also provided.

Thus Development and Procurement Division can be seen to cover a vast spectrum of activity all of which is vital to the continued advancement of British Telecom.



Integrated circuit testing is part of the work of British Telecom's Quality Assurance Division.

Materials Department's transport fleet ranges from the familiar engineering vans to large purpose built vehicles.

Telemarketing and Telecom Tan, two of British Telecom Spectrum's value added services are now fully operational. Telemarketing uses the phone to promote and sell clients' products and services while Telecom Tan provides a complete computer-assisted answering facility. *British Telecom Journal* takes a look at how both are shaping up.

Telemarketing manager, Robert Liederman.

Take-off for Telemarketing

Robert Liederman

About 18 months ago, AT & T and its Bell operating companies circulated an eight-page leaflet to more than 11 million American businesses. The main objective was to encourage them to use the telephone in their marketing efforts thus increasing network traffic. Any consultancy work needed to help companies learn how to use the telephone was a bonus although in many cases, companies had to go to outside telephone marketing agencies because AT & T did not have telemarketing campaign facilities.

British Telecom, however, does. Being at least one step ahead of the Americans is certainly gratifying, but what exactly is telemarketing and why is British Telecom involved in it?

AT & T define telemarketing as 'a strategic plan which enhances the traditional marketing/communications mix, by using telecommunications to broaden or integrate current sales or service functions'. British Telecom's definition is more direct: 'telemarketing is the structured and systematic use of the telephone for marketing purposes'.

Effective use of the telephone is ideal for isolating good prospects or for making appointments for sales opportunities instead of physically seeking out potential customers. The telephone helps service key customers as well as providing a means to make special offers. Research can be quickly accomplished and new products can be introduced. Marginal accounts can be serviced regularly without high out-of-the-way journey costs and leads can be converted into sales thus reducing sales costs.

But if the telephone is so effective, why isn't everybody using it? Perhaps part of the reason is the image of the double-glazing representative grappling with the directory; perhaps it is because the telephone, as a mass marketing tool, is seen as new and unproven in much the same way as computers were viewed in the early days. More likely, however, is

Telemarketing 'communicator' Sharon Evans works from a carefully prepared script to follow up leads on behalf of a client.

Robert Liederman, far right, discusses progress at a production meeting in his office with Telemarketing accounts staff.

that when marketing staff are faced with problems and decisions it is far easier to stick with the familiar routine.

When analysed, however, properly planned and co-ordinated telephone marketing is an easily controlled medium. For example only approved presentations are used and because of the systematic nature of telemarketing, consistent results and accurate cost projections can be expected.

IBM, Rank Xerox, Leyland Trucks, Allied Breweries and Kimberly-Clarke are among the companies who have found that by combining the telephone with other media, their representatives are more productive.

British Telecom's radiopaging service, for instance, makes use of several different media – space advertising, television, and direct mail among them. In some cases, such as in mail, they can tell much of their story and actually ask for the order; in other cases, telling the full story would be too expensive. There are also questions which cannot be answered in print and people may require additional information or a demonstration of the product before making a decision.

Yet because most enquirers are interested in one or two pagers only, the expense and time of a salesman is difficult to justify. A far better solution is to meet the demand for information not by mail but with a telephone call. Part of the call is a demonstration of how paging works; part is a determination of prospect need. Decisions are taken immediately and offer the customer a highly competitive cost per pager.

The average number of pagers and the amount of different facilities taken is higher than on mail alone largely due to the ability to engage the potential customer in conversation about what he or she really needs. Top buyers, usually looking for a high-volume package price, are then referred to the salesforce for a face-to-face meeting. In this way, the salesforce is freed to concentrate on its major accounts and advertising costs are maximised. The customer also receives quick personal response to his enquiry from British Telecom.

AT & T reduced costs significantly by using the telephone to sell the Horizon call-connect system. British Telecom's product groups now not only have an 'in-house' service to which they can refer customers, but also one which could be useful in their own marketing.

British Telecom has adopted telemarketing basically because it is a potential money spinner and can provide customers with a further telecommunication-based service. Also, British Telecom generally can make use of experienced and professional telephone marketing expertise while still keeping the business inside the corporation.

British Telecom Spectrum's commitment to telemarketing is total. As well as having more telecommunications based technical resources than most companies, Spectrum has brought in leading experts in the field to head its drive and to ensure that British Telecom remains in the forefront of this exciting and new approach.

Mr R. Liederman, is manager of British Telecom Spectrum's Telemarketing service.

British Telecom Journal, Autumn 1983

Tan is the answer

David Jones

Telecom Tan offers an effective, comprehensive and professional range of telephone marketing services throughout the UK providing customers with a fast, simple and effortless way of responding to advertisements and promotions. It answers calls, handles enquiries, takes orders and analyses results. In short, it provides a personal, round-the-clock telephone marketing service tailored to individual requirements.

Telecom Tan specialises in telephone answering services, exploiting British Telecom's wide resources. There is no standing charge for the use of Tan and charges relate purely to the volume of calls handled. The computer system to which it is linked is the most sophisticated of its kind in Europe.

Every Tan customer has a special number and incoming calls are received at the operations centre. There the computer immediately links in all relevant information from the appropriate data file

and presents it in visual form to a trained 'client representative'.

The call is answered with an individually chosen message and while staff continue the conversation, all instructions and necessary information – offers, prices, stock situation – are available on the computer screen. Particulars of the order or enquiry are entered into the computer, along with customer details and fulfilment instructions.

Information on every call is stored, aggregated and forwarded by arrangement. If a compatible computer link exists, the information is available instantly. Ultimately a detailed analysis of all calls over an agreed time is presented in whatever form required but is always prepared clearly, quickly and in complete confidence.

Tan might typically handle, for instance, customer response to one advertisement or provide a regular service. It can take orders for single items, or alternatively run a complete order department. The service is equally at home when dealing with heavy industrial products, consumer items, or professional services.

Tan staff are telephone professionals, trained to answer calls quickly, courteously and knowledgeably and the service is completely confidential. All call information is immediately entered into their computer and accessed only when needed, and then by Tan staff using security codes. Every procedure is designed to eliminate error.

Now that Tan is well established in marketing services it has launched a range of message and call out services from taking and passing on calls for a one-man repair service, such as a plumber or electrician, to controlling a nationwide field service operation for major organisations, involving possibly hundreds of engineers.

The message service is set up to take calls diverted from a client's own phone line, and answer them in exactly the same way as a personal secretary or assistant. It will provide 24-hour secretarial support at a fraction of the cost of a full-time employee.

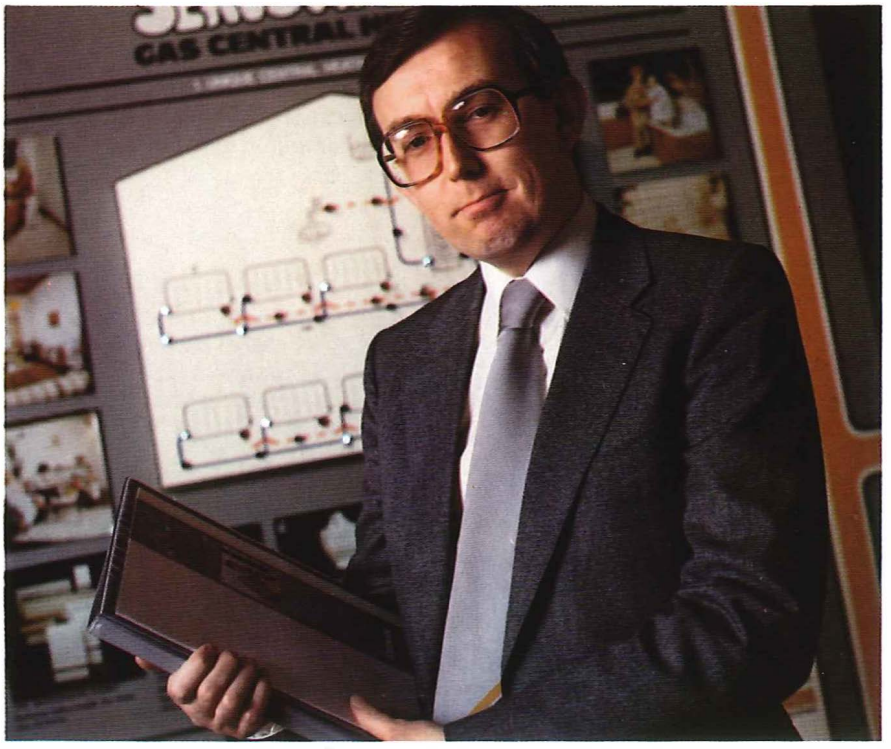
Statistics suggest that less than 25 per cent of attempted telephone calls get through to the person for whom they are intended. Add to this the fact that people will often not consider using the phone outside office hours because they do not believe anyone will be there to answer and it becomes clear that there is an enormous communication gap. It is this gap that Tan aims to fill.

But Tan is not the only division of British Telecom attacking this problem. Radiophone takes the call to the person on the move; Radiopaging alerts a user that a message is waiting; Telecom Gold provides a 24-hour electronic mail service. Tan completes the set by providing the 24-hour 'intelligent voice at the end of the phone' with all the necessary computer back up.

Over the next five years, Tan aims to build and provide, with the help of other British Telecom divisions, the most comprehensive range of services possible to fill the gap between merely making a phone call and actually delivering information in the right form to the right person at the right time.

Telecom Tan operator Connie Sheeran at work in the operations centre at Bristol.

Regular user of the Telecom Tan service is John Wheen, marketing services manager of Servowarm gas central heating.



Mr D. L. Jones is general manager of Telecom Tan, based in Bristol.

British Telecom Journal, Autumn 1983

Marine Equipment For Hire

Seventy miles from London, lies the busy city of Southampton, for years one of the United Kingdom's major trading ports. Since 1974, it has also been the home of British Telecom International's Marine Services, and it is from here that British Telecom cableships travel the world's oceans laying and maintaining the submarine cable networks which form a vital part of international communications.

Less well known is BTI's role in developing specialist tools to help make submarine cable work more economical and practical. Until now these aids have been used almost exclusively by British Telecom but, in an effort to provide essential income for funding future research and development, Marine Services are now offering a selection of equipment for hire to companies and telecommunications administrations around the world.

Perhaps the most well known of these tools is the recently-commissioned submersible trenching craft, which became available earlier this year for comprehensive trials and subsequent commercial work. Known as 'Seadog', the 15-tonne craft can be launched from a support vessel – either its mother ship *CS Monarch* which has been specially modified or from suitably approved ships. The unmanned submersible can descend to the seabed under its own power, and locate and trench cables in depths down to 150 fathoms. The craft has a wide range of telemetry and other on-board guidance systems.

But Seadog, flagship of the hire facility, is not the only aid on offer. Typical of equipment available is the portable hauling machine, a device used in continuous cable laying or hauling operations. It is used by BTI to increase the linear cable engine capability of its own cableships and can now be used to provide the facility on hired craft. Supplied with its own power unit, the hydraulically-powered machine is a portable version of the British Telecom-developed hydraulic linear cable engine and allows different-sized cables as well as joint housings to be passed through without loss of grip. It is ideal for supplementing on-board equipment and could well save the expense of hiring a larger ship or even prevent the loss of work to another company.

Another successful aid now being hired is known as the cut and hold grapnel, and was developed by British Telecom to help recover unarmoured cable from deep water where there is not enough slack in the cable to allow it to be lifted unbroken to the surface. Ideal for optical fibre cable or metallic systems with

Left:
The basic grapnel is best used in a rock-free seabed and is designed to recover armoured cables.

Below:
Technical officer Bill Boothsby reassembles one of Marine Services' cut-and-hold grapnels following a major overhaul, including shot blasting and repainting. The grapnel was subsequently shipped to Geneva for display at Telcom 83.

Alan Hilton loads the portable hauling machine on to a truck bound for Martlesham where the machine, used to increase cable hauling capacity on cableships and also to provide a cable engine facility on hired craft, will be used in experimental work.

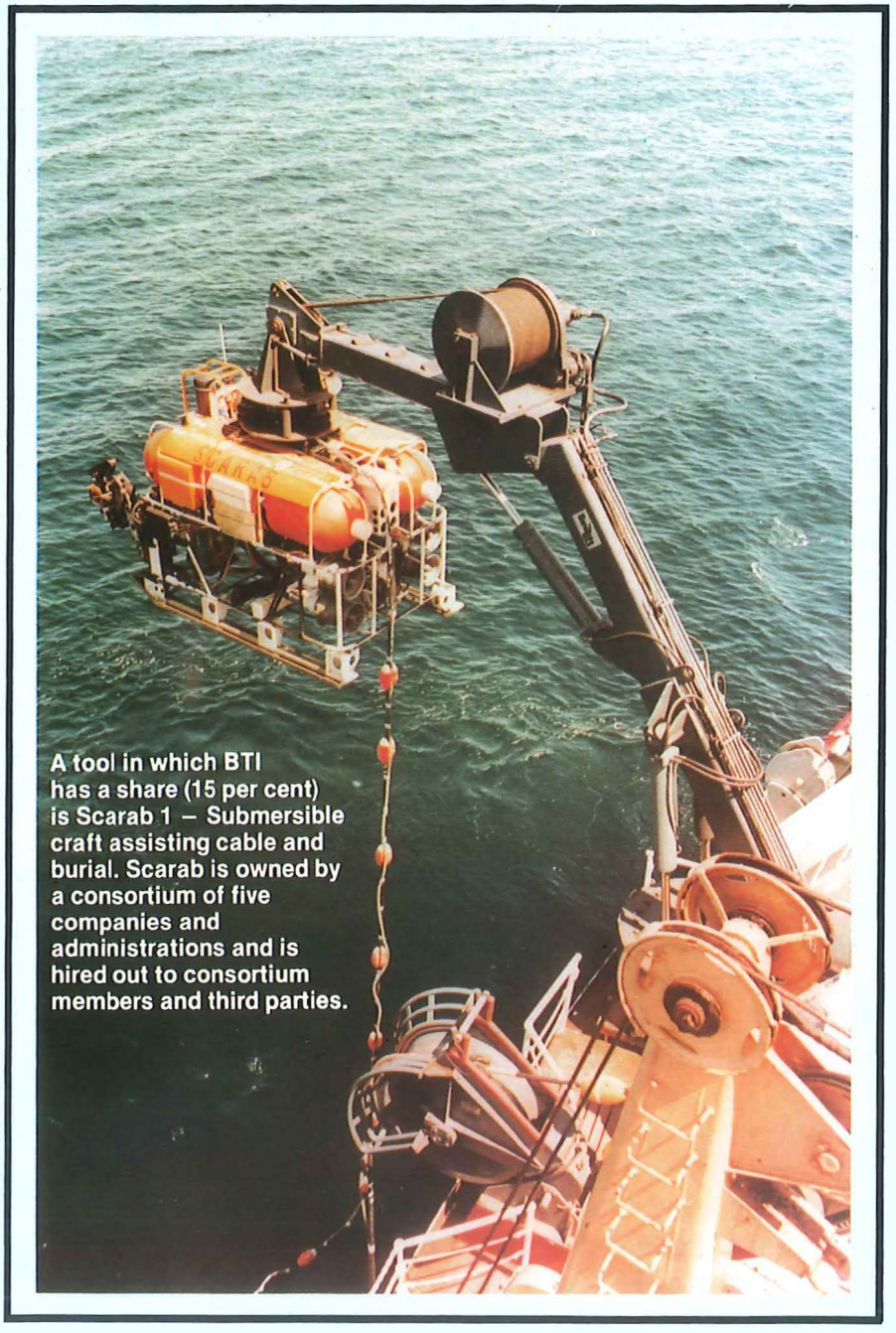
closely-spaced repeaters, the grapnel can be dragged across a cable line and, once hooked, uses its stored hydraulic energy to wind a length of the cable into the grapnel. Once secure, the cable is then cut, and the grapnel, together with the attached cable end, is lifted on board. Considerable repair time can be saved with the use of this grapnel thus reducing overall costs.

There are other grapnels too, including three designed for detrenching. The necessity for these has increased as more and more cables are buried to avoid trawler and anchor damage. They are capable of digging to a predetermined depth as they are towed along, and can hook and lift cables to the surface. A special sensing sledge can be used in association with the grapnel and, when towed ahead of the grapnel, gives early warning of the cable, allowing time for the ship to slow down and reposition itself above the cable. These special sledges cut the chances of breaking a buried cable when grappling. Detrenching grapnels can also be used to test the suitability of the seabed for ploughing.

Where submarine cables come ashore, every effort is made to land them in sandy areas, preferably buried to a depth of two feet or more. Special cable detectors have been developed to locate these buried cables and are capable of identifying one out of a number of cables close together. The detectors can be used both on land and in the sea down to a depth of some 20 to 30 feet.

This new hire approach by BTI Marine Services to offer such facilities to the submarine cabling industry reflects British Telecom International's commercial approach in helping to fund research and development. And it is only through activities such as these that British Telecom International will continue to maintain a world lead in many fields of telecommunications.

Information about equipment mentioned in this feature can be obtained from Marine Services division at Southampton. The number to call – Southampton (0703) 332107.



A tool in which BTI has a share (15 per cent) is Scarab 1 – Submersible craft assisting cable and burial. Scarab is owned by a consortium of five companies and administrations and is hired out to consortium members and third parties.

British Telecom Journal at Geneva. Its business manager, John Klee, points out the advantages of a two-year subscription to an overseas visitor.

British Telecom chairman Sir George Jeffe

In the v shop w

Visitors to the one-acre British Pavilion in the world's foremost telecommunications exhibition held at Geneva in October were able to see for themselves the vast strides made by the UK telecommunications industry in the past four years.

The four-yearly showcase, known this year as Telecom 83, is regarded as the most influential in the world, and coincides with World Telecommunications Year. It provided a golden opportunity for industry to present the largest display of British telecommunications equipment and services ever seen at an international exhibition.

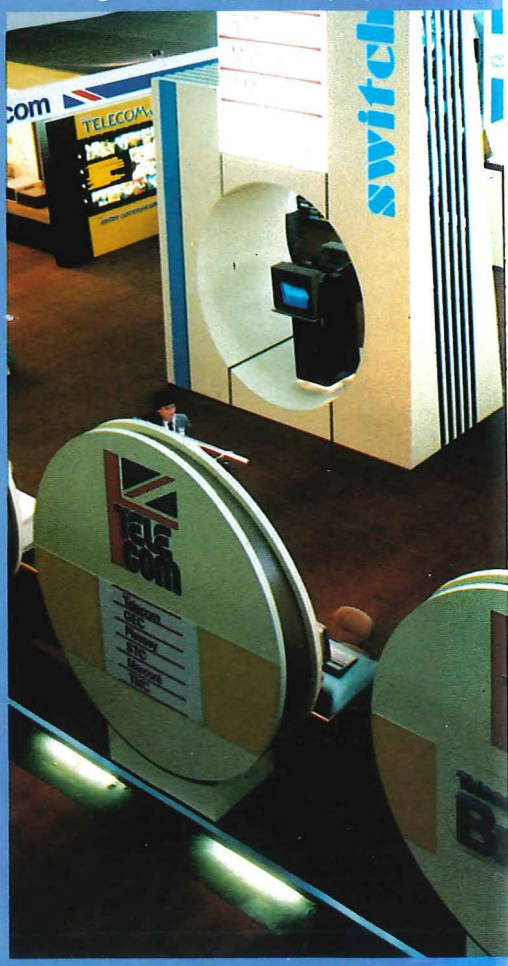
Its focal point was the British Pavilion, where a co-ordinated display was presented by British Telecom and a number of major companies. One of British Telecom's prime objectives was to persuade visitors to choose London as the centre for their international communications networks.

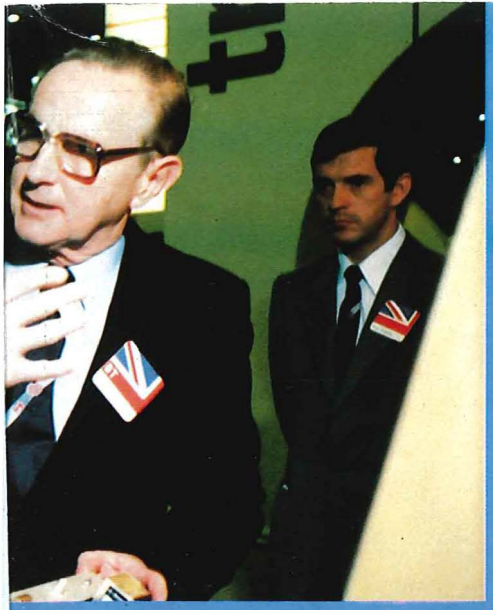
Preview day visitors included the British Consul-General and British Telecom chairman, Sir George Jefferson who toured the pavilion and later gave the keynote address for Forum 83 – a major symposium on telecommunications sponsored by the International Telecommunications Union.
The chairman's busy schedule also included a briefing for the world's press.

Kenneth Baker, Minister for Information Technology, attended the official opening and, with a contingent of VIPs, toured the exhibition and met Sir George on the steps of the British Pavilion.

Highlight for the UK contingent was British National Day. Guest of honour, in his capacity as vice-chairman of the British Overseas Trade Board, was HRH The Duke of Kent, who visited the British Pavilion and showed a great interest in many of the British Telecom exhibits.

Theme of the vast one-acre British Pavilion featuring a co-ordinated display from Britis





n (right) tours the pavilion on preview day.

The British telecommunications industry emerges into a bright new competitive world.

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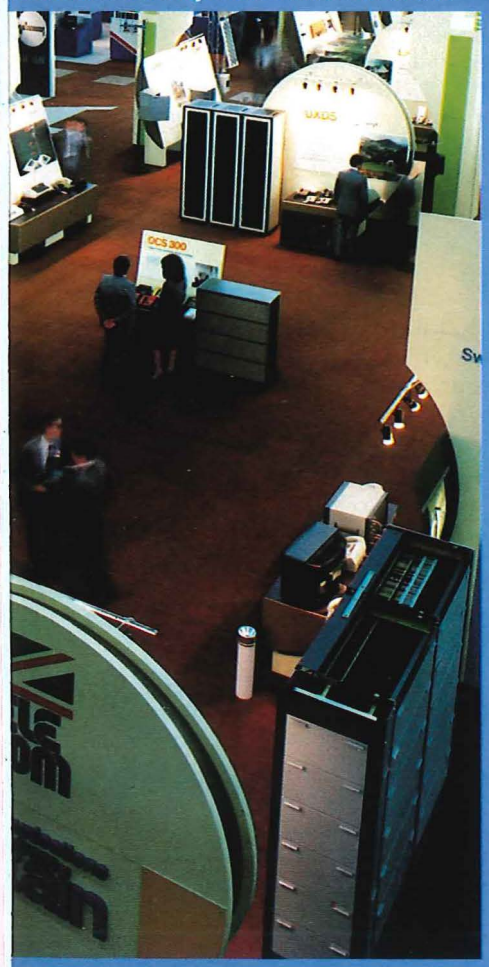
Telecommunications from Britain,
Telecom and major UK manufacturers.



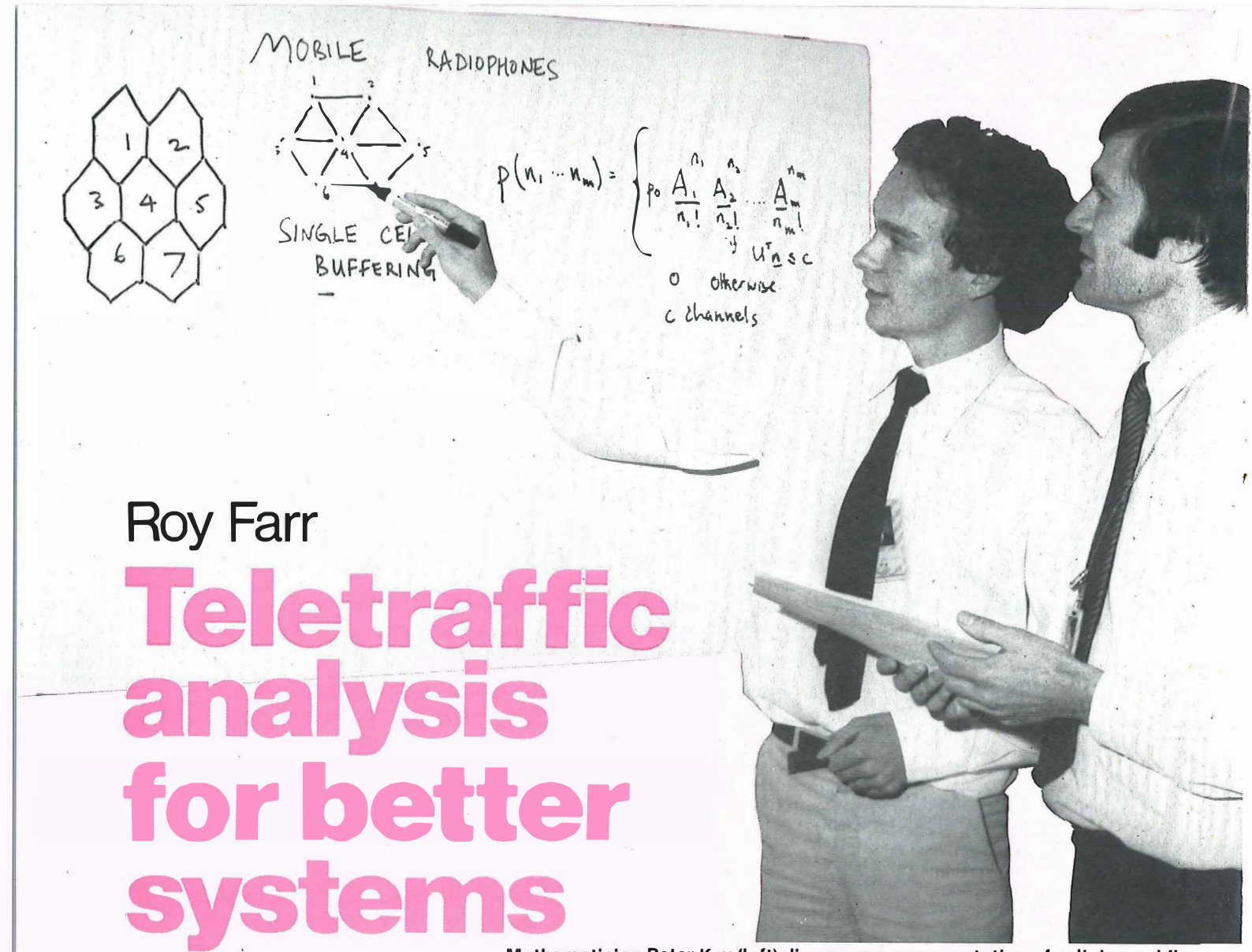
He later spoke at a special national day luncheon, where he emphasised the export potential of the UK offering.

The day also saw the public signing of a major £2 million contract between British Telecom and the Malawi administration for three small digital exchanges and three digital radio links. And during the exhibition, British Telecom also confirmed a £9 million order from leading Wall Street stockbrokers Merrill Lynch for its new City Business System.

New exhibits in the co-ordinated area included an extensive range of new-generation systems and equipment, all of which were brought together by an integrated services digital network. And System X, Britain's new family of up-to-the-minute switching systems recently boosted by fresh British Telecom orders and the introduction of a new, second-generation unit at Coventry, continued to hold worldwide interest. Another attraction was a working model of Seadog, British Telecom International's remotely-controlled submersible cable locating and burying craft.

A full range of residential and business communications systems were on show, together with many new and improved specialist products and services. And for the first time ever, *British Telecom Journal* played a persuasive part in selling information – through its own pages – from a special booth at the exhibition's Book Fair.

Visitors left the exhibition in no doubt that the UK, and British Telecom in particular, was in business to persuade the world that not only was London, with its comprehensive communications capabilitites, the right place to set up an international network, but also to encourage the world to buy British Telecom products and services through Telconsult and Teletrade.



Roy Farr

Teletraffic analysis for better systems

Mathematician Peter Key (left) discusses a representation of cellular mobile radiophones with colleague Roger Thompson.

Teletraffic analysis, which embraces the study of telecommunications traffic behaviour, ensures that telecommunications systems will carry traffic as efficiently and economically as possible. Within British Telecom Teletraffic Division, it is broken down into three main areas: the study and development of the supporting teletraffic theory; the study of systems already, or soon to be, in service and the study of new services and system or network design concepts.

Teletraffic theory has come a long way since all telecommunications traffic in the UK was switched by Strowger exchanges. The introduction of more complex switching systems, new network designs, communication between computers and a growing emphasis on new services to carry aural and visual information, has led to new demands on the underlying theory which depends heavily on mathematical probability and statistical analysis.

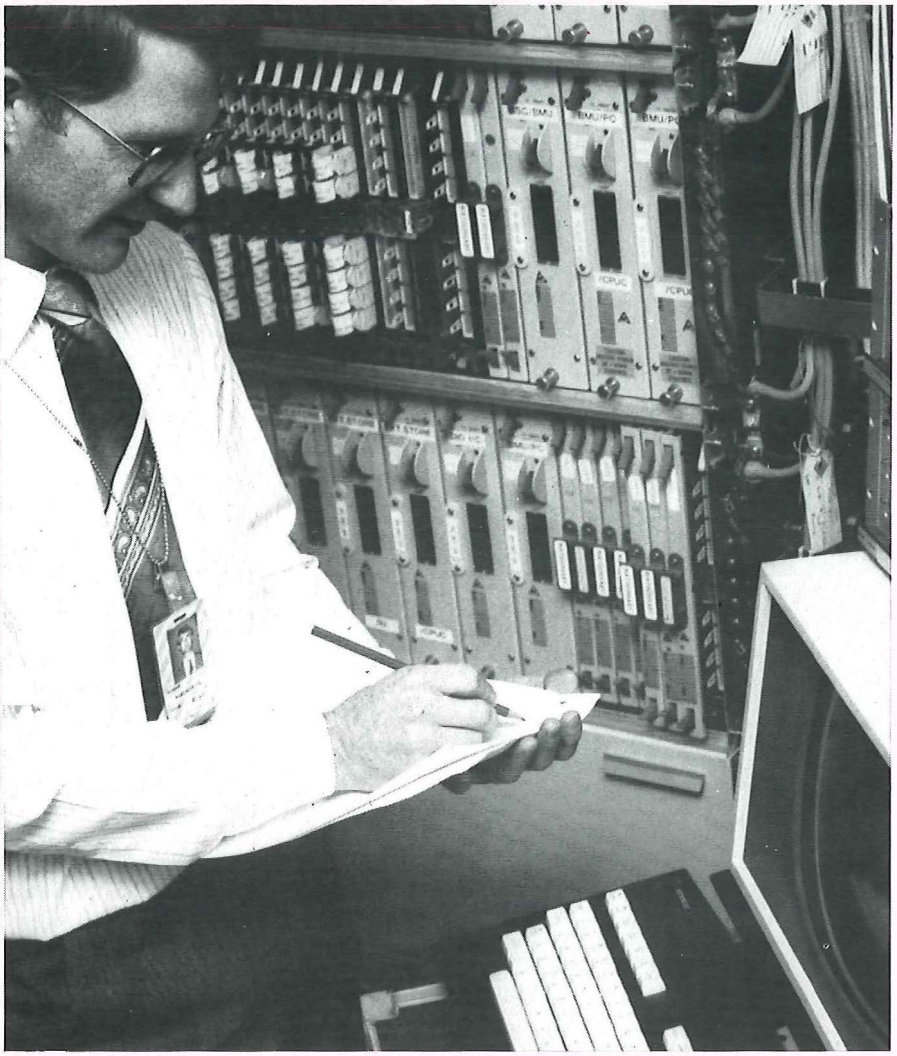
Engineers who are skilled in this, not only provide a specialist advisory service but also take part in establishing new international standards through the International Telephone and Telegraph Consultative Committee (CCITT) and regularly exchange ideas with their counterparts overseas at international conferences.

Although small groups of teletraffic engineers are maintained by the principal UK telecommunications equipment manufacturers, British Telecom Teletraffic Division has the largest pool of operational teletraffic experts in the country with a staff of about 40. The training of teletraffic engineers presents a problem because of the highly specialised work and the small number of people involved. Expertise in teletraffic theory exists at a few British universities, but until recently there were no courses specifically designed for the teletraffic engineer. In an attempt to improve this situation, Teletraffic Division has helped to establish a one-year postgraduate course at Essex University.

A Strowger exchange can be broken down into many separate component elements. The traffic-carrying capacity of each element can then be determined for a given grade-of-service. A straightforward mathematical process is used and the results for each element aggregated to give overall exchange capacity. With the advent of common-control exchanges, however, the elements into which an exchange could be split became too large and complex for successful mathematical analysis.

It was fortunate that at about this time – some 20 years ago – large computers began to offer alternative solutions to the problem. They extended the range of mathematical analysis calculations possible and also provided the means of actually simulating the events taking place within an exchange.

A computer simulation of any telecommunications system requires the writing of a program which describes the logical progression and timing of events involved in its operation and then imposes on this a series of random numbers representing demands on the system, such as call arrivals and holding times. The resulting model can be made to simulate the system under various traffic loadings so



Executive engineer Phil Harris measures the rate at which the System X trunk field support unit processor at Martlesham handles calls.

that its performance can be measured. Essential for a successful model, therefore, is a detailed understanding of how the system works.

More and more, with modern exchange systems incorporating processor control, this means detailed knowledge of the control software. Where a system is under development, such detailed information is rarely available early enough so the model is first built on the basis of broad assumptions and run using estimated input data, to predict possible shortcomings in teletraffic performance.

As the development proceeds, the model is refined to take account of new information and re-run using improved input data estimates, the results being fed back to the system designers to enable them to improve the design where necessary. This process continues until the model closely simulates the completed system when, by the use of actual measurements of software run times as input data, system performance can be accurately predicted.

Most simulation work undertaken by Teletraffic Division has used an internally-developed computing package known as 'Telesim'. This is designed specifically for event-by-event simulations and is not best suited to the study of processors. For such studies, a simulation can be written more easily using a process-oriented language such as 'Simula', likely to be increasingly used.

Simulation is a time-consuming procedure and for speedy results, teletraffic engineers depend on their experience to reduce complex interactions to a level of simplicity where mathematical analysis can be successfully applied. Such analysis can be used to isolate those parts of a system likely to generate teletraffic problems before a detailed but limited simulation study of these is undertaken. Alternatively, limited simulations may be used to check the accuracy of a simplified mathematical solution.

The largest simulation model yet attempted by the division is of the System X processor and its overload control mechanism, where full advantage has been taken of the opportunity to develop the model in parallel with the actual processor. The simulation takes up several thousand lines of computer program but has been instrumental in verifying and refining the processor design. It has also enabled the division to make a significant contribution to the design of an effective overload control system.

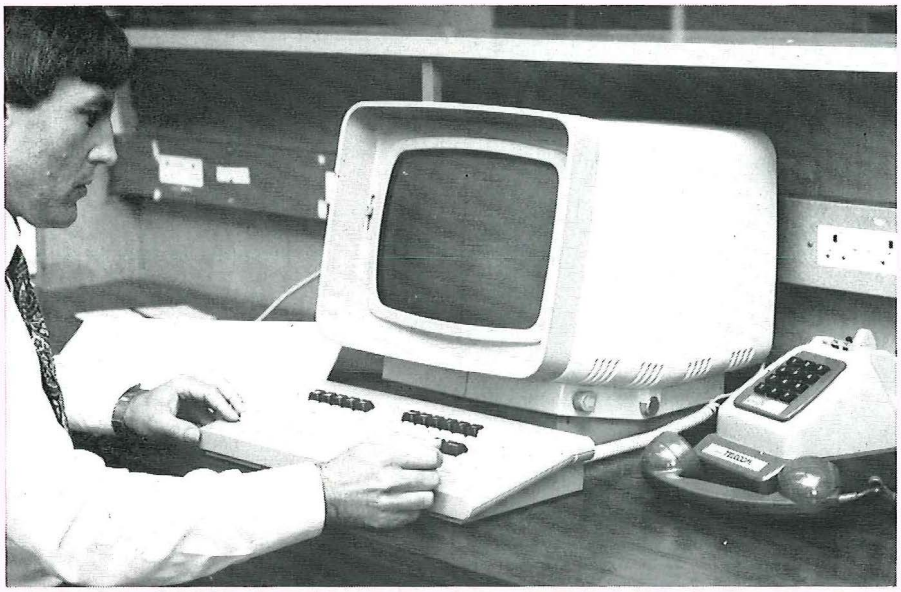
Overload control is of paramount importance for processor-controlled exchanges such as System X, especially now that more and more customers are equipping themselves with the means of making automatic repeat-attempt calls. If a processor becomes overloaded because of heavy call congestion or equipment failure, such that it is unable to cope with the demand placed upon it, action must be taken to regulate the situation to avoid the indiscriminate loss of calls being set up or in progress.

The purpose of overload control is, therefore, to minimise the effect of processor overload on customers. At a given level of processor demand tasks must be shed by the processor in a progressive manner and in reverse order of priority, so that the essential job of maintaining and clearing down calls in progress may continue. Customers attempting to make calls which cannot be processed must be dissuaded by equipment engaged tone and, in extreme situations, it may be necessary to reject calls which are already being set up.

The size of the System X processor simulation model is exceptional and can only be justified over a lengthy timescale. But even the simplest simulation model requires much computing power since long runs are necessary to give statistically reliable results. On-line access to a large main-frame computer is, therefore, almost always essential. For the future, the availability of microprocessors of increasing power is expected to make their use for simulation studies a practical proposition, with on-site interactive operation offering significant cost and time-saving advantages.

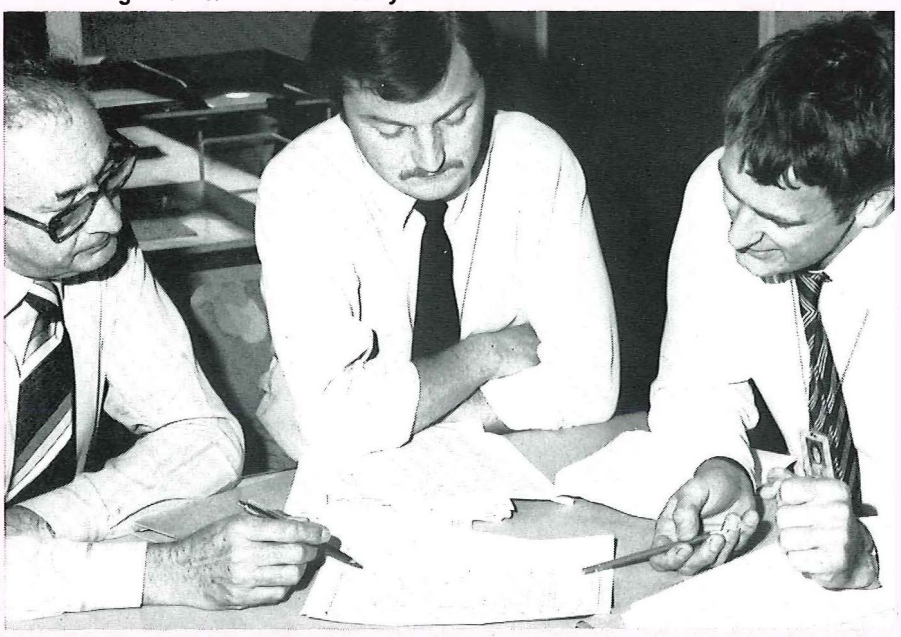
It is as yet too soon to put a value on the worth of teletraffic work undertaken for System X but an earlier example arose from the decision to equip TXE4A exchanges for multi-frequency (MF) keyphones, where the problem of how best to quantify the necessary exchange equipment was referred to Teletraffic Division.

Ordinary dial telephones use simple loop-disconnect (LD) signalling to convey the dialled digits to the exchange, where the digits are received on registers. Calls from keyphones can only be handled by more expensive registers needed to interpret the MF signals but these registers are also able to deal with LD calls. The crux of the problem was the difficulty in forecasting keyphone de-



John Adams, Teletraffic Division executive engineer at work developing a 'model' for a proposed new integrated services local network.

Author Roy Farr (left) discusses with Dave Marsh and Paul Griffiths teletraffic work being undertaken for Plessey.



mand with any degree of accuracy. The aim therefore, was to provide the two types of register in such a way as to minimise costs while connecting them to ensure that satisfactory service would continue to be offered to all customers if the forecast of keyphone penetration proved wrong.

Several approaches were tested before the final solution was arrived at and a mathematical model was used to produce the required dimensioning tables. These proved so bulky that it was decided to give exchange planners direct access to the computer program which generates the tables. Planners can now obtain a print-out of the required section of the tables at a local terminal. A saving of more than £300,000 in register costs is predicted over the lifetime of TXE4A exchanges as a result of this work.

Nowadays teletraffic analysis goes far beyond telephone exchanges and embraces the whole range of telecommunications and information systems. The word 'system' takes account of all situations in which customers or equipment are attempting to obtain a service from a limited source. At times of great demand they may have to queue for service or their attempt may fail totally, depending on how the system is designed. By participating in the research and early design stages of new systems, Teletraffic Division is able to reduce the risk of major system changes later and give confidence to designers that their systems will achieve the performance desired.

Much work has already gone into studies of Radiopaging, Radiophone and Packet SwitchStream for high-speed data and attention is now being given to the study of different ways of implementing proposals for an integrated services digital network (ISDN). New technology itself poses new problems and with larger and more complex circuits being squeezed onto smaller and smaller chips, there is merit in optimising the teletraffic performance of a new concept in advance of detailed component design.

The needs of functional software can also be established at an early stage and its overall structure specified before programming begins. For many of these studies Teletraffic Division works closely with staff at British Telecom Research Laboratories at Martlesham and it is the growing importance of this liaison that has prompted the move of the division from London to East Anglia.

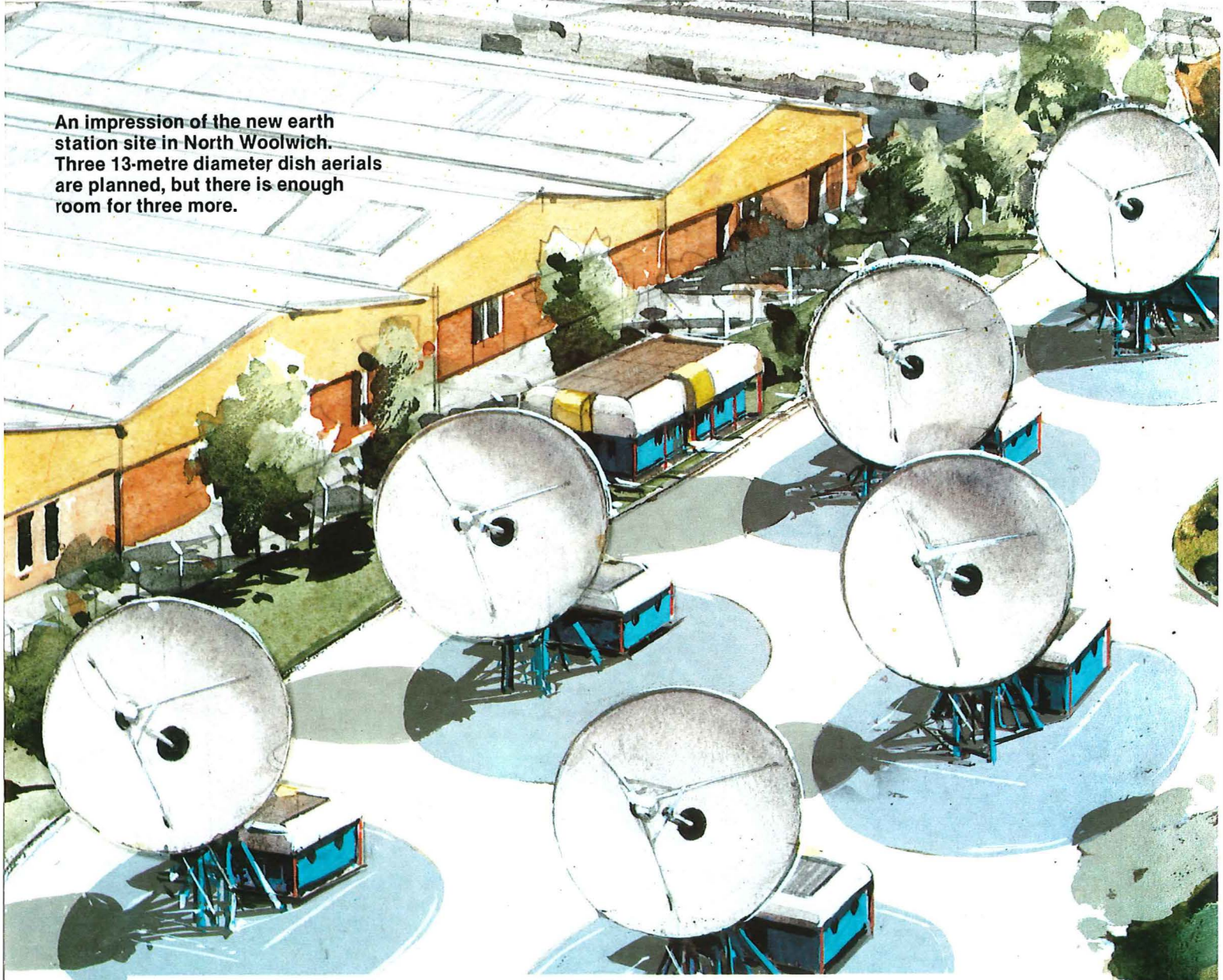
The work of Teletraffic Division however, is not exclusively confined to British Telecom. The division has, for example, recently provided the Department of Industry with technical advice to help them choose from competing cellular radio systems and is currently engaged on work for Plessey Telecommunications on System X. The division's experience is also available to overseas customers through British Telconsult.

In future, British Telecom will offer its customers a whole new range of services with customer behaviour patterns and traffic characteristics different from those which now apply. If the problems posed by these new services are to be understood, data on likely patterns and characteristics has to be assembled now. Data is, in fact, collected from other service providers, both here and overseas, and from such unlikely sources as statistics on the sales of video-recorders. This work is an essential preliminary to the extension of existing teletraffic theory that will become necessary.

The division has existed at headquarters since 1971 although a small unit devoted to teletraffic analysis was in being long before this, and has contributed significantly to improvements in the performance and cost of telecommunications systems used by British Telecom. For the future, early consultation by service originators and system designers will be encouraged to ensure the efficiency that will be vital in what is becoming an increasingly competitive environment.

Mr R. E. Farr is a head of section in Teletraffic Division responsible for systems evaluation.

British Telecom Journal, Autumn 1983



An impression of the new earth station site in North Woolwich. Three 13-metre diameter dish aerials are planned, but there is enough room for three more.

Go-ahead for dockland dishes

British Telecom International (BTI) is to build a satellite earth station in the heart of London's dockland. The earth station – London's first – will be operational early next year and will transmit television programmes to cable television systems in the UK and Europe, and provide the capital's businesses with the latest advanced telecommunications services.

Development of the derelict site follows agreement by the London Dockland Development Corporation to detailed planning submissions from BTI earlier this year. The earth station will be at North Woolwich close to the old King George V Dock. Two dish aerials, 13m (43ft) in diameter, are planned to be ready for service early next year with one operating to the European Communications Satellite (ECS) and the other to an Intelsat satellite. A third aerial is planned for later; and in all there is enough room to locate a total of up to six dishes.

BTI currently provides television transmissions to cable television networks in Europe via the Orbital Test Satellite. It now plans to transfer these to ECS using the new dockland service. The second aerial will be used to distribute up to six television programmes to UK cable networks.

This new dockland project is totally separate from BTI's existing major earth stations at Goonhilly, Cornwall and Madley, Herefordshire, and a third planned site in the Dorset-Somerset area. These earth stations, using dish aerials up to 32 metres in diameter, carry public telecommunications traffic, data, and television services for major broadcasting organisations around the world.

Monarchs for 100 years

Reading Area telecommunications historian **John Duncan** continues his short series with a tribute to mark the centenary of Monarch cableships.

A hundred years ago, the first cableship specifically designed for the Post Office slipped into the water at Glasgow. Her launch began a tradition of service which continues today with British Telecom's three-strong fleet patrolling the world's oceans repairing and maintaining vital undersea cable links.

The 1883 *Monarch* was an iron screw steamship with a gross tonnage of 1,122. Second in the line of *Monarchs,* she succeeded the original, a 512-ton wooden vessel used just once for unsuccessful Post Office cable-laying operation off the Irish coast. Later deemed unseaworthy, the first Monarch finished her days as a coal hulk. The second Monarch was 250 foot long, and could travel at 11 knots. After performing superbly on trials, she remained in valuable service until 1915 when she met a sudden and violent end while on her way from Dover to Beachy Head, Eastbourne to repair the Anglo-French cable.

Early on the morning of 8 September, as she nosed westward hugging the tall chalk cliffs, those at breakfast in Dover's plush Hotel Metropole overlooking the bay were startled when, like an erupting geyser, a colossal column of water burst out of the ship followed instantly by an ear-splitting explosion which rattled the hotel windows. Bits and pieces of *Monarch* flew in all directions. From the funnel clouds of fumes, sulphur-yellow, and deadly, belched high into the sky.

The attack was launched from a German submarine seeking revenge against the cableship. For within an hour of the outbreak of war *Monarch* had slipped into the Channel and dragged enemy cables up with grappling hooks. They were cut, new lengths spliced on, and then taken to Dover and Brighton for use by the British military forces.

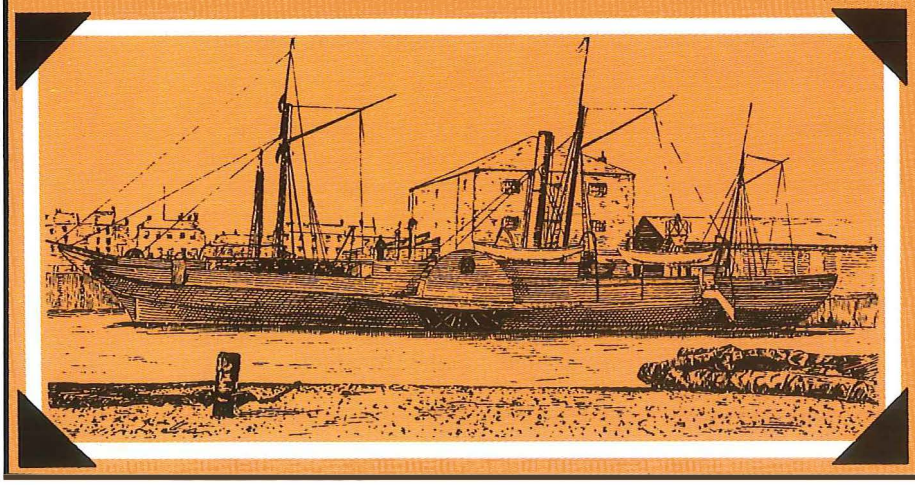
The torpedo which hit *Monarch* exploded almost amidships and tore a hole in the ship's side, big enough to drive a single decker bus through. Six hundred tons of seawater cascaded in. She began to list immediately and within three minutes only the forecastle head was above water. Out of her crew of 74, three were killed and the remainder were taken to Dover where the local postmaster arranged for free telegrams to relatives and cash advances to help the men home.

Monarch had been designed as a schooner, and with her two long, slim and elegant masts, she would have held her own against the millionaire yachts moored at Cannes. Built at a cost of £36,450, her refinements included a library, four state reception rooms, a dining room tastefully lined with walnut panels, and furniture which was hand carved from Hungarian ash. The two Napier engines could churn out 1,200 horse-power and the anchors and chains were 'best quality stockless'.

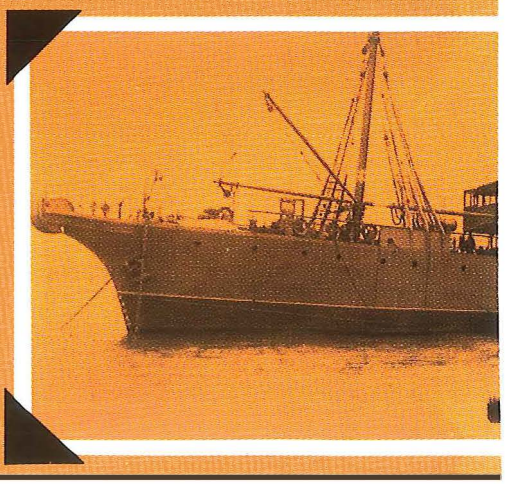
Within a year of the Dover disaster,

Today's Monarch was launched in 1975. More than 300 feet long, it carries a crew of 64 and weighs 3,500 tons.

The original Monarch, a 512-ton wooden paddle steamer built in the middle of the last century, finished her days as a coal hulk.



Monarch number three, built in 1916, was mistaken attack by an American destroye



however, the Post Office was to see the launch of a new vessel bearing the name *Monarch*. Between the two world wars *Monarch III* was engaged in laying and repair work around the British Isles but in 1944 like her predecessor she became a victim of war when she was accidentally shelled by an American destroyer. After repairs she put to sea again but the next year was mined and sunk off the Suffolk coast.

Monarch IV was the largest cable-laying and repair vessel in the world. She was built in 1945 and could remain at sea for 100 days. She was constantly in demand on both sides of the Atlantic and after 25 years' Post Office service was sold to Cable and Wireless.

Bearer of the name *Monarch* today is one of British Telecom's twin cableships launched in 1975. The present day vessel is three and a half times the weight of the 1883 ship but carries a slightly smaller crew of 64.

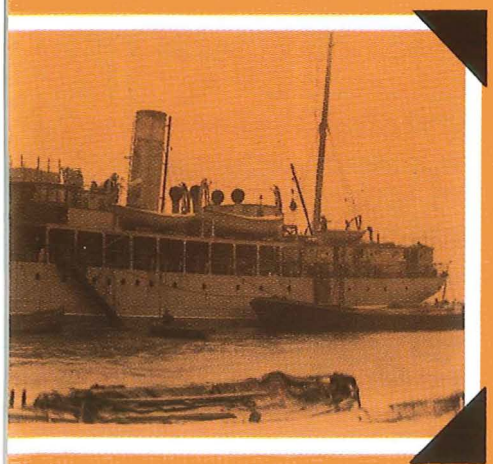
Although primarily intended for cable repair operations in and around the British Isles and on the north west European continental shelf, the modern-day *Monarch* can work in greater depths if necessary.

Certainly the cheering crowd which gathered on Clydeside in 1883 would have found the role played by today's *Monarch* hard to imagine.

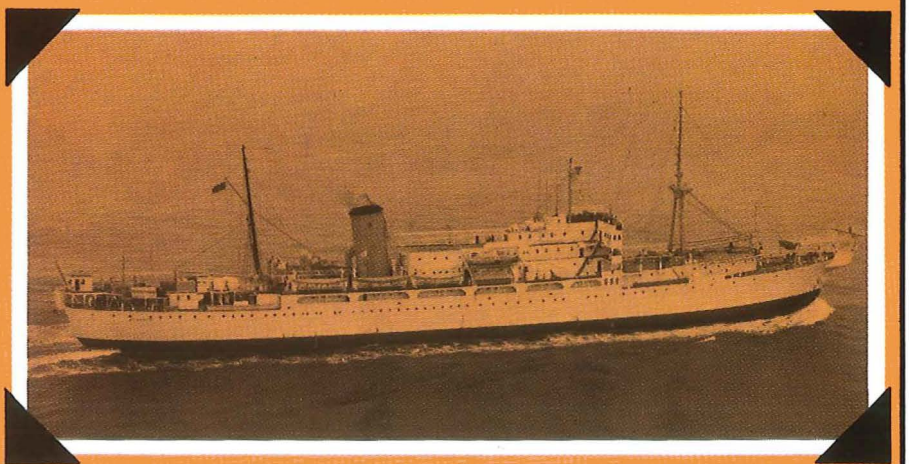
British Telecom Journal, Autumn 1983

An artist's impression depicting the sinking of the second Monarch launched 100 years ago as the first cableship designed specifically for the Post Office. After more than 30 years' service Monarch was torpedoed by a German submarine off Dover in 1915.

also a war casualty. She survived a in 1944 but was sunk the following year.



The fourth cableship Monarch was built in 1945, and was the largest cable laying and repair vessel in the world.

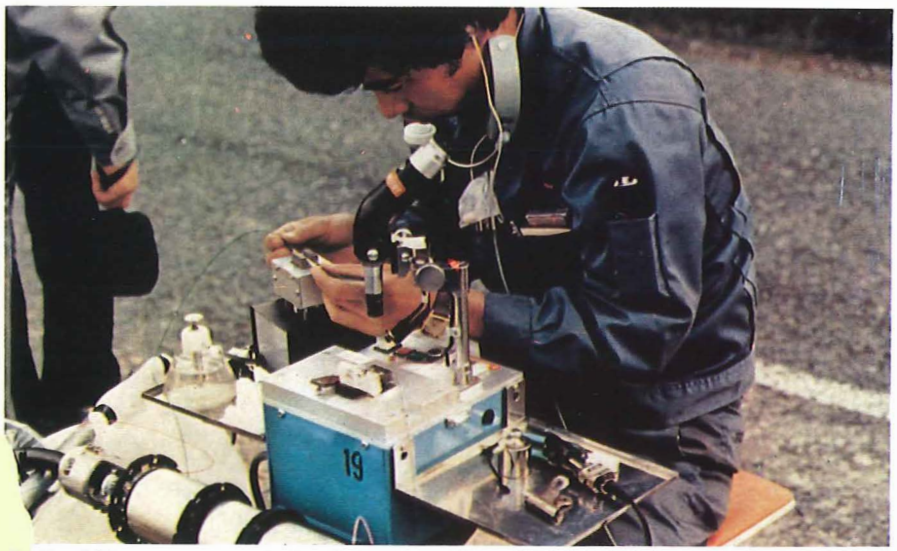


This, the fifteenth in our series on overseas administrations, looks at the Republic of Ireland, a country of lush green pastures where an ambitious development programme is now underway.

Ireland catches up

The Republic of Ireland is about a quarter the size of the UK – but has a population of only 3.5 million. Its economy is largely agricultural but electronics, chemicals, textiles, clothing and machinery are all developing industries. Service industries in Ireland account for nearly half of the employed population and represent the largest sector of employment. Telephone penetration is about 22 per cent of population.

O'Connell Street, Dublin.



Optical fibres are now being introduced into the Irish telecommunications system. Here a fibre is being jointed.

During the mid-1970s, the demand for telecommunications in Ireland grew rapidly with telephone use showing an annual growth of between 12 to 15 per cent. But the expansion of the telephone network could not keep pace with demand, and by 1978, the Irish telecommunications network had reached a state of crisis, with an evergrowing waiting list and severe congestion in the trunk network resulting in a deteriorating quality of service.

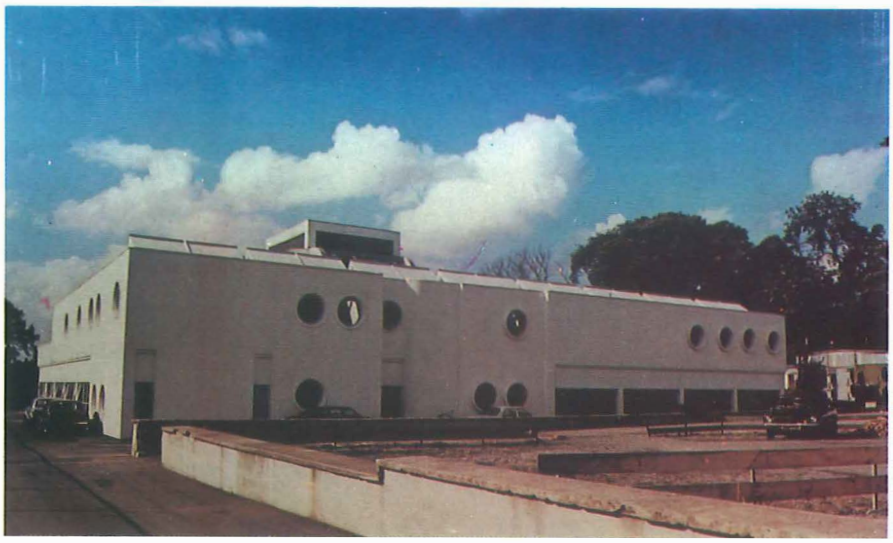
In 1980, following a recommendation from a review group commissioned by the Government, a five-year accelerated development programme was launched at a total estimated cost of about IR£1,000 million (£880 million). The main aims of the programme were to raise the quality of telephone, telex and data services to the level of other EEC countries and to maintain it at that level; to provide, by the end of next year, a fully automatic telephone service, including subscriber trunk dialling both nationally and internationally; to increase the rate of connection of new lines; and finally, to lay the groundwork for continuing growth.

The size of this task meant that it was necessary to expand the system in five years by as much as had been achieved in the previous 80 years. It was recognised that this would not be easily achieved and careful planning and organisation would be required to implement the programme effectively.

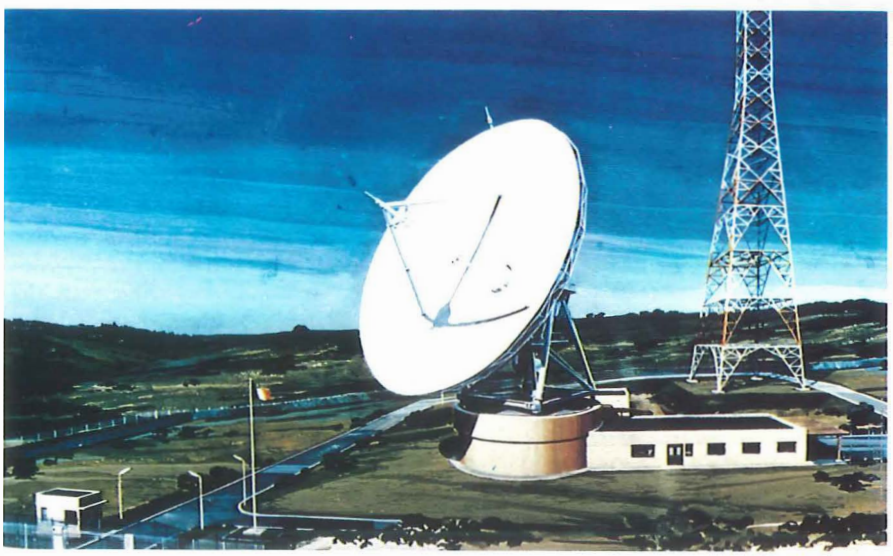
Telecommunications services in the Republic, which currently employ 18,000 staff, are administered by a central government department – the Department of Posts and Telegraphs – which has its headquarters in Dublin.

The country is divided into eight administrative districts including one for the greater Dublin area. Although

This modern exchange building at Roslevin in County Athlone houses Ireland's first digital exchange.



Ireland's first earth station is now being built at Midleton in County Cork.



most services have in the past been administered from Dublin, there has been increasing devolution to the other seven district headquarters at Limerick, Cork, Portlaoise, Drogheda, Galway, Sligo and Waterford.

In line with a recommendation by the review group, the intention is to transfer administration of telecommunications services to an independent state-sponsored company, to be known as 'Bord Telecom Eireann' and the necessary legislation has recently been enacted by the Dail (Irish Parliament) to enable the changeover to become effective. It is expected the new company will become fully operational towards the end of this year or early next.

The increased demand of the 1970s coupled with various industrial disputes resulted in the long waiting list, and by early 1980, agreement was reached to employ private contractors to install residential cabling. A record number of 207,000 connections – a third of the current total – have since been made.

Under the development programme, about 240 exchange buildings have been completed and a further 100 are being built. New area engineering headquarters have been provided at 27 centres, and a further 18 are being built or are being fitted out. Two new engineering schools have been opened to train staff in the new technology required to operate and maintain the digital exchanges now being installed.

Initial progress on the vital programme to convert a predominantly manual system into a fully automatic one was slow, but the pace has since quickened and about 92 per cent of the network is now automatic. It is expected that this year, more than 100 manual exchanges will be converted to automatic working, with a further 300 during 1984.

Quality of telephone service has lagged behind other EEC countries but the new trunk exchanges and trunk circuits added to the system over the last three years have already greatly improved this situation. Another effort towards better quality of service includes a programme to improve the reliability of underground cabling in Dublin to reduce faults and the time taken to repair them. The programme involves extending pressurisation to the main subscriber cable network, and preventative maintenance to upgrade the cable plant and eliminate poor workmanship or weak points. The aim is to reduce the failure rate on local calls to below two per cent and to reduce the corresponding failure rate on subscriber dialled trunk calls to below four per cent.

Direct dialling to all parts of the UK is now available from all automatic areas. Ninety nine per cent of calls made to countries other than the UK are now dialled direct by the 70 per cent of customers equipped with international direct dialling facilities. Within the next 18 months, these facilities will be extended to nearly all customers.

Telephone tariffs in Ireland have recently been reviewed. Rental for an ordinary exchange line in an automatic area is IR£128 (about £112) for a business line and IR£118.16 (£104) for a residential line. Local calls are untimed at a cost of IR9.6p (8.4 pence) from a customer's own telephone, and IR10p (8.8 pence) from a coinbox. All trunk calls are timed. When connection, annual rental, and call charges are taken together, telephone service in the Republic is more expensive for both business and residential customers than it is in the UK.

The annually-issued telephone directory for Ireland is in two parts, one covering the greater Dublin area, and the other all areas outside Dublin. The preface to the directory is published in both Irish and English and customers can choose in which language their entry is to be published. A new, free computerised directory enquiry service has been introduced and access is available from most parts of the country.

To supplement existing recorded information services – the speaking clock and weather forecast – the Irish telecommunications administration has plans to introduce sports news, dial-a-disc and special announcement services as well as localised weather information services for special interest groups like farmers and yachtsmen.

Ireland currently has about 6,500 telex customers. Last year, connections increased by 836 and it is expected that higher figures will be achieved this year. Currently the waiting list is about 1,200 – 700 of these from the Dublin area. Various problems, which have restricted growth in telex installations in Dublin, are being gradually overcome, but the main problem – shortage of underground cable is likely to persist for some time.

Basic rental for a standard telex installation within 60km of Dublin telex exchange is IR £776 (£680). For telex installations farther than 60km from Dublin, a higher rental applies, based on the distance involved. The waiting list for data connections is now over 2,000, but efforts are being made to reduce this and it is planned to introduce a national packet switching network early next year.

Ireland has recently become a member of the European Communications Satellite organisation (Eutelsat), and work is going ahead in building Ireland's first earth station near Cork. It is due to be brought into service next year and will provide direct satellite communications facilities to the Atlantic Ocean region, avoiding the need to route traffic via other European earth stations such as Goonhilly in Cornwall.

The expansion and introduction of new technology in the Irish telecommunications network has, of course, required massive investment. Last year £175 million (sterling) was spent on the development programme, and a further £180 million is expected to be required during this year. To augment the capital funds provided from the exchequer, and to arrange alternative financing by private participation, a new company, Irish Telecommunications Investments Limited, was set up in 1981. Last year £115 million was raised from private sources and the company hope to raise a further £155 million during 1983.

European institutions have shown great interest in Irish telecommunications development, and this is reflected by the fact that the Exchequer has obtained loans for development from the European Investment Bank and the EEC community instrument for borrowing and lending. Grant aid has also been obtained from the European regional development fund.

From a total capital expenditure on telecommunications of £793 million (sterling) since 1973, some 40 per cent has come from European sources. The ambitious development programme is currently on target for completion next year which is an achievement of which the Irish Posts and Telegraphs Department can be justifiably proud. ⓣ

The authors – **Messrs P. H. Dabbs, P. A. Long, I. Sarwar** and **Ms C. M. C. Aust** are all members of the international comparisons group in the organisation, performance and systems department of the Local Communications Services Division. They acknowledge the help of **Mr C. J. Rafferty** of the Irish Department of Posts and Telegraphs.

British Telecom Journal, Autumn 1983

Merlin

		Result 82/83	% Growth over 81/82	Result 81/82	% Growth over 80/81
Telephone Service	Size of System				
	Total working connections	19,429,000	2.5	18,963,000*	3.0
	Total working stations	28,882,000	1.5	28,454,000*	2.1
	Call office connections	77,000	0.0	77,000	0.0
	Shared service connections	834,000	—24.9	1,111,000	—18.0
	Growth of System				
	Net demand for connections	1,545,000	10.9	1,393,000	—10.6
	Net supply of connections	1,577,000	—0.1	1,578,000	—10.5
	Penetration				
	Stations per 1,000 population	517	2.0	507*	1.8*
	Traffic				
	Inland effective calls: trunk	3,603,000,000	4.6	3,446,000,000	3.3
	Inland effective calls: local	17,800,000,000	2.5	17,360,000,000	3.1
	Continental: outward calls	93,109,000	7.8	86,352,000	8.7
	Intercontinental: outward calls	55,265,000	20.7	45,806,000	23.9
	Telephone usage				
	Calls per connection	1,123	0.3	1,120	—0.6
	Local Exchanges				
	Total	6,325	0.1	6,318*	—0.3
	Strowger	n/a	n/a	4,201	—5.0
	Crossbar	n/a	n/a	555	3.4
	Mixed Strowger/Crossbar	n/a	n/a	35	—14.6
	Electronic	n/a	n/a	1,480	13.4
	Mixed Strowger/Electronic	n/a	n/a	47	38.2
Telex Service	Size of System				
	Total working lines	92,622	0.3	92,378*	2.6*
	Traffic				
	Inland calls chargeable	92,950,000	1.1	91,964,000*	
	Inland calls: effective	95,864,000	0.3	95,545,000*	
	External outward number of minutes	n/a	n/a	244,538,000	8.1
Telecom Staff	Number of employees by division				
	Inland	213,579	—1.3	216,377	**
	BT Enterprises	1,192	26.8	940	**
	BT International	12,757	—10.3	14,219	**
	Major Systems	4,280	1.8	4,203	**
	Central Services	7,866	—5.6	8,330	**
	Data Processing Executive	3,965	1.2	3,919	**
	Corporate Headquarters	2,337	—36.1	3,659	**
	Corporation total	245,976	—2.3	251,647	**

* Amended figures

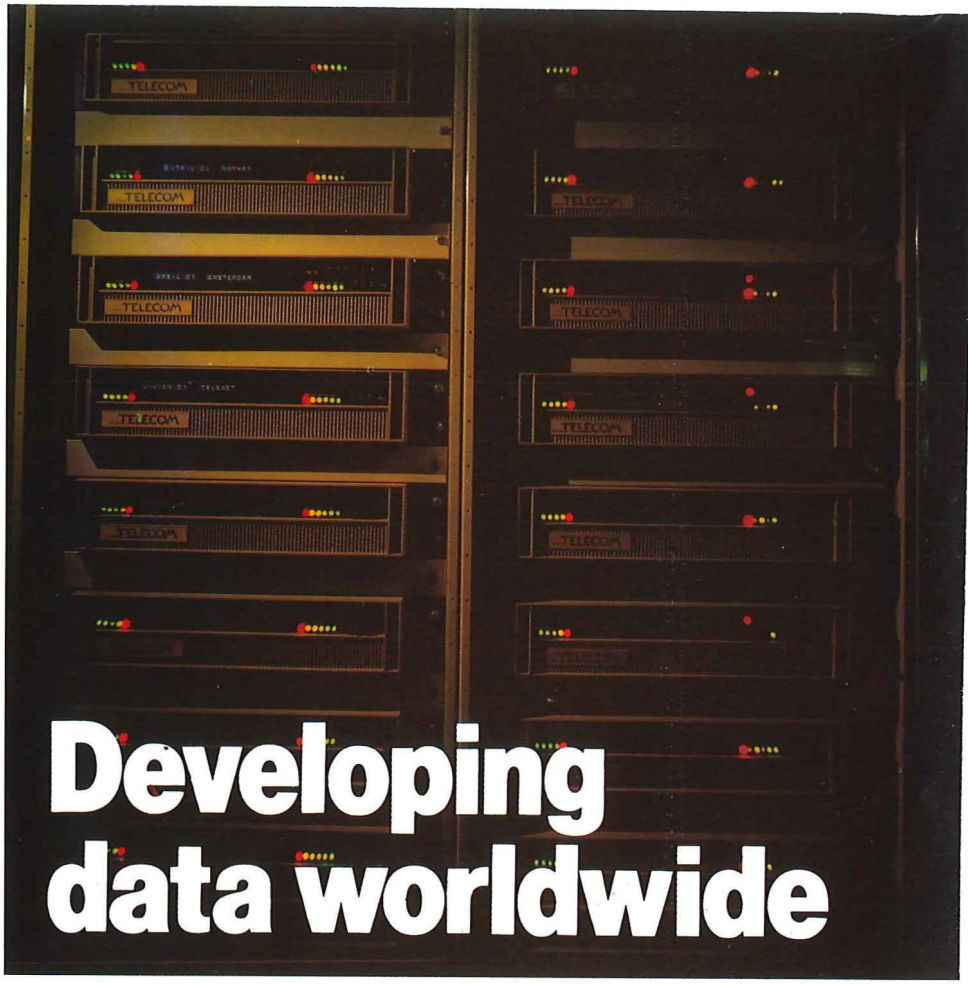
** Since the re-organisation of British Telecom a comparison would be misleading

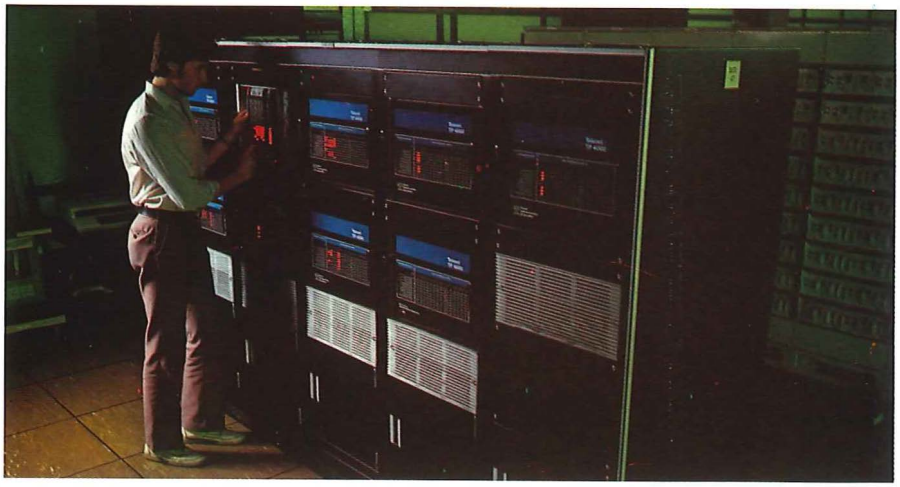
With a profit for the 1982/83 financial year of £365 million, British Telecom has earned a 5.8 per cent return on capital — well above the 5.5 per cent financial target set by government. Profit on turnover for the year of £6377 million is just under six pence in the pound.

The year in figures

Developing data worldwide

Chris Broomfield and Peter Allen





Ten years ago, the experimental packet switching service (EPSS) was launched as British Telecom's first involvement in packet switching. Although technically successful, EPSS did not enter commercial service – mainly because of changes to international recommendations.

The international packet switched data service was brought into service by BTI in December 1978. IPSS was an immediate success and expanded rapidly. At about the same time, the European Commission funded a European data network, Euronet, to link member countries of the economic community and Switzerland. The initial aim of Euronet, which opened commercially in March 1980, was to provide access to scientific and technical information databases within the community.

The UK national packet switching service – Packet SwitchStream – became operational in August 1981 and was interconnected with the IPSS packet switching exchange (PSE) at the end of that year to provide international service for PSS customers. In September last year, the IPSS PSE was interconnected to the Euronet exchange in London, increasing international service available to UK PSS customers still further. During this period, BTI customers who used the IPSS and Euronet exchanges were transferred to PSS.

Since international service began, the IPSS gateway has been radically modified. Not only has the software been changed on numerous occasions and the network adapted to meet increasing demand, but the main switching hardware has been completely replaced. This reflects not only the rapid changes which have taken place but also developments in the production of recommendations by the international telephone and telegraph consultative committee (CCITT). These developments have resulted in BTI becoming recognised as a world leader in implementing the CCITT X75 signalling system for inter-working between national packet switching systems.

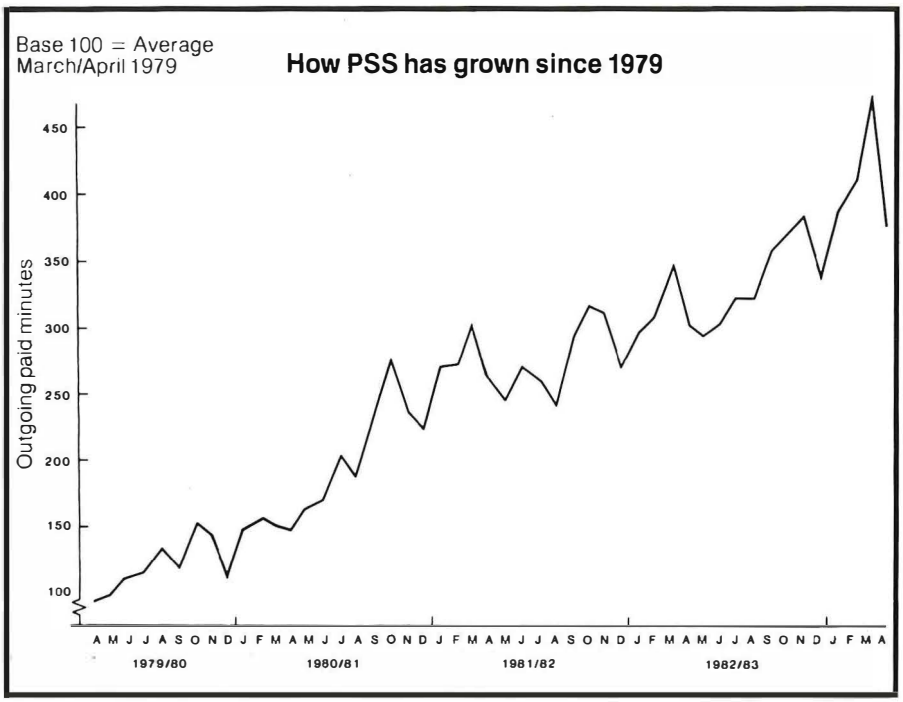
Plans are under way for a new international packet switched data service (IPSS) gateway exchange initially to complement the existing system. When completed in 1985, this new London-based exchange will allow BTI to take advantage of technological advances during the last three years to provide higher traffic capacity per unit and additional customer and administrative facilities.

The IPSS gateway currently provides service with 26 countries. In several countries, more than one national network exists. Plans to extend service to additional countries and networks are in hand.

In the USA and Canada, the number of public packet networks continues to grow. Possibly the most significant recent development has been the decision by American Telephone and Telegraph to provide BPSS – originally called Bell Packet Switching Service, now renamed Basic Packet Switching Service. But provision of packet switched data networks is not restricted to the major development countries of the world. Many third world countries are also installing public packet switched networks.

So why is packet switching developing so rapidly? There are three reasons – availability, versatility and cost. Ten years ago, packet switching systems were in their infancy being provided as one-off experimental projects. Now most major international telecommunications suppliers as well as some computer manufacturers can offer proven systems.

The primary object of the first packet switching systems was to provide remote access to databases. Although packet switching continues to meet this need,



Left:
Technician Paul Cousins checks the voltage supply to the Telenet processor switch on the packet switched exchange.
All public data traffic to and from the UK passes through this unit.

Right:
Technical officer Pete Langford shows second-year apprentice Ian Collett how a 24-hour update is saved onto tape in the PSE's network control centre. Tapes hold a variety of information, including billing details, program updates as well as accounting and statistical information.

database access provides less and less of the total traffic. Increasingly, packet switched networks are being used as a transmission system complementing and interconnecting with existing networks and services.

Access between packet and telex networks is becoming increasingly available. Packet networks are ideally suited for developing electronic mailbox services, like Telecom Gold, and will be used as a prime transmission medium for the international teletex service. High-speed access from a customer into the national/international packet networks provides a company with the flexibility it needs in meeting all of its communication requirements.

Services will only succeed if the price to the customer is right. The rapid growth confirms that the tariff is competitive although BTI recognises that changes are necessary if new markets are to be exploited to the full.

Packet switching has now moved from a new technological idea for accessing remote computers to providing one of the increasing range of advanced services for commerce and industry. Concepts involved have been applied in numerous communication designs from local area networks to large-scale international, public and private data networks. The future for packet switching is assured as the definitions to provide identical features become incorporated in the design of integrated services digital networks.

Packet switching networks worldwide

Existing

Australia
Austria
Bahrain
Barbados
Belgium
Bermuda
Canada
Denmark
Dubai
Finland
France
French Antilles
Gabon
Hong Kong
Ireland
Israel
Japan
Luxembourg
Mexico
Netherlands
New Zealand
Norway
Portugal
Singapore
South Africa
Spain
Sweden
Switzerland
United Kingdom
United States
West Germany

Proposed

Brazil
Bulgaria
Chile
Greece
Kuwait
South Korea
Taiwan
Trinidad
Yugoslavia

Mr. C. Broomfield is data services product manager in BTI's international business services and is responsible for the IPSS service.

Mr. P. Allen is head of data services and development in international business services, and is responsible for the commercial aspects of IPSS.

British Telecom Journal, Autumn 1983

John Meek

A computerised number allocation system, developed in Leeds Telephone Area and approved for national implementation, has been adapted for use by local exchange enquiry operators.

Leeds Telephone Area has 400,000 working lines contained in 56 exchanges and four charge groups. The Area has two automanual centres (AMC) – one sleeve control, and the other a cordless unit. Until now information on exchange telephone number use has been held on a series of cards, which housed a permanent record of the state of each line on each of the exchanges. Each card contained 100 numbers and they were updated by clerical staff on the receipt of advice notes, and used to allocate spare telephone numbers to marketing division.

The size of the record file will increase by 50 per cent in the next 20 years and will, with the increased flexibility of common control units, be subject to even more regular changes. With the increasing size of the records and quicker turnover of lines on certain exchanges, there was an obvious need to use small business computer (SBC) technology to relieve the number allocation work load.

The system which has been developed provides not only an up-to-date record of exchange connections but facilities for automatic allocation of single lines and PBX groups to the consumer products and business systems units. It continuously monitors spare lines on each exchange and can provide statistics on an exchange, charge group, or Area basis to compare with figures produced by customer rental records.

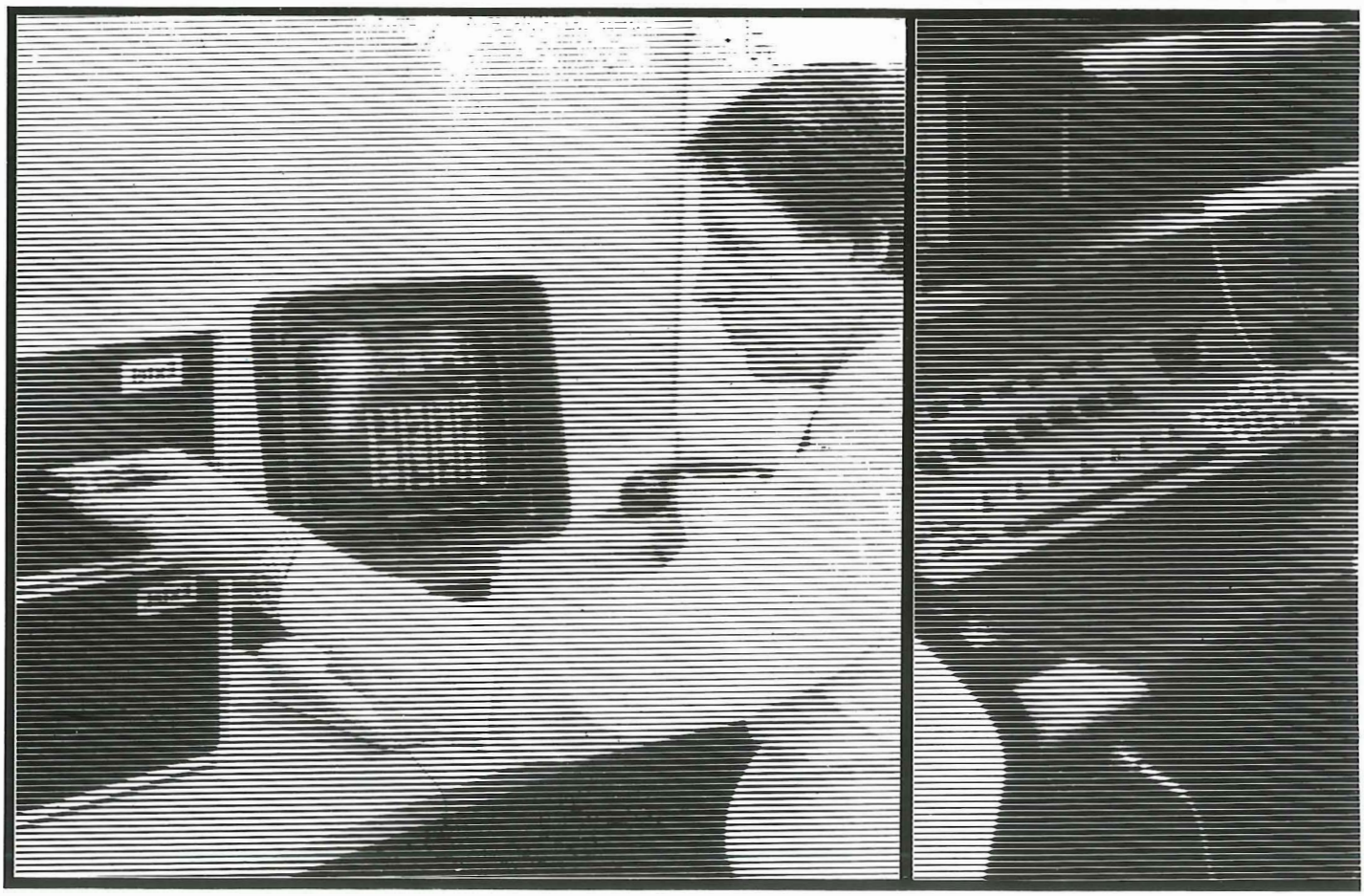
The system also provides not only a full record of exchange connections, class of service and date provided, but many other aids for day-to-day 'housekeeping' of the data files. The software is designed for use on single and multi-user microcomputers and the full records for Leeds Area use 4/Mbytes of disk store.

The most expensive item in creating a class of service database is the staff input time. The work of loading the Leeds Area data took the equivalent of one year of clerical effort. Having put in the creative effort, the savings are proportional to the use made of the information: the more varied and diverse use made of a database, the more efficient it will be. Other aspects of Area work in which a

Enquiry operators'

Telecom superintendent John Nesbitt at work on the Hi-net computer which is linked to the enquiry service in the new system.

Julie Jones, a telephonist at Leeds Park in response to a customer enquiry.



large card record database, similar to the new system, were considered, therefore, and it soon became obvious that automanual centre enquiry work was an obvious candidate.

The enquiry service provided by the AMC's consists of three main aspects of work – verification of the class of service of a particular line, advising of a new number where a line has been connected to the changed number interception (CNI) service and the handling of incoming calls to lines connected to the service interceptions (SVI). The information needed by the exchange enquiry operator, therefore, must include details for every line for which the AMC is the enquiry centre and the support paperwork requires much clerical effort.

The heart of the system is the card which provides the class of service information on a matrix basis, and includes details of telephone numbers connected to CNI and SVI. The weaknesses of the system are its labour intensity its inaccuracy and its sheer size.

A new system at present on trial in Leeds Park cordless exchange will use the number allocation system database which contains information almost identical to that held on AMC enquiry record cards. An expansion of the database to include specific AMC/EQ requiments has already been carried out. Clerical staff use one of seven terminals to update the number allocation database from information received on advice notes.

The central processing unit (CPU) chosen for the database has capacity for 20 Mbytes of file storage, and tape back-up facilities. Complete hardware for the cordless unit consists of two CPUs working as main and standby on a single network. They are mounted on a table unit below which are fitted two cabinets, each housing eight workstation processors. Each workstation processor serves one of 16 miniature VDUs mounted on cordless switchboard enquiry positions. All enquiry operators' VDUs have access to the full Area database. Hardware for the sleeve control centre is similar. Exchange clerical staff are also provided with access to the CPUs, to update CNI and SVI information.

Further simple improvements which will continue to aid telephone number and AMC management includes Area data being available to each AMC leading to night concentration of AMC traffic, installation address being made available to the enquiry operator and database update customer contact point, helping to reduce advice note circulation.

Mr J. C. Meek is a senior telecommunications superintendent in Leeds Telephone Area working on planning in the local network.

British Telecom Journal, Autumn 1983

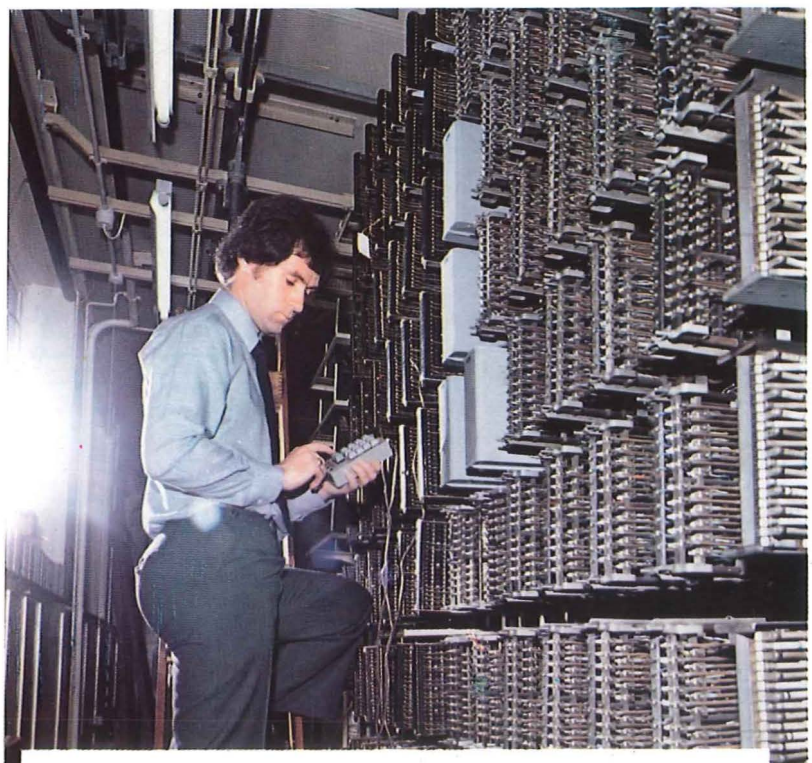
small-screen boost

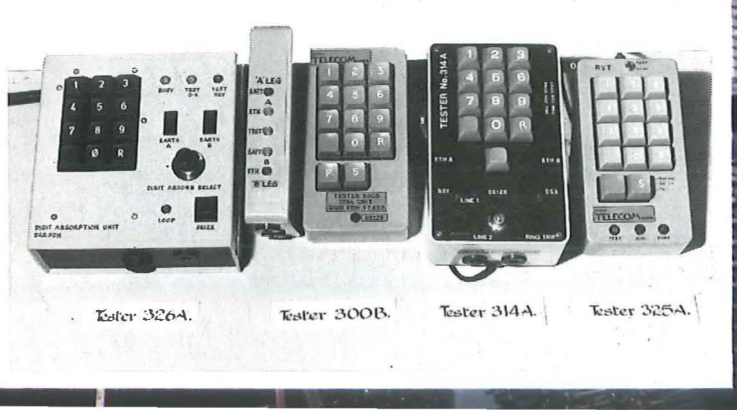
cordless exchange reads information

Clerical assistant Hazel Cromack uses a visual display unit to update the data file from advice notes.

Doug Booth

Improving business efficiency





Harrogate in North Yorkshire, once described as the 'Mecca of the North Yorkshire Riviera', is renowned for its flora and spa atmosphere and is also becoming famous for its exhibition facilities. But the 50 or so British Telecom staff selected each year to attend the two-week work study practices course run by the efficiency assignment section in Local Communications Services find little time to enjoy the sights.

The course is designed to give managers a grounding of work study practices such as activity sampling, activity charting, statistical and critical path analysis, and work measurement.

Yet work study training forms only a part of the work carried out in Harrogate, where staff specialise in efficiency assignments and computer applications. More importantly, the section, comprising 30 or so skilled staff, are working to help Local Communications Services, and particularly telephone areas, to increase their profitability and improve their standard of service.

For many years, the section has been sponsored by other headquarters divisions to carry out projects and has dealt mainly with practices and procedures for internal and external planning and works in telephone areas. Recent reorganisational changes have been reflected in the way that the section will in future operate. The current trend is towards projects taken on at short notice and carried out promptly and professionally, not only for BTHQ but also for regions and individual telephone areas. Its work can be geared to meet the pressing needs of local network and local exchange systems managers as well as consumer product and business product managers at area level.

Projects carried out at Harrogate have included:

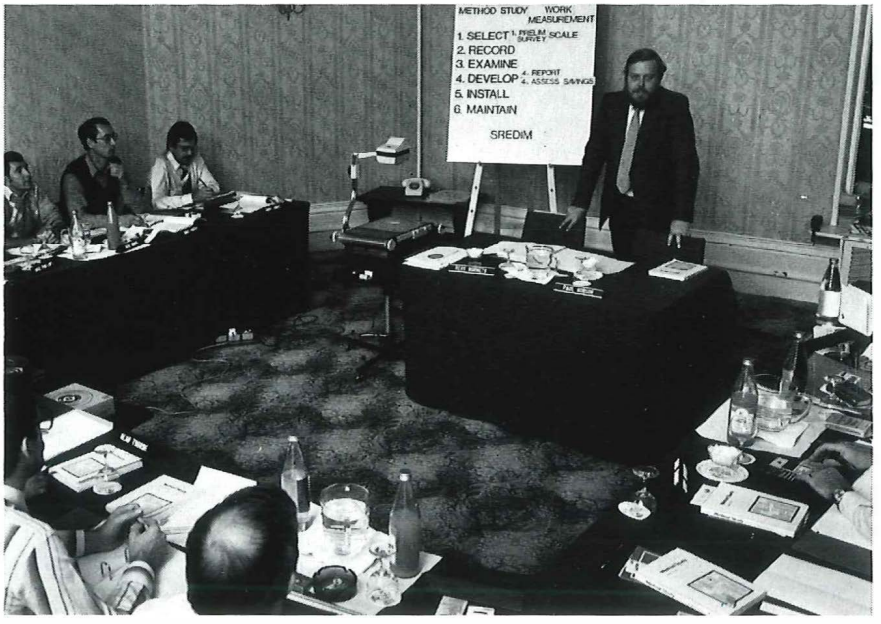
- A computer program called Extrans (sponsored by York and Norwich Areas) which is helping telephone areas faced with the problem of diverting customer circuits from an old to a new exchange. Using a small business computer, Extrans produces cable diversion, jointing and testing schedules and cuts down much of the tedious, repetitive clerical work associated with exchange transfers. Built into the program are other checks which help to eliminate some of the errors which can creep into manually-prepared paper records. Schedules can be produced by the computer on the same day the work is to be carried out, rather than several weeks in advance, as was previously the case.
- A study which recommended the introduction of quality control techniques, using check lists for both staff and supervisors concerned about the quality of external plant – both overhead and underground. A program of seminars for regional and area managers has already been completed, and the scheme has now been introduced into most telephone areas. The success of introducing quality control techniques for external plant has led to further studies covering both exchange equipment and customer apparatus.
- A computer project called Mace – management and control of external work – which was sponsored and developed by Harrogate and the Data Processing Executive (DPE). The scheme is now firmly established in eight regions and provides much-needed control information, especially where there is a shortage of underground plant. A general enquiry facility (Genfac) enables data to be accessed simply and quickly and in the format required for control and management. Further facilities are being designed to help with planning of works, estimate preparation and stores availability. External planning groups will soon be able to access the system directly. Traditional and lengthy methods of tendering for external contract work are also under review to assess how areas can best get 'value for money' from outside contractors.
- A system called Iwis – internal works information – sponsored by Local Exchange Services, which will help to control their internal planning and works functions. Developed on similar lines to Mace, it provides standard facilities, such as schedules of work, progress of current work, work group performance, future manpower requirements and budget information. Iwis is now being progressively introduced in telephone areas and should be available nationwide by the end of this year. Like Mace, it uses Genfac as a way into the system.
- A system, now being tested in Peterborough Area, and known as Ampere, is designed to make the best use of power engineering resources, including power and heating plant, ventilation plant and lifts. A computerised management information system, Ampere, should be more widely available early next year.
- An exchange transfer investigation study which has rapidly identified three major areas where significant improve-

Top:
Harrogate – spa town, popular resort and home of British Telecom's efficiency assignment section.

Far left:
One of the efficiency assignment section's projects is to develop and evaluate testing equipment used on exchange transfer work. Assistant executive engineer Tom Feeney, a member of the group currently evaluating efficiency improvements, checks out a tester.
Inset: Four of the testers under evaluation.

Left:
Tom Wright, head of one of the efficiency assignment groups points out damage sustained by an underground duct to colleague Peter Hill at a local telecommunications engineering centre.

Paul Robson, an assistant executive engineer tutor, takes efficiency engineering students through work study procedures, part of a two-week course held in a local hotel.



ments could be introduced – testing, record work and jumpering. New testing techniques associated with exchange transfers for customers' lines have resulted in substantial reduction in the time needed to test customers' lines before exchanges are transferred. Telephone area staff have played an important part in tester development, and many of their ideas have been incorporated into the work carried out by Harrogate and Factories division.

- A computer program to allocate equipment numbers and produce exchange records which was first introduced in British Telecom North East. Harrogate staff further developed the program and, following a field trial, it has now been implemented nationally, improving both accuracy and resultant efficiency.
- The product evaluation of new terminating devices such as those produced by Krone (UK) and Porta (USA). Trials in telephone areas have shown that insulation displacement techniques used by the new terminating blocks are quicker, easier and safer. The blocks also incorporate improved circuit protection and easier-to-reach terminating tags which no longer require the use of hot soldering irons.
- A study on large telephone exchanges which showed there are considerable benefits in using computers to allocate circuits and maintain a database for all exchange records.
- A stock control procedure covering slide-in units for business products and systems was developed for Newcastle Area. A pilot study to check the profitability of Monarch call connect systems has also been recently carried out.

The valuable experience gained from TXE exchange transfers has also been made available to Local Exchange Services to improve the design and facilities provided by System X, as well as reducing the time taken to bring the type of exchange into service. A further study is now under way and covers existing internal planning and works fields, with a view to simplifying procedures and improving efficiency.

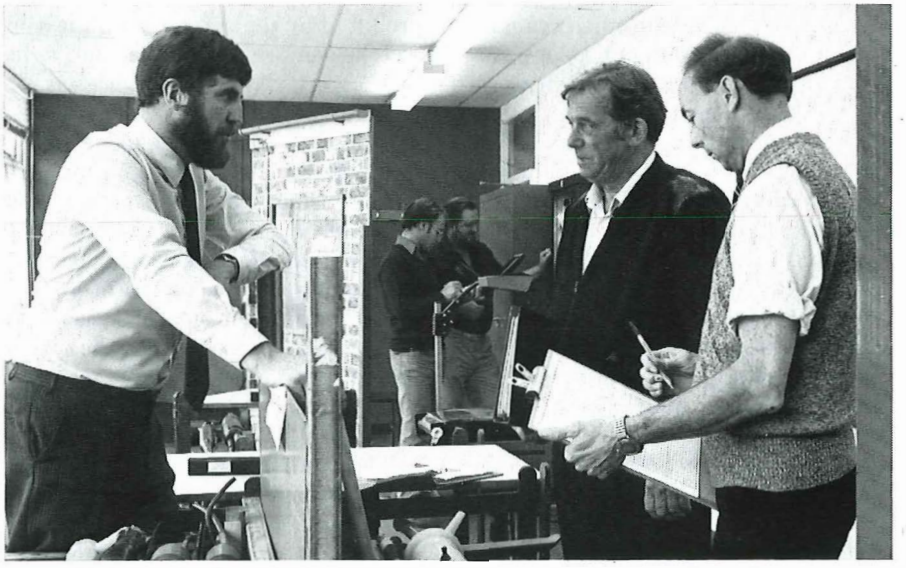
PABXs form a substantial part of business revenue, and it is therefore vital that area management has at its fingertips the right performance and cost statistics for individual installations. Harrogate's PABX maintenance information system (Pamis) computer program, now available in most telephone areas, enables information on PABX maintenance costs to be collected, processed quickly and efficiently and produced in the format required by management. Two further computer programs capable of producing similar facilities for call connect systems and coin boxes are also being developed, and should soon be widely available.

The efficiency assignment section is continually adapting to solve problems and meet the needs of Local Communications Services, to improve service and increase profitability. It offers a consultancy service to sponsors from headquarters, regions and areas, subject to the usual constraints of manpower and resources. And unlike external consultants, the service from Harrogate is about to operate as a recoverable cost centre, and is not in business to make a profit.

If the service offered by the Harrogate staff helps to cut down routine chores, eliminates paper work and enables employees throughout British Telecom to use their creative skills more productively, then it can only help the organisation to prosper and grow in the new commercial environment. For further details – please telephone Harrogate (0423) 60781, 60729 or 57262.

Mr D. Booth is head of the efficiency assignments and computer applications section in organisation, performance and systems division, BTHQ.

British Telecom Journal, Autumn 1983



The efficiency assignment section has completed a series of seminars which aims to improve the quality of information to external works and underground maintenance supervisors. Specially commissioned by three regions, the seminar, here under the guidance of Ken Warburton, was held in Harrogate. Similar seminars are being run by Harrogate-trained tutors in other regions.

Peter Robbins is responsible for computerised management information on call offices, PABXs and call connect systems. Here he instructs an area call office duty supervisor on billing procedures.

The new Plessey 8600 Series.

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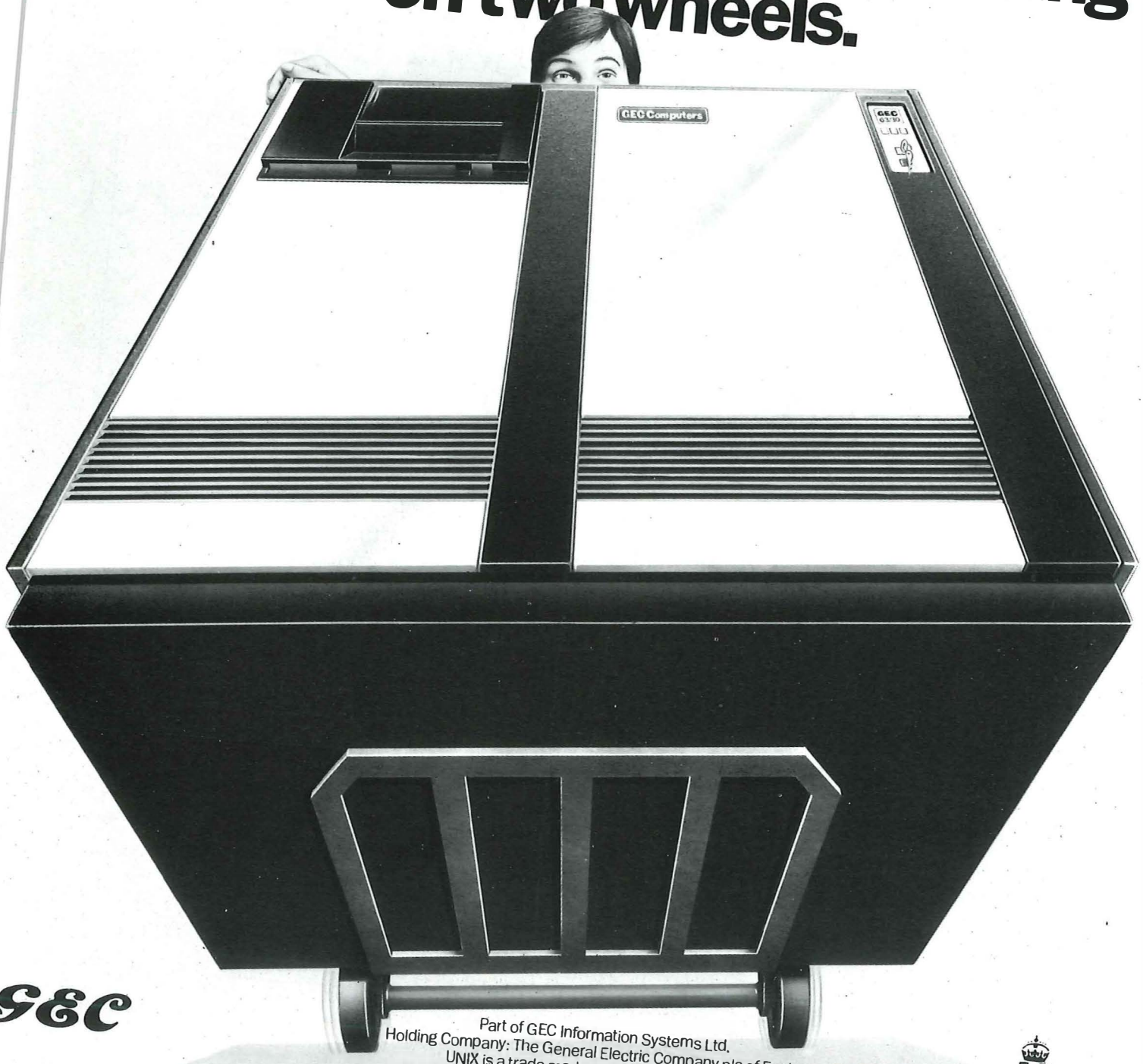

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More changes at the top

Changes to the board of British Telecom and other new senior appointments have been announced in the last few weeks.

Mr Deryk Vander Weyer, formerly group deputy chairman of Barclay's Bank, has become deputy chairman after serving as a part-time board member since October 1981.

Former British Telecom International managing director and current board member Mr Jim Hodgson has been made vice-chairman of British Telecom. His post at BTI is filled by Mr Tony Booth, director of British Telecom London, while City Area general manager Dr Peter Troughton takes over from Mr Booth.

Mr Ron Back, managing director, National Networks has been confirmed as a new board member.

The new board members from outside British Telecom are Mr Colin Crook, who will be managing director of British Telecom Enterprises, and Mr John King, director for marketing and corporate strategy.

Mr King was formerly commercial director, business communications systems, for Philips in Holland while Mr Crook was group managing director in London for Zynar – a firm involved in wide area communications and the formation of local area networks.

Mr John Goble, a senior partner in the solicitors firm of Herbert Smith and Co., was appointed a non-executive board member from 1 November.

Sir George Macfarlane will remain on the board for at least another year.

● Mr John Harper, managing director of British Telecom Inland Division, has retired on health grounds. The Division has now been split into Local Communications Services under Mr Iain Vallance and National Networks under Mr Ron Back.

MISCELLANY

Switched-star cable TV

British Telecom is negotiating multi-million pound contracts with British industry for supplying advanced technology for cable television. The orders are for second generation systems, using the switched-star principle favoured by the Government for longer term franchises.

British Telecom expects to offer the system in the second half of next year in time for the installation of the first new networks.

Switched star was designed by British Telecom and developed in co-operation with British industry. It uses optical fibre technology where appropriate and is more advanced than any comparable system in the world. It is being offered by BT Cable, the new organisation created by British Telecom to lead its entry into the cable television market.

Another British Telecom division, Cable Interactive Services, is offering cable television operators a cabletext magazine and Gamestar video games.

Martlesham Medal

The two engineers who masterminded for British Telecom the design and development of System X, Britain's advanced new electronic telephone exchanges which are set to revolutionise the nation's telecommunications services, have received the Martlesham Medal Award for 1983. They are Mr Roy Harris and Mr John Martin who led the early stages of the System X project which proved vital to its success.

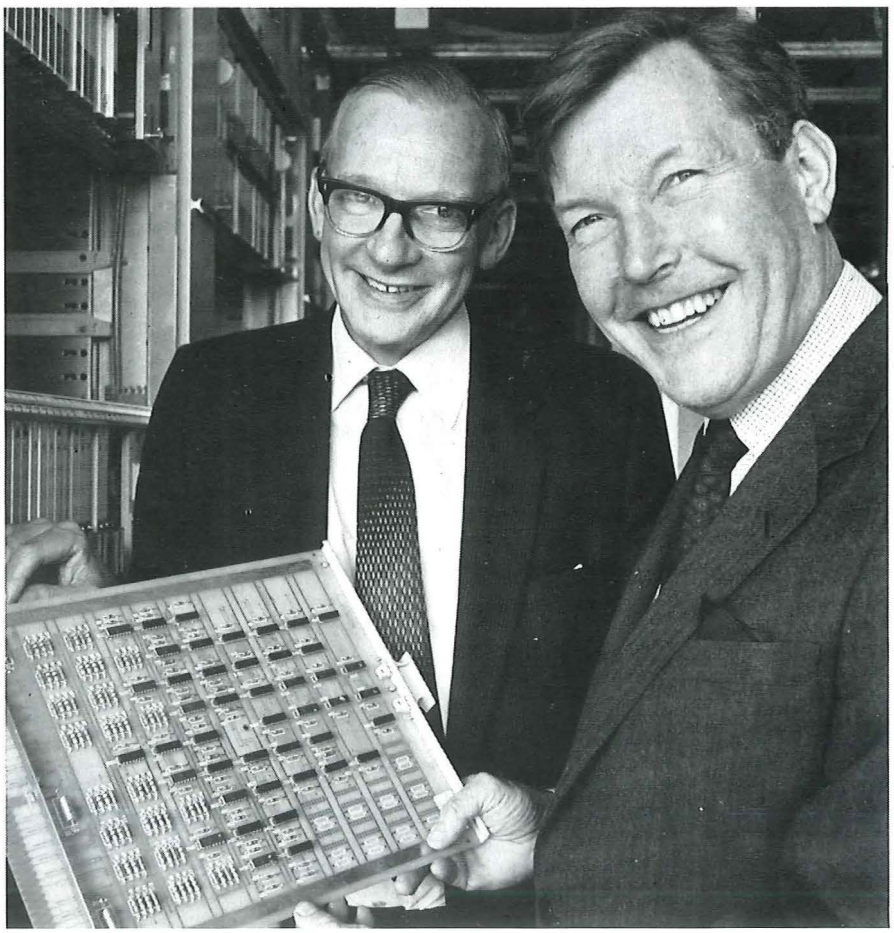
Mr Harris originated the concept of using modules – electronic building blocks – as the basis of design, while Mr Martin's role was to direct and co-ordinate the project, forging design teams from 1,400 staff drawn from British Telecom, GEC, Plessey and STC, the four co-operating partners. The presentation was made by British Telecom chairman Sir George Jefferson at Coventry, home of the first System X telephone exchange to use a second-generation design of processor.

SatStream goes west

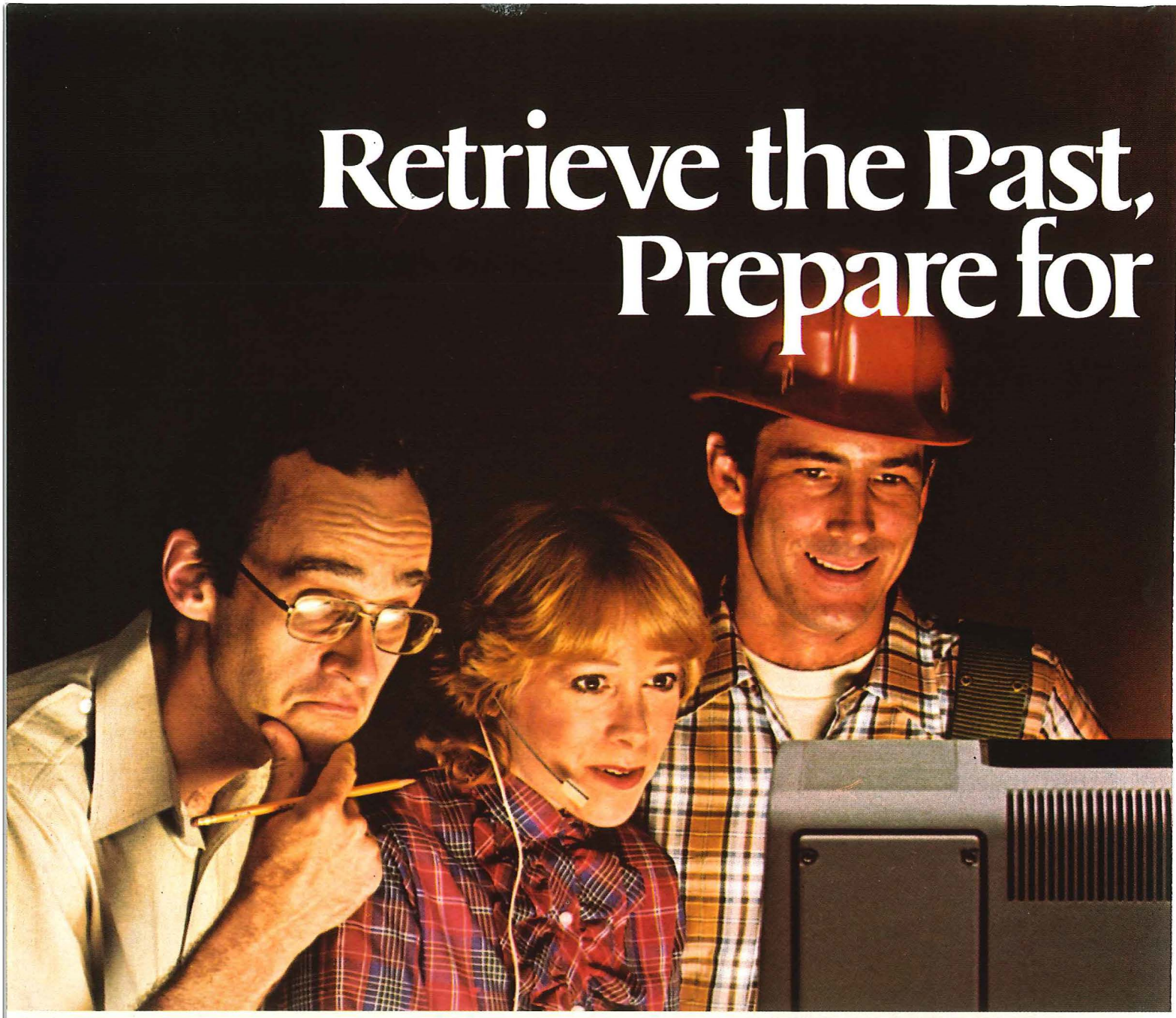
British Telecom will forge a new link with Canada next year with the launch of the world's first satellite-based digital business service between different continents.

This advanced communications service

Roy Harris (left) and John Martin with some of the microchips used in System X. See 'Martlesham Medal' on this page.



Retrieve the Past, Prepare for



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The Northern Telecom LRS-100 Loop Reporting System is the most powerful tool available to achieve this aim. It automates and completely integrates the RSC administration and testing functions—customer line records, fault reports, testing, priority assignments, distribution management, statistics—literally every important function of the RSC.

The past: the answer to your problems.

When a customer reports a problem, the person receiving the call gets complete customer line record data instantly, including station equipment facts and a history of prior repairs and installation orders. The system verifies the fault and a firm commitment for service can be given to the customer immediately. Skilled testers are able to concentrate on the more difficult problems, thus enabling their time to be used more effectively.

The present: accurate distribution reduces wasted time.

Automatic and accurate distribution priority management and geographic block control substantially reduce time wasted in fruitless journeys by outside work forces. Also, by recognizing "common cause" fault patterns the system eliminates duplication of handling and distribution. Most importantly, LRS-100 automation helps balance the RSC's workload and utilize its resources for better management of the repair work force and no confusion—just smooth, efficient service from initial fault report to close-out.

The future: face it with confidence.

By maximizing control and making effective use of RSC resources and outside work forces, LRS-100 offers management some very important advantages in an increasingly competitive environment. Instant access to the LRS-100 customer service facts, line diagnosis (with interpreted results) and accuracy of distribution allows everyone in the RSC to work more effectively because everyone has all the information needed about the work in progress. By compiling statistics automatically, LRS-100 gives managers the information they need to control the present and plan the future.

Through the system's automated routining capability and our exclusive cable topology reports, you will be able to spot problems as they develop, improving service through preventive maintenance.

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37 – SatStream North America – is being set up by British Telecom International (BTI) and Teleglobe Canada using an Atlantic Ocean Intelsat V satellite. BTI will establish the service to the USA later in 1984.

SatStream North America's first customer will be the Bank of Montreal. It will provide the bank with integrated data and voice communications between its offices in Bucklersbury House, in the business heart of London, and Toronto.

The new transatlantic link is the first of BTI's SatStream services – small-dish digital satellite communications for international business customers.

Hong Kong connection

British Telecom's specialist export division, Teletrade, has sold its City Business System (CBS), a communications system for financial and commodity dealers, to Hong Kong. Teletrade has reached an agreement with the Hong Kong Telephone Company to allow the company to market, install and maintain the City Business System throughout the colony.

The agreement has already resulted in one order for CBS and Teletrade expects total sales in the colony to top £3 million over the next few years.

Modulas from Merlin

British Telecom Merlin, the corporation's new business equipment division, has become the exclusive supplier of Modulas – an advanced microcomputer system designed to provide full office automation for the retail travel industry.

The exclusive agreement was reached with the system's two developers – Tourism Technology Limited (TTL) and Future Technology Systems Limited (FTS).

Merlin will market, install and maintain the product through its national sales and service organisation. Modulas is the only system to be developed with the full backing of the Association of British Travel Agents (ABTA) and complies with the office automation specification tailored by ABTA to meet travel agents' needs.

Face to face

The world's first full-colour digital transatlantic business videoconferencing service began in September.

Run by British Telecom International (BTI) and the American Telephone and Telegraph Company (AT&T), the new service is the first commercial use of TAT-7, the new submarine link between Britain and America which came into operation in September.

Initially, this advanced form of communications was available between British Telecom's London Confravision Studio and various teleconferencing rooms in the US. Small low-cost terminals are expected to be available later – incorporating television camera, screen, microphone and loudspeaker – which will enable users to set up conferences from rooms in their own premises using ordinary office lighting.

In addition to the AT&T service, BTI is planning a second transatlantic video conferencing service later in the autumn, in conjunction with Satellite Business Systems. This will use a satellite link across the Atlantic, as well as the American domestic satellite used by SBS in the US.

Also this autumn, British Telecom plans to start trials of videoconferencing within the UK using small low-cost terminals suitable for business premises and using the same digital compression techniques.

Team's top prize

A jointing machine capable of the telecommunications equivalent of micro-surgery has earned its developers top prize in British Telecom's first Fit for Purpose competition.

The machine joins hair-thin optical fibres to an accuracy of within one thousandth of a millimetre before the fibres are joined with a high voltage electric arc. It is completely portable and with battery power can be used down manholes as well as on the surface. The device was the brain child of a team of BTHQ engineers outstationed at Wembley. They received a cheque for £1,000.

The 'Fit for Purpose' competition was launched by British Telecom to stimulate professional skills throughout the corporation and to reward outstanding achievements by staff.

Optical progress

Latest British Telecom research into optical fibre transmission is opening up the possibility that a single hair-thin strand of glass could be carrying about 30,000 phone calls by the end of the decade – 20 times more than at present. Also other work at British Telecom's research laboratories at Martlesham Heath near Ipswich suggests that the interval between regeneration – or amplification – of the light impulses could be raised more than tenfold from the present distance of 30 km to something approaching 400 km.

Further improvements can result from making glass purer than at present. Martlesham scientists are working on infrared glass materials for fibres offering the possibility of attenuation as low as 0.01 dB per kilometre as opposed to the current best of 0.2 per km. Taking all factors into consideration, transmission range could be extended by as much as ten times or more.

Aid for businesses

British Telecom has launched a scheme that places its advanced telecommunications equipment within easy financial reach of business customers. Systemrent is a new fixed-term option for businesses wanting to use British Telecom's latest microprocessor-controlled call connect systems, teleprinters, and other high-technology products.

Products with a sale price above £2,000 will qualify for the scheme and the terms for Systemrent include a connection charge, usually about 20 per cent of the sale price of the equipment, and the rental, made up of two elements.

The main rental element will be determined in relation to the normal sale price and will be fixed over a minimum term agreed with the customer. Minimum terms can vary between two and seven years to suit customers' needs, but terms of more than five years will be limited to the larger call connect systems.

The second element, for maintenance, is payable for as long as the equipment is hired, and will provide a comprehensive 'on site' service.

Contracts

Dictaphone has won a £1.75 million contract for the supply of systems designed to record all emergency 999 calls. The Series 5000 communications recording units are upgraded versions of systems already in use by threequarters of Britain's fire, police and ambulance control centres.

Electrolocation, specialists in cable and pipe location, has won its largest-ever order – worth more than £500,000 – from British Telecom. The Bristol-built Radiolocation sets will be used to confirm the position of underground cables and to avoid other utilities' services.

Ferranti GTE has been asked to supply, under a £750,000 contract, further Rhapsody telephones. A £650,000 option has also been agreed to guarantee the provision of future units.

Fidelity Radio has been awarded a second contract by British Telecom to supply cordless telephones worth some £3¼ million to follow an existing contract worth £1¼ million. The telephones, marketed by British Telecom under the name of Hawk, should have all been delivered by March next year.

GEC Information Systems has recently received orders from British Telecom totalling £16 million. They include £8 million for Ambassador switching systems bringing the total for this system to £30 million since 1982.

Marconi Communications Systems has been awarded two separate contracts from BTI to supply antennae and transmission equipment for the proposed earth station at North Woolwich in London's dockland (see page 21).

Plessey Semiconductors has been given interim approval by British Telecom to supply plastic encapsulated telephone relay drivers, devices which help improve electrical circuit quality.

RTZ Computer Services has been asked by British Telecom to supply software, training and support packages for some 200 staff in 40 UK locations. Worth £500,000, the contracts for the GL General Ledger Package were prompted by the need for better management information at area level.

Standard Telephones and Cables has won an order for ABC alarms, an STC-developed alarm system, that can give warnings of up to three types of emergency over existing telephone lines. The system will be installed in Cambridge area. STC has also signed a $34 million contract in the US to provide Computer Consoles computerised directory assistance system to the UK.

Thorn EMI Electronics has secured its first major order from British Telecom for microwave link equipment with a contract worth nearly £1 million. The order for low-cost point-to-multipoint local distribution systems was won by the company's Communications Division based in Wells in the face of keen competition from the US and Japan.

Informal meetings

British Telecom London are again holding a series of monthly informal meetings during the winter months.

Future meetings include topics such as cable tv (8 December), cellular radio (17 January), raising and spending cash (15 February) and Local Communications Services (15 March).

All meetings are held at Camelford House, Albert Embankment and start at 5pm.

TAT-7 goes live

TAT-7, the new £100 million transatlantic cable was officially inaugurated in September by a video-conference between London and New York. The 3,277 nautical mile cable can carry more than 4,200 simultaneous phone calls and boosts Britain's transatlantic telephone cable capacity by more than 50 per cent.

The new link will handle computer data and telex messages as well as phone calls to and from the US and Canada.

News to US

Two of America's national television networks can now beam British and European news back to the US by satellite round the clock, every day of the year, through British Telecom.

British Telecom International (BTI) has won major contracts to provide ABC and CBS with their own dedicated transmission facilities across the Atlantic, enabling the companies to transmit live and taped television programme material 24 hours a day.

Televotes take off

The recent BBC1 programme *'So you think you can believe your eyes'*, used British Telecom's Televote service to test viewer's powers of observation.

Viewers voted by ringing one of six numbers – three for true and three for false. But nothing was said – the call itself was sufficient to register a vote. British Telecom equipment noted the response, totalled the calls and transmitted the information directly to the studio.

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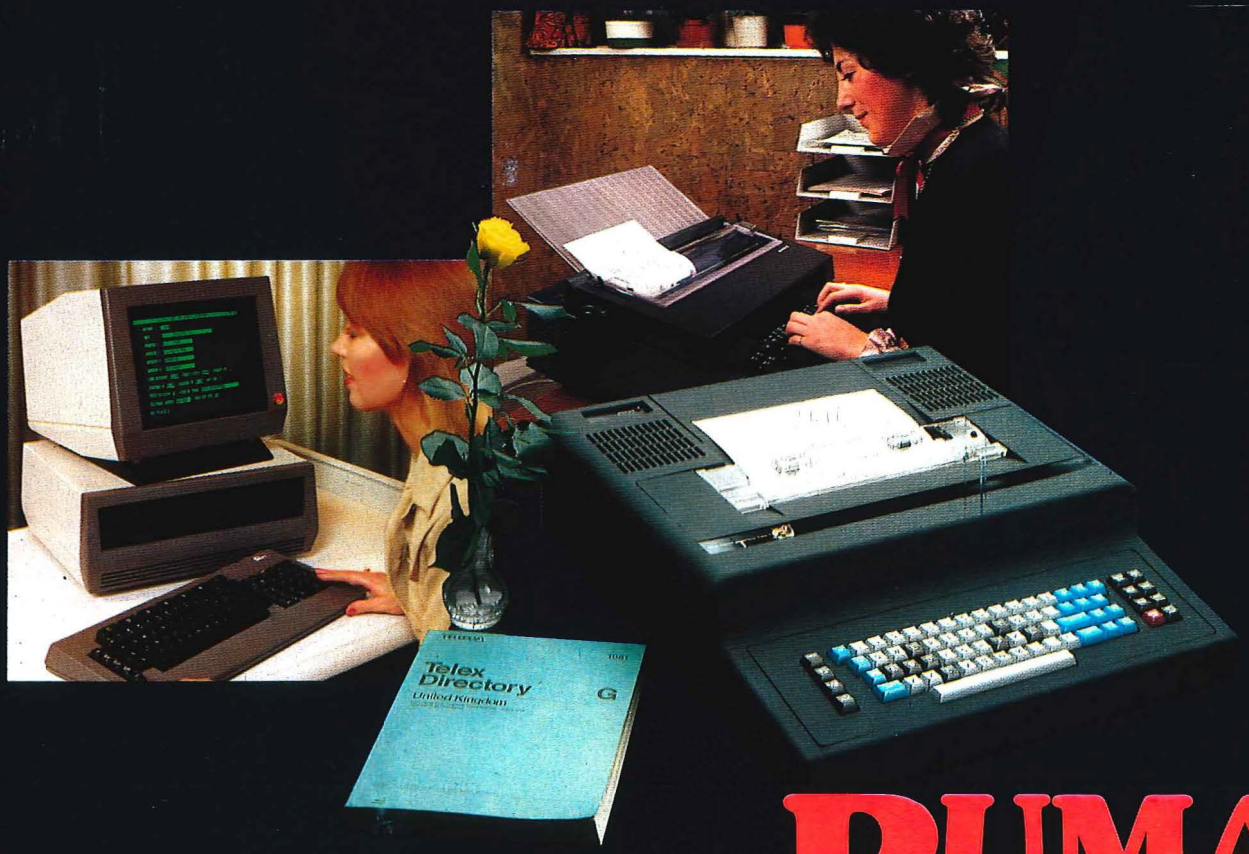

PUMA TELEX

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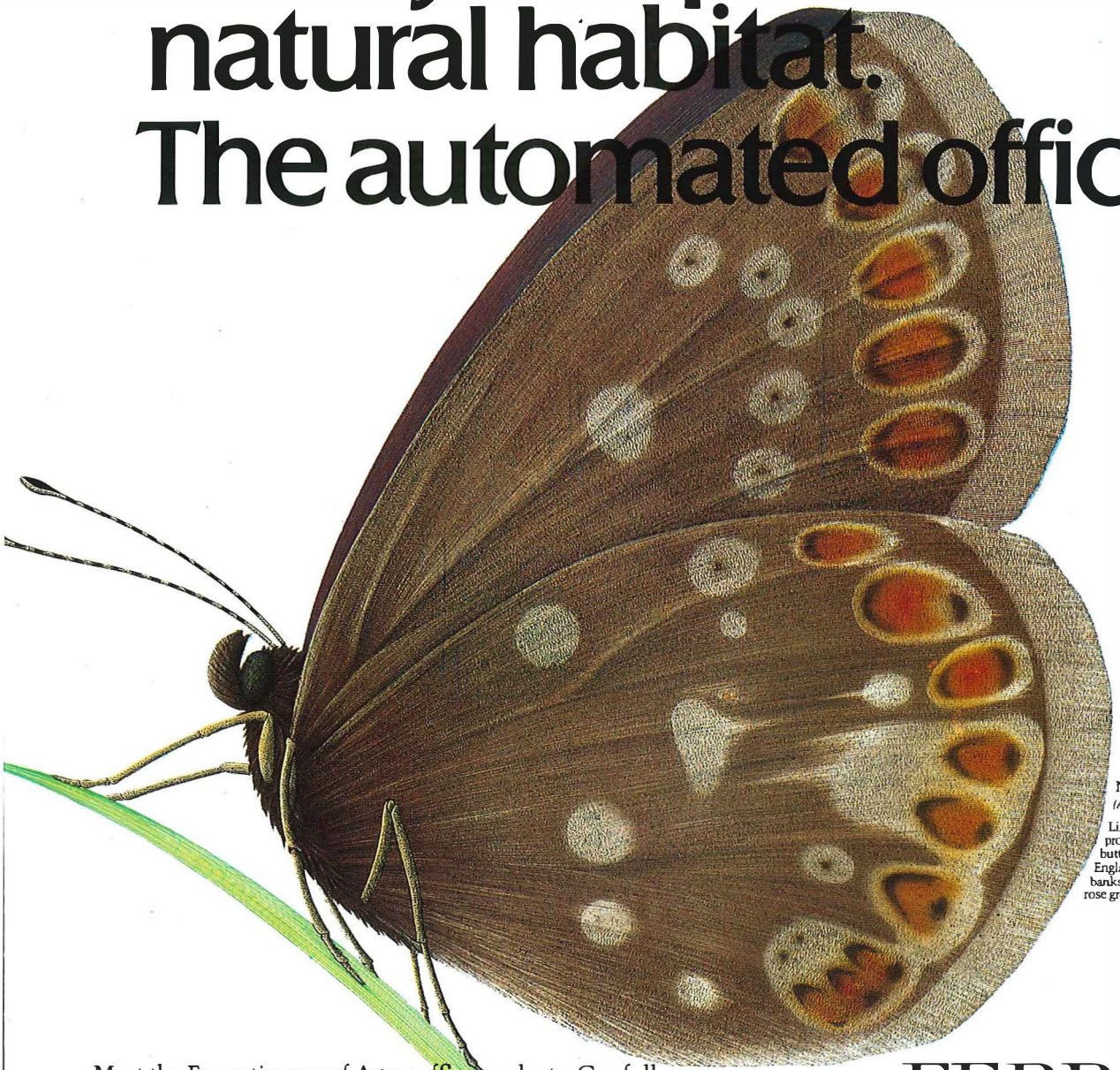
The Argus species. Perfectly adapted to its natural habitat. The automated office.



NORTHERN BROWN ARGUS
(Aricia artaxerxes)

Like its namesake the Argus office product range, this very active butterfly is domiciled in Northern England. Look for it on rough grassy banks where its food plant, the rock rose grows.

Meet the Ferranti range of Argus office products. Carefully evolved to blend naturally with the 'office of the future' environment, Argus products are quiet, compact and easy to live with.

Their user-friendly technology is designed to deliver maximum efficiency with minimum operator effort.

Argus displays, for instance, can be read easily and accurately without eyestrain.

Don't be fooled either by the delicate elegance and eye-catching sophistication of the species. It's a survivor. Durable and flexible enough to adapt to your office's changing demands a d requirements.

Not surprisingly, behind the Argus name is a company with over 30 years in the computer business and an unsurpassed reputation for quality assurance.

The Argus species presently includes the Pro-Personal Computer, the PT7 Programmable Terminal, FT80 VDU Work Station, the Hand Print Recognition Tablet as well as Telex Manager, Teletex Manager, Voice Manager and Teletex Adaptor.

ARGUS
OFFICE PRODUCTS

For further information contact:
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FERRANTI
Computer Systems

I'd like to know more about the Argus family of office products, particularly:

- ☐ Pro-Personal computer
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Satellite communications– the new link.

Whatever the need, Plessey satellite ground stations provide the new link for even better national and international communications.

Proven expertise in switching and transmission systems means that Plessey has the capability to link the ground received satellite signal into public, private and local community networks.

Plessey remote stations supply high quality, reliable telephony, data, telex, television and radio links for businesses and the public.

Plessey Telecommunications Limited recently won a £1 million contract from British Telecom International for an enhanced Standard B earth station at Goonhilly Downs in Cornwall.

Plessey is responsible for the provision, installation, acceptance testing and commissioning of the earth station, which will be transmitting live in 1983.

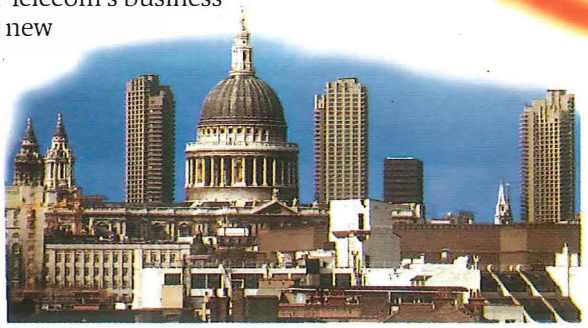
The station will interwork with Intelsat IV, IVA, V, VA, and subsequent satellites to transmit and receive vision and sound on two colour TV channels at either 625 or 525 lines, and is capable of being extended to handle a further two channels.

Contact Transmission Division for further information.

Plessey-the vital link in the London Network.

Soon, London's business community will be getting the full benefit of British Telecom's Kilastream and Megastream X-stream services –at the speed of light.

It's the result of increasing demand from British Telecom's business users for high-speed data transmission facilities. The new services will be carried by a high bit-rate, fibre optic transmission network called the London Network.

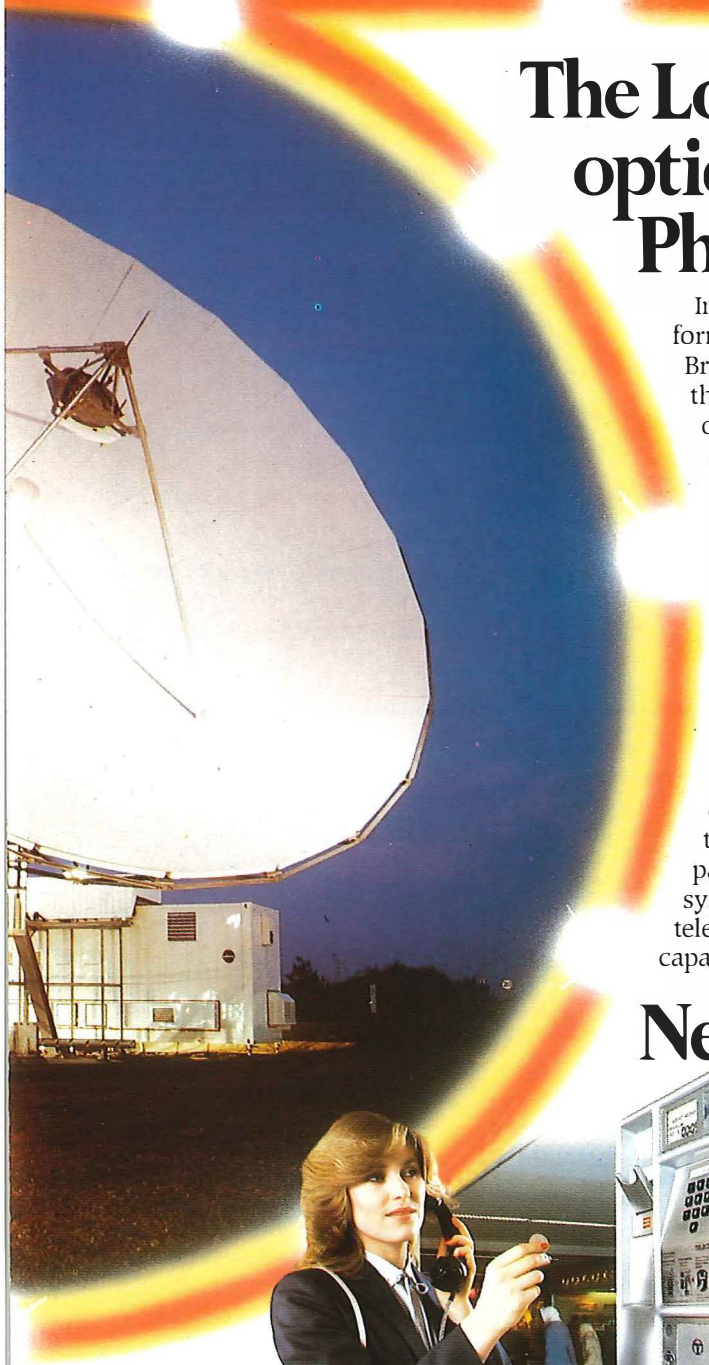


As a world leader in fibre optics, and major UK supplier of optical transmission systems, Plessey was chosen by British Telecom to supply optical transmission equipment.

The contract, worth £0.5 million, includes 8 and 34 Mbit/s line terminal equipment, intermediate station equipment and higher order muldex from the Plessey product portfolio.

With a completion date set for May 1984, Plessey is aiming to commence deliveries in November 1983, to meet British Telecom's requirements.

Contact Transmission Division for further information.



The London-Birmingham optical fibre link enters Phase 2 with Plessey.

In July last year Plessey formally handed over to British Telecom what was then the world's longest optical fibre route. Reaching from London to Birmingham, the link provides two 34 Mbit/s systems each with a capacity of 480 telephony channels or sixteen 2 Mbit/s digital streams for data transmission.

Plessey is now installing and commissioning two further 140 Mbit/s systems, each with a capability of providing 1920 telephony channels or the equivalent in data, marking Phase 2 in the London-Birmingham programme.

As a world leader in optical fibre systems Plessey continues to make fresh advances in optoelectronic technology, which is one reason why it was chosen to participate on the London-Birmingham link. For optical systems from 2 to 565 Mbit/s providing 30 to 8000 telephone channels per installed fibre, Plessey offers a total capability. *Contact Transmission Division for further information.*

New intelligent Plessey payphones for New Zealand.

The new Plessey payphones are unique. They're tough on vandals and what's more they can function on their own—making them a highly attractive and cost effective proposition for any PTT authority.

In New Zealand, Plessey has been awarded a three-year contract (with a further right of renewal) to supply payphones to the Post Office.

In July 1982, Plessey won the £40 million contract to supply 77,000 new microprocessor controlled payphones to British Telecom.

The payphones, being installed now throughout the UK, were chosen on their high reliability, automatic status reporting, and ability to refund unused coins.

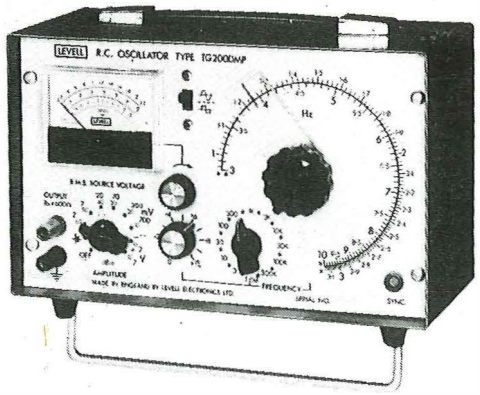
Contact Telecommunications Products and Services Division for further information..

Plessey Telecommunications Limited (Transmission Division) Beeston, Nottingham, United Kingdom NG9 1LA. Tel: Nottingham (0602) 254831. Telex: 37201.

Plessey Telecommunications Limited (Telecommunications Products & Services Division), Edge Lane, Liverpool, United Kingdom L7 9NW. Tel: Liverpool (051) 228 4830. Telex: 629267.

PLESSEY telecommunications

RC OSCILLATORS



LEVELL ELECTRONICS have a range of OSCILLATORS covering frequencies from 0.02 Hz to 2 MHz.

There is a DECADE OSCILLATOR with digital frequency tuning and a FUNCTION GENERATOR providing sine, square, triangle, pulse, ramp and asymmetrical sine waves.

Various RC OSCILLATORS are available as detailed below:

TG152 SERIES

FREQUENCY	3 Hz to 300 kHz in 5 decade ranges.
ACCURACY	±2% ±0.1 Hz to 100 kHz, increasing to ±3% at 300 kHz.
SINE OUTPUT	2.5V rms down to <200 μV.
DISTORTION	<0.2% from 50 Hz to 50 kHz. <1% from 10 Hz to 200 kHz.
SQUARE OUTPUT	2.5V peak down to <200 μV.
SYNC OUTPUT	2.5V rms sine.
METER SCALES	0/2.5V and −10/+10 dB on TG152DM.

TG200 SERIES

FREQUENCY	1 Hz to 1 MHz in 12 ranges. 0 to 1% fine control to TG 200DMP.
ACCURACY	±1.5% ±0.01 Hz up to 100 kHz. ±2% up to 1 MHz.
SINE OUTPUT	7V rms down to <200 μV with Rs = 600Ω.
DISTORTION	<0.05% from 50 Hz to 15 kHz, <0.1% from 10 Hz to 50 kHz, <0.2% from 5 Hz to 150 kHz, <1% at 1 Hz and 1 MHz.
SQUARE OUTPUT	TG200D, DM and DMP only, 7V peak down to <200 μV. Rise time <150 nS.
SYNC OUTPUT	>1V rms sine in phase with output.
SYNC INPUT	±1% freq. lock range per volt rms.
METER SCALES	TG200DM and DMP only, 0/2V 0/7V and −14/+6 dBm.

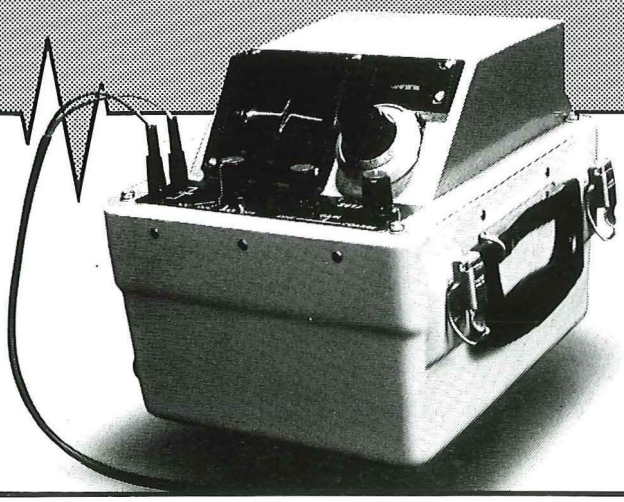
TG152 SERIES: £88 to £110

TG200 SERIES: £110 to £149

Send for data covering our range of instruments. Prices are plus carriage, packing and VAT.

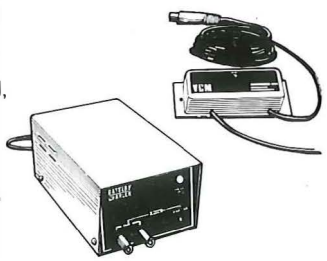
LEVELL ELECTRONICS LTD.

Moxon Street, Barnet, Herts. EN5 5SD, England.
Telephone: 01-440 8686/449 5028.



'MINI-MOLE' is battery operated and can be used anywhere – without mains supply. To ensure its constant readiness in the field, a mains battery charger and an in-vehicle charger module are available options.

'MINI-MOLE' finds faults quickly, accurately, simply and economically.



MINI-MOLE

Cable Fault Locator
New 2km version available

There's no hit or miss with this unique, robust and highly portable instrument. In seconds, it pinpoints faults with laboratory accuracy – but it is built as a rugged, simple, every day working tool for use in the field.

'MINI-MOLE' is British Telecom approved. It has immediate time and cost saving applications wherever underground or above ground networks are vital to communication. To P.T.T.'s it is an essential aid to constantly reliable operation.

Wherever there is a cable – there's a need for 'MINI-MOLE'. In factories, industrial and military installations, in ships, security systems, cable T.V. or any office where computers and electronic systems are essential to efficiency.

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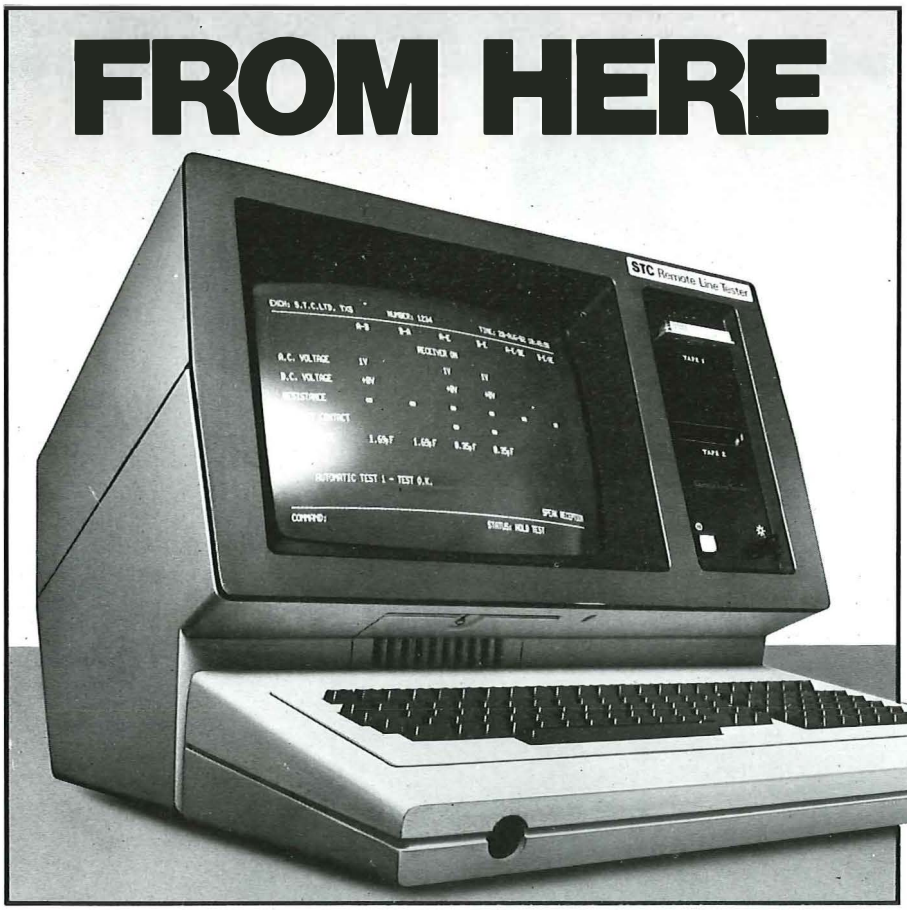
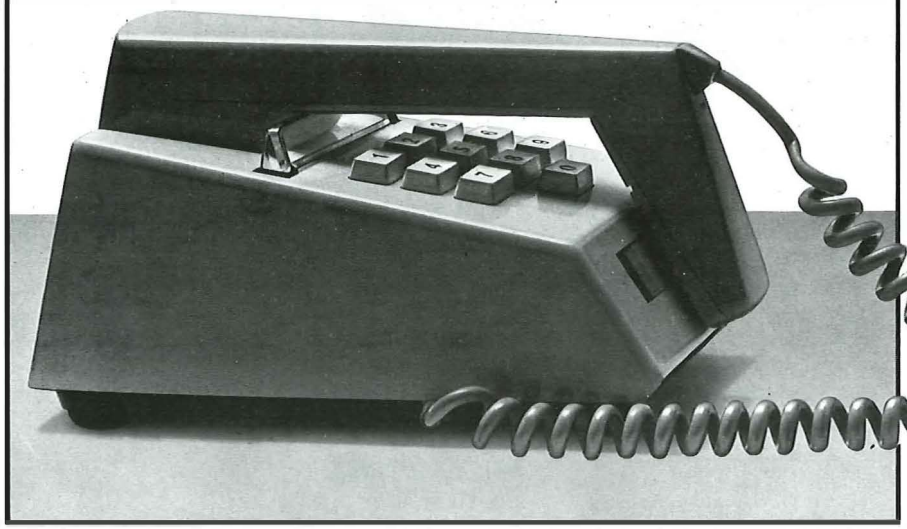


STC'S REMOTE LINE TESTER

TO ETERNITY



CAN CHECK SUBSCRIBER'S LINES REGARDLESS OF DISTANCE.

From London to Edinburgh.
From Lands End to John O'Groats.

Or from Clapham Common to Tooting Bec.

STC's new RLT, or Remote Line Tester, can locate and identify faults on a subscriber's line or telephone (even coinboxes, or subscriber's private meters), from any distance via the telephone network regardless of transmission medium.

Automatic routining facilities can take place overnight by simply programming the central controller.

This operates on a network of unmanned Remote Units in telephone exchanges in the test areas.

Moreover the RLT has a print-out facility available on demand for all lines falling outside of pre-set BT standards.

The logical sequence of operations with STC's RLT means that little retraining of test operators is needed.

British Telecom set STC the problem of designing equipment which would improve the efficiency of STC's universally used machinery.

And the STC's Remote Line Tester was the answer.

If you would like to know more about the STC RLT, please ring us on 01-368 1234, or write to:
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Information Terminals Division,
Oakleigh Road South, New Southgate,
London N11 1HB.

STC

STC Telecommunications Ltd.

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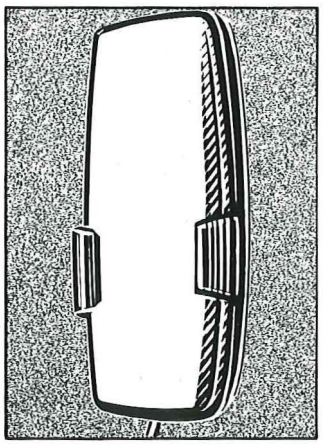
Prepare yourself for a flood over here.



The phone is the Flipfone. The original one-piece telephone with the multi-million turnover.

It's approved for use on the B.T. network and is now available for immediate delivery.

Its consumer appeal is proven.

It has last number re-dial, an attractive space saving wall holster and an eyecatching design.

In fact its a conversation piece!

The RRP is a mere £49.95 including VAT (£4.95 for the holster) and the trade price will endorse our claim that the Flipfone really is an exciting new profit opportunity.

Little wonder it has been a phenomonal success in the States, and with the marketing campaign already under way over here it looks as if the U.K. market will match its counterpart across the Atlantic!

Consumer Products are not distributing the Flipfone but if you would like to sell it in your area and enjoy the benefit of a national advertising campaign contact **Justin Orde on 01-581 8011** or return the coupon below.

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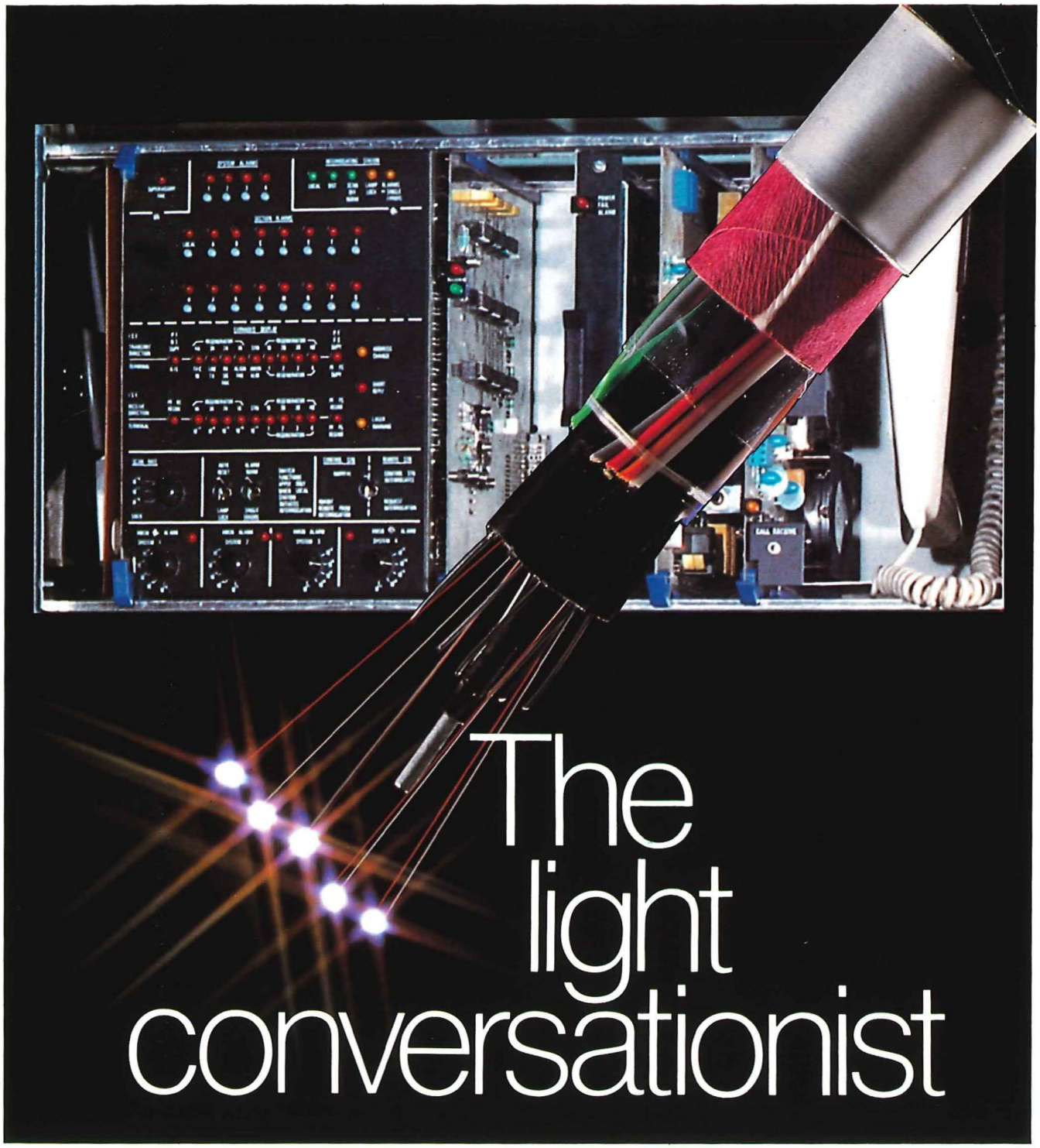

The light conversationist

There's nothing lightweight about our commitment in the field of light transmission The above sample of Teloptic Cable – a highly successful common link between the source and end user – is simply one example. With more than fifty years' experience in manufacturing and installing all types of cable, with the vast resources of associated GEC companies to call on and a world-wide, working knowledge of network project management – we have the capability to provide the *complete* fibre optic package. So why not let TCL shed a little light on your next telecommunications project.

TCL

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But then, most word processors ask for it.

They might as well spend their time in solitary confinement in the office word processing department, because that's all they can do: process words.

Not so with ICL's DRS word processing systems. They have another string to their bow.

They can communicate.

This vital ability has enabled ICL to create the DRS Document Storage System. Linked into a Local Area Network, every single DRS word processor - wherever it may be situated - can call up, store, and update information held in a central electronic file.

But this ability to communicate is not limited to other word processors. DRS word processing systems also link the users with office systems like phototypesetters, optical character readers, and telex. They provide access to the BT Gold electronic mail system, and can connect with other computer systems like IBM, Honeywell, DEC, and Olivetti. And, of course, they can communicate with all ICL distributed office systems through IPA—ICL's Information Processing Architecture.

Even by themselves, DRS word processing systems can run a host of DP applications on CP/M86.* So combine the flexibility and resilience of a stand-alone system with all the operational benefits of shared resource working and communication, and you can see why DRS word processing systems are far more than word processors.

It's criminal what some people do to word processors.

They are information processors.

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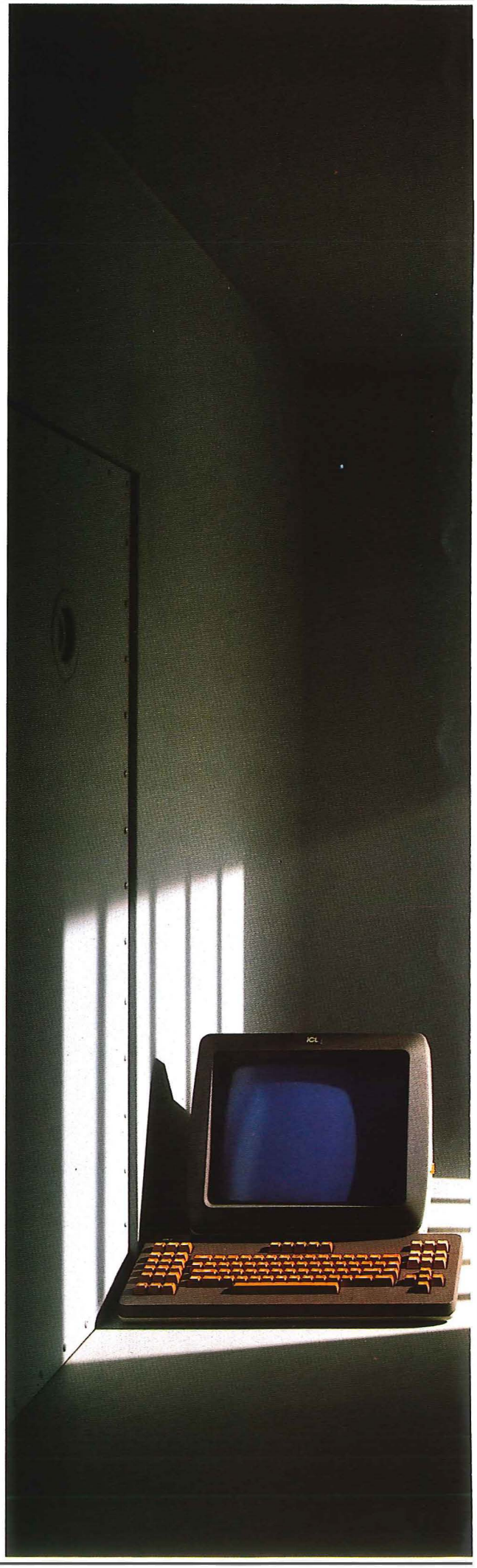

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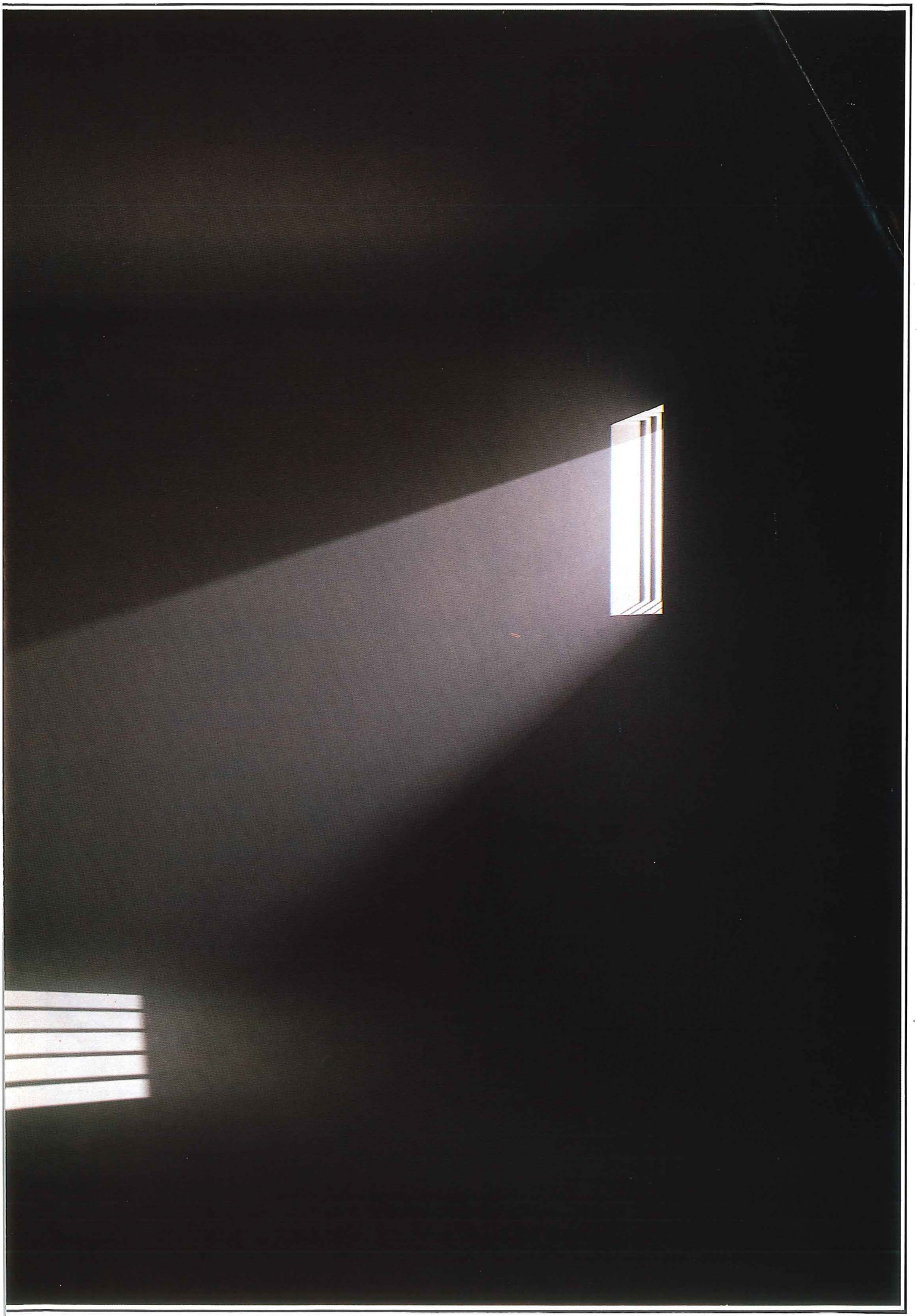

Good Morning

It's the dawn of the digital 80's from GEC Telecommunications. Now with a total network capability in digital transmission systems up to 140 Mbit/s; microwave radio systems, coaxial-cable and optical-fibre line systems and a complete range of digital multiplex.

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Telecommunications

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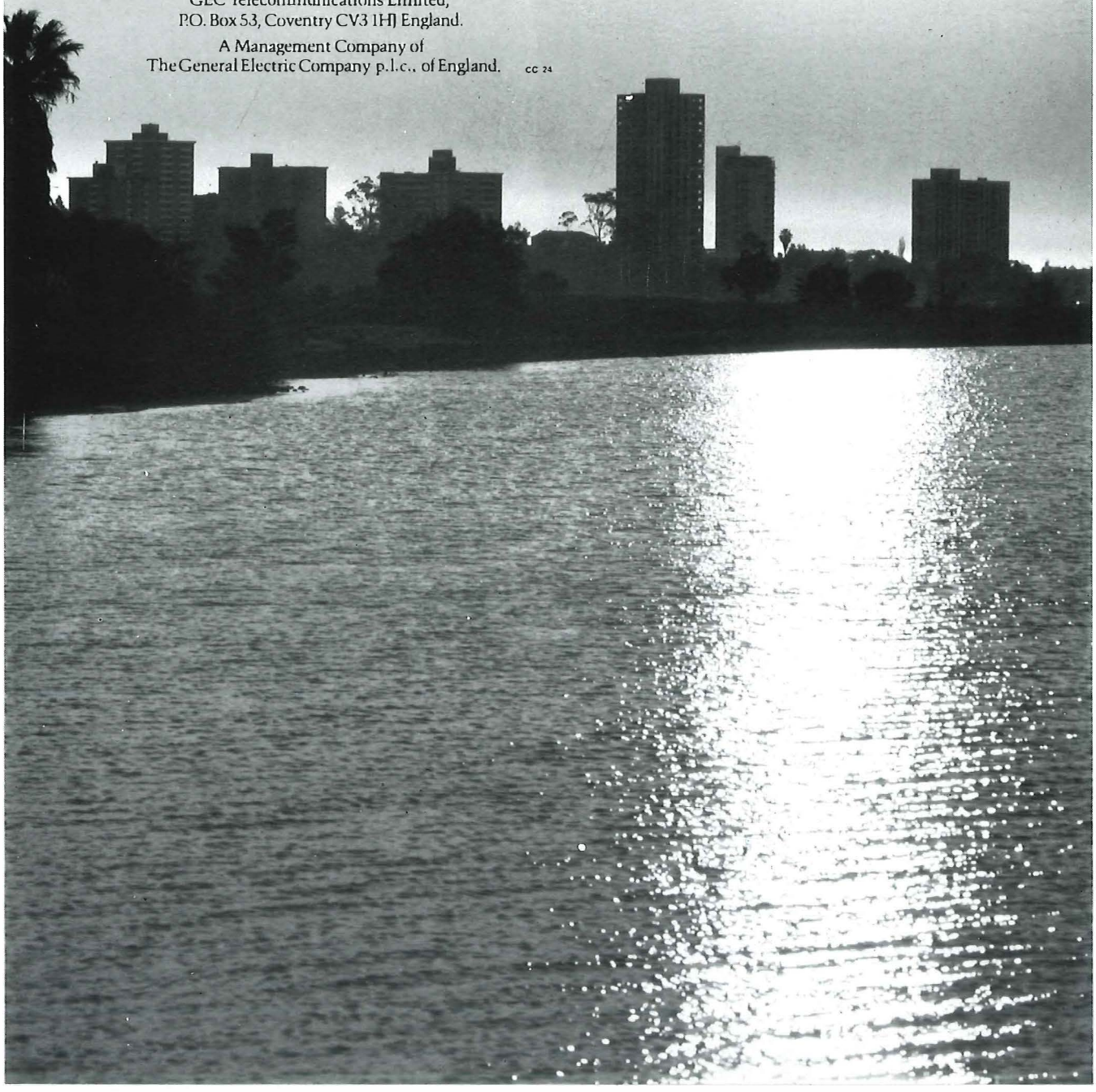

Did your minicomputer's memory suddenly forget?

Next time be ready with a Sola Mini UPS.

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The Power Protectors

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A Sola Mini UPS works continuously to insure clean, no-break, no-dip power. It converts commercially available AC power to filtered, regulated AC power to protect your system from power problems every day. In the event of a blackout it provides uninterrupted back up power until commercial voltage is restored. Units are available in 400 or 750 VA, 60 Hz and 300 or 600 VA, 50 Hz, with up to 24 minutes of battery back up.

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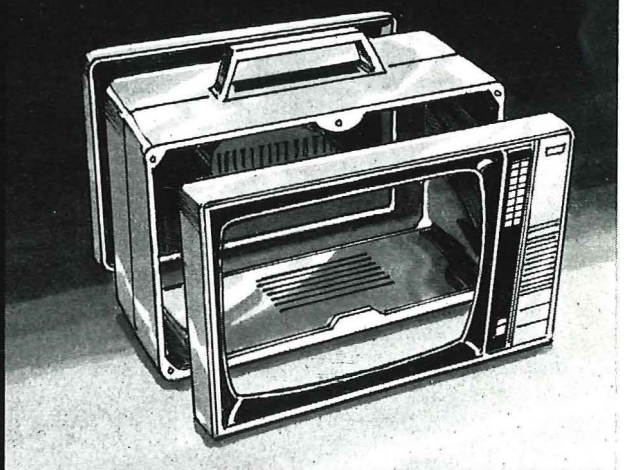

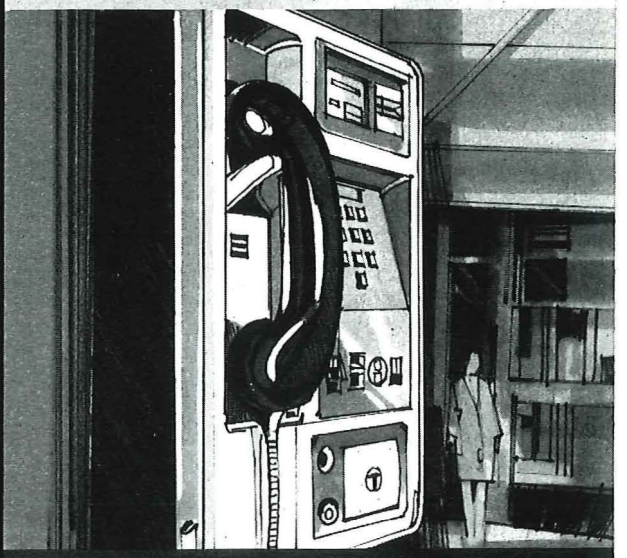

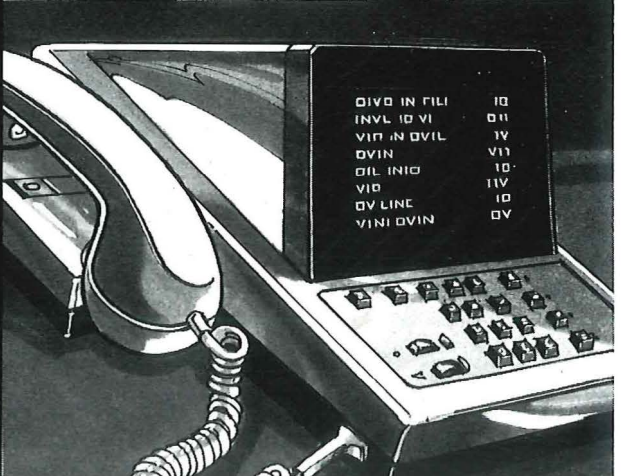

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