Post Office telecommunications journal

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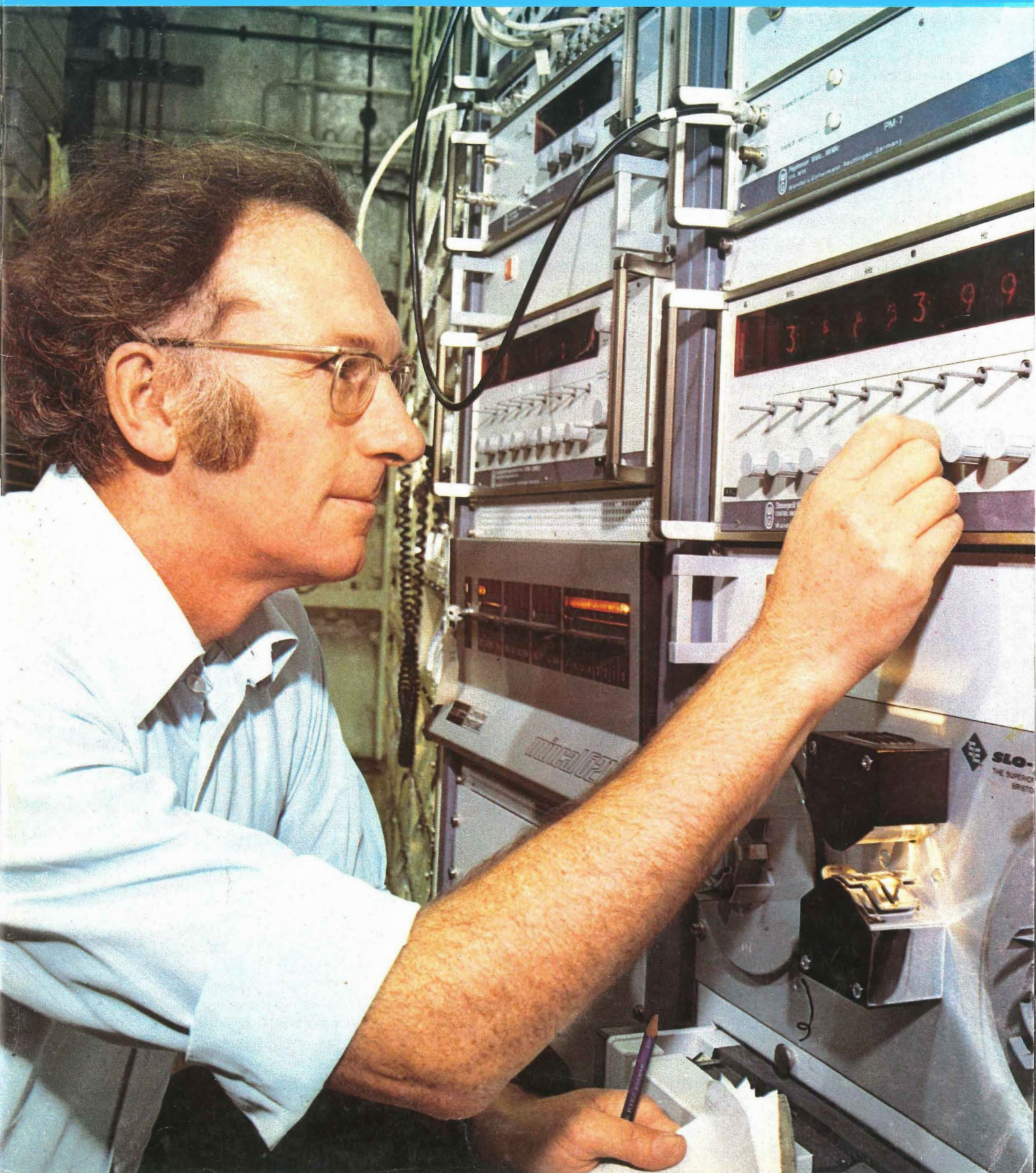

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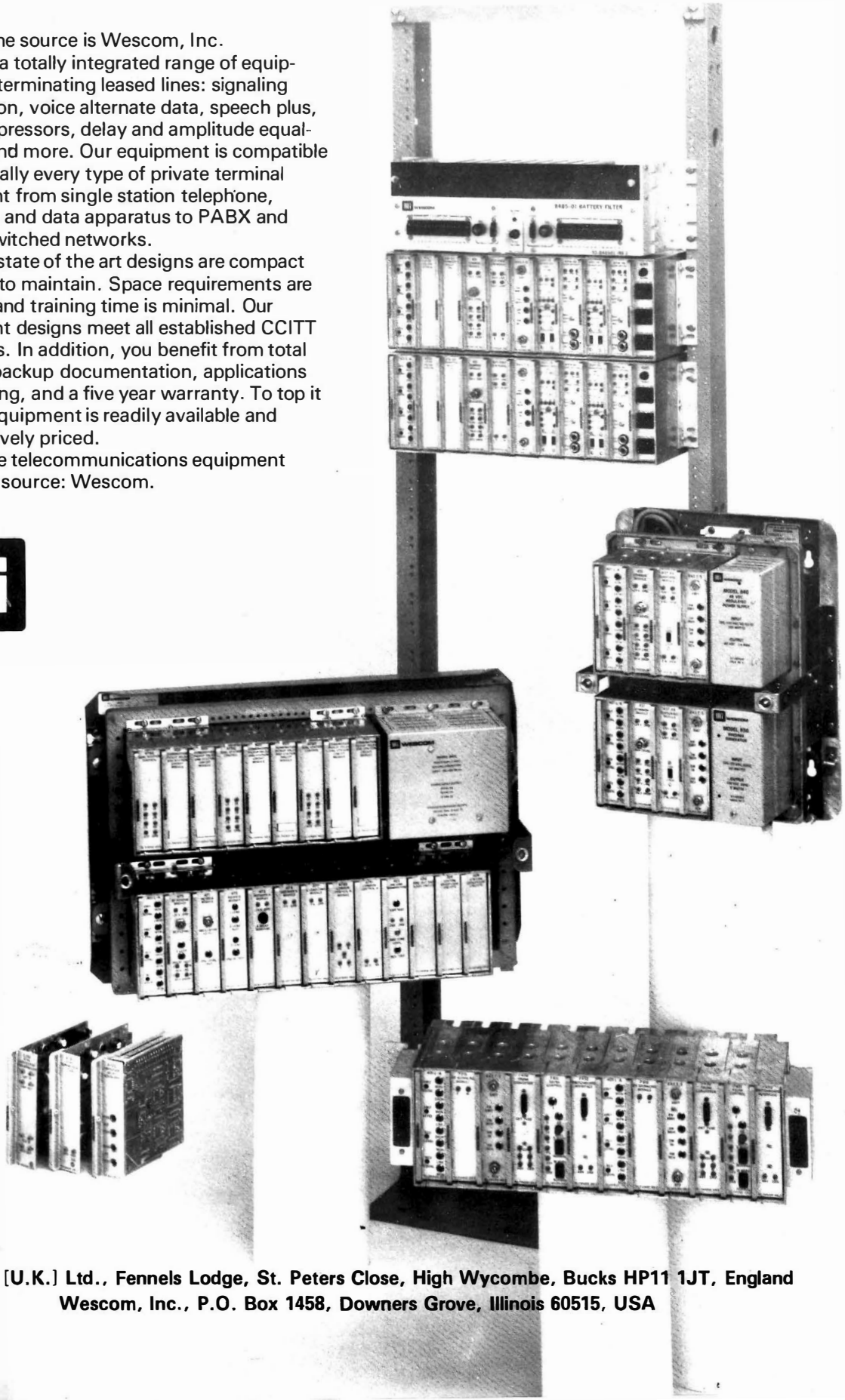

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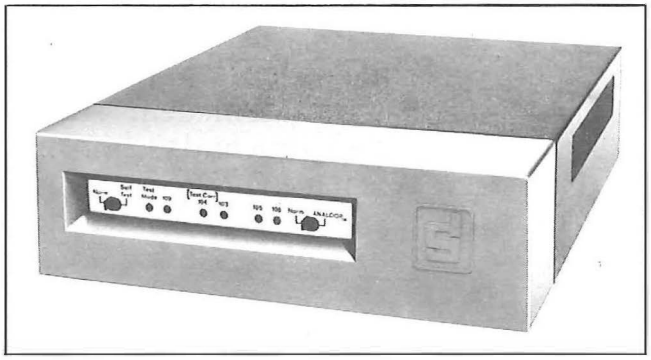

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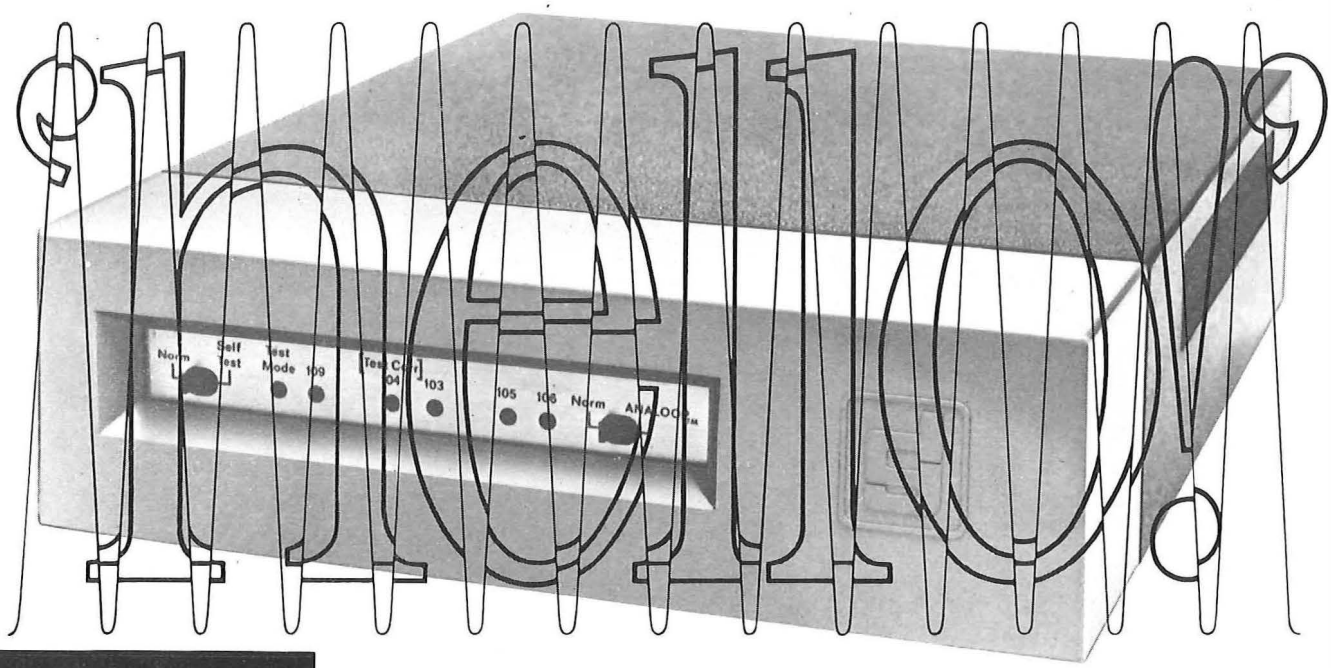

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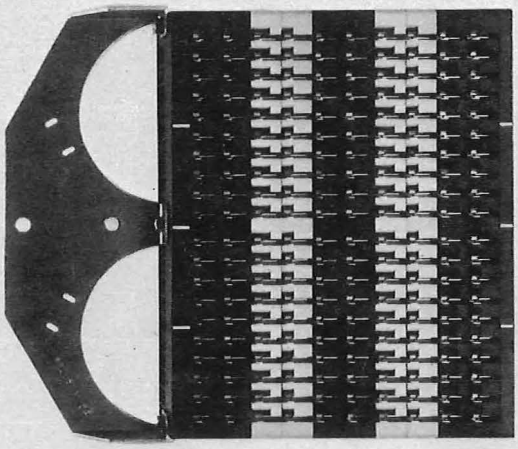

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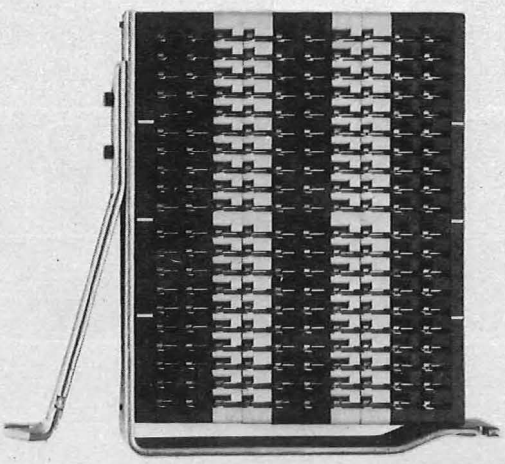

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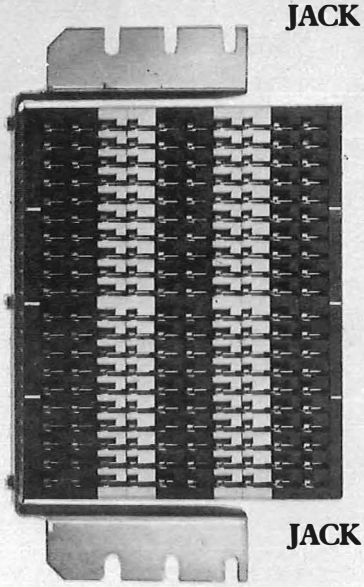

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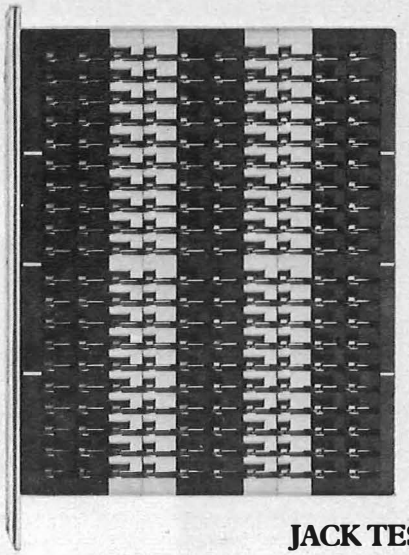

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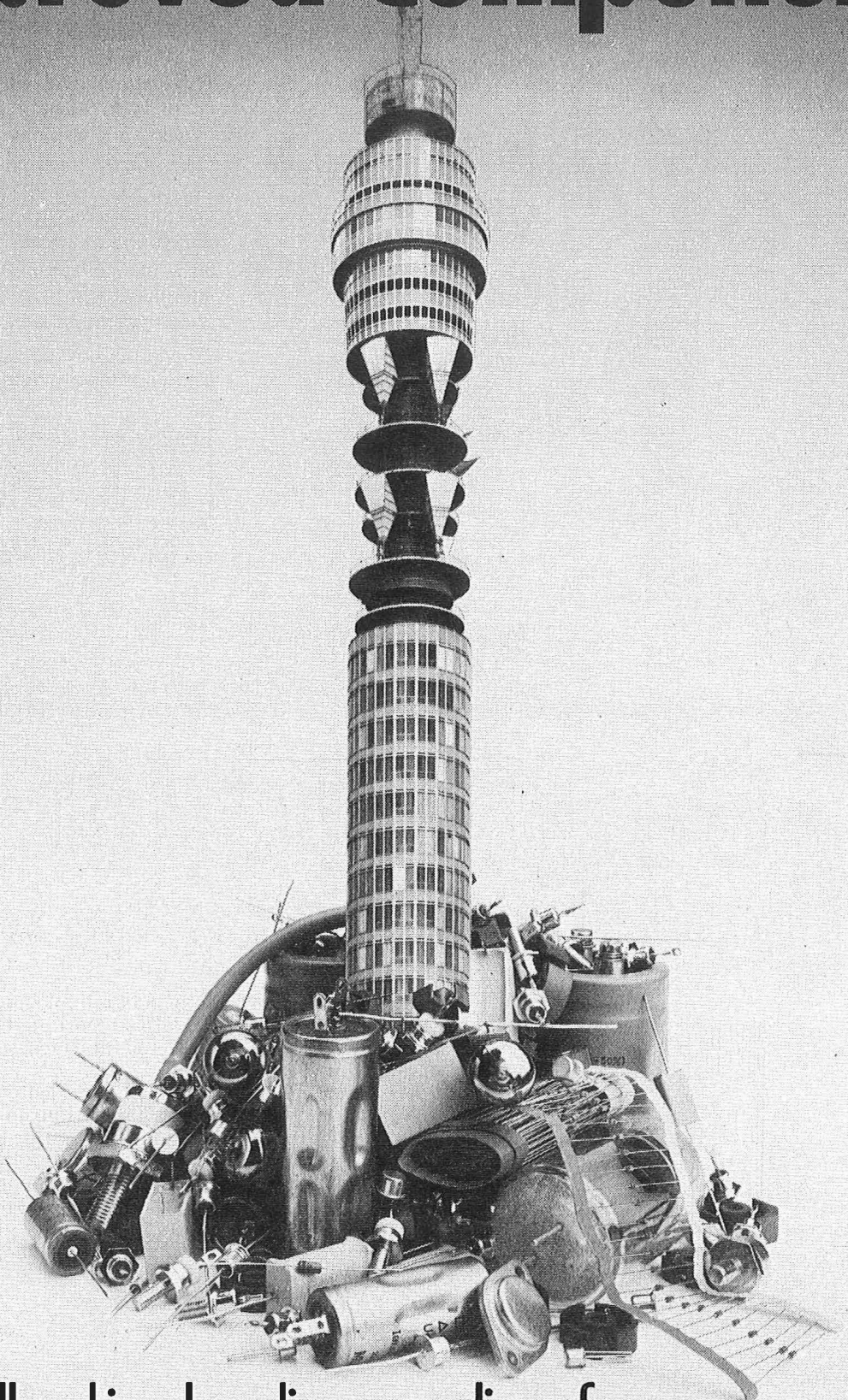

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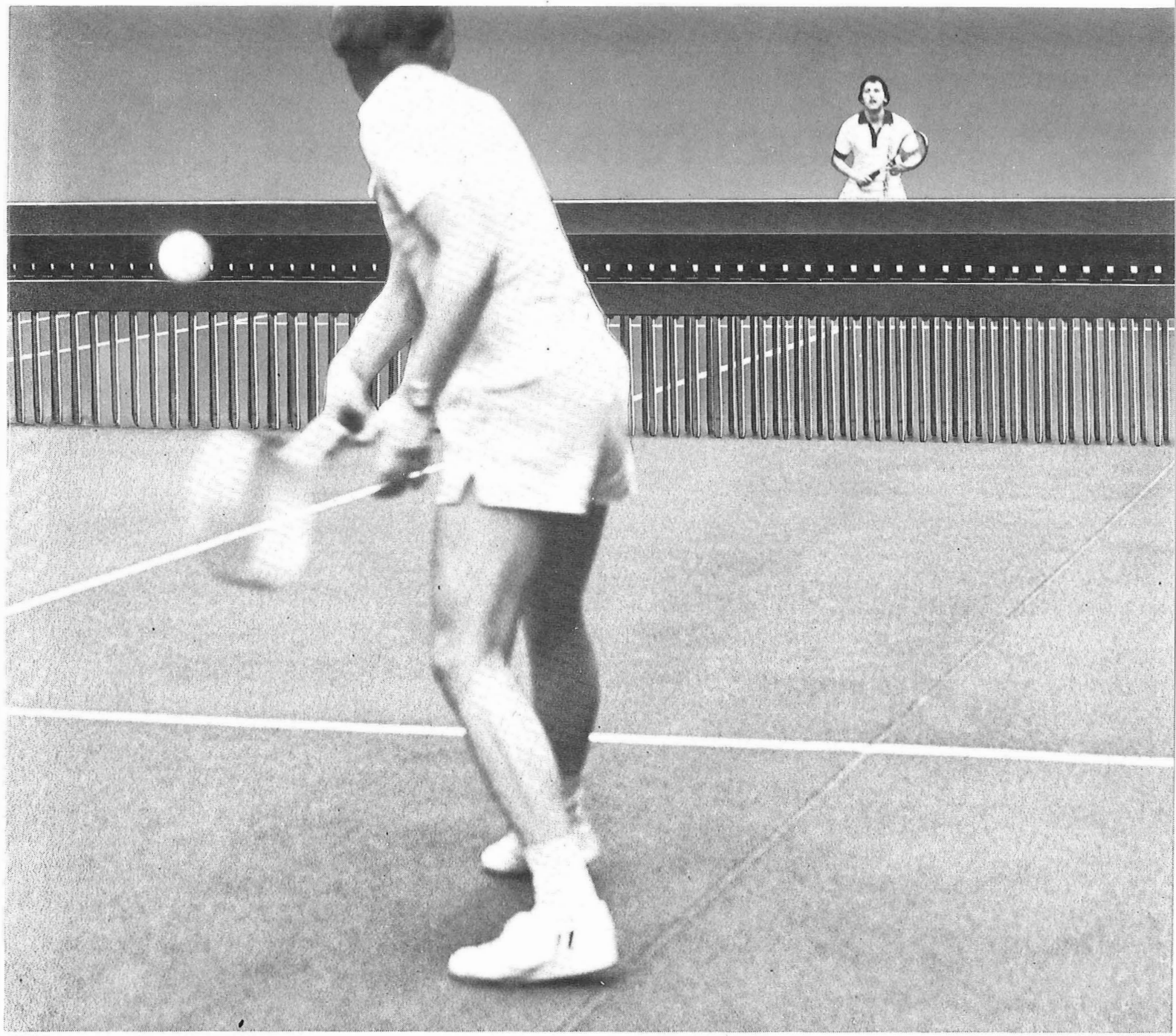

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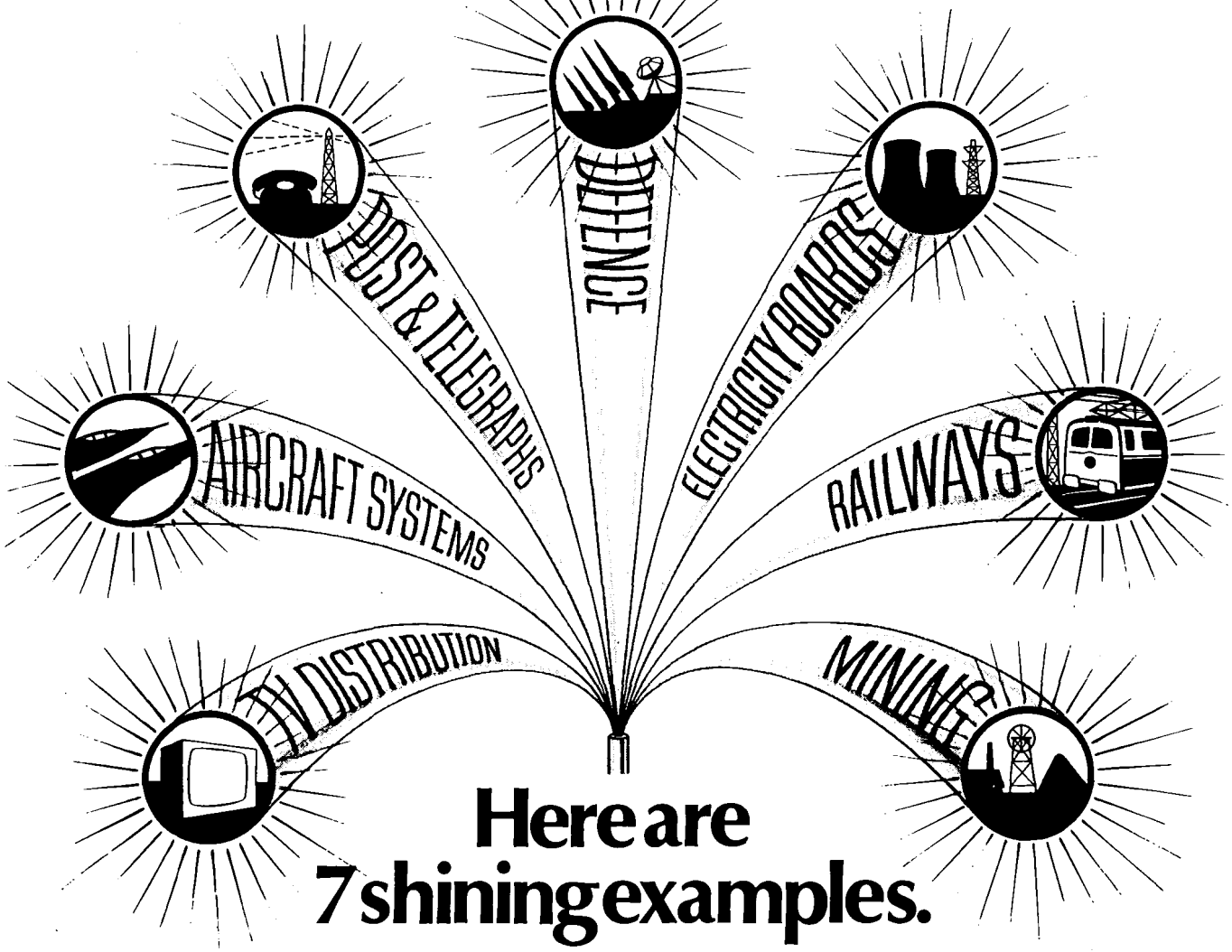

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In addition to its complete immunity to electromagnetic radiation, optical fibre promises many other advantages over conventional copper circuits. For example, low attenuation coupled with high bandwidth. Small flexible and light of character, it also eases handling and installation. And ultimately there's the obvious benefit of low product-cost and low scrap value.

If you want to know more about Teloptics – facts, figures or advice – contact the Teloptic Communications Department, Telephone Cables Limited.

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Space for links with Europe

Support for the European Communications Satellite (ECS) project which will provide valuable alternative routes for telephone calls and live television transmissions between Britain and the Continent, marks a further step forward in Post Office plans for meeting the continuing high growth in international communications.

The ECS project is being managed by Eutelsat, the organisation set up by the European telecommunication administrations specifically for the purpose. The Post Office was the 16th signatory to an agreement which will divide the cost of the project among the countries taking part in it.

Each nation's share in ECS is about equal to its estimated use of the satellite's capacity. Britain's share is 15 per cent and with France we are the biggest contributor to the project. Only one other document remains to be signed to make ECS a reality: an agreement between Eutelsat and the European Space Agency (ESA) under which the Space Agency will design, build and launch the satellites making up the project.

Mr Peter Benton, managing director, Telecommunications, has commented that the Post Office's backing for ECS is vital both for Britain and Eutelsat. With its large capacity – it can handle up to 12,000 phone calls and two television pictures simultaneously – Europe's own spacecraft will help not only cater for the increasing number of phone calls between Britain and Europe but also enable the Post Office to meet demand for new services in the future.

The first satellite is due to be launched in 1981 and it will be used initially in trials of the services which ECS will make possible. It will become operational when the second, standby, satellite, planned for 1983, is available. Both satellites will be in geo-stationary orbit 35,900 km (22,300 miles) above the equator.

The ECS satellites will operate at 11/14 GHz – much higher radio frequencies than those in current services – and use new techniques which are already being tried out with Europe's Orbital Test Satellite (OTS) launched earlier this year. A new all-British designed earth aerial to work to OTS was unveiled recently at Goonhilly earth station in Cornwall (see page 15).

Although this new aerial will be able to work with ECS as well as OTS, it is likely that for operational use another aerial will be built at the Post Office's second earth station at Madley near Hereford.

As well as carrying phone calls and television pictures, ECS will also allow the introduction of new high-speed data services. It will also have the capability of providing telecommunications services for North Sea oil platforms beyond the range of the Post Office's present radio systems.

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Cover: Technical Officer Bob Anderson of St Margaret's Bay repeater station, Kent, checks the signals being received from submerged repeaters on the UK–Belgium submarine system using new computer controlled measuring techniques. (See page 4.)

The ten-year target

D Maul

Wales and The Marches Telecommunications Board has drawn up a special 10-year plan for improving its local underground network with a view to halving the number of faults over the next decade and bringing service into line with the national average.

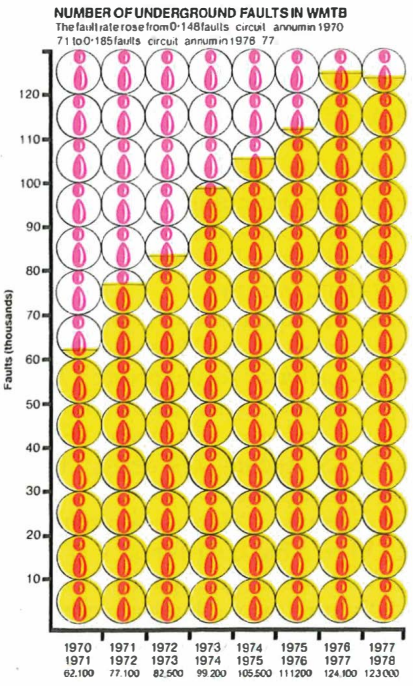
THE TREMENDOUS technological advances of recent years are probably nowhere better illustrated than in the development of Post Office Telecommunications. As customers' equipment has become more complex, so has there been spectacular advances in the design of switching systems, and dialling to some of the most remote places in the world is now commonplace.

In the local cable network, however, although the type of cable sheath used has altered – as have methods of sheath closure – basically, each customer still relies on an individual pair of wires between the exchange and his premises. Reliability of the local network plays a vital part in the quality of service offered to customers, and in the cost of maintenance activities. Unlike most other parts of the system, the local network is not duplicated in any way, so that failure of a local cable means customers are out of service for as long as it takes to effect a repair.

Before the WMTB plan was drawn up the average customer in the Region could expect more faults on his line than the average customer elsewhere in the United Kingdom. He was also likely to have to wait longer for the fault to be cleared.

It was against this background that the WMTB 10-year Improvement Plan for reducing the fault rate and bringing it in line with other parts of the UK, was formulated early in 1977 and became fully operational a few months later. And already benefits have been achieved. The fault rate in 1977-78 was reduced and there was a considerable reduction in the number of faults lasting longer than two days.

Growth in the network will play an important part in securing improved performance, but achieving total success will depend on a sustained drive at improvement over the whole 10-year period. The number of working circuits in Wales and The Marches is expected approximately to double



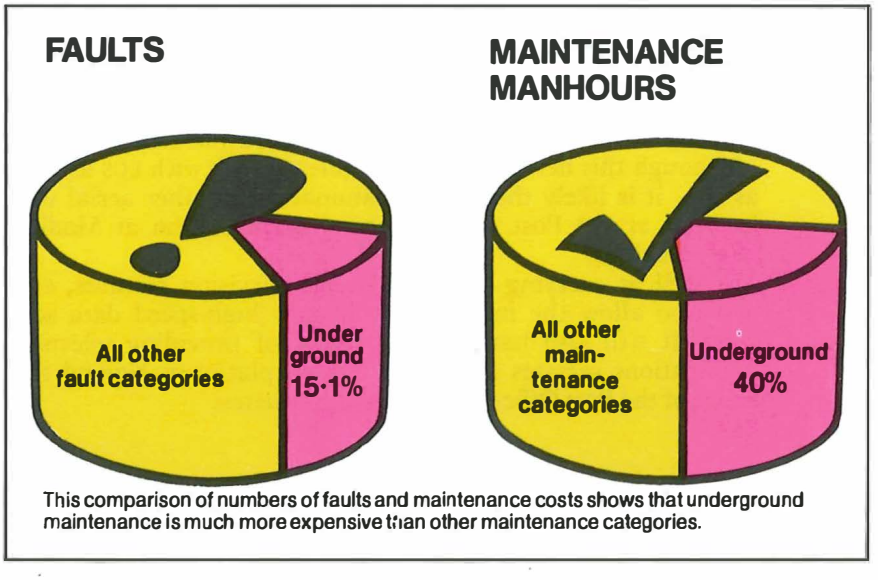
over the next decade, and this will virtually complete the network for the remainder of this century. The plan will be used as a practical tool to guide the field force and is flexible enough to be reviewed and varied at regular intervals to suit changing circumstances.

A target performance for all new circuits of better than 0.054 faults per circuit per annum has been laid down, and the plan includes a code of recommended standards for new plant to help planning and provisioning staff meet the target figure. This code contains a number of fundamental guidelines, including the type of distribution system to be used, circumstances in which cables should be fed in duct, and the kinds of joints to be utilised.

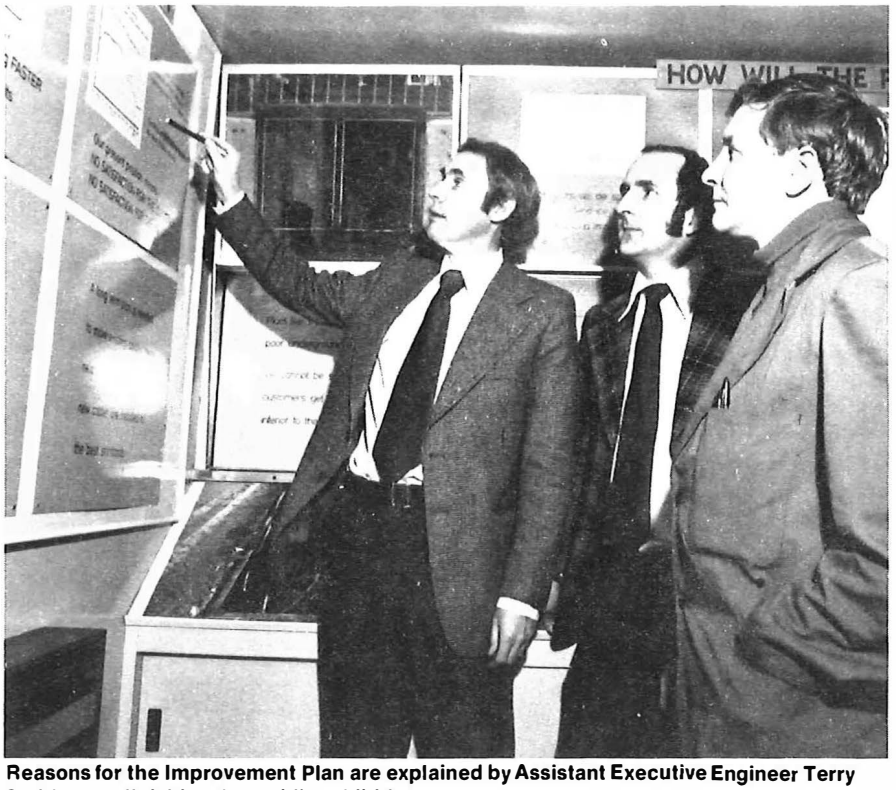
The performance actually achieved by new plant is being measured on a sample basis throughout the Region followed by thorough investigation and concentration of effort if performance is found to be below the desired figure.

It is, of course, equally important to halt the deteriorating performance of existing plant and to begin to improve it, and it is intended that systematic identification and replacement of the most fault-prone parts of the network will be carried out. An improvement target of a five per cent per annum has been set which, taken with the achievement of the new plant standards, will enable the overall network target to be met.

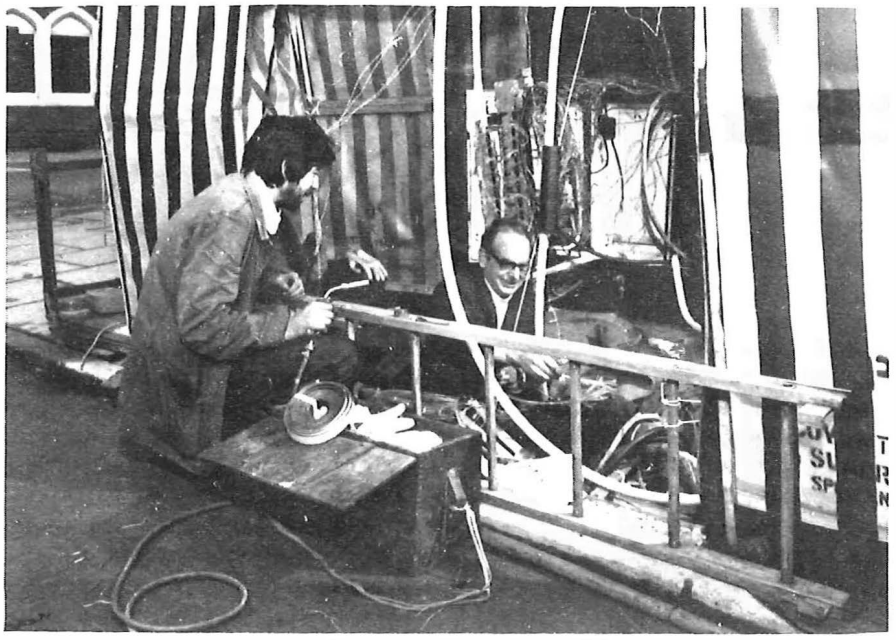
The starting point for any plan must



This comparison of numbers of faults and maintenance costs shows that underground maintenance is much more expensive than other maintenance categories.



Reasons for the Improvement Plan are explained by Assistant Executive Engineer Terry Smith to staff visiting the mobile exhibition.



Technicians Ron Jones (right) and Trevor Griffiths, of Cardiff Area at work renewing a primary cross connection and associated joint.

be a full, detailed understanding of the problems involved. Identifying the precise cable, joint or interconnection point which is the root cause of a problem is no easy task. Three methods of locating poor items of plant are available, all of which are now being used.

Local Line Insulation Routiner (LLIR) will enable potential faults to be found before customer service is lost; the Report of Defective Plant procedure will be used by staff in the field to draw attention to bad plant; while Blackspot Analysis will enable individual customers' fault histories to be built up in such a way that common items of plant giving rise to faults are identified.

Having identified a list of plant requiring replacement or improvement, the work is programmed. Some jobs, such as renewing a small joint or cable length are small, in which case the work is done quickly, as the items are identified. Many of the jobs revealed by LLIR work fall into this category, but other tasks are bigger, involving perhaps the renewal of an entire cross-connection point or even the replacement of sections of the network on housing estates. These must be allocated priorities and arranged into a programme of work for jointing staff.

Plant on the replacement list in localities for which development schemes are planned, will be incorporated in the job as part of the overall scheme to achieve maximum economies. Also, of course, some improvement work will be done in the normal course of fault repairs.

A vital part of the plan is to ensure that funds are available at the time and in the places needed for the additional work. The plan has meant insisting on the highest standards of plant provision, but in bringing this about, a careful balance must be struck, and a financial monitoring system has been set up by which the costs and achievements can be kept under scrutiny.

Because final success relies on staff and their immediate supervisors carrying out the work, several methods are being used to make everyone aware of the reasons for the plan. An exhibition caravan toured the Region between December last year and April this year visiting all centres occupied by staff involved with the underground network.

The facts and figures behind the plan were shown with photographs indicating the standards of plant provision to be aimed for. An exhibition of some practical examples of the correct techniques to be used was included and visitors were encouraged to discuss the plan in the context of their own type of problems.

Special training courses have also been run for supervising officers to ensure that all the methods of obtaining the highest quality plant are understood. Staff are being kept informed of progress of achievement of the plan and given information on new items and techniques in a six-monthly news-sheet called "Cable News and Views."

Success will ultimately depend on every member of staff engaged on the network contributing positively to the improvement. A good start has been made, but there is still a long way to go and much dedicated work ahead if the long term aims are to be achieved within the 10-year time scale.

Mr D. Maul is Head of Group in external maintenance, Wales and the Marches Telecommunications Board.

Computer measures for undersea cable

PJ Clark and C Ball

The beach at St Margaret's Bay near Dover where the UK-Belgium cable subject of the computer controlled measuring techniques, comes ashore.

ONE OF THE basic essentials of any submarine cable system is a facility to monitor accurately its performance, and with the increasing band width of modern systems this has usually proved a tedious and time consuming duty for staff working at both terminals.

A new technique which uses a programmable computer controlled measuring equipment to acquire the cable maintenance information has now been developed and is being used on the latest UK–Belgium cable which runs for 100km between St Margaret's Bay, Kent in the United Kingdom and Veurne in Belgium. This cable system can carry 3,900 simultaneous phone calls.

Modern submarine cable systems usually consist of a single coaxial cable laid between the terminal stations with repeaters inserted at regular intervals. Until now cables installed have been of the analogue frequency division multiplex (FDM) type using frequency ranges up to 45 MHz for those bands carrying traffic.

Usually two types of test are made on a routine basis – one to monitor the performance of individual submerged repeaters, and the other to check frequency characteristics of the cable. Most systems have had special complex equipment to monitor the performance of each submerged repeater, which involved sending a unique signal out from one terminal to which a particular repeater would respond by returning another signal to the terminal.

The new technique requires the installation of one or two stable oscillators in each submerged repeater, and each oscillator sends a continuous low level tone to one of the cable terminals. Each repeater can be separately identified by assigning a unique frequency, or pair of frequencies, to it. It is then a simple exercise to measure each signal from the submerged repeaters using standard – and much cheaper – measuring equipment in terminal stations. These results can then be analysed to give all necessary maintenance data.

Technical Officer Colin Bird reads off pilot signal measurements from the UK-Belgium cable on a visual display unit at St Margaret's Bay.

The question obviously arises why this solution has not been used before instead of building expensive, tailor-made test equipment. The answer lies in a number of factors. Firstly there was the need to balance greater information gained from a complex supervisory system against the reduced costs of a more simple system. It was also necessary to produce a stable and reliable oscillator for installing in submerged repeaters. This was not needed with the previous supervisory systems.

In fact as more reliable transistors supercede valves, a complex supervisory system is less necessary. Further, with the advent of high frequency cable systems, repeater spacings are reduced, so that with the increased number of repeaters for a given length a simplified and less costly supervisory system would be advantageous.

Clearly, for a given type of system the number of submerged repeater measurements made will depend on the number of repeaters in that system. The repeater spacing, for example, for a British 45 MHz system is about 2.74 nautical miles, and for a transatlantic system it would contain about 1,000 repeaters, which would require from 1,000 to 2,000 measurements per supervisory run.

In the submarine system test equipment field not all types of tailor-made submerged repeater monitoring equipment (SRME) have been automated. In the case of the second (14 MHz) transatlantic system to Canada a prototype SRME utilising a simple form of paper tape control was available, producing a pen and ink trace of the performance of each of the 473 submerged repeaters. But the record produced still required manual interpretation before the results could be analysed.

For future systems it was considered that it would be an advantage to have a non-dedicated and easily programmed, signal measuring set and signal generator that could be arranged to make any measurement required for the maintenance of the cable and present the results in an easily understood form.

The second basic type of test – the measurement of the system's frequency response – has to date been carried out by sending a series of different signals from one end of the cable and measuring them at the other, ensuring that the frequencies chosen do not interfere with traffic.

This type of test has required staff at both terminal stations to work together for extended periods, which can cause problems when there are differences in time zones or when holidays and meal breaks interfere.

If, however, the measuring system was made sufficiently flexible, say by use of programmable test equipment and computers, it would be possible for the equipment at both ends of a system to be simultaneously controlled, enabling end-to-end measurements to be made automatically and for information to be passed between the cable terminals so that both have all the necessary maintenance information.

The advantages of this would be best realised on a long system, but it was thought wise to use a short cable system like UK–Belgium for the first application, where most of the advantages could be obtained but many of the problems reduced.

It was, in fact, decided to buy a double-ended, computerised automatic test equipment (ATE) consisting of identical computer-controlled test equipment systems at both terminal stations which communicate by using a data circuit set up over a spare engineering speaker circuit.

In the UK–Belgium cable, a method of sensing and compensating for sea temperature changes has been included in each submerged repeater, significantly reducing the requirements for terminal adjustments. A surveillance program has been written for the automatic test equipment which measures the pilot signals from both terminals and prints alarm messages if the signal levels go out of the limits which can be set by the terminal staff to any suitable value. In most cases these would be of a much closer tolerance than alarms provided on the terminal equipment itself.

The pilot signal measurements are taken at both ends of the cable continually and this information is displayed in frequency ascending order, on a visual display unit (VDU). Terminal station staff can then see at a glance how well the system is equal-

Fred Dawkins, Leading Technical Officer, and Bob Anderson, another Technical Officer, analyse measurements taken from the UK-Belgium cable at St Margaret's Bay.

Fred Dawkins calls up his opposite number in Belgium to discuss particular aspects of system equalisation.

ised for the effects of sea temperature changes at any time.

A further program has been written which takes measurements at pilot frequencies at each amplifier test point throughout the terminal. A set of measurements has been taken for reference so that a fault can be quickly located in the terminal equipment.

It was found that the practical advantages gained by the use of ATE could be divided into four main areas – speed, time, result processing and errors. As the test equipment can make measurements more rapidly than a manual system it is possible to carry out tests which would otherwise be impractical, and staff also have time to analyse the measurements rather than spend all their time on making them.

ATE can also make measurements at any time, which is particularly useful when long haul systems are considered and there is a significant time difference between terminals or when the terminal time zones are slightly different, as between the UK and Belgium. It was particularly useful to carry out tests even when the remote terminal was unmanned.

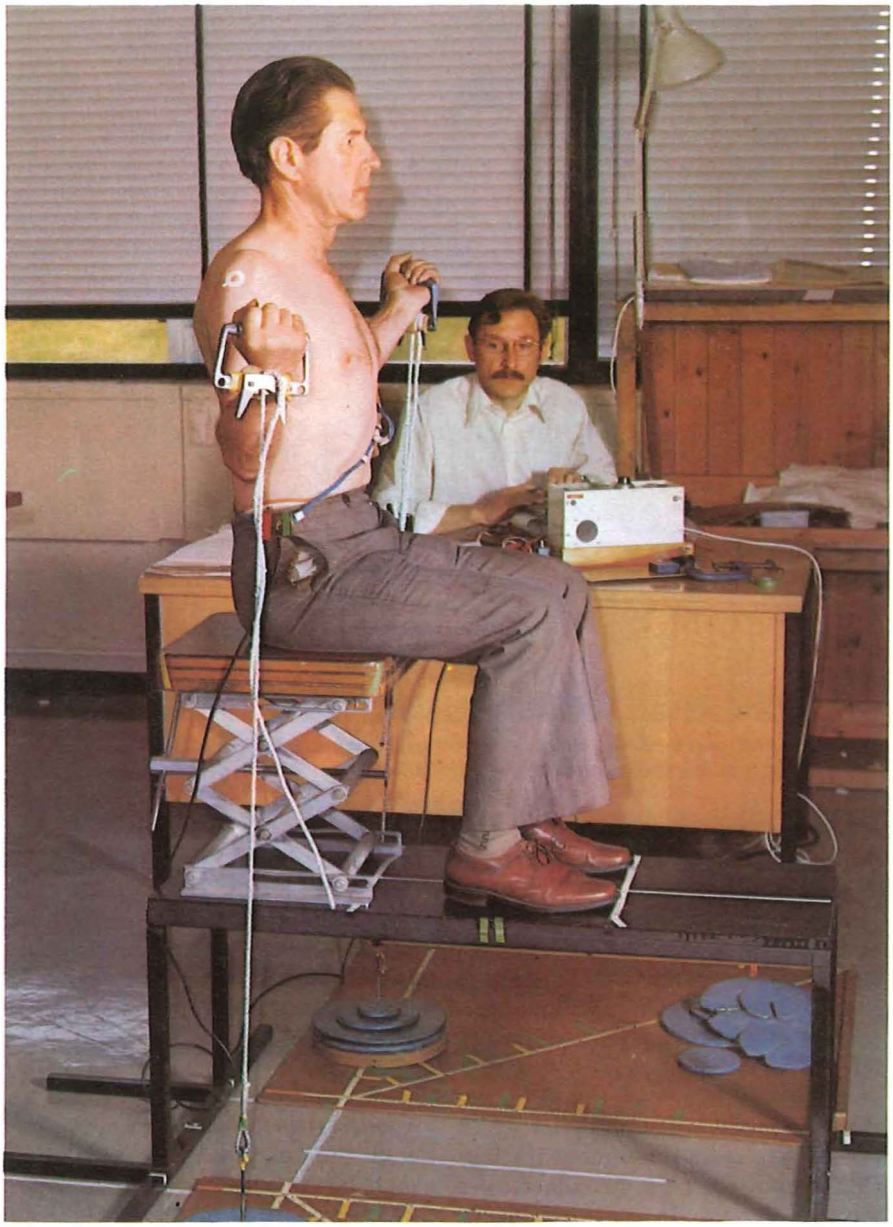
It is possible for the computer to be programmed to compensate for the loss of test cords and to print out compensated results in a standard format which significantly reduces staff effort, eliminating the need for time consuming manual calculations. A tape of the results that can be stored and further processed in the Post Office's main computers, is also produced so that the performance of the system can be compared with others of the same type.

Whenever large numbers of measurements are made manually a number of errors are bound to occur, particularly when test result data has to be read from one terminal to another via an engineering speaker circuit between people of different nationalities. It has been shown that collecting and processing test data automatically has significantly reduced the recording of errors.

There are, however, many aspects of automatic test equipment uses and programming that still need to be explored, but the exercise with the UK–Belgium cable has been useful experience in refining and defining requirements for computer controlled measuring equipment, particularly for longer cables, or for terminal stations with a number of different systems.

Mr P. J. Clark is an Assistant Executive Engineer in Network Planning Department working on future submarine cable developments.
Mr C. Ball, also on AEE, was until recently involved in undersea cable maintenance.

PO Telecommunications Journal, Autumn 1978



A Post Office volunteer undergoes tests at Surrey University where a research project is underway looking at the problems of back injuries among Post Office Telecommunications staff.

IN THE BEST OF HEALTH

Shortly after the Post Office's Occupational Health Service was set up, DR PETER GILBERT, PRINCIPAL MEDICAL OFFICER, TELECOMMUNICATIONS, described in the Journal its plans for protecting and improving the health of staff. Here he reviews the progress made during the past five years.

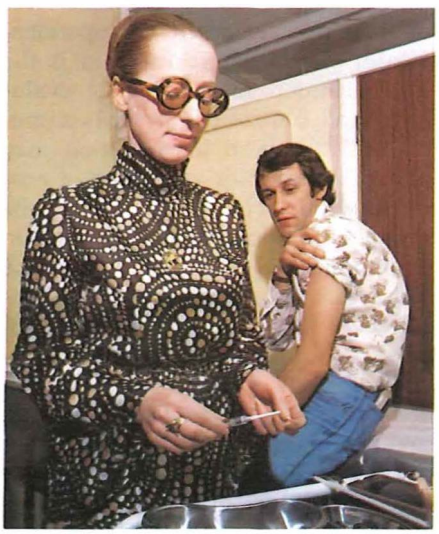
FROM THE OFFER of flu jabs for all the Corporation's 400,000 plus workforce, to the 4,000 Telecommunications engineers swallowing tiny radio transmitters to aid research into backache, the Post Office Occupational Health Service (OHS) has, in its first five years, made news not only within the organisation but in the general press and broadcasting media as well as in many highly respected medical journals.

But important as the more newsworthy achievements of OHS might be, its real success must be measured at grassroots level, for occupational health, as opposed to the old concept of industrial medicine, is concerned with the mental and physical well-being of staff in every grade.

When the OHS was set up in 1972, the Post Office's Chief Medical Officer (CMO), Dr Peter Taylor, was committed to produce a review of the service after five years. This he has done and after full consultation and discussion with management, personnel, OHS and the unions, the final review was presented to the Management Board and the CMO's recommendations accepted.

Key feature of the OHS in Telecommunications is the Regional health team comprising both full and part-time doctors and nurses with secretarial and clerical support staff. The Regional Medical Officer (Senior RMO in London Telecommunications Region), is the leader of the team and is responsible to the Regional Director or Board Chairman from an executive point of view, and professionally to the PMO, Telecommunications. The

Senior Nursing Officer Miss Nadia Cotter prepares to give Overseas Telegraph Operator John Reed his regular injection for an allergy to house dust. His visit to her office from nearby Fleet Building, London, saves taking time off to go to hospital.



London, Midlands, North-West and Scottish Telecommunications Regions and Boards have their own teams, but all other regions share with the Postal Business.

The major part of OHS time and effort goes in three main areas. First there is identification and advice on hazards to staff at work or to the public; second, advice on the type of work suitable for those with temporary or permanent disabilities and on those who need premature retirement because of ill health. Thirdly comes advice given to individuals with health problems, perhaps caused by their working environment.

OHS also investigates causes of sickness absence and suggests means by which it may be reduced. It advises on all health aspects of recruitment and employment and, where possible, undertakes recruitment and other health examinations. It provides, too, professional advice and guidance to first-aiders and those concerned with food and sanitary hygiene, as well as conducting research and helping outside agencies in the study of matters important to the health of staff.

In 1977 there were more than 100,000 requests for advice or help from management, individuals and the unions, and an encouraging feature is the steady increase in the number of people approaching OHS on their own initiative.

It was realised early on that a close working relationship between the OHS and all levels of personnel management, first aid, welfare and safety services as well as with the unions in the Telecommunications Business, was essential. In spite of occasional difficulties in one or two areas there is no doubt these close relationships have been well developed and continue to function very effectively.

The OHS relies heavily on the services of the now enlarged Occupational Health Group whose function is the identification, measurement, evaluation and control of physical, chemical and biological hazards that may affect the health or well being of people at work. About 75 per cent of the group's time and effort is devoted to environmental problems within the Telecommunications Business. Examples over the last year include microwave at radio stations, solvents in drawing offices and epoxy resins. Refrigerants in air conditioning plants and beryllium oxide in heat sinks have also been investigated.

It is usually maintained that preventive medicine is central to the practice of occupational health and in any case there can be little doubt that prevention is cheaper than cure. In the preventive field it is comparatively easy, by investigations in the working environment, to prevent occupational ill health. Unfortunately effective prevention of non-occupational ill-health is by no means as simple.

Dr Gilbert (left) and Mr Albert Hill, the Post Office's Occupational Hygienist, study a dust monitor which can be used in a modified form for testing asbestos levels.

One major project in this field was the influenza vaccination trial which ran for five years throughout the Post Office, and which is the subject of a separate report. It consisted of the offer of vaccination against influenza to large groups of people in all the Businesses, and comparison of their sick absences during each winter with a matched controlled group who were not vaccinated.

The results were conclusive: sickness absence was lower in the vaccinated group, and many people were therefore spared the unpleasantness of true influenza. The Businesses also saved money.

On the basis of the final report of the trial the Post Office Board agreed that vaccination should be offered in the autumn of 1977 to all Post Office employees. The response rate in Telecommunications was 27 per cent. The financial saving on lost time throughout the Corporation was estimated at about £1m. a year.

It is frequently said that both voluntary health checks and screening of individuals for particular conditions should be part of a preventive medicine programme. It is true that voluntary health checks, particularly for those over 45, can reveal cases of previously unrecognised disease for which treatment would be effective, such as raised blood pressure or diabetes and other opportunity for personal health education or counselling about health problems.

Unfortunately, with existing resources of staff in the whole Corporation the OHS could not possibly offer such health checks for more than a small proportion of the 155,000 staff over the age of 45, and then obviously only in areas where OHS staff were in post.

In Telecommunications it has been possible to offer such a service in a few areas and this has certainly been welcomed by the employees who have taken part. The evidence that such measures would benefit the Post Office financially in a quantifiable way would certainly not be easy to obtain and a trial would have to be continued for a number of years.

Apart from the substantial cost the question remains whether OHS should undertake screening of women for breast and cervical cancer. At present the accepted view in the OHS is that the best way to achieve early diagnosis in breast cancer is to educate women in the techniques of self examination by the use of special films and leaflets, and this has already been carried out with OH nurses playing the leading role.

The consequences of successful

health education for industry is a potential reduction in sickness absence while demonstrating concern for the health and well being of employees. With its limited resources and other commitments, the OHS has so far restricted its activities to local projects undertaken with the agreement of management and unions. These have been well received and set an example which, it is very much hoped, others will soon be following.

Regional MOs have in fact been asked to obtain details of any planned health education programme to be run by NHS Area Health Authorities with a view to discussing their possible use, where appropriate, with management and unions. As a consequence, measures to further health education in the Post Office will increase, at minimal cost to the Corporation.

Related to this is the question of the Provision of Treatment services. A few of these were established in the Post Office before the OHS came into existence. It has been OHS policy, however, not to set up new centres because, as a "low risk" industry, the number of injuries sustained in offices is very small. (See page 28).

The Council of Post Office Unions has, however expressed the view that limited services staffed by nurses should be made available in a few of the largest offices.

The CMO recommends in his Five Year Review that the OHS should continue to examine the issues raised with the Business and the unions. The question of research is frequently raised by both sides, but pure medical research is of course a highly expensive team effort. With its relatively limited resources the OHS is not equipped to carry out research projects on its own, and the policy remains one of co-operation and collaboration with outside bodies such as the Medical Research Council, universities and the Employment Medical Advisory Service.

In fact, several interesting projects are currently underway. PMOT with Telecommunications Management Services has set up a controlled trial on the Telecommunications On-Line Data (TOLD)programme to investigate allegations of ill-effects of visual display unit operation on eyesight. Another project is the research now being carried out in collaboration with the University of Surrey into the incidence and possible prevention of back troubles among Telecommunications engineers.

This involves volunteers swallowing a small "radio pill" which records changes in intra-abdominal pressure which can be directly correlated with the forces acting on the spinal column during various types of activity. From this it is hoped that it will be possible eventually to devise methods of working to avoid frequent peak forces being applied to the back.

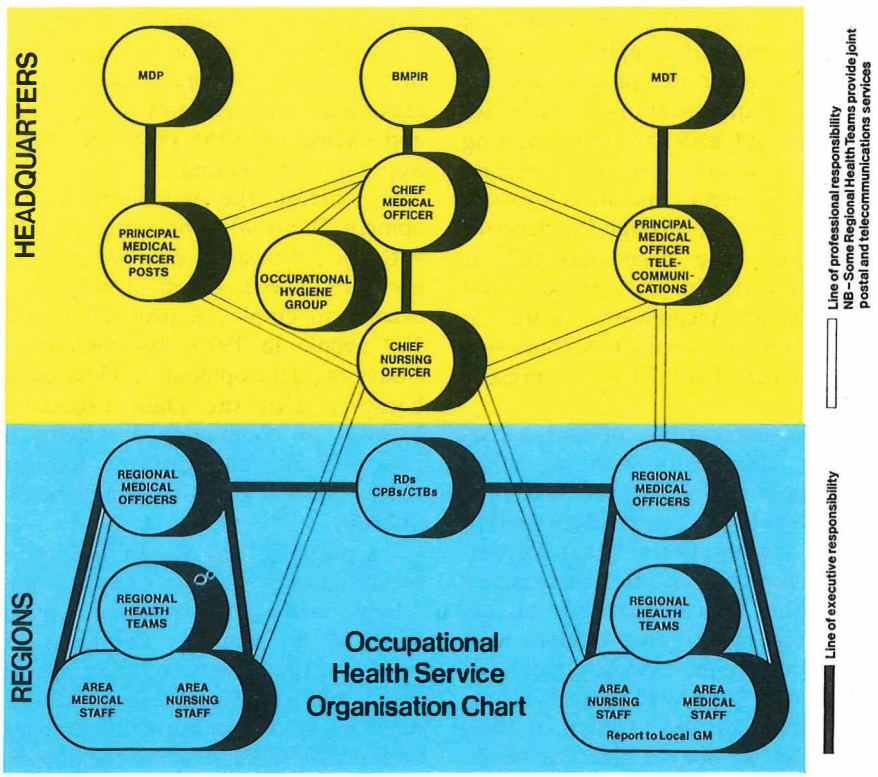
Stress has also received considerable attention, and concern has frequently been expressed by both management and unions about the possible ill-effects of stress on employees. Unfortunately the imprecise nature of this subject and the emotion it engenders makes its measurement very difficult. The OHS has done pilot work towards identifying the size of the problem particularly in relation to medical retirement and there is a research project running at present with the Medical Research Council. The latest development is the inclusion in certain management training courses of a session on "prevention of stress in managers" using the expertise of the University of Manchester Institute of Science and Technology.

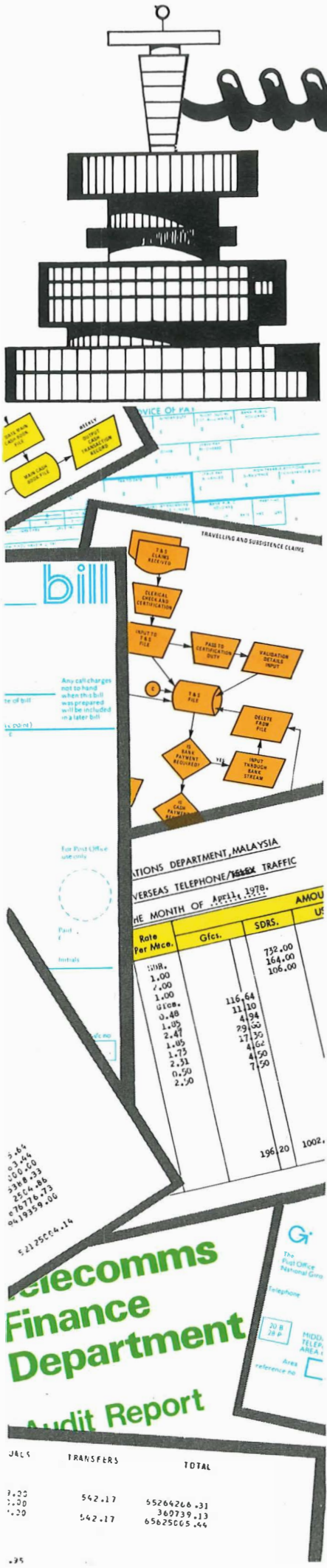
The OHS role in First Aid has changed little. It has been suggested that OHS should assume overall control and responsibility for the service throughout the Post Office – a proposition which has far-reaching implications for the OHS, particularly in terms of its resource capacity and for the first-aiders themselves who take a pride in their voluntary status.

The OHS would not in principle be opposed to a more structured relationship with the first aid service as long as it had the necessary resources to take on this additional responsibility. Organisation of the service, however, is primarily a management responsibility, as is the obligation to meet statutory and Post Office requirements. It is also outside CMO's brief to advance definitive proposals involving re-allocation of responsibilities within the Businesses affecting staff in other disciplines.

And finally there is the question of cost. The forecast for 1978–79 for OHS in Telecommunications is £0.9m. and it is interesting to note – although the two figures must not be directly related – that the cost of sickness absence in the Telecommunications Business in 76/77 was £35.3m. The cost to the Business of the OHS can be expressed also as £350 per head. By any standards, particularly in comparison with other large industries, this is cheap.

Although during its first five years Telecommunications OHS has developed on the lines agreed at its inception, there is still room for improvement and further development. It is essential therefore that the service remains flexible so that its organisation and activities can be adapted to meet the needs of both management and staff in the business and also in different geographical Regions throughout the UK.





Holding the purse strings

In the seventh in our series on some of the many different jobs essential to the efficient operation of Post Office Telecommunications, Mr Ken Nash, Director of Telecommunications Finance Department, outlines some of the aspects of his work.

IT IS probably a safe bet that no Finance Department in any organisation would win any prizes for popularity. The common view of such Departments is that they are preoccupied with making things balance, and with frustrating other people's best schemes, while having few original ideas of their own: in fact the sort of image from which the Treasury and the Inland Revenue have always been sufferers.

The fact is that the work of Post Office Telecommunications Finance Department (TFD), with its hand on the purse strings of a multi-million pound organisation is a vital element in the structure of the Business. Now with 550 staff, it is a lively place to work in, and is these days a scene of much constructive forward-looking activity, in tune with the general tempo of the Business.

We have, I think, always sought to be professional, in the general sense of the term, and increasingly now people are studying for the professional accountancy qualifications which we believe are of great value in meeting today's demands. A day release scheme has been in operation for some years, and so far, through this scheme, 23 people have been accepted as members of the Institute of Costs and Management Accountants (ICMA) or Association of Certified Accountants (ACCA) while about 70 are at present studying.

The Department has, of course, particularly close links with its fellow practitioners in finance and accounts, in the Regions, in other Telecommunications Headquarters (THQ) Departments, and in Central Headquarters (CHQ). But because virtually all decisions (and many non-decisions too!) involve money in some way, one's job in TFD tends to involve contacts with a wide variety of other specialists, thus calling for a suitable blend of adaptability and consistency, compromise and, of course, a degree of firmness.

Any attempt at a comprehensive account of the business of TFD would be about as exciting as the THQ telephone directory, so perhaps more acceptable is to highlight some of the tasks currently under way in the six Divisions.

For the Budget Division there is a pronounced monthly cycle of activity in the production of short-range (one to two year) business financial forecasts for top management in Telecommunications and for the Post Office Board. The Division also contributes to longer-range financial projections, such as the Medium Term Plan, and the Business Plan. Its resources for development work are at present limited, but it is working on various plans to enhance both the reliability and the speed of production of its forecasts.

The Division also incorporates a Cashier's Group which pays out about £400m a year to suppliers of services to the Business, and a further £700m in settlements with organisations overseas, loan interest and repayments, and payments to the Post Office Staff Superannuation Fund.

By contrast, the Accounting Development Division is concerned entirely with the planning of new systems. Set up in 1975 with a staff of only 11, it expects to employ a peak of around 100 people in 1979. Its mission includes the development, in close collaboration with the Data Processing Service, of computerised systems of financial and managements accounting which will begin to come into use in 1980.

The purpose is to make financial information available on a faster, more reliable and more flexible basis at all levels of the Business. The facility is known as the New Accounting System (NAS), and it will process expenditures of about £3,000m annually. Integral with it will be a system for the purpose of Accounting and Control of

Engineering Stores (ACES). The Division is also developing computerised registers of fixed assets, consistent with the standards of financial accounting expected of large undertakings.

The Financial Studies Division is concerned with offering a wide range of advice on the financial evaluation of programmes and projects to all parts of the Business, including the newly created Executives. The Division must, therefore, continuously keep abreast of developments both in evaluation methods so as to give the best service to its many customers, and also in the Business as a whole, so that it responds flexibly to changing needs.

In addition it is responsible for the costing system, the outputs of which are required to determine the profitability of our various services and the tariff action needed to keep prices at an appropriate level and for carrying out post audit of investment and other projects. The latter function is in course of being taken over by a new, independent Internal Audit Division reporting to the Senior Director, Finance and Management Services.

With the bulk of the effort put into the development of a new payroll system (PARIS) having been completed, the Billing, Expenditure and Audit Division is now predominantly concerned with telephone billing. The computerised telephone billing system is the medium through which the bulk of our income – about £2,600m a year – is collected. Currently, almost 60 million telephone bills are issued annually. It is a very large and complex system, requiring a high degree of reliability and as much flexibility as possible.

There is, of course, as with the Accounting Development Division, close collaboration with the Data Processing Service. At present the system using LEO 326 computers is being phased out, and its place taken by the New Billing System (NBS) using modern ICL 2900 series computers. It offers a more informative bill and scope for new customer services, such as budget accounts. Nationwide coverage by NBS is expected by late 1979.

Internal Audit of Area offices was developed to Regional Directors some time ago, and TFD responsibility in this area now consists mainly of setting and maintaining standards achieved in part by monitoring visits and participation with Regional audit teams in selected Area audits. The section concerned also audits THQ Departments and Regional Headquarters, together with proposed and existing computer systems. It will provide the main element of the new Internal Audit Division, already referred to.

The External Finance Division is unique in TFD in undertaking a full range of finance and accounting functions, paralleling those of the other Divisions, but focused on the international and maritime services. In this it closely complements the work of the External Telecommunications Executive (ETE). More specifically, it exchanges accounts with operating organisations overseas, to a total value of about £390 million annually, produces a detailed quarterly report on the financial situation of the external services, evaluates major capital projects related to those services, and participates with ETE in various international negotiations.

Production of the international traffic accounts has recently been computerised, and overseas organisations have shown great interest in the system. Uniquely within TFD, the Division also bills customers for certain services such as international leased circuits.

From the Accounts Division, the best-known visible product is the published Annual Accounts, which are the main pre-occupation from about March to July. These, however, are in some ways only the tip of the iceberg, in the form of the year-round processing of the monthly accounting documents such as the Cash Account, the Cost Statement and the Balance Statement of telephone income which flow in from Area and other offices.

The Division also produces quarterly accounts, to audit standard, and will produce monthly accounts when the resources are available. It maintains the Business plant accounts and contributes to the financial review system by producing regular forecasts of income, and of certain items of expenditure. It also acts as treasurer for the Business in arranging loans as necessary and in investing surplus funds, through Girobank.

As for the job of the Director himself, the fact is, of course, that TFD is unique in the Business in having two Directors. Iain Vallance, as Director, Telecomms Financial Planning, shares with me the management of the Department. He looks after certain Divisions while I have responsibility for the rest, but they work together from day-to-day exactly as they did when there was only one Director.

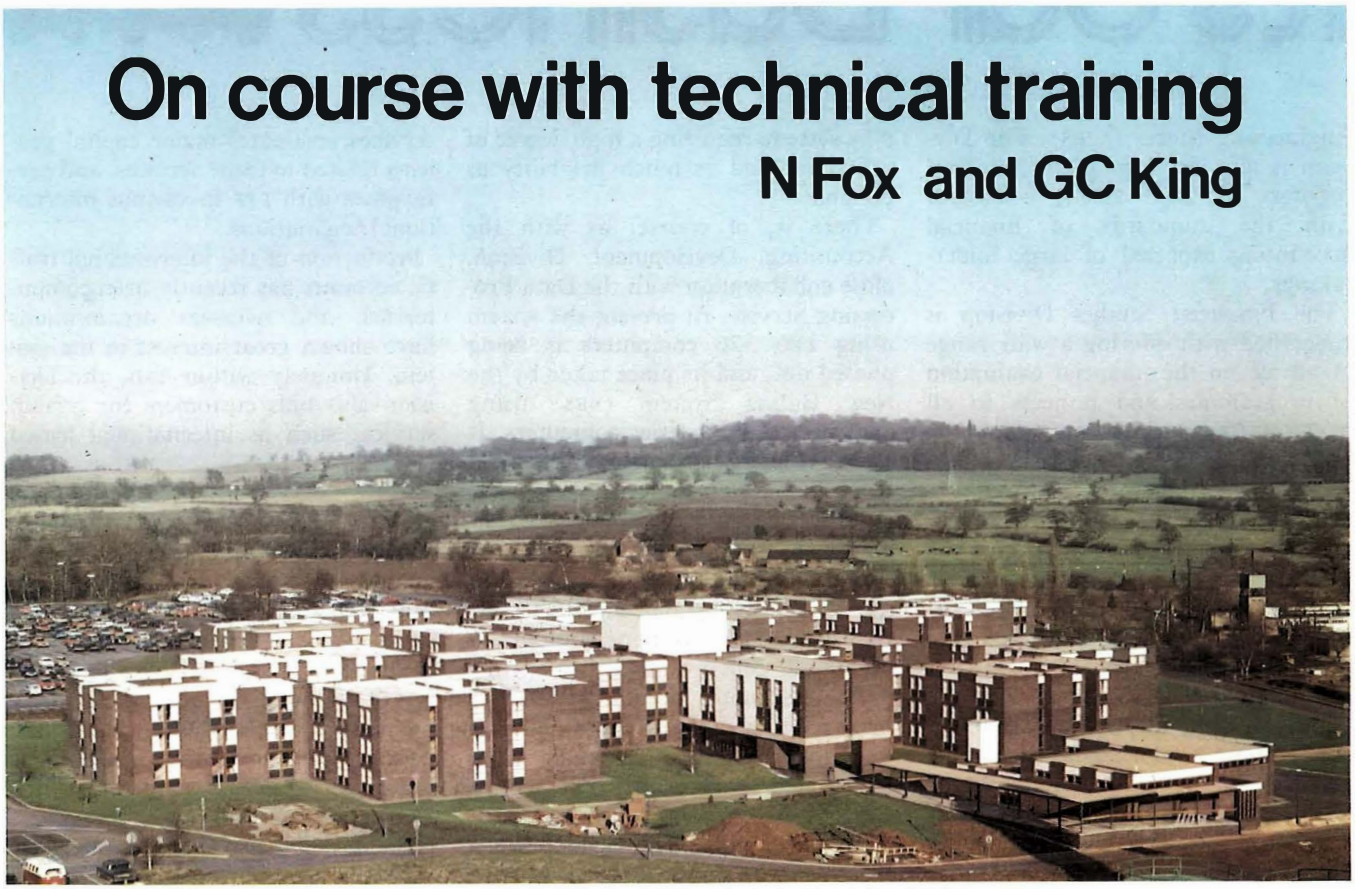
We find our days offer a very full package of what might be called the technical business of the Divisions, of the administrative matters which arise in any such large Department, and of the person-to-person links which humanise the job.

Naturally there are sometimes setbacks and frustrations, but there is never a dull moment and there is always the possibility of finding an even better way not only of keeping the score but helping pick the winners of tomorrow's matches as well.

Mr Nash (centre) presides over his monthly Heads of Divisions meeting. Seated (left to right) are Mr D. M. Dunkley, Mr J. Tomlinson, Mr R. J. Stormer, Mr Nash, Mr I. D. Vallance, Director of Financial Planning, Mr B. Rigby and Mr J. H. Temple.

On course with technical training

N Fox and GC King



A general view showing the residential accommodation at the Post Office Technical Training College.

THE EVER increasing size and complexity of the Post Office telecommunications network combining new systems and technologies with equipment based on older techniques, causes a variety of problems not least of which is staff training and re-training as each new system creates its own peculiar demands.

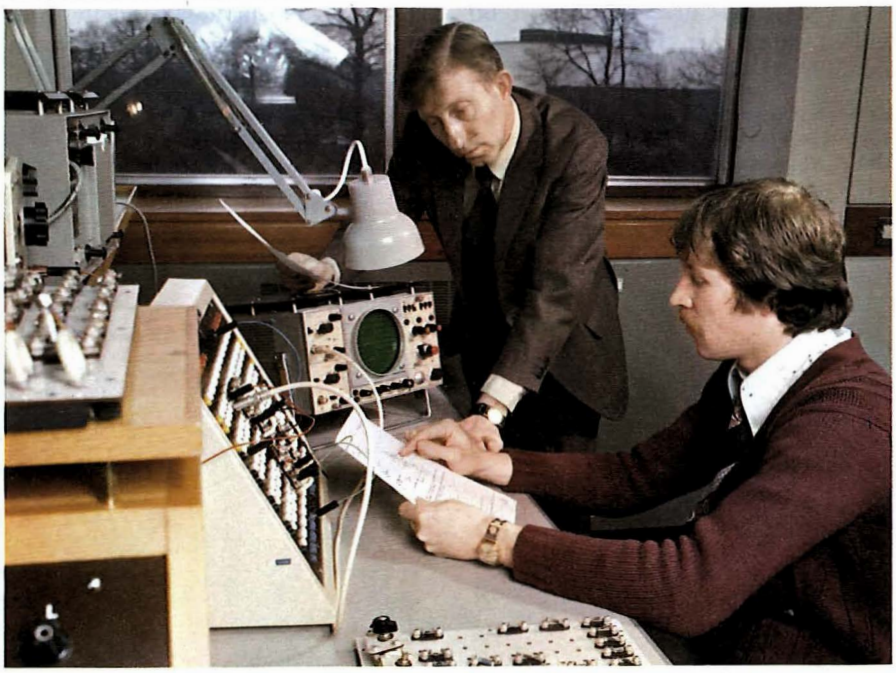
To meet this constant need, the Post Office Technical Training College, occupying three sites covering about 100 acres near Stone in Staffordshire, provides residential training for up to 830 students, mainly Technicians and Technical Officers and their supervisors from the Telecommunications and Postal Businesses.

They attend short courses of between one and five weeks on the technical vocational aspects of their jobs, ranging over the maintenance and construction of telephone exchanges, private automatic branch exchanges (PABXs), repeater stations, postal machinery, power and accommodation services, telegraphs, data, external planning and motor transport. More than 200 different courses are now on offer to Areas, Regions, Telecommunications Headquarters and the Postal Business.

Known originally as the Central Training School (CTS), the College was born as an offshoot of the Circuit Laboratory, in the City of London in 1924. It grew at the former Research Station, Dollis Hill in north London through the 1930s, and finally settled at Stone in 1946 in modified temporary wartime buildings which are now being replaced in stages by purpose-designed training blocks and living quarters for students, resident domestic staff and visitors. Throughout 1977, 13,300 students attended courses and more than 15,000 students are expected this year.

Training technical staff for today's telecommunications network is inevitably a costly business. The training block at present under construction, which will contain 20 lecture rooms,

Lecturer Sam McNally supervises an exercise on a plug-in electronic circuit board with a student on one of the courses.



46 equipment and practical rooms and 48 offices, will cost over £1.8 million. Further building and equipment for training purposes will cost another £2 million plus.

The telecommunications teaching staff are organised in functional groups of lecturers, mainly Assistant Executive Engineers (AEEs) and Engineering Instructors (IEs), each group being controlled by an Executive Engineer (EE). The motor transport teaching staff have a similar structure with Motor Transport (MT) grades.

A small engineering group runs the supporting services of workshops, stores, transport, planning, construction, drafting and reprographics, while the executive and clerical staff provide the administrative functions of cash, staff, records, statistics, students' call up, accommodation and stores. Significant labour forces for maintenance purposes are made available by the General Manager, Stoke-on-Trent Telephone Area and the Department of the Environment, Property Services Agency (PSA). In all, the Principal has responsibility for nearly 1,500 staff working or studying in his complex at any one time.

Let us now look at future plans for the College. The evolution of Strowger equipment training culminated with a custom built rack designed to represent a complete exchange system, which could be used for both demonstrations and individual student faulting practice. Similar racks were also designed for UAX 13s, signalling systems, register translators, Strowger PABXs and the small electronic exchange.

The provision of individual faulting equipment for modern common control systems with the single, expensive, technically complex computer type control, presents difficulties when used in the 24-seat course tuition situation. The TXE2 training equipment partly overcomes this by dispersing individual line circuits, registers and supervisory relay sets, to faulting bays, so enabling a full course of students to work in pairs simultaneously. The common control equipment faulting is, however, still by its nature restricted to one small group at a time.

TXE4 has an even greater proportion of common control equipment. Control is more evenly distributed and security is ensured by duplication or triplication of the major control items such as the main control units, marker/supervisory processing units and cyclic stores. The training exchange is

Jim Hudson, a lecturer at the Technical Training College, points out the power feed unit on a 24 channel pulse code modulation line system.

standard except that it has a relatively small switching area but normal full common control facilities.

The aim of the practical work is to familiarise students with the exchange documentation, fault printout, routiners and portable test gear, with emphasis on the maintenance of service. Up to four parties of students can work simultaneously in different parts of the exchange.

During training for TXE2, TXE4 and other equipments, students investigate the performance of electronic circuits in the laboratory by plug-in boards, which, using standard elements mounted on plugs, enable circuits to be set up quickly without the need for soldering or tag cleaning.

The continuing proliferation of proprietary PABXs maintained by Post Office staff causes training problems in the amount of accommodation required for the training models and the need for the teaching staff to cope with an increasing number of different courses each for small numbers of students.

The IBM 3750 is a large all electronic PABX with solid state switching controlled by a pair of specially programmed computers. Staff with electro-mechanical system experience only are re-trained to maintain this equipment to a high technical standard on two courses, the first lasting three weeks and the second four weeks.

Each course has eight seats only because every student must obtain adequate practical experience and the equipment can only accommodate a limited number at any one time. Only one course can run at a time, and a continuous stream of courses is necessary to meet the demand, though the student to staff ratio of 8:2 makes the tuition more personal and therefore more effective.

In System X, the new family of switching systems due to come into service in the early 1980s, microelectronics will be used and its main features will include common channel signalling, digital switching and stored program control. A TTC group is already engaged in providing solutions to the new re-training problems that these new techniques will bring.

Telegraph and datel training embraces time division multiplex multi-channel transmission systems, semi-electronic telegraph terminals, the auto-telex system and data transmission. Various training techniques are used on these courses. On some, the students use 'functional documentation' in a self-teach mode with a trainer available for help and advice when required.

Transmission equipment was originally rigidly standardised, but became diversified as manufacturers developed their own equipment designs to meet common Post Office specifications. Today training emphasis is placed on the build-up of equipment and its functions rather than circuit details, and practical work is done on different manufacturers' equipment.

An electronic repair course covers

Students at the Post Office's new Motor Transport School, 2.5 miles from the main Technical Training College, work in small groups on practical tasks such as stripping down a petrol engine.

component faulting for maintenance and repair centre staff. The expansion of digital transmission will soon require the 24 and 30 channel pulse code modulation (PCM) courses to be augmented by 120 and 140 Mbit digital line system courses.

A power group provides training on Telecommunications power plants and accommodation services, such as high voltage AC supplies, lifts, lighting and air conditioning plant, and safe working methods are a major feature of all power courses. An external plant group deals with external planning and works supervision, cable balancing and precision testing. An interesting training aid, involving many common local line planning problems, is a model town designed and built by the group. A postal engineering group, an agency service provided for the Postal Business, aims to train men for the maintenance of mechanised letter offices, and covers the principles and practices of both mechanical and electronic machine maintenance.

In January this year the Motor Transport School, serving the Telecommunications and Postal Businesses, moved from Yeading, Middlesex, to a purpose built unit 2.5 km from the main Technical Training College. This school runs courses on hand tools, body repairs, oxy-acetylene and electric arc welding, all the component parts of motor vehicles, such as petrol and diesel engines, transmission, brakes, steering and electrical equipment. The more specialised requirements of hydraulic, pneumatic and electronic control equipment on mechanised aids and electric vehicles are also catered for.

Heavy Goods Vehicle (HGV) driver training and training leading up to Approved Driving Instructor (ADI) qualifications for Post Office driving instructors, together with a Workshop Supervisor course are also available. MT students live, and have their midday meals in the main college. A regular Post Office bus service takes them to and from the Motor Transport School.

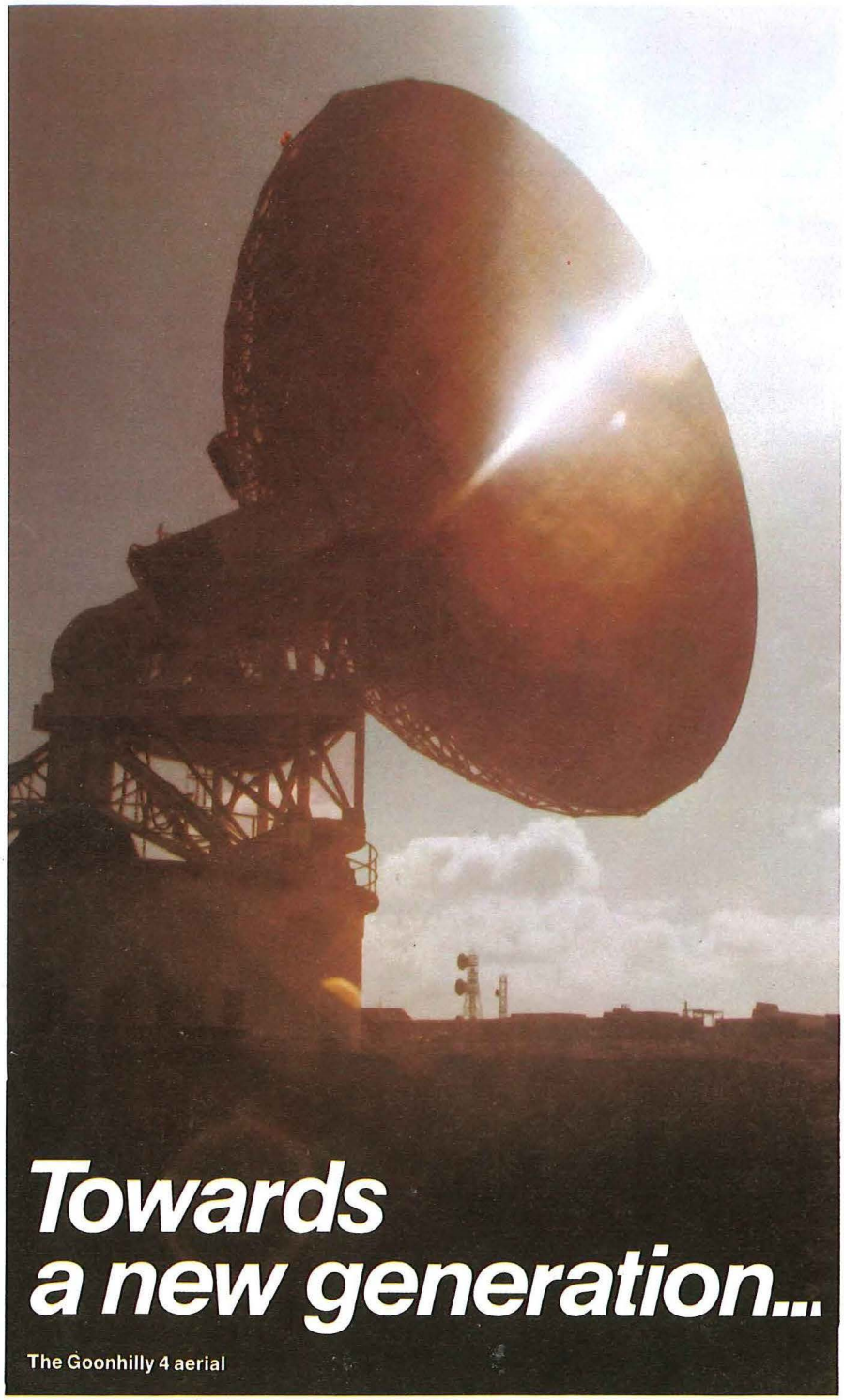
A small teaching methods group provides introductory, general and advanced training for lecturers and engineering instructors as well as providing a general training back-up and consultancy service, monitoring new visual aids, films, books, and reports.

For off-duty relaxation, students have the use of quiet lounges, table tennis, snooker and television rooms, a cinema, club, shop, lending library and various outdoor sports facilities. There is a public post office on site and telephones for evening calls home. A Welfare Officer is available for consultation by students with personal or confidential problems and a health centre and doctor are also provided on site.

This, then, represents a broad outline of some of the main functions of the Technical Training College. It is safe to say that the vocational tuition offered covers much of the technological spectrum of electrical and electronic engineering, and the training undertaken is vital to the installation, maintenance and supervision of all engineering aspects of the Telecommunications Business.

Mr N. Fox is Deputy Principal of the Technical Training College and **Mr G. C. King** is an Executive Engineer with responsibility for training investigations and development in the College.

PO Telecommunications Journal, Autumn 1978.



Towards a new generation...

The Goonhilly 4 aerial

A NEW ERA in space-age communications has dawned with the handover of a new all-British radio aerial at the Post Office earth station on Goonhilly Downs, Cornwall.

Known as Goonhilly 4, the £3¼ million aerial will be used with the next generation of communication satellites, sending test speech and television signals to the Orbital Test Satellite (OTS) launched in May for the European Space Agency (ESA).

Designed and built by Marconi Communications Systems Limited with aid of £850,000 from the Department of Industry, the aerial was formally handed over by Mr Tom Mayer, Marconi's Managing Director, to Mr John Whyte, Senior Director, Development, in Telecommunications Headquarters.

OTS is the first step towards Europe's own satellite system for the 1980s which is intended to provide high-capacity communication links across Europe and the Mediterranean area to meet future demand for international telephone calls and live television pictures. (See editorial, page 1)

With the continuing rapid growth in world communications – international phone calls to and from Britain alone are doubling every four to five years – existing generation satellite systems are beginning to run out of spare capacity. Since Intelsat 1 – the first commercial satellite which started working in 1965 – the global networks of Intelsat and other satellite systems have made possible a huge growth in international telecommunications.

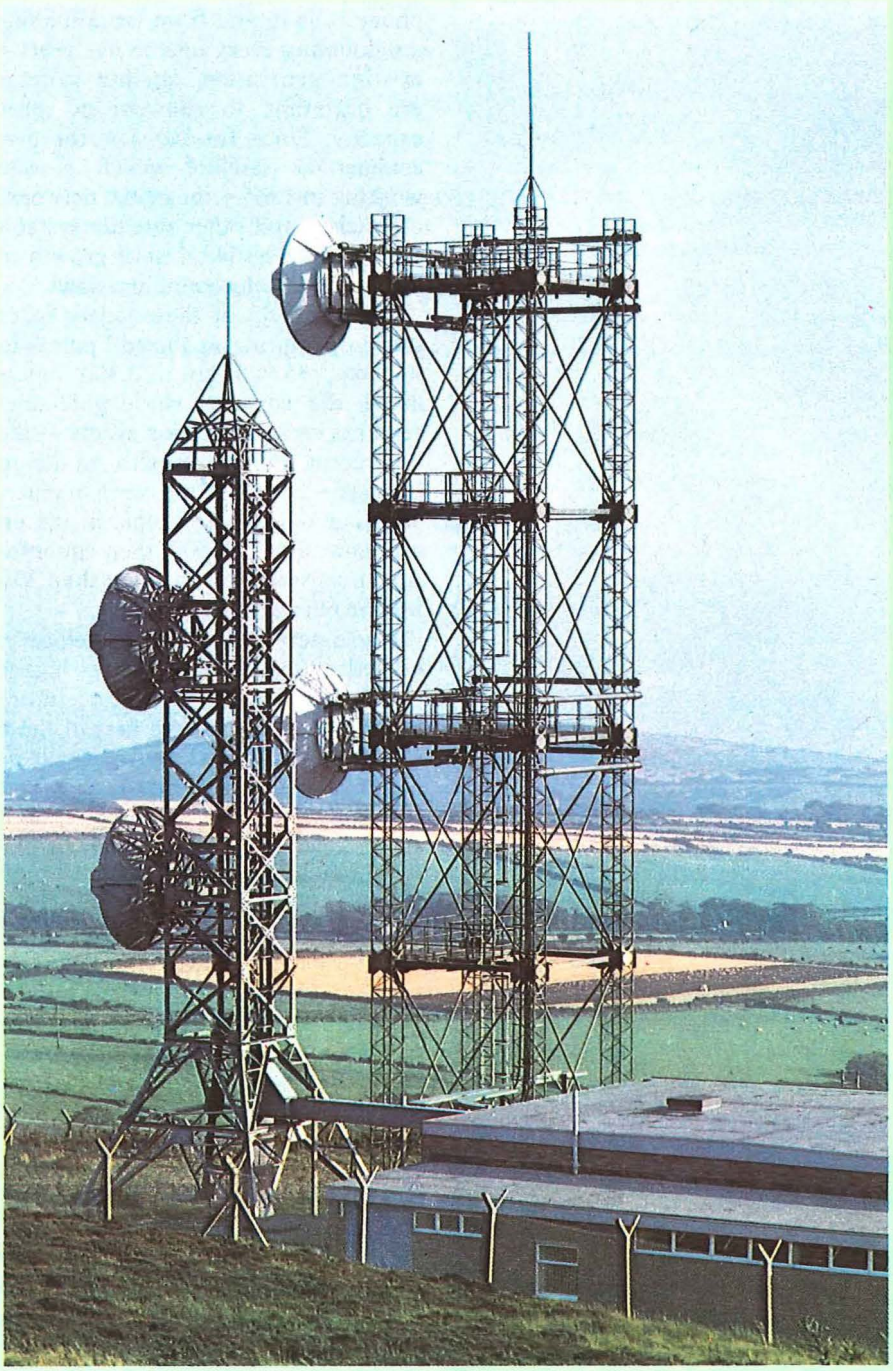
With the help of these lonely space stations, orbiting at "fixed" points in the sky, 35,900 km (22,300 miles) above the equator, world-wide television coverage of major events – like the recent Commonwealth games in Canada – have become commonplace, and four out of five people in the UK are now able to dial their international calls direct – to more than 350 million phones in 76 countries.

Now, a new generation of satellites is needed, based on operation at higher radio frequencies, to meet future needs. OTS is one of the first of these satellites. It is a test bed and will be used by Western Europe to check that the new technology performs as well as its designers predict. Although it is not intended that OTS will be used operationally, its capacity would be sufficient to carry up to 6,000 telephone calls and two television pictures simultaneously.

Goonhilly 4 – at 19 m (62 feet) diameter significantly smaller than earlier Goonhilly aerials – is one of the first of a new design of high capacity earth terminals to work with the new satellites. During the next 18 months it will be sending simulated speech and television signals up to the satellite, which will receive them and re-transmit back to the aerial. Detailed measurements will be made of aerial and satellite performance in handling the signals.

The telephony part of the test programme with OTS will centre on trials with digital transmission – achieved by means of four-phase, phase-shift-keying modulation in time division multiple access (TDMA). In this technique, the traffic from each country is concentrated into a short burst of modulated carrier transmitted in a pre-determined time slot, with careful synchronisation of all the earth stations involved.

The capacity can be approximately doubled by use of the technique known as digital speech interpolation sending the speech of one telephone conversation during pauses in other conversations.



ISLAND OUTPOST

BW Fielding

Ellan Vannin, as the Isle of Man was known by the ancient Celts, is the fifth nation of the British Isles, being neither Scottish, English, Irish nor Welsh – but Manx. It is the nearest community to the mean centre of the British Isles, lying 20 miles off the Scottish coast, 32 miles from Cumbria and County Down and 45 miles from North Wales. It is also part of Liverpool Telephone Area, 75 miles away.

The main communication link with the mainland is the Post Office microwave radio station at Creg-ny-Baa, four miles from Douglas. The other end of the link is at Dalton-in-Furness.

THE TELEPHONE first came to the Isle of Man in 1889 when Mr George Gilmore obtained a licence to operate a public telephone exchange in Douglas. He started with 12 subscribers to his system but yielded to the pressure of big business three years later when he sold his licence to the National Telephone Company.

When the Post Office secured the monopoly of telephone communication in 1912 there were 637 island customers.

The next milestone was the provision of an undersea trunk route of six circuits to Liverpool in 1926. Further development took place in 1933 when Mr Gilmore's original exchange – by now bursting at the seams – was replaced by a new manual exchange. Telephone growth in the 1920s and 30s was slow but it was in this period that the basic cable network was laid and the exchange boundaries were defined. Between 1938 and 1940, 10 UAXs were installed to serve the country districts, leaving the principal town, Douglas, dependent on the new manual exchange.

After World War II telephone growth continued slowly and in the late 1950s and early 60s it was held back by an economic slump on the Island when the population fell from the 50,000 of the 19th Century to an all time low of 48,000 in 1961. Subsequent recovery saw an increasing demand for telephones and from the 7,381 connections in 1963 a penetration of 12,000 lines was achieved in 1973, rising to more than 17,000 at the present time when the population stands at 60,000.

By 1988 it is forecast there will be 28,000 connections. The influx of banking and financial organisations which are very active internationally requires a relatively large number of telex and datel facilities to meet their needs. Modernisation and development of the telephone system has matched the reviving fortunes of the Manx economy and the six trunk lines of 1926 have become 252 micro-wave radio channels to the mainland with a further 120 submarine circuits to carry this year's total of two and a quarter million dialled trunk calls and

200,000 trunk calls via the operator.

A programme of replacement of the UAXs has been in progress since 1972. Two have already been changed over to TXE2 exchanges, two more are nearly ready for change-over and the rest will follow before 1980. Douglas manual exchange was replaced by a non-Director auto manual exchange in 1967. Subscriber Trunk Dialling (STD) has come slowly to the Island but now 96 per cent of trunk calls can be dialled and the International Direct Dialling (IDD) service has been available since 1976. In this decade nearly £3 million will be invested to meet the telecommunications needs of the Island.

All work except internal planning is undertaken by the Island's 86 engineers. This includes internal construction, external planning and construction, microwave radio, repeater station, UAX non-director and TXE2 maintenance and radio interference. All new housing estates are cabled underground by agreement with the builders and all stores come from the Post Office Supplies Department Depot at Preston who ship them to Douglas in containers.

Operating staff do all the work of a mainland AMC and, with extra staff, cope with the high summer season traffic which for night staff is twice the non-season level. There is a tremendous load in particular during the TT races when special facilities are provided for race officials, time-keepers and the news media. The Island is a self-contained charge group and all calls out are trunk calls.

Manxmen are proud of their long tradition of representative government through their Parliament – Tynwald. Next year they will celebrate its millennium – 1,000 years – of continuous existence of the Viking institution. The Isle of Man directory, which has just been distributed, has been specially designed to pay tribute to the event and is unique. The cover colour is straw with red printing and there are new illustrations and an additional page carrying articles on the histories of Tynwald and of the Triskele – the three legs of man – while the millenium symbol appears on the front cover.

At Port Erin, TXE2 exchange Technical Officer Mike Loundes tests submarine cable equipment which has been moved into the apparatus room so that internal maintenance work can be under one roof.

Technician Les Callow working on cables in a joint-box on Douglas Head, with the harbour and Douglas Bay in the background.

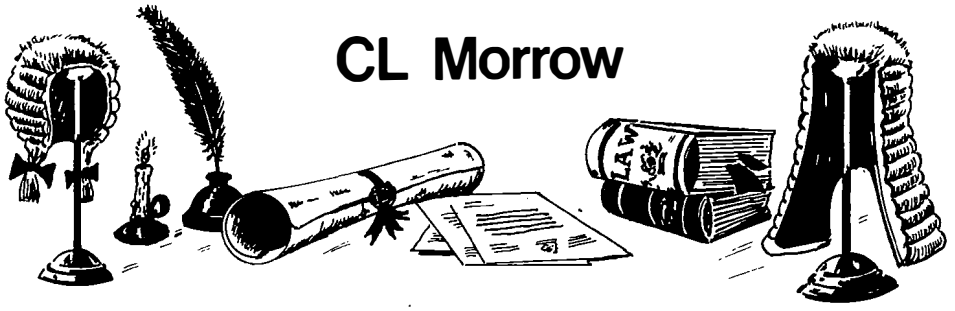
Recent years have seen an increasing demand on the Isle of Man for self-determination and the Isle of Man Government studied the economics of a takeover of the Posts and Telecommunication services in 1972. The outcome of their deliberations was that they negotiated the purchase of the Postal Service and set up the Manx Postal Authority in 1974.

A decision on a take-over of the Telecommunications service was deferred for 10 years because of the huge capital investment involved. It could be, however, that in the 1980s, the Isle of Man will become the third authority in the United Kingdom, alongside Hull and the Channel Isles, to operate its own telephone service. Until it does it remains an important outpost of Liverpool Telephone Area.

Mr B. W. Fielding is Head of General Services Division in Liverpool Telephone Area with responsibility for operator services on the Isle of Man.

Keeping a legal eye open

CL Morrow



The office of "The Solicitor" is probably one of the oldest in the Post Office and can be traced back to the reign of Charles II in 1683. Today The Solicitor's Office comprises 66 professional men and women including barristers and is supported by more than 100 executive and clerical staff. It deals with everything from land purchase to Industrial Tribunals and from scrutiny of Government legislation to prosecution for fraud and theft.

WHY, it might reasonably be asked, should a Post Office conveyancer have to go to the Records Office to trace the course of underground works forming part of fortifications constructed during the Napoleonic Wars to repel invaders? The answer, in fact, is decidedly practical. He was not looking for a cache of rum laid down by the defenders against the possibility of a long seige, but was simply ensuring that the unfilled tunnels posed no threat to the stability of buildings to be constructed for Chatham Telephone Engineering Centre.

And from seaborne invasion to seaborne pollution and the "Amoco Cadiz": The Post Office's Civil Litigation Division was involved in the recent inquiry set up by the Liberian Government to investigate the circumstances of the disaster because when accidents occur at sea, records of communications with the ships concerned can be of vital importance in determining how and why it all happened.

In the case of the "Amoco Cadiz", contact with the shore was, at the critical time, being made through Post Office radio stations, and the possibility that documentary and oral evidence might be required from the Post Office clearly calls for the presence of a lawyer.

The Solicitor's Office plays a role in fact, which touches on virtually every aspect of Post Office activity. Based at Euston Tower in London, the Office has three departments. Conveyancing (operating from the old Savings Bank offices in Holloway), Litigation and Prosecution, and Advisory. Each is headed by a Director.

The Conveyancing Department is organised into four divisions, each of which provides legal services for a particular group of Regions. These services consist primarily of operational conveyancing – the transfer on purchases and sales and the granting and taking of leases of sites and buildings throughout England and Wales. This covers a lot of dealings as the book value of the whole of the Post Office's land and buildings is more than £1,000m. As Scotland and Northern Ireland have their own systems of land law, property dealings in those areas are dealt with by local solicitors.

Clearly an organisation cannot be a landowner on this scale without having problems, and the very size of the holding increases the likelihood that the problems which do arise will display a variety which the average solicitor in private practice would never encounter.

Boundary disputes, nuisances on adjoining premises, neighbours requiring easements, trespasses, planning matters and threats of compulsory purchase are among the more obvious examples of the situations which arise and for which the Conveyancing Department provides an advisory service. Currently the total of active cases exceeds 2,000.

The Litigation and Prosecution Department has three divisions – two for civil litigation and one for prosecution, which correspond broadly with the civil and criminal jurisdictions of the courts.

The name Civil Litigation Division is misleading in that it suggests that the divisions are concerned only with civil litigation in the courts. This is itself no mean area, ranging from debt collecting in the county court to issues of fundamental legal significance which sometimes reach the House of Lords. But the name conceals a much wider forensic practice. It includes arbitrations arising out of contractual disputes and – in that spectacular growth area of the past few years – disputes dealt with by Industrial Tribunals. With a total Post Office staff of more than 400,000 it is not surprising that disputed claims for redundancy payments and allegations of unfair dismissal provide a considerable flow of work.

The Civil Litigation Divisions also provide advisory services based on expertise and experience in court proceedings. This would be, for example, when there is a request from a party involved in litigation, but not with the Post Office, who wants evidence from a Post Office employee or production

Taking a close look at a statute with his secretary, Mrs Anne Holland, is Mr Edmond Orkin, Head of Division in the Advisory Department.

of a record or document which has a bearing on the case.

Similarly the Prosecution Division has both an operational and an advisory role. Before 1969 the Post Office, as a Department of the Crown, undertook enforcement of those offences against the criminal law which were closely associated with the Post Office's own activities. Since 1969 the Corporation has continued to prosecute in cases such as fraudulent telephone calls, stealing from the post, opening and delaying postal packets and, under an agency arrangement with the Home Office, prosecutes offences against the Wireless Telegraphy Acts even though the Post Office no longer has the job of administering those Acts. Prosecution of Savings Bank frauds is also carried out on an agency basis for the Department of National Savings.

But the Prosecution Division is not just the scourge of villains, radio pirates and licence dodgers. It has, too, the more benevolent role of defending Post Office staff in road traffic proceedings at magistrates courts. It is also called on from time to time to provide general advice on criminal law and procedure and on questions of evidence in criminal cases.

As far as the Advisory Department is concerned it is easier to say what it does not cover than what it does. In other words, the many legal services required by the Post Office not falling to the other two departments are undertaken by this one.

Although sometimes involved in certain "contentious" areas – for example in public inquiries to do with planning and compulsory purchase – much of its work is in drafting and in giving legal advice on whatever problems "clients" in the Businesses and CHQ may come up with.

This can be a tall order considering the complexity of the Post Office's activities and the speed with which Parliament and the courts have recently made new laws and changed the old. Every public and private Bill, and much subordinate legislation, is closely scrutinised at all stages on the way through Parliament by the Advisory Department.

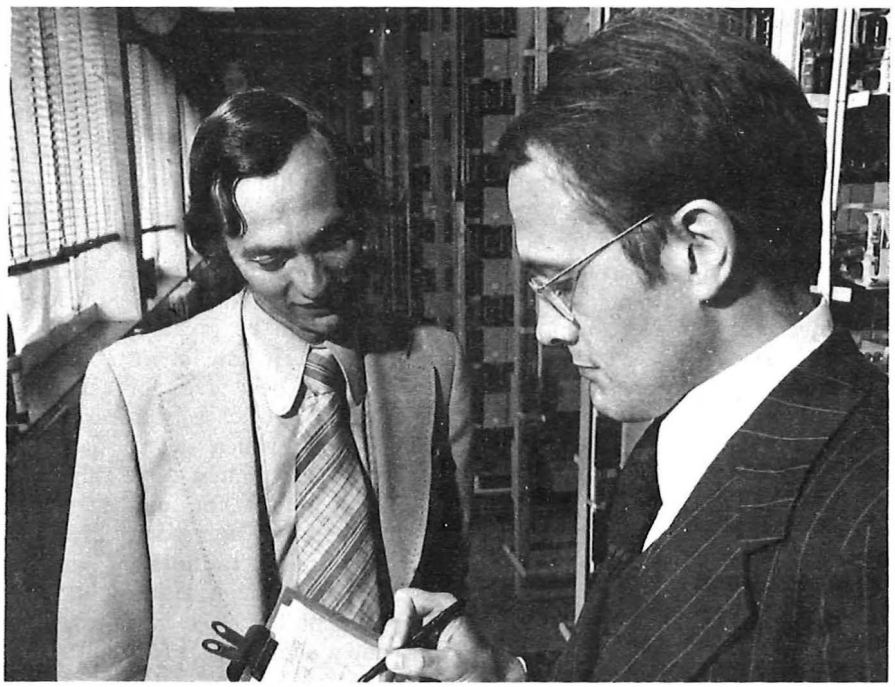
Almost all aspects of the Telecommunications Business have legal implications of course, from the procurement, installation and maintenance of the infrastructure to the relationships with customers who use it. But there are also problems common to all parts of the Post Office – staff's conditions of service, pensions, industrial relations and financial matters, as well as problems peculiar to the other Businesses, such as National Girobank and National Data Processing Service. Even the rural bus services and newspaper deliveries associated with the Postal Business have their own peculiar legal aspects.

In such a wide field there are, of course, countless anecdotes and as everyone enjoys a good crime story it is not surprising that as far as topical tales are concerned, the Prosecution Division proves the most prolific source of material.

There was the case, for instance, of the patient pair who removed nearly 40 tons of solder from store in a succession of wheelbarrow trips by concealing the loot among legitimately drawn items. "Phreaking" and other ways of getting free telephone calls also provide a fertile area to which the intelligentsia of crime are unfortunately drawn.

In Wales recently 20 university students were prosecuted – mostly in

Advisory Department solicitor Mr Tom Price (right) inspecting Whitehall Exchange in London with Assistant Executive Engineer Ian Richardson, Officer In Charge of the building which was the subject of a rating dispute earlier this year.



Mrs Thalia Chivers, a solicitor in the Litigation and Prosecution Department at Euston Tower, passes in the shadow of the Post Office Tower on her way to a court hearing.

Welsh – for taking advantage of the fact that a severed barring strap in a local exchange had enabled them to dial free trunk calls from coinboxes. Some of them claimed to believe that by dialling the code digits of the local exchange they were automatically reversing the charges.

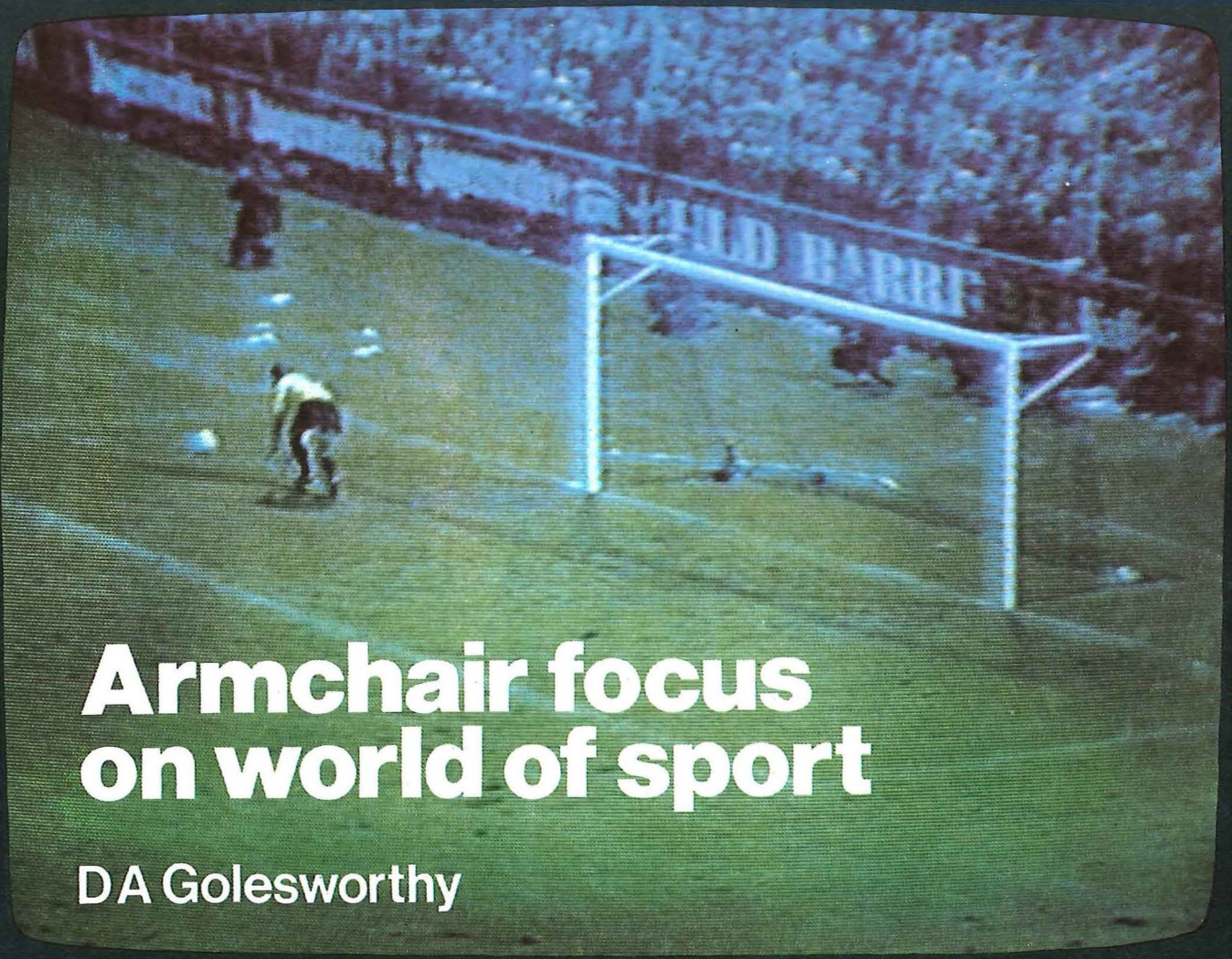
Examples of some recent activities in the Advisory Department serve as a reminder that most new ideas, whether in the form of technical advances or marketing innovations, have considerable legal ramifications. The preparation for the Prestel viewdata system has presented this Department with a variety of problems. Development of System X and the satellite projects planned for the 1980s have called for negotiation and co-operation in the provision of complicated legal bases.

The Advisory Department, perhaps more than any other in the Solicitor's Office, has to be prepared to break new ground. It has, for instance, had to adapt to new ideas for achieving familiar ends, such as the leasing arrangements which were used to finance the two latest cable ships and replacements of the motor vehicle fleet. There has been advice given on agreements for consultancy services for foreign administrations, and the Department has even been asked to provide a short course of training for the benefit of a lawyer from Libya.

But all this can reveal only the tip of a very big iceberg. It may, however, serve to remind the many who throughout their Post Office careers never come into contact with the Solicitor's Office, that very few aspects of their work and their personal status as employees, union members or prospective pensioners do not fall within the field of its activities. A sobering thought indeed...

Mr C. L. Morrow is Director of the Advisory Department of The Solicitor's Office at Central Headquarters.

PO Telecommunications Journal, Autumn 1978.



Armchair focus on world of sport

D A Golesworthy

SPORT of all kinds today has greater international appeal than ever before, thanks largely to the dramatic advances which have taken place in worldwide telecommunications. Events like the World Cup soccer championships held in Argentina earlier this year are, for example, no longer remote affairs to be read about in tomorrow's newspapers or followed via a crackly wireless commentary, but colourful spectacles to be enjoyed in millions of homes around the globe as they happen. .

International link-ups by cable or satellite are now so sophisticated that the time needed to arrange for a television newsman to broadcast an urgent bulletin halfway across the world can be not much more than it takes to make a few telephone calls. Fortunately, for those who have to handle such transmissions, however, most requests for broadcasting facilities arrive well in advance.

The Post Office international programmes booking centre at Caroone House, just around the corner from the Old Bailey in the City of London and part of the External Telecommunications Executive (ETE), handles bookings by telephone, telex and letter at the rate of about 2,000 sound transmissions and 100 television transmissions every month, the bulk of them from broadcasters.

The bookings having been accepted, the transmissions are set up by engineers at the Post Office's satellite earth station at Goonhilly, Cornwall, and the Post Office Tower, and through the special switchboard of the International Sound Programme Centre which is situated at Faraday Building in London.

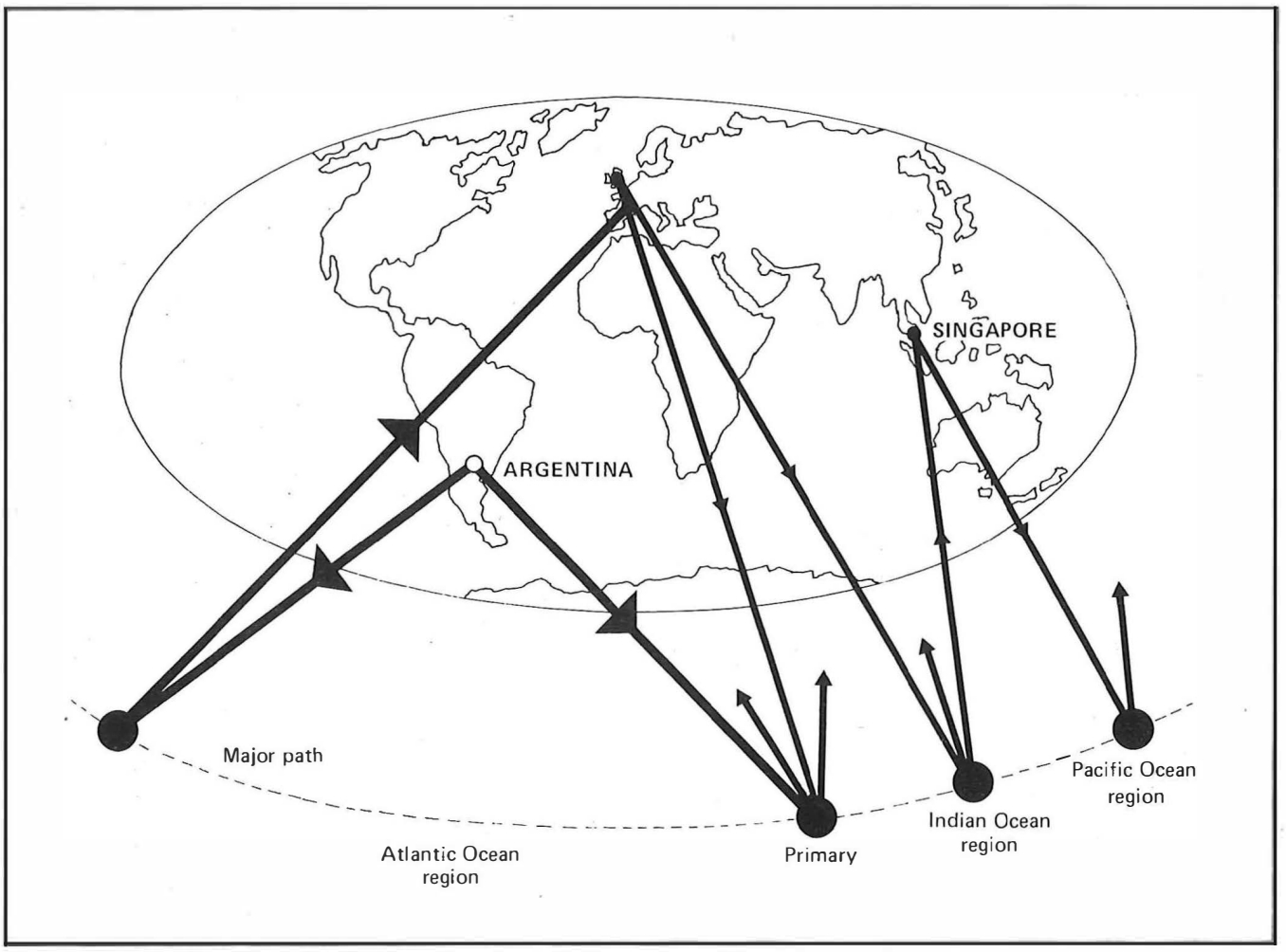
A transmission from the United States, for instance, arrives simultaneously in two parts, sound and vision, with the sound coming via satellite through Goonhilly into Faraday Building and the vision via Goonhilly into the Post Office Tower. Both parts are then transmitted to the BBC or ITV for co-ordination and screening. A transmission from Europe would arrive by microwave signal at the Post Office Tower, already co-ordinated.

Where there is real urgency over a satellite link up, staff can simply pick up their red telephone "hot-line" at Caroone House which provides a direct link with Goonhilly and through there to the Intelsat Operations Centre in Washington DC and virtually any earth station around the world.

But with great sporting events such as the World Cup, Wimbledon, the Olympic or Commonwealth Games or, recently, the European Games in Czechoslovakia, the sheer complexity of the arrangements, involving simultaneous transmissions to many countries, demands much planning to be done in advance.

For along with the pictures, each country (and often each individual broadcasting organisation) requires a link to carry the commentary and "background noise" and yet another to enable the commentator to receive instructions from the programme producer in the studio back home.

During the 1978 World Cup Soccer championships in Argentina, the number of transmissions and receptions involving Intelsat, the 102 member-nation organisation which owns and operates the satellites used for global transmissions, totalled 1,364, giv-



How pictures and sound from the World Cup soccer matches in Argentina were relayed via satellites around the globe.

ing a total of 2,728 hours of transmissions and receptions worldwide.

The opening game of the World Cup was transmitted around the world on four satellites – two Intelsat IV-A satellites over the Atlantic Ocean and one Intelsat IV over the Indian and Pacific Oceans. Transmissions originated at the Argentinian Balcarce earth station and went out on television channels on two Intelsat satellites over the Atlantic.

The primary path satellite transmission from Argentina was mainly for countries in North and South America, while the major path satellite was for Europe and for onward transmission, via Goonhilly earth station, to 16 countries on the Indian Ocean Intelsat satellite.

Pleumeur Bodou earth station in France retransmitted the pictures via another channel in the primary Atlantic satellite to nine countries using the Secam television standard, while the Indian Ocean transmission was retransmitted yet again by an earth station at Singapore to the Pacific Ocean satellite for soccer fans in New Caledonia and French Polynesia.

It has been estimated that there were some 400 transmissions on the system of World Cup material other than the actual games themselves, meaning another 700 transmission and reception hours and a grand total for the World Cup tournament of more than 3,400 hours, surpassing even the 1976 Montreal Olympics in popularity. In fact, a record for simultaneous coverage of a single event was established when the final game, between Argentina and Holland, was telecast or relayed live through eight different earth stations around the world and received by no fewer than 63 countries across the globe.

Miss Corinne Godfrey, a Clerical Officer at the Post Office international programmes booking centre, uses the "hot-line" telephone direct link to Goonhilly earth station.

Comparison with the transmissions during the 1974 World Cup shows clearly the remarkable growth in interest in international soccer as well as the growth of the Intelsat system. In the tournament of four years ago there were just 500 satellite transmissions totalling some 1,500 hours of coverage. Inevitably an operation as large and complex as coverage of the World Cup is further complicated by last-minute changes in orders from countries as their fortunes in the tournament change.

According to Intelsat those countries which showed the most interest in the World Cup were Brazil, Colombia, Ecuador, the members of the European Broadcasting Union, Iran, Iraq, Israel, Kuwait, Mexico, Nicaragua, Peru, Qatar, Saudi Arabia, the United Arab Emirates, the United

Arab Republic, the United States and Venezuela. One surprise satellite viewer for the last two matches was the People's Republic of China. The game of soccer is now so popular throughout the world, in fact, that several countries built earth stations specially for the World Cup series.

A much less complicated operation, but nonetheless involving preparations beginning about a year in advance, was the coverage of the European Games in Prague, Czechoslovakia this August. In this case the transmission was handled by the European Broadcasting Union (EBU), which has special circuits to carry vision with "sound in sync" with member broadcasting organisations paying for the service through a formula by which costs are shared depending upon how many countries wish to receive the programme.

With the EBU circuits providing the pictures and "background noise", the role of the Post Office was to arrange for channels for the commentary and for control from the studio. Both the BBC and London Weekend Television leased through circuits from Czechoslovakia to London throughout the Games, while BBC Radio ordered occasional circuits for its bulletins.

Although the routing of the EBU circuits varied depending on which members had ordered transmissions at various periods of the Games, a typical pattern was a link-up from Czechoslovakia to Austria to Yugoslavia to Italy to Switzerland to West Germany to Belgium to France and then to London.

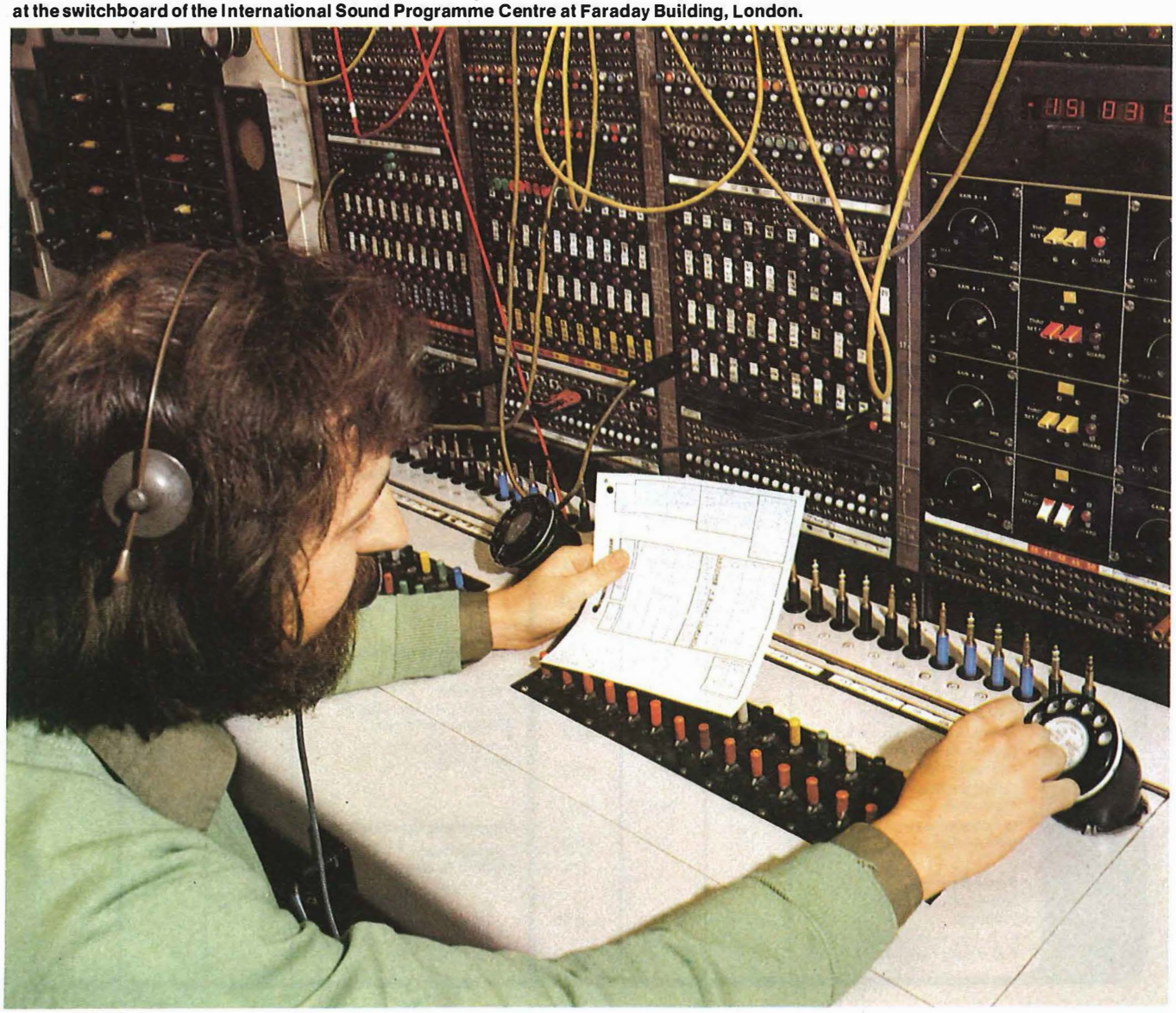
The Post Office booking centre at Caroone House can itself arrange circuits for programme transmissions which are going to last only a few days through the International Sound Programme Centre.

Always with an eye to the future, it was as long ago as the 1976 Olympic Games that the Post Office were first in contact with Moscow about possible transmission facilities for the 1980 Games, and consideration is now being given, in co-operation with the broadcasting organisations, on how best to handle the UK end of the operation concerning television requirements and the type and number of circuits likely to be provided in Russia.

Indications are that with yet more earth stations in operation and possibly further satellite facilities available by 1980 the worldwide coverage will put even this year's World Cup in the shade.

Mr. D. A. Golesworthy is a Higher Executive Officer at the Post Office External Telecommunications Executive's international programmes booking centre at Caroone House.

Technical Officer Brian Pearson handles a sound link-up at the switchboard of the International Sound Programme Centre at Faraday Building, London.



Year of record growth

OVERALL profits of £367.7 million for the year ending 31 March 1978 were announced by the Post Office – an increase of £76.4 million over the previous year. Individual business contributions to the result were: Telecommunications £325.5 million, Posts £40.4 million, Giro £2.8 million and Data Processing Services £1.1 million. Remittance Services lost £2.1 million.

Commenting on the figures, Sir William Barlow, Chairman of the Post Office, said that vigorous marketing, a determination to sell Post Office services and successful anti-inflation measures had contributed to the second successive good year of results. In Telecommunications, a year of expansion saw record growth.

Explaining how all surpluses were ploughed back for the benefit of customers, Sir William said that the Post Office continued to have one of the largest investment programmes of any UK organisation, totalling some £870 million in 1977-78 with almost all the money spent in Britain. The programme would be even larger in 1978-79.

Sir William commented: "On the Telecommunications side in particular, the importance of the investment programme is vital in view of the increasing range of new services and new equipment. It is vital also for an important UK manufacturing sector and much therefore depends on a healthy, and profitable Telecommunications business."

Among the highlights of the year for Telecommunications were that:

- The number of telephones in service passed 23 million and the numbers of calls made and orders received for service set new records;
- Britain became the first country to offer telephone customers direct dialling to more than 50 countries.
- A massive exchange modernisation programme was announced and contracts worth nearly £30 million placed for System X equipment, the telephone system of the future.
- A 1979 launch for the Prestel public viewdata service was announced.

Orders for service were more than 25 per cent above 1976-77 levels, with more than half completed within two weeks. Customers made 8.2 per cent more local, 10.1 per cent more trunk and 27.5 per cent more international calls. Telex lines in service grew by 10.5 per cent and data transmission terminals by 15.5 per cent.

Modernisation continued, with 18 per cent of customers served by electronic or crossbar exchanges by 31 March. Calls could now be dialled from nearly 80 per cent of lines to some 360 million – 85 per cent – of the world's telephones in 76 countries. Automatic telex service was extended to a total of 111 countries.

In Research and Development, the key part of the total £56.7 million programme was a progressive build-up on System X. Major development contracts were signed and production orders were being placed for local exchanges to be in service in 1981.

Looking at future prospects in Telecommunications, Sir William emphasised the need to improve and expand service while accelerating progress on new technology. It was important to improve relationships with major equipment suppliers.

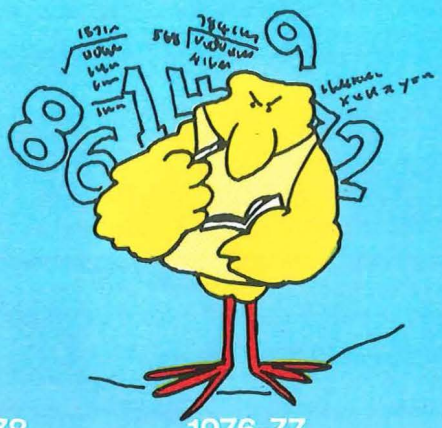
Quality of telephone service

Detailed records of the quality of telephone service were published for the first time in September by the Post Office. In future the figures will be published annually with quarterly updates. This table shows national average figures.

	1975/76	1976/77	1977/78
	%	%	%
Local Automatic Service			
Calls connected successfully	64·0	64·8	64·1
Calls which obtain engaged or no reply	27·2	26·6	27·3
Calls that fail due to customer	7·1	7·1	7·1
Calls that fail due to Post Office	1·7	1·5	1·5
STD Automatic Service			
Calls connected successfully	64·6	65·3	64·7
Calls which obtain engaged or no reply	22·5	22·5	23·3
Calls that fail due to customer	9·2	8·9	8·7
Calls that fail due to Post Office	3·7	3·3	0·66
Repair Service			
Yearly fault reports per telephone	0·68	0·67	0·66
Fault reports cleared by end of next working day	82·2	74·4	68·4

	1975/76	1976/77	1977/78
	%	%	%
Inland Operator Service			
Calls answered within 15 seconds	90·7	87·1	84·3
International Automatic Service			
Calls connected successfully	35·3	37·0	38·2
Calls that fail in international automatic exchanges	58·9	57·6	57·6
Calls that fail due to other causes	5·8	5·4	4·2
International Operator Service			
Calls answered within 15 seconds	77	63	58

The year in figures



A review of Post Office Telecommunications progress in the year 1977-78

	1977-78 result	1977-78 % growth over 76-77	1976-77 result	1976-77 % growth over 75-76
TELEPHONE SERVICE				
Size of system				
Total working connections	15073000	8.0	13963000	5.5
Total working stations	23261000	7.0	21739000	4.7
Call office connections	77000	0.1	77000	0.1
Shared service connections	1579000	–8.9	1733000	–13.2
Growth of system				
Net demand for connections	1881000	32.0	1425000	22.2
New supply of connections	1753000	23.2	1423000	11.9
Penetration				
Stations per 1000 population	415	6.1	391	5.6
Traffic (in millions)				
Inland effective calls: trunk	2703	10.1	2456	4.2
Inland effective calls: local	14600	8.2	13500	5.5
Continental: outward calls	52.7	24.4	42.4	21.1
Inter-continental: outward calls	17.8	46.0	12.2	31.0
Telephone usage				
Calls per connection	1197	1.6	1178	—
Calls per head of population	310	8.4	286	5.5
Local exchanges				
Total	6231		6260	
Strowger	not yet available		5046	
Crossbar			389	
Mixed strowger/crossbar			27	
Electronic			787	
Mixed strowger/electronic			11	
TELEX SERVICE				
Size of system				
Total working lines	72000	10.5	65000	9.6
Traffic				
Inland calls	74913000	3.9	72094000	14.0
External outward numbers of minutes	158755000	11.9	141851000	13.5
TELEGRAPH SERVICE				
Telegrams				
Inland	3201000	–6.9	3440000	–18.7
External				
UK originating	4918000	–4.8	5165000	–12.4
UK terminating	4833000	–8.0	5254000	–10.1
UK transit	4194000	–8.8	4599000	–4.8
TELECOMMUNICATIONS STAFF				
(Part timers count as half)				
Telecommunications Headquarters (including Research, Development and Procurement)	20441	1.7	20102	–1.4
Regional Headquarters	12879	–1.2	13034	–1.4
Telephone Areas	191539	–1.7	194920	–4.5
Total	224859	–1.4	228056	–4.1

AS SIMPLE AS ABC

J Valentine

LIFE could soon become considerably more difficult for housebreakers, burglars and villains generally, thanks to a new Post Office service which is literally as simple as ABC. Known as Alarms by Carrier, it enables an alarm signal from a customer's premises to be transmitted over a normal telephone line – but at above audio frequencies – to a special terminal at the local police or fire brigade HQ.

And because the ABC system is electronically and continuously tested for the presence of line faults the danger of unknown malicious interference is minimised. All cases of line faults and disconnection are signalled to the Post Office maintenance centre, and where they occur on a police call installation they will be notified to the police control room for appropriate action to be taken. Thus if a burglar cuts the telephone wire prior to 'doing' a premises, he is likely to find a police welcome when he emerges with his haul.

Until now the methods most commonly employed for transmitting fire and intruder alarms were use of '999' autodiallers which alert the operator when activated, and direct point-to-point private circuits between protected premises and fire and/or police control rooms. Private circuits are also used to link protected premises with alarm company control rooms either directly or by multiplexing techniques.

As ordinary exchange lines are used the cost of ABC is not price sensitive according to the distance between the customer's premises and the emergency HQ as applies with private circuits. Furthermore private circuits in practice do not normally exceed one and a half miles in length for alarm transmission purposes. As well as this, some police and fire authorities are reluctant to accept further terminations from direct circuits because of the ever increasing accommodation demands of terminal equipment.

When activated the ABC system transmits fire or intruder alarm indications from the customer's premises to the local telephone exchange. Signals are then forwarded to a central control telephone exchange by use of time and frequency division multiplexing techniques. From there they are routed to either the police or fire emergency control room equipped with a special teleprinter type terminal which is able to deal with alarm signals from a large number of protected premises. This considerably reduces the accommodation demands for the terminal equipment needed.

Each part of the transmission path is continuously monitored and any faults which occur are automatically recorded on a terminal, identical to that in the fire or police control room which is located in a Post Office maintenance centre.

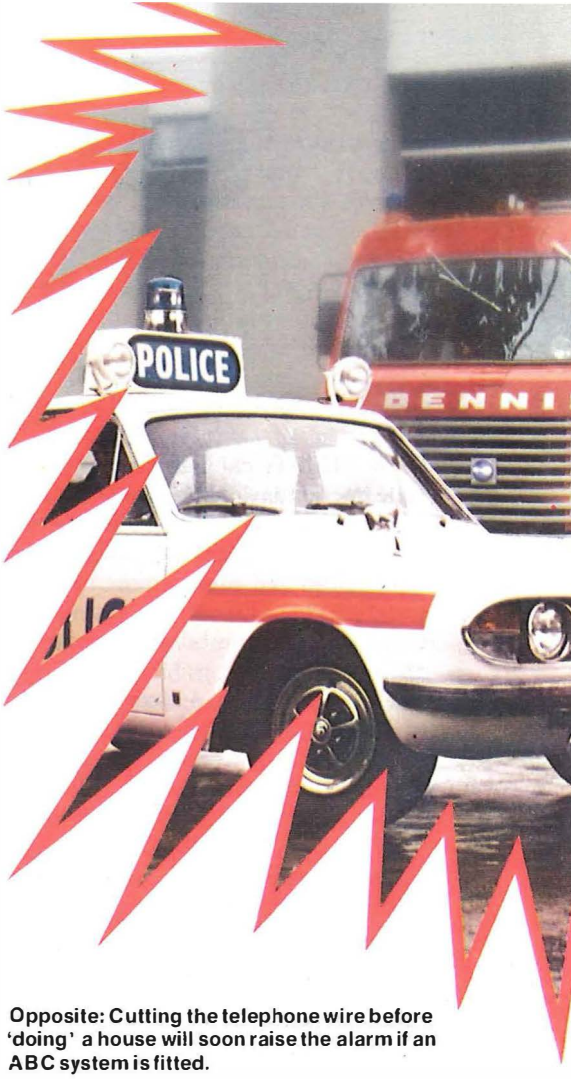
Service will be available in selected telephone exchange areas in Norfolk and Suffolk. The service offered to customers will include either a Post Office provided fire call point or police call point. Arrangements for the connection of automatic fire or intruder detection equipment provided by private industry are being discussed with the alarm industry and the fire and police authorities.

The Post Office call points are manually operated, and are similar in operation to the "break-glass" fire alarms common in many buildings. They have been specially designed for ABC and consist of a plastic case suitable for wall mounting with a central flexible inset. Thumb pressure applied to this inset releases a micro-switch and causes the emergency call signal to be transmitted.

The call point is connected to a carrier transmitter unit which in turn is connected to a telephone pair. A separate low pass filter isolates the telephone circuit from the carrier transmitter so that ABC does not affect the normal function of the exchange line, nor is the alarm signal affected when the line is in use for normal telephone purposes.

Mr J. Valentine has been closely involved with the development of the ABC system at Telecommunications Headquarters but has recently moved to become Regional Marketing Officer, Eastern Telecommunications Region.

PO Telecommunications Journal. Autumn 1978



Opposite: Cutting the telephone wire before 'doing' a house will soon raise the alarm if an ABC system is fitted.

Below: At the first hint of danger, a garage attendant can alert the police by thumb pressure on his ABC call point.

SAFETY MATTERS IN THE OFFICE

RG Vance and J Ferris

IF A FILING cabinet drawer is left wide open or a telephone cable is trailed carelessly across the floor most people recognise the potential danger and steer clear. A much more difficult situation for the safety officer is to convince people to be alert to the less obvious hazard.

In the Post Office – long recognised as a highly safety-conscious organisation – there has been a particularly positive campaign to tackle this problem in Glasgow Telephone Area.

Following a national agreement made in 1973 to give safety committees a formal place in the joint consultation machinery, local discussion led to the setting up of two new bodies – one to look after engineering operations and the other to cater for offices and switchrooms.

The Committee for Offices and Switchrooms is chaired by a Deputy General Manager while the Area's safety duty Executive Officer is secretary. There are four management members who change regularly but always include a Head of Division and lower management staff from the different fields covered by the Committee. Six trade union members are chosen by their unions.

From the outset the Committee decided on a planned programme of activity designed to improve the ways in which management organised safety both administratively and in the physical conditions which make for a safe environment. The other major objective was to improve the impact of safety publicity.

Initially one of the most difficult problems was to persuade office staff that despite their apparently safe work environment when compared with, say, engineers climbing poles or using winches, they could, nevertheless, be at considerable risk when stretching to high shelves or simply carrying a pile of papers down the stairs.

Attention was focused first on what might be called the basic mechanics of management's knowledge of accidents. Publicity was given to the need to report all accidents, the location of accident books was decided and advertised, and layout of forms for accident investigation was improved. Help was also given to supervisors undertaking accident investigation.

The quality of accident investigation was studied, as was the extent that safety training and information were given to staff at every appropriate training course from induction through refresher to preparation for a supervisory role. Many ideas arose from this, resulting in all-round improvements.

As a standing item, two members of the Committee examine the investigation records of all accidents in their "territory" each quarter. They report to the Committee, and ultimately to management, on anything needing further attention – whether it be the quality of the investigation or an aspect of training or accommodation standards.

Next the Committee turned its attention to the quality of publicity and its

Miss Margaret Rollo, Assistant supervisor, and Mr Ross Elder, acting Telecommunications Traffic Superintendent, conduct a safety walk in the cordless switchroom.

control, aiming to reach a situation where management or the Committee would be able to organise a comprehensive publicity campaign. An important side-issue was the introduction of a much needed control of notice board displays. Each became the responsibility of a supervisor who was also helped to build a library of safety posters which could be used for either local or full Area display.

Publicity potential was boosted by the purchase of a loop projector for cassette films, free-standing notice boards, and a set of display boards. All this equipment is dual purpose, being available to other groups such as sales or training for operational purposes.

The use of these tools of safety publicity depends largely on nationally produced films and posters, but the Committee has also developed a local line in publicity with photographic reconstructions of accidents which have occurred in the Area. Agreement from the person suffering the accident is always sought and the local Post Office Ambulance Centre helps in staging the accident situation.

One major publicity drive was on the theme of fire prevention and this was used as a test of the Committee's ability to devise and co-ordinate its publicity machine by using all the equipment – films, posters and display panels – to put over a single message. After circulation of the display to major buildings, staff reaction was assessed and showed that such a display could be organised to make maximum impact on all concerned.

Having dealt with the main administrative and publicity aspects, the Committee then turned to control of the working environment and devised a system of premises inspection, based on already published information. Every part of the Committee's territory of offices and switchrooms is divided into "walks" examined regularly by two inspectors trained to recognise safety hazards.

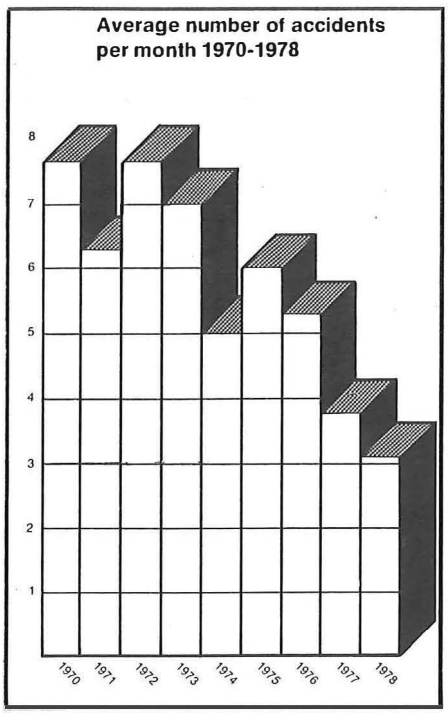
Identified hazards are discussed with the group supervisor in charge of the area, who is responsible for further action. The inspectors' role finishes at this point and responsibility is transferred to front-line management. Inspection reports are seen by managers who monitor the scheme, and where necessary, Accommodation Group are involved.

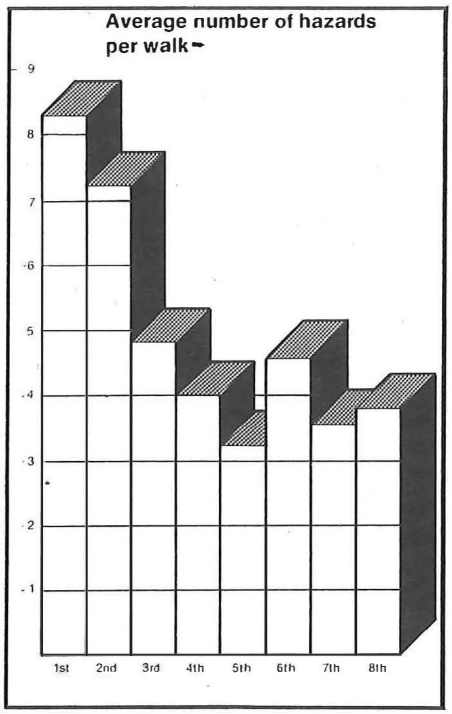
At the Committee's instigation a system was devised for priority clearance of safety hazards requiring action by the Government's Property Services Agency (PSA). After test by the Committee, the premises inspection scheme was given a large-scale trial before final acceptance by management. The scheme works well and has already brought a major reduction in the number of hazards and consequential decrease in the amount of accident potential.

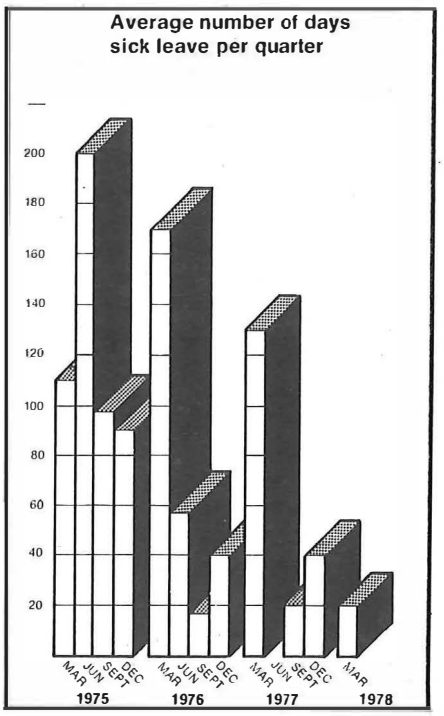
The Committee's function was early on identified as 'to monitor management's safety effort and suggest means of improvement'. It has operated on the three main areas of safety activity – administrative processes, control of conditions, and inculcating safety consciousness and the reward has been to see a reduction in the already low level of accidents.

Having used most of the major weapons in the traditional safety armoury, the Committee now looks forward to new challenges produced by the application of the Health and Safety at Work Act. Although the Telecommunications Business has generally been well ahead of any standards set by the Act, the introduction of trade union safety representatives is a new issue and it remains to be seen how their role will tie in with that of the Joint Committee.

Mrs Sheila Smith and Miss Norma Dow, two Clerical Assistants, ponder a point while visiting the "Fire Safety" display





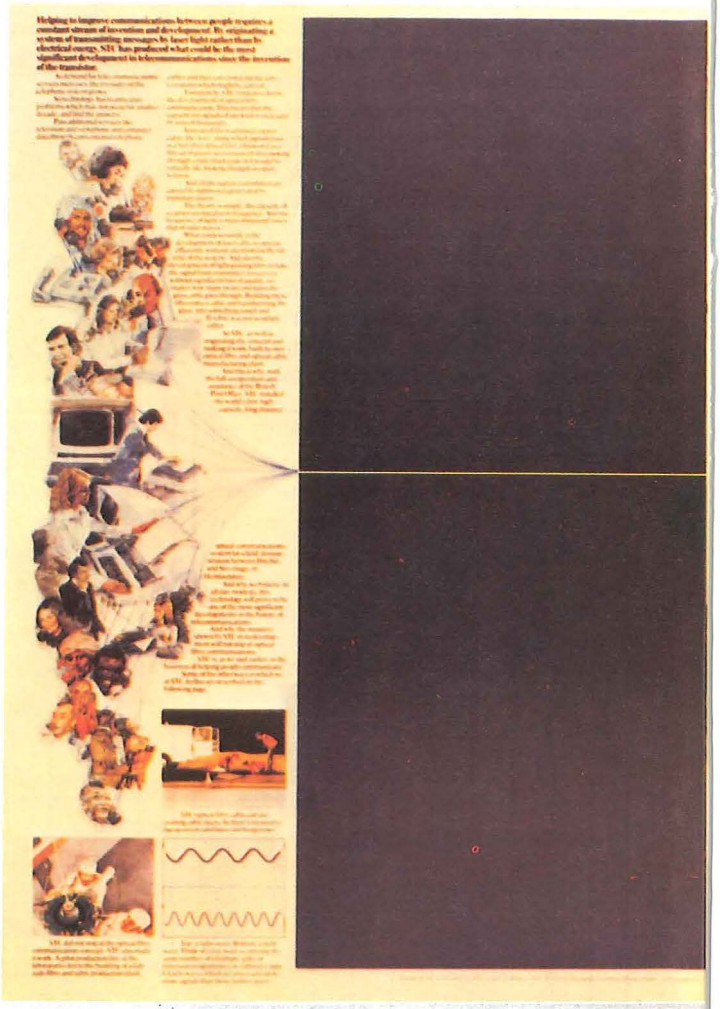


Mr R. G. Vance is Deputy General Manager, Glasgow Telephone Area.
Mr J. Ferris, is the Area's Safety Duty Executive Officer.

PO Telecommunications Journal, Autumn 1978

Remember STC's 8-page This year we're using only

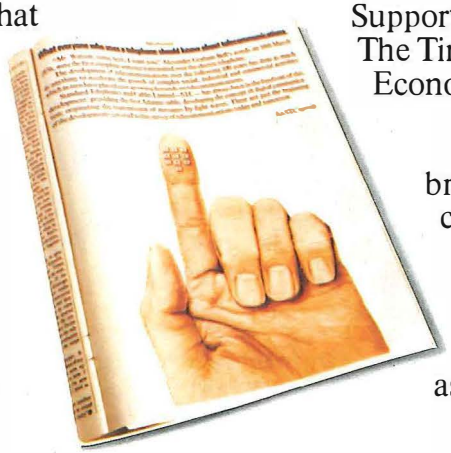
Very simply, STC is in the business of helping people communicate.



Last year we had the feeling that people like you, and like us, were not always understood. The people we talk to are not always technical experts.

They are, however, people who do wield a fair amount of influence where it matters.

Which is why last year we published an illustrated glossary of telecommunications, in an 8-page feature in the Sunday Times Magazine.



Supported by shorter versions in The Times and Financial Times; the Economist and New Scientist.

What happened?

We sent out almost 25,000 brochures to industry and commerce, and to schools and colleges, together with over 10,000 wallcharts.

We also gained valuable business enquiries as a result of the feature,

advertisement last year? four to tell a bigger story.

but that's another story.

It seemed to us that we should do something of the same sort, again.

Where last year we looked at our business in breadth, this year we thought we should look at it in depth.

With the theme of innovation, we chose optical fibre communications as our example.

After all, we not only originated the concept, we developed it and we made it work.

We chose the Financial Times to launch this year's story.

Perhaps you saw it, or have been told about it.

If you would like a copy of our story as a leaflet, or a wallchart, just ask.

Peter Earl, Director-Public Relations,
Standard Telephones and Cables Limited,
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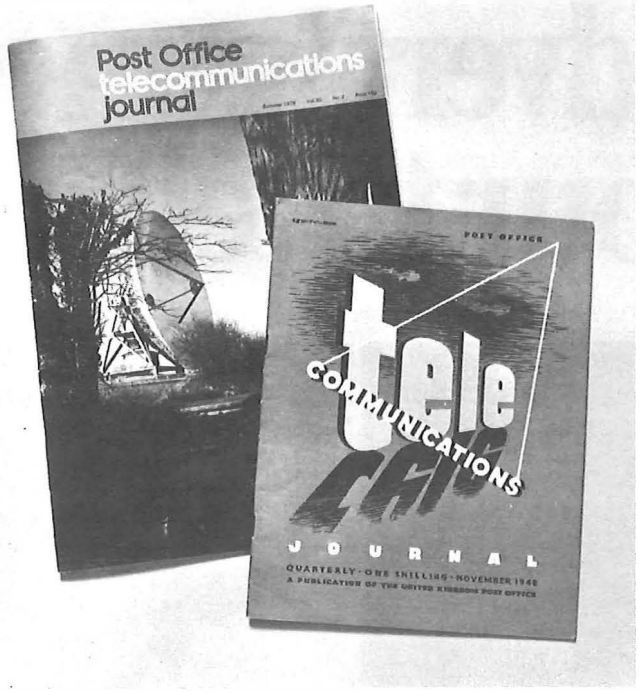
MANY HAPPY RETURNS



THE PAST 30 years have seen a breathtaking technological revolution in telecommunications both in this country and throughout the world. In 1948 there were just 4.6 million telephones in the UK, a figure which had risen to 23.2 million by 1978 when its 13 million telephone customers were able to dial direct to 350 million telephones in 76 countries.

And compare the volume of traffic: In all 2,900 million calls were made in the UK in 1948 while 30 years later the number had increased sixfold to 17,454 million.

The situation with regard to finance is equally impressive. In 1948 revenue was £86.5 million – now it is £2917 million.

Mr Freddie Phillips

Post Office Telecommunications Journal celebrates its 30th birthday with this issue – a landmark which coincides with the retirement of Mr Freddie Phillips, Director of Telecommunications Marketing and, since 1974, Chairman of the Journal's Editorial Board. Here Mr Phillips, whose own career spans 40 years, recalls some of the main developments covered by the Journal since its first appearance in November 1948

In these days of optical fibres, System X and Prestel it is hard to believe that Post Office Telecommunications Journal was born in the same year that Bell invented the transistor in the United States. But it is pleasing to note that like telecommunications, the Journal itself has made dramatic advances. From a circulation of 14,000 copies an issue in 1948, it has steadily increased to its present level of 61,000 and in the process has been a valuable medium for explaining seemingly mind boggling technologies in what is an easily understood way.

Let us just look at a few of the most significant events of the past three decades...

- ●1948 The transistor invented by Bell in the United States
- ●1954 New inland telex service established
- ●1956 First transatlantic telephone cable opened
- ●1958 Subscriber Trunk Dialling (STD) service inaugurated by HM the Queen
- ●1962 Satellite communications station at Goonhilly Downs, Cornwall begins working
- ●1963 International Direct Dialling (IDD) introduced
- ●1965 Intelsat 1 (Early Bird) launched
- ●1966 Change to all figure numbers begins
- ●1969 Post Office becomes a public Corporation
- ●1976 Birth of Buzby, the telephone bird and beginning of his spectacular flight to stardom

Keeping pace with the above and many other important events has not always been easy but Telecommunications Journal has provided a constant and reliable record. My retirement is tinged with regret that I shall be leaving the Business at one of the most exciting times in its history with the marketing effort really beginning to pay dividends. I wish both it and Telecommunications Journal continued success in the years ahead.

PO Telecommunications Journal, Autumn 1978

MISCELLANY

New Nordic link

The UK's undersea telecommunications links with Scandinavia will be more than tripled by 1980 when a new £14½ million cable, capable of carrying about 4,000 telephone calls at once, comes into service between Norfolk and Denmark. Five undersea cables, with a total capacity of 1,956 circuits, are currently in use between Britain and the Nordic countries, and the new link – 292 nautical miles long – will have about three times the capacity of the largest of these.

The cable is one of several major submarine systems planned by the Post Office in close co-operation with other European countries. Systems of similar design have been, or are being, installed on routes from the UK to Belgium and France. Further systems will be installed by 1980 to Spain and the Netherlands.

Another visual aid

A self-adhesive dial ring with enlarged numerals for people with restricted vision, is now available to phone customers for just 40p. Simple instructions for fitting are provided, also in large print, and the ring can be in place on any standard dial-type phone, except the Trimphone and weatherproof models, in a few seconds.

It is the latest addition to the Post Office's range of telephone aids for the handicapped and has been developed in co-operation with the Royal National Institute for the Blind and the Department of Health and Social Security.

Fuel bills cut

Energy savings of £8½ million a year already achieved by Post Office Telecommunications can now be boosted by a further £¼ million following the findings of a year's trial of a new computer-based scheme in the Midlands Telecommunications Region.

The scheme – devised as part of the Post Office's massive 'save it' campaign introduced in the wake of the 1973 fuel crisis – pinpoints ways of reducing electricity bills, and producing savings of some £30,000 in the Midlands trial alone.

A regular review of the 70 or so different tariffs available to Post Office Telecommunications would be impossible to carry out manually, but in an operation involving the Post Office's Data Processing Service, the mammoth task has been brought down to manageable proportions with the aid of computer programs.

The total electricity bill for Post Office Telecommunications now runs at more than £19 million a year.

Contract

Pye TMC Ltd – to design and develop the Small Business System – an electronic key telephone system based on a modular building brick principle, which will meet needs ranging, typically, from two external lines plus eight extensions suitable for the smaller user, up to 10 external lines plus 30 extensions which could be extended further for the larger business.

Charges down

Charges for the Post Office's satellite telex service for ships, introduced just over a year ago to provide round-the-clock links with more than 100 ships equipped to use the Marisat system, have been cut from £4.50 a minute to £3.25 a minute (VAT is extra), with a one-minute minimum charge on dialled calls, and a three-minute minimum on operator calls.

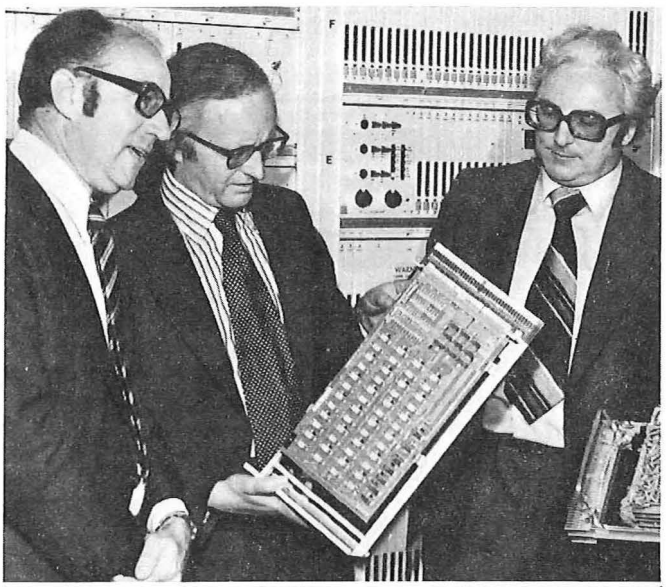
The reductions in costs for the service, which operates through satellites orbiting 22,300 miles above the Atlantic and Pacific Oceans, were made possible by cuts in the charges made by Comsat General – one of the American companies which provides the facility – to countries which use the service.

Art of telecommunications

A nationwide competition with prizes totalling £6,750 is being run by the Post Office, encouraging youngsters to use their imagination to portray telecommunications today and in the future. It is part of an international contest being organised to mark the World Telecommunication Exhibition, TELECOM 79, in Geneva next September.

Entrants, aged between eight and 18, are asked to express their ideas in photographs, drawings, paintings or other illustrations, with the chance of winning any of the 180 prizes on offer, while top award winners can match their skills against people of similar ages in other parts of the world.

The aim is to make young people more aware of the ever-growing use of telecom-



Mr Peter Benton, Managing Director, Post Office Telecommunications, examines a solid state store unit from a TXE4 telephone exchange during his recent visit to the electronic switching division of Plessey Telecommunications Ltd, at Huyton, near Liverpool. (Left to right) Mr K. F. Lilley, Director and General Manager, Mr Benton and Mr M. E. Glynn, Chief Executive of Plessey.

munications, the part that telephone, telex, data and other communications play in home and business life, and the need for qualified technical people to meet future developments.

Details of the competition, which closes on March 1, 1979, are being advertised and sent direct mail to 34,000 schools in the UK, or can be obtained from Colin Wise, ITU Pictorial Competition, Post Office Telecommunications, Room 438 Union House, St. Martin's-le-Grand, London EC1A 1AR.

Eurodata growth

Europe could have more than 80,000 digital data terminals of all kinds by 1982, made up of more than 55,000 terminals on circuit-switched services and nearly 30,000 on packet-switched networks, according to figures given in a survey outlining the future plans of 13 European telecommunications administrations.

The survey, of great value for planning by the computing and computer-using industries involved in data transmission in Western Europe, is contained in the second edition of "Public Data Networks" published for the European Conference of Posts and Telecommunications Administrations (CEPT), by the Eurodata Foundation in London.

Twelve countries have or are planning circuit-switched services by 1982 and the remaining country intends to introduce such a service after that date. Eleven of the 13 also have packet switching plans.

In the UK copies of the book may be obtained from the Eurodata Foundation, Lutyens House, Finsbury Circus, London EC2M 7LY at a cost of £10.

Chairman's lecture

Post Office Chairman Sir William Barlow was due to give the Presidential Lecture of the Postal and Telecommunications Society on November 16. Other talks scheduled for the Society, which meets at 4.45pm in the Assembly Hall, Fleet Building, London, include one by Dr Alex Reid, Director of the Prestel viewdata project, on December 12, and one by Mr Frank Lawson, Deputy Director of Telecommunications Marketing, on January 17.

Cheaper to Italy

Sending computer data by phone to Italy is now cheaper, with the introduction of International Datel 2400 to that country, enabling users to send data at up to 2,400 bit/s. Until a couple of months ago the highest rate for a Datel service to Italy was 1,200 bit/s, using International Datel 600 facilities.

Record hit

The Post Office's record release service, which enables callers in London on numbers beginning 01 to hear potential hit records by dialling 154, was re-introduced in September after being replaced in the summer by cricket scores-by-phone. The record service received more than three million calls from September 1977 to April of this year.

Bureau at Heathrow

Travellers in the 'air side' of the departure lounge of London Heathrow Airport's Terminal 3 are now able to dial their own international calls to countries beyond Europe from five special booths in a new Post Office telephone bureau, open from 8am to 10.30pm, including weekends.

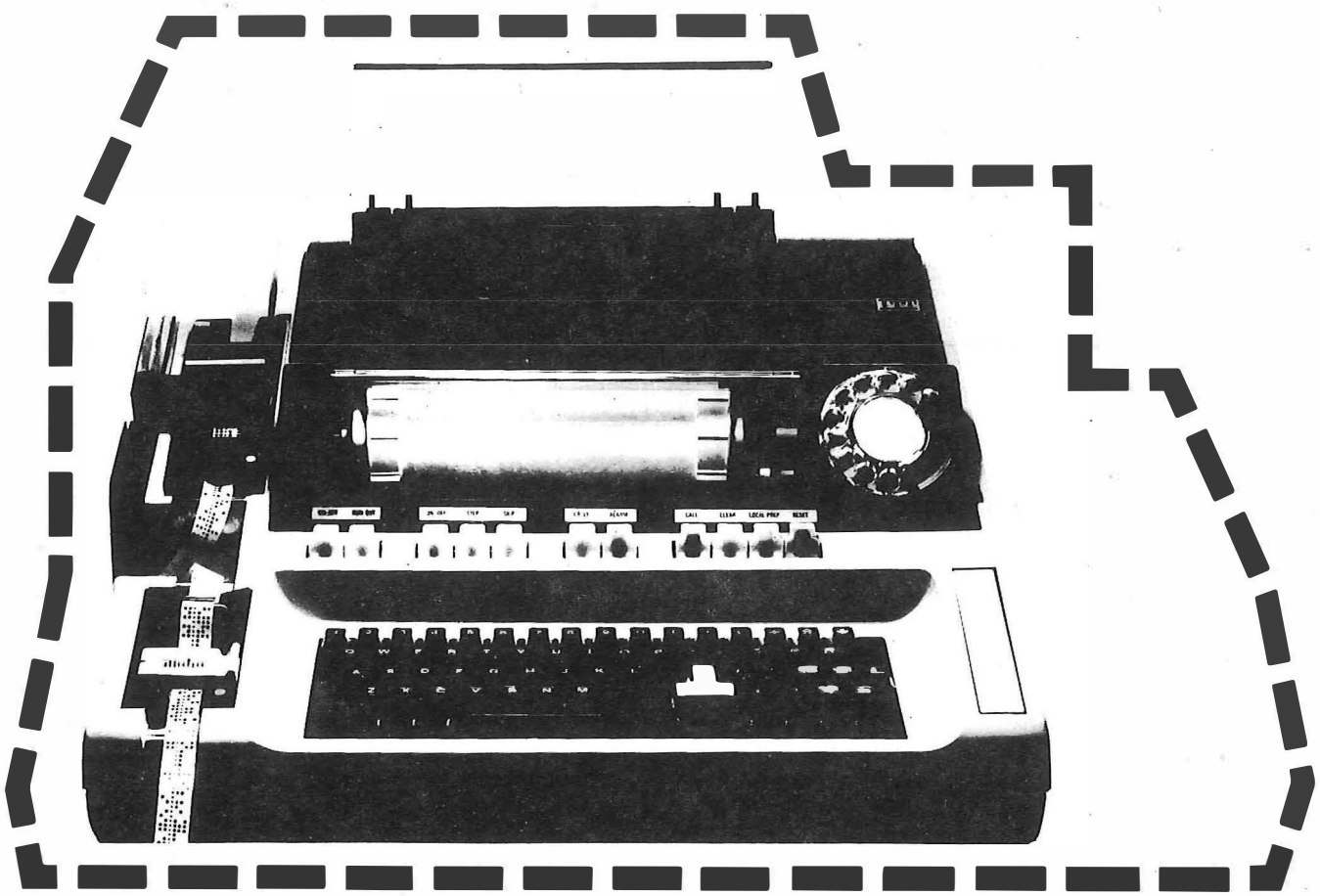
An attendant is on hand to help travellers if required and to collect the fee, acceptable in sterling, travellers' cheques or a range of foreign currencies.

Philippines – automatically

Britain's telex links with the Philippines Telegraph and Telephone Corporation network went automatic in August, so UK users can now set up international calls direct to four of the country's five telex networks.

Informal meetings

Speakers at LTR informal meetings during the winter will include Messrs J. H. Crouch and N. W. May on Cable and Wireless services abroad (February 7) and Messrs W. L. Goldie and J. C. Spanton on the role of Factories Division (March 8). On January 9 LTR Director Mr K. H. Ford will chair a special debate. All meetings will be held at LTR HQ, Camelford House at 5pm.



ITT Creed Teleprinter grows smaller and wins large British Post Office Contract.

The British Post Office has been using ITT Creed's teleprinters since the start of the telex service in the United Kingdom.

But they've recognised the growing demand for a smaller and lighter machine that is easier to operate and maintain.

Here then is the electronic ITT Creed 2300. It has just been ordered, for the first time, for use on the UK telex network, as part of a 24 million pound order to ITT Creed for new equipment.

Its electronic design gives it high reliability and its modular construction simplifies maintenance.

The British Post Office expects all equipment to be suitably robust for a long and useful life. And their customers must be just as satisfied with the equipment. So their approval on a new product is never given lightly.

For further information on the ITT 2300 Teleprinter, write to the address below:–
Sales Information Dept., ITT Creed Limited, Hollingbury, Brighton BN1 8AN, England.

ITT Creed Limited ITT

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The Journal is published in January, April, July and October, price 18p per issue. The biennial postal subscription is £3.50, or life subscription of £6 for retired Post Office staff.

Advertisements:
Communications should be addressed to Sheila Underwood, Forge House, Bell Lane, Brightwell-cum-Sotwell, Wallingford, Oxon OX10 0QD. Telephone: Wallingford (0491) 39370/35448.
Advertising copy should be addressed to Eric Gardener, Alabaster Passmore and Sons Ltd., Tovil Works, Maidstone, Kent ME15 6XA.
No official responsibility is accepted for any of the private or trade advertisements included in this publication.

Contributions:
The Editorial Board will be glad to consider articles of general interest in the telecommunications field from all sources. No guarantee of publication can be given. The ideal length of such articles is between 1,000 and 1,500 words. The views of contributors are not necessarily those of the Board or of the Post Office.

Correspondence:
Communications should be addressed to the Editor, Post Office Telecommunications Journal, Public Relations Department, Post Office Central Headquarters, 23 Howland St., LONDON W1P 6HQ. Telephone: 01-631 2192/2230 (editorial), 2193 (sales).
Remittances should be made payable to "The Post Office" and should be crossed "& Co." The Giro account number is 535-1006.

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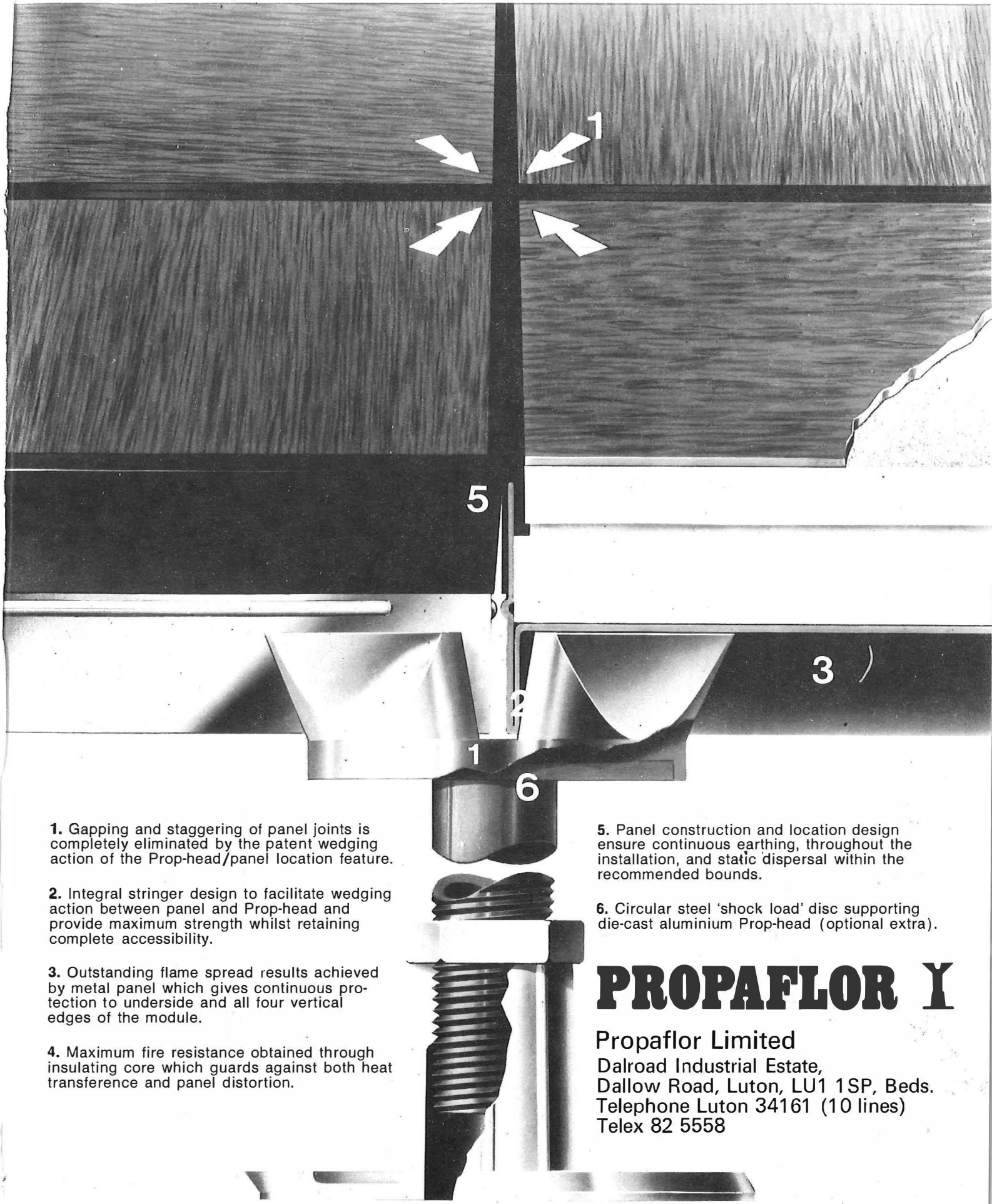

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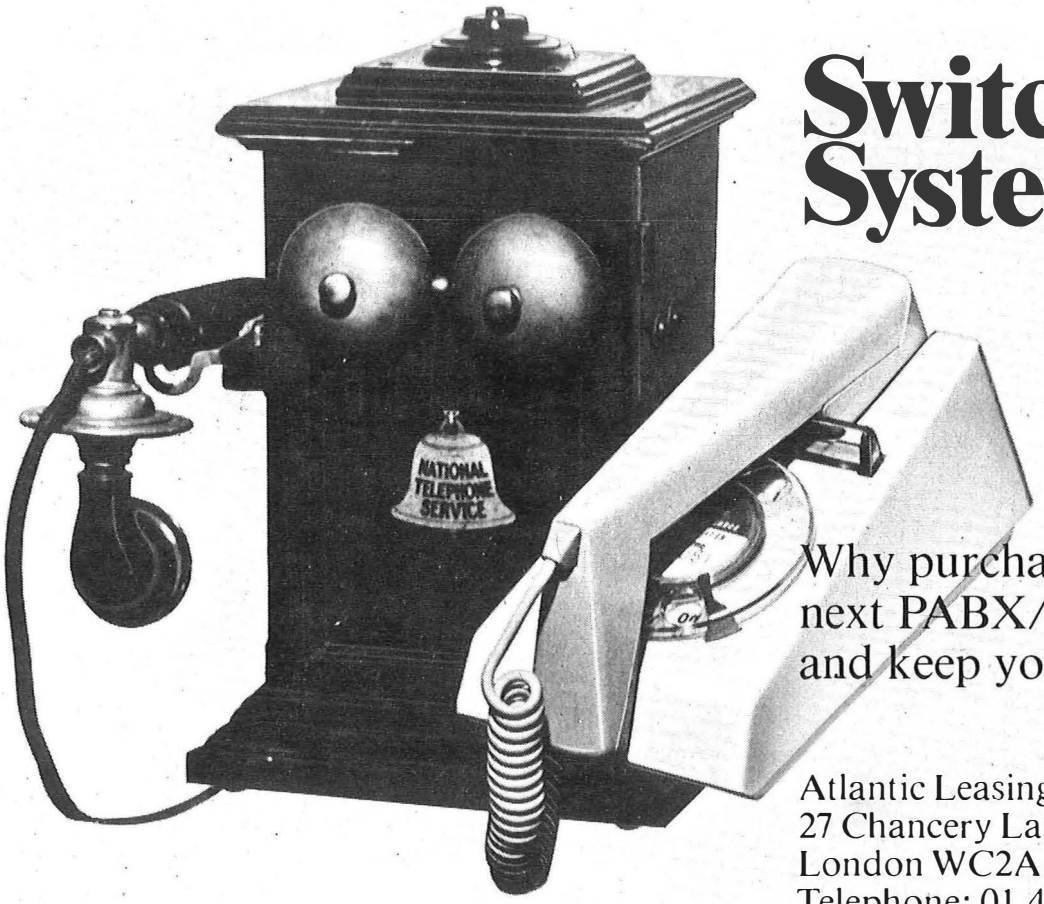

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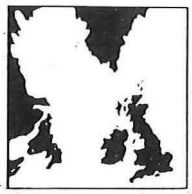
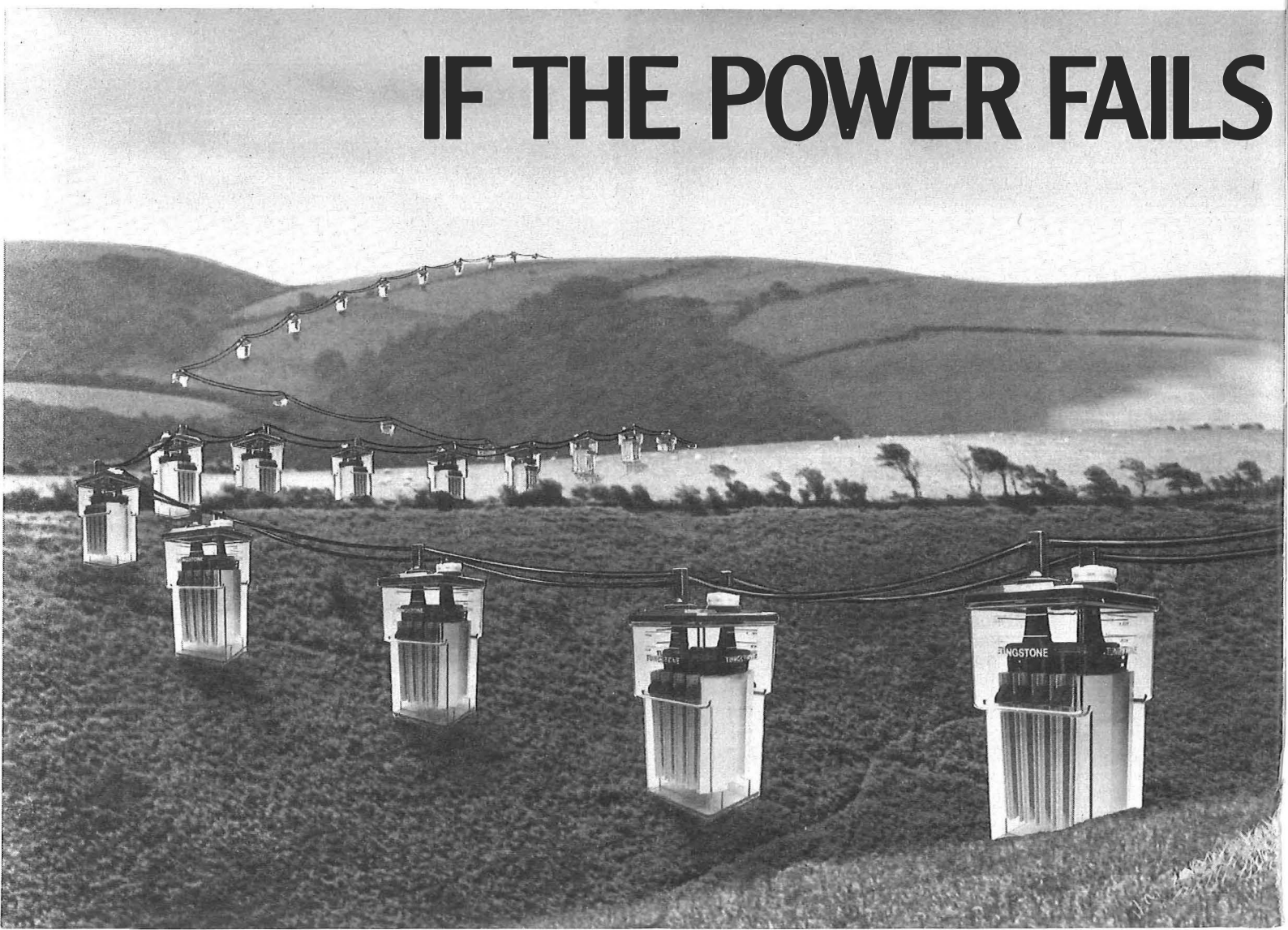


IF THE POWER FAILS



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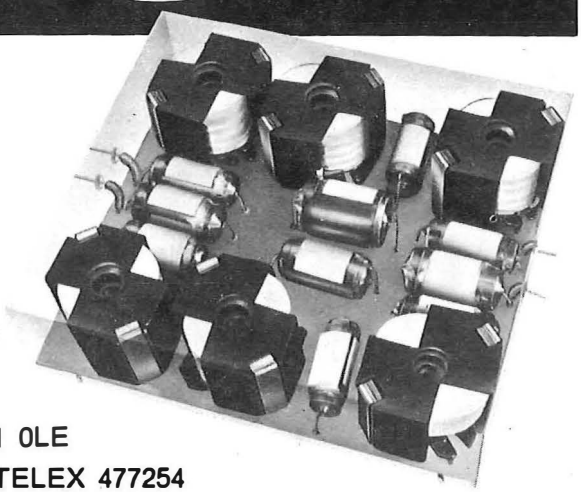

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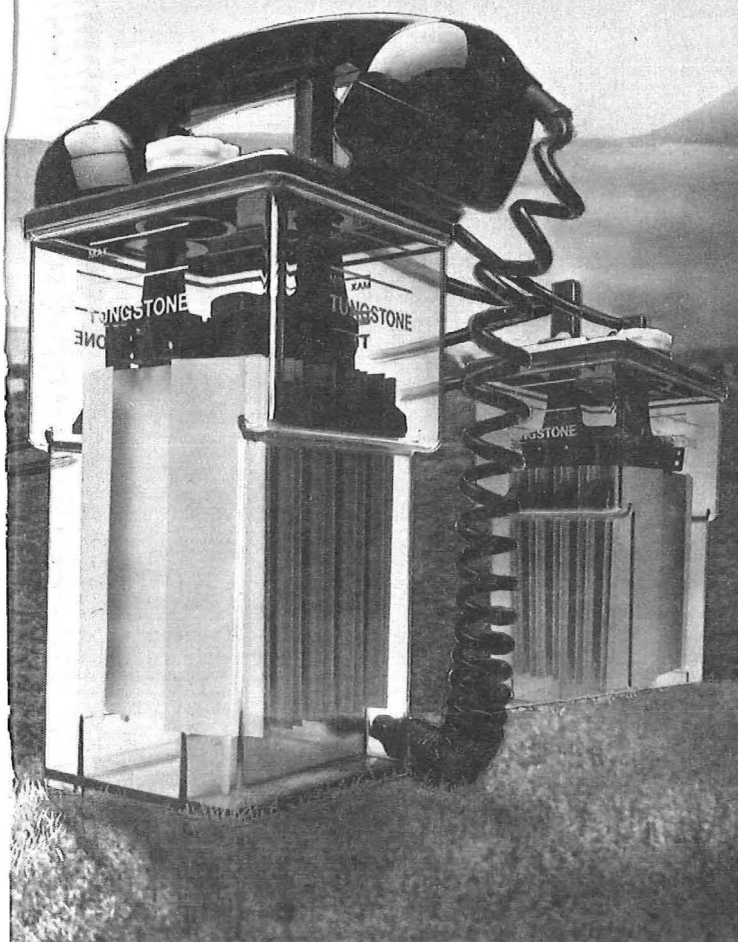

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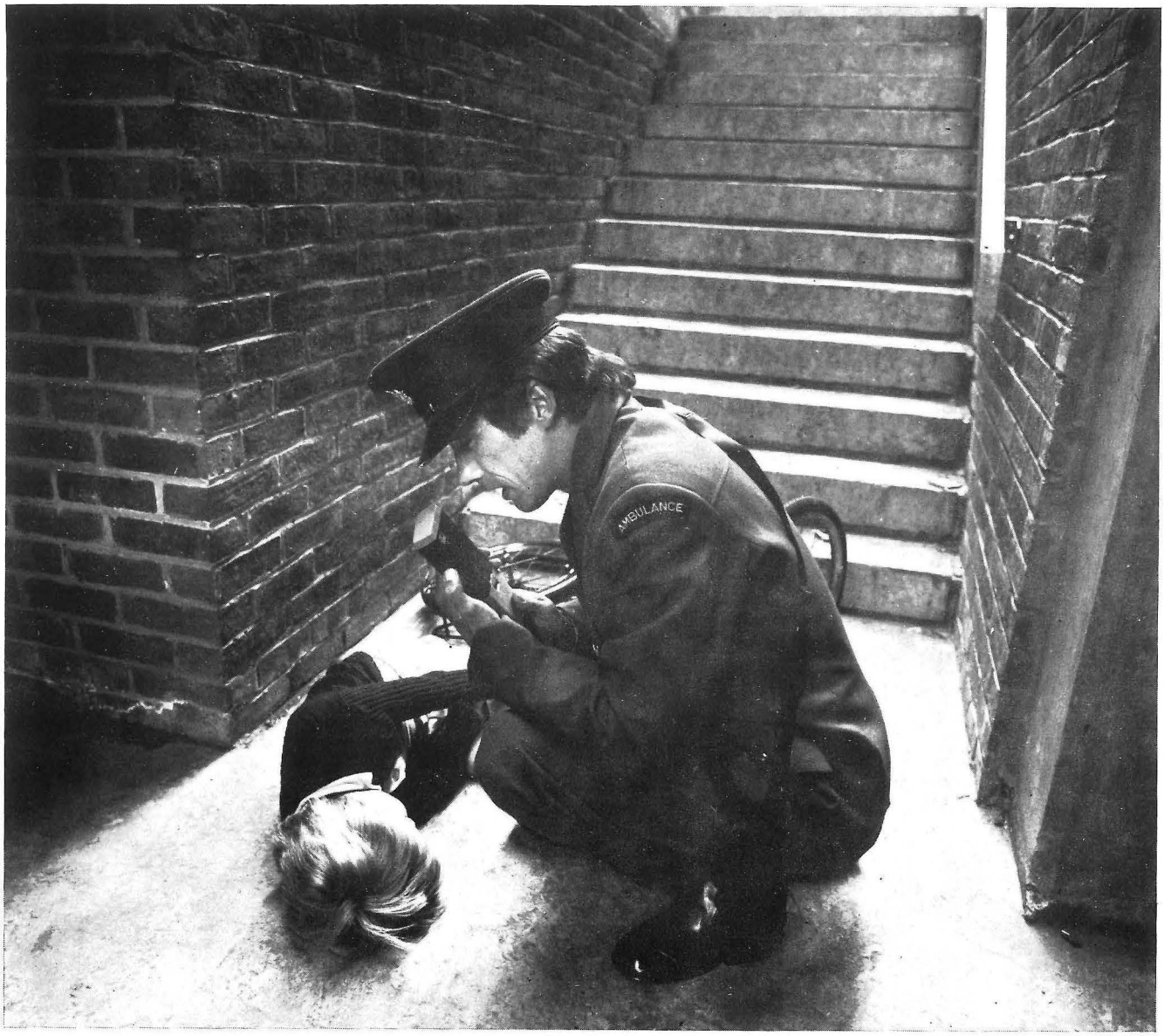

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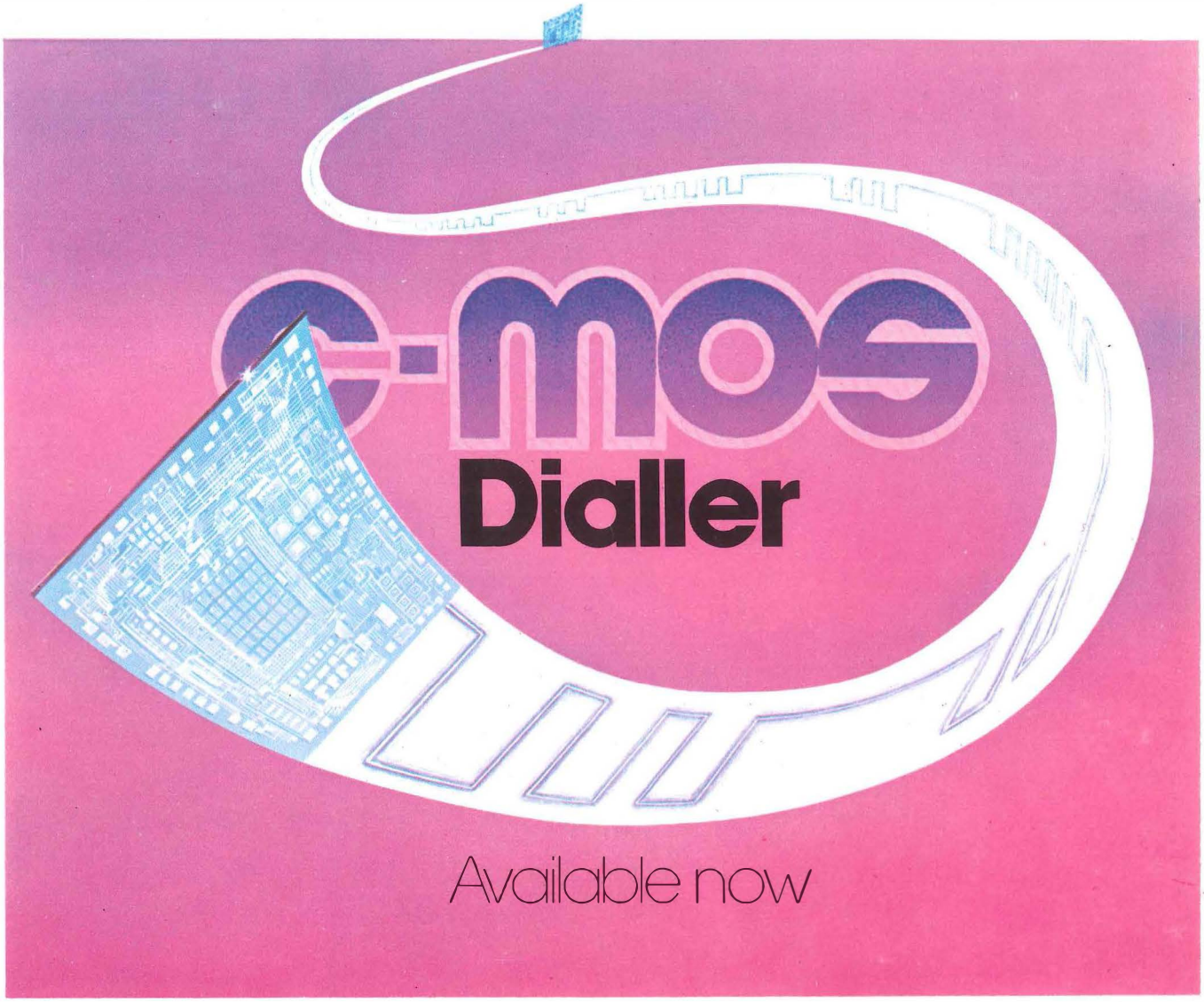

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- ✳ On chip clock
- ✳ Redial Facility
- ✳ Line powered operation
- ✳ Reset on line power breaks
- ✳ 4x3, 1 of 12 or 2 of 7 keyboards
- ✳ Binary inputs for auto-diallers
- ✳ Meets all major International specifications

The AY-5-9150 series diallers work direct from the telephone line and require very few external components while preserving, and adding to, all the features of previous Push Button diallers.

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