GPO General Post Office

PRESS AND BROADCAST NOTICE

HEADQUARTERS BUILDING · ST. MARTIN'S-LE-GRAND · LONDON E.C.1

CENtral 1170

P.B. 255(T)

1st December, 1958.

SUBSCRIBER TRUNK DIALLING AT BRISTOL

The opening of Subscriber Trunk Dialling at Bristol brings into service the first installation of GRACE - Group Routing And Charging Equipment.

This automatic apparatus takes over the functions of the operator in setting up trunk calls. It notes the number required, selects the correct route to that number and charges for the call at the appropriate rate.

The equipment is constructed on a unit principle so that its size can be readily suited to the needs of a particular exchange and can easily be enlarged to meet growth in telephone traffic. The Bristol installation is capable of completing over 6,000 calls per hour.

To obtain connexion to GRACE, and to present the required exchange and number to the equipment in a suitable form, the subscriber dials the national number of the subscriber he requires. The national number consists of a series of figures and letters to identify the required exchange, followed by the called subscriber's local number. All national numbers start with 0 and dialling 0 connects the call to GRACE.

CALL CHARGER

Initial connexion is made to a Register Access Relay Set or Call Charger. The Call Charger remains associated with the call throughout its duration, its main function being to start charging at the appropriate rate when the call is answered and to continue charging until the calling subscriber hangs up.

For setting up the call and selecting the correct charging rate, two further items of equipment, a Register and Translator, are called into use.

Registers, which are used only during the setting-up of a call, are provided in a common pool which can handle 66 calls simultaneously. A Call Charger taken into use by a call associates itself immediately with any available free Register. The Registers are of electronic design based on the use of cold-cathode tubes inter-connected by miniature selenium rectifier gates.

The number dialled by the subscriber is received by the Register, counted and coded electronically and stored on cold-cathode tubes in '2-out-of-5' code. A total of 45 tubes per Register is provided for this purpose giving a capacity for 9 digits.

TRANSLATOR'S FUNCTIONS

The first one, two or three digits received by the Register identify the charging group of the wanted exchange. It is the function of the Translator to inspect these digits and deduce from them the route and charge rate for the call. The Translator is in effect the brain of the system, incorporating a permanent memory of the route and charge rate for all calls that can be made by Bristol subscribers.

The Translator is also of electronic design and can deal with a Register in a few milliseconds. This high speed of operation permits it to control up to 40 Registers, to each of which it is connected sequentially by electronic gates once every two-third second. Each time it is connected to a Register it decides what action if any is required and sets the Register to perform this action.

While the Translator is dealing with its other Registers, the Register carries out this action and when this is completed receives a further instruction on its next connexion to the Translator. This master control arrangement permits a relatively simple design of Register since it is called upon in the main to carry out only similar and simple operations.

INSTRUCTIONS TO REGISTER

The first instruction given to the Register is a signal representing the charge rate for the call. This is passed by the Register to the Call Charger, where it sets an electromechanical switch to select the appropriate metering rate ready to start charging when the call is answered. Subsequent instructions cause the Register to send suitable signals to the automatic switches in the local and distant exchanges to route the call to the required exchange. These are followed by the digits of the called subscriber's number, which have been stored in Register and select the required line. When the connexion is complete, the Register releases from the Call Charger and is free to set up further calls.

When the call is answered the Call Charger operates the calling subscriber's meter once and then periodically throughout the call at intervals of time depending on the distance.

METERING

The meter on which the call charge is recorded is the one previously used only for recording local call charges. It is an extremely reliable mechanism of the Veeder type and each line in the exchange has its own meter.

If, however, a subscriber must know the cost of a dialled call at the time it is made to charge it to the user (e.g. in a hotel), a meter can be rented and installed at his premises to work in step with his meter at the exchange.

Operation of this meter is controlled by an equipment in the exchange which responds to the charge units received by the subscriber's exchange meter and connects a pulse of 50c/s alternating current to the line. This signal passes over the two wires of the line in parallel, via the meter at the subscriber's premises to an earth return. By applying the signal in this balanced manner no interference to the subscriber's conversation is caused.

The meter has a sensitive moving iron movement tuned to 50c/s to prevent misoperation by ringing current or dialling surges. It is equipped with three hands which move over a graduated scale, taking one step for each pulse of current received. Two of these hands indicate the total number of 2d. charge units used while the third indicates the number of units used on individual calls and can be set to zero after each call.

NOTE TO EDITORS

The GRACE equipment was designed and developed under the procedure for joint development between the Post Office and the leading manufacturers of telephone equipment in the United Kingdom, i.e., The Automatic Telephone & Electric Co. Ltd., The General Electric Co. Ltd., Messrs. Ericsson Telephones Ltd., Messrs. Siemens Edison Swan Ltd., and Messrs. Standard Telephones & Cables Ltd., The main Contractor at Bristol was The Automatic Telephone & Electric Co. Ltd., but The General Electric Co. Ltd., supplied and installed the registers and translators for "GRACE". Subscribers' private meters have been developed in co-operation with Smith's Industrial Instruments, Ltd., and Ferranti, Ltd.

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P.B. 255

4th December, 1958.

QUEEN TO DIAL FIRST 2d. TRUNK CALL

NEW SERVICE OPENS AT BRISTOL

CHEAP, QUICK AND EASY

Tomorrow afternoon (Friday December 5th) at the Bristol Central telephone exchange, Her Majesty the Queen will open the first subscriber trunk dialling installation in this country by dialling a trunk call to the Lord Provost of Edinburgh.

This will inaugurate the new system intended to make trunk calls cheap, quick and easy. Starting in Bristol tomorrow, it will spread during the next few years to towns and cities all over the United Kingdom.

Earlier the Queen, accompanied by the Duke of Edinburgh, will visit the special Post Office exhibition in Bristol where demonstrations are being given of subscriber trunk dialling (STD) and the working of GRACE, the robot telephone operator. Mr. Ernest Marples, M.P., will here demonstrate S.T.D. to the Royal party.

As soon as Her Majesty dials the first call, the new service will be open to the 18,000 telephones connected to the Bristol Central exchange. From these 'phones it will be possible to make trunk calls without the help of an operator to half the subscribers in the country, including most of the largest centres of population in Britain. For example they will be able to dial calls direct to:-

London
Birmingham
Brighton
Cardiff
Edinburgh
Glasgow
Leeds
Leicester
Liverpool
Manchester
Newcastle-on-Tyne
Nottingham
Sheffield
Southampton

and also the following cities and towns:-

Bridgwater
Chester
Chippenham
Cleethorpes
Dursley
Exeter
Frome
Gloucester
Grimsby
Hove
Kingsbridge
Newport (Mon)
Penzance
Plymouth
Portsmouth
Salisbury
Shaftesbury
Shepton Mallet
Swansea
Swindon
Taunton
Truro
Worcester

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SIMPLE CODES

Bristol Central subscribers will be able to make trunk calls to these places by dialling simple codes (all beginning with 0 to connect them to GRACE) before the numbers they require. For a call to CENtral 1234 in London they will dial 01 CEN 1234; 01 is the appropriate code for London and gives Bristol Central subscribers direct access to the London automatic system. The code for Edinburgh is 031 and for a call to WAVerley 1234 in Edinburgh the Bristol Central subscriber dials 031 WAV 1234; for a call to Cardiff 56789 he dials 0CA2 56789.

To enable them to dial these codes the subscribers concerned have been given special lists of dialling codes and their telephones have been fitted with dials showing letters and figures, like those provided in the largest centres (such as London, Birmingham, Manchester, Glasgow, etc.) where subscribers already use letters and figures when dialling local calls. Lettered dials are now being fitted on new telephones in many towns to save the work of changing them when S.T.D. comes along.

2D. BUYS TIME AND DISTANCE

Not only does S.T.D. revolutionise the method of making trunk calls, it also brings radical changes in the methods of charging for them, introducing as it does, the "twopenny telephone". The charge for a dialled trunk call will be recorded in units of 2d. on a meter at the exchange as the call progresses. There is no minimum 3-minute charge for dialled trunk calls; for a call from Bristol to London or Edinburgh, for example, 2d. buys 12 seconds of conversation time, and a minute will cost only 10d. For a dialled call from Bristol to Swindon 2d. will buy 20 seconds and to Cardiff or Gloucester 30 seconds.

Not only will cheap short duration trunk calls be available by dialling but longer duration calls will be cheaper too - partly because of the more accurate timing and partly because the average rate of charge will be generally lower. A dialled 3-minute call from Bristol to London will cost 2s. 6d. compared with 3s. 0d. for a call connected by the operator.

During the cheap rate period the periods available for 2d. on dialled trunk calls will be half as long again as during the day. Trunk calls which Bristol Central subscribers cannot yet dial or which they prefer to obtain via the operator will be charged at the old standard rates.

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HEADQUARTERS BUILDING · ST. MARTIN'S-LE-GRAND · LONDON E.C.1

CENtral 1170

Bristol Central subscribers will also be the only subscribers in the country who will be able to get a local call for 2d. This will cover 3 minutes during the day, or 6 minutes during the cheap rate period.

The full tariff for local and trunk dialled calls made from telephones on Bristol Central exchange during the day, compared with the standard rates, is as follows:-

Distance	Standard 3 minute minimum charge	Charges for local and dialled trunk calls			
		Time bought for 2d.	1 minute call	2 minute call	3 minute call
Local call	3d. untimed	3 minutes	2d.	2d.	2d.
Up to 35 miles	1s. 0d.	30 secs.	4d.	8d.	1s. 0d.
35 - 50 miles	1s. 9d.	20 secs.	6d.	1s. 0d.	1s. 6d.
50 - 75 miles	2s. 3d.				
75 - 125 miles	3s. 0d.	12 secs.	10d.	1s. 8d.	2s. 6d.
Over 125 miles	3s. 6d.				

QUARTERLY ACCOUNTS

Accounts for subscribers who can dial trunk calls will be sent out quarterly; bulk totals will be shown for dialled calls.

The new system has been made possible by the development of GRACE (Group Routing And Charging Equipment), which interprets the code dialled by the subscriber, selects the route for the call to reach the distant exchange, operates switches at any intermediate and the distant exchange, determines the rate of charge for the call and, when the call is answered, controls the recording of the charge on the meter as the call proceeds.

Eventually the new system will be extended all over the country, but it will take many years to install the additional equipment needed everywhere. If the existing exchange is manual it must first be converted to automatic working. A programme of S.T.D. installation is planned and it is hoped that by 1970 three quarters of all trunk calls will be dialled by subscribers.

New coin-boxes from which trunk calls can be dialled will be installed later at Bristol and at the other centres where S.T.D. is installed.

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CENtral 1170

FUTURE PLANS

Places for which S.T.D. is planned by the end of 1960 are:-

Aldershot
Aylesbury
Ayr
Bodmin (1959)
Bridlington
Bridgwater
Bristol (1959)
Burnham-on-Sea
Burton-on-Trent
Carlisle
Chatham
Chester
Chippenham
Dartford
Doncaster
Dundee
Evesham (1959)
Gloucester
Grays Thurrock
Greenock
Haslemere
Hereford
Lancaster
Leicester
Lincoln
Margate (Thanet)
Melton Mowbray
Middlesbrough
Narborough
Newmarket
Oadby
Peterborough
Redcar
Scunthorpe
Skipton
Swansea
Syston
Taunton
Thurnby
Truro
Waltham Cross
Warrington
Watford
Worcester
Wrexham
York

Some of these 46 towns are served by a number of exchanges. S.T.D. is planned for one or more exchanges in these towns by the end of 1960.