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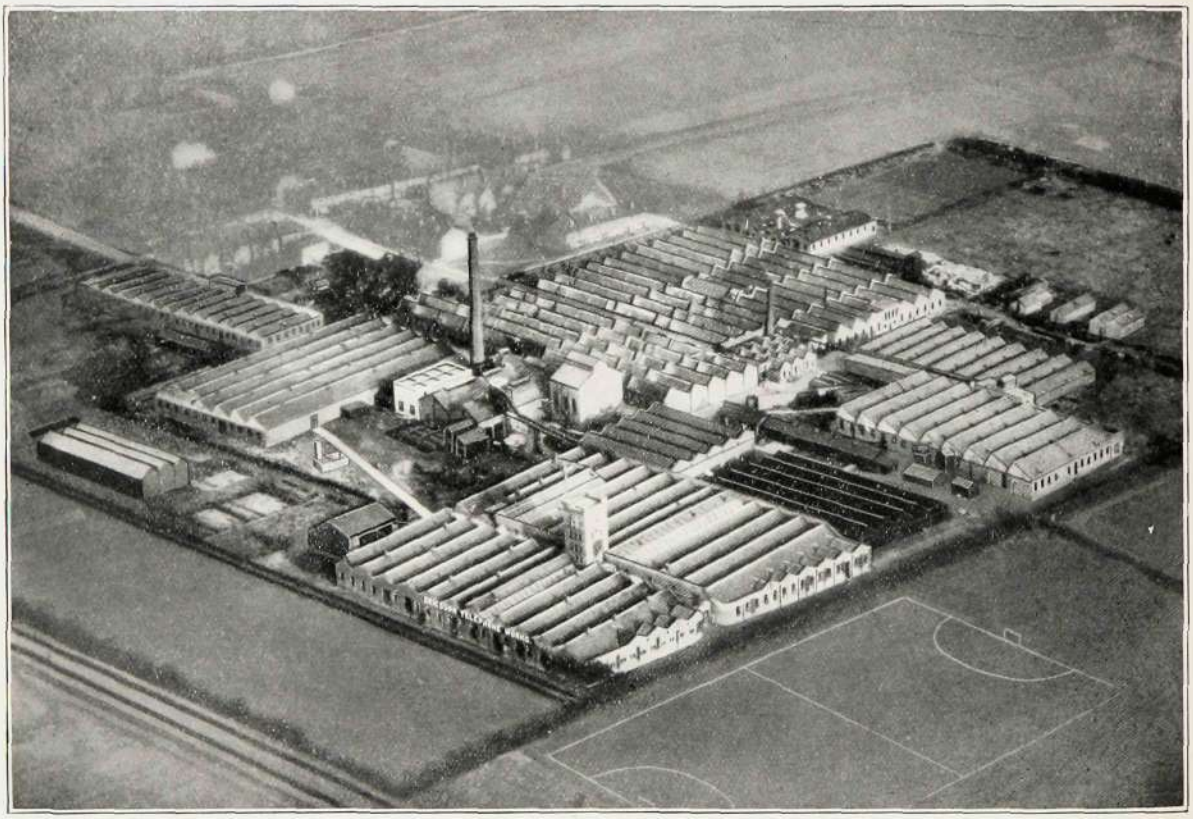
TELEPHONE WORKS,
BEESTON, NOTTINGHAM

Telephones : Beeston 54225 (3 *Lines*)

Head Office : 67/73, KINGSWAY, LONDON, W.C. 2

Telephones : Holborn 3271 (3 *Lines*)



Aerial View of the Works, Beeston, Nottingham

P.A.B.X's for New Zealand

DURING the past year Ericsson's have received several orders for P.A.B.X. equipments from New Zealand, that zealous supporter of Empire trade. The size of these installations varies from 35 to 70 lines, but in a few cases the first switching level has been utilized and thus provides for an ultimate of 80 lines. The operation and circuit features conform to British Post Office standard practice except in one or two particulars outlined below.

The class of service given on all equipments is the " attended in " and " automatic out " with local automatic intercommunication. This service provides for the following :—

(*a*) Automatic intercommunication of subscribers connected to the P.A.B.X.

(*b*) Outgoing calls to the public automatic exchange set up automatically by dialling ' O ' followed by the wanted subscriber's directory number.

(*c*) Incoming calls from the public exchange completed via an attendant at the P.A.B.X.

Dialling ' O ' to reach the public exchange is one of the variations from British Post Office practice, the latter requiring the digit " 9 " for this service. Digit " 9 " on these installations is the one dialled by subscribers requiring the manual attendant. The P.A.B.X. subscribers, or " extensions " as they are usually termed, are given two-digit numbers ranging from 20 to 88. The number " 89 " is reserved for testing purposes.

By means of a simple strapping arrangement any extension can be debarred direct access to the public exchange. Should a subscriber so restricted dial " O ", the call would be routed to the manual attendant who could extend it to the public exchange under her own supervision.

The exchange lines are arranged for bothway working and night switching. With the latter arrangement certain predetermined extension lines can be connected directly to particular exchange junction circuits at night time, thus giving them, during the periods when the P.A.B.X. manual board is not staffed, all the facilities enjoyed by a subscriber on the public exchange.

It is worthy of note that the method employed for night switching is another departure from British Post Office standard practice, and it has proved a very satisfactory solution. For this purpose the dial key in the exchange line circuit is made a three position one, the key being thrown downwards for dialling and upwards for night switching. In the upward position the predetermined extension is connected straight through to the exchange junction circuit and both the exchange line and extension concerned are " busied " to calls from the connectors. As a result of these modifications the cord circuits are not used in connection with night switching, and the keys therein, usually employed for this purpose, are eliminated.

One of the difficulties encountered at the outset, originating from the existence of two types of public exchange equipment in New Zealand, was that some of these

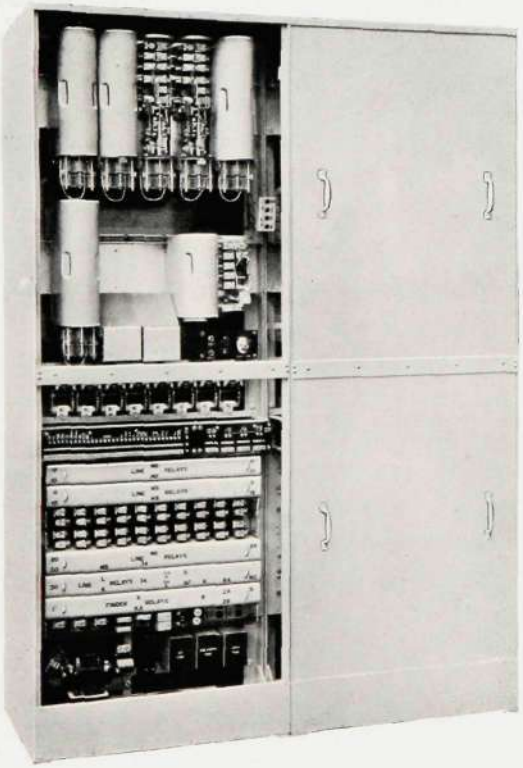
boards had to function in conjunction with the standard British Post Office dial, numbered 1 to 0 in an anti-clockwise direction, and others with a dial numbered 9 to 0, also in an anti-clockwise direction. Thus on exchanges using the latter type of dial, if the digit " 1 " is dialled the equipment will actually receive 9 impulses.

In order to avoid differences in the equipment in use on the P.A.B.X's, varying with the type of dial employed, a cross-connection field between the line terminals and the connector outlets is introduced. Thus on boards using the British Post Office dial the line terminals are cross-connected to the connector outlets in a " straight " manner, viz. 20–20, 21–21 etc. to 89–89 ; whilst on the boards using the " reverse " dial the line terminals are cross-connected to the connector outlets in the following manner :—

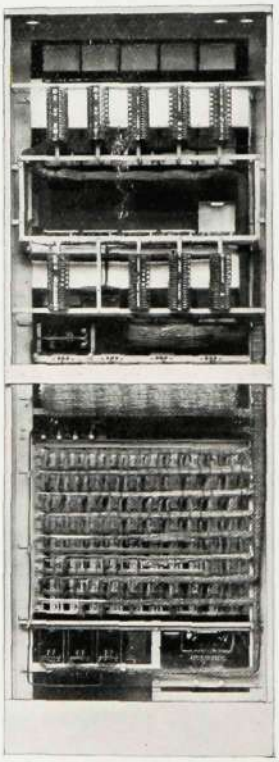
20–80 ; 21–89 ; 22–88 ..... to 29–81
30–70 ; 31–79 ; 32–78 ..... to 39–71
40–60 ; 41–69 ; 42–68 ..... to 49–61
50–50 ; 51–59 ; 52–58 ..... to 59–51
60–40 ; 61–49 ; 62–48 ..... to 69–41
70–30 ; 71–39 ; 72–38 ..... to 79–31
80–20 ; 81–29 ; 82–28 ..... to 89–21

A typical instance of the sequence of operations on an installation using " reverse " type dials would perhaps make the arrangement more clear.

Assuming a subscriber dials " 31 ", then the connector receives impulses equivalent to " 79 " from the standard dial. According to the table above connector outlet " 79 " is cross-connected to the line terminal " 31 "; thus the transposition is made and the right subscriber rung.



Front of two Auto-Units fitted together, with one set of doors removed



Rear view of Single Unit P.A.B.X's.

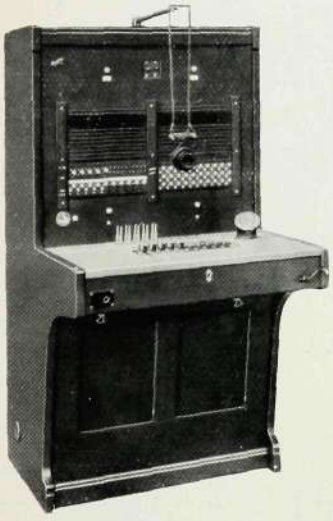
Having dealt with the special operating features connected with these boards, a brief description of the two main components, namely, the Auto Unit and the Manual Board, may be of interest.

The Auto Unit, as can be seen from the typical illustrations, is totally enclosed in a sheet iron cabinet with lift out doors at

front and rear. When an exchange comprises two units, they are fitted side by side on site, and bolted together after the adjoining sheet iron sides are removed to permit of direct cabling between them.

The unit is complete with all the necessary switching equipment, fuse panels, alarm relays, cross-connecting field and also a small " jack-in " type ringing dynamotor with associated control gear and tone equipment.

The switching equipment comprises uniselectors as line finders and two-motion switches of the 100 outlet type as connectors. All relays used are of the latest Post Office standard, " 3,000 " type, incorporating twin contacts, and the relay groups are fitted with dust-proof covers.



The manual switchboard

The manual board is of the floor pattern type and of oak construction. The plugshelf and keyshelf are covered with red fibre to prevent scratching and chipping. The keyshelf is arranged to provide writing space for the attendant. One of the special features of the board is the suspended transmitter, which is of a type standardized by the Customer for this class of installation.

Lamps are employed throughout for both calling and supervision. " Through " clearing is not used.

All exchange lines are provided with visual engaged signals so that the operator can see at a glance those that are being used by extensions for direct outgoing calls, i.e. level " 0 " calls.

The apparatus for the cord circuits and exchange lines is mounted on a small hinged gate at the rear of the board. The fuse panel is also mounted at the rear and is arranged so that if a fuse blows the circuit affected is automatically " busied."

This article would not be complete without a word about the packing of these boards ; a feature of utmost importance when one considers that they are to be conveyed a distance of approximately 12,000 miles, representing a seven weeks sea voyage. It is a great compliment to our shipping department that we have not had any serious complaint of damage from New Zealand in connection with these orders.

The packing crates consist of $1\frac{1}{4}$" tongued and grooved timber with 8" x $1\frac{1}{4}$" " pin ends." Each crate is bound all round by three sets of hooped battens 8" x $1\frac{1}{4}$", pitched at suitable distances. On the inside of the case there is a " Pluvex " lining and then five inches of wood wool upholstering all round. The boards therefore are embraced in a " cushion " and are thus effectively protected from damage by vibration or jar.

In conclusion, it should be mentioned that the working voltage is fifty.