

Announcing the 740-A P.B.X.

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RECOGNITION of the value of telephone service to business houses came so soon after the first telephone conversation that a private branch exchange switchboard was in use at Ansonia, Connecticut, less than five years later. Since then the course of development of P.B.X. switchboards has been steady, paralleling closely that of switchboards for central offices. As telephone messages have taken an increasingly important part in the transaction of business, P.B.X. switchboards to meet a wide variety of traffic situations have been brought out, embodying in each case whatever current developments were appropriate. Introduction of the dial in the Bell System paved the way for the 700-C dial P.B.X., which has all its stations connected to step-by-step apparatus for local and outgoing calls. To complete incoming calls, however, an operator is needed, so the stations are also connected to jacks for manual operation. Though this system is feasible for establishments of almost any size, it is ordinarily only in installations serving one hundred stations or more that it is economical to have the lines appear at combined manual and step-by-step equipment.

The majority of business houses require fewer than 100 station lines and to provide these firms with a more satisfactory dial service the 740-A P.B.X. is now available. The cost of operating the new P.B.X. will be con-

siderably less than that for a corresponding 700-C, due partly to the fact that a cheaper method has been devised for handling its incoming calls. These calls come in not to a manual switchboard with a jack for each line but to a small attendant's cabinet containing lamps and keys. The cabinet, which somewhat resembles a cordless P.B.X., will take up only about one square foot of space on a commercial desk. The attendant can therefore do other work when she is not busy with calls and

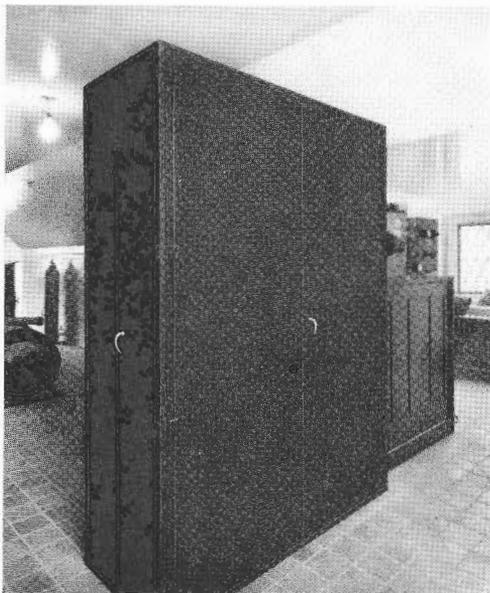


Attendant's cabinet, located in a butler's pantry. The pictures were taken at the first installation, on a large country estate

it is expected that she will be able to give approximately two-thirds of her time to clerical duties.

Keys and lamps on the front panel

of the attendant's cabinet, when used in conjunction with a standard dial sub-set on her desk, enable her to connect a total of ten central office trunks and P.B.X. tie lines to desired extensions; she can also originate local or outgoing calls. Each trunk and tie line is equipped with two keys and three lamps. One key is used to connect the trunk or tie line to the attendant's telephone or to hold it until a required extension is available, the second key connects a station line to a central office trunk for night service and the three lamps show the status of any call in progress. One of two keys associated with the attendant's line must be operated every



Mechanical and power equipment, in the power house of a large estate. In the foreground, switch frame; to the right, power cabinet

time she dials, and the other every time she originates or transfers a call. Provision of a second cabinet increases the possible number of trunks and tie lines from ten to nineteen, the

maximum that can be accommodated in any installation.

The step-by-step switches and their associated equipment are mounted on the switch frame. One side of this frame provides for the equipment of twenty selector-connectors, nineteen trunk or tie line circuit units and one attendant's telephone circuit unit. The other side is arranged to mount twenty line finders and the miscellaneous equipment associated with the circuits on the frame.

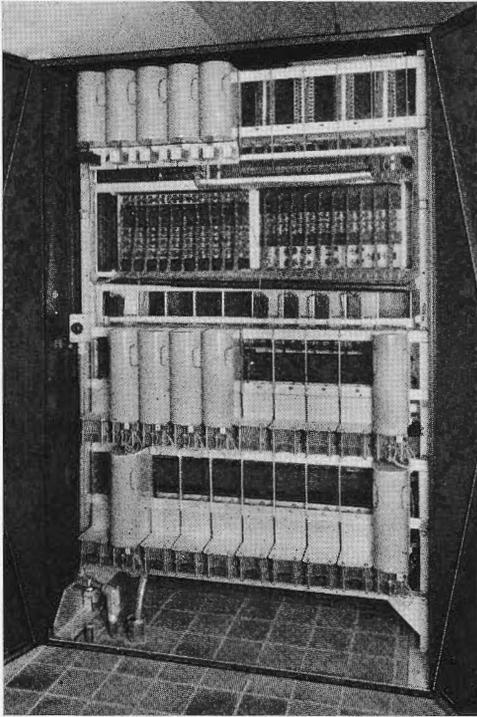
The switch frame is stocked fully wired and equipped except for line and cut-off relays, line finders, selector-connectors and trunk or tie line circuit units which will be provided in accordance with busy hour traffic. When the switch frame is located in an office it will be enclosed in a sheet metal casing finished in olive green.

The power cabinet contains the storage battery with its charging, voltage regulation and alarm equipment.

By operating the dial on the telephone of any station line, it will be possible to connect with any other station line, with the attendant's line, with a central-office trunk (unless the station line is denied central-office service) or with a tie line to an associated distant P.B.X. The dial tie line feature is extremely attractive to a firm which requires efficient communication channels between its branches located in the same city or in adjacent neighborhoods, but too far apart to be served economically by one P.B.X.; the 740-A provides for tie lines to as many as three such distant P.B.X.'s. A tie line permits direct interconnection of two P.B.X.'s without the intervention of the central office operator and the advantage of this arrangement is well appreci-

ated by those of us in the Laboratories who have reason to make frequent calls to 195 Broadway.

When any call is being originated,

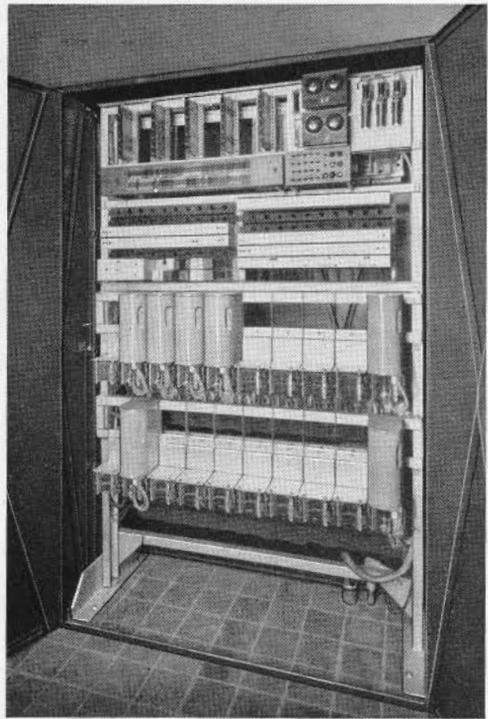


Selector-connector side of the switch frame; at the top, trunk circuit and attendant's circuit equipment

the removal of the receiver from its hook will cause a line finder to operate to connect the calling station to an idle selector-connector. The calling party on hearing dial tone will dial the desired number, consisting of two digits for a station line and one digit for a trunk or tie line, and the selector-connector will operate to connect the calling line to the called station or to select an idle trunk or tie line. Normally the P.B.X. will have a capacity of 88 station lines and 10 trunks to the central office but the station line capacity will be somewhat less than 88 lines where tie lines are

provided or where more than 10 central-office trunks are required.

An incoming call will signal the attendant, who will operate a key, find out what extension is wanted, and dial its number. If the line is busy or if the party does not answer, she can dial another extension or hold the call until the desired line is free. When the called party hangs up his receiver, the switches will release without assistance from the attendant, thereby relieving her from interruptions in her other work. On incoming calls



Line-finder side of the switch frame

the attendant can be summoned by a movement of the receiver hook at the extension and she can transfer the call to another line by releasing the switches and dialing the new number. Night service keys allow each trunk to be connected directly to one station

line so that night calls from central office can be routed to as many station lines as there are trunks and, since all local and outgoing calls are dialed, a night attendant at the P.B.X. will seldom be required.

From the manufacturing, operating, and cost aspects the equipment of the 740-A P.B.X. is a particularly happy combination. Practically all of its apparatus and circuits resemble corresponding apparatus and circuits in step-by-step central offices so that its manufacturing problems are not new and its maintenance requirements and adjusting procedure are those used in a central office. Its two fundamental units of equipment, the line finder and the selector-connector, are similar in appearance and require similar assembling processes and maintenance routines. Maintenance will be further simplified by the regulating equipment* which will automatically maintain a battery potential

*The power plant is described by Lewis Earl on pages 389-391.

between the limits of 44 and 50 volts.

Telephone equipment cannot be manufactured in a day and yet to give efficient service a telephone company should be prepared to supply a P.B.X. to a customer on short notice. Because of the great variations in the telephone requirements of different businesses it is extremely difficult to design a dial P.B.X. which can be speedily distributed and installed. Particular attention was paid to this phase in engineering the 740-A. Like a ready-made suit, it is manufactured in advance to meet the requirements of a percentage of its customers and is easily altered to satisfy the others. Where it fits the traffic requirements without alteration, it is simply necessary to locate the switch frame, the power equipment and the attendant's cabinet and to run their connecting cables; adjustment to traffic needs requires little more than this.

Early orders indicate that the 740-A is a welcome addition to the P.B.X. family.

