The 1A Key Telephone System

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UP TO the present time, a business or residence subscriber requiring access to more than one telephone line has been equipped according to one of the standard wiring plans. Many of such plans are available; each has a number and includes a different set of features, such as means for picking up any one of a number of central-office, PBX, private, or intercommunicating lines, holding one line while using another, cutting off extension stations or ringers, or signaling on intercommunicating circuits. Each such numbered plan covered the arrangement for a particular number of lines, and specified the particular desk-mounted key and the other station equipment required. Very often, however, no numbered plan was available to meet the particular requirements of the subscriber, and as a result the Telephone Companies were forced to furnish many special installations, which were usually modifications of existing plans.

With the development of the combined telephone set, with all the usual station apparatus in one housing, it was decided to incorporate the keys for picking up and holding a number of lines in the base of a similar set. At the same time a flexible arrangement has been developed that provides the equivalent of the wiring plans on a feature basis. Instead of having numbered plans for various combinations of features, each feature may be selected as a unit, and the combination may be formed as desired. In this way almost any combination can be provided without any special engineering by the local tele-

phone company. This combination of unit wiring plans on a unit basis controlled by keys in the base of the handset is called the 1A key system.

Besides these basic modifications, the 1A key system incorporates a number of improvements that give it many advantages over the former wiring plans. From the subscriber's point of view there is the improved appearance and convenience of having all the keys in the base of the telephone set immediately in front of the user, and in the reduction of the wiring formerly required between the separately mounted key and the telephone. Besides this, several new features are provided. These include: allowing a ringer to be common to several lines, the exclusion of extension stations, and automatic signaling on intercommunicating lines.

The exclusion feature is provided by a key associated with one of the switchhook plungers, as indicated in Figure 1. The internal wiring of the sets is such that this exclusion key will always be associated with the first line. When it is desired to exclude other stations from this line, the exclusion key button is pulled up, which opens the line to all excluded stations. When the handset is replaced on the mounting the exclusion key is automatically restored to normal, reconnecting the excluded stations to the line. When the exclusion key plunger is not pulled up, it acts the same as the other switchhook plungers, and can therefore be used for flashing. When it is desired to flash the operator while the exclusion key is pulled up, the other switchhook plunger may be operated. In installations involving more than two stations, it is possible to wire the exclusion keys in series so that the station electrically nearest the central office or PBX will exclude all other stations. The station next nearest will exclude all stations except the first, but with this manually operated exclusion arrangement, it is not possible to provide mutual exclusion between two or more stations.

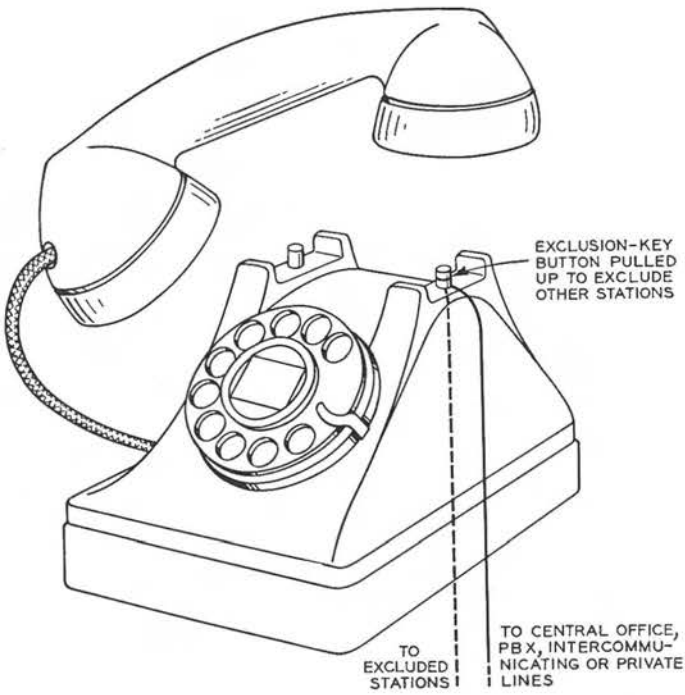

Fig. 1—One of the switchhook plungers may be arranged to operate a key when pulled up, and thus disconnect an extension station

Exclusion arrangements provided heretofore have either been fully automatic or have been manually operated and restored. Automatic exclusion has the disadvantage

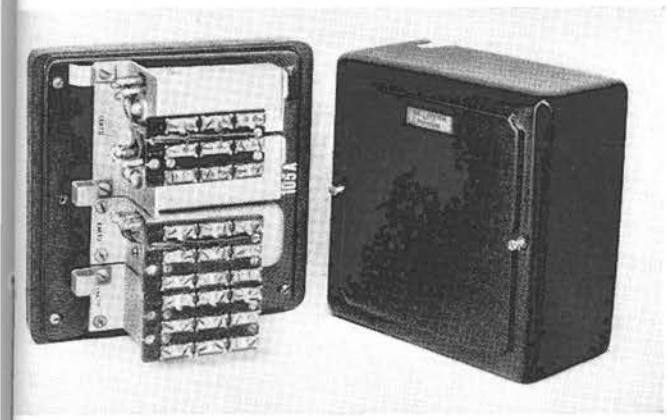

Fig. 2—Apparatus box used with the 1A key system

that, in general, one station cannot be connected at any time during the period that another station is on the line. Manually operated exclusion arrangements used heretofore have the disadvantage that the exclusion key at the principal station may inadvertently be left in the operated position after the completion of conversation. The exclusion feature that is provided with the 1A key telephone system has neither of these disadvantages.

Four types of telephone sets are used for the 1A key system. One is like the standard combined set but with the addition of the exclusion key. This set is used when there is only one line. Another, of the same size as the standard set, is equipped with a combined turn and push key, and is used for installations having a maximum of two lines. The third set is slightly larger than the standard subscriber set and is provided with four keys, which may be of several types. This set is used for a maximum of four lines. The fourth set, of the same size as the four-key set, shown in the photograph at the head of this article, has six keys and is for use with a maximum of six lines. Any of these latter three sets may or may not be equipped with the exclusion key as desired.

Besides the keys mounted in the base of the handset, a certain amount of additional equipment may also be required, and for each feature this is arranged in coded units that may be mounted in a small apparatus box as shown in Figure 2. One of these individual units is shown in Figure 3. Mounting on 1¾-inch centers, or a multiple of 1¾ inches depending on the equipment required, these units include a small terminal panel equipped with combined solder and screw terminals. The solder terminals are for use by the shop to terminate leads from the equipment on the units, and the screw terminals are for use by the installer, so that no soldering is required for installation. The units are mounted in the equipment box in such a way that the relays will be horizontal when the box is mounted on a vertical surface and will be

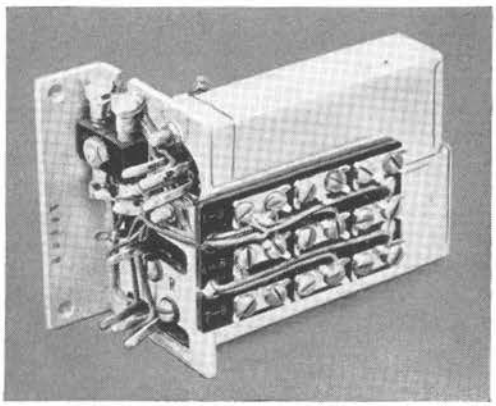

Fig. 3—One of the equipment units available for the 1A system

accessible for maintenance or adjustment. Lamp units are furnished when the features selected require them.

The features provided by the 1A telephone system permit calls to be answered or originated on from one to six central-office, PBX, intercommunicating, or private lines; calls to be held on from one to five central-office or PBX lines; extension stations or ringers, or the ringer in the set, to be cut off, or the ringer in the set to be disconnected, and a distant extension station or ringer connected; one or more extension stations to be disconnected from a line during conversation; and signaling on intercommunicating circuits or private lines. The ringer in a key telephone set may be used for one line only, or as a common ringer for all the lines.

When the sets are arranged for automatic signaling with intercommunicating lines, an automatic-signaling intercommunicating line circuit is required. This circuit is intended primarily for use where there is one principal and one subordinate station, and is designed for signaling in one direction only. The buzzer of the subordinate station will be operated automatically when the handset at the principal station is lifted, and will be disconnected when the subordinate station answers. The buzzer cannot then be re-operated until both stations have hung up. A separate circuit will be required if the subordinate station is to be permitted to signal the principal station.

Booth-Ventilating Fans

Telephone booths cannot always be located advantageously from a ventilation standpoint and for these situations centralized air-circulating systems or individual electric fans may be provided. In the past, individual fans have been mounted on a bracket inside the booth at one corner of the ceiling. They have been equipped with metal blades and provided with wire guards.

A quiet fan with rubber blades has recently been developed. The fan motor is mounted between rubber cushions in a cast bracket and attached to the ceiling of the booth as shown in the illustration. A door-switch, which heretofore controlled the ceiling light, also starts the fan when the door closes. An "on-off" switch permits the patron to control the fan when the door is closed.

This ventilating fan gives a properly directed stream of air and circulates the free air in the booth more effectively.