

CIRCUIT DESCRIPTION  
STATION SYSTEMS DEVELOPMENT DEPARTMENT  
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STATION SYSTEMS  
KEY TELEPHONE SYSTEM NO. 1A  
KEY AND TELEPHONE CIRCUIT  
ARRANGED FOR PICK UP, HOLDING  
CUT-OFF AND SIGNALING

CHANGES

D. DESCRIPTION OF CIRCUIT CHANGES

- D.1 The drawing rating was changed to "Mfr. Disc."
- D.2 "Replaced by SD-69206-01" was added.
- D.3 Note 312 was added

All other headings under "Changes", no change.

1. PURPOSE OF CIRCUIT

- 1.1 This circuit provides a means for associating the talking and dialing circuit of a station with a number of central office, PBX, private or intercommunicating lines of a No. 1A key telephone system by means of pickup keys. It also provides for holding a bridge on one or more lines, excluding other stations, cutting off other stations, extension ringers or a listening in set and for signaling intercommunicating stations.

2. WORKING LIMITS

- 2.1 None.

3. FUNCTIONS

- 3.1 On central office or PBX lines.
- 3.11 Provides for picking up any one of a maximum of five central office or PBX lines.

- 3.12 Provides for holding any of a maximum of five central office or PBX lines.
- 3.13 Provides for dialing.
- 3.14 Provides for an audible signal on incoming calls.
- 3.15 Provides for a cut-off key which may be used for disconnecting an extension station or an extension ringer from a given line and when desired connects the ringer in the set to the line. It is also used to disconnect a listening-in set.
- 3.16 Provides for an exclusion key which may be operated when the hand set is off the mounting to disconnect one or more extension stations from the first line and which will be restored to normal when the hand set is replaced on the mounting.
- 3.2 Provides for picking up an intercommunicating line.
- 3.3 Provides for signaling an intercommunicating station.
- 3.4 Provides for picking up a private line.
- 3.5 Provides for signaling a private line station.

#### 4. CONNECTING CIRCUITS

- 4.1 Line and Signaling Circuit of the No. 1A key telephone system.
- 4.2 Key Telephone Circuits of the No. 1A key telephone system.

#### DESCRIPTION OF OPERATION

#### 5. ANSWERING OR ORIGINATING A CALL

To answer or originate a call the pickup key is associated with the desired line must be operated. With the pickup key operated and the hand set removed from the mounting the station is connected to the central office, P.B.X., private or intercommunicating line in the usual manner. When originating a call on an intercommunicating or private line it will be necessary to operate the signaling key to signal the called party except when the intercommunicating automatic signaling circuit is used.

## 6. DIALING

In the case of an outgoing call that required dialing the dial is operated in the usual manner.

## 7. EXCLUSION

The exclusion key is only associated with the first line. When it is desired to exclude other stations from this line the exclusion key is operated. This opens the line to all excluded stations. When the hand set is replaced on the mounting at the end of the call, the exclusion key is automatically restored to normal reconnecting the excluded stations to the line.

If it is desired to flash the operator while the exclusion key is in the operated position the mounting plunger which is not associated with the exclusion key is operated in the usual manner for flashing. This does not disturb the position of the exclusion key.

The exclusion key can also be used as a common ringer or buzzer cut-off key while the handset is off its mounting.

## 8. RINGER IN SET

The ringer in the set may be used either as a line ringer or a common ringer. When it is used as a line ringer it will operate on all incoming calls on the line with which the ringer is associated when ringing current is applied to the line at the central office or P.B.X. When it is used as a common ringer, it will operate when ringing current is applied to any line at the central office or P.B.X. with which the common ringer is associated.

## 9. BUZZER IN SET

The installer may replace the ringer that is provided in the key telephone set by a buzzer mounted on a 36A bracket. In this case the buzzer may be used as a signal common to a number of P.B.X. or central office lines or as a intercommunicating signal.

## 10. HOLDING

The line may be held by the operation of the hold key in the telephone set. The hold key when operated opens the operating path for the (L) relay shown on the line and signaling circuit of the No.

1A key telephone system, releasing it, and closes a circuit for operating the (H) relay, also shown on the line and signaling circuit, through its primary winding in series with the central office or P.B.X. loop and station telephone set. When the (H) relay operates, its holding tertiary winding will be connecting across the line in series with its non-inductive quaternary winding and in parallel with its primary winding. When the hold key is released, the operated pickup key will release, the operating primary winding circuit of the (H) relay will be opened, the (H) relay will be held operated by its tertiary winding and the set will be disconnected from the line.

## 11. TRANSFERRING CALLS

If the call is to be transferred to another station and the intercommunicating line is provided, the line is held as described in paragraph 10. The pickup key associated with the intercommunicating line is then operated and the desired station is reached over the intercommunicating line described in paragraph 12. The transferred call is picked up at the second station by operating the pickup key associated with the desired line. In case the call is to be transferred to a station which does not have intercommunicating service, it is necessary to employ some other means of communication with the desired station.

## 12. INTERCOMMUNICATING SIGNALING

The intercommunicating signaling arrangement of the No. 1A key telephone system provided for both code and selective signaling. When code signaling alone is employed the operation of the signal key in the telephone set will operate all the buzzers of the system directly. When selective signaling alone is employed, a separately mounted 5A9A key or equivalent is required and the operation of any signal key will operate the desired buzzer. When both code and selective signaling are required at any station, it will be necessary to provide a relay shown on the line and signaling circuit which will operate whenever a signaling key is operated to operate the buzzers on a code signaling basis. The operation of a signaling key to signal on a selective basis is provided for by connecting the signaling leads directly to the buzzer leads without operating the relay. When the intercommunicating automatic signaling circuit is used in connection with an

intercommunicating line the buzzer at the called station operates when the handset at the calling station is removed from the mounting.

13. FUNCTION OF CUT-OFF KEY

The cut-off key can only be associated with one line in the set but provision is made to wire it to any desired line. It is used for disconnecting extension stations or extension ringers from a given line and when desired connects the ringer in the set to the line. It is also used to disconnect a listening-in set.

14. PURPOSE OF THE TABLE UNDER NOTE 101

The table provides the information necessary for selecting the proper key telephone set required for a given type of service. It also provides the information required to make the necessary wiring changes at the terminals in the set to secure certain optional features.

The table shows the key top diagram of all the different types of keys, the code number of the sets and the code number of the cords used with the sets. It also shows the color of the cord conductors and the terminals in the set to which these conductors connect. For each of the keys, either of two optional combinations of features may be provided. The notes associated with the table explain the variation in connections that is employed to secure the combination of features.

15. 61P FILTER AND 152A CONDENSER

The 61P filter is used to suppress radio induction from the dial and is furnished only when specified. The 152A condenser is also furnished only when specified and is used to suppress radio induction from the 7 type buzzer when it is operated on direct current.

BELL TELEPHONE LABORATORIES, INC.