

CIRCUIT DESCRIPTION
STATION APPARATUS DEVELOPMENT DEPARTMENT

CD-69002-01
Issue 15D
Appendix 1D
Dwg. Issue 16D

STATION SYSTEMS
NO. 100 KEY EQUIPMENT
TELEPHONE, DIAL, AND TRIPPING CIRCUIT

Drawings for SD-69002-01 have been converted from 4- by 7-inch handbook size to 8-1/2 by 11-inch handbook size. This CD will no longer be printed in 4- by 7-inch handbook size.

BELL TELEPHONE LABORATORIES, INCORPORATED

DEPT 5113-WFBW-LHA

STATION SYSTEMS
NO. 100 KEY EQUIPMENT
TELEPHONE, DIAL AND TRIPPING CIRCUIT

CHANGES

B. CHANGES IN APPARATUS

B.1 Superseded 364 Jack (V) Option	Superseded By 223A Jack (U) Option	Replaced 528 Receiver	Replaced By 716D Receiver
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D. DESCRIPTION OF CIRCUIT CHANGES

D.1 The rating was changed from "A. T. & T. Co. Standard" to "A & M only."

Min. Ins. Res.

Manual or Panel Areas	20000 Ohms
Step-by-Step Areas	30000 Ohms

D.2 "Replaced by SD 69162-01 except for additions" was added.

D.3 Note 110 has been added.

All other headings under "Changes," no change.

3. FUNCTIONS

3.1 To enable the subscriber to talk over the line to central office or P.B.X. or over a private line.

3.2 To enable the subscriber to dial over a line to central office or P.B.X.

3.3 To trip machine ringing.

3.4 To prevent noise in the subscriber's receiver during dialing.

3.5 To close the transmitter circuit only while a connection is established.

1. PURPOSE OF CIRCUIT

1.1 This circuit is used so that the subscriber at a multiple line subscriber's set may use a breast transmitter and a head receiver.

2. WORKING LIMITS

When used with line to Cent. Off.
Maximum conductor loop resistance.

To Manual Central Office	1590 Ohms
To Step-by-Step Central Office	3000 Ohms
To Panel Central Office	1675 Ohms

Min. Ins. Res.

To Manual or Panel Central Office	10,000 Ohms
To Step-by-Step Central Office	15,000 Ohms

When used with line to P.B.X.
Max. conductor loop resistance.

To 550C, 550SC, 551A or 551B P.B.X.	110 Ohms
To 600C, P.B.X.	110 Ohms
To 605A, 701A or 711 P.B.X.	465 Ohms
To 700C or 710C P.B.X.	255 Ohms
To 740A or 740B P.B.X.	10 Ohms
To 740C P.B.X.	1200 Ohms

4. CONNECTING CIRCUITS

4.1 Multiple line circuit to central office or P.B.X.

4.2 Private line.

DESCRIPTION OF OPERATION

5. OUTGOING CALL

The subscriber originates a call by operating a key associated with a line to central office or P.B.X. or with a private line. Battery and ground from the line circuit operate the (BR) relay. The (BR) relay operates the (SR) which in turn operates the (RS) relay. The (RS) relay short-circuits the receiver, closes the transmitter circuit and operates the (CT) relay. The operation of the (CT) relay closes the ring of the circuit, locks itself to the (BR) relay, connects the transmitter circuit to the contacts of the (BR) relay and releases the (SR) relay. The release of the (SR) relay causes the release of the (RS) relay which removes the short-circuit from

the receiver and from the secondary winding of the (BR) relay. The circuit is now in the talking condition.

6. DIALING

In order to dial over a line to a central office or P.B.X. the talk key associated with the desired line is operated. When the dial is moved off normal the (H) relay operates, opening the telephone circuit, operating relay (D) and shunting the (A) resistance across the (BR) relay. The (D) relay opens the tip side of the line toward the telephone circuit, short-circuits the (BR) relay and the (A) resistance, locks relay (H) and operates relay (RS). The (RS) relay short-circuits the receiver to prevent clicks when the dial restores to normal. When the dial restores the (D) relay releases, removing the short-circuit from the parallel combination consisting of the (A) resistance and the (BR) relay, closes the tip side of the line toward the telephone circuit and releases the (H) and (RS) relays. The release of the (H) relay removes (A) resistance shunt from around the (BR) relay and closes the talking circuit. The release of the (RS) relay opens the shunt from the receiver. The (D) and (H) relays are slow in releasing in order that a false pulse will not be given.

7. INCOMING CALLS

The subscriber answers an incoming call by operating a key associated with the lighted line lamp. The (BR) relay with its primary and secondary windings in parallel is bridged across the line

to trip machine ringing. The (BR) relay may or may not operate on ringing current but it will operate on direct current supplied during the silent interval. The (BR) relay operates the (SR) relay which in turn operates the (RS) relay. The (RS) relay short-circuits the receiver, keeps the secondary winding of the (BR) relay across the line in parallel with the primary winding, closes the transmitter circuit and operates the (CT) relay. The (CT) relay locks to the (BR) relay, connects the transmitter circuit to the contacts of the (BR) relay and opens the circuit for the (SR) relay. The (SR) relay released, releases the (RS) relay. The (RS) relay removes the short-circuit from the receiver and disconnects the secondary winding of the (BR) relay. The (CT) relay is slow operating and the (SR) and (RS) relays are slow releasing in order that the secondary winding of the (BR) relay will be connected long enough to trip machine ringing.

8. DISCONNECT

When the subscriber restores the operator's talking key the (BR) relay releases in turn releasing the (CT) relay and opens the transmitter circuit thus restoring the circuit to normal.

9. GENERAL

The (B) resistance and (B) condenser are provided to reduce the peak voltages which are generated in the transmitter circuit when this circuit is opened.

BELL TELEPHONE LABORATORIES, INC.

DEPT. 3330-WMB-WLF