

CIRCUIT DESCRIPTION
SWITCHING SYSTEMS DEVELOPMENT DEPARTMENT

CD-66503-01
Issue 3-D
Appendix 4-D
Dwg. Issue-11-D

PBX SYSTEMS
NO 755A
TRUNK CIRCUIT

CHANGES

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 Connecting information for leads T and
R previously read, "To central office
sub. line ckt. direct on through station ckt.
em. trans. key, to two way ring down trunk
circuit connecting to magneto central office."

4. Connecting Circuits

4.7 Recorded Telephone Dictation Trunk
SD-65728-01

All other headings, no change.

BELL TELEPHONE LABORATORIES, INC.

DEPT. 2313-JRA-RLL-BB

CIRCUIT DESCRIPTION
SWITCHING SYSTEMS DEVELOPMENT DEPARTMENT

CD-66503-01
Issue 3-D
Appendix 3-D
Dwg. Issue 10-D

P.B.X. SYSTEMS
NO. 755A
TRUNK CIRCUIT

CHANGES

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 Fig. 1M is rated Mfr. Disc. and superseded by Fig. 1N to provide for machine wrapping of connections on surface wired units.

All other headings, no change.

BELL TELEPHONE LABORATORIES, INC.

DEPT. 2353-MRG-EWO-GC

PBX SYSTEMS
NO. 755A
TRUNK CIRCUIT

CHANGES

B. CHANGES IN APPARATUS

B.1 Superseded

(A) & (B)
584 DE Sub.
Sets, Fig. 2
& "X" Option

Superseded By

(A) & (B)
531A3 Sub.
Sets, Fig. 7
& "W" Option

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 Fig. 7 and option W and X are added to the options used table and to circuit note 108.

D.2 Reference to Fig. 7 is added to circuit note 104.

All other headings, no change.

BELL TELEPHONE LABORATORIES, INC.

DEPT. 3330-MHK-AJB-GV

PBX SYSTEMS
NO. 755A
TRUNK CIRCUIT

CHANGES

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 The punching assignment shown in
fig. 51 is rated "Mfr. Disc." and
a new one is added.

All other headings, no change.

BELL TELEPHONE LABORATORIES, INC.

DEPT. 3330-MHK-AJB-NM

P.B.X. SYSTEMS
NO. 755A
TRUNK CIRCUIT

CHANGES

B. CHANGES IN APPARATUS

B.1 Added

Fig. 6

Res. (A) 19PG

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 Notes 109 and 110 were added.

D.2 Added Fig. 6 to provide means for using key telephone sets with illuminated key buttons.

All other headings under changes, No change.

1. PURPOSE OF CIRCUIT

1.1 This circuit is used to provide two-way service between a central office and the 755A P.B.X.

2. WORKING LIMITS

2.1	Maximum conductor loop resistance	610 ohms*
	Minimum insulation resistance	
	Manual and panel areas	20,000 ohms
	Step-by-step areas	30,000 ohms
	(Maximum resistance of each "L" lead	50 ohms
Fig. 4	(Maximum resistance of each "GRD" lead	
	(For 3 lamps or less	50 ohms
	(For 4 lamps	25 ohms

*The maximum conductor loop resistance plus the station loop resistance shall not exceed 725 ohms for all stations other than those connected to Figure 5 in which case the resistance shall not exceed 700 ohms.

3. FUNCTIONS

3.01 Provides means for connecting the trunk to a station.

3.02 Permits stations having non-lockout service to connect to a busy trunk.

3.03 Prevents stations having lockout service from connecting to a busy trunk.

3.04 Prevents stations having restricted service from making outgoing calls.

3.05 Permits stations having restricted service to pick up transfer calls and to answer incoming calls.

3.06 Connects a holding condition across the trunk when the hold key at the station is depressed.

3.07 Removes the holding condition when the trunk is taken up by a station or when the line is open at the central office.

3.08 Provides an audible signal on an inward call from central office.

3.09 Provides a flashing visual signal on an inward call from central office and lights it steady when the trunk is busy.

3.10 Provides a flashing visual signal during the ringing and silent periods of the machine ringing on inward calls.

3.11 Stops the audible signal if the central office call is abandoned or answered.

3.12 Extinguishes the visual signal after a time interval if the central office call is abandoned.

3.13 Holds a keyless station connected to the trunk after it is connected by means of a control key at a control station until the receiver at the keyless station is replaced on the switchhook.

3.142 Provides means to increase the charging rate when the trunk is busy or is in a hold or ring-up condition.

3.143 Provides means for connecting to key telephone sets using illuminated key buttons.

4. CONNECTING CIRCUITS

- 4.1 No. 755A P.B.X. station circuit.
- 4.2 No. 755A P.B.X. tone, ringing, alarm and common timing circuits.
- 4.3 No. 755A P.B.X. line, line switch and call allotter circuit.
- 4.4 Standard line circuits in manual, panel or step-by-step central office.
- 4.5 No. 755A P.B.X. power charge and discharge circuit.
- 4.6 Two-way ringdown trunk circuit to magneto central office.

DESCRIPTION OF OPERATION

5. OUTWARD CALL TO CENTRAL OFFICE

5.1 When the receiver is removed from the switchhook at a P.B.X. station and one of the trunk keys is operated, ground through the winding of a relay in the line, line switch and call allotter circuit and through the contacts of the switchhook and key is connected to the "CS-NL" or "CS-LO" lead which operates the (T) relay. The (T) relay connects the "SM" lead to the "SMS1" and "SMS2" leads for operating the select magnet associated with the trunk in the line, line switch and call allotter circuit for preparing the trunk for connection to the called line, and operates a relay in the call allotter circuit which opens the "SMS" lead to the link circuits. When the hold magnet in the line, line switch and call allotter circuit operates, the "T" and "R" leads will be closed through to the calling station and the "S1" lead will be closed through to ground in the line, line switch and call allotter circuit for operating the (B) relay. The (B) relay when operated, opens the "CS-LO" lead to the (T) relay to prevent stations arranged for lockout service from being connected to the trunk when the line is busy, closes a circuit for holding the (H) relay when the (H) relay operates, connects ground to the "CT" lead for increasing the battery charging rate, lights the trunk lamp when provided as a busy signal and opens the ringing bridge circuit of the (R) relay and "R" condenser from across the line. The (B) relay also closes the "CS-LO" lead to the "TS" lead for providing a busy tone to a calling subscriber having lockout service. Otherwise, this relay performs no function at this time. Connection from station to the central office is now established. The (H1) relay also operates when the tip and ring leads are closed

through to the station which, however, performs no function at this time.

6. HOLDING

6.1 When the hold key at the station set is operated, ground is connected to the "H" lead operating the (H) relay. The (H) relay locks up under control of the (B) relay. The (H) relay also opens the trunk toward the station and connects the non-inductive "S" winding of the (H2) relay across the line for preventing the opening of the trunk to the central office and for holding operated the (H1) relay. The (H) relay also operates the (H2) relay and opens the "N" lead toward the line, line switch and call allotter circuit which, however, performs no functions at this time. The (H2) relay closes another holding path for the (H1) relay as the first holding path will be opened when the (H) relay releases. The (H2) relay also connects ground to the "CT" lead from the power, charge and discharge circuit for increasing the charging rate of the battery while the trunk is in the hold condition, closes a circuit for keeping the lamp lighted when the (B) relay releases, and connects the "CS-RS" lead to the (T) relay after the (B) relay releases to permit a restricted service station picking up the call that has been held and transferred to the restricted service station. The (H2) relay also closes a holding circuit for itself through contacts of the (B) relay and the (H) relay when the (B) relay releases. When the hold key at the station is operated, the operated trunk key will release which will remove ground indirectly from the "S1" lead, releasing the (B) relay. The (B) relay releases the (H) relay and connects the (T) relay to the "CS-LO" lead, and to the "CS-RS" lead through the contact of the (H2) relay and closes a holding circuit for the (H2) relay.

7. RESEIZURE

7.1 When the receiver is removed from the switchhook at a station having restricted or non-restricted service, ground will be connected on the "CS-NL", "CS-LO" or "CS-RS" lead, which will operate the (T) relay. The (T) relay again closes a circuit for operating the "SM" select magnet associated with the trunk which connects the trunk to the station when the hold magnet in the line switch circuit operates. The "T", "R" and "S1" leads will again be closed through connecting the station with the central office and operating the (B) relay. The (B) relay releases the (H2) relay, which removes the bridge of the "S" winding of the (H2) relay from

across the line; otherwise, the (B) relay performs the same function as described in paragraph 5.1. The release of the (H2) relay transfers the "CS-RS" lead from the (T) relay winding to the "TS" lead in the tone, ringing, alarm and common timing circuit.

8. DISCONNECTION

8.1 When the receiver is replaced on the switchhook at the station set, or the operated trunk key is released, ground will be removed from the "SI" lead releasing the (B) relay and restoring the circuit to normal. The (H1) relay will also release at this time as the tip and ring leads will be opened.

9. RESTRICTED LINES

9.1 If a station is to be restricted from making outgoing calls, ground will be connected to the "CS-RS" lead instead of to the "CS-NL", or "CS-LO" lead when the receiver is removed from the switchhook at a station set. This "CS-RS" lead is connected to the "TS" lead from the tone, ringing alarm and common timing circuit for operating a relay in that circuit which will start the busy tone circuit functioning. The subscriber at the restricted service station will receive this busy tone through the line circuit as the connection to the trunk cannot be established. Restricted lines, however, can answer and transfer incoming trunk calls.

10. RELEASE FROM CENTRAL OFFICE WHEN TRUNK IS IN HOLD CONDITION

10.1 If the trunk is in the holding condition; that is, with the non-inductive "S" winding of the (H2) relay bridged across the trunk, and the connection is broken at the central office, the (H1) and (H2) relays will release, restoring the trunk to normal.

11. INCOMING CALLS

11.1 On an incoming call the (R) relay will operate and, the ringer in the (B) subscriber set, if provided, will sound while ringing current is applied to the trunk at the central office. The (R) relay operates the (R1) relay which locks up under control of the (B) relay and a relay in the tone, ringing, alarm and common timing circuit over the "LK" lead. If the call is abandoned, the (R) relay will cease to operate and, after a time interval, the relay which holds the (R1) relay

operated over the "LK" lead will function, which will release the (R1) relay, restoring the circuit to normal. The operation of the (R1) relay closes a circuit to the (TRK) lamps, if provided, which flashes the lamps, connects the "CS-RS" lead to the winding of the (T) relay to permit restricted stations to answer incoming calls, connects ground to the "CT" lead for increasing the battery charging rate, connects GRD to the "R1" and "ST" leads to the tone, ringing, alarm and common timing circuit to start the ringing circuit and the common timing circuit functioning, and closes interrupted ringing current which is on the "M" lead to Fig. 2 and 3, if provided, to operate the trunk ringer or buzzer and to the "CB1", "CB2" and "CB3" leads to operate the common trunk and station ringers or buzzers. When the (B) relay operates, as described in paragraph 5.1, it causes the lamps to light steady, releases the (R1) relay which silences the ringers or buzzers, and opens the lead to the tone, ringing, alarm and common timing circuit, causing relays in this circuit to cease functioning.

12. KEYLESS STATION CONNECTED TO TRUNK BY MEANS OF A CONTROL KEY

12.1 When a keyless station is connected to the trunk by means of a control key, the connection will be held under control of the (H1) relay which connects ground on the "N" lead, causing the (CO) relay in the line circuit to hold operated. When the receiver is replaced on the switchhook at the keyless station, the (H1) relay will release, which will release the (CO) relay in this line circuit, restoring the circuit to normal.

13. LINE STATIONS

13.1 Line Stations are permanently connected to the trunk and are independent of all key operations. When the receiver at one of the line stations is removed from the switchhook the (L) relay operates which operates the (B) relay. The (H1) relay also operates but performs no function at this time. The (B) relay performs the same function as described in Paragraph 5.1.

14. RESISTANCE CIRCUIT FIG. 6

The (A) resistance is provided to compensate for the low voltage lamps provided in the key telephone sets equipped with illuminated key buttons.

BELL TELEPHONE LABORATORIES, INC.

DEPT. 3330-JBD-FJS-BC