

CIRCUIT DESCRIPTION
SYSTEMS DEVELOPMENT DEPARTMENT
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PANEL SYSTEM
CENTRAL "A" SWITCHBOARD
INCOMING TRUNK CIRCUIT
NON-COIN SPECIAL SERVICE
FROM PANEL OFFICE
ARRANGED FOR RINGBACK

CHANGES

D. DESCRIPTION OF CIRCUIT CHANGES

- D.1 Reference to lamp transfer circuit is added in diagram of cross-connections.

All other headings, No change.

BELL TELEPHONE LABORATORIES, INC.

DEPT. 332

LBS) BD
FJS)

CIRCUIT DESCRIPTION
SYSTEMS DEVELOPMENT DEPARTMENT
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PANEL SYSTEM
CENTRAL "A" SWITCHBOARD
INCOMING TRUNK CIRCUIT
NON-COIN SPECIAL SERVICE
FROM PANEL OFFICE
ARRANGED FOR RING BACK

CHANGES

A. CHANGED AND ADDED FUNCTIONS

- A.1 Arranged for connection to lamp transfer circuit so that call may be transferred to night position during periods of light load.

D. DESCRIPTION OF CIRCUIT CHANGES

- D.1 Connection of "L" lead from (L) relay direct to answering jack circuit shown as "S" wiring. "T" wiring added, showing connections to answering jack at night position and to lamp transfer circuit, so that when the key in the lamp transfer circuit is operated, calls will be answered at the night position.
- D.2 Circuit Note 106 added, covering use of "S" and "T" wiring.

All other headings under "Changes" - No change.

DEVELOPMENT

1. PURPOSE OF CIRCUIT

- 1.1 This circuit was designed for use in a panel central "A" switchboard to terminate incoming non-coin special service trunks from a distant panel office.

2. WORKING LIMITS

2.1 Trunk Supervision

Maximum External Circuit Resistance to 48 V. Battery to Operate (L) Relay - 5,710 ohms.
Maximum External Circuit Resistance to Operate (L1) Relay - 3,705 ohms.

Minimum External Circuit Resistance to Release (L1)
Relay - 29,120 ohms.
Maximum Trunk Conductor Loop Resistance - 3,000 ohms.
Minimum Insulation Resistance - 30,000 ohms.

2. (SL) Relay

Rated External Sleeve Resistance 113 or 200 ohms.

OPERATION

3. FUNCTIONS

- 3.1 To signal the operator on an incoming call.
- 3.2 To ring back on the trunk toward the calling subscriber.
- 3.3 To give supervision.
- 3.4 Optional wiring provided to permit transfer of calls to night position during periods of light load.

4. CONNECTING CIRCUITS

- 4.1 Answering Jack Circuit.
- 4.2 Outgoing Special Service Non-Coin Trunk Circuit.
- 4.3 Lamp Transfer Circuit.

DETAILED DESCRIPTION

5. INCOMING CALL

When a call is originated at the distant end relay (L) is operated lighting the line lamp.

6. OPERATOR ANSWERS

When the operator answers relay (SL) is operated releasing relay (L), which extinguishes the line lamp, and operating relay (L1), which shunts the trunk causing the supervisory lamp of the associated cord circuit to be extinguished.

7. RING BACK

When the ringing key of the associated cord is operated to ring back on the calling subscribers line relays (RB), (RB1), (RB2) and (BR) are operated in the order named. The latter reverses the polarity of relay (L1) to the trunk causing a ringing condition to be established at the distant office. Relays (RB1) and (RB2) are used in the ringing chain to prevent false rings.

8. DISCONNECT

When the subscriber replaces the receiver on the switch-hook relay (L1) is released lighting the supervisory lamp of the associated cord circuit as a disconnect signal. When the plug of the cord is removed from the jack of the associated circuit relay (SL) is released and the circuit is restored to normal.

9. TRANSFER OF CALLS TO NIGHT POSITION

When "T" wiring is furnished, and the transfer key in the lamp transfer circuit is operated, the (L) lead is transferred to the lamp associated with the answering jack at the night position, so that when a call comes in, the operation of the (L) relay lights the lamp at the night position instead of the lamps associated with the regular answering jacks.

BELL TELEPHONE LABORATORIES, INC.

DEPT. 332

AR)
WLF) WP

PANEL SYSTEMS
CENTRAL "A" SWITCHBOARD
SPECIAL SERVICE TRUNK CIRCUIT
BRIDGED SUPERVISION TOWARDS CORD
ARRANGED FOR REVERSE BATTERY
SIGNAL ON RING BACK

CHANGES

C. CHANGES IN CIRCUIT REQUIREMENTS
OTHER THAN THOSE APPLYING TO ADDED
OR REMOVED APPARATUS

C.1 Requirements are added for the (L)
B424 relay for use when Fig. B is
used and the former requirements are
designated for use when Fig. A is used.

All other headings, no change.

BELL TELEPHONE LABORATORIES, INC.

DEPT. 3330-MCK-AJB-WP

PANEL SYSTEMS
CENTRAL "A" SWITCHBOARD
SPECIAL SERVICE TRUNK CIRCUIT
BRIDGED SUPERVISION TOWARDS CORD
ARRANGED FOR REVERSE BATTERY
SIGNAL ON RING BACK

CHANGES

2B (RS) has been shown connected to
2T (SL) instead of 1T (SI) to correct a
drafting error.

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 Ground has been removed from
2T (SL) Fig. B, 24v battery has
been shown connected to 1T (SL) and

All other headings, no change.

BELL TELEPHONE LABORATORIES, INC.

DEPT. 3350-ARB-FJS-AE

PANEL SYSTEMS
CENTRAL "A" SWITCHBOARD
SPECIAL SERVICE TRUNK CIRCUIT
BRIDGED SUPERVISION TOWARDS CORD
ARRANGED FOR REVERSE BATTERY
SIGNAL ON RINGBACK

CHANGES

A. CHANGED AND ADDED FUNCTIONS

- A.1 An optional arrangement has been added for use when outgoing trunks are equipped with class of service tone, to prevent the tone being passed prematurely due to plug fumbling.

B. CHANGES IN APPARATUS

B.1 Added

R292 relay (SL) Figure B
R555 relay (SL) Figure B
U829 relay (RS) Figure B

D. DESCRIPTION OF CIRCUIT CHANGES

- D.1 The main figure has been designated "Figure 1 Trunk Circuit".
- D.2 Figure B has been added to provide ring start when the operator answers to prevent prematurely passing tone due to plug fumbling when the outgoing trunk is equipped with class of service tone.
- D.3 Figure A was formerly part of Figure 1.
- D.4 The repeating coils in Figure 1 have been given optional designations.
- D.5 Note 103, a Table of "Features and Options", Note 105, a Table "Record of Figures, Wiring and Apparatus Changes" and a table of "Options Used" have been added.
- D.6 Information formerly in Notes 103 and 106 have been placed in the table of features and options and a new note 106 has been added.

E. CHANGES IN TRANSMISSION REQUIREMENTS

- E.1 The impedance data for the 94E coil formerly showed the max. loss at 0.9

All other headings under "Changes",
No change.

1. PURPOSE OF CIRCUIT

- 1.1 This circuit is designed for use in a panel or crossbar central "A" switchboard to terminate incoming

noncoin special service trunks from a distant panel or crossbar office.

2. WORKING LIMITS

2.1 Trunk Supervision

- 2.11 Maximum external circuit loop resistance to operate (L) relay with 40 Volt battery in distant office 5,710 ohms.
- 2.12 Maximum external circuit loop to operate (Ll) relay - 3,705 ohms.
- 2.13 Minimum external circuit loop resistance to release (Ll) relay - 29,120 ohms.
- 2.14 Maximum trunk conductor loop resistance - 3000 ohms.
- 2.15 Minimum insulation resistance - 30,000 ohms.
- 2.16 Rated external sleeve resistance - 113 or 200 ohms to 24 volt battery.

3. FUNCTIONS

- 3.1 To signal the operator on an incoming call.
- 3.2 An optional arrangement is provided to prevent passing tone prematurely when outgoing trunks are equipped with class of service tone.
- 3.3 To ring back on the trunk toward the calling subscriber.
- 3.4 To provide supervision to the "A" operator.
- 3.5 An option is provided to permit transfer of calls to night position during periods of light load.

4. CONNECTING CIRCUITS

- 4.1 Answering Jack Circuit-SD-90467-01.
- 4.2 Combination Cord Circuit- SD-96131-01.
- 4.3 Outgoing Special Service Non-Coin Trunk Circuit - SD-96209-01, SD-25656-01.
- 4.4 Lamp Transfer Circuit-SD-96053-01.
- 4.5 Emergency Transfer Circuit-SD-95458-01.

DESCRIPTION OF OPERATION

5. INCOMING CALL

When a call is originated at the distant end relay (L) operates and

lights the trunk lamp in the answering jack circuit.

6. OPERATOR ANSWERS

6.1 Figure A

When the operator answers relay (SL) operates releasing relay (L), which extinguishes the trunk lamp. The (SL) relay operated also causes relay (Ll) to operate over the trunk loop. Relay (Ll) places a resistance bridge across the trunk toward the answering cord causing the supervisory lamp in the cord to be extinguished.

6.2 Figure B

When the operator answers relay (SL) operates but performs no function until the plug is fully seated and relay (RS) is operated. This is to prevent battery and ground through relay (Ll) from being passed back to the distant office in case the plug is fumbled or partially inserted to make the sleeve only. This battery and ground would cause the distant circuit to pass the class of service tone, if used, before the plug is seated and it would then not be heard by the operator. When the plug is fully seated relay (RS) operates over the ring to battery in the cord circuit and locks under control of relay (SL). Relay (RS) operated releases relay (L) which extinguishes the trunk lamp. Relay (RS) also connects relay (Ll) to the trunk conductors and furnishes ground to the emergency transfer circuit when this circuit is used as an emergency line circuit. Relay (Ll) operates over the trunk loop and

places a resistance bridge across the trunk toward the answering cord causing the supervisory lamp in the cord to be extinguished.

7. RING BACK

When the ringing key of the associated cord is operated to ring back on the calling subscriber line relays (RB), (RB1), (RB2) and (BR) are operated in the order named. The latter reverses the polarity of relay (Ll) to the trunk causing a ringing condition to be established at the distant office. Relays (RB1) and (RB2) are used in the ringing chain to prevent false rings.

8. DISCONNECT

When the subscriber replaces the receiver on the switchhook relay (Ll) releases, lighting the supervisory lamp of the associated cord circuit as a disconnect signal. When the plug of the cord is removed from the jack relay (SL) in Figure A or relays (SL) and (RS) in Figure B release and the circuit is restored to normal.

9. TRANSFER OF CALLS TO NIGHT POSITION

When "T" wiring is furnished and the transfer key in the lamp transfer circuit is operated, the (L) lead is transferred to the lamp associated with the answering jack at the night position, so that when a call comes in, the operation of the (L) relay lights the lamp at the night position instead of the lamps associated with the regular answering jacks.

BELL TELEPHONE LABORATORIES, INC.

DEPT. 3350-ARB-FJS-RJ