

STEP BY STEP SYSTEM
NO. 1, 350A OR 355A
TEST DISTRIBUTOR CONTROL CIRCUIT
FOR USE IN TESTING SUBSCRIBER LINES
FROM LOCAL TEST DESK NO. 14

CHANGES

D. DESCRIPTION OF CIRCUIT CHANGES

- D.1 The title is changed to include "355A".
- D.2 The replacing note "Replacing SD-31776-01 For Test Distributor Control Circuit" is added.
- D.3 The connecting information in Fig. 1 is changed to include "To Test Trunk Selector Circuit".
- D.4 The title of Figs. "P" and "Q" and "CAD1" are revised. In Fig. Q, a 3 wire Jumper is added to the "Line Insulation Test Control Ckt.". In Fig. Q, reference is added to "C.D.F.". In Fig. P, reference to "Distant Off. is added in connecting information. In CAD1, reference to "Test Distr." is added at "T.S.".
- D.5 Note 102 is changed to delete the word "Interoffice".

4. CONNECTING CIRCUITS

When this circuit is listed on a key-sheet the connecting information thereon is to be followed.

- 4.1 Test Trunk Circuit From Local Test Desk No. 14 - SD-90018-01.
- 4.2 Test Distributor Circuit - SD-31236-01.
- 4.3 Test Distributor Circuit - SD-32007-01.
- 4.4 Line Insulation Test Control Ckt. - SD-32219-01.
- 4.5 Test Trunk Selector Circuit - SD-95709-01.

All other headings, no change.

BELL TELEPHONE LABORATORIES, INCORPORATED

DEPT. 2325-VDM-EWO-BA

CIRCUIT DESCRIPTION
SWITCHING SYSTEMS DEVELOPMENT DEPARTMENT

CD-31349-01
Issue 4-D
Appendix 4-D
Dwg. Issue 9-D

STEP-BY-STEP SYSTEM
NO. 1 OR 350A
TEST DISTRIBUTOR CONTROL CIRCUIT
FOR USE IN TESTING SUBSCRIBER LINES
FROM LOCAL TEST DESK NO. 14

CHANGES

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 The connecting information in Fig. 1 is changed to include "To Line Insulation Test Control Ckt."

D.2 CAD1, CAD2 and CAD3 are added.

D.3 Cross connection Figs. P and Q are changed to include reference to line insulation test control circuit.

4. CONNECTING CIRCUITS

When this circuit is listed on a keysheet the connecting information thereon is to be followed.

4.1 Test Trunk Circuit from Local Test Desk No. 14 - SD-90018-01.

4.2 Test Distributor Circuit - SD-31236-01.

4.3 Test Distributor Circuit - SD-32007-01.

4.4 Line Insulation Test Control Ckt. - SD-32219-01.

All other headings, no change.

BELL TELEPHONE LABORATORIES, INCORPORATED

DEPT. 2353-VDM-EWO-GH

STEP BY STEP SYSTEM
NO.1 OR 350A
TEST DISTRIBUTOR CONTROL CIRCUIT
FOR USE IN TESTING SUBSCRIBER LINES
FROM LOCAL TEST DESK NO. 14

CHANGES

B. CHANGES IN APPARATUS

B.1 Superseded Superseded By
R1401 relay R1818 relay
149CG relay 149AR relay
B4 relay B1072 relay
"p" option "N" option

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

C.1 Adjustment "A" is designated,
rated "Mfr. Disc." and superseded

by adjustment "B" for operation over
maximum trunk loop of 1500 ohms.

C.2 Test note 2 is added.

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 Working limits for adjustment "A"
are designated and working limits
for adjustment "B" are added.

D.2 "P" option is designated, rated
"Mfr. Disc." and superseded by
"N" option for operation over maximum
trunk loop of 1500 ohms.

D.3 Notes 108 and 109 are added.

2. WORKING LIMITS

(D) and (S) relays.

2.1 Min. Ins. Res. 60,000 ohms

2.2 Max. Ext. Ckt. Res.

	Earth Pot. ±15V	Earth Pot. 0 V
Adj. "A"		
Relay (D)	730 ohms	1220 ohms
Relay (S)	4470 ohms	6915 ohms
Adj. "B"		
Relay (D)	1025 ohms	1800 ohms
Relay (S)	5600 ohms	8450 ohms

All other headings, no change.

BELL TELEPHONE LABORATORIES, INC.

DEPT. 3310-DR-RLL-W2

STEP-BY-STEP SYSTEM
NO. 1 OR 350A
TEST DISTRIBUTOR CONTROL CIRCUIT
FOR USE IN TESTING SUBSCRIBER LINES
FROM LOCAL TEST DESK NO. 14

CHANGES

B. CHANGES IN APPARATUS

B.1	Superseded	Superseded By	Removed
	1 - 149CG Rel. (DC) "Y" Option 1 - R72 Rel. (CD), "R" Option	(DC) Y183 "U" Option 1 Y270 Rel. (CD) "Q" Option	1 - 149CG Rel. (DD) "T" Option

D. DESCRIPTION OF CIRCUIT CHANGES

- D.1 The (DC) relay, 149CG is designated "Y" option and rated "Mfr. Disc.". It is superseded by the Y183 relay, "U" option.
- D.2 Notes 105, 106 and 107 and the options used table are added.
- D.3 The (DD) relay 149CG is designated "T" option and is rated "Mfr. Disc.". It is superseded by "S" option.
- D.4 The (CD) relay, R72 is designated "R" option and rated "Mfr. Disc.". It is superseded by the Y270 relay, "Q" option.

4. CONNECTING CIRCUITS

When this circuit is listed on a keysheet the connecting information thereon is to be followed.

- 4.1 Test Trunk Circuit from Local Test Desk No. 14 -
SD-90018-01
- 4.2 Test Trunk Ringing Circuit -
SD-31236-01
- 4.3 Test Distributor Circuit -
SD-32007-01

All other headings no change.

BELL TELEPHONE LABORATORIES, INC.

DEPT. 3310-LAH-RLL-KM

STEP-BY-STEP SYSTEM
NO. 1 OR 350A
TEST DISTRIBUTOR CONTROL CIRCUIT
FOR USE IN TESTING SUBSCRIBER LINES
FROM LOCAL TEST DESK NO. 14

CHANGES

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 Prior to this issue no equipment designation was shown in the title box and (TST DIST C CKT) was shown on the circuit requirements table.

All other headings, no change.

BELL TELEPHONE LABORATORIES, INC.

DEPT. 3310-MHK-RLL-B

STEP-BY-STEP SYSTEM
NO. 1 OR 350A
TEST DISTRIBUTOR CONTROL CIRCUIT
FOR USE IN TESTING SUBSCRIBER LINES
FROM LOCAL TEST DESK NO. 14

CHANGES

D. DESCRIPTION OF CIRCUIT CHANGES

- D.1 The cross connections have been changed
- D.2 The main figure is designated Fig. 1 and the connecting information in Figs. A & B changed accordingly.
- D.3 "No. 1 or 350A" has been added as the second line of the title.

All other headings under "Changes", no change.

1. PURPOSE OF CIRCUIT

- 1.1 This circuit is used as a connecting link between a test distributor circuit and a test trunk circuit for the purpose of testing subscriber lines from the local test desk No. 14.

2. WORKING LIMITS

2.1 (D) Relay

- 2.11 The maximum external circuit resistance is 730 ohms with ± 15 volts earth potential.
- 2.12 The maximum external circuit resistance is 1220 ohms without earth potential.
- 2.13 The minimum insulation resistance is 60,000 ohms.

2.2 (S) Relay

- 2.21 The maximum external circuit resistance is 4470 ohms with ± 15 volts earth potential.
- 2.22 The maximum external circuit resistance is 6915 ohms without earth potential.

2.23 The minimum insulation resistance is 60,000 ohms.

3. FUNCTIONS

- 3.1 To close the sleeve lead towards the test desk when the test distributor places a ground on the line-S lead, after a bridge has been placed across the line-T and line-R.
- 3.2 To hold a bridge across the line-T and line-R leads during the testing of the subscriber's line.
- 3.3 Arranged to delay closing the test-T and test-R leads to the test trunk until after the dial key in the test cord has been restored to normal, after the desired number has been dialed.
- 3.4 To connect a ground to the line-T and line-R leads in order to release the cut-off relay in the subscriber's line circuit when the proper key at the test desk is operated.
- 3.5 To advance the test connector by rotary stepping without releasing the connector chain of circuits.
- 3.6 To restore to normal when the disconnect key in the test trunk circuit is operated.
- 3.7 The operation of the (SB) relay is placed under control of a relay in series with one side of the trunk to permit making tests of the test distributor without blocking the (SB) relay nonoperated.

4. CONNECTING CIRCUITS

- 4.1 Test Trunk Circuit at Local Test Desk No. 14.
- 4.2 Test Trunk Ringing Circuit.
- 4.3 Test Distributor Circuit.

DESCRIPTION OF OPERATION

5. ORIGINATING A CALL

When Figure A is used and the plug of a test cord is inserted in the jack of a test trunk and the dial key is operated, a bridge is placed across the tip and ring in series with compensating resistances (C) and (D) (when furnished), or through "Z" wiring, completing a circuit over the line-T and the line-R to operate the (A) and (G) relays in the test distributor circuit. The operation of these relays causes a ground to be connected to the line-S lead and operates the (SB) relay. When Figure B is used, the bridge, which is placed

across the tip and ring to operate the (A) and (G) relays in the test distributor circuit, completes the circuit through the (LS) relay in series with the line-T which causes the (LS) relay to operate and also causes a ground to be connected to the line-S lead. The (LS) relay operated causes the (SB) relay to operate and lock to the line-S ground. The (SB) relay operated, (Figure "A" or "B") then operates the (KD) relay and closes a circuit from ground ("X" or "Y" wiring) through the (S) and (D) relays over the trunk-S lead to battery in the test cord at the test desk, operating the (S) and (D) relays. The (S) relay operated, operates the (SD) relay. The (KD) relay operated, operates the (SC) and (CT) relays and closes a bridge through its own contact to hold the pulsing relays in the test distributor circuit. This bridge is supplemented by the operation of the (SC) relay.

6. HOLDING THE CONNECTION DURING DIALING

When the (D) relay operates, it shunts down the (KD) relay through the (A) resistance. This releases the (CT) and (SC) relays and operates the (DC) relay. The (SC) relay is slow to release in order to hold the bridge across the line-T and line-R leads while the (CT) and (KD) relays are releasing. The (DC) relay operated, operates the (DD) relay, which in turn operates the (CD) relay to open the test-T and test-R leads. These leads are closed again toward the test distributor as soon as the (CD) relay releases. The (KD) relay released holds the (DC), (DD) and (CD) relays operated. The (CT) relay released short-circuits the (B) resistance, keeps the test-T and test-R leads open, and keeps the circuit closed to the line-T and line-R leads for dialing.

7. CLOSING THROUGH THE LINE FOR TESTING

After the desired line to be tested has been selected by the test connector, the dial key in the test circuit is restored to normal. This opens the trunk-S lead and releases the (S) and (D) relays. High resistance battery is then connected to the trunk-S lead, which reoperates the (S) relay. The (D) relay being marginal does not operate at this time. The (D) relay released removes the shunting ground from the (KD) relay, which operates and causes the reoperation of the (CT) and (SC) relays. The (KD) relay upon operating releases the (DC) relay, which in turn causes the release of the (DD) and (CD) relays. With the (CT) relay operated and the (CD) relay released, the test-T and test-R leads free from any bridge, battery or ground are cut through to the subscriber's line for testing. The (DC), (DD), and (CD) relays are slow in releasing in order to delay closing the test-T and test-R leads until the bridge across the test cord is removed by restoring the dial key to normal. This is to reduce the possibility of prematurely tripping in case the

line is being called at this time. Relays (KD) and (SC) each closes a bridge across the line-T and line-R in series with the 100 ohm resistance (B) to hold the test distributor.

8. RELEASING CUT-OFF RELAY

When it is desired to release the out-off relay, the sleeve of the test cord is opened at the test desk by the operation of the proper key. This releases the (S) relay, which in turn releases the (SD) relay. With the (SD) relay released, ground from the back contact of the (CD) relay through the (CT) is connected to the line-T lead for the purpose of shunting down and releasing the (G) relay in the test distributor circuit. This same ground through the (B) resistance is connected to the line-R lead to hold the (A) relay in the test distributor circuit. The release of the (G) relay opens the sleeve lead to the cut-off relay, releasing it. The (SD) relay is slow releasing to prevent the above operation when the (S) relay releases momentarily.

9. ADVANCE OF TEST CONNECTOR

When the dial key in the test desk is reoperated, a bridge is connected across the trunk-T and trunk-R leads and a low resistance battery is connected to the trunk-S lead, causing the (D) relay to operate. The (D) relay operated, shunts down the (KD) relay through the (A) resistance; the (KD) relay releasing, releases the (CT) and (SC) relays and operates the (DC) relay, which in turn operates the (DD) and (CD) relays. Relay (CD) when operated cuts off the test-T and test-R leads from the trunk. With relays (CT), (KD) and (SC) released, resistance (B) is short-circuited and the test distributor is held by the bridge in the test desk. The connector may be advanced by means of the dial to other lines in the same level or it may be released by means of the connector release key in the test desk and advanced to a different level by means of the dial.

10. DISCONNECTION

When the disconnect key of the test trunk circuit is operated, the trunk tip and ring leads are opened and a low resistance battery is connected to the trunk-S lead, causing the (D) relay to operate. When Figure B is used, and the trunk tip and ring leads are opened, the (LS) relay releases. The (D) relay operated shunts down the (KD) relay through resistance (A). The (KD) relay released, releases the (CT) and (SC) relays and operates the (DC) relay, which in turn operates the (DD) and (CD) relays. Relay (CD) operated, disconnects the test-T and test-R leads from the trunk. With relays (KD) and (SC) released, the bridge across the line-T and line-R leads is opened, causing the

test distributor and test connector to release. When the test distributor is normal, ground is removed from the line-S lead to release the (SB) relay. The (SB) relay released (a) causes the release of the (DC), (DD) and (CD) relays, (b) opens the trunks-S lead which causes the (S), (D) and (SD) relays to release. This restores the circuit to normal.

BELL TELEPHONE LABORATORIES, INC.

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