STEP-BY-STEP SYSTEMS
NO. 350A OR 355A
TEST LINE CIRCUIT
FOR TESTING LOCAL OR TOLL TRAIN
FOR RINGING AND CONTINUITY

1. PURPOSE OF CIRCUIT

1.1 This circuit is designed to provide for routing calls over a local or toll train in testing for ringing, continuity, and supervision. After the test line is seized, the ringing is tested and the tripping relay is tripped, after which an interrupter is connected to the tip and ring to give flashing and supervision back to the test man.

2. WORKING LIMITS

2.1 None.

3. FUNCTIONS

3.1 To receive and check the ringing from the connector.

3.2 To provide a ringing trip path.

3.3 To send back a tone to the test man.

3.4 To check supervisory relay of toll transmission selectors.

3.5 To repeat to the test man the opening and closing of the tip and ring circuit.

3.6 Restoring to normal.

4. CONNECTING CIRCUITS

4.1 This circuit will function with any standard step-by-step local connector having automatic ringing and reverse battery supervision, and with toll connectors.

DESCRIPTION OF OPERATION

5. CIRCUIT OPERATION

5.1 Seizure

When the connector seizes this test line, ground over the sleeve conductor operates relay (S) which (1) closes a

circuit from tone to winding of repeating coil (A) thru condenser (B) and (2) closes the circuit from ground on the sleeve thru the break contact of relay (H) to the winding of relay (F1) which operates and causes relay (F2) to operate and open the 60 IPM interrupter ground circuit.

5.2 Ringing

When ringing current is first received over the tip and ring, the (L) relay does not operate because of the high resistance of thermistor (A). After approximately 1/2 second, the thermistor (A) heats up, lowering its resistance sufficiently to permit relay (L) to operate. Relay (H) then operates and locks to the sleeve lead closing the loop through repeating coil (A) and resistance (A) for operating the tripping relay of the connector. This period of time arising from the above sequence of operations is made use of to enable the test man to check for ringing induction.

5.3 Tripping

In most cases the 1213-ohm loop is this circuit is sufficiently low to trip ringing. However, in offices where subscriber sets are fitted with 42A ringers and superimposed ringing current is employed, it is necessary to also bridge the vacuum tube (A) of Fig. 2 across the repeating coil and 1200-ohm resistance. In this case the ringing current breaks down the tube and lowers the loop circuit resistance temporarily to permit the tripping relay of the connector to operate.

5.4 Tone

The (H) relay operating and connecting the ring to one side of the repeating coil, completes the circuit for tone to be received by the test man.

5.5 Flashing

The operation of relay (H) above also opens ground from the path used to operate relay (F1) which in turn releases relay (F2). Thus after approximately .6 second, the 60 IPM interrupter, to the back contact of relay (F2), is closed through a make contact on relay (H) for intermittently operating relay (F), which opens and closes the circuit through the loop, The test man is thus able on local trains to test the operation and release of the reversing relay in the connector and on toll trains to test for satisfactory operation of the supervisory relay of the toll transmission selector.

5.6 Release

When the test man disconnects, the connector releases the test line, releasing the (S) and (H) relays and restoring the circuit to normal

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DEPT. 3350

RLQ)
RSW)EN

STEP-BY-STEP SYSTEMS
NO. 350A OR 355A
TEST LINE CIRCUIT
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FOR RINGING AND CONTINUITY

CHANGES

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

C.1 The release adjustment for relay
(F1) was, readj. 0.9.
(F2) 0.9

C.2 Added test note "Adjacent relays shall not be engergized. See B.S.P."

C.3 Added insulate inf. for relay (F1) on ckt. req. table.

All other headings, No change.

BELL TELEPHONE LABORATORIES, INC.

DEPT. 3350 RLQ-RSW

STEP-BY-STEP SYSTEMS
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FOR RINGING AND CONTINUITY

CHANGES

B. CHANGES IN APPARATUS

B.1 Superseded	Superseded By
(F) "Z" option U124 relay	(F) "Y" option U1222 relay

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

C.1 The adjustment for

		Soak	Opr.	Hold	Rel.
(F2) relay Y139 was	Test	31	18	1.7	0.8
	Readj.	31	17	1.6	1.1
(F) relay U124 was	Test		6.7		
	Readj.		6.3		

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 The "Z" and "Y" options were added to the options used in table.

D.2 Circuit Note 105 was added.

D.3 The Z and Y options were added to the (F) relay.

All other headings, No change.

BELL TELEPHONE LABORATORIES, INC.

DEPT.3330 HCM-REK

STEP-BY-STEP SYSTEMS
NO. 350A OR 355A
TEST LINE CIRCUIT
FOR TESTING LOCAL OR TOLL TRAIN
FOR RINGING AND CONTINUITY

CHANGES

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

C.1 For the (F) relay, "Y" option, changed Test Clip Data under "Connect Ground" from 3T(F) to 5T(F).

All other headings, No change.

BELL TELEPHONE LABORATORIES, INC.

DEPT. 3330-MCK-FJS

STEP-BY-STEP SYSTEMS
NO. 350A OR 355A
TEST LINE CIRCUIT
FOR TESTING LOCAL OR TOLL TRAIN
FOR RINGING AND CONTINUITY

CHANGES

B. CHANGES IN APPARATUS

B.1

Superseded	Superseded By
(L) J25 relay	(L) J20 relay
(A) 19NT resist. X option	(A) 18GE resist. W option
(A) 97A repeat coil V option	(A) 307R repeat coil (307R) U option

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 Options U, V, W and X are added to the options used table and note 105.

D.2 Relays J20 and J25 are added to note 105.

D.3 Note 106 is added.

D.4 Prior to this issue the "60 IPM or 60A" lead was designated only "60 IPM".

D.5 Cross connection figure 51 is rated Mfr. Disc. and figure 52 is added.

All other headings, no change.

BELL TELEPHONE LABORATORIES, INC.

DEPT. 3310-MKS-RLL-SI

SXS SYSTEMS
NO. 350A OR 355A
TEST LINE CIRCUIT
FOR TESTING LOCAL OR TOLL TRAIN
FOR RINGING AND CONTINUITY

CHANGES

B. CHANGES IN APPARATUS

B.1 Superseded	Superseded By
(A) Thermistor 1A "T" option	(A) Thermistor 8A "S" option

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 "T" & "S" options have been added to the options used table, and to Thermistors listed in Par. B.

D.2 Fig. 2 & Circuit Note 102 rated "A&M Only".

D.3 Circuit Note 102 revised to include "X" option.

D.4 Circuit Note 105 revised to include "T" & "S" options and Fig. 2.

D.5 On issue 6-D, Fig. 52, "1 PER OFFICE" is added to leads from punchings 5, 7, & 11, and "1 PER 5 CIRCUITS" is added to leads from punchings 10 & 20, "OR TO R.R. GROUND" is added to lead from punching 20. Lead from punching 11 was designated "TO POWER RING CKT".

4. CONNECTING CIRCUITS

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

4.1 Local Connector 2 Ring Semi Selector Ring - SD-30206-01 (Typical).

4.2 Toll Connector 2 Ring Semi Selector Ring - SD-31171-01 (Typical).

4.3 60 & 120 IPM Interrupter & Interrupter Alarm Circuit - SD-31606-01 (Typical).

4.4 Miscellaneous Alarm Circuit Key Circuit - SD-31974-01.

4.5 Power Ring Circuit - SD-80885-01 - SD-80780-01.

All other headings, no change.

BELL TELEPHONE LABORATORIES, INC.

DEPT. 3360-CFC-CGM-EH