

CIRCUIT DESCRIPTION
AMERICAN TELEPHONE & TELEGRAPH CO.
DEPT. OF DEVELOPMENT & RESEARCH.
BELL TELEPHONE LABORATORIES, INC.
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PANEL SYSTEM
LOCAL TEST DESK NO. 12-B
SECONDARY TEST KEY CIRCUIT
FOR 51 TYPE DIAL TESTER CIRCUIT

CHANGES

A. CHANGED AND ADDED FUNCTIONS

A.1 None.

B. CHANGES IN APPARATUS

B.1 None.

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

C.1 None.

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 The rating of this circuit has been changed from "A. T. & T.
Co. Standard" to "A & M Only".

DEVELOPMENT

1. PURPOSE OF CIRCUIT

1.1 No change.

2. WORKING LIMITS

2.1 No change.

OPERATION

3. FUNCTIONS

3.1 No change.

4. CONNECTING CIRCUITS.

4.1 No change.

DETAILED DESCRIPTION

5. No change.

AMERICAN TELEPHONE & TELEGRAPH CO.
DEPT. OF DEVELOPMENT & RESEARCH.
BELL TELEPHONE LABORATORIES, INC.

DEPT. 332

EBS } YB
WHM }

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LOCAL TEST DESK NO. 12-B
SECONDARY TEST KEY CIRCUIT
FOR 51 TYPE DIAL TESTER CIRCUIT

CHANGES

A. CHANGED AND ADDED FUNCTIONS

A.1 None.

B. CHANGES IN APPARATUS

B.1 None.

C. CHANGES IN CIRCUIT REQUIREMENTS OTHER THAN THOSE APPLY-
ING TO ADDED OR REMOVED APPARATUS

C.1 Added
(DT)
(BY) 2U Lamp

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 The (DT-BY) lamp is added to provide for connection to 51 type dial tester circuit on which this lamp is not shown.

D.2 Note 104 is added.

D.3 On the key top diagram for the ALNC key (HA) was shown as (NA).

DEVELOPMENT

1. PURPOSE OF CIRCUIT

1.1 This circuit is designed to connect the 51 type dial tester circuit to the secondary test circuit and telephone circuit of the local test desk for the purpose of testing subscribers' and operators' dials. The particular type of test, low speed or high speed dial test or readjust, is controlled by keys in this circuit.

2. WORKING LIMITS

2.1 None.

OPERATION

3. FUNCTIONS

- 3.1 This circuit is individual to a position at the local test desk. The operation of a key in this circuit causes the idle 51 type dial tester circuits to hunt for it and when seized by the first one causes the others to stop hunting. Connection is made through this circuit between the 51 type dial tester circuit and the secondary test cord and telephone circuit of the associated position at the local test desk. By the operation of keys one of four test conditions are established as follows: low speed dial test, low speed dial readjust, high speed dial test and high speed dial readjust. Repeat tests, using the same or different test conditions may be made without disconnecting from the 51 type dial tester circuit.

4. CONNECTING CIRCUITS

- 4.1 51 type dial test circuit, arranged for use with ringer test circuit and local test desk test circuit.
- 4.2 Secondary test circuit and telephone circuit of local test desk.

DETAILED DESCRIPTION

5. APPARATUS AND FUNCTIONS

- 5.1 The "A1" type keys are parts of other "A1" type keys in the secondary test circuit of the local test desk.
- 5.2 (DIAL TEST) key is locking and single throw. It is used for the purpose of associating a 51 type dial tester circuit with this circuit, and is left operated as long as it is desired to hold the 51 type dial test circuit.
- 5.3 (LT) and (LA) keys are locking and controlled by the same lever. (LT) key is operated for low speed dial test. (LA) key is operated for low speed dial readjust.
- 5.4 (HT) and (HA) keys are locking and controlled by the same lever. (HT) key is operated for high speed dial

test, (HA) key is operated for high speed dial re-adjust.

- 5.5 (DT-BY) lamp is provided at each position of the test desk using a 51 type dial tester. The lamp lights whenever all the dial testers are busy.

6. CIRCUIT OPERATION

6.1 Seizure by Dial Tester When it is desired to associate a 51 type dial tester circuit with the secondary test circuit of a position at the local test desk, the (DIAL TEST) key is operated. The operation of this key connects battery through (HG) 150 ohm resistance to (HG) lead; then connects ground to (ST) lead and ground through the winding of (DT) relay to (TD) lead. The (DIAL TEST) key is so constructed that battery is connected to (HG) lead before ground is connected to (ST) lead. This is in case a 51 type dial tester circuit is resting on the terminals of the selector associated with this position in order not to move this dial tester off this terminal. Ground on (ST) lead causes the idle 51 type dial tester circuits to hunt for battery through 150 ohms on (HG) lead. When this circuit is found by a dial tester, the selector of the dial tester circuit will stop on the associated terminals and battery from the dial tester circuit over (TD) lead will operate (DT) relay. The operation of (DT) relay opens (ST) and (HG) leads causing other 51 type dial tester circuits to stop hunting, and releasing the hunting relays of the associated dial tester circuit.

6.2 Class of Test One of the four test keys (LT), (LA), (HT) or (HA), will be operated depending upon the type of test it is desired to make as follows:

6.21 Low Speed Dial Test When it is desired to test a low speed dial within its test limits, (LT) key is operated. The (f) lead is grounded operating a relay in the telephone circuit to close the secondary of the monitoring circuit. When "X" wiring is used the ring conductor is cut through to the selector of the dial tester circuit and the tip conductor is grounded at the dial tester circuit. Both (SP) and (RJ) leads will be open under this condition. When "Y" wiring is used the tip and ring conductors are cut through to the dial tester circuit and the (SP) lead will be open.

6.22 Low Speed Dial Readjust When it is desired to test a low speed dial within its readjust limits, (LA) key is operated. The (f) lead is grounded operating a relay in the telephone circuit to close the second-

dary of the monitoring circuit. When "X" wiring is used the ring conductor is cut through to the selector of the dial tester circuit and the tip conductor is grounded at the dial tester circuit. (SP) lead will be open and (RJ) lead will be grounded under this condition. When "Y" wiring is used the tip and ring conductors are cut through to the dial tester circuit and the (SP) lead is connected to ground through 5,000 ohms resistance.

6.23 High Speed Dial Test When it is desired to test a high speed dial within its test limits, (HT) key is operated. The (f) lead is grounded operating a relay in the telephone circuit to close the secondary of the monitoring circuit. When "X" wiring is used the ring conductor is cut through to the selector of the dial tester circuit and the tip conductor is grounded at the dial tester circuit. (SP) lead will be grounded and (RJ) lead will be open under this condition. When "Y" wiring is used the tip and ring conductors are cut through to the dial tester circuit and the (SP) lead is connected to 48 volt battery.

6.24 High Speed Dial Readjust When it is desired to test a high speed dial within its readjust limits, (HA) key is operated. The (f) lead is grounded operating a relay in the telephone circuit to close the secondary of the monitoring circuit. When "X" wiring is used the ring conductor is cut through to the selector of the dial tester circuit and the tip conductor is grounded at the dial tester circuit. Both (SP) and (RJ) leads will be grounded under this condition. When "Y" wiring is used the tip and ring conductors are cut through to the dial tester circuit and the (SP) lead is grounded.

6.3. Dial Tone When the 51 type dial tester circuit is ready to make a dial test, the regular dial tone will be sent out over the ring of the line where "X" wiring is used or the tip of the line where "Y" wiring is used and battery will be connected to (HL) lead, operating (M) relay, closing the monitoring circuit through (DIAL TEST) key and leads (d) and (e) to the telephone circuit at the local test desk. The dial tone is audible at the station under test and at the local test desk. With the circuit in this condition, the maintenance man or subscriber at the station under test may talk to the attendant at the local test desk, but the attendant cannot be heard at the station under test. When

the dial tone is heard zero should be dialed. When the (L) relay in the 51 type dial tester circuit releases on the first pulse the battery is disconnected from (HL) lead releasing (M) relay opening the monitoring circuit. The purpose of this is to prevent dial clicks in the attendant's ear and to remove the capacity bridge which might interfere with pulsing.

- 6.4 Test Tone At the completion of the tenth pulse a tone is connected to the line and battery will be connected to (HL) lead operating (M) relay, again closing the monitoring circuit through (DIAL TEST) key to the telephone circuit at the local test desk. Distinctive tones indicating a too fast, O.K. or too slow condition will be audible at the station under test and at the local test desk. With the circuit in this condition, the maintenance man or subscriber at the station under test may talk to the attendant at the local test desk, but the attendant cannot be heard at the station under test.
- 6.5 Repeat Tests When the distinctive tone indicating the test condition of the dial is audible, the 51 type dial tester circuit will be restored to normal by the station under test disconnecting or by restoring the operated test key (LT), (LA), (HT) or (HA). On restoring to normal the tone is disconnected and battery is removed from (HL) lead, releasing (M) relay, in turn opening the monitoring circuit at the local test desk. Provided (DIAL TEST) key is not restored to normal, the 51 type dial tester circuit will remain associated with the position of the local test desk. If, after sufficient time for the relays in the 51 type dial tester circuit to release, the station under test is again bridged across the line or if, in the case where the station remained bridged across the line, a test key is operated, the 51 type dial tester circuit will prepare to make another test, and when ready will connect the regular dial tone to the ring and close the monitoring circuit in the same manner as for the first test.
- 6.6 Talking to Test Desk Attendant With all the test keys (LT), (LA), (HT) and (HA) normal, lead 5 is closed through to lead 4 and lead 6 is closed through to lead 3 and a talking circuit may be established between the local test desk and the station under test. This feature permits the attendant at the local test desk to talk with the station between tests.
- 6.7 All Dial Testers Busy Lamp If all the dial tester circuits are busy, a chain circuit is closed thru contacts of relays in the dial tester circuits which lights the

(DT-BY) lamps which are multiplied to all the positions of the test desk arranged to use the 51 type dial tester.

- 6.8 Disconnection When the (DIAL TEST) key is restored to normal the circuit over (TD) lead is broken. The associated 51 type dial tester circuit will not be disassociated, however, even with this key normal unless all the test keys are normal or the station under test has disconnected. With the test keys normal or with the station under test disconnected the dial tester circuit will be released when (DIAL TEST) key is restored to normal.

BELL TELEPHONE LABORATORIES, INC.

DEPT. 332-A-1

TDR)
WHM)