TRUNK GROUP USAGE CIRCUIT SD-32049-01

OPERATION TESTS

STEP-BY-STEP SYSTEMS

1. GENERAL

1.01 This section describes a method of testing trunk group usage circuit SD-32049-01, for Nos. 1 and 350A step-by-step offices.

1.02 The tests covered are:

(A) Trunk Group Selection

(B) Hold and Repeat Features

(C) Hold Magnet and Select Magnet Chain Circuits

(D) Meter Voltage Calibration

(E) Busy Indicating Meter Registration

(F) Speed of Readings

(G) Control by Timer

(H) Trunks Busy Indications

1.03 An assistant at the control cabinet will facilitate making tests (E), (F) and (H).

1.04 Test (H) should be made only during a period of light traffic.

1.05 If this equipment has been idle for an extended period, it may be desirable to exercise the equipment for a period of approximately one hour before proceeding with these tests. To exercise the equipment, operate the TIMER and DIAL switches at the control cabinet (see paragraph 3.01), and when the ST DL lamp lights dial code 11.

2. APPARATUS

Tests (F) and (G)

2.01 KS-3008 stop watch or its equivalent.

Test (F)

2.02 No. 35 type test set.

2.03 No. W2W cord, 6 feet long, equipped with one No. 310 plug, one No. 360B tool, and one No. 360C tool (2W17A), and two No. 419A tools.

3. PREPARATION

All Tests

3.01 At the control cabinet, restore all toggle switches to normal.

Note: When ON-OFF designation plates are provided on the toggle switches, the switches are normal when the lever arms are in the following positions:

CAL - OFF
TIMER - OFF
REP - ON
HOLD - ON
DIAL - OFF

3.02 Connect the busy indicating meters to the binding posts on the control cabinet by means of the W2CW cords provided with the equipment.

3.03 Place the meters at least six inches apart and not near any large pieces of iron.

3.04 With the meters positioned as they will be used during the tests, set the pointer of each meter opposite line N (normal) by means of the zero corrector screw on the meter.

Test (F)

3.05 Insert the plug of the W2W cord into the TEST T & R jack of the 35 type test set.

4. METHOD

(A) Trunk Group Selection

4.01 This test checks that the control circuit will function properly to select a particular trunk group under control of the dial, and then continue automatically to select successively higher numbered trunk groups until the highest numbered group is reached.

4.02 At the control cabinet, operate the DIAL switch, and observe that the ST DL (start dial) lamp is lighted.

4.03 Dial the digit 1, and observe that the TENS lamp No. 1 is lighted.

4.04 Dial another digit 1. Observe that the UNITS lamp No. 1 is lighted, and that the TEN bell sounds once.

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4.05 After a short interval (approximately 2.5 seconds) the control circuit should automatically advance to the next higher numbered trunk group. This is evidenced by UNITS lamp No. 1 being extinguished and lamp No. 2 being lighted.

4.06 The control circuit should continue to advance to successively higher numbered trunk groups in the order 13, 14, etc. to 10, 21 to 20, 31 to 30, etc. to the highest numbered trunk group which is 00. The TENS and UNITS progress lamps should light in numerical sequence in step with the trunk group selected. Each time the UNITS progress lamp No. 1 lights, the TENS lamp should advance one digit and the TEN bell should sound once.

4.07 When the progress lamps 00 are lighted, it is an indication that the control circuit has satisfactorily advanced over 100 trunk groups.

4.08 Restore the DIAL switch to normal. Observe that the ST DL lamp and progress lamps 00 are extinguished.

4.09 Reoperate the DIAL switch and dial code 11 followed immediately by digit 5. Observe that progress lamps 11 are lighted and remain lighted until automatic trunk group progression begins. The dialing of the digit 5 should not affect the progress lamp indication.

4.10 Restore the DIAL switch to normal, and check that the lamps are extinguished.

4.11 Reoperate the DIAL switch, and observe that the ST DL lamp is lighted and that the progress lamps are not lighted. This indicates that the control circuit selector mechanism has returned to normal.

4.12 Dial code 00 and observe that progress lamps 00 light.

4.13 Restore the DIAL switch to normal, and check that all lamps are extinguished.

(B) Hold and Repeat Features

4.14 This test checks the ability of the control circuit to stop the trunk group progression at any point in the cycle under control of the HOLD switch, and also to cause repeated readings on the same trunk group under control of the REP (repeat) switch.

4.15 At the control cabinet, operate the HOLD and DIAL switches, and dial the code 11. Observe that the TENS No. 1 and UNITS No. 1 progress lamps are lighted and remain lighted.

4.16 Restore the HOLD switch to normal. Observe that automatic trunk group progression begins as indicated by numerical advance of the progress lamps to 12, 13, etc.

4.17 When trunk group 15 is reached as indicated by the TENS and UNITS progress lamps, reoperate the HOLD switch. Observe that progress lamps 15 remain lighted and automatic progression is halted.

4.18 Operate the REP switch, and then restore the HOLD switch to normal. Observe that progress lamps 15 remain lighted and that the busy indicating meters read N and something greater than N alternately.

4.19 Restore the REP and DIAL switches to normal. Observe that the ST DL lamp and progress lamps are extinguished.

(C) Hold Magnet and Select Magnet Chain Circuits

4.20 This test checks the ability of the control circuit to block and prevent progression to the next higher trunk group if any of the hold magnets or select magnets associated with the trunk group under observation fail to operate.

4.21 At the crossbar switches associated with this equipment, insulate springs 1 and 2 of a hold magnet in the second parallel combination of hold magnets associated with busy indicating meter No. 1. Refer to the office records to obtain the location of the parallel combination of hold magnets.

4.22 At the control cabinet, operate the DIAL switch, and dial code 15. Observe that progress lamps 15 are lighted and that automatic trunk group progression begins.

4.23 The progress lamps should be lighted successively in numerical sequence until lamps 21 are lighted. Observe that automatic progression stops and lamps 21 remain lighted.

4.24 Remove the insulation from the hold magnet springs, and note that the automatic trunk group progression starts again as indicated by the advance of the progress lamps.

4.25 Restore the DIAL switch to normal, and observe that the ST DL lamp and progress lamps are extinguished.

4.26 Insulate springs 1 and 2 of select magnet 5 of any of the crossbar switches associated with this equipment.

4.27 Operate the DIAL switch and dial the code 11. Observe that the progress lamps are lighted successively in numerical

sequence until lamps 15 are lighted. At this point, automatic progression stops and lamps 15 remain lighted.

4.28 Remove the insulation from the select magnet springs, and note that automatic progression starts again as indicated by the advance of the progress lamps.

4.29 Restore the DIAL switch to normal, and observe that the ST DL lamp and progress lamps are extinguished.

(D) Meter Voltage Calibration

4.30 This test checks that the voltage applied to the busy indicating meters can be adjusted to result in accurate meter deflections.

4.31 At the control cabinet, operate the DIAL and CAL (calibrate) switches. Observe that busy indicating meters No. 1 (and No. 6, if provided) deflect to the line designated CAL on the scale.

4.32 If either or both of the meters fail to give the proper deflection, turn the knob of the associated B potentiometer on the control cabinet until the pointer of the meter is opposite the CAL line.

4.33 Restore the CAL and DIAL switches to normal.

(E) Busy Indicating Meter Registration

4.34 This test checks that the busy indicating meters give an accurate registration of the number of busy trunks.

4.35 At the control cabinet operatethe DIAL switch.

4.36 At the control circuit equipment, block the T relay non-operated, and block operated relay H (and relay HA, if provided).

4.37 Observe that each busy indicating meter registers 0.

4.38 At the busy recording relay equipment, block operated the first TB relay associated with each busy indicating meter.

4.39 Observe that each busy indicating meter registers 2 busy trunks.

4.40 Continue blocking TB relays operated in numerical sequence, observing that as each set of relays is added the indicating meters register an additional 2 busy trunks, until all the TB relays are blocked operated. For each registration, observe that the meter pointer is opposite the appropriate number and does not point to a line between the numbered spaces.

4.41 Restore the DIAL switch to normal, and remove the blocking tools from relays T, TB, H (and HA, if provided).

(F) Speed of Readings

4.42 This test checks that the closed and open periods to the busy indicating meters are satisfactorily proportioned and that the time required for a complete cycle of 100 readings is between 4 minutes and 4 minutes and 30 seconds.

4.43 At the busy recording relay equipment, block non-operated all the TB relays associated with busy indicating meter No.1.

4.44 At the control cabinet, operate the REP and DIAL switches, and dial code 11. Observe that progress lamps 11 light steadily and that busy indicating meter No. 1 registers 0 and N alternately.

4.45 Caution must be observed in making connections and setting the sliders of the 35 type test set while performing this part of the test. At the control circuit equipment, connect the 35 type test set by means of the W2W cord and the No. 419A tools across the terminals of the ZR resistance associated with busy indicating meter No. 1. Adjust the 35 type test set until 30 milliamperes flow through its meter on the circuit closures. Use care not to exceed this value as an excess of current will cause busy indicating meter No. 1 to be overloaded. Observe that busy indicating meter No. 1 now alternates between N and 30.

4.46 Check that busy indicating meter No.1 definitely remains normal for a very short period after each reading. If necessary, adjust the TO potentiometer at the control circuit equipment until this condition is obtained. Turning the TO adjusting screw clockwise will increase the normal period and counterclockwise will decrease the period.

4.47 Using a stop watch, check that a cycle of 10 readings is completed in approximately 26 seconds. If necessary, adjust the TC potentiometer at the control circuit equipment until this condition is obtained. Turning the TC adjusting screw clockwise will increase the time required to complete 10 readings and counter-clockwise will decrease the time required.

4.48 Restore the REP switch to normal, and with the aid of the progress lamp indications and a stop watch check that the time required for a complete cycle of 100 readings is between 4 minutes and 4 minutes and 30 seconds. The lighting of progress lamps 00 is an indication that 100 readings have been completed.

4.49 Restore the DIAL switch to normal, disconnect the 35 type test set from the ZR resistance and remove the blocking tools from the TB relays. Note that all lamps on the control cabinet are extinguished and that the busy indicating meters are normal.

(G) Control by Timer

4.50 This test checks that the timer circuit is functioning satisfactorily to cause each trunk group to be tested at 5 minute intervals.

4.51 At the control cabinet, operate the TIMER and DIAL switches. After the ST DL lamp lights, dial code 11.

4.52 Observe that the WARN buzzer sounds for a short interval within 15 seconds. When the buzzing stops, observe that the progress lamps advance in numerical sequence from 11 to 00.

4.53 Shortly after trunk group 00 is reached, observe that the WARN buzzer sounds again. When the buzzing stops, observe that progress lamps 00 are extinguished and that the WARN lamp and progress lamps 11 are lighted.

4.54 Approximately 15 seconds later, observe that the WARN buzzer sounds again. When the buzzing stops the WARN lamp is extinguished, and once more the progress lamps advance in sequence. Five minutes should have elapsed from the time the buzzing stopped in 4.52 until the buzzing stop in 4.54.

4.55 After the control circuit has progressed through several trunk groups as indicated by the progress lamps, restore the DIAL switch to normal. Observe that the ST DL lamp and the progress lamps are extinguished.

4.56 Reoperate the DIAL switch and dial a two digit code such as 55. Observe that the associated progress lamps are lighted, and that trunk group advance continues from this point until trunk group 00 is reached. Shortly after trunk group 00 is reached, observe that the WARN buzzer sounds and that the WARN lamp lights.

4.57 After the WARN lamp lights, restore the DIAL switch to normal, and observe that the ST DL lamp remains lighted.

4.58 Without delay, reoperate the DIAL switch and dial a two digit code such as 55. Observe that the dial is ineffective in selecting a trunk group while the WARN lamp is lighted.

4.59 Restore the DIAL and TIMER switches to normal, and observe that all lamps are extinguished.

(H) Trunks Busy Indications

4.60 This test checks that the equipment will function satisfactorily to transmit the correct trunks busy indications to the busy indicating meters.

4.61 At the busy recording relay equipment, block non-operated all but the first of the TB relays associated with busy indicating meter No. 1.

4.62 At the control cabinet, operate the REP, HOLD and DIAL switches, and dial code 11.

4.63 From the assignment list, determine the location of the trunks in trunk group 11 associated with busy indicating meter No. 1.

4.64 Determine that the two trunks associated with the first TB relay are idle, and observe that busy indicating meter No. 1 reads 0.

4.65 Busy one of the trunks out of service, and observe that the meter indicates 1. Busy the other trunk out of service, and observe that the meter indicates 2.

4.66 Remove the busy condition from the two trunks associated with the first TB relay, block this TB relay non-operated, and remove the blocking tool from the next TB relay associated with busy indicating meter No. 1.

4.67 Proceed as in 4.64 and 4.65 with the trunks associated with the second TB relay.

4.68 Continue in the above manner until all the trunks in trunk group 11 associated with busy indicating meter No. 1 have been checked.

4.69 Advance to the next trunk group by restoring the REP switch to normal and momentarily releasing the HOLD switch. Check that the progress lamps indicate the desired trunk group, and reoperate the REP switch.

4.70 Repeat the above procedure until each trunk group associated with each busy indicating meter has been checked.

5. REPORTS

5.01 The required record of these tests should be entered on the proper form.