LINE MESSAGE REGISTERS ASSOCIATED WITH LINE FINDER EQUIPMENT CROSS CONNECTION AND OPERATION TESTS USING TEST SET SD-30490-01 (J34706A) AND TEST LINE SD-31610-01 OR EQUIVALENT STEP-BY-STEP SYSTEMS

1. GENERAL

1.01 This section describes methods of checking the continuity of line message register cross-connections and of making a 100-operation test of message registers in line finder offices. The tests covered in this section are as follows:

(A) Operation Test and Cross-Connection Check Using Test Call Method

(B) Cross-Connection Check Using Buzzer Circuit

(C) Cross-Connection Check Using Test Set and Buzzer Circuit

(D) 100-Operation Test of Message Register

1.02 This section is reissued to incorporate material from the addendum in its proper location. In this process marginal arrows have been omitted.

1.03 The tests in this section may be performed on either a one-man or a two-man basis. The services of an assistant will be advantageous whenever a large number of tests are to be made at one time.

1.04 Each of the tests in this section checks that the cross-connection of the message register is continuous and free from ground and that the register is associated with the proper line group terminals. Tests (B) and (C), and also Test (A), except in the case of P.B.X. and other rotary hunting group lines, check that the proper connector multiple terminal is associated with the register and line terminal.

1.05 The various tests have the following applications:

(a) In offices where it is the practice to test groups of registers in advance of the receipt of service orders, Test (D) should be used to pre-test the registers. Upon completion of a service order, if the necessary test line arrangement is available for making Test (A) this test should be used to check the cross-connections and the register operation except in the case of P.B.X. and other rotary hunting group lines; Test (B) should be used wherever Test (A) does not apply.

(b) In offices where registers are not pre-tested, Test (C) should be used in conjunction with and in advance of Test (D) to check the cross-connections and register operation upon completion of a service order.

(c) In addition to the uses in connection with service orders covered above the tests have the following applications. Test (A) or (B) may be applied in conjunction with cross-connection changes made for plant or traffic reasons; however, Test (A) should be applied to registers in service only upon specific authorization. Tests (C) and (D) may be used to verify register conditions on lines in service but Test (D) should be made on working registers only at the request of the Commercial or Accounting Departments.

1.06 A record of individual register readings shall be taken, and entered on the proper form, before and after making any specific tests according to method (A) or (D), or in any other case where the register is operated in performing any of the tests covered by this section. This record should be forwarded in accordance with local instructions for the purpose of correcting register records.

1.07 Care should be exercised in connecting to terminals in order not to operate the register.

1.08 If a register fails on test and is replaced by a new register, record the readings of the old register before and after test and also the readings of the new register before and after test.

2. APPARATUS

Test (A)

2.01 Hand Test Set D-81763 or equivalent.

2.02 No. 477A (or No. 375A) Make-Busy Tool.

2.03 One P4L Cord equipped with one No. 289A Plug and one No. 234 Plug (4P6A) or one P4D Cord equipped with one No. 152 Plug and one No. 234 Plug (J99214A-L6).

2.04 Two Operator's Telephone Sets as required. (See 3.02)

Test (B)

2.05 Two W1C Cords, each equipped with one No. 116 Plug and one No. 360B Tool provided with a No. 365 Tool (Two 1W6B Cords each provided with a No. 365 Tool).

Test (C)

2.06 Message Register Test Set J34706A (SD-30490-01) or X-61354.

2.07 Two P3E Cords each equipped with two No. 110 Plugs (3P6B).

2.08 One P4L Cord equipped with one No. 289A Plug and one No. 234 Plug (4P6A) or one P4D Cord equipped with one No. 152 Plug and one No. 234 Plug (J99214A-L6).

2.09 One P4A Cord equipped with two No. 154 Plugs (4P1D). This cord is required when the test set is used at the message register rack.

2.10 One W1C Cord equipped with one No. 116 Plug and one No. 360B Tool provided with a No. 365 Tool (1W6B Cord provided with a No. 365 Tool).

2.11 Two Operator's Telephone Sets as required. (See 3.02)

Test (D)

2.12 Message Register Test Set J34706A (SD-30490-01) or X-61354.

2.13 Two P3E Cords each equipped with No. 110 Plugs (3P6B).

2.14 One P4L Cord equipped with one No. 289A Plug and one No. 234 Plug (4P6A) or one P4D Cord equipped with one No. 152 Plug and one No. 234 Plug (J99214A-L6).

Note: If the register has not been connected for service, use a W1C Cord equipped with one No. 116 Plug and one No. 360B Tool provided with a No. 365 Tool (1W6B Cord provided with a No. 365 Tool). See 4.30.

2.15 One P4A Cord equipped with two No. 154 Plugs (4P1D).

2.16 Two Operator's Telephone Sets as required. (See 3.02)

3. PREPARATION

3.01 Obtain from the Plant Department records, the line group and line finder terminal numbers associated with the connector terminal number specified and, in an office where all lines are not permanently wired to message registers, the message register number of each line to be tested. Also, determine whether the connector terminal number is for a tip or a ring station in the case of two-party line groups.

Tests (A), (C) and (D)

3.02 If two men are to perform the test establish a talking circuit between the I.D.F. and message register rack.

Tests (C) and (D)

3.03 By means of two P3E cords, connect jack 48V of the test set to the 48-volt battery and ground jack, and jack 64V (or 65V) of the test set to the 64-volt battery jack.

Note: To avoid possible grounding of the battery supply leads, connect the cords to the test set first and, when disconnecting, remove the cords from the test set last.

4. METHOD

(A) Operation Test and Cross-Connection Check Using Test Call Method

4.01 Read the message register under test and enter the reading on the proper form. Insert (or request the assistant to insert) at the V.I.D.F. the No. 289A or the No. 152 plug, of the cord equipped with the No. 234 plug, into the T and T1 jacks of the test line circuit. The stay cord of the No. 289A plug should be to the bottom or the ridged side of the No. 152 plug should be to the left. Then attach the No. 234 plug to the line group terminals with which the message register under test is associated.

4.02 Connect the hand test set to the HS jack on the message register rack. Listen on the line and if it is not busy depress the C button on the hand set. Dial tone should then be heard.

Note: On certain types of P.B.X. trunks dial tone will not be heard. In such cases insert a No. 477A (or a No. 375A) tool between the bottom springs of the HS jack until the tone is heard and then remove the tool.

4.03 If the register is associated with the tip party station of a two-party

line, insert a No. 477A (or a No. 375A) tool between the bottom springs of the HS jack.

4.04 Dial the number of the line with which the register is associated. Busy tone should be heard, indicating that the proper connector terminal is cross-connected. Release the C button of the hand test set long enough to release the connection.

4.05 Dial the number of a connector multiple test line in a reverse battery connector group. After ringing is tripped an answer condition is set up on the test line. Remove the tool, if used, from the HS jack before releasing the C button or disconnecting the hand test set. Then disconnect the hand test set and the tool.

4.06 Read the register and enter the reading on the proper form. Note that the register reading is one higher than before the test was made.

(B) Cross-Connection Check Using Buzzer Circuit

Lines Not Permanently Wired to Registers

4.07 At the V.I.D.F. insert the No. 116 plug of a W1C cord into the BUZ 2 jack of the buzzer circuit.

4.08 Connect the No. 365 tool of the cord to the terminal on the V.I.D.F. to which the message register is cabled. If the buzzer is heard at this time it indicates that the wiring is grounded (or, if a working ring party or individual line, that the line is busy or that the wiring is grounded). If the buzzer is not heard proceed with the test.

4.09 At the V.I.D.F. insert the No. 116 plug of a W1C cord into the BUZ 1 jack.

4.10 Touch the S terminal (or the TR terminal if the tip party register is being checked) at the line group terminal strip with the No. 365 tool of the cord in jack BUZ 1.

4.11 The buzzer on the I.D.F. should be heard if the cross-connections are correct. Remove the test connections.

Lines Permanently Wired to Registers

4.12 At the H.I.D.F. insert the No. 116 plug of a W1C cord into the BUZ 2 jack of the buzzer circuit.

4.13 Connect the No. 365 tool of the cord to the S terminal (the M terminal if the tip party register is being checked) at the connector multiple terminal strip. If the buzzer is heard at this time it indicates that the wiring is grounded (or, if a working ring party or individual line, that the line is busy or that the wiring is grounded). If the buzzer is not heard proceed with the test.

4.14 At the V.I.D.F. insert the No. 116 plug of a W1C cord into the BUZ 1 jack.

4.15 Touch the S terminal (or the TR terminal if the tip party register is being checked) at the line group terminal strip with the No. 365 tool of the cord in jack BUZ 1.

4.16 The buzzer on the I.D.F. should be heard if the correct connector terminal and line group terminal are cross-connected. Disconnect the BUZ 2 jack from the terminal on the H.I.D.F.

(C) Cross-Connection Check Using Test Set and Buzzer Circuit

4.17 By means of a P4A cord, connect jacks T and T1 of the test set to jacks T and T1 of the test line at the message register rack with the plug nearest the notched part of the shell of the No. 154 plug in the T jack in each case.

4.18 At the V.I.D.F. insert (or request the assistant to insert) the No. 289A or the No. 152 plug, of the cord equipped with the No. 234 plug, into the T and T1 jacks of the test line circuit. If using the No. 289A plug, the plug located above and to the left of the stay cord should be inserted into the T jack; if using the No. 152 plug, the plug nearest the ridged side of the shell should be inserted into the T jack. Then attach the No. 234 plug to the line group terminals with which the message register to be tested is associated.

4.19 When checking the register of an individual line or the ring party register of a two-party line, the TR key should be normal. When checking the tip party register, operate the TR key and leave it operated during the check.

4.20 Operate the CT key of the test set. Observe that the CT lamp lights. If testing an individual line or a ring party of a two-party line, this indicates that the wiring is not grounded (and, if a working line, that the line is not busy). If testing a tip party of a two-party line, the lighting of the CT lamp indicates that the wiring is not grounded, and that the message register lead is continuous but it does not indicate that the cross-connection is correct. Release the CT key and note that the CT lamp is extinguished.

4.21 For lines not permanently wired to message registers proceed as in 4.22 to 4.24; for lines permanently wired, proceed as in 4.25 to 4.27.

Lines Not Permanently Wired to Registers

4.22 Insert (or request the assistant to insert) the No. 116 plug of a W1C cord into the BUZ 2 jack on the V.I.D.F.

4.23 Then connect (or request the assistant to connect) the No. 365 tool of the cord to the terminal to which the message register is cabled at the V.I.D.F.

4.24 Operate the CT key of the test set. The buzzer on the I.D.F. should be heard and the CT lamp of the test set should light if the cross-connections are correct. Remove the test connections.

Lines Permanently Wired to Registers

4.25 Insert (or request the assistant to insert) the No. 116 plug of a W1C cord into the BUZ 2 jack on the H.I.D.F.

4.26 Then connect (or request the assistant to connect) the No. 365 tool of the cord to the S terminal (the M terminal if the tip party register is being checked) at the connector multiple terminal strip.

4.27 Operate the CT key of the test set. The buzzer on the I.D.F. should be heard and the CT lamp of the test set should light if the correct connector terminal and line group terminal are cross-connected. Then disconnect the BUZ 2 jack from the terminal on the H.I.D.F. and disconnect the No. 234 plug from the line group terminals.

(D) 100-Operation Test of Message Register

4.28 Read the message register under test and enter the reading on the proper form.

4.29 By means of a P4A cord, connect jacks T and T1 of the test set to jacks T and T1 of the test line at the message register rack with the plug nearest the notched part of the shell of the No. 154 plug in the T jack in each case. The DISC-ST key of the test set should be in the DISC position.

4.30 At the V.I.D.F. insert (or request the assistant to insert) the No. 289A or the No. 152 plug, of the cord equipped with the No. 234 plug, into the T and T1 jacks of the test line circuit. If using the No. 289A plug, the plug located above and to the left of the stay cord should be inserted into the T jack; if using the No. 152 plug, the plug nearest the ridged side of the shell should be inserted into the T jack. Then attach the No. 234 plug to the line group terminals with which the message register to be tested is associated.

Note: If the register to be tested has not been cross-connected for service and is normally operated by a 65-volt booster battery over the sleeve, it will be necessary to temporarily cross-connect the register to a spare line circuit. In all other cases where register to be tested has not been cross-connected for service use a W1C cord, instead of the cord equipped with the No. 234 plug, and connect the No. 116 plug to the T1 jack and the No. 365 tool to the message register terminal on the IDF. Keep the TR key (if equipped) normal and proceed according to 4.32 and 4.34 to 4.44.

4.31 When testing the register of an individual line or the ring party register of a two-party line, the TR key should be normal. When testing the tip party register, operate the TR key and leave operated during the test.

4.32 Operate the CT key of the test set. Observe that the CT lamp lights, indicating that the wiring is not grounded. Release the CT key and note that the CT lamp is extinguished.

4.33 Operate the DISC-ST key to the PASSING position. Then operate it to the ST position. If the subscriber line is busy, the BY lamp will light. If the line is idle, the S lamp will light in which case proceed with the test.

Note: If the subscriber should attempt to originate a call at any time while the steps outlined in 4.34 to 4.42 are being followed, the SUB lamp will light. In this event, immediately operate the ST key to the PASSING position, in order not to interfere with service. The S and SUB lamps will be extinguished. Release the OPR, NO, HOLD or INT key, if operated. After two or three seconds operate the DISC-ST key to the ST position. If the line is still busy, the BY lamp will light. When the line becomes idle, the BY lamp will be extinguished and S lamp will light, at which time proceed with the test.

4.34 Operate the OPR key. Set the No. 1 (OPR) resistance slide for the specified test "operate" value of the register. Release the OPR key.

Note: When testing the ring party register of a two-party line or the register of an individual line, the S lamp will be extinguished while the key is operated.

4.35 Operate and release the OPR key at least three times and note that the register operates once, and only once for each time the OPR key is operated.

Note: If the (B) relay of the test set is not of the slow release type, momentarily operate the INT key after each release of the OPR key to insure the release of the register.

4.36 Operate the HOLD key. Set the No. 3 (HOLD) resistance slide for the specified test "hold" value of the register. (See note in 4.34.)

4.37 With the HOLD key operated, operate the OPR key and observe that the register operates. Then release the OPR key.

4.38 With the HOLD key still operated, again operate the OPR key and observe that the register does not advance, indicating that the armature remains in an operated position. Release the HOLD and OPR keys.

4.39 Operate the NO key. Set the No. 2 (NO) resistance slide for the specified test "non-operate" value of the register. (See note in 4.34.) Release the NO key.

4.40 Operate and release the NO key at least three times and note that the register does not operate.

4.41 Read the register under test and enter the reading on the proper form.

4.42 With the No. 1 (OPR) resistance slide in the position previously established in 4.34, operate and hold the INT key. (See note in 4.34.) Operate the interrupter lever of the test set to its extreme downward position and then allow it to return to normal without interference. When the interrupter lever has returned to normal, release the INT key.

4.43 Read the register again and enter the reading on the proper form. Note that this reading is 100 registrations more than the reading before the interrupter lever was operated.

4.44 Remove the test connections.

5. REPORTS

5.01 The required record of these tests should be entered on the proper form and forwarded according to local instructions.