LOW RESISTANCE LINE MESSAGE REGISTER CROSS CONNECTION AND OPERATION TESTS USING TEST SET SD-32150-01 (J34725A) 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, of making a 100 operation test of low resistance message registers and an operation test of auxiliary line circuits used to operate low resistance message registers.

1.02 The tests covered are:

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

This test checks that the cross-connections of the message register are continuous and that the register is associated with the proper connector multiple terminal except in the case of P.B.X. lines that are 1-way trunks and do not have a connector multiple terminal. In the case of lines of this type a check is made that the register is associated with the proper line group terminals. A check is also made for the operation of the register under service conditions, and in the case of auxiliary line circuits a complete test of the auxiliary line circuit.

(B) Cross-Connection Check Using Buzzer Circuit

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

Tests (B) and (C) check that the proper connector multiple terminal is associated with the register and line group terminals.

(D) 100-Operation Test of Message Register

This test checks that the register will operate on its specified "operate" current flow value and not operate on its specified "non-operate" value. It also checks the register for 100 operations.

1.03 The tests in this section may be performed on either a 1-man or a 2-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 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 pretest the registers. Upon completion of a service order, Test (A) should be used to check the cross-connections and the register operation.

(b) In offices where registers are not pretested, 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 application. Test (A) or (B) may be applied in conjunction with cross-connection changes made for plant or traffic reasons. Tests (C) and (D) may be used to verify register conditions on lines in service, but Test (D) normally is made on working registers at the request of the Commercial or Accounting Departments. Tests (A) or (D) should not be applied to registers in service without specific authorization.

1.05 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.

1.06 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

2.01 The apparatus required for each test is shown in the following list. The details of each item are covered in the indicated paragraphs.

Apparatus	No. Required for Test			
	A	B	C	D
Hand Test Set (2.02)	1			
Testing Cord (2.03)	1			1
No. 477A Make-Busy Tool	1			
Operator's Telephone Set (See 3.02)	2		2	2
Testing Cord (2.04)		2	2	*1
Patching Cord (2.05)			1	1
Patching Cord (2.06)			1	1
Patching Cord (2.07)			1	1
Message Register Test Set (2.08)			1	1

* This cord required only if the register is not connected for service.

2.02 No. 1011G Hand Set (dial hand test set) equipped with a W2CL Cord, one No. 471A Jack and a No. 240A Plug (2W39A Cord) or an equivalent dial hand test set. The No. 3 and 4 springs of the No. 240 Plug should be strapped.

2.03 P4L Cord equipped with one No. 289B and one No. 234 Plug (4P6A Cord).

2.04 W1C Cord equipped with one No. 116 Plug and one No. 360B Tool (1W6B Cord) provided with a KS-6278 Tool equipped with a No. 108 Cord Tip.

2.05 KS-7993 Cord and Plug.

2.06 P3E Cord, eight feet long equipped with two No. 310 Plugs (3P6E Cord).

2.07 P4N Cord equipped with two No. 289B Plugs (4P8B Cord).

2.08 Message Register Test Set J34725A (SD-32150-01).

3. PREPARATION

3.01 Obtain from the Plant Department records, the line group and line finder terminal numbers associated with the connector 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.

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

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

Tests (C) and (D)

3.03 Using a P3E cord connect the 48V jack of the test set to a 48-volt battery supply.

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

3.04 Using the KS-7993 cord connect the AC jack of the test set to a convenient a-c outlet.

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. or V.C.D.F. the No. 289B plug of the P4L cord into the T and T1 jacks of the test line circuit. The stay cord of the No. 289B plug should be to the bottom.

4.02 Connect the No. 234 plug of the P4L cord to the connector terminals of the line under test.

Note: If there is no associated connector terminal, connect to the line group terminals.

4.03 Connect the hand test set to the HS jack on the message register rack. Listen on the line and if it is not busy operate the switch of the dial hand test set to the TALK position. Note that dial tone is heard.

Note: On certain types of P.B.X. trunks dial tone will not be heard. In such cases insert a No. 477A tool between Nos. 5 and 6 springs of the HS jack until the tone is heard and then remove the tool.

4.04 Dial the number of a connector multiple test line in a reverse battery connector group. After the connector has seized the test line and the ringing has been tripped, note that the register advances one step during the relatively long (approximately 5-second) test line loop closure.

Note: If a connector multiple test line is not provided, dial the office telephone and note that the register does not operate within 2 seconds after the telephone is answered and does operate after 6 seconds.

4.05 Operate the switch of the hand test set to the MON position and disconnect the No. 240 plug from the HS jack.

4.06 Read the register and enter the reading on the proper form.

(B) Cross-Connection Check Using Buzzer Circuit

Lines Not Permanently Wired to Registers

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

4.08 Connect the KS-6278 tool of the cord to the terminal on the V.I.D.F. or V.C.D.F. to which the message register is cabled.

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

4.10 If the circuit provided for operating the message register is used as a trunk circuit, touch the A or TR terminal of the line group terminals, associated with the register under test, with the KS-6278 tool. Observe that the buzzer sounds indicating that the cross-connection to the register is correct.

4.11 If the circuit provided for operating the message register is used as an auxiliary line circuit, touch the A terminal of the auxiliary line circuit, associated with the register under test, with the KS-6278 tool. Observe that the buzzer sounds indicating that the cross-connections are correct.

4.12 In order to verify that the proper register is associated with the proper line number, connect the KS-6278 tool of the cord connected to the BUZ 2 jack to the T terminal of the connector multiple of the line number associated with the register under test at the H.I.D.F. or H.C.D.F. Touch the KS-6278 tool of the cord connected to the BUZ 1 jack to the T terminal of the line group terminals associated with the register under test. Observe that the buzzer sounds.

Lines Permanently Wired to Registers

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

4.14 At the H.I.D.F. connect the KS-6278 tool of the cord to the M terminal of the wire number associated with the register under test.

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

4.16 Touch the A terminal of the line group terminals associated with the register under test with the KS-6278 tool of the cord connected to the BUZ 1 jack. Observe that the buzzer sounds indicating that the cross-connections are correct.

4.17 Disconnect the BUZ 2 jack from the M terminal on the H.I.D.F.

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

4.18 Connect the T and T1 jacks of the test set to the T and T1 jacks of the test line circuit at the message register rack . The stay cords of both plugs should be to the bottom.

Message Register Circuit Used as a Trunk Circuit

4.19 Insert (or request the assistant to insert) the No. 116 plug of a W1C cord into the T1 jack at the V.I.D.F. or V.C.D.F. and connect the KS-6278 tool to the A or TR terminal of the line group terminals associated with the register under test at the V.I.D.F. or C.D.F.

4.20 Operate the START key of the test set and then the CT key.

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

Lines Not Permanently Wired to Registers

4.22 Connect (or request assistant to connect) the KS-6278 tool of the W1C cord, connected to the BUZ 2 jack, to the terminal to which the message register is cabled at the I.D.F. or C.D.F.

4.23 Observe that the buzzer of the test circuit sounds indicating that the cross-connection to the register is correct.

4.24 In order to verify that the proper register is associated with the proper line number, connect the KS-6278 tool of the W1C cord connected to the T1 jack of the T terminal of the line group terminals associated with the register under test. Connect (or request the assistant to connect) the KS-6278 tool of the W1C cord connected to the BUZ 2 jack to the T terminal of the connector multiple of the line number associated with the register under test. Observe that the buzzer of the test circuit sounds.

4.25 Remove the test connections.

Lines Permanently Wired to Registers

4.26 Connect (or request the assistant to connect) the KS-6278 tool of the W1C cord connected to the BUZ 2 jack to the M terminal of the connector multiple associated with the register under test.

4.27 Observe that the buzzer of the test circuit sounds indicating that the cross-connections are correct. Remove the test connections.

Message Register Circuit Used as an Auxiliary Line Circuit

4.28 Insert the No. 116 plug of a W1C cord into the T1 jack of the test circuit at the V.I.D.F. or V.C.D.F. and connect the KS-6278 tool to the A terminal of the auxiliary line circuit associated with the register under test.

4.29 Insert (or request the assistant to insert) the No. 116 plug of a W1C cord into the BUZ 2 jack at the H.I.D.F. or C.D.F. and connect the KS-6278 tool to the terminal to which the message register is cabled at the C.D.F. or I.D.F.

4.30 Observe that the buzzer of the test circuit sounds indicating that the cross-connection to the register is correct.

4.31 Proceed as in 4.24 and then remove the test connections.

(D) 100-Operation Test of Message Register

Message Register Circuit Used as a Trunk Circuit

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

4.33 Using a P4N cord connect the T and T1 jacks of the test set to the T and T1 jacks of the test line at the message register rack with the stay cords of both No. 289B plugs to the bottom.

4.34 At the V.I.D.F. or C.D.F. insert (or request the assistant to insert) the No. 289B plug of the P4L cord into the T and T1 jacks of the test line circuit, the stay cord of the No. 289B plug should be to the bottom. 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 connected for service, use a W1C cord instead of the P4L cord and connect the No. 116 plug to the T1 jack and the KS-6278 tool to the message register terminal at the I.D.F.

4.35 Operate the START key of the test set. If the line is busy the BUSY lamp will light in which case the test should be delayed until the BUSY lamp is extinguished.

4.36 If the line is not busy observe that the SLEEVE lamp lights.

Note 1: If the register being tested has not been connected for service, the SLEEVE lamp will not light and any reference to the SLEEVE or SUB lamp should be disregarded.

Note 2: If the subscriber should attempt to originate a call at any time while the steps as outlined in 4.36 to 4.43 are being followed, the SUB lamp will light. In this event immediately restore the START key in order not to interfere with service. Observe that the SUB lamp and SLEEVE lamps are extinguished. Restore the OPR, NON OPR or INT keys if operated. After two or three seconds operate the START key and if the line is still busy the BUSY lamp will light. When the line becomes idle the BUSY lamp will be extinguished and the SLEEVE lamp will light, at which time proceed with the test.

4.37 Operate the OPR key. Adjust the OPR potentiometer so that the milliammeter records the specified test "operate" value of the register. Restore the OPR key.

4.38 Operate and hold the NON OPR key. Adjust the NON OPR potentiometer so that the milliammeter records the specified test "non-operate" value. Restore the NON OPR key.

4.39 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.

4.40 Operate and release the NON OPR 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 OPR resistance slide in the same position as established in 4.37 momentarily operate the INT key. Observe that the INT lamp lights.

4.43 At the end of a short interval observe that the INT lamp is extinguished.

4.44 After the INT lamp is extinguished 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 INT key was operated.

4.45 Remove the test connections.

Message Register Circuit Used as an Auxiliary Line Circuit

4.46 Proceed as in 4.32 and 4.33.

4.47 At the V.I.D.F. or C.D.F. insert (or request the assistant to insert) the No. 289B plug of the P4L cord into the T and T1 jacks of the test line circuit, the stay cord of the No. 289B plug should be to the bottom. Attach the No. 234 plug to the T, R, S, and A terminals of the auxiliary line circuit associated with the register under test. (See note of 4.34).

4.48 At the auxiliary line circuit relay equipment associated with the register under test insulate No. 1T contact of the A relay.

4.49 Proceed as in 4.35 to 4.44.

4.50 Remove the insulator from the A relay contact of the auxiliary line circuit and 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.