

DISTRICT JUNCTOR TESTS
 (WIRE SPRING)

CONTENTS

- | | |
|------------------------|--|
| 1. GENERAL INFORMATION | 5. ROUTINE TESTS USING ITE-4073 TO SUPPLEMENT TEST FRAME |
| 2. TEST EQUIPMENT | 6. SUPPLEMENTARY TESTS USING AUTOMATIC TEST CIRCUIT |
| 3. SUPPLEMENTARY TESTS | |
| 4. ROUTINE TESTS | |

1. GENERAL INFORMATION

1.1 Description: This section outlines routine and supplementary tests of wire spring subscriber district junctor circuits, SD-26201-01. Routine and certain supplementary operating tests are made with automatic test circuit SD-25158-01.

1.2 Test Sequence: The following circuits should be in working condition before routine tests of district junctors are started: Subscriber sender link, subscriber sender, marker connector, originating marker, district link, office link, coin supervisory link and coin supervisory circuits.

1.3 A circuit test is one of the single routine tests (charge, early disconnect, operator, etc.) applied once to one district junctor circuit.

1.4 Records and Requirements: ID-1313, 1315 and 1334 trouble records are used to record results of tests. Refer to Handbook 50, Section 3 for further information concerning records. Section 3 of this handbook lists routine test requirements for these circuits.

2. TEST EQUIPMENT

2.1 Test Sets and Accessories

Amt.	Code	Description	With ITE
01	ITE-4073	Z.R. Test Set	
1	ITE-4442	Ohmmeter	
+1	ITE-9627	Remote Control Cord	4023
As Req.	298A	Make Busy Plugs	4023
1	ITE-8253	Contact Protection Test Set	4023

0 Optional may be used at same time as test frame to speed up testing of local timing.

+ The 32A test set furnished with test frame may be used in place of ITE-9627.

2.2 Cords Required with ITE-4073

Amt	ITE	Lgth	Cdrs.	One End	Other End	With ITE
2	9598	12'	2	110 Plug	110 Plug	%4023
3	9639	12'	3	110 Plug	3-ITE-2455 Plugs	4034
1	9775	12'	6	2-110 Plugs	325 Plug	4073
2	9952	12'	20	2-Recep. Plugs	20 Pt. Fixt.	4073
1	9547	12'	1	ITE-2455 Plug	ITE-2455 Plug	4023
1	9601	12'	3	310 Plug	310 Plug	4023

% Crossbar Test Accessory Set

3. SUPPLEMENTARY TESTS

3.1 Grounding Bar

3.11 At each district junctor frame perform the following tests in order to detect imperfect or missing ground connections.

3.12 Set the ITE-4442 volt-ohmmeter on X1 resistance scale. Check for zero resistance indication between vertical ground bars of each equipped unit on district junctor frames and between last vertical bar and horizontal bar at top of frame.

3.13 A resistance reading indicates an imperfect connection or open connection between units. Contact surfaces involved should be cleaned and screws tightened or missing connections added as required.

3.2 Fusing

3.21 Talking Battery Filter Fuses

3.211 This circuit is shown on miscellaneous circuit for district junctors frames, SD-25204-01. It is not advisable to install these fuses until power plant is operating on a 24 hour basis.

3.212 Before installing 20 ampere and 1-1/3 ampere fuses (FC1 and FC2) in filter circuit, charge FC1 and FC2 capacitors by connecting a 25 or 60 watt 110 volt lamp across 20 ampere fuse posts. When lamp dims appreciably disconnect lamp and install 20 ampere fuse. Then install associated 1-1/3 ampere fuse.

3.22 20 Ampere Fuses

3.221 Before installing 20 ampere fuse for each side of junctor frame, check that fuse posts are free from crosses and clear of ground.

3.23 Circuit Fuses

3.231 Check each fuse post for absence of crosses and ground.

3.232 Verify at one point that each fuse is associated with proper junctor circuit.

3.233 Check for presence of solid ground at vertical ground bar of each equipped unit.

3.3 Contact Protection and CH Interrupter Test

3.31 Check the following contact protection networks using method described in Handbook 50, Section 2.

3.32 Insulate B and F contacts of CH interrupters. The networks listed are equivalent circuits and may be checked against each other.

CP Network	Type of Res.	Type of Circuit	Test Connection
Des.	Res.	Circuit	Connection
OF	160 Ω	Charged	12-OB
EF	160 Ω	"	12-EB
OB	160 Ω	"	12-OF
EB	160 Ω	"	12-EF

3.33 Remove insulation from back contact of odd CH interrupters and front contact of even interrupters.

3.34 Check that OB and EF relays operate under control of interrupter.

3.35 Remove insulation from front contact of odd interrupters and back contact of even interrupters.

3.36 Verify that OF and EB relay operate.

3.4 Sleeve Resistor

3.41 Set ohmmeter to X1 resistance scale.

3.42 Measure resistance between IND punchings 2 and 10 (or 16 when circuit is arranged for local timing and zone registration) of vertical terminal strip on each unit.

3.43 Meter should indicate:

Min. 9 ohms - Max. 11.0 ohms

3.5 MR Lead Resistor

3.51 Set ohmmeter to X10 resistance scale.

3.52 Connect one test lead to punching 14 (MR lead) or punching 15 (MR1 lead) for odd numbered district link switches, or to punchings 6 or 7 for even link switches. Punchings indicated are located on unit horizontal terminal strip and connections are used for checking 10 districts on unit.

3.53 Connect other ohmmeter lead to number 6 make contact of each F relay in group of 10 circuits under test.

3.54 Verify that meter indicates:

Min. 600 - Max. 750

3.6 DJ Interrupter Checking Circuit

3.61 Block first OF relay operated. This opens operating path of first OB relay. Lamp PC lights and alarm sounds. Remove relay block and retire alarm by momentary operation of RL key.

3.62 Block remaining frame OF relays operated in turn, checking that associated OB relays remain non-operated and alarm indications are received.

3.63 Repeat preceding tests blocking in turn relays OB, EB and EF and verify that associated relays remain non-operated and alarm indications (PC lamp and audible alarm) are received.

3.7 Automatic Release and False Automatic Release

3.71 At subscriber sender link frame insert a make busy plug into MB jack associated with group of twenty junctors under test.

3.72 At unit vertical terminal strip, short circuit tip and ring of 20 circuits under test using alligator clips or bare strap wire.

3.73 Insulate F contact of RF interrupter. Manually operate any one of 20 CH relays in junctor group under test. Observe that RL relay does not operate. Release CH relay.

3.74 Temporarily short circuit the number 8 make contact of relay RL. Operate in turn each of CH relays in junctor group and verify that RL relay operates.

3.75 Remove short circuit from number 8 contact of relay RL. Operate each T and CH relay of 20 junctors and verify that relays lock operated.

3.76 Remove insulation from RF interrupter. Relay RF operates and holds when interrupter contact makes. Check that all relays release when RB interrupter contact makes after a delay of about 1 minute with T option or 2 minutes with U option.

3.77 If one of the interrupters is reversed or B lead is falsely grounded, the circuits will release immediately after operation of RL relay. If both interrupters are reversed, circuits will release within 2 to 4 seconds.

3.78 Remove make busy plug at sender link frame and tip and ring straps at junctor frame. Repeat test for remaining circuits as required.

3.8 Test For Crosses at Interrupter Relay Contacts

3.81 Block OB, EB, OF and EF relays associated with junctor group under test normal.

3.82 Check for absence of battery at number 2 contact (front) of CS relays in group.

3.83 Manually operate CS relay and then I relay of each circuit in turn. Verify that CH relay fails to operate.

3.84 Block operated relays OB, EB, OF and EF. Manually operate CS relays in turn and verify that associated I and CH relays operate.

3.85 Remove relay blocks and retire PC lamp and alarm by momentarily operating RL key.

3.86 Repeat test as required for all district junctor groups.

3.9 Miscellaneous Circuits

3.91 Check following miscellaneous circuits in any convenient manner:

- (a) Test battery supply.
- (b) Fuse alarm.
- (c) Spare jack to MDF.
- (d) Frame line circuit.

3.92 When checking fuse alarms, verify that alarm will function when FA, FC1, FC2 or 20A lamps are removed.

4. ROUTINE TESTS

NOTE: To reduce testing time, test set ITE-4073 may be used to make charge call and timing tests. With the setup per Paragraph 6 the test frame and the ITE-4073 test set may be used without interference.

4.1 Failure Indications

4.11 If a trouble is encountered the test circuit stops and TA lamp lights. Refer to the lamp signals provided on the test frame and to Section 121 for indications regarding the character of the trouble. Where a particular trouble or progress lamp is not lighted, note the class of test, class of district junctor circuit, and position of the TST selector on the test frame.

4.2 Charge Call

4.21 When testing two-party districts every other routine cycle should be made with the TPC key operated and the LC key normal, or if both keys are operated two cycles of test are made on these districts. When testing districts equipped for zone service every other cycle should be made with the Z key operated and the LC key normal, or if both keys are operated, two cycles of test are made on these districts.

4.22 Operate the LC key, the TPC or Z key as described in Paragraph 4.21 and then operate the ST key. The EC lamp lights at the end of the cycle unless a trouble is encountered. Restore the test circuit to normal when the EC lamp lights.

4.3 Early Disconnect

4.31 The purpose of this test is to check the operation of the district junctor circuit in those cases where the call is abandoned after the office code has been dialed and the originating marker circuit has completed its functions, but before the sender circuit has made trunk test.

4.32 Operate the DSC key and then operate the ST key. The EC lamp lights at the end of the cycle unless trouble is encountered. Restore the test circuit to normal when the EC lamp lights.

NOTE: In offices where the senders are of the timed release type, on one cycle of test a visual check shall be made to verify the correct operation of the I relay.

4.4 Operator and Condenser Tests

4.41 Operator call test (Paragraph 4.43) and condenser test (Paragraph 4.44) shall be made on alternate routine cycles.

4.42 On one cycle of test (either the operator or condenser test) use the emergency controller circuit at each sender link frame in order to check the district junctor test frame leads through the emergency sender link controller circuit. When the test is completed at a sender link frame reconnect the regular controller circuit. The emergency circuit should be cut in at only one sender link frame at a time.

4.43 Operate the OPR key and then operate the ST key. The EC lamp lights at the end of the cycle unless a trouble is encountered.

4.44 Operate the CDR and then operate the ST key. The EC lamp lights at the end of the cycle unless a trouble is encountered.

4.45 Restore the test circuit to normal when the EC lamp lights.

4.5 Local Timing

4.51 This test is applied to non-coin district junctors arranged for overtime registration of non-zone calls.

4.52 Perform tests per Paragraphs 4.53 and 4.54 on alternate cycles.

4.53 Operate the LC and T keys, and then operate the ST key. After the initial charge is checked the test circuit measures the initial talking period of approximately 5 minutes and 7 seconds, during which time the test circuit checks that no additional charge is received. After the initial talking period has elapsed, the test circuit checks the first overtime charge and disconnects. The EC lamp lights when the test has been made of all circuits.

4.54 Operate the LC, SUB-DISC and T keys and then operate the ST key. After the initial charge is checked the test circuit measures the initial talking period, during which time the test circuit checks that no additional charge is received. Immediately before the end of the initial talking period, the test circuit releases the district junctor CS relay, indicating that the called subscriber has disconnected and then checks that no overtime charge is sent out by the district junctor circuit. The EC lamp lights when the test has been completed on all circuits.

5. ROUTINE TESTS USING ITE-4073 TO SUPPLEMENT TEST FRAME

5.1 Setup for Test (See Figure 1)

NOTE: With the following test setup the district junctor test frame and the ITE-4073 test set can be used without interference. However tests cannot be made simultaneously on district junctors associated with the same sender link frame.

5.101 Locate the test set, ITE-4073, at the sender link frame whose associated district junctors are to be tested. Run a four conductor test cable from the district junctor test frame to the MISC. T.S. of any district link frame.

Referring to Note 201 on district junctor test frame schematic drawing SD-25158-0104, remove the straps between terminals 08 & 18, 28 & 38 and 48 & 58 during the time the ITE-4073 test set is connected. Connect punchings on the miscellaneous T.S. at the test and district link frames as follows:

Dist. Jctr. Test Frame (SD-25158) Misc. T.S. punch.	Shown on Misc. Ckt. SD-25204 District Link Frame Misc. T.S. punch:
18	160
28	161
38	162
58	163

5.102 Temporarily remove the TEL jacks of the district junctor frames from the frame line circuit by disconnecting the cross-connection at the H.M.D.F.

5.103 Connect the test set terminals to the TEL jacks of the district junctor frame, using two ITE-4109 spade tips, as follows:

Test Set	TEL Jack
Term. G	Jack A - sleeve
" BT	" A - tip
" BTA	" B - sleeve
" D	" B - tip

5.104 Strap the terminals of the test set as follows: GA to GRD, DA to DB, and LO to LOA.

5.105 Using an ITE-9952 cord, connect the fixture to punchings, 130-139 (leads GO-G9) and 140-149 (leads DO-D9) on the EM CONT terminal strip at the sender link frame. Connect plugs P1 and P2 to the test set connectors D and G respectively.

5.106 Using a second ITE-9952 cord, connect the fixture to punchings 40-49 (leads HO-H9) and 50-59 (leads SO-S9) on the MISC terminal strip and connect plugs P1 and P2 to the test set connectors H and S respectively.

5.107 Using cord ITE-9639 equipped with alligator clips connect the test set D3 jack to punchings on the EM CONT and MISC terminal strips as follows:

D3 Jack	Pchg.	T.S.	Lead
Ring	150	EM CONT.	TRL
Tip	151	EM CONT.	RL
%Sleeve	22	MISC.	ST (See Note)

% Extend, using ITE-9547 cord.

NOTE: The ST lead may be connected to punching 89 of the EM CONT TS instead of the punching shown above if the A and B transfer switches of the sender link are operated.

5.108 Connect the 1 and 2 plugs of ITE-9775 cord to the D1 and D2 jacks, respectively, of the test set. Connect the 325 plug of ITE-9775 to any vertical of the district junctor test connector switch on the SSL frame.

5.109 Select a small group of local charge trunks at the H.M.D.F. and change cross-connections on the marker route relays as required to gain access to these trunks. Determine the code of the trunk group selected.

5.110 Connect one trunk in the trunk group associated with the selected route relays to the district junctor frame B jack at the H.M.D.F. Make the remaining trunks of the group busy at the O.G.T. jack bay.

5.111 Patch the TL and S jacks of the test set to the B and A jacks, respectively, of the district junctor frame using ITE-9601 and ITE-9598 cords.

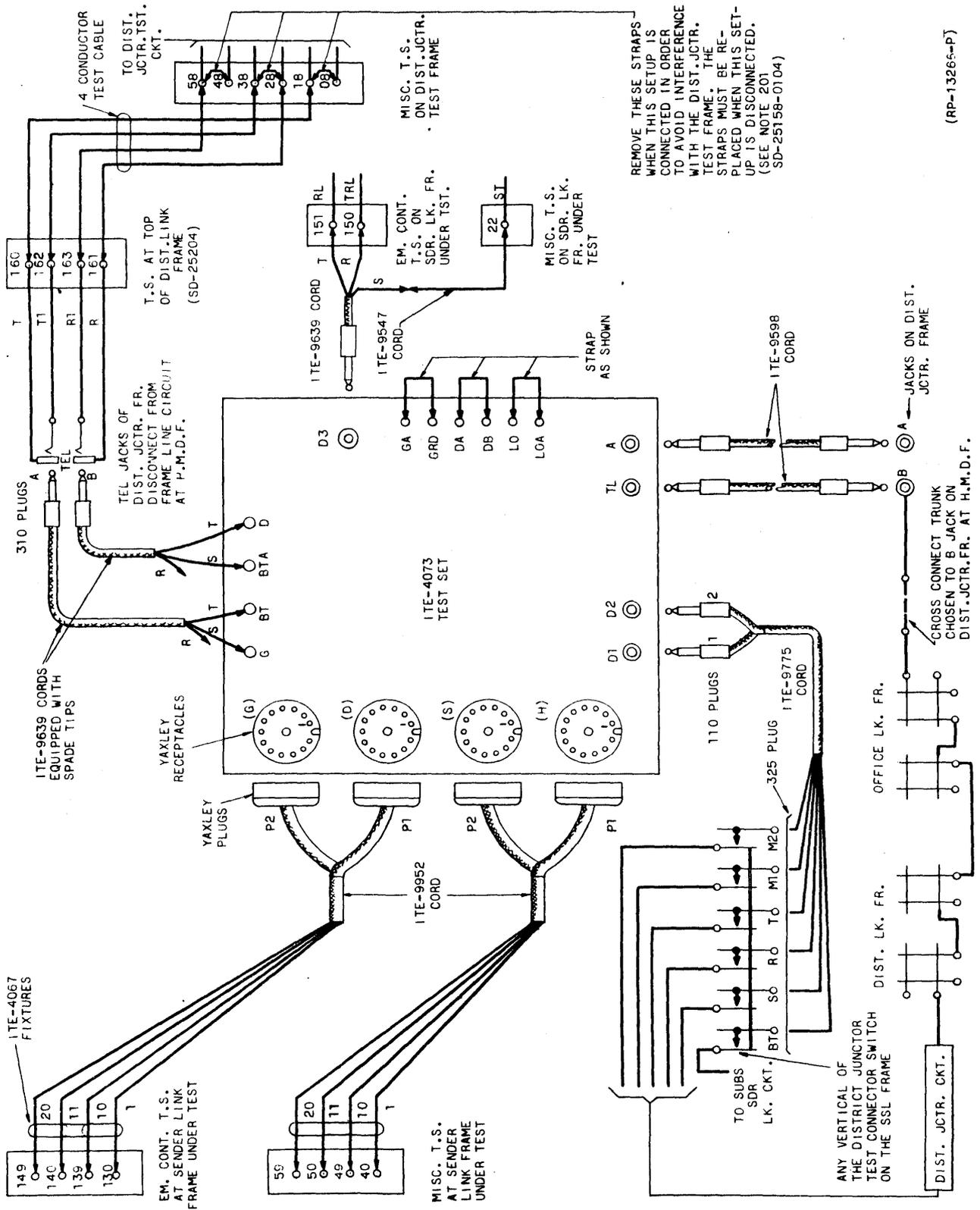


FIG. 1 SETUP FOR TEST USING ITE-4073 TO SUPPLEMENT TEST FRAME

5.112 Using three 298 type plugs set up the office code to be dialed by inserting plugs into the A1-9 jack corresponding to the A digit and into the B1-9 and C1-9 jacks corresponding to the B and C digits. If no plug is inserted 0 will be dialed for the particular digit.

5.2 Failure Indications

5.21 If a trouble is encountered the test circuit stops. Refer to lamp signals provided on the test set and TMO-4073 for indications regarding the character of the trouble.

5.3 Charge Calls

5.31 When testing two-party districts operate the (2-PY) (2-PY) etc. (0-1), (2-3), keys corresponding to the two party district junctor groups before starting the test; on every other routine cycle operate the TPC key. When testing districts equipped for zone service every other cycle should be made with the ZR key operated and the D key normal.

5.32 Operate the (2 PY), TPC and ZR or D keys as required per Paragraph 5.31 and then the ST key. The EC lamp lights on the test set at the end of the cycle unless a trouble is encountered. Release the ST key to restore the test circuit to normal when the EC lamp lights.

5.4 Local Timing

5.41 This test is applied to non-coin district junctors arranged for overtime registration of non-zone calls.

5.42 Perform tests per Paragraphs 5.43 for district junctors arranged for overtime registration of non-zone calls.

5.43 Operate the D and T keys, and then operate the ST key. After the initial charge is checked the test circuit measures the initial talking period of approximately 5 minutes and 7 seconds, during which time the test circuit checks

that no additional charge is received. After the initial talking period has elapsed, the test circuit checks the first overtime charge and disconnects. The EC lamp lights when the test has been made of all circuits. Release the ST key to restore the test set to normal.

5.44 Operate the D, SUB-DISC and T keys and then operate the ST key. After the initial charge is checked the test circuit measures the initial talking period, during which time the test circuit checks that no additional charge is received. Immediately before the end of the initial talking period, the test circuit releases the district junctor CS relay, indicating that the called subscriber has disconnected, and then checks that no overtime charge is sent out by the district junctor circuit. The EC lamp lights when the test has been completed on all circuits. Release the ST key to restore the test set to normal.

6. SUPPLEMENTARY TESTS USING AUTOMATIC TEST CIRCUIT

NOTE: The tests per Paragraphs 6.1 and 6.2 need be made on only one district junctor in each group.

6.1 Automatic Release

6.11 Operate the AR key and then operate the ST key. A test is made on each circuit for its ability to release the calling subscriber line if the called subscriber disconnects and the calling subscriber does not. The AR lamp lights during the timing of the release interval. The EC lamp lights at the end of the cycle.

6.2 False Automatic Release

6.21 Operate the AR and FAR keys and then operate the ST key. A test is made on each circuit that the release circuit does not release the district junctor during momentary release of the district CS relay. The EC lamp lights at the end of the cycle.

R. E. RAHMES

Engineer of Installation