CONCENTRATED LOAD TESTS

CROSSBAR ORIGINATING EQUIPMENT

CONTENTS

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1. GENERAL INFORMATION

1.01 Description of Test: The tests described in this section consist primarily of a series of tests in which a number of simultaneous calls are directed through the various units of the crossbar equipment in an attempt to simulate operating conditions in a working office. Simultaneous calls are to be construed to mean the simultaneous operation of line relays of the lines used for test or the dialing of a common last digit of the office code.

1.02 Sequence of Tests: The tests are so arranged that the line link frames may be turned over progressively as the tests are completed on each frame. The tests are divided into two groups as follows:

(a) Line link horizontal group and secondary switch tests. These tests involve the use of a large number of lines on each line link frame and must be completed early in the load test period so that the line link frames may be turned over immediately after completion of certain terminating load tests. These tests are covered in Paragraphs 3.1 and 3.2.

(b) All other originating tests. These tests can be made using unassigned lines which will remain available for load test after blocking tools have been placed in assigned lines. These tests do not interfere with the turnover of the line link frames and can be made at any time during the load test period. The tests are covered in Paragraphs 3.3, 3.4, 4, 5, 6, 7, 8, 9, 10 and 11 The telephone company will furnish cross-connection assignments in sufficient time to complete all cross-connection work before starting these tests.

1.03 Test Call Charts. Call Charts shall be prepared showing the lines and trunks to be used for each test. These charts should show all necessary information such as, Line Location, Trunk Number, Trunk Location, Test Cord and Jack, Make Busy and Blocking Notes, etc.

1.04 Office Code and Line Cross-Connections. The test calls shall use the office code and line cross-connections and features provided for the office at the time of turnover. Where the omission of cross-connections or features does not permit applying any of the requirements, such requirements are waived.

1.05 Lines Used for Tests

1.051 Tests on message register lines involving the use of markers will not be completed unless the marker checks that a ground is on the M1 lead. A temporary strap from the M1 terminal to the frame of the 325A plug of the ITE-9637 cord will eliminate the necessity of using cross-connected lines for these tests.

1.052 AMA lines used for test

(a) For tests on AMA line link frames it is necessary to select lines from the line cross-connection list to insure that cross-connections are installed in the translator for each line used for test. Without translator cross-connections the transverter will block. When making calls using AMA lines, entries will be perforated on the tapes of the recorders associated with the districts used in the tests. The installer need not procees these tapes to obtain the recorded information. The telephone company may process the tapes if they find it desirable to do so for their own information.

(b) When making AMA calls with answer and disconnect entries, use a different code in each group of 5 trunks and arrange the trunks to terminate in their own group.

1.06 Trouble Indications

1.061 Insert make busy plugs into the HOLD Jacks of all equipment involved in the various tests outlined in this section.

1.062 When conducting these tests it is imperative that the testers check all irregularities such as trouble indicator records, frame alarms and deviations from the normal operation of the equipment (for example, buzzing relays or magnets) because the test equipment merely provides originating and terminating facilities and is not arranged to block on irregularities or operation involving second trials.

1.063 When tests are being conducted in more than one unit of equipment at the same time, special attention must be given to insure that trouble indications or alarms brought in by one test group do not mask trouble indications sought by another group. In all cases, the tests should be stopped until the trouble indicator record has been taken or the reason for the frame alarm ascertained.

1.064 The following are the principal manifestations of trouble:

(1) Failure to complete.

(2) False overflow routing.

(3) Trouble indicator alarms and records.

(4) Frame alarms.

1.065 It is advisable to record all trouble indications due to errors in operating the test equipment even though such troubles are discounted in the test analysis.

1.066 Traffic and trouble register readings of all registers associated with the equipment tested by the concentrated load tests should be recorded daily. The reason for excessive or insufficient registration should be determined and the trouble cleared.

1.067 At least twenty-five repeat tests without trouble shall be made in cases where the cause of the failure cannot be found. Where trouble is found, sufficient repeat tests shall be made to insure that the trouble has been cleared.

1.068 When a number of calls are originated simultaneously at the two party line link frames, legitimate time outs may occur at the line links due to the time required by the senders to make two party test. Any time outs occurring however, must be investigated for their cause.

1.07 Circuit Changes. Circuit changes affecting the circuits to be tested shall be completed before the concentrated load tests are started. Any other tests being made during this interval shall be made in such a manner that they do not interfere with the concentrated load tests.

1.08 Supplementary test time interval for equipment covered by the concentrated load tests shall be construed as terminating with the start of the concentrated load tests instead of terminating at the time of turnover.

1.09 Additions. On additions the concentrated load test may be made on the various circuits as they are connected into the working equipment.

1.10 Joint Test. It is recommended that these tests be conducted jointly by the Installation Division and representatives of the telephone company.

1.11 Channel Test. On small installations, the channel tests listed in Section 142 may be combined with the tests in Paragraph 5.2 of this section.

1.12 Split Groups. Use non-split groups when available. If split groups must be used, make busy right trunks when using left verticals on District Link primary switches and busy left trunks when using right verticals on District Link primary switches.

2. TEST EQUIPMENT

2.1 Test Sets and Accessories

Amt	Code	Description	With ITE
See Note *1	ITE-4032	Line Link Test Set	
	ITE-4081 or ITE-4081A	Automatic Call Originator Test Set	
1	ITE-4074	Multi-call Test Set	
As Req.	ITE-2331	Extension Jack Box	Ø4023
As Req.	298 or 349A	Make Busy Plugs	Ø4023
As Req.	322A	Make Busy Plugs	Ø4023
As Req.	ITE-8507	Alligator Clip	Ø4023
6	ITE-4087	Extension Jack Box	4081
4	ITE-4075	Message Reg. Unit	4081
10	325C	Make Busy Plugs	Ø4023

Ø Crossbar Test Accessory Set.
* Use ITE-4081 on new installations and ITE-4074 on additions to existing equipment. Use ITE-4081A for AMA jobs.

NOTE: One ITE-4032 is required for a job up to 150 frames; two sets for jobs up to 300 frames and 3 sets for jobs of more than 300 frames.

2.2 Cords for Use with ITE-4032

Amt	ITE	Description	With ITE
1	9598	Two Conductor, with 2-110 Plugs	4032
10	9637	Three Conductor, with 110 Plug and 325A Plug	4032
10	9601	Three Conductor, with 2-110 Plugs	4032

2.3 Cords for Use with ITE-4081

Amt	ITE	Lgth	Cdrs	Terminals	With ITE
23	9600	6'	3	2-110 Plugs	4081
21	9601	12'	3	2-110 Plugs	4081
20	9637	12'	3	110 and 325A Plugs	4081
23	9624	6'	3	109 Plug - #93 Cord Tips	4081
or 23	9605	12'	3	309 - 310 Plugs	Req.

2.4 Cords for Use with ITE-4074

Amt	ITE	Cdrs	Lgth	One End	Other End	With ITE
10	9605	3	12'	310	309	Req.
10	9637	3	12'	110	325A	4074
10	9600	3	6'	110	110	4074

3. LINE LINKS

NOTE: When testing coin lines, disconnect the lines one at a time after the associated lamp is extinguished to prevent coin supervisory circuits from blocking due to all lines being common in the test set. Refer to Paragraph 10 when testing coin line groups.

3.1 Horizontal Line Group

3.11 Connect 48V battery and ground to the Line Link Test Set, ITE-4032 using cord ITE-9598.

3.12 Connect 10 lines from horizontal group 0 to jacks 0 to 9 of the test set so as to use each LT relay. Select lines in each vertical and column in accordance with the row of the following table which represents the number of columns in the line group on the frame under test. For example if the line link frame under test has 5 columns insert the cord associated with test set jack 5 into Vertical 0 of Column 4.

Insert cord assoc. with test set jack	Into vertical and column indicated by 2 digit figure under number representing quantity of columns in line link frame under test. First digit is vertical, second is column.					
	2	3	4	5	6	7
0	1-0	6-1	1-1	8-2	1-2	8-3
1	3-0	8-1	3-1	3-1	3-1	3-2
2	5-0	5-0	5-0	5-1	5-1	5-1
3	7-0	7-0	7-0	7-0	7-0	7-0
4	9-0	9-0	9-0	9-0	9-0	9-0
5	0-1	0-2	0-3	0-4	0-5	0-6
6	2-1	2-2	2-3	2-4	2-5	2-6
7	4-1	4-2	4-3	4-3	4-4	4-5
8	6-1	1-1	6-2	6-3	6-4	6-4
9	8-1	3-1	8-2	1-2	8-3	1-3

3.13 Operate keys L0 to L9 and G. With the test set connected as in Paragraph 3.12 the lamps on the test set should light in the sequence indicated in the table below under the column indicating the condition of the (RP) relay of the line link controller at the start of the test. The order of service of columns and lines reverses for every call. The calls may not be served in the proper sequence due to a slow LT relay. If the correct sequence is not obtained the cause should be determined. Check that only one lamp lights at a time. More than one lamp lighting at a time is an indication of trouble.

Sequence in which lamps should light	
(RP) Operated	(RP) Normal
4	5
5	4
3	6
6	3
2	7
7	2
1	8
8	1
0	9
9	0

3.14 Release the G key and note that the connections are released.

3.15 Repeat the tests per Paragraphs 3.12 to 3.14 at least twice from each horizontal group. Test at least one horizontal group on the frame using the mate controller.

3.2 Secondary Switch Test

3.21 Connect one line from each horizontal group to jacks 0 to 9 of ITE-4032. Select each line in the same line test position (LT relay).

3.22 Insert make busy plugs into the SS1 to SS9 jacks of the line link frame.

3.23 Operate keys 0 to 9 and G. The lamps on the test set should light in sequence 0 to 9 but may not due to a slow HA relay. The cause of any deviation should be determined. Check that only one lamp lights at a time. Observe that no hold magnets operate on the No. 1 secondary switch while secondary switch 0 is being tested.

3.24 Release the G key and note that the connections are released.

3.25 Repeat this test at least twice from each secondary switch, observing that no hold magnets operate on the associated secondary switch of the pair.

NOTE: Refer to Paragraph 10 when testing coin lines.

3.26 Remove the make busy plugs upon completion of the test.

3.3 D Relay Chain (See Figure 1)

3.31 Locate the Line Link Test Set, ITE-4032, at the service observing jack panel.

3.32 At the subscriber sender link frames, insert 298A plugs into the MB jacks of all district junctor groups except the one to which the D relay chain to be tested has access.

3.33 Patch one line from each line link frame having access to the district junctor group to a test line jack (TL) using an ITE-9637 cord. At the service observing jack panel (SOJP) patch the test line jack appearances to the jacks on the Line Link Test Set in the same order that the D relay preference chain permits the line link frame to obtain access to the district junctor group. When there are two (2) appearances of a district junctor group on a line link frame originate two (2) calls in the same horizontal group on that line link frame and make busy one switch of each of the pairs of secondary switches on which the group appears.

3.34 Operate keys 0 to 6 as required and G and note that the lamps light as senders are seized. The calls may or may not be served in the same order as the frames appear in the lockout chain depending upon the variation in operating time of relays in the controller circuits.

3.35 Repeat this test at least twice into each district junctor group shifting the make busy plugs in the MB jacks as required to obtain access to the district junctor group to be tested. It will also be necessary to shift some of the line link connections to obtain access to the district junctor groups.

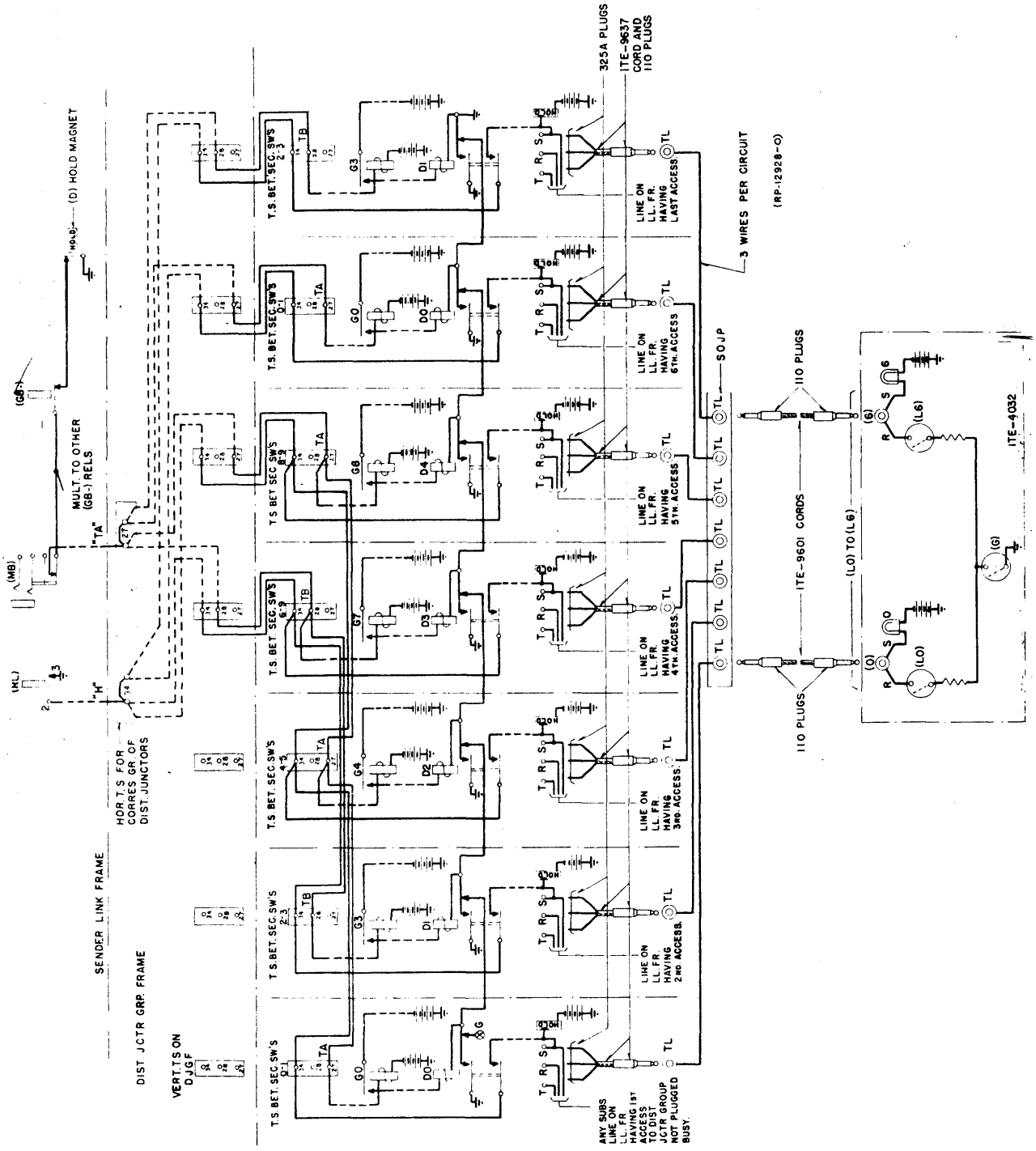


FIG. 1 SETUP FOR TESTING D RELAY CHAIN

3.36 Remove the make busy plugs upon completion of the test.

3.4 Test of SH Leads (See Figure 2)

3.41 With one end of a test receiver connected to ground, run the pick end over punchings 0 to 9 of the horizontal terminal strips of the HDJGF and note that there is no click. A click indicates a false closure of contacts on a DA or a DB relay on a line link frame having access to the group of district junctors to which the horizontal terminal strip is connected. With the test receiver connected to battery check that some of the 0 to 9 punchings are grounded.

3.42 Using a test receiver, check that the cores of the DA and DB relays of the line link frames are not crossed with battery or ground while the relay is manually operated. An SH lead crossed to the core will appear as a battery cross.

4. SUBSCRIBER SENDER LINKS

4.1 Lockout of Senders (LL Relay Chain) (See Figure 3)

4.11 Locate the Line Link Test Set at the SOJP. In this test, the LL relay chain associated with each sender subgroup is tested by placing one call at the same time through each sender link appearance of the sender subgroup. Where the number of appearances of the sender subgroup exceeds the number of senders in the subgroup, place as many calls at the same time as there are senders in the subgroup and make additional tests from the remaining appearances not tested on the first setup. When there is more than one appearance of a sender subgroup on a sender link frame, all appearances on a frame shall be tested simultaneously.

4.12 At a number of line link frames equal to the number of sender link secondary switch appearances of the sender subgroup to be tested, make busy all secondary switches except one so that access is obtained to each subscriber sender link frame at which the sender subgroup appears. Where the sender subgroup has more than one appearance on the same sender link frame, be sure to use line link secondary switches terminating in different district junctor groups on the same district junctor frame.

4.13 At each line link frame patch one line to the TL jacks using ITE-9637 cords. Patch the test line jack appearances at the common jack panel to the jacks on the Line Link Test Set in the order that the LL relay preference chain permits the sender link frames to have access to the sender subgroup.

4.14 Make busy all sender subgroups except the one associated with the LL relay chain under test.

4.15 Operate keys 0 to 9 as required and G and note that the lamps light as senders are seized. Release the G key.

NOTE: The lamps may or may not light in the same order as the preference chain depending upon variations in the operating time of relays in the controller circuits.

4.16 Repeat this test at least five times on the LL relay chain associated with each subscriber sender subgroup.

4.17 During these tests the Emergency Sender Link Controller Circuit shall be used on each sender link frame during the test of at least one sender subgroup.

4.18 Remove make busy plugs upon completion of the test.

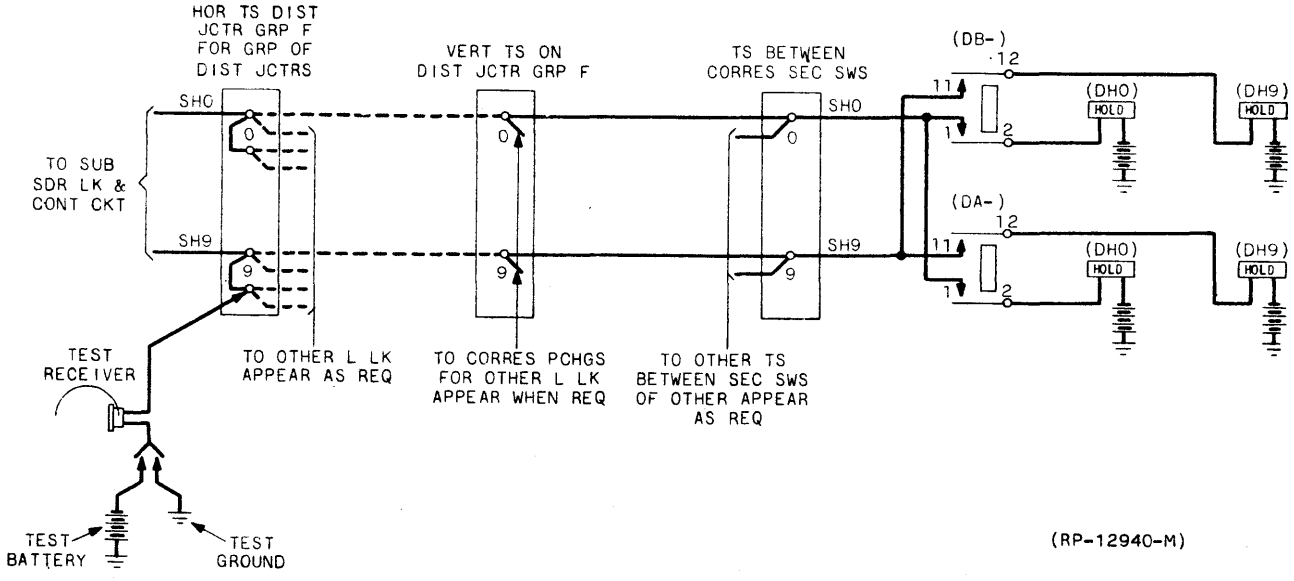


FIG. 2 SETUP FOR TEST OF SH LEADS

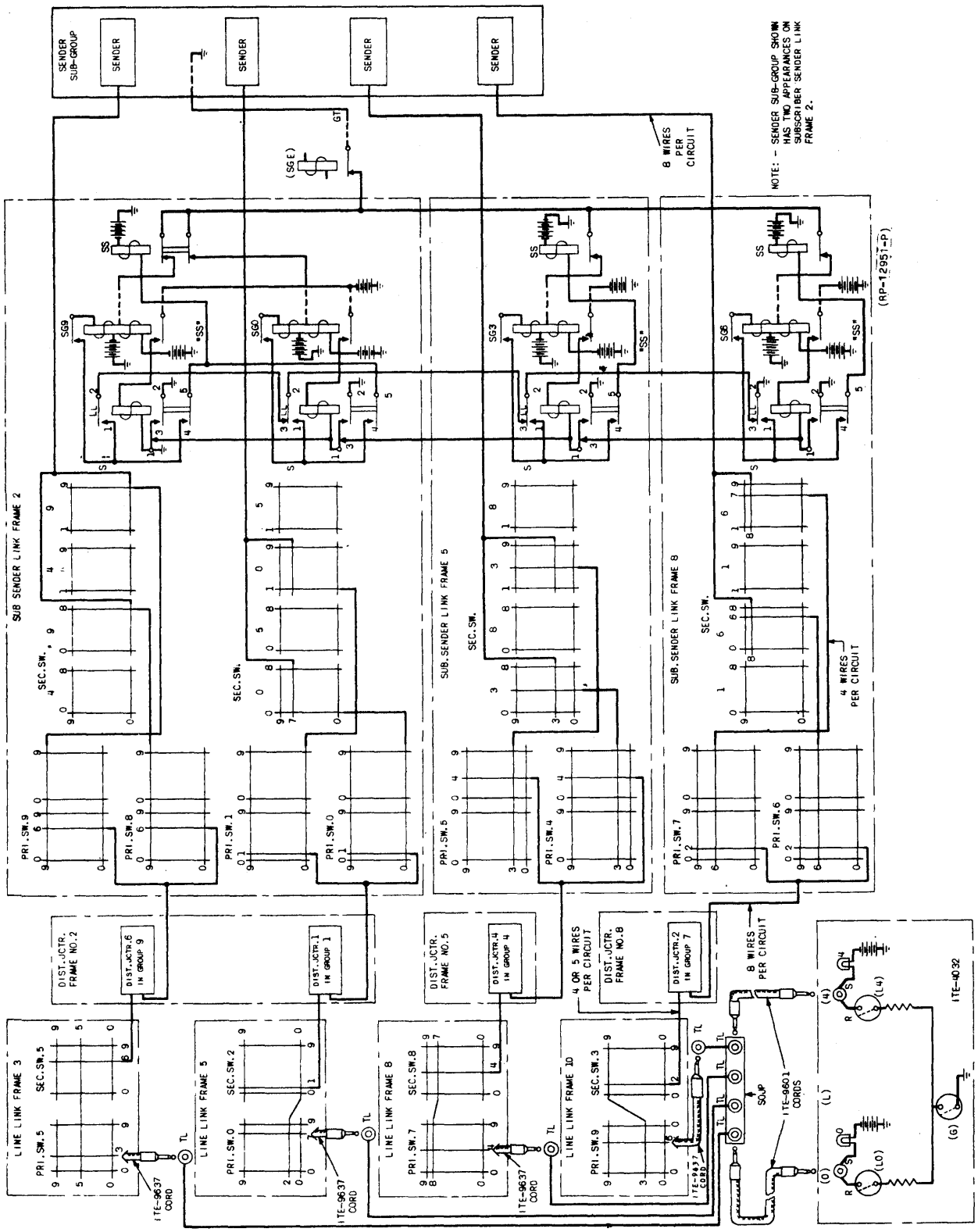


FIG. 3 SETUP FOR TEST OF LL RELAY CHAIN

5. DISTRICT FRAMES

5.1 Simultaneous Calls on District Junctor Subgroup Using all Markers

5.101 Iocate the automatic call originator test set, ITE-4081 and six ITE-4087 extension jack boxes at the SOJP or the OGTT frame. Refer to Figure 4 for connection and TMO-4081 for test set operation.

5.102 Connect 48V battery and ground to ITE-4081 using 14 BRC wire with a 5 ampere fuse in the battery feed.

5.103 At the Line Link Frames having access to the first subgroup of District Junctors, busy all secondary switches except those having access to the junctors to be tested. Patch as many lines, using ITE-9637 cords, to the TL jacks as there are junctors in the subgroup. Patch the test line jack appearances at the SOJP to the IO to 4 jacks of any two groups on the ITE-4081 test set, using ITE-9601 cords.

5.104 At the OGT jack panel, connect ten of the switchboard cords that have been spliced to cable conductors, or, if the test set is located at the OGTT frame, patch 10 ITE-9605 cords to the test jacks of ten trunks (in one or two trunk groups appearing on different pairs of office link frames). Any trunks reached by dialing assigned office codes may be used for the test, F.S. trunks being preferred. When testing AMA lines use trunks with assigned office codes that require bulk billed (2 line) recording. If the trunks chosen are cross-connected, the cross-connections should be lifted during the tests, or if they terminate on local incoming trunks, I65C plugs may be inserted in the test jacks of the associated incoming trunks in order to remove the trunk A relay from the tip and ring. Make busy remaining trunks of the trunk groups used for these tests.

NOTE 1: When arranging trunk groups and making secondary switches busy for this test observe that sufficient channels are available to complete the ten calls originated during each test.

NOTE 2: If zone registration equipment is installed, refer to Paragraph 11.

5.105 At the OGT panel, connect one of the three switchboard cords, with the sleeve spliced to a spare conductor in the cable, to an overflow trunk. Make the remaining overflow trunks busy. Where more then one subgroup of overflow trunks are provided, connect a switchboard cord as above to a trunk in each subgroup making all other trunks in the groups busy. Provisions are made in the test set for three such patches. If there are more than three markers, cross-connections may be temporarily changed on them in order to make a patched overflow trunk available to any marker.

5.106 At the SOJP, connect the extension jack box end of the ten trunks to the test set TK 0 to 4 jacks of the two groups associated with the L- 0 to 4 jacks being used for the test, so that calls, originated on the five L jacks of a group, will terminate on the five TK jacks associated with the same group. Connect the overflow trunk extension jacks to the OFL jacks of ITE-4081. Use ITE-9600 cords between the extension jack boxes and the test set.

5.107 At the test set, fasten the four ITE-4075 (message register units) two high to the upper side of the handle on the end near the CT jacks. Insert the CT and TBL plugs of an ITE-4075 in the CT and TBL jacks of each group. Set up the code and number to be dialed over the five lines in each group by inserting 322A plugs in the associated A,B,C,TH,H,T, and U jacks. (Where two digit codes are used, insert plugs in the A and C jacks and operate the associated 2 DGT key). Operate the group CN key when any of the calls in the group are to be originated on coin lines. Operate the ANS key of any group originating calls on AMA lines. Operate the GRP keys associated with the unused groups of test set lines and trunks.

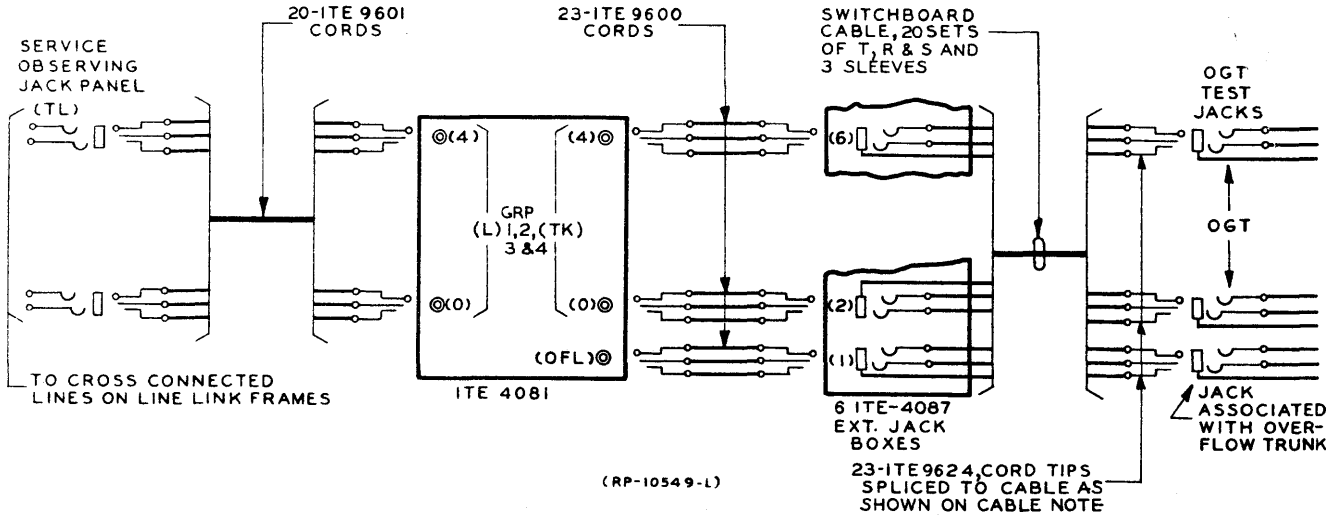


FIG. 4 SETUP FOR TESTS OF PARAGRAPHS 5, 6, 7, 8, 9 & 10

5.108 Operate the ST key. As each line is connected to a sender the associated L lamp lights. Approximately 1-1/2 seconds after all lines used for test have senders attached, the test set proceeds to dial the test codes and numbers. As the markers set up the calls to trunks, trunk test is made and the corresponding TK lamp lights. Observe that the TK lamp associated with each trunk used for test lights and that the OFL lamp does not light.

5.109 Release the ST key and observe that all L and TK lamps are immediately extinguished.

NOTE: On coin lines the L lamps will remain lighted until the coin supervisory circuits have completed their function.

5.110 Insert 325C make busy plugs in the ten right verticals of the district link primary switch under test.

5.111 Operate the ALM-HLD and AST keys. The test set proceeds to make its tests as with the ST key operated. When all calls are satisfactorily terminated on the trunks to the test set, the test circuit automatically restores and repeats the tests. If all calls originated do not terminate on the trunks to the test set, the test set blocks and approximately 15 seconds after the last digit is dialed the ALM lamp lights. Determine the cause of the failure and restart the test by momentarily releasing and reoperating the ALM-HLD key. Permit the test to operate automatically until five tests using the ten left links have been made. Restore the ALM-HLD and AST keys.

5.112 Move the 325C plugs from the ten right verticals to the ten left verticals of the district link primary switch under test and repeat the operations of Paragraph 5.111 testing the ten right links.

5.113 Make tests per 5.108 to 5.112 on each subgroup of ten subscriber district junctors.

5.2 Markers Testing for Access to a District Frame with Marker Overlap Operation

5.21 Connect 10 lines on line link frames to the originating jacks of the test set. Distribute the lines over the line link frames and make line link secondary switches busy so that at least one call will be placed in each subgroup of ten district junctors on the first district frame under test. Where there are KP district junctors on the frame, distribute the calls for this subgroup uniformly over the other subgroups.

5.22 At the jack panels, patch to the required number of trunks to be used for test as in Paragraphs 5.104 to 5.106.

5.23 Dial the test calls and release as in Paragraphs 5.108 to 5.109.

5.24 Operate the ALM-HLD and AST keys and allow the test set to repeat the test five times before proceeding to test the next district frame.

5.25 Perform this test on all district frames.

5.26 In order to test marker overlap when more than five markers are installed, the following test shall be made on one district frame.

(a) Apply the tests twice on the selected frame. During one set of tests, have one-half of the markers available and during the second set of tests have the other half of the markers available.

5.3 All Markers Testing for Access to District Frames

5.31 Connect 20 assigned lines on line link frames to the originating (L-0 to 4) jacks of the test set in such a manner as to place at least one call in each district frame. Busy secondary switches on the line link frames so as to place the calls in the desired district frames.

5.32 At the jack panels, patch to the required number of trunks to be used for test as in Paragraphs 5.104 to 5.106.

5.33 Dial the test calls and release as in Paragraphs 5.108 and 5.109.

5.34 With the AST and ALM-HLD keys operated as in Paragraph 5.111, repeat the tests fifty times. Ten of the tests should be made using the emergency marker preference circuits.

6. OFFICE FRAMES

6.1 Markers Testing for Access to Office Frames

6.11 At as many line link frames as convenient, patch twenty assigned lines to the TL jacks. Patch the TL jack appearances at the SOJP to the L jacks of ITE-4081.

6.12 At the O.G.T. jack panel, plug up twenty trunks in from one to four trunk groups appearing on a pair of office frames. (As the test set dials the codes in groups of five lines, the number of trunks used in any trunk group should be in multiples of five and should be distributed over both frames of the pair being tested). Make the remaining trunks of the chosen trunk group or groups busy. At the extension jack boxes, patch the trunks to the TK jacks of the test set so that the calls will terminate in the same group or groups from which they were originated. Connect the OFL jack as in Paragraph 5.106.

NOTE: Where possible use codes having 1 or two subgroups and no alternate route. When codes are used which have subgroups of trunks or alternate route trunks appearing on other pairs of frames these groups should also be made busy.

6.13 Set up the codes and numbers to be dialed over each group of five lines by inserting 322A plugs in the associated A,B, C, TH, H, T and U jacks of ITE-4081 as required.

6.14 Operate the ST key and check that all twenty calls are terminated on the trunks to the test set, as indicated by the lighted TK lamps and that the OFL lamp does not light.

6.15 Release the ST key and note that all connections are released.

6.16 Operate the ALM-HLD and AST keys, and permit the test set to repeat the tests at least fifty times. On ten of the tests use the emergency marker preference circuit.

6.17 Leaving the test set patched to the line links as covered in Paragraph 6.11, apply tests per Paragraph 6.12 to 6.16 on each pair of office frames.

7. ORIGINATING MARKER CONNECTORS

7.1 Lockout of Senders

7.11 At the line link frames, patch a number of assigned lines equivalent to the number of subscriber senders served by the connector under test to the TL jacks using ITE-9637 cords. Patch the TL jack appearances at the SOJP to the jacks of ITE-4081.

7.12 At the OGT panel patch the same number of full selector trunks in a trunk group to the TK jacks of ITE-4081 as there are originating lines patched to the L jacks. Busy the remaining trunks of the group. Make one overflow trunk available and patch it to an OFL jack of the test set. Operate the test set GRP keys associated with the unused groups of five lines and trunks or where part of the lines of a group are used, operate the C and TK keys associated with the unused lines.

7.13 Make all senders busy except the ones served by the marker connector to be tested.

7.14 Set up the code to be dialed and operate the ST key. Observe that all TK lamps associated with the trunks used for the test light.

7.15 Release the ST key and observe that all connections are released.

7.16 Operate the ALM-HLD and AST keys and permit the test set to repeat the tests twenty times on each marker connector.

7.17 Remove the make busy plugs.

NOTE: By using the twenty lines of this test set, these tests may be performed on two markers connectors at a time. Where less than ten senders are served by a connector, reduce the number of calls originated by the test set accordingly.

7.2 Lockout of Markers

7.21 At the line link frames patch ten assigned lines to the TL jacks. Patch the TL jack appearances at the SOJP to two groups of L jacks on the ITE-4081 test set.

7.22 At the O.G.T. panel, patch ten full selector trunks in a trunk group to the TK jacks of ITE-4081. Busy the remaining trunks of the group. Make one overflow trunk available and patch it to an OFL jack of the test set. Operate the test set GRP keys associated with the unused groups.

7.23 Make busy all subscribers senders but ten. Distribute these senders so that there is at least one in each marker connector. If there are more than ten connectors, make additional tests to include those connectors using senders served by them.

7.24 Busy all markers except the one to be used for test.

7.25 Set up the code to be dialed and operate the ST key. Observe that the ten TK lamps associated with the trunks used for the test light.

7.26 Release the ST key and observe that all connections are released.

7.27 Operate the ALM-HLD and AST keys and permit the test set to repeat the test twenty times on each marker.

8. AMA CONNECTORS

8.1 Transverter Connectors

8.11 Lockout of Senders

8.111 At the AMA line link frames patch a number of assigned lines equivalent to the number of subscriber senders served by the connector under test to the TL jacks using ITE-9637 cords. Patch the TL jack appearances at the SOJP to two groups of L jacks of ITE-4081.

8.112 At the OGT panel patch the same number of full selector trunks in a trunk group to the TK jacks of ITE-4081 as there are originating lines patched to the L jacks. Use trunks with assigned office codes that require bulk billed (2 line) recording. Busy the remaining trunks of the group. Make one overflow trunk available and patch it to an OFL jack of the test set. Operate the test set GRP keys associated with the unused groups of five lines and trunks or where part of the lines of a group are used, operate the C and TK keys associated with the unused lines.

8.113 Make all senders busy except the ones served by the transverter connector to be tested.

8.114 Set up the code and number to be dialed and operate the ST key. Observe that all TK lamps associated with the trunks used for the test light. Observe that transverter trouble indicator alarms are not received during these tests as the TK lamps may light even though trouble occurs resulting in AMA equipment failure.

8.115 Release the ST key and observe that all connections are released.

8.116 Operate the ALM-HLD and AST keys and permit the test set to repeat the tests five times on each transverter connector.

8.117 Remove the make busy plugs.

NOTE: By using the twenty lines of this test set, these tests may be performed on two transverter connectors at a time. Where less than ten senders are served by a connector reduce the number of calls originated by the test set accordingly.

8.12 Lockout of Transverter

8.121 At the AMA line link frame patch ten assigned lines to the TL jacks. Patch the TL jack appearances at the SOJP to two groups of L jacks on the ITE-4081 test set.

8.122 At the O.G.T. panel, patch ten full selector trunks in a trunk group to the TK jacks of ITE-4081. Use trunks with assigned office codes that require bulk billed (2 line) recording. Busy the remaining trunks of the group. Make one overflow trunk available and patch it to an OFL jack of the test set. Operate the test set GRP keys associated with the unused groups.

8.123 Make busy all subscribers senders but ten. Distribute these senders so that there is at least one in each transverter connector. If there are more than ten connectors, make additional tests to include those connectors using senders served by them. In the additional tests use at least two of the connectors used in the first test. For example, if 17 connectors are furnished make the first test on connectors 0 to 9 and the additional test on connectors 7 to 16.

8.124 Busy all transverters except the one to be used for test.

8.125 Set up the code and number to be dialed and operate the ST key. Observe that the ten TK lamps associated with the trunks used for the test light. Observe that transverter trouble indicator alarms are not received during these tests as the TK lamps may light even though trouble occurs resulting in AMA equipment failure.

8.126 Release the ST key and observe that all connections are released.

8.127 Operate the ALM-HLD and AST keys and permit the test set to repeat the test five times on each transverter.

8.2 Translators

8.21 At the AMA line link frames patch 10 assigned lines whose directory number cross-connections are located on the translator under test, to the TL jacks using ITE-9637 cords. Patch the TL jack appearances at the SOJP to two groups of L jacks on the ITE-4081 test set.

8.22 At the O.G.T. panel, patch ten full selector trunks in a trunk group to the TK jacks of ITE-4081. Use trunks with assigned office codes that require bulk billed (2 line) recording. Busy the remaining trunks of the group. Make one overflow trunk available and patch it to an OFL jack of the test set. Operate CN key for tip party translator. Operate the test set GRP keys associated with the unused groups.

8.23 Set up the code and number to be dialed and operate the ST key. Observe that the ten TK lamps associated with the trunks used for the test light. Observe that transverter trouble indicator alarms are not received during these tests as the TK lamps may light even though trouble occurs resulting in AMA equipment failure.

8.24 Release the ST key and observe that all connections are released.

8.25 Operate the ALM-HLD and AST keys and permit the test set to repeat the test ten times on each translator.

9. ORIGINATING MARKERS

9.1 Class of Service

9.11 In the same manner as the preceding tests, complete ten simultaneous calls from ten assigned lines of each class of subscriber service (IMR, Flat Rate, 2MR, Coin, Etc.) to a group of ten trunks. These tests shall be applied at least twenty times for each class of service.

10. COIN CONTROL LINK

10.1 The requirements of the test are met when the test on line link secondary switches is made as described in Paragraph 3.2. Failure of the coin control circuit would prevent the proper release of the line used for test. In offices having more than ten coin supervisory circuits the line link secondary switch tests should be made with 9 or less coin supervisory circuits available at a time. The coin supervisory circuits should be rotated during the test so that all coin supervisory circuits are used at some time during the concentrated load tests.

11. ZONE REGISTRATION EQUIPMENT

11.1 Test From Subgroup of Ten District Junctors

11.11 This test shall be made in the same manner as the test on district junctor subgroups are made in Paragraph 5.1 except that calls shall be made to a trunk group in each zone. If desired, the tests of the zone registration may be combined with the tests of Paragraph 5.1, in which case calls would be routed to a trunk group in each zone.

11.12 Only five zone registration circuits are to be available to the ten district circuits. Five calls will be completed with zone registration circuits attached and five without.

11.13 This test shall be applied twice to each zone unless there are less than three zones in which case the test shall be applied five times to each zone.

11.14 Repeat the tests per Paragraph 11.11 to 11.13 on each subgroup of subscriber district junctors arranged for multiple registration.

11.15 Remove the make busy plugs.

11.2 Ten Simultaneous Calls Each From a Different Subgroup of Subscriber District Junctors Arranged for Multiple Registration

11.21 At the line link frames patch ten assigned subscriber lines to the TL jacks. Select these lines and make secondary line link switches busy so that each line will select a different subgroup of district junctors arranged for multiple registration. Patch the TL jack appearances at the SOJP to the (L) jacks on the ITE-4081.

11.22 Select a code that will cause the marker to select a zone registration circuit. At the O.G.T. panel patch ten trunks, of the trunk group assigned to this code, to the TK-0 to 4 jacks of two groups on the ITE-4081 test set. Make all other trunks in the group busy. Arrange the overflow trunk as outlined in Paragraph 5.106.

11.23 Set up the code to be dialed and operate the ST key. Observe that the TK lamps associated with the trunks used for test light.

11.24 Release the ST key and observe that all circuits are released.

11.25 Operate the ALM-HLD and AST keys, and permit the test to be repeated five times.

11.26 Repeat the tests per Paragraphs 11.21 to 11.25 so that all subgroups of subscriber district junctors arranged for multiple registration are covered.

12. LINE LINKS - ADDITIONS

12.1 Horizontal Line Group

12.11 Perform the test outlined in Paragraph 3.1 on all added line link frames. Perform the test during a light load period and with the consent of the operating telephone company.

12.2 Secondary Switches and District Junctor Groups

NOTE: This test should be made during a light load period and with the consent of the operating telephone company.

12.21 Setup for Test (See Figure 5)

12.211 Locate the ITE-4074 multi-call test set at the line link frame under test. Supply battery and ground to the test set by means of an ITE-9598 cord.

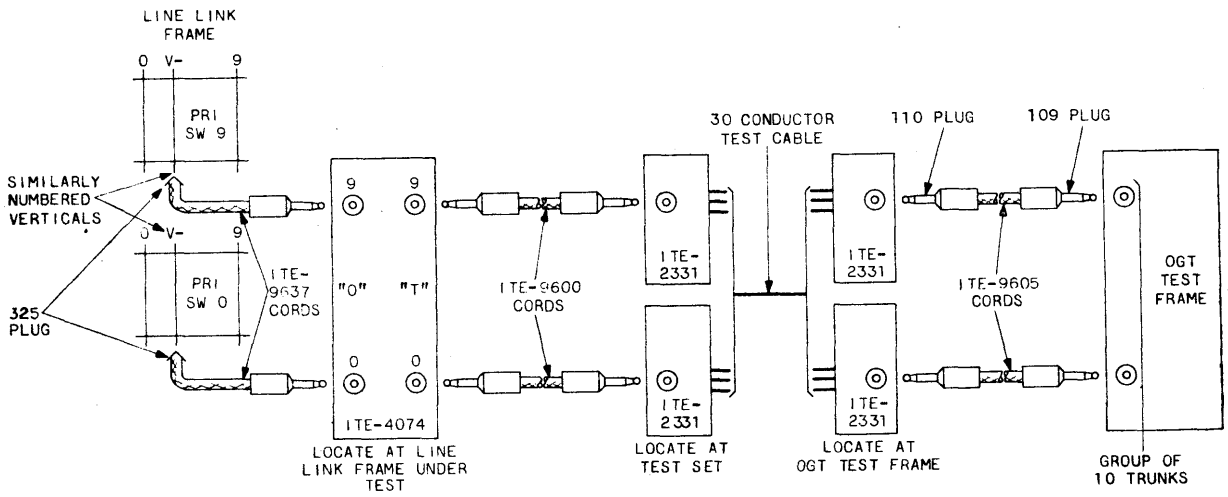
12.212 Patch one ITE-9637 cord from each horizontal group to jacks 0 (0 - 9) of the test set. Select each line in the same line test position (LT relay). Associate the cord to horizontal 0 with the 00 jack on the test set and etc.

12.213 Locate two (2) ITE-2331 extension jack boxes at the test set and two (2) more at the OGT test frame.

12.214 Using 10 ITE-9600 cords connect the T (0-9) jacks of the test set to 10 jacks of the 2 ITE-2331 extension jack boxes of the test set.

12.215 Patch the 10 jacks of the ITE-2331 extension jack boxes at the test set to 10 jacks of the extension jack boxes at the OGT test frame using a 30 conductor test cable.

12.216 Establish a temporary trunk group of ten trunks on a pair of office frames (Preferably an added Pair if provided). A temporary route relay on each marker will be required and is to be cross-connected in a class other than



NOTE: IF MORE CONVENIENT THE TEST SET MAY BE LOCATED AT SOME OTHER POINT SUCH AS THE OGTTF

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FIG. 5 SETUP FOR TEST OF SECONDARY SWITCHES AND DISTRICT JUNCTOR ON ADDITIONS

operator class. The trunk group should be assigned a vacant code number which can be reached by dialing 3 digits in a 3 digit area and 2 digits in a 2 digit area. Disconnect the code used from the vacant code signal.

NOTE: It will be necessary to remove the "unused trunk ground" on the trunks used in this test. This ground is usually applied at the MDF.

12.217 With ITE-9605 cords patch the 10 trunks of the group chosen to the 10 jacks of the ITE-2331 extension jack boxes which have been patched to the 10 jacks of the extension jack boxes at the test set.

12.218 Insert make busy plugs into all the SS jacks of the line link frame under test except the SS jack of the secondary switch under test.

12.22 Test Operations

12.221 Operate the D (0-9) keys to the dialing position.

12.222 Operate the G key. The lamps 0 (0-9) light in sequence 0 to 9 as each line is attached to a sender. If the lamps do not light in sequence it may be due to a slow HA relay. The cause of any deviation should be determined. Check that no hold magnets operate on the No. 1 secondary switch.

12.223 Release the G key and note that the connections are released.

12.224 Repeat this test at least twice from each secondary switch on all added line link frames, observing that no hold magnets operate on the associated secondary switch of the pair.

NOTE: Refer to Paragraph 15 when testing added coin lines.

12.225 Operate TT and T(0-9) keys. From one secondary switch appearance of each new or rearranged subgroup of district junctors perform operation described in Paragraphs 12.221 and 12.222. After senders are attached to each line dial the code of the selected group of trunks and the four numerical digits 1111. Observe that all the calls are terminated to the test set as indicated by the lighted T (0-9) lamps. Operate and release the REV key. Release the G key and note that connections are released.

12.226 Make the test of Paragraph 12.225 using the 10 left and 10 right district links in turn. Make the right and left links busy as required by inserting 325C plugs in the 10 right or left verticals of the district link primary switch under test. Make sure that there are sufficient channels available to complete the 10 calls. Make the test 5 times thru the left links and five times thru the right links.

12.227 Refer to tests in Paragraph 14 before removing test equipment.

12.3 D Relay Chain on Addition

NOTE: Perform this test during a light load period and with the consent of the operating telephone company.

12.31 Perform the test described in Paragraph 3.3 on all added or relocated district junctor subgroups. Do not insert 298A plugs into the MB jacks of the District junctor groups as stated in Paragraph 3.32. To obtain access to the district junctor group under test insert make busy plugs into all the SS jacks of the line link frames on which the group appears, except the SS jacks of the secondary switches having access to the group under test.

13. LOCKOUT OF SENDERS ON ADDITIONS (LL RELAY CHAIN)

NOTE: Perform this test during light load period and with the consent of the telephone company.

13.1 Perform the test described in Paragraph 4 on each added or relocated subgroup of senders.

NOTE: Release the G key immediately after senders are seized in order to reduce interference with service calls.

14. ORIGINATING MARKER CONNECTORS ON ADDITIONS

NOTE: These tests should be made during a light load period and with the consent of the operating telephone company.

14.1 Lockout of Senders

14.11 Setup for Test

14.111 Using a setup similar to that described in Paragraph 12.21, at the line link frames patch a number of assigned lines equivalent to the number of subscriber senders served by the connector under test, to the 0 jacks of the test set.

14.112 At the OGT test frame patch the same number of trunks in the trunk group selected to the T jacks of the test set as there are originating lines patched to the 0 jacks. Busy the remaining trunks in the group if there are any.

14.113 Make all senders busy except the ones served by the marker connector under test.

14.114 If there are more than 10 senders in the group under test, make busy all but 10 and make additional tests to include those busied.

14.12 Test Operations

14.121 Operate the D keys that have lines patched to the line link frames to the dialing position.

14.122 Operate the G key and after senders are attached to each line dial the code of the chosen trunk group. Observe that all the T lamps associated with the trunks used for test light.

NOTE: Dial the code immediately after senders are seized in order to reduce sender holding time to a minimum since all senders in the office will be busy during the time the senders are attached to the lines.

14.123 Release the G key and observe that the connections are released.

14.124 Repeat operations of Paragraphs 14.122 and 14.123 ten times on each added marker connector.

14.125 Remove the make busy plugs from the sender subgroup and restore test set keys to normal at completion of test.

14.2 Lockout of Markers

14.21 Setup for Test

14.211 Using a setup similar to that described in Paragraph 12.21 at the line link frames patch ten assigned lines to the 0 jacks of the ITE-4074 test set.

14.212 At the OGT test frame arrange a group of 10 trunks as in Paragraph 12.1 and patch them to the T jacks of the ITE-4074 test set.

14.213 Make busy all subscribers senders but ten. Distribute these senders so that there is at least one in each added marker connector. If there are more than 10 added connectors, make additional tests to include those connectors, using senders served by them.

14.214 Busy all markers except the one to be used for test.

14.22 Test Operations

14.221 Operate the D (0-9) keys to the dialing position.

14.222 Operate the G key and after senders are attached to each line dial the code of the chosen trunk group. Observe that the T (0-9) lamps light indicating that the calls have been terminated to the test set.

NOTE: Dial the code immediately after senders are seized in order to reduce sender holding time to a minimum since all senders in the office will be busy during the time the senders are attached to the lines.

14.223 Release the G key and observe that all connections are released.

14.224 Perform operations described in Paragraph 14.221 to 14.223 five times on each marker.

14.225 Remove the make busy plugs and test equipment and restore test set keys to normal at completion of test and remove all temporary cross connections. Restore the "unused trunk ground" and Vacant Code ground connections.

15. COIN CONTROL LINK ON ADDITIONS

15.1 The requirements on the test are met when the test on added line link secondary switches is made as described in Paragraph 12. Failure of the coin control circuit would prevent the proper release of the line used for test. In offices having more than ten added coin supervisory circuits the line link secondary switch tests should be made with 9 or less added coin supervisory circuits available at a time. The coin supervisory circuits should be rotated during the tests so that all added coin supervisory circuits are used at some time during the concentrated load tests. If there are no added coin supervisory circuits, a group of 9 or less existing ones should be used for test.

→ Arrowed lines indicate new or changed information.

R. E. RAHMES

Engineer of Installation

Reason for Reissue:
To make additions to Paragraph 1.

Replaces Section 100 dated 8-17-50.