DECODER CONNECTORS
TESTS
PANEL OFFICES

1. GENERAL

1.01 This section describes methods of testing decoder connectors by means of the decoder test frame.

1.02 In testing the decoder connectors, tests are made on all paths through the various decoder connectors to the decoders. This is accomplished by testing all decoder connectors successively in connection with each decoder. The test set is also arranged so that successive tests may be made on the paths between all decoder connectors and a particular decoder or repeat tests may be made on the paths of any decoder connector either to all decoders successively or to a particular decoder.

1.03 When making decoder connector tests, the decoders are connected to the test frame in order to check their paths but the functions of the decoders themselves are not tested. The decoders are tested by a separate operation as described in the section on decoder tests. Various leads are opened in the decoder in order to remove conditions which would interfere with the tests to be made. For each path under test, all leads through the decoder connector to the decoder are tested for continuity, and for crosses with other leads, or with battery or ground. In addition, the contacts of all decoder and test frame multi-contact relays involved are tested for opening when the relays are released.

1.04 While the normal interval during which a decoder connector is held for each individual test is very small, the encountering of a trouble may involve considerable delay. It is therefore desirable to make decoder connector tests during periods of light traffic, in order to minimize the possibility of interfering with service.

1.05 Should a decoder connector to which the test frame is attempting to connect, be busy, the CNB (connector busy) lamp is lighted at the test frame and if the busy condition persists, both the decoder connector and the test frame time alarms operate. Under this condition, proceed as outlined under decoder connector time alarm routine. If the decoder to which the test frame is attempting to connect is busy, the DB (decoder busy) lamp lights, and unless the decoder is released, the decoder time alarm operates. This condition should be handled in accordance with the procedure outlined for decoder time alarm routine.

1.06 One switch is provided per group of decoders to control the connection of the decoders to the test frame. For each group of decoders one switch is also provided for each 17 associated decoder connectors.

2. APPARATUS

2.01 Decoder Test Frame per SD-21188-011.

2.02 No. 32-A Test Set.

2.03 No. 184 Make-busy Plugs, as required.

3. PREPARATION

3.01 Restore any keys which are operated to their normal positions.

3.02 Operate the RN (restore to normal) key to insure that all switches are in their normal positions and then restore the key to normal.

4. METHOD

(a) Test of all Paths

4.01 Operate the CONN (connector) key.

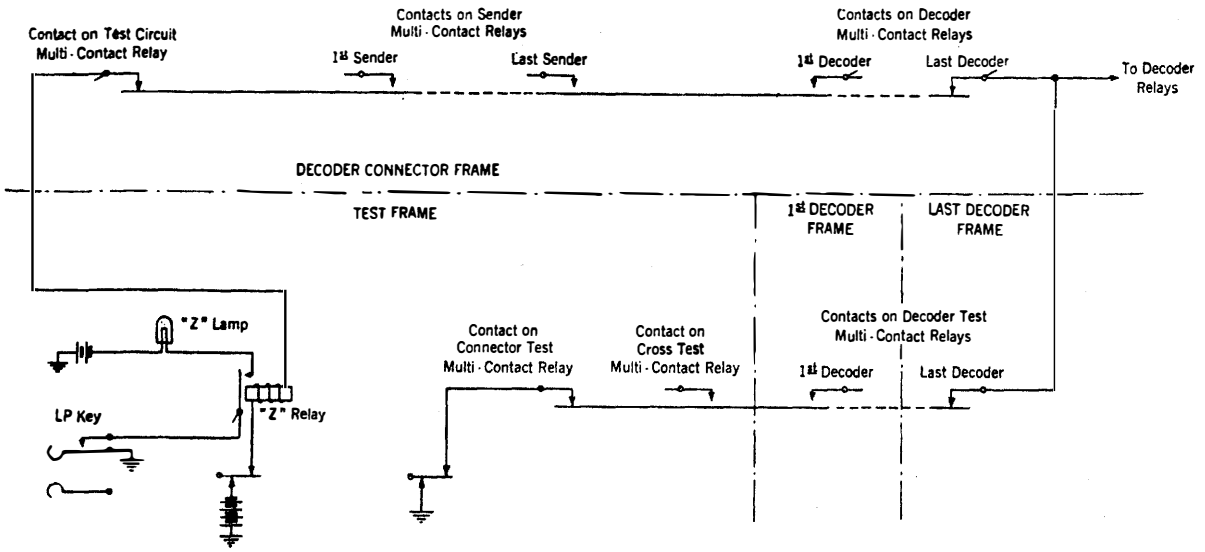
4.02 Operate the ST (start) key to start the test.

4.03 The first decoder of the first group and the first decoder connector of that group are connected to the test frame for the purpose of testing their leads. The following tests are made as the connector test control switch of the test circuit advances through its various positions.

4.04 With the connector test control switch in position 2 or 11, each lead is connected as shown in Fig. 1 and a continuity test is made.

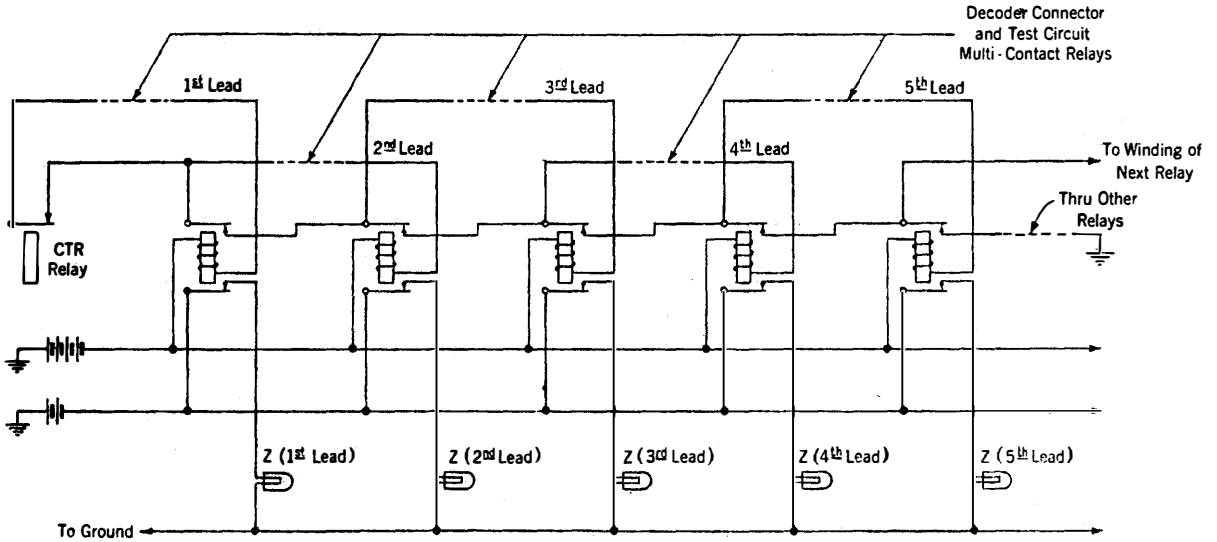
4.05 In position 3 or 12 of the connector test control switch, the Z relays of the test circuit, having already been operated, are locked as shown schematically in Fig. 2 and each lead is tested for crosses with other leads or with ground.

4.06 With the connector test control switch in position 4 or 13, all leads are re-connected as shown on Fig. 1 and the test circuit multi-contact relays of the decoder are re-



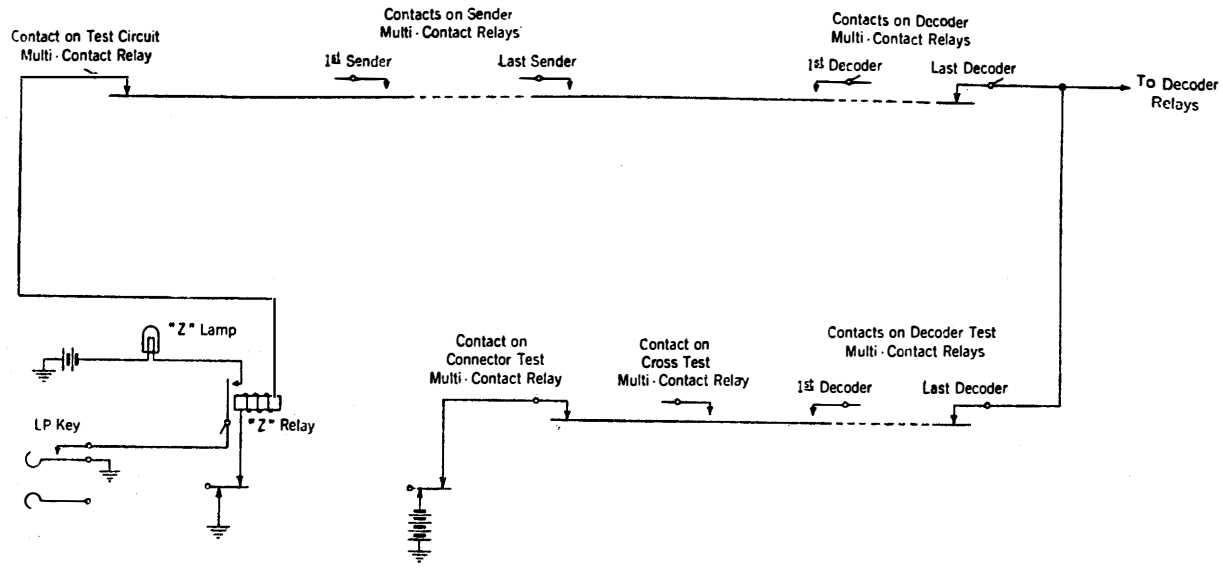
Schematic of Test Set Connections for Testing Continuity of Each Lead

Fig. 1.



Schematic of Test Set Connections in Testing Leads for Crosses and Grounds

Fig. 2.



Schematic of Test Set Connections of Each Lead for False Battery Tests

Fig. 3.

leased in order to test for the opening of all contacts.

4.07 In position 5 or 14 of the connector test control switch, the leads to be tested for false battery are connected as shown in Fig. 3, operating the Z relays. The leads are then opened, releasing the corresponding Z relays. If any of the leads are crossed with battery, the corresponding Z relay fails to release.

4.08 With the connector test control switch in position 6 or 15, all leads are connected as shown on Fig. 3 and tested for false battery by releasing the decoder multi-contact relays of the decoder connector. This test is effective only in the decoder connector, not extending to the decoder, and also serves to test for the opening of all contacts of the decoder multi-contact relays of the decoder connector.

4.09 In position 7 or 16 of the connector test control switch, all leads are connected as shown on Fig. 1 and the test circuit multi-contact relays in the decoder connector are released to test for the opening of all contacts.

4.10 When tests have been completed on the path between the first decoder connector and the first decoder, the succeeding decoder connectors of the first group are connected and their respective paths to the first decoder are tested in the same manner.

4.11 When the paths of all decoder connectors to the first decoder have been tested, the operations are repeated, using each of the remaining decoders.

4.12 When the paths from all decoder connectors to all decoders have been completed in the first group, similar tests are made in the second group.

4.13 In the event of a test failure, refer to part 5 " Procedure in Case of Alarm."

4.14 If no trouble is encountered, the test proceeds until the path between the last decoder connector and the last decoder has been tested, when the EC (end of cycle) lamp lights.

4.15 To stop the test at any time, restore the ST key to normal.

4.16 To repeat the cycle, when the EC lamp has lighted, release and reoperate the ST key.

(b) Test of the Paths between all Decoder Connectors and a Particular Decoder

4.17 Operate the CONN key.

4.18 Operate the PPH (particular path) and LP (lamp) keys.

4.19 Operate the PC (particular circuit) key and select the decoder whose paths it is desired to test by depressing the proper DR-GR (decoder group) and DRS (decoder selection) keys. When the decoder selection switch has taken the proper setting, as indicated by the group and decoder lamps lighted, release the PC and LP keys.

4.20 Operate the ST key to start the test.

4.21 The series of tests described in paragraphs 4.04 to 4.09 are made on the paths from all decoder connectors successively to the decoder which has been selected.

4.22 In the event of a test failure, refer to part 5 " Procedure in Case of Alarm."

4.23 If no trouble is encountered, the tests proceed until the path from the last decoder connector to the decoder has been tested, when the EC lamp lights.

4.24 To stop the test at any time, restore the ST key to normal.

4.25 To repeat the cycle when the EC lamp has been lighted, release and reoperate the ST key.

(c) Repeat Tests of the Paths between a Particular Decoder Connector and all Decoders Successively

4.26 Make the sender frame associated with the decoder connector to be tested busy at the sender make-busy panel.

4.27 Operate the CONN key.

4.28 Select the desired decoder connector as follows:

4.29 Operate the PC and LP keys.

4.30 Depress the CONN-FR (connector frame) key corresponding to the frame on which the decoder connector to be tested is located and the proper DR-GR key.

4.31 Depress the A, B or C connector selection key.

4.32 When the connector selection switches have taken the proper setting, as indicated by the decoder connector lamps, restore the PC and LP keys and operate the REP (repeat) key.

4.33 Note the reading of the REP register. This register records the number of repeat tests made.

4.34 Operate the ST key to start the test.

4.35 The various decoders are connected successively to the decoder connector which has been selected and the series or tests described in paragraphs 4.04 to 4.09 is made on each path.

4.36 In the event of a test failure, refer to part 5. " Procedure in Case of Alarm."

4.37 If no trouble is encountered, the test is repeated on all paths of the decoder connector under test.

4.38 When the required number of tests have been completed, as indicated by the REP register, stop the test by restoring the ST key to normal.

4.39 Restore the associated sender frame to service by removing the No. 184 plug from the FB jack at the sender make-busy panel.

(d) Repeat Tests of the Path between a Particular Decoder Connector and a Particular Decoder

4.40 Make the sender frame associated with the decoder connector to be tested busy at the sender make-busy panel.

4.41 Operate the CONN key.

4.42 Select the desired decoder connector as described in paragraphs 4.28 to 4.31 and operate the REP key.

4.43 Operate the PPH key and select the desired decoder by depressing the proper DR-GR and DRS keys.

4.44 Restore the PC and LP keys.

4.45 Note the reading of the REP register.

4.46 Operate the ST key to start the test.

4.47 The series of tests described in paragraphs 4.04 to 4.09 are repeated on the path under test.

4.48 In the event of a test failure, refer to part 5. " Procedure in Case of Alarm."

4.49 When the desired number of tests have been completed, as indicated by the REP register, stop the test by restoring the ST key to normal.

4.50 Restore the associated sender frame to service by removing the No. 184 plug from the FB jack at the sender make-busy panel.

5. PROCEDURE IN CASE OF ALARM

5.01 Should a trouble be encountered on any of the tests described above, the test circuit is blocked, and, after the predetermined time interval, gives an alarm. When this occurs, the TBL and TT lamps at the test frame are lighted and the large d-c. bell at the trouble indicator from is tapped at intervals. An indication of the condition is also given at the floor alarm board by the lighting of the TT lamp and, if the TR key at the test frame is operated, the audible alarm operates.

5.02 Operate the TA (time alarm) key to retire the test frame alarms while the trouble is being traced.

5.03 Operate the PPH and REP keys if they are not already operated.

5.04 Operate the LP key.

Note: Due to the combined heating effect of the indicating lamps, which may be harmful to the panel, the LP key should not be operated for a longer period than is necessary.

5.05 Ascertain the path under test by means of the DR-GR and DR lamps and the CONN-FR and CONN lamps lighted at the test frame.

5.06 If the sender frame associated with decoder connector under test has not been made busy, make it busy at the sender make-busy panel.

5.07 Observe the position of the control switch at the test frame to determine the test on which the failure occurred. These tests and the positions in which they are made are listed below:

Connector Test Control Sw. Position	Test
2 or 11	Continuity test.
3 or 12	False ground and cross test, and time alarm test.
4 or 13	Test of contacts on test circuit multi-contact relay of decoder.
5 or 14	False battery test on leads not normally connected to battery in decoder (transmitting leads).
6 or 15	False battery test on all leads and test of contacts on decoder multi-contact relays of decoder connector.
7 or 16	Test of contacts on test circuit multi-contact relays of decoder connector.

5.08 Observe the (checking) Z lamps lighted at the test frame.

5.09 If the connector test control switch is found in position 2 or 11, the failure of any Z lamp to light, indicates an open in the corresponding lead.

5.10 If the connector test control switch is found in position 3 or 12, operate the LP1 key. Any lighted Z lamp indicates that the associated lead is grounded falsely, or crossed with another lead. In the latter case, the lamps associated with both leads are lighted.

5.11 If the connector test control switch is found in position 4 or 13, any Z lamp lighted indicates a failure to open the corresponding pair of contacts on the test circuit multi-contact relays of the decoder.

5.12 If the connector test control switch is found in position 5 or 14, operate the LP1 key. Any Z lamp which remains lighted indicates that there is a false battery on the corresponding lead.

5.13 If the connector test control switch is found in position 6 or 15, any lighted Z lamp indicates that either the associated lead has false battery on it somewhere in the decoder connector or the corresponding contacts on the decoder multi-contact relays of the decoder connector are not opened.

5.14 If the connector test control switch is found in position 7 or 16, any Z lamp lighted indicates that the corresponding contacts of the test circuit multi-contact relays in the decoder connector are not opened.

5.15 If the trouble is located in the decoder, and is such that other decoder connectors may be affected, make the decoder busy by placing a No. 184 plug in the associated DB jack.

5.16 Should the trouble disappear before it has been located, operate the CA (control advance) key and make repeat tests of the path on which the failure occurred in an effort to reproduce the condition. If no further trouble is encountered after an adequate number of repeat tests, release the TA key and the REP and PPH keys, if necessary, and proceed with the testing.

5.17 With the REP key operated, the functions of the CA key are extended to the decoder and decoder connector frames by means of remote control jacks (B). The operation and release of the red button of a No. 32-A test set plugged into one of these jacks or the momentary insertion of a No. 184 plug has the same effect as the operation and release of the CA key.

5.18 After locating and clearing a trouble in a decoder connector or decoder, make repeat tests, as required, to insure the proper operation of the equipment before restoring it to service.

5.19 Restore the decoder connector (and the decoder if it has been made busy) to service by removing the No. 184 plugs.

6. REPORTS

6.01 The required record of this routine should be entered on the proper form.