

DATA SET 109H-TYPE PRIVATE LINE APPLICATION MAINTENANCE

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1. GENERAL

1.01 This section provides the maintenance procedures to be followed when using a data set 109H-type (Fig. 1) as part of a private line system.

1.02 The data set 109H-type does not require routine or periodic maintenance; however, these maintenance procedures are used to aid in locating and clearing a trouble condition.

1.03 The data station is maintained by replacing the data set and/or associated components (Fig. 1) if they prove to be defective. This section provides information on data set 109H-type only, and does not contain information on any associated business machine or customer-provided terminal (CPT).

1.04 When a data set is replaced, the defective unit should be carefully packed (in original-type cartons if available) and returned to the distributing house in accordance with normal procedures.

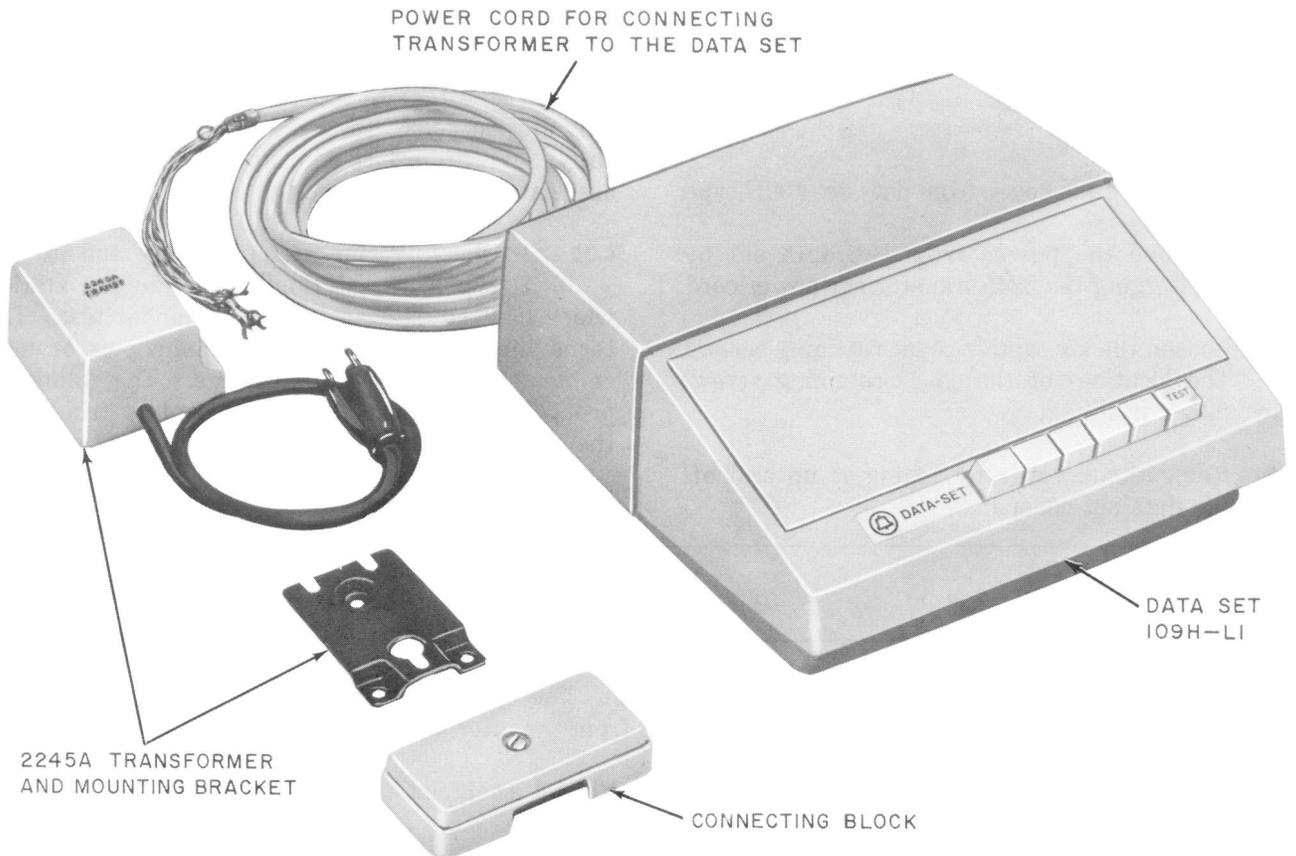


Fig. 1—Data Set 109H-L1—Accessories

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2. MAINTENANCE AIDS

2.01 No special tool or equipment is required to perform the following maintenance checks or activities. A KS-20538-L1 volt-ohm-milliammeter or equivalent is used to make the checks or adjustments called for in these maintenance procedures.

2.02 Before starting the maintenance procedures outlined in this section, a visual inspection of the data set should be made. This check should include all cords and connections.



A copy of the section entitled Data Set 109H-Type—Private Line Application—Installation (591-037-200) will be required to check station installation.

2.03 Determine the options required at this station, and using the installation BSP, check the connections required to install these options. After verifying that the data set is properly installed and undamaged, proceed with the trouble clearing procedures outlined in Part 4.

3. MAINTENANCE PROCEDURES

Cover Removal

3.01 To remove the cover from data set 109H-type:

- (1) Remove the power from the data set by unplugging the 2245 transformer power cord.
- (2) Loosen the six captive cover retaining screws. The locations of the cover retaining screws are shown in Fig. 2.
- (3) Remove the cover by lifting it up and off the data set basepan.

Note: The cover removal procedure is identical for all data set models.

Cover Replacement

3.02 To replace the cover on the data set, proceed as follows.

- (1) Make sure the cover retaining screws are loose so that they will engage the cover brackets.
- (2) Lower the cover into place over the basepan so that the cover brackets engage the cover retaining screws. Check the positioning of the cover to make sure it is not binding on the data set keys.
- (3) Tighten the cover retaining screws (Fig. 2) to lock the cover in place.

4. TROUBLESHOOTING PROCEDURES

4.01 A suggested sequence of maintenance is given in the flowchart in Fig. 3. The blocks of the flowchart are numbered to provide easy reference. Although the numbers are for reference only and do not indicate the sequence of operation, they correspond to the step numbers of the associated step-procedure.

4.02 In the following step-procedure and in Fig. 3, the term "station" refers to the station which has the data set 109H-type under test. The term "line" refers to the telephone pair or loop connected between the data sets. The following procedure does not attempt to isolate trouble in the equipment associated with the data set.

4.03 Test Procedure:

STEP	PROCEDURE
1	When trouble is experienced with a private line system, it is reported to the telephone company and a trouble report is filled out from the information supplied by the customer.
2	After a trouble report is received it should be analyzed to determine, if possible, the cause or location of the trouble condition.
3	If an analysis of the trouble report indicates that the trouble condition could not be caused by the near-end station, proceed to Step 4. When the cause of the trouble seems to be

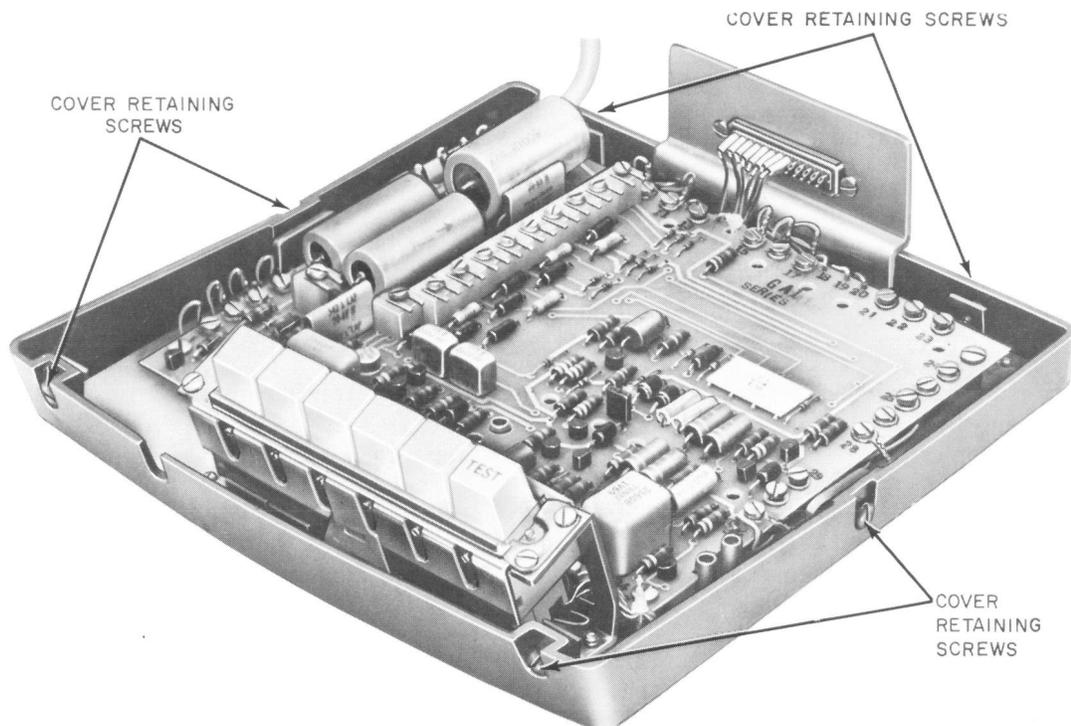


Fig. 2—Data Set 109H-Type—Cover Removed

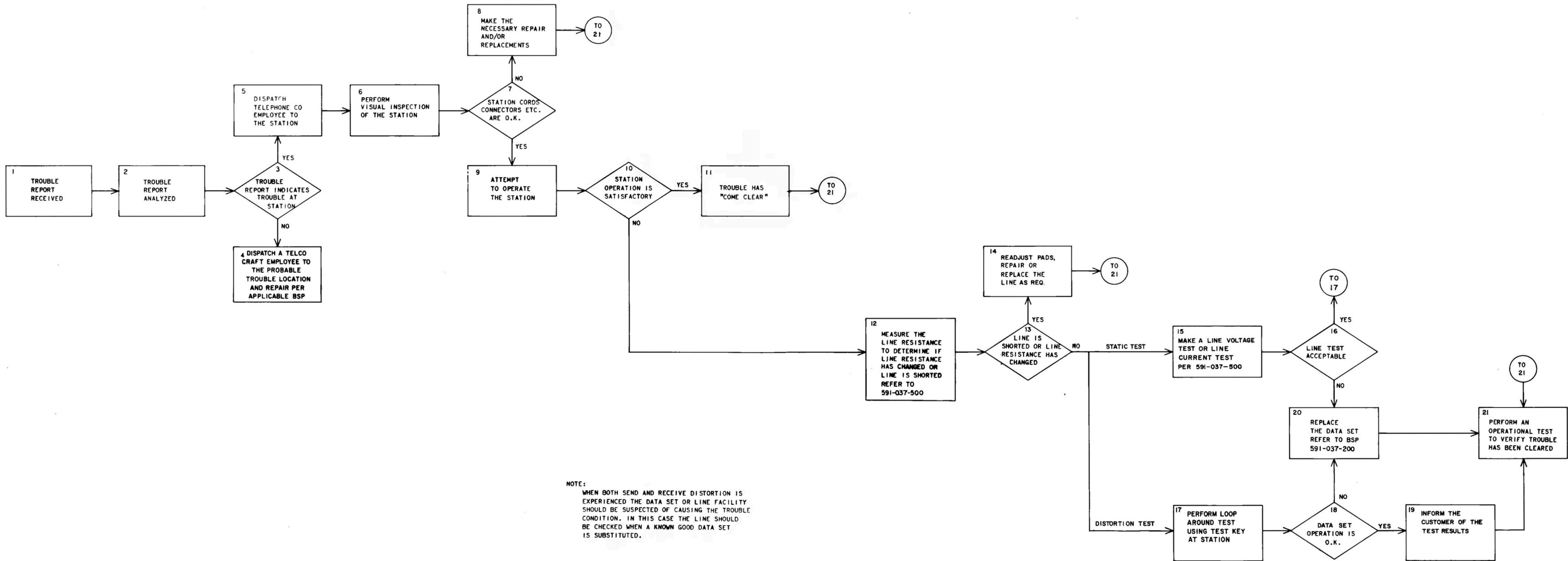
STEP	PROCEDURE
	at the near-end station or cannot be pinpointed from the trouble report, omit Step 4 and proceed to Step 5.
4	When analysis of the trouble report indicates that the trouble is located at the far-end station rather than at the near-end station, a telephone company craft employee will have to be dispatched to the probable trouble location to clear the trouble condition. When the trouble condition is located and corrected, this completes the trouble-clearing procedures given in this practice, and Steps 5 through 20 can be omitted.
5	When analysis of the trouble report indicates that the trouble is located at the near-end station or in cases where the location of the trouble cannot be pinpointed, a telephone craft employee will have to be dispatched to the station.
6	Upon arrival at the station, the telephone company employee should perform a visual inspection of the station to determine if there is any physical damage or obvious reason for the reported trouble.
7	When there has been some physical damage to the station (eg, broken cord or connectors), proceed to Step 8. If a visual inspection of the station does not locate anything that could cause the trouble condition, proceed to Step 9.
8	Make the necessary repairs and/or replacements to restore the station to service. Proceed to Step 21 and perform an operational test of the station to verify that the station is operative and that the trouble condition has been cleared.

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STEP	PROCEDURE
9	Attempt normal operation of the station.
10	When the station operates satisfactorily, proceed to Step 11. When trouble occurs during the attempt to operate the station, proceed to Step 12.
11	When the station operates properly, the trouble condition may have "come clear." In order to verify the station operation, proceed to Step 21 and perform the indicated operation test.
12	Measure the line resistance to determine the line resistance value and verify the line is not shorted or otherwise impaired. Refer to the section entitled Data Set 109H-Type—Private Line Application—Test Procedures (591-037-500) for information on making this test.
13	When the line is not shorted, compare the measured resistance value with the line order or line circuit card. If the resistance is within ± 65 ohms of the correct value, proceed to Step 15. If the line is shorted or there has been a change of ± 65 ohms in the line resistance, proceed to Step 14.
14	When the line is shorted, it must be repaired or replaced. If the resistance value of the line has changed, determine if the data set pads can be adjusted to compensate for this change. When the data set pads can be changed to give an acceptable total resistance value, they should be reset and the station retested to determine if the trouble condition has been cleared. When the data set pads cannot be adjusted to provide an acceptable resistance, the line will have to be repaired or replaced. Upon completion of the repair or replacement, proceed to Step 21 and test the operation of the station to verify that the trouble condition has been cleared. Note: For information on setting the data set pads, refer to Section 591-037-200.
15	When the previous tests indicate that the line is satisfactory and the station will not operate properly, perform a line current or voltage test. When making these tests, refer to Section 591-037-500.
16	When the line test indicates the line is acceptable, proceed to Step 17; if not, proceed to Step 20. Note: Step 17 refers to performance tests such as checking the slicing level and loop-back testing of the data set. An alternate method of locating a possible trouble is to perform an end-to-end distortion test as given in Section 591-037-500. An acceptable distortion test or slicing level test indicates that the data set is functioning properly and the terminal equipment should be suspected of causing the trouble condition (see Step 19). When testing indicates high distortion, the data set should be suspected of causing the trouble (see Step 20).
17	Performance of the data set can be verified by checking the ability of the data set to detect and recognize marking and spacing signals. The data set may also be tested from the far end by depressing the TEST key. This loops data through the data set and back to the far end. In order to perform either the slicing level test or loop-around test, refer to the applicable parts of Section 591-037-500.
18	When testing indicates that the data set is operating properly, proceed to Step 19. If the data set is causing the trouble condition, proceed to Step 20.

STEP	PROCEDURE
19	Inform the customer of the results of the preceding test and request that the terminal equipment operation be checked and verified. After checking and verifying that the terminal equipment is operative, an overall system operational test should be made to verify that the trouble condition has been cleared.
20	A known good data set can be substituted if the data set is suspected of causing the trouble. When a replacement data set is substituted, it must be equipped with all the required options and features provided by the data set that is being replaced. Refer to Section 591-037-200 for information on providing the required features and options. Refer to the applicable parts of this section for information on gaining access, removal, and reinstallation of the data set.
21	<p>Perform an operational test of the data station to verify that the trouble condition has been cleared before returning the station to service. Refer to Section 591-037-500.</p> <p><i>Note:</i> If the trouble condition has not been located and eliminated by the preceding step-procedure, request the help through proper lines of authority to clear the trouble condition.</p>

4.04 After completion of the maintenance procedures and verification that the trouble condition has been eliminated, return the station to service.



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Fig. 3—Trouble Locating Procedure and Maintenance Flowchart