

DATA SET 109C-TYPE
USED IN 10-TYPE DATA LINE CONCENTRATOR SYSTEM (DATREX*)
MAINTENANCE

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1. GENERAL

1.01 This section describes the maintenance procedure for Data Set 109C-type when installed in model No. 33 or 35 teletypewriter (TTY) and used in DATREX service. Figure 1 illustrates Data Set 109C-L1 installed in a model 33 TTY.

* Service mark of the Bell System.

1.02 Routine maintenance is not required on Data Sets 109C-type.

1.03 Data Sets 109C-type suspected of being in trouble should be tested as described in the section entitled Data Set 109C-Type Used in Data Line Concentrator System (DATREX*), Test Procedures (591-031-501). If the data set meets the test requirements:

- (a) Verify with the customer that the terminal equipment and associated cords test satisfactorily.
- (b) Check for connector and cord defects in the data station.
- (c) Check for intermittent trouble in station wiring.

1.04 Data sets not meeting test requirements should be replaced in order to restore customer service as quickly as possible.

2. MAINTENANCE AIDS

2.01 For overall circuit information, refer to CD and SD-1D164-01. Additional information is contained in the following sections:

| SECTION | TITLE |
|-------------|--|
| 591-031-101 | Data Set 109C-Type Description and Operation |
| 591-031-201 | Data Set 109C-Type Installation |
| 591-031-501 | Data Set 109C-Type Test Procedures |

2.02 In addition to standard hand tools, a KS-14510-L1 volt-ohm-milliammeter (VOM), or equivalent, will be required.

3. MAINTENANCE PROCEDURES

3.01 To gain access to Data Set 109C-type it is necessary to remove the TTY cover. The

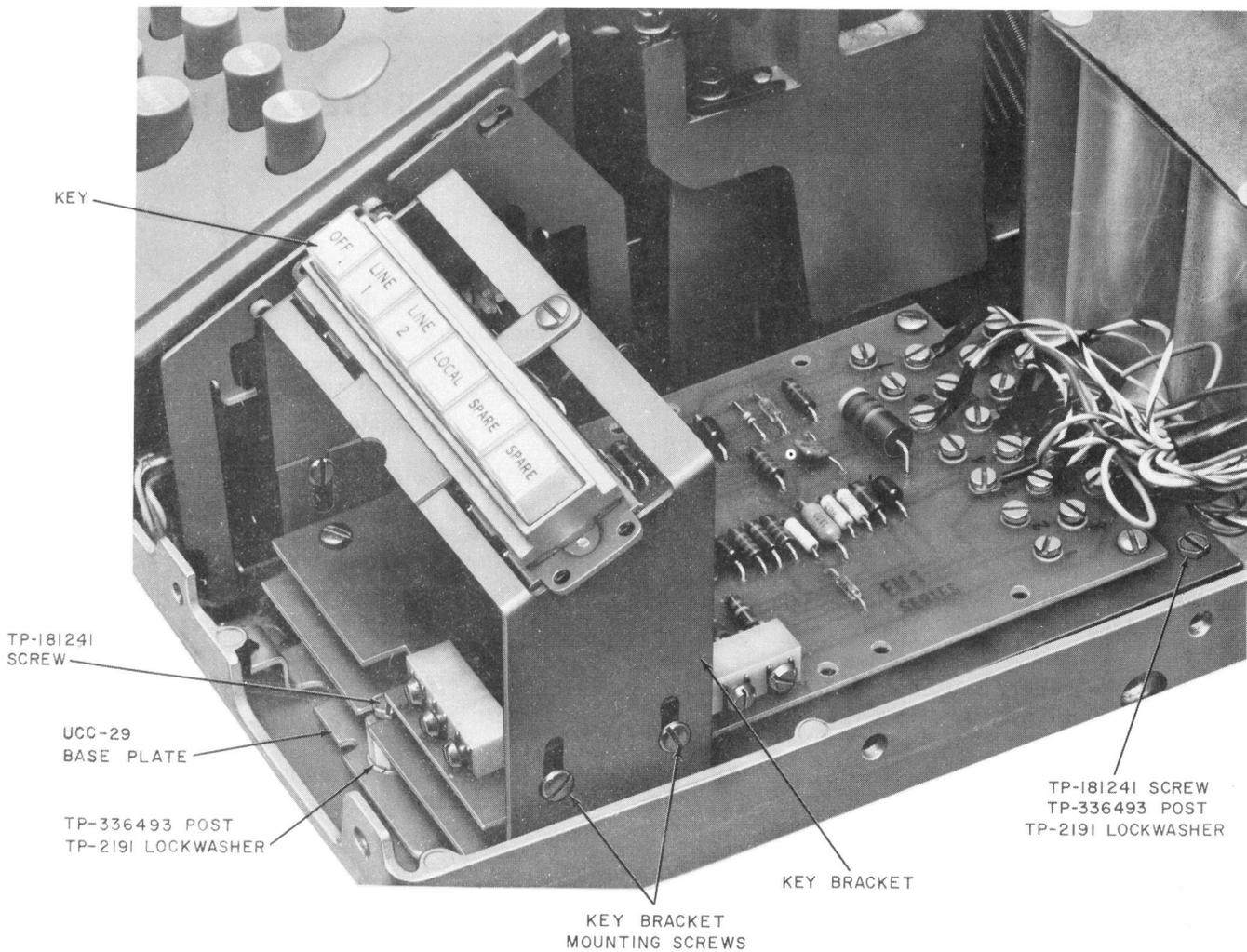


Fig. 1—Data Set 109C-L1 Installed in Model No. 33 Teletypewriter

mounting of the data set and TTY cover removal differ for the model No. 33 and 35 TTYs.

A. Cover Removal, Model No. 33 Teletypewriter

3.02 Cover Removal Procedure:

- (a) Disconnect TTY power cord from wall receptacle.
- (b) Remove telephone line plug or red lead of mounting cord when a 42A connecting block is used.
- (c) Remove paper and paper roll spindle.
- (d) Remove the two screws that secure the bezel to the cover and remove the bezel by lifting vertically.
- (e) Remove nameplate by pulling outward and down.
- (f) Remove the four front cover screws.
- (g) Remove the three rear cover screws.
- (h) Remove setscrews from the left side of the tape reader (ASR set only).
- (i) Remove teletypewriter cover by lifting vertically.

B. Removal of Data Set 109C-Type From Model No. 33 Teletypewriter

3.03 Data Set Removal Procedure:

- (a) Remove the gray plastic collar from the data set keys.
- (b) Disconnect the loop leads from the data set and unplug the TTY cable from the call control unit.

Note: The TTY cord terminates in spade lugs which are attached to screw terminals on the rear of the data set. See the section entitled Data Set 109C-Type Used in Data Line Concentrator System (DATREX*), Installation (591-031-201).

- (c) Remove the three mounting screws (one in front center and two at the rear) which secure the data set baseplate to the posts on the call control unit (Fig. 2).

- (d) Lift the data set vertically and remove it from the teletypewriter.

- (e) If desired, disconnect the TTY cord which is connected to the screw terminals at the rear of the data set.

C. Reinstalling Data Set 109C-Type in Model No. 33 Teletypewriter

3.04 Reinstallation Procedure:

- (a) Replace the gray plastic collar over data set keys so that it seats firmly.
- (b) Connect spade terminals of TTY cord to screw terminals on rear of data set. See section entitled Data Set 109C-Type, Data Line Concentrator System (DATREX*), Installation (591-031-201).
- (c) Place data set in position in front of the UCC 29 call control unit so that the screw

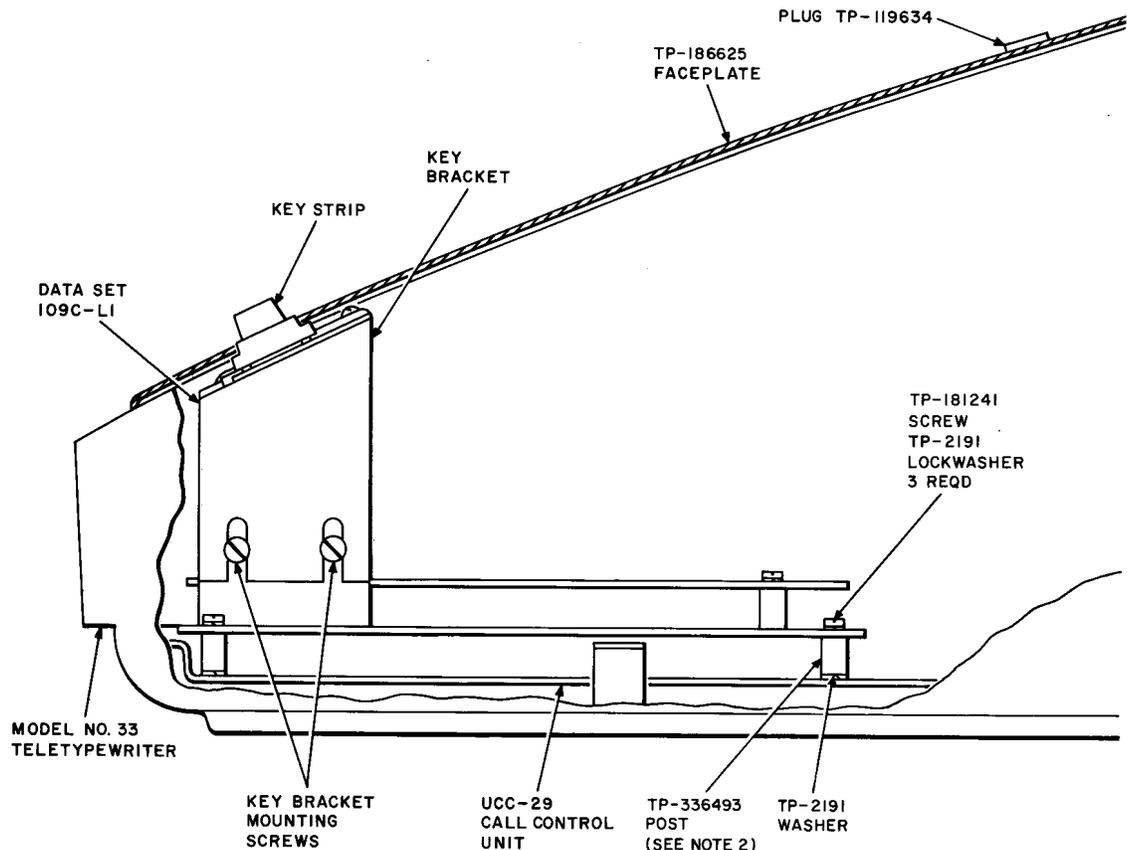


Fig. 2—Mounting Details, Data Set 109C-L1 in Model No. 33 Teletypewriter

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slots in the metal bracket of the data set line up with the spacers on the UCC 29 baseplate. See Fig. 2.

(d) Insert the three mounting screws through the slots in the metal bracket of the data set; position data set so that key collar is in the center of the faceplate opening, and tighten mounting screws. Connect TTY cord by plugging into call control unit.

(e) Replace TTY cover.

(f) Adjust the height of the key bracket so that its top is flush with the TTY cover.

Note: It may be necessary to reposition the data set so that the key collar is in the center of the key opening in the faceplate.

(g) Reconnect telephone line and power cord which were disconnected in 3.02(a) and (b).

(h) Perform operational test. See section entitled Data Set 109C-Type Used in Data Line Concentrator System (DATREX*), Test Procedures (591-031-501).

D. Cover Removal, Model No. 35 Teletypewriter

3.05 Cover Removal Procedure:

(a) Disconnect teletypewriter power cord from wall receptacle.

(b) Remove telephone line plug or red lead of mounting cord if equipped with 42A connecting block.

(c) Operate the two cover latches on each side of the upper cover and open the upper cover to its partially open position.

(d) Remove the two pan head screws securing the pushbutton assembly in the faceplate area from the underside of the pedestal.

(e) Remove the two screws securing the faceplate to the lower cover and remove the faceplate by lifting vertically.

(f) Grasp the handgrips located in the front of the lower cover, operate the cover latch and raise the cover.

(g) Verify that the left rear stop arm is latched when the lower cover is fully open.

E. Removal of Data Set 109C-Type From Model No. 35 Teletypewriter

3.06 Data Set Removal Procedure:

(a) Remove the gray plastic collar from the data set keys.

(b) Disconnect the loop leads from the data set and unplug the TTY cable from the call control unit.

(c) Remove the two mounting screws from beneath the pedestal pan.

(d) Lift data set vertically and remove the nutplate that is positioned beneath the EU1 circuit pack (Fig. 3).

(e) If desired, disconnect the TTY cord which is connected to the screw terminals at the rear of the data set.

F. Installing Data Set 109C-Type in Model No. 35 Teletypewriter

3.07 Installation Procedure:

(a) Connect spade-ended leads to data set. See Data Set 109C-type installation practice.

(b) Place the TP-336459 plate in the pedestal pan so that holes in the plate line up with the holes in the pan (Fig. 3).

(c) Place the TP-192271 nutplate between the EU1 circuit pack and the metal baseplate of the data set so the holes in the baseplate and nutplate line up. It may be necessary to insert a toothpick or spudger into the holes from beneath the pedestal pan to ensure proper alignment of the mounting screw holes in nutplate, data set baseplate, and plate on pedestal pan. Take care not to damage the printed wiring on the EU1 circuit pack.

(d) Insert the two TP-55320 mounting screws through the holes in the bottom of the pedestal pan and start them in the nutplate (Fig. 3).

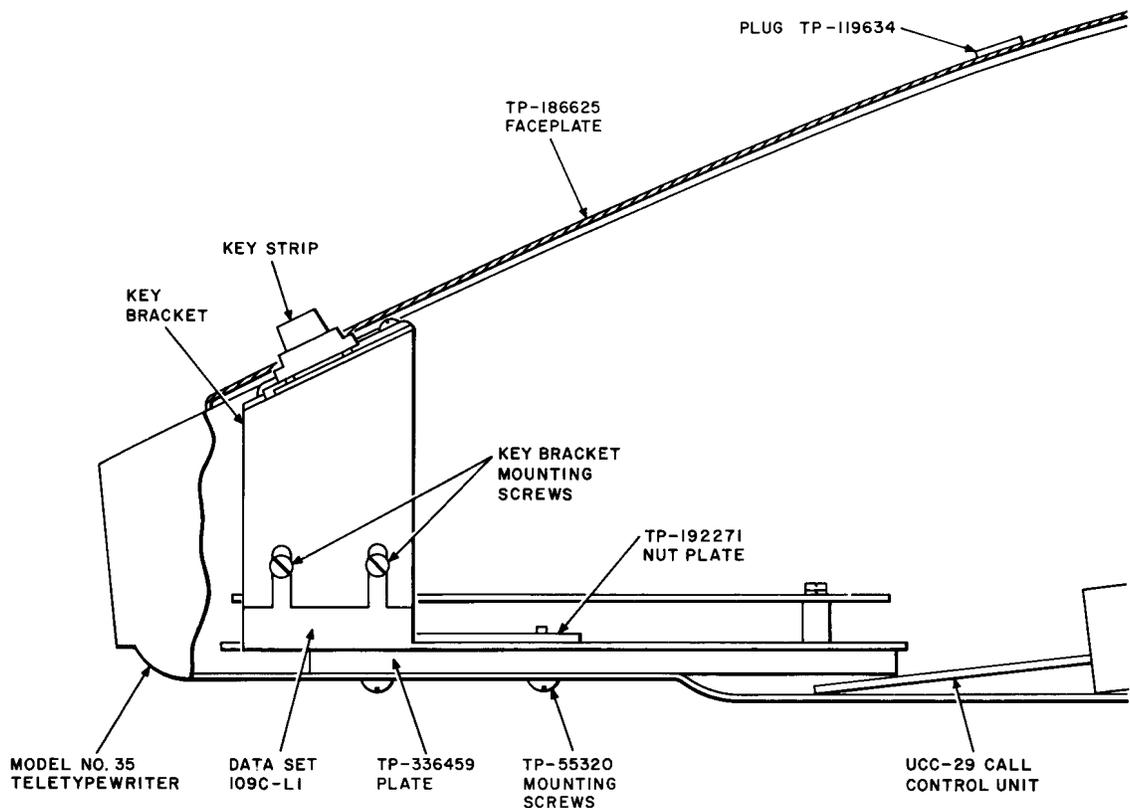


Fig. 3—Mounting Details, Data Set 109C-L1 in Model No. 35 Teletypewriter

- (e) Adjust the height of key bracket so it is flush with bezel when the cover is closed.
- (f) Lay faceplate in position on cover, position data set so that key strip is in center of faceplate opening, and tighten data set mounting screws.
- (g) Plug TTY cord connector into UCC 29 call control unit.
- (h) Reconnect telephone and power cord which were disconnected in 3.05(a) and (b).
- (i) Perform operational test. See section entitled Data Set 109C-Type Used in Data Line Concentrator System (DATREX*), Test Procedures (591-031-501).

4. MAINTENANCE ACTIVITIES

4.01 A suggested sequence of maintenance is given by Fig. 4, Trouble Locating Procedure and Maintenance Flowchart. 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 operations, they correspond to the steps of the associated step-procedure in 4.03.

4.02 In the following step-procedure and Fig. 4, the term "station" refers to the data transmission equipment connected to the line side of the concentrator. The term "line" refers to the telephone pair or loop connected between the data set and the concentrator. The following procedure does not attempt to indicate trouble in the concentrator or in equipment associated with the trunk side of the concentrator, since this is covered by other BSPs.

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4.03 Maintenance Procedure:

| STEP | PROCEDURE |
|-------------|--|
| 1 | When trouble is experienced with DATREX system, it is reported to the telephone company and a trouble report is filled out from the information received from the customer. After a trouble report is received, it should be analyzed to determine, if possible, the cause or location of the trouble condition (see 591-811-300). |
| 2 | If an analysis of the trouble report indicates the trouble condition could not be caused by the station on the line side of the concentrator (line station), proceed to Step 3. When the cause of the trouble seems to be at the line station, or cannot be pinpointed from the trouble report, proceed to Step 4. |
| 3 | When analysis of the trouble report indicates the trouble is located at the concentrator or other specific location instead of the line station, dispatch must be made to that location. When this is the case, the organization receiving the trouble report will be responsible for dispatching a telephone company employee to clear the trouble condition. |
| 4 | When analysis of the trouble report indicates the trouble is located at the line station, or in cases where the location of the trouble cannot be pinpointed, a telephone company employee will be dispatched to the station. |
| 5 | 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. |
| 6 | When there has been some physical damage to the station (broken cord or connectors, etc), proceed to Step 7. If a visual inspection of the station does not locate any obvious causes of the trouble condition, proceed to Step 8. |
| 7 | Make the necessary repairs and/or replacements to restore the station to service. Proceed to Step 26 and perform an operational test of the station to verify the station is operative and the trouble condition has been cleared. |
| 8 | Attempt normal operation of the station. |
| 9 | If the station operates satisfactorily, proceed to Step 10. If trouble occurs during the attempt to operate the station, proceed to Step 11. |
| 10 | If the station operates properly, the trouble condition may have "come clear." In order to verify the station operation, proceed to Step 26 and perform the indicated operational test. |
| 11 | If the station does not operate properly, analyze the operation or failure of the station to operate to determine the cause of the trouble. |
| 12 | If the cause of the trouble is obvious from the attempted operation (mechanical problems with TTY, etc), proceed to Step 13. When the cause of the trouble is not apparent, proceed to Step 14. |

| STEP | PROCEDURE |
|------|--|
| 13 | Make the required repairs and/or adjustments to clear the trouble condition. After the trouble has been corrected, perform an operational test in Step 26 to verify the operation of the station as part of the DATREX system. |
| 14 | When the cause of the trouble cannot be determined by analysis of station operation, perform the local test. If the station operates properly in the local mode, perform the applicable tests indicated in Steps 15, 18, 19, and 20. |
| 15 | If the station does not operate properly in the local mode, proceed to Steps 24 and/or 26. These tests are not separable. |
| 16 | <p>Measure the line resistance to determine the line resistance value and verify that the line is not shorted.</p> <p><i>Note:</i> If a VOM is applied to the metallic loop at the station, it is possible that the line circuit of the concentrator will operate and cause a through put (connection).</p> |
| 17 | If the line is not shorted, compare the measured resistance value with the line order or line circuit card. If the resistance has not changed appreciably, proceed to Step 26. If the line is shorted or the resistance has changed, proceed to Step 18. |
| 18 | <p>If 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. If the data set pads can be changed to give an acceptable total resistance value, the data set pads should be reset and the station tested to determine if the trouble condition has been cleared. If the data set pads cannot be adjusted to provide an acceptable resistance value, the line will have to be replaced. Upon completion of the repair or replacement, proceed to Step 27.</p> <p><i>Note:</i> For information on setting the data set pads, refer to section entitled Data Set 109C-Type Used in 10-Type Data Line Concentrator System (DATREX*) Installation (Section 591-031-201).</p> |
| 19 | If the station is not connecting, perform a line current test. For information on making this test, refer to the section entitled Data Set 109C-Type Used In 10A Data Line Concentrator System (DATREX*) Test Procedures (Section 591-031-501). |
| 20 | Send distortion, ie, distortion transmitted to the line by the station, may result from dirty or damaged send contacts in the TTY or a malfunction of the data set. Refer to the applicable Field Maintenance Practice (FMP) for information on testing the teletypewriter to determine if it is causing this trouble condition. |
| 21 | Receive distortion may result for a distorted signal coming in from the line, or a malfunction of the data set or teletypewriter. Refer to the applicable FMP for information on testing the TTY to determine if it is the cause of the distortion. |
| 22 | If the line current test indicates the data station is supplying an acceptable connection signal to the concentrator, proceed to Step 23. If the connection signal is unacceptable, proceed to Step 26. |

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| STEP | PROCEDURE |
|------|---|
| 23 | If the line current is acceptable, the station is not the cause of the trouble experienced in connecting to the concentrator. In this case, an employee is dispatched to the concentrator. |
| 24 | When the TTY test and local operation of the station indicates the TTY is operating properly, proceed to Step 27. If the TTY is in trouble, proceed to Step 25. |
| 25 | Repair and/or adjust TTY per applicable FMP. After clearing the TTY trouble condition, proceed to Step 27. |
| 26 | After the line test has indicated the line is acceptable, a known good data set should be substituted to determine if the data set is defective. When a replacement data set is substituted it must be equipped with all the required options and features provided by the original set. Refer to the section entitled Data Set 109C-Type Used In 10-Type Data Line Concentrator System (DATREX*) Installation (591-031-201) for information on providing the required options and features. Refer to the applicable parts of this section for information on gaining access, removal and reinstallation of the data set. |
| 27 | 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 the section entitled Data Set 109C-Type Used In 10-Type Data Line Concentrator System (DATREX*), Test Procedures (591-031-501). |
| 28 | If the trouble condition has not been located and eliminated by the preceding step-procedure, request help through the proper lines of authority to clear the trouble condition. |
| 29 | After completion of the maintenance procedures and verification that the trouble condition has been eliminated, the station is returned to service. |

5. REFERENCES

5.01 For additional information on the DATREX system, refer to the following BSPs.

| SECTION | TITLE | 591-811-Series | 10-Type Data Line Concentrator System (DATREX*) |
|-------------|---|----------------|---|
| 591-810-100 | 10-Type Data Line Concentrator System (DATREX*) Description | 579-200-350 | Model 33 Teletypewriter, Field Maintenance Practice |
| 591-810-300 | 10-Type Data Line Concentrator System (DATREX*) Maintenance | 479-300-350 | Model 35 Teletypewriter, Field Maintenance Practice |

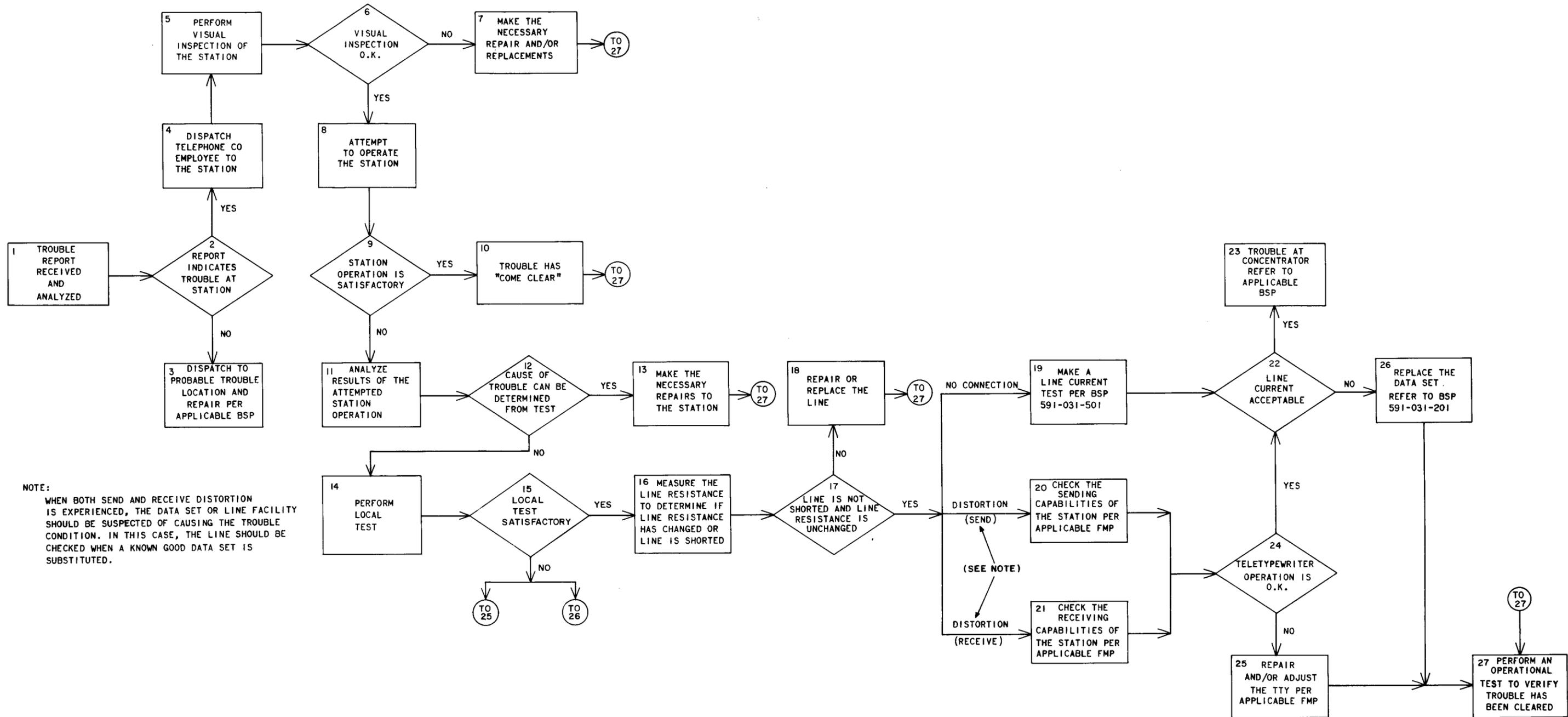


Fig. 4—Trouble Locating Procedures and Maintenance Flowchart