DATA SET 109C-TYPE

USED IN 10-TYPE DATA LINE CONCENTRATOR SYSTEM (DLCS*)

MAINTENANCE

1. GENERAL

1.01 This section provides a suggested maintenance procedure for Data Set 109C-type when installed in a model No. 33 or 35 teletypewriter (TTY) as part of a Data Line Concentrator System (DLCS) service. Figure 1 illustrates Data Set 109C-L1 installed in a model 33 TTY.

*Formerly called DATREX.

1.02 This section is reissued to include DDD dialing capabilities. This includes Data Set 109C-L1/3 (rotary dial) and Data Set 109C-L1/4 (TOUCH-TONE® dial). Since this reissue constitutes a general revision, arrows which ordinarily denote changes have been omitted.

1.03 Routine maintenance is not required on Data Sets 109C-type. This section provides aids for locating and clearing a trouble condition.

1.04 The data station is maintained by replacing the data set and/or associated components if they prove to be defective. This section provides information on Data Set 109C-type only. It does not contain information on the 10-type data line concentrator or associated equipment.

1.05 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. A tag describing the trouble experienced should be affixed to the data set.

2. MAINTENANCE AIDS

2.01 In addition to standard hand tools, a KS-20538-L1 volt-ohm-milliammeter (VOM) with alligator-clip probes, or equivalent, will be required to make the checks or adjustments called for in these maintenance procedures.

2.02 The maintenance procedures used to isolate a trouble condition to a specific location or piece of equipment in a DLCS are contained in Section 591-810-300.

3. MAINTENANCE PROCEDURES

3.01 To gain access to Data Set 109C-type it is necessary to remove the TTY cover. The mounting of the data set and TTY cover removal differ for the model No. 33 and 35 TTYs.
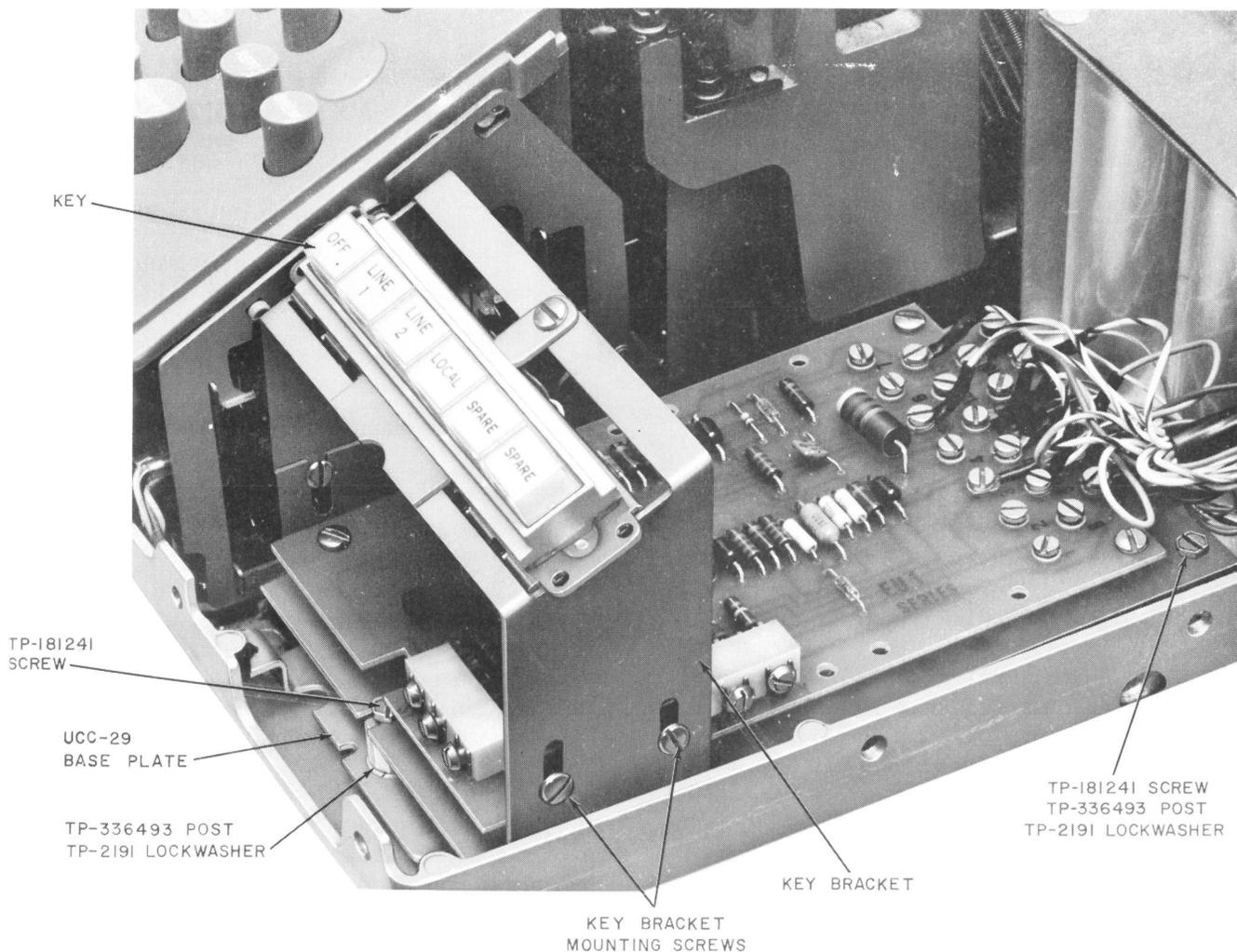
Fig. 1—Data Set 109C-L1 Installed in Model No. 33 Teletypewriter

A. Cover Removal, Model No. 33 Teletypewriter

3.02 *Cover Removal Procedure:*

(a) Disconnect TTY power cord from wall receptacle.

(b) Remove paper and paper roll spindle.

(c) Remove the two screws that secure the bezel to the cover and remove the bezel by lifting vertically.

(d) Remove nameplate by pulling outward and down.

(e) Remove the four front cover screws.

(f) Remove the three rear cover screws.

(g) Remove setscrews from the left side of the tape reader (ASR set only).

(h) 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) Disconnect the loop leads from the data set and unplug the TTY cable from the UCC-29 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 Section 591-031-201.

(b) If data set is coded List 3 or 4, disconnect the leads of the listen-only handset (receiver) from the screw terminals at the rear of the data set. Remove the anchor from under the EU1 circuit board mounting screw at the right rear of the data set. See Fig. 2 and 3.

(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. 4).

(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:*

Note: When making connections in the following procedure, refer to Section 591-031-201.

(a) Connect spade terminals of the TTY cord to screw terminals on rear of data set.

(b) If data set is coded List 3 or 4, pass the leads and anchor of the listen-only handset (receiver) through the bell adjustment slot under the TTY pedestal pan.

(c) Place data set in position in front of the UCC-29 call control unit so that the screw slots in the metal bracket of the data set line up with the spacers on the UCC-29 baseplate. See Fig. 4.

(d) Insert the three mounting screws through the slots in the metal bracket of the data set; position data so that key collar is in the center of the faceplate opening, and tighten mounting screws.

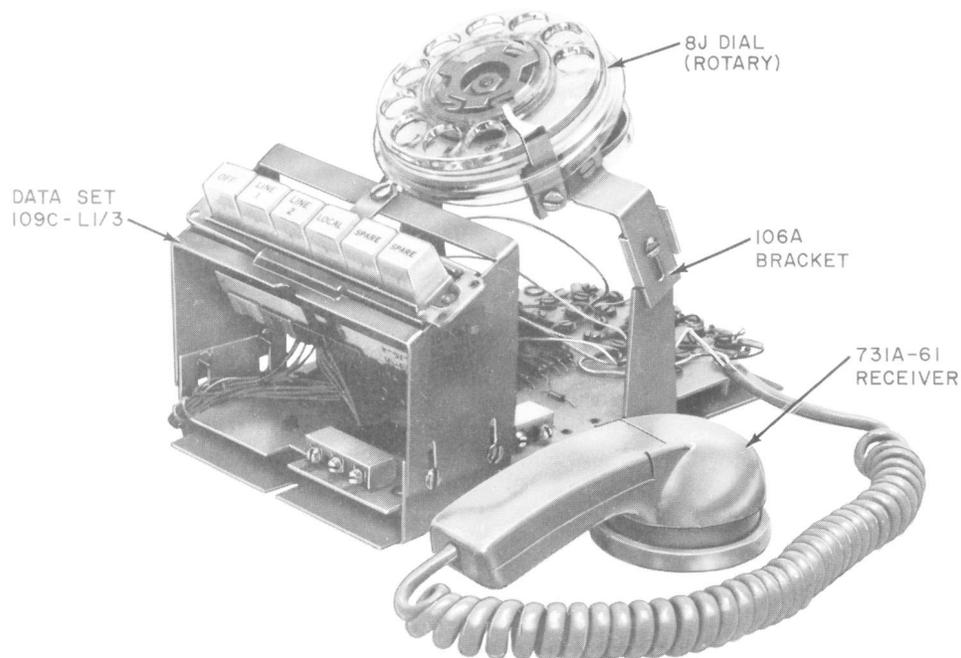(e) Connect TTY cord by plugging into UCC-29 call control unit.
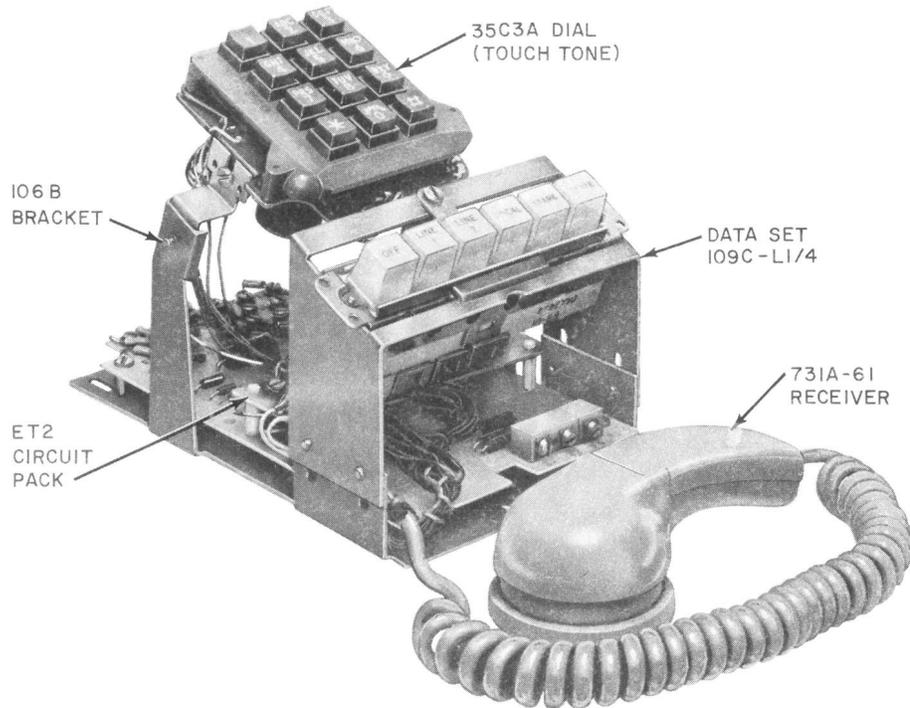

Fig. 2—Data Set 109C-L1/3

Fig. 3—Data Set 109C-L1/4

(f) Connect loop leads.

(g) If data set is coded List 3 or 4, connect the leads of the listen-only handset (receiver) to the screw terminals at the rear of the data set. Anchor the cord under the EU1 circuit board mounting screw at the right rear of the data set.

(h) Replace TTY cover.

(i) 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.

D. Cover Removal, Model No. 35 Teletypewriter

3.05 *Cover Removal Procedure:*

(a) Disconnect teletypewriter power cord from wall receptacle.

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

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

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

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

(f) 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) Disconnect the loop leads from the data set and unplug the TTY cable from the UCC-29 call control unit.

(b) If data set is coded List 3 or 4, disconnect the leads and anchor of the listen-only handset (receiver) from the screw terminals at the rear of the data set.
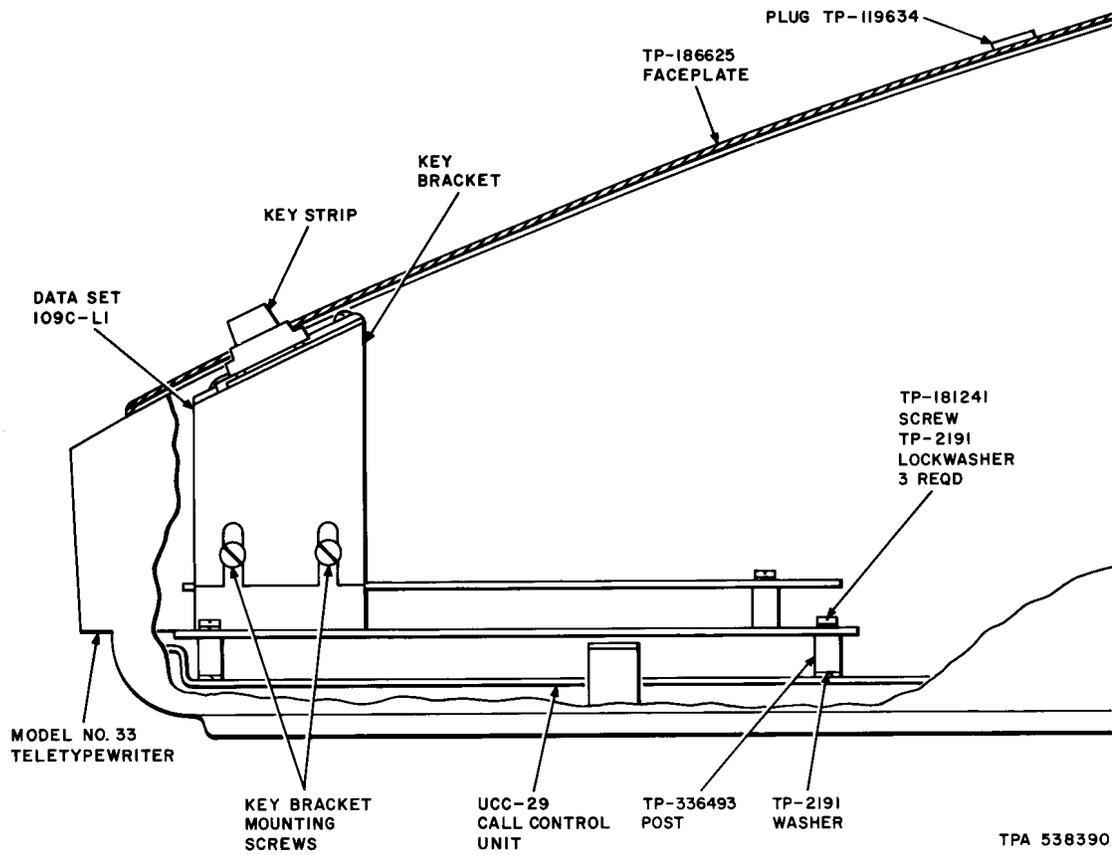
PLUG TP-119634

TP-186625
FACEPLATE

KEY
BRACKET

KEY STRIP

DATA SET
109C-LI

TP-181241
SCREW
TP-2191
LOCKWASHER
3 REQD

MODEL NO. 33
TELETYPEWRITER

KEY BRACKET
MOUNTING
SCREWS

UCC-29
CALL CONTROL
UNIT

TP-336493
POST

TP-2191
WASHER

TPA 538390

Fig. 4—Mounting Details, Data Set 109C-L1 in Model No. 33 Teletypewriter

(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. 5).

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

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

3.07 Reinstallation Procedure:

Note: When making connections in the following procedures, refer to Section 591-031-201.

(a) Connect spade-ended leads of TTY cord to data set.

(b) If data set is coded List 3 or 4, pass the leads and anchor of the listen-only handset (receiver) through the bell adjustment slot under the TTY pedestal pan.

(c) Place the TP-336459 plate in the pedestal pan so that holes in the plate line up with the holes in the pan (Fig. 5).

(d) Place the TP-199271 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.

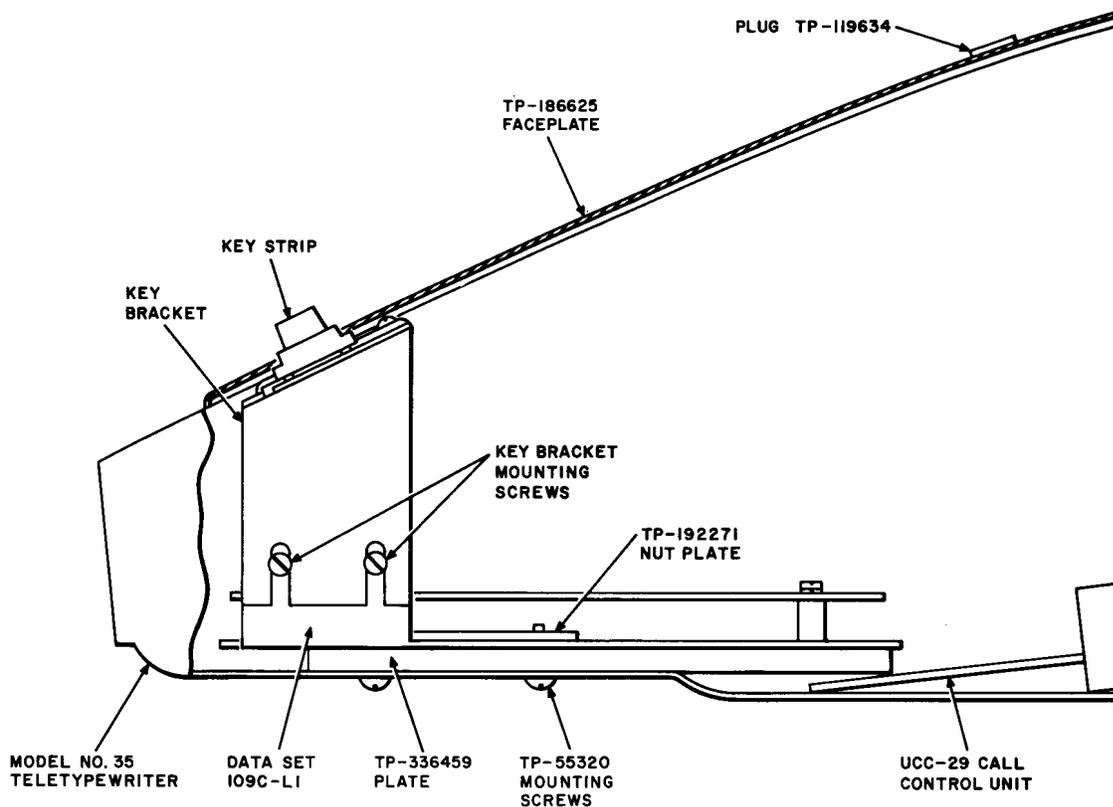(e) Insert the two TP-55320 mounting screws through the holes in the bottom of the

Fig. 5—Mounting Details, Data Set 109C-L1 in Model No. 35 Teletypewriter

pedestal pan and start them in the nutplate (Fig. 5).

(f) Adjust the height of key bracket so it is flush with bezel when the cover is closed.

(g) 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.

(h) Plug TTY cord connector into UCC-29 call control unit.

(i) Connect loop leads.

(j) If data set is coded List 3 or 4, connect the leads of the listen-only handset (receiver) to the screw terminals at the rear of the data set. Anchor the cord under the EU1 circuit board mounting screw at the right rear of the data set.

4. TROUBLESHOOTING PROCEDURES

4.01 A suggested sequence of maintenance is given by the flowchart in Fig. 6. 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. 6, 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. It is assumed that any trouble has been isolated to the data set and interface equipment before following this step-procedure.

4.03 *Maintenance Procedure:*

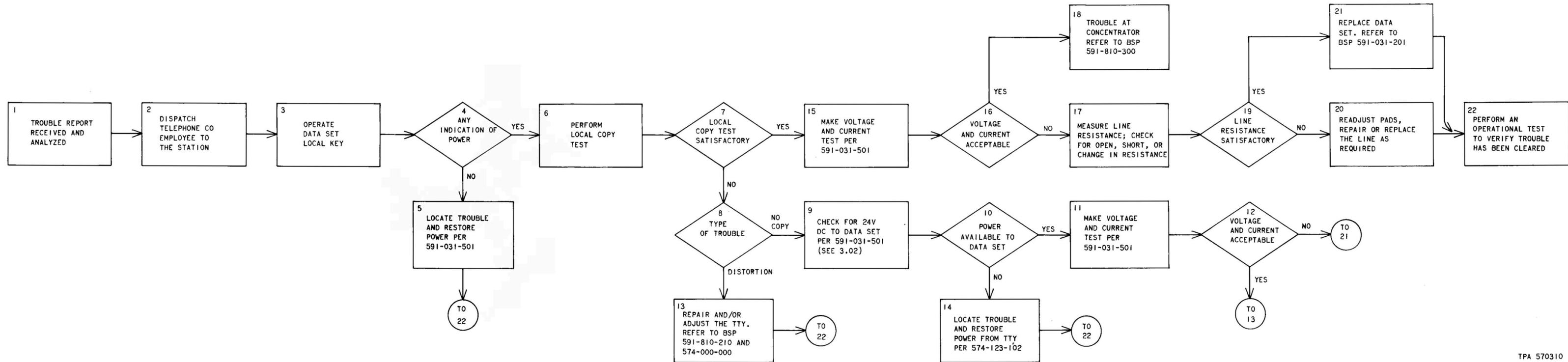| STEP	PROCEDURE
1	When trouble is experienced with DLCS system, it is reported to the telephone company and a trouble report is filled out from the information received from the customer. After a trouble report is received, it should be analyzed to determine, if possible, the cause or location of the trouble condition.
2	When analysis of the trouble report indicates the trouble is located at the station, or in cases where the location of the trouble cannot be pinpointed, a telephone company employee will be dispatched to the station.
3	Operate data set LOCAL key. If the station has power, a lamp will light under the key and the TTY motor will start.
4	If there is an indication of power, proceed to Step 6. If there is not any indication of power, proceed to Step 5.
5	If the station is not receiving power, loose or bad connections can be the cause. Check for power according to Section 591-031-501. When power is restored, proceed to Step 22.
6	Perform the local copy test as a means of checking the operation of both the TTY and Data Set 109C-type when arranged for DLCS service.
7	If the local copy test is satisfactory, proceed to Step 15 for a voltage and current test which may isolate the trouble. If the local copy test is not satisfactory, proceed to Step 8.
8	An unsatisfactory local copy test must be analyzed to determine if the trouble was copy distortion (proceed to Step 19) or if the trouble was no copy (proceed to Step 13).
9	With the KS-20538-L1 VOM set at the 30 DCV range, measure across terminals 11 (positive) and 9 on EU1 circuit pack for +24 volts dc.
10	If the +24 volts dc is available to the data set, proceed to Step 11. If the power is not detected, proceed to Step 14.
11	Make a voltage and current test per Section 591-031-501. This test will determine if the TTY or data set is at fault. Proceed to Step 12.
12	If voltage and current are acceptable, the TTY is probably the source of trouble. Proceed to Step 13. If voltage and current are not acceptable, the data set is probably the source of trouble. Proceed to Step 21.
13	Repair and/or adjust the TTY. Refer to Sections 591-810-210 and 574-000-000 for help and references in locating and fixing trouble. Repeat Step 6 before proceeding to Step 22.
14	The UCC-29 call control unit of the TTY is probably at fault. Locate trouble and restore power to the data set from TTY per Section 574-123-102. Repeat Step 6 before proceeding to Step 22.

STEP	PROCEDURE
15	At this point, the TTY is assumed to be working satisfactorily. A voltage and current test should be made to isolate the trouble further.
16	If the line current test indicates the data station is supplying an acceptable connection signal to the concentrator, proceed to Step 18. If the connection signal is unacceptable, the line circuit of the concentrator may not be allowing current to flow. Before replacing data set, check to see if marking voltage is applied to metallic loop by measuring it with the tip or ring disconnected and LINE 1 or LINE 2 button depressed. If the marking voltage is within limits, the concentrator or line is at fault. Proceed to Step 18. If the marking voltage is out of limits, proceed to Step 17.
17	If the station does not operate properly, measure line resistance and check for open, short, or change in resistance. *Note:* 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 connection to a trunk.
18	Concentrator is at fault. Contact immediate supervisor and refer to Section 591-810-300.
19	If the line is shorted or open, 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. Proceed to Step 20. If the line resistance was satisfactory, proceed to Step 21. *Note:* For information on setting the data set pads, refer to Section 591-031-201.
20	Repair or replace line. Proceed to Step 22.
21	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 data set. Refer to Section 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. Proceed to Step 22.
22	Perform an operational test of the data station to verfy that the trouble condition has been cleared before returning the station to service. Refer to Section 591-031-501. After completion of the maintenance procedures and verification that the trouble condition has been eliminated, the station is returned to service. *Note:* 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.

5. REFERENCES

5.01 For additional information on the DLCS, refer to the following BSPs and the additional practices referred therein.

SECTION	TITLE
574-000-000	Numerical Index—Division 574—Teletypewriter 30 Series
574-123-102	Call Control Unit UCC-29 For EIA and Direct Neutral Interface—Description and Principles of Operation
591-010-100	Wide Area Data Service (WADS) Using Station Arrangement A
591-031-101	Data Set 109C-Type Used in 10-Type Data Line Concentrator System (DLCS*)—Description and Operation
591-031-201	Data Set 109C-Type Used in 10-Type Data Line Concentrator System (DLCS*)—Installation
591-031-501	Data Set 109C-Type Used in 10-Type Data Line Concentrator System (DLCS*)—Test Procedures
591-810-100	10-Type Data Line Concentrator System (DLCS*)—Description
591-810-110	33 and 35 Teletypewriter Stations—Description
591-810-210	33 and 35 Teletypewriter Stations—Installation and Checkout
591-810-300	10-Type Data Line Concentrator System (DLCS*)—Maintenance
591-810-500	10-Type Data Line Concentrator System (DLCS*)—Test Procedures
591-811 Series	10-Type Data Line Concentrator System (DLCS*)

Fig. 6—Trouble Locating Procedures and Maintenance Chart

TPA 570310