

DATA SET 108-TYPE
SINGLE PRIVATE LINE STATION
USING DATA AUXILIARY SET 820D-TYPE
DESCRIPTION AND OPERATION

1. GENERAL

1.01 The purpose of this section is to provide a physical and operational description of Data Sets 108A- and 108C-type Single Private Line Station using Data Auxiliary Set (DAS) 820D-type.

1.02 This section is reissued to include information on DAS 820D-L1 and DAS 820D-L1A which replace DAS 820D1 and DAS 820D2, respectively. DAS 820D1 and DAS 820D2 are rated manufacture discontinued (MD). All references to DAS 820D-L1 and DAS 820D-L1A also apply to DAS 820D1 and DAS 820D2, respectively, except where noted.

1.03 Data Set 108A-type is intended to work with Data Set 108B-type for hub operation or with Data Set 108C-type for station-to-station service. Data Set 108C-type is intended to work with Data Set 108A-type for station-to-station service only. Information on Data Set 108B is found in the section entitled Data Set 108B—Description (312-800-100).

Note: Data Set 108D-type may be used in place of Data Set 108C. For description of station use with Data Set 108D, refer to the section entitled Data Set 108D—Description (591-028-100).

1.04 For detailed information on Data Sets 108A- and 108C-type, refer to the section entitled Data Set 108-Type Private Line System Station Application—Description (591-023-100).

1.05 DAS 820D-type is designed for use in private line service to provide an interface circuit between a Bell System- or customer-provided terminal (CPT) and Data Set 108A-, 108C-, or 109A-, and 109E-type.

2. PHYSICAL CHARACTERISTICS

2.01 DAS 820D1 (Fig. 1) consists of an 11-inch by 11-inch by 5-1/2 inch 2-tone gray plastic housing which contains an 18A power unit, TEST key and lamp, and a 61A apparatus mounting equipped with a circuit pack (CP) AR16 or AR17. DAS 820D1 is provided with a KS-14532-L16 power cord and is intended for use as a single station set working in conjunction with a CPT.

Note: AR16 CP has been rated MD. Information on AR16 CP has been retained for those CPs still in service. For the purpose of this section, information on AR17 CP will refer to AR16 CP also.

2.02 DAS 820D2 is identical to DAS 820D1 with the exception that DAS 820D2 is not supplied with a cover or power cord. DAS 820D2 is intended for use as a single station set working in conjunction with a Bell System teletypewriter (TTY). An M3AY cord equipped with a 7593 Hubbell connector should be ordered separately to provide power for DAS 820D2.

2.03 DAS 820D-L1 and DAS 820D-L1A (Fig. 2) are identical to DAS 820D1 and DAS 820D2, respectively, with the following exceptions.

(a) The 6-screw terminal strip (TS A) is replaced by a 26-screw terminal board (TB 1).

(b) AR17 CP is not provided with DAS 820D-L1 and DAS 820D-L1A and must be ordered separately.

(c) Wiring is added between the card connectors to allow the use of CP cards other than AR16 and AR17 CPs. (eg, AR430 CP used with

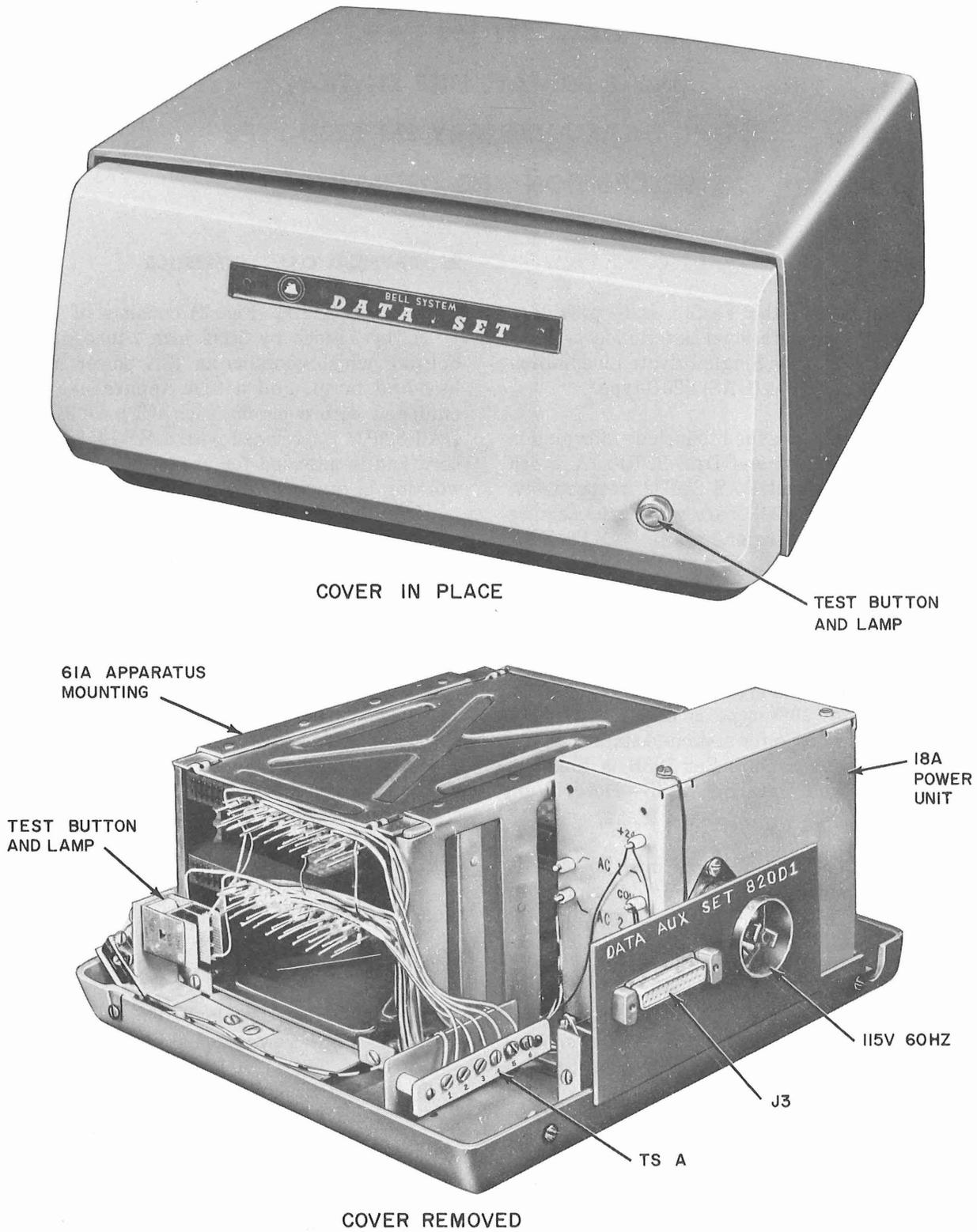


Fig. 1—Data Auxiliary Set 820D1

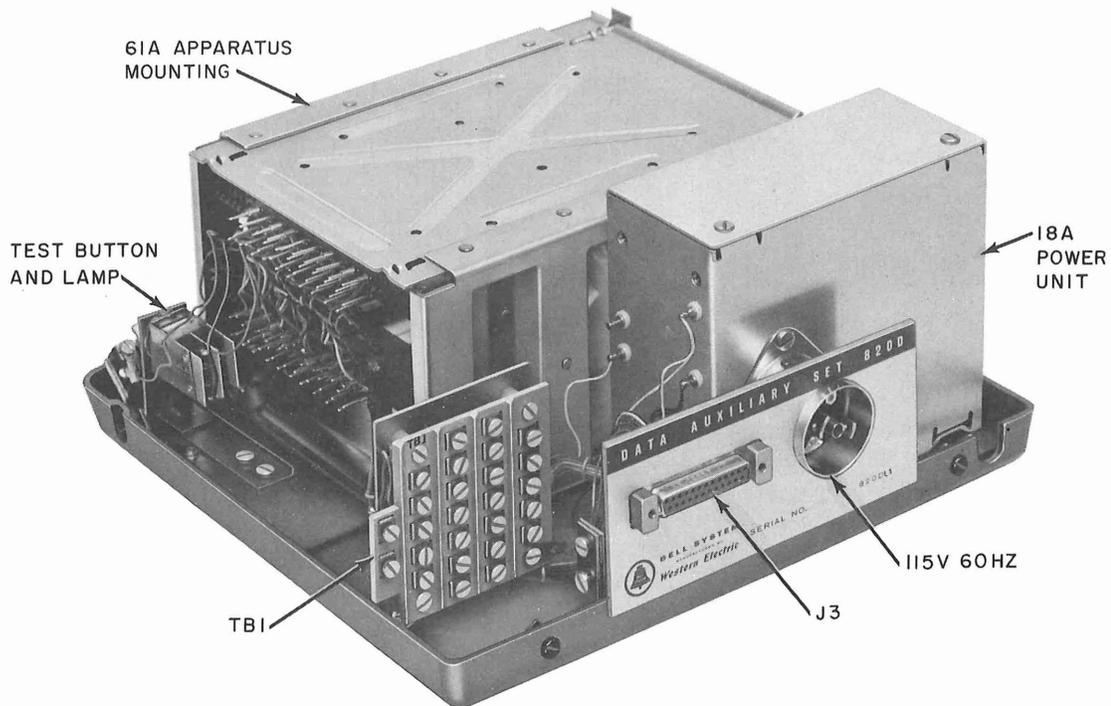


Fig. 2—Data Auxiliary Set 820D-L1A

Data Line Concentrator System. See Section 591-023-110 for information pertaining to AR430 CP.)

Note: The DAS 820D-L1 and 820D-L1A are not compatible with AR16 CP.

(d) Wiring is added which allows operation of the test relay and TEST lamp when the TEST key is operated at installations utilizing half-duplex data sets such as the Data Set 109A. This causes continuous space to be transmitted by the station placed in the test mode.

(e) The DAS 820D-L1A is provided with an M3AY power cord which is equipped with spade tips on one end and a Hubbell 7593 connector on the other.

2.04 Data Set 108A- or 108C-type is mounted in a space provided in the 61A apparatus mounting of DAS 820D-type (Fig. 3). The data

set is not furnished with the DAS and must be ordered separately, as required.

2.05 A Data Set 108A- or 108C-type single private line station using DAS 820D-L1 may be installed on any surface (shelf, desk, table, etc) that is convenient for customer use and within limit of the 50-foot interface cord furnished by the customer. DAS 820D-L1 weighs approximately 11-1/2 pounds.

2.06 The Data Set 108A- or 108C-type single private line station using DAS 820D2 is intended for installation in the kneewell of a Bell System Model 35 TTY (Fig. 4). DAS 820D-L1A may be mounted in the same way.

2.07 A TEST key with its associated lamp is located on the front of the DAS. Terminals are provided on terminal board (TB 1) or terminal strip (TS A) (used with DAS 820D1 or DAS 820D2) at the rear of the DAS for connection of a remote TEST key and lamp (not furnished with the DAS).

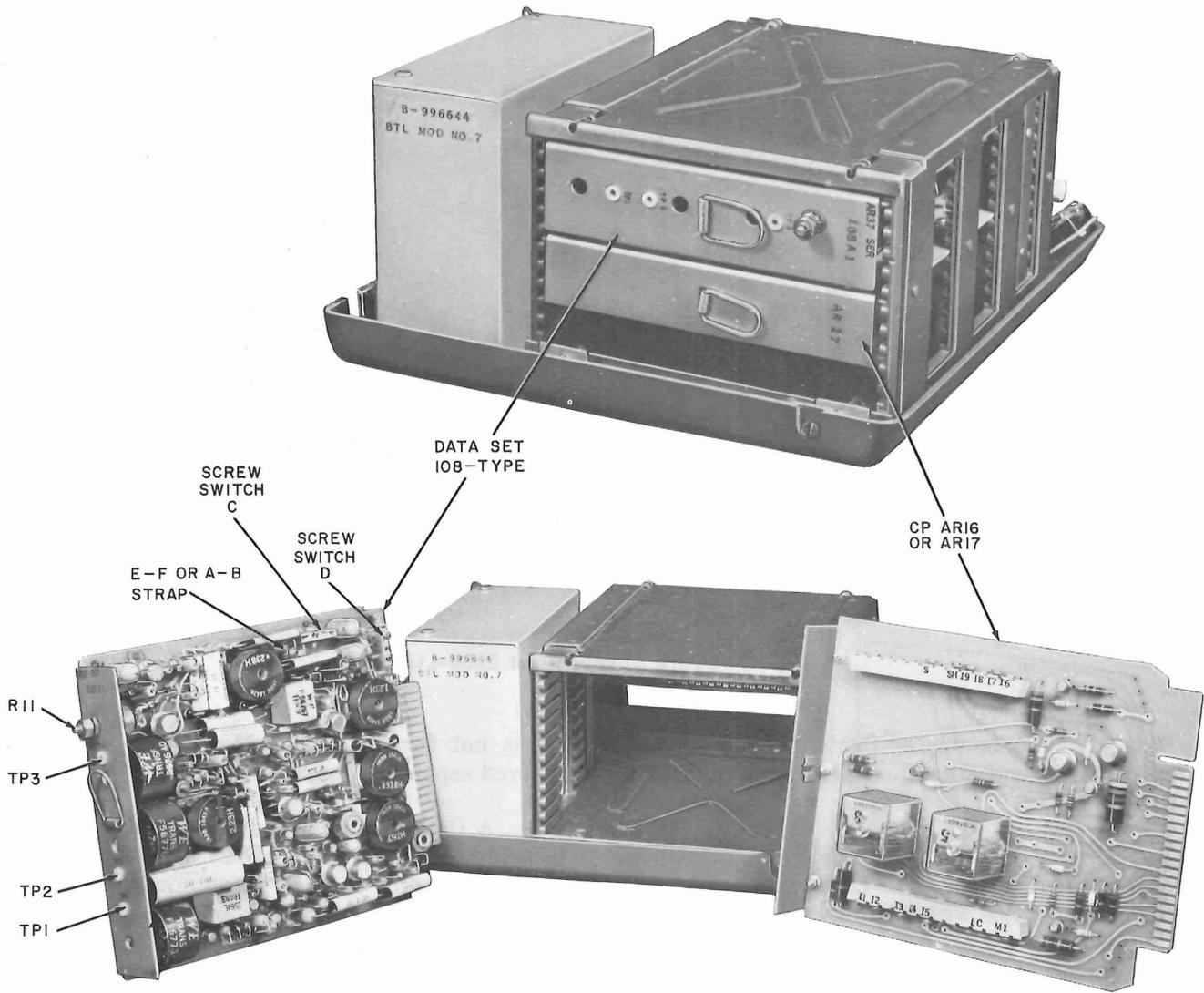


Fig. 3—Data Set 108-Type and Data Auxiliary Set 820D-Type

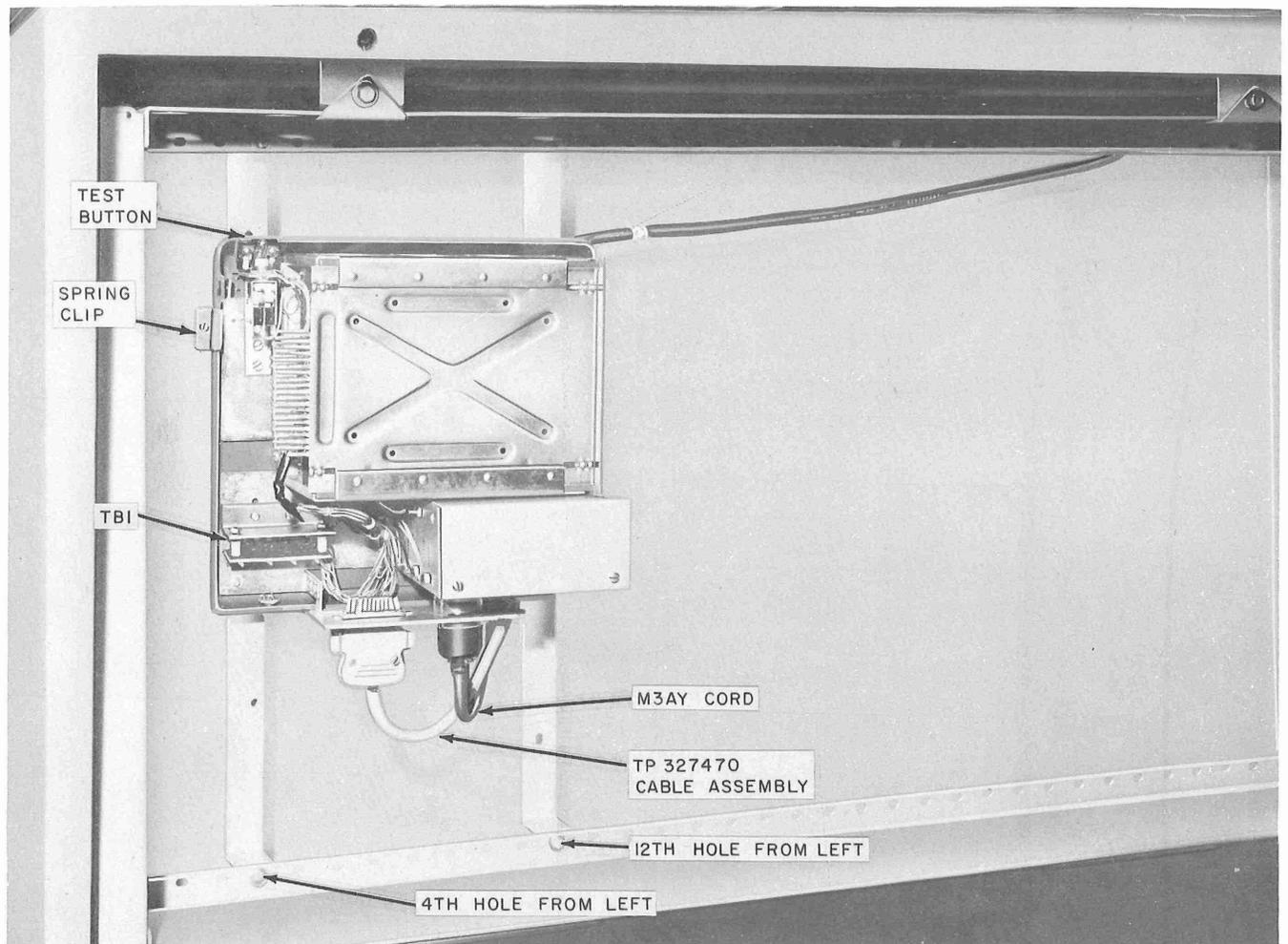


Fig. 4—Data Auxiliary Set 820D-L1A Mounted in a Bell System Model 35 Teletypewriter

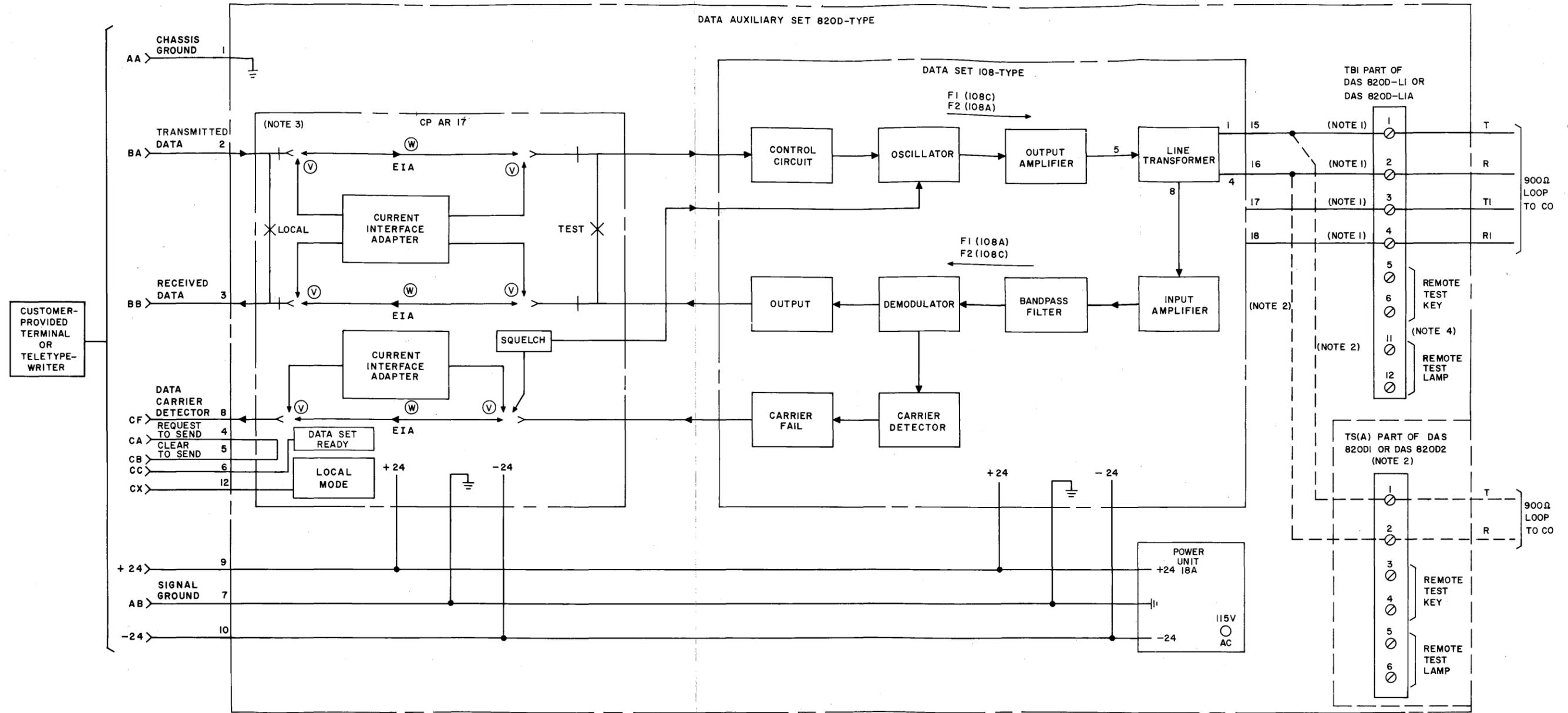
3. FUNCTIONAL CHARACTERISTICS

3.01 A Data Set 108A- or 108C-type single private line station using DAS 820D-type will function on a voltage interface conforming to Electronic Industries Association (EIA) Standard RS-232-B or on a 20-mA neutral current interface. Options must be selected at the time of installation for the type of interface to be used.

3.02 Figure 5 is a simplified block diagram of a Data Set 108-type single private line station using DAS 820D-type. Connections are shown for DAS 820D-L1 or DAS 820D-L1A and for DAS 820D1 or DAS 820D2.

3.03 Additional leads provided for EIA interface option in addition to CA and CB are as follows:

- **BA**—Transmitted Data (from the data processing terminal equipment)
- **BB**—Received Data (to the data processing terminal equipment)
- **CA**—Request to Send (from the data processing terminal equipment)
- **CB**—Clear to Send (to the data processing terminal equipment)



- NOTES:
1. 4-WIRE CONNECTION USED ON DAS 820D-LI OR DAS 820D-LIA.
 2. CONNECTED FOR USE WITH DAS 820D1 OR DAS 820D2.
 3. (V) DESIGNATES CURRENT INTERFACE OPTION.
(W) DESIGNATES EIA INTERFACE OPTION.
 4. TERMINALS 7 THROUGH 10, AND 13 THROUGH 26 ARE NOT SHOWN.

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Fig. 5—Data Set 108-Type, Single Private Line Station Using Data Auxiliary Set 820D-Type, Simplified Block Diagram

- **CC**—Data Set Ready (to the data processing terminal equipment)
- **CF**—Data Carrier Detector (to the data processing terminal equipment)
- **CX**—Local Mode Control (from the data processing terminal equipment)
- **AB**—Signal Ground
- **+P**—+24 volts for telephone company use
- **-P**—-24 volts for telephone company use.

3.04 Leads provided for current interface option are as follows.

- (a) **Transmit:** This lead forms a send loop through the send contact of the teletypewriter to the -24 volt supply of the DAS.
- (b) **Receive:** This lead forms a 20-mA neutral current receive loop through the 680-ohm selector magnet driver (SMD) of the teletypewriter or the receiver portion of CPT to the -24 volt supply of the DAS.



A 680-ohm resistive termination is required for proper operation of the DAS. The DAS may be damaged if lower resistive termination is not provided.

- (c) **Carrier Detector:** This lead forms a loop through a carrier alarm circuit in the terminal equipment to the +24 volt supply of the DAS. The minimum load resistance of the carrier detector loop should be 2000 ohms.
- (d) **Local Mode:** This lead forms a loop through a local mode contact in the teletypewriter to the +24 volt supply of the DAS. A closed contact will put the station into the local mode.
- (e) **CA and CB:** The CA lead is strapped to the CB lead for use with a Bell System TTY.
- (f) **AB:** Signal ground
- (g) **+P:** +24 volts for telephone company use
- (h) **-P:** -24 volts for telephone company use.

3.05 Data Sets 108A- and 108C-type are designed to operate into a nominal 900-ohm loop.



Data Sets 108A- and 108C-type are not designed to handle supervisory line current.

Connections for the telephone loop and the remote TEST key and lamp, if required, are through a screw terminal board (TB 1) for DAS 820D-L1 and DAS 820D-L1A or terminal strip (TS A) for DAS 820D1 and DAS 820D2 located at the rear of the DAS. The accessible connections on DAS 820D-L1 and DAS 820D-L1A are:

- (a) 4-wire line connections for the data set (terminals 1 and 2, 3 and 4)
- (b) A parallel connection across the TEST key for the remote TEST key (terminals 5 and 6)
- (c) A parallel connection across the TEST lamp for the remote TEST lamp (terminals 11 and 12).

3.06 These same accessible connections on DAS 820D1 and DAS 820D2 are as follows:

- (a) 2-Wire line connections for the data set (terminals 1 and 2)
- (b) A parallel connection across the TEST key for the remote TEST key (terminals 3 and 4)
- (c) A parallel connection across the TEST lamp for the remote TEST lamp (terminals 5 and 6).

3.07 The basic function of the DAS is to exchange transmitted and received data between the data set and the data processing terminal equipment. When the DAS is placed in the test mode, the data set is isolated from the data terminal and data signals are looped from receive to transmit leads of all data sets except data sets 109A and 109D-type. When the DAS is placed in the local mode, the data terminal is isolated from the data set and data signals are looped from the transmit to receive leads of the data terminal.

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3.08 Local mode of operation enables the terminal equipment to provide an off-line loop-around connection for performing a terminal test. The local mode is established by the terminal equipment applying a positive voltage to the customer interface lead CX. This positive (ON) voltage operates the local relay on AR17 CP as follows:

- (a) Connects the transmitted data (BA) lead to the received data (BB) lead
- (b) Blocks data set signals from reaching the interface
- (c) Clamps the transmit lead of the data set marking
- (d) Turns off the data set ready interface lead (CC) to the terminal equipment.

To restore the data station to normal mode, the terminal equipment removes the positive voltage on the interface lead CX and applies a negative voltage to CX. This negative (OFF) voltage releases the local relay.

3.09 The available options on the Data Set 108A- or 108C-type single private line station are as follows:

- (a) EIA or 20-mA current interface
- (b) Copy or no copy in the test mode
- (c) Local copy or no local copy
- (d) Mark or space hold on carrier fail with current interface
- (e) Transmitted carrier squelch or no carrier squelch on loss of received carrier.

Note: When the carrier squelch option is provided, the 108B Data Set at the serving test center must be arranged for mark hold operation.

4. OPERATION

4.01 Upon completion of Data Set 108A- or 108C-type single private line station installation, the data station operates continuously and is unattended. No adjustments are required under normal circumstances.

4.02 The data station is conditioned for loop-back testing by depressing either the TEST key on the front of the DAS or the remote TEST key when remote test facilities are installed. The DAS TEST key is a push-push type. It is pressed once to condition the data station for testing and pressed again to release the data station from the test mode. The TEST lamp lights when the data station is in the test mode.

5. REFERENCES

5.01 Detailed information for Data Sets 108A- and 108C-type single private line station using DAS 820D-type is found in the following circuit descriptions (CDs) and schematic drawings (SDs):

CD- & SD-3D024-01 Data Set 108A-Type

CD- & SD-3D032-01 Data Set 108C-Type

CD- & SD-3D031-01 Data Auxiliary Sets 820D and 820E-Type

CD- & SD-73060-01 Data Set 108D-Type.

5.02 The following BSPs may be used for further information pertaining to Data Set 108-type single private line stations.

| SECTION | TITLE |
|-------------|---|
| 312-800-100 | Data Set 108B—Description |
| 312-805-100 | Data Set 108D-Type Used With Type-3 Low Voltage Hub Arrangements—Description |
| 591-023-100 | Data Set 108-Type—Private Line Station Application—Description |
| 591-023-201 | Data Set 108-Type—Single Private Line Station Using Data Auxiliary Set 820D-Type—Installation and Connections |
| 591-023-301 | Data Set 108-Type—Single Private Line Station Using Data Auxiliary Set 820D-Type—Maintenance |
| 591-023-501 | Data Set 108-Type—Single Private Line Station Using Data Auxiliary Set 820D-Type—Test Procedures |
| 591-028-100 | Data Set 108D-Type—Description |