DATA SETS 108D- AND 108E-TYPES SINGLE PRIVATE LINE STATION ARRANGEMENT USING DATA AUXILIARY SET 820D DESCRIPTION AND OPERATION

1. GENERAL

1.01 This section provides physical and operational descriptions of data sets 108D- and 108E-types when used in a data auxiliary set (DAS) 820D-L1 or 820D-L1A equipped with an AR17 circuit pack (Fig. 1). In this section, data sets 108D- and 108E-types shall be referred to as data sets 108D and E.

1.02 Data sets 108D and E provide low-speed (up to 300 bauds) data transmission to the line and control signals through the DAS 820D to the data terminal. The AR17 circuit pack provides interface options within DAS 820D for varied operating conditions. A functional description of data sets 108D and E, AR17 circuit pack, and DAS 820D is covered in Part 3 of this section.

1.03 Data sets 108D and E work within DAS 820D for station-to-station or station-to-hub operation. For a detailed description of data set 108D and E when used in a station application, refer to the section entitled Data Sets 108D- and 108E-Types—Used in Station Applications—Description (591-028-100).

1.04 Data set 108D or 108E and AR17 circuit pack are not supplied with DAS 820D, and therefore must be ordered separately.

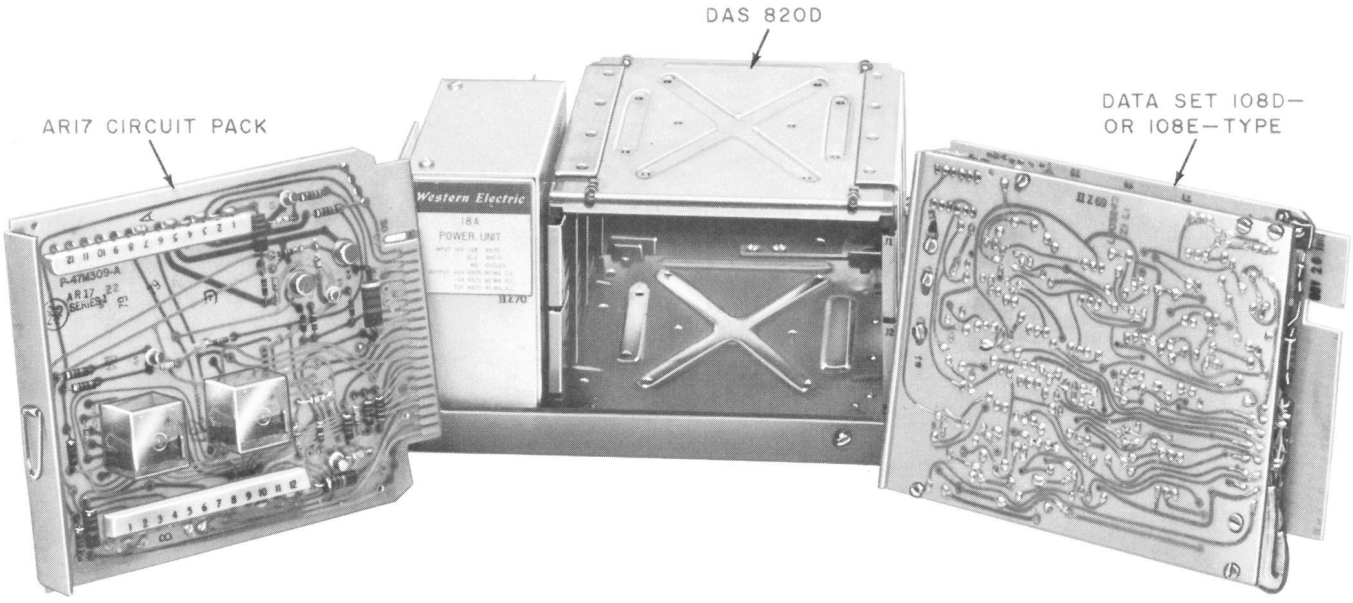


Fig. 1—Data Set 108D- or E-Type and AR17 Circuit Pack Used in Data Auxiliary Set 820D

2. PHYSICAL DESCRIPTION

2.01 This part describes the physical appearance of the DAS 820D and AR17 circuit pack. For a physical description of data sets 108D and E, refer to Section 591-028-100.

2.02 The DAS 820D (Fig. 2) is 11 inches wide, 11 inches long, and 5-1/2 inches high, and weighs approximately 11-1/2 pounds when equipped with data set and circuit pack. The major components are as follows:

- 18A power unit
- 26-screw terminal board (TB1)
- Terminal equipment 25-pin connector (J3)
- Pushbutton switch (TEST button)
- Lamp (TEST lamp)
- 61A apparatus mounting with provisions for a data set and circuit pack.

2.03 DAS 820D-L1A (Fig. 3) is identical to DAS 820D-L1 with few exceptions. Table A shows the physical differences between the data auxiliary sets. DAS 820D-L1 is intended for use with a customer-provided terminal or a Bell System model 37 TTY. DAS 820D-L1A is intended for use with a Bell System model 28, 33, or 35 TTY.

2.04 The TEST button and TEST lamp are located on the front of the DAS 820D. TB1 is located on the rear of the DAS and provides access to the DAS circuits as shown in Fig. 4.

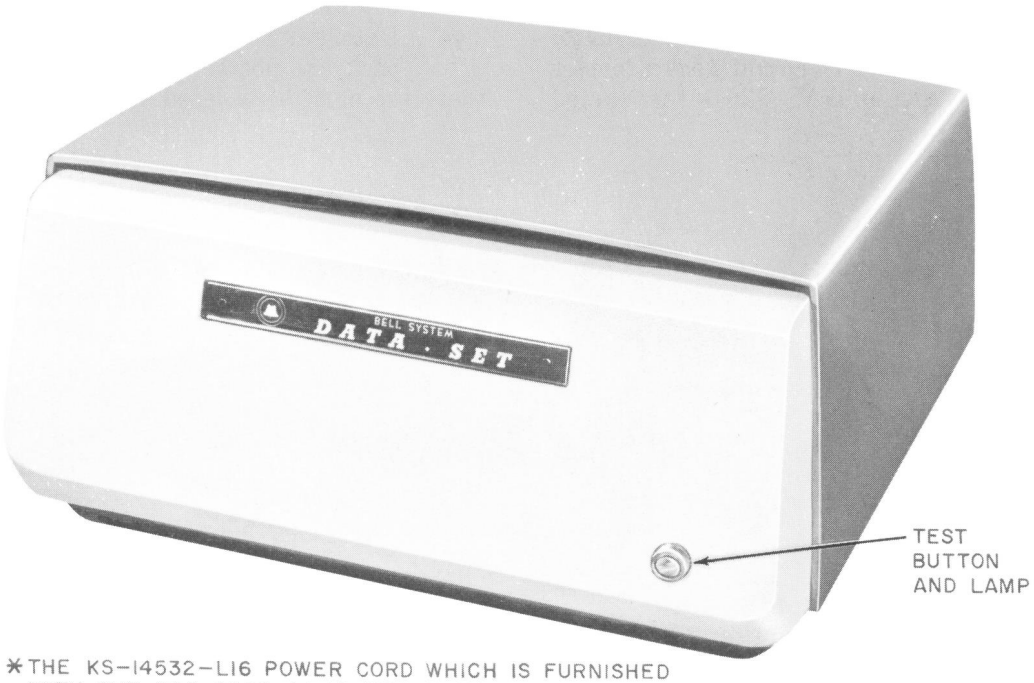


Fig. 2—Data Auxiliary Set 820D-L1

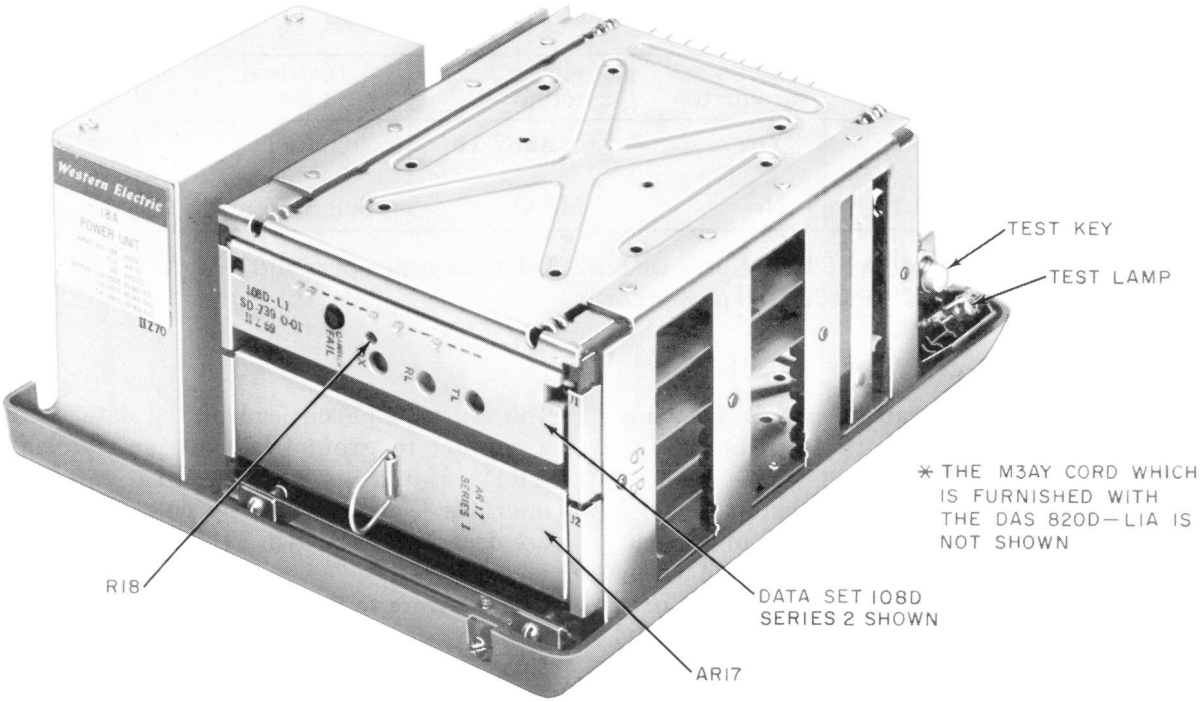


Fig. 3—Data Auxiliary Set 820D-L1A

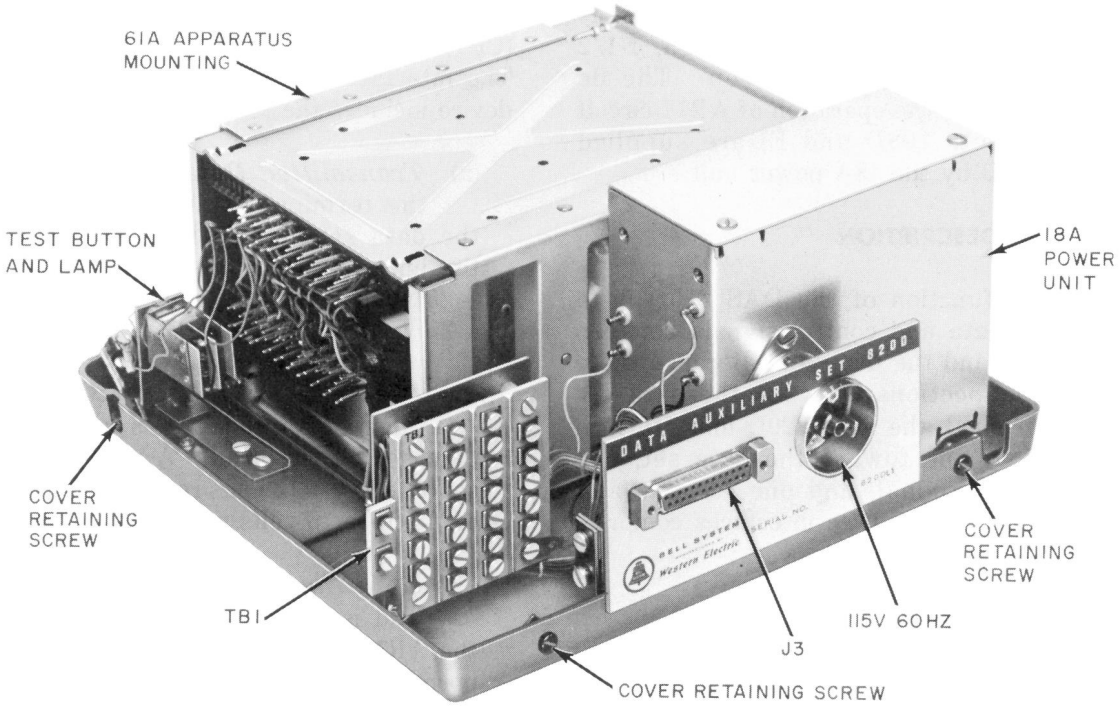


Fig. 4—Data Auxiliary Set 820D—Accessible Connections

TABLE A

DAS 820D-L1 AND 820D-L1A DIFFERENCES

DATA AUX SET	COVER PROVIDED	POWER CORD	TERMINAL DEVICE
820D-L1	Yes	KS-14532-16	CPT
820D-L1A	No	M3AY	*Bell System TTY

*Model 37 TTY uses DAS 820D-L1 with the cover and KS-14532-L16 power cord.

2.05 The DAS 820D-L1 can be installed on any surface (shelf, desk, table, etc) that is convenient for customer use and within limit of the interface cord furnished by the customer. DAS 820D-L1 is mounted inside the pedestal of a model 37-type TTY; DAS 820D-L1A is intended to be mounted in the pedestal of a model 35-type or a 33-type TTY. DAS 820D-L1A can also be mounted in the model 28 TTY; however, mounting procedures ***must*** be locally engineered since there is no standard method. Refer to sections listed in 5.01 for installation information on the data station mounted in a Bell System TTY.

2.06 The AR17 circuit pack (refer to Fig. 1) is a single plug-in printed circuit card that measures approximately 5-1/2 inches high, 1-1/2 inches wide, and 7-1/10 inches deep. The dc voltages necessary for the operation of AR17 circuit pack (and data sets 108D and E) are supplied through DAS 820D by the 18A power unit.

3. FUNCTIONAL DESCRIPTION

3.01 The basic function of the DAS 820D is to exchange data and control signals between the data terminal and the data set. Because there are no direct connections between the data set and the data terminal, the DAS 820D must furnish three interfaces: one toward the data set, one toward the data terminal, and one for line and control connections. The three interfaces comprise the function of the DAS.

DAS Interface to Data Set

3.02 The transmitted data, received data, and carrier detector signal voltages interfacing the data set (Fig. 5) and DAS conform to Electronic Industries Association (EIA) Standard RS-232-C. The carrier squelch lead of the data set requires a contact to ground for carrier squelch (within AR17) and ***does not*** use EIA voltages. The interface leads provided by data sets 108D and E are described in Section 591-028-100.

DAS Interface to Data Terminal

3.03 The interface toward the data terminal can be a current or an EIA voltage interface. The type of interface is an option in the AR17 circuit pack and must be selected at the time of installation.

3.04 The EIA voltage interface is intended to be used with a customer-provided terminal (CPT) or Bell System TTY utilizing EIA interface. The interface between the DAS and the terminal device includes the following leads:

(a) ***Transmitted Data Lead (BA):*** Data from the terminal equipment is transmitted to the data set on this lead for transmission to the line. A signal from the terminal of −3 to −25 volts represents a mark; a signal of +3 to +25 volts represents a space.

(b) ***Received Data Lead (BB):*** Data to the terminal equipment is received from the data set on this lead. A signal from the data set of −5 to −15 volts represents a mark; a signal of +5 to +15 volts represents a space.

(c) ***Data Set Ready Lead (CC):*** When this lead is connected to a positive potential in the AR17 circuit pack, the data set is ready for normal operation. The CC lead is connected to a negative potential if the station is put in the local or test mode. If the DAS loses power, the voltage will be zero.

(d) ***Received Line Signal Detector Lead (CF):*** This lead will be at a positive potential when a carrier is being received from the line. When the carrier is not detected or if data link is lost, the CF lead will have a negative potential and the CF lamp will light.

(e) ***Local Mode Control (CX):*** This lead is connected from a local mode contact in the TTY to the +24 volt supply of the DAS (refer to 3.09).

(f) ***Request to Send (CA):*** This lead forms a loop through the AR17 circuit pack from the terminal equipment.

(g) ***Clear to Send (CB):*** This lead forms a loop through the AR17 circuit pack to the terminal equipment.

(h) ***Signal Ground (AB):*** This lead is the common reference for signal and power supply grounds. It is not connected to frame ground (AA).

(i) ***Frame Ground (AA):*** This lead is connected to the frame of the terminal equipment and to the ac power cord ground.

(j) ***Power (±P):*** 24 volts for telephone company use only.

3.05 The current interface is intended to be used with a Bell System TTY utilizing current interface. The interface between the DAS and the TTY includes the following leads:

(a) ***Transmit:*** This lead forms a current send loop through the send contact of the TTY to the −24 volt supply of the DAS 820D.

(b) ***Receive:*** This lead forms a current receive loop through the selector magnet driver (SMD) of the TTY to the −24 volt supply of the DAS 820D.

(c) ***Carrier Detector:*** This lead forms a loop through a carrier alarm circuit in the terminal equipment to the +24 volt supply (available in the DAS). If carrier is present, the lead is at zero (ground) voltage potential. If carrier is lost, an open condition exists which activates the carrier alarm circuit in the terminal equipment. The minimum load resistance of the carrier detector loop should be 2000 ohms.

(d) ***Local Mode Control:*** This lead is connected from a local mode contact in the TTY to the +24 volt supply of the DAS (refer to 3.09).

(e) ***AB:*** Signal ground.

(f) ***±P:*** 24 volts for telephone company use only.

DAS Interface for Line and Control Connections

3.06 The interface for line and control connections provides access to the tip and ring leads of the data set via TB1. Access for remote TEST button and TEST lamp is also provided on TB1. The accessible connections on DAS 820D-L1 and 820D-L1A are shown in Fig. 4. Refer to 591-028-201 (Table A) for TB1 terminal assignments.

AR17 Circuit Pack Functions

3.07 The AR17 circuit pack works within the DAS to provide the following optional functions:

(a) EIA or 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: Installation of all options available with DAS 820D, AR17 circuit pack, and data sets 108D and E is covered in Section 591-028-201.

Data Set Functions

3.08 Data sets 108D and E are full-duplex, frequency-shift-keyed, serial transmission data sets which provide low-speed (up to 300 bauds) data transmission over either 2-wire or 4-wire private line voiceband facilities. For a detailed functional description of both data sets, refer to Section 591-028-100.

Local Mode

3.09 A local relay is provided on AR17 circuit pack to allow a local mode of operation. Local mode of operation enables the terminal equipment to provide an off-line loop-around connection through the customer interface for performing a terminal test. The local mode is established by the terminal equipment applying a positive voltage to the customer interface lead CX (through terminal 12 on J3). The positive (ON) voltage operates the local relay on AR17 circuit pack as follows:

(a) Connects the transmitted data (BA) lead to the received data (BB) lead within the AR17 circuit pack to form a loop from the terminal device.

(b) Blocks terminal equipment signals from reaching the data set

(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 also applies a negative voltage to CX for EIA interface). This OFF condition releases the local relay.

4. OPERATION

4.01 Data set 108D or E single private line station operates continuously and unattended once installation is completed. No adjustments are required under normal circumstances.

4.02 A TEST button is provided on the DAS 820D. Operation of this button:

(a) Lights the DAS 820D TEST lamp

(b) Disconnects the data set BA lead from the terminal device

(c) Connects the BA lead to the BB lead within the AR17 circuit pack to form a loop toward the line

(d) Holds the CC lead in the OFF condition

(e) Causes a carrier squelch on carrier fail conditon.

In this mode the transmission facility and data set may be tested from the far end. Reoperation of the DAS 820D TEST button extinguishes the TEST lamp and returns the station to the idle mode. The customer may optionally receive copy in the test mode.

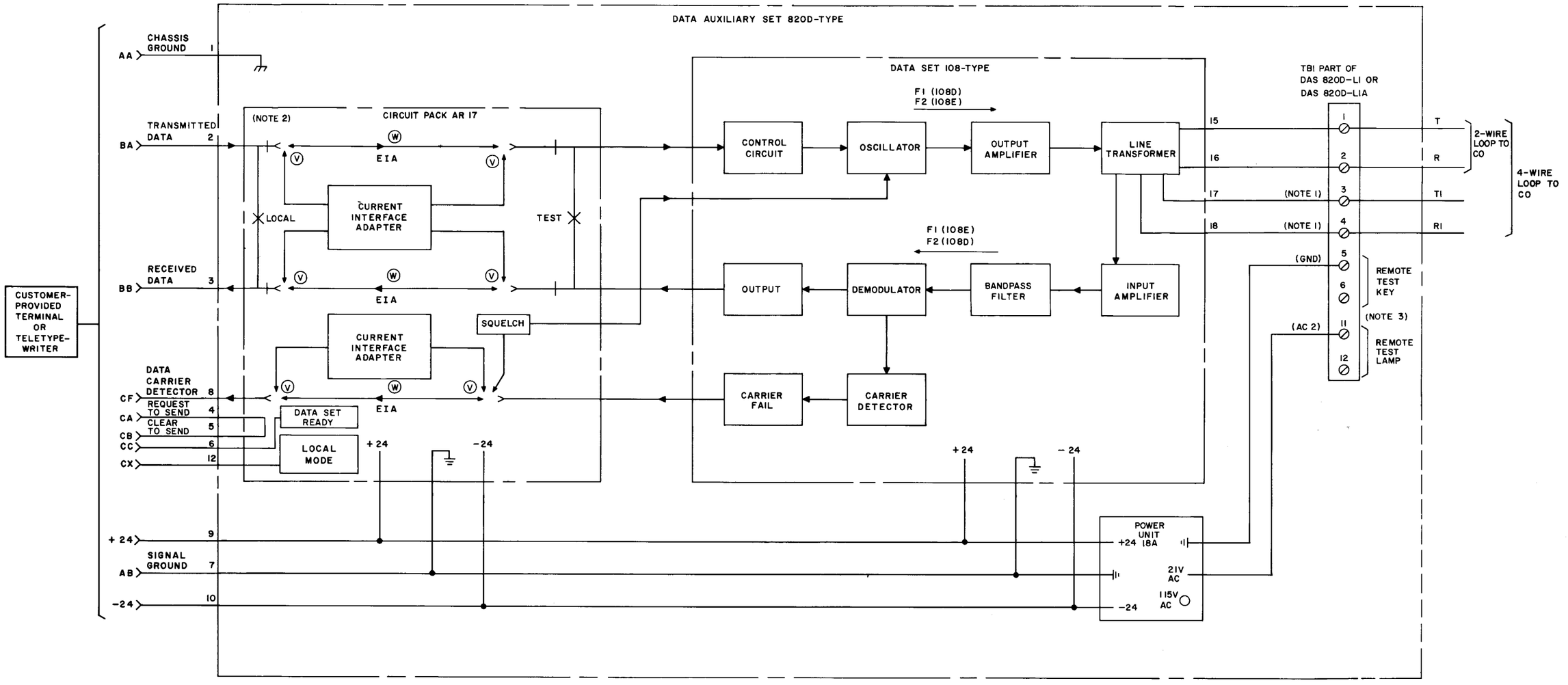
4.03 The test mode feature on the DAS can also be put under control of a remote TEST button by connection of terminals TB1-5 and TB1-6 of the DAS 820D to the remote TEST button. Unless a remote TEST button is locally engineered, the TTY front panel (model 35 TTY), rear panel (model 33 TTY) or door (model 37 TTY) must be opened to attain access to the DAS 820D TEST button.

5. REFERENCES

5.01 Detailed information for data set 108D and E single private line station using DAS 820D is found in the following circuit descriptions (CDs), schematic drawings (SDs), and Bell System Practices (BSPs):

SECTION	TITLE
CD&SD-3D031-01	Data Auxiliary Sets 820D- and 820E-Type
CD&SD-73060-01	Data Set 108D-Type
CD&SD-1D229-01	Data Set 108E-Type
591-028-100	Data Sets 108D and 108E-Types—Used in Station Applications—Description
591-028-201	Data Sets 108D- and 108E-Types—Single Private Line Station Arrangement—Using Data Auxiliary Set 820D—Installation
591-028-301	Data Sets 108D- and 108E-Types—Single Private Line Station Arrangement—Using Data Auxiliary Set 820D—Maintenance

SECTION	TITLE
591-028-501	Data Sets 108D- and 108E-Types—Single Private Line Station Arrangement—Using Data Auxiliary Set 820D—Test Procedures
591-801-202	37 Teletypewriter Keyboard Send-Receive (KSR) Station Arrangement — Nonswitched Point-to-Point Private Line Service—Installation
591-802-201	37 Teletypewriter Automatic Send-Receive (ASR) Station Arrangement — Nonswitched Point-to-Point Private Line Service—Installation
591-803-201	37 Teletypewriter Receive Only (RO) Station Arrangement—Nonswitched Point-to-Point Private Line Service—Installation
591-815-201	33 and 35 Teletypewriter Stations for General Purpose—Point-to-Point Private Line Service—Installation and Checkout



NOTES:

1. 4-WIRE CONNECTION USES TI AND RI TO RECEIVE DATA.
2. (V) DESIGNATES CURRENT INTERFACE OPTION.
   (W) DESIGNATES EIA INTERFACE OPTION.
3. TERMINALS 7 THROUGH 10, AND 13 THROUGH 26 ARE NOT SHOWN.

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