DATA SET 108A- OR C-TYPE SINGLE PRIVATE LINE STATION USING DATA AUXILIARY SET ▸820D-L1 or◂ 820D-L1A IN THE 10-TYPE DATA LINE CONCENTRATOR SYSTEM (DLCS)

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1. GENERAL

1.01 This section covers the physical and functional description of the Data Set 108A- or C-type when used to provide single private line (PL) station data service in the 10-type Data Line Concentrator System (DLCS). This arrangement incorporates the Data Auxiliary Set (DAS) ▸820D-L1 or◂ 820D-L1A equipped with an AR430 circuit pack (hereafter referred to in this section as AR430 CP) as the associated mounting apparatus.

1.02 This section is reissued to:

(a) Include information pertaining to the DAS 820D-L1 which is used with a customer-provided terminal (CPT).

(b) Delete all reference to the acronym DATREX.

(c) Include information pertaining to the use of a 6041H key to provide key control of transmit supervision, a remote TEST key/lamp, and/or a visual camp-on signal indication.

1.03 The Data Set 108A- or C-type single PL station is used to provide either half-duplex (HDX) or full-duplex (FDX) data service at a maximum of 150 bauds, via PL telegraph (Data Set 108A and Data Set 108B) or voice (Data Set 108C and Data Set 108D) transmission facilities and the ▸10-type Data Line◂ Concentrator, between a Bell System teletypewriter (TTY) terminal ▸or CPT◂ and the trunks of the ▸10-type Data Line◂ Concentrator.

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

1.05 ▸The DAS 820D-L1 provides the connecting circuitry between the data set, AR430 CP and CPT.◂

1.06 The DAS 820D-L1A provides the connecting circuitry between the data set, AR430 CP and the TTY terminal.

1.07 The AR430 CP provides the supervisory signaling necessary for the ▸Data Line◂ Concentrator to recognize a request for service or request for disconnect from the station.

The Data Set 108A- or C-type and AR430 CP are not supplied with the DAS 820D-L1 or 820D-L1A and must therefore be ordered separately.

2. PHYSICAL DESCRIPTION

2.01 This part describes the physical appearance of the DAS ▸820D-L1 or◂ 820D-L1A and AR430 CP. For a physical description of the Data

Sets 108A- and C-types, consult the section referenced in 1.04.

2.02 The DAS 820-L1A (Fig. 1) is designed for use with a Bell System TTY terminal. The major components of the DAS 820D-L1A are an 18A power unit, a 26-screw terminal board (TB1), a key-type switch (TEST key), and a lamp (TEST lamp), all of which are mounted on a 61A apparatus mounting. It is provided with an M3AY power cord which is terminated in a Hubbell connector at one end and spade tips on the other.

2.03 ▶The DAS 820-L1 (Fig. 2) is the same as the DAS 820D-L1A except that it is for use with a CPT, comes equipped with a plastic cover, and is provided with a KS-16935-L11 power cord. The power cord is six feet long and terminates in a Hubbell connector at one end and a parallel blade grounding-type molded plug at the other.◀

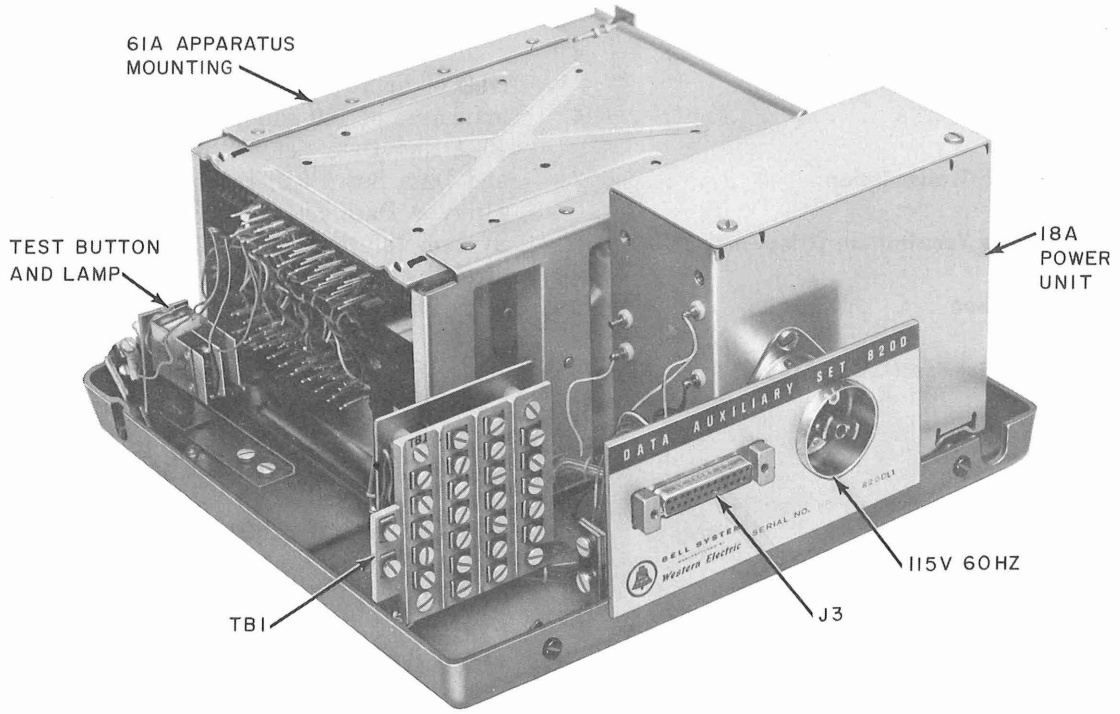

Fig. 1—Data Auxiliary Set 820D-L1A

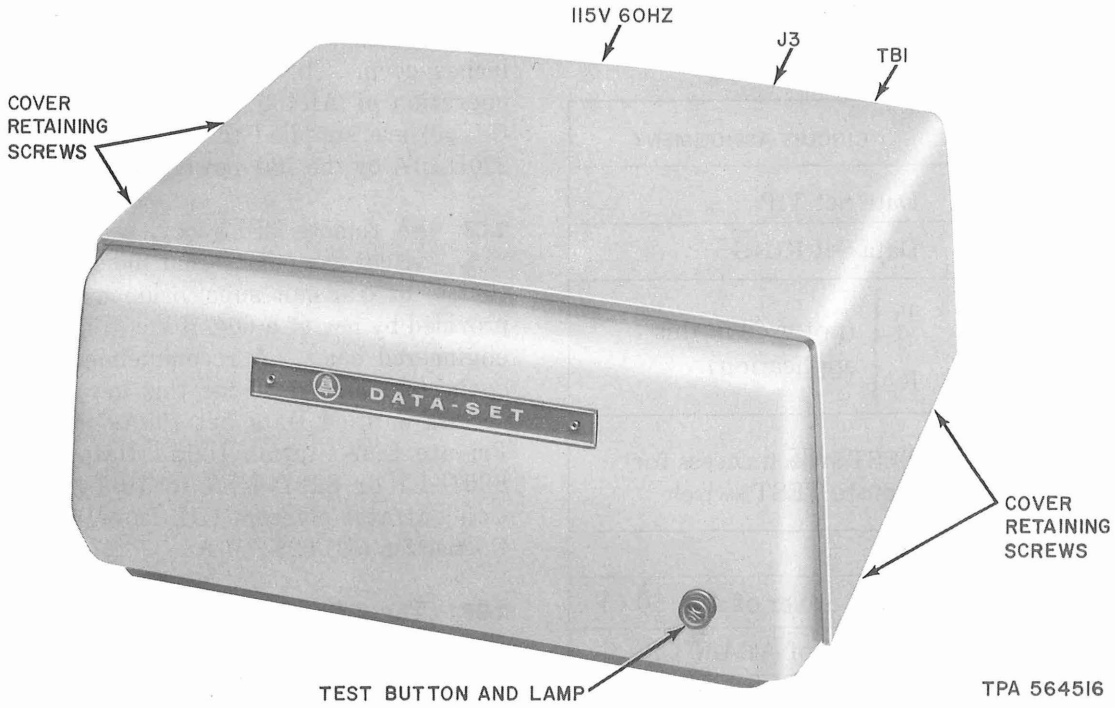

Fig. 2—Data Auxiliary Set 820D-L1

2.04 The TEST key and TEST lamp are located on the front of the DAS ▶820D-L1 or◀ 820D-L1A. TB1 is located on the rear of the DAS and provides access to the DAS circuits as shown in Table A.

TABLE A

TB1 TERMINAL ASSIGNMENTS

TERMINAL	CIRCUIT ASSIGNMENT
1	Data Set TIP
2	Data Set RING
3	T_1 (not used in this application)
4	R_1 (not used in this application)
5	TEST switch access for remote TEST switch
6	TEST switch access for remote TEST switch
7	NC
8	Lamp driver of AR430 CP
9	CD lead of AR430 CP
10	CD lead from CPT or TTY terminal
11	TEST lamp access for remote TEST lamp
12	TEST lamp access for remote TEST lamp
13 through 22	NC
23	Frame ground
24	Signal ground
25	+24V dc
26	—24V dc

2.05 The DAS 820D-L1A is approximately 11 inches wide, 5-1/2 inches high, 11 inches deep, and weighs approximately 11-1/2 pounds. It is intended for installation inside the pedestal of a model 33-type or 35-type TTY on a 180A backboard and a 102A (33 TTY) or 96A (35 TTY) bracket.

2.06 ▶The DAS 820D-L1 has the same physical dimensions as the DAS 820D-L1A. However, it is intended for installation in any location that is convenient for the customer and within reach of the CPT interface cable. This cable should not exceed 50 feet in length.◀

2.07 The AR430 CP (Fig. 3) is a single plug-in printed circuit card that measures approximately 5-1/2 inches high, 1-1/2 inches wide, and 7-1/2 inches deep. The dc voltages necessary for the operation of AR430 CP (and Data Set 108A- or C-type) are supplied through DAS ▶820D-L1 or◀ 820D-L1A by the 18A power unit.

2.08 ▶A remote TEST key, remote TEST lamp, visual camp-on signal indicator, and/or key control of transmit supervision may be optionally provided by use of a 6041H key (Fig. 4) on a locally engineered basis. A recommended assembly and connection procedure for this key is given in the section entitled Data Set 108A- or C-Type Single Private Line Station Using Data Auxiliary Set 820D-L1 or 820D-L1A in 10-Type Data Line Concentrator System (DLCS)—Installation and Connection (591-023-210).◀

2.09 The TTYs which may be used with ▶the DAS 820D-L1A◀ arrangement are the model 33 automatic send and receive (ASR) or keyboard send and receive (KSR) and the 35 KSR equipped with a logic package having interface signals that conform to the Electronic Industries Association (EIA) Standard RS-232-B or -C. The major components of this logic package are the EIA interface circuitry and a key (Fig. 5) consisting of six buttons, each of which is equipped with a lamp. All six of the buttons may be functional; however, only five of the lamps are operable.

2.10 ▶Any CPT which has an interface that conforms to EIA Standard RS-232-B may be used with the DAS 820D-L1 arrangement.◀

3. FUNCTIONAL DESCRIPTION

A. General

3.01 A Data Set 108A- or C-type single PL station using DAS ▶820D-L1 or◀ 820D-L1A and AR430 CP will function on a voltage interface that conforms to EIA Standard RS-232-B or -C. A functional block diagram of this arrangement is shown in Fig. 6. The heavy lines are used to depict the signal paths and the light lines the control leads.

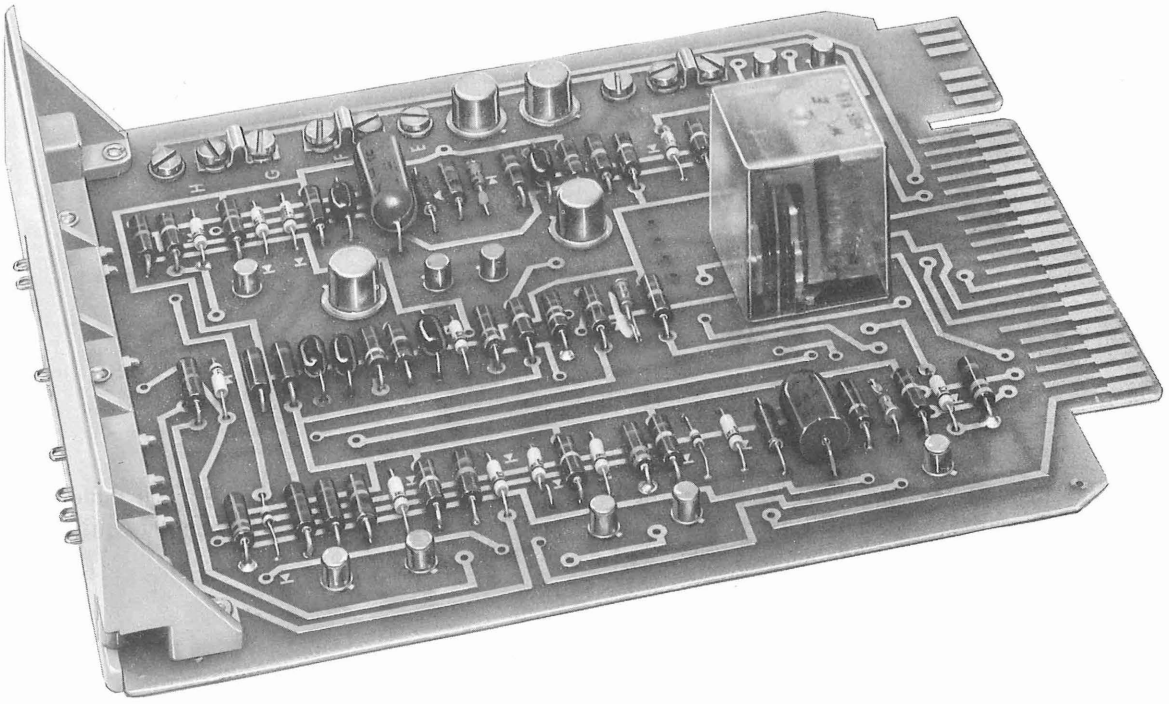

Fig. 3—AR430 Circuit Pack

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Fig. 4—Optional 6041H Key Assembly

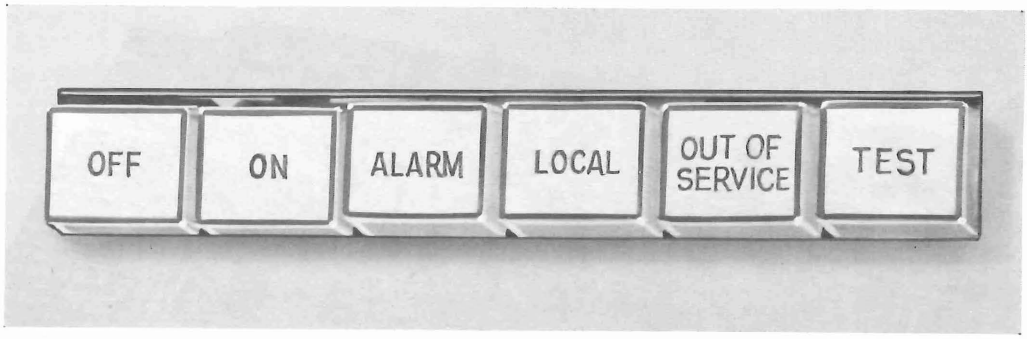

Fig. 5—TTY Key/Lamp Strip

3.02 A summary of the features and options provided in the DAS ▶820D-L1,◀ 820D-L1A, and AR430 CP for ▶Data Line Concentrator◀ operation is given in Table B. An indication as to which of these options are factory-equipped is also given in the table.

TABLE B

DAS ▶820D-L1 OR◀ 820D-L1A AND AR430 CP OPTIONS

FEATURE OR OPTION	OPTION DESIG	FACTORY EQPD	INSTALL IN	REMARKS
CD control of transmit supervision	ZC	√	TB1 of DAS ▶820D-L1 or◀ 820D-L1A	
Key control of transmit supervision	ZD			▶See Fig. 6◀
Camp-on detector	E	√	AR430 CP	
CC turned off by CD	A	√		
CC independent of CD	ZA			
CA looped to CB	H	√		
CA looped to CC	G			Not used in DLCS
Receive space timer	F			

Note: AR430 CP option H (factory-equipped) is not functional for the DLCS.

3.03 Interface leads between the ▶CPT or◀ TTY and DAS ▶820D-L1 or◀ 820D-L1A are provided by the DAS as follows.

(a) AA (frame ground)—This lead provides an interconnection of the ▶CPT or◀ TTY and DAS ▶820D-L1 or◀ 820D-L1A frame grounds. It may also be connected to the DAS signal ground (AB) when necessary.

(b) AB (signal ground)—This lead provides an interconnection of the ▶CPT or◀ TTY and DAS ▶820D-L1 or◀ 820D-L1A signal grounds. It may be connected to AA when necessary.

3.04 Interface leads between the ▶CPT or◀ TTY and AR430 CP are provided by DAS ▶820D-L1 or◀ 820D-L1A as follows.

(a) BA (transmitted data)—This lead delivers data signals originated by the ▶CPT or◀ TTY to the AR430 CP.

(b) BB (received data)—This lead delivers the data signals received by AR430 CP from the data set to the ▶CPT or◀ TTY.

(c) CA (request to send)—This lead is not used at stations in the 10-type Data Line Concentrator System.

(d) CB (clear to send)—This lead is not used at stations in the 10-type Data Line Concentrator System.

(e) CC (data set ready)—This lead delivers an indication to the ▶CPT or◀ TTY when the data set is ready to start transmitting.

(f) CD (data terminal ready)—This lead delivers an indication to AR430 CP that the ▶CPT or◀ TTY is ready to transmit and receive data. It may also be strapped to the receive supervisory gate to allow CC to be turned off by CD (AR430 CP, option A).

(g) CF (received line signal detector)—This lead delivers an indication to the ▶CPT or◀ TTY when the data set detects carrier on the line.

Note: Although at TTY stations the CF lead is delivered to the TTY, it is not utilized in this arrangement unless locally engineered.

3.05 Connecting wiring between Data Set 108-type and AR430 CP is provided by DAS ▶820D-L1 or◀ 820D-L1A as follows.

(a) BA (send data)—This lead delivers the data signals received by AR430 CP from the ▶CPT or◀ TTY to the data set for transmission to the line.

(b) BB (received data)—This lead delivers the data signals received from the line to the AR430 CP.

(c) CF (received line signal detector)—This lead delivers an indication to the AR430 CP when the data set detects carrier on the line.

B. Message Transmission

Transmit Supervision

3.06 When the station is in the idle state, the CD lead is off (negative), the CC lead is off, the BA lead is marking, and the data set is transmitting the spacing frequency to the line and receiving the marking frequency from the line. ▶In addition, at TTY stations the TTY motor is off.◀ The spacing signal from the data set located at the station (Data Set 108A- or C-type) is received by the line-side data set (Data Set 108A-type) of the PL interconnection arrangement.

3.07 Detection of the spacing signal at the interconnection arrangement squelches current toward the concentrator from the data set. The concentrator recognizes this state as an idle line.

3.08 When a station attendant ▶at a TTY station◀ requests service, operation of the ON button on the TTY will start the TTY motor. Approximately two seconds later, the CD lead will turn on (positive). If the AR430 CP is equipped with option A, CD turning on will allow the receive supervisory gate to turn on (provided carrier is being received), which will then turn on lead CC and light the ON lamp. If the AR430 CP is not equipped with option A, the CC lead will already be on (provided carrier is being received) and the ON lamp will light immediately upon operation of the ON button. With CD on and BA marking, the transmit supervisory gate is turned on, causing the data set to transmit the marking frequency to the line.

3.09 Detection of a marking signal by the interconnection arrangement unsquelches the output from data set toward the concentrator. The concentrator recognizes this state as a request for service and connects the line to a trunk. If all trunks in the concentrator are busy, the concentrator will return a camp-on signal to the station. This condition can be recognized at ▶a TTY station◀ by the fact that the TTY receive mechanism selects a delete character every three seconds.

3.10 ▶When the station attendant at a station arranged for key control of transmit supervision (eg, CPT station equipped with 6041H key) operates

the ON button, positive voltage (CD—ON) is applied to the CD lead, the ON lamp is lighted, and the data set will send the marking frequency (provided the BA lead is marking) to the line. The remainder of the operation is the same as described in 3.09.◀

Receive Supervision

3.11 The Data Set 108A- or C-type single PL station, using DAS ▶820D-L1 or◀ 820D-L1A and AR430 CP ▶in the 10-type Data Line Concentrator System◀ , does not require receive supervision. However, option links are provided which rearrange receive supervision circuits to detect camp-on signals (AR430 CP, option E). Detection of the camp-on by the camp-on detector circuit will turn on the lamp driver circuit. By provision of an external lamp on a locally engineered basis (eg, 6041H key),◀ the output of the lamp driver circuit can be utilized to light the external lamp every three seconds.

C. Message Termination (Disconnect)

3.12 Termination of a call may be accomplished by operation of the OFF button on the TTY ▶(TTY station) or OFF button on the 6041H key.◀ This extinguishes the ON lamp and turns off the CD lead. ▶In addition, at TTY stations it turns off the TTY motor.◀ The BA lead remains in the marking condition. With lead CD in the off condition, the transmit supervision gate is turned off. Turning off the transmit supervision gate causes the data set to transmit the spacing frequency to the line. ▶If the AR430 CP is not equipped with option A, the receive supervision gate will remain on as long as a carrier is being received. If the AR430 CP is equipped with option A, the off condition of the CD lead will turn off the receive supervision gate, thereby turning off the CC lead.◀

3.13 When the spacing signal is detected by the interconnection arrangement, the output from the data set toward the concentrator is squelched. The concentrator recognizes this condition as a request for disconnect. The station is now in the idle mode.

3.14 Another method of terminating a call is the sending or receiving of an end-of-transmission (EOT) character. When an EOT from either the station or concentrator end is detected ▶by the CPT or◀ in the TTY stunt box ▶of a station equipped for EOT disconnect,◀ the disconnect sequence is the same as when the OFF button on the TTY is operated (3.12 and 3.13).

3.15 If the computer initiates a disconnect by turning off its CD lead, the concentrator will disconnect the trunk and ignore the request-for-service bid on the line until the station is turned off and a new request for service is originated.

D. Local Mode

3.16 A TTY station can be put in the local mode by operation of the LOCAL button on the TTY. This starts the TTY motor, lights the LOCAL lamp on the TTY, disconnects the BA lead from the DAS 820D-L1A and loops it back to the BB lead, and holds the CD lead in the off condition. The TTY can now be used for preparing tapes, editing tapes, or typing practice. In this mode, the TTY page printer will copy whatever is sent from the tape reader or keyboard. ▶This mode of operation is entirely a function of the TTY machine.◀ Restoration of the LOCAL button will extinguish the LOCAL lamp and return the station to the idle mode.

3.17 ▶Placing a CPT station in the local mode is entirely dependent on the type of terminal equipment being provided by the customer.◀

E. Out of Service (OOS) Mode

3.18 A TTY station can be put in the OOS mode by operation of the OUT OF SERVICE button on the TTY. This lights the OUT OF SERVICE lamp and places the station in the same state as operation of the OFF button. However, in this mode, the TTY motor remains off and operation of the ON button will not initiate a call. Restoration of the OUT OF SERVICE button extinguishes the OUT OF SERVICE lamp and returns the station to the idle mode.

3.19 ▶Placing a CPT station in the OOS mode is entirely dependent on the type of terminal equipment being provided by the customer. In any case, the CD lead must be held in the off condition while the CPT is in the OOS mode.◀

F. Test Mode

3.20 A TEST key is provided on the DAS ▶820D-L1 and◀ DAS 820D-L1A. Operation of this key

lights the DAS 820D-L1A TEST lamp, connects the received data lead from the data set to the send data lead, holds the receive supervision gate off, and clamps lead BB marking. Lead CC is held off by the receive supervision gate. In this mode the transmission facility and data set may be tested from the far end. Restoration of the DAS ▶820D-L1 or◀ 820D-L1A TEST key extinguishes the TEST lamp and returns the station to the idle mode.

3.21 ▶At a TTY station,◀ the TEST button on the TTY key does nothing but light the lamp under the button. However, the leads from the button have an appearance on the TTY set logic assembly terminal board (TB). This allows the TTY TEST button to be locally engineered as a remote TEST key by connection of terminals TB1-5 and TB1-6 of the DAS to terminals 2 and 4 of the TTY set logic assembly TB. ▶A remote TEST key may also be provided by use of a 6041H key as described in the section referenced in 2.08 (591-023-210).◀

G. Alarms

3.22 Unless ▶a TTY station is◀ locally engineered to have the ALARM lamp on the TTY indicate when a carrier failure occurs, the lamp is lighted only when a paper-low condition occurs in the TTY. Replenishment of the paper supply will extinguish the ALARM lamp. ▶The alarm indications at a CPT station are not a function of the data set or DAS.◀

4. OPERATION

4.01 This part describes how to place a Data Set 108A- or C-type single PL station, using DAS ▶820D-L1 or◀ 820D-L1A and AR430 CP in the ▶10-type Data Line Concentrator System,◀ in its various modes of operation.

4.02 To place a TTY station in the on-line mode, ensure that the OUT OF SERVICE, LOCAL, and TEST buttons on the TTY are not operated (OUT OF SERVICE, LOCAL, and TEST lamps on TTY are extinguished). Verify that the TTY has a sufficient supply of paper (ALARM lamp on TTY extinguished). Verify that the DAS 820D-L1A TEST key is not operated (DAS 820D-L1A TEST lamp extinguished). Now operate the ON button on the TTY. The TTY motor will start and, if the AR430 CP is equipped with option A, approximately two seconds later the ON lamp will light. When the answer-back code is received, the system is ready for data exchange.

> ***Note:*** ▶If the AR430 CP is ***not*** equipped with option A, the ON lamp will light at the same time the ON button is operated.◀

4.03 ▶To place a station equipped with the 6041H key in the on-line mode, ensure that TEST button on the 6041H key is not operated (TEST lamp on 6041H key extinguished) and operate the ON button. When the answer-back code is received, the system is ready for data exchange.◀

4.04 If all of the concentrator trunks are busy, a camp-on signal will be returned to the station by the concentrator. The camp-on signal can be recognized at a TTY station by the fact that the TTY receive mechanism selects a delete character every three seconds and ▶at CPT or TTY stations,◀ (if provided by local engineering) the camp-on lamp will flash every three seconds. If the station is left in this state, the concentrator will connect it to a trunk whenever one becomes available. In any case, operation of ▶the OFF button (stations equipped with 6041H key),◀ the OFF button on the TTY ▶(TTY stations),◀ or detection of an EOT character will return the station to the idle state and cause a request for disconnect to be sent to the concentrator.

4.05 A TTY station can be placed in the local mode by operation of the LOCAL button on the TTY. In this mode, the TTY motor will run continuously and the page printer will copy any data that is sent from the keyboard or tape reader. ▶The placing of a CPT station in the local mode is dependent on the type of terminal equipment provided by the customer.◀

4.06 A TTY station may be taken out of service by operation of OUT OF SERVICE button on the TTY. In this mode the TTY motor is off, maintenance may be performed on the station equipment, and no calls can be initiated until the button is restored. ▶The manner in which a CPT station is taken out of service is dependent on the type of terminal equipment provided by the customer.◀

4.07 The TEST button on the TTY performs no function other than lighting the TEST lamp unless it has been locally engineered to do otherwise

(3.21). In order to place a TTY station in the test mode, it is necessary to gain access to the DAS 820D-L1A. ▶Therefore, it is strongly recommended that the TTY TEST switch be arranged as described in 3.21.◀ Operation of the TEST key on the DAS ▶820D-L1,◀ 820D-L1A, or TTY (when locally engineered) will loop the data set send data led back to the receive data lead. A loop-back test of the transmission facility and data set may now be performed from some test point along the line.

4.08 ▶If a station is equipped with a 6041H key, operation of the TEST button on the 6041H key will place the station in the test mode in the same manner as operation of the TEST button on the DAS (4.07).◀

5. REFERENCES

5.01 The following schematic drawings, circuit descriptions, and Bell System Practices (BSPs) pertain to the Data Set 108A- or C-type single PL station using DAS 820D-L1A for the 10-type Data Line Concentrator System.

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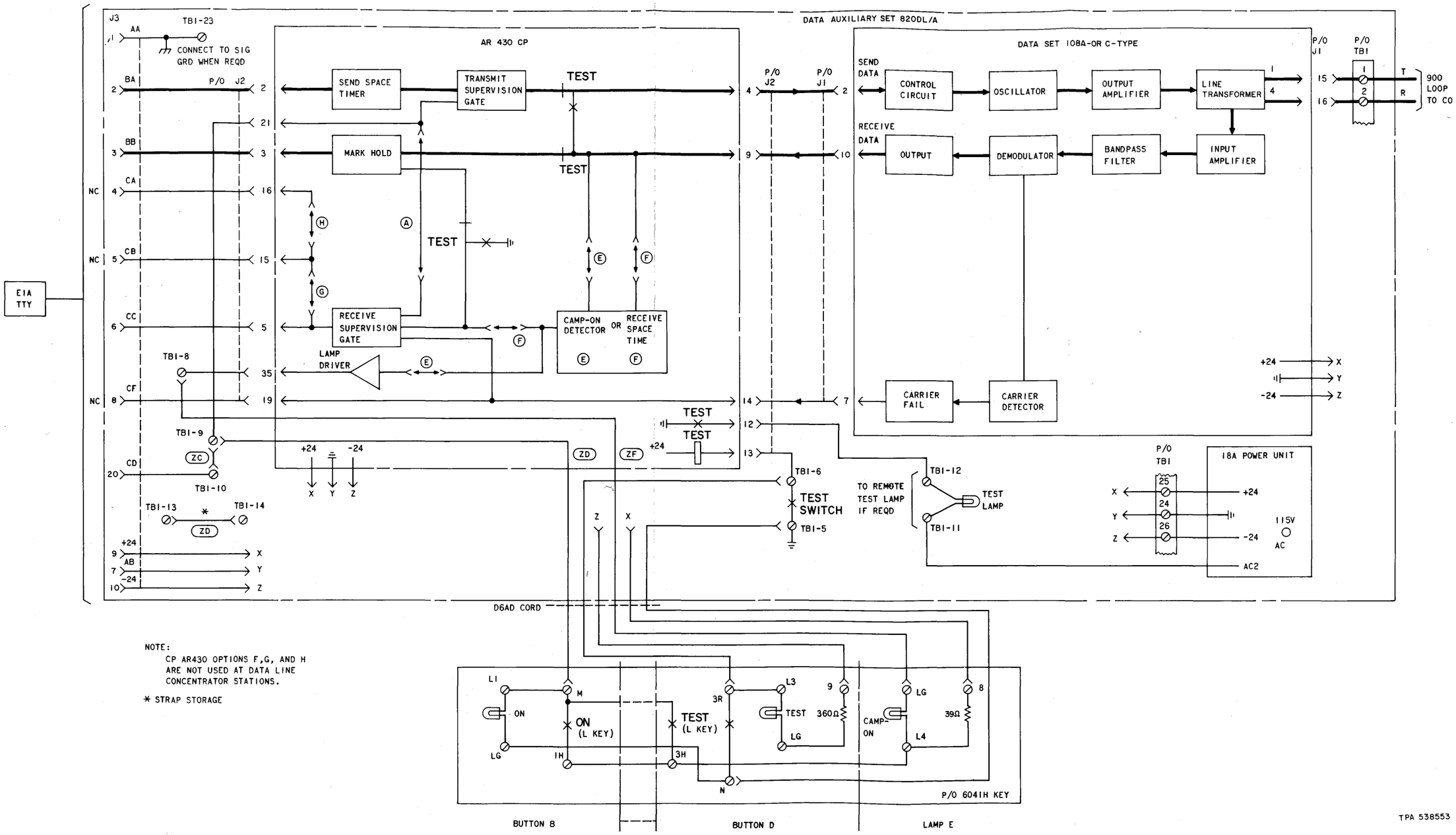

NOTE:
CP AR430 OPTIONS F,G, AND H ARE NOT USED AT DATA LINE CONCENTRATOR STATIONS.

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Fig. 6—Functional Block Diagram of Data Set 108-Type —Single Private Line Station Using DAS 820D-L1 or 820D-L1A in the 10-Type Data Line Concentrator System