PRIVATE LINE STATION ARRANGEMENTS USING DATA SETS 108F AND 108G WITH DATA AUXILIARY SETS 830B, 830C, AND 830D INSTALLATION AND CONNECTIONS

CONTENTS PAGE

1. GENERAL

1.01 This section contains information concerning the installation and connection of data sets (DSs) 108F and 108G alone (Fig. 1) and with data auxiliary sets (DASs) 830B-L1A, 830C-L1A, and 830D-L1 (Fig. 2, 3, and 4). A typical arrangement is shown in Fig. 5.

1.02 The reasons for reissuing this section are listed below. Since this reissue is a general revision, no revision arrows have been used to denote significant changes.

(a) Added Uniform Service Order Code (USOC) in Table A.

(b) Added DAS 830D-L1.

(c) Added option table and the connection diagram for DAS 830D-L1.

1.03 Data set 108F and G and associated DASs should be installed in conformance with the general requirements of Section 590-010-200; entitled Data Sets and Data Access Arrangements—General Installation and Connection Information.

1.04 For optimum appearance and utility, locate the data apparatus on a desk, table, stand, or in a Bell System provided equipment cabinet. When required, or upon customer request, a 193A backboard can be used to wall-mount the data apparatus.

1.05 Data set 108F and G will operate over a temperature range of 40°F to 120°F with relative humidity of 20 to 95 percent (applies only if condensation does not accumulate on the circuit pack).

1.06 The data set must be located near the associated customer-provided equipment (CPE) or Bell System teletypewriter (TTY) hereafter referred to, collectively, as terminal equipment. The interface cord supplied by the customer should not exceed 50 feet in length (as recommended by Electronic Industries Association [EIA] standards). In order to minimize inductive interference with data signals, the telephone line should not be carried in the same cable run as cable between the data set and terminal equipment. If this condition cannot be met, the telephone line must be run in type SK (shielded) station wire between the data set and the cable distribution terminal or building entrance. The shield should be grounded at one end only, preferably at the distribution terminal end.

Fig. 1—DS 108F or 108G

2. OPTIONS

A. Data Set 108F and 108G

2.01 Data sets 108F and G are provided with a number of options which are installed prior to placing the data set in service. All options are installed and removed with the switches or option strap shown in Fig. 6. Each option and associated switch (refer to Fig. 7 for switch [S1 and S2] operation) or strap setting is listed in Table A. Similar information is contained on the label located on the underside of the data set housing. Extra labels are available by ordering Form E-10064.

2.02 The installer should verify that the options called for on the service order are installed,

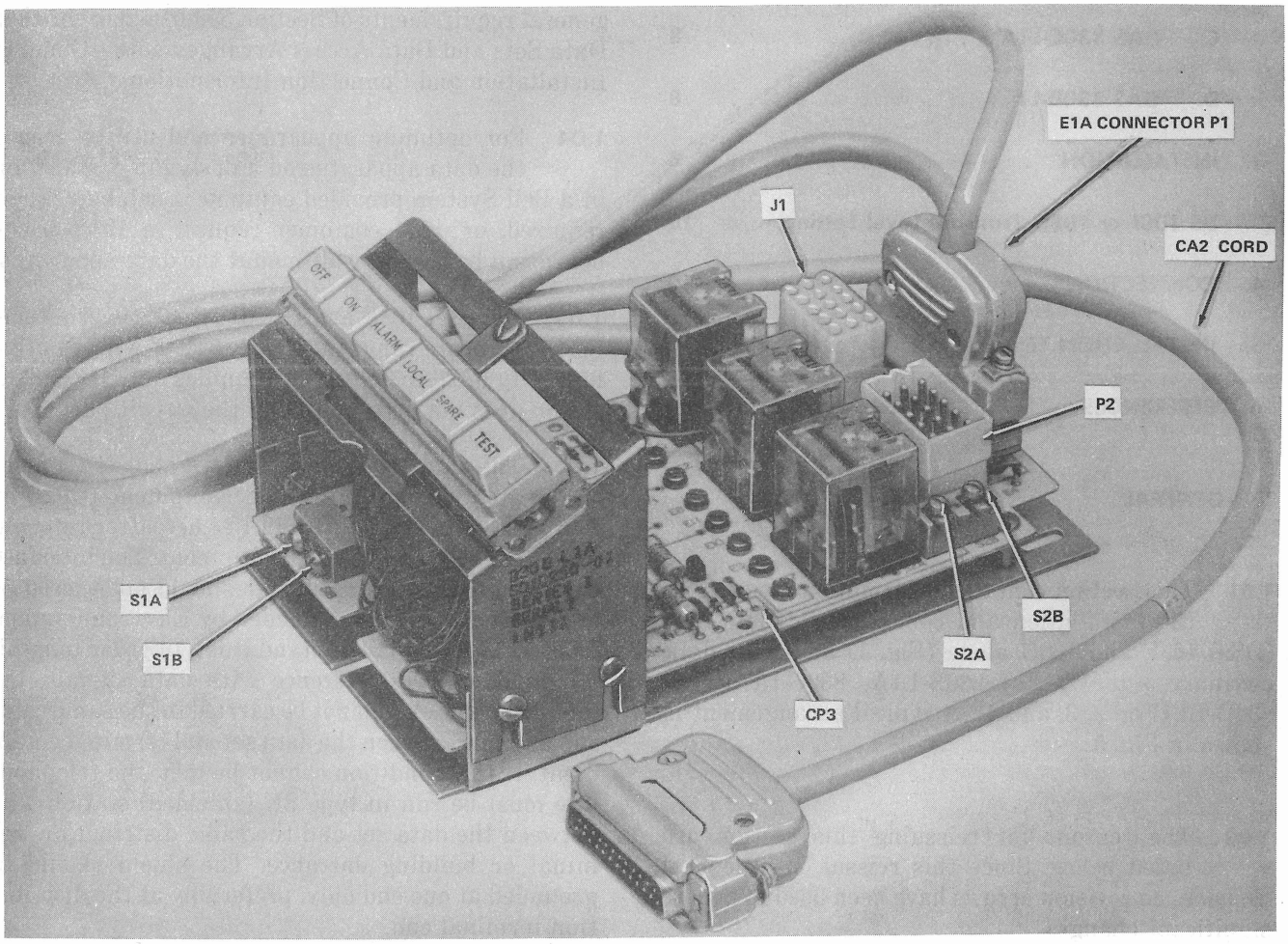


Fig. 2—DAS 830B-L1A

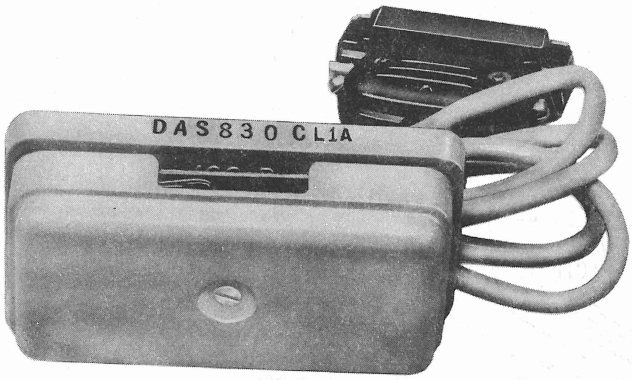


Fig. 3—DAS 830C-L1A

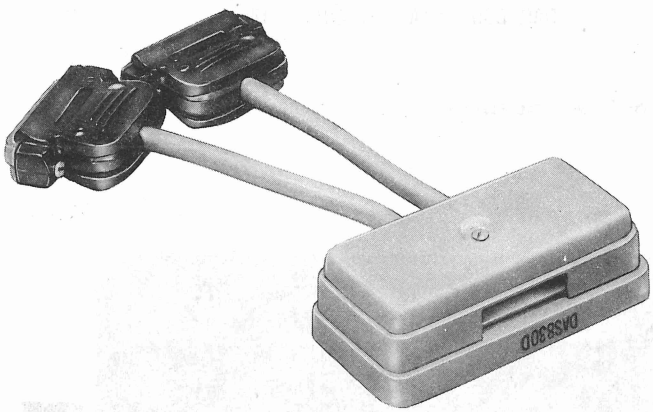


Fig. 4—DAS 830D-L1

which may (as telephone company option) call for equipping the data set circuit pack with a 52A1 data unit to provide the data set with remotely activated digital loopback capability.

2.03 To access the data set option switches, it is necessary to remove the data set from the housing:

Warning: When removing front and rear covers use finger pressure only. No special tools are required. Excessive force may crack the data set cover.

(1) Remove the front and rear covers by gently squeezing on top and bottom and pulling.

Warning: After removal the circuit pack should be placed on a clean, dry, nonconductive surface.

(2) Release the circuit pack latching mechanism of the data mounting (Fig. 8).

(3) Slide the circuit pack out the rear of the housing (Fig. 9).

2.04 ***2-Wire or 4-Wire Operation (Options Y or Z):*** Depends on line facilities available.

2.05 ***Remote Test Connection Via J1 (Yes or No) (Option P or N):*** Allows a DAS 830B-L1A or TTY connected to the data set to remotely activate the test mode.

2.06 ***Resistor Bypass for Negative Voltage (-P) on J1 (Yes or No) (Option R or Q):*** This option is used whenever the data set is arranged with a DAS 830B-L1A or 830C-L1A.

2.07 ***Receiver Gain Reduction (Yes or No) (Option K or J):*** Normally 6 dB (option K) is used. No reduction (option J) is used when the loop shows an unusually high loss.

2.08 ***Mark or Space Hold (Option U or V):*** On loss of carrier frequency this choice of options determines whether the received data (BB) line is held on a negative (marking) voltage or a positive (spacing) voltage.

2.09 ***Clear to Send (CB) Internally Connected*** as follows:

- ***Receive Supervision (RS) (Option W):*** Used only if CPE requires supervision on the received line signal detector line (CF). Refer to the example in Fig. 10.
- ***Request to Send (CA) (Option X):*** Used when the terminal equipment requires CA connected to CB. Refer to the example in Fig. 11.
- ***(Unconnected) (Option E):*** Used when no output to CB is required.

2.10 ***Carrier Control*** is as follows:

- ***Via Request to Send (CA) (Option D):*** This option cannot be selected at the same

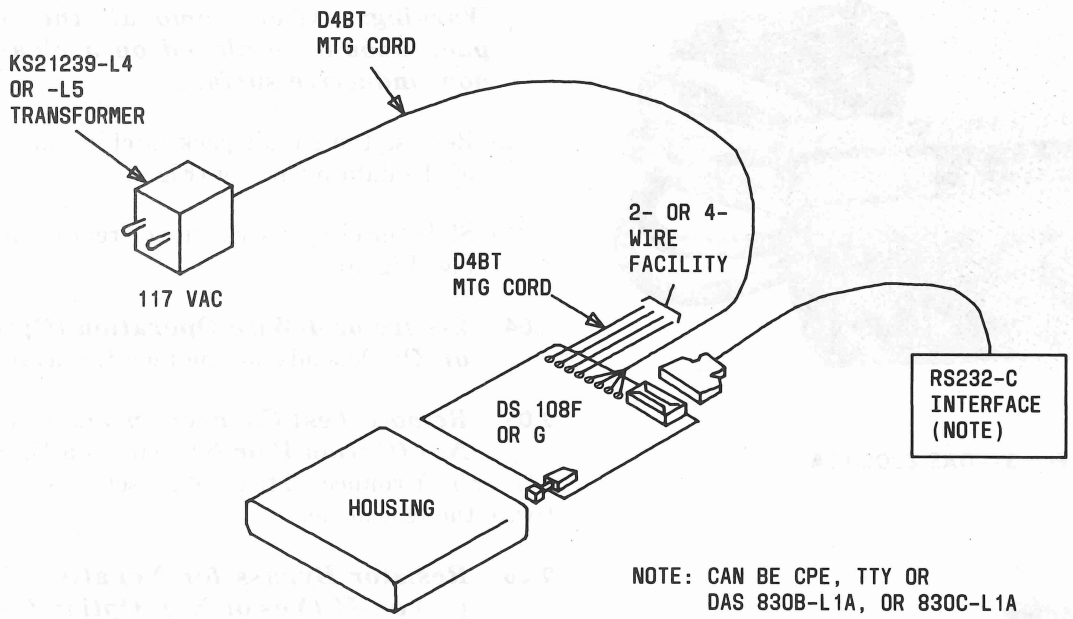


Fig. 5—Typical DS 108F or G Arrangement

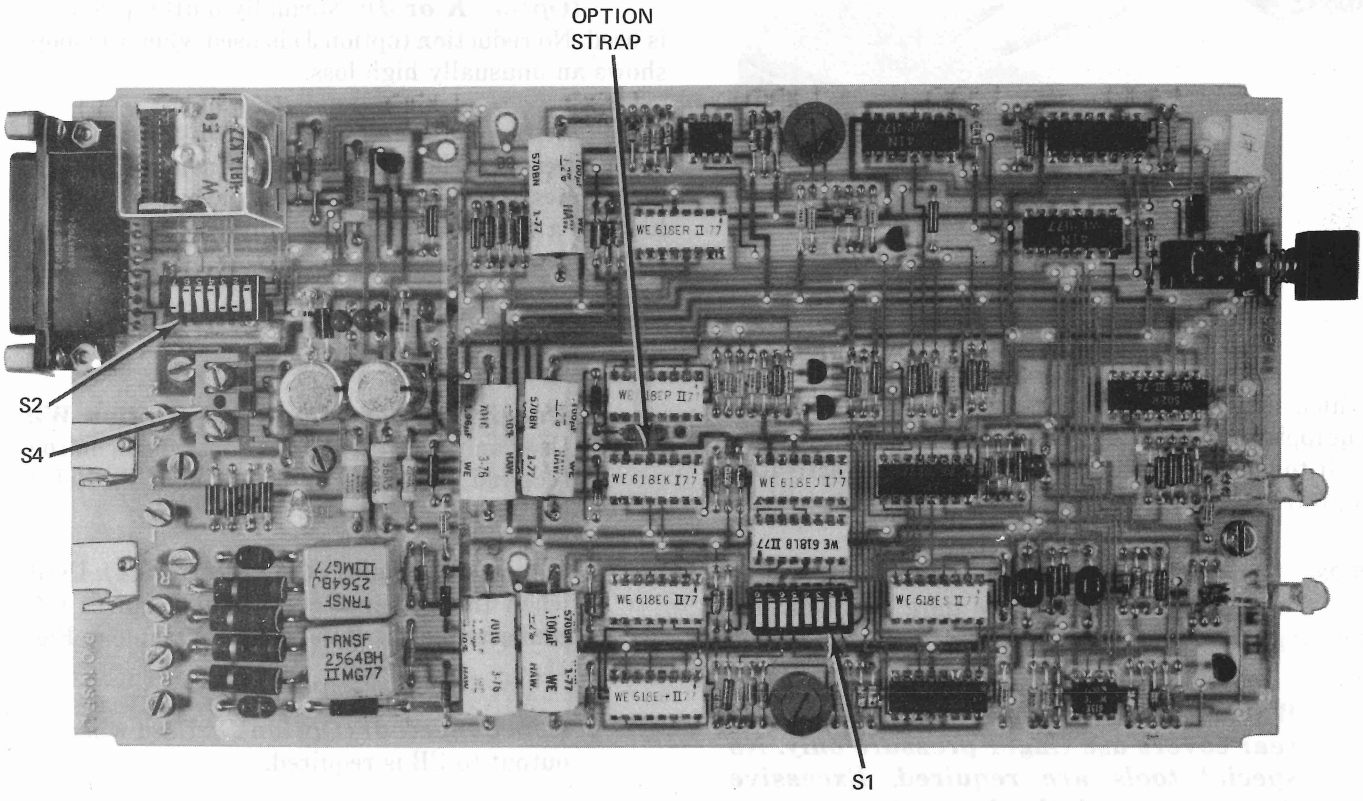


Fig. 6—Circuit Pack of DS 108F (Similar to DS 108G Circuit Pack)

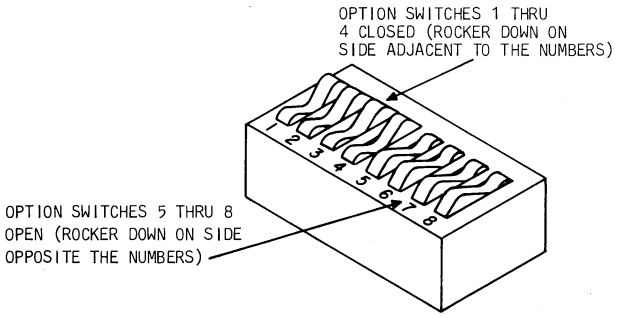


Fig. 7—Dual In-Line Package (DIP) Switch Operation

time as option X above. It is used when carrier control is desired from the terminal equipment (as in polling systems). Refer to the example in Fig. 10.

- ***Via Receive Supervision (RS) (Option T):*** Used when the far-end set is to have full facilities supervision. It provides the "carrier squelch on carrier fail". This option ***cannot*** be installed at both ends of a system.

- ***Always on in Data Mode (Option S):*** Used in normal point-to-point systems and at the polling end of polling systems. The car-

TABLE A
DATA SET 108F OR G OPTIONS

FEATURE		OPTION	SWITCH SETTING (S1-)		USOC DECSN
			OPEN	CLOSED	
Facility	4-Wire	Z	4	3	
	2-Wire	Y*	3	4	
Mark or Space Hold	Mark	U*	2	1	B3
	Space	V	1	2	B4
			SWITCH SETTING (S2-)		
CB Internally Connect to	None	E	5,6	–	
	RS	W	6	5	D7
	CA	X*	7	6	D8
Carrier Control	Via CA	D	2,4,6	7	
	Via RS	T	2,7	4	A1
	Always on in Data Mode	S*	4,7	2	A2
	Always off in Data Mode	H	2,4,7	–	
Remote Test Connection Via J1	Yes	P	–	1	
	No	N*	1	–	
Local Copy in Test Mode	Yes	G	–	3	C5
	No	F*	3	–	C6
			OPTION STRAP		
Receiver dB Gain Reduction	6	K*	E2-E3		
	0	J	E1-E2		
			SCR SWITCH (S4-)		
Ground Wire (GRD) Connected to Signal Ground (SG)	Yes	M*	–	B	E9
	No	L	B	–	E10
Resistor Bypass for Negative Voltage (-P) on J1	Yes	R	–	A	
	No	Q*	A	–	

* Factory furnished option.

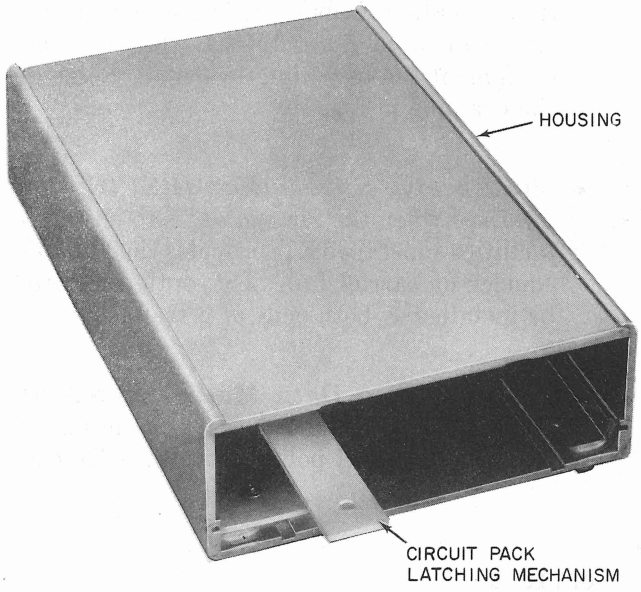


Fig. 8—DS 108F or G Housing

rier is always ***on*** except when controlled by receive supervision in the test mode.

- ***Always off in Data Mode (Option H):*** This option is used in broadcast systems and keeps the carrier ***off*** except when controlled by receive supervision in the test mode. Refer to the example in Fig. 11.

2.11 ***Local Copy in Test Mode (Option G):*** Used when the data interchange code between terminal equipment and testboard is the same and no restrictions exist on the use of the paper in the terminal equipment.

2.12 ***No Local Copy in Test Mode (Option F):*** This option should be used only when the terminal equipment uses a data interchange code that differs from the code used by the testboard, or the terminal equipment uses special paper (such as numbered forms or airline ticket blanks).

2.13 ***Ground Wire Connected to Signal Ground (SG) (Option M):*** Connects SG to the "green wire" ground via the third prong of the

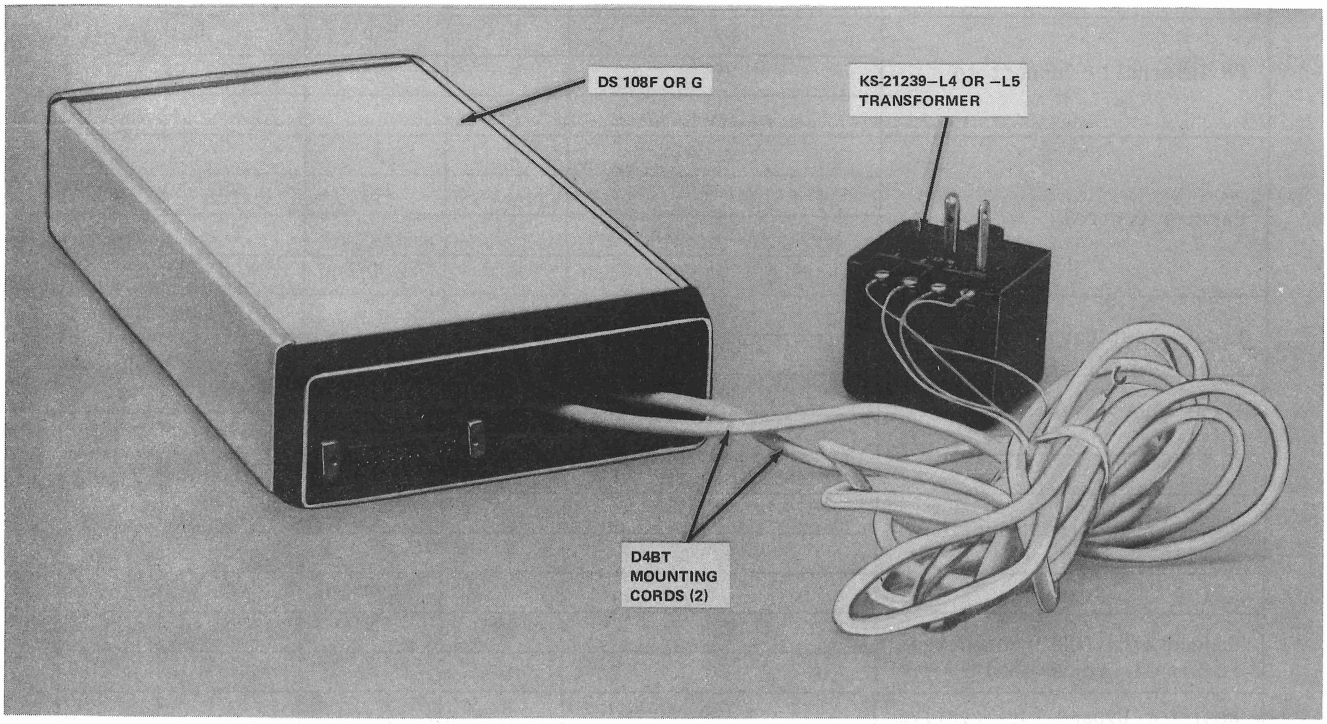
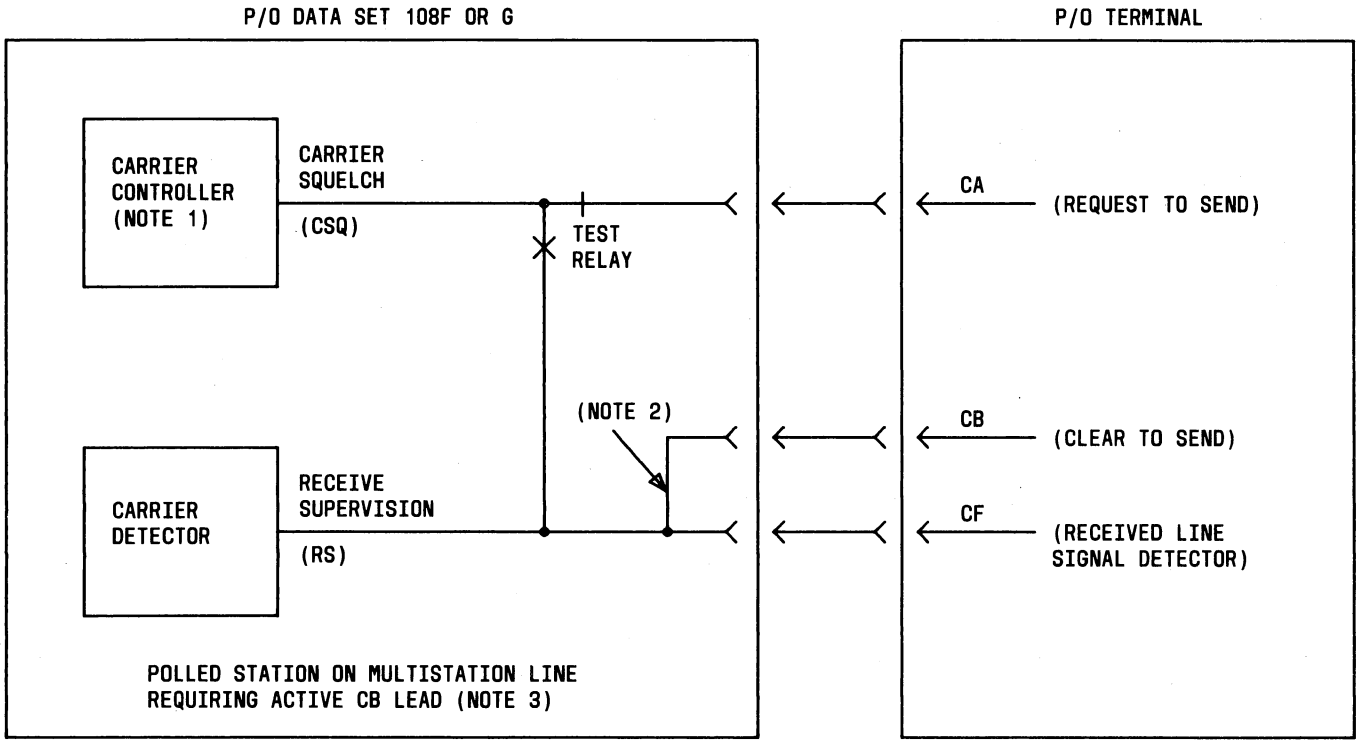


Fig. 9—DS 108F or G Rear View



NOTES:
1. OPTION D, CARRIER CONTROL VIA CA.
2. OPTION W, CB CONNECTED TO RS.
3. THIS IS AN EXAMPLE OF THE APPLICATION OF THESE OPTIONS, AND IS NOT LIMITING.

Fig. 10—Example of DS 108F or G Options D and W

power transformer. The data set housing always remains ungrounded.

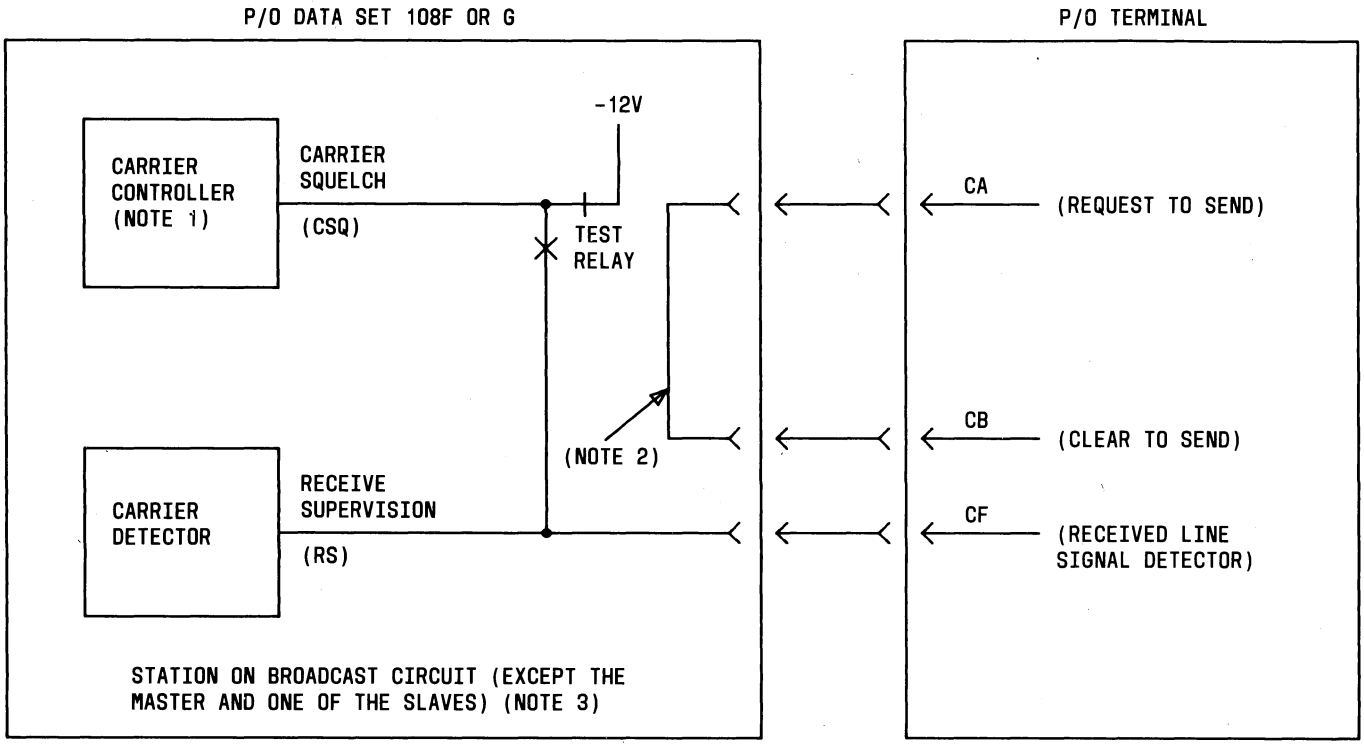
2.14 ***Ground Wire Not Connected to Signal Ground (SG) (Option L):*** Maintains SG as a floating ground.

2.15 ***Remotely Activated Digital Loopback:*** This telephone company option requires installation of a 52A1 data unit on the data set circuit pack as shown in Fig. 12. The 52A1 data unit permits a test center to remotely activate the digital loop test mode of the data set by sending a spacing signal of 1 second or longer duration. The test center can deactivate the test mode after performing the test by sending a marking signal of 0.5 seconds. The following restrictions apply:

- Customer data cannot normally contain spacing signals in excess of 0.6 seconds.
- The 52A1 data unit can be installed on one data set only of any two that communicate with each other.
- Data Set 108G equipped with the 52A1 data unit cannot use the space hold option if the distant data set provides the carrier squelch on carrier rail option.
- Data Set 108E equipped with the 52A1 data unit cannot use the space hold option if the distant data set provides both the carrier squelch on carrier fail option and space hold option.

B. DAS 830B-L1A

2.16 The DAS 830B-L1A provides the options shown in Table B.



NOTES:
1. OPTION H, CARRIER CONTROL ALWAYS IN DATA MODE.
2. OPTION X, CB CONNECTED TO CA.
3. THIS IS AN EXAMPLE OF THE APPLICATION OF THESE OPTIONS, AND IS NOT LIMITING.

Fig. 11—Example of DS 108F or G Options H and X

C. DAS 830C-L1A

2.17 The DAS 830C-L1A (Fig. 13) provides the options shown in Table C.

D. DAS 830D-L1

2.18 The DAS 830D-L1 provides the options shown in Table D.

3. INSTALLATION

3.01 Prior to installing DS 108F or G and the associated data auxiliary sets ensure that:

- The correct private line data set is used.
- Refer to Table E for compatibility.
- The desired options are installed in DS 108F or G and the data auxiliary set.

3.02 The data set requires a power source that provides 105 to 129 volts 7 watts at 57 to 63 Hz. The customer must supply an outlet that will accept the 3-prong plug on the KS-21239-L4 or -L5 power transformer provided with the data set. To prevent the data set from being turned off accidentally, this outlet should not be under the control of a switch. To avoid the possibility of data errors due to a potential difference between data set ground and terminal equipment ground, the outlet for the data set power cord should be served from the same ac distribution panel as the terminal equipment. If this condition cannot be met, a test using the 6H impulse counter should be performed to detect the presence of noise potential. This test is described in Section 591-818-500. If test requirements are not met, data set ground and terminal equipment ground must be bonded together in accordance with local regulations.

3.03 The data set is equipped with a 25-pin female EIA interface connector to provide EIA inter-

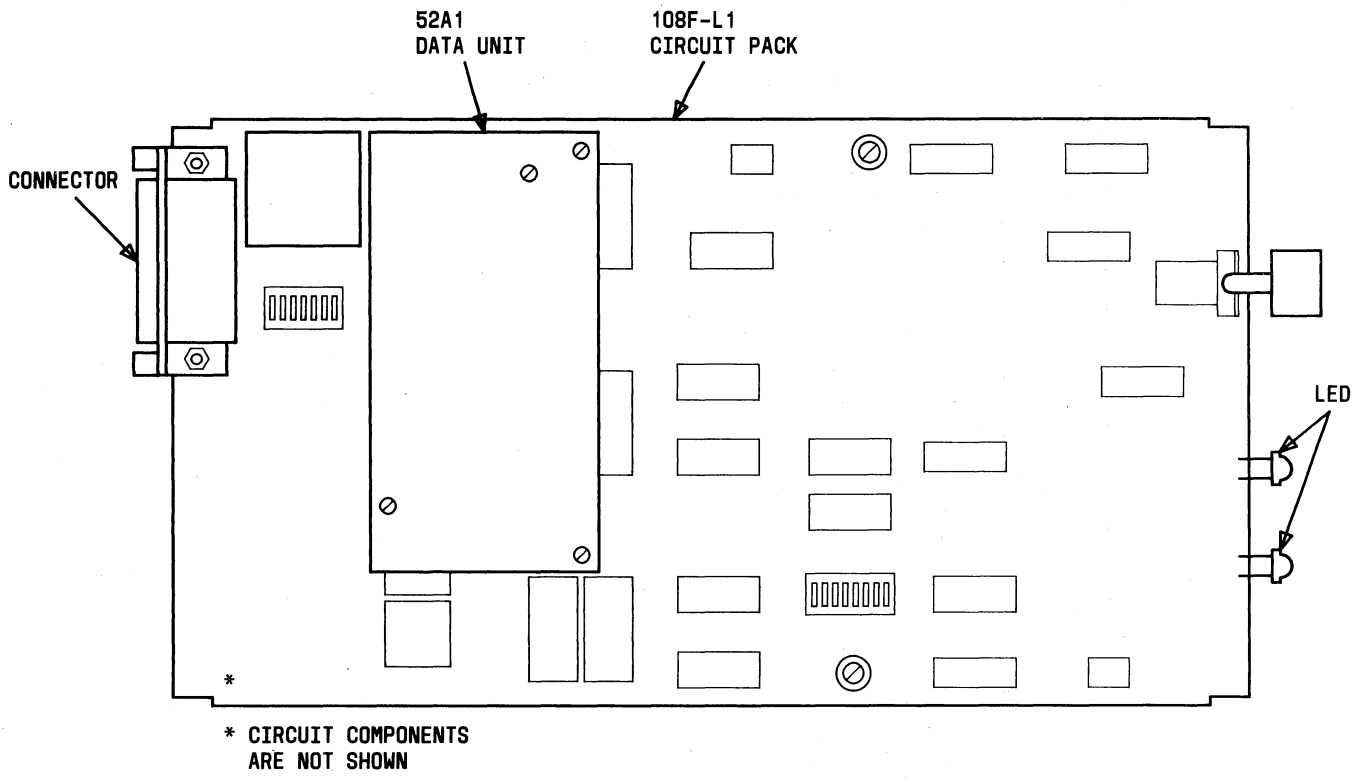


Fig. 12—DS 108F-LI Equipped With 52A1 Data Unit

TABLE B

DAS 830B-L1A OPTIONS

FEATURE	OPTION	SWITCH SETTING	
		OPEN	CLOSED
Local Copy	Z		S1A
No Local Copy	Y*	S1A	
Paper alarm — motor stop†	X*	S2B	
Paper alarm — no motor stop	W		S2B
EOT disconnect‡	V		S2A
No EOT disconnect	U*	S2A	
Space clamp§	T*		S1B
Mark clamp§	S	S1B	

* Factory furnished option.

† Paper alarm (low paper or out of paper) stops TTY motor.

‡ If an end-of-transmission (EOT) character is received by the TTY, the TTY will turn off (placing a mark on select magnet driver to guard against spurious characters).

§ Mark or space clamp on the BA lead when TTY is in OFF condition.

face to either terminal equipment or data auxiliary set. Telephone line interface must be provided using locally furnished wire. Locally furnished wire must also be provided between power transformer KS-21239-L4 or -L5 and the data set. D4BT mounting cords are recommended for power and telephone line connections.

3.04 Installation of the DAS 830B-L1A, ET1 circuit pack (Fig. 14), and EC 833 break detection circuit is made at the service center (Fig. 15). The wiring for ET1 circuit pack arrangement with DAS 830B (Fig. 16) includes a send space timing circuit and a message-waiting lamp circuit.

DS 108F or 108G Transmit Level Setting

3.05 The DS 108F or G transmit level may be set for the output level specified on the CLRC according to Table F.

4. CONNECTIONS

4.01 This part contains information for connecting DS 108F or G alone and with DASs 830B-L1A, 830C-L1A and 830D-L1.

4.02 The connection diagrams are as follows:

- Fig. 17—DS 108F or G Connection Diagram
- Fig. 18—DS 108F and G With DAS 830B-L1A Connection Diagram
- Fig. 19—DS 108F or G With DAS 830C-L1A Connection Diagram
- Fig. 20—DS 108F or G with DAS 830D-L1 Connection Diagram.

5. INSTALLATION TESTS

5.01 After installation is complete refer to Section 591-818-500 for test procedures.

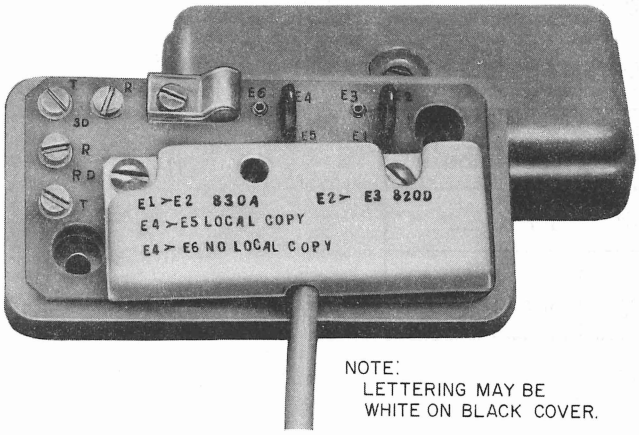


Fig. 13—DAS 830C-L1A Terminal Board

6. REFERENCES

6.01 The following Bell System Practices provide additional information on DS 108F and G and associated equipment:

SECTION	TITLE
591-042-100	Data Sets 108F and 108G—Identification
591-818-100	Private Line Station Arrangements Using Data Sets 108F and 108G With Data Auxiliary Sets 830B and 830C—Description
591-818-500	Private Line Station Arrangements Using Data Sets 108F and 108G With Data Auxiliary Sets 830B and 830C—Maintenance and Test Procedures
598-083-102	Data Auxiliary Set 830B—Identification
598-083-103	Data Auxiliary Set 830C—Description
598-083-107	Data Auxiliary Set 830D—Identification

6.02 The following schematic drawings (SDs) and circuit descriptions (CDs) contain information on DS 108F and 108G or associated equipment:

SECTION	TITLE
SD- & CD-1D250-01	Data Auxiliary Sets 830A, 830B, 830C, and 830D
SD- & CD-1D285-01	Data Set 108F
SD- & CD-1D286-01	Data Set 108G and 52A1 Data Unit

TABLE C

DAS 830C-L1A OPTIONS

FEATURE		OPTION	LINK POSITION
Local Copy	Yes	Z	E4 to E5
	No	Y*	E4 to E6
For Operation With	DAS 830A or DS 108F or G	X	E1 to E2
	DAS 820D	W*	E2 to E3

* Factory furnished option.

TABLE D

DAS 830D-L1 OPTIONS

FEATURE		LINK OPTION	POSITION
Time Delay	Long	Z*	E1 to E2
	Short	Y	E2 to E3

* Factory Furnished Option.

TABLE E

DS 108F AND G LINE COMPATIBILITY

DATA SET	FAR-END DATA SET
108F	103F (In the answer mode) 108A 108E 108G 108J
108G	103F (In the originate mode) 108B 108C 108D 108F 108H

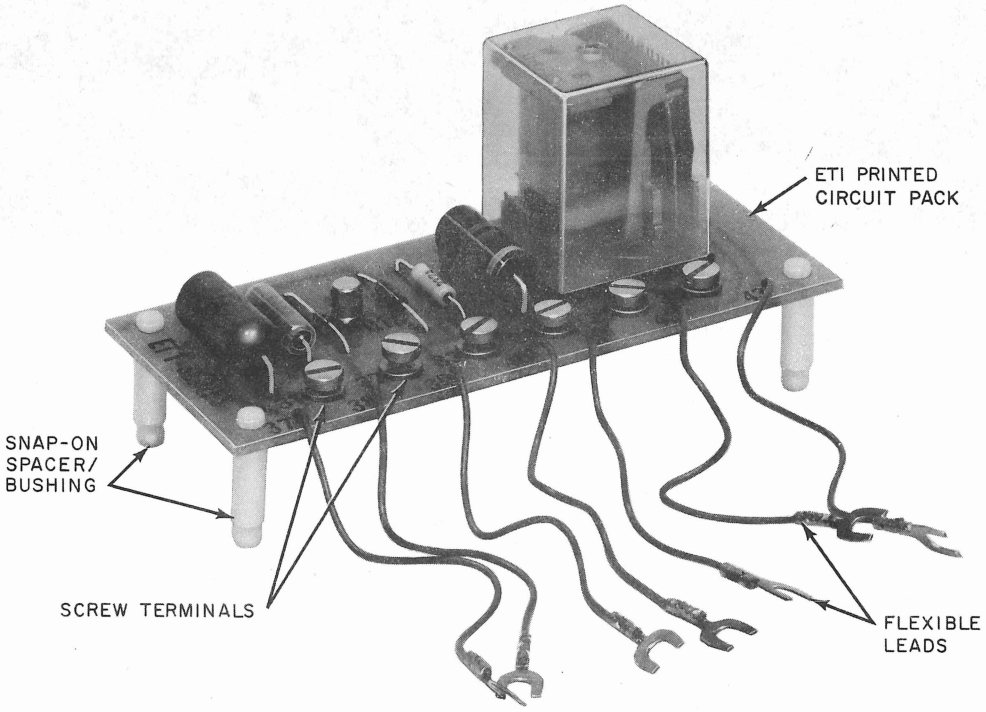


Fig. 14—ET1 Circuit Pack

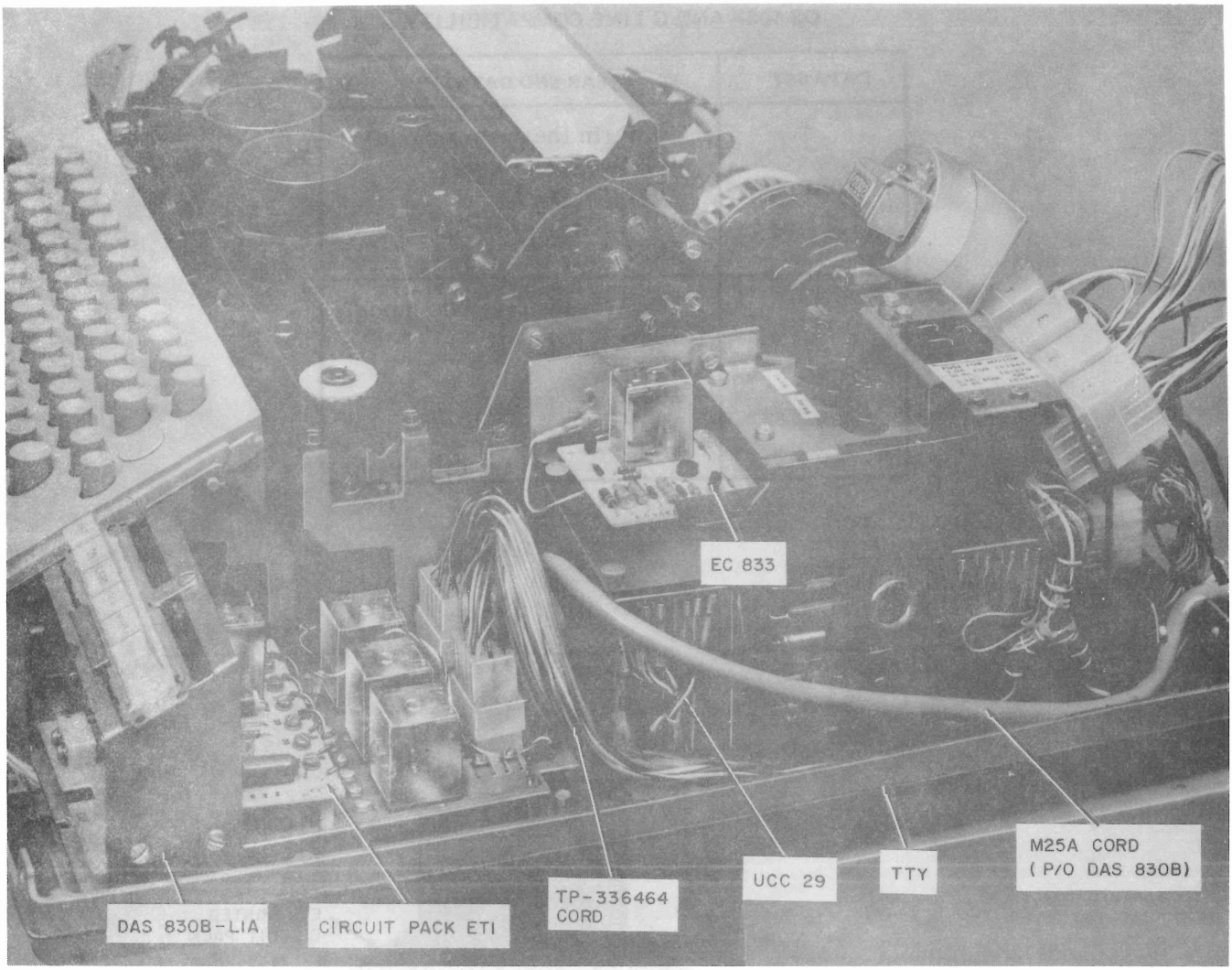
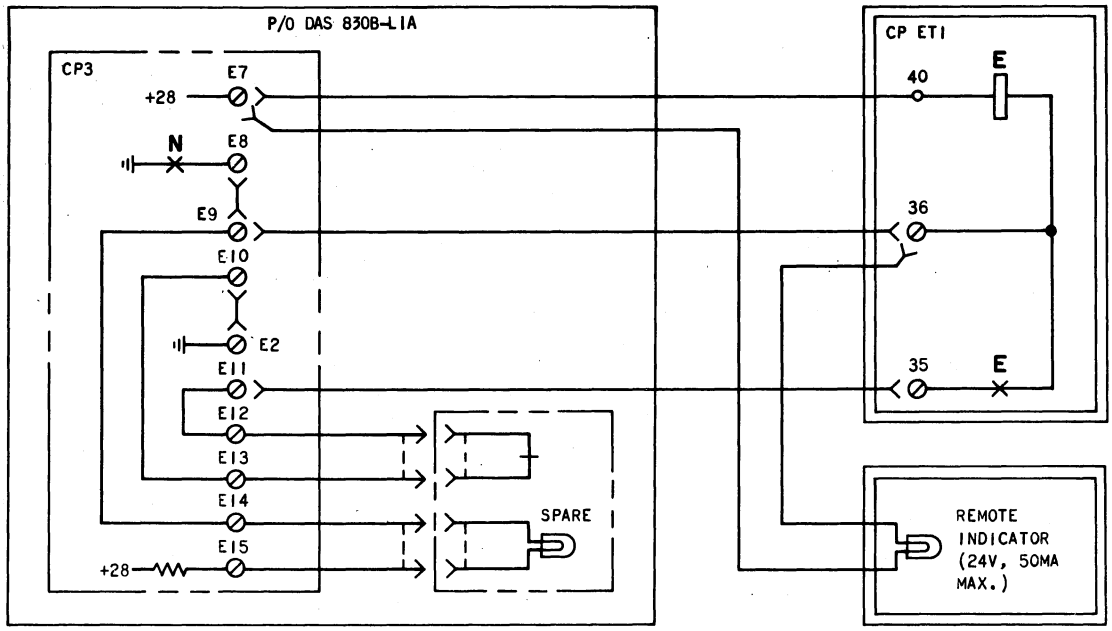
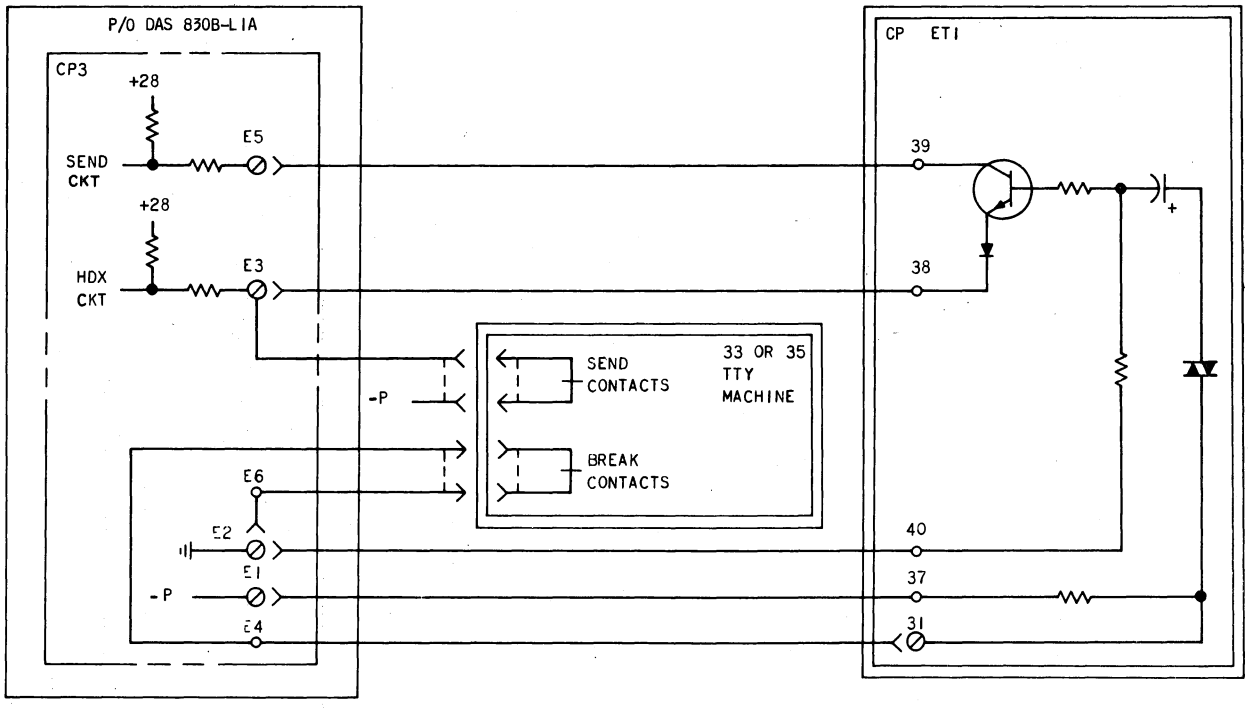


Fig. 15—DAS 830B-L1A Mounted in TTY



WIRING OF CP ETI AND DAS 830B-LIA WITH TSPS NO. 1 HOTEL/MOTEL SERVICE FOR MESSAGE WAITING INDICATION ("SPARE" BUTTON MAY BE RELABLED FOR PROPER IDENTIFICATION, AND LOCKING SCREW MAY BE REMOVED TO CONVERT THE BUTTON TO NONLOCKING, NONRELEASING.) THE ARRANGEMENT FOR MESSAGE WAITING INDICATION CANNOT BE USED WITH EITHER THE ARRANGEMENT FOR SEND SPACE TIMING OR WITH THE TELETYPEWRITER BREAK DETECTION OPTION. THE LOCAL BUTTON MUST RETAIN THE BLOCKING RING 812365948 (P-23F594).



WIRING OF CP ETI AND DAS 830B-LIA FOR SEND SPACE TIMING

Fig. 16—ET1 Circuit Pack Arrangement

TABLE F

DS 108F OR G TRANSMIT LEVEL SETTING

TRANSMIT LEVEL (IN dBm)	SWITCH SETTING (S1 –)	
	OPEN	CLOSED
–1	5, 6, 7, 8	–
–3	5, 7, 8	6
–5	5, 6, 8	7
–7	5, 6, 7	8
–9*	6, 7, 8	5
–11	7, 8	5, 6
–13	6, 8	5, 7
–15	6, 7	5, 8

* Factory furnished option.

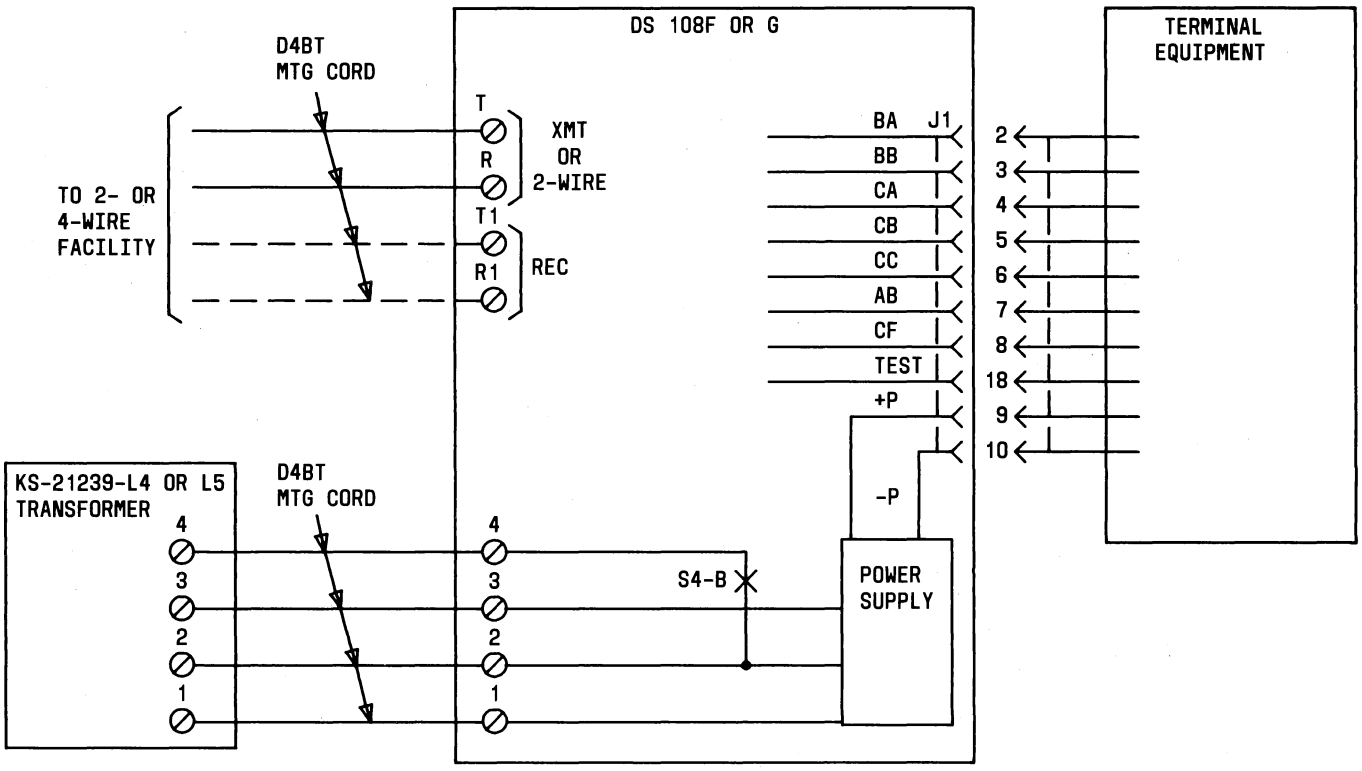


Fig. 17—DS 108F or G Connection Diagram

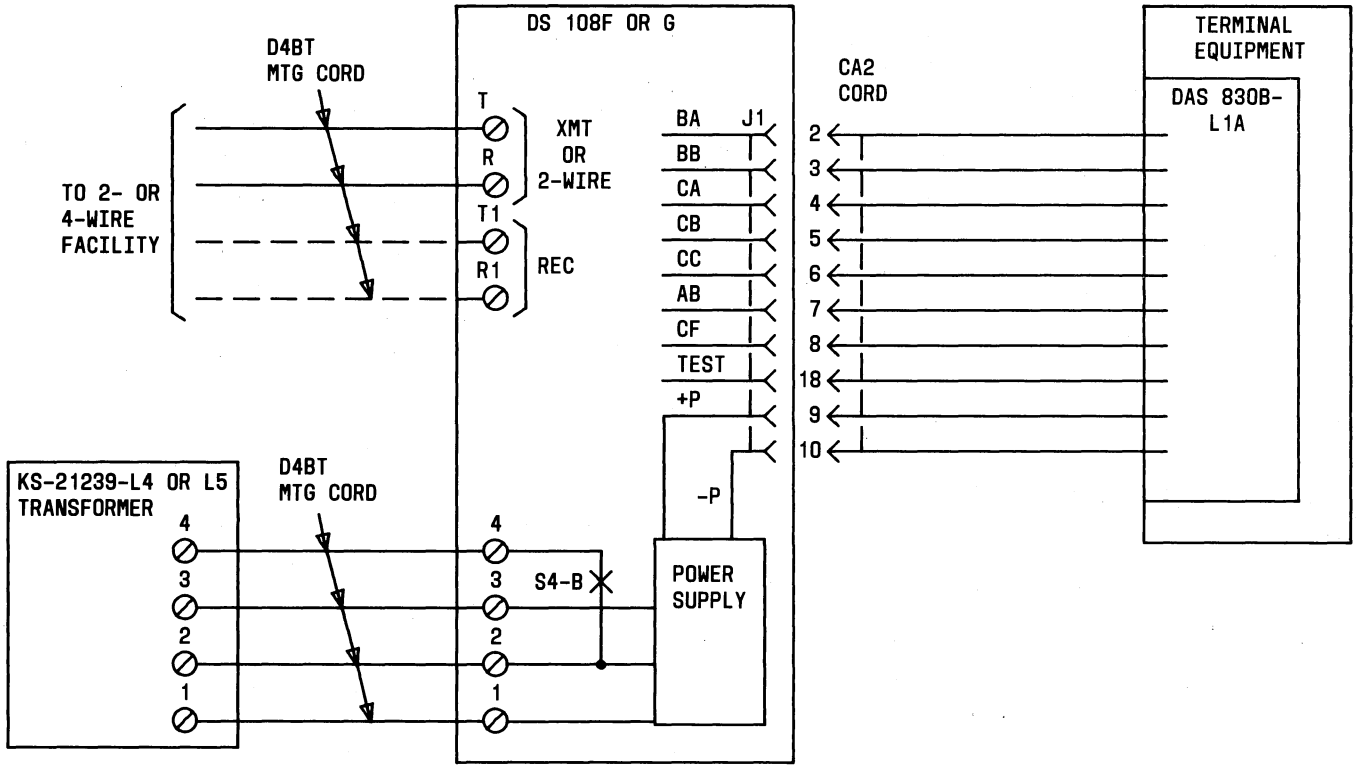
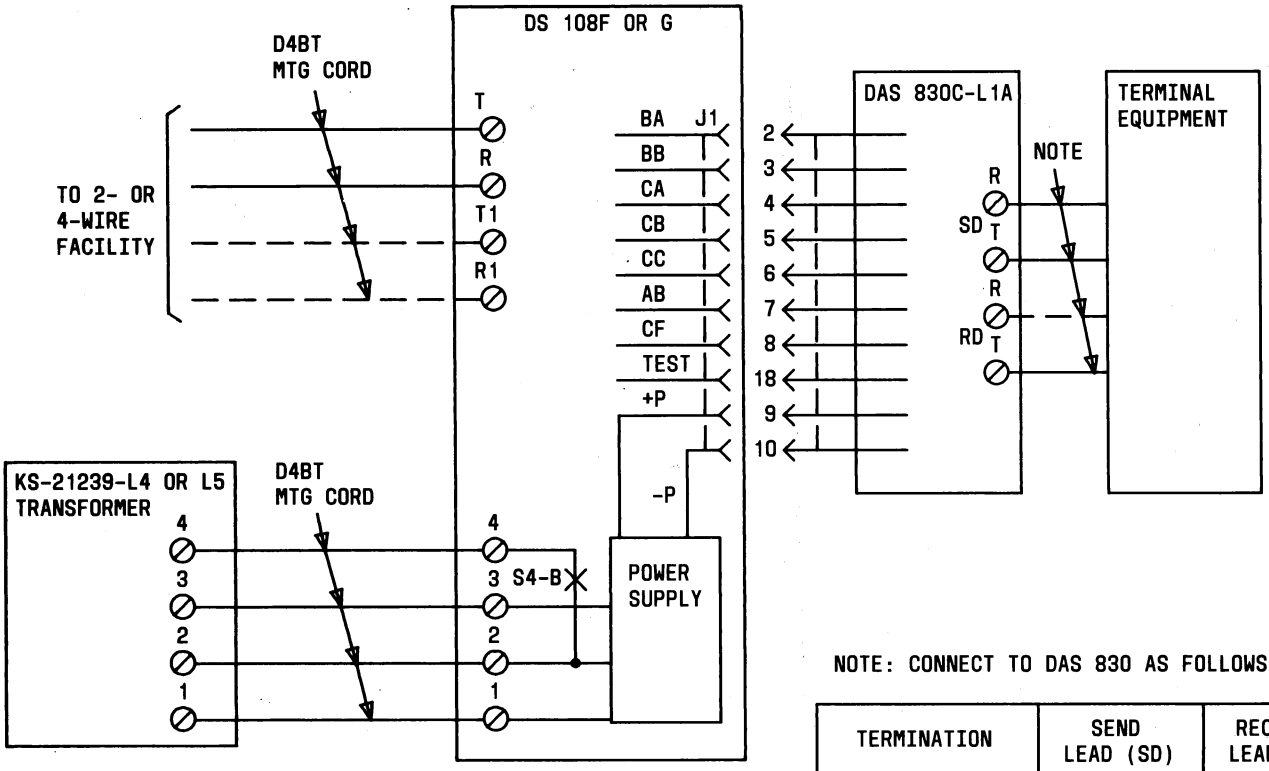


Fig. 18—DS 108F or G With DAS 830B-L1A Connection Diagram



NOTE: CONNECT TO DAS 830 AS FOLLOWS:

TERMINATION	SEND LEAD (SD)	RECEIVE LEAD (RD)
4-WIRE CIRCUIT	+ TO SD-R - TO SD-T	+ TO RD-R - TO RD-T
3-WIRE CIRCUIT	+ TO SD-R	- TO RD-T
	COMMON TO SD-T	

Fig. 19—DS 108F or G With DAS 830C-L1A Connection Diagram

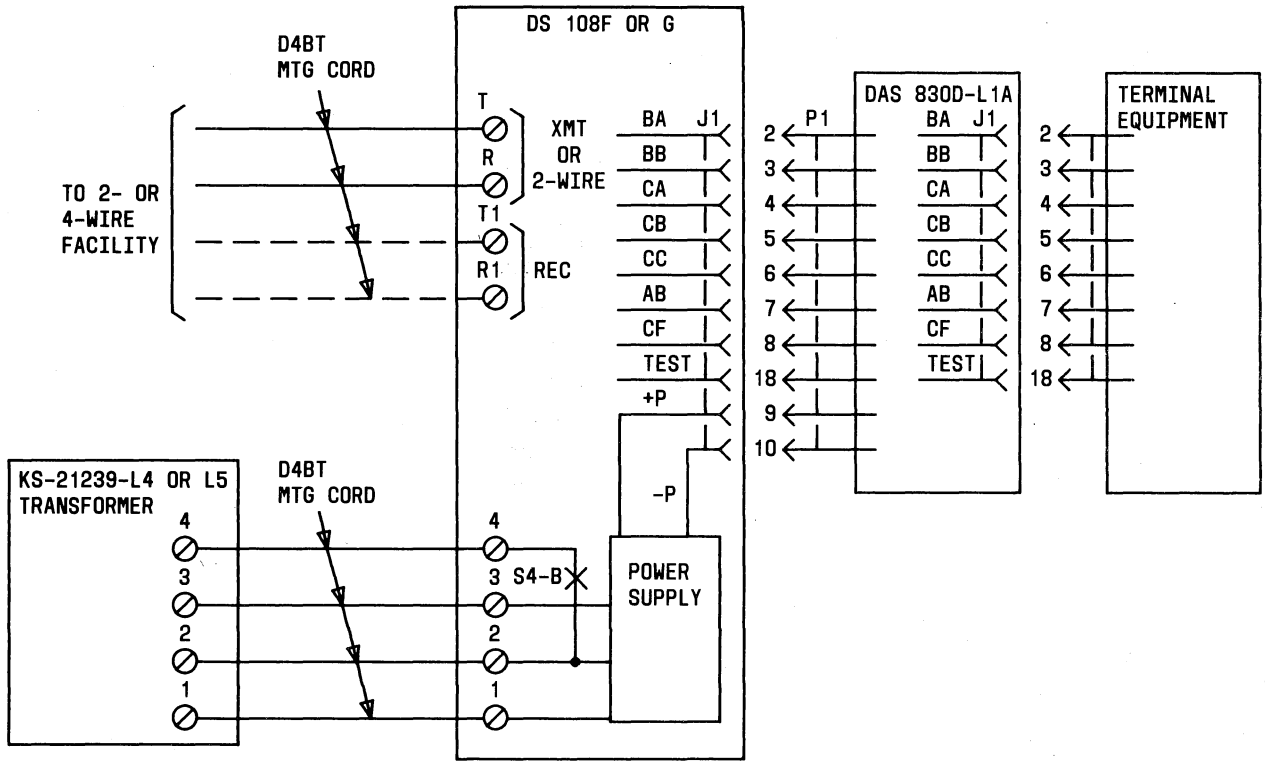


Fig. 20—DS 108F or G With DAS 830D-L1 Connection Diagram