PRIVATE LINE STATION ARRANGEMENTS USING DATA AUXILIARY SETS 830A, 830B, AND 830C WITH DATA SETS 108- AND 109-TYPE DESCRIPTION AND OPERATION

CONTENTS PAGE

1. GENERAL

1.01 Data auxiliary set (DAS) 830A (Fig. 1) equipped with data set 108- or 109-type provides the basic data arrangement for private line (PL) service using customer-provided equipment (CPE) or Bell System teletypewriters (TTYs). DAS 830A (equipped with a data set) can be used in conjunction with DAS 830B (Fig. 2) ▸or DAS 830C (Fig. 3)◂ to provide the station arrangements shown in ▸Fig. 4.◂

1.02 This section is reissued to include information pertaining to the DAS 830C and to make miscellaneous changes to improve the section's usability.

1.03 The DAS 830A, 830A/830B, and ▸830A/830C◂ arrangements can be used to provide low-speed service at the following baud rates.

- DAS 830A used with CPT—300 baud
- DAS 830A used with EIA TTY--150 baud
- DAS 830A/830B used with M33 or M35 TTY—110 baud.
- ▸DAS 830A/830C used with CPE or 30-, 45-, 55-, and 75-baud TTYs—up to 75 baud.
- DAS 830A/830C used with General Purpose 35 TTY—150 baud.◂

1.04 DAS 830B connects the DAS 830A [Electronic Industries Association (EIA) interface] to a Model 33- or 35-type teletypewriter (TTY) interface and replaces Teletype TP186627 set logic assembly. The DAS 830A and 830A/830B arrangement can be used to replace most PL and telegraph services provided by DAS 820D and the associated control cards (AR17 and AR430 circuit packs).

1.05 ▸DAS 830C (Fig. 3) is used with a DAS 830A equipped with a data set 108- or 109-type, to convert standard EIA voltages from the data set to a 3- or 4-wire 20 mA current interface for a CPE or TTY requiring a 20 mA current interface of 30, 45, 55, or 75 baud. Operation of the DAS 830C up to 150 bauds is satisfactory with the Bell System General Purpose 35 TTY. The voltage interface between the DAS 830A and the DAS 830C conforms to EIA specification RS-232-C.◂

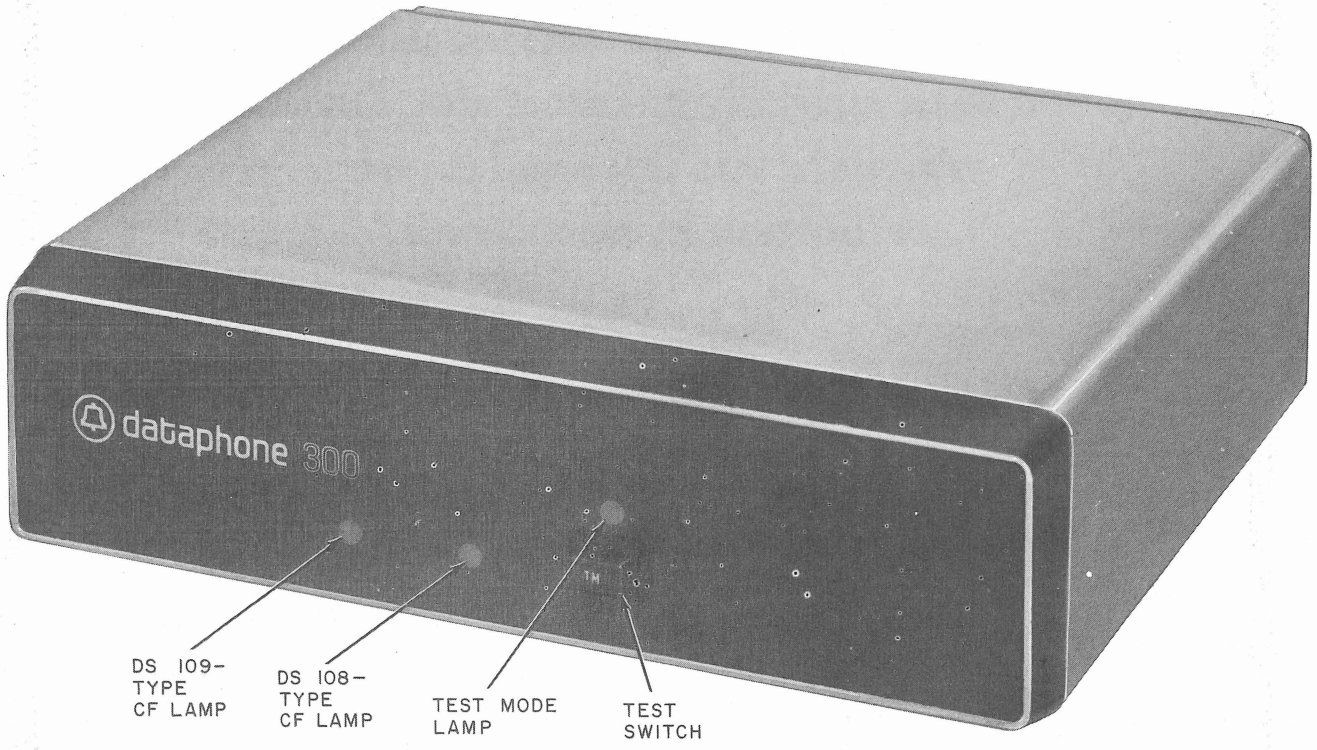


Fig. 1—DAS 830A

2. PHYSICAL DESCRIPTION

DAS 830A

2.01 DAS 830A has an aluminum chassis with removable front and back plastic covers. Access to the screw terminals and option switches is obtained by removing the rear cover. Refer to Fig. 5 for the location and designation of these switches. Access to the data set is obtained by removing the front cover. The test switch (TM) and associated indicator are shown in Fig. 1. Table A lists the power cords and additional physical information for DAS 830A.

DAS 830B

2.02 DAS 830B is a 6-button key unit designed for mounting under the faceplate of the TTY is front of the UCC29 (Fig. 6). DAS 830B is installed in the TTY by the service center. Table A provides physical information for DAS 830B.

DAS 830C

2.03 DAS 830C consists of a metal and plastic housing which contains a printed circuit board. The circuit board and plastic cover is mounted on a 168D-49 backboard equipped with a 101A-49 cover. The circuit board provides option jacks and screw terminals (Fig. 7) for connections to a CPT or TTY. The DAS 830C is equipped with a 5-foot cord; one end equipped with a male 25-pin EIA connector for connection to a DAS 830A (or 820D):

- Pin 2—Transmitted data (BA).
- Pin 3—Received data (BB).
- Pin 7—Signal ground (AB).
- Pin 8—Carrier fail (CF).

Note: One end of CF lead is connected in the connector. The other end is not connected (taped and stored in DAS 830C housing).

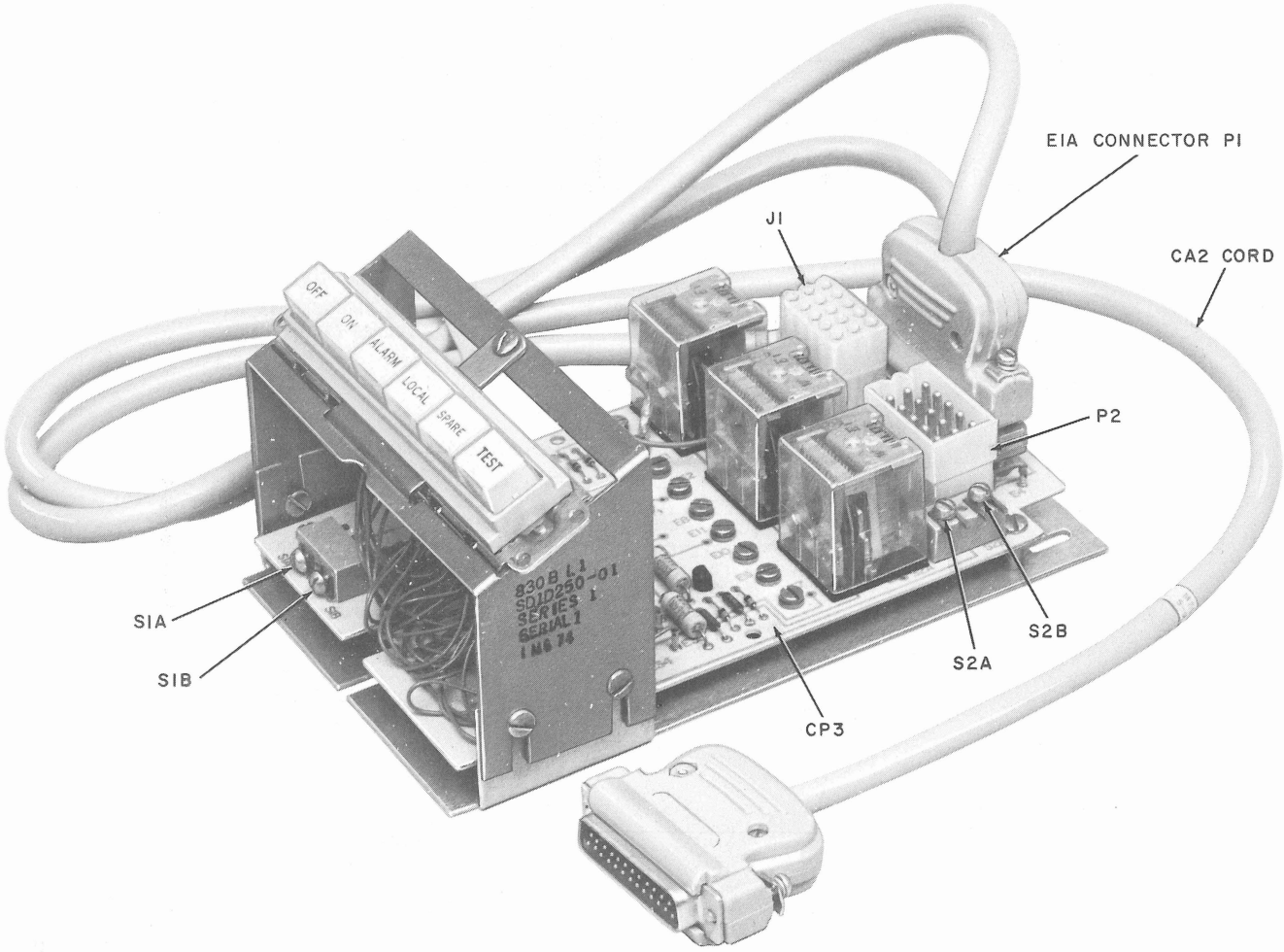


Fig. 2—DAS 830B

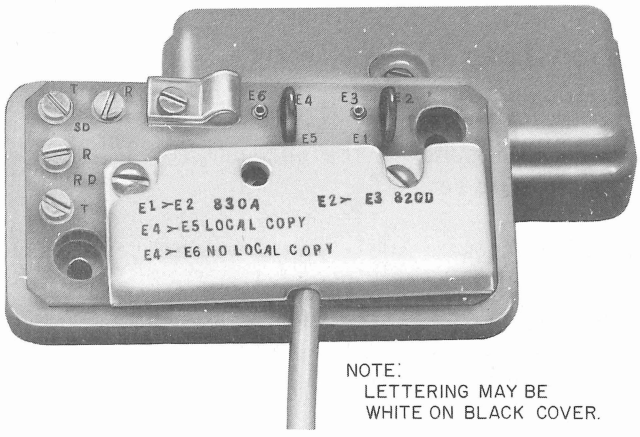


Fig. 3—DAS 830C

- Pin 9—plus 24 volts (+P) from DAS 830A (or 820D).
- Pin 10—minus 24 volts (−P) from DAS 830A (or 820D).

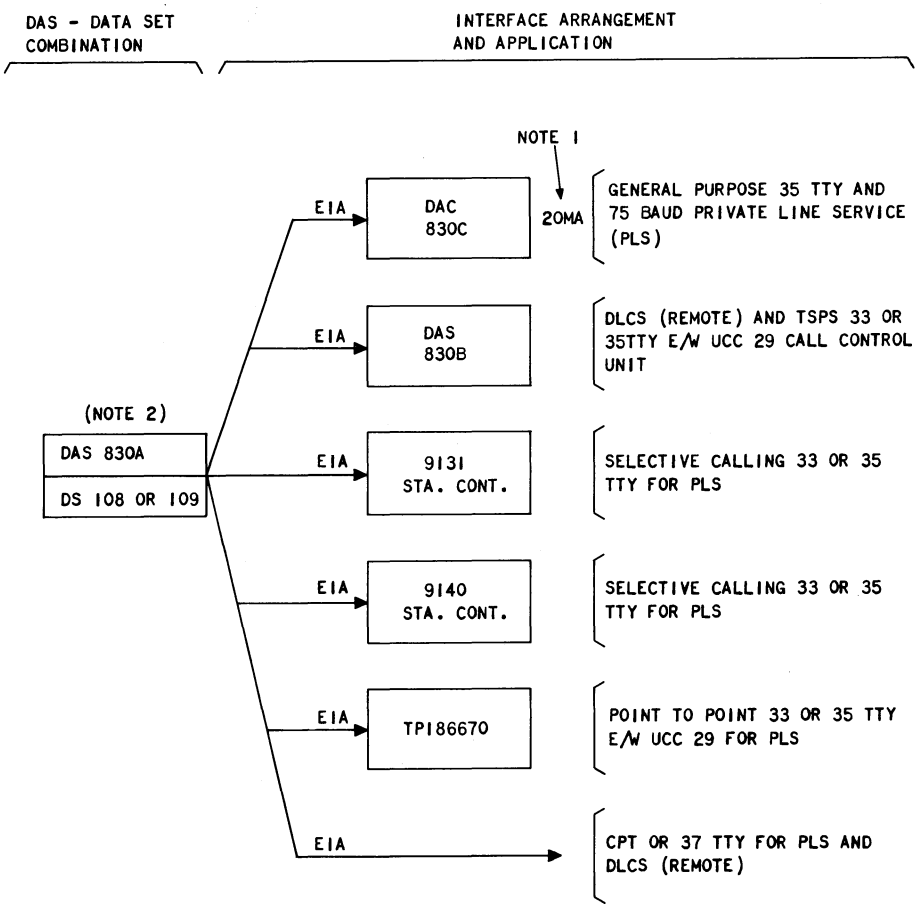
Table A lists the power cords and additional physical information.

3. FUNCTIONAL DESCRIPTION

DAS 830A

3.01 DAS 830A serves as an interconnecting unit for the data set and terminal device. It provides the data set with:

- physical mounting for the data set



NOTES:
1. THREE WIRE 20MA INTERFACE FOR GENERAL PURPOSE 35 TTY AND FOUR-WIRE 20MA INTERFACE FOR 30, 45, 55 OR 75 BAUD APPLICATIONS.
2. WHEN USED WITH DAS 830C, DAS 830A MAY BE INTERCHANGED WITH DAS 820D-TYPE (ANY SERIES) E/W ARI7 CARD. FOR FOR ALL OTHER ARRANGEMENTS, DAS 830A MAY BE INTERCHANGED WITH DAS 820D-TYPE (SERIES 3 OR HIGHER) E/W ARI7 CARD.

Fig. 4—DAS 830A, 830A/830B, and 830A/830C Applications

- power connections
- line facility connections (2-wire or 4-wire)
- EIA output connections to the terminal device, DAS 830B, or DAS 830C
- test mode function
- option selection switches.

3.02 The optional features provided by DAS 830A are given in Table B. The data set options available depend on the options provided by the selected data set.

3.03 Data sets 108D (Fig. 8), 108E (Fig. 9), or 109E (Fig. 10) are used in DAS 830A. The options provided by data set 108D and E are shown in Table C. The options provided by data set 109E are shown in Table D.

3.04 The use of data sets other than those listed in 3.03 will restrict the features available in DAS 830A. The following manufacture discontinued

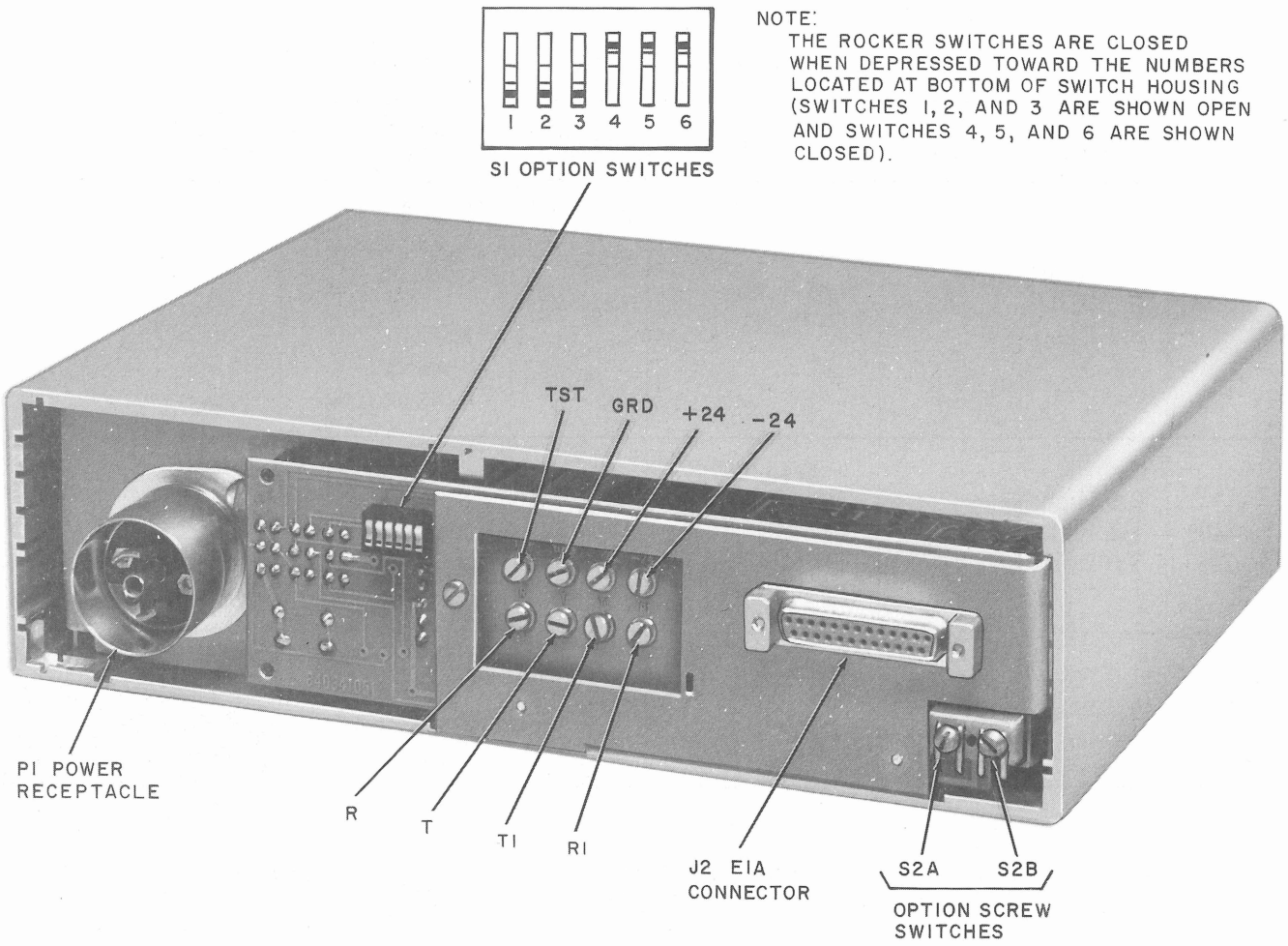


Fig. 5—DAS 830A—Rear View—Cover Removed

(MD) data sets may be used subject to the restrictions listed.

Data set 108A and C restrictions:

- No 4-wire operation
- No carrier squelch in test mode
- NO DATA SET READY (CC) LEAD INDICATION
- No carrier squelch on carrier fail
- No space hold on receive data (BB) lead.
- Locally engineered options outlined in Notes 5 and 6 of Table B.

Data set 109A restrictions:

- No FDX capabilities
- No space hold on receive data (BB) lead
- No loop-back in test mode
- Continuous spacing is sent on transmit data (BA) lead in test mode.

Data set 109D restrictions:

- No FDX capabilities
- No loop-back in test mode.

TABLE A

PHYSICAL INFORMATION FOR DAS 830A, 830B, AND 830C

DAS	SIZE (INCHES)	WEIGHT (POUNDS)	VOLTAGE	POWER	POWER CORD (NOTE 1)	INTERFACE TOWARD TERMINAL EQUIPMENT
830A	2.7 High 10.5 Wide 8.7 Deep	8	105 — 130 Vac 60 Hz	15 Watts	M3AY Spade tips on one end. KS-14532-L16 Standard 3-prong plug.	EIA
830B	3.5 High 4.5 Wide 7.0 Deep	2	+20 to +28V from TTY —22 to —26V from DAS	3 Watts 1/2 Watt	None (Direct Connection)	Current for 33 and 35 TTY equipped with UCC29 (Notes 2 and 3)
830C	1.2 High 3.9 Wide 2.0 Deep	6 oz	+24 ±2V —24 ±2V	3/4 Watt	KS-19088-L2 E/W KS-19166-L2 Hood	Current for up to 75 baud PL service or 35 General Purpose PL TTY

Notes:

1. M3AY cord is used when DAS 830A is used in M33 or M35 TTY. KS-14532-L16 cord is used when DAS 830A is associated with a CPT or M37 TTY.
2. DAS 830B →and 830C provide← an EIA interface toward DAS 830A.

→3. A TP-336464 cord is required to interconnect the DAS 830B to the UCC29 of the TTY.←

- ◗Continuous spacing is sent on transmit data (BA) lead in test mode.◖

DAS 830B

3.05 In addition to providing current to EIA conversion between a CPE or TTY and the DAS 830A, the DAS 830B provides the options or control features indicated in Table E.

3.06 DAS 830B provides six buttons for controlling the operation of the terminal. Fig. 11 shows the 6-button key and the functions provided by each button.

3.07 When transmitting data, the TTY current-no-current signals are converted by DAS 830B to EIA signals for use by the data set. When receiving data, the EIA signals are converted to current-no-current signals for use by the TTY.

3.08 DAS 830B also provides for TTY machine control by end of text (EOT) character. When an EOT is received, the TTY motor is turned off and a mark is placed on the select magnet driver (SMD) lead to guard against spurious characters. The TTY will remain off until the associated data set detects loss of carrier and then redetects carrier. Upon redetection of carrier, the TTY motor will turn on.

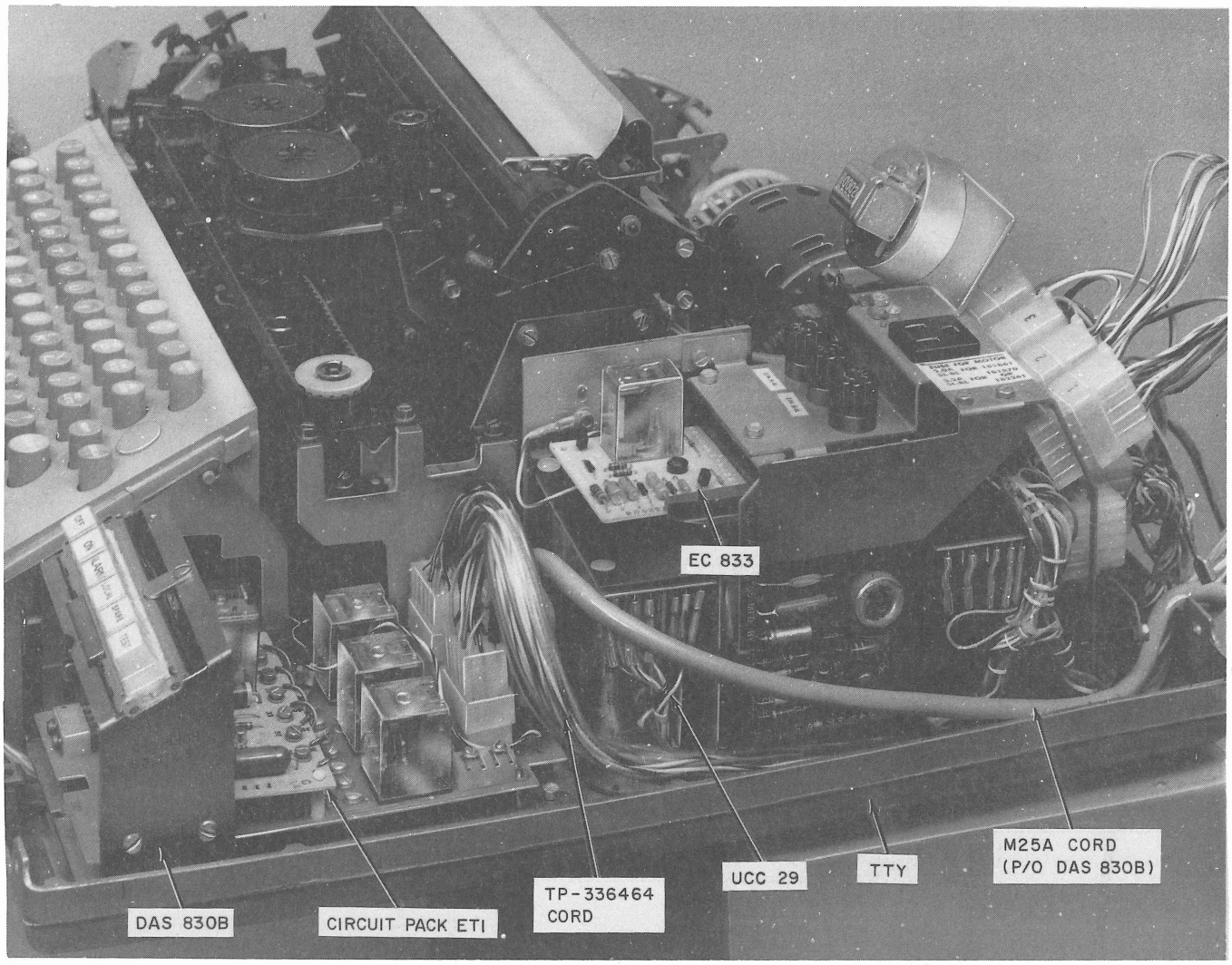


Fig. 6—DAS 830B Mounted in TTY

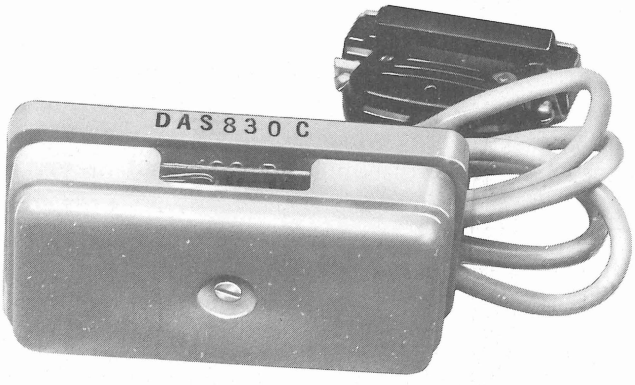


Fig. 7—DAS 830C Terminal Board

A. DAS 830B With ET1 Circuit Pack

3.09 Two additional arrangements can be implemented by using an ET1 circuit pack (Fig. 12) with DAS 830B. The circuit pack provides:

- a send space timing (SST) circuit, required for remote data line concentrator system stations with break capability
- a message waiting lamp circuit for use with Traffic Service Position System (TSPS) No. 1 Hotel Billing Information Center TTY.

Screw terminals and holes are provided on DAS 830B for easy connecting and mounting of the ET1 circuit pack.

TABLE B

DAS 830A OPTIONS

FEATURE	OPTION	REMARKS
Copy in test mode	Z or Y	Copy in test mode is optional.
No copy in test mode		
Request-to-send (CA) looped to clear-to-send (CB) (Note 1)	X or W	For CPTs designed to use CA and CB leads (Note 2).
Received line signal detector looped to CB (Note 1)		When carrier from the far end is detected, a positive signal on the data set RS lead is looped to the CB lead, indicating a clear-to-send condition (Note 3).
Carrier squelch on carrier fail (Note 4)	T or S	Carrier transmission can optionally be squelched upon failure of carrier reception. (Notes 5 and 6)
No carrier squelch on carrier fail		
Resistor bypass for —24 volt lead (—P) on J2-10 (Used with DAS 830B)	B or Q	Bypass of current-limiting resistor provides operating power to DAS 830B.
Resistor in series with —24 volt lead (—P) on J2-10 (Used with CPT)		
Remote test connection via J2-18	P or N	Provides for remote test capabilities via EIA connector.
No remote test connection via J2-18		
Frame grd (AA) connected to signal grd (AB)	M or L	Connection of AA to AB may prevent excess noise from entering the data set.
Frame grd (AA) not connected to signal grd (AB)		

Notes:

1. Option X must not be used with option W.
2. Customer-provided terminal (CPT) designed to use the CA and CB leads can work in this PL service without modification.
3. Option W is to be provided in standard PL station arrangements. Local engineering will be required when the request-to-send (CA) lead is to be connected to the carrier squelch (CSQ) lead for squelching outgoing carrier. When the CA and CSQ leads are connected, operation of the station in the test mode requires that the customer EIA plug be disconnected in series 1 only.
4. Option T can only be used with data sets 108D and 108E.

Although not considered as a standard option(s), the following can be used as a local engineering arrangement.

5. When the DAS 830A series 2 or higher is used for data set 108D or 108E broadcast service, connect a wire (solder) from point A to point B on CP2. This will squelch the transmitter of the data set in the data mode and will enable the transmitter in the test mode.
6. The DAS 830A series 2 or higher may be arranged for customer control of the data set transmitter squelch circuit by opening switches S1-2 and S1-5, and closing switch S1-3.

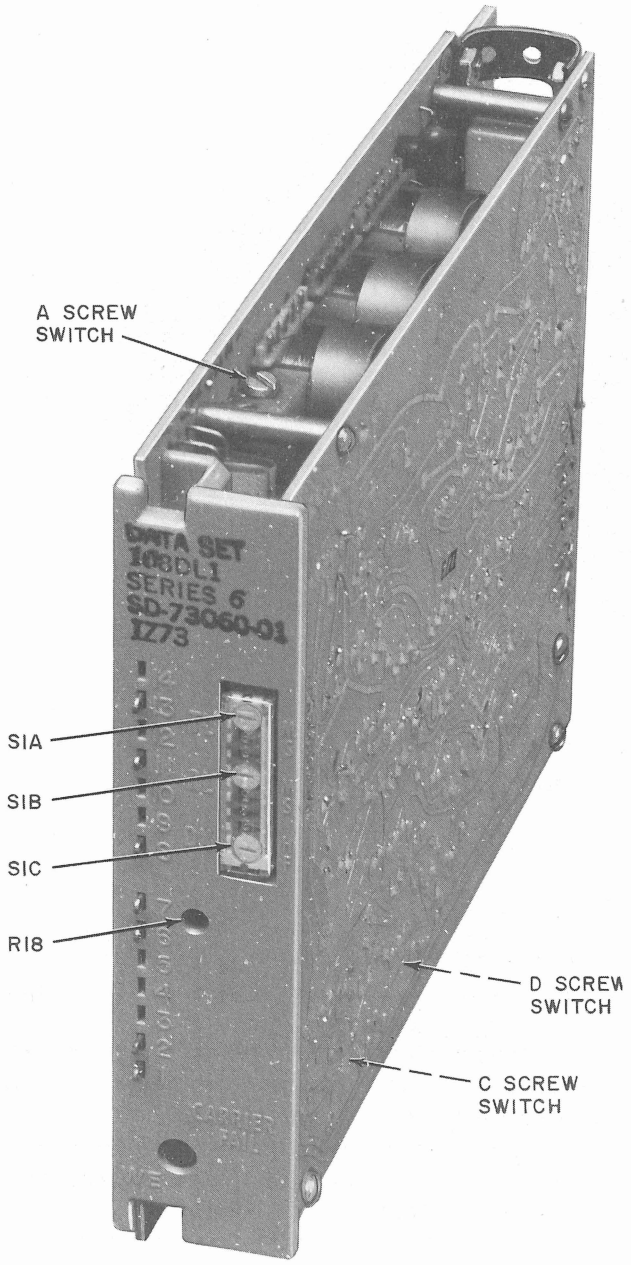


Fig. 8—Data Set 108D

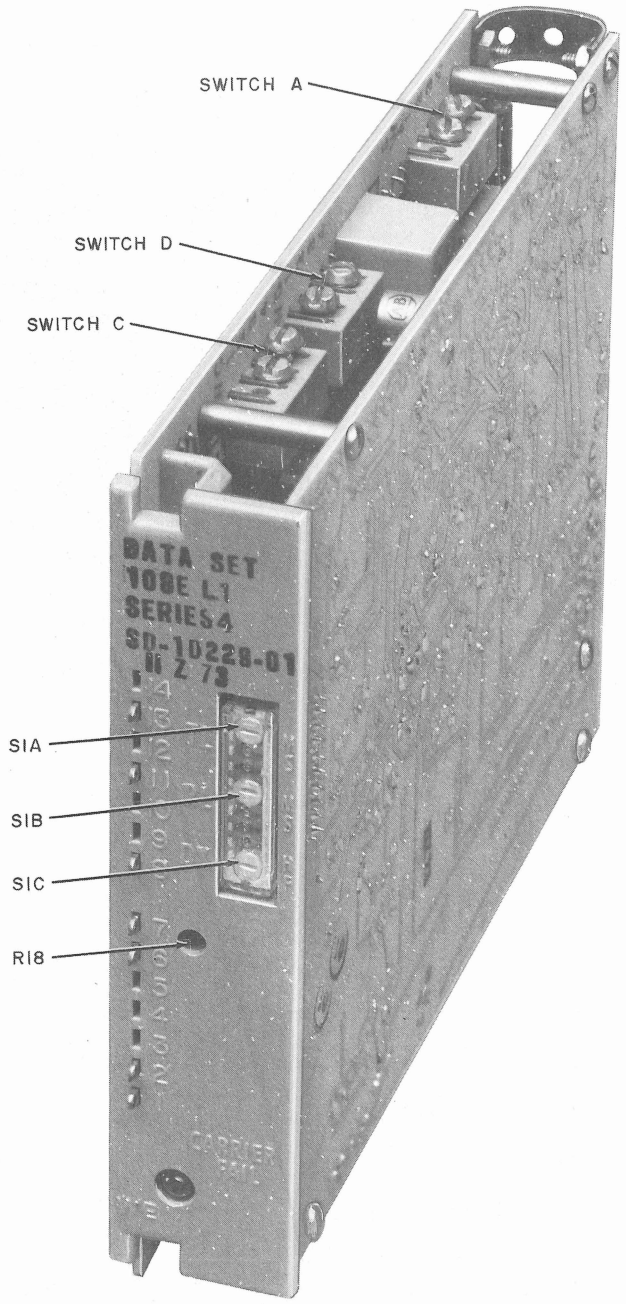


Fig. 9—Data Set 108E

B. DAS 830B With TTY Break Detection Circuit EC-833

3.10 The TTY break detection circuit EC-833 (part of Teletype TP186630 modification kit), installed within the UCC29, is compatible with DAS 830B. The spare lamp and button contacts are already wired to appropriate connectors which interface with the EC-833. The TTY break detection circuit cannot be used in conjunction with the message waiting lamp circuit.

C. DAS 830B With DAS 820D-L1A

3.11 The DAS 830B is compatible with the DAS 820D-L1A, seris 3, or higher.

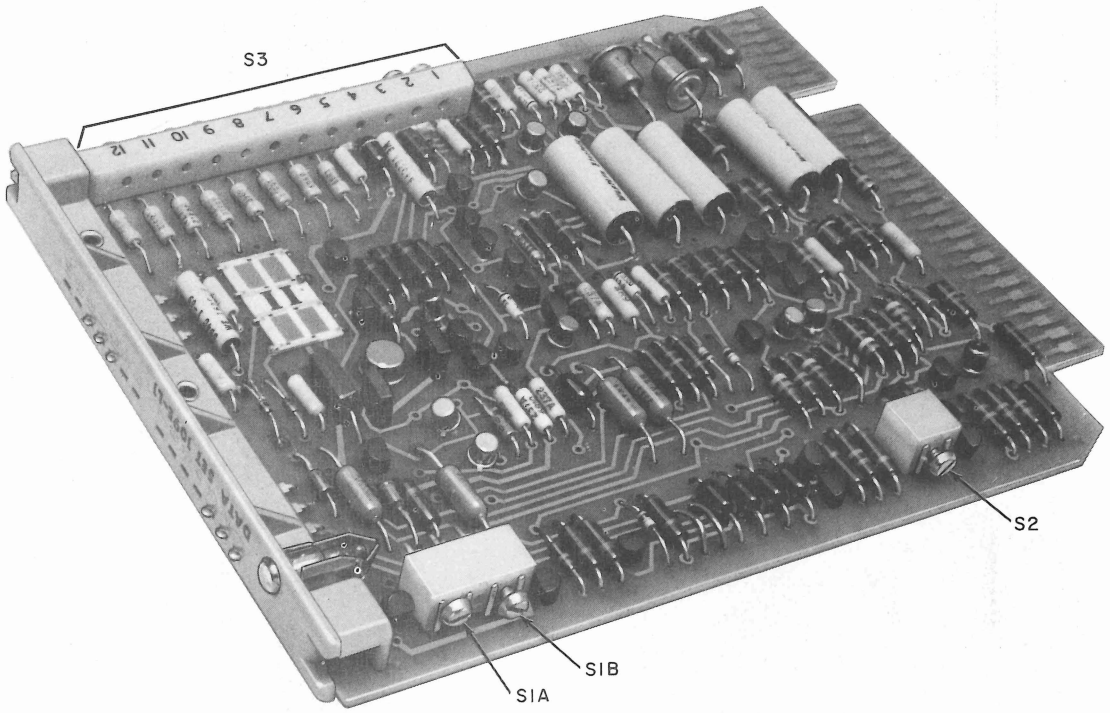


Fig. 10—Data Set 109E

TABLE C

DATA SETS 108D AND 108E OPTIONS

FEATURE	OPTION	REMARKS
Mark hold on TL (BB)	U or V	The data set transmits a marking condition on the TL (or BB) lead when a loss of received carrier is detected.
Space hold on TL (BB)		The data set transmits a spacing condition on the TL (or BB) lead when a loss of received carrier is detected.
FDX operation	X	Required for PL station operation.
2-wire operation	Y or Z	Allows connection to 2-wire facilities.
4-wire operation		Allows connection to 4-wire facilities.

DAS 830C

3.12 DAS 830C serves as an interconnecting unit for a DAS 830A or 820D to a CPE or TTY on a 3- or 4-wire basis. The options provided by the DAS 830C are given in Table F.

4. DATA STATION TEST FACILITIES

4.01 DAS 830A provides a TEST relay which may be activated by the TEST switch (TM) mounted on DAS 830A. The TEST relay may also be operated remotely via two screw terminals or

◗TABLE D◖

DATA SET 109E OPTIONS

FEATURE		OPTION	REMARKS
Crossover Shift	None	P or Q or R	Always provide at PL stations to minimize distortion.
	Mark		Always provide at DLCS station for camp-on detection.
	Space		Not used in PL station arrangements.
BB Lead	Mark Hold	U or V	When the loop current falls below minimum requirements for more than 15 ms, BB lead is clamped marking.
	Space Hold		When the loop current falls below minimum requirements for more than 15 ms, BB lead is clamped spacing.
No Current Squelch		Y	Option Y is always used at PL stations to prevent both stations from becoming squelched.

◗TABLE E◖

DAS 830B OPTIONS

FEATURE	OPTION	REMARKS
Mark clamp	S or T	Mark clamp on the BA lead when TTY is in the OFF condition. (See Note.)
Space clamp		Space clamp on the BA lead when TTY is in the OFF condition. (See Note.)
No EOT disconnect	U or V	The TTY will not turn OFF upon receiving EOT.
EOT disconnect		The TTY will turn OFF upon receiving EOT and place a mark on select magnet driver to guard against spurious characters.
Paper alarm — Motor Stops	W X or X W	The TTY motor is stopped upon a low-paper or out-of-paper condition.
Paper alarm — Motor does not stop		The TTY motor is not stopped upon a low-paper or out-of-paper condition.
Full-duplex	Y or Z	No local copy of transmitted data provided.
Half-duplex		Local copy of transmitted data provided.

Note: When option W X is provided, the BA lead can be clamped to the selected option (mark or space) when a low-paper or out-of-paper condition occurs.

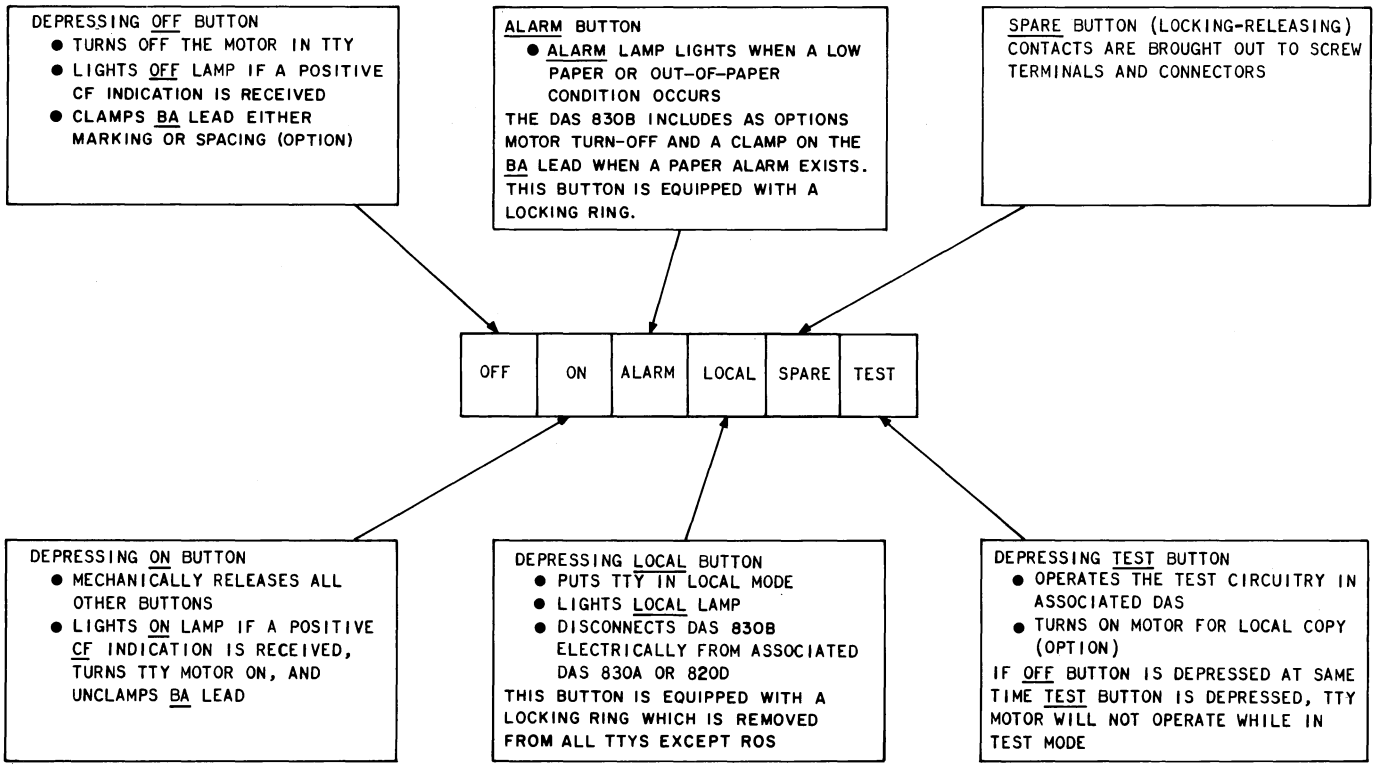


Fig. 11—DAS 830B—Key Designations and Functions

by the TEST switch of DAS 830B (if used). When the TEST relay is operated:

(a) The BA and BB leads of the data set are disconnected from the data terminal or associated DAS 830B and interconnected for remote testing.

(b) The CC lead is open.

(c) The carrier detector (RS) lead of the data set is connected to its carrier squelch (CSQ) lead.

(d) The CA lead is disconnected from CSQ when provided.

(e) The TEST lamp associated with DAS 830A is lit.

5. REFERENCES

5.01 The following Bell System Practices provide additional information on DAS 830A and associated equipment:

SECTION	TITLE
591-023-ZZZ	Data Sets 108A- and 108C-Type
591-024-ZZZ	Data Sets 109A-Type
591-028-ZZZ	Data Sets 108D- and 108E-Type
591-036-ZZZ	Data Sets 109E-Type
591-816-200	Private Line Station Arrangements Using Data Auxiliary Sets 830A and 830B With Data Sets 108- and 109-Type—Installation and Connections
591-816-300	Private Line Station Arrangements Using Data Auxiliary Sets 830A and 830B With Data Sets 108- and 109-Type—Maintenance

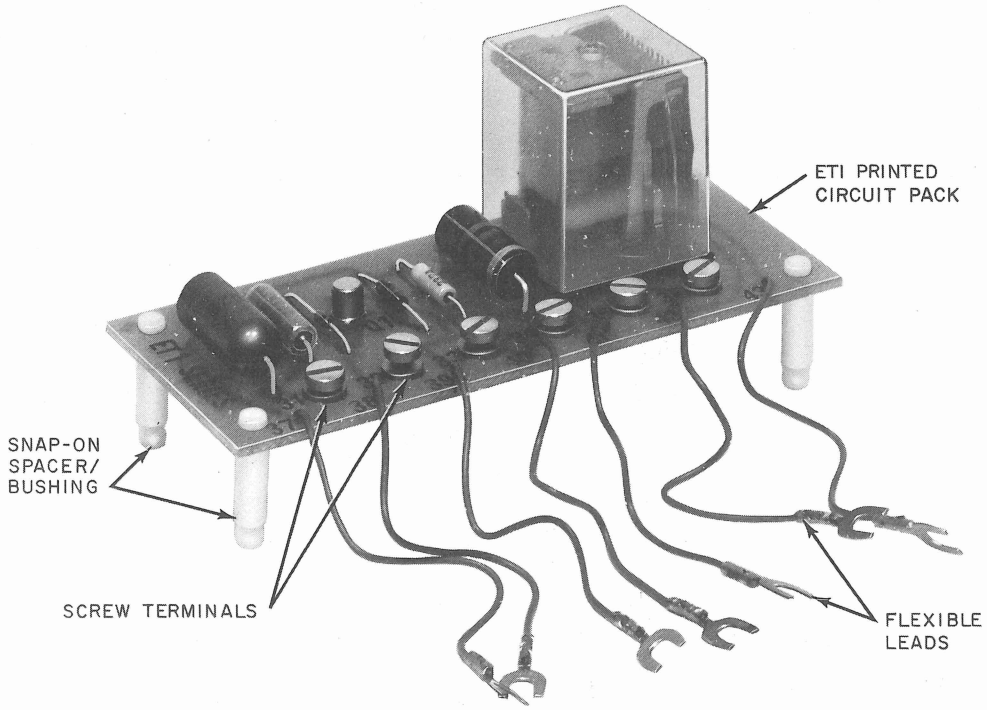


Fig. 12—ET1 Circuit Pack

TABLE F

DAS 830C OPTIONS

FEATURE	OPTION
Local copy	Z or Y
No local copy	
Arranged for use with DAS 830A	X or W
Arranged for use with DAS 820D	

SECTION	TITLE
591-816-500	Private Line Station Arrangements Using Data Auxiliary Sets 830A and 830B With Data Sets 108- and 109-Type—Test Procedures

SECTION	TITLE
598-083-100	Data Auxiliary Set 830A—Identification
598-083-102	Data Auxiliary Set 830B—Identification
598-083-103	Data Auxiliary Set 830C—Description

5.02 The following schematic drawings (SDs) and circuit descriptions (CDs) contain information on DAS 830A or associated equipment:

NUMBER	TITLE
SD- & CD-3D024-01	Data Set 108A (MD)
SD- & CD-3D032-01	Data Set 108C (MD)
SD- & CD-73060-01	Data Set 108D
SD- & CD-1D229-01	Data Set 108E
SD- & CD-3D025-01	Data Set 109A (MD)

NUMBER	TITLE
SD- & CD-1D164-01	Data Set 109C (ET1 CP)
SD- & CD-1D198-01	Data Set 109E
SD- & CD-3D031-01	Data Auxiliary Sets 820D- and 820E-Type
SD- & CD-1D250-01	Data Auxiliary Sets 830A, 830B, and 830C