

**DATA SET 113C-L1/2**  
**TRANSMITTER-RECEIVER**  
**SINGLE SET**  
**INSTALLATION AND CONNECTIONS**

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**1. GENERAL**

**1.01** This section contains the information needed to install and connect data set (DS) 113C-L1/2. The data set should be installed in conformance with the general instructions given in Section 590-010-200. The information in this section covers the installation of data sets in individual mountings. Refer to Section 590-010-202 for a description of multi-set arrangements in 40A-type data mounting(s) and cabinet.

**1.02** Whenever this section is reissued, the reason for reissue will be given in this paragraph.

**1.03** DS 113C-L1/2 provides Dataphone® service as described in Section 314-205-501, over an ambient temperature range of 40 to 120°F with a relative humidity range of 20 to 95 percent.

*Note:* These environmental operational limits are valid only if no condensation occurs.

**1.04** DS 113C-L1/2 should be located near the Bell System terminal or customer-provided equipment (CPE), since the customer-provided interface cord should not exceed 50 feet in length to conform to EIA standards.

**1.05** Low voltage alternating current is supplied to the data set by plug-mounted wall transformer KS-21239-L4, attached to the power cord of the mounting. The lug should be used to secure the transformer to the power outlet where local regulations permit by using an attached 6-32 by 1/2-inch oval head machine screw.

*Caution: If the outlet has a metal cover, do not remove the center screw to mount the transformer. When this screw is removed, it is possible for the metal cover to fall across the prongs of the transformer.*

The customer must provide ac power of 105 to 129V at 57 to 63 Hz at a standard 3-wire grounded power receptacle that is easily accessible to the data set. The receptacle should not be under control of a switch. The power required per set is approximately 8 watts. Approximately 3 watts of this is dissipated in the wall transformer.

*Caution: Remove and discard the protective covering from the data set mounting. If not removed before*

**NOTICE**

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Bell System except under written agreement

*prolonged operation, excessive heating of the data set may result.*

**1.06** A 25-pin KS-19087-L6 connector is provided at the rear of the data set for connection to the CPE. This connector is designed to connect to a customer-provided Cinch or Cannon DB-19604-432 plug equipped with a DB-51226-1 hood, or equivalent. The key telephone set connects to the M13F cord of DS 113C-L1/2.

## 2. CIRCUIT PACK REMOVAL AND REPLACEMENT

**2.01** DS 113C-L1 must be removed from the mounting to be accessible (Fig. 1).

**Caution:** Handle the data set by the nonconductive surfaces only, to prevent damage.

DS 113C-L1 should be removed from the mounting as follows:

- (1) Remove the front cover by gently squeezing it at the top to disengage the top hooks, then rotate it down and out of the mounting.
- (2) Remove the data set from the mounting by pulling on the handle or by gently prying behind the faceplate with fingers.

**2.02** To replace DS 113C-L1 in the mounting, proceed as follows:

- (1) Slide the CP into the mounting, ensuring that it is firmly seated at the rear.
- (2) Hook the tabs on the bottom of the front cover into the detents in the bottom of the mounting, and gently press the top of the front cover into the mounting until it snaps into place.

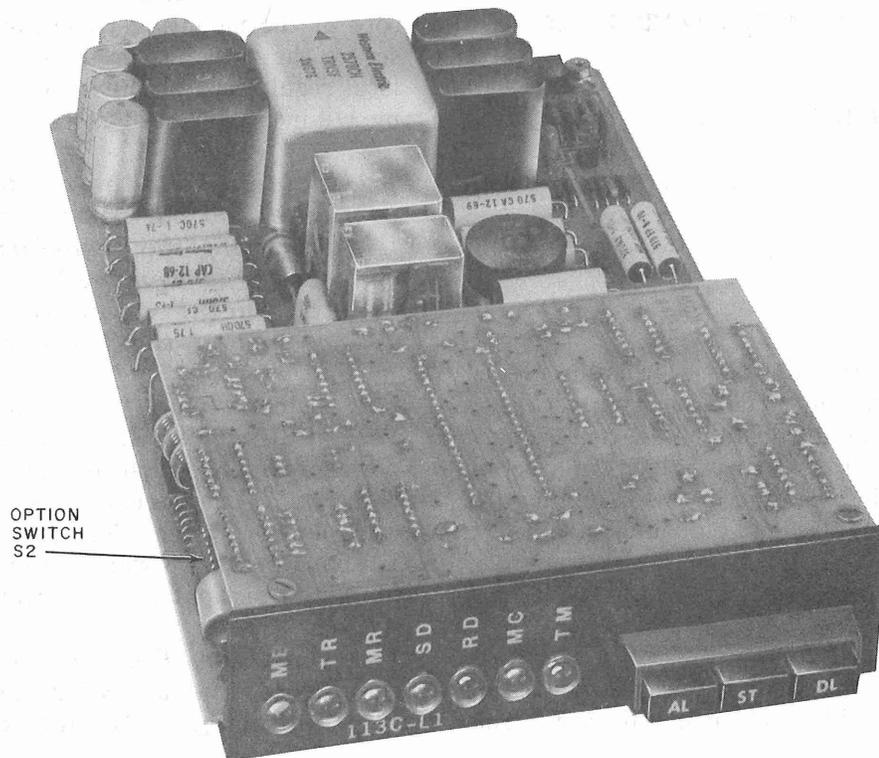


Fig. 1—DS 113C-L1

### 3. OPTIONS

**3.01** The installer should remove DS 113C-L1 from the mounting and install the options called for on the service order prior to placing it in service.

**3.02** An option label is shipped affixed to the bottom of the mounting. Extra labels are available by ordering Form E-10063.

**3.03** The data set transmit level is fixed at a level lower than -9 dBm. It must not exceed -9 dBm under any operating condition.

**3.04** Data set options are determined by the switch settings S1 (on data mounting) and S2 (on circuit pack). See Fig. 1 and 2. A description of the options shown in Table A follows.

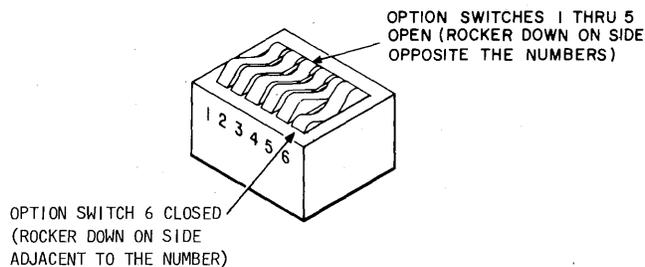


Fig. 2—Option Switch

#### *Receive Space Disconnect*

- YES (option V): When this option is provided, the data set always disconnects upon receipt of a space disconnect signal of at least 2 seconds, but may disconnect in response to a spacing signal as short as 1 second.
- NO (option Y): When this option is provided, the data set does not disconnect upon receipt of a spacing signal of any duration.

#### *Send Space Disconnect*

- YES (option T): When the data terminal ready (CD) lead is turned **off**, the data set transmits  $3 \pm 1$  seconds spacing signal prior to disconnecting.

- NO (option U): When the data terminal ready (CD) lead is turned **off**, the data set disconnects immediately and no spacing signal is sent.

#### *Loss of Carrier Disconnect*

- YES (option S): When this option is provided, the data set disconnects when incoming carrier is lost for approximately 250 ms.
- NO (option R): When this option is provided, the data set does not disconnect when carrier is lost.

#### *CC Indication*

- EARLY (option ZD): When this option is provided, the CC lead turns **on** when data set goes off-hook. Some CPE require this early indication to obtain operating speed before data is received.
- DELAYED (option ZC): When this option is provided, the CC lead turns **on** when carrier is detected.

#### *CB and CF Indications*

- COMMON (option A): When this option is provided, the CF lead turns **on** when carrier is detected, and the CB lead turns **on** when handshaking is completed. Thereafter, both leads turn **off** with loss of carrier and turn **on** with reappearance of carrier.
- SEPARATE (option B): When this option is provided, the CB lead turns **on** when handshaking is completed and remains **on** for the duration of the data call. The CF lead turns **on** when carrier is detected and turns **off** when carrier is lost.

#### *CC Indication for Analog Loop*

- ON (option ZF): When this option is provided, the CC lead is **on** during analog loop test mode. Some CPE require this **on** condition during this test mode.
- OFF (option ZE): When this option is provided, the CC lead is **off** during analog loop test mode.

TABLE A

## OPTION SWITCH SETTINGS

FEATURE		OPTION	FACTORY FURNISHED OPTION	SWITCH SETTING S2 SWITCH ON CM1 CONTACT SETTING							PROVIDE
				1	2	3	4	5	6	7	
Receive Space Disconnect	YES	V	√	—	—	—	—	O	—	—	One per set
	NO	Y		—	—	—	—	X	—	—	
Send Space Disconnect	YES	T	√	—	—	—	—	—	X	—	One per set
	NO	U		—	—	—	—	—	O	—	
Loss of Carrier Disconnect	YES	S	√	—	O	—	—	—	—	—	One per set
	NO	R		—	X	—	—	—	—	—	
CC Indication	EARLY	ZD	√	X	—	—	—	—	—	—	One per set
	DELAYED	ZC		O	—	—	—	—	—	—	
CB and CF Indications	COMMON	A	√	—	—	—	X	—	—	—	One per set
	SEPARATE	B		—	—	—	O	—	—	—	
CC Indication for Analog Loop	ON	ZF	√	—	—	O	—	—	—	—	One per set
	OFF	ZE		—	—	X	—	—	—	—	
		SEE NOTE									
Common Grounds	YES	Q	√	Close S1 screw switch on 47F1 DM							One per set
	NO	P		Open S1 screw switch on 47F1 DM							

X = Contact closed      O = Contact open      — = Contact not applicable

*Note:* This space may be filled in by craft employee when options have been determined.

### Common Grounds

- YES (option Q): When this option is provided, signal ground is connected to frame ground.
- NO (option P): When this option is provided, signal ground and frame ground are not connected together.

### 4. INTERFACE LEADS

**4.01** DS 113C-L1/2 provides the customer with the interface leads listed in Table B. These leads conform to EIA Standard RS-232-C.

**4.02** The telephone and ACU interface leads and their uses are listed in Table C and described as they are used in DS 113C-L1/2 installations.

TABLE B  
CUSTOMER INTERFACE

EIA DESIGNATION	CIRCUIT	CP CONNECTOR PIN ASSIGNMENT	CUSTOMER INTERFACE CONNECTOR PIN ASSIGNMENT
AA	Protective Ground	—	Note 1
BA	Transmitted Data	2	2
BB	Received Data	3	3
CB	Clear to Send	5	5
CC	Data Set Ready	6	6
AB	Signal Ground	7	7
CF	Data Carrier Detector	8	8
+P	Data Set Test (+12V)	27	9
-P	Data Set Test (-12V)	26	10
—	Not Used	—	11 } Note 2
—	Not Used	—	19 }
CD	Data Terminal Ready	22	20
CN	Analog Loop	25	25

*Note 1:* Not wired in connector but available in data mounting.

*Note 2:* Pin 19 is connected to pin 11 in the housing. This circuit is not used in low-speed data sets.

*Note 3:* All other interface connector pins on the mounting are unused. As specified in EIA Standard RS-232, connector pins 9 and 10 are not to be used by the CPE.

4.03 Figure 3 shows a simplified diagram of the telephone set, interface, and the data set.

## 5. CONNECTIONS

5.01 DS 113C transmit level is fixed at a nominal -9.75 dBm into a 600-ohm line, and will not exceed -9 dBm. DS 113C is designed to be connected to a type 1 Dataphone loop and requires no loop treatment if the type 1 parameters specified in Section 314-205-501 are met.

5.02 In cases where trouble is suspected to be caused by data transmission levels greater than -12 dBm (eg, -11 dBm) at the central office, install a 78B insertion loss pad. Refer to Fig. 4.

## CARD DIALER

5.03 The 662A1 and 2662 telephone sets are equipped with card dialers and may be substituted for the telephone sets shown in each installation arrangement described in this section; however, installation changes are required.

- Connect tip and ring in the telephone as follows:

TEL SET	CONNECTION
2662A1	Ring to tel net. term. A Tip to TB1 term. 7
662A1	Ring to tel net. term. A Tip to tel net. term. G

TABLE C

## TELEPHONE AND ACU INTERFACE

DESIGNATION	DESCRIPTION	CIRCUIT PACK CONNECTOR PIN ASSIGNMENT	P1 PLUG PIN ASSIGNMENT
L	Tel set line lamp voltage from data set	18	1
LG	Tel set line lamp control from data set	35	4
TD	Talk/data control from tel set	14	5
R	Tel line tip lead	20	7
C	Contact closure to ground from data set to ACU to indicate data mode	15	14
D1	Contact closure to ground from ACU to data set to place set off-hook	16	16
T1	Tel set tip lead	34	21
R1	Tel set ring lead	33	22
A	Used to provide the talk indication to ACU	37	23
A1		38	24
TDG	Ground lead	36	25
RT	Remote test (Note 1)	17	—

*Note 1:* Used in 40A-type data mounting only.

- For arrangements which include an 801-type ACU but without the M15H cord, make the following change in either the 662A1 or 2662A1 telephone set. Connect the insulated and stored V-BR lead of the D50K mounting cord to TB2-1.
- For arrangements of the 2662A1 telephone set, no external ac power is required. For all arrangements of the 662A1 telephone set, ac power for the card dialer should be provided by a 2012B transformer connected as follows:
  - (1) Individually tape and store the O-V and V-O leads connected to terminals P1 and P2 on the 41-type dial in the telephone set.
  - (2) Connect one output terminal on the 2012B transformer to P1 and the other output terminal to P2.

**SINGLE DATA SET**

**5.04 DS 113C-L1/2 Without ACU:** When a single DS 113C-L1/2 is installed without an ACU, connect tip and ring in the associated telephone set and connect the cables as shown in Fig. 5. Figure 6 provides detailed wiring information for the single data set installation without ACU. This information is useful in troubleshooting.

**Note:** DS 113C-L1/2 may be wall-mounted either vertically or horizontally by using a 193A backboard.

**5.05 DS 113C-L1/2 With ACU:** Two arrangements for installing an ACU with DS 113C-L1/2 are provided. The arrangement shown in Fig. 7 can be used for all ACU codes. The arrangement shown in Fig. 8 should be used with DAS 801C-L1/2A or DAS 801C-L1/2 when an M15H cord is available. Except for the factory-provided M15H connecting cord, DAS 801C-L1/2 and DAS 801C-L1/2A are the same. When the arrangement

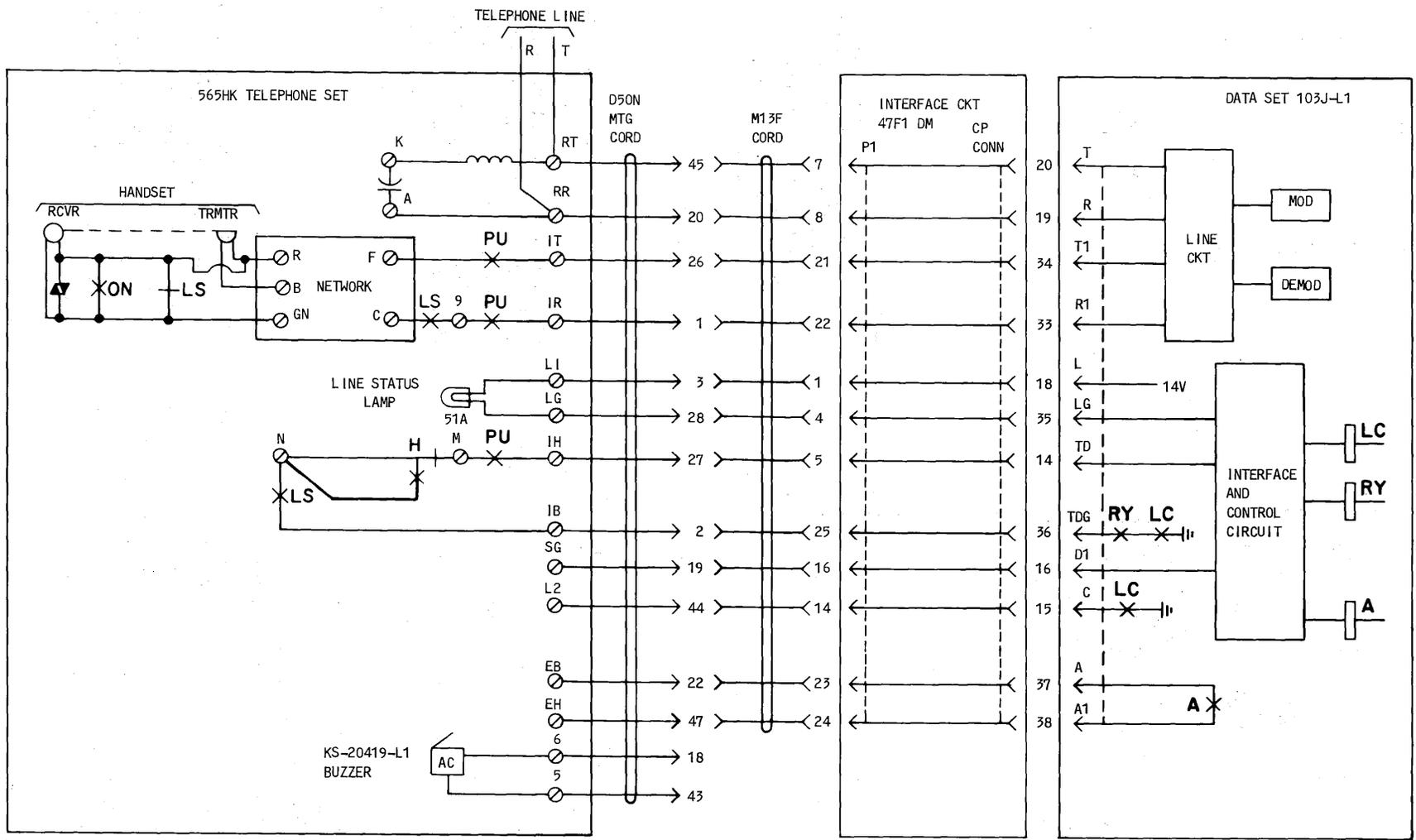
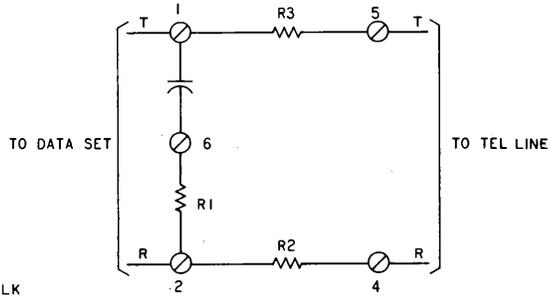
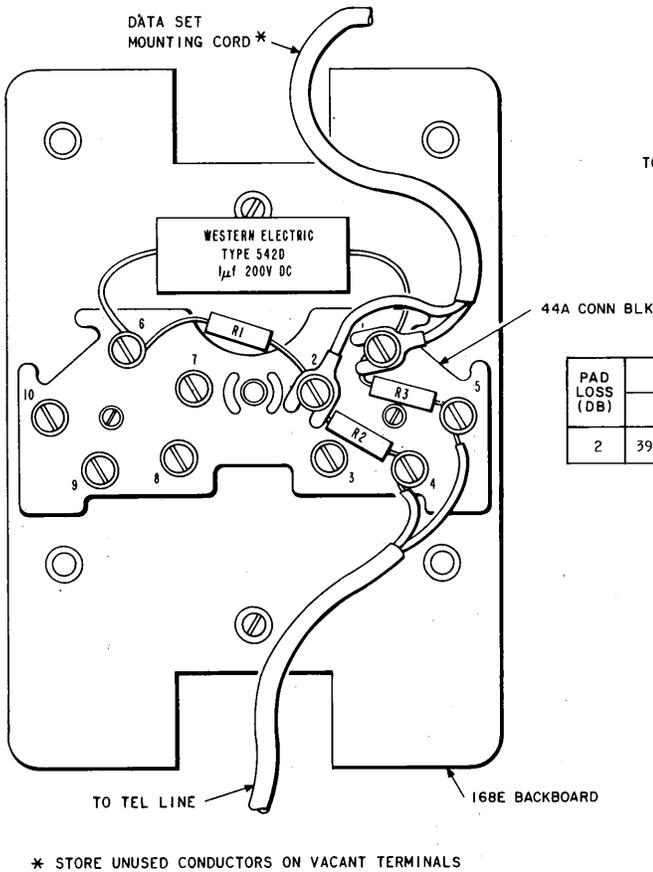


Fig. 3—Interface Between Telephone Set and Data Set Line Control



PAD LOSS (DB)	RESISTOR VALUE (OHMS)							ORDERING INFORMATION	
	R1			R2 AND R3					
2	3900	ORANGE	WHITE	RED	110	BROWN	BROWN	BROWN	78B

- NOTES:
1. RESISTORS ARE ALLEN BRADLEY, 1 WATT, 5% TOLERANCE (KS-19151 L1). CAPACITOR IS WESTERN ELECTRIC CO. 542D TYPE, 1μF, 200VDC.
  2. A 101C TYPE COVER SHOULD BE USED TO PROTECT THE PAD.
  3. THE PAD VALUE SHOULD BE STENCILED ON COVER FOR FUTURE REFERENCE.

Fig. 4—Connection to Insertion Loss Pad

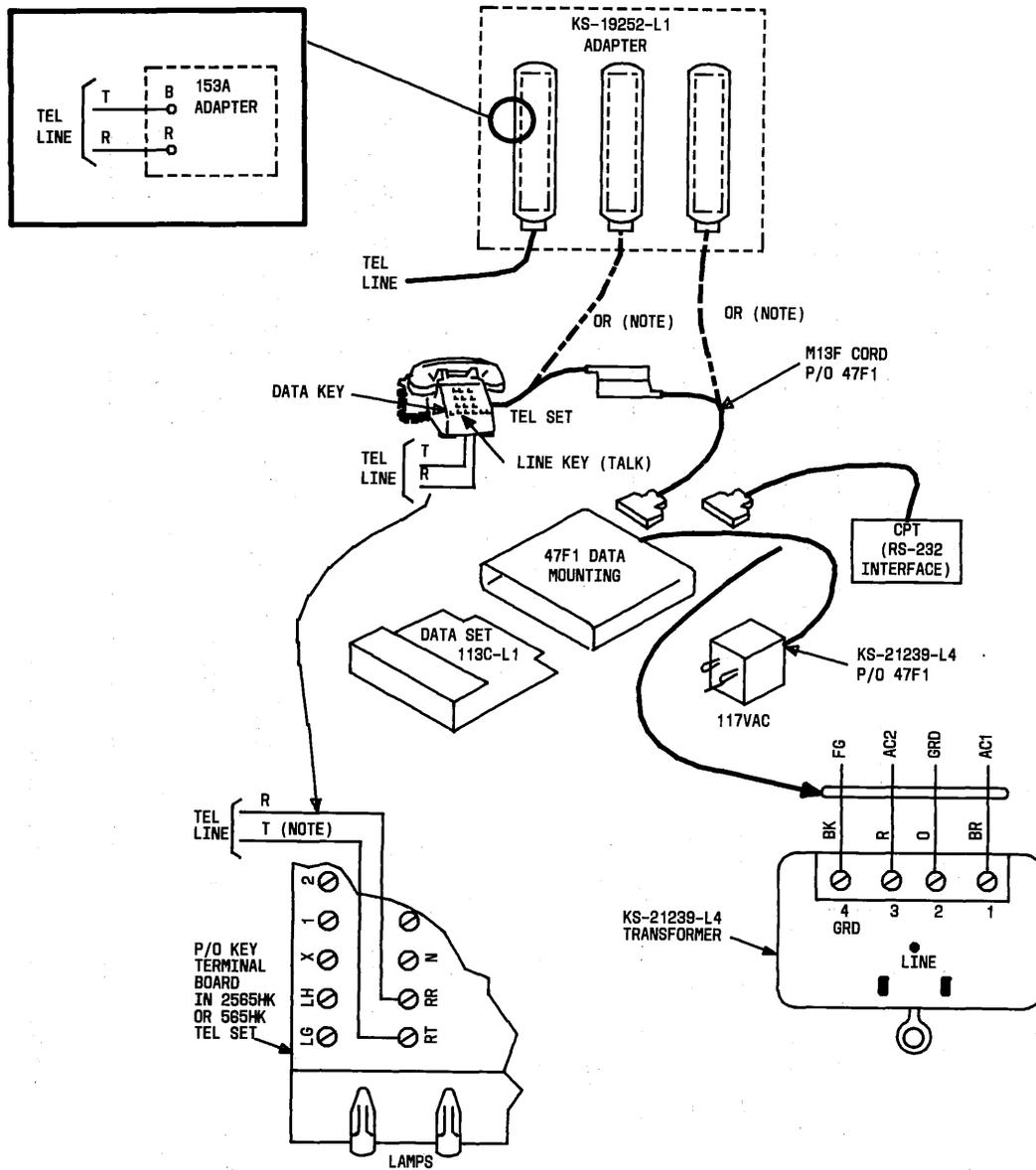
shown in Fig. 7 is used, a strap must be added in the telephone set to enable the ACU to clear the data set. The strap is not needed when the arrangement shown in Fig. 8 is used. Figure 9 provides detailed wiring information for the arrangement shown in Fig. 7. When the arrangement shown in Fig. 8 is used, the telephone line should be connected as shown in Fig. 5.

**SINGLE DATA SET WITH SHARED TEL SET**

5.06 If DS 113C-L1/2 shares its telephone set with other new family data sets, the data set should be connected in accordance with Fig. 10. The KS-21253-L3 adapter makes it possible for DS 113C to share a telephone set with other new family data sets with a minimum of effort on the part of the installer, since most of the connections are made via 50-pin connectors. Refer to Fig. 11 and 12 for details of the adapter.

5.07 To eliminate the need for several 110-Vac outlets, the individual KS-21239-L4 and 2012A transformers can be plugged into a multiple power outlet strip (Fig. 10). A 602-15 Waber Electric power outlet strip accommodates three transformers. A 1A2 power panel accommodates eight transformers. If there is interference, the cord spade lugs must be bent upward. A KS-14532-L20 or equivalent cord is required with the 1A2 power panel.

5.08 At installation of three or fewer data sets, tip and ring pairs may be connected directly to adapter screw terminals T1 and R1, T2 and R2, and T3 and R3, respectively, for the first three data sets. This arrangement eliminates the need for the B25A cable and the 66E-type connecting block.



NOTE: TIP AND RING FROM CENTRAL OFFICE CAN BE CONNECTED DIRECTLY TO TERMINALS RT AND RR ON TEL SET. USE DASHED ARRANGEMENT SHOWN AT TOP OF PAGE ONLY WHEN IT IS NOT CONVENIENT TO CONNECT T & R IN TEL SET.

Fig. 5—Typical DS 113C-L1/2 Installation With 565HK Telephone Set

6. INSTALLATION TEST

6.01 After installation is completed, the data set should be tested to determine if it is operating properly. Refer to Section 591-041-500.

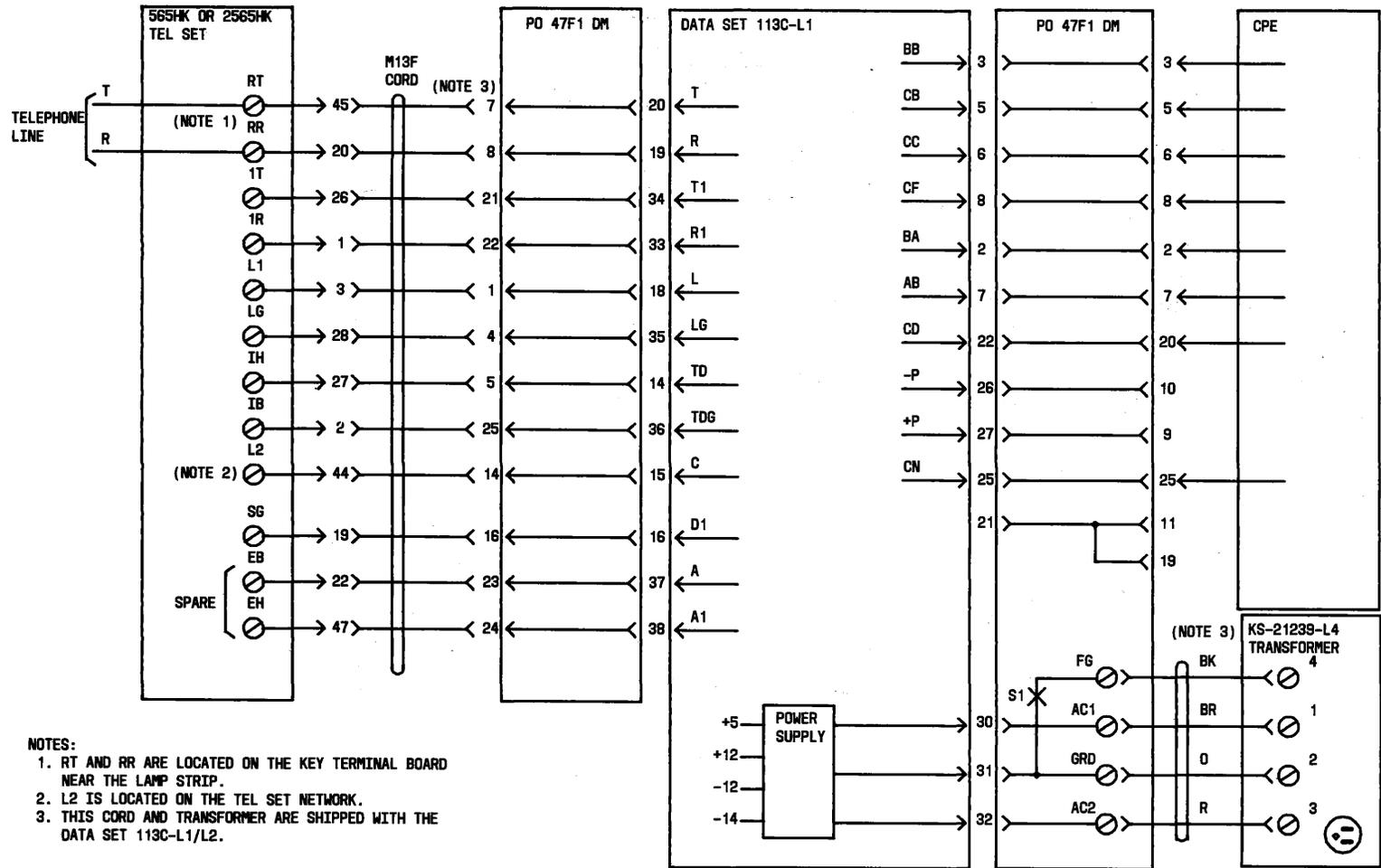


Fig. 6—DS 113C-L1/2 Installation With 565HK Telephone Set—Connection Diagram

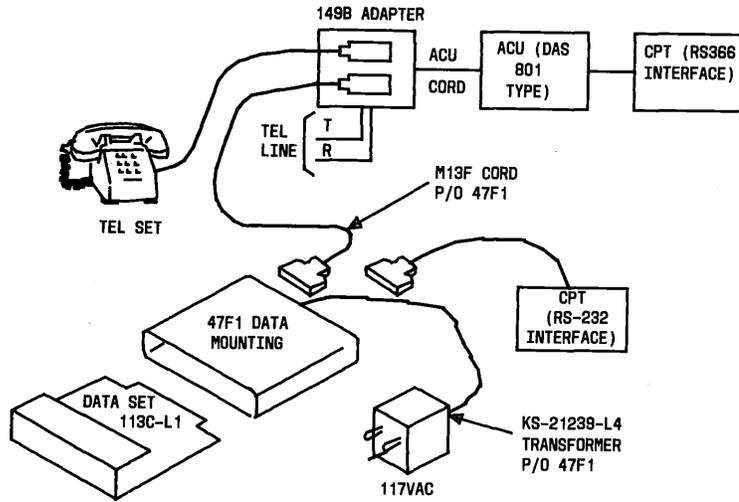
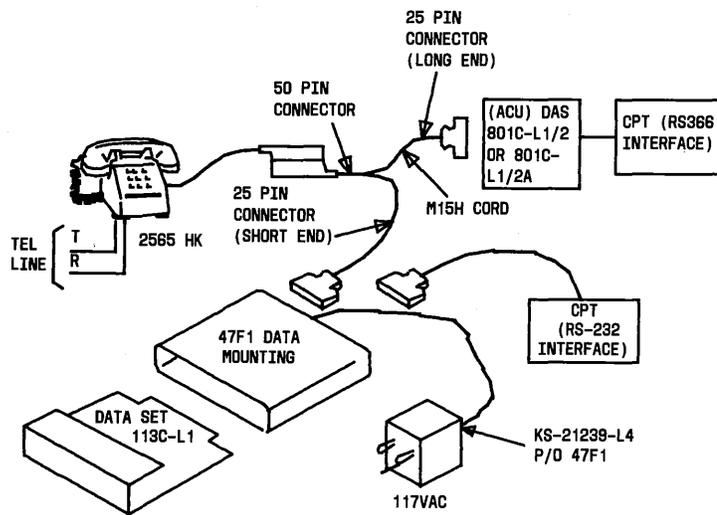


Fig. 7—Typical DS 113C-L1/2 With ACU and Telephone Set



SINGLE SET INSTALLATION WITH NEW FAMILY ACU

NOTE:

A 149B ADAPTER, AN M13G CORD AND M13F CORD CAN BE USED INSTEAD OF AN M15H CORD.

Fig. 8—Single Data Set Installation With 801C ACU

DAS 801-TYPE ACU OPTIONS

	DAS 801C-L1/2 (BSP 598-012-202)	DAS 801C4 (BSP 598-012-201)	DAS 801A6 (BSP 598-010-201)
REQUIRED	X, T, B, ZG, ZP	X, T, B, ZG, ZB, ZH, ZM, M	X, T, B, ZB, ZF, ZG, M
NOT USED	W, S, E, Q, ZA, ZN	W, S, E, Q, F, ZA, ZC, ZJ, ZK, ZL, N, G, Z	W, S, E, Q, F, ZA, ZC, ZE, N, G, Z
CHOOSE	V OR Y, R OR H, G OR Z, ZU OR ZV, ZQ OR ZR OR ZS OR ZT	V OR Y, R OR H, ZD OR A	R OR H, ZD OR A

NOTES:

1. OPTIONS DAS 801 PER ADJACENT TABLE. REFER TO 598-010-201, 598-012-201 OR 598-012-202 FOR INSTALLATION AND REMOVAL OF OPTIONS.
2. DAS 801C-L1/2 IS EQUIPPED WITH AN M13G CORD. DAS 801C4 AND DAS 801A6 ARE EQUIPPED WITH A D10P CORD.
3. IF EITHER DAS 801C-L1/2 OR 801C4 IS USED, THE TELEPHONE LINE MUST BE ARRANGED FOR TOUCH-TONE SERVICE. IF DAS 801A6 IS USED OR IF DAS 801C-L1/2 OR 801C4 HAS OPTION V INSTALLED, THE TELEPHONE LINE MUST BE ARRANGED FOR GROUND-START OPERATION.
4. INSTALLER STRAPS.
5. TERMINAL DESIGNATIONS SHOWN ARE FOR 565HK AND 2565HK TELEPHONE SETS. ADD STRAP IN TELEPHONE SET AS SHOWN. FOR THE 662A1 OR 2662A1 TELEPHONE SET, CONNECT THE INSULATED AND STORED (V-BR) LEAD OF THE D50K MOUNTING CORD TO TERMINAL 1. NO STRAPPING IS REQUIRED.
6. L2 IS LOCATED ON THE TEL SET NETWORK.
7. THIS CORD AND TRANSFORMER SHIPPED WITH DATA SET 113C-L1/2.

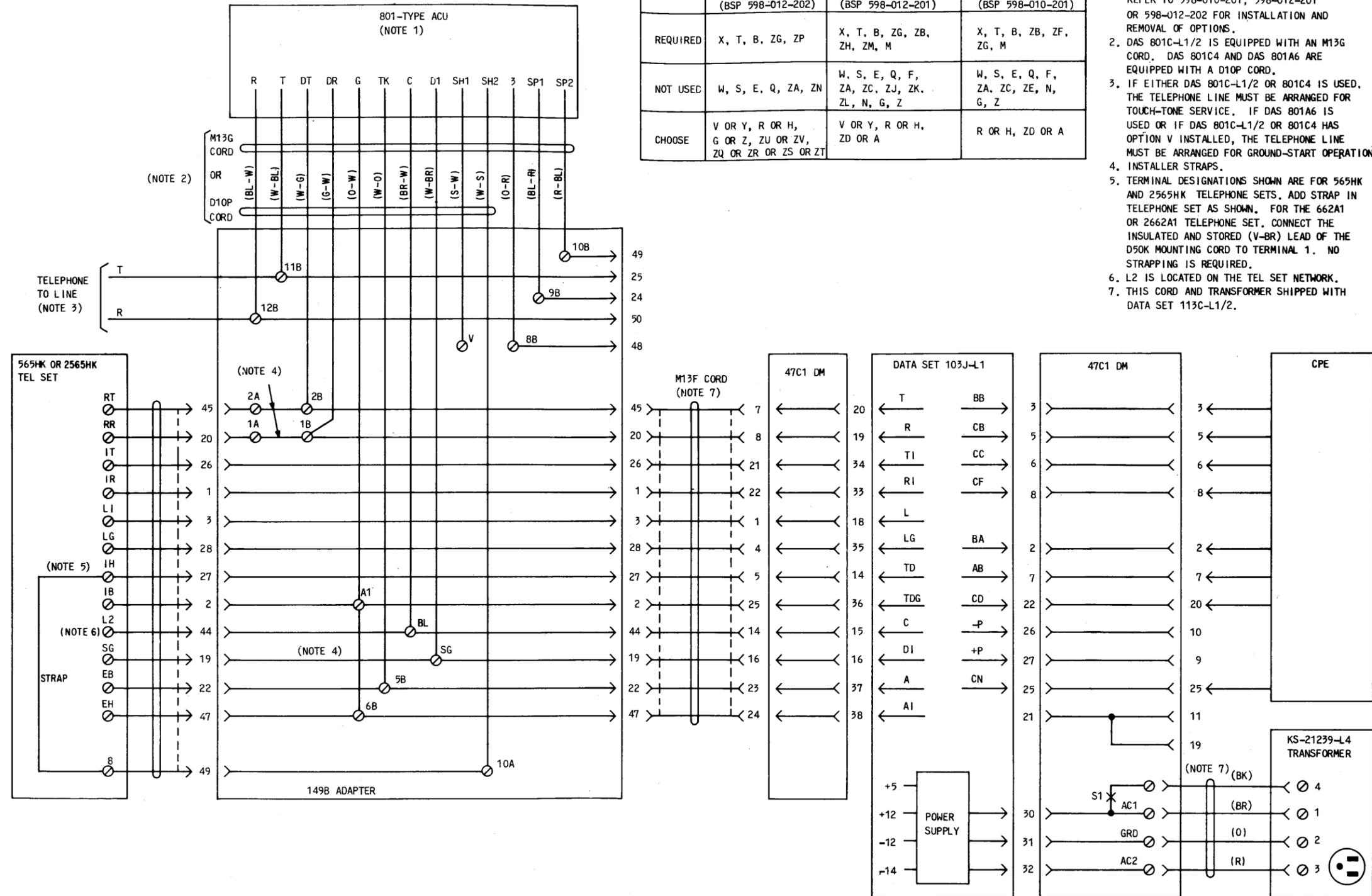
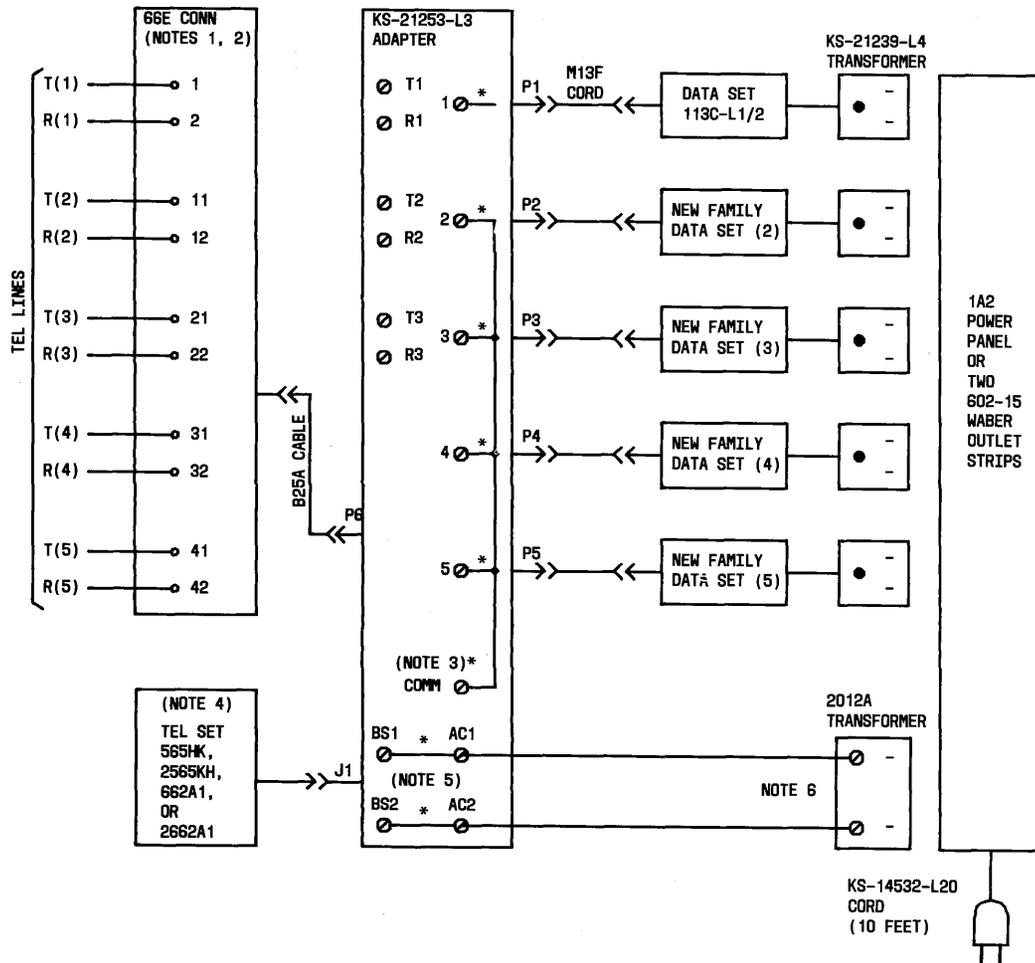


Fig. 9—DS 113C-L1/2 Installation With ACU and 565HK Telephone Set—Connections



NOTES:

1. THE ARRANGEMENT AS SHOWN IS FOR FIVE NEW FAMILY DATA SETS WITH RINGING-ACTIVATED COMMON BUZZER IN THE TELEPHONE SET, EXCEPT DS 113C AND DS 113D, WHICH CANNOT ACTIVATE A COMMON RINGER. SEE NOTE 3.
2. IF THE INSTALLATION IS FOR TWO OR THREE DATA SETS, THE 66E CONNECTING BLOCK AND THE B25A CABLE CAN BE OMITTED AND THE TELEPHONE LINES CONNECTED DIRECTLY TO THE T AND R TERMINALS OF THE ADAPTER.
3. IF AUDIBLE RINGING AS COVERED BY NOTE 1 OR NOTE 5 IS NOT DESIRED FOR A PARTICULAR LINE, REMOVE THE FACTORY-PROVIDED STRAP BETWEEN ADAPTER TERMINAL COMM AND THE TERMINAL (1, 2, 3, 4, 5) CORRESPONDING TO THE PARTICULAR TELEPHONE LINE.
4. IF AUDIBLE RINGING IS REQUIRED FOR ONE LINE, THE RINGER IN THE TELEPHONE SET MAY BE STRAPPED ACROSS THAT LINE AS FOLLOWS: ON THE 66E CONNECTING BLOCK STRAP T TO 39 AND R TO 40. FOR EXAMPLE, TO CONNECT THE RINGER ACROSS LINE 1, STRAP 1 TO 39 AND 2 TO 40.
5. IF A RINGING GENERATOR IS AVAILABLE AND COMMON RINGING OF THE TELEPHONE SET RINGER IS REQUIRED, REMOVE STRAPS BS1 TO AC1 AND BS2 TO AC2 AND CONNECT RINGING GENERATOR ACROSS BS1 AND BS2 ON THE ADAPTER. CHANGE THE TELEPHONE SET AS FOLLOWS:  
 565HK, 2565HK TEL SET - DISCONNECT THE BUZZER  
 - STRAP RR TO 5 AND STRAP RT TO 6.
6. PROVIDE THE 2012A TRANSFORMER ONLY IF COMMON RINGING PER NOTE 1 OR NOTE 5 IS REQUIRED.

Fig. 10—Multiple Individually Housed DS 113C-L1/2 Installation With Other New Family Data Sets

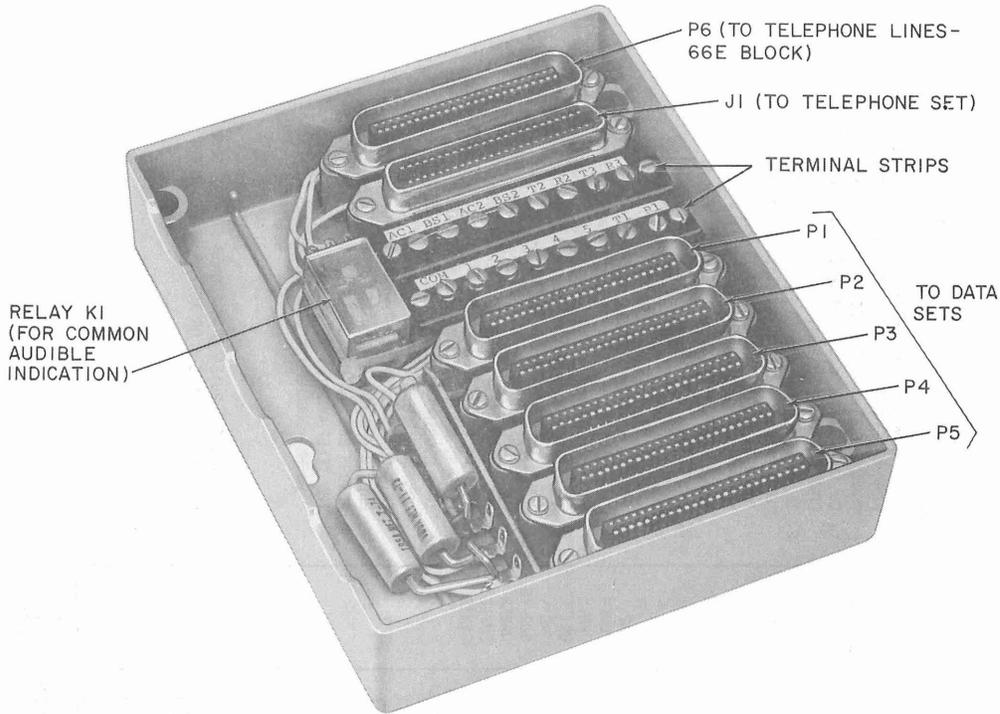


Fig. 11—KS-21253-L3 Adapter With Cover Removed

7. REFERENCES

7.01 The following BSPs provide additional information:

SECTION

TITLE

590-010-200

Data Sets and Data Access Arrangements—General Installation and Connection Information

SECTION

TITLE

314-205-501

Data Systems—DATA-PHONE® Service—Direct Distance Dialing Network—Test Requirements for Subscriber, Foreign Exchange, and Remote Exchange Lines

590-010-202

Data Sets—Station Arrangements for Mixed Data Set Types in 40A2 Data Mounting

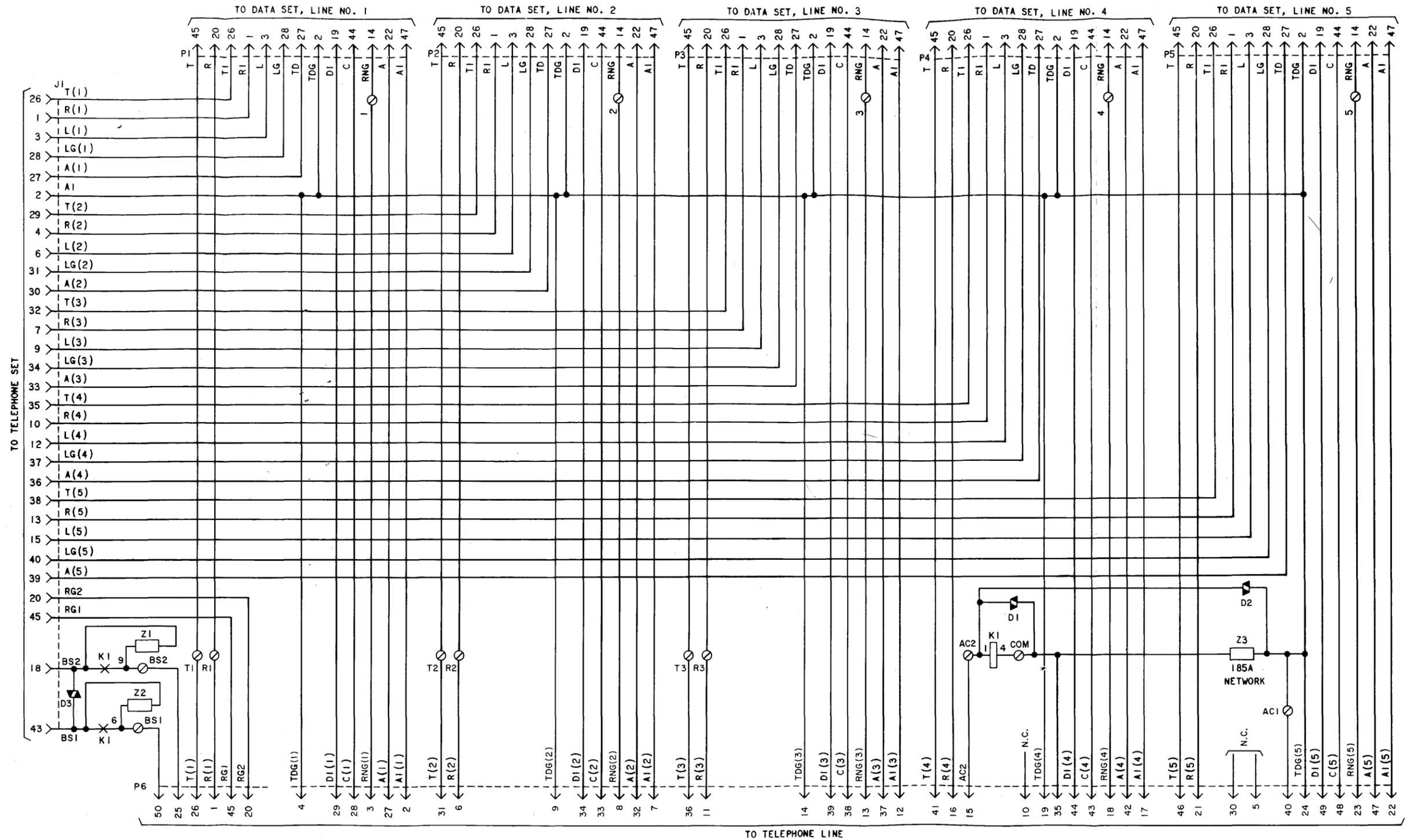


Fig. 12—Adapter for up to Five Data Sets Connected to One Key Telephone Set