

DATA SET 113D-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) 113D-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 113D-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 113D-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 wall transformer KS-21239-L4 attached to the power cord of the mounting. The KS-21239-L4 transformer is plug-mounted. 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. 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 10 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 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 113D-L1/2.

NOTICE

Not for use or disclosure outside the
Bell System except under written agreement

2. CIRCUIT PACK REMOVAL AND REPLACEMENT

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

Caution: If the data set is removed from the mounting, it should be handled by the nonconductive surfaces only. Otherwise, certain circuit components may be damaged.

DS 113D-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 113D-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.

3. OPTIONS

3.01 The installer should remove DS 113D-L1 from the mounting and install the options called

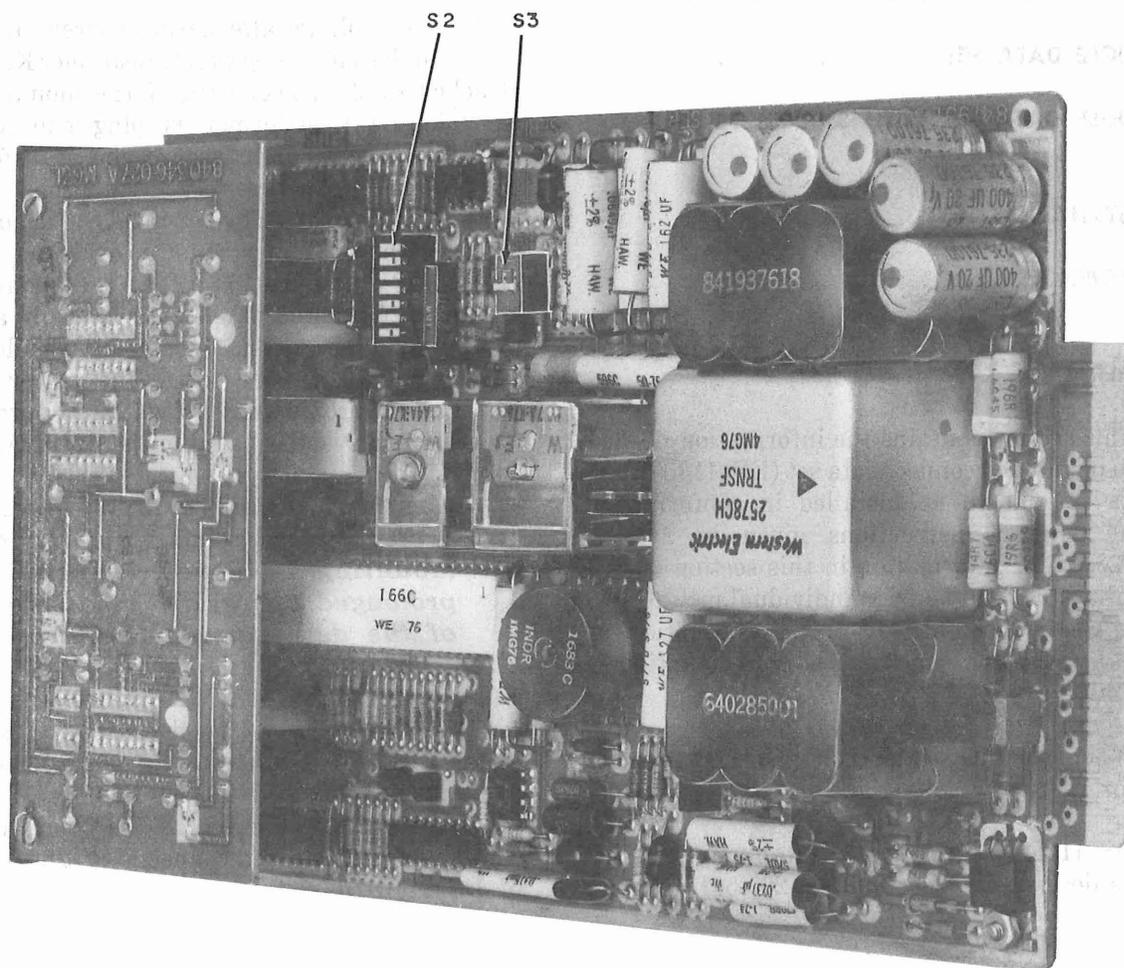


Fig. 1—DS 113D-L1

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-6573.

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

3.04 Data set options are determined by the switch settings S1 (on data mounting), S2 (Fig. 2) and S3 (Fig. 3) on DS 113D-L1. A description of the options shown in Table A follows.

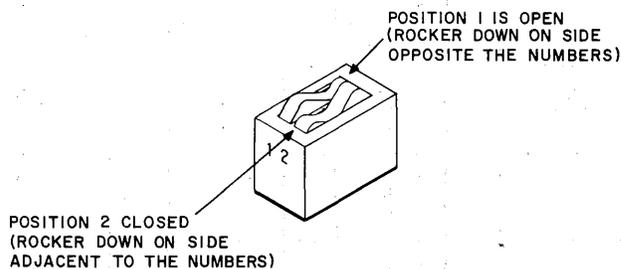


Fig. 2—Option Switch S2

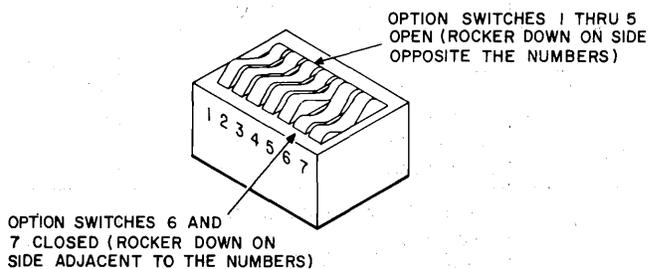


Fig. 3—Option Switch S3

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 ± 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.

CB and CF Indications

- COMMON (option A): When this option is provided, the CB and CF leads turn **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.

Fail Safe State of CN Circuit

- ON (option K): When this option is provided, an open circuit is interpreted as an **on** condition on the CN lead and causes the line to be made busy if option F is installed.

TABLE A
OPTION SWITCH SETTINGS

FEATURE	OPTION	FACTORY FURNISHED OPTION	SWITCH SETTING S2 SWITCH CONTACT SETTING							PROVIDE	
			1	2	3	4	5	6	7		
A1 Receive Space Disconnect	YES	V X	√	—	—	O	—	—	—	—	One per set
	NO	Y		—	—	X	—	—	—	—	
B3 Send Space Disconnect	YES	T X	√	—	—	—	—	—	—	X	One per set
	NO	U		—	—	—	—	—	—	O	
Loss of Carrier Disconnect	YES	S X	√	—	—	—	—	O	—	—	One per set
	NO	R		—	—	—	—	X	—	—	
CB and CF Indications	COMMON	A X	√	—	X	—	—	—	—	—	One per set
	SEPARATE	B		—	O	—	—	—	—	—	
CC Indication for Analog Loop	ON	ZF X	√	—	—	—	O	—	—	—	One per set
	OFF	ZE		—	—	—	X	—	—	—	
E9 Automatic Answer	YES	ZH X	√	—	—	—	—	—	O	—	One per set
	NO	ZG		—	—	—	—	—	X	—	
Fail Safe State of CN Circuit D7	ON	K		X	—	—	—	—	—	—	One per set
	OFF	J X	√	O	—	—	—	—	—	—	
SEE NOTE											
			S3 SWITCH CONTACT SETTING								
Tip-Ring Make Busy	YES	F		X	—					One per set	
	NO	E X	√	O	—						
Contact to Ground Make Busy Floating Contact Make Busy	For use with 40A-type data mounting			Not available when option ZB is used							— —
Common Grounds	YES	Q X	√	Close S1 screw switch on 47E1 DM							One per set
	NO	P		Open S1 screw switch on 47E1 DM							

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

Note: This space may be filled in by craftsperson when options have been determined.

- OFF (option J): When this option is provided, an open circuit is interpreted as an *off* condition on the CN lead. If the customer does not provide a signal on the CN lead, option J must be installed or the data set will not be functional.

Automatic Answer

- YES (option ZH): When this option is provided, the automatic answer feature of the data set is enabled.
- NO (option ZG): When this option is provided, incoming calls can only be answered manually.

Tip-Ring Make Busy

- YES (option F): When this option is provided, any one of the following conditions will make the telephone line busy:
 - (1) A power fail condition
 - (2) The CN lead being *on*.
 - (3) Zero volts or an open circuit on the CN lead, provided the K option is installed
 - (4) Operating the AL test button.
- NO (option E): When this option is provided, the tip-ring make-busy feature is disabled.

Contact to Ground Make Busy or Floating Contact Make Busy

- These features can only be used with the 40A data mounting.

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

4.02 Figure 4 shows a simplified diagram of the telephone set, interface, and the data set.

5. CONNECTIONS

5.01 The data signal power level reaching the serving central office (SCO) should be no greater than -12 dBm. Usually the average loop loss between the SCO and the data set is -3 dBm or greater. This -3 dBm loop loss combined with the fixed -9 dBm output level of the data set ensures that the signal reaching the SCO is not greater than -12 dBm. In some cases the loop loss is less than -3 dBm, and should be padded down. To meet the required power level, it may be necessary to install a pad external to the data set. The necessary pad may be ordered assembled or may be made up in the field and installed in accordance with Fig. 5.

5.02 In the event the actual loop loss is not known, it may be determined as follows.

- (1) Dial the central office milliwatt supply or request the local testboard to send 1000-Hz tone at 0 dBm on the loop.
- (2) Use a transmission test set with 600-ohm termination to measure the level of the incoming signal. The numerical reading is equal to the loop loss in dB (for example, -6 dBm on the meter is equal to 6 dB loop loss).

5.03 When the loop loss has been determined, the pad value may be selected as follows:

LOOP LOSS	USE
0.0 to 2.0 dB	2-dB pad
2.0 to 3.0 dB	1-dB pad
Greater than 3.0 dB	No pad

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
—	Not Used	—	19
CD	Data Terminal Ready	22	20
CE	Ring Indicator	23	22
CN	Make Busy/Analog Loop	25	25

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

Note 2: 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.

Note 3: Pin 19 is connected to pin 11 in the housing. This circuit is not used in low-speed data sets.

SINGLE DATA SET

5.04 DS 113D-L1/2: When a single DS 113D-L1/2 is installed, connect tip and ring in the associated telephone set and connect the cables as shown in Fig. 6. Figure 7 provides detailed wiring information for the single data set installation. This information is useful in troubleshooting.

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

SINGLE DATA SET WITH SHARED TEL SET

5.05 If DS 113D-L1/2 shares its telephone set with other new family data sets, the data

set should be connected in accordance with Fig. 8. The KS-21253-L3 adapter makes it possible for DS 113D 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. 9 and 10 for details of the adapter.

5.06 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. 8). A 602-15 Waber Electric power outlet strip accommodates three transformers. A 1A2 power panel accommodates eight transformers. If there is interference, the spade lugs must be bent upward. A KS-14532-L20 or equivalent cord is required with the 1A2 power panel.

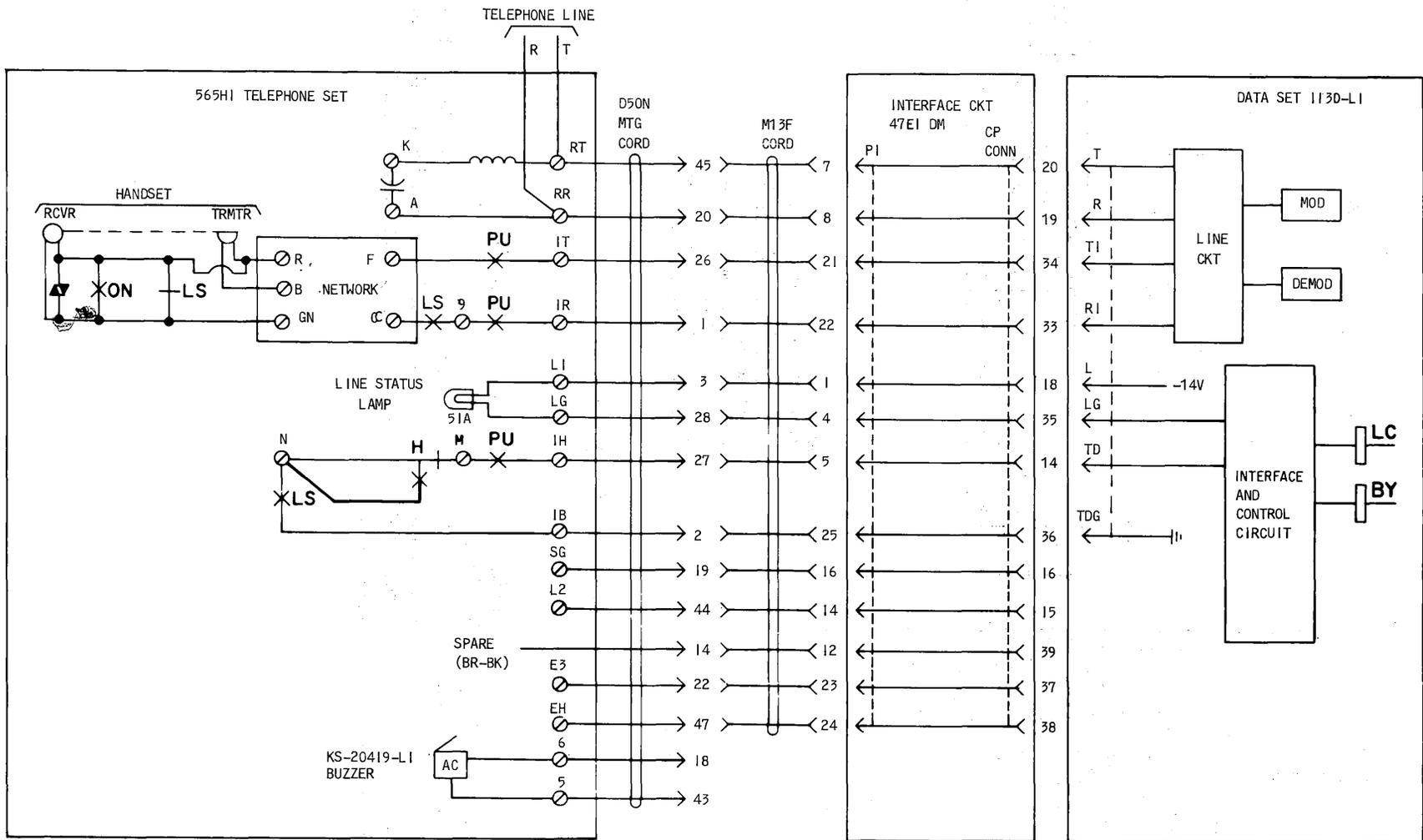
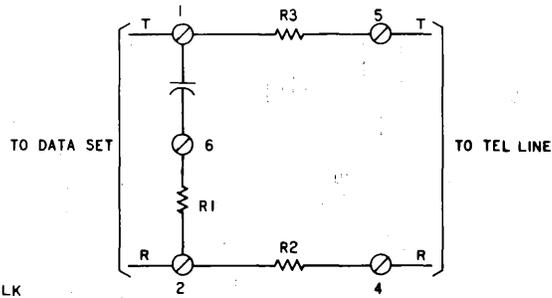
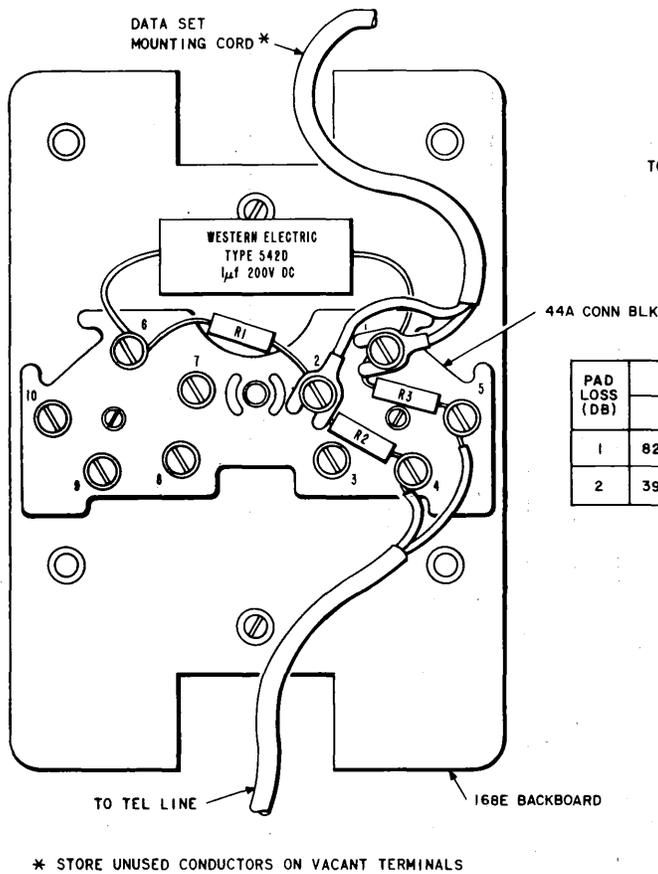


Fig. 4—Simplified Diagram of Telephone Set, Interface Circuit, and Data Set



PAD LOSS (DB)	RESISTOR VALUE (OHMS)				ORDERING INFORMATION
	R1		R2 AND R3		
1	8200	GRAY RED RED	47	YELLOW VIOLET BLACK	78A
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. 5—Loss Pad Connections

5.07 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.

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 591-040-500.

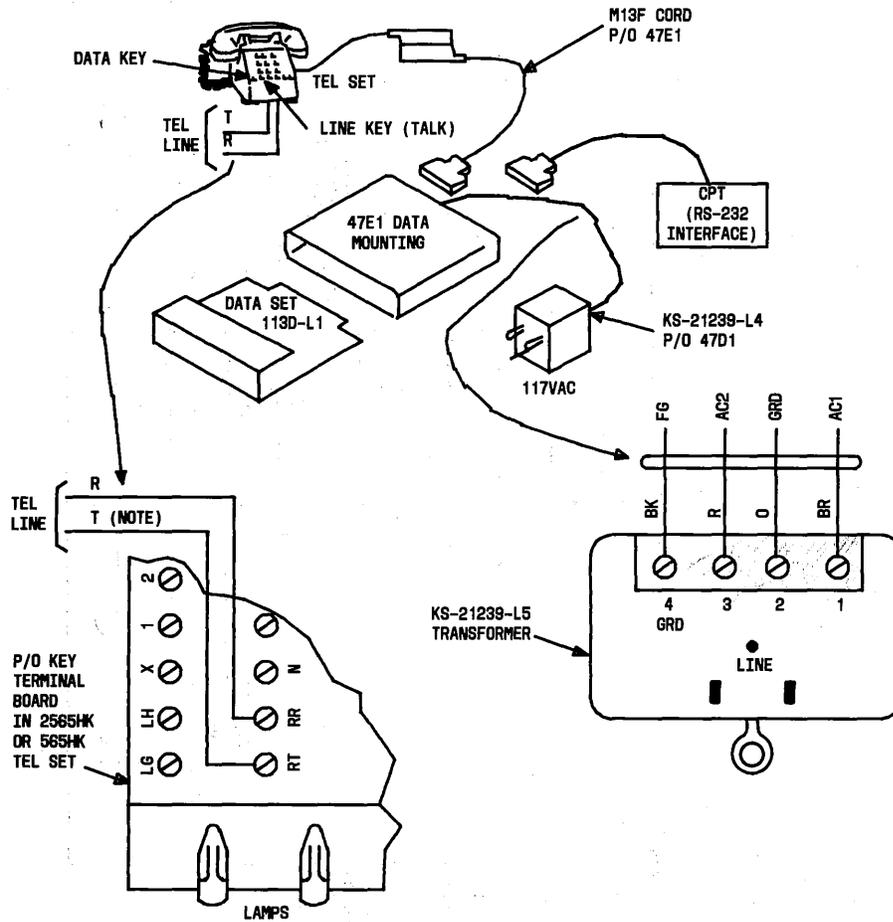


Fig. 6—Typical DS 113D-L1/2 Installation With 565HK Telephone Set

7. REFERENCES

7.01 The following BSPs provide additional information:

SECTION	TITLE	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 40A Data Mounting
		590-010-200	Data Sets and Data Access Arrangements—General Installation and Connection Information

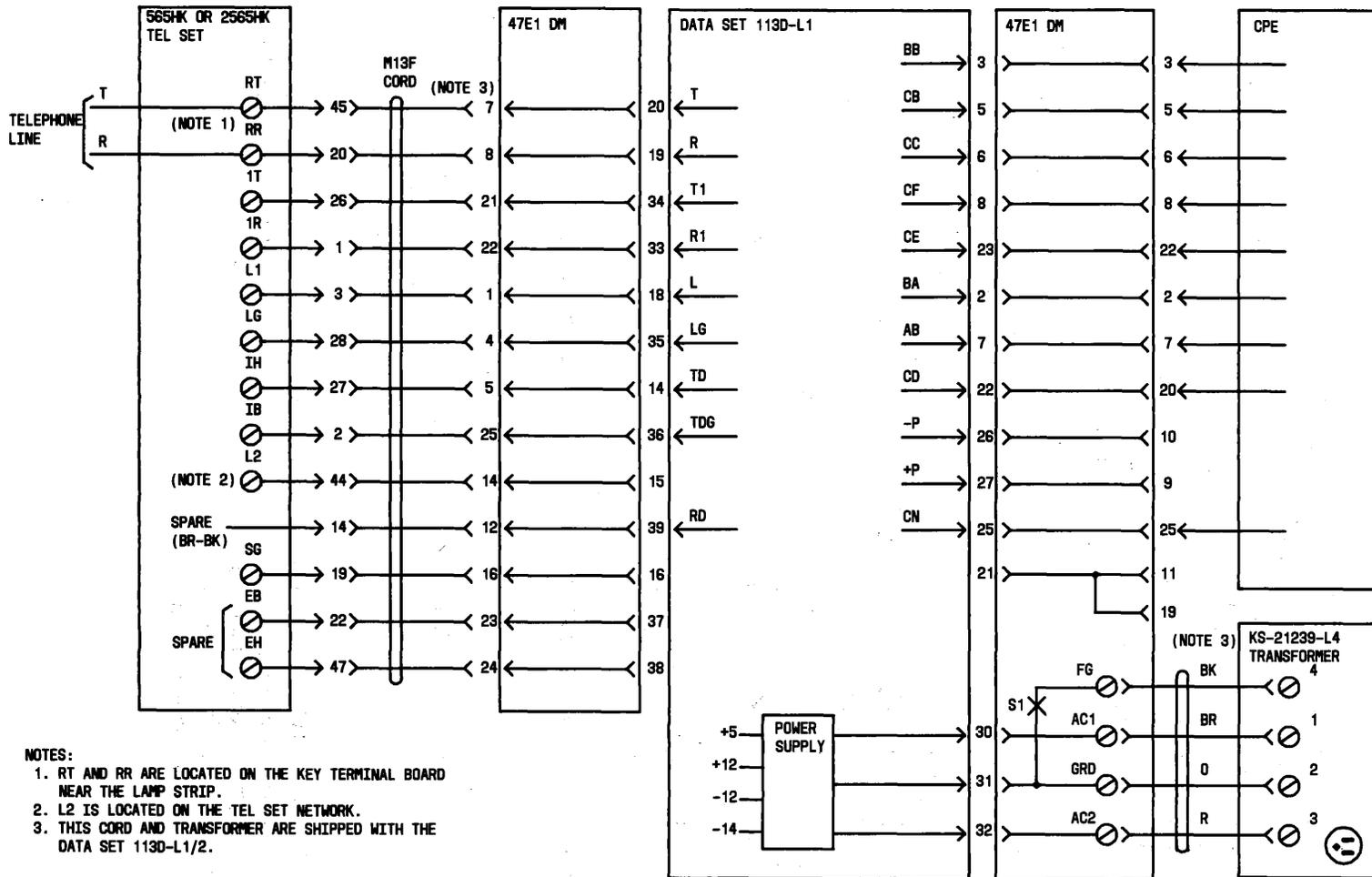


Fig. 7—DS 113D-L1/2 Installation With 565HK Telephone Set—Connection Diagram

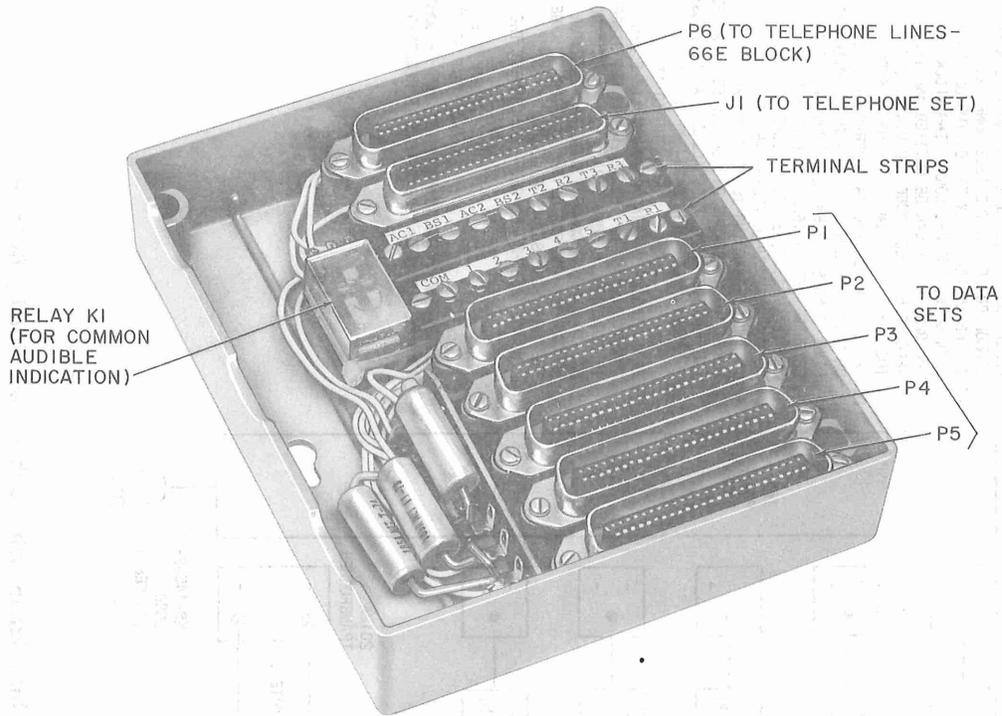


Fig. 9—KS-21253-L3 Adapter With Cover Removed

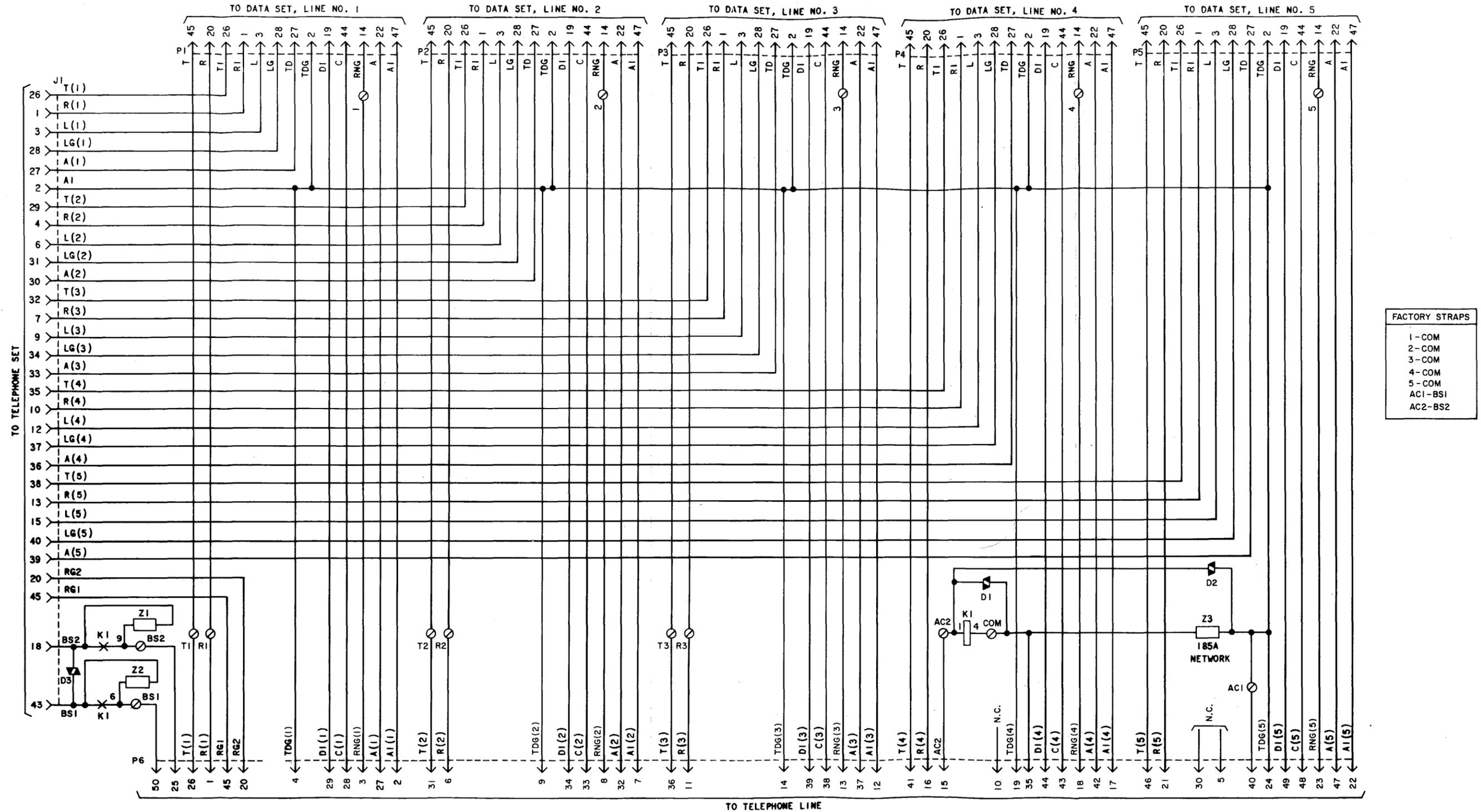


Fig. 10—Adapter for up to Five Data Sets Connected to One Key Telephone Set