

DATA SET 113DR-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) 113DR-L1/2. The data set should be installed in conformance with the general instructions given in Section 590-011-200. The information in this section covers the installation of data sets in individual mountings. Refer to Section 590-011-202 for a description of registered multiset installations in 40A3 data mountings and Bell System provided cabinets.

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

1.03 DS 113D-L1 has been replaced by DS 113DR-L1 which is the registered version of the data set. DS 113DR-L1 meets the requirements of the

FCC registration program. The registration number for DS 113DR-L1 is AS593M-62992-MD-E.

1.04 General information concerning registered data sets and arrangements follows:

- Registered versions of data sets are coded with an "R" in the data set code.
 - All Bell System switched network data sets not coded with an "R" in the data set code are grandfathered.
 - Grandfathered DS 113D may be connected in registered arrangements provided the interface with the network is made with the appropriate jack and cord as shown in the connection diagrams in this section.
 - DS 113DR may be connected in grandfathered arrangements provided the interface with the network is made using the appropriate cords as shown in the connection diagrams in this section.
 - Connections to the telephone lines must be made via the proper cords to the voice or data jack as shown in the connection diagrams in this section.
 - In the one-to-five data set arrangements a mixture of new-family data sets (103JR, 113CR, 113DR, 201CR, 202SR, 208BR, and 212AR) may be used as shown in the connection diagrams in this section.
- 1.05** DS 113DR-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.

NOTICE

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

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

1.06 DS 113DR-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 Electronic Industries Association (EIA) recommended standards.

1.07 Low voltage alternating current is supplied to the data set by wall transformer KS-21239-L5 attached to the power cord of the mounting. The KS-21239-L5 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.

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 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.*

1.08 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 113DR-L1/2. This connection can be extended by using B25A cables as needed. Refer to the connection diagrams for the maximum lengths of the extension.

2. CIRCUIT PACK REMOVAL AND REPLACEMENT

2.01 DS 113DR-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 113DR-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 113DR-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 113DR-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-6983R.

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 condition.

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

Receive Space Disconnect

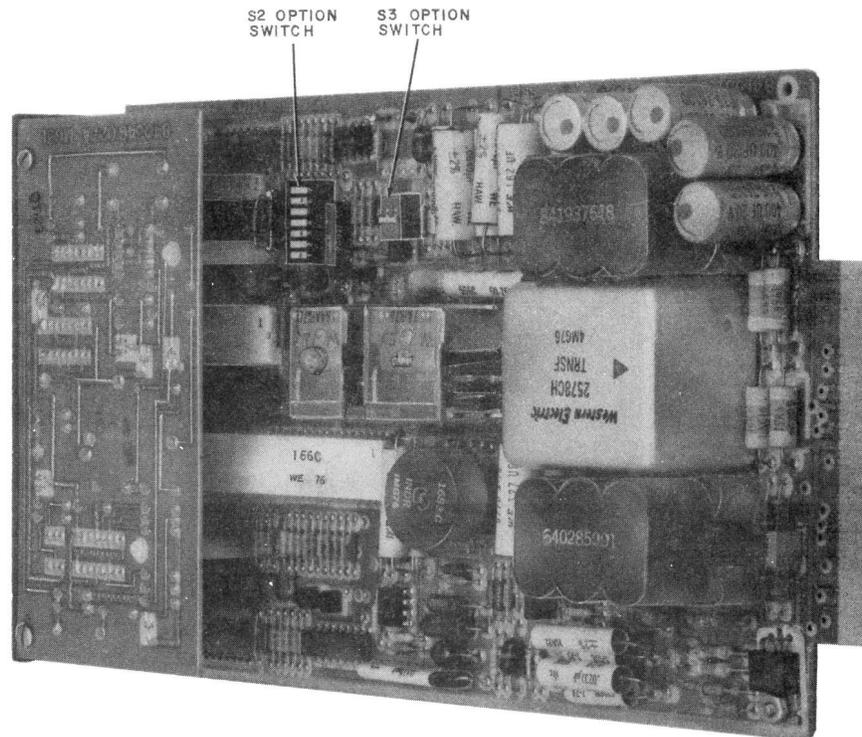


Fig. 1—DS 113DR-L1

- 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,

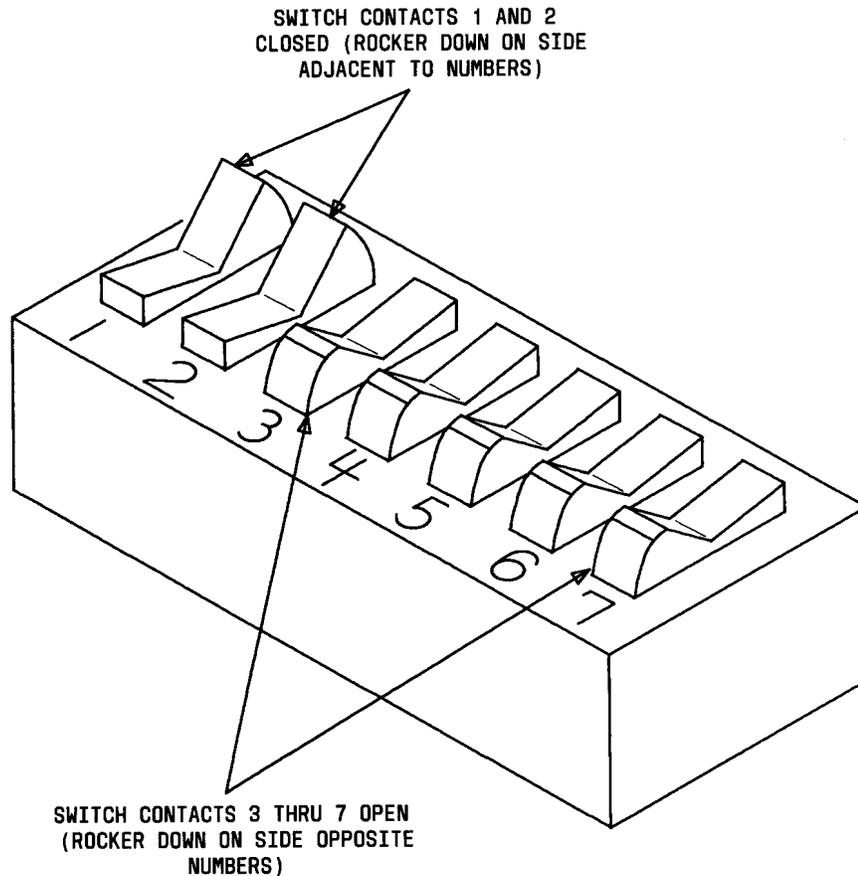


Fig. 2—Option Switch S2

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.
- 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.

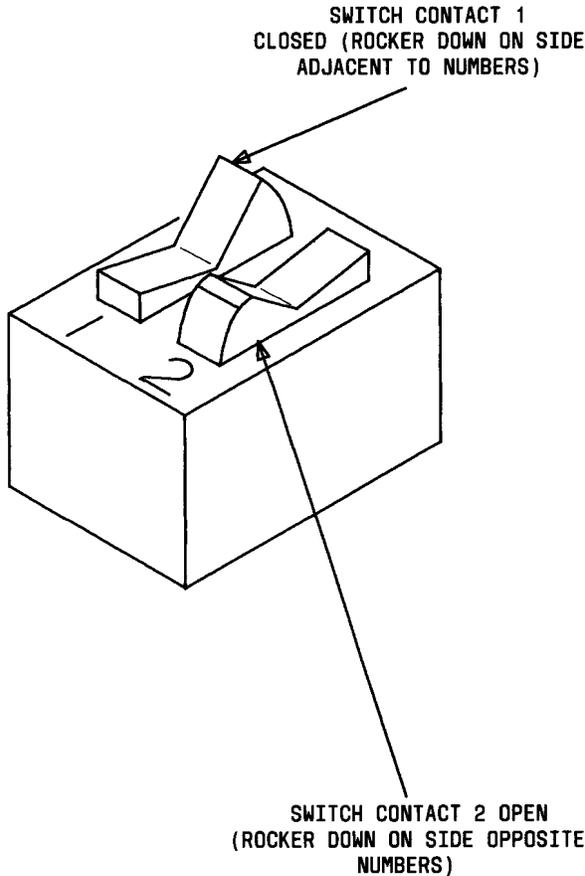


Fig. 3—Option Switch S3

- 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-type data mounting in grandfathered arrangements.

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 113DR-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 interface leads and their uses are listed in Table C and described as they are used in DS 113DR-L1/2 installations.

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

5. CONNECTIONS

5.01 DS 113DR transmit level is fixed at a level not to exceed -9 dBm under any operating condition. DS 113DR is designed to be connected to a basic access line having parameters specified in Section 314-205-501.

CARD DIALER

5.02 The 2662A1M telephone set is equipped with a card dialer and may be substituted for the 2565HKM telephone set shown in the arrangements. If the telephone line is to be connected to the telephone set, connect the M4AS cord as follows:

M4AS CORD	2662A1M TERMINAL
R	TEL NET A
G	TB1-7

TABLE A
OPTION SWITCH SETTINGS

FEATURE		OPTION	FACTORY FURNISHED OPTION	SWITCH SETTING S2 SWITCH 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	—	—	
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	—	—	—	
Automatic Answer	YES	ZH	✓	—	—	—	—	—	O	—	One per set
	NO	ZG		—	—	—	—	—	X	—	
Fail Safe State of CN Circuit	ON	K		X	—	—	—	—	—	—	One per set
	OFF	J	✓	O	—	—	—	—	—	—	
				S3 SWITCH CONTACT SETTING							
Tip-Ring Make Busy	YES	F		X	—						One per set
	NO	E	✓	O	—						
Contact to Ground Make Busy Floating Contact Make Busy	For use with 40A-type data mounting in grandfathered arrangements			Not available when option ZB is used							— —
Common Grounds	YES	Q	✓	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

TABLE B
CUSTOMER INTERFACE

EIA DESIGNATION	CIRCUIT	CIRCUIT PACK 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.

Y INSULATE AND STORE

B INSULATE AND STORE

6. STATION ARRANGEMENTS

6.01 The station arrangements described in this part comply with the FCC registration program and apply only to DS 113DR-L1/2. Section 590-011-202 describes station arrangements using DS 113DR-L1 and 40A3 data mountings. Refer to Fig. 5 for detail drawings of key telephone set, KS-21239-L5 transformer, and 153A adapter connections. Refer to Fig. 6 through 9 for connection diagrams of the arrangements. Fig. 10

and 11 are provided to aid troubleshooting of the arrangements.

6.02 DS 113DR-L1/2 Only: Connect tip and ring leads of the M4AS cord to the 153A adapter and connect the cables as shown in Fig. 6.

The following parts are required:

DS 113DR-L1/2

153A Adapter

B25A Cables, as needed, length as shown in Fig. 6.

TABLE C
TELEPHONE INTERFACE

DESIG-NATION	DESCRIPTION	CIRCUIT PACK CONNECTOR PIN ASSIGNMENT	25-PIN PLUG PIN ASSIGNMENT
L	Tel set line lamp control from data set	18	1
LG	Tel set line lamp ground from data set	35	4
TD	Talk/data control from tel set	14	5
T	Tel line tip lead	20	7
R	Tel line ring lead	19	8
T1	Tel set tip lead	34	21
R1	Tel set ring lead	33	22
TDG	Ground lead	36	25
RT	Remote test	17	—
MB	Make busy	40	—
MB1	Make busy	13	—

Note 1: Not used in registered arrangements.

Note: An M4AS cord, up to 25 feet long, must be used for the connection to a voice jack (USOC RJ11C) or data jack (USOC RJ41S or USOC RJ45S). A seven-foot cord is shipped with the data set.

6.03 DS 113DR-L1/2 With Telephone Set:

Connect tip and ring leads of the M4AS cord to the telephone set and connect the cables as shown in Fig. 7.

The following parts are required:

DS 113DR-L1/2

B25A Cables, as needed, length as shown in Fig. 7

565HKM, 2565HKM, or 2662A1M Telephone Set

Note: An M4AS cord, up to 25 feet long, must be used for the connection to a voice jack (USOC RJ11C) or data jack (USOC RJ41S or USOC RJ45S). A seven-foot cord is shipped with the data set.

6.04 DS 113DR-L1/2 With Telephone Set (Alternate Method): Connect tip and ring leads of the M4AS cord to the 153A adapter and connect the cables as shown in Fig. 8.

The following parts are required:

DS 113DR-L1/2

KS-19252-L1 Adapter

153A Adapter

B25A Cables, as needed, length as shown in Fig. 8

565HKM, 2565HKM, or 2662A1M Telephone Set

Note: An M4AS cord, up to 25 feet long, must be used for the connection to a voice jack (USOC RJ11C) or data jack (USOC RJ41S or USOC RJ45S). A seven-foot cord is shipped with the data set.

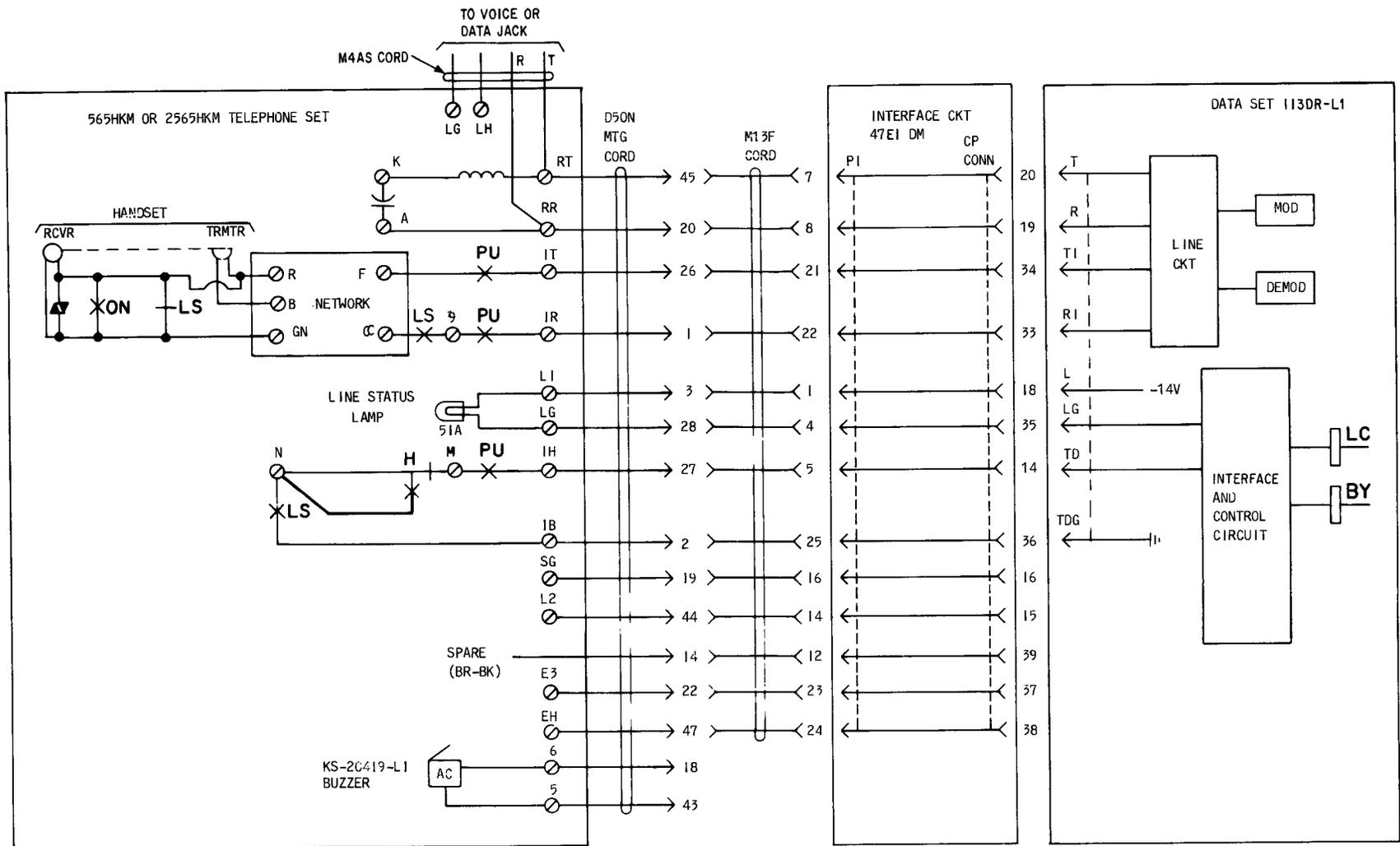


Fig. 4—Interface Between Telephone Set and Data Set

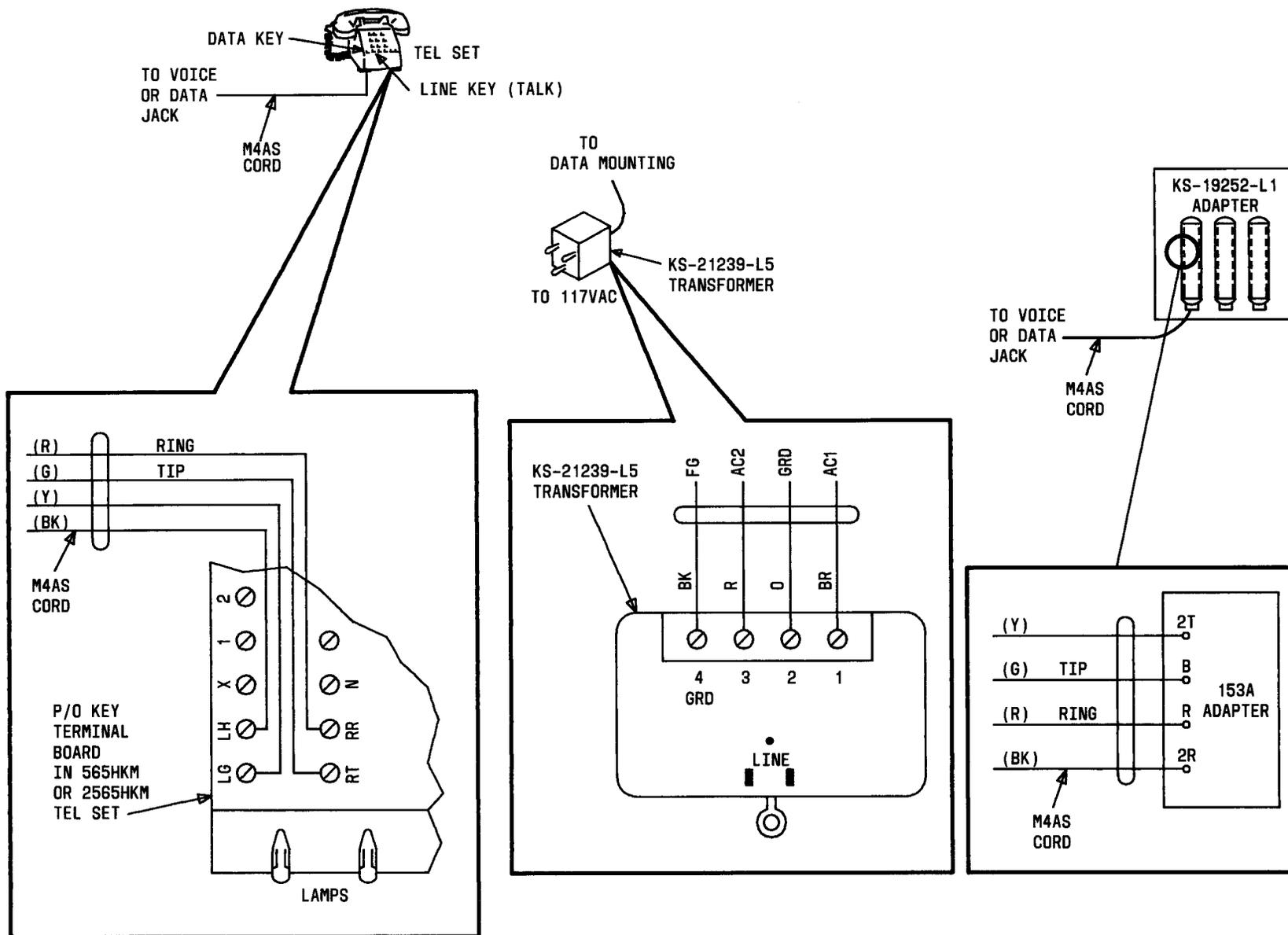
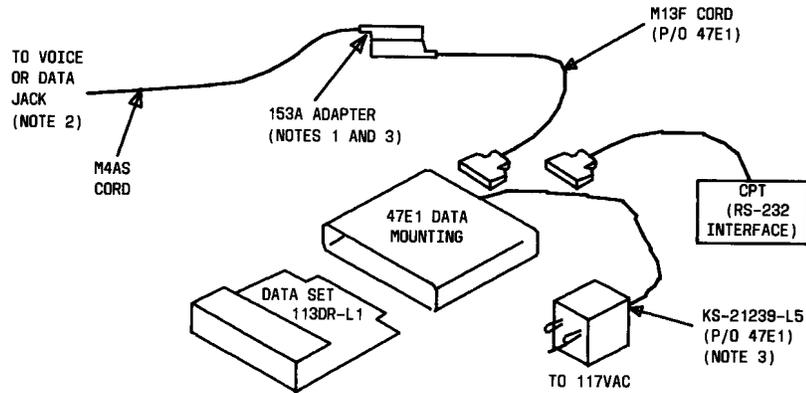
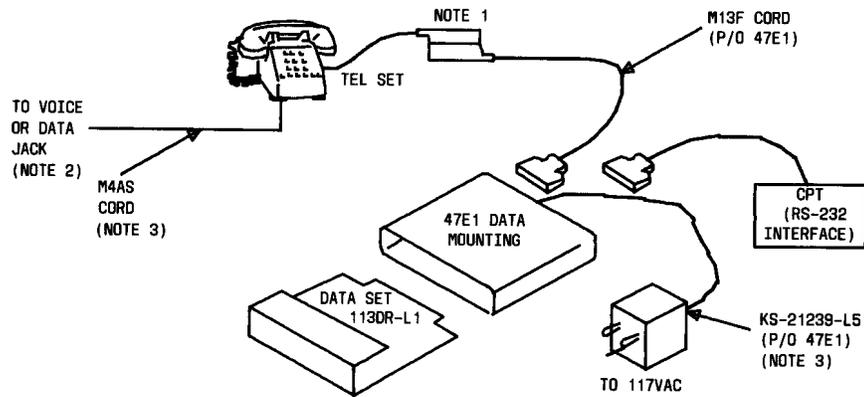


Fig. 5—Details of Key Telephone Set, KS-21239-L5 Transformer, and 153A Adapter Connections



- NOTES:
1. THE CONNECTION MAY BE EXTENDED WITH B25A CABLES UP TO 60 FEET.
 2. USE VOICE JACK USOC RJ11C OR DATA JACK USOC RJ41S (WITH SWITCH SET TO PROG) OR DATA JACK USOC RJ45S.
 3. FOR CONNECTIONS TO 153A ADAPTER AND KS-21239-L5 TRANSFORMER, REFER TO FIG. 5.

Fig. 6—DS 113DR-L1/2 Only—Connection Diagram



- NOTES:
1. THE CONNECTION MAY BE EXTENDED WITH B25A CABLES UP TO 60 FEET.
 2. USE VOICE JACK USOC RJ11C OR DATA JACK USOC RJ41S (WITH SWITCH SET TO PROG) OR DATA JACK USOC RJ45S.
 3. FOR CONNECTIONS TO KEY TELEPHONE SET AND KS-21239-L5 TRANSFORMER, REFER TO FIG. 5.

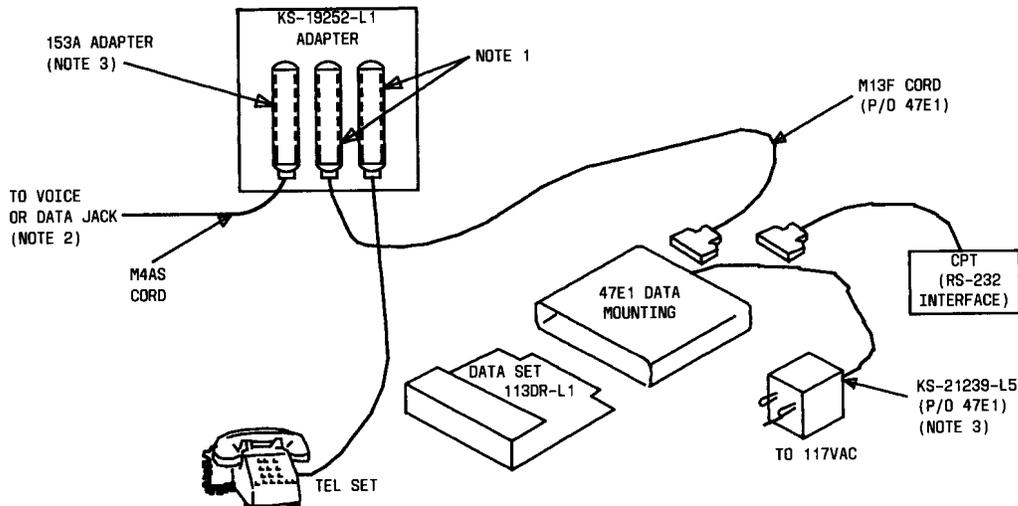
Fig. 7—DS 113DR-L1/2 With Telephone Set—Connection Diagram

6.05 One to Five Data Sets With Optional Shared Telephone Set: DS 113DR-L1/2 can share a telephone set with up to four other data sets. The connections should be in accordance with Fig. 9.

The following parts are required:

DS 113DR-L1/2 (one to five)

KS-21253-L3 Adapter



NOTES:

1. THESE CONNECTIONS MAY BE EXTENDED WITH B25A CABLES. THE TOTAL EXTENSION PROVIDED BY B25A CABLES BETWEEN TELEPHONE AND DATA SET MAY NOT EXCEED 60 FEET.
2. USE VOICE JACK USOC RJ11C OR DATA JACK USOC RJ41S (WITH SWITCH SET TO PROG) OR DATA JACK USOC RJ45S.
3. FOR CONNECTIONS TO 153A ADAPTER AND KS-21239-L5 TRANSFORMER, REFER TO FIG. 5.

Fig. 8—DS 113DR-L1/2 With Telephone Set (Alternate Method)—Connection Diagram

B25A Cables, as needed, length as shown in Fig. 9

M10G, M10H, or M10J cord (refer to Table D)

565HKM, 2565HKM, or 2662A1M Telephone Set (optional)

6.06 Multiple Power Outlets: To eliminate the need for several 110-Vac outlets, the individual KS-21239-L5 transformers can be plugged into a multiple power outlet strip. 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.

6.07 KS-21253-L3 Five Set Adapter—Alternate Line Connections: When one to three data sets are used with the KS-21253-L3 five set adapter, the following line connections may be used in place of the M10-type cord. Connect

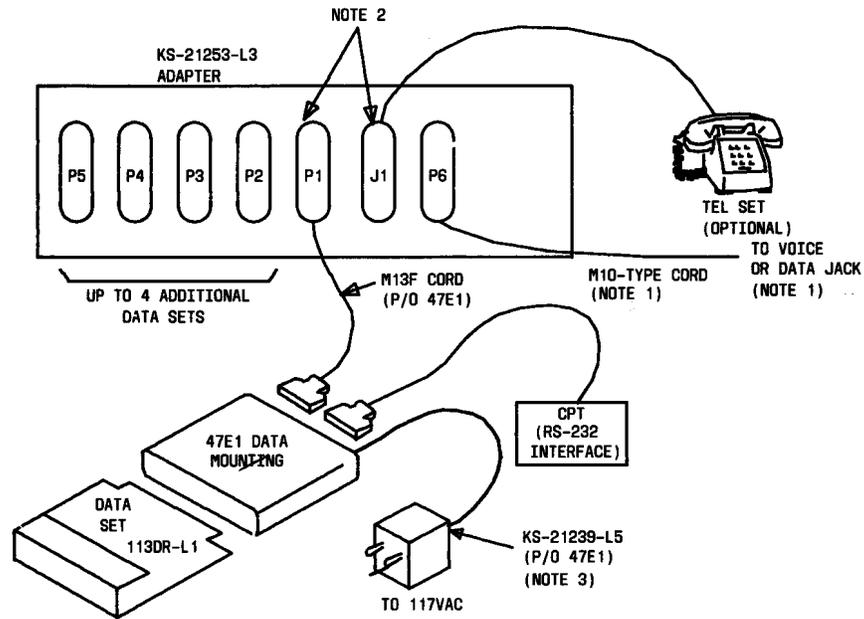
the appropriate M4A-type cord to one of the terminal pairs T1-R1, T2-R2, or T3-R3 of the adapter, as described below.

Connections for 100-Type Data Sets

Connect the green and red leads of an M4AS cord to the T and R terminals, respectively, of one terminal pair. Plug the cord into a voice jack USOC RJ11C, a data jack USOC RJ41S, with the switch set to the PROG position, or a data jack USOC RJ45S. Tape and store the unused leads of the cord.

Connections for 200-Type Data Sets

Connect the orange and blue leads of an M4AU cord to the T and R terminals, respectively, of one terminal pair. Plug the cord into a data jack USOC RJ41S, with the switch set to the FLL position. Tape and store the unused leads of the cord.



- NOTES:
1. FOR REQUIRED CORD AND JACK COMBINATION, REFER TO TABLE D.
 2. THESE CONNECTIONS MAY BE EXTENDED WITH B25A CABLES, THE TOTAL EXTENSION PROVIDED BY B25A CABLES BETWEEN TELEPHONE SET AND ANY DATA SET MAY NOT EXCEED 60 FEET.
 3. FOR CONNECTIONS TO KS-21239-L5 TRANSFORMER, REFER TO FIG. 5.

Fig. 9—One to Five Data Sets With Optional Shared Telephone Set—Connection Diagram

TABLE D

CORD AND JACK COMBINATION
FOR TWO TO FIVE DATA SET INSTALLATIONS

TYPE OF DATA SETS INSTALLED	JACK USOC NO.	JACK SWITCHES SET TO	CORD CODE
100 Series Only	RJ21X	(None)	M10J
	RJ26X	PROG	M10H
	RJ27X	(None)	M10H
100 Series Mixed With 200 Series	RJ26X	FLL	M10G

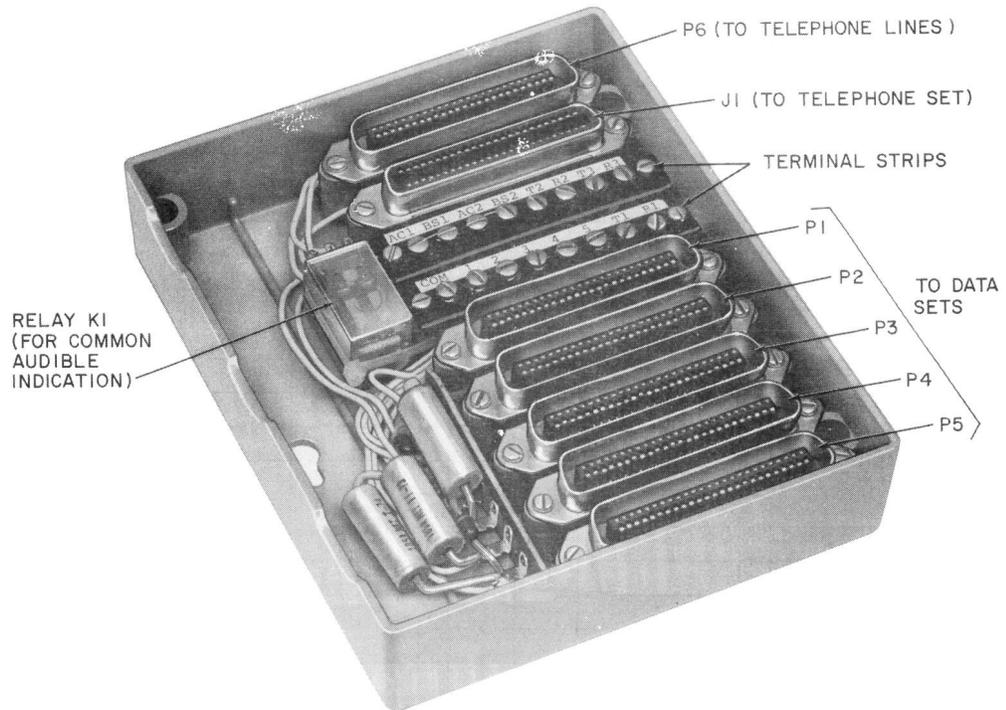


Fig. 10—KS-21253-L3 Adapter With Cover Removed

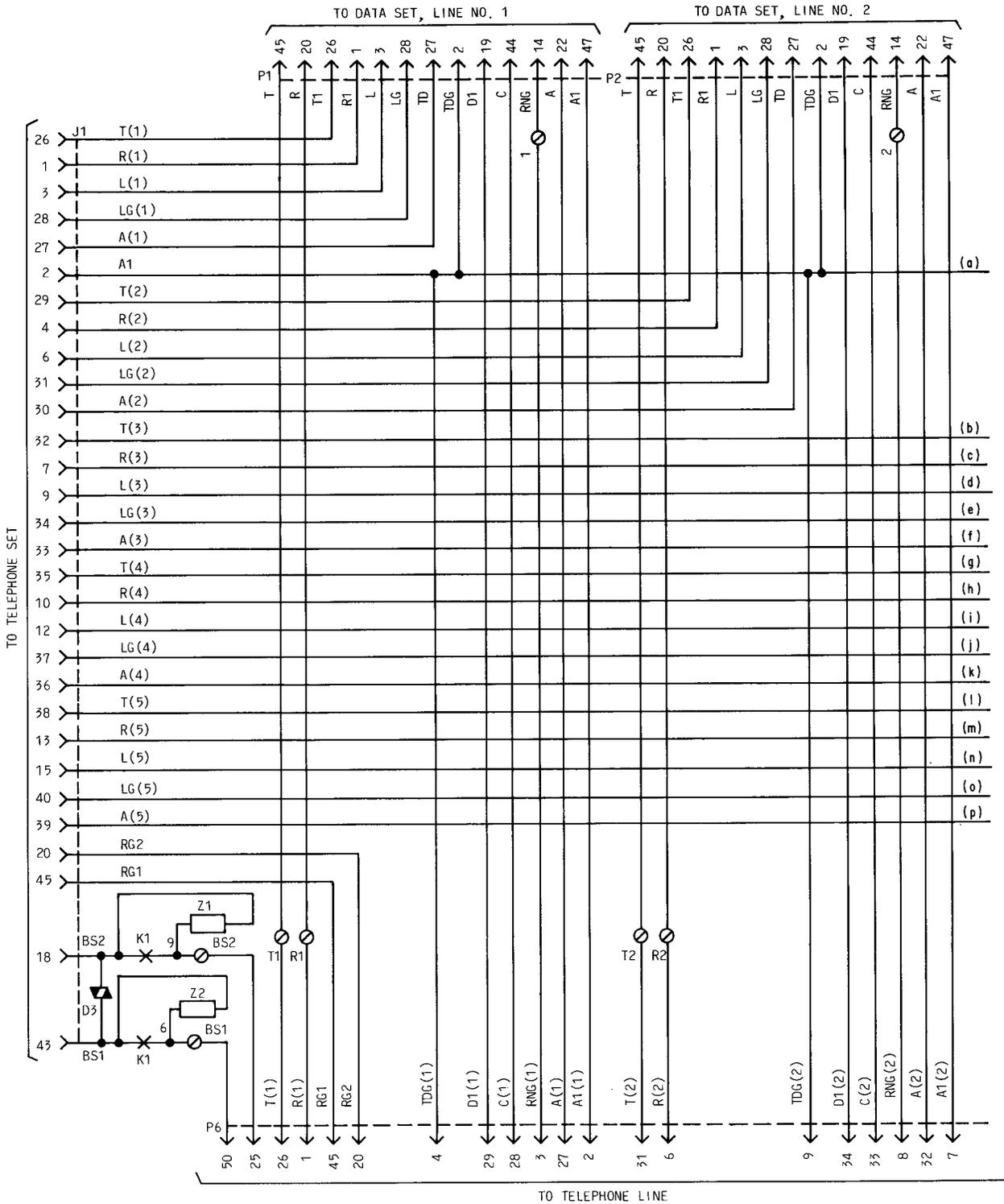


Fig. 11—KS-21253-L3 Adapter—Wiring Diagram (Sheet 1 of 2)

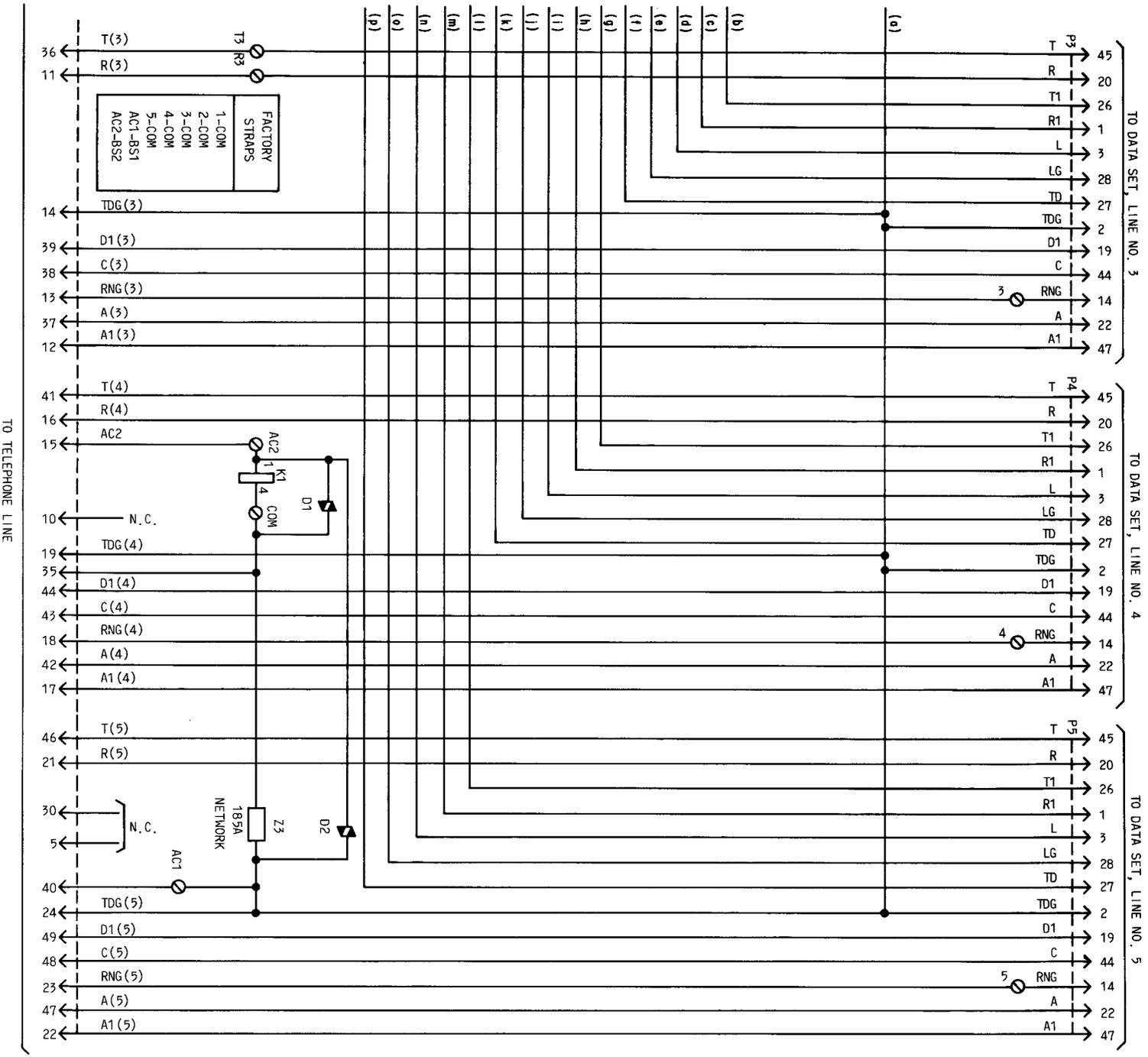


Fig. 11—KS-21253-L3 Adapter—Wiring Diagram (Sheet 2 of 2)

SECTION 591-047-200

7. INSTALLATION TEST

7.01 After installation is completed, the data set should be tested to determine if it is operating properly. Refer to Section 591-047-500.

8. REFERENCES

8.01 The following BSPs provide additional 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

SECTION

TITLE

590-011-200	Data Sets and Data Access Arrangements—General Installation and Connection Information
590-011-202	Registered Data Sets—Station Arrangements for Registered Data Sets in 40A3 Data Mountings
590-101-103	Jacks for Registered Data Equipment—Single and Multiline Installations
591-047-100	Data Set 113DR-L1/2—Transmitter-Receiver—Single Set—Description and Operation
591-047-500	Data Set 113DR-L1/2—Transmitter-Receiver—Single Set—Test Procedures