DATA SET 113CR-L1A/2
TRANSMITTER-RECEIVER
SINGLE SET
INSTALLATION AND CONNECTIONS

CONTENTS PAGE

1. GENERAL

1.01 This section contains the information needed to install and connect data set (DS) 113CR-L1A/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 590-011-202 for registered station arrangements that include multi-set arrangements for registered data sets 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1.03 Data set 113C-L1/2 has been replaced by 113CR-L1A/2 the registered version of the data set. The 113CR-L1A meets the requirements of the FCC registration program. The registration number for the 113CR is AS593M-70209-DM-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 113C may be connected in registered arrangements provided the interface with the network is made with the appropriate jack and cord.
- DS 113CR may be connected in grandfathered arrangements provided the interface with the network is made using the appropriate cords as shown in the arrangement figures.
- Connections to the telephone lines must be made via the proper cords to the voice or data jack.
- In the five data set arrangements a mixture of new-family data sets (103JR, 113CR, 113DR, 201CR, 202SR, 208BR, and 212AR) may be used.

1.05 The DS 113CR-L1A/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.

1.06 The DS 113CR-L1A/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 plug-mounted wall transformer KS-21239-L5, 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 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 113CR-L1A/2. This connection can be extended by using B25A cables as needed. Refer to the installation figures for the maximum lengths of the extension.

2. CIRCUIT PACK REMOVAL AND REPLACEMENT

2.01 Data set 113CR-L1A must be removed from the mounting to be accessible (Fig. 1).

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

The DS 113CR-L1A 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 113CR-L1A in the mounting, proceed as follows:

(1) Slide the data set 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 113CR-L1A 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-10063R.

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

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

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.

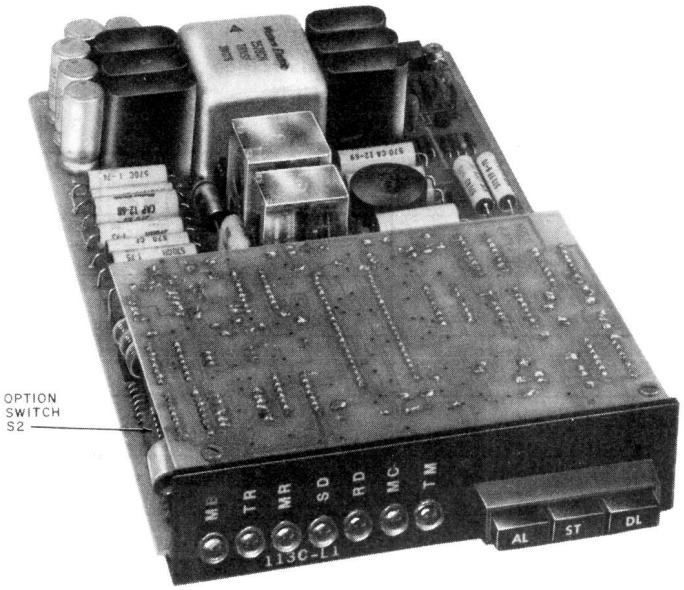


Fig. 1—DS 113CR-L1A

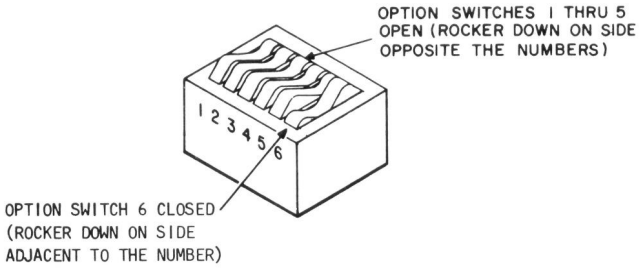


Fig. 2—Option Switch

- 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.

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

TABLE A

OPTION SWITCH SETTINGS

FEATURE		OPTION	FACTORY FURNISHED OPTION	SWITCH SETTING S2 SWITCH ON CM1 CONTACT SETTING						
				1	2	3	4	5	6	
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 (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.

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 The DS 113CR-L1A/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 automatic calling unit (ACU) interface leads are listed in Table C and described as they are used in DS 113CR-L1A/2 installations.

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

5. CONNECTIONS

5.01 Data set 113CR transmit level is fixed at a level not to exceed -9 dBm under all operating conditions. The DS 113CR 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 telephone sets shown in the arrangement shown in Fig. 4 or Fig. 6.

- Connect tip and ring in the telephone as follows:

M4AS CORD	2662A1M TERMINAL
R	TEL NET A
G	TB1-7
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. These procedures apply only to DS 113CR-L1A when used with the 47F1 data mounting. Section 590-011-202 describes installation of data stations using DS 113CR-L1A and 40A3 data mountings. Refer to Fig. 4 for detail drawings of key telephone set, loudspeaker set, transformer, and 153A adapter connections.

6.02 ***DS 113CR-L1A/2 With Telephone Set Without ACU:*** When a single DS 113CR-L1A/2 is installed without an ACU, connect tip and ring leads of the M4AS cord to the associated telephone set and connect the cables as shown in Fig. 5.

The following parts are required:

DS 113CR-L1A/2

B25A Cables, as needed, length as shown in Fig. 5

565HKM or 2565HKM 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.

6.03 ***DS 113CR-L1A/2 With Telephone Set Without ACU (Alternate Arrangement):*** 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 113CR-L1A/2

KS-19252,L1 Adapter

153A Adapter

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

TABLE B

CUSTOMER INTERFACE

EIA DESIG-NATION	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.

565HKM or 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 113CR-L1A/2 With Data Auxiliary Set (DAS) 801CR-L1/2 and Telephone Set:*** Connect tip and ring leads of the M4AS cord to the associated telephone set and connect the cables as shown in Fig. 7.

The following parts are required:

DS 113CR-L1A/2

DAS 801CR-L1/2

107B Loudspeaker Set
Two D4BT Cords
2012D Transformer
} Optional

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

565HKM or 2565HKM Telephone Set

TABLE C

TELEPHONE AND ACU INTERFACE

DESIG-NATION	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.

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.

6.05 ***DS 113CR-L1A/2 With DAS 801CR-L1/2 and 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 113CR-L1A/2

DAS 801CR-L1/2

107B Loudspeaker Set
Two D4BT Cords
2012D Transformer
] Optional

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

KS-19252,L1 Adapter

153A Adapter

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.

6.06 ***DS 113CR-L1A/2 With DAS 801CR-L1/2 Without Telephone Set:*** Connect tip and ring leads of the M4AS cord to the 153A adapter and connect the cables as shown in Fig. 9.

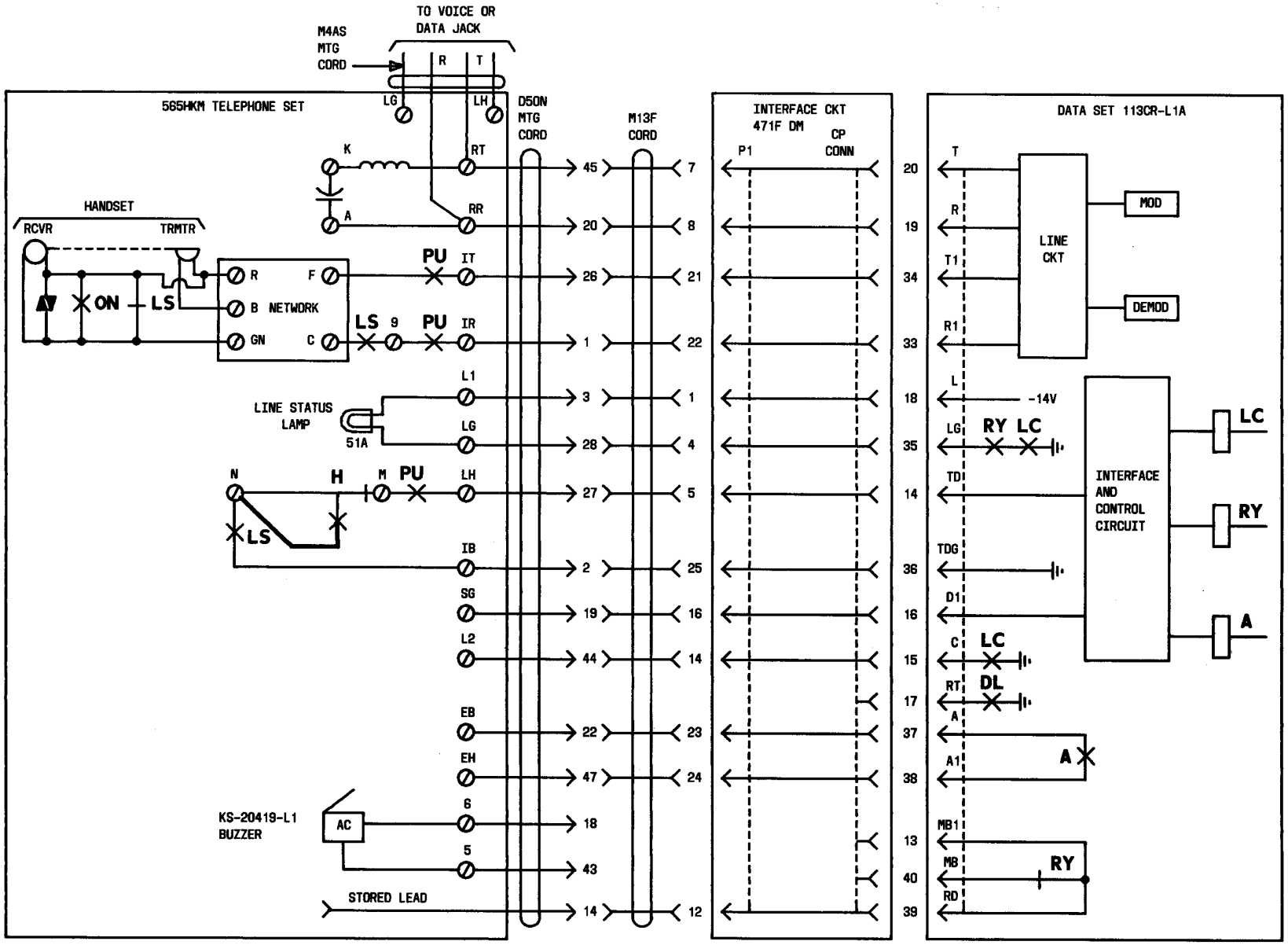


Fig. 3—Interface Between Telephone Set and Data Set Line Control

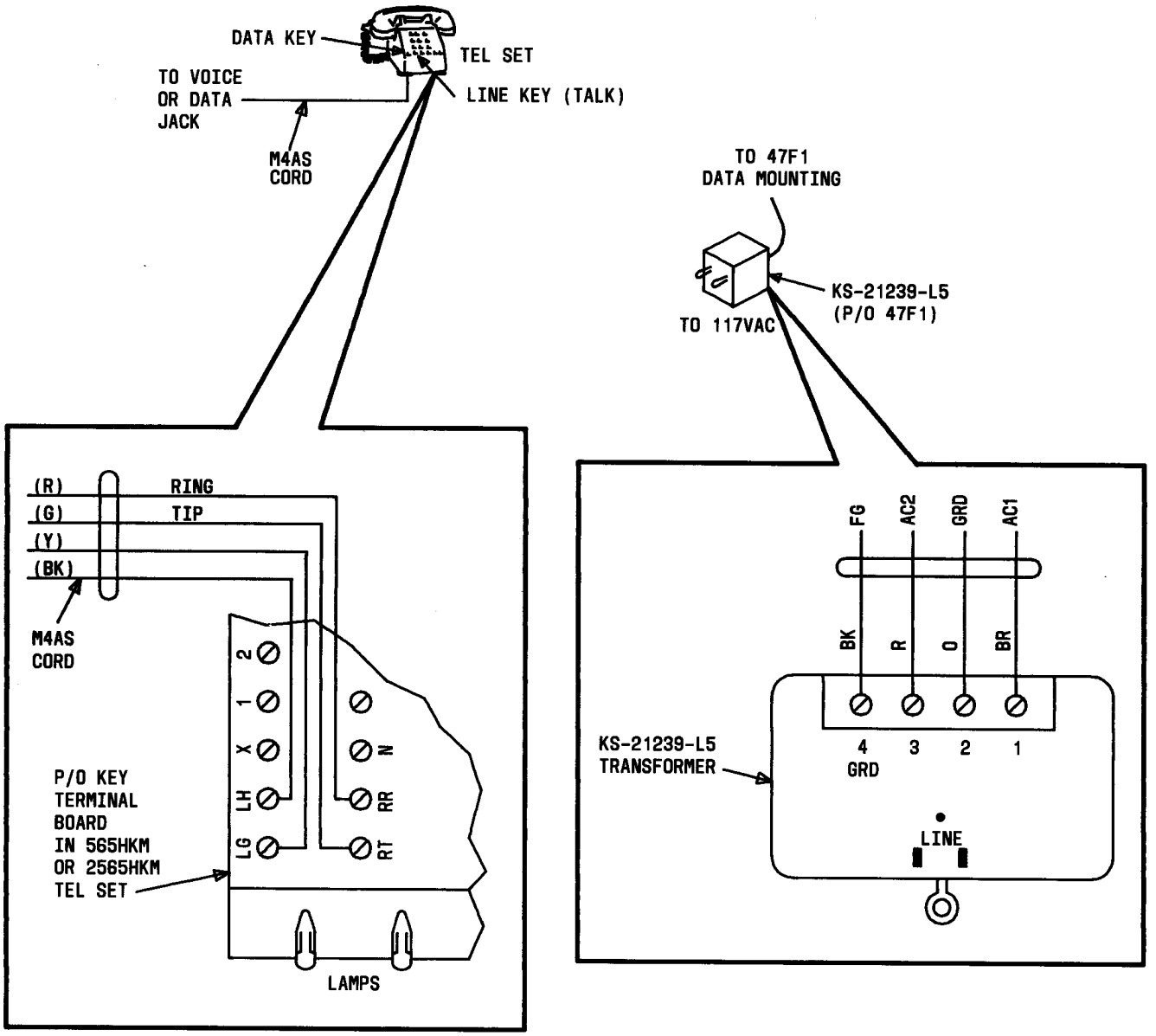


Fig. 4—Details of Key Telephone Set, Loudspeaker Set, Transformer, and 153A Adapter Connections (Sheet 1 of 2)

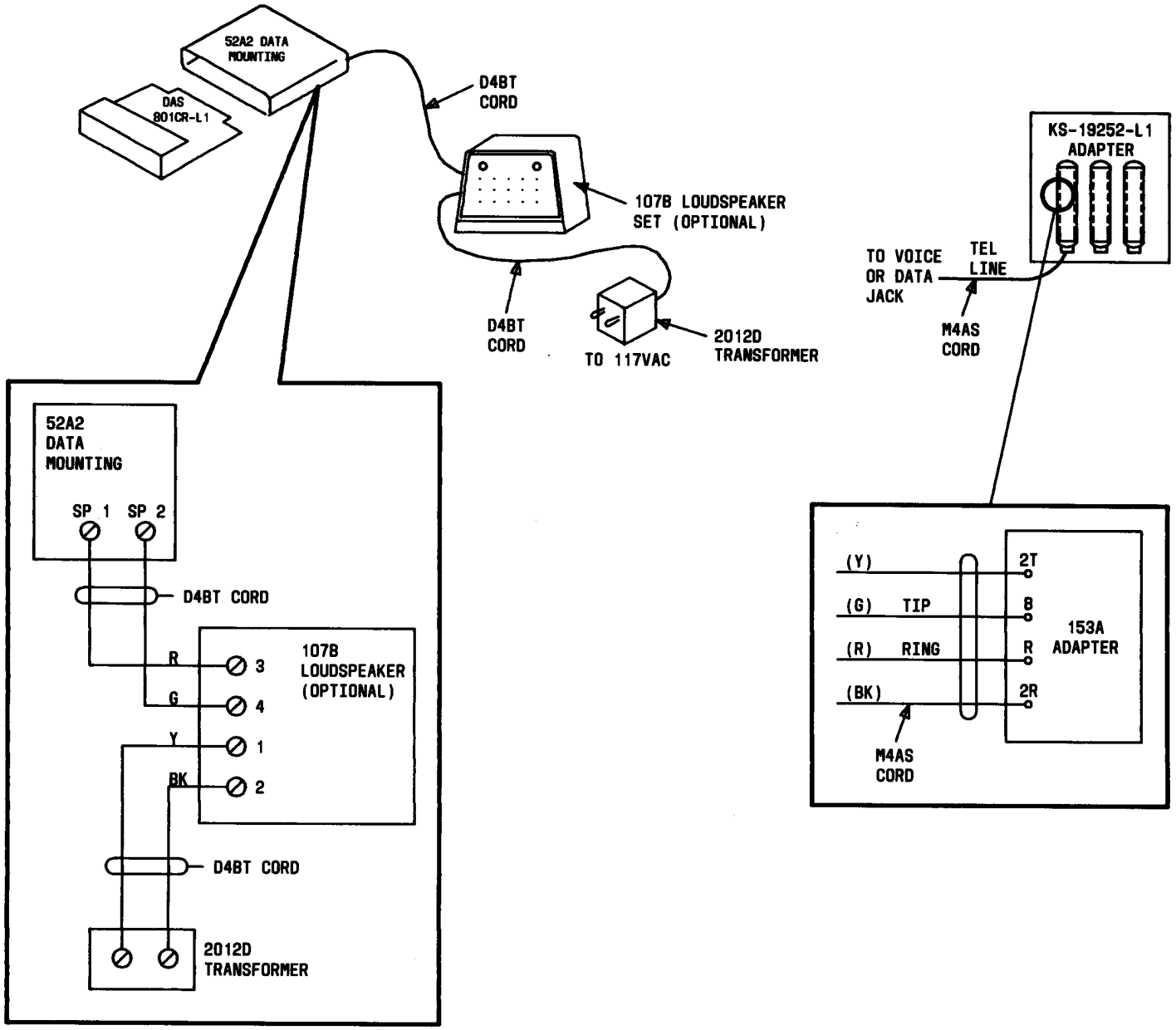
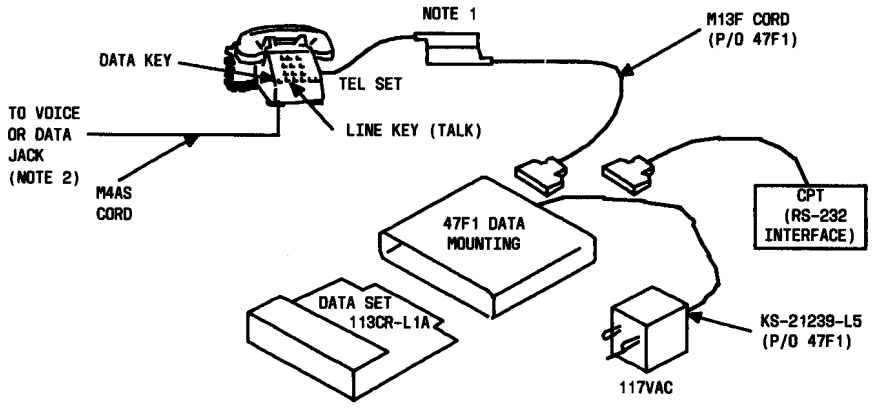
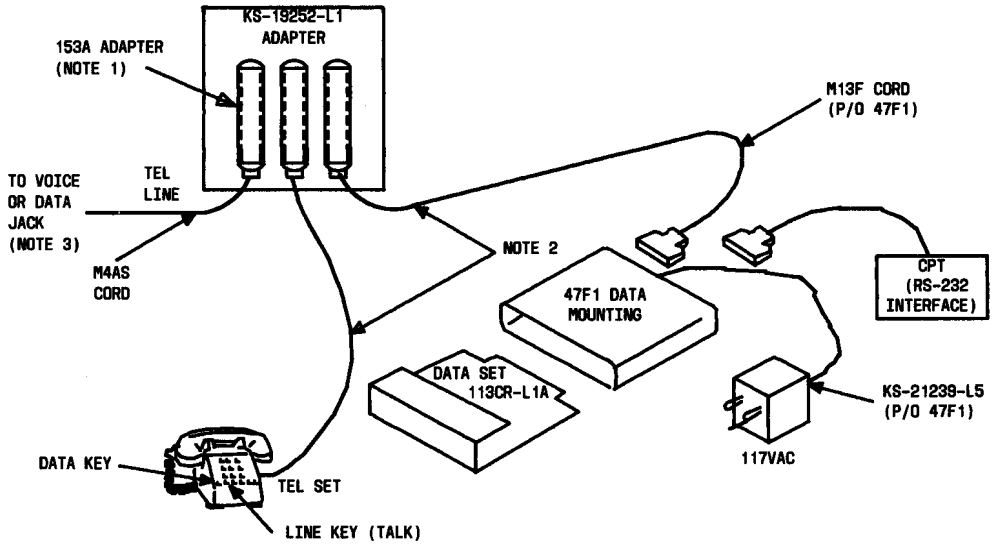


Fig. 4—Details of Key Telephone Set, Loudspeaker Set, Transformer, and 153A Adapter Connections (Sheet 2 of 2)



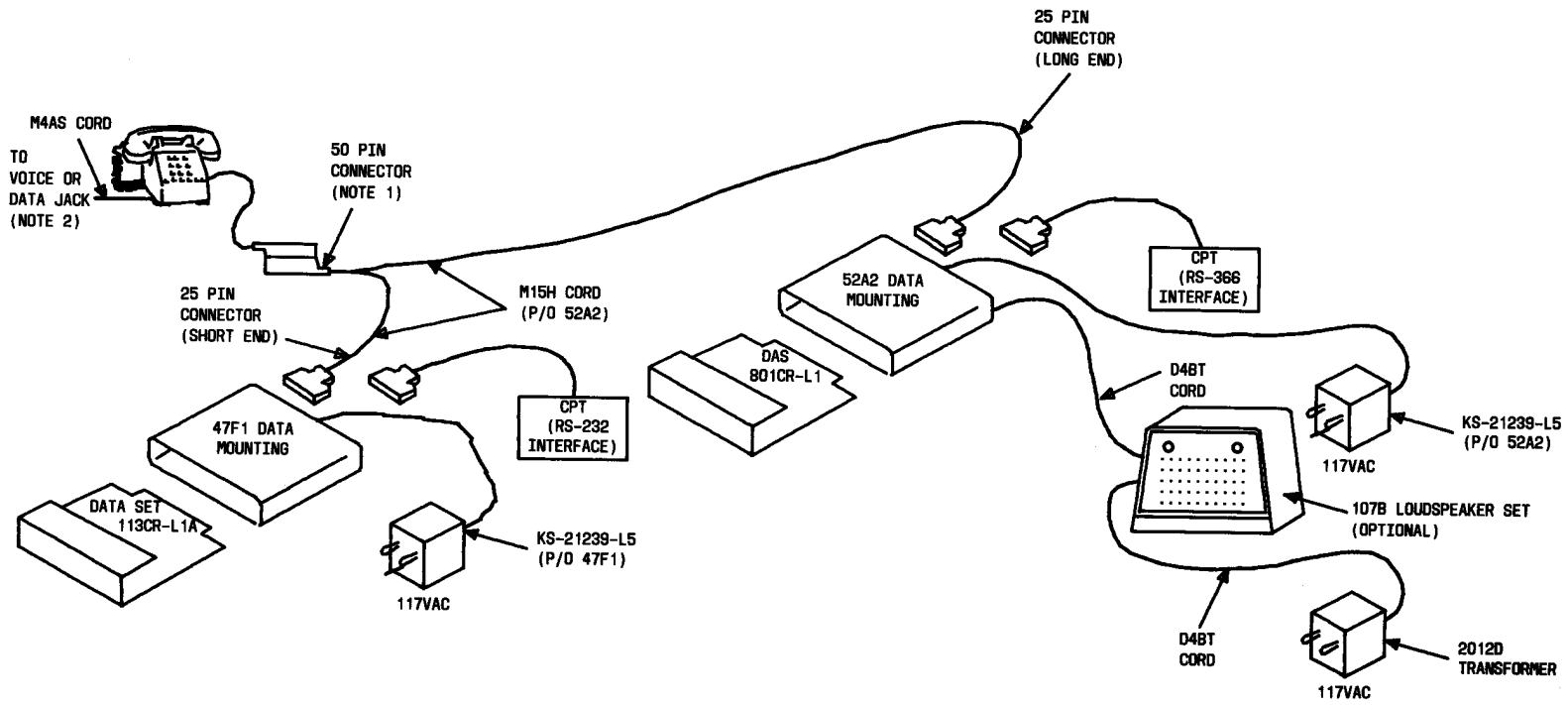
NOTES:
1. THE CONNECTION MAY BE EXTENDED WITH B25A CABLES UP TO 60 FEET.
2. USE VOICE JACK USOC RJ11C OR DATA JACK USOC RJ41S (WITH SWITCH SET TO PROG) OR DATA JACK USOC RJ45S.

Fig. 5—Typical Installation of DS 113CR-L1A/2 With Telephone Set



NOTES:
1. THE 153A ADAPTER PLUGS DIRECTLY INTO ADAPTER KS-19252-L1
2. EITHER OR BOTH THESE CONNECTIONS MAY BE EXTENDED WITH B25A CABLES THE TOTAL LENGTH OF ALL EXTENSION CABLES MAY NOT EXCEED 60 FEET.
3. USE VOICE JACK USOC RJ11C OR DATA JACK USOC RJ41S (WITH SWITCH SET TO PROG) OR DATA JACK USOC RJ45S.

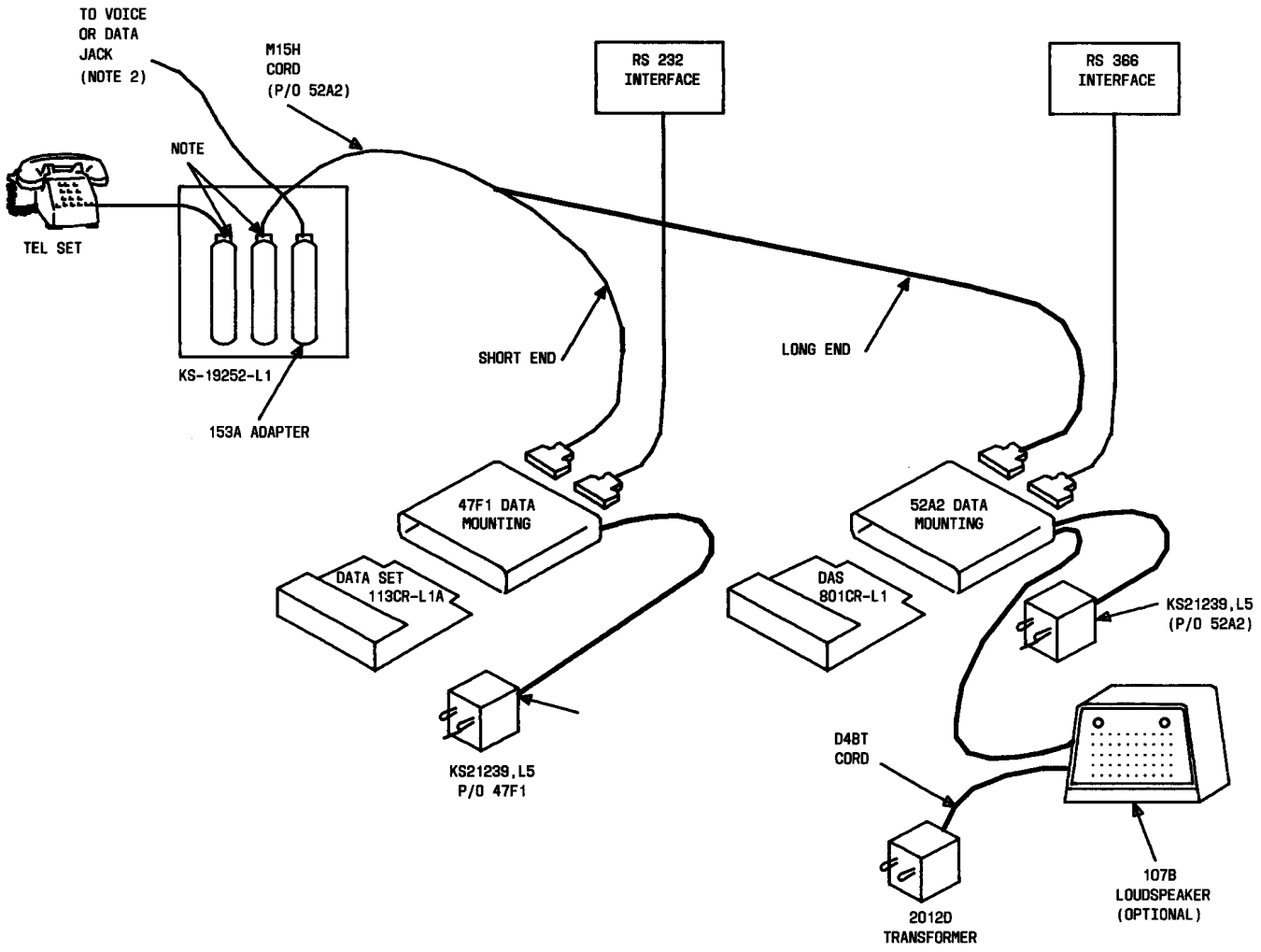
Fig. 6—Installation of DS 113CR-L1A With Telephone Set (Alternate Arrangement)



NOTES:

1. THE CONNECTOR 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.

Fig. 7—Single DS 113CR-L1A/2 Installation With ACU and Telephone Set



NOTES:

1. EITHER OR BOTH THESE CONNECTIONS MAY BE EXTENDED WITH B25A CABLES THE TOTAL LENGTH OF ALL EXTENSION CABLES 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.

Fig. 8—Single Set Installation With ACU and Telephone Set (Alternate Arrangement)

The following parts are required:

DS 113CR-L1A/2

DAS 801CR-L1/2

107B Loudspeaker Set
Two D4BT Cords
2012D Transformer
] Optional

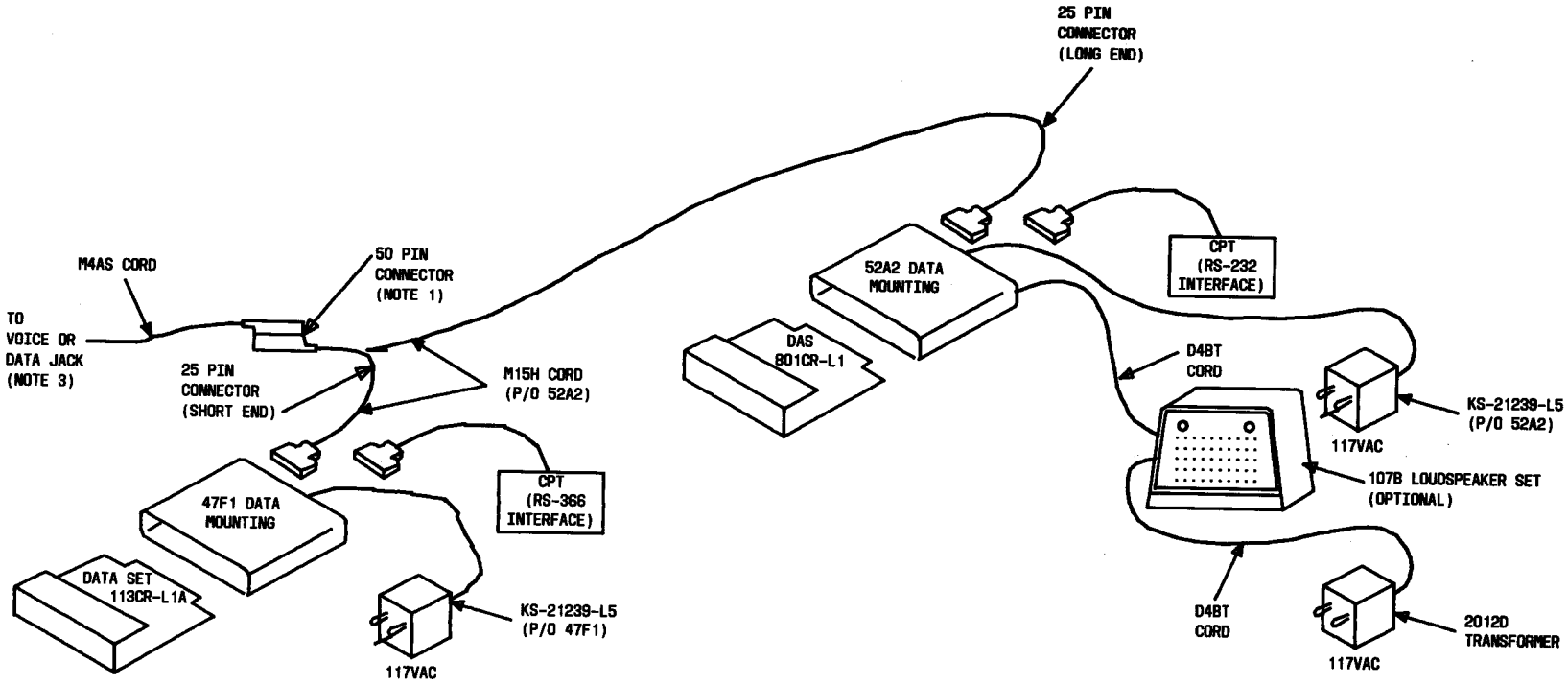
B25A Cables, as needed, length as shown in Fig. 9.

KS-19252,L1 Adapter

153A Adapter

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.

6.07 ***Up to Five Single Data Sets With Shared Telephone Set Without ACU:*** Up to five DS 113CR-L1A/2 can share the associated



NOTES:

1. THE CONNECTION MAY BE EXTENDED WITH B25A CABLES UP TO 60 FEET.
2. INSULATE AND STORE UNUSED LEADS.
3. USE VOICE JACK USOC RJ11C OR DATA JACK USOC RJ41S (WITH SWITCH SET TO PROG) OR DATA JACK USOC RJ45S.

Fig. 9—Single Set Installation With ACU Without Telephone Set

telephone set with other data sets. The connections should be in accordance with Fig. 10.

The following parts are required:

DS 113CR-L1A/2 (up to five data sets)

KS-21253,L3 Adapter (Refer to Fig. 11 and 12)

B25A Cables, as needed, length as shown in Fig. 10.

565HKM or 2565HKM or 2662A1M Telephone Set

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

6.08 ***Up to Five Single Data Sets With DAS 801CR-L1/2 and Optional Telephone Set:*** Up to five DS 113CR-L1A/2 and associated DAS 801CR-L1/2 can be used in an installation. The connections should be in accordance with Fig. 13.

The following parts are required:

DS 113CR-L1A/2 (up to five data sets)

DAS 801CR-L1/2 (one per data set requiring an ACU)

107B Loudspeaker Set
Two D4BT Cords
2012D Transformer
] Optional

B25A Cables, as needed, length as shown in Fig. 13.

KS-21253,L3 Adapter (Refer to Fig. 11 and 12)

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

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

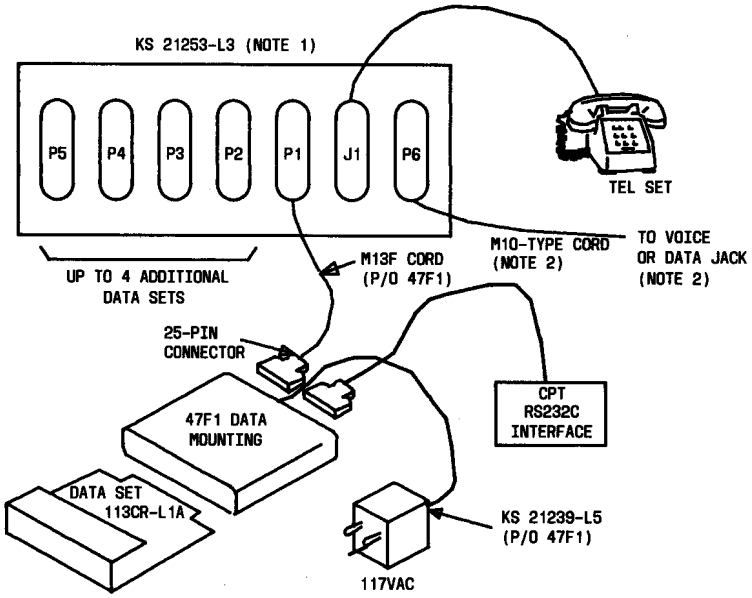
7. INSTALLATION TEST

7.01 After installation is completed, the data set should be tested to determine if it is operating properly. Refer to Section 591-046-500.

8. REFERENCES

8.01 The following BSPs provide additional information:

SECTION	TITLE
314-205-501	Data Systems—DATAPHONE® Service—Direct Distance Dialing Network—Test Requirements for Subscriber, Foreign Exchange, and Remote Exchange Lines
590-010-200	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



NOTES:

1. ANY OF THESE CONNECTIONS MAY BE EXTENDED WITH B25A CABLES USING THE FOLLOWING TABLE:

CONNECTOR TO BE EXTENDED	MAX LENGTH IN FEET OF B25A CABLES				
TEL SET	60	45	30	15	0
DATA SET (EACH SET)	0	15	30	45	60

2. USE CORD AND JACK COMBINATIONS SPECIFIED IN THE FOLLOWING TABLE:

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—Five Data Set Installation Without ACU With Telephone Set

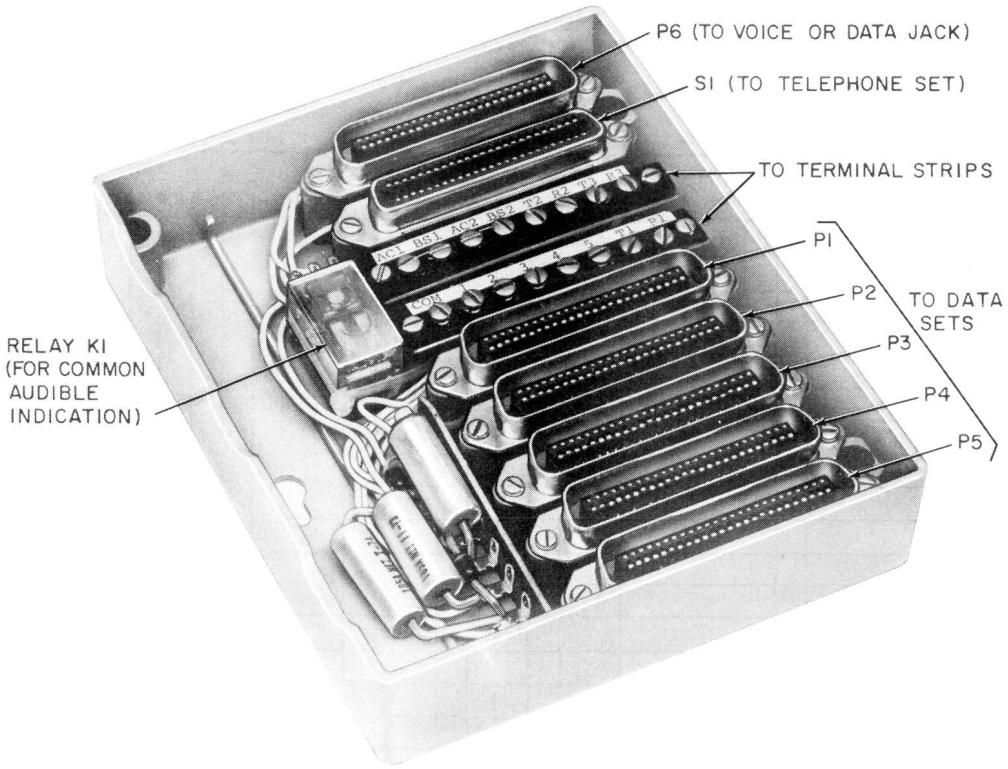


Fig. 11—KS-21253-L3 Adapter With Cover Removed

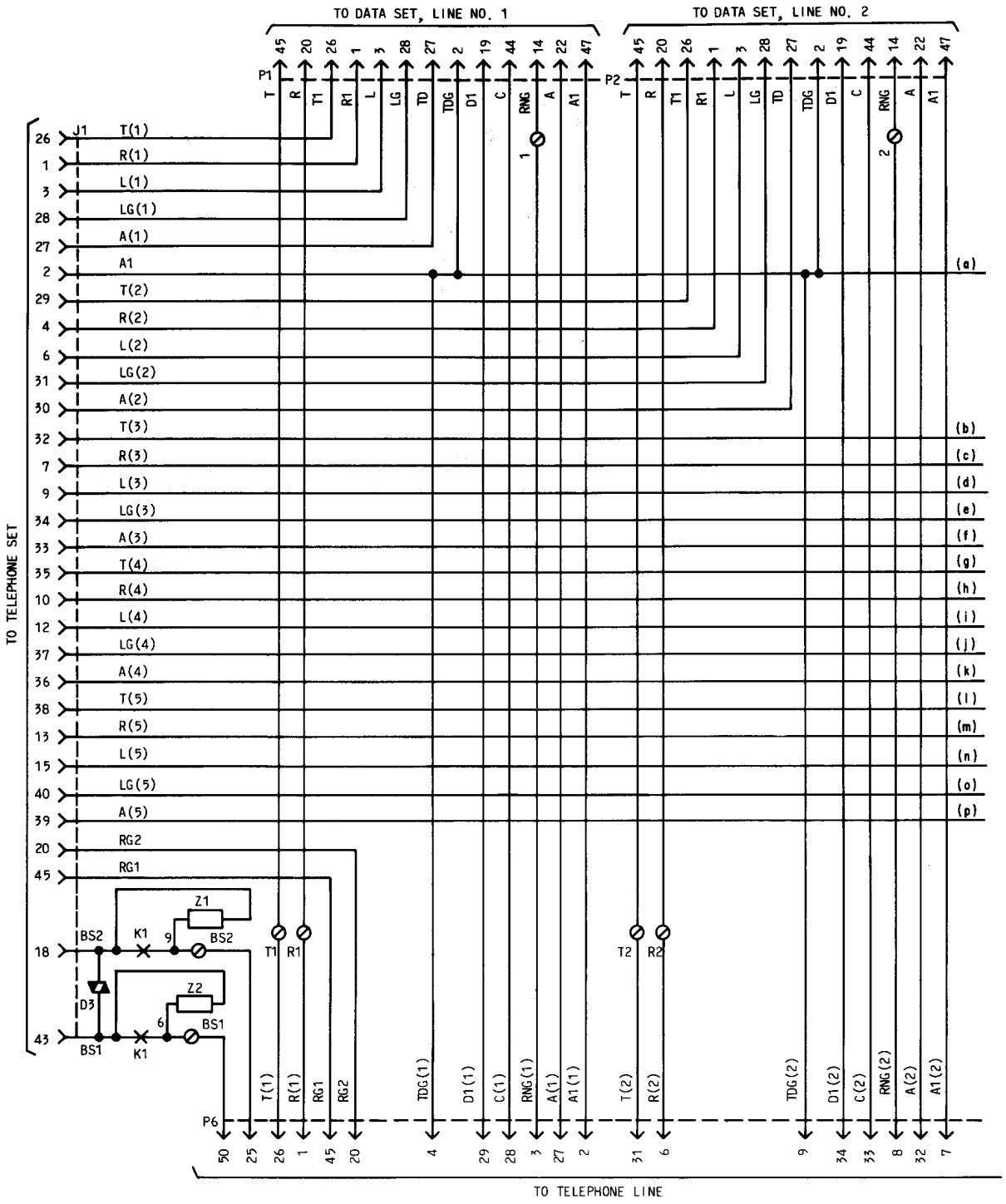


Fig. 12—Adapter for Up to Five Data Sets Connected to One Key Telephone Set (Sheet 1 of 2)

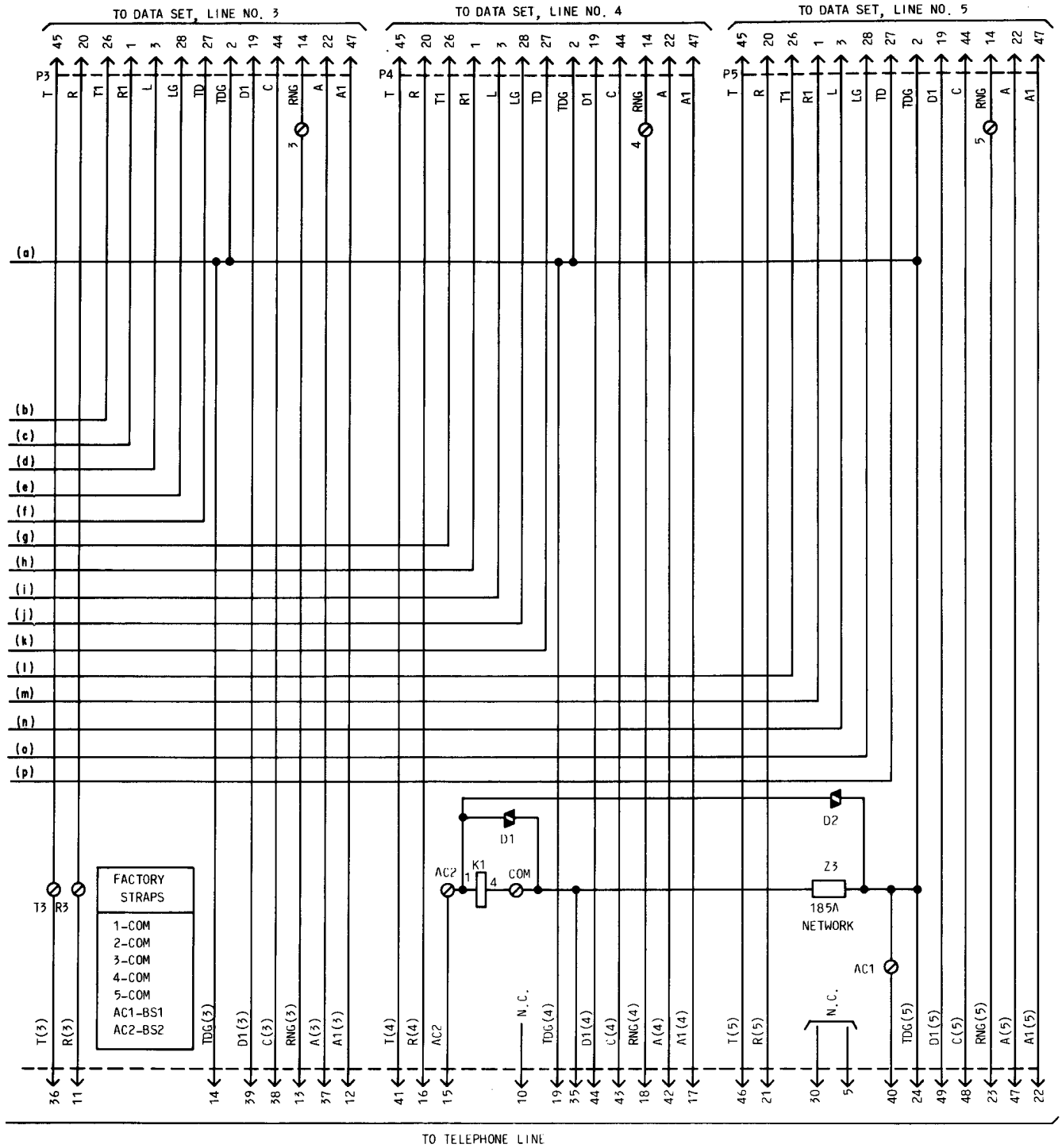
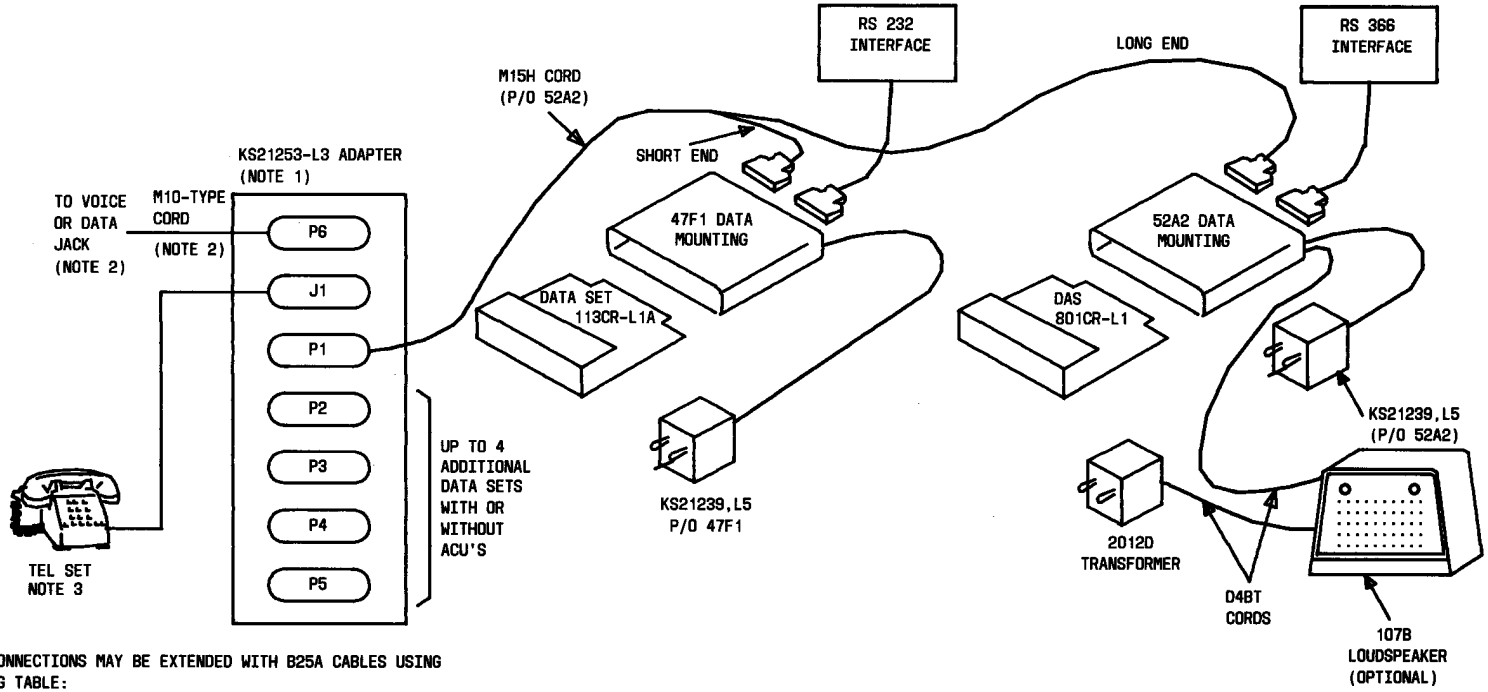


Fig. 12—Adapter for Up to Five Data Sets Connected to One Key Telephone Set (Sheet 2 of 2)



NOTES:

1. ANY OF THE CONNECTIONS MAY BE EXTENDED WITH B25A CABLES USING THE FOLLOWING TABLE:

CONNECTOR TO BE EXTENDED	MAX LENGTH IN FEET OF B25A CABLES				
TEL SET	60	45	30	15	0
DATA SET (EACH SET)	0	15	30	45	60

2. USE CORD AND JACK COMBINATIONS SPECIFIED IN THE FOLLOWING TABLE:

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

3. IF THE TELEPHONE SET IS NOT USED IN THIS ARRANGEMENT EACH DATA SET MAY BE EXTENDED UP TO 60 FEET.

Fig. 13—Five Data Set Installation With ACU and Optional Telephone Set

TABLE D

TELEPHONE LINE CORDS AND JACKS
FOR FIVE DATA SET INSTALLATIONS

DATA SET TYPES 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