

DATA SET 401H-TYPE TRANSMITTER INSTALLATION AND CONNECTIONS

1. GENERAL

1.01 This section provides installation and connection information on Data Set 401H-type.

1.02 This section is reissued to include installation and connection information for Data Set 401H6, to provide information pertaining to Data Sets 401H4, 401H5, and 401H6 series 2, to revise Table A, and to revise Table B to include new requirements for limiting the transmitting level of the data sets to reach the serving central office at approximately -12 dBm. Since this reissue constitutes a general revision, change arrows have been omitted.

1.03 Data Set 401H-type is designed for mounting on a vertical surface. It is enclosed in a gray metal cabinet for inside installations. If outdoor mounting is required, the customer must provide a weatherproof enclosure which meets the environmental requirements specified by the Bell System Technical Reference—Data Set 401H-Type.

1.04 Data Set 401H-type is used on individual lines only. It must not be connected to lines using an A lead control or PBX lines unless provided for by local engineering design.

1.05 Data Set 401H6 will be installed as part of the Traffic Measurement System No. 1A. Only connection information between the line and data set is included in this section.

1.06 The line coupler board circuit pack (CP) BE27 used in Data Sets 401H4, 401H5 and 401H6 series 1 has been rated manufacture discontinued (MD) and has been replaced by CP BE58. The line coupler board CP BE58 used in Data Sets 401H4, 401H5, and 401H6 series 1 has been rated MD and has been replaced by CP BE61. The parallel modulator board CP BE14 used in Data Sets 401H4, 401H5, and 401H6 series 1 has been rated MD and has been replaced by CP BE64.

Data Sets 401H4, 401H5, and 401H6 containing boards CP BE61 and CP BE64 are designated series 2.

1.07 When test or demonstration calls are made at the time of installation, refer to the section entitled Crediting Charges On Test Calls (010-250-001) for proper procedure for crediting charges.

1.08 Verify that the loop has been tested and meets requirements outlined in the section entitled Data Systems—DATA PHONE® Service—Direct Distance Dialing Network—Test Requirements for Subscriber, Foreign Exchange, and Remote Exchange Lines (314-205-501).

2. INSTALLATION

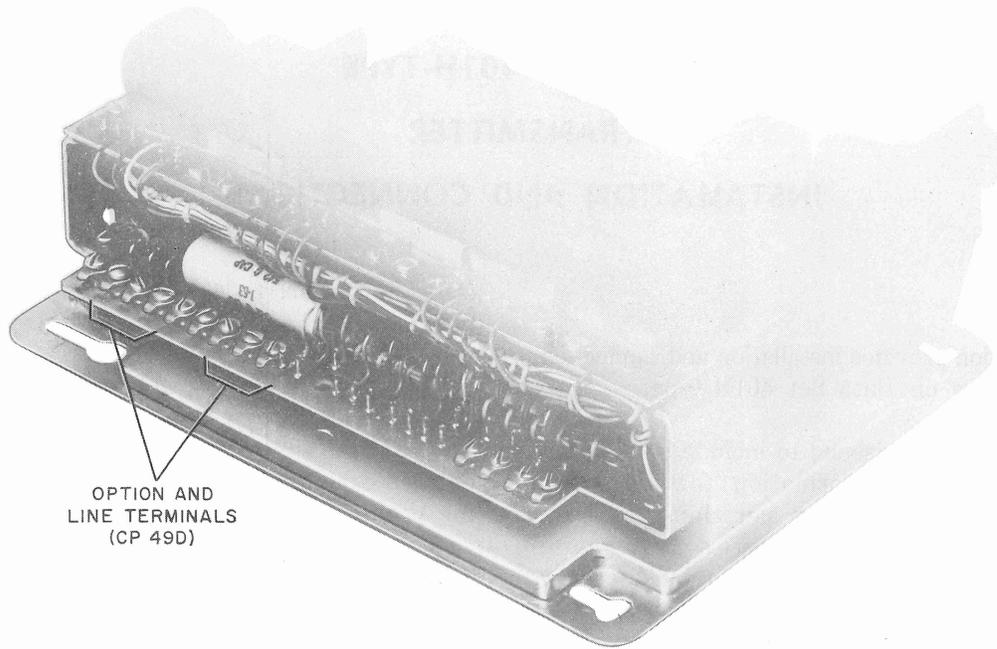
2.01 Data Set 401H-type is designed to operate on 48- or 72-volt lines having a wide central office and loop resistance range. Series resistors are provided on an optional basis to minimize the effects of loop resistance variations.

2.02 Figure 1 shows option and line terminals for Data Sets 401H1 through 401H3. Figure 2 shows the location of option screws for Data Set 401H5 series 1.

2.03 Table A explains the wiring options for Data Sets 401H1 through 401H3.

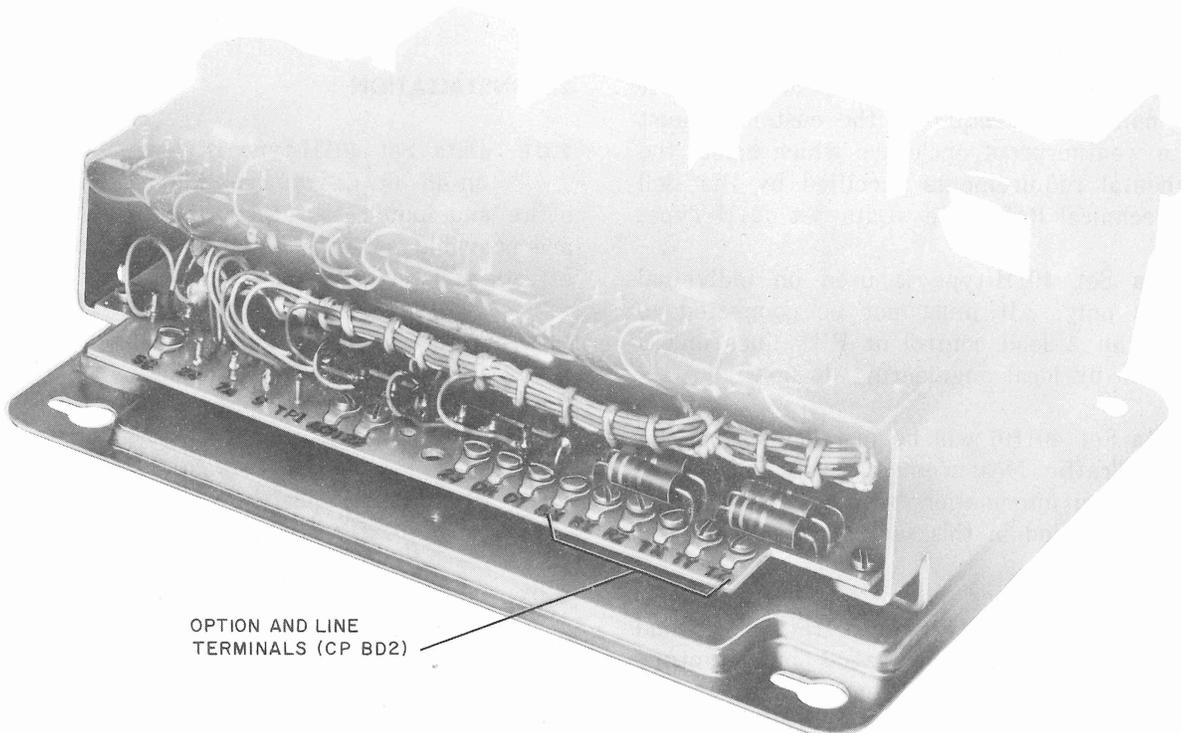
2.04 Table B shows options and padding for Data Set 401H-type. It is suggested that Data Set 401H2, series 1 (rated MD) be returned to the distributing house to be modified rather than adding an external pad.

Note: An insertion loss pad must be added externally to those data sets which cannot satisfy the new level requirements by internal option strapping or modification.



OPTION AND
LINE TERMINALS
(CP 49D)

A. DATA SET 40IH1



OPTION AND LINE
TERMINALS (CP BD2)

B. DATA SET 40IH2 AND 40IH3

Fig. 1—Data Sets 40IH1, 40IH2, and 40IH3 Option and Line Terminals

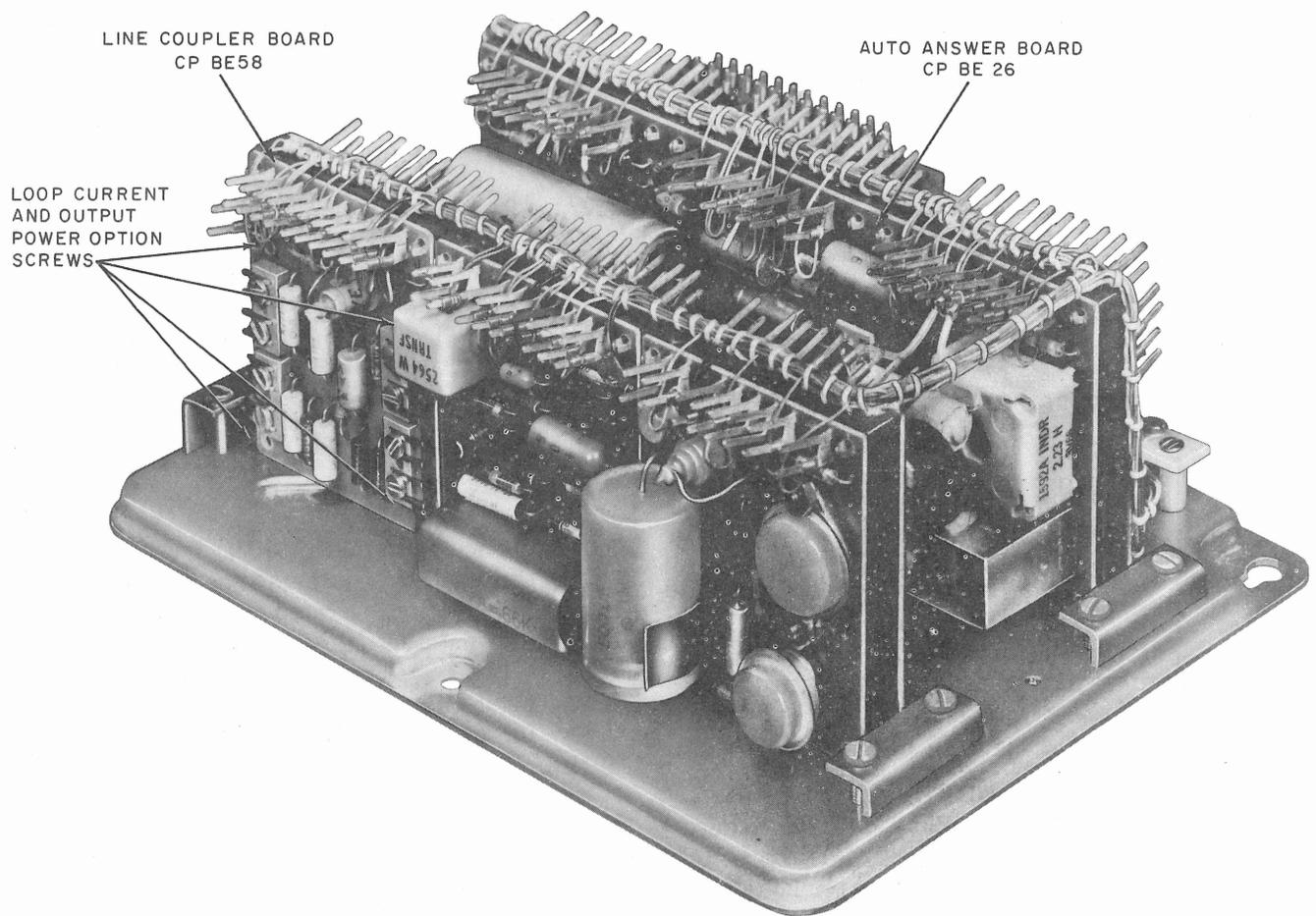


Fig. 2—Data Set 401H5 Series 1 Option Screws

2.05 Loop loss in dB at 1 kHz can be determined from the circuit layout record card.

2.06 The resistance of the loop and central office can be determined from the circuit layout record card or by the following procedure.

Note: Measure central office battery current before the data set is connected.



Determine the polarity of the central office battery before performing the following steps to avoid damage to the meter.

(a) Connect a KS-14510 L1 volt-ohm-milliammeter or equivalent (set to indicate a maximum of 120 milliamperes) between tip and ring of the incoming telephone line; note reading.

(b) Remove meter from tip and ring and set meter function switch to 60 on DC VOLTS range.

Note: For 72-volt central offices, set switch to 300 volts.

(c) Connect meter to tip and ring and note reading.

(d) Divide reading taken in (c) by reading noted in (a). This will give the resistance of the loop and central office.

2.07 Knowing the loop resistance and loop loss values, use Table B to determine option and/or pad required. Refer to Part 3 of this section for option and pad connection information.

TABLE A

WIRING OPTIONS FOR DATA SETS 401H1,
401H2, AND 401H3

WIRING OPTIONS	TELEPHONE LINE CONNECTIONS
X	Connect tip to terminal TX and ring to terminal RX. Refer to Fig. 1.
Y	Connect tip to terminal TY and ring to terminal RY
Z	Connect tip to terminal TZ and ring to terminal RZ.

Note: Data Sets 401H1, 401H3 series 2, and 401H4 through 401H6 do not require padding. Options for Data Sets 401H4 through 401H6 are made by tightening or loosening screws on the line coupler. Tightening a screw makes contact between two terminals on the block. Loosening the screw opens the circuit between the terminals. Figure 3 shows line terminals for Data Set 401H5.

2.08 When Data Set 401H5 is to be installed, the KS-16886 L2 transformer must be used

to supply power for the answer-back channel detectors. The transformer is equipped with a 17-inch, 2-wire cord and plug and should be mounted within 12 inches from a 117-volt 60-Hz ac power receptacle.

2.09 The customer must furnish a standard 3-wire grounding-type, 117-volt 60-Hz ac power receptacle (capable of accepting a plug with two parallel blades and a round-shaped grounding pin) for installation of the KS-16886 L2 transformer. The receptacle must not be under control of a switch.

3. CONNECTIONS

3.01 Connection is made to the business machine through the interface connector. The interface connector is located on the wiring entrance end of the data set.

3.02 Figure 4 furnishes necessary wiring information for installing Data Sets 401H1, 401H2, and 401H3.

3.03 Figure 5 furnishes necessary wiring and option information for installing Data Sets 401H4 and 401H5.

3.04 Tip (T) and ring (R) connections for Data Set 401H6 are made to TB2. Connect T to terminal 3 of TB2 and R to terminal 1.

3.05 Figure 6 provides the necessary information for installing and connecting the insertion loss pad.

TABLE B

DATA SET	NOMINAL CENTRAL OFFICE BATTERY (VOLTS)	CENTRAL OFFICE AND LOOP RESISTANCE (OHMS)	ITEM	LOOP LOSS IN DB AT 1 KHZ											
				0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12
401H1*	48	Less than 700	Option	X	X	X	X	X	X	X	X	X	X	X	X
		700-1100	Option	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
		1100-1410	Option	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z
	72	1300-1650	Option	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
		1650-2120	Option	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z
401H2† and 401H3 Series 1	48	Less than 800	Option Pad	Y 6	Y 5	Y 4	Y 3	X -	X -	X -	X -	X -	X -	X -	X -
		800-1350	Option Pad			Z 6	Z 5	Z 4	Y -	Y -	Y -	Y -	Y -	Y -	Y -
		1350-1450	Option Pad				Z 4	Z 3	Z 2	Z -	Z -	Z -	Z -	Z -	Z -
		1450-1550	Option Pad					Z 3	Z 2	Z -	Z -	Z -	Z -	Z -	Z -
		1550-1650	Option Pad						Z 2	Z -	Z -	Z -	Z -	Z -	Z -
		1650-1950	Option Pad							Z -	Z -	Z -	Z -	Z -	Z -
	72	1300-2020	Option Pad			Z 6	Z 5	Z 4	Y -	Y -	Y -	Y -	Y -	Y -	Y -
		2020-2170	Option Pad				Z 4	Z 3	Z 2	Z -	Z -	Z -	Z -	Z -	Z -
		2170-2320	Option Pad					Z 3	Z 2	Z -	Z -	Z -	Z -	Z -	Z -
		2320-2500	Option Pad						Z 2	Z -	Z -	Z -	Z -	Z -	Z -
401H3 Series 2‡	48	Less than 900	Option	X	X	X	X	X	X	X	X	X	X	X	X
		900-1400	Option			Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
		1400-1950	Option					Z	Z	Z	Z	Z	Z	Z	Z
	72	1300-1350	Option	X	X	X	X	X	X	X	X	X	X	X	X
		1350-2100	Option			Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
2100-2830	Option						Z	Z	Z	Z	Z	Z	Z		
401H4, 401H5, and 401H6 Series 1	48	Less than 700	Option	FGH	FGH	EGH	EGH	EG	G	H	H	None	None	None	None
		700-1000	Option			BD FGH	BD FG	BD EGH	BD GH	BD EG	BD G	BD H	BD	BD	BD
		1000-1250	Option				AC FGH	AC FG	AC EGH	AC GH	AC G	AC H	AC H	AC	AC

TABLE B (Cont)

DATA SET	NOMINAL CENTRAL OFFICE BATTERY (VOLTS)	CENTRAL OFFICE AND LOOP RESISTANCE (OHMS)	ITEM	LOOP LOSS IN DB AT 1 KHZ												
				0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	
401H4, 401H5, and 401H6 Series 1 (Cont)	48	1250-1950	Option							ABCD FGH	ABCD EGH	ABC DGH	ABC DEG	ABC DG	ABC DH	ABCD
	72	1300-1500	Option			BD FGH	BD FG	BD EGH	BD GH	BD EG	BD G	BD H	BD	BD	BD	BD
		1500-1870	Option				AC FGH	AC FG	ACE GH	AC GH	AC G	AC H	AC H	AC	AC	AC
		1870-2830	Option								ABCD FGH	ABCD EGH	ABC DGH	ABC DEG	ABC DG	ABC DH
401H4, 401H5, and 401H6 Series 2	48	Less than 700	Option	FH	EH	EFG	FG	EG	G	EF	F	E	E	None	None	
		700-1000	Option	BD EGH	BD EFH	BD EH	BD H	BD FG	BD EG	BD G	BD EF	BD F	BD E	BD E	BD	BD
		1000-1250	Option	AC EFGH	AC FGH	AC GH	AC FH	AC H	AC EFG	AC FG	AC G	AC EF	AC F	AC E	AC	AC
		1250-1950	Option			ABCD EFGH	ABCD FGH	ABC DGH	ABC DFH	ABC DH	ABC DEFG	ABC DEG	ABC DG	ABCD F	ABCD E	
	72	1300-1500	Option	BD EGH	BD EFH	BD EH	BD H	BD FG	BD EG	BD G	BD EF	BD F	BD E	BD E	BD	BD
		1500-1870	Option	AC EFGH	AC FGH	AC GH	AC FH	AC H	AC EFG	AC FG	AC G	AC EF	AC F	AC E	AC	AC
		1870-2830	Option			ABCD EFGH	ABCD FGH	ABCD GH	ABCD FH	ABCD H	ABCD EFG	ABCD EG	ABCD G	ABCD F	ABCD E	

*Data Set 401H1 requires output and loop loss measurements to determine if installation is suitable.
 Data Set 401H1 installation is suitable when data set power output plus loop loss is equal to or less than -12dBm. If the installation is not suitable, replace with Data Set 401H4. Data Set 401H1 is rated MD.
 †Data Set 401H2 is rated MD.
 ‡Data Set 401H2 Series 1 when modified becomes Data Set 401H3 Series 2.

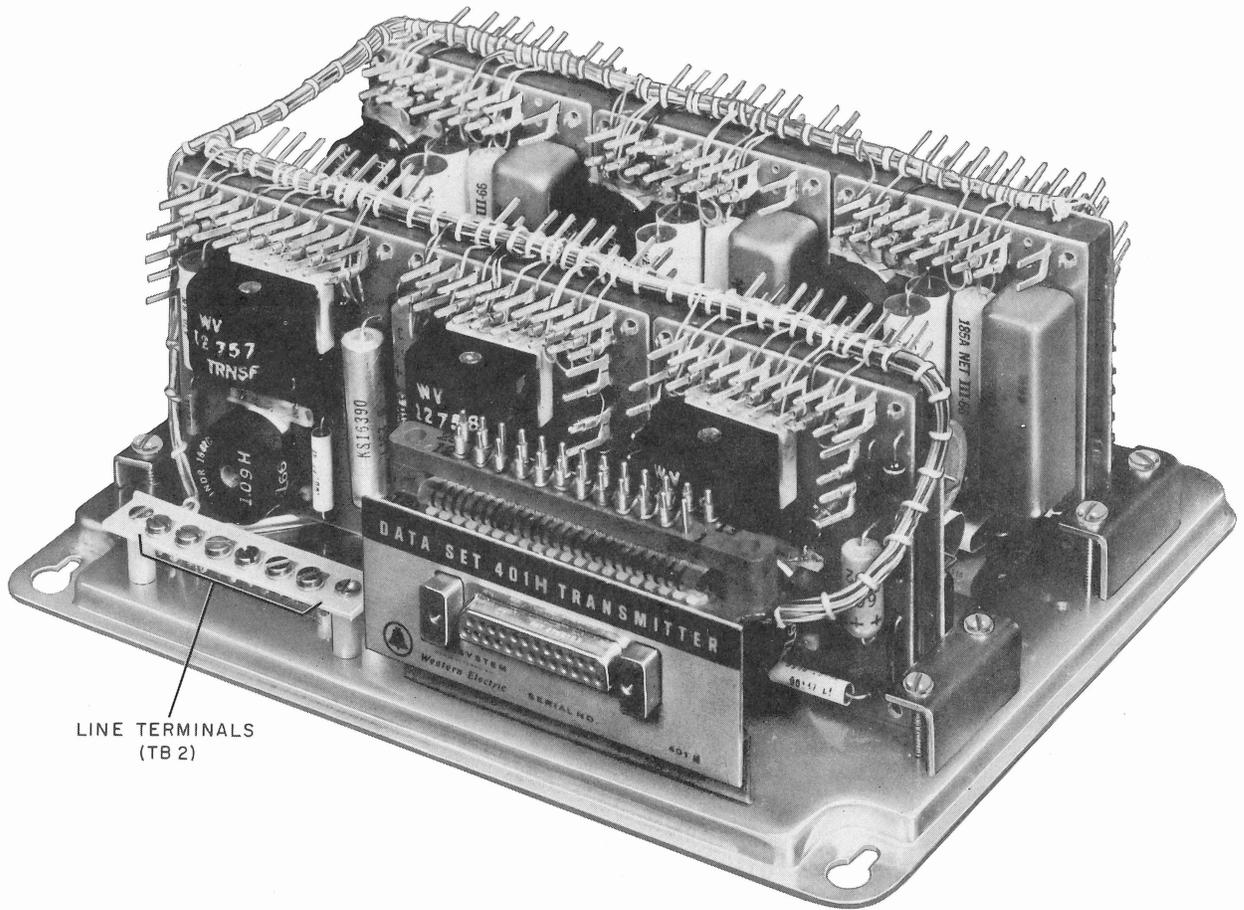


Fig. 3—Data Set 401H5 Line Terminals

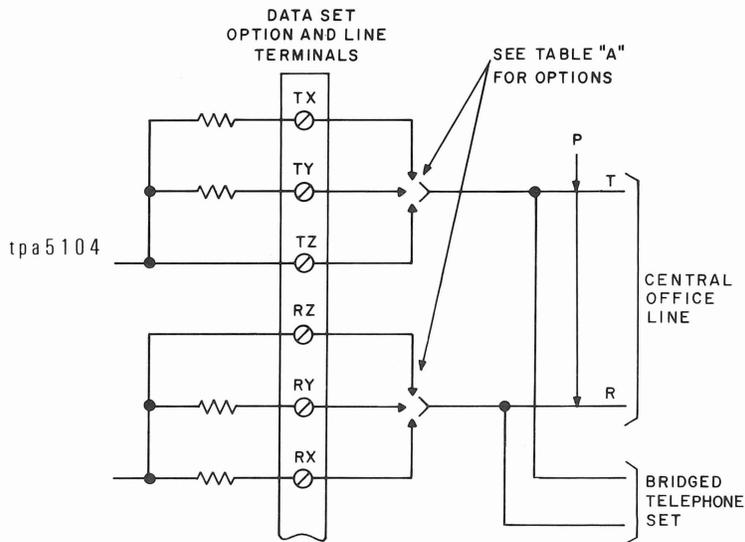
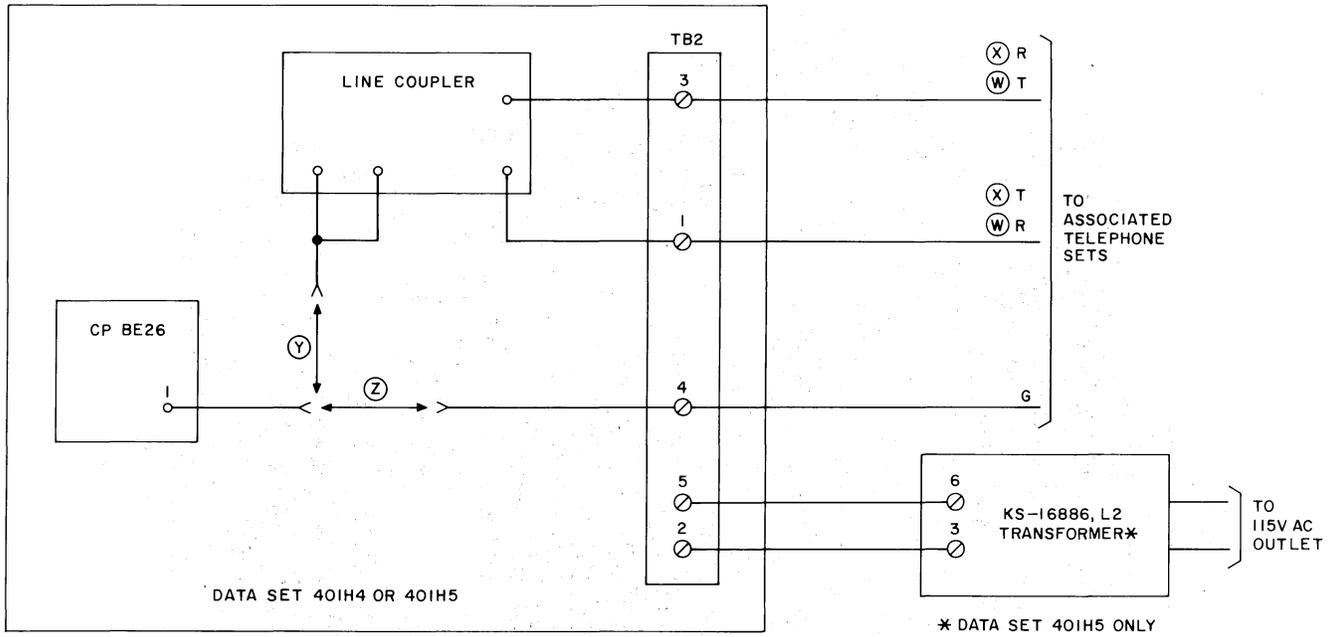


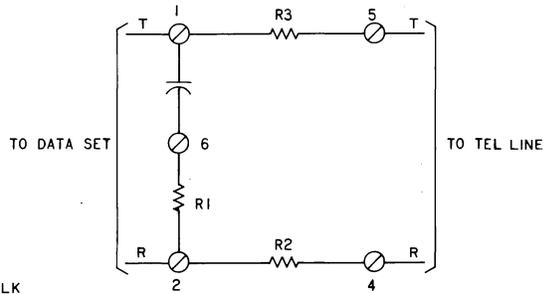
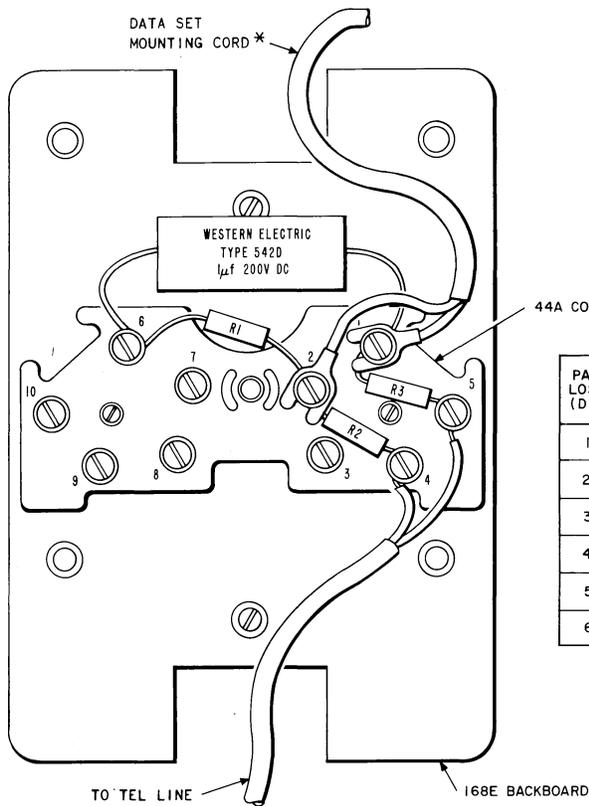
Fig. 4—Data Sets 401H1, 401H2, and 401H3 Used With Bridged Telephone Set



RINGING	TIP-GRD	W, Z
	RING-GRD	X, Z
	TIP-RING	W, Y

DATA SET 401H4 AND 401H5
ARE FACTORY FURNISHED
WITH Y OPTION

Fig. 5—Data Sets 401H4 and 401H5 Options and Connections



PAD LOSS (DB)	RESISTOR VALUE (OHMS)				ORDERING INFORMATION
	R1		R2 AND R3		
1	8200	GRAY RED RED	47	YELLOW VIOLET BLACK	F-58101
2	3900	ORANGE WHITE RED	110	BROWN BROWN BROWN	F-58102
3	2700	RED VIOLET RED	160	BROWN BLUE BROWN	F-58103
4	2000	RED BLACK RED	220	RED RED BROWN	F-58104
5	1500	BROWN GREEN RED	240	RED YELLOW BROWN	F-58105
6	1100	BROWN BROWN RED	270	RED VIOLET BROWN	F-58106

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.

* STORE UNUSED CONDUCTORS ON VACANT TERMINALS

Fig. 6—Insertion Loss Pad Installation and Connection Diagram