DATA SET 113A-TYPE
INSTALLATION AND CONNECTION

1. GENERAL

1.01 This section describes the procedure to be followed for the installation of Data Set 113A-type (Fig. 1).

Fig. 1—Data Set 113A-L1A

1.02 This section is reissued to correct the method of installation and connection and to include information pertaining to Data Set 113A-L1/2 and 113A-L1A/2. Since this reissue is a general revision, arrows ordinarily used to indicate changes have been omitted.

1.03 The data set should be installed in accordance with existing practices covering the installation of station sets.

1.04 The data set must be located within range of the customer-provided interface connector cable. This cable should not exceed the Electronic Industries Association (EIA) limitation of 50 feet.

1.05 Data Sets 113A-L1(A) and 113A-L1(A)/2 equipped with option W obtain power from the transmission facility; therefore, it is not necessary to locate it near an ac power receptacle.

1.06 Data Sets 113A-L1/2 and 113A-L1A/2 (when equipped with option V or X) obtain power from both the transmission facility and an externally mounted transformer. Therefore, the customer must furnish a standard 105- to 130-volt, 57- to 63-Hz ac power receptacle equipped to accept a plug equipped with two parallel blades.

The ac outlet must not be under the control of a switch.

1.07 It must be verified that the overall transmission facility has been tested and meets the transmission requirements specified in the section entitled Data Systems—DATA-PHONE® Service on Direct Distant Dialing Networks—Test Requirements for Subscriber, Foreign Exchange, and Remote Exchange Lines (314-205-501).

2. OPTIONS

2.01 Data Sets 113A-L1 or 113A-L1A do not provide any options. However, if these data sets are Series 3 or higher they may be upgraded to a 113A-L1/2 or 113A-L1A/2, respectively, by installing a D-180458 Modification Kit.

2.02 Data Sets 113A-L1(A)/2 are provided with three options. Option X equips the set with a data lamp and CD lead control; option V equips the data set with a data lamp and disables the CD lead control, and option W disables both the data lamp and the CD lead control. To implement the option required, refer to Table A.

3. INSTALLATION AND CONNECTIONS

If the data set is a 113A-L1/2 or 113A-L1A/2, ensure that the proper option is provided before the data set is installed.

3.01 If the data set being installed is a 113A-L1A or 113A-L1A/2, verify that the transmission facility to be used is arranged for TOUCH-TONE® service.

A. Data Sets 113A-L1(A) and Data Set 113A-L1(A)/2 Equipped with Option W

3.02 Data Set 113A-L1(A) and Data Set 113A-L1(A)/2 (option W installed) are line-powered data sets which do not have either a data lamp or CD lead control, and therefore ***do not*** require an external power source. These data sets should be installed as follows.

(a) Place the data set in a location that facilitates connection to the data terminal interface cable and the transmission facility.

(b) At the transmission facility connector block, connect the data set connecting cable [D3BU-type (Series 1 and 2) or D4BJ-61 (series 3 or higher)] as follows:

(1) Connect the green spade-tipped lead to the TIP of the transmission facility.

(2) Connect the red spade-tipped lead to the RING of the transmission facility.

(3) If provided, insulate and store the yellow and black spade-tipped leads.

B. Data Set 113A-L1(A)/2 Equipped With Option V or X

3.03 Data Set 113A-L1(A)/2 equipped with option V or X is both line powered and transformer powered. Therefore, it requires an external power source and may be installed as follows.

(a) Place the data set in a location that facilitates connection to the data terminal interface cable, transmission facility, and an ac power outlet.

(b) At the transmission facility connector block, connect the data set connecting cable (D4BJ-61) as follows:

(1) Perform 3.02(b) (1) and 3.02(b) (2).

(2) Connect two wires from the external 2012B transformer to the connecting block.

Note: These wires ***must*** be long enough to reach from the wall outlet to the connecting block.

(3) At the connecting block, connect the yellow spade-tipped lead to one wire from the external 2012B transformer.

(4) At the connecting block, connect the black spade-tipped lead to the other wire from the external 2012B transformer.

(5) Plug in the external 2012B transformer.

A 2012A transformer is not interchangeable with the 2012B transformer and therefore cannot be used to power Data Set 113A-L1(A)/2.

C. Transmission Power Level Adjustment

Note: A TTS-28 Transmission Measuring Set (TMS) or equivalent is needed for the following alignment procedure. A KS-20538-L1 volt-ohm-milliammeter (VOM) may be used if the TTS-28 TMS is not available; however, the TTS-28 TMS is much more desirable because of its built-in rejection of 60-Hz line power pickup. This rejection of 60-Hz line power improves the accuracy of low-level transmitter output adjustments (less than −10 dBm).

3.04 If the transmission facility line loss is known, adjust the data set transmitter power level as follows.

(a) Remove data set rear cover as described in the section entitled Data Set 113A-Type—Maintenance (591-033-300).

(b) Place the handset off-hook and operate the TALK/CLEAR key.

TABLE A

WIRE CONNECTIONS TO IMPLEMENT DATA SET 113A – L1(A)/2 OPTIONS

STEP	COLOR CODE	CONNECT	DISCONNECT	FROM	TO	REMARKS
Option X – Data Lamp and CD Lead Control (Factory Provided)						
1	Strap		√	APP Unit – Term. L1	ER1 CP – Term. E6	
2	SL	√		Data Key – Term. 2	ER1 CP – Term. E6	
3	R-3W	√		HH1 CP – Term. 10	ER1 CP – Term. E6	
4	BR	√		Data Key – Term. 1	APP Unit – Term. L1	
5	G-3R	√		HH1 CP – Term. 11	APP Unit – Term. L1	
6	Strap		√	Lamp Strip – Term. HL	HH1 CP – Term. 7	
7	W	√		Test Key – Term. 4	HH1 CP – Term. 7	
8	0-3W	√		ER1 CP – Term. E14	HH1 CP – Term. 8	
9	BL-3W	√		ER1 CP – Term. E1	HH1 CP – Term. 9	
10	R	√		D4BJ-61 Cord	HH1 CP – Term. 1	If option W is presently in data set, R wire must be disconnected from ER1 CP – Term. E6
11	Y	√		D4BJ-61 Cord	One side of 2012B Trans.	
12	BK	√		D4BJ-61 Cord	Other side of 2012B Trans.	
Option V – Data Lamp and Disabled CD Lead Control						
1	Strap		√	APP Unit – Term. L1	ER1 CP – Term. E6	
2	G-3R	√		HH1 CP – Term. 11	APP Unit – Term. L1	
3	BR	√		Data Key – Term. 1	APP Unit – Term. L1	
4	R-3W	√		HH1 CP – Term. 10	ER1 CP – Term. E6	
5	SL	√		Data Key – Term. 2	ER1 CP – Term. E6	
6	W		√	HH1 CP – Term. 7	Test Key – Term. 4	Disconnect from HH1 CP – Term. 7, tape, and store
7	Strap	√		Lamp Strip – Term. HL	HH1 CP – Term. 7	
8	0-3W	√		ER1 CP – Term. E14	HH1 CP – Term. 8	
9	BL-3W	√		ER1 CP – Term. 1	HH1 CP – Term. 9	
10	R	√		D4BJ-61 Cord	HH1 CP – Term. 1	If option W is presently in data set, R wire must be disconnected from ER1 CP – Term. E6

TABLE A (Cont)

STEP	COLOR CODE	CONNECT	DISCONNECT	FROM	TO	REMARKS
Option V – Data Lamp and Disabled CD Lead Control (Cont)						
11	Y	√		D4BJ-61 Cord	One side of 2012B Trans.	
12	BK	√		D4BJ-61 Cord	Other side of 2012B Trans.	
Option W – Disabled Data Lamp and Disabled CD Lead Control						
1	Y		√	D4BJ-61 Cord	One side of 2012B Trans.	
2	BK		√	D4BJ-61 Cord	Other side of 2012B Trans.	
3	G-3R		√	APP Unit – Term. L1	HH1 CP – Term. 11	Disconnect from APP Unit – Term. L1, tape, and store.
4	BR		√	APP Unit – Term. L1	Data Key – Term. 1	Disconnect from APP Unit – Term. L1, tape, and store.
5	SL		√	ER1 CP – Term. E6	Data Key – Term. 2	Disconnect from ER1 CP – Term. E6, tape, and store.
6	R-3W		√	ER1 CP – Term. E6	HH1 CP – Term. 10	Disconnect from ER1 CP – Term. E6, tape, and store.
7	R		√	D4BJ-61 Cord	HH1 CP – Term. 1	
8	R	√		D4BJ-61 Cord	ER1 CP – Term. E6	
9	Strap	√		APP Unit – Term. L1	ER1 CP – Term. E6	
10	0-3W		√	HH1 CP – Term. 8	ER1 CP – Term. E14	Disconnect from HH1 CP – Term. 8, tape, and store.
11	BL-3W		√	HH1 CP – Term. 9	ER1 CP – Term. E1	Disconnect from HH1 CP – Term. 9, tape, and store.
12	Strap		√	Lamp Strip – Term. HL	HH1 CP – Term. 7	
13	W	√		Test Key – Term. 4	HH1 CP – Term. 7	

Note: The sequence of 3.04(b) may be reversed; ie, operate the TALK/CLEAR key and then place the handset off-hook.

(c) When dial tone is received, dial the number of the quiet line or nearby telephone.

(d) When the quiet line or nearby telephone answers, operate the DATA key, then operate the TEST key, and place the handset on-hook (data lamp lighted when using Data Set 113A-L1(A)/2 equipped with option V or X).

(e) Set FUNCTION switch of TTS-28 TMS to dBm BRDG 0 position (VOM function switch to indicate ac voltage) and connect the + and − leads of TTS-28 TMS (or VOM) across the tip and ring of the data set [Fig. 2—113A-L1(A) or Fig. 3—113A-L1(A)/2] .

(f) Using Table B, locate under the LINE LOSS column the transmission facility line loss and adjust R31 on the ER1 circuit pack [Fig. 2—113A-L1(A) or Fig. 3—113A-L1(A)/2] until the TTS-28 TMS meter indicates the corresponding dBm level listed in the dBm column (or VOM indicates the corresponding RMS voltage listed in the RMS voltage column).

Note: The dBm reference in Table B is in respect to 1 mW into a 900-ohm load.

TABLE B

TRANSMITTER POWER LEVEL

LINE LOSS	REQUIRED LEVEL (dBm) AT TIP AND RING	EQUIVALENT RMS VOLTAGE AT TIP AND RING (IN VOLTS)
Above 12 dB	0	0.95
10 to 12 dB	−2	0.76
8 to 10 dB	−4	0.59
6 to 8 dB	−6	0.48
4 to 6 dB	−8	0.38
2 to 4 dB	−10	0.30
0 to 2 dB	−12	0.24

(g) Disconnect the TTS-28 TMS (or VOM) and operate the TALK/CLEAR key (data lamp extinguished when using Data Set 113A-L1(A)/2 equipped with option V or X).

(h) Replace the data set cover(s) as described in Section 591-033-300.

Note: A TTS-28 TMS (or equivalent) is required for the following procedure since the 900-ohm bridging termination facilitates the procedure.

3.05 If the transmission facility line loss is not known, perform the following.

(a) Remove the data set rear cover as described in the section entitled Data Set 113A-Type—Maintenance (591-033-300).

(b) Place the handset off-hook and operate the TALK/CLEAR key.

Note: The sequence of 3.05(b) may be reversed; ie, operate the TALK/CLEAR key and then place the handset off-hook.

(c) When dial tone is received, dial the number of the 1000-Hz, 1-mW terminal in the serving central office.

(d) When the 1000-Hz tone is received, connect the + and − leads of the TTS-28 TMS across the tip and ring of the transmission facility.

(e) Operate the TTS-28 TMS FUNCTION switch to the 900Ω TERM 0 position and place the handset on-hook.

Note: Do ***not*** operate the DATA key at this time.

(f) Record the dBm level of the received tone as indicated on the TTS-28 TMS meter. This is the line loss of the transmission facility.

(g) Disconnect the transmission measuring set and perform 3.04(b) through (h).

D. Verification of Mark Voltage on Transmitted Data Lead

3.06 Plug the data terminal interface connector into J1 on the rear of the data set. Verify

with the customer that the data terminal presents a steady mark voltage on the transmitted data lead while in the idle mode. If this information is not available it may be checked as follows.

(a) Remove data set rear cover as described in Section 591-033-300.

(b) Condition TTS-28 TMS or VOM to measure between 3 and 25 volts dc.

(c) Connect + lead of TTS-28 TMS or VOM to terminal E2 on ER1 circuit pack of the data set.

(d) Connect – lead of VOM to ER1 circuit pack terminal E13 of data set. The meter should indicate more than 5 volts (marking voltage).

(e) Disconnect both meter leads and replace the data set cover(s) as described in the section entitled Data Set 113A-Type—Maintenance (591-033-300).

4. INSTALLATION TESTS

4.01 Upon completing the installation, connections, and adjustment of Data Set 113A-type, refer to the section entitled Data Set 113A-Type—Test Procedures (591-033-500) for test procedures and requirement.

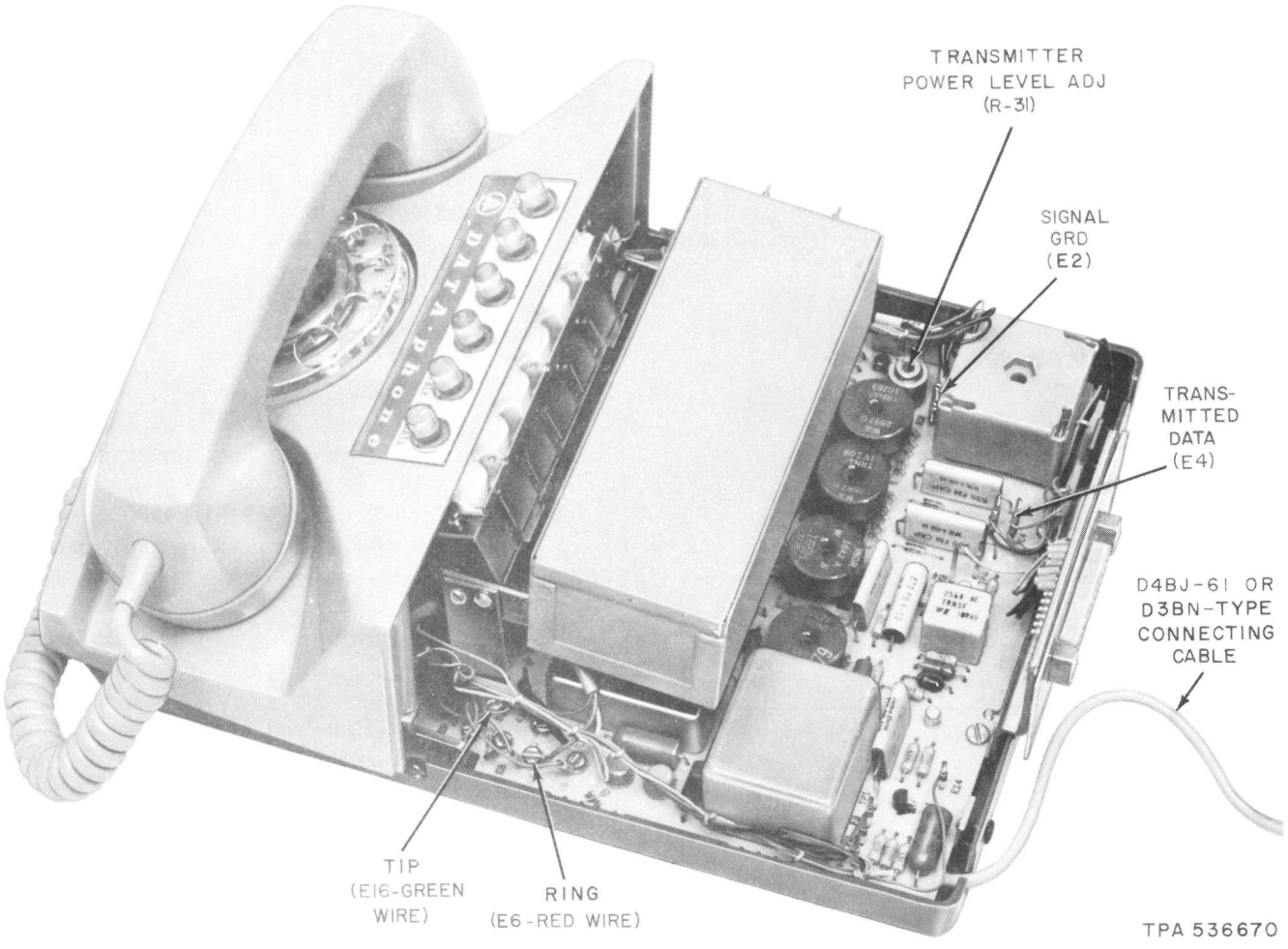

Fig. 2—Data Set 113A-L1—Rear Cover Removed

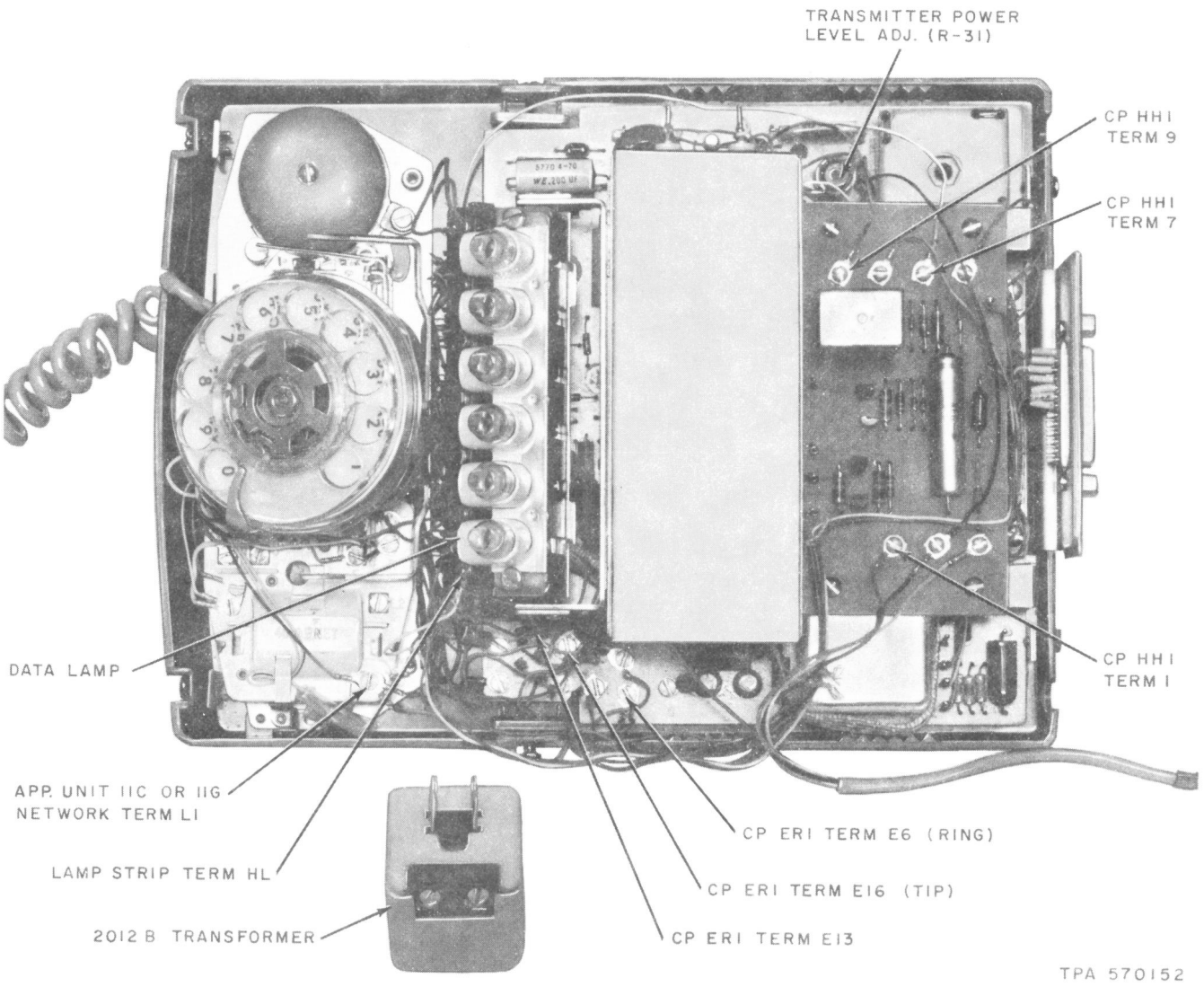

Fig. 3—Data Set 113A-L1/2—Front and Rear Covers Removed

W.E. WIRING NOTES 591-033-200 ISSUE 4

NOTES:

TABLE-A
THIS MAY BE USED AS REF. OR CROSS CHECK

1. REMOVE TAPE FROM FOLLOWING LEADS.
   A. WIRE FROM TERMINAL 4 OF TEST KEY.(WHITE)
   B. WIRE FROM TERMINAL 1 OF DATA KEY.(BROWN)
   C. WIRE FROM TERMINAL 2 OF DATA KEY.(SLATE)
   D. WIRE FROM TERMINAL E2 OF CP ER1.
   E. WIRE FROM TERMINAL E14 OF CP ER1.
   F. WIRE FROM TERMINAL E1 OF CP ER1.
   G. BLACK WIRE OF D4BJ CORD.
   H. YELLOW WIRE OF D4BJ CORD.
   I. WIRE FROM TERMINAL 20 OF J1 CONNECTOR
2. REMOVE WIRE FROM (JUMPER) E6 ON CP ERI TO L1 ON NETWORK (APP. UNIT).
3. REMOVE RED WIRE OF D4BJ CORD FROM E6 ON CP ERI
4. PREWIRE LAMP STRIP AND HHI CIRCUIT PACK — OPTION
   A. CONNECT WIRE FROM TERMINAL 4 OF CP HHI TO TERMINAL HL OF LAMP STRIP. — V/X
   B. CONNECT WIRE FROM TERMINAL 12 OF CP HHI TO TERMINAL HLG OF LAMP STRIP. — V/X
5. INSTALL CP HHI AND LAMP STRIP. INSTALL 51A LAMP IN DATA LAMP POSITION.
6. WIRE J1 CONNECTOR AS FOLLOWS:
   A. CONNECT WIRE FROM TERMINAL 20 OF CONNECTOR J1 TO TERMINAL 6 OF CP HHI. — V/X
7. WIRE KEYS AS FOLLOWS:
   A. CONNECT WIRE FROM TERMINAL 4 OF TEST KEY TO TERMINAL 7 OF CP HHI (WHITE) — X OPT ONLY
   B. CONNECT WIRE FROM TERMINAL 1 OF DATA KEY TO TERMINAL L1 OF NETWORK.(BROWN) — V/X
   C. CONNECT WIRE FROM TERMINAL 2 OF DATA KEY TO TERMINAL E6 OF CP ERI. (SLATE) — V/X
8. CONNECT D4BJ CORD AS FOLLOWS: — OPTION
   A. RED WIRE TO TERMINAL 1 OF CP HHI — V/X
   B. YELLOW WIRE TO TERMINAL 3 OF CP HHI — V/X
   C. BLACK WIRE TO TERMINAL 2 OF CP HHI — V/X
9. CONNECT CP ERI TO CP HHI AS FOLLOWS: — OPTION
   A. CONNECT WIRE FROM TERMINAL E1 OF CP ERI TO TERMINAL 9 OF CP HHI — V/X
   B. CONNECT WIRE FROM TERMINAL E14 OF CP ERI TO TERMINAL 8 OF CP HHI — V/X
   C. CONNECT WIRE FROM TERMINAL E2 OF CP ERI TO TERMINAL 2 OF CP HHI — V/X
10. CONNECT CP HHI TO CP ERI AS FOLLOWS: — OPTION
   A. CONNECT WIRE FROM TERMINAL 10 OF CP HHI TO TERMINAL E6 OF CP ERI — V/X
   B. CONNECT WIRE FROM TERMINAL 13 OF CP HHI TO TERMINAL E7 OF CP ERI — V/X
   C. CONNECT WIRE FROM TERMINAL 5 OF CP HHI TO TERMINAL E8 OF CP ERI — V/X
   D. CONNECT WIRE FROM TERMINAL 11 OF CP HHI TO TERMINAL L1 OF NETWORK. — V/X
11. CONNECT YELLOW AND BLACK WIRES OF THE D4BJ-61 CORD TO MOUNTING BLOCK FOR ACCESS TO 20128 TRANSFORMER..
12. FOR OPTION V ONLY
    CONNECT STRAP BETWEEN TERMINAL 7 OF CP HHI AND TERMINAL HL OF LAMP STRIP.
    REMOVE WHITE WIRE FROM TERM. 7 CP HHI COMING FROM TERM. 4 OF TEST KEY.
    INSULATE AND STORE.