

## TELEPHONE SETS

### 830- AND 2830-TYPE

#### 1. GENERAL

1.01 This section contains identification, installation, connections, and maintenance information on the 830- and 2830-type telephone sets.

1.02 This section is reissued to:

- Add D50BA-87 mounting cord
- Show D50AK-87 mounting cord MD
- Add 647AJ5 key
- Make wiring changes on sets equipped with new line switch
- Show necessary wiring changes when sets are used with speakerphone (Table H)
- Revise dial restriction information (Table C and Fig. 6)
- Add 533K diode for use with station busy lamp.

#### 2. IDENTIFICATION

##### Purpose

2.01 The 830- (rotary dial) and 2830- (TOUCH-TONE® dial) type telephone sets are obtainable as modular or complete desk-type, 10- or 11-button, key telephone sets equipped to provide standard key system features (Fig. 1 and 2). Refer to Table A for available colors.

##### Application

2.02 Used with central office, PBX or intercommunicating line circuits in 1A1, 1A2, or 6A key telephone systems (KTS). These sets are not equipped for use with 1A KTS.



Fig. 1—830CM Telephone Set



Fig. 2—830DM Telephone Set

2.03 All 830- and 2830-type telephone sets may be used with the 4A speakerphone. All sets may be used with the 3-type speakerphone; however, due to the limited number of mounting cord leads, an auxiliary mounting cord (D10R) may be required.

#### NOTICE

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

**Optional Components****2.04** Optional Components (order separately):

- Diode, 533K (preferred), KS-21765L1, or KS-15724L1 (for use with station busy lamp)
- Buzzer, KS-8109L2
- Buzzer, KS-20419L1 (one provided with set)
- Dial, 8CA-58 (for 830-type set used with speakerphone)
- 819041708 (P-90D170) or [819041971 (P-90D197) adhesive backed] Polarity Guard
- D-180656 Kit of Parts (for wall shelf mounting arrangement)
- Lamp, 51A (Hold button for message waiting).

**Replaceable Components**

**2.05** Replaceable components are determined locally (all standard replaceable components such as ringer, dial, etc, are identified on Fig. 7 through 12).

**Design Features**

**2.06** Design features for the 830- and 2830-type sets are as follows:

- Modular set
- 10-button (9-line pickup and hold on all sets except the 830DM and 2830DM)
- 11-button (7-line pickup, hold, recall, and 2 intercom on 830DM and 2830DM only, see Fig. 2)
- All pickup and intercom buttons are convertible to signaling
- Automatic Button Restoration (ABR) with preselect, 830DM and 2830DM telephone sets only
- Multiline Conferencing (MLC) 830DM and 2830DM telephone sets only, on pickup lines only (no conferencing on intercom lines or pickup-to-intercom lines).

- Hold button can be illuminated (lamp ordered separately)

- KS-20419L1 buzzer provided and connected to dedicated mounting cord leads

- Provision for mounting KS-8109L2 buzzer or additional KS-20419L1 buzzers on base pan

- Plug-in handset (G12A or G15A)

- Provision for polarity guard assembly (optional) all 2830-type telephone sets except 2830DM set

- Limited number of mounting cord leads restricts number of optional features which may be provided. If additional leads are required, an auxiliary D10R cord may be used.

- An access hole is provided in the P1-type ringer for biasing spring adjustment, refer to Section 501-259-101

- 3-type or 4A speakerphone (2.03)

- Tip and ring are common to all pickup buttons through internal mounting cord wiring.

**Operating Features**

**2.07** The operating features for the 830- and 2830-type telephone sets are the same as all standard key type telephone sets with the following exception. The 830DM and 2830DM telephone sets provide the following additional features:

- (a) **Multiline Conferencing:** Any combination of pickup buttons may be simultaneously depressed, for this feature, however, it is not possible to conference CO/PBX lines with the dedicated intercom lines, or intercom lines with each other.



**When lines are conferenced, distant stations may have difficulty hearing each other and transmission quality is not guaranteed.**

(b) **Automatic Button Restoration (ABR):**

The ABR feature releases locked-down buttons when the handset is restored. The buttons may be preset without removing the handset from the cradle.

(c) **Line Recall:** An amber-capped recall button provides switchhook flash without releasing the buttons.

(d) **Intercom:** Two buttons are dedicated to the intercom feature. These buttons are located on the right end of the 10-button key. These buttons may be converted in the standard manner to provide signaling or may be used for CO/PBX lines. However, CO/PBX lines when terminated at these positions will not be conferencable.

### 3. INSTALLATION

3.01 Assemble the required components to the telephone set base.

**Note:** On current production keys the cap must be properly oriented to lock the cap into the button.

3.02 Individual signaling may be provided by converting a locking key button to nonlocking. Remove the 812857738 (P-28E773) locking pin from the button to be converted and modify per Table. B.

3.03 If an additional buzzer is required, plastic screw grommets and mounting screws are provided for installation. The additional KS-8109L2 or KS-20419L1 buzzer must be ordered separately.

#### 3.04 Dial Restriction:

(1) 830-Type Telephone Set:

(a) Install a 533K (preferred), KS-21765L1, or 446F diode between terminals RR and F of the network as shown in Fig. 6.

(b) Wire telephone set as shown in Table C.

(2) 2830-Type Telephone Set:

(a) Wire telephone set as shown in Table C.

(3) Installations as described above will restrict dialing on all lines of the respective telephone

set. To permit dialing on selective lines reverse tip and ring leads of the line involved at the distribution terminal or 66-type connecting block. When a 2A1 matrix block is used, the reversing of conductors must be done on the telephone set side of the matrix block.

(4) For additional information on dial restriction, refer to Section 500-155-100.

3.05 Polarity guard (all 2830-type telephone sets except the 2830DM; see 3.06) should be used only when specified by local instructions for end-to-end signaling installations where battery and ground reversals may be encountered. An 819041708 (P-90D170) polarity guard assembly is installed on the right key bracket (Fig. 4) with screw provided or an 819041971 (P-90D197) polarity guard assembly (adhesive backed) is installed wherever space permits. Connect per Table D.

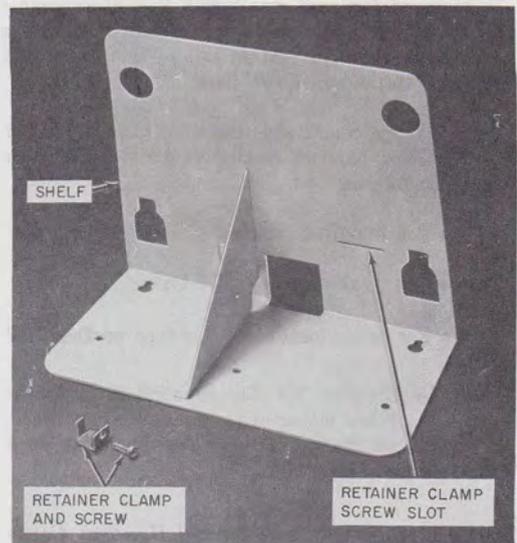
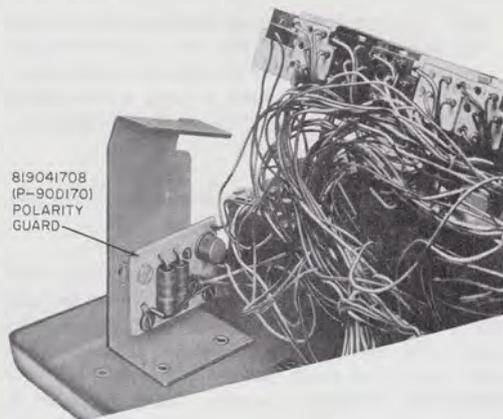


Fig. 3—D-180656 Kit of Parts for Wall Mounting Arrangements

3.06 The 830DM and 2830DM telephone set employs the 2A1 matrix block in place of polarity guard described in 3.05. This unit provides eight polarity guard circuits. One polarity guard circuit



**Fig. 4—819041708 (P-90D170) Polarity Guard, Installed**

is required for each line which is conferenceable by multibutton depression. The polarity guard is located between the station side of the line circuit and the station cut-down field.

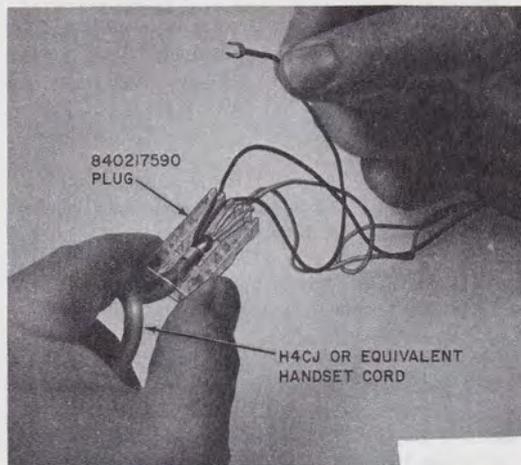
**3.07** Where conditions warrant, G3A6, G12A, or G15A handset can be replaced with other types as follows:

- For impaired hearing — G6-type
- For weak speech — G7-type
- For noisy location — G8-type or D-180413

Refer to Division 501 for connections of these handsets. When either of these handsets are used, an H4DU, an H4CJ, or equivalent handset cord must be used (see 3.08).

**3.08 *Installing Spade-Tipped Handset Cords in Early Production Sets Equipped with G12A Handset:*** To install spade-tipped handset cord (H4CJ or equivalent) remove J Hook

Stayband from the cord. Cut back and remove cord sheath to stayband marks. Thread spade-tipped conductors through plug (Fig. 5) (spade tips must be bent to clear cord entrance). Pull cord until about 1/4-inch of cord sheath is in the central cavity of the plug. Separate the conductors into two groups and tie an overhand knot, pulling the knot to the cord sheath. Pull the cord from plug until strain relief position is attained by knot entering sheath and resting against plug. Feed spade-tipped conductor straight through jack 812266203 (P-22F620) and connect to proper terminals. Insert plug in jack.



**Fig. 5—Installation of Spade-Tipped Handset Cords**

**Note:** On later version of the telephone set base, a plug (Fig. 5) is not required and a notch is provided on front lip of base pan for J Hook Stayband of nonmodular type cords.

**3.09** When adding speakerphone to 830-type telephone sets; the 8RA dial must be replaced by an 8CA dial (order separately) to provide the additional off-normal contacts required for speakerphone connections.

**3.10** When using speakerphone with telephone sets equipped with the new line switch assembly, make wiring changes shown in Table H. The new line switch can be identified by two additional leads which are (BL). ♦This modification is not required on sets equipped with old type line switches.♦

#### 4. MAINTENANCE

**4.01** Maintenance of the 830- and 2830-type telephone set should be limited to checking for loose or broken connections and replacement of items per local instructions.

**4.02** Early manufactured cords in neutral light pearl-gray (-82) and dark gray-brown (-83) have been MD. All new mounting cords will be satin-silver (-87).

**4.03** Current sets are equipped with a P1B ringer which does not have the (S-R), (S), and (BL) leads. For maintenance purposes, either the P1B or P1A ringer may be used. (If P1A ringer is used, insulate and store the unused leads.)

**4.04** For maintenance of keys, buzzers, dials, speakerphone components, and polarity guard, refer to appropriate sections pertaining to these items.

**4.05** The current production 647-type keys have been modified for easy lamp replacement by merely removing the lamp cap and inserting a 553-type tool through the hole in the top of the button. In early production models it is necessary to remove faceplate, key collar, and button for lamp replacement.



**Telephone sets should NOT be carried by the handset cradle. Line switch failure may be caused by applying excessive strain to the handset cradle and the line switch mounting arrangement.**

#### 5. CONNECTIONS



**Due to the limited number of mounting cord conductors the 830- and 2830-type telephone sets do not follow standard wiring arrangements (Fig. 7 through 12).**

**5.01** To provide mounting cord leads for illuminating the HOLD button, the ringer or buzzer leads must be used, meaning only two of the three options (ringer, buzzer, or hold lamp) may be provided at the same time.

**5.02** To provide station busy lamp modify the telephone set per Table E. The 533K (preferred), KS-21765L1, or KS-15724L1 diode is used to prevent false busy signals and must be ordered and installed separately.

**5.03** To provide priority hold (I HOLD) modify the telephone set per Table F.

**5.04** To provide 3-type speakerphone leads in the mounting cord, the buzzer leads along with the lamp and lamp ground leads from the 8th and 9th key buttons must be used. An auxiliary D10R cord may be used if these leads are not available. For connections for all sets, refer to Section 512-620-485 and ♦Table H.♦

**5.05** To provide 4A speakerphone connections, refer to Section 512-740-470 and ♦Table H.♦

**5.06** To provide polarity guard for all 2830-type telephone sets except the 2830DM, refer to Table D. The 2A1 matrix block is used for a polarity guard for the 2830DM telephone set (see 5.07).

**5.07** The 2A1 matrix block (ordered separately) provides the polarity guard function to telephone set with multiline conferencing via multibutton depression. The matrix block consists of a 66-type molded plastic connecting block, containing quick-connect terminals wired and equipped with eight diode bridges for eight lines. The matrix block is connected between the line circuit and the station cut-down field. For connections to the 2A1 matrix block, refer to Table G.



**If a station requires line ringing on a particular line, connect the ringing leads from the key telephone set to the appropriate terminals on the LINE SIDE of the matrix block, not to the station side.**

**5.08** For schematic information, refer to Fig. 7 through 12.

TABLE A  
COLOR ORDERING GUIDE

HOUSING, CORDS, AND HANDSET		COORDINATED FACEPLATE COLOR	
COLOR	SUFFIX	COLOR	SUFFIX
Black	-03	Charcoal	-70
Ivory	-50	Muted Ivory	-80
Green	-51	Light Green	-71
Red	-53	Muted Red	-69
Yellow	-56	Light Yellow	-72
White	-58	Light Gray	-73
Light Beige	-60	Muted Beige	-75
Aqua Blue	-62	Muted Blue	-76

TABLE B  
PICKUP SIGNAL KEY CONVERSION

CONVERSION OPTION (NOTE)	647A5 KEY LEADS								
	O-W	S-W	G-R	BL-BK	BR-BK	BK-BR	BK-BL	R-G	W-S
HPPPPPPPPP	7	7	7	11	11	11	15	15	15
HPPPPPPPPS	7	7	7	11	11	11	15	15	26
HPPPPPPSSS	7	7	7	11	11	11	15	26	26
HPPPPPPSSS	7	7	7	11	11	11	26	26	26
HPPPPSSSSS	7	7	7	11	11	26	26	26	26
HPPPPSSSSS	7	7	7	11	26	26	26	26	26

**Note:** Move (O-Y) mounting cord lead from terminal 12 (6) to terminal 26. Beyond five signal conversions strap terminal 26 to 28 and move the signal leads consecutively to terminal 28.  
Example: (BL-BK) lead from terminal 11 to 28, then (G-R) from 7 to 28 etc.

- All other telephone sets.
- 830A1M (MD) or 2830A1M (MD) (early version)

♦ TABLE C ♦

## DIAL RESTRICTION MODIFICATION (NOTE 1)

TEL. SET	LEAD		REMOVE FROM		CONNECT TO	
	FUNCTION	COLOR	NET.	SET	NET.	SET
830DM and 2830DM	Line Tip	G		8		3
	Line Ring	R		3		8
830CM and 2830CM MFR 2-77 or later	Line Tip	G		8		6
	Line Ring	R		6		8
830CM and 2830CM E/W New Line Switch and MFR Before 2-77 (Note 2)	Line Tip	G		16		6
	Line Ring	R		6		16
830A1M, 830B1M 830C, 830CT, or 830CM E/W Old Line Switch	Line Tip	G	F			6
	Line Ring	R		6	F	
2830A1M, 2830B1M, 2830C, 2830CT, or 2830CM E/W Old Line Switch	Line Tip	G		8		6
	Line Ring	R		6		8

*Notes:*

1. Rotary dial telephone sets must have a 533K (preferred) or KS-217651L1 or a 446F diode installed between RR and F of the network see Fig. 5.
2. The new line switch can be identified by two additional leads which are (BL).

TABLE D

POLARITY GUARD CONNECTIONS (GUARD ASSEMBLY)

WIRE OR LEAD	COLOR	REMOVE FROM	CONNECT TO	
		NET.	GUARD ASSY.	NET.
Dial	BK	RR	T	
	G-W	C	S	
Line Switch	W	C	S	
Guard Assembly	G			RR
	W			C

Note: For use when specified by local instructions for end-to-end signaling installations.

TABLE F

I HOLD CONNECTIONS (NOTE)

LEAD		REMOVE FROM	CONNECT TO
Hold Key	(G-W)	22	7
	(BK-BL)	7	22
SP Lead — Use (Y-O)* or spare mounting cord conductor			13

Note: For additional information see SD-69530-01.

\* (Y-O) lead may be used unless connected for other options.

TABLE E

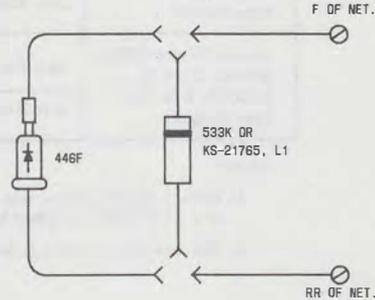
STATION BUSY LAMP CONNECTIONS

LEAD	OPERATION
Hold Key (G-W)	Remove from term. 22 and connect to 27 or other spare term.
533K* or KS-21765L1* or KS-15724L1 Diode (Ordered Separately)	Connect as shown or to same spare term. as above 
Mtg Cord (Y-O) (Note)	Remove from <span style="border: 1px solid black; padding: 2px;">14</span> <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">15</span> connect to 22

- All other telephone sets.
- 830A1M (MD) or 2830A1M (MD) (early version)

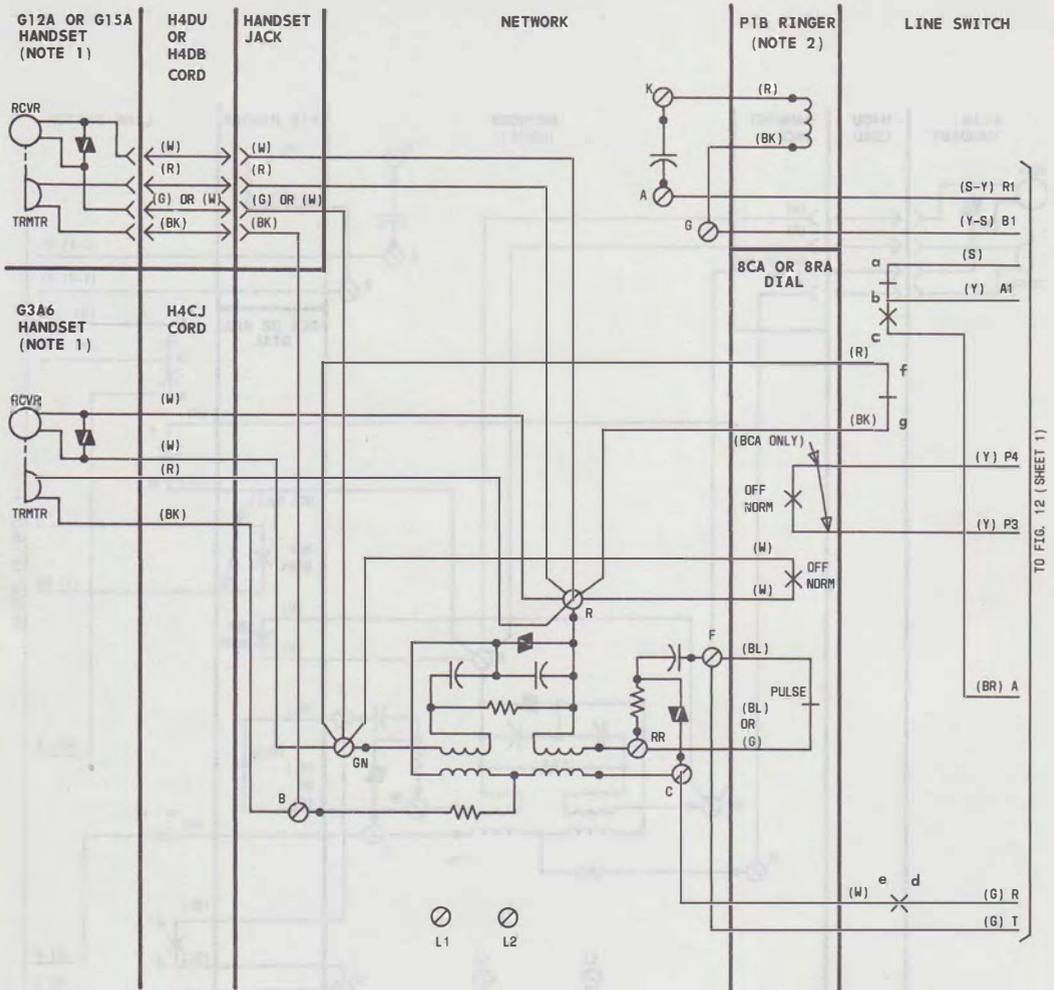
\* Negative end (end with band) of 533K or KS-21765L1 diode connects to terminal 27 (or other spare terminal) and positive end to 22.

Note: Use spare mounting cord lead if (Y-O) lead is used to provide other options.



NOTE: 533K IS PREFERRED.

Fig. 6—Installing Diode for Dial Restriction



TO FIG. 12 (SHEET 1)

- NOTES:
1. LATER B30C(MD) TELEPHONE SET IS EQUIPPED WITH A G3A6 HANDSET WHICH IS WIRED DIRECTLY TO THE TELEPHONE SET. EARLY PRODUCTION B30-TYPE TELEPHONE SETS WERE EQUIPPED WITH A G12A PLUG-ENDED HANDSET. B30CM TELEPHONE SETS ARE EQUIPPED WITH G15A HANDSET.
  2. EARLY PRODUCTION TELEPHONE SETS MAY BE E/W P1A RINGERS WHICH WILL HAVE (S), (S-R), AND (BL) LEADS WHICH ARE INSULATED AND STORED.

Fig. 7—Part of 830A1M, B1M, C, CT, or CM (Equipped With Old Line Switch) Telephone Set, Connections

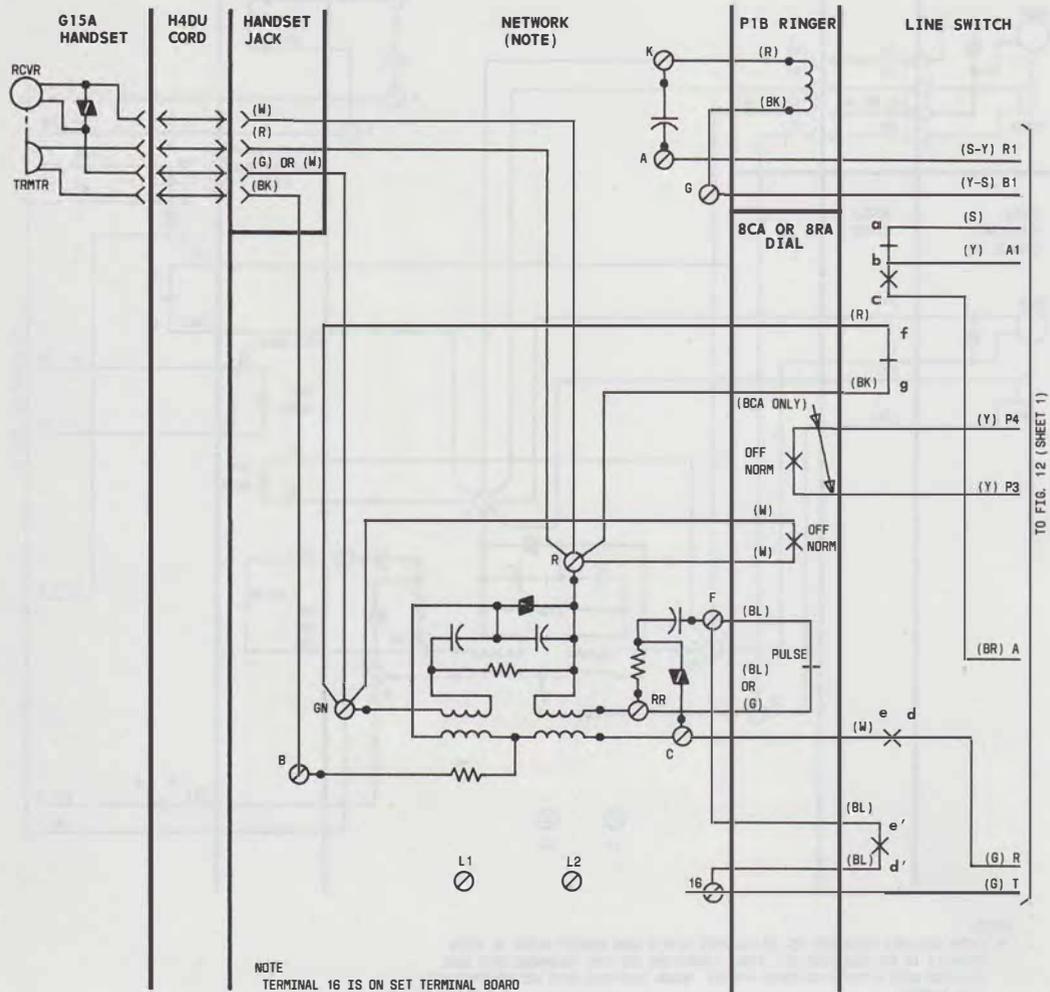


Fig. 8—Part of 830CM (Equipped With New Line Switch and Manufactured Before 2-77) Telephone Set, Connections

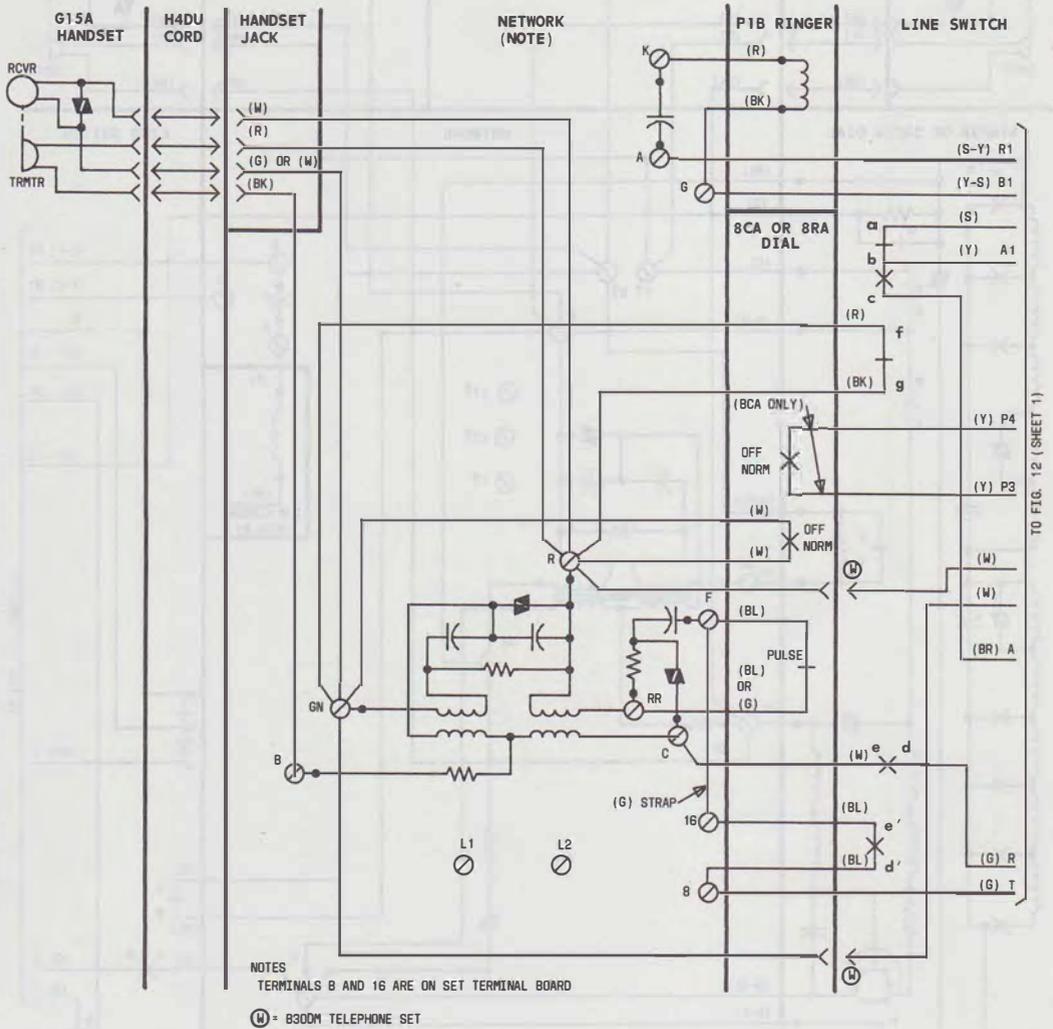


Fig. 9—Part of 830CM (Manufactured 2-77 or Later) or 830DM Telephone Set, Connections

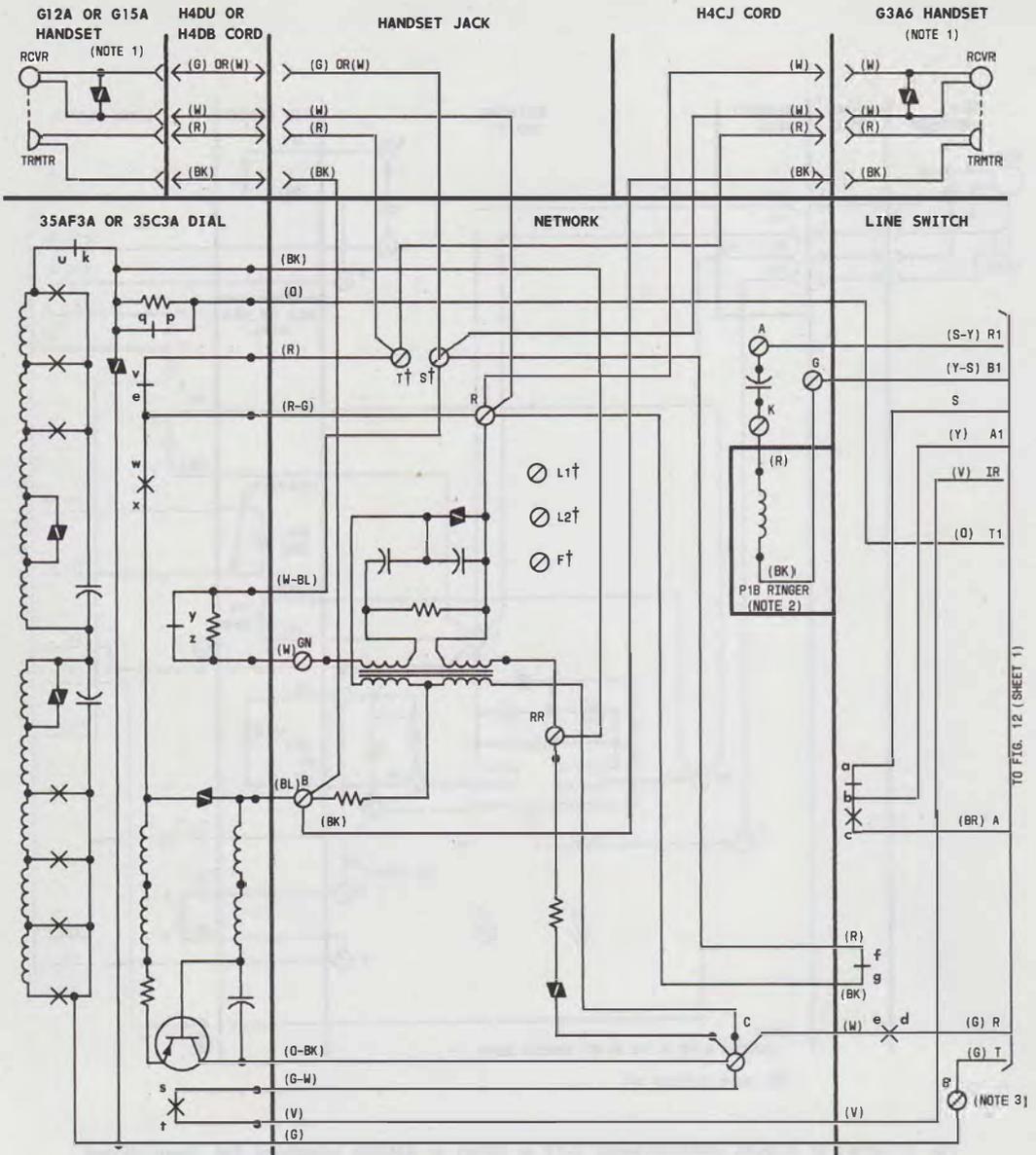


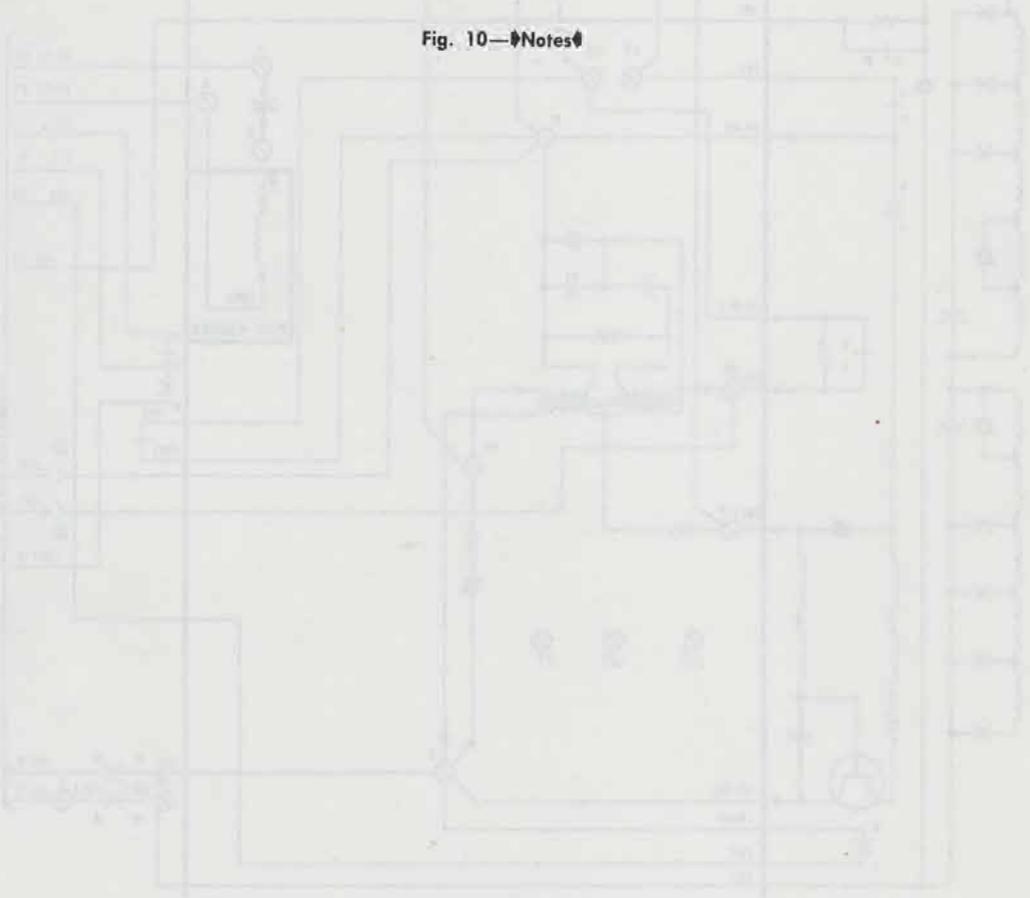
Fig. 10—Part of 2830A1M, B1M, C, CT, or CM (Equipped With Old Line Switch) Telephone Set, Connections

## NOTES:

1. LATER 2830C(MD) TELEPHONE SET IS EQUIPPED WITH A G3A6 HANDSET WHICH IS WIRED DIRECTLY TO THE TELEPHONE SET. EARLY PRODUCTION 2830-TYPE TELEPHONE SETS WERE EQUIPPED WITH A G12A PLUG-ENDED HANDSET. 2830CM TELEPHONE SETS ARE EQUIPPED WITH G15A HANDSET.
2. EARLY PRODUCTION TELEPHONE SETS MAY BE E/M P1A RINGERS WHICH WILL HAVE (S), (S-R), AND (BL) LEADS WHICH ARE INSULATED AND STORED.
3. TERMINAL B IS ON SET TERMINAL BOARD.

† IF SET HAS BEEN CONVERTED IN SERVICE CENTER TO A 2830-TYPE AND HAS A 4228AA NETWORK LEADS SHOWN TERMINATED ON S WILL BE ON L1 AND LEADS SHOWN TERMINATED ON T WILL ON L2 AND TERMINAL F CANNOT BE USED AS A SPARE TERMINAL.

Fig. 10—Notes



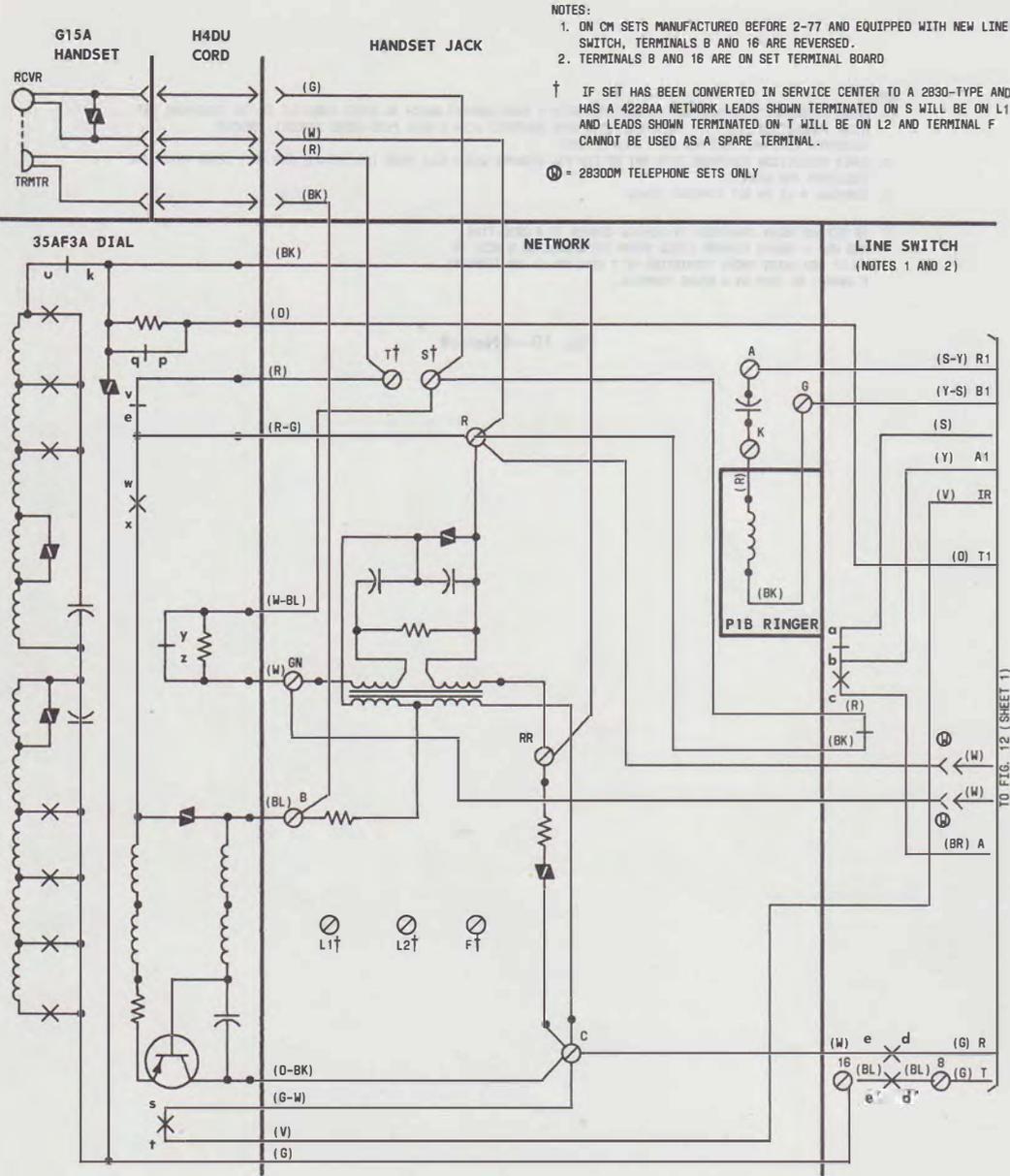


Fig. 11—Part of 2830CM (Equipped With New Line Switch) or 2830DM Telephone Set, Connections

TABLE G

2A1 MATRIX BLOCK

LINE	LINE TERM. (LEFT)	STATION TERM. (RIGHT)
1	T	1
	R	5
2	T	7
	R	11
3	T	13
	R	17
4	T	19
	R	23
5	T	25
	R	29
6	T	31
	R	35
7	T	37
	R	41
8*	T	43
	R	47

\*If more than 8 lines are provided, additional 2A1 matrix blocks are required.

TABLE H

SPEAKERPHONE MODIFICATION FOR TELEPHONE SETS EQUIPPED WITH NEW LINE SWITCH (NOTE)

TEL. SET	LEAD COLOR	REMOVE FROM TERM.	CONNECT TO TERM.
830DM, 2830DM, or 830CM and 2830CM MFR 2-77 or later	G	16	8
830CM MFR before 2-77	G	16	F
2830CM MFR before 2-77	G	8	16

Note: The new line switch can be identified by two additional leads which are (BL). No modification is required on sets equipped with the old type line switch, [no (BL) leads].

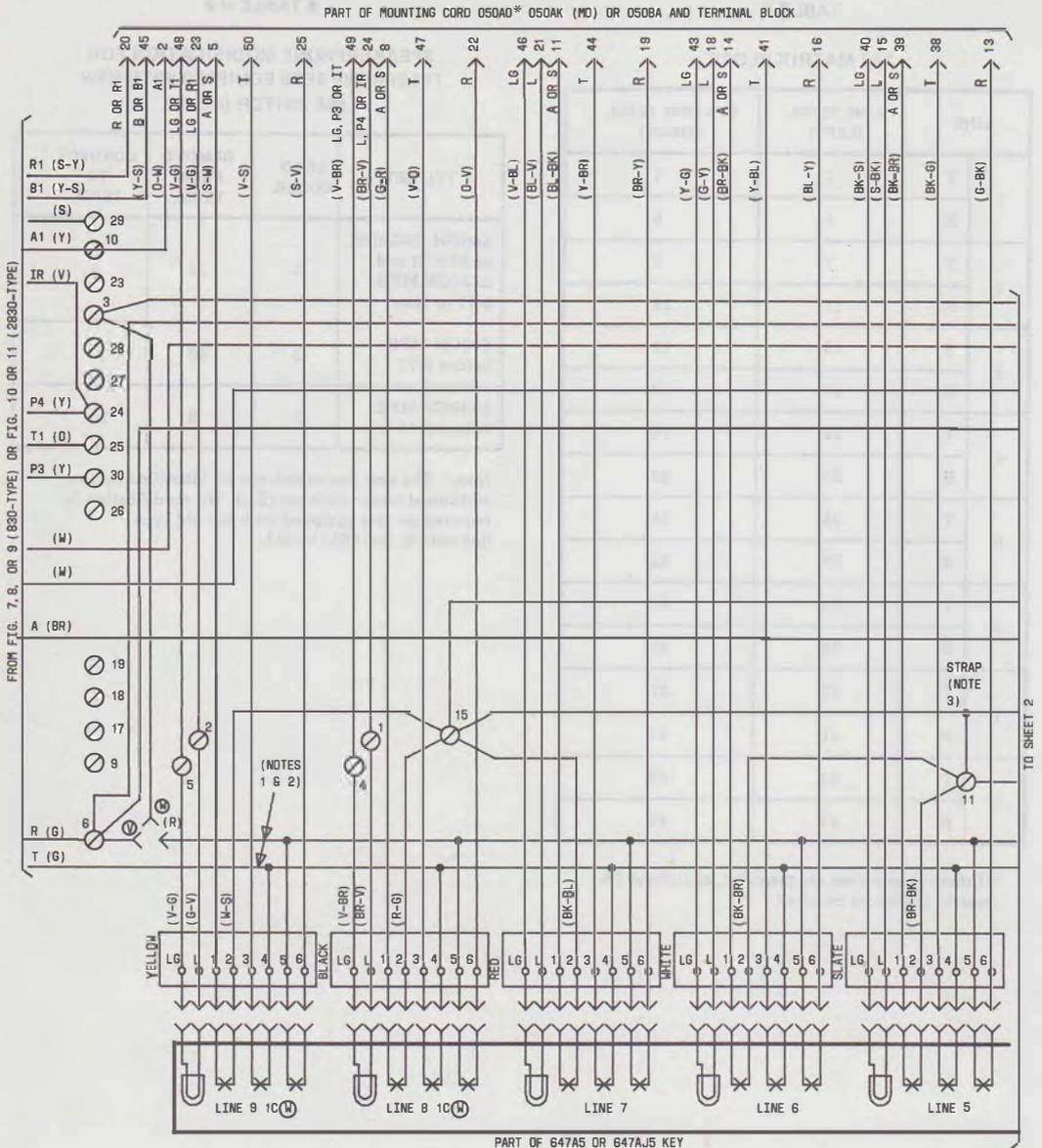


Fig. 12—300- or 2830-Type Telephone Set, Key and Mounting Cord Arrangement (Sheet 1 of 2)

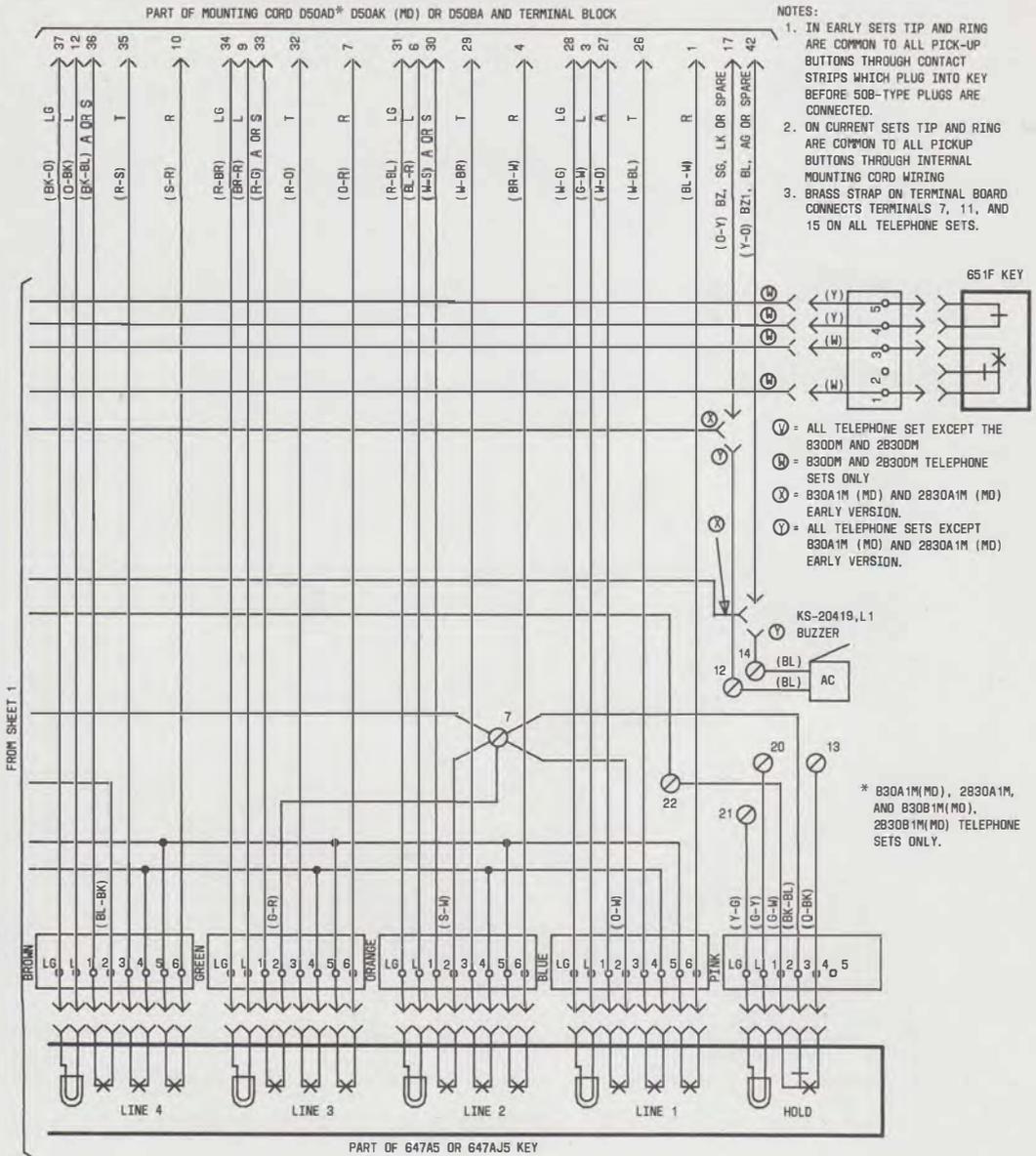


Fig. 12—830- or 2830-Type Telephone Set, Key and Mounting Cord Arrangement (Sheet 2 of 2)†