REFERENCE

1220A HAND TELEPHONE SET

AC1 AND AD1 TELEPHONE BASES

1. GENERAL

1.01 This section provides identification, installation, maintenance, and connection information for the 1220A hand telephone set, and the associated AC1 and AD1 telephone bases. This information was previously contained in Sections 502-320-100, 502-321-100, and 502-321-400 which are hereby canceled.

2. IDENTIFICATION

2.01 The 1220A hand telephone set (Fig. 1) is a component of the dial-in-handset TRIMLINE® telephone set. The hand telephone set is a complete telephone set except for the handset cord, ringer, and line switch which are housed in either a AD1 (Fig. 2) or AC1 telephone base.

2.02 The AC1 telephone base is used for wall mounted installations while the AD1 base is used for desk-type installations.

Ordering Guide

2.03 A complete telephone set consists of a hand telephone set,base, handset cord, and mounting cord, all of which must be ordered separately.

- Set, Telephone, Hand, 1220A-*
- Base, Telephone, AC1-*
- Base, Telephone, AD1-*
- Cord, Handset, H4DB-*
- Cord, Mounting, D5AL-* 5 feet-6 inches, 9, 13, and 25 feet (AD1 base)
- Cord, Mounting, D5AN-* 5 feet-6 inches, 9 and 13 feet—Retractable (AD1 base)

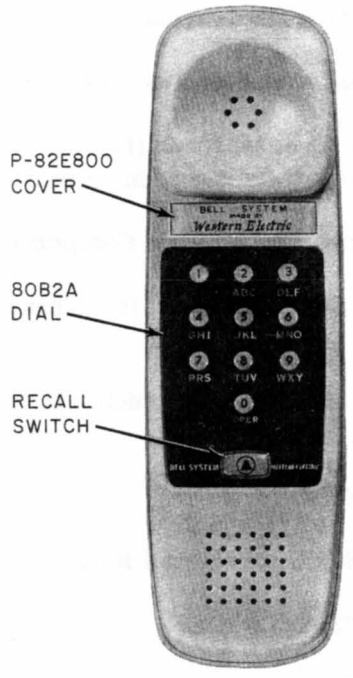


Fig. 1—1220A Hand Telephone Set

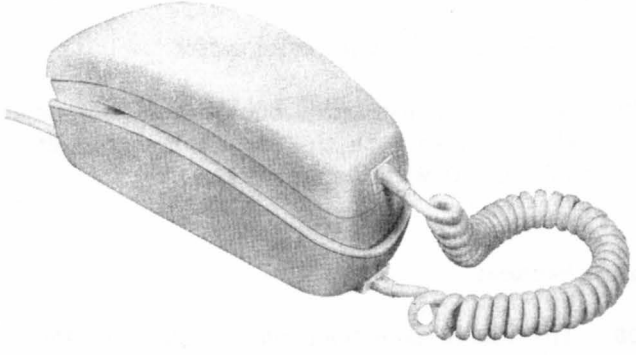


Fig. 2—AD1 Telephone Base With 1220A Hand Telephone Set

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

- Cord, Handset, H5AA-* 5 feet-6 inches, 9 and 13 feet (Required when providing tip identifying ground)
- Cord, Handset, H5AD-* 5 feet-6 inches only (Equipped with Message Waiting Lamp)
- P-90D231 Polarity Guard Assembly

2.05 ***Associated Apparatus or Equipment:***

- 2012A Transformer (for other suitable transformers, see section on transformers)

2.06 ***Replaceable Common Components:***

- Lamp, 53B (replacement for all hand telephone sets)
- Lamp, 51B (current production hand telephone sets)
- P-82E8-* Cover
- P-25E803 Number Card Retainer
- P-28E320 Light Seal
- Form, E-5002A (number card)
- Ringer, P1A
- Card,Face,Dial (see Table A)

* Refer to Table A for color suffix.

2.07 A customer instruction booklet (GN-2433) is shipped lose with the hand telephone set and should be left with the customer.

TABLE A

COLOR SELECTION AND PIECE PART INFORMATION

HAND TELEPHONE		DIAL FACE CARD	
STANDARD COLOR*	SUFFIX	COLOR	PIECE PART NO.
Black	—03	Slate	P-22F570
Ivory	—50	Cinnamon Brown	P-22F571
Green	—51	Dark Jade Gray	P-22F572
Red	—53	Burgundy	P-22F573
Yellow	—56	Gold	P-22F574
White	—58	Slate	P-22F570
Rose Pink	—59	Rose	P-22F575
Lt. Beige	—60	Sandalwood	P-22F576
Lt. Gray	—61	Slate	P-22F570
Aqua Blue	—62	Peacock Blue	P-22F577
Turquoise	—64	Turquoise Green	P-22F578

* Refer to Section 500-120-100 for promoted colors.

Design Features

2.08 The 1220A hand telephone set provides the following features:

- Illuminates 10-button TOUCH-TONE® dial.

Note: Early production handsets will have the lamp in a vertical position, current production handsets have the lamp in horizontal position.

- Equipped with recall switch.
- P-82E800 type cover or number card and associated retainer can be used to conceal housing screws and lamp.

Note: 1220-type hand telephone sets may be found in the field with a number card or cover used to conceal the screws in the handset. Current production sets will have the number card in the base since this is a more convenient location for the customer.

- Equipped with jack (Fig. 3) to accommodate a plug ended handset cord (Fig. 4).

2.09 AC1 and AD1 telephone base provides the following features:

- Factory-wired for individual or bridged service.
- Adjustable ringer volume control.

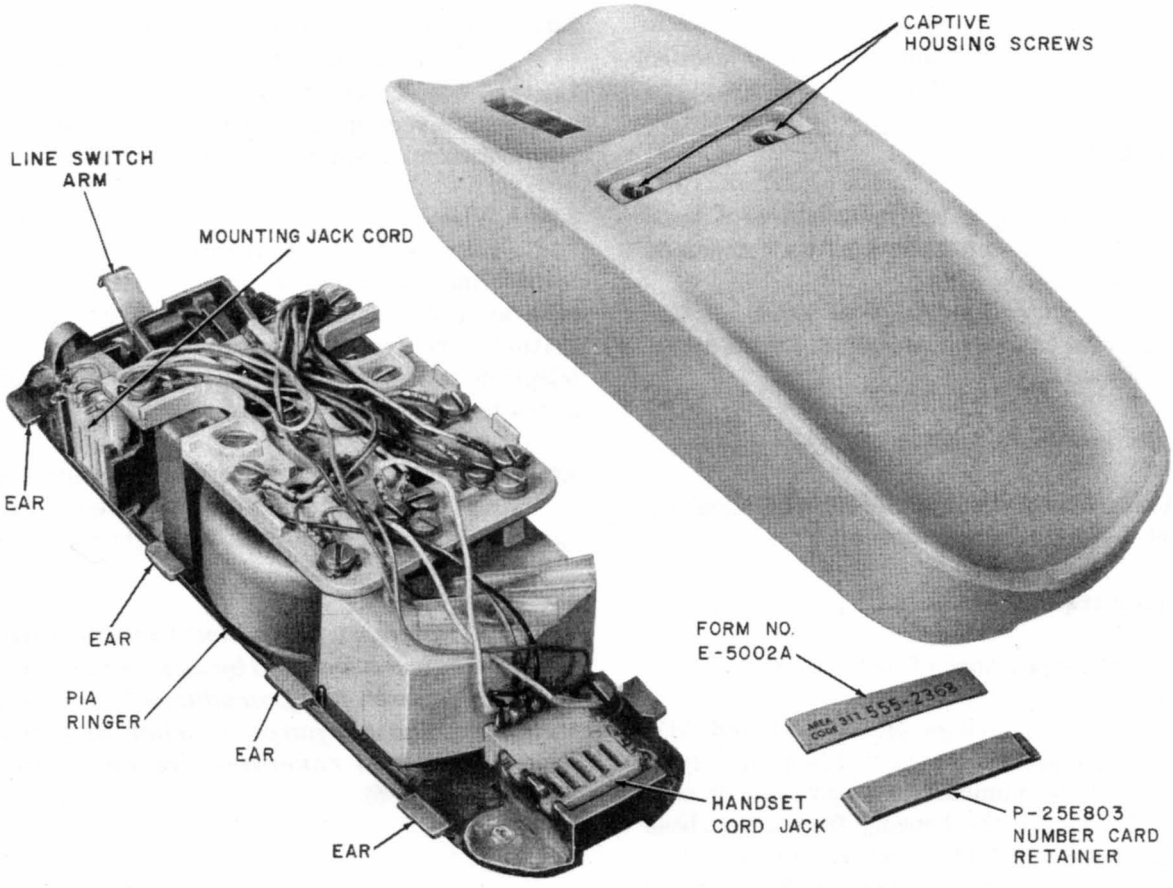


Fig. 3—Interior of AD1 Telephone Base (Current Production)

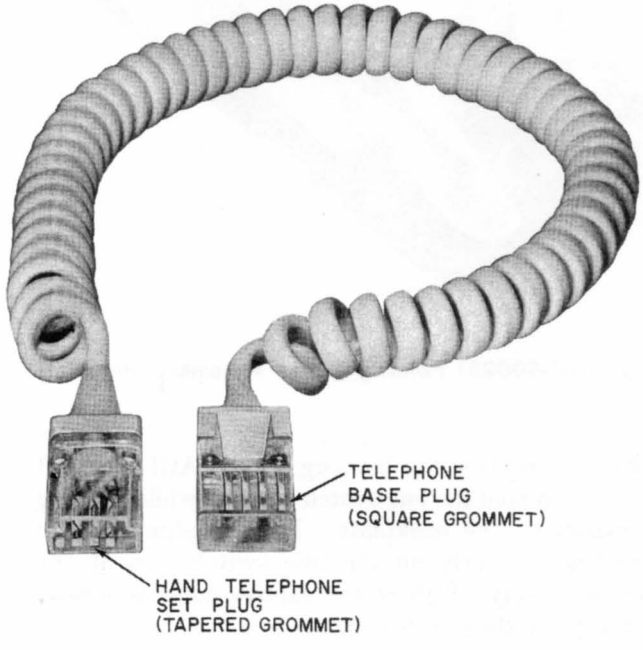


Fig. 4—H4DB Cord

- AC1 base (for vertical mounting)—jack equipped to receive plug-ended handset cord.
- AD1 base (for horizontal mounting)—jack equipped to receive plug-ended handset and mounting cords.
- A lead control (optional).
- 4-party full selective or 8-party semiselective ringing by adding 426N diode (optional).
- Space provided on bases for number card and associated number card retainer.
- The cover of the AC1 telephone base permits hanging the hand telephone set along either side of the base by hooking the receiver end on the top edge of the cover. This feature permits hanging up the handset without going to on-hook position.

2.09 The hand telephone set with base can be used on CO or PBX lines and can be modified for use with 1A, 1A2, or 6A key telephone systems.

3. INSTALLATION

3.01 When planning the installation of a hand telephone set together with its companion base, consider the following:

- Safety for yourself, customer, and maintenance personnel
- Location—desk, table, wall, etc.
- Availability of power outlet for hand telephone set dial light transformer
- Space requirement
- General appearance of installation

3.02 The plastic housings of the AC1 and AD1 bases are secured by captive housing screws located behind the number card and number card retainer. To remove the housing from either base assembly,use a KS-16750 type releaser or equivalent to remove the number card retainer (Fig. 5). ***Be careful not to damage the housing.*** Loosen the two captive screws, which are now exposed, and lift the housing off.

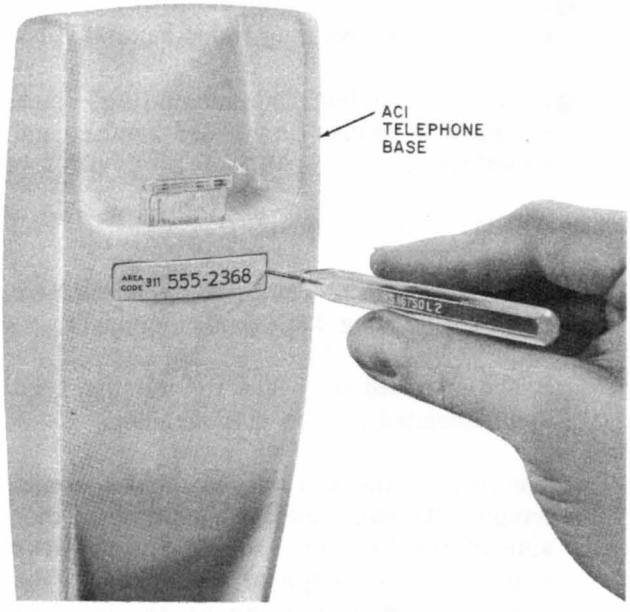


Fig. 5—Removing Number Card Retainer

3.03 The AC1 base may be mounted directly to a firm vertical surface. If necessary, use a 155-type adapter or 182-type backboard. Refer to appropriate section in Division 463 for additional information on adapters and backboards.

3.04 When inside wire to the AC1 (wall) telephone base is exposed, terminate the line and transformer wiring at a common bridging point, such as a 42A connecting block. Run one quad station wire from the connecting block to the telephone base. Wiring may enter from the opening at the bottom, top, or through the backplate.

3.05 In cases where an inside wire is already in place through a wall, an exposed wire run may be necessary between the dial light transformer and the base.

Polarity Guard should only be installed when instructed by local administrative practices or procedures for end-to-end signaling purposes when battery and ground reversals are encountered (Fig. 6).

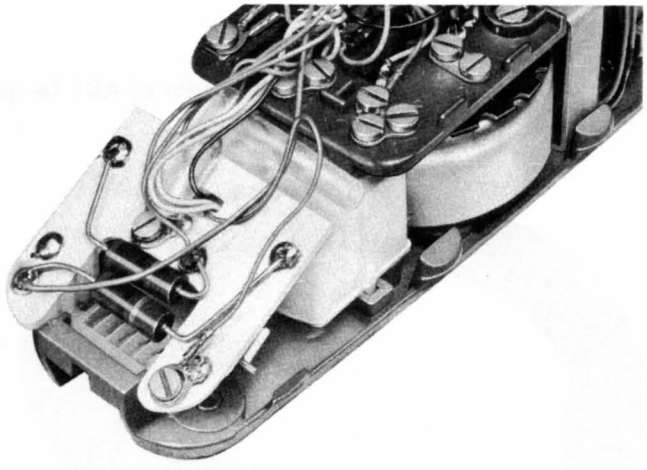


Fig. 6—P-90D231 Polarity Guard Assembly, Installed

3.06 To replace the housing on the AC1 base lift and hold the line switch plunger while housing is placed on the backplate. Release plunger so it will rest properly on the line switch arm of the base assembly. Tighten the captive housing screws and replace the number card.

3.07 Insert the plug end of the D5AL or D5AN mounting cord (Fig. 7) into the jack located on the underside of the base assembly. ***Make sure that the spring clip of the plug snaps into place to secure the plug.*** Lay the cord in the cord channel and slide the cord retainer over the cord.

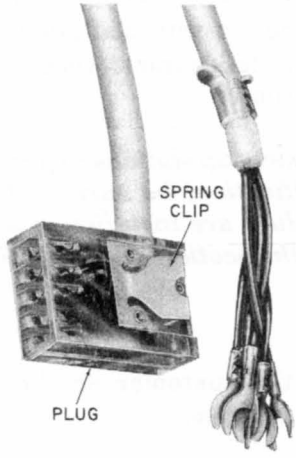


Fig. 7—D5AL Mounting Cord

3.08 Connect the 1220A hand telephone set to a telephone base by plugging an H5AB or H5AA (tip party identifying ground) cord in the jacks on each component.

3.09 If tip party identification is required, an H5AA cord must be used. Check under P-82E800 cover to see that screw used in tip party identification switch is tightened down. The absence of a screw or screw hole in the identification switch position indicates that the connection has been made in the network at the factory.

3.10 If message waiting lamp feature is required, an H5AD cord must be used (Fig. 8). The lamp equipped end of the cord plugs into the hand telephone set.

When using these push-in-lock type plugs make sure the contacts are in proper position to make electrical connection with the mating contacts, and that the plug is placed in the proper receptacle. Either error will cause circuitry problems and extreme difficulty in removing the plug.

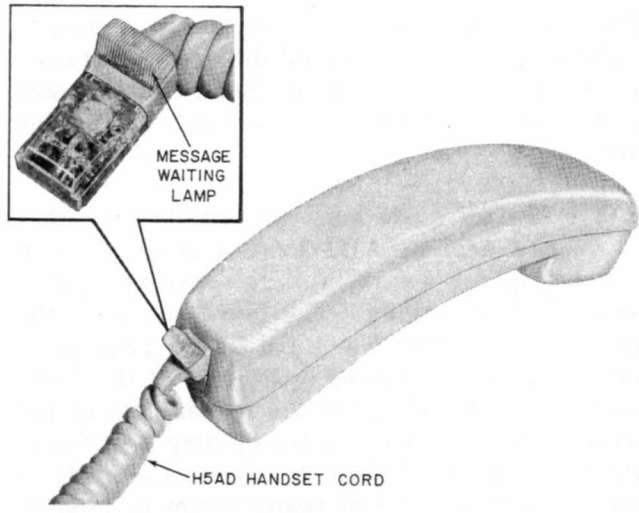


Fig. 8—H5AD Handset Cord (Message Waiting Lamp)

3.11 Where a single dial light is involved, use a 2012A transformer. Select a 105-120 volt ac receptacle not controlled by a switch. If the transformer does not have the folded-blade prongs use a 2A clamp to secure transformer to the outlet. Where two or more dial light sets are installed, refer to the section on station transformers for use with multiple installations.

The illumination of the dial diminishes with increased cord lengths. In installations where the illumination is considered inadequate, the 53B lamp may be replaced by a 53A, if the lamp power is supplied by a 2012A transformer and the combined lengths of mounting and handset cords exceed 15 feet. Refer to Part 5, Maintenance, for dial lamp replacement.

3.12 For proper illumination of the dial the length of wire between the transformer and telephone set should not exceed 250 feet of inside wire.

3.13 When the hand telephone set is used in conjunction with a key telephone system, the dial lamp can be powered from the 10 volt tap of a 101G or equivalent power supply of the key system. If a 10 volt power supply is used replace 51B or 53 lamps with 51A or 53A lamps.

3.14 Ringing and/or identification ground, where required, is common to the lamp circuit.

Damage to the transformer may result if there is sufficient ground potential difference between power and telephone grounds. Refer to appropriate section on bonding to power grounds in Division 460.

3.15 A 426N diode must be installed in either the AC1 or AD1 base assembly when connecting for 4-party full selective or 8-party semiselective ringing. The two leads from the diode are designated No. 1 and No. 2. Lead No. 1 extends from the flanged (gold) base of the diode; lead No. 2 extends from the housing tip of the diode. Place the diode in the opening provided in the terminal board (Fig. 9). Dress the leads to the appropriate terminal board terminals, refer to Table E for connections.

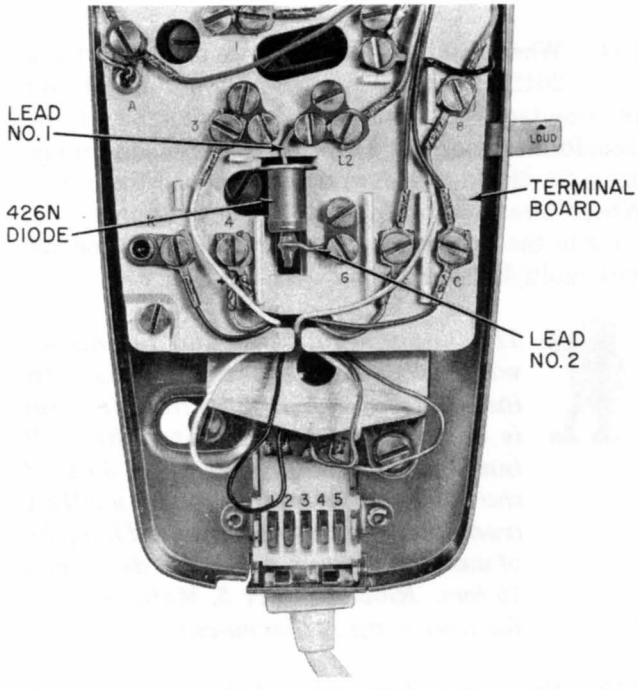


Fig. 9—426N Diode Installed

3.16 Where extreme noise induction conditions exist, the 426N diode will not be used. Instead, a cold-cathode tube or a ringer isolator installed on a 74A connecting block may be used. See section on inductive noise for connection information.

3.17 For portable installations of the AD1 telephone base, terminate the line and transformer wiring to 550A jacks or equivalent. Connect the spade-tipped leads of the D5AL or D5AN mounting cord to a 505A plug. Connect other end of mounting cord to AD1 base in normal manner.

3.18 For portable installations when only one portable telephone set is equipped with a dial light, one 2012A transformer may be connected to two or more jacks. When more than one portable telephone set with dial light is installed, refer to section on station transformers for selection of proper power source.

On 2-party tip stations requiring ground identification, be sure that the jacks and plugs are installed in accordance with the section on jacks and plugs.

4. OPERATION

4.01 Instruct the customer on the necessary operating features.

4.02 ***Recall Switch (Fig. 1):*** Point out recall switch and explain advantages of switch. Example: If a person receives busy tone at conclusion of dialing a number, he may depress the recall switch for a few seconds; then release. Dial tone will again be heard. This is done in place of depressing line switch plunger on the telephone base.

Caution: If the recall switch is depressed during conversation or dialing, central office equipment may be disconnected.

4.03 Demonstrate the three-step ringer volume control. Caution the customer about ringer cutoff if the screw is removed to provide this feature.

5. MAINTENANCE

5.01 Maintenance of the AC1 and AD1 telephone bases is limited to ringer bias adjustment, burnishing or adjusting contacts, and replacement of defective components.

5.02 For adjustments and ringer cutoff feature of the P1A ringer, refer to the appropriate ringer section in Division 501.

5.03 In areas where RF suppression is required, replace the hand telephone set with a set that has been modified by the local distributing

house. Modified sets will not be recoded but will be stamped ***"RF Suppressed See Section 500-150-100".*** Stamp is located adjacent to handset cord jack where the set code is stamped.

5.04 Field maintenance of the 1220A hand telephone set is limited to the following:

- Dial lamp
- P-25E803 number card retainer
- P-28E320 light seal
- Form E-5002A number card
- Handset Cords
- P-82E800 Cover

5.05 To replace a dial lamp in the TRIMLINE hand telephone set, remove cover or number card retainer and light-seal plate. Current production hand telephone sets have the lamp in a horizontal position and a KS-6320 orange stick can be used to remove the lamp (Fig. 10). ***EXERCISE CAUTION TO PREVENT THE LAMP FROM FLYING OUT OF THE SOCKET IN A DANGEROUS MANNER.*** In early production hand telephone sets use a 553A tool to remove the lamp from its vertical position (Fig. 11).

Note: Lamps carried for maintenance reasons should be of the 53B type since both early and current production handsets accommodate this type.

5.06 To replace a plug ended handset cord (Fig. 12) or mounting cord (Fig. 13) use a KS-16750 type releaser. Insert tool in space provided and apply pressure against spring clip toward body of plug. When spring clip has been depressed pull plug out of jack.

If transmission troubles are experienced or the dial is inoperative, replace the hand telephone set.

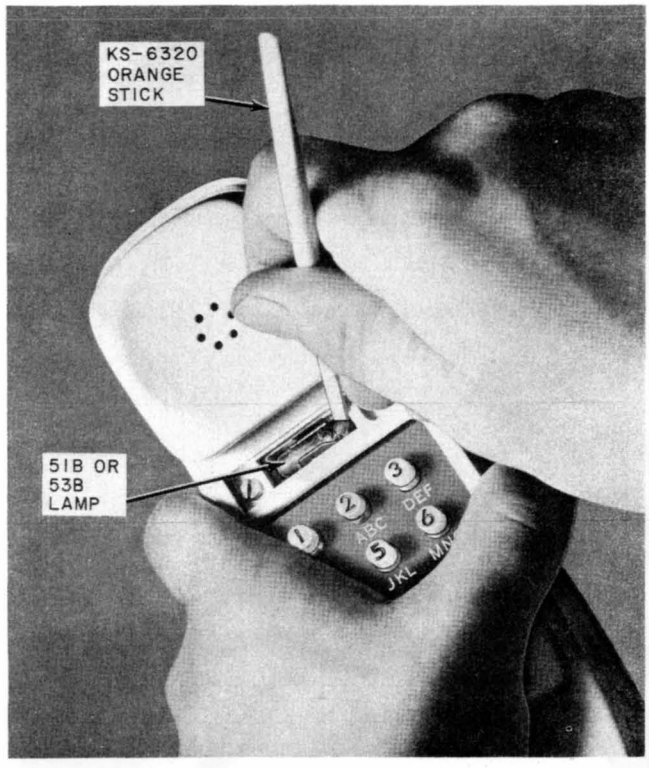


Fig. 10—Removing Dial Lamp From Current Production 1220A Hand Telephone Set

5.07 To test hand telephone set procede as follows:

(a) Make sure all connections are correct and secure, and line polarity for TOUCH-TONE dial is correct.

(b) Listen to set receiver for presence of dial tone.

(1) If dial tone is heard, dial any digit or digits prescribed by local instructions to break dial tone. If dial tone can be broken, depress and release recall button. After second dial tone is obtained, call the local ringer test circuit for TOUCH-TONE dials and test each button of the dial as required by local test procedures. If dial fails test, replace complete hand telephone set.

(2) If dial tone is not heard, in set receiver, connect dial hand test set at connecting

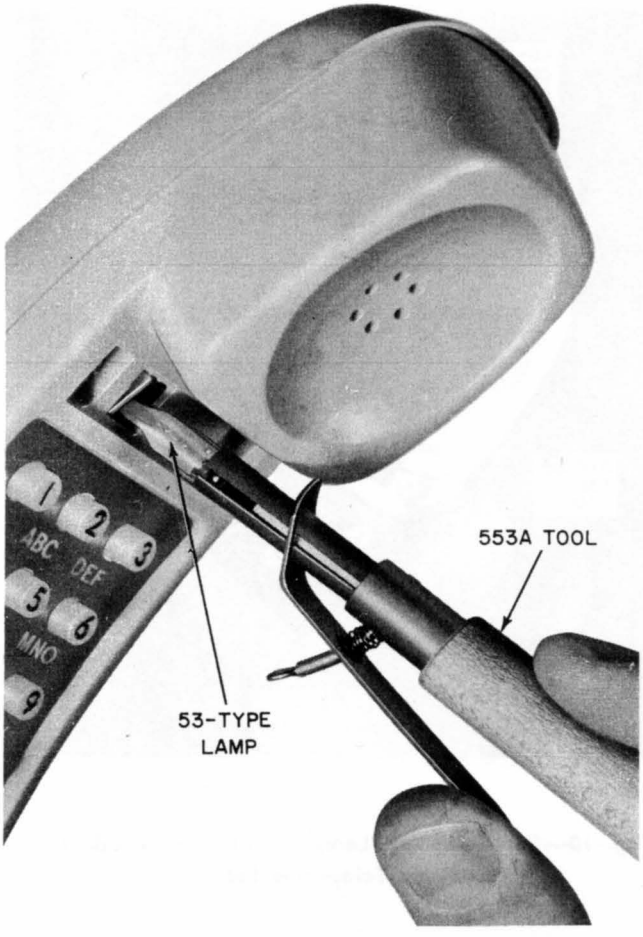


Fig. 11—Replacing Dial Lamp in Early Production 1220-Type Hand Telephone Set

block. If dial tone is heard with test set, remove the handset cord at the hand telephone set and move the test set leads to the (G) and (R) conductors at the cord plug. If dial tone is not heard, replace the hand telephone handset cord and telephone set base.

6. CONNECTIONS

6.01 Refer to Table F for connections if a polarity guard is provided.

6.02 Dial restriction of a TOUCH-TONE dial equipped telephone set is controlled by the polarity applied to the dial. Reverse tip and ring to restrict dial, and leave the dial in the handset. Check that ringer connections have not been affected by line reversal.

Note: Dial restriction cannot be provided on a TOUCH-TONE telephone set where local instructions specify using a polarity guard.

6.03 Fig. 16 and Table B provides wiring changes and connections required for using the TRIMLINE telephone set with 1A1, 1A2, or 6A key telephone systems.

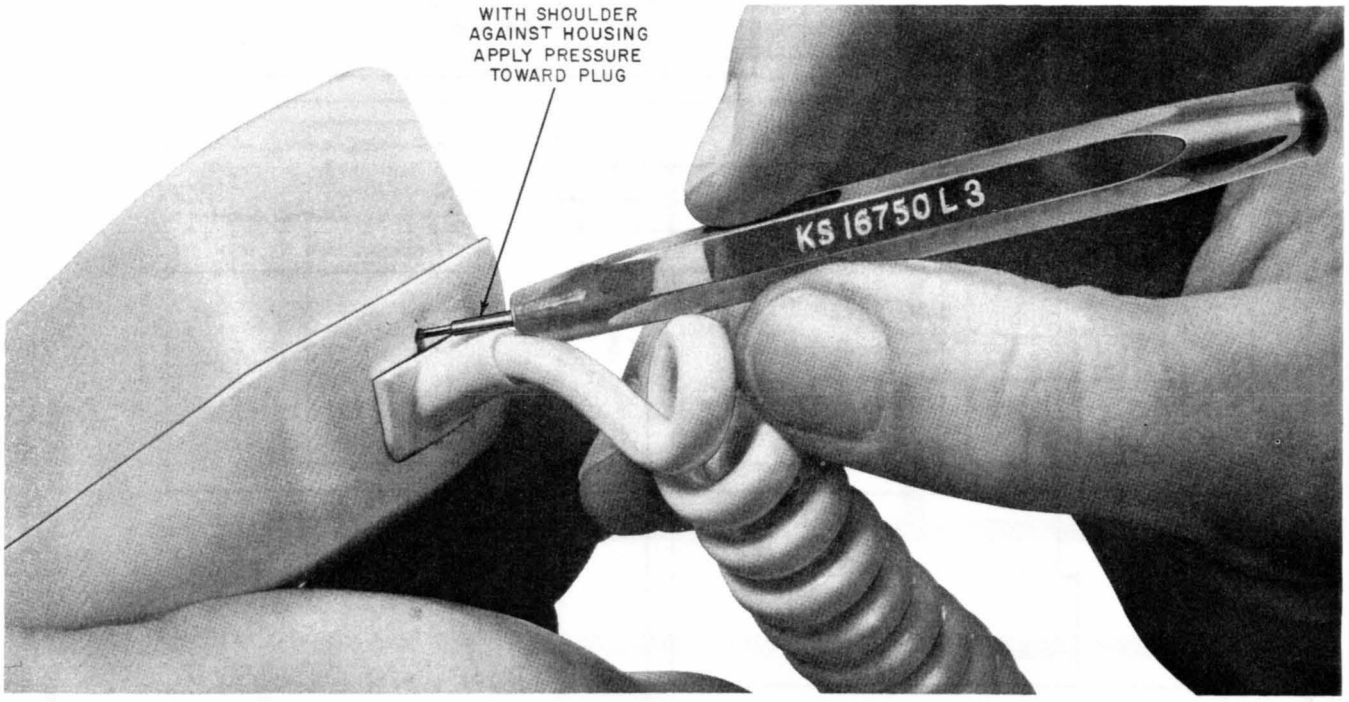


Fig. 12—Removing Cord From TRIMLINE Hand Telephone Set

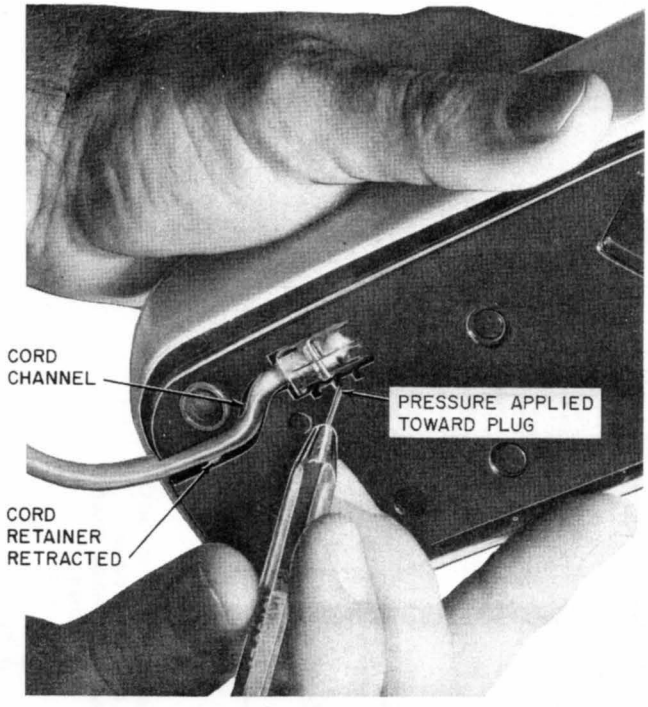


Fig. 13—Removing Mounting Cord From AD1 Telephone Base

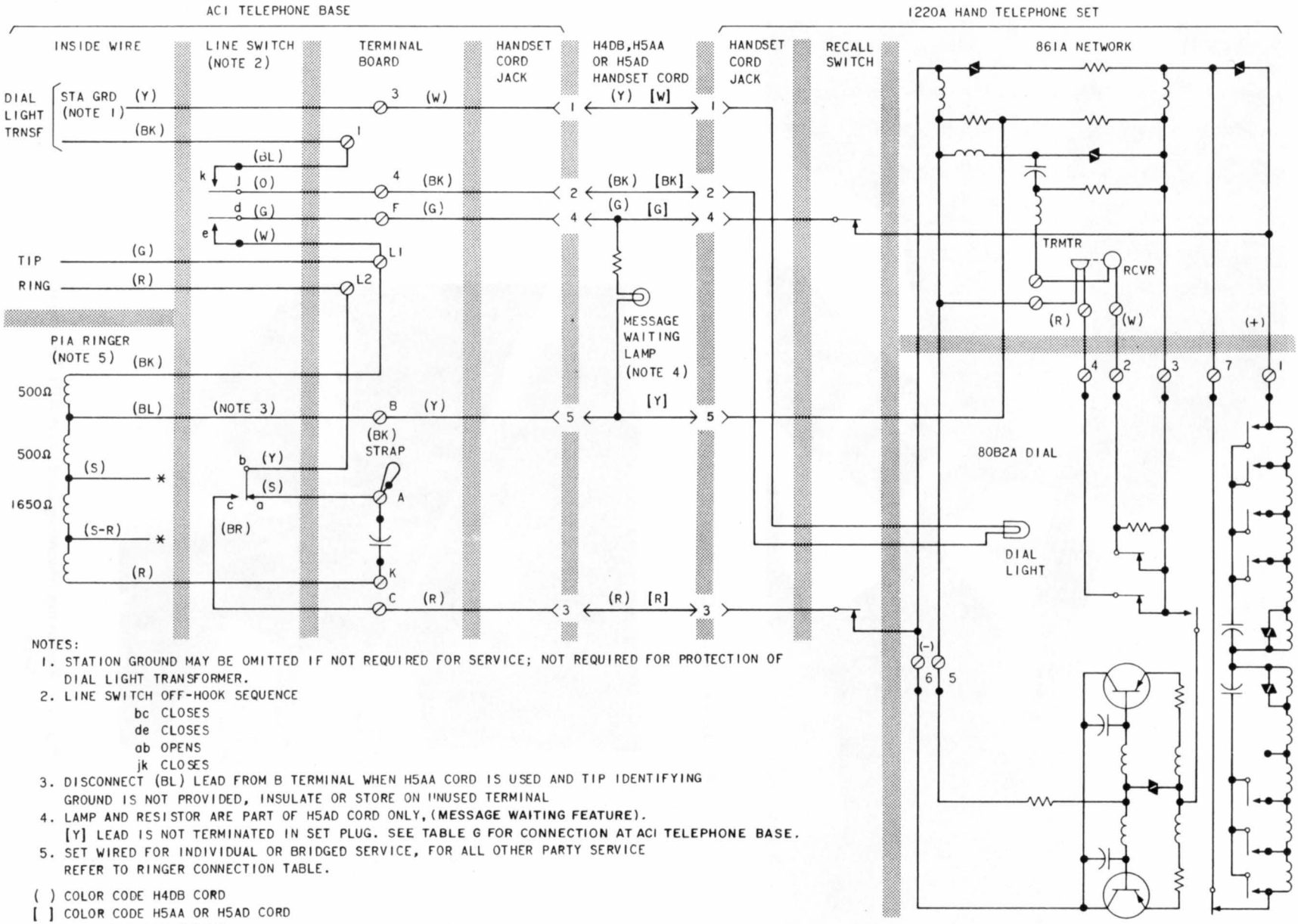
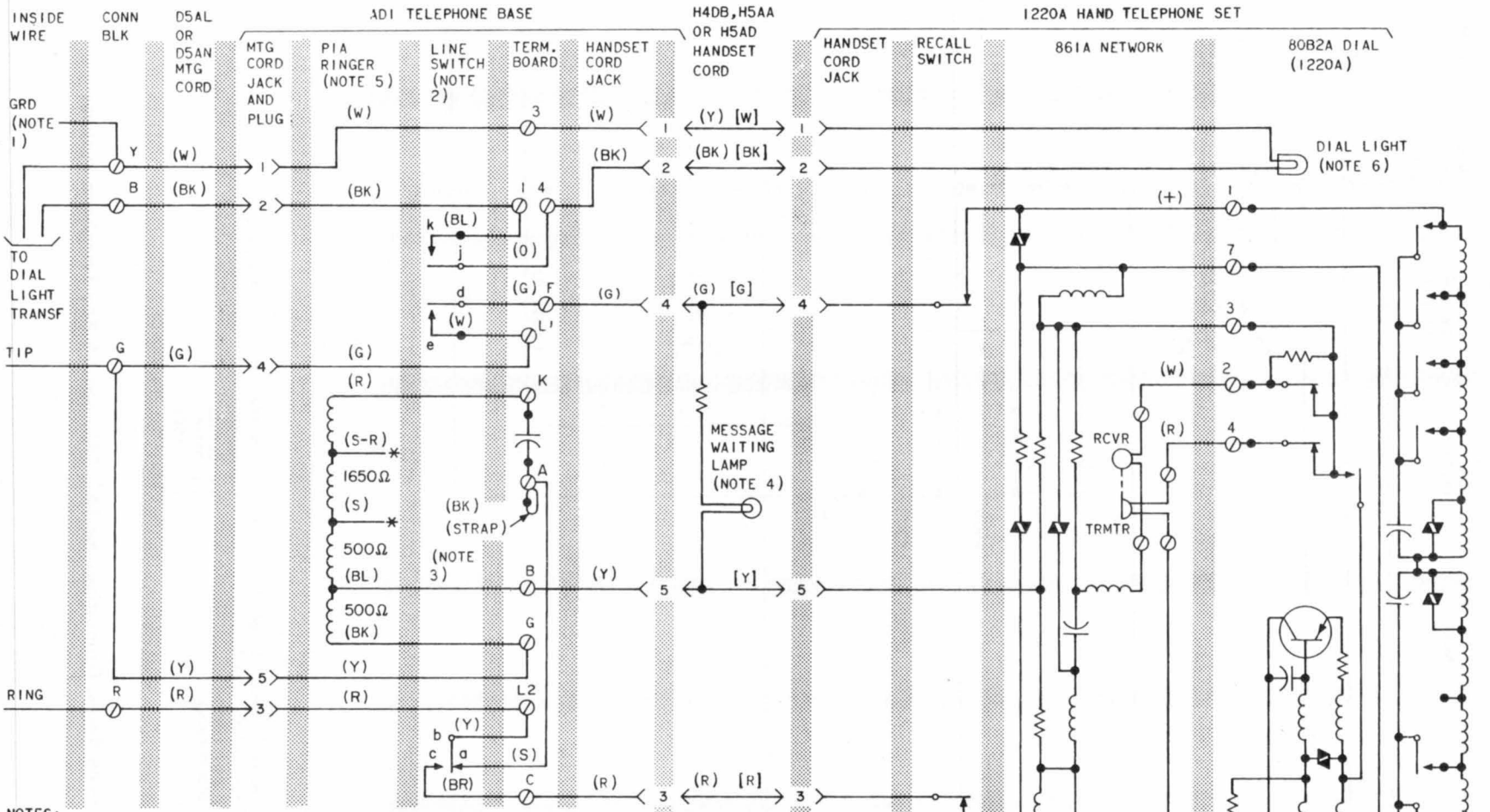


Fig. 14—1220A Hand Telephone Set and AC1 Telephone Base, Wiring Diagram

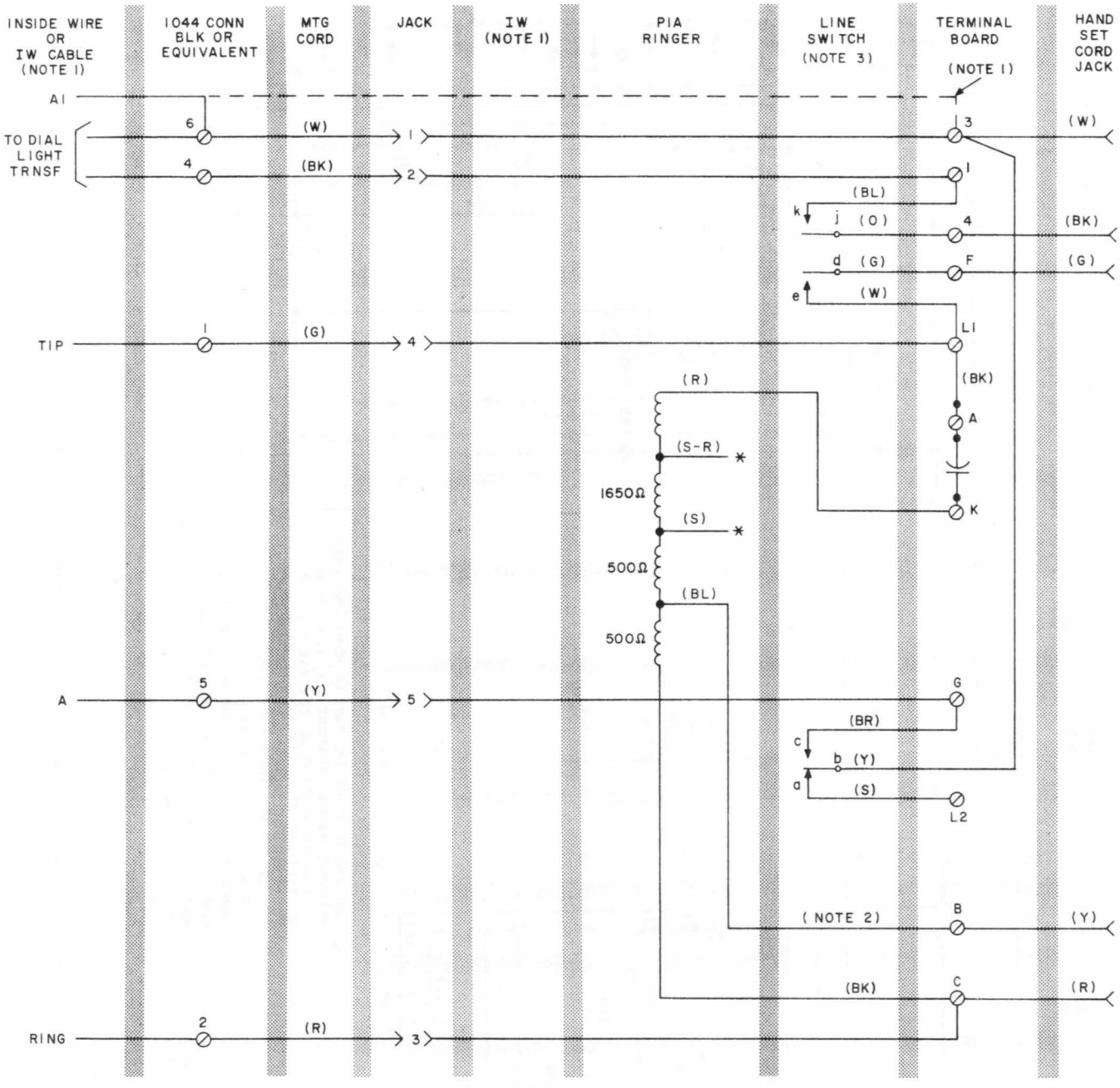


NOTES:

1. STATION GROUND MAY BE OMITTED IF NOT REQUIRED FOR SERVICE; NOT REQUIRED FOR PROTECTION OF DIAL LIGHT TRANSFORMER.
2. LINE SWITCH OFF-HOOK SEQUENCE:
   bc CLOSES
   de CLOSES
   ab OPENS
   jk CLOSES
3. DISCONNECT (BL) LEAD FROM B TERMINAL WHEN H5AA CORD IS USED AND TIP IDENTIFYING GROUND IS NOT PROVIDED, INSULATE OR STORE ON UNUSED TERMINAL.
4. LAMP AND RESISTOR ARE PART OF H5AD CORD ONLY, (MESSAGE WAITING FEATURE). [Y] LEAD IS NOT TERMINATED IN SET PLUG. SEE TABLE H FOR CONNECTIONS AT AD1 TELEPHONE BASE.
5. SET WIRED FOR INDIVIDUAL OR BRIDGED SERVICE, FOR ALL OTHER PARTY SERVICE REFER TO RINGER CONNECTION TABLE.
6. CHANGE TO 53A LAMP IF COMBINED LENGTH OF HAND TELEPHONE SET CORD AND (AD1 BASE) MOUNTING CORD EXCEEDS 15 FEET.

( ) COLOR CODE H4DB CORD
[ ] COLOR CODE H5AA OR H5AD CORD.
* INSULATE AND STORED.

Fig. 15—1220A Hand Telephone Set and AD1 Telephone Base, Wiring Diagram



NOTES:

1. RUN INSIDE WIRE DIRECTLY TO TERMINAL BOARD WHEN AC1 BASE IS USED AND TO CONNECTING BLOCK WHEN AD1 BASE IS USED.
2. DISCONNECT (BL) LEAD FROM TERMINAL B WHEN H5AA CORD IS USED, INSULATE OR STORE ON UNUSED TERMINAL.
3. LINE SWITCH OFF-HOOK SEQUENCE
   b-c CLOSES
   d-e CLOSES
   a-b OPENS
   j-k CLOSES

* INSULATED AND STORED

Fig. 16—AC1 and AD1 Telephone Bases, Connections for 1A1, 1A2, and 6A Key Telephone Systems

TABLE B

CONVERSION FOR USE WITH 1A1, 1A2, AND 6A KTS

LEAD		COLOR	TERMINAL BOARD	
			FROM	TO
Line Switch		BR S Y	C A L2	G L2 3
Ringer	AC1	BK	L1	C
	AD1	BK	G	C
Mtg Cord or IW		R	L2	C
Capacitor Strap		BK	A	L1

TABLE C

AC1 (WALL) TELEPHONE BASE CONNECTIONS FOR 2-PARTY SERVICE

WIRE OR LEAD		COLOR	RING PARTY	TIP PARTY	
				NO IDENT GROUND	WITH IDENT GROUND (NOTE 1)
Inside Wire	Ring	R	L2	L1	L1
	Tip	G	L1	L2	L2
	GRD	Y	3	3	3
	TRNSF	BK	1	1	1
Ringer Leads (Note 2)		R	K	K	K
		BK	3	3	3
		BL	B	B	B
Handset Cord Jack		R	C	F	F
		G	F	C	C

Notes:

1. Same connections used for either 1000 or 2650 ohm Central Offices. For tip party identifying ground — 1000Ω or 2650Ω H5AA cord must be used.
2. To permanently silence ringer; move (R) ringer lead from K to G on terminal board. For tip party identification (BK) ringer lead must remain on G of terminal board.

* Disconnect (BL) lead from terminal B when H5AA cord is used and tip identifying ground is not provided, insulate or store on unused terminal.

TABLE D

AD1 (DESK) TELEPHONE BASE CONNECTIONS FOR 2-PARTY SERVICE

WIRE OR LEAD		COLOR	RING PARTY	TIP PARTY	
				NO IDENT GROUND	WITH IDENT GROUND (NOTE 1)
Inside Wire at Conn Block	Ring	R	R	R	R
	Tip	G	G	G	G
	GRD	Y	Y	Y	Y
	TRNSF	R	Y	Y	Y
		G	B	B	B
Mtg Cord at Conn Block		R	R	G	G
		G	G	R	R
		Y	Y	Y	Y
		BK	B	B	B
		W	Y	Y	Y
Mtg Cord in Tel Base		R	L2	L2	L2
		G	L1	L1	L1
		Y	G	G	G
		BK	1	1	1
		W	3	3	3
Ringer Leads (Note 2)		R	K	K	K
		BK	G	G	G
		BL	B	B	B
Handset Cord Jack		R	C	F	F
		G	F	C	C

Notes:

1. Same connections used for either 1000 or 2650 ohm Central Offices. For tip party identifying ground — 1000Ω or 2650Ω H5AA cord must be used.
2. To permanently silence ringer; move (R) ringer lead from K to G on terminal board. For tip party identification (BK) ringer lead must remain on 3 of terminal board.

* Disconnect (BL) lead from terminal B when H5AA cord is used and tip identifying ground is not provided, insulate or store on unused terminal.

TABLE E

CONNECTIONS FOR 4-PARTY FULL SELECTIVE OR 8-PARTY SEMISELECTIVE RINGING USING 426N DIODE

PARTY		LEADS OR COLOR	—RING	—TIP	+RING	+TIP
Line Wire Conn at Conn Block	Ring	R	R	R	R	R
	Tip	G	G	G	G	G
	GRD	Y	Y	Y	Y	Y
Dial Light Transformer Leads		1	Y	Y	Y	Y
		2	B	B	B	B
Mtg Cord at Conn Block		R	R	R	R	R
		G	G	G	G	G
		Y	Y	Y	Y	Y
		W	Y	Y	Y	Y
		BK	B	B	B	B
Mtg Cord or Inside Wire at Term. Board		R	L2	L2	L2	L2
		G	L1	L1	L1	L1
		Y	3	3	3	3
		W	3	3	3	3
		BK	1	1	1	1
426N Diode *		①	L2	L1	3	3
		②	G	G	G	G
Ringer Leads		BK	K	K	K	K
		R	3	3	L2	L1
		S	†	†	†	†
		S-R	G	G	G	G
		BL	B	B	B	B
Strap From A		BK	3	3	L2	L1
Line Switch		S	†	†	†	†

* ① Flanged (Gold) base installed in enlarged part of opening, see Fig. 9.
② Knob end (housing tip).

† Insulate and store.

TABLE F

P-90D231 POLARITY GUARD ASSEMBLY CONNECTIONS (AC1 OR AD1 TELEPHONE BASE)

WIRE OR LEAD	COLOR	REMOVE FROM	CONNECT TO	
		TERMINAL BOARD	POLARITY GUARD ASSEMBLY	TERMINAL BOARD
Handset Cord Jack	R G	C F	Term. R Term. T	
Polarity Guard Assembly	R G			C F

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

TABLE G

MESSAGE WAITING LAMP IN CORD CONNECTIONS FOR 1220A HAND TELEPHONE SET TO AC1 TELEPHONE BASE

CORD OR INSIDE WIRE	LEAD	AC1 TERM. BOARD	
		REMOVE FROM	CONNECT TO
Inside Wire	G		L1
	R		L2
Handset Cord Jack Leads	W		3
	BK		4
	R		C
	G	F	L1
	Y	B	L2

TABLE H

MESSAGE WAITING LAMP IN CORD CONNECTIONS FOR 1220A HAND TELEPHONE SET TO AD1 TELEPHONE BASE

CORD OR SET WIRING	LEAD	AD1 TERM. BOARD	
		REMOVE FROM	CONNECT TO
Set Wiring	G		L1
	R		L2
Handset Cord Jack Leads	W		3
	BK		4
	R		C
	G	F	L1
	Y	B	L2