

220-, 226-, 2220-, AND 2226-TYPE HAND TELEPHONE SETS IDENTIFICATION, INSTALLATION, CONNECTIONS, AND MAINTENANCE

1. GENERAL

1.01 This section contains information for the 220-, 226-, 2220-, and 2226-type hand telephone sets (Fig. 1, 2, and 3).

1.02 The reasons for reissuing this section are listed below. Revision arrows are used to emphasize the more significant changes.

- Add the 315B amplifier for 226A hand telephone set
- Show the 315A amplifier (MD) for 226A hand telephone sets
- Change Fig. 25 and 26.

2. IDENTIFICATION

2.01 The 220A (MD), 220C, 220AL, 220AM, and 226A rotary dial and 2220B (MD), 2220C, 2220BM, and 2226A TOUCH-TONE* dialing hand telephone sets are intended for use with other components and apparatus to make up a complete telephone set. Refer to Table A for identification of associated apparatus.

2.02 These handsets are presently used with the TRIMLINE* telephone, Transaction, Elevator, Conference, and some DESIGN LINE† decorator telephones.

2.03 They consist primarily of a plastic deck and shell, a dial, flexible circuit board (network), handset cord jack, transmitter, and receiver units.

2.04 The 220A (MD) and 2220B handsets are equipped with jacks which accept the large

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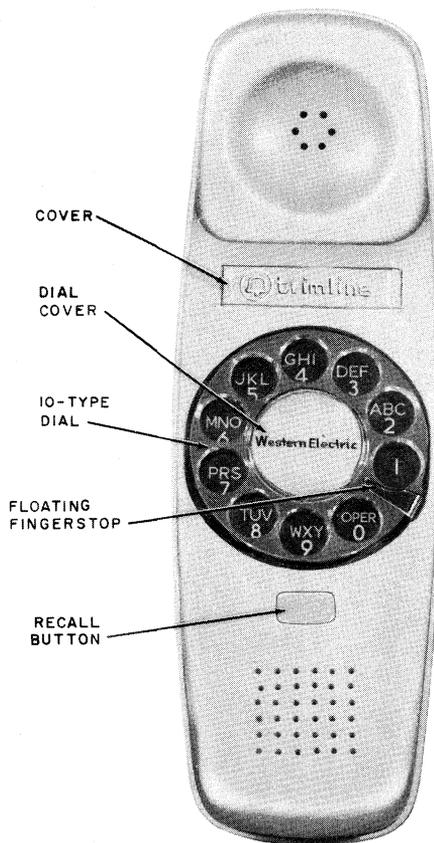


Fig. 1—220-Type Hand Telephone Set

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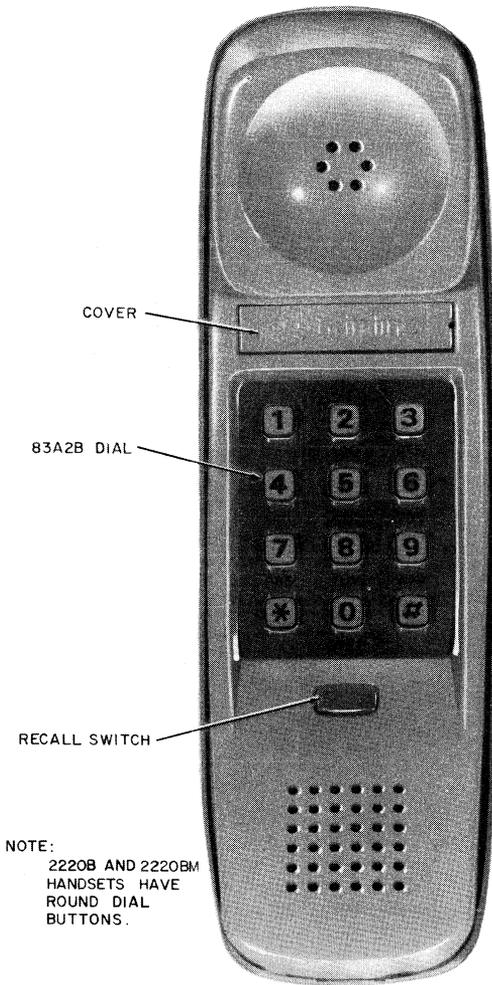


Fig. 2—2220C Hand Telephone Set

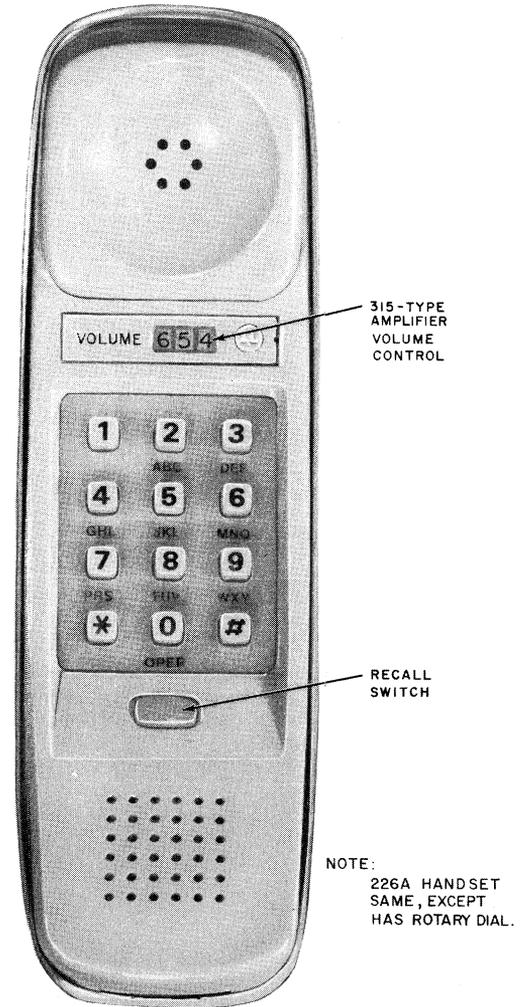


Fig. 3—2226A Hand Telephone Set

(maxi) plug of the H4DB, H5AA, or H5AD handset cord. The 220C, 220AL, 220AM, 226A, 2220C, 2220BM, and 2226A handsets are equipped with jacks and/or adapters which accept the small (mini) plug of the H4DU (modular) handset cord (Fig. 4).

2.05 The 220A (MD), 220AM, 2220B (MD), and

2220BM handsets are equipped with a dial light which requires an external power source (2012A (MD) or 2012C transformer) or equivalent 6-volt supply. The 220C, 220AL, 226A, 2220C, and 2226A handsets are equipped with light emitting diodes (LED) for dial illumination. Power to light these dials is supplied by CO battery over the incoming line

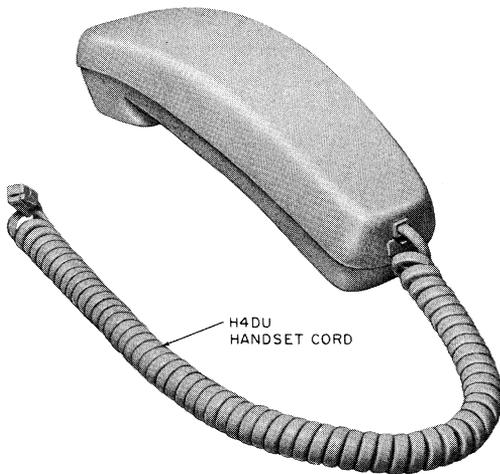


Fig. 4—H4DU Handset Cord Installed in Hand Telephone Set

and no local power is required. The 220C, 220AL, and 226A rotary dial handsets are stamped LED at location shown in Fig. 5. The LED equipped TOUCH-TONE† telephone dial handsets can be identified by the square dial buttons.

2.06 The 226A and 2226A handsets contain an amplifier which provides up to 20dB of receiver gain for customer's with impaired hearing or use in noisy locations.

2.07 When an LED-type hand telephone set is provided, instruct the customer that during the time a TOUCH-TONE telephone dial button is depressed the dial light will be extinguished, and with the rotary-type dial, light will flicker during the run down operation of the dial.

2.08 For tip party with identifying ground when the LED-type hand telephone sets are provided, it will be necessary to open the handset and make connections as indicated in paragraphs 3.04 and 3.05.

Ordering Guide

2.09 Basic Handsets:

- Set, Telephone, Hand, 220C-‡

‡ Refer to Table B for color suffix.



Fig. 5—220C, 220AL, and 226A Hand Telephone Set Identification Stamping (LED)

- Set, Telephone, Hand, 220AL-‡
- Set, Telephone, Hand, 220AM-‡
- Set, Telephone, Hand, 226A-‡ (for persons with impaired hearing or noisy location)
- ♦Set, Telephone, Hand, 2220C-‡ (includes polarity guard)♦
- Set, Telephone, Hand, 2220BM-‡
- Set, Telephone, Hand, 2226A-‡ (for persons with impaired hearing or noisy location)
- ♦Set, Telephone, Hand, 2220BMG-‡ (includes polarity guard)♦

2.10 Replaceable Components:

TABLE A

IDENTIFICATION OF "TRIMLINE" TELEPHONE COMPONENTS AND ASSOCIATED APPARATUS (Note 1)

HAND TEL SET CODE	METHOD OF IDENT.	TEL BASE CODE	WALL JACK OR MTG CORD CODE	HANDBSET CORD CODE	BASE HANDBSET JACK ADAPTER CODE	HAND TEL SET JACK ADAPTER CODE	METHOD OF PROVIDING TIP PARTY IDENT. GRD
220A or 2220B	Large Handset Cord Jack With Code Stenciled Inside on Shell	AC1, AC1P	630A (AC1P)	H4DB	None	None	H5AA Cord
		AD1	D5AL				
		AD2	D4BU	H4DU	231B (AD2)	227D	None Note 3
		AC2, AC2P	630A (AC2P)				
		AD2, AD3	D4BU				
220AM or 2220BM	227D Adapter in Handset Jack of a 220A or 2220B	AC1, AC1P	630A (AC1P)	H4DU	231B	227D†	Note 4
		AD1	D5AL				
		AD2	D4BU	H4DU	None	227D†	None Note 3
		AC2, AC2P	630A (AC2P)				
		AD2, AD3	D4BU				
220AL	LED Printed Under Fingertop. 227D Adapter in Handset Jack	AC1, AC1P	630A (AC1P)	H4DU	231B	227D*	D-180824 Kit of Parts
		AD1	D5AL				
		AD2	D4BU	H4DU	231B (AD2)		
		AC2, AC2P	630A (AC2P)				
		AD2, AD3	D4BU				
2220C (Early Version)	(4) Wire Springs in Handset Jack. Square Buttons (2220C) (Minimodular)	AC1, AC1P	630A (AC1P)	H4DU	231B	None	D-180825 Kit of Parts Note 2
		AD1	D5AL				
		AD2	D4BU	H4DU	231B (AD2)		
		AC2, AC2P	630A (AC2P)				
		AD2, AD3	D4BU				
220C, 226A, 2220C (Late Version) or 2226A	LED Printed under Fingertop (220C and 226A) Square Buttons on Dial (2220C and 2226A) (Minimodular)	AC1, AC1P	630A (AC1P)	H4DU	231B	None	
		AD1	D5AL				
		AD2	D4BU	H4DU	231A (AD2)		
		AC2, AC2P	630A (AC2P)				
		AD2, AD3	D4BU				

Note 1. All components and apparatus are ordered separately.

Note 2. The 2220C (early versions) do not require the 282B adapter.

Note 3. This combination of components can not be wired for tip party identification.

Note 4. 227D and 231B adapters must be removed for tip party identification and H5AA handset cord provided.

* Factory Installed.

† Field or service center installed.

◆ TABLE B ◆

COLOR SELECTION

COLOR	SUFFIX	COVER 226A, 2226A	COVER 220A, 220C, 220AL, 220AM, 2220B, 2220C, 2220BM	DIAL COVER 220A, 220C, 220AL, 220AM, 226A	DECK 220C, 226A (SEE NOTE)	SHELL 220C, 226A (SEE NOTE)	DECK 2220C, 2226A (SEE NOTE)	SHELL 2220C, 2226A (SEE NOTE)
Black	-03	841376759	840431035	818850034 (P-88E003)	841375504	841375256	841356751	841356504
Ivory	-50	841376767	840431506	818850505 (P-88E050)	841375520	841375272	841356777	841356520
Green	-51	841376775	840431514	818850513 (P-88E051)	841375538	841375280	841356785	841356538
Red	-53	841376783	840431530	818850539 (P-88E053)	841375546	841375298	841356793	841356546
Yellow	-56	841376791	840431563	818850562 (P-88E056)	841375553	841375306	841356801	841356553
White	-58	841376809	840431589	818850588 (P-88E058)	841375561	841375314	841356819	841356561
Lt. Beige	-60	841376817	840431605	818850604 (P-88E060)	841375579	841375322	841356827	841356579
Aqua Blue	-62	841376825	840431621	818850620 (P-88E062)	841375587	841375330	841356835	841356587
Brown	-104	841376833	840431100	818850109 (P-88E010)	841375595	841375348	841356876	841356629
Rust	-124	841376882	840431126	818850125 (P-88E012)	841375603	841375355	841356918	841356660

Note: These are the only recommended deck and shells to be replaced in field.

- Lamp, 51B or 53B (use 53A for replacement)
- Cover, Dial (Fig 1 and Table B)
- Cover (Fig. 1, 3 and Table B)
- 812362382 (P-23F238) Light Seal Plate (220A [MD], 220AM, 2220B [MD], and 2220BM only)
- Deck (220C and 2220C), Table B
- Shell (220C and 2220C), Table B
- ◆Amplifier, 315A (MD) (226A only)◆
- Amplifier, 315B ◆(226A and 2226A only)◆
- Unit, Transmitter, T1 §
- Unit, Receiver, LB-Type §
- Adapter, 227D-29 (220AL, 220AM, and 2220BM only).

2.11 **Optional Apparatus (ordered separately):**

- D-180719 Kit of Parts (220C, 226A, 2220C, and 2226A only) provides inductive hearing aid pickup
- ◆D-180984◆ Kit of Parts (2220B (MD) and 2220BM only) polarity guard, install in associated hand telephone set when indicated on service order
- D-180824 Kit of Parts (220AL only) tip party identification
- D-180825 Kit of Parts (220C, 226A, 2220C, and 2226A only) tip party identification
- D-180891 Kit of Parts (2220C and 2226A only) Radio Frequency Interference (RFI) only if RFI is received when hand telephone set is on-hook. Refer to Section 500-150-100 for additional information on RFI.

2.12 **Design Features:**

- Dial located in handset (rotary or TOUCH-TONE telephone dial)

§ 220C, 226A, 2220C, and 2226A only.

- Illuminated dial
- Plug-ended handset cord
- Equipped with a recall switch to make repeated calls without hanging up handset
- Polarity Guard (factory provided, 2220C, ◆2220BMG,◆ and 2226A only).

3. **INSTALLATION**

3.01 The plastic deck and shell of these handsets are held together by two screws located under the cover above the dial (Fig. 6). If necessary to open hand telephone set, refer to paragraphs 3.02 and 3.03.

3.02 **Removal of Hand Telephone Set Cover (Shell).**

Caution: *Be careful not to insert tip of the releaser too deep or mar the handset housing. Under no circumstances should a screwdriver be used.*

- (1) Use a KS-21107L1 tool or equivalent to remove the cover located above the dial.
- (2) Carefully back out the two exposed screws with a 3/16-inch blade screwdriver.
- (3) Remove handset cover (shell).

Note: If the D-180719 Kit of Parts is required, the chassis can be removed from the desk on the 220C, 226A, 2220C, and 2226A handsets by removing four (4) mounting screws (Fig. 7).

3.03 **Replacement of Hand Telephone Set Cover.**

- (1) Hook the opening in the cover (shell) under the lip of the deck (located below the handset cord jack).
- (2) Gently push the shell and deck together.
- (3) Tighten the two captive screws.
- (4) Replace cover above dial.



Fig. 6—Location of Housing Screws

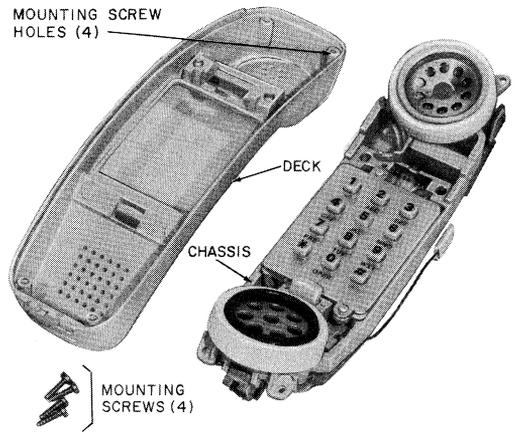


Fig. 7—2220C Hand Telephone Set With Chassis Assembly Removed from Deck

A. Tip Party Identification (D-Kits of Parts)

D-180824 (220AL)

3.04 If tip party identification is required, install a D-180824 Kit of Parts in the 220AL hand telephone set as follows.

- (1) Remove shell from handset, paragraphs 3.01 and 3.02
- (2) Remove the existing 227D adapter from the handset cord jack by grasping adapter on both sides and pulling outwards.
- (3) Install the 227C adapter from the kit of parts into the handset cord jack (Fig. 8).
- (4) Connect the (Y) and (BK) spade-tipped leads to terminals A and 4, respectively, of the network (Fig. 8).
- (5) The 840362776 terminal board, furnished in the kit, mounts in the associated telephone base, refer to Section 502-303-101 or 502-322-400 for installation and connection information.
- (6) Replace the handset shell, paragraph 3.03.

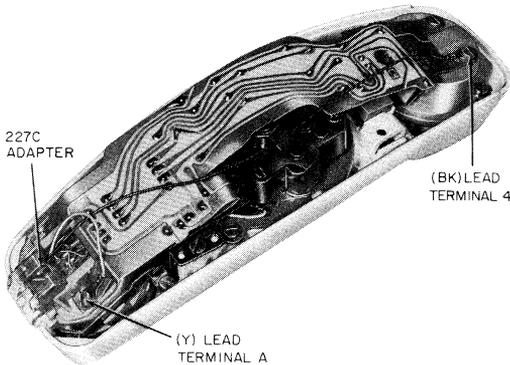


Fig. 8—D-180824 Kit of Parts Installed in 220AL Hand Telephone Set

D-180825 (220C, 226A, 2220C, and 2226A)

3.05 Install D-180825 Kit of Parts in 220C, 226A, 2220C, and later version 2220C hand telephone set as follows.

- (1) Remove shell from handset, paragraphs 3.01 and 3.02.
- (2) Install the 282A (MD) or 282B adapter onto the existing handset cord jack by positioning the adapter on the handset cord jack body as shown in Fig. 9. Slide the adapter into the jack body until locked into place. When correctly assembled, the two gold wire contact springs of the adapter will be positioned in the formerly vacant slots of the jack paralleling the existing gold contact springs (Fig. 9).
- (3) Connect the (Y) and (BK) spade-tipped leads of the adapter to terminals A and 4, respectively, of the network.

Note: The 282-type adapter is not required in early version 2220C handsets since the handset cord jacks are equipped with (W) or (Y) and (BK) spade-tipped leads which should be removed from their stored locations and connected to terminals A and B or 4, respectively.

- (4) The 840362776 terminal board, furnished in the kit, mounts in the associated telephone

base, refer to Section 502-303-101 or 502-322-400 for installation and connection information.

- (5) Replace the handset shell, paragraph 3.03.

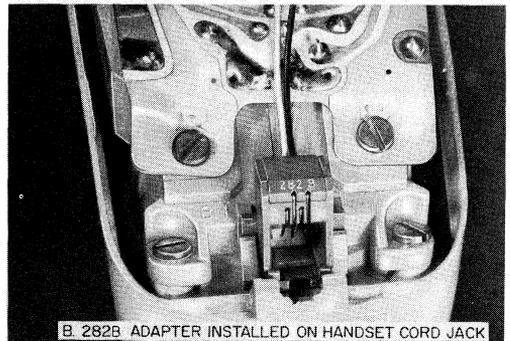
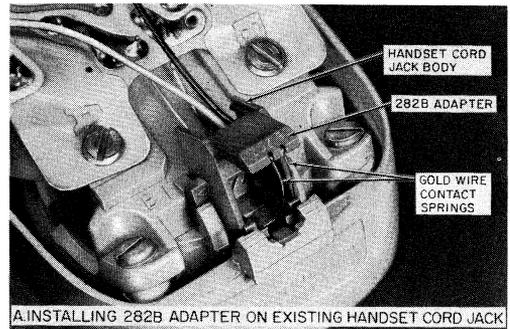


Fig. 9—D-180825 Kit of Parts Installed in 220C, 226A, 2220C, or 2226A Hand Telephone Set

B. D-180891 Kit of Parts (2220C and 2226A only) RFI Modification (Fig. 10)

3.06 To prevent RFI in the on-hook position when the early version 2220C handset (identified by four contact springs in the handset cord jack) is provided, install kit of parts as follows.

- (1) Remove the shell from handset, paragraphs 3.01 and 3.02.

- (2) Connect the insulated and stored (Y) handset cord jack lead and one end of the (Y) 824612527 (P-46J252) lead assembly furnished in the kit together using a D-161488 connector (ordered separately). Insulate the connector.
- (3) Remove the screw from the flexible circuit tab (network) at receiver terminal C and insulate the tab.
- (4) Insulate the shank portion of the other end of the (Y) spade-tipped lead assembly and connect to the receiver terminal vacated by the flexible circuit tab.
- (5) Connect the insulated and stored (BK) handset cord jack lead to terminal 5 on the flexible circuit board (network) and insulate the shank portion of the spade tip.
- (6) Replace the handset shell, paragraph 3.03.

Note: The 282B adapter furnished with the kit of parts is not required to convert the (early version) 2220C hand telephone set.



To complete the modification of a TRIMLINE telephone set for RFI, it is necessary to open the AC- or AD-type telephone base and make certain wiring changes. Refer to Section 500-150-100 for wiring connections and Section 502-303-101 for information on removing the base housing.

3.07 To prevent RFI in the on-hook position when the later version 2220C and 2226A handsets (identified by the two contact springs in the handset cord jack) are provided, install kit of parts as follows.

- (1) Remove the shell from handset, paragraphs 3.01 and 3.02.
- (2) Position the 282B adapter furnished in the kit on the existing handset cord jack body as shown in Fig. 9.
- (3) Slide the adapter into the body until locked into place. When correctly assembled, the two gold wire contact springs of the adapter will be positioned in the formerly vacant slots of the jack paralleling the existing gold contact spring (Fig. 9).

- (4) Remove the screw from the flexible circuit tab (network) at receiver terminal C. Insulate the tab.
- (5) Insulate the shank portion of the (BK) adapter spade-tipped lead and connect to the receiver terminal vacated by the flexible circuit tab.
- (6) Connect the (Y) adapter lead to terminal 5 on the flexible circuit board (network). Insulate the shank portion of the spade tip.
- (7) Replace the handset shell, paragraph 3.03.

Note: The (Y) 824612527 (P-46J252) lead assembly furnished with the kit of parts is not required to convert the (late version) 2220C hand telephone set.



To complete the modification of a TRIMLINE telephone set for RFI, it is necessary to open the AC- or AD-type telephone base and make certain wiring changes. Refer to Section 500-150-100 for wiring connections and Section 502-303-101 for information on removing the base housing.

C. Inductive Hearing Aid Pickup (D-180719 Kit of Parts)

3.08 For customer's with telephone pickup type hearing aids, a D-180719 Kit of Parts may be installed in the 220C, 226A, 2220C, and 2226A handsets as follows.

- (1) Remove the shell and deck from the molded plastic chassis assembly (paragraphs 3.01, 3.02 and Fig. 7).
- (2) Twist and lift off the receiver retainer, receiver unit, and receiver grommet from the receiver cup on the chassis assembly.
- (3) Remove the receiver retainer and grommet from the receiver unit and **discard only the retainer and grommet.**
- (4) From the kit of parts (Fig. 11) install the receiver grommet in the field coil assembly with the lip of the grommet protruding outside the assembly.
- (5) Place the receiver unit in the coil assembly (Fig. 12).

- (6) With the receiver unit in place in the coil assembly, install the gasket on top of the receiver unit (Fig. 13). Place complete assembly in the chassis assembly receiver cup.



In order to properly insert the receiver unit with the receiver coil into the receiver cup, hold handset in an upright vertical position with the varistor across the receiver unit at the top. Carefully place unit in the receiver cup and snap retainer to the chassis assembly receiver cup (Fig. 14).

- (7) Loosen the two (2) network receiver cup mounting screws (Fig. 15) on back side of the receiver cup. Terminate one (1) of the black (BK) coil leads under each screw (Fig. 16).
- (8) Reassemble the handset.
- (9) Install the card (Fig. 11) which identifies a coil equipped handset in location where the cover above the dial was removed. Place the (clear) card retainer over the card.
- 3.09** ♦ If a 2220B (MD) or 2220BM hand telephone set is provided and a polarity guard is required, a D-180984 Kit of Parts must be ordered separately and installed in the hand telephone set as follows.

- (1) Remove the shell from the hand telephone set as described in paragraph 3.02.
- (2) Remove the 227D adapter (if provided) from the handset cord jack.
- (3) Plug the polarity guard adapter into vacated jack (Fig. 16).
- (4) Dress the adapter leads as shown in Fig. 16 and replace the hand telephone set shell as described in paragraph 3.03.

Note: If the installation requires tip party identification on a two-party line with automatic number identification, a 2220C hand telephone set must be provided.♦

4. MAINTENANCE

- 4.01** Field maintenance of these hand telephone sets is limited to the replaceable components listed in the ordering guide, paragraph 2.10.

Danger: Exercise caution to prevent the lamp from flying out of the socket in a dangerous manner.

- 4.02** To replace a dial lamp in the 220A (MD), 220AM, 2220B (MD), or 2220BM hand telephone set, remove the cover (Fig. 1). A KS-6320 orange stick can be used to remove the lamp (Fig. 18). In early production handsets use a 553A tool to remove the lamp from its vertical position (Fig. 19).

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

- 4.03** To replace the 315-type amplifier in 226A or 2226A handsets, proceed as follows.

- (1) Remove shell from handset, paragraphs 3.01 and 3.02.
- (2) Remove the network receiver cup mounting screw and the three (3) 315-type amplifier network connecting screws (Fig. 20). Carefully raise the flexible circuit board (network) and remove the amplifier receiver cup mounting screw (Fig. 21). Release the amplifier spring catch by depressing with a KS-21107L1 or equivalent releaser as shown in Fig. 22, and lift amplifier out.

- (3) Install replacement amplifier in reverse order used in removal and reassemble of handset.

- 4.04** To replace a transmitter or receiver unit in 220C, 226A, 2220C, or 2226A handset, proceed as follows.

- (1) Remove shell and chassis from handset paragraphs 3.01, 3.02 and Fig. 7.
- (2) Twist and lift off the transmitter and/or receiver unit, retainer, and grommet from the cup on the chassis.
- (3) Separate the defective unit from the grommet and retainer.
- (4) Install replacement unit in reverse order used in removal and reassemble of handset.



In order to properly insert the receiver unit into the receiver cup, hold handset in an upright vertical position with the varistor across the

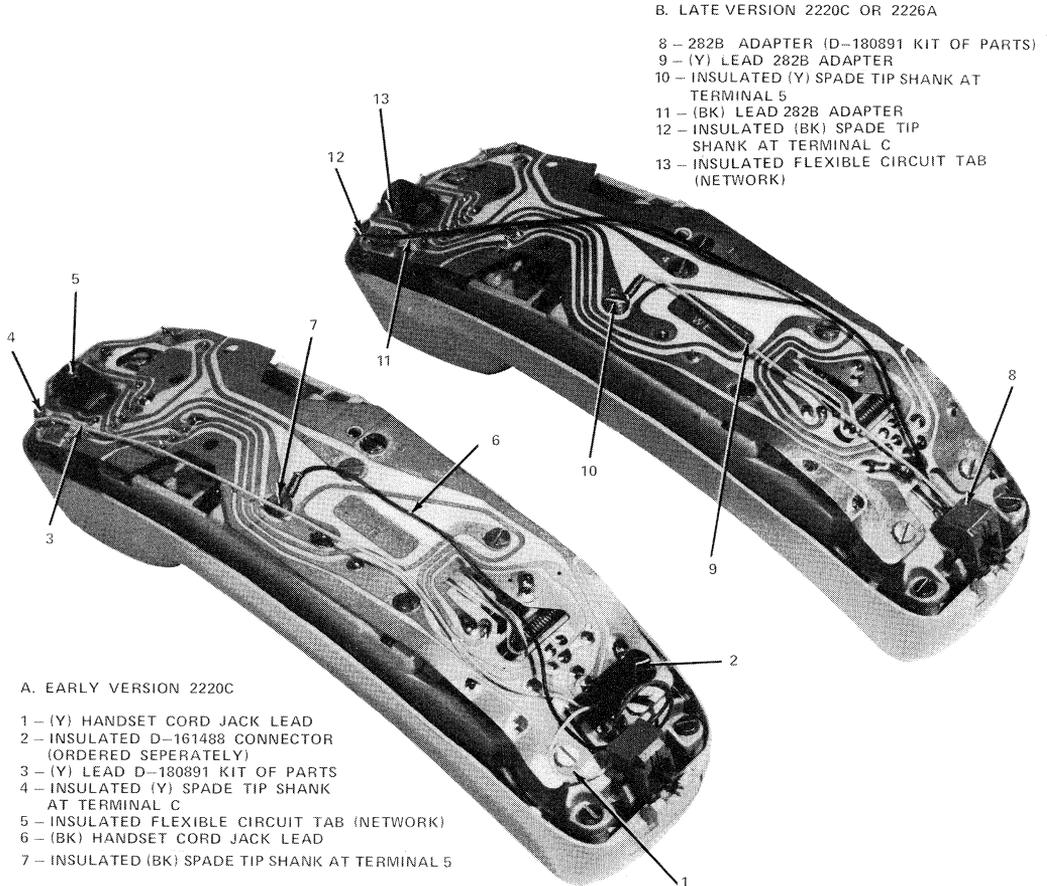


Fig. 10—2220C or 2226A Hand Telephone Set Modified for RFI

receiver unit at the top. Carefully place unit in the receiver cup and snap retainer to the chassis assembly.

5. CONNECTIONS

5.01 To restrict the dial on the 220A (MD), 220AL (early version), or 220AM hand telephone set, place a strap between the pulsing contacts as shown

in Fig. 23. On the 220AL (current version) place a strap between the two (2) screws located on the flexible circuit board above the dial. In the 220C or 226A place an insulated strap between terminals 1 and 2 on the network. The dial will remain in the handset after being restricted in all cases.

5.02 For dial restriction of a TOUCH-TONE telephone dial equipped hand telephone set with-

SECTION 502-303-102

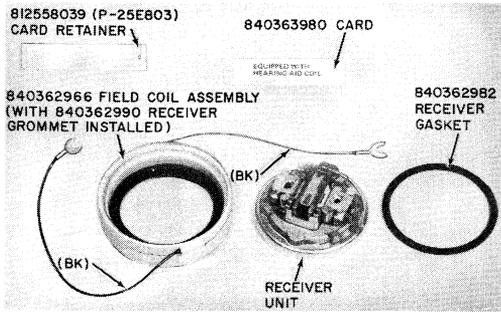


Fig. 11—D-180719 Kit of Parts and Receiver Unit

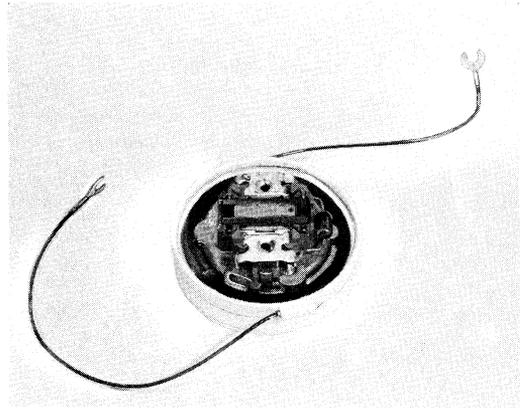


Fig. 13—Receiver Unit and Gasket Installed in Coil Assembly

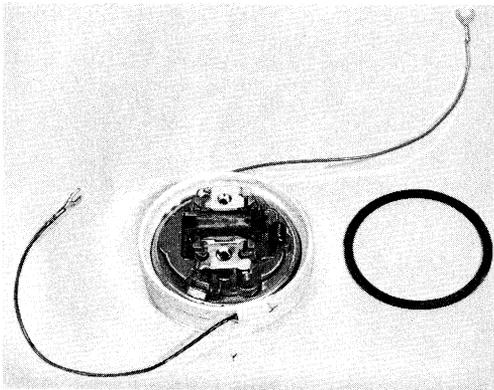


Fig. 12—Receiver Unit Installed in Coil Assembly

out a polarity guard, reverse tip and ring in telephone base and leave dial in handset.

Note: Any handset with a polarity guard installed cannot be restricted.

5.03 Internal connections for the 220-, 226-, 2220-, and 2226-type hand telephone sets are shown in Fig. 24 through 31.

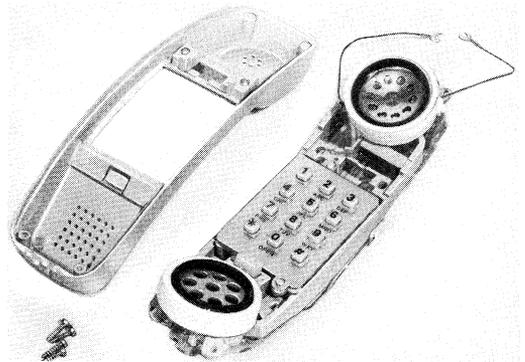


Fig. 14—Field Coil Installed in Receiver Cup of Chassis Assembly

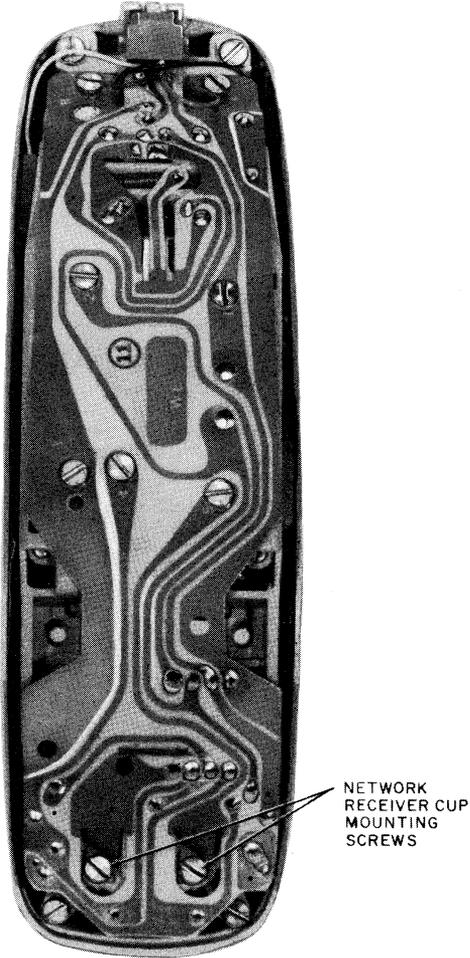
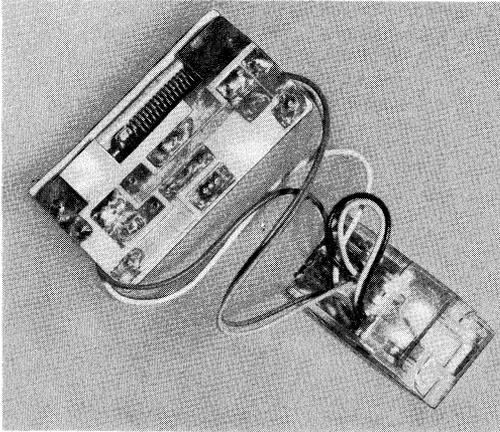
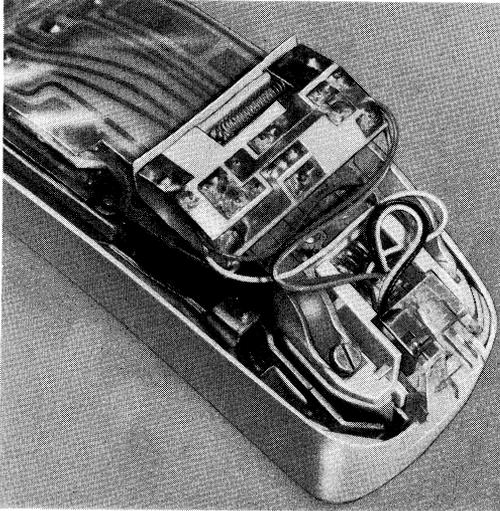


Fig. 15—2220C Hand Telephone Set Showing Location of Network Mounting Screws



A. D-180984 KIT OF PARTS



B. D-180984 KIT OF PARTS, INSTALLED IN HAND TELEPHONE SET

Fig. 16—D-180984 Kit of Parts (Polarity Guard) Installed in 2220B (MD) or 2220BM Hand Telephone Set



Fig. 17—Terminating Field Coil Leads to Receiver Cup Mounting Screws



Fig. 18—Removing Dial Lamp From 2220BM Hand Telephone Set

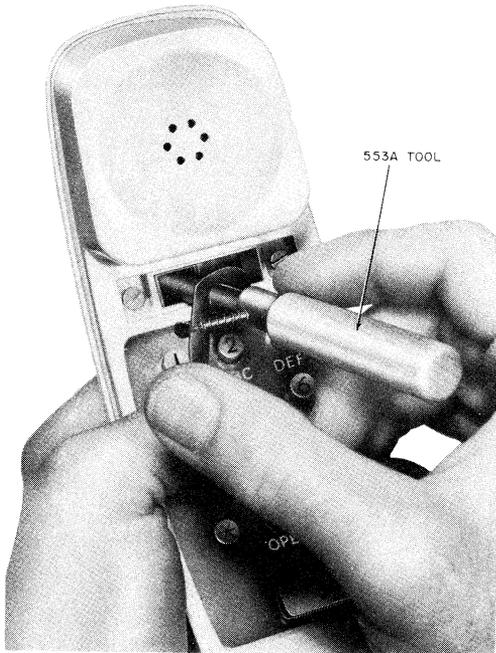


Fig. 19—Removing Dial Lamp Using 553A Tool

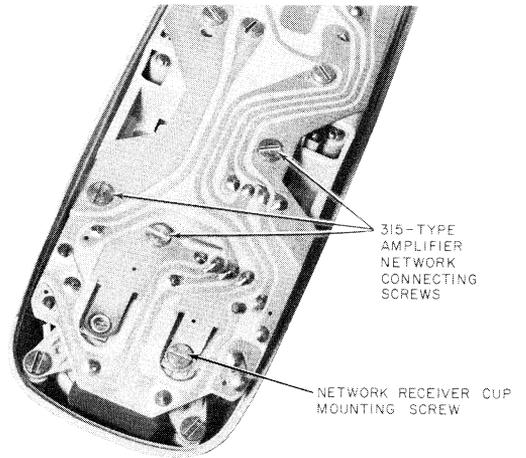


Fig. 20—Location of Mounting Screws Used to Connect Amplifier in Hand Telephone Set

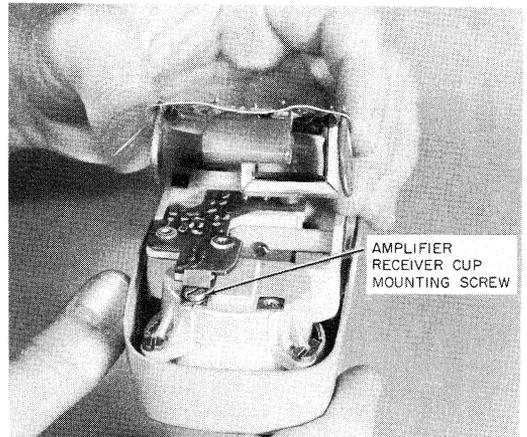
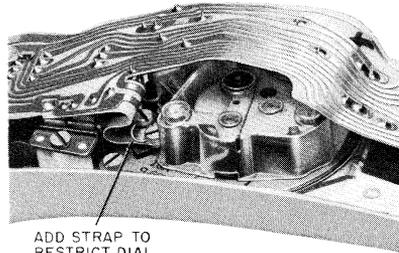


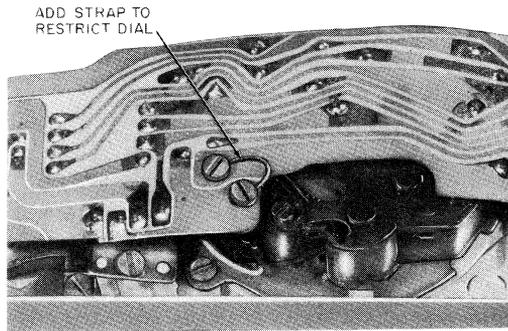
Fig. 21—Fastening Amplifier to Receiver Unit Cup of Hand Telephone Set



Fig. 22—Releasing Spring Catch on 315-Type Amplifier



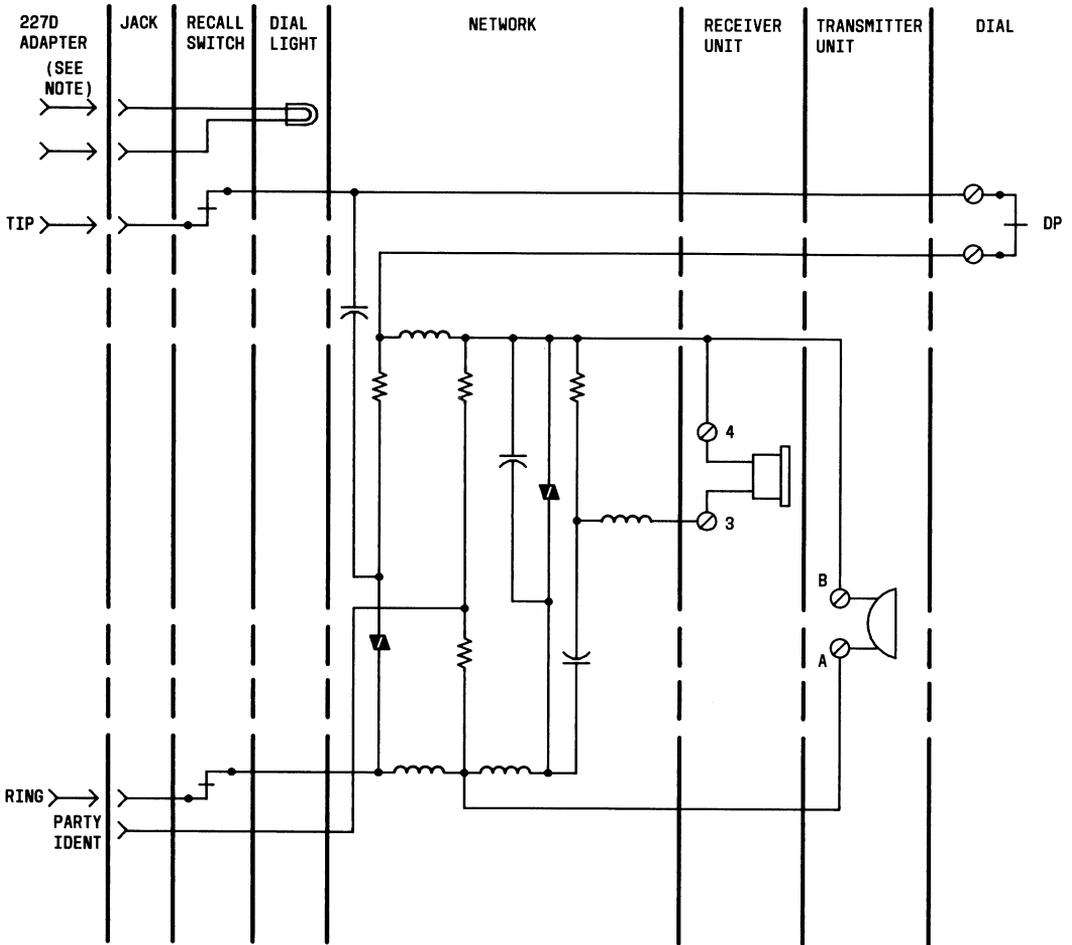
A. 220A (MD), 220 AL (EARLY VERSION) AND 220 AM HAND TELEPHONE SETS



B. 220AL (CURRENT VERSION) HAND TELEPHONE SET

Fig. 23—Restricting Dial of 220A (MD), 220AL (Early Version), or 220AM Hand Telephone Set

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NOTE: PROVIDED WITH 220AM HANDSET ONLY.
 DP - DIAL PULSE CONTACTS

Fig. 24—Schematic of 220A (MD) and 220AM Hand Telephone Set

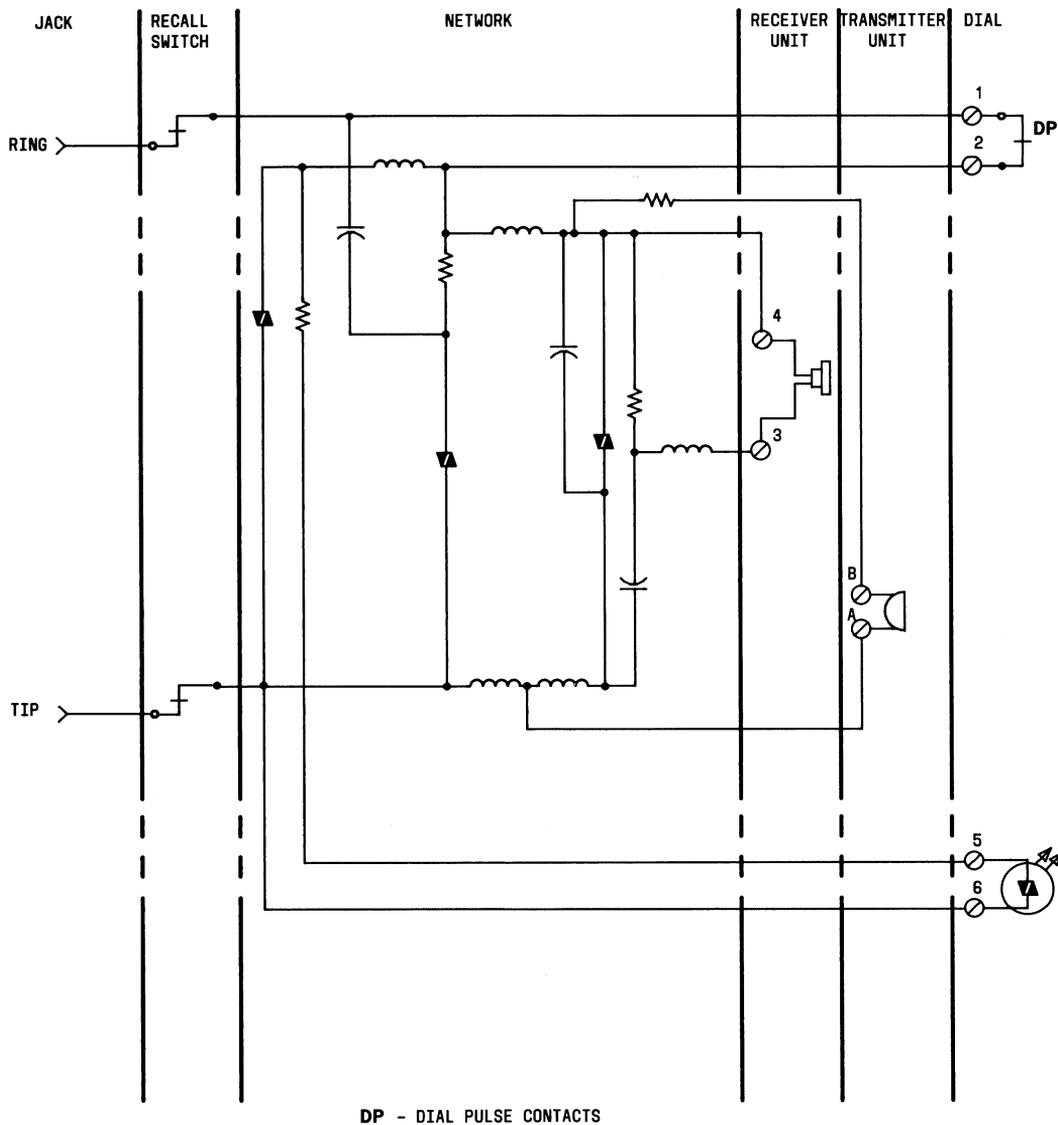


Fig. 25—Schematic of 220C Hand Telephone Set

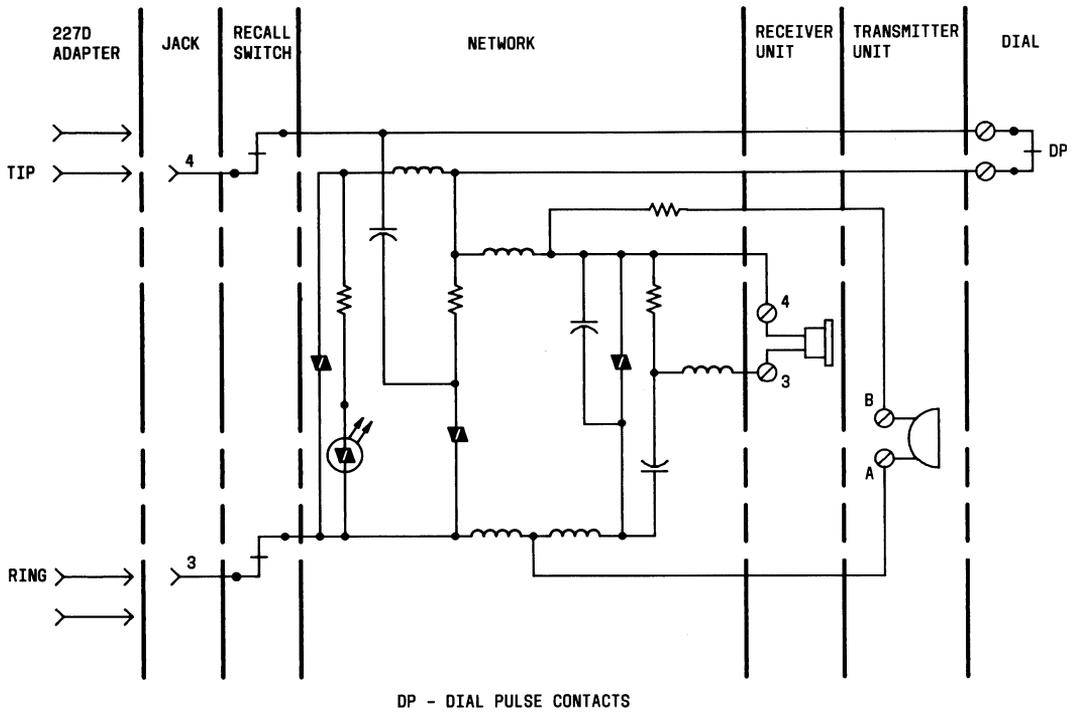


Fig. 26—Schematic of 220AL Hand Telephone Set

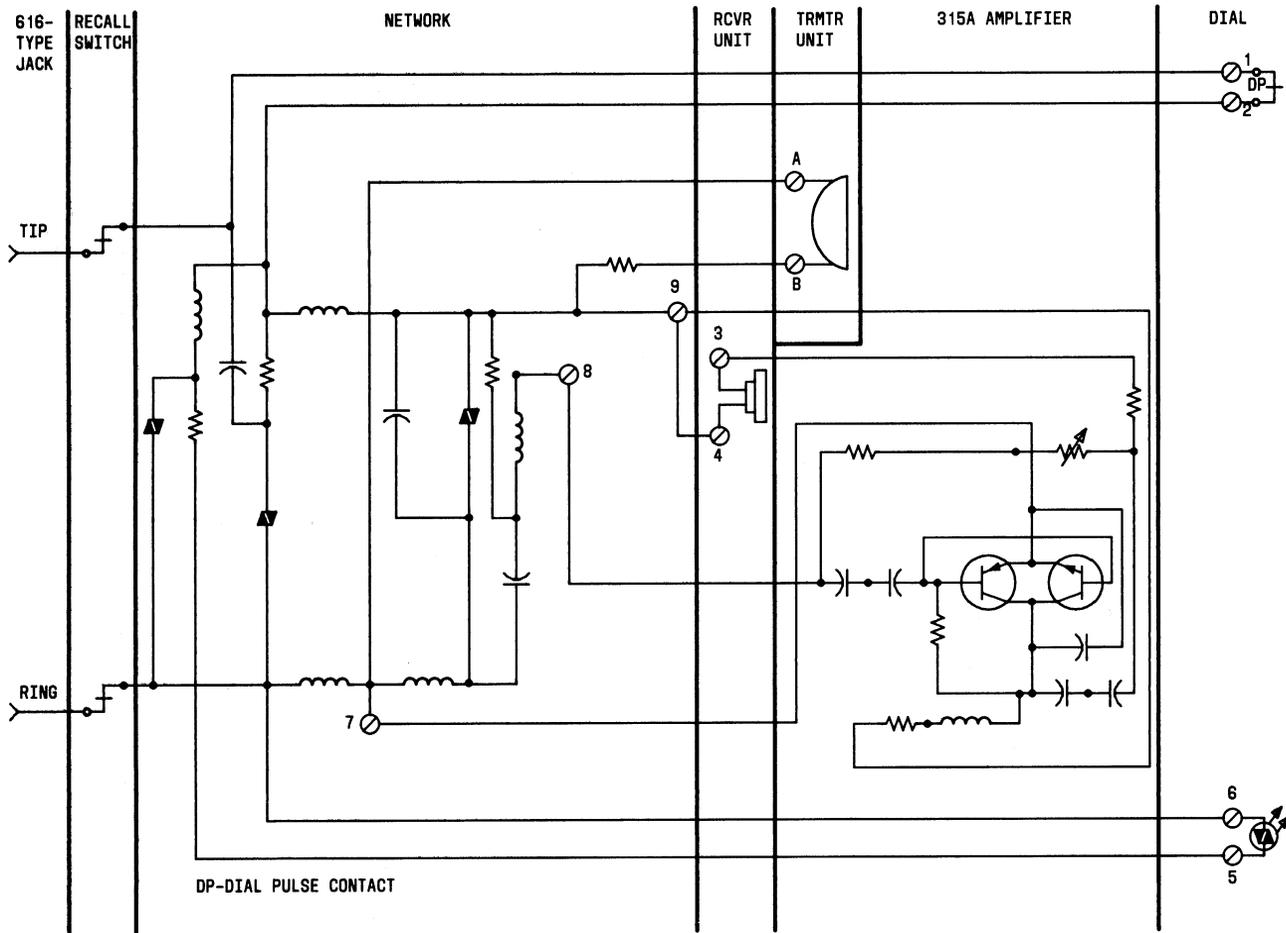


Fig. 27—Schematic of 226A Hand Telephone Set With 315A (MD) Amplifier

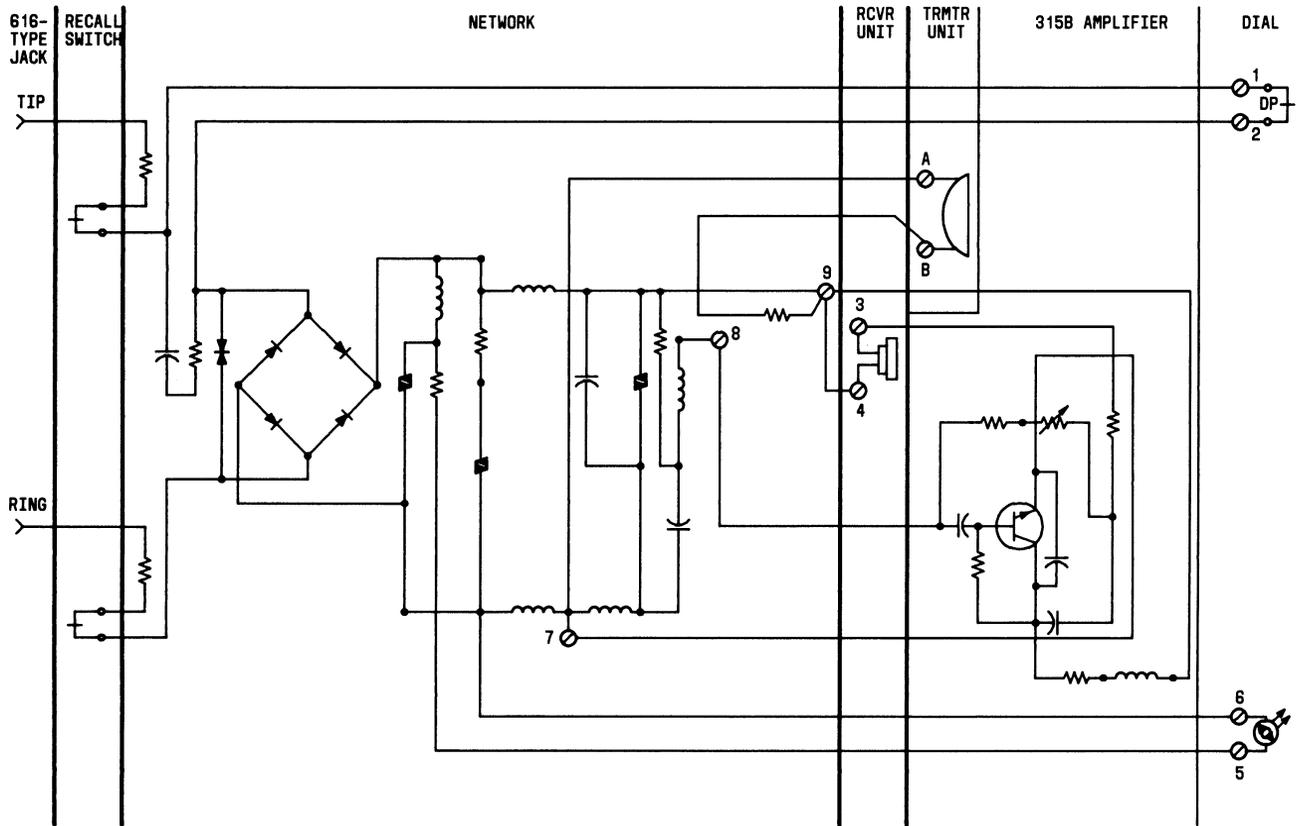
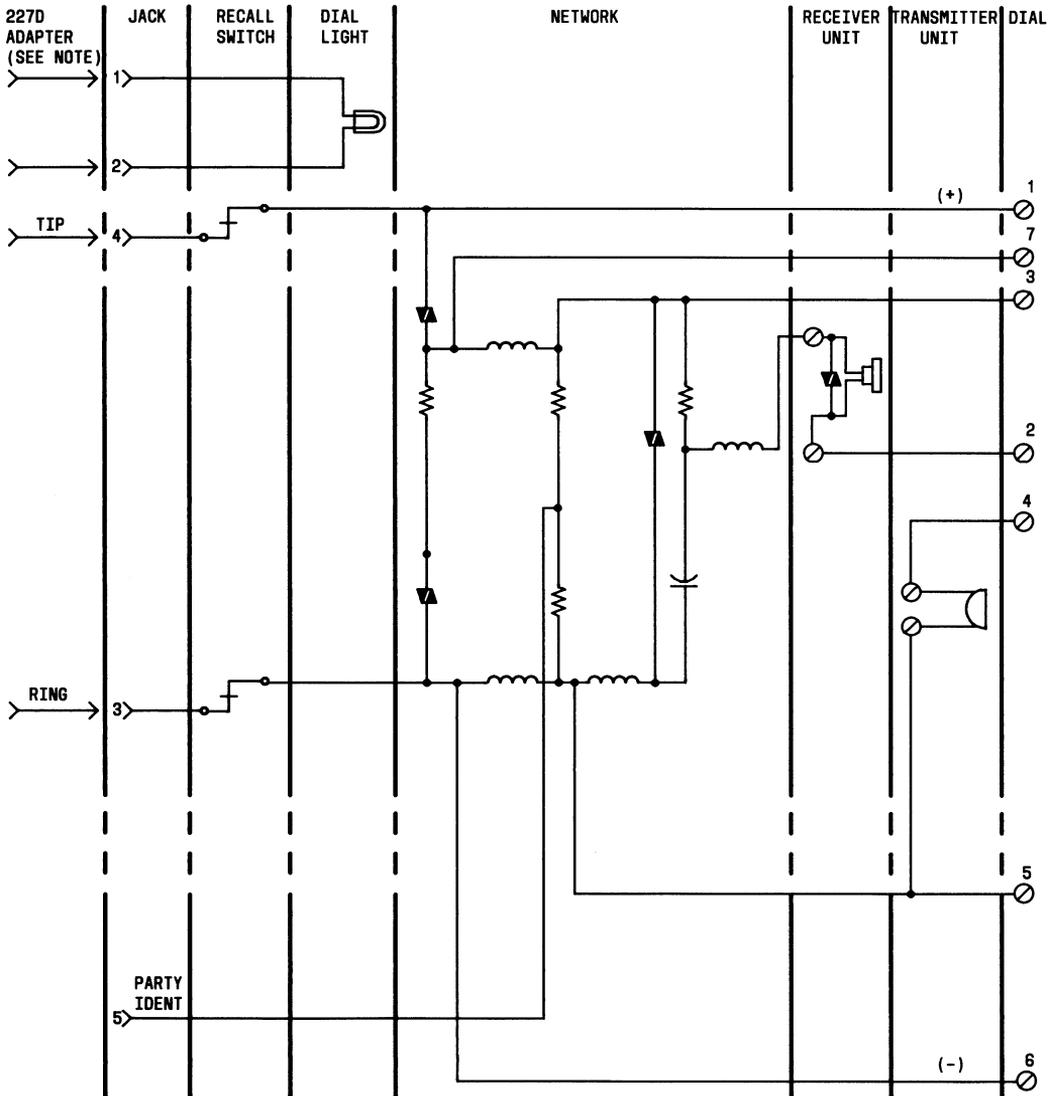
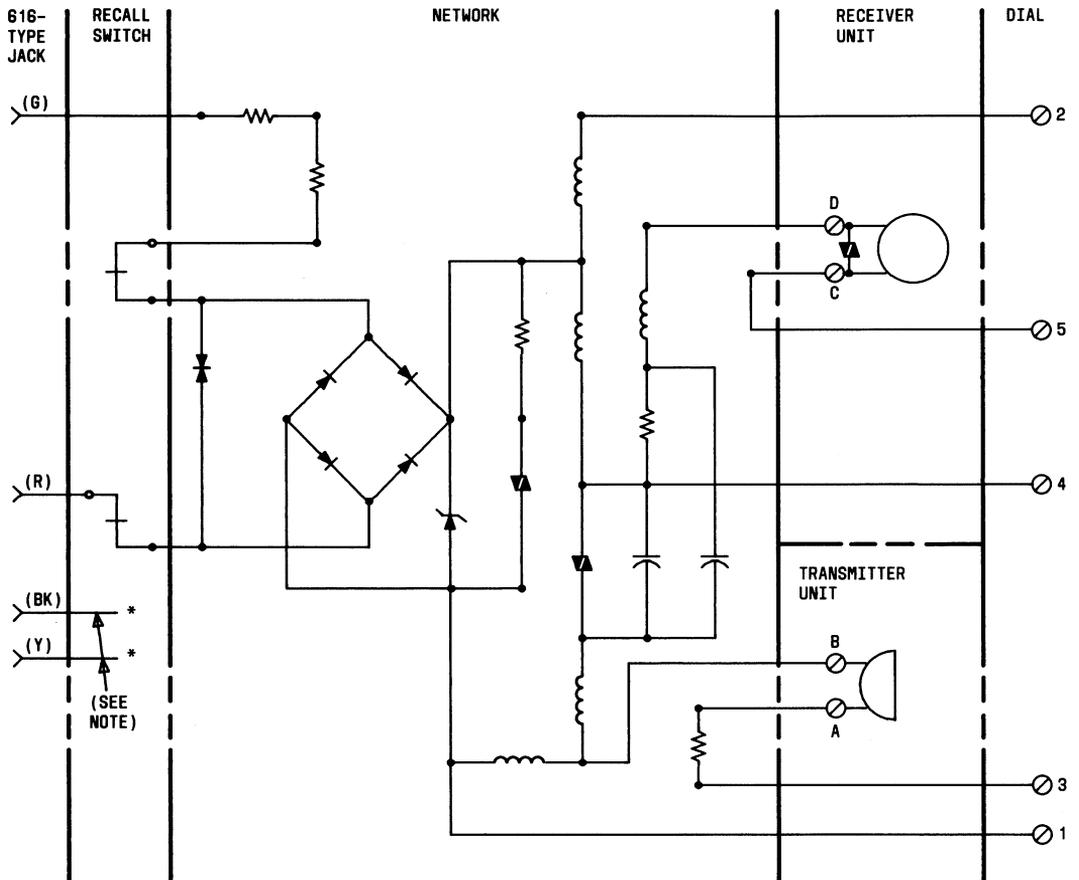


Fig. 28—Schematic of 226A Hand Telephone Set With 315B Amplifier



NOTE:
PROVIDED WITH 2220BM HANDSET ONLY.

Fig. 29—Schematic of 2220B (MD) and 2220BM Hand Telephone Set



*INSULATED AND STORED
 NOTE: THESE LEADS ARE FURNISHED IN
 EARLY VERSION 2220C HANDSETS ONLY.

Fig. 30—Schematic of 2220C Hand Telephone Set

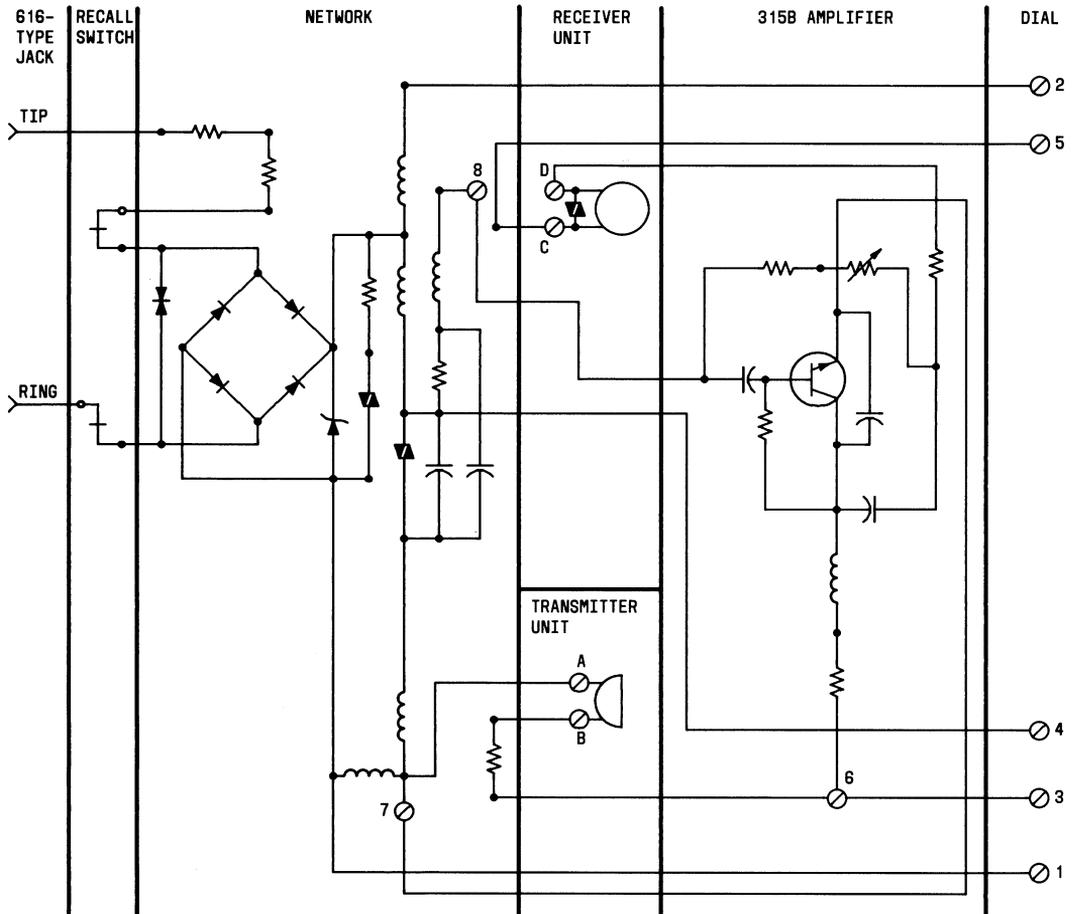


Fig. 31—Schematic of 2226A Hand Telephone Set