

## TELEPHONE SETS

### 532, 533, 535, AND 536 TYPES

### TRANSISTORIZED AMPLIFIER SETS

#### 1. GENERAL

1.01 This section covers the 500-series telephone sets which are used for customers requiring receiver or transmitter amplification.

1.02 This section is reissued to add information on the 535- and 536-type telephone sets. Due to extensive changes, marginal arrows have been omitted.

#### 2. DESCRIPTION AND USE

2.01 These sets are similar in appearance to other 500-type sets. The only difference in their external appearance is a knurled knob which is used as a volume control. It is located adjacent to the dial. (See Fig. 1.) Internally, they contain the regular components of the 500-type sets and the additional apparatus indicated in Part 3, Supplies.

2.02 The transistorized amplifier operates on nominal line voltage and does not require power from local batteries.

2.03 Since the increased resistance of these sets will affect the release of held lines, it is recommended that their use with 1A key telephone systems be restricted and that preference be given to use with 1A1 key telephone systems wherever practicable.



Fig. 1—Telephone Sets Equipped with Transistorized Amplifiers—External

2.04 The 532-type telephone set is used for customers requiring receiver amplification on common battery service except 4-party selective and 8-party semiselective.

2.05 The 533-type telephone set is the same as the 532 type for use on 4-party selective and 8-party semiselective service.

2.06 The 535-type telephone set is for use at noisy locations. It provides limited receiver amplification and limited reduction of transmitter and sidetone levels with the handset push-to-listen button normal, for talking and listening with moderate noise, and full receiver amplification and almost complete disabling of the transmitter when the handset push-to-listen button is operated, for listening with high noise.

2.07 The 536-type telephone set is used for customers requiring speech amplification, or for whispered confidential conversations.

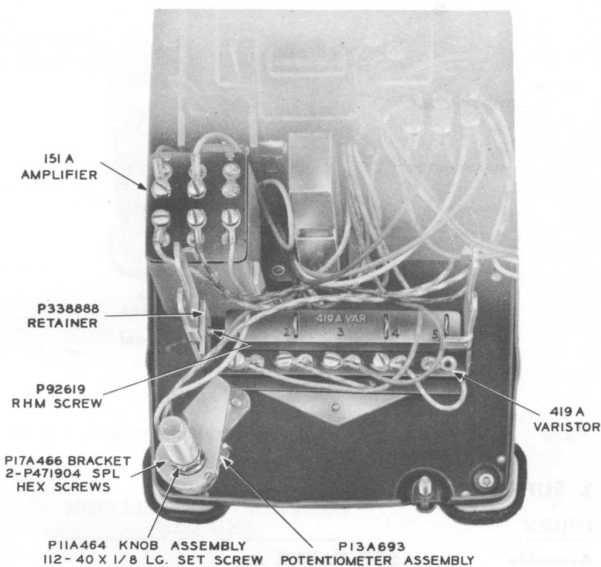


Fig. 2—532-type Telephone Set—Internal

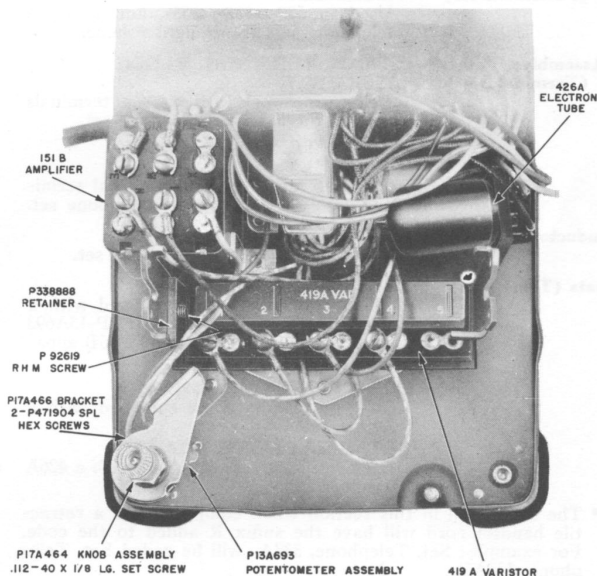


Fig. 3—533-type Telephone Set—Internal

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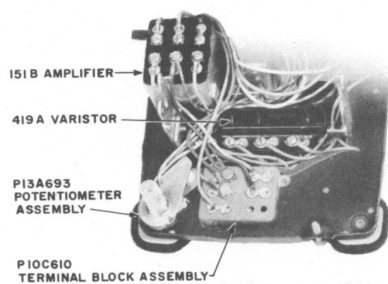


Fig. 4—535-type Telephone Set—Internal

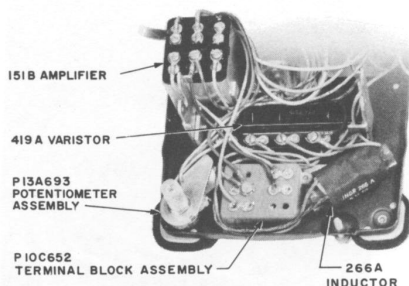


Fig. 5—536-type Telephone Set—Internal

2.08 These sets may be obtained in the colors indicated in Part 3, Supplies, Table A.

### 3. SUPPLIES

#### INDEX

#### ORDERING INFORMATION AND USE

Assembly  
(Housing)

SEE TABLE A

Assembly  
(Potentiometer)

**P-13A693, POTENTIOMETER ASSEMBLY.**

Used in 532-, 533-, 535-, and 536-type telephone sets to regulate volume.

Assemblies  
(Terminal Block)

**P-10C610, TERMINAL BLOCK ASSEMBLY.**

Resistor network with external terminals used in the 535-type telephone set.

**P-10C652, TERMINAL BLOCK ASSEMBLY.**

Capacitor network with external terminals used in the 536-type telephone set.

Inductor

**INDUCTOR, 266A.**

Used in the 536-type telephone set.

Sets (Telephone)

**SET, TELEPHONE, 532A-. \* †**

500-type telephone set equipped with a 151B amplifier, 419A varistor, P-13A693 potentiometer assembly, and a 95B apparatus blank.

**SET, TELEPHONE, 532B-. \* †**

532-type telephone set equipped with a 7-type dial.

**SET, TELEPHONE, 533A-. \* †**

532A telephone set equipped with a 426A electron tube.

\* The sets listed in this section when equipped with a retractile handset cord will have the suffix R added to the code. For example: Set, Telephone, 532A- will be coded Set, Telephone, 532AR-.

† These sets will be furnished in the color indicated as shown in Table A.

### SET, TELEPHONE, 533B-. \* †

532-type telephone set equipped with a 7-type dial and a 426A electron tube.

### SET, TELEPHONE, 535A-3. \*

500-type telephone set equipped with a 151B amplifier, 419A varistor, P-13A693 potentiometer assembly, P-10C610 terminal block assembly, G2E-3 handset, and a 95B-3 apparatus blank.

### SET, TELEPHONE, 535B-3. \*

535-type telephone set equipped with a 7-type dial.

### SET, TELEPHONE, 536A-3. \*

500-type telephone set equipped with a 151B amplifier, 419A varistor, P-13A693 potentiometer assembly, P-10C652 terminal block assembly, 266A inductor, and a 95B-3 apparatus blank.

### SET, TELEPHONE, 536B-3. \*

536-type telephone set equipped with a 7-type dial.

### Varistor

### VARISTOR, 419A.

A full-wave rectifier used in 532-, 533-, 535-, and 536-type telephone sets.

\* The sets listed in this section when equipped with a retractile handset cord will have the suffix R added to the code. For example: Set, Telephone, 532A- will be coded Set, Telephone, 532AR-.

† These sets will be furnished in the color indicated as shown in Table A.

TABLE A

#### Ordering Information for Colored Telephone Sets

Telephone Set Type				Code Suffix	Color	Housing Assembly Code
532	533	535	536			
X	X	X	X	-3	Black	P-340247
X	X			-50	Ivory	P-14A626
X	X			-50A	Ivory—Two-tone	P-14A626
X	X			-51	Green	P-14A627
X	X			-51A	Green—Two-Tone	P-14A627
X	X			-52	Gray	P-14A628
X	X			-52A	Gray—Two-Tone	P-14A628
X	X			-53	Red	P-14A629
X	X			-53A	Red—Two-Tone	P-14A629
X	X			-54	Brown	P-14A630
X	X			-54A	Brown—Two-Tone	P-14A630
X	X			-55	Beige	P-14A631
X	X			-55A	Beige—Two-Tone	P-14A631
X	X			-56	Yellow	P-14A632
X	X			-56A	Yellow—Two-Tone	P-14A632
X	X			-57	Blue	P-14A633
X	X			-57A	Blue—Two-Tone	P-14A633

### 4. INSTALLATION

4.01 The 532-, 533-, and 535-type telephone sets are equipped with a regular 3-conductor mounting cord and the 536 type with a regular 4-conductor mounting cord. They are installed in the same manner as other 500-type telephone sets.

### 5. CONNECTIONS

5.01 The wiring diagrams and line and ringer connections are shown as follows:

Telephone Set Type	Wiring Diagram Fig.	Line and Ringer Connection Table
532	6	B
533	7	C
535	8	B
536	9	B

**TABLE B**  
**LINE AND RINGER CONNECTIONS FOR 532-, 535-, AND 536-TYPE TELEPHONE SETS**

Class of Service	42A Connecting Block Terminals								Connections in Telephone Set*									
	Line Wire				Mounting Cord				Mounting Cord				Ringer Leads				Switch Leads	
	Ring	Tip	Gnd	Control	R	G	Y	BK	R	G	Y	BK†	R	BK	S	S-R	S	S-W
Bridged or Individual Flat or Message Rate Inc PBX 750A and 755A Keyless Stations	R	G	Y		R	G	G		L2	L1	G		L2	G	K	A	L2	4
Ring Party, Flat or Message Rate	R	G	Y		R	G	Y		L2	L1	G		L2	G	K	A	L2	4
Tip Party, Flat Rate (Except Those Listed Below)	R	G	Y		G	R	Y		L2	L1	G		L2	G	K	A	L2	4
Tip Party, Dial Message Rate, Automatic Message Accounting, Zone Registration	R	G	Y		G	R	Y		L2	L1	G		K	G	B	B	A	4
Tip Party, Flat Rate Automatic Ticketing	R	G	Y		G	R	Y		L2	L1	G		B	B	K	G	A	4
1A and 1A1 Key Telephone Systems ‡	R	G	Y	B	R	G	Y	B	L2	4	G	L1	L2	4	K	A	L2	G

**Note: Boldface type** indicates connections that must be changed in set as furnished.

\*Lettered terminals on network, numbered terminals on varistor.

†Tape and store in 536-type telephone set when not used.

‡4-conductor mounting cord required for common ringer in 1A key telephone systems.

6-conductor mounting cord required for common ringer in 1A1 key telephone systems.

**TABLE C**  
**LINE AND RINGER CONNECTIONS FOR 533-TYPE TELEPHONE SETS**

Class of Service	42A Connecting Block Terminals						Connections in Telephone Set									
4-Party Selective 8-Party Semiselective	Line Wire			Mounting Cord			Mounting Cord			Ringer Leads				Tube Leads		
	Ring	Tip	Gnd	R	G	Y	R	G	Y	R	BK	S	S-R	R	BK	Y
Party Position																
—Ring 1 and 5	R	G	Y	R	G	Y	L2	L1	G	G	G	A	K	G	K	L2
—Tip 2 and 6	R	G	Y	G	R	Y	L2	L1	G	G	G	A	K	G	K	L2
+Ring 3 and 7	R	G	Y	R	G	Y	L2	L1	G	L2	L2	A	K	L2	K	G
+Tip 4 and 8	R	G	Y	G	R	Y	L2	L1	G	L2	L2	A	K	L2	K	G

**Note:** Boldface type indicates connections that must be changed in set as furnished.

To permanently silence ringers—move Y mounting cord to R at connecting block.

5.02 To permanently silence ringers in 532-, 535-, and 536-type telephone sets, move BK ringer lead to K except for Tip Party, Dial Message Rate, Automatic Message Accounting, and Zone Registration; then move S-R ringer lead to K.

5.03 The 535- and 536-type telephone sets may be converted for use on polarized ringing lines by adding a 426A electron tube. The tube is mounted as shown in Fig. 3 with the furnished screw. The line and ringer connections are the same as shown in Table C for the 533-type telephone set.

## 6. MAINTENANCE

6.01 These sets may, for testing purposes, be connected as a 500-type telephone set and tests made as indicated in C32.539, 500-series Telephone Sets, Maintenance. Tests for amplification should be made with the test desk.

6.02 To test the 532- and 533-type telephone sets functioning as a 500-type telephone set, move the W handset cord from W of the amplifier to G of the network. Disconnect Y-BR from G and R-W from R of the network. These steps will disconnect the amplifier and potentiometer.

6.03 To test the 535-type telephone set functioning as a 500-type telephone set, move W handset cord from W of the amplifier to G of the network, move BL handset cord to R, and BK handset cord to B of the network. Disconnect Y-BR from G of the network and R from T of the terminal block assembly. These steps will disconnect the amplifier, potentiometer, and terminal block assembly.

6.04 To test the 536-type telephone set functioning as a 500-type telephone set, move the BK handset cord to B of the network and disconnect the R-BK and BR-BK from B of the network. These steps will disconnect the amplifier, potentiometer, and terminal block assembly.

### Amplifier Circuit

6.05 In the 532- and 533-type telephone sets, the input to the amplifier is connected in place of the receiver (network terminals R and G) and the receiver is connected across the output of the amplifier (network terminal R, amplifier terminal W). The operating current for the amplifier is obtained from the central office line by connecting the amplifier L and V terminals across the network terminals R and B. (See Figs. 6 and 7.) Moving the potentiometer knob clockwise should increase receiver amplification.

6.06 In the 535-type telephone set, the receiver circuit functions in a manner similar to the 532-type telephone set.

(a) With the handset push-to-listen button normal, maximum receiver amplification is limited by an additional resistor (T to D of the terminal block assembly) in series with the potentiometer. Transmitter and sidetone levels are

reduced by a shunt (S to T) and a series (S to Y) resistor at the transmitter. In this talking position, sidetone should increase noticeably as the potentiometer knob is advanced clockwise to increase amplification.

(b) When the handset push-to-listen button is operated, the receiver amplification is increased by shorting out the series (D to T) resistor. Transmitter and sidetone levels are further reduced by an additional series resistor (H to T of the terminal block assembly). (See Fig. 8.) Advancing the potentiometer knob should increase receiving volume. In this condition the transmitter is essentially dead.

6.07 In the 536-type telephone set the transmitter output is connected through a capacitor (H to T of the terminal block assembly) to the input of the amplifier. The output of the amplifier is connected through a series capacitor (S to U of the terminal block assembly) across the network terminals R and B. The inductor is used to isolate the input from the output of the amplifier. The operating current for the amplifier is obtained from the central office line by connecting the amplifier L and V terminals across network terminals R and B. (See Fig. 9.) Moving the potentiometer knob clockwise should increase amplification.

6.08 Proper polarity of the central office line is maintained across the amplifier by the 419A varistor. It is connected between the network terminals (C and F for dial sets and C and RR for manual sets) and the line contacts of the switch, except when used with 1A and 1A1 key systems, where one side of the line is connected directly to the varistor.

6.09 The 151A and B amplifiers are not replaceable, but the potentiometer assembly, varistor, inductor, and terminal block assemblies may be replaced. Some possible trouble indications and suggested corrective measures are listed in Table D.

**TABLE D**

Trouble	Probable Cause	Corrective Measure
Set noisy	Potentiometer arm not making contact at times	Replace potentiometer assembly
Poor reception	Open or short in amplifier	Replace set
Does not amplify	Open potentiometer	Replace potentiometer assembly
	Open or short in amplifier	Replace set
Set tests open	Open varistor	Replace varistor

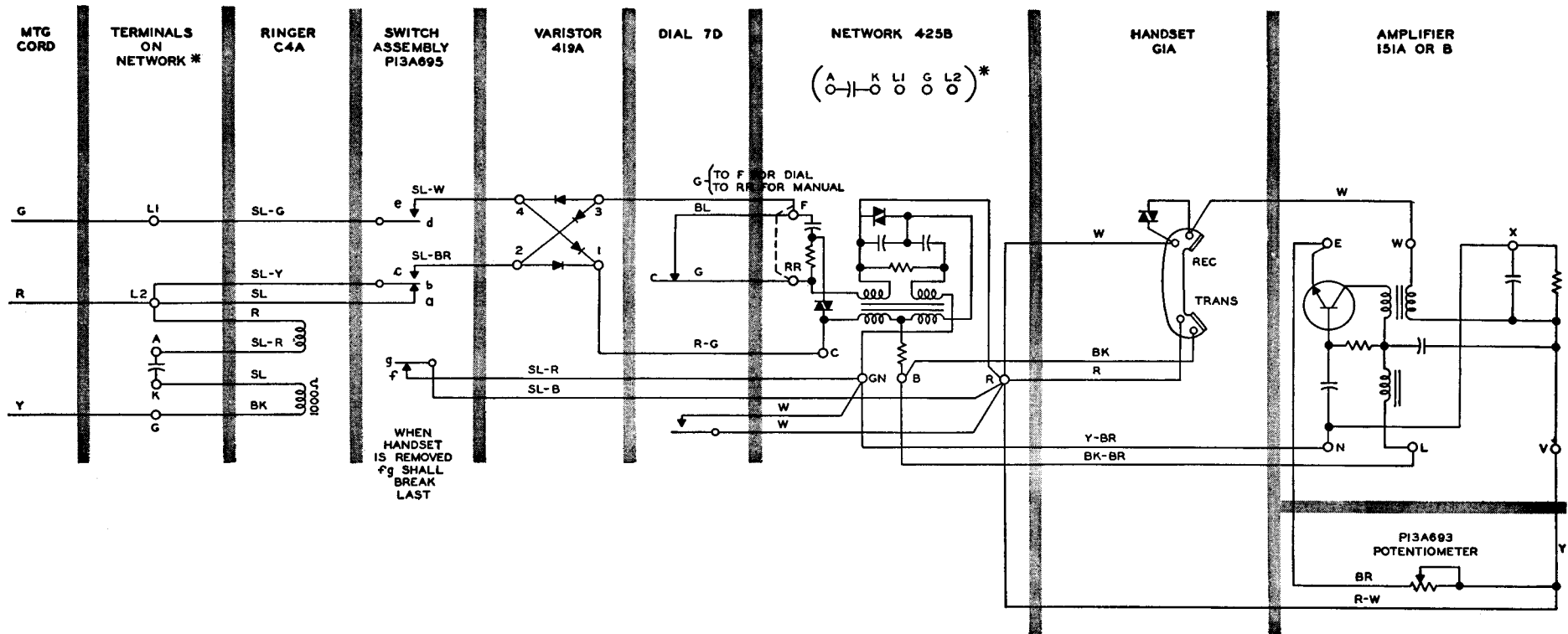


Fig. 6—532-type Telephone Set—Connections

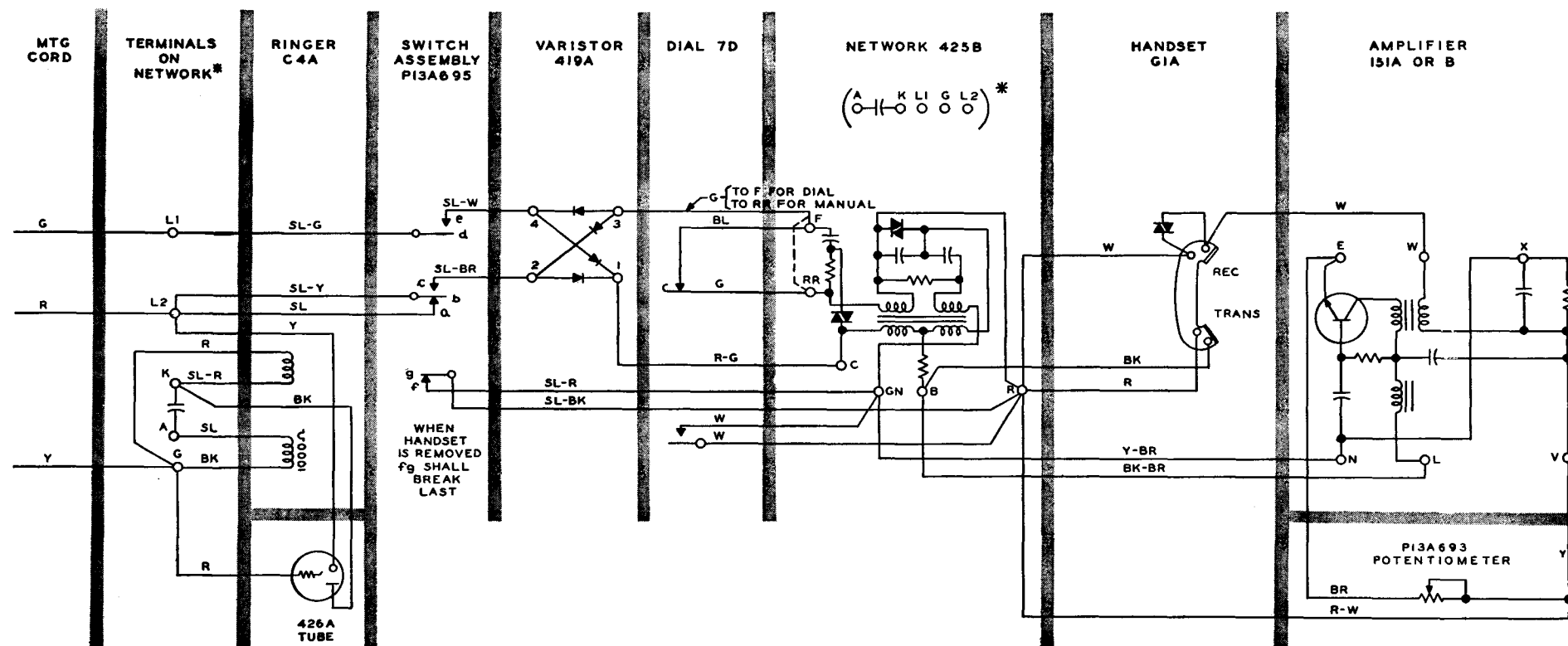


Fig. 7—533-type Telephone Set—Connections

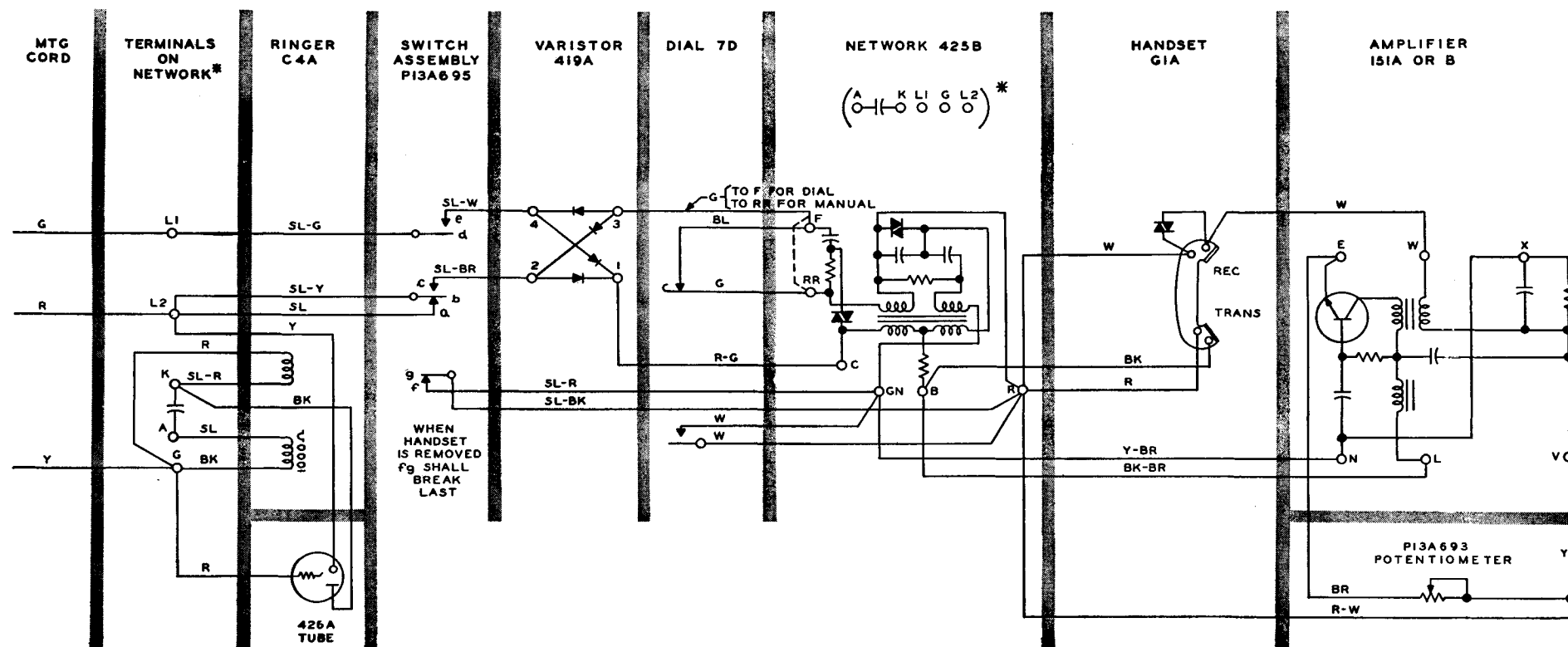


Fig. 7—533-type Telephone Set—Connections

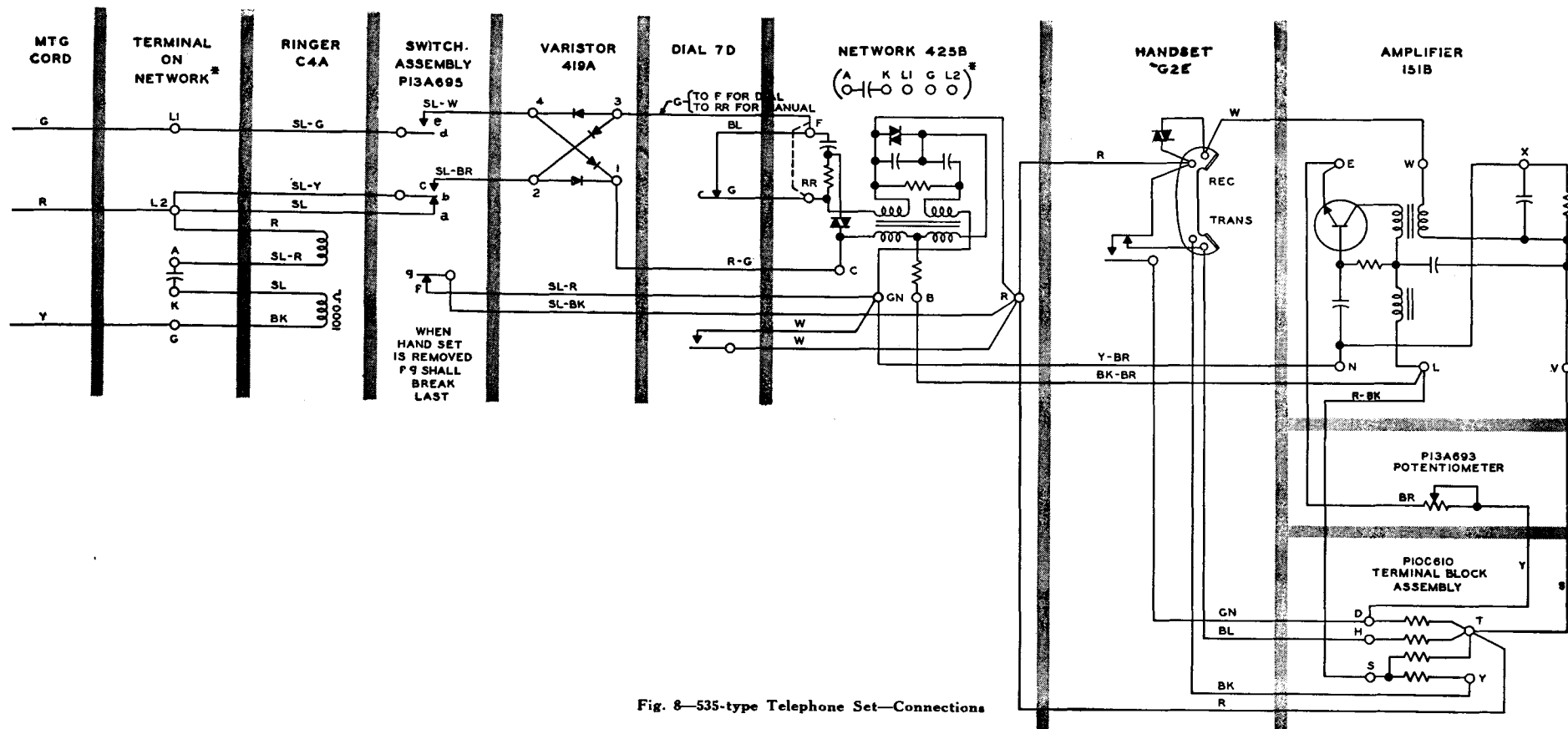


Fig. 8—535-type Telephone Set—Connections



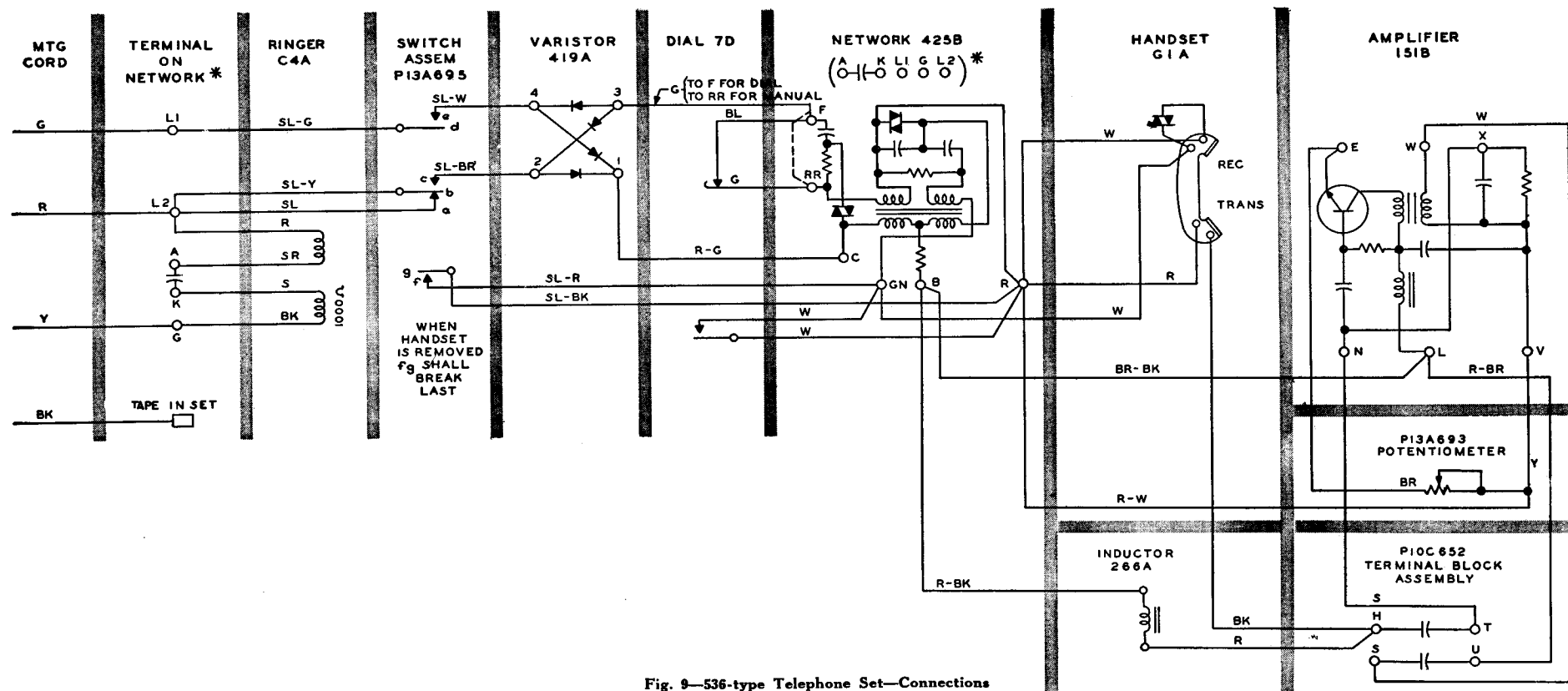


Fig. 9—536-type Telephone Set—Connections