

**HiFi ENGINE®**

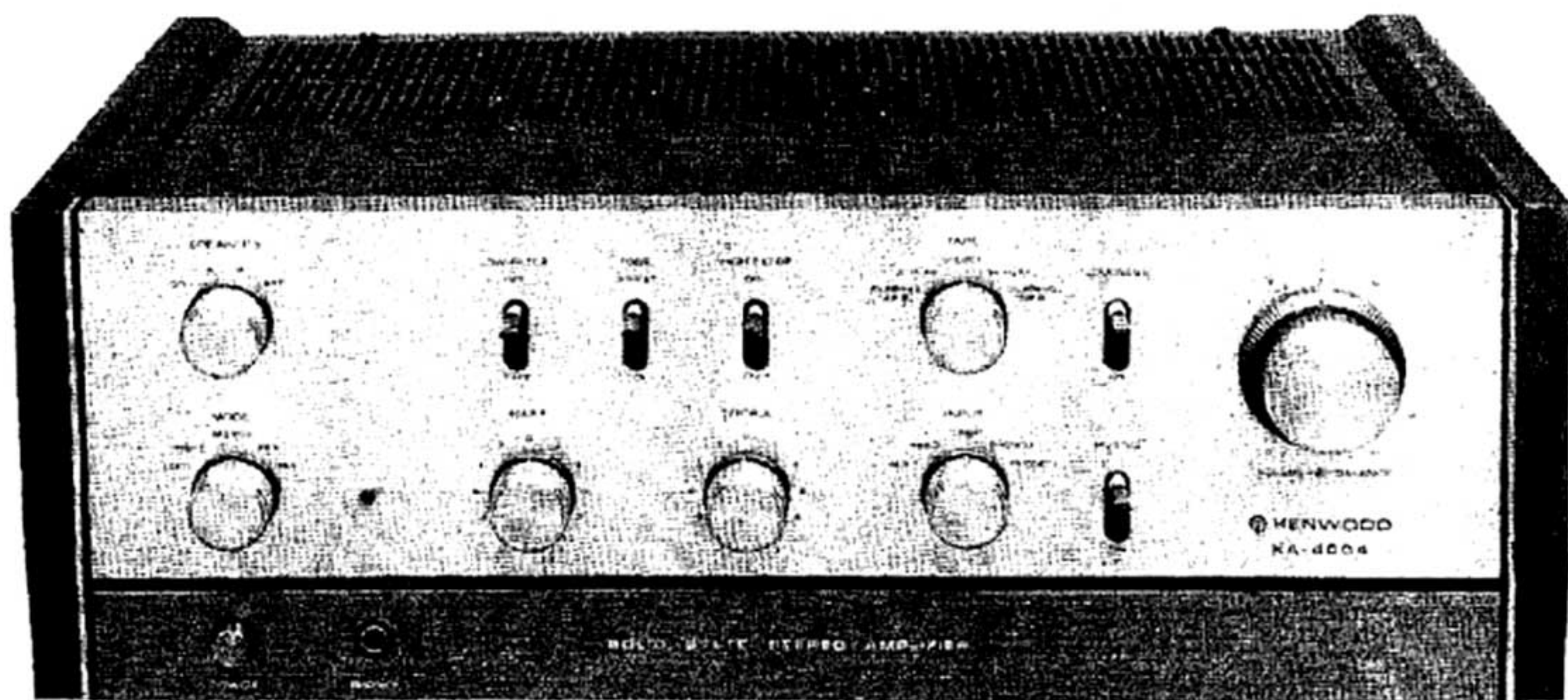
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**KENWOOD**  
HI/FI STEREO COMPONENTS

# SERVICE MANUAL

## KA-4004



**STEREO AMPLIFIER**

## POWER OUTPUT:

36 Watts RMS continuous power stereo, 18 Watts per channel, both channels operating simultaneously into 8 ohm loads at any frequency from 20 Hz to 20,000 Hz.

36/36 Watts:

Each channel operating into 4 ohms at 1,000 Hz.

25/25 Watts:

Each channel operating into 8 ohms at 1,000 Hz.

26 + 26 Watts:

Both channels operating into 4 ohms at 1,000 Hz.

19 + 19 Watts:

Both channels operating into 8 ohms at 1,000 Hz.

95 Watts IHF total Dynamic Power into 4 ohms.

56 Watts IHF total Dynamic Power into 8 ohms.

## HARMONIC DISTORTION:

Less than 0.5% at rated output from 20 Hz to 20,000 Hz

Less than 0.05% at -3 dB rated output.

### Intermodulation Distortion (60 Hz & 7,000 Hz = 4 : 1):

Less than 0.5% at rated output.

Less than 0.08% at -3 dB rated output.

### Power Bandwidth (IHF):

10 Hz to 50,000 Hz.

### Input Sensitivity, Input Impedance

(for rated output, at 1,000 Hz):

|                         |        |           |
|-------------------------|--------|-----------|
| PHONO 1:                | 2.5 mV | 50 k ohms |
| PHONO 2:                | 2.5 mV | 50 k ohms |
| TUNER:                  | 160 mV | 30 k ohms |
| AUX 1 & 2:              | 160 mV | 30 k ohms |
| TAPE PLAY, A & B (Pin): | 160 mV | 30 k ohms |
| MAIN AMP. INPUT:        | 1 V    | 50 k ohms |

### Recording Output (below rated input):

TAPE REC, A & B: 160 mV

DIN CONNECTOR: 40 mV

### Signal to Noise Ratio (below rated output):

PHONO 1 & 2: 65 dB

TUNER: 75 dB

AUX 1 & 2: 75 dB

TAPE PLAY A & B: 75 dB

NOISER AT MINIMUM VOLUME CONTROL: 0.3 mV at 8 ohms 0.000012 milliwatts.

**Damping Factor:** 64 at 16 ohms load  
32 at 8 ohms load

**Speaker Impedance:** Accepts 4 to 16 ohms

**Bass Control:** ±10 dB at 100 Hz

**Treble Control:** ±10 dB at 10,000 Hz

**Low Filter:** 80 Hz Cutoff, 6 dB per octave.

**High Filter:** 7,000 Hz Cut off, 6 dB per octave.

**Loudness Control (-30 dB):** +8 dB at 100 Hz  
+3 dB at 10,000 Hz

## GENERAL:

### Switches:

SPEAKERS: OFF, A, B, A + B

SELECTOR: AUX 1, AUX 2, TUNER, PHONO 1  
PHONO 2

MODE: LEFT, RIGHT, STEREO, REV,  
MIX.

TAPE MONITOR: DUBBING (A→B), A PLAY,  
SOURCE, B PLAY, DUBBING (B→  
A).

OTHERS: LOW & HIGH FILTER,  
LOUDNESS, MUTING, TONE  
DEFEAT, POWER

**AC Outlets:** 3 switched & 1 unswitched.

**Power Consumption:** 105 Watts at full power

15 Watts at no signal

**Dimensions:** 17-1/8" W, 6-1/32" H, 11-13/16" D.  
(435 W, 153 H, 300 D mm.)

**Weight:** 20.5 lbs.

# TROUBLESHOOTING

Can you hear radio program ?  
Can you hear sounds of record player ?  
Can you hear sounds of tape playback ?

You can find out following complaints.



No sound. (If you get audio signal at PRE-OUT jack, you check main amp.)

Radio program can be heard, yet record player reproduction and tape playback are defective.

Sound of record player can be heard, yet reception of radio program and tape playback are defective.

Sound of tape playback can be heard, yet reception of radio program and tape playback are defective.

Only tape playback is defective.

Only record player reproduction is defective.

Only reception of radio program is defective.

Preamp trouble (Refer to P. 4)

Selector switch trouble

Monitor switch trouble

Tuner trouble

Tone amp (including filter amp) trouble (Refer to P. 4)

Main amp (including protection) trouble (Refer to P. 5)

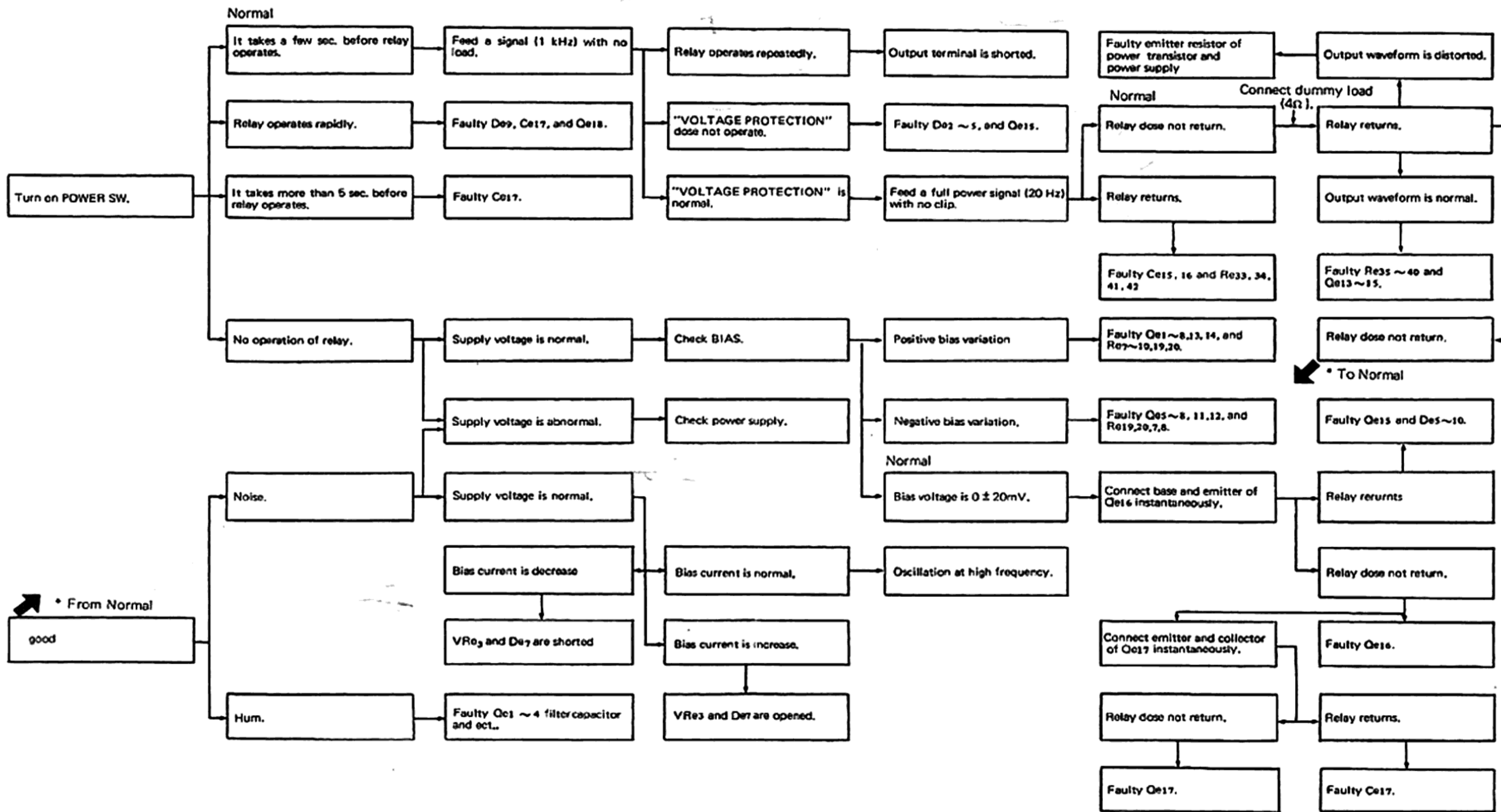
■ Preamp Unit (X08-1080-12)

| Complaint                                       | Possible cause  | Repairs            |
|---|---|--------------------|
| No sound  | Faulty transistors Qd <sub>1</sub> ~ 4.   | Check and replace  |
| Noise   | Faulty transistors Qd <sub>1, 2</sub> , resistors Rds <sub>5, 6, 25, 26</sub> , and capacitors Cd <sub>1, 2, 21, 22</sub> . | Check and replace. |
| Dynamic range                                   | Faulty transistors Qd <sub>1, 2</sub> and capacitors Cd <sub>1, 2</sub> .   | Check and replace  |
| Hum   | Faulty capacitor Cd <sub>23, 24</sub> .   | Check and replace  |
| Poor output at low frequency at phono position. | Faulty capacitor Cd <sub>15, 16, 19, 20</sub> .   | Check and replace  |

■ Tone amp Unit (X11-1070-10)

| Complaint         | Possible cause  | Repairs           |
|-------------------|---|-------------------|
| No sound          | Faulty transistors Qi <sub>1</sub> ~ 4.   | Check and replace |
| Noise             | Faulty lever switch (TONE DEFEAT)   | Check and replace |
| (Position at AUX) | Faulty capacitors Ci <sub>3, 4, 13, 14</sub> .                                    | Check and replace |
|                   | Faulty transistors Qi <sub>1</sub> ~ 4 and resistors Ri <sub>1, 2, 23, 24</sub> . | Check and replace |

■ Main amp (X07-1030-01)



# AUDIO ADJUSTMENT

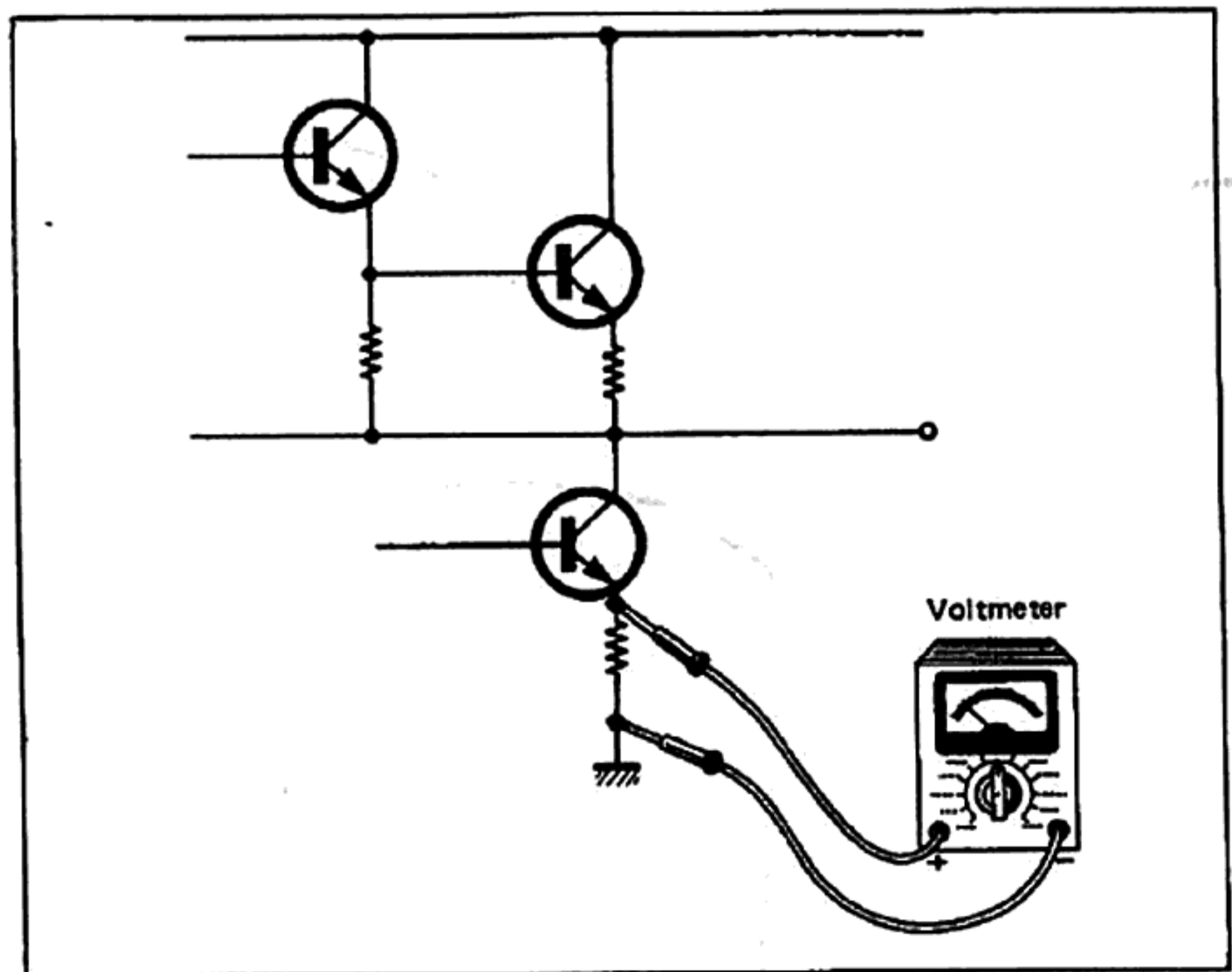
## [BIAS ADJUSTMENT]

### When using the voltmeter

1. Connect the voltmeter to the emitter resistor of power transistors.
2. Check the voltmeter to point around 15 mV.
3. If not, turn the PC trimmer potentiometer (VRe1, 2) so that the meter has rating value.

### When using the audio generator and oscilloscope

1. Connect the dummy load ( $8\Omega$ ) to loud speaker terminal and connect the oscilloscope across the dummy.
2. Feed the signal (1 kHz) to the set.
3. Check the waveform to be the best.
4. If not, turn the PC trimmer potentiometer (VRe1, 2) so that the waveform is distortionless.
5. Check the voltmeter to point around 15 mV.

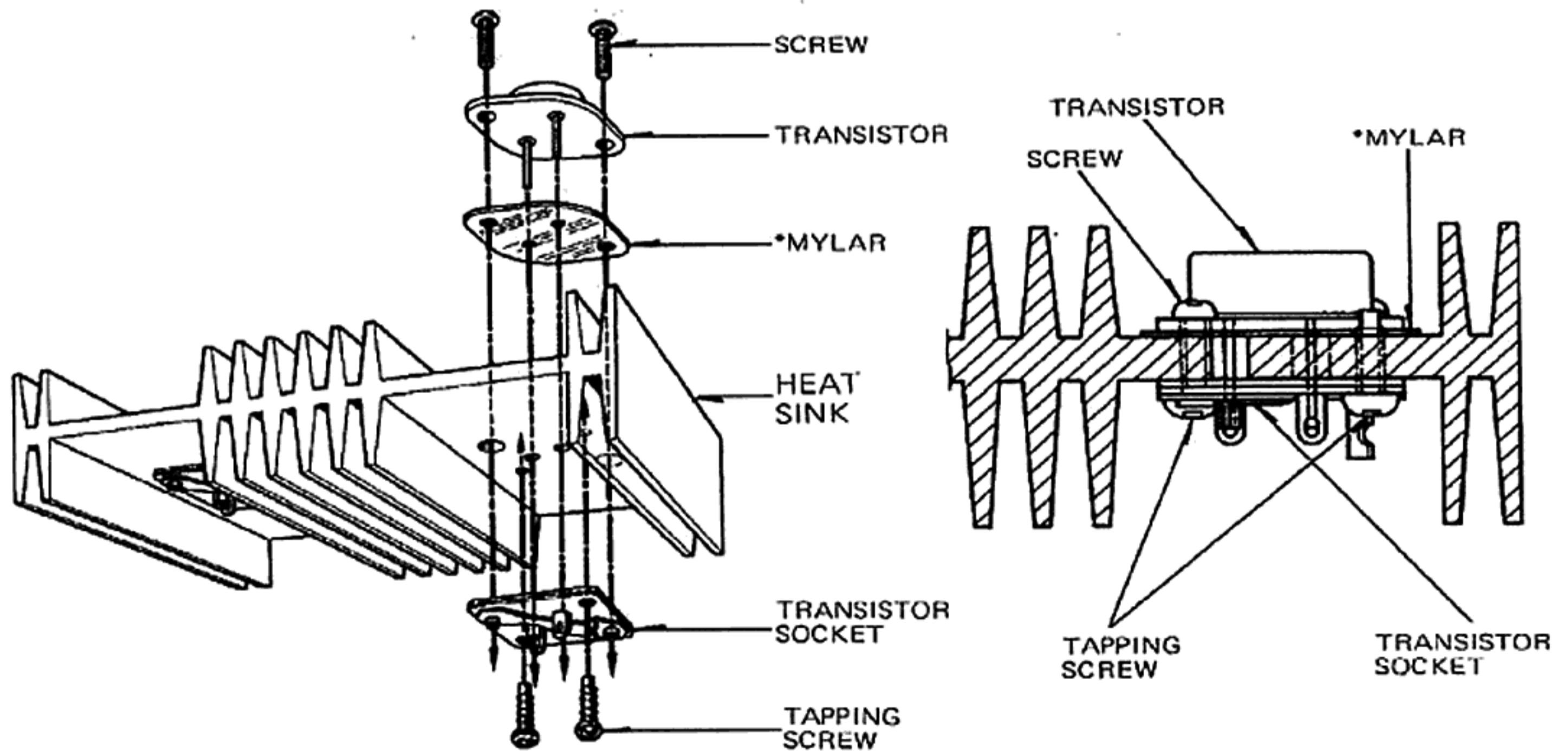


# HOW TO REPLACE POWER TRANSISTOR

## REPLACING POWER TRANSISTORS

1. Remove screws (not tapping screw).
2. Replace the power transistor with new.  
At this time, don't forget to spread silicone grease on faces of mylar.
3. Fix the power transistor with screw on the heat sink.
4. Check the transistor is not in contact with chassis.

- Note:**
1. Tapping screw holds the transistor socket. Don't remove it without necessity.
  2. Before fixing the transistor, in the case of replacing transistor socket, fix the transistor socket.

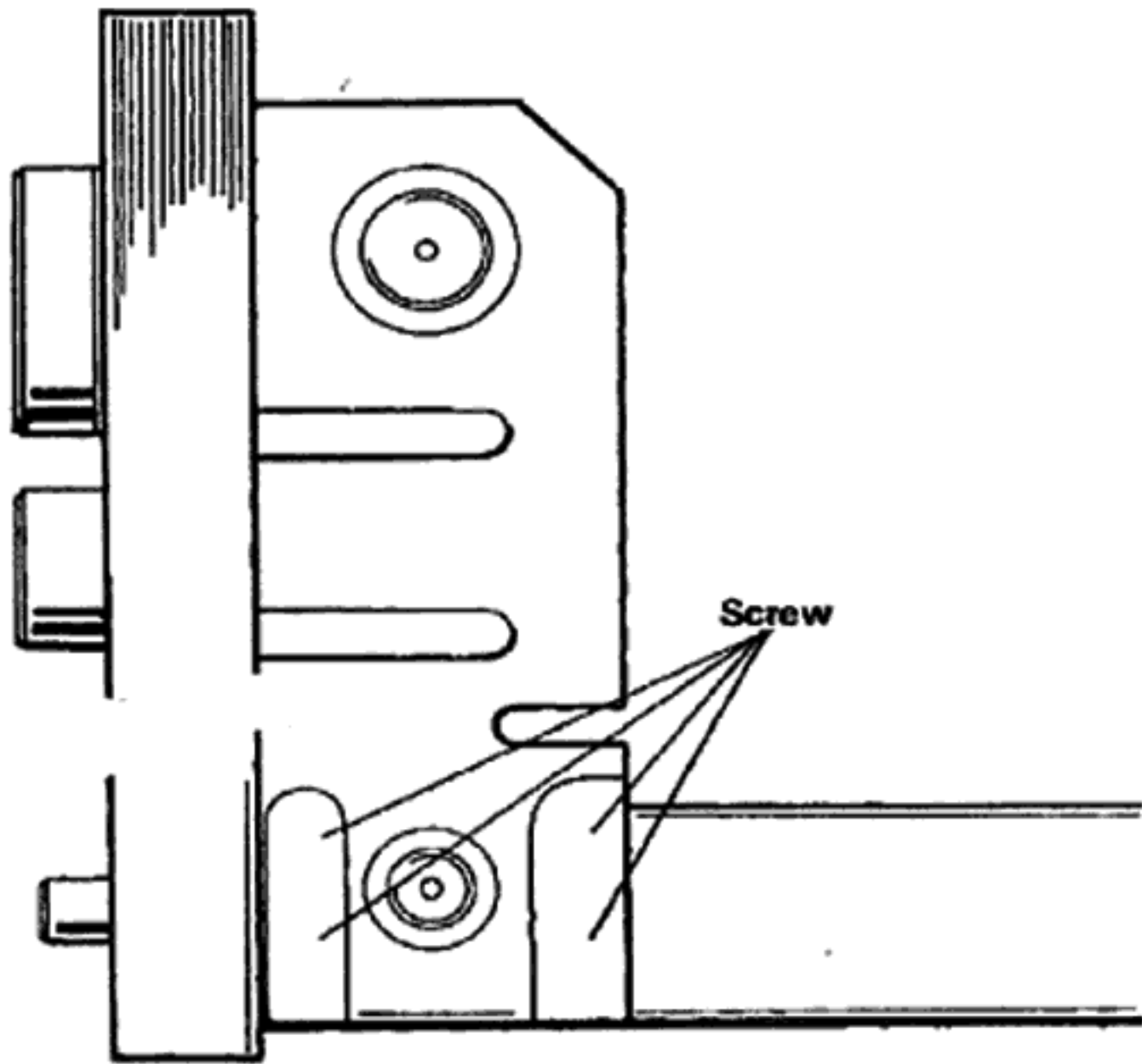


\*Don't forget to spread silicone grease on the faces of mylar.

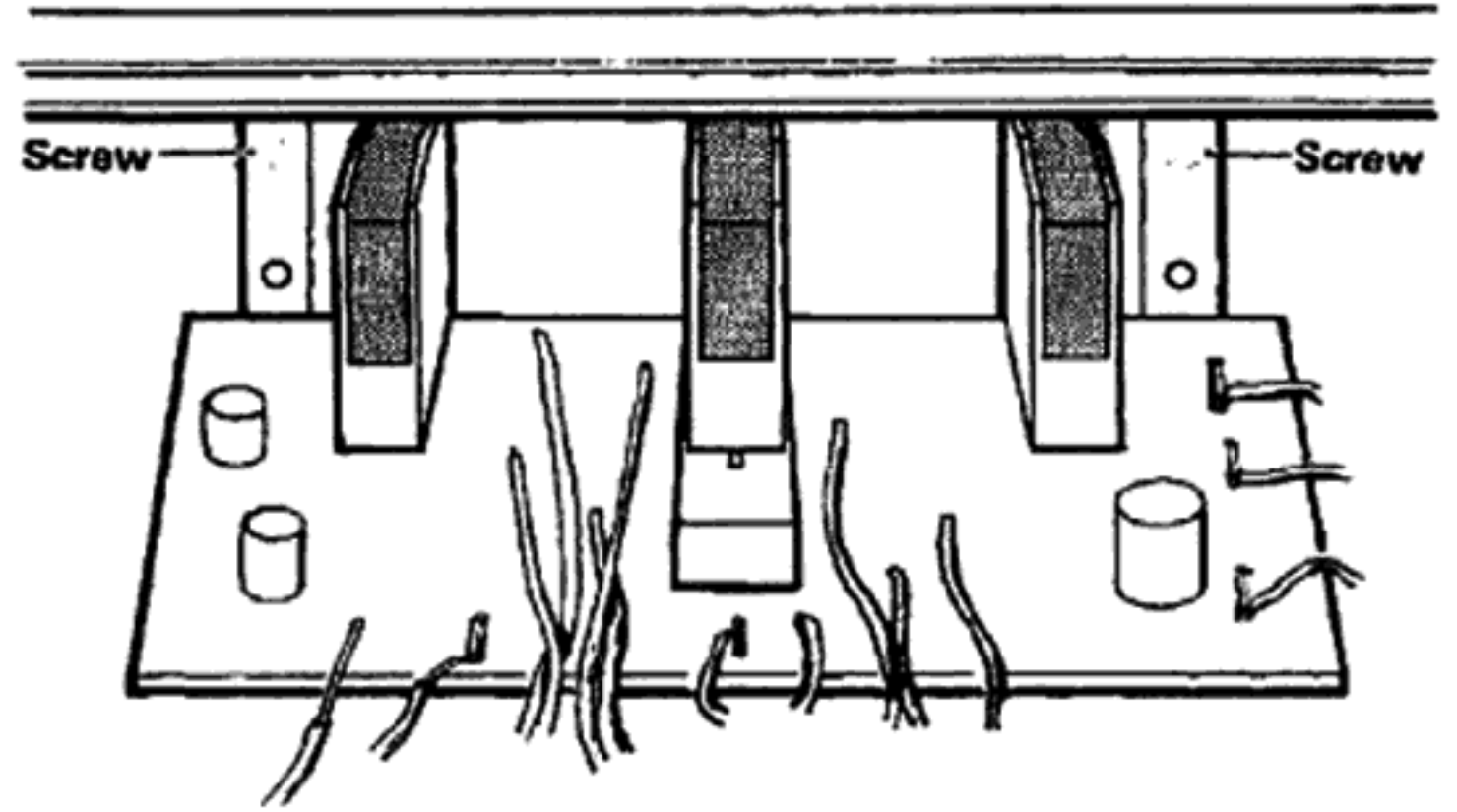
**Caution:** KA-4004 has different heat sink drawn in illustration.



# HOW TO REPLACE PUSHBUTTON PC BOARD



① Remove the cabinet and screws fixing front panel and chassis.



② Remove screws fixing PC board.



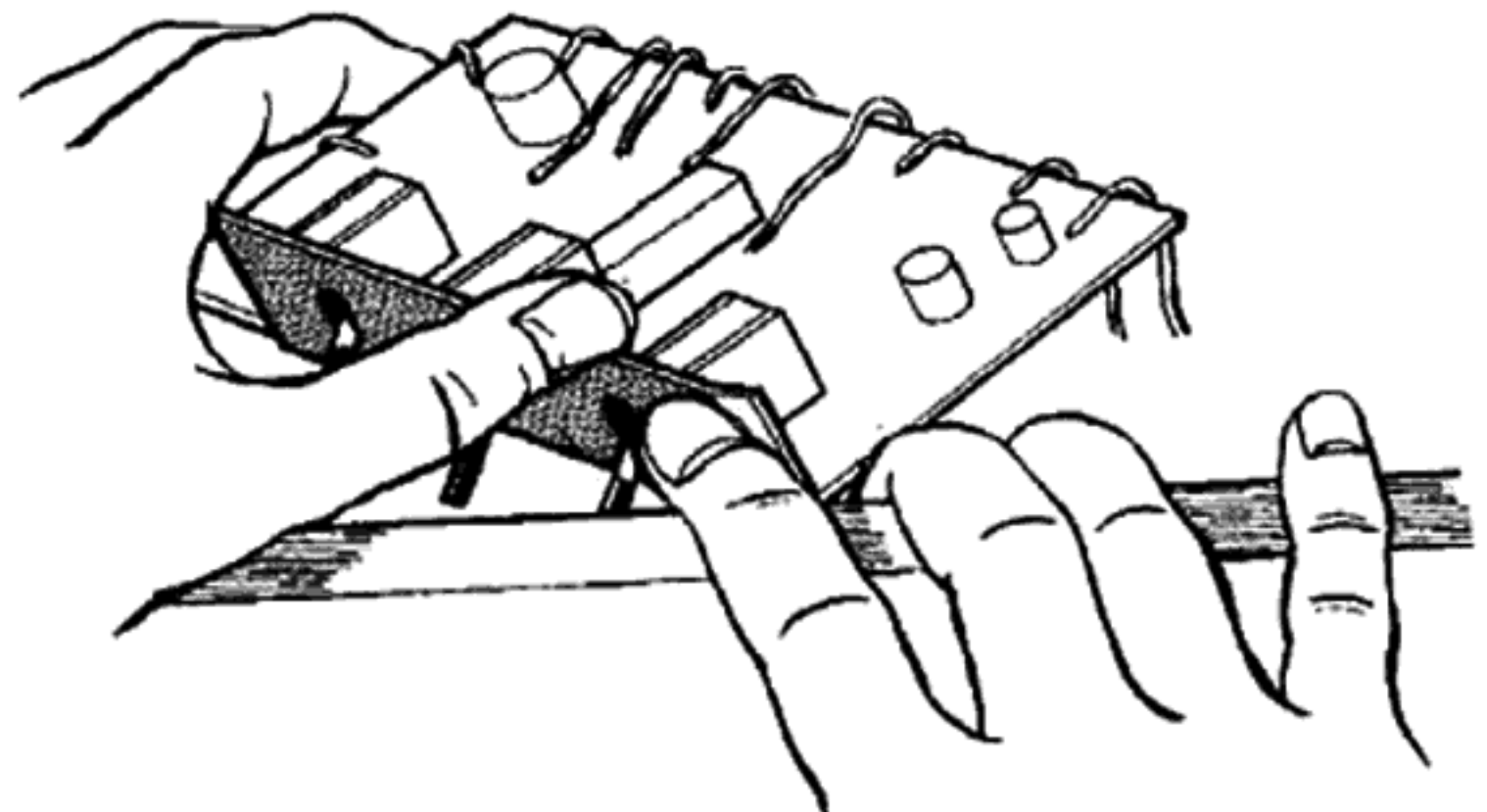
LOW FILTER

TONE DEFEAT

HIGH FILTER



③ Push down lever switches.

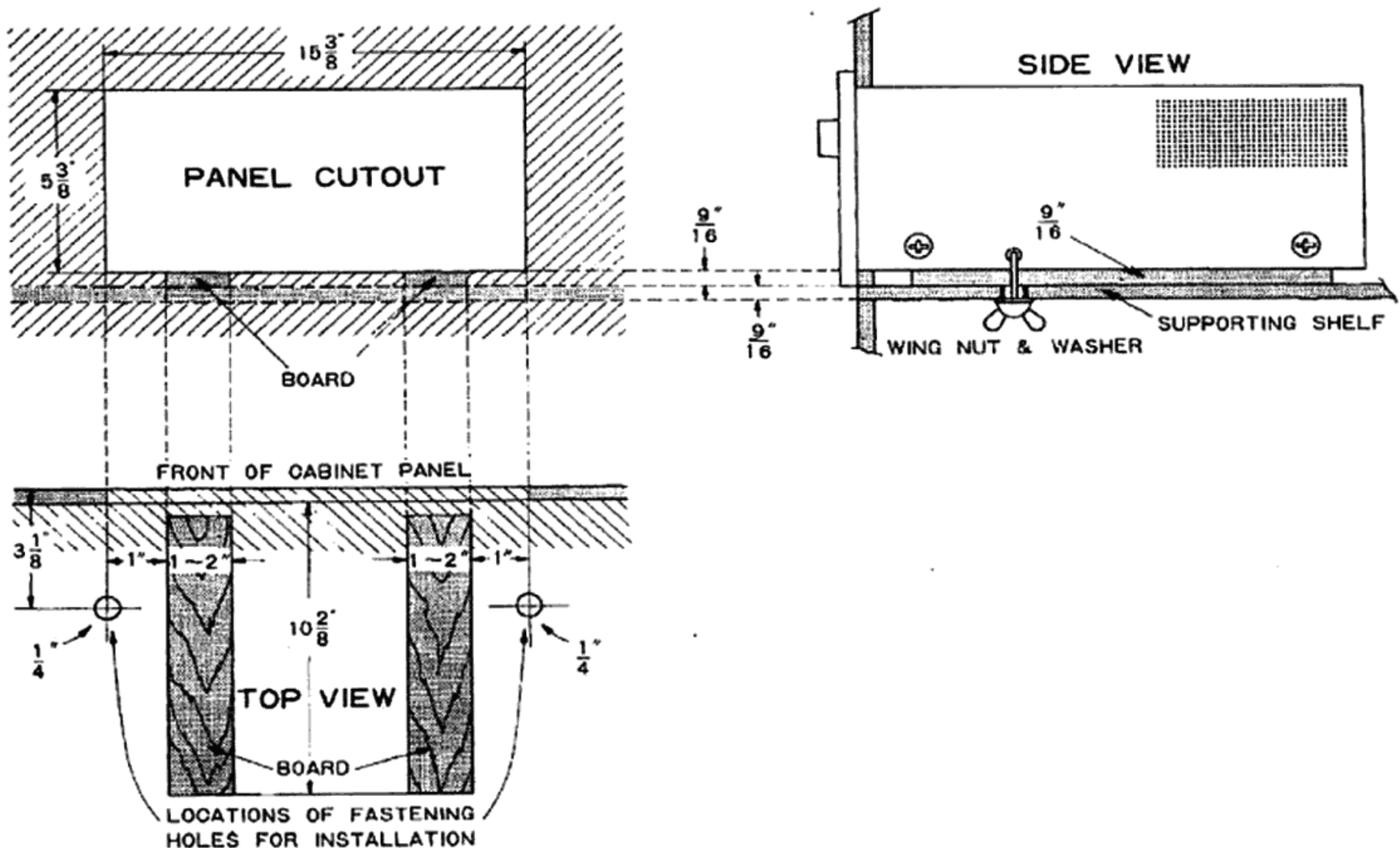


④ While pulling the front panel remove the PC board.

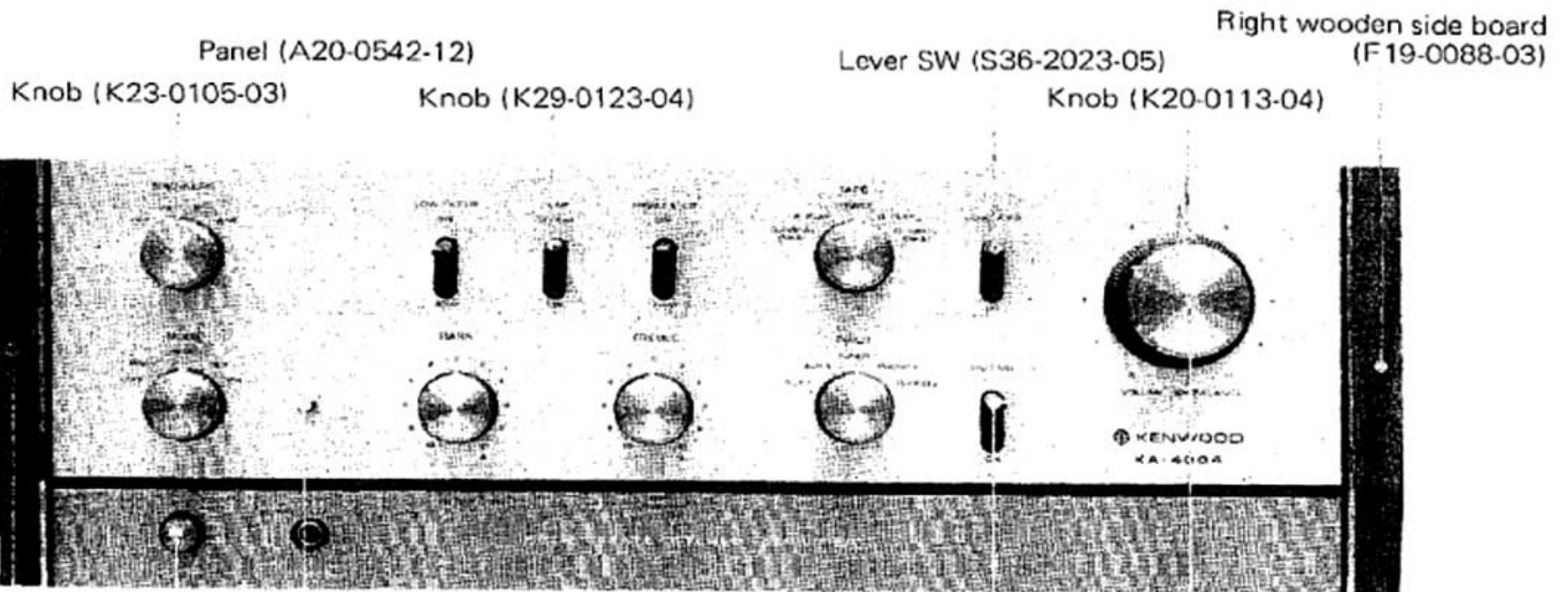
# MOUNTING TEMPLATE

## DIRECTIONS FOR PANEL MOUNTING

1. First remove the wooden side boards which are attached to both sides of the amplifier's metal enclosure. This can be done by removing three screws from each side board. Put these long screws away until such time as you may wish to reattach the side boards later. They are not required for panel mounting.
2. The 4 short screws which are supplied with this unit are now used to join the amp chassis and its metal enclosure. Screw them into the two lower holes on each side of the metal enclosure. Never use the long screws that were removed with the side boards as this may damage the amplifier.
3. Locate the supporting shelf at the height you wish the amplifier positioned.
4. Remove the four bottom legs.
5. An air space must be made between the bottom of the set and the supporting shelf to assure good ventilation and cool operation. This space can be made by placing two boards which measure  $\frac{9}{16}$ " thick by 1" to 2" width between chassis and the supporting shelf.
6. Cut out the cabinet panel in the dimensions of  $5\frac{3}{8}$ " x  $15\frac{3}{8}$ " as shown in above Panel Cutout. The bottom of the cutout should be flush with the bottom plate of the amplifier, as shown in the side view. The distance between the bottom of the cutout and the top of the supporting shelf is  $\frac{9}{16}$ ".
7. The amplifier is held in place by two bolts. The holes must be made in the shelf to correspond with the holes in the amplifier. Use the "Top View" template to locate these holes on the supporting shelf. The holes should be made  $\frac{1}{4}$ " in diameter or somewhat larger.



# EXTERNAL VIEW



Left wooden side board (F19-0087-03)

Indicator (B08-2010-04)  
\*Pushbutton SW

Lever SW (S36-2023-05)

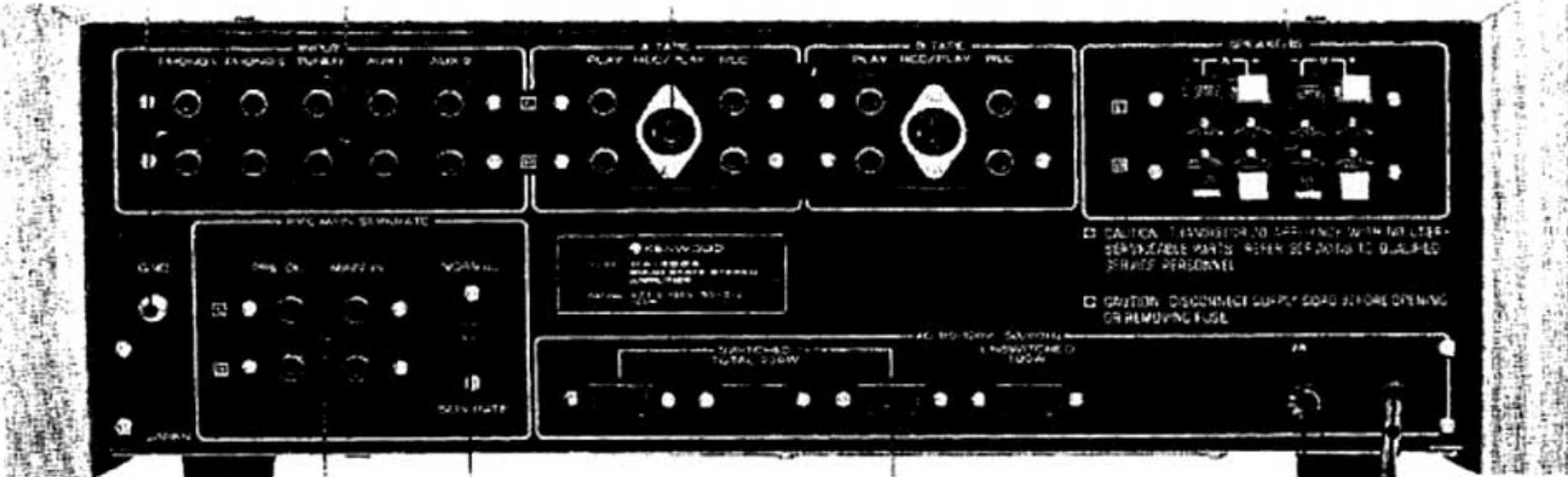
Knob (K21-0254-03)

GND terminal (N08-0002-04)

Pin jack (E13-1002-05)

Pin jack (E13-0401-05)

Push terminal (E21-0802-05)



Leg (J02-0049-14)

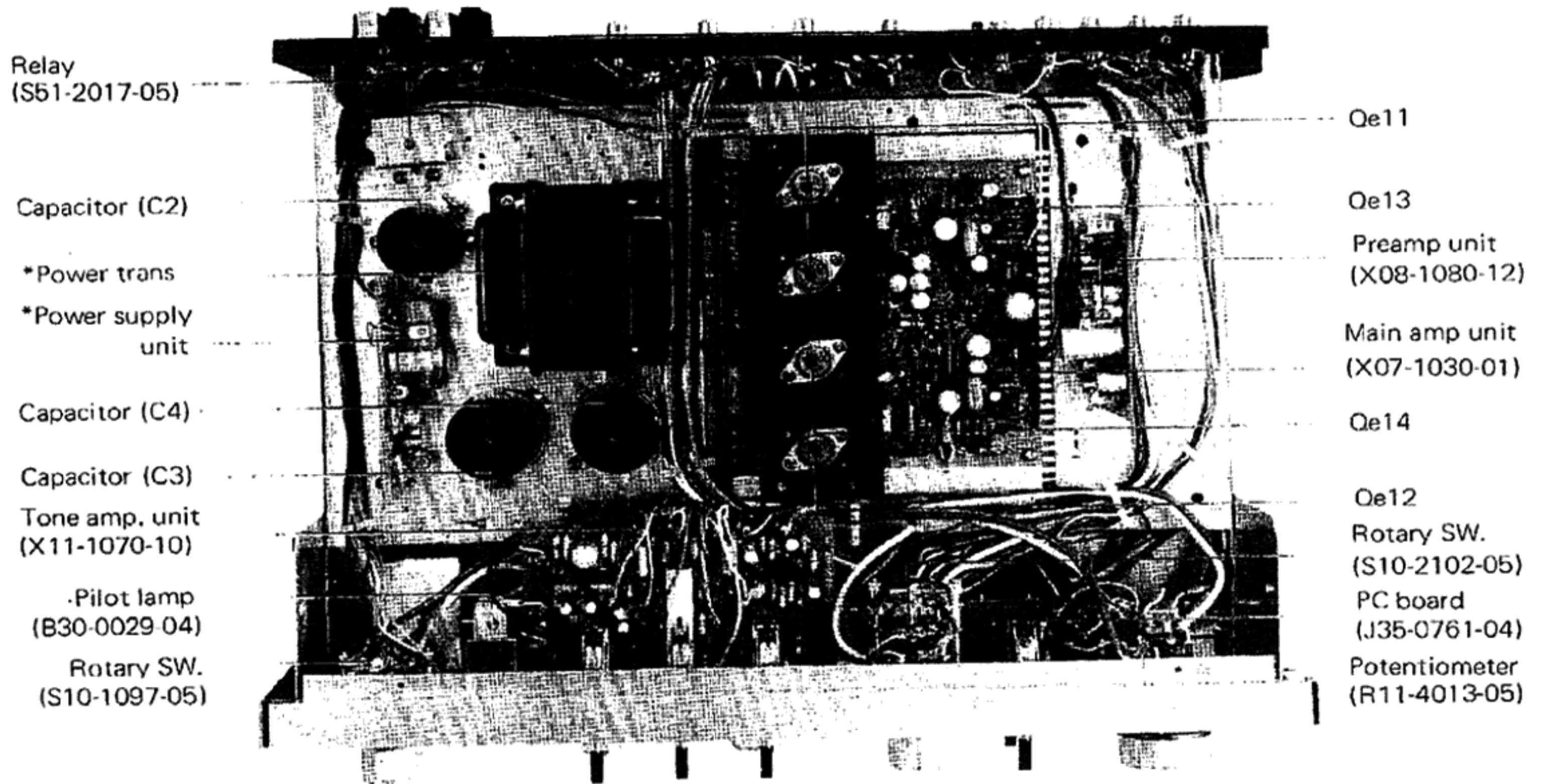
Pin jack (E13-0408-05)

Slide SW (S31-2007-05)

AC outlet (E08-0205-15)

\*Power cord  
\*Fuse holder

# INTERNAL VIEW



\* Refer to parts list

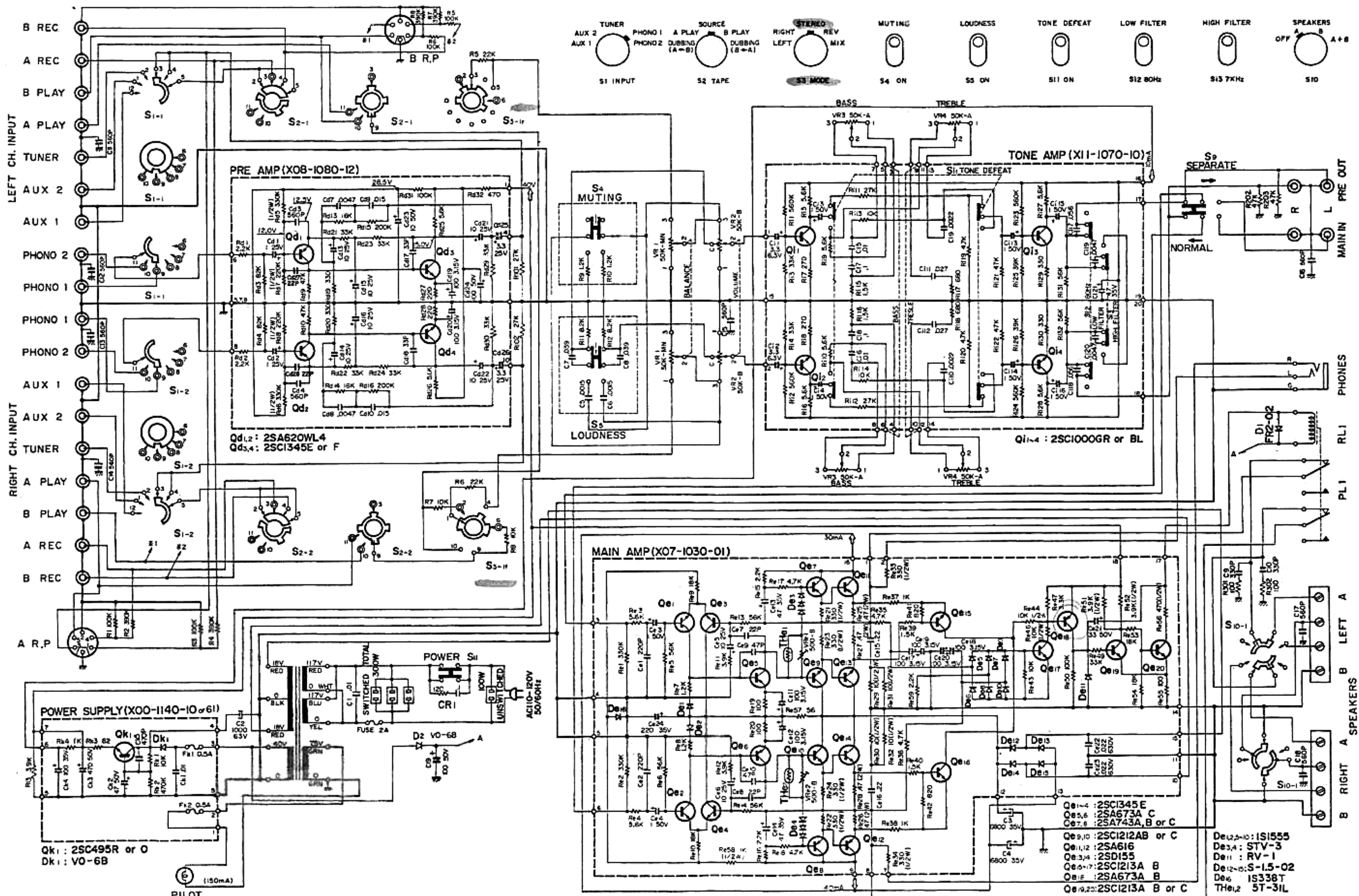
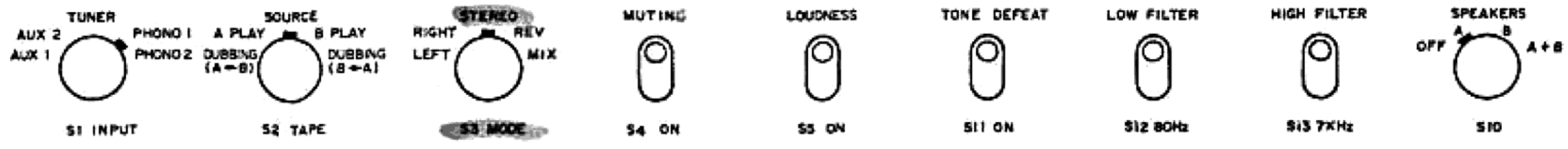
# PARTS LIST

| Ref. No.             | Parts No.    | Description                                       | Remarks |  |
|----------------------|--------------|---|---------|--|
| <b>CAPACITOR</b>     |              |   |         |  |
| C1                   | C90-0029-05  | Oil filled 0.01 $\mu$ F $\pm$ 20% -0%             | UL      |  |
| C2                   | C90-0137-05  | Electrolytic 1000 $\mu$ F 63WV                    |         |  |
| C3, 4                | C90-0136-05  | Electrolytic 6800 $\mu$ F 35WV                    |         |  |
| C5, 6                | CQ92M1H152K  | Mylar 0.0015 $\mu$ F $\pm$ 10%                    |         |  |
| C7, 8                | CQ92M1H393K  | Mylar 0.039 $\mu$ F $\pm$ 10%                     |         |  |
| C9, 10               | CK45D1H331M  | Ceramic 330pF $\pm$ 20%                           |         |  |
| C11 ~ 18             | CK45D1H561M  | Ceramic 560pF $\pm$ 20%                           |         |  |
| C19                  | CE02W1H101   | Electrolytic 100 $\mu$ F 50WV                     |         |  |
| <b>RESISTOR</b>      |              |   |         |  |
| R1                   | PD14BY2E104J | Carbon 100k $\Omega$ $\pm$ 5% 1/4W                |         |  |
| R2                   | PD14BY2E394J | Carbon 390k $\Omega$ $\pm$ 5% 1/4W                |         |  |
| R3                   | PD14BY2E104J | Carbon 100k $\Omega$ $\pm$ 5% 1/4W                |         |  |
| R4                   | PD14BY2E394J | Carbon 390k $\Omega$ $\pm$ 5% 1/4W                |         |  |
| R5, 6                | PD14BY2E223J | Carbon 22k $\Omega$ $\pm$ 5% 1/4W                 |         |  |
| R7, 8                | PD14BY2E103J | Carbon 10k $\Omega$ $\pm$ 5% 1/4W                 |         |  |
| R9, 10               | PD14BY2E122J | Carbon 1.2k $\Omega$ $\pm$ 5% 1/4W                |         |  |
| R11, 12              | PD14BY2E822J | Carbon 8.2k $\Omega$ $\pm$ 5% 1/4W                |         |  |
| R13                  | RC05GF2H392J | Carbon 3.9k $\Omega$ $\pm$ 5% 1/2W                |         |  |
| R101, 102            | PD14BY2E273J | Carbon 27k $\Omega$ $\pm$ 5% 1/4W                 |         |  |
| R202, 203            | PD14BY2E473J | Carbon 47k $\Omega$ $\pm$ 5% 1/4W                 |         |  |
| R301, 302            | RC05GF2H101J | Carbon 100 $\Omega$ $\pm$ 5% 1/2W                 |         |  |
| <b>SEMICONDUCTOR</b> |              |   |         |  |
| D1                   |              | FR2-02  |         |  |
| D2                   |              | V06B  |         |  |
| <b>SWITCH/RELAY</b>  |              |   |         |  |
| S1                   | S10-2103-05  | Rotary (INPUT)                                    |         |  |
| S2                   | S10-2102-05  | Rotary (TAPE MONITOR)                             |         |  |
| S3                   | S01-1013-05  | Rotary (MODE)                                     |         |  |
| S4                   | S36-2023-05  | Lever (MUTING)                                    |         |  |
| S5                   | S36-2023-05  | Lever (LOUDNESS)                                  |         |  |
| S9                   | S31-2007-05  | Slide (PRE-OUT MAIN-IN)                           |         |  |
| S10                  | S10-1097-05  | Rotary (SPEAKERS)                                 |         |  |
| RL1                  | S51-2017-05  | Relay   |         |  |
| <b>POTENTIOMETER</b> |              |   |         |  |
| VR1                  | R11-4013-05  | Potentiometer (BALANCE) 50k $\Omega$ (MN) 4 gangs |         |  |
| VR2                  | R11-4013-05  | Potentiometer (VOLUME) 50k $\Omega$ (B) 4 gangs   |         |  |
| VR3                  | R08-4056-05  | Potentiometer (BASS) 50k $\Omega$ (A) dual        |         |  |
| VR4                  | R08-4056-05  | Potentiometer (TREBLE) 50k $\Omega$ (A) dual      |         |  |
| <b>MISCELLANEOUS</b> |              |   |         |  |
| -                    | A01-0179-03  | Case  |         |  |
| -                    | A10-0320-01  | Chassis   |         |  |
| -                    | A20-0539-02  | Panel assembly                                    |         |  |
| -                    | A20-0542-12  | Panel   |         |  |
| -                    | A21-0103-03  | Ornamental plate                                  |         |  |
| -                    | A22-0118-02  | Sub panel   |         |  |
| -                    | A40-0098-03  | Bottom plate                                      |         |  |
| -                    | A49-0011-03  | Left side board (inside)                          |         |  |
| -                    | A49-0012-03  | Right side board (inside)                         |         |  |
| -                    | A49-0013-03  | Left side board (outside)                         |         |  |
| -                    | A49-0014-03  | Right side board (outside)                        |         |  |

| Ref. No. | Parts No.                                    | Description                                      | Remarks |
|----------|--|--|---------|
| —        | B07-0084-04                                  | Black spacer (POWER)                             |         |
| —        | B08-2010-04                                  | Red indicator                                    |         |
| P.L.     | B30-0029-15                                  | Pilot lamp (8V, 150mA)                           |         |
| —        | B42-0009-04                                  | Passed sticker                                   |         |
| —        | B42-0037-00                                  | Shorted pin caution card                         |         |
| —        | B52-0137-00                                  | Schematic diagram                                |         |
| —        | E08-0205-15                                  | AC outlet x 4                                    | UL      |
| —        | E11-0002-05                                  | Phone jack (PHONES)                              |         |
| —        | E13-0401-05                                  | Pin jack with DIN                                |         |
| —        | E13-0408-05                                  | Pin jack (4P)                                    |         |
| —        | E13-1002-05                                  | Pin jack (10P)                                   |         |
| —        | E14-0107-05                                  | Shorted pin x 2                                  |         |
| —        | E15-0012-15                                  | Pilot lamp socket                                |         |
| —        | E21-0802-05                                  | Push terminal (8P)                               |         |
| —        | F07-0011-04                                  | Lamp cover                                       |         |
| —        | F19-0087-03                                  | Left wooden side board                           |         |
| —        | F19-0088-03                                  | Right wooden side board                          |         |
| —        | G16-0046-04                                  | Rubber sheet                                     |         |
| —        | H01-0813-04                                  | Carton case                                      |         |
| —        | J02-0049-14                                  | Leg x 4  |         |
| —        | J19-0268-04                                  | Relay stopper                                    |         |
| —        | J21-0192-04                                  | Amp stopper x 2                                  |         |
| —        | J21-0815-04                                  | AC outlet mounting hardware x 4                  |         |
| —        | J21-0817-04                                  | Pin jack mounting hardware (4P)                  |         |
| —        | J21-0749-04                                  | Pin jack mounting hardware (10P)                 |         |
| —        | J21-0993-04                                  | Pin jack mounting hardware (DIN) x 2             |         |
| —        | J21-0996-04                                  | Indicator mounting hardware                      |         |
| —        | J21-0997-04                                  | Push terminal mounting hardware                  |         |
| —        | J25-0760-04                                  | PC board   |         |
| —        | J25-0761-04                                  | PC board   |         |
| —        | K20-0113-04                                  | Knob (BALANCE)                                   |         |
| —        | K21-0254-03                                  | Knob (VOLUME)                                    |         |
| —        | K23-0105-03                                  | Knob (SPEAKERS, MODE, BASS, TREBLE, INPUT, TAPE) |         |
| —        | K29-0115-04                                  | Knob (POWER)                                     |         |
| —        | K29-0123-04                                  | Knob (lever switch) x 5                          |         |
| —        | X07-1030-01                                  | Main amp unit                                    |         |
| —        | X08-1080-12                                  | Preamp unit                                      |         |
| —        | X11-1070-10                                  | Tone amp with filter circuit                     |         |
|          | In North America add to the following parts. |  |         |
| —        | A23-0307-02                                  | Rear panel                                       |         |
| —        | B40-0654-04                                  | Model name plate . . . only Canada               |         |
| —        | B42-0359-04                                  | UL caution sticker x 2                           | UL      |
| —        | B46-0002-00                                  | Warranty card . . . only U.S.A.                  |         |
| —        | B46-0021-00                                  | Warranty card . . . only Canada                  |         |
| —        | B50-0849-00                                  | Instruction manual                               |         |

| Ref. No. | Parts No.              | Description                           | Remarks |
|----------|------------------------|---------------------------------------|---------|
| —        | B58-0043-00            | Carton case caution card              |         |
| —        | D32-0021-04            | Switch stopper                        |         |
| —        | E30-0046-05            | Power cord                            | UL      |
| F        | F05-2021-05            | Fuse (2A) . . . only U.S.A.           | UL      |
| F        | F05-2023-05            | Fuse (2A) . . . only Canada           |         |
| —        | H03-0150-04            | Carton case                           |         |
| —        | J13-0016-15            | Fuse holder                           | UL      |
| —        | L03-0072-05            | Power trans. . . . only U.S.A.        |         |
| —        | L05-0010-05            | Power trans. . . . only Canada        |         |
| CR1      | R90-0097-05            | Spark killer . . . only U.S.A.        |         |
| S11      | S39-2002-05            | Pushbutton switch (POWER)             | UL      |
| —        | X00-1140-10            | Power supply unit                     |         |
|          | In other area do . . . |                                       |         |
| —        | A23-0308-02            | Rear panel                            |         |
| —        | B42-0368-04            | EP sticker                            |         |
| —        | B46-0022-00            | Warranty card                         |         |
| —        | B46-0023-00            | Warrenty card                         |         |
| —        | B50-0850-00            | Instruction manual                    |         |
| —        | B58-0139-00            | Power supply caution card             |         |
| —        | B58-0144-00            | Power voltage selector caution card   |         |
| —        | B58-0146-00            | Spare fuse caution card               |         |
| —        | B69-0018-00            | KENWOOD service stations' list        |         |
| —        | D32-0021-04            | Switch stopper x 2                    |         |
| —        | E30-0034-05            | Power cord                            |         |
| F        | F05-1023-05            | Fuse (1A)                             |         |
| F        | F05-2023-05            | Fuse (2A)                             |         |
| —        | J13-0033-05            | Fuse holder                           |         |
| P.T      | L03-0072-05            | Power trans.                          |         |
| —        | S31-2001-05            | Slide switch (power voltage selector) |         |
| S11      | S39-2003-05            | Pushbutton switch (POWER)             | SEV     |
| —        | X00-1140-01            | Power supply unit                     |         |

# SCHEMATIC DIAGRAM



Qk1 : 2SC495R or O  
Dk1 : VO-6B

Qe1,2 : 2SC1345 E  
Qe3,6 : 2SA673A C  
Qe7,8 : 2SA743A, B or C  
Qe9,10 : 2SC1212AB or C  
Qe11,12 : 2SA616  
Qe13,14 : 2SD155  
Qe15,17 : 2SC1213A B  
Qe16 : 2SA673A B  
Qe19,20 : 2SC1213A B or C

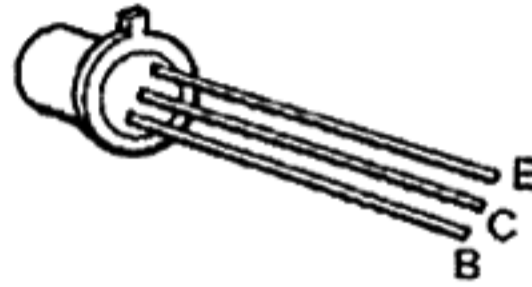
De1,2,10 : 1S1555  
De3,4 : STV-3  
De11 : RV-1  
De12-15 : S-1.5-02  
De6 : 1S338T  
The1,2 : 5T-31L



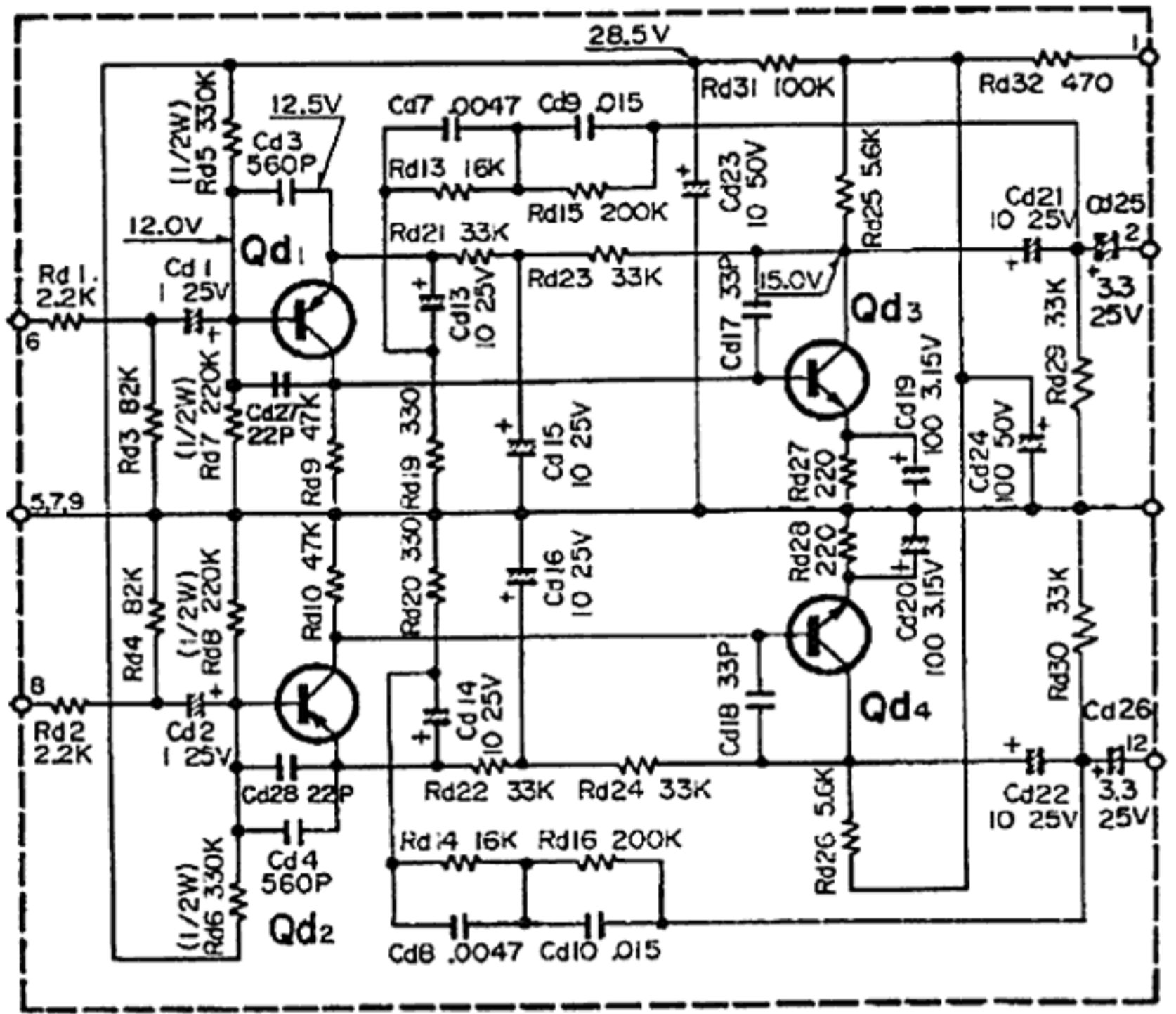
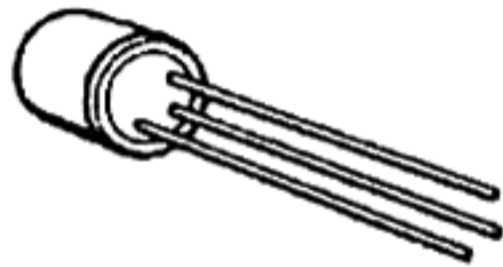
**SCHEMATIC DIAGRAM**

**TRANSISTOR LEADS**

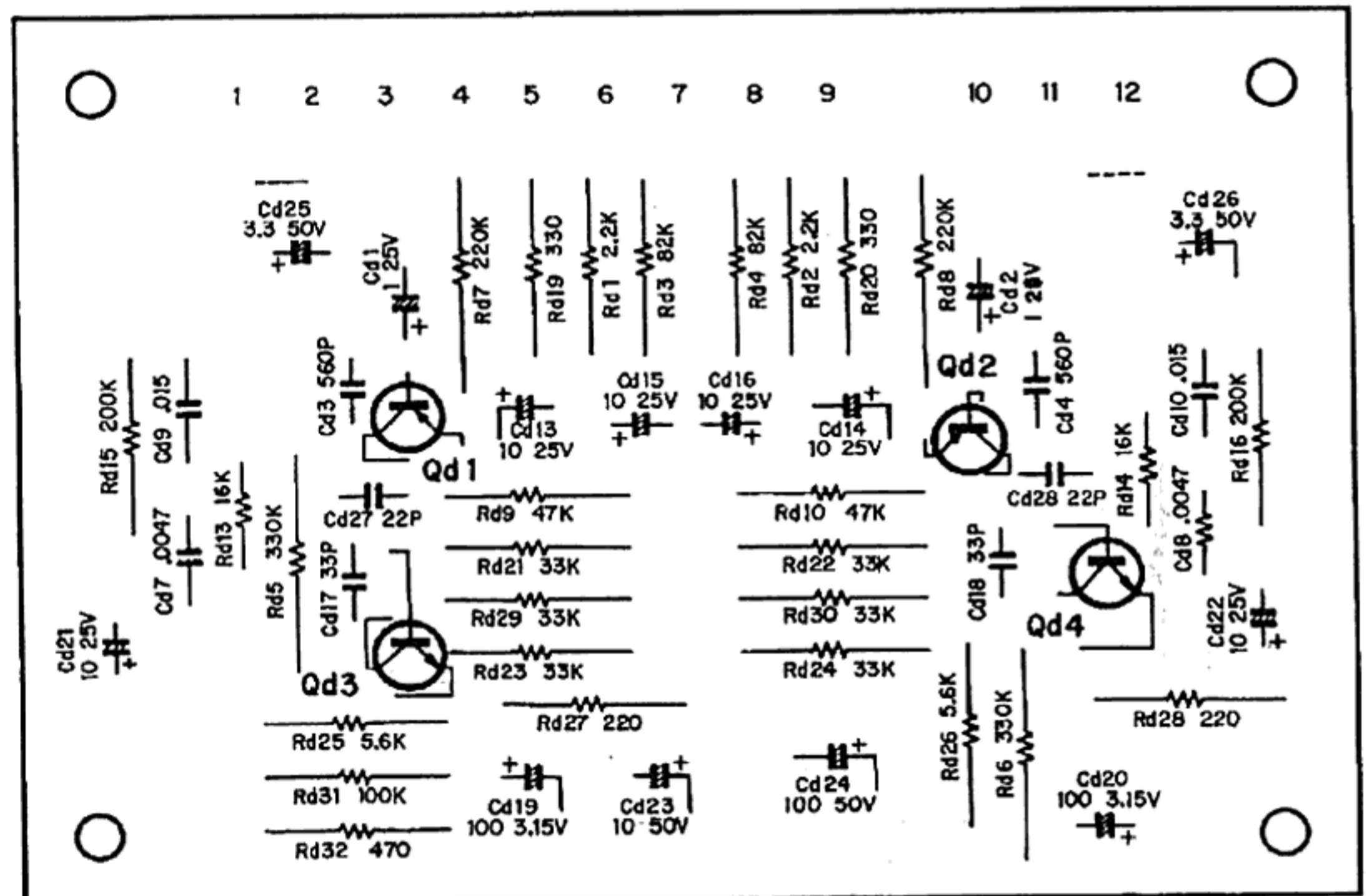
2SA620WL



2SC1416



**SEALED CIRCUIT ASSEMBLIES-PHANTOM VIEWS**

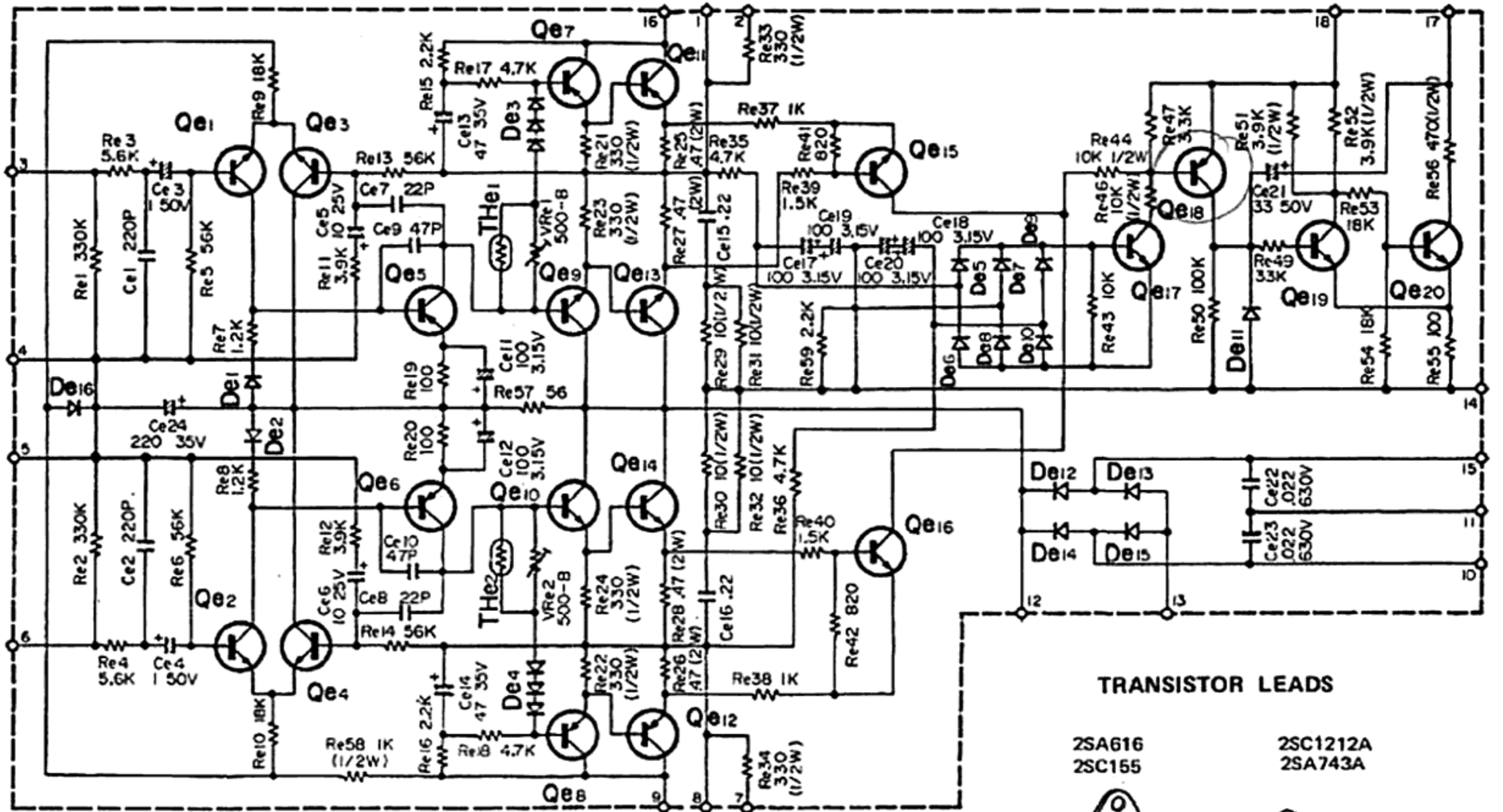


Qd1, 2 : 2SA620WL4 Qd3, 4 : 2SC1416BL

**PARTS DESCRIPTION LIST**

| Ref. No.             | Parts No.    | Description  |                |           | Remarks |
|----------------------|--------------|--------------|----------------|-----------|---------|
| <b>CAPACITOR</b>     |              |              |                |           |         |
| Cd1, 2               | CS04E1E010M  | Tantalum     | 1 $\mu$ F      | 25WV      |         |
| Cd3, 4               | CK45D1H561M  | Ceramic      | 560pF          | $\pm$ 20% |         |
| Cd7, 8               | CQ93M1H472J  | Mylar        | 0.0047 $\mu$ F | $\pm$ 5%  |         |
| Cd9, 10              | CQ93M1H153J  | Mylar        | 0.015 $\mu$ F  | $\pm$ 5%  |         |
| Cd13 ~ 16            | CE04W1E100   | Electrolytic | 10 $\mu$ F     | 25WV      |         |
| Cd17, 18             | CC45SL1H330K | Ceramic      | 33pF           | $\pm$ 10% |         |
| Cd19, 20             | CE04W0F101   | Electrolytic | 100 $\mu$ F    | 3.15WV    |         |
| Cd21, 22             | CE04W1E100   | Electrolytic | 10 $\mu$ F     | 25WV      |         |
| Cd23                 | CE04W1H100   | Electrolytic | 10 $\mu$ F     | 50WV      |         |
| Cd24                 | CE04W1H101   | Electrolytic | 100 $\mu$ F    | 50WV      |         |
| Cd25, 26             | CE04W1H3R3   | Electrolytic | 3.3 $\mu$ F    | 50WV      |         |
| Cd27, 28             | CC45SL1H220K | Ceramic      | 22pF           | $\pm$ 10% |         |
| <b>RESISTOR</b>      |              |              |                |           |         |
| Rd1, 2               | PD14BY2E222J | Carbon       | 2.2k $\Omega$  | $\pm$ 5%  | 1/4W    |
| Rd3, 4               | PD14BY2E823J | Carbon       | 82k $\Omega$   | $\pm$ 5%  | 1/4W    |
| Rd5, 6               | RN92A2H334J  | Metal film   | 330k $\Omega$  | $\pm$ 5%  | 1/2W    |
| Rd7, 8               | RN92A2H224J  | Metal film   | 220k $\Omega$  | $\pm$ 5%  | 1/2W    |
| Rd9, 10              | PD14BY2E473J | Carbon       | 47k $\Omega$   | $\pm$ 5%  | 1/4W    |
| Rd13, 14             | RN92A2E163G  | Metal film   | 16k $\Omega$   | $\pm$ 1%  | 1/4W    |
| Rd15, 16             | PD14BY2E204J | Carbon       | 200k $\Omega$  | $\pm$ 5%  | 1/4W    |
| Rd19, 20             | PD14BY2E331J | Carbon       | 330 $\Omega$   | $\pm$ 5%  | 1/4W    |
| Rd21 ~ 24            | PD14BY2E333J | Carbon       | 33k $\Omega$   | $\pm$ 5%  | 1/4W    |
| Rd25, 26             | PD14BY2E562J | Carbon       | 5.6k $\Omega$  | $\pm$ 5%  | 1/4W    |
| Rd27, 28             | PD14BY2E221J | Carbon       | 220 $\Omega$   | $\pm$ 5%  | 1/4W    |
| Rd29, 30             | PD14BY2E333J | Carbon       | 33k $\Omega$   | $\pm$ 5%  | 1/4W    |
| Rd31                 | PD14BY2E104J | Carbon       | 100k $\Omega$  | $\pm$ 5%  | 1/4W    |
| Rd32                 | PD14BY2E471J | Carbon       | 470 $\Omega$   | $\pm$ 5%  | 1/4W    |
| <b>SEMICONDUCTOR</b> |              |              |                |           |         |
| Qd1, 2               |              | 2SA620WL4    |                |           |         |
| Qd3, 4               |              | 2SC1416BL    |                |           |         |

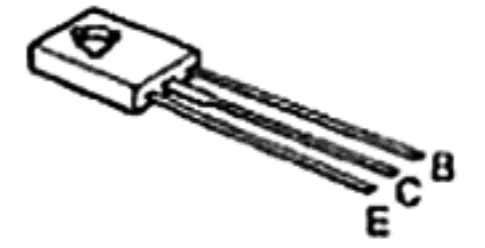
**SCHEMATIC DIAGRAM**



**TRANSISTOR LEADS**

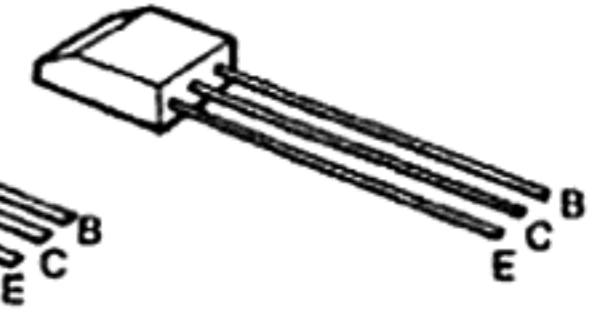
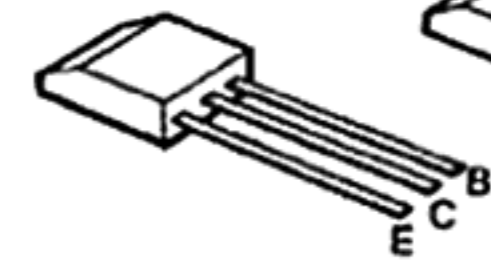
2SA616  
2SC155

2SC1212A  
2SA743A

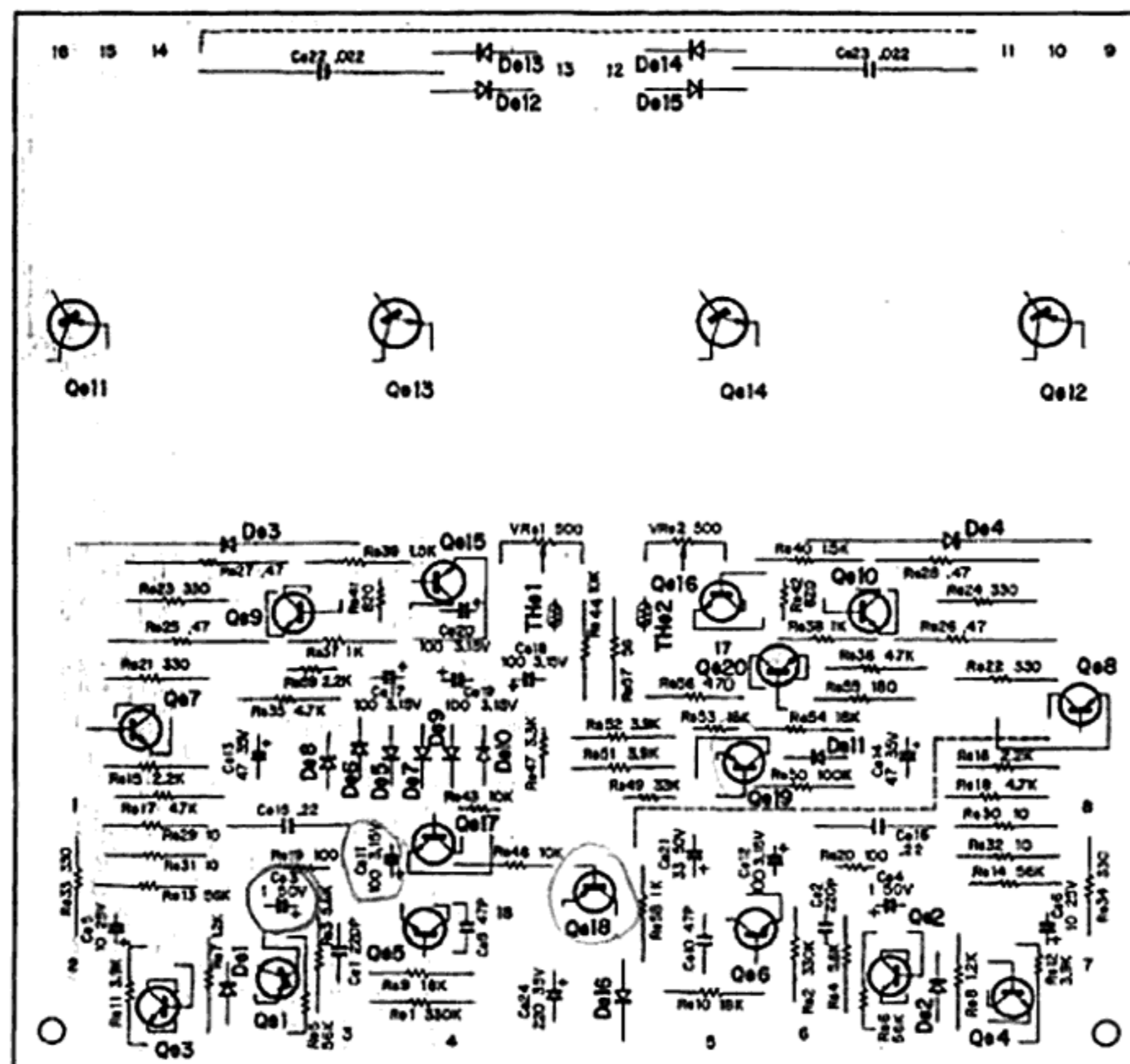


2SA673A  
2SC1213A

2SC1345



**SEALED CIRCUIT ASSEMBLIES-PHANTOM VIEWS**

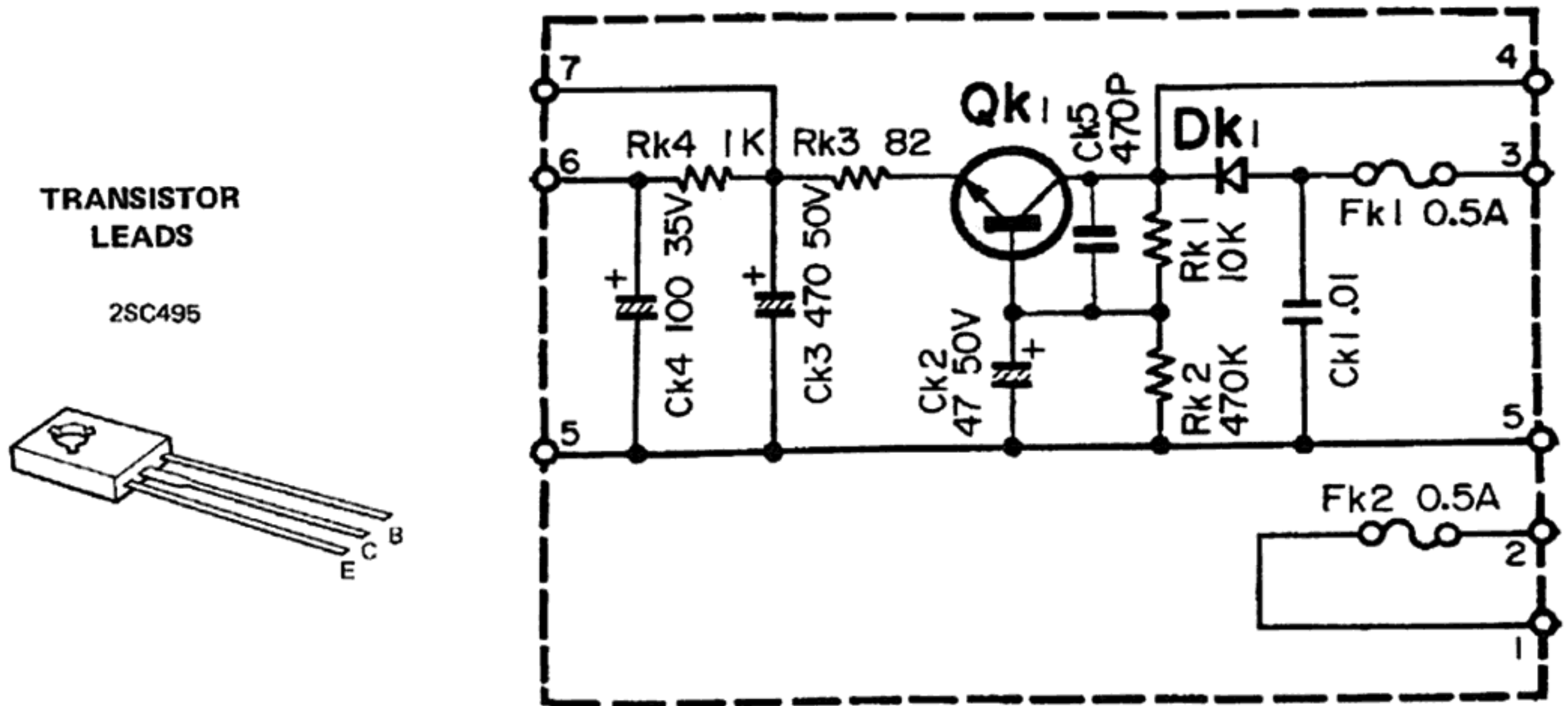


- Qe1 ~ 4: 2SC1345(E) Qe5, 6: 2SA673A(C) Qe7, 8: 2SA743A(B) or (C)
- Qe9, 10: 2SC1212A(B) or (C) Qe11, 12: 2SA616 Qe13, 14: 2SD155
- Qe15 ~ 17: 2SC1213A(B) Qe18: 2SA673A(B) Qe19, 20: 2SC1213A(B) or (C)
- De1, 2: 1S1555 De3, 4: STV-3 De5 ~ 10: 1S1555 De11: RV-1
- De12 ~ 15: S1.5-02 De16: 1S338T THe1, 2: 5T-31L

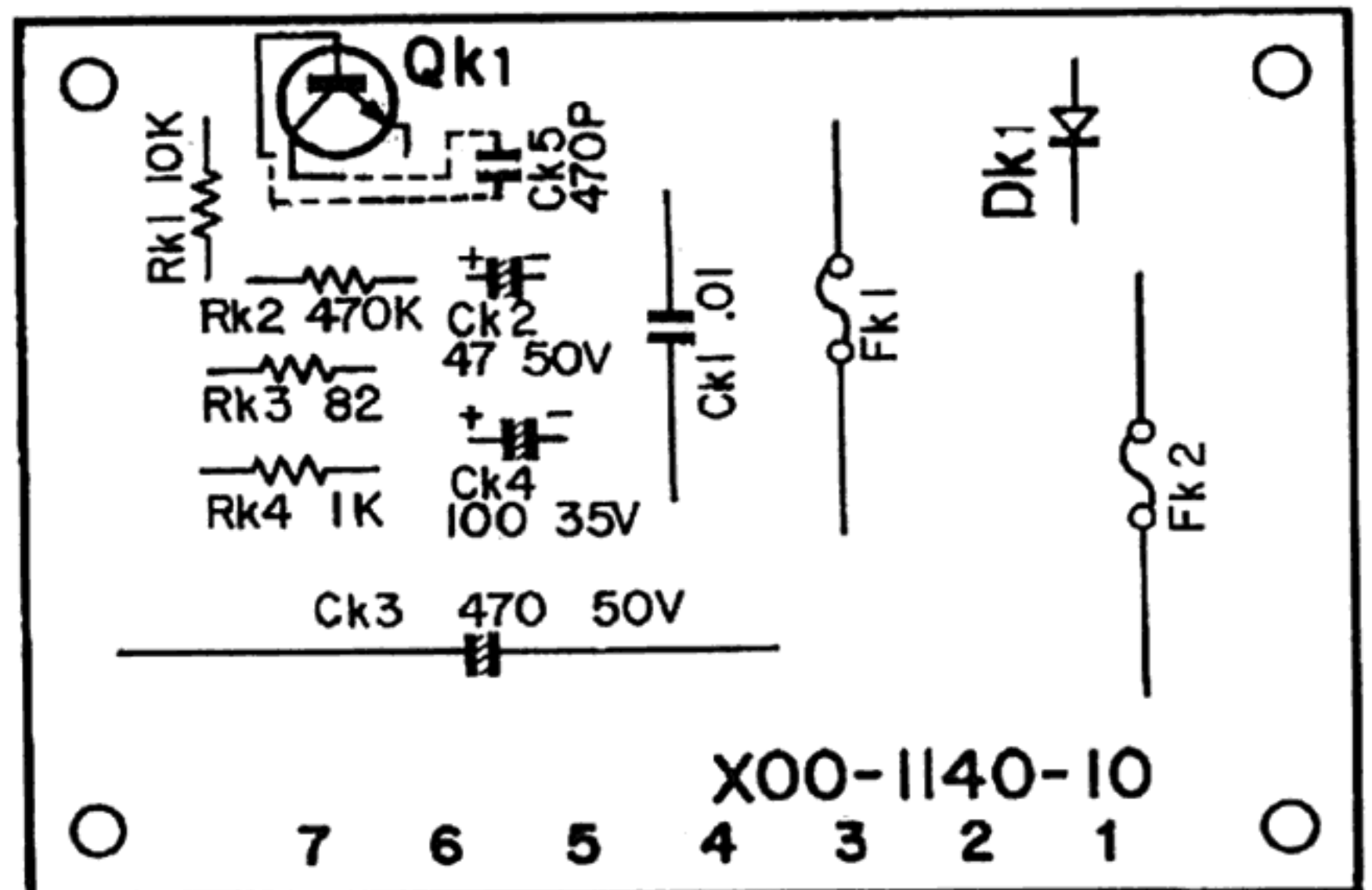
**PARTS DESCRIPTION LIST**

| Ref. No.             | Parts No.    | Description                | Remarks |
|----------------------|--------------|----------------------------|---------|
| <b>CAPACITOR</b>     |              |                            |         |
| Ce1, 2               | CC94SL1H221K | Ceramic 220pF ±10%         |         |
| Ce3, 4               | CE04W1H010   | Electrolytic 1μF 50W       |         |
| Ce5, 6               | CE04W1E100   | Electrolytic 1μF 25WV      |         |
| Ce9, 10              | CC94SL1H470K | Ceramic 47pF ±10%          |         |
| Ce11, 12             | CE04W0F101   | Electrolytic 100μF 3.15WV  |         |
| Ce13, 14             | CE04W1V470   | Electrolytic 47μF 35WV     |         |
| Ce15, 16             | CO93M1H224M  | Mylar 0.22μF ±20%          |         |
| Ce17 ~ 20            | CE04W0F101   | Electrolytic 100μF 3.15WV  |         |
| Ce21                 | CE04W1H330   | Electrolytic 33μF 50WV     |         |
| Ce22, 23             | CP02B2J223M  | Oil filled 0.022μF ±20%    |         |
| Ce24                 | CE04W1V221   | Electrolytic 220μF 35WV    |         |
| <b>RESISTOR</b>      |              |                            |         |
| Re1, 2               | PD14BY2E334J | Carbon 330kΩ ±5% 1/4W      |         |
| Re3, 4               | PD14BY2E562J | Carbon 5.6kΩ ±5% 1/4W      |         |
| Re5, 6               | PD14BY2E563J | Carbon 56kΩ ±5% 1/4W       |         |
| Re7, 8               | PD14BY2E122J | Carbon 1.2kΩ ±5% 1/4W      |         |
| Re9, 10              | PD14BY2E183J | Carbon 18kΩ ±5% 1/4W       |         |
| Re11, 12             | PD14BY2E392J | Carbon 3.9kΩ ±5% 1/4W      |         |
| Re13, 14             | PD14BY3E563J | Carbon 56kΩ ±5% 1/4W       |         |
| Re15, 16             | PD14BY2E222J | Carbon 2.2kΩ ±5% 1/4W      |         |
| Re17, 18             | PD14BY2E472J | Carbon 4.7kΩ ±5% 1/4W      |         |
| Re19, 20             | PD14CY2E101J | Carbon 100Ω ±5% 1/4W       |         |
| Re21 ~ 24            | RC05GF2H331K | Carbon 330Ω ±10% 1/2W      |         |
| Re25 ~ 28            | RN14AB3DR47J | Metal film 0.47Ω ±5% 2W    |         |
| Re29 ~ 32            | RC05GF2H100K | Carbon 10Ω ±10% 1/2W       |         |
| Re33, 34             | RC05GF2H331K | Carbon 330Ω ±10% 1/2W      |         |
| Re35, 36             | PD14BY2E472J | Carbon 4.7kΩ ±5% 1/4W      |         |
| Re37, 38             | PD14BY2E102J | Carbon 1kΩ ±5% 1/4W        |         |
| Re39, 40             | PD14BY2E152J | Carbon 1.5kΩ ±5% 1/4W      |         |
| Re41, 42             | PD14CY2E101J | Carbon 100Ω ±5% 1/4W       |         |
| Re43                 | PD14CY2E101J | Carbon 100Ω ±5% 1/4W       |         |
| Re44                 | PD14BY2E103J | Carbon 10kΩ ±5% 1/4W       |         |
| Re46                 | PD14BY2E103J | Carbon 10kΩ ±5% 1/4W       |         |
| Re47                 | PD14CY2E332J | Carbon 3.3kΩ ±5% 1/4W      |         |
| Re49                 | PD14CY2E333J | Carbon 33kΩ ±5% 1/4W       |         |
| Re50                 | PD14BY2E104J | Carbon 100kΩ ±5% 1/4W      |         |
| Re51, 52             | RC05GF2H392K | Carbon 3.9kΩ ±10% 1/2W     |         |
| Re53                 | PD14CY2E183J | Carbon 18kΩ ±5% 1/4W       |         |
| Re54                 | PD14BY2E183J | Carbon 18kΩ ±5% 1/4W       |         |
| Re55                 | PD14BY2E101J | Carbon 100Ω ±5% 1/4W       |         |
| Re56                 | RN14AB3A471K | Metal film 470Ω ±10% 1W    |         |
| Re57                 | PD14BY2E560J | Carbon 56Ω ±5% 1/4W        |         |
| Re58                 | RC05GF2H102K | Carbon 1kΩ ±10% 1/2W       |         |
| Re59                 | PD14CY2E222J | Carbon 2.2kΩ ±5% 1/4W      |         |
| <b>SEMICONDUCTOR</b> |              |                            |         |
| Qe1 ~ 4              |              | 2SC1345 (E)                |         |
| Qe5, 6               |              | 2SA673A(C)                 |         |
| Qe7, 8               |              | 2SA743A(B) or (C)          |         |
| Qe9, 10              |              | 2SC1212A(B) or (C)         |         |
| Qe11, 12             |              | 2SA616                     |         |
| Qe13, 14             |              | 2SD155                     |         |
| Qe15 ~ 17            |              | 2SC1213A(B)                |         |
| Qe18                 |              | 2SA673A(B)                 |         |
| Qe19, 20             |              | 2SC1213A(B) or (C)         |         |
| De1, 2               |              | 1S1555                     |         |
| De3, 4               |              | STV-3                      |         |
| De5 ~ 10             |              | 1S1555                     |         |
| De11                 |              | RV-1                       |         |
| De12 ~ 15            |              | S-1.5-02                   |         |
| De16                 |              | 1S338T                     |         |
| THe1, 2              |              | 5T-31L                     |         |
| <b>POTENTIOMETER</b> |              |                            |         |
| VRe1, 2              | R12-0026-05  | PC trimmer (BIAS) 500Ω (B) |         |
| <b>MISCELLEOUS</b>   |              |                            |         |
| -                    | E02-0208-05  | transistor socket x 4      |         |
| -                    | F01-0081-03  | heat sink                  |         |

**SCHEMATIC DIAGRAM**



**SEALED CIRCUIT ASSEMBLIES-PHANTOM VIEWS**

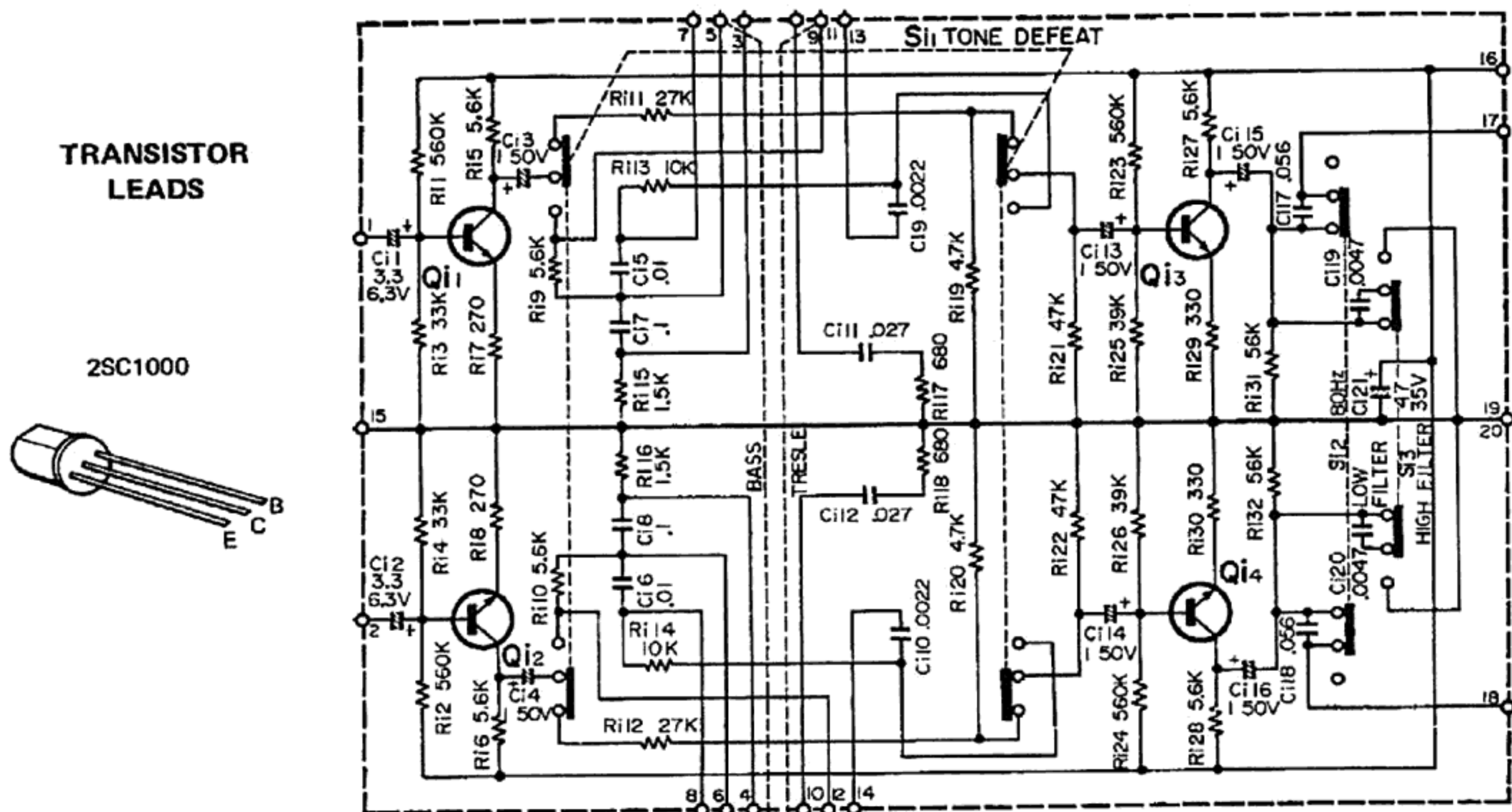


Qk1 : 2SC495(R) or (O) Dk1 : V06B

**PARTS DESCRIPTION LIST**

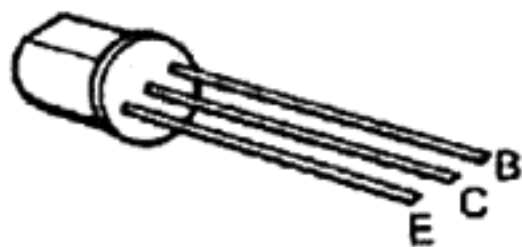
| Ref. No.             | Parts No.                  | Description                        | Remarks |
|----------------------|----------------------------|------------------------------------|---------|
| <b>CAPACITOR</b>     |                            |                                    |         |
| Ck1                  | CP02B2J103M                | Oil filled 0.01 $\mu$ F $\pm$ 20%  |         |
| Ck2                  | CE04W1H470                 | Electrolytic 47 $\mu$ F 50WV       |         |
| Ck3                  | CE02W1H471                 | Electrolytic 470 $\mu$ F 50WV      |         |
| Ck4                  | CE04W1V101                 | Electrolytic 100 $\mu$ F 35WV      |         |
| Ck5                  | CK45D1H471K                | Ceramic 470pF $\pm$ 10%            |         |
| <b>RESISTOR</b>      |                            |                                    |         |
| Rk1                  | PD14BY2E103J               | Carbon 10k $\Omega$ $\pm$ 5% 1/4W  |         |
| Rk2                  | PD14BY2E474J               | Carbon 470k $\Omega$ $\pm$ 5% 1/4W |         |
| Rk3                  | RC05GF2H820K               | Carbon 82 $\Omega$ $\pm$ 10% 1/2W  |         |
| Rk4                  | RC05GF2H102K               | Carbon 1k $\Omega$ $\pm$ 10% 1/2W  |         |
| <b>SEMICONDUCTOR</b> |                            |                                    |         |
| Qk1                  |                            | 2SC495(R) or (O)                   |         |
| Dk1                  |                            | V06B                               |         |
| <b>MISCELLANEOUS</b> |                            |                                    |         |
| F1, 2                | F05-5017-05<br>J13-0023-05 | Fuse(0.5A)<br>Fuse holder          | UL      |

## SCHEMATIC DIAGRAM

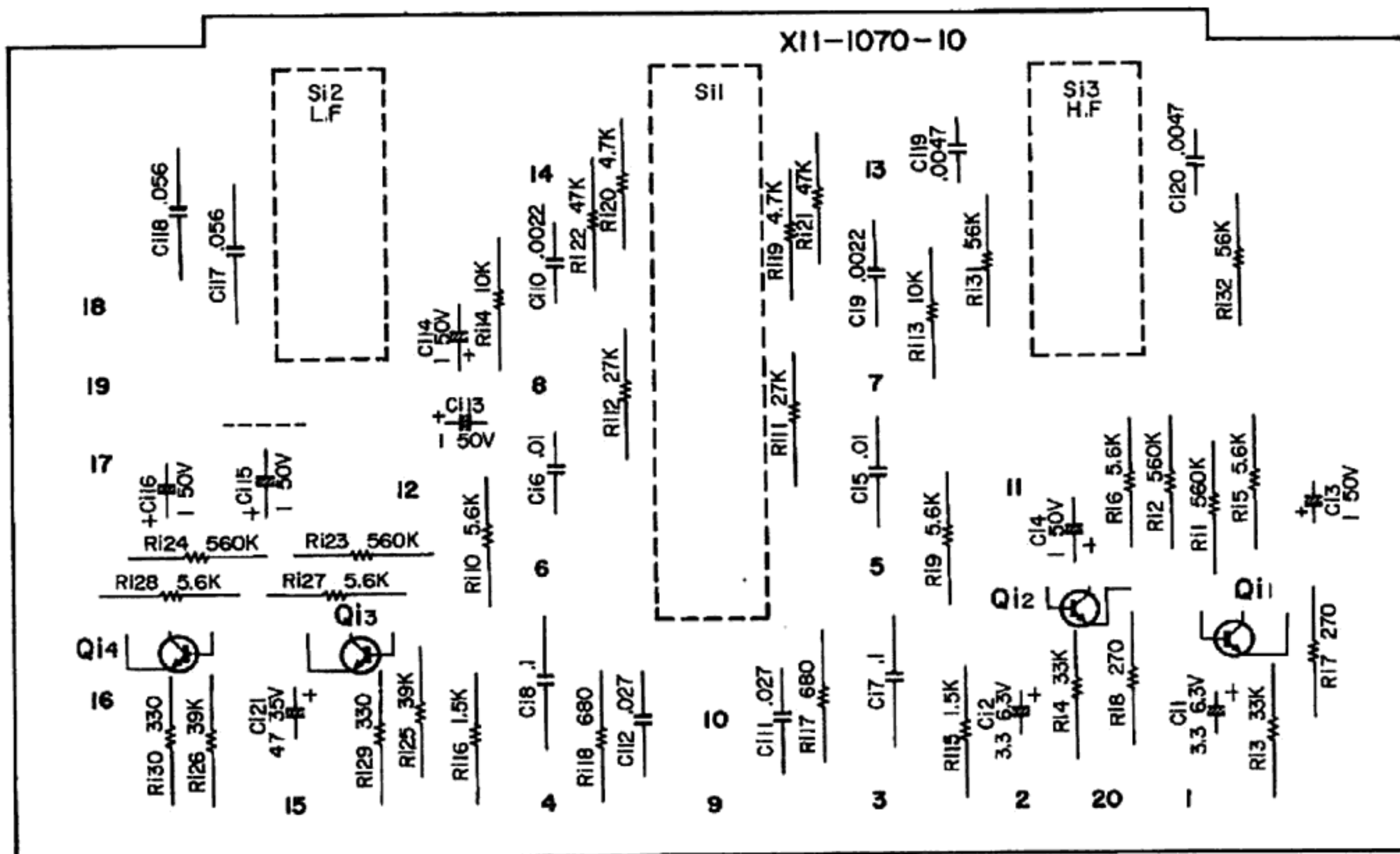


TRANSISTOR LEADS

2SC1000



## SEALED CIRCUIT ASSEMBLIES-PHANTOM VIEWS



Q1 ~ 4 : 2SC1000(GR) or (BL)

**PARTS DESCRIPTION LIST**

| Circuit No.          | Parts No.        | Description                         | Remarks |
|----------------------|------------------|-------------------------------------|---------|
| <b>CAPACITOR</b>     |                  |                                     |         |
| Ci1, 2               | CS04D0J3R3X or M | Tantalum 3.3 $\mu$ F 6.3WV          |         |
| Ci3, 4               | CE04W1H010       | Electrolytic 1 $\mu$ F 50WV         |         |
| Ci5,6                | CQ93M1H103K      | Mylar 0.01 $\mu$ F $\pm$ 10%        |         |
| Ci7, 8               | CQ93M1H104K      | Mylar 0.1 $\mu$ F $\pm$ 10%         |         |
| Ci9,10               | CQ93M1H222K      | Mylar 0.0022 $\mu$ F $\pm$ 10%      |         |
| Ci11, 12             | CQ93M1H273K      | Mylar 0.027 $\mu$ F $\pm$ 10%       |         |
| Ci13,~ 16            | CE04W1H010       | Electrolytic 1 $\mu$ F 50WV         |         |
| Ci17, 18             | CQ93M1H563K      | Mylar 0.056 $\mu$ F $\pm$ 10%       |         |
| Ci19, 20             | CQ93M1H472K      | Mylar 0.0047 $\mu$ F $\pm$ 10%      |         |
| Ci21                 | CE04W1V470       | Electrolytic 47 $\mu$ F 35WV        |         |
| <b>RESISTOR</b>      |                  |                                     |         |
| Ri1, 2               | PD14BY2E564J     | Carbon 560k $\Omega$ $\pm$ 5% 1/4W  |         |
| Ri3, 4               | PD14BY2E333J     | Carbon 33k $\Omega$ $\pm$ 5% 1/4W   |         |
| Ri5,6                | PD14BY2E562J     | Carbon 5.6k $\Omega$ $\pm$ 5% 1/4W  |         |
| Ri7, 8               | PD14BY2E 271J    | Carbon 270 $\Omega$ $\pm$ 5% 1/4W   |         |
| Ri9, 10              | PD14BY2E562J     | Carbon 5.6k $\Omega$ $\pm$ 5% 1/4W  |         |
| Ri11, 12             | PD14BY2E273J     | Carbon 27k $\Omega$ $\pm$ 5% 1/4W   |         |
| Ri13, 14             | PD14BY2E103J     | Carbon 10k $\Omega$ $\pm$ 5% 1/4W   |         |
| Ri15, 16             | PD14BY2E152J     | Carbon 1.5k $\Omega$ $\pm$ 5% 1/4W  |         |
| Ri17, 18             | PD14BY2E681J     | Carbon 680 $\Omega$ $\pm$ 5% 1/4W   |         |
| Ri19, 20             | PD14BY2E472J     | Carbon 4.7k $\Omega$ $\pm$ 5% 1/4W  |         |
| Ri21, 22             | PD14BY2E473J     | Carbon 47k $\Omega$ $\pm$ 5% 1/4W   |         |
| Ri23, 24             | PD14BY2E564J     | Carbon 560k $\Omega$ $\pm$ 5% 1/4W  |         |
| Ri25, 26             | PD14BY2E393J     | Carbon 39k $\Omega$ $\pm$ 5% 1/4W   |         |
| Ri27, 28             | PD14BY2E562J     | Carbon 5.6 k $\Omega$ $\pm$ 5% 1/4W |         |
| Ri29, 30             | PD14BY2E331J     | Carbon 330 $\Omega$ $\pm$ 5% 1/4W   |         |
| Ri31, 32             | PD14BY2E563J     | Carbon 56k $\Omega$ $\pm$ 5% 1/4W   |         |
| <b>SEMICONDUCTOR</b> |                  |                                     |         |
| Qi1 ~4               |                  | 2SC1000(GR) or (BL)                 |         |
| <b>SWITCH</b>        |                  |                                     |         |
| Si1                  | S36-4012-05      | Lever (TONE DEFEAT)                 |         |
| Si2                  | S36-2023-05      | Lever (LOW FILTER)                  |         |
| Si3                  | S36-2023-05      | Lever (HIGH FILTER)                 |         |



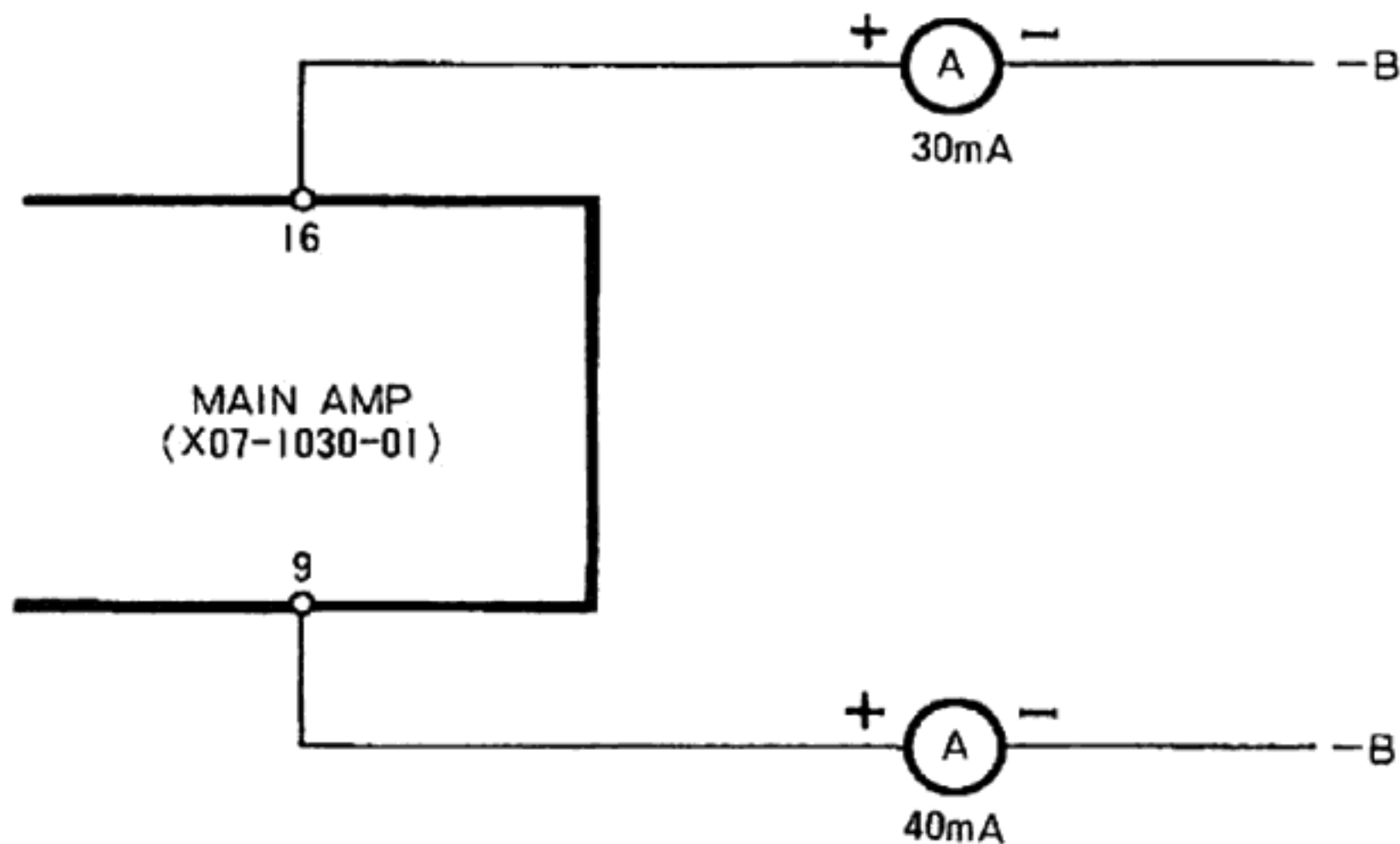
# ADJUSTMENT OF AUDIO SECTION

(KA-4004)

## WHEN USING TESTER AS AMMETER

1. Set pc trimmer potentiometer (VRe1, 2) to its min..
2. Couple tester (as ammeter) to terminal 16 of main amp unit and power supply lead.
3. Adjust pc trimmer potentiometer (VRe1) so that tester reading is 30mA.
4. Remove tester to terminal 9 of that and power supply lead.
5. Adjust pc trimmer potentiometer (VRe2) so that tester reading is 40mA.

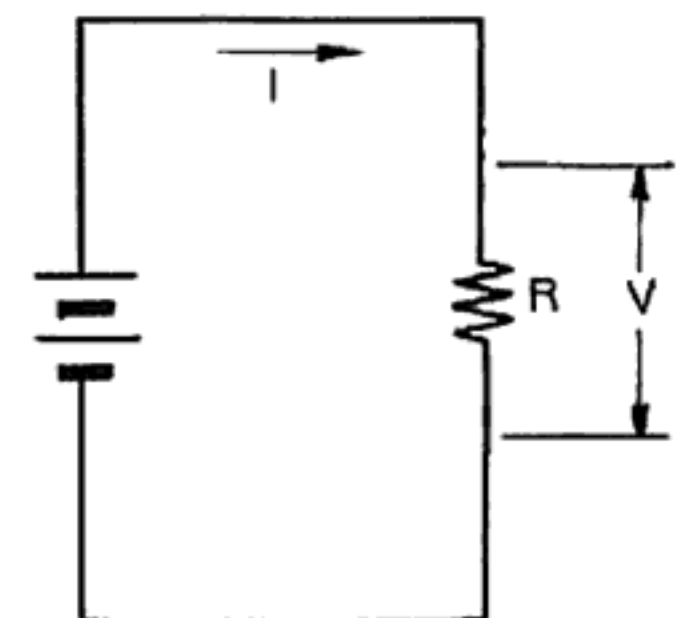
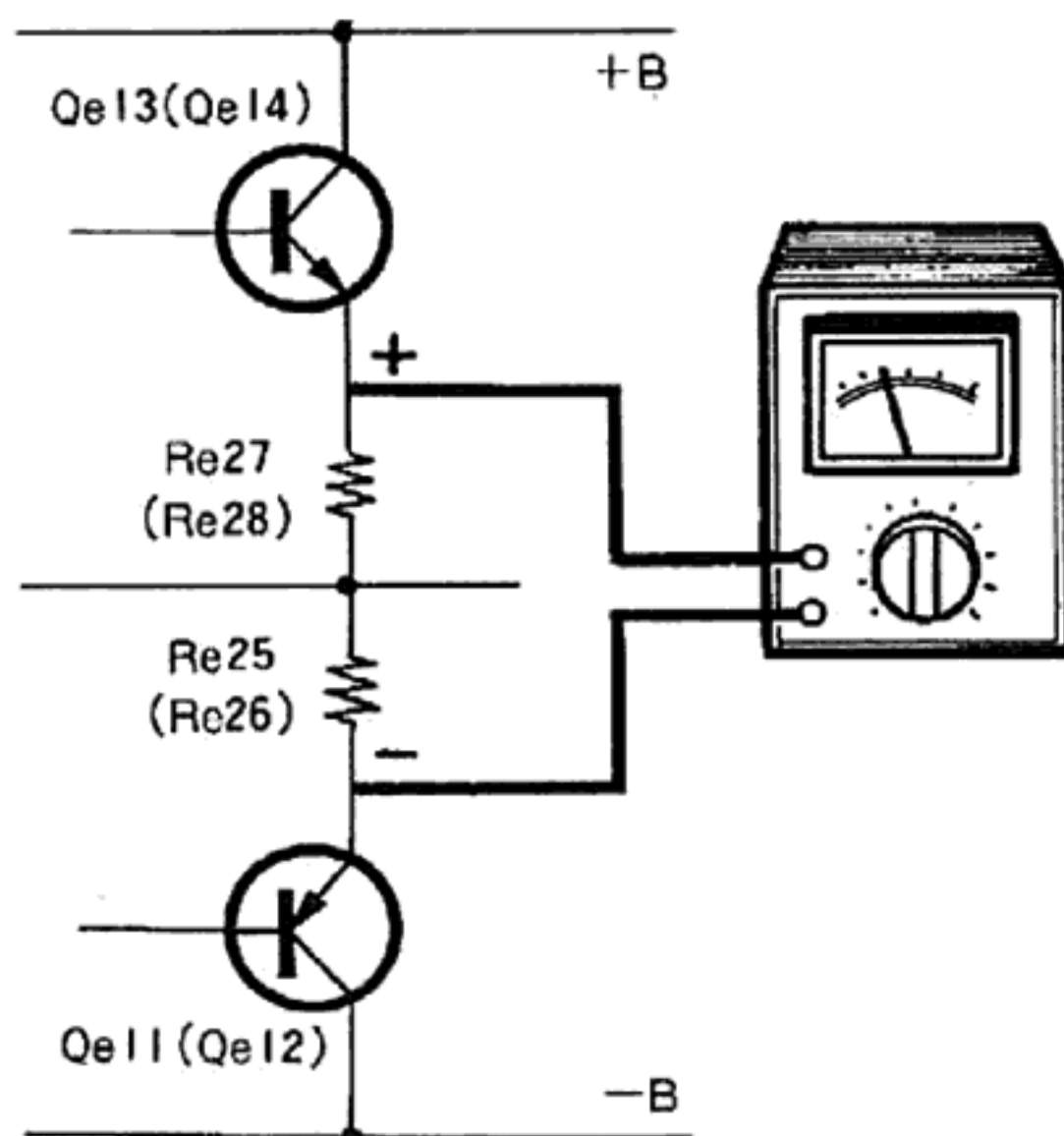
**NOTE:** Notice that ampere between L-ch and R-ch is different.



## WHEN USING TESTER WITH LOW LEVEL RANGE (Less than 0.3V range)

1. Connect tester (as voltmeter) to emitter of power transistor respectively.
2. Adjust pc trimmer potentiometer (VRe1, 2) so that tester reading is 20mV.

**NOTE:** This method is by the VOLTAGE DROP.



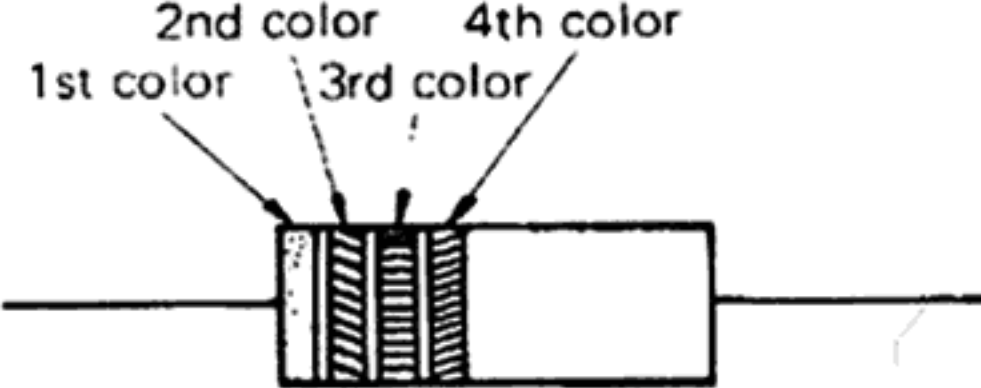
## THE SIMPLIFIED CIRCUIT

The total resistance is  
 $R = Re25 + Re27 \doteq 1 \text{ ohm.}$   
Bias current (I) is 20mA.  
The voltage drop can be found from Ohm's Law.  
 $V = I \times R = 20\text{mV.}$

# COLOR CODE

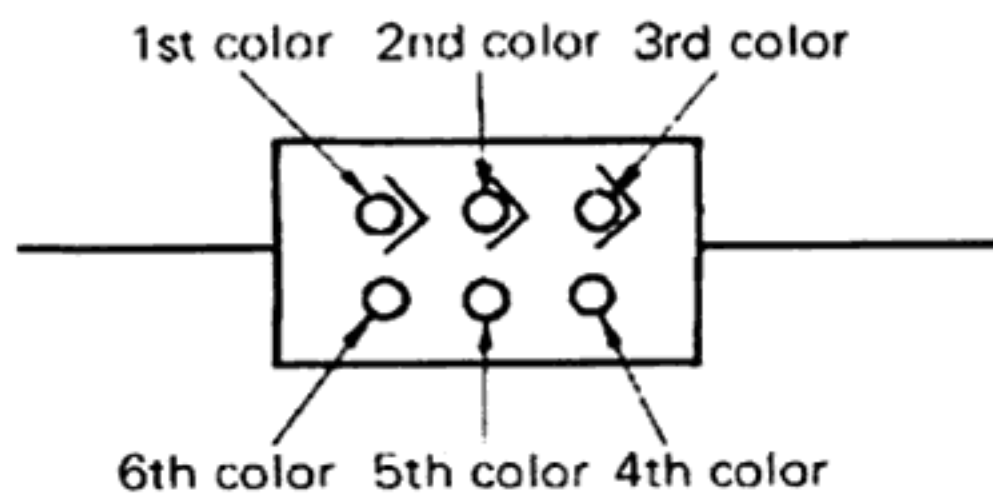
## RESISTOR

| COLOR (meaning) | 1st (value) | 2nd (value) | 3rd (multiplier) | 4th (tolerance) |
|-----------------|-------------|-------------|------------------|-----------------|
| Black           | 0           | 0           | $10^0$           | —               |
| Brown           | 1           | 1           | $10^1$           | ±1%             |
| Red             | 2           | 2           | $10^2$           | ±2%             |
| Orange          | 3           | 3           | $10^3$           | —               |
| Yellow          | 4           | 4           | $10^4$           | —               |
| Green           | 5           | 5           | $10^5$           | —               |
| Blue            | 6           | 6           | $10^6$           | —               |
| Purple          | 7           | 7           | $10^7$           | —               |
| Grey            | 8           | 8           | $10^8$           | —               |
| White           | 9           | 9           | $10^9$           | —               |
| Gold            | —           | —           | $10^{-1}$        | ±5%             |
| Silver          | —           | —           | $10^{-2}$        | ±10%            |
| Non-color       | —           | —           | —                | ±20%            |



## CAPACITOR (MICA)

| COLOR (meaning) | 1st (grade) | 2nd (value) | 3rd (value) | 4th (multiplier) | 5th (tolerance) | 6th (characteristic) |
|-----------------|-------------|-------------|-------------|------------------|-----------------|----------------------|
| Black           | X           | 0           | 0           | $10^0$           | ±20%            | —                    |
| Brown           | —           | 1           | 1           | $10^1$           | ±1%             | B                    |
| Red             | Z           | 2           | 2           | $10^2$           | ±2%             | C                    |
| Orange          | —           | 3           | 3           | $10^3$           | —               | D                    |
| Yellow          | —           | 4           | 4           | $10^4$           | —               | E                    |
| Green           | —           | 5           | 5           | —                | * ±5%           | —                    |
| Blue            | —           | 6           | 6           | —                | —               | —                    |
| Purple          | —           | 7           | 7           | —                | —               | —                    |
| Grey            | Y           | 8           | 8           | —                | —               | —                    |
| White           | —           | 9           | 9           | 0.1              | ±10%            | —                    |



Unit = pF

\* Capacitance being less than 10pF is ±0.5pF on tolerance.

## **KENWOOD ELECTRONICS, INC.**

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