

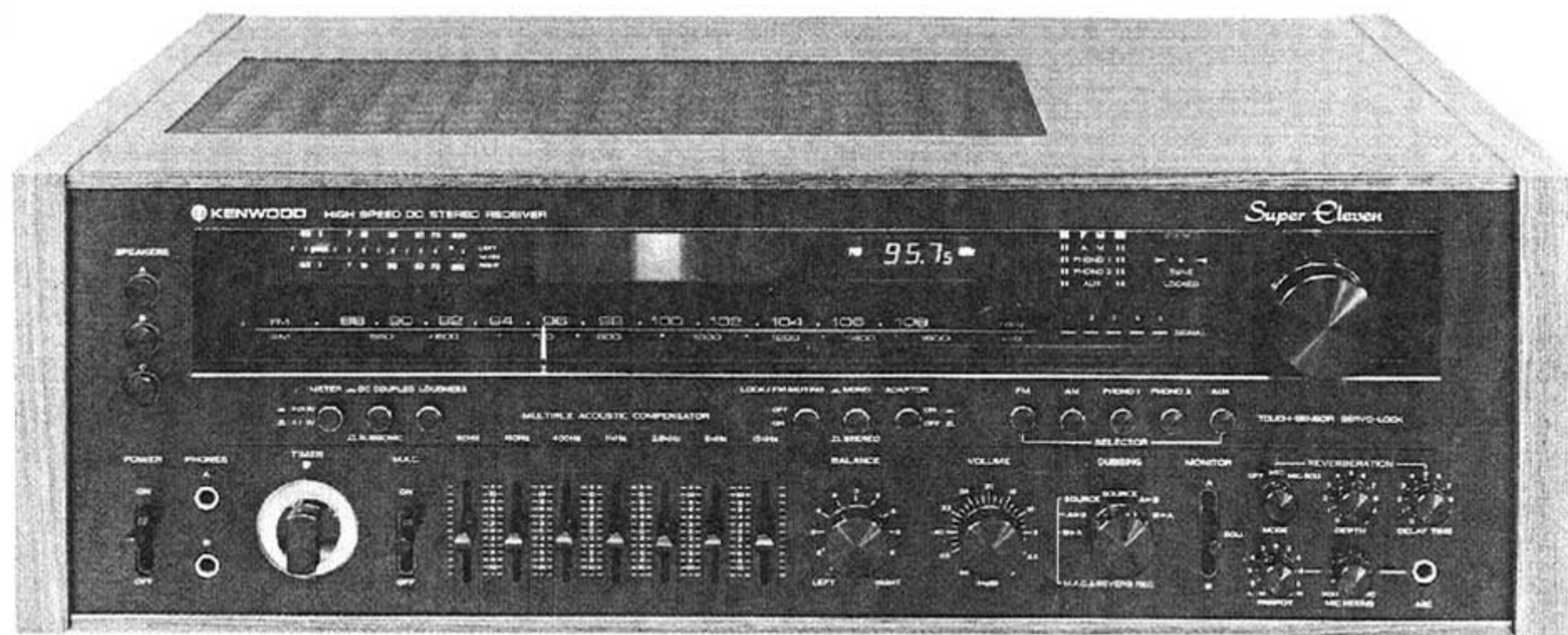


**KENWOOD®**  
HI/FI STEREO COMPONENTS

# SERVICE MANUAL

## SUPER ELEVEN

An item of adjustment is written in three languages — English, French and German.  
*Un article sur les réglages est écrit en trois langues, Anglais, Français et Allemand.*  
Ein Artikel der Abgleich wird auf drei Sparchen. Englische, Franösisch und Deutsch geschriebn.



**HIGH SPEED DC STEREO RECEIVER**

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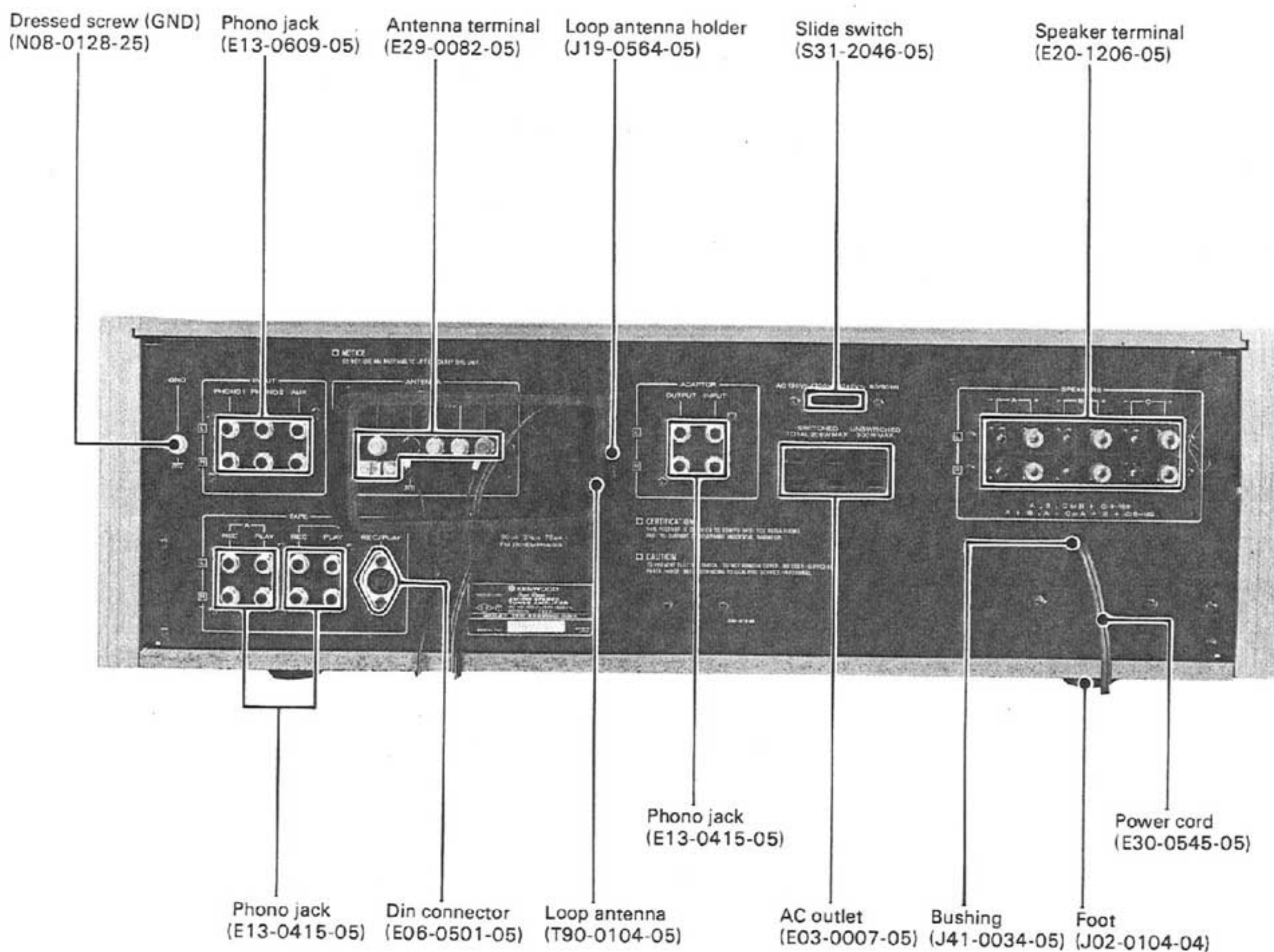
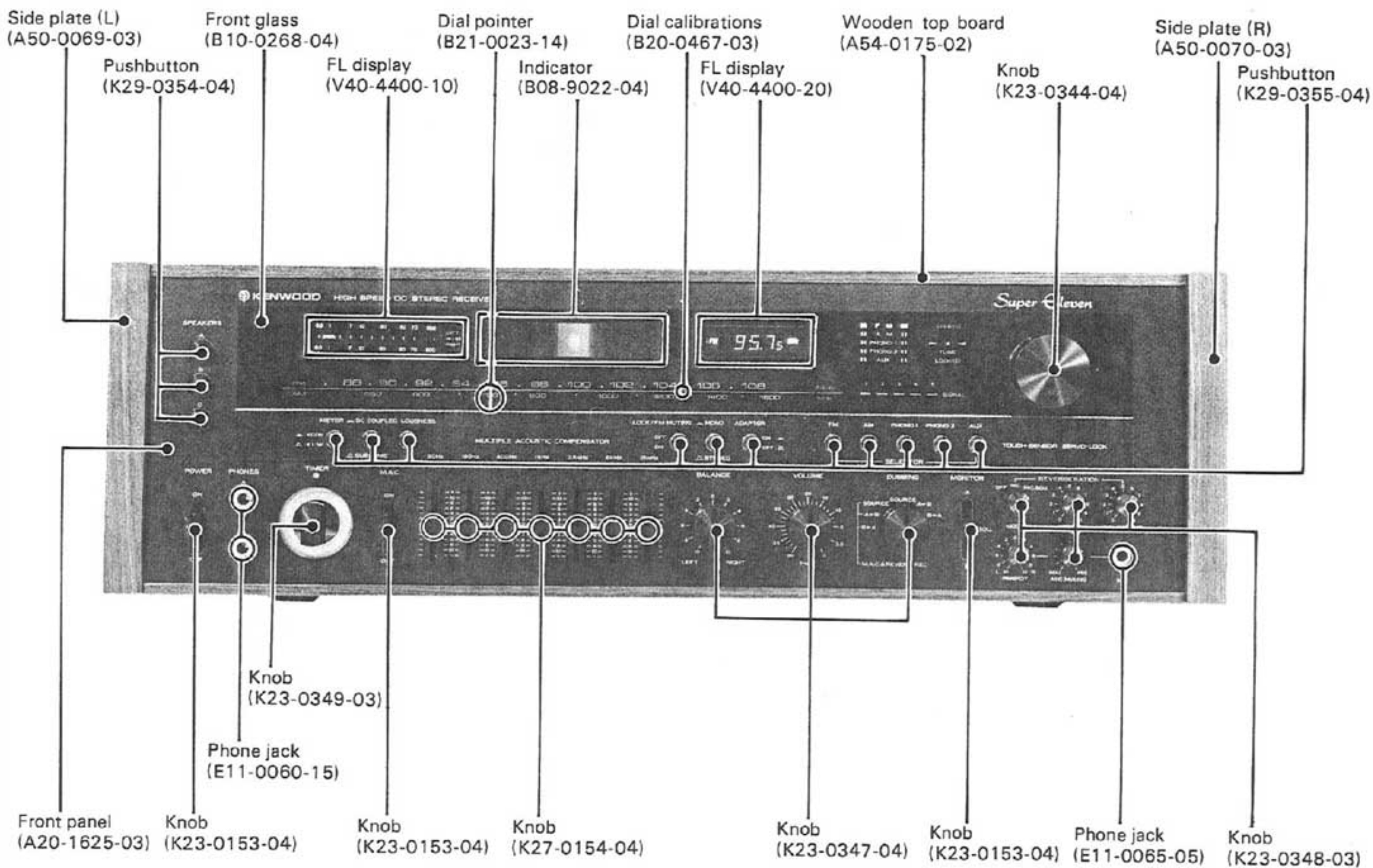
**Note:**

Component and circuitry are subject to modification to insure best operation under differing local conditions. This manual is based on, the PX (U) standard, and provides information on regional circuit modification through use of alternate schematic diagrams, and information on regional component variations through use of parts list.

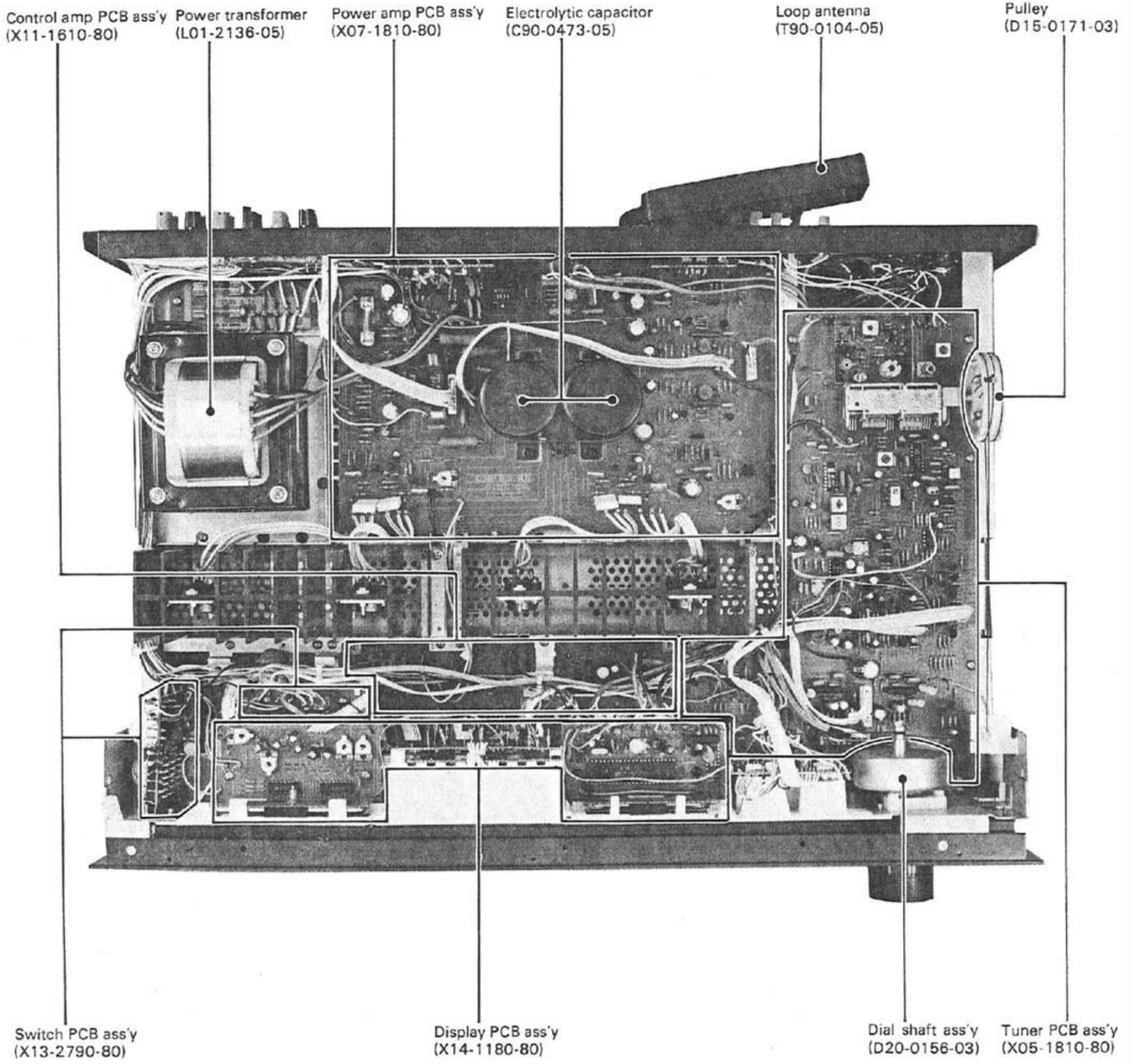
| Region                    | Code |
|---------------------------|------|
| U.S.A. ....               | K    |
| Canada.....               | P    |
| PX (Far East).....        | U    |
| PX (Europe).....          | UE   |
| Australia.....            | X    |
| Europe & Scandinavia..... | E    |
| England.....              | T    |
| South Africa.....         | S    |
| Other Areas.....          | M    |
| Audio Club.....           | H    |

There is no plan for producing units of K, P, X, E, T and S types.

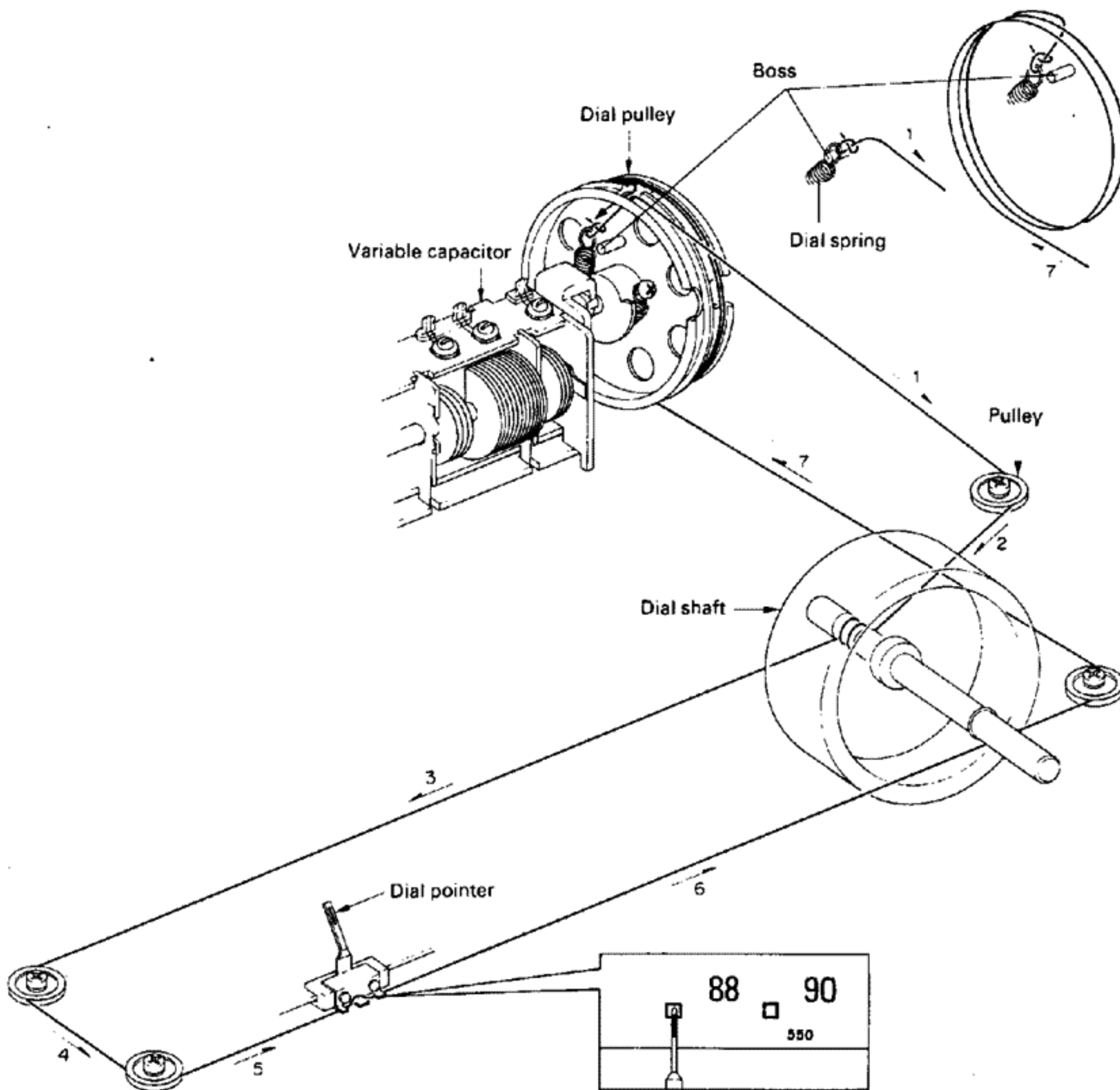
## EXTERNAL VIEW



## INTERNAL VIEW



## DIAL CORD STRINGING

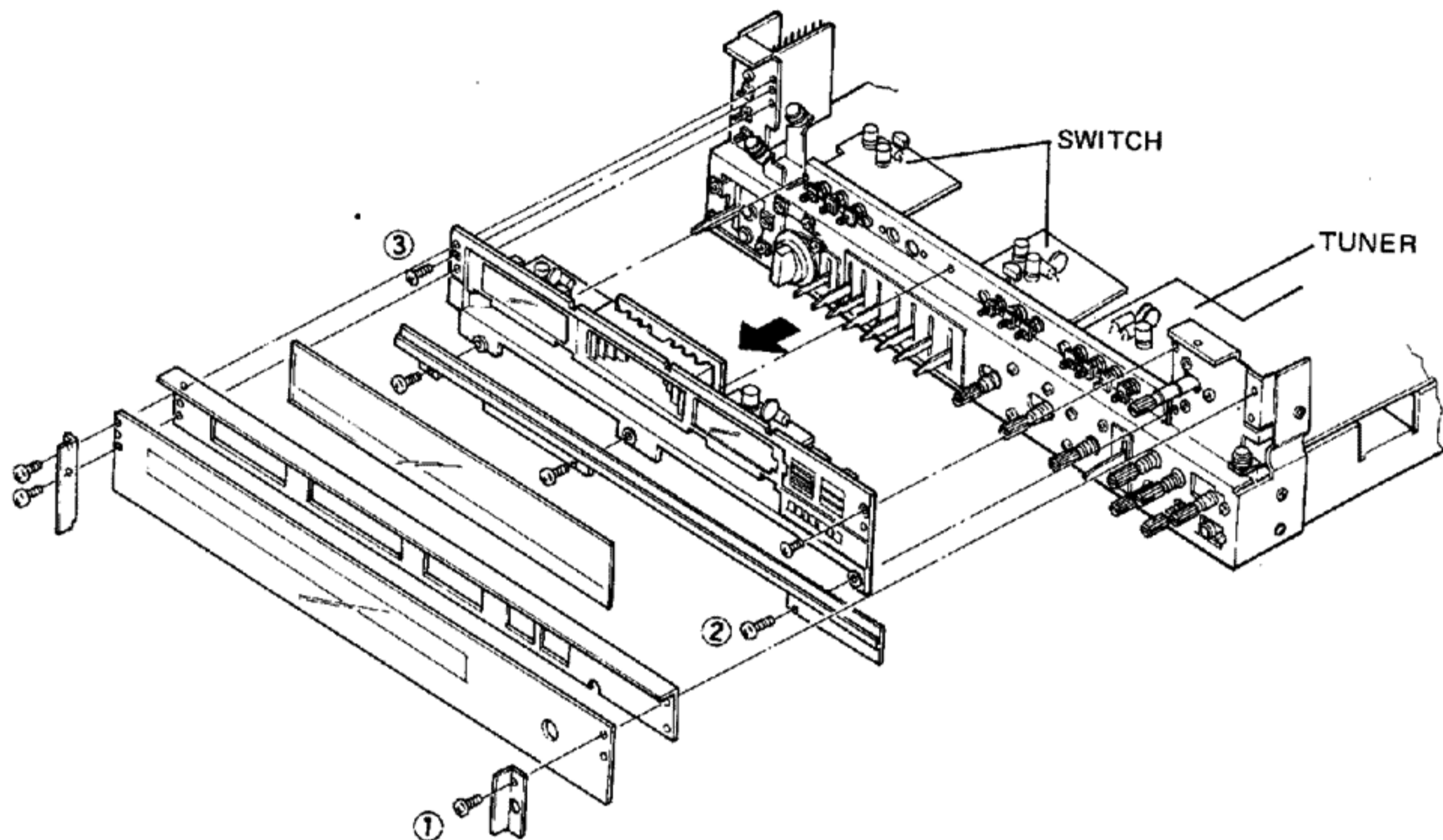


### DIAL CORD STRINGING

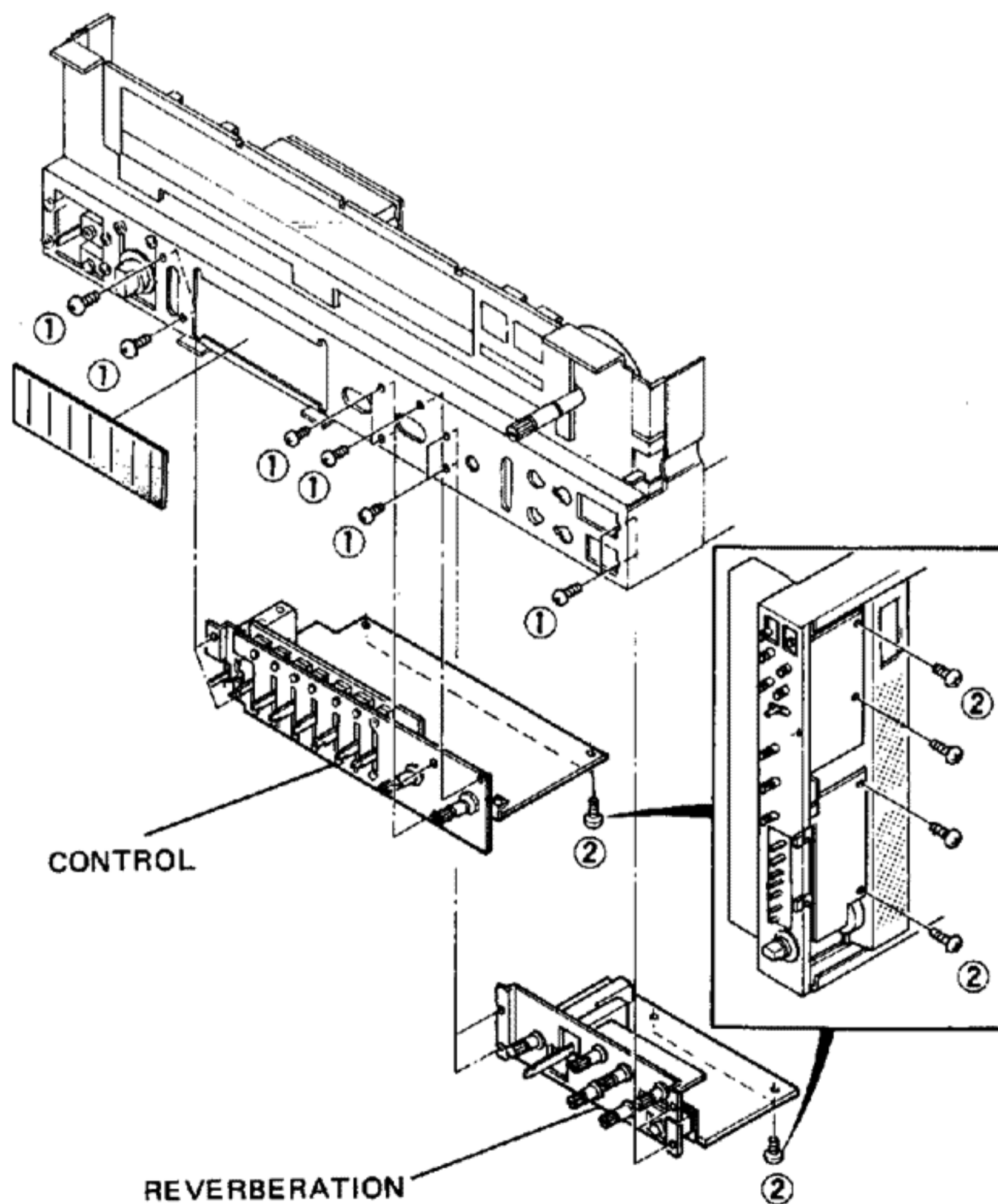
1. Fully open the variable capacitor.
2. Tie the end of the dial cord at the dial spring, giving a margin of about 10 cm. Hook the spring on the boss.
3. Set the dial pulley as illustrated and fix it with a screw.
4. Dress the dial cord in the direction of "1" to "2" and wind 2 turns around the dial shaft starting from its lower side.
5. Dress the dial cord in the direction of "3" through "7" and wind it 2 and a half turns around the dial pulley starting from its lower side.
6. Rigidly tie it with the margin cord and the dial spring (provided as described in 3) and release the dial spring from the boss.
7. Fully close the variable capacitor, then mount the dial pointer as illustrated.

## DISASSEMBLY FOR REPAIR

### SWITCH and TUNER PC BOARD

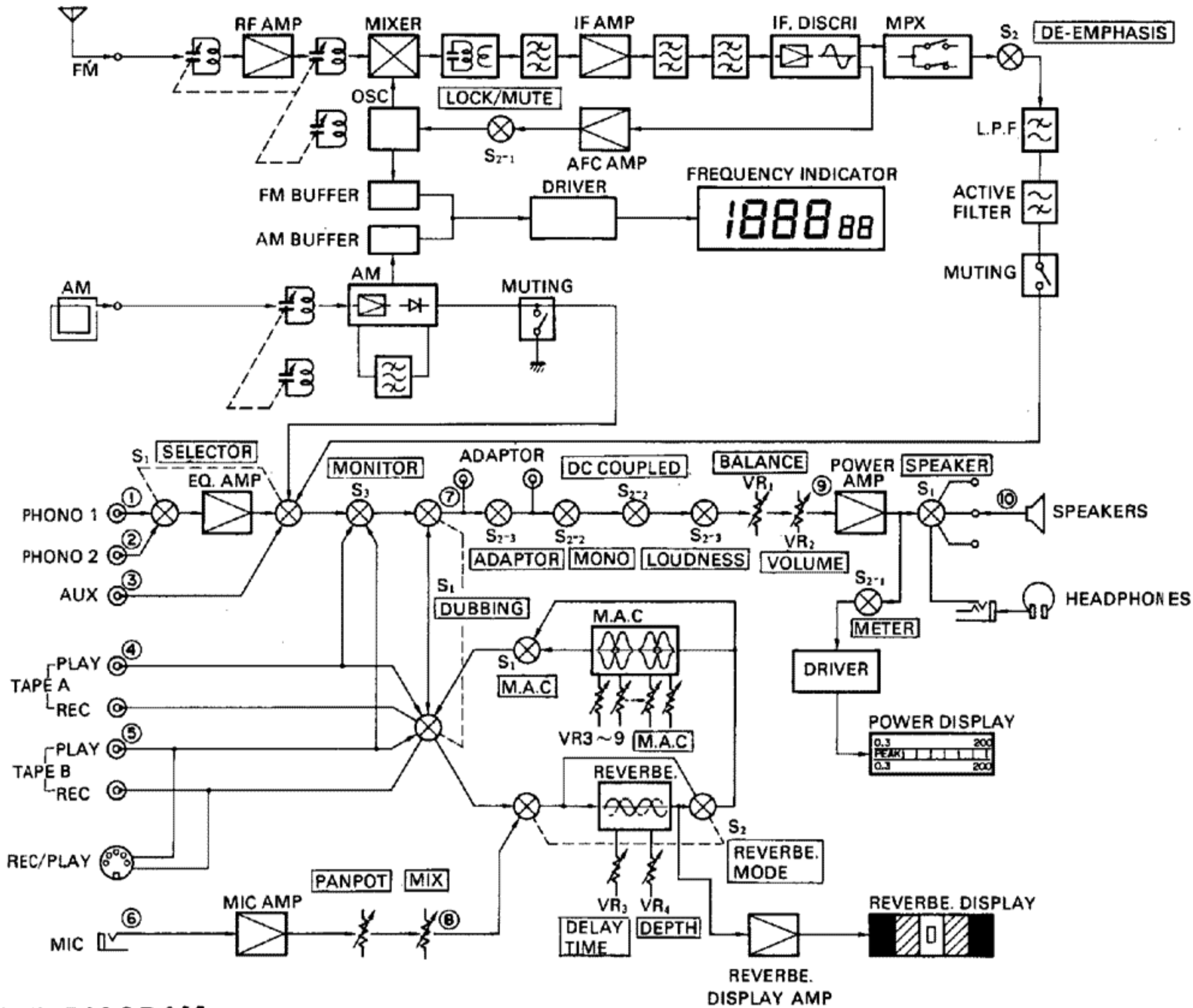


### CONTROL and REVERBERATION PC BOARD

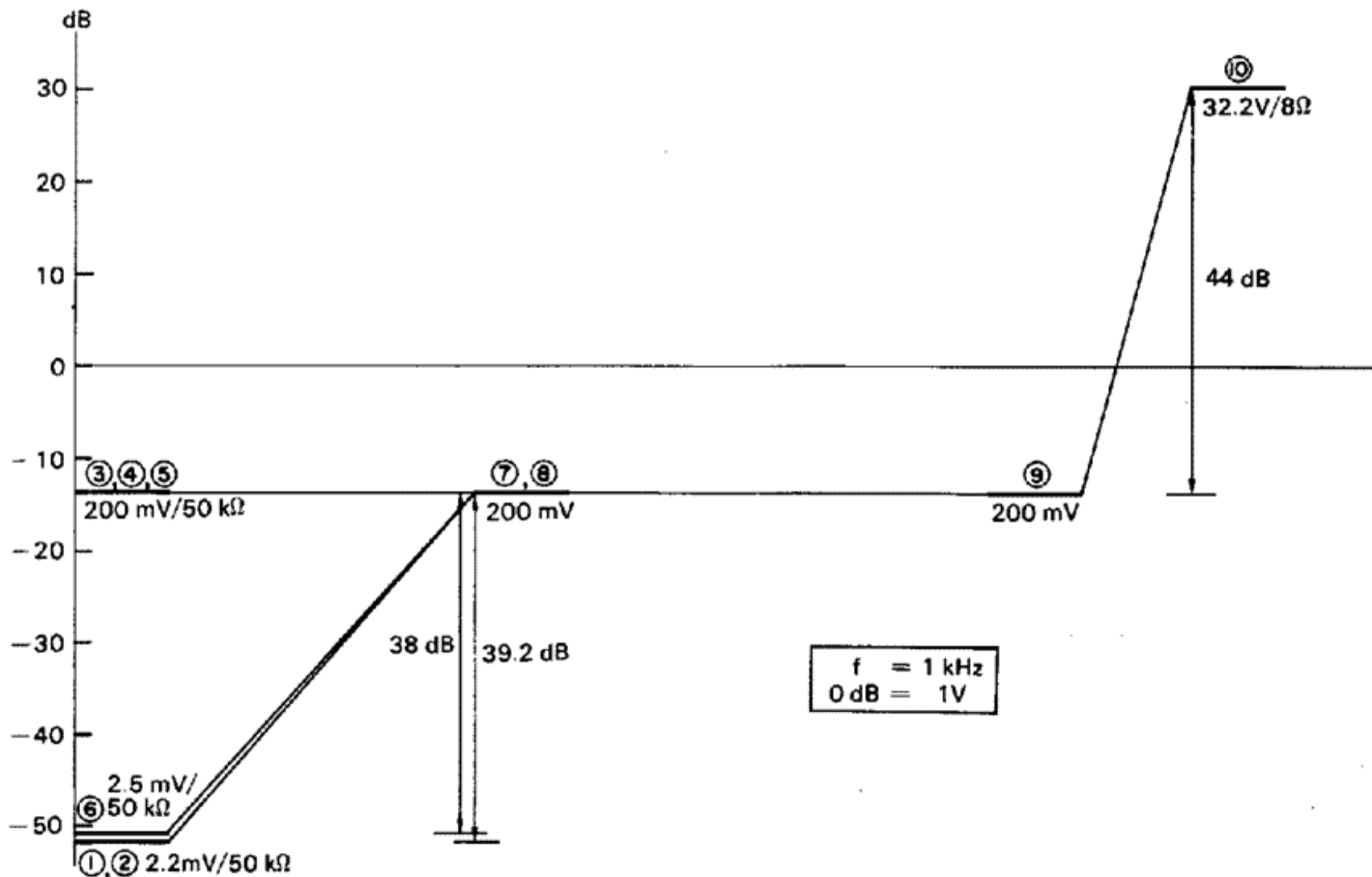


## BLOCK AND LEVEL DIAGRAM

### BLOCK DIAGRAM



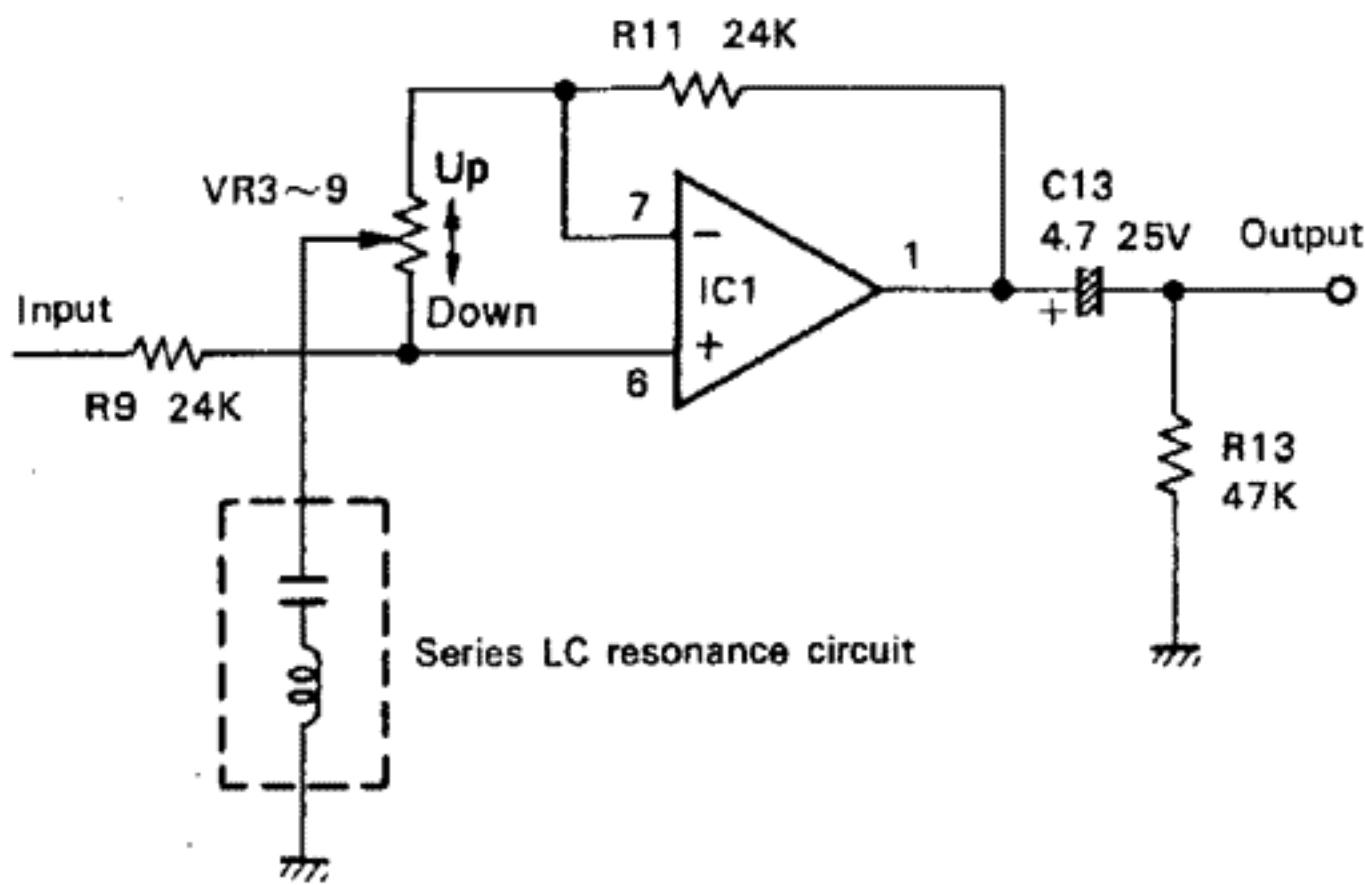
### LEVEL DIAGRAM



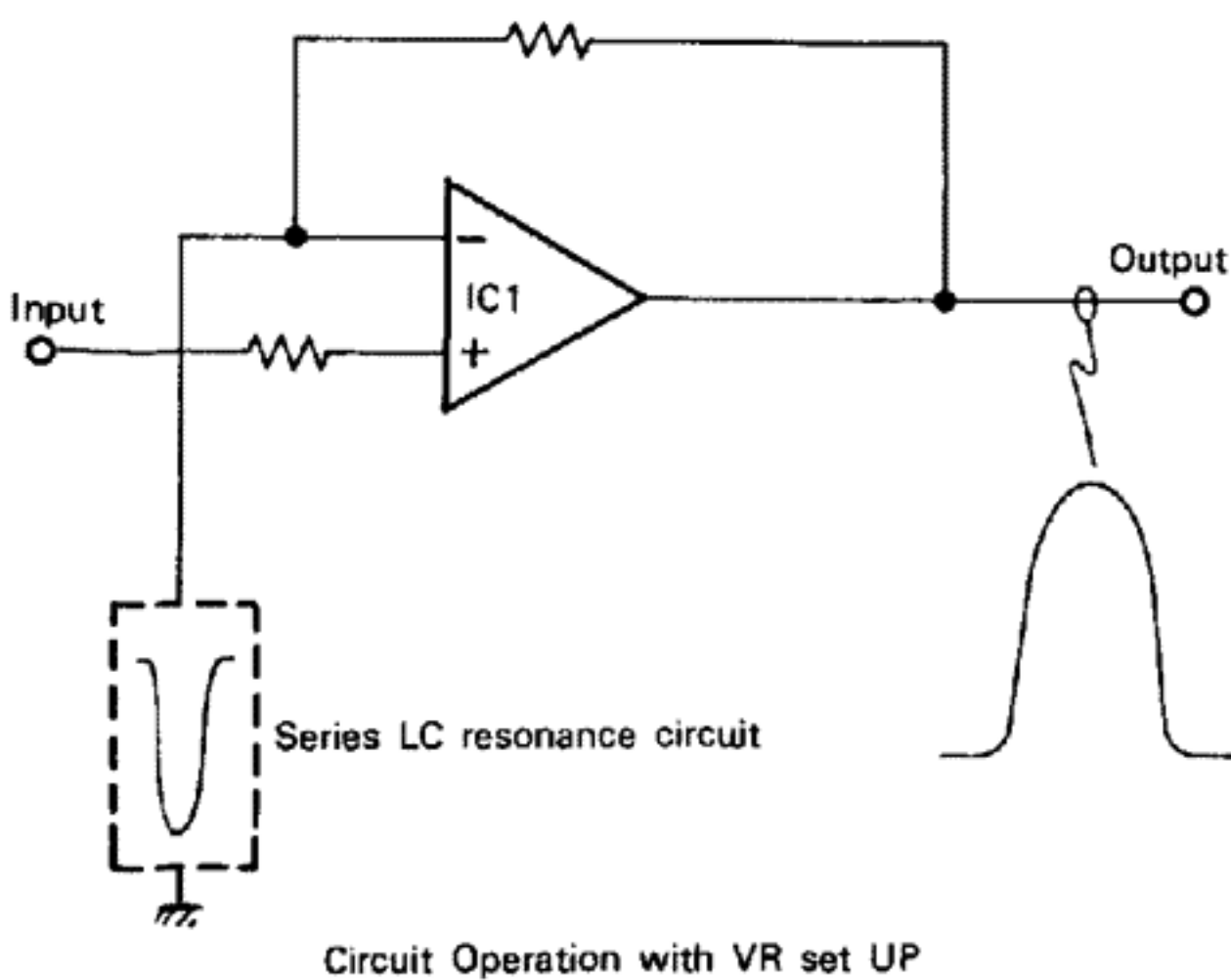
## CIRCUIT DESCRIPTION

### M.A.C. (Multiple Acoustic Compensator) circuit

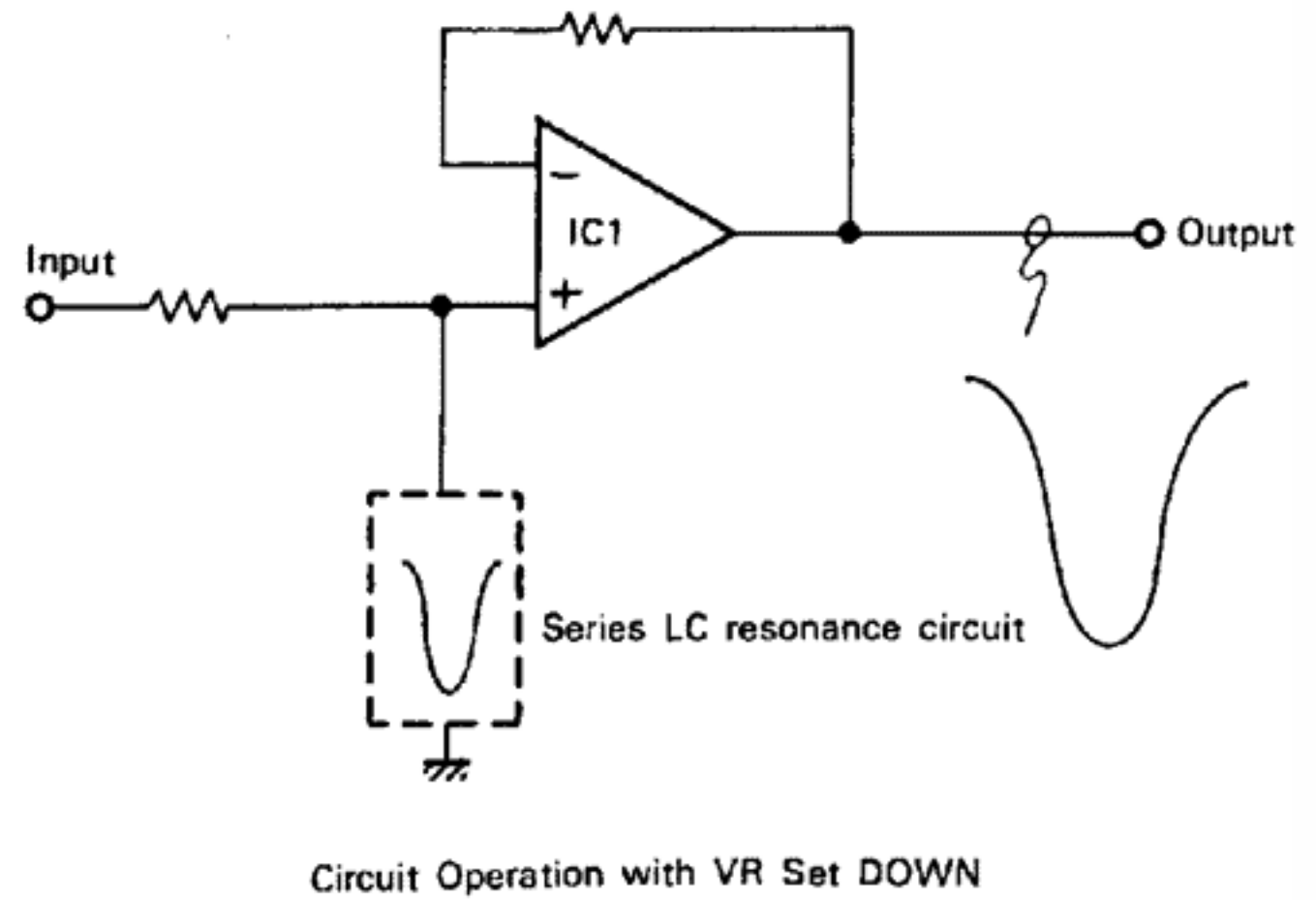
The principle of operation of the M.A.C. circuit is shown below. A potentiometer is connected between the inverting and non-inverting input terminals and its center tap is connected to a series LC resonance circuit.



When one of the slide potentiometers (VR3 ~ VR9) is slid up, the series LC resonance circuit is connected to the inverting input terminal, so that the negative feedback loop incorporates the resonance circuit. Therefore, the amount of the negative feedback varies according to the impedance of the series LC resonance circuit, that is, the gain becomes maximum at the frequency with the minimum impedance.



When VR is slid down, the resonance circuit is connected to the non-inverting input terminal so that the gain characteristic follows the resonance curve.



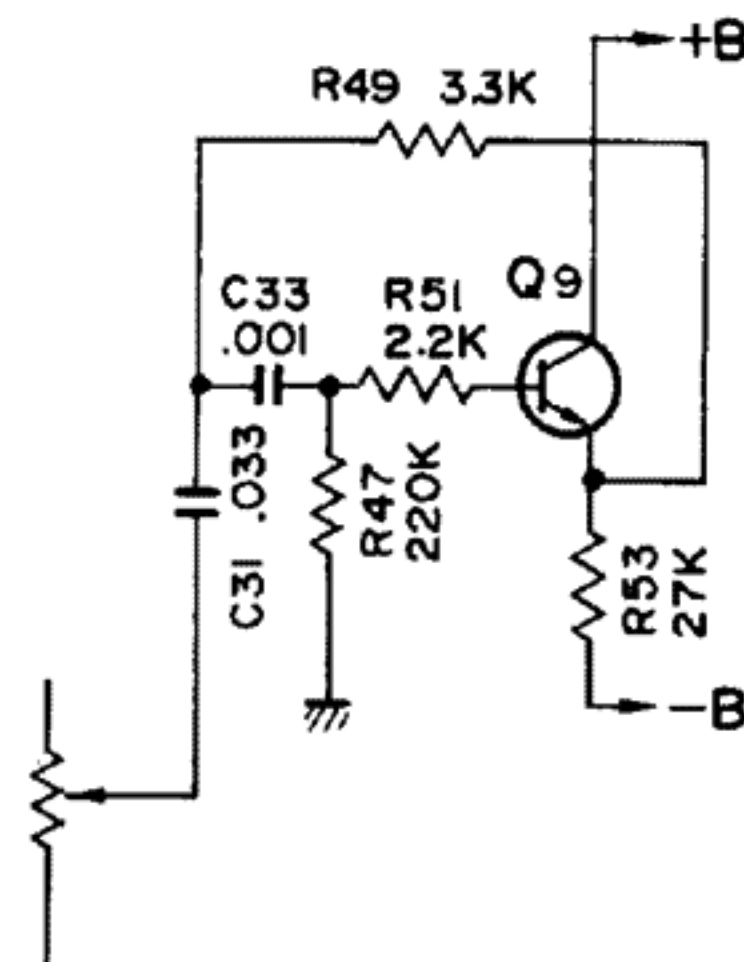
### Series LC resonance circuit

When an AC voltage is applied to an inductor, a current which is  $-\pi/2$  out of phase with the voltage flows. In the Super Eleven, an emitter follower circuit which shifts the phase in the same way as an inductor is used instead of the series LC resonance circuit.

This emitter follower circuit has the following advantages compared to the circuit using an actual inductors and capacitors.

1. Less influenced by induced hum.
2. Less weight and size.
3. Less cost.
4. More stable.

The circuit shown below acts in the same way as the series LC resonance circuit and is called a simulated inductor.





## CIRCUIT DESCRIPTION

How this circuit operates as an inductor is explained below. The circuit diagram below shows a simplified simulated inductor circuit.

When an input voltage  $E_i$  is applied,  $E_i'$  is applied to the base of  $Q_1$ . Since  $E_i'$  is obtained by differentiating  $E_i$ ,  $E_i'$  leads  $E_i$  with a phase difference of  $\phi$ .  $Q_1$  forms an emitter follower, so its output voltage  $E_o$  has the same phase as  $E_i'$ . Thus,  $E_o$  leads  $E_i$  with a phase difference of  $\phi$ .  $E_f$  across  $R_2$  is  $E_i$  minus  $E_o$ . As  $E_o$  is leading  $E_i$  by  $\phi$ ,  $E_f$  lags behind  $E_i$  with a phase difference of  $\phi'$ .

The input current  $I_i$  is the sum of  $I_1$  which flows through  $C_1$  and  $R_1$ , and  $I_2$  which flows through  $R_2$ . Since the total impedance of  $C_1$  and  $R_1$  is sufficiently larger than that of  $R_2$  and  $Q_1$  has a large input impedance,  $I_1$  is very small. Therefore,  $I_i$  is nearly equal to  $I_2$ .  $I_2$  is equal to  $E_f (= E_i - E_o)$  divided by  $R_2$ . Since  $E_f$  lags  $E_i$  by  $\phi'$ ,  $I_2 (= E_f/R_2)$  also lags  $E_i$  by  $\phi'$ .

These characteristics are the same as the voltage and current characteristics of an inductor and, therefore, this circuit operates as an inductor.

The equivalent inductance  $L_e$  and series resistance  $R_e$  are  
 $L_e = C_1 R_1 R_2$  (H),  $R_e = R_2$  ( $\Omega$ )

In the 1 kHz control circuit of the Super Eleven,  
 $C_1 = 0.001$  ( $\mu F$ ),  $R_1 = 220$  ( $k\Omega$ ) and  $R_2 = 3.3$  ( $k\Omega$ )

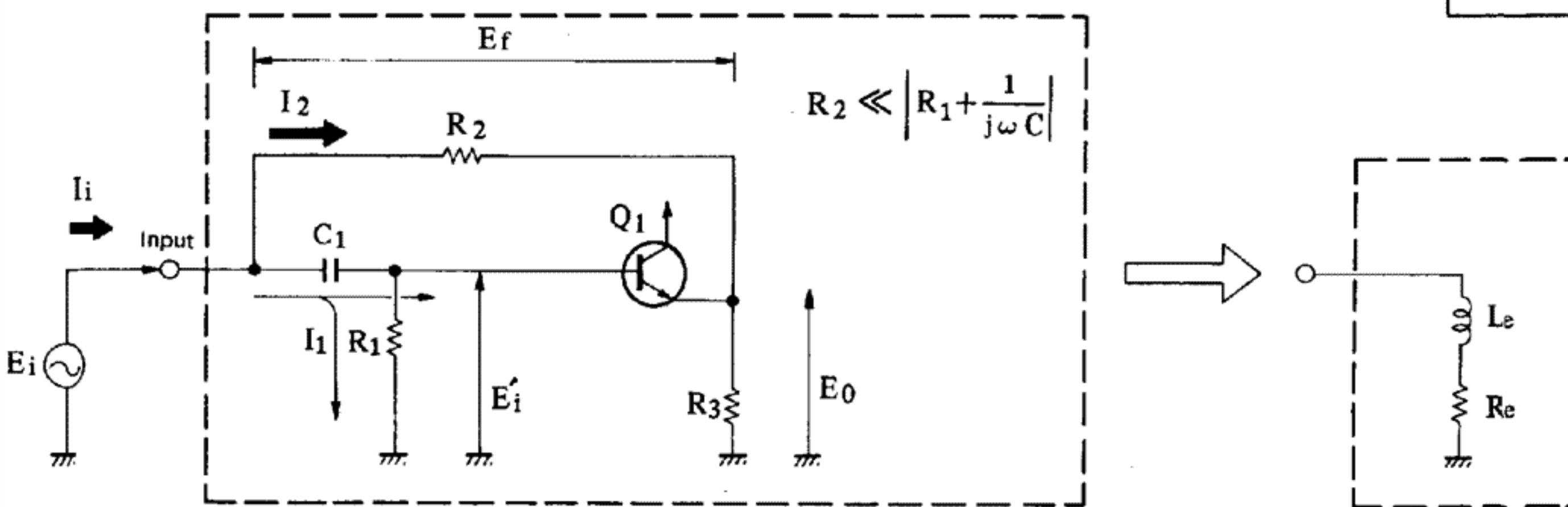
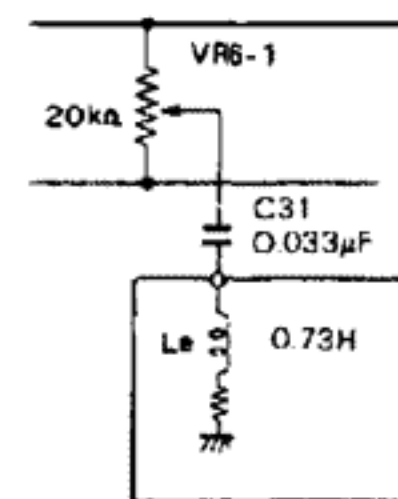
Then,

$$L_e = 0.001 \times 10^{-6} \times 220 \times 10^3 \times 3.3 \times 10^3 = 0.73 \text{ (H)}$$

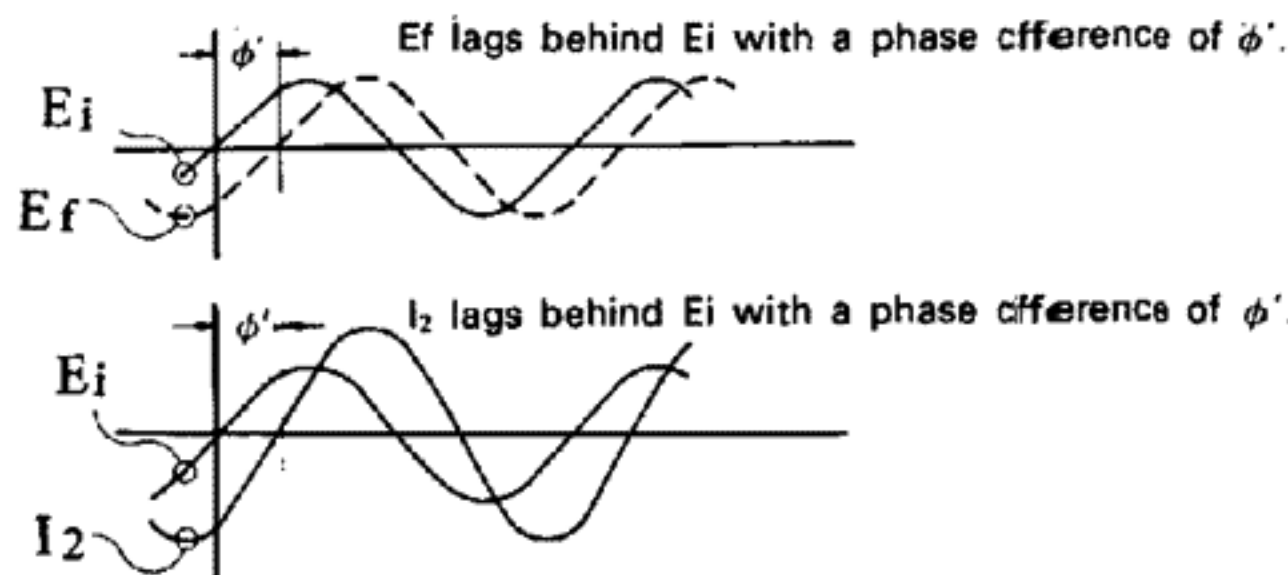
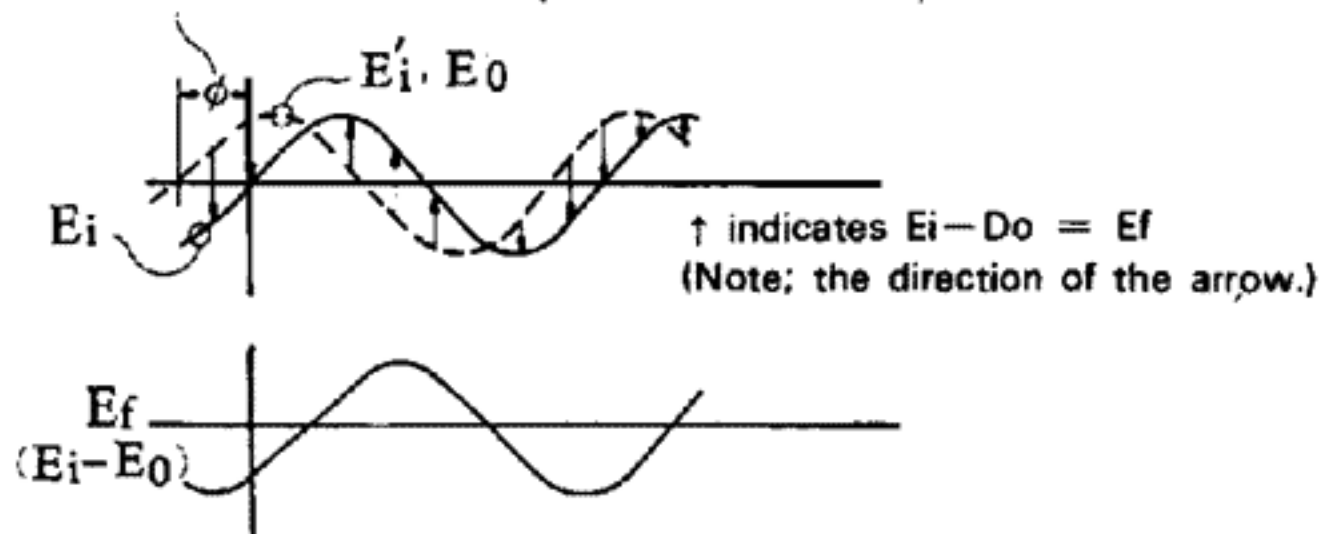
The resonance frequency is given by

$$f_0 = \frac{1}{2\pi} \sqrt{\frac{C_{31}}{L_e}} \quad (C_{31} = 0.033 \mu F)$$

$$= \frac{1}{2\pi} \sqrt{\frac{0.033 \times 10^{-6}}{0.73}} = 1025 \text{ (Hz)} \approx 1 \text{ kHz}$$



$E_i'$  and  $E_o$  lead  $E_i$  with a phase difference of  $\phi$ .



## CIRCUIT DESCRIPTION

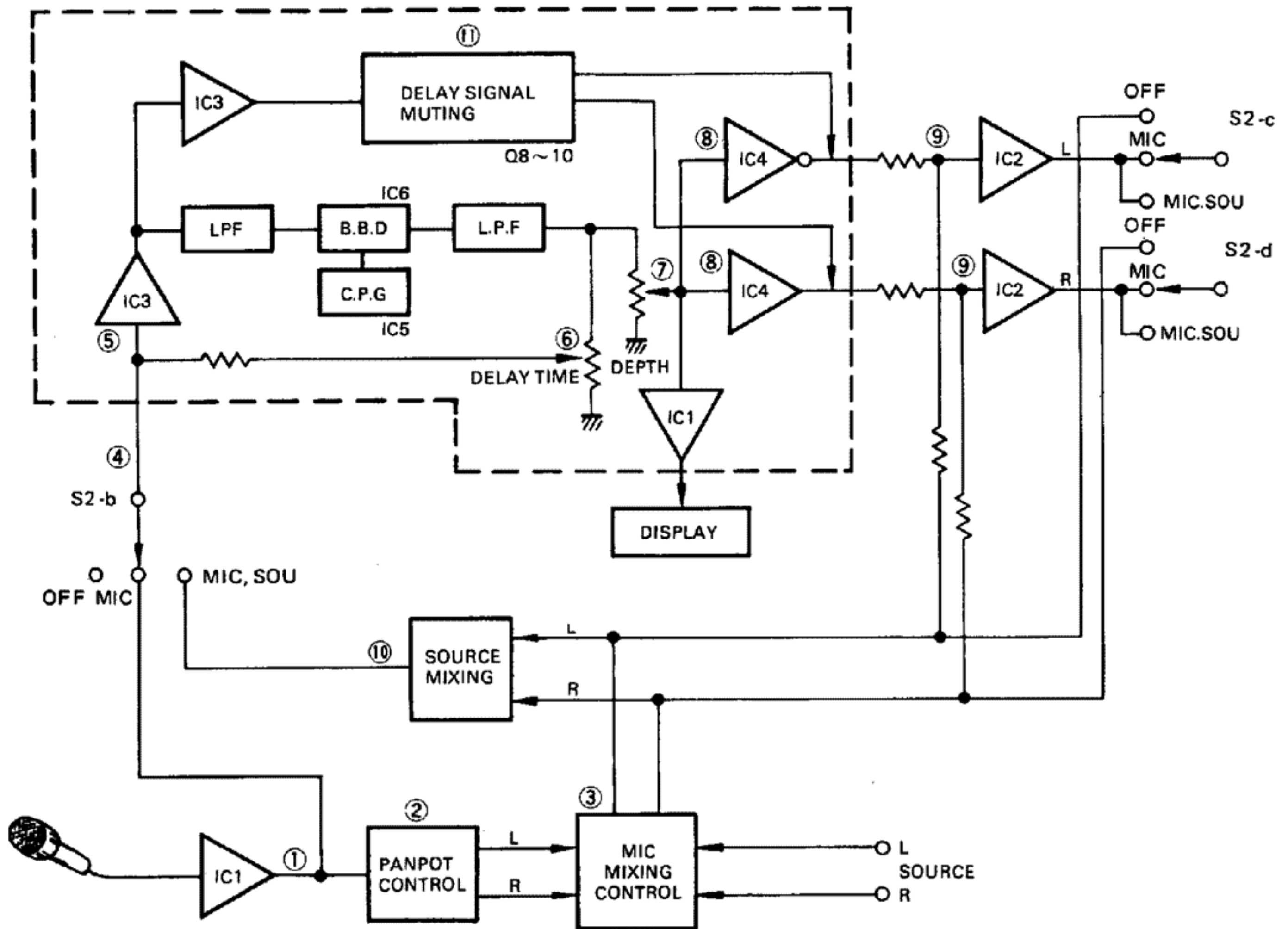


Fig. 1 < Reverberation circuit >

### Reverberation Circuit Explanation

#### 1. Reverberation circuit

The reverberation circuit used in the Super Eleven has a monaural configuration using a B.B.D. (Bucket Bridge Device) and has the mixers and dividers shown in figure 1.

#### 1 MIC

The microphone signal amplified by IC1 (MIC AMP) ① is divided into left and right channel signals by the panpot control ②, then mixed with the source signals by the MIC mixing control ③. At the same time, the microphone signal is applied to the reverberation circuit through S2-b ④, then output from the DEPTH control ⑦. This signal is divided into the inverting and non-inverting amplifiers (IC4) ⑧ and these signals are mixed with the left and right

signals, respectively ⑨. (This phase inversion gives a stereo effect.) The signal from the DELAY TIME control ⑥ is fed back to the input ⑤ so that reverberation effect can be controlled.

IC3 and Q8 ~ Q10 mute the reverberation when the input level is low ⑪.

#### 2 MIC SOU

The signals from the MIC mixing control ③ are mixed into a monaural signal by the source mixing circuit ⑩. Then, the signal is applied to the reverberation circuit through S2-b, and is subject to the same operation as in 1 MIC.

The B.B.D. is a delay element operating as follows.

## CIRCUIT DISCIPTION

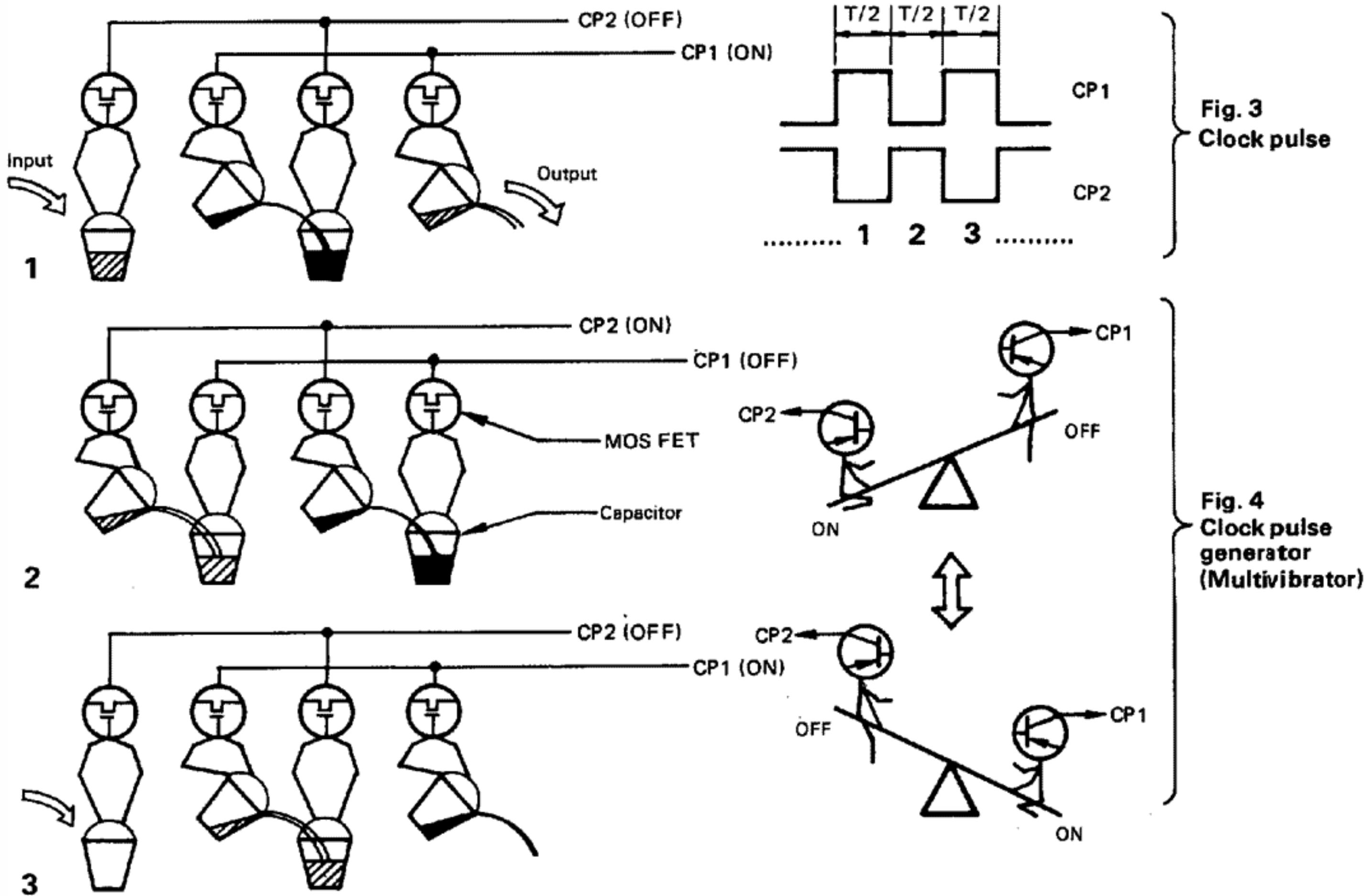


Fig. 2

Figures 3 and 4 show clock pulse generator operation and its output waveforms. FETs in the B.B.D. are turned on and off sequentially according to the clock pulse signal. The delay time of each stage is  $T/2$ , and the total delay time of the B.B.D. is  $N/2f_{cp}$ , where  $f_{cp}$  (clock pulse frequency) = 40 kHz and  $N$  (number of B.B.D. elements) = 2048 in the Super Eleven. With the DELAY TIME control ( ⑥ in Fig. 1), the delay time can be doubled.

Figure 5 shows input and output waveforms of the B.B.D. Since the B.B.D. is controlled by the clock pulse ( $T/2$ ), high frequencies cannot be transferred correctly. The output signal is applied to a low-pass filter to remove the clock pulse component.

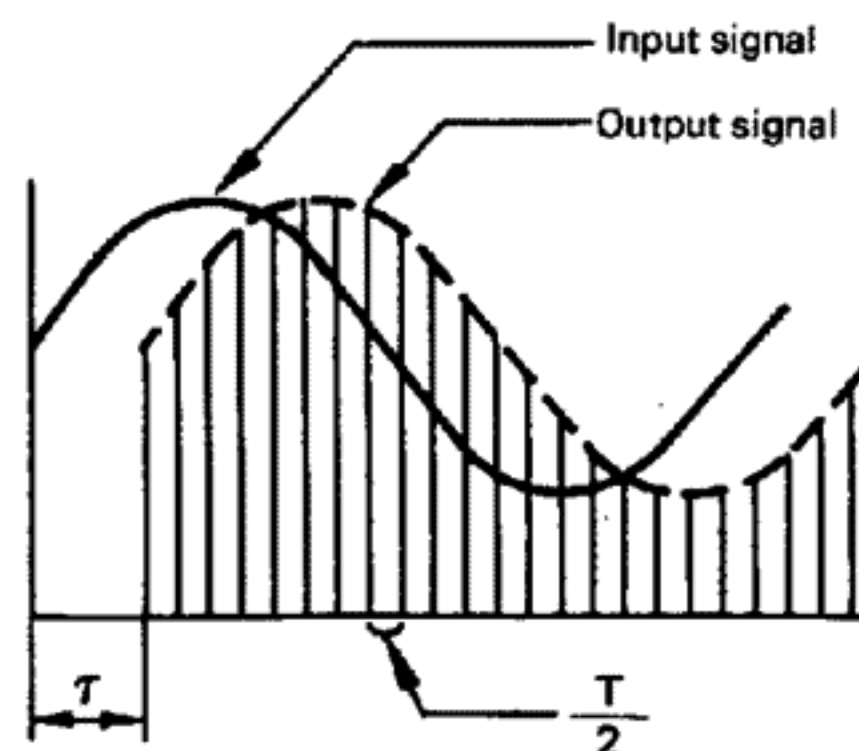
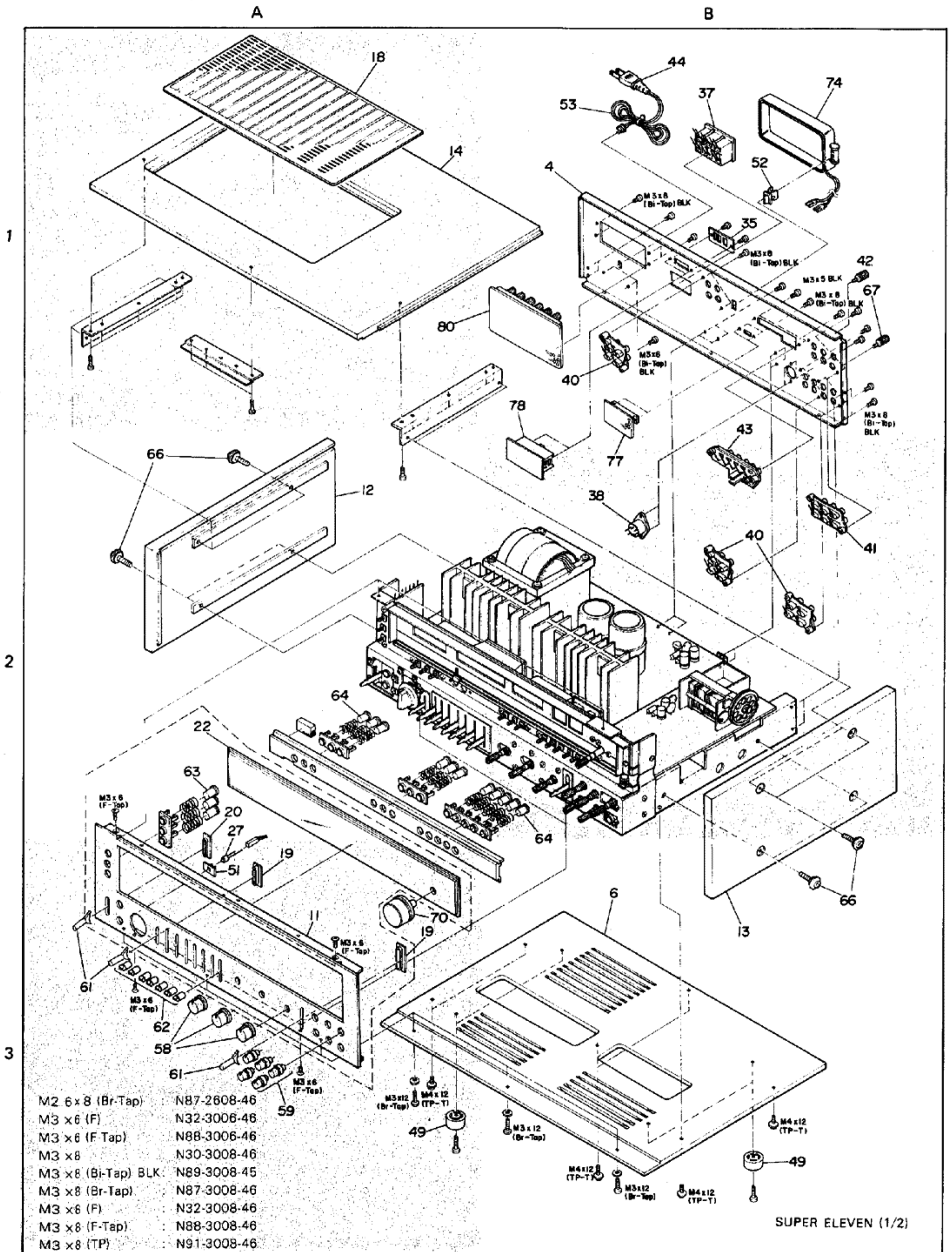


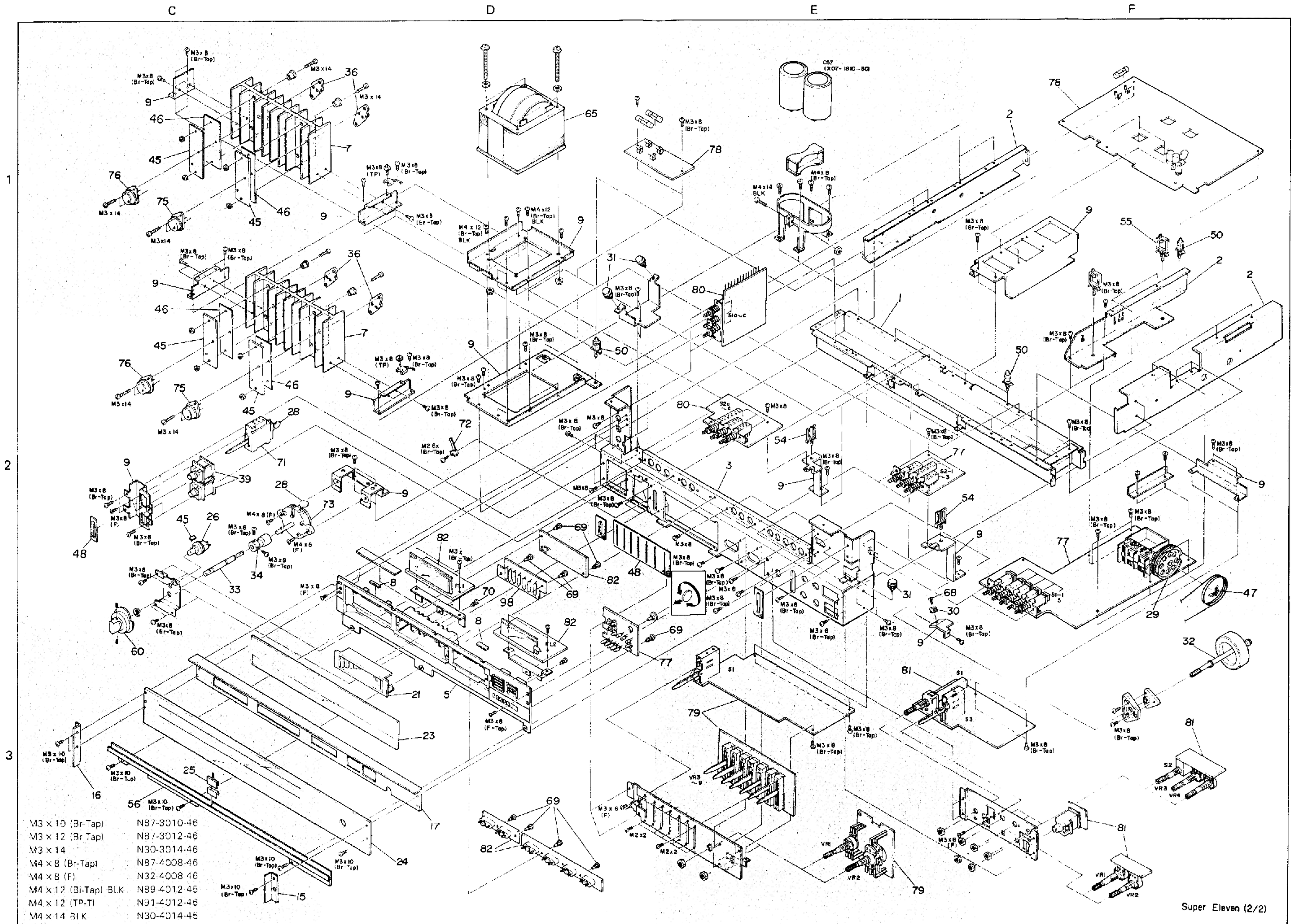
Fig. 5

# SUPER ELEVEN

## EXPLODED VIEW



# EXPLODED VIEW



# ADJUSTMENT/REGLAGES/ABGLEICH

## TEST INSTRUMENT

Oscilloscope  
 AM signal generator  
 FM signal generator  
 Audio generator  
 AC voltmeter  
 FM multiplex generator  
 Frequency counter  
 DC voltmeter  
 Distortion meter  
 Dummy antenna

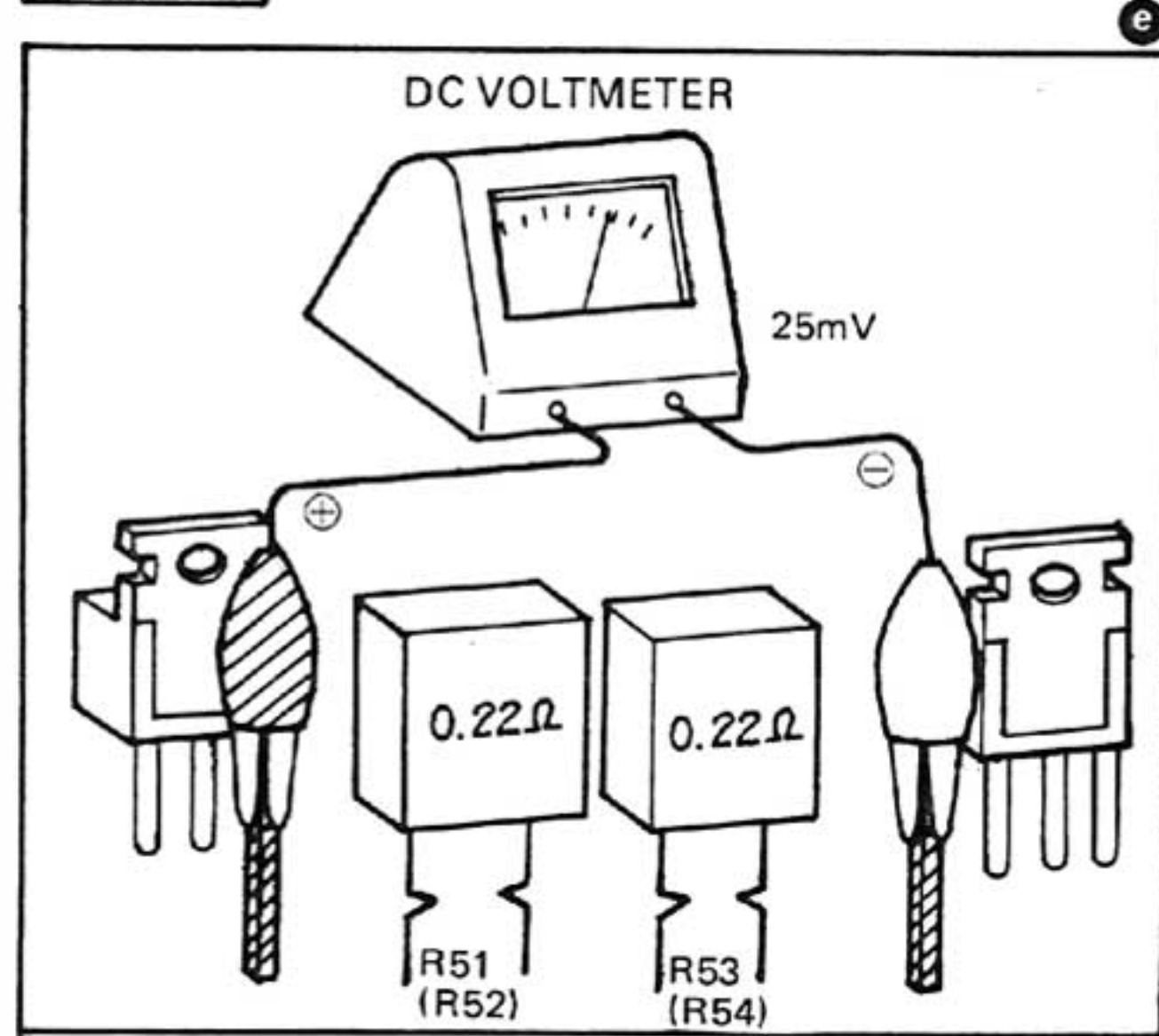
## APPAREILLAGE

Oscilloscope  
 Générateur MA  
 Générateur MF  
 Générateur audio fréquences  
 Voltmètre CA  
 Générateur multiplex stéréo  
 Fréquence-mètre  
 Voltmètre CC  
 Distorsiomètre  
 Antenna fictive

## PRÜFINSTRUMENTE

Oszilloskop  
 MW-Signalgenerator  
 UKW-Signalgenerator  
 NF-Signalgenerator  
 UKW-Multiplexgenerator  
 Frequenzzähler  
 Gleichspannungsmesser  
 Klirrfaktormesser  
 Antennennachbildung

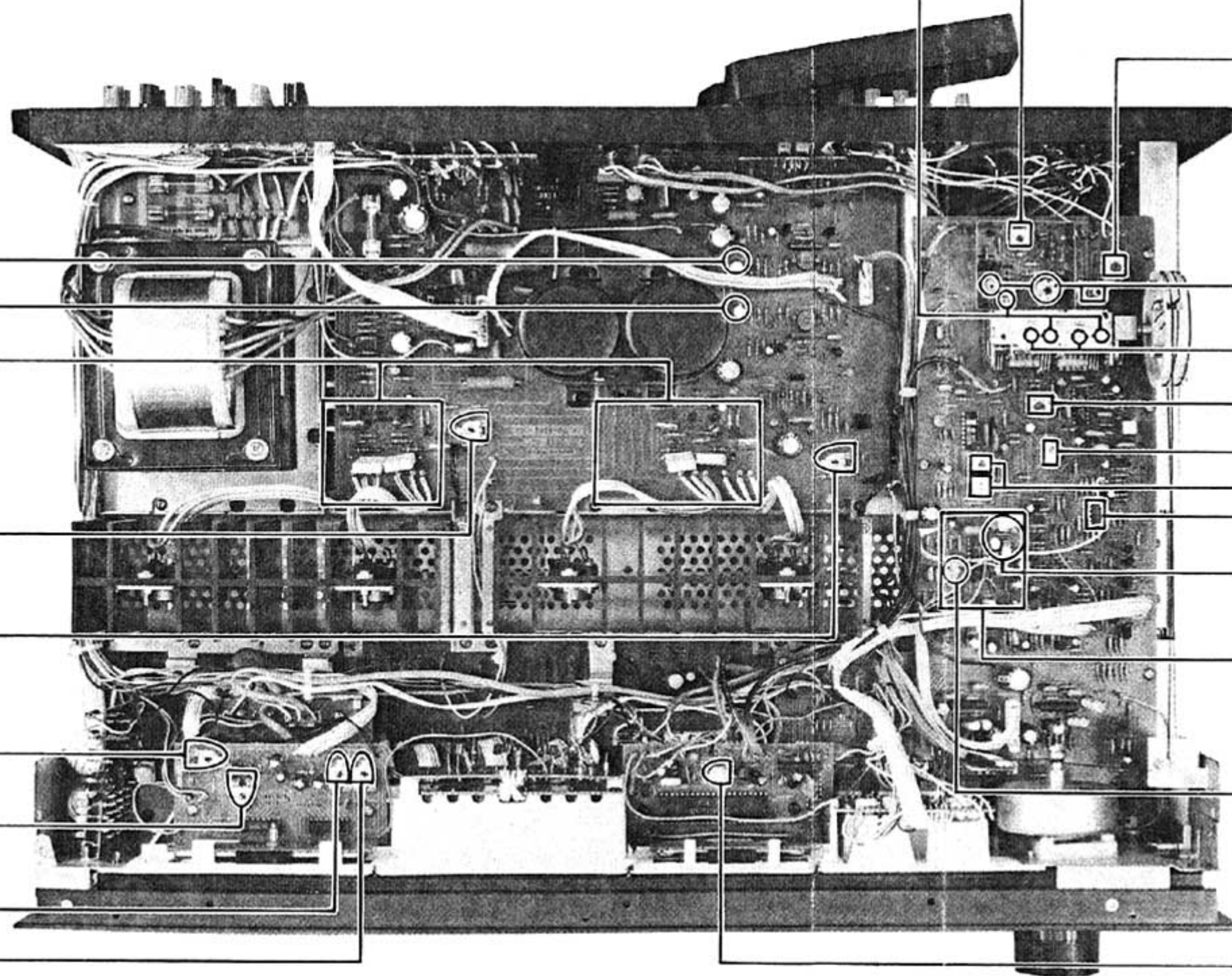
## AUDIO



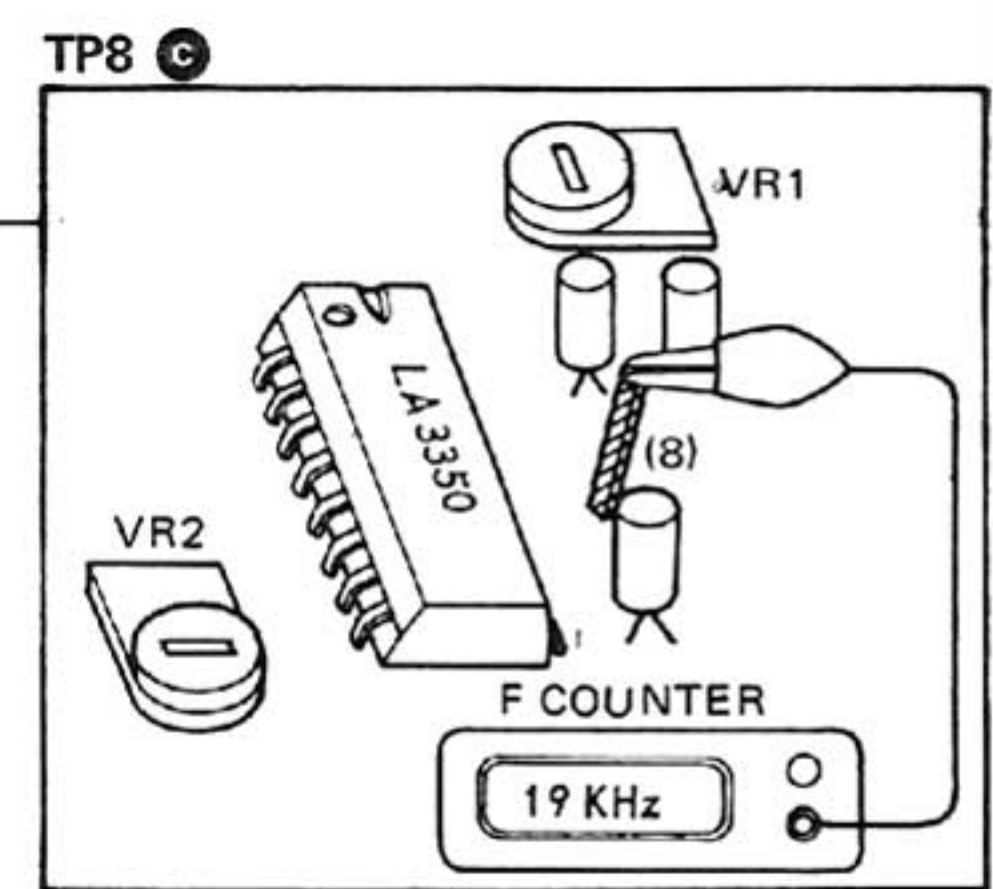
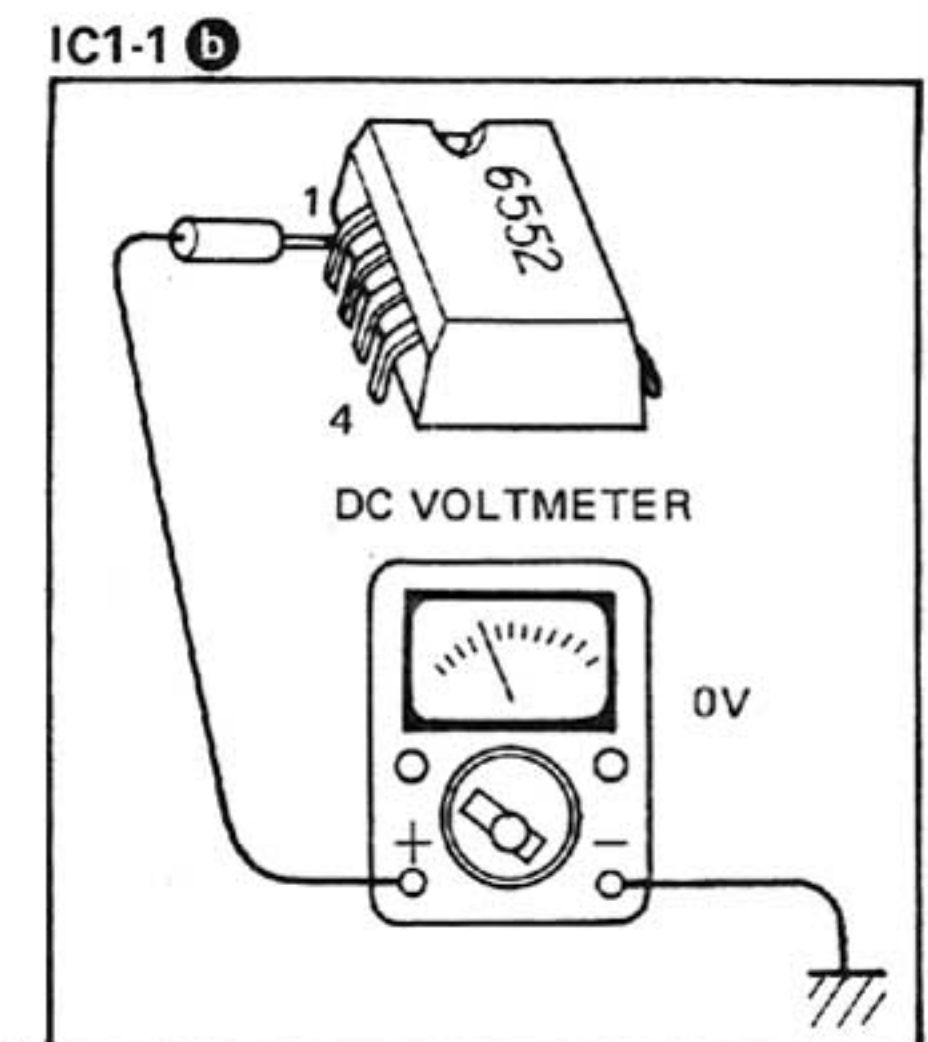
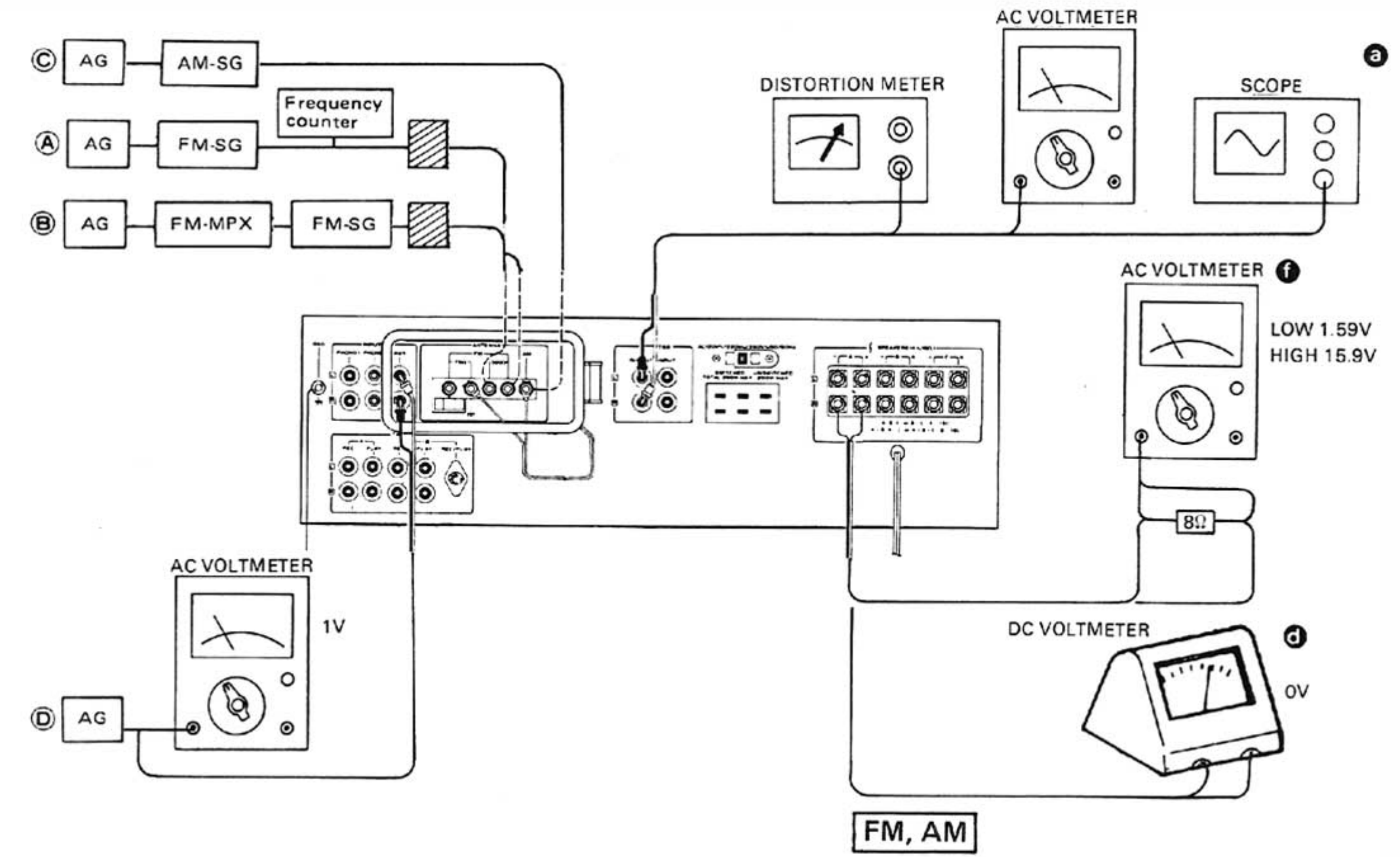
- 1 OFFSET (CENTER) (L) — VR1
- 1 OFFSET (CENTER) (R) — VR2

- 2 IDLE (BIAS) CURRENT (L) — VR3
- 2 IDLE (BIAS) CURRENT (R) — VR4

- 3a POWER METER LOW (R) — VR2
- 3b POWER METER HIGH (R) — VR4
- 3a POWER METER LOW (L) — VR1
- 3b POWER METER HIGH (L) — VR3



- TCA,TCR, TC1 — 2b FM TRACKING (2)
- L5 — 4 DISTORTION
- L10 — 2a AM TRACKING (1)
- L1,2,4 — 2a FM TRACKING (1)
- TCL,TCO — 2b AM TRACKING (2)
- L11 — 2a AM TRACKING (1)
- CF4 — 1 IFT
- L6,7 — 1b,1c DISCRIMINATOR (2),(3)
- IC1-1
- VR1 — 3 VCO
- TP8 (VR1, VR2)
- VR2 — 5 SEPARATION
- VR5 — 6 FREQUENCY COUNTER



# ADJUSTMENT

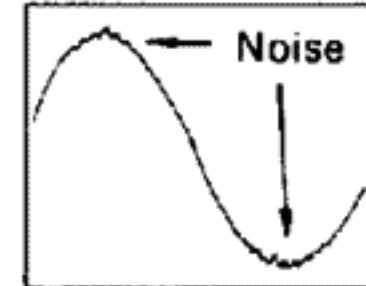
| NO:                                        | ALIGNMENT         | TEST EQUIPMENTS |                                                                                                            | RECEIVER SETTING    | OUTPUT INDICATOR      | ADJUSTMENT POINTS | REMARKS            |
|--------------------------------------------|-------------------|-----------------|------------------------------------------------------------------------------------------------------------|---------------------|-----------------------|-------------------|--------------------|
|                                            |                   | CONNECTION      | SETTING                                                                                                    |                     |                       |                   |                    |
| <b>FM*1</b>                                |                   |                 |                                                                                                            |                     |                       |                   |                    |
| 1a                                         | DISCRIMINATOR (1) | Ⓐ               | 95 MHz<br>1 kHz, ±75 kHz (Dev)                                                                             | FM-MONO<br>95 MHz   | Ⓐ                     | —                 | *2                 |
| 1b                                         | DISCRIMINATOR (2) | - do -          | 95 MHz<br>1 kHz, ±75 kHz (Dev)<br>60 dB (ANT input)                                                        | FM-STEREO<br>95 MHz | Ⓑ<br>(IC1-1)          | L6                | ±100 mV            |
| 1c                                         | DISCRIMINATOR (3) | - do -          | - do -                                                                                                     | - do -              | Ⓐ                     | L7                | Minimum distortion |
| Repeat alignments "1a ~ 1c" several times. |                   |                 |                                                                                                            |                     |                       |                   |                    |
| 2a                                         | FM TRACKING (1)   | Ⓐ               | 90 MHz<br>1 kHz, ±75 kHz (Dev)                                                                             | FM-MONO<br>90 MHz   | Ⓐ                     | L1,2,4            | Maximum deflection |
| 2b                                         | FM TRACKING (2)   | - do -          | 106 MHz<br>1 kHz, ±75 kHz (Dev)                                                                            | FM-MONO<br>106 MHz  | - do -                | TCA,TCR,TC1       | - do -             |
| Repeat alignments "2a, 2b" several times   |                   |                 |                                                                                                            |                     |                       |                   |                    |
| 3                                          | VCO               | Ⓐ               | 95 MHz<br>0 (Dev)<br>60 dB (ANT input)                                                                     | FM-STEREO<br>95 MH  | Ⓒ *3<br>(19 kHz TP8)  | VR1               | 19 kHz<br>±50 Hz   |
| 4                                          | DISTORTION        | Ⓑ               | 95 MHz *4<br>1 kHz, ±68.25 kHz (Dev)<br>SELECTOR: L + R<br>60 dB (ANT input)                               | - do -              | Ⓐ                     | L5                | Minimum distortion |
| 5                                          | SEPARATION        | - do -          | 95 MHz<br>1 kHz (Mod)<br>68.25 kHz (Dev.<br>under L + R position)<br>60 dB (ANT INPUT)<br>SELECTOR: L or R | - do -              | - do -                | VR2               | Minumum crosstalk  |
| 6                                          | FREQUENCY COUNTER | Ⓐ               | 89.10 MHz<br>0 (Dev.)<br>60 dB (ANT INPUT)                                                                 | FM-MONO<br>89.1 MHz | Fluorescent indicator | VR5               | 89.10 MHz          |
| <b>AM *5</b>                               |                   |                 |                                                                                                            |                     |                       |                   |                    |
| 1                                          | IFT               | Ⓒ               | 1,000 kHz<br>400 Hz, 30% Mod                                                                               | AM<br>1,000 Hz      | Ⓐ                     | CF4               | Maximum deflection |
| 2a                                         | AM TRACKING (1)   | - do -          | 600 kHz<br>400 Hz, 30% Mod                                                                                 | AM<br>600 kHz       | - do -                | L10,11            | - do -             |
| 2b                                         | AM TRACKING (2)   | - do -          | 1,400 kHz<br>400 Hz, 30% Mod                                                                               | AM<br>1,400 kHz     | - do -                | TCL,TCO           | - do -             |
| Repeat alignments "2a,2b" several times.   |                   |                 |                                                                                                            |                     |                       |                   |                    |

# ADJUSTMENT

| NO.                                        | ALIGNMENT           | TEST EQUIPMENTS |             | RECEIVER SETTING                                                       | OUTPUT INDICATOR | ADJUSTMENT POINTS            | REMARKS |
|--------------------------------------------|---------------------|-----------------|-------------|------------------------------------------------------------------------|------------------|------------------------------|---------|
|                                            |                     | CONNECTION      | SETTING     |                                                                        |                  |                              |         |
| <b>AUDIO</b>                               |                     |                 |             |                                                                        |                  |                              |         |
| 1                                          | OFFSET (CENTER)     | —               | —           | VOLUME; ∞ (— dB)                                                       | d                | CEN.ADJ.<br>VR1<br>(VR2)     | 0V      |
| 2                                          | IDLE (BIAS) CURRENT | —               | —           | - do -                                                                 | e                | BIAS ADJ.<br>VR3<br>(VR4)    | 25 mV   |
| 3a                                         | POWER METER         | ⓐ               | 1 kHz<br>1V | METER range: × 1<br>Adjust VOLUME so that AC voltmeter indicates 1.59V | f<br>POWER METER | MET.ADJ.LOW<br>VR1<br>(VR2)  | 0.3W    |
| 3b                                         | POWER METER         | - do -          | - do -      | METER range: × 1<br>Adjust VOLUME so that AC voltmeter indicates 15.9V | - do -           | MET.ADJ.HIGH<br>VR3<br>(VR4) | 30W     |
| Repeat adjustments "3a, 3b" several times. |                     |                 |             |                                                                        |                  |                              |         |

\*1 When performing the adjustments, be sure to turn the reverberation circuit and M.A.C. off.

\*2 Adjust the tuning knob so that the same amount of noise is observed at the top and bottom of the output waveform with a weak signal.



\*3 If your frequency counter's sensitivity is low, use an AC voltmeter (with high input impedance) as an amplifier.

\*4 Set deviation to ±68.25 kHz with selector in L + R position.

Set deviation of pilot signal to 6.75 kHz (9%)

\*5 Keep the AM loop antenna connected when connecting the AM-SG.



## REGLAGES

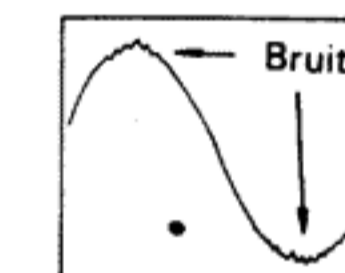
| N°                                         | ALIGNEMENT           | APPAREILLAGE |                                                                                                     | REGLAGE DU AMPLI-TUNER | INDICATEUR DE SORTIE   | POINTS DE REGLAGES | REMARQUES           |
|--------------------------------------------|----------------------|--------------|-----------------------------------------------------------------------------------------------------|------------------------|------------------------|--------------------|---------------------|
|                                            |                      | RACCORDEMENT | REGLAGE                                                                                             |                        |                        |                    |                     |
| <b>SECTION MF *1</b>                       |                      |              |                                                                                                     |                        |                        |                    |                     |
| 1a                                         | DISCRIMINATEUR (1)   | Ⓐ            | 95 MHz                                                                                              | FM-MONO                | Ⓐ                      | —                  | *2                  |
| 1b                                         | DISCRIMINATEUR (2)   | - idem -     | 95 MHz<br>1kHz, ±75 kHz (Dév)<br>60 dB (Entrée ANT)                                                 | FM-AUTO/MUTE<br>95 MHz | Ⓑ<br>(IC1-1)           | L6                 | ±100 mV             |
| 1c                                         | DISCRIMINATEUR (3)   | - idem -     | - idem -                                                                                            | - idem -               | Ⓒ                      | L7                 | Distortion minimale |
| Répéter les points 1a ~ 1c plusieurs fois. |                      |              |                                                                                                     |                        |                        |                    |                     |
| 2a                                         | ALIGNEMENT (1)       | Ⓐ            | 90 MHz<br>1 kHz, ±75 kHz (Dév)                                                                      | FM-MONO<br>90 MHz      | Ⓐ                      | L1,2,4             | Déviations maximale |
| 2b                                         | ALIGNEMENT (2)       | - idem -     | 106 MHz<br>1 kHz, ±75 kHz (Dév)                                                                     | FM-MONO<br>106 MHz     | - idem -               | TCA,TCR,TC1        | - idem -            |
| Répéter les points 2a ~ 2b plusieurs fois. |                      |              |                                                                                                     |                        |                        |                    |                     |
| 3                                          | OSCILATEUR<br>19 kHz | Ⓐ            | 95 MHz<br>0 (Dév) 60 dB                                                                             | FM-AUTO/MUTE<br>95 MHz | Ⓒ *3<br>(19 kHz T.P.8) | VR1                | 19 kHz<br>±50 Hz    |
| 4                                          | DISTORSION           | Ⓑ            | 95 MHz *4<br>1 kHz (Mod)<br>±68,25 kHz (Dév)<br>L + R (SELECTION)<br>60 dB                          | - idem -               | Ⓒ                      | L5                 | Distorsion minimale |
| 5                                          | SEPARATION           | - idem -     | 95 MHz<br>1 kHz (Mod)<br>sur la position (L + R)<br>68,25 kHz (Dév)<br>60 dB (ENTREE<br>ANT) L ou R | - idem -               | - idem -               | VR2                | Diaphonie minimale  |
| 6                                          | FREQUENCE-METER      | Ⓐ            | 89,10 MHz<br>0 (Dév)<br>60 dB (Entrée ANT)                                                          | FM-MONO<br>89,1 MHz    | Indicateur à fréquence | VR5                | 89,10 MHz           |
| <b>SECTION MA *5</b>                       |                      |              |                                                                                                     |                        |                        |                    |                     |
| 1                                          | TFI                  | Ⓒ            | 1.000 kHz<br>400 Hz, 30% (Mod)                                                                      | AM<br>1.000 kHz        | Ⓐ                      | CF4                | Déviations maximale |
| 2a                                         | ALIGNEMENT (1)       | - idem -     | 600 kHz<br>400 Hz, 30% (Mod)                                                                        | AM<br>600 kHz          | - idem -               | L10,11             | - idem -            |
| 2b                                         | ALIGNEMENT (2)       | - idem -     | 1.400 kHz<br>400 Hz, 30% (Mod)                                                                      | AM<br>1.400 kHz        | - idem -               |                    | - idem -            |
| Répéter les points 2a ~ 2b plusieurs fois. |                      |              |                                                                                                     |                        |                        |                    |                     |

## REGLAGES

| N°.                                | ALIGNEMENT                     | APPAREILLAGE |             | REGLAGE DU AMPLI-TUNER                                                                     | INDICATEUR DE SORTIE | POINTS DE REGLAGE            | REMARQUES |
|------------------------------------|--------------------------------|--------------|-------------|--------------------------------------------------------------------------------------------|----------------------|------------------------------|-----------|
|                                    |                                | RACCORDEMENT | REGLAGE     |                                                                                            |                      |                              |           |
| <b>SECTION AMPLI</b>               |                                |              |             |                                                                                            |                      |                              |           |
| 1                                  | TENSION DE DECALAGE (CENTER)   | —            | —           | VOLUME: minimale                                                                           | Ⓓ                    | CEN ADJ<br>VR1<br>(VR2)      | 0V        |
| 2                                  | COURANT DE POLARISATION (BIAS) | —            | —           | idem                                                                                       | Ⓔ                    | BIAS ADJ<br>VR3<br>(VR4)     | 25 mV     |
| 3a                                 | POWER METRE                    | Ⓓ            | 1 kHz<br>1V | Regler le VOLUME en sortie que Le VU mètre indique 3W lorsque le volt-mètre indique 1,59V  | Ⓘ<br>POWER METRE     | MET ADJ LOW<br>VR1<br>(VR2)  | 0.3W      |
| 3b                                 | POWER METRE                    | - idem -     | 1 kHz<br>1V | Regler le VOLUME en sortie que. Le VU mètre indique 3W lorsque le volt-mètre indique 1,59V | Ⓘ<br>POWER METRE     | MET ADJ HIGH<br>VR3<br>(VR4) | 30W       |
| Répéter les 2 et 3 plusieurs fois. |                                |              |             |                                                                                            |                      |                              |           |

\*1 Lors du réglage, s'assurer de débrancher le circuit de réverbération et le circuit M.A.C.

\*2 Ajuster le bouton d'accord de façon que la même quantité de bruit puisse être observé au sommet et en bas de la forme d'onde de sortie sous des conditions d'alimentation de signal faible



\*3 Si votre compteur de fréquence a une faible sensibilité, utilisez un voltmètre à courant alternatif (avec une impédance d'entrée élevée) comme amplificateur.

\*4 Régler la déviation à ±68,25 kHz avec le sélecteur en position L + R (gauche + droite). Régler déviation du signal pilote à 6,75 kHz (9%).

\*5 Maintenir l'antenne bouclée MA connectée pour connecter le générateur MA.

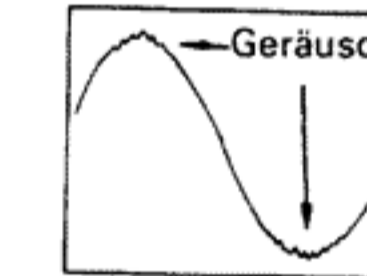
# ABGLEICH

| NR.                                                | ABGLEICH                        | PRÜFEINRICHTUNG |                                                                                                                | RECEIVER EINSTELLUNG | AUSGANGS-ANZEIGE        | EINSTELL-PUNKT | BEMERK-UNGEN           |
|----------------------------------------------------|---------------------------------|-----------------|----------------------------------------------------------------------------------------------------------------|----------------------|-------------------------|----------------|------------------------|
|                                                    |                                 | AN-SCHLÜSSE     | EINSTELLUNG                                                                                                    |                      |                         |                |                        |
| <b>UKW-EMPFANGSABTEILUNG *1</b>                    |                                 |                 |                                                                                                                |                      |                         |                |                        |
| 1a                                                 | DISKRIMI-NATOR (1)              | Ⓐ               | 95 MHz<br>1 kHz, ±75 kHz (Hub)                                                                                 | FM-MONO<br>95 MHz    | Ⓐ                       | —              | *2                     |
| 1b                                                 | DISKRIMI-NATOR (2)              | - dito -        | 95 MHz<br>1 kHz, ±75 kHz (Hub)<br>60 dB (Eingangssignalpegel)                                                  | FM-STEREO<br>95 MHz  | Ⓑ<br>(IC1-1)            | L6             | ±100 mV                |
| 1c                                                 | DISKRIMI-NATOR (3)              | - dito -        | - dito -                                                                                                       | - dito -             | Ⓐ                       | L7             | Minimaler klirrfaktor  |
| Abstimmungen „1a bis 1c“ mehrere Male wiederholen. |                                 |                 |                                                                                                                |                      |                         |                |                        |
| 2a                                                 | UKW-EMPFANGS-BEREICH (1)        | Ⓐ               | 90 MHz<br>1 kHz, ±75 kHz (Hub)                                                                                 | FM-MONO<br>90 MHz    | Ⓐ                       | L1,2,4         | Maximaler Ausschlag    |
| 2b                                                 | UKW-BEREICH (2)                 | - dito -        | 106 MHz<br>1 kHz, ±75 kHz (Hub)                                                                                | FM-MONO<br>106 MHz   | - dito -                | TCA.TCR.TC1    | - dito -               |
| Abstimmungen „2a und 2b“ mehrere Male wiederholen. |                                 |                 |                                                                                                                |                      |                         |                |                        |
| 3                                                  | SPANNUNGS-GEREGELTER OSZILLATOR | Ⓐ               | 95 MHz<br>0 Hub<br>60 dB                                                                                       | FM-STEREO<br>95 MHz  | Ⓒ *3<br>(19 kHz, T.P.8) | VR1            | 19 kHz<br>±50 Hz       |
| 4                                                  | KLIRR-FAKTOR                    | Ⓑ               | 95 MHz *4<br>1 kHz, ±68,25 kHz (Hub)<br>Wähler: L + R<br>60 dB                                                 | - dito -             | Ⓐ                       | L5             | Minimaler Klirrfaktor  |
| 5                                                  | STEREO KANAL TRENNUNG           | - dito -        | 95 MHz<br>1 kHz, ±68,25 kHz<br>(Hub bei L + R<br>Stellung), 60 dB<br>(Eingangssignalpegel)<br>Wähler: L oder R | - dito -             | - dito -                | VR2            | Minimales Übersprechen |
| 6                                                  | FREQUENZ-ZÄHLER                 | Ⓐ               | 89,10 MHz<br>0 (Dev) 60 dB<br>(Eingangssignalpegel)                                                            | FM-MONO<br>89,1 MHz  | Frequenz-indikator      | VR5            | 89,10 MHz              |
| <b>MW-EMPFANGSABTEILUNG *5</b>                     |                                 |                 |                                                                                                                |                      |                         |                |                        |
| 1                                                  | ZF-T                            | Ⓒ               | 1.000 kHz<br>400 Hz, 30% Mod                                                                                   | AM<br>1.000 kHz      | Ⓐ                       | CF4            | Maximaler Ausschlag    |
| 2a                                                 | MW EMPFANGS-BEREICH (1)         | - dito -        | 600 kHz<br>400 Hz, 30% Mod                                                                                     | AM<br>600 kHz        | - dito -                | L10,11         | - dito -               |
| 2b                                                 | MW EMPFANGS-BEREICH (2)         | - dito -        | 1.400 kHz<br>400 Hz, 30% Mod                                                                                   | AM<br>1.400 kHz      | - dito -                | TCL.TCO        | - dito -               |
| Abstimmungen „2a und 2b“ mehrere Male wiederholen. |                                 |                 |                                                                                                                |                      |                         |                |                        |

# ABGLEICH

| NR.                                                | ABGLEICH                 | PRÜFEINRICHTUNG |             | RECEIVER EINSTELLUNG                                                          | AUSGANGS-ANZEIGE      | EINSTELL-PUNKT               | BEMERK-UNGEN |
|----------------------------------------------------|--------------------------|-----------------|-------------|-------------------------------------------------------------------------------|-----------------------|------------------------------|--------------|
|                                                    |                          | ANSCHLÜSSE      | EINSTELLUNG |                                                                               |                       |                              |              |
| <b>VERSTÄRKER</b>                                  |                          |                 |             |                                                                               |                       |                              |              |
| 1                                                  | OFFSET SPANNUNG (CENTER) | —               | —           | VOLUME ZU Stellung „∞“                                                        | Ⓓ                     | CEN.ADJ<br>VR1<br>(VR2)      | 0V           |
| 2                                                  | LEER-LAUFS (BIAS)        | —               | —           | - dito -                                                                      | Ⓔ                     | BIAS.ADJ<br>VR3<br>(VR4)     | 25 mV        |
| 3a                                                 | LEISTUNGS-MESSER         | Ⓓ               | 1 kHz<br>1V | Den VOLUMEN so regulieren, daß die Gleichspannungsmesser-Ableseung 1,59V ist. | Ⓕ<br>Leistungs-messer | MET.ADJ LOW<br>VR3<br>(VR4)  | 0,3W         |
| 3b                                                 | LEISTUNGS-MESSER         | Ⓓ               | 1 kHz<br>1V | Den VOLUME so regulieren, daß die Gleichspannungsmesser-Ableseung 15,9V ist.  | Ⓕ<br>Leistungs-messer | MET.ADJ HIGH<br>VR3<br>(VR4) | 30W          |
| Abstimmungen „3a und 3b“ mehrere Male wiederholen. |                          |                 |             |                                                                               |                       |                              |              |

- \*1 Wenn Sie eine Justierung durchführen, nicht vergessen, den Nachhallschaltkreis und M.A.C. auszuschalten.
- \*2 Den Abstimmknopf so einstellen, daß an der oberen und unteren Grenze der Ausgangswellenform bei schwachem Signal desselbe Geräusch auftritt.

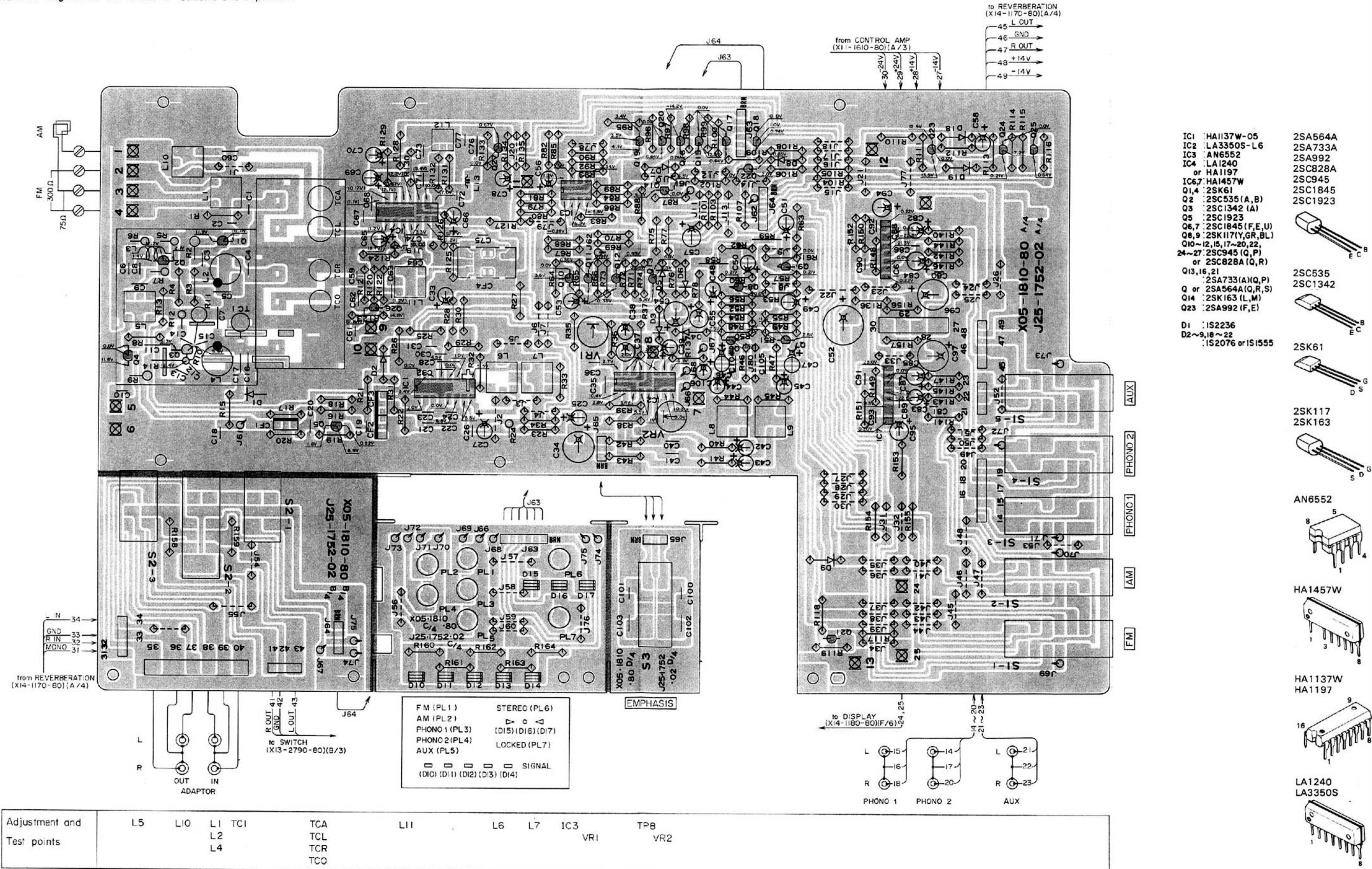


- \*3 Wenn Ihr Frequenzzähler nur eine geringe Empfindlichkeit hat, verwenden Sie ein Wechselstrom-Voltmeter (mit hoher Eingangs-impedanz) als Verstärker.
- \*4 Hub mit dem Wahlschalter auf L + R auf 68,25 kHz einstellen. Hub des Kontrollsignals auf 6,75 kHz (9%) einstellen.
- \*5 Die-MW Schleifenantenne beim Anschliessen des Signalgenerators angeschlossen lassen.

# PC BOARD

## TUNER (X05-1810-10) Component side view

Refer to the schematic diagram for the values of resistors and capacitors.

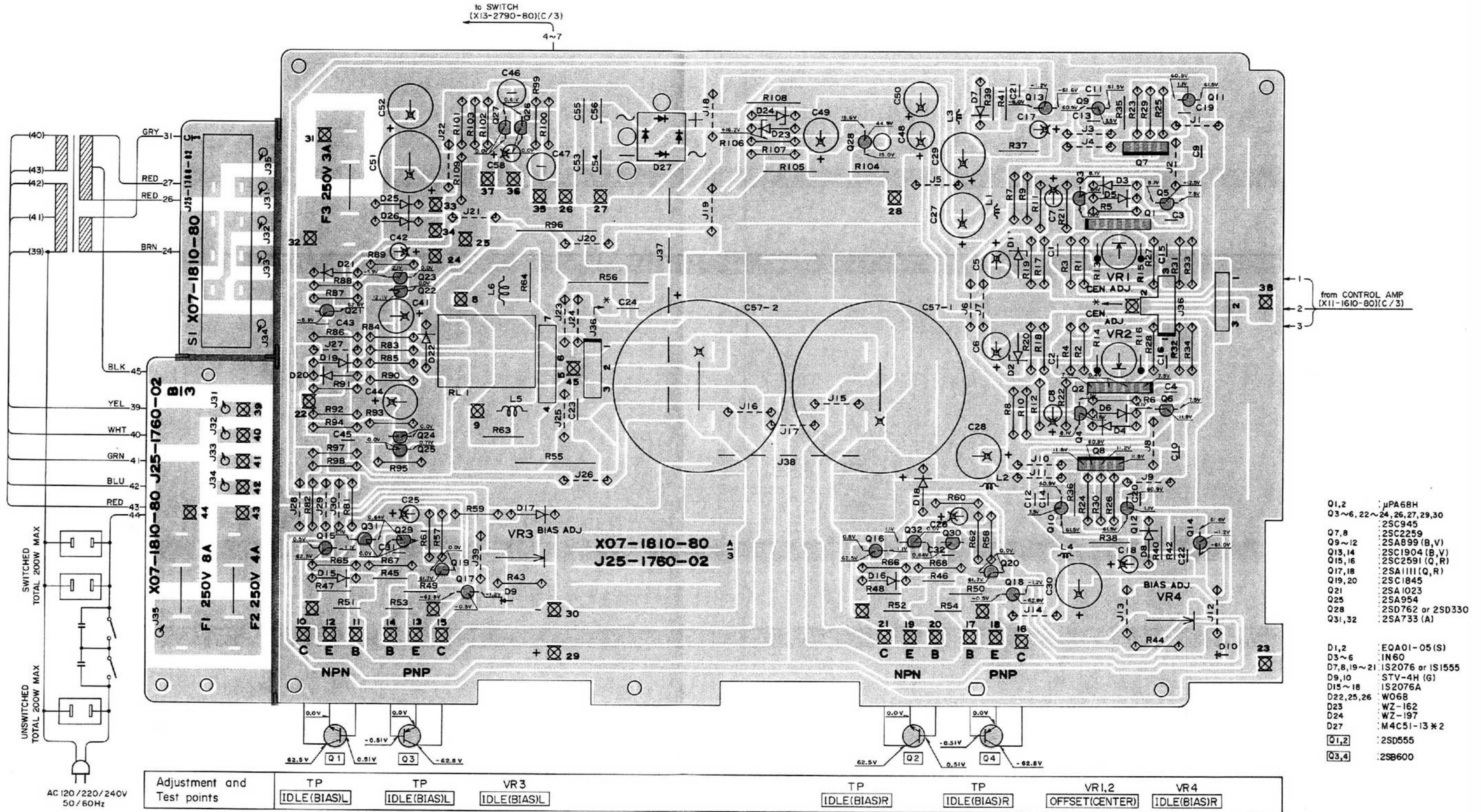




# PC BOARD

## POWER AMP (X07-1810-80) Component side view

Refer to the schematic diagram for the values of resistors and capacitors.

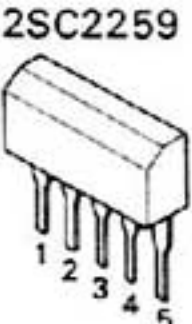
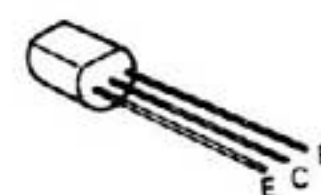


- Q1,2 :  $\mu$ PA68H
- Q3~6, 22~24, 26, 27, 29, 30 : 2SC945
- Q7, 8 : 2SC2259
- Q9~12 : 2SA899 (B, V)
- Q13, 14 : 2SC1904 (B, V)
- Q15, 16 : 2SC2591 (Q, R)
- Q17, 18 : 2SA1111 (Q, R)
- Q19, 20 : 2SC1845
- Q21 : 2SA1023
- Q25 : 2SA954
- Q28 : 2SD762 or 2SD330
- Q31, 32 : 2SA733 (A)

- D1, 2 : EQA01-05 (S)
- D3~6 : 1N60
- D7, 8, 19~21 : 1S2076 or 1S1555
- D9, 10 : STV-4H (G)
- D15~18 : 1S2076A
- D22, 25, 26 : W06B
- D23 : WZ-162
- D24 : WZ-197
- D27 : M4C51-13 \* 2
- Q1, 2 : 2SD555
- Q3, 4 : 2SB600



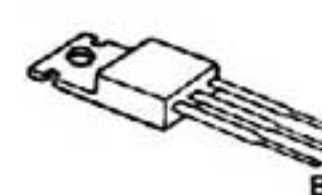
- 2SA733 (A)
- 2SA954
- 2SA1023
- 2SC945
- 2SC1845



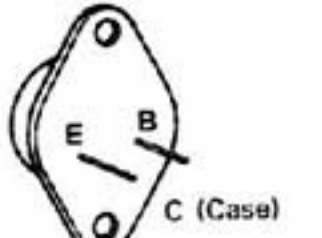
- 2SA899
- 2SC1904



- 2SA1111
- 2SC2591
- 2SD330
- 2SD762



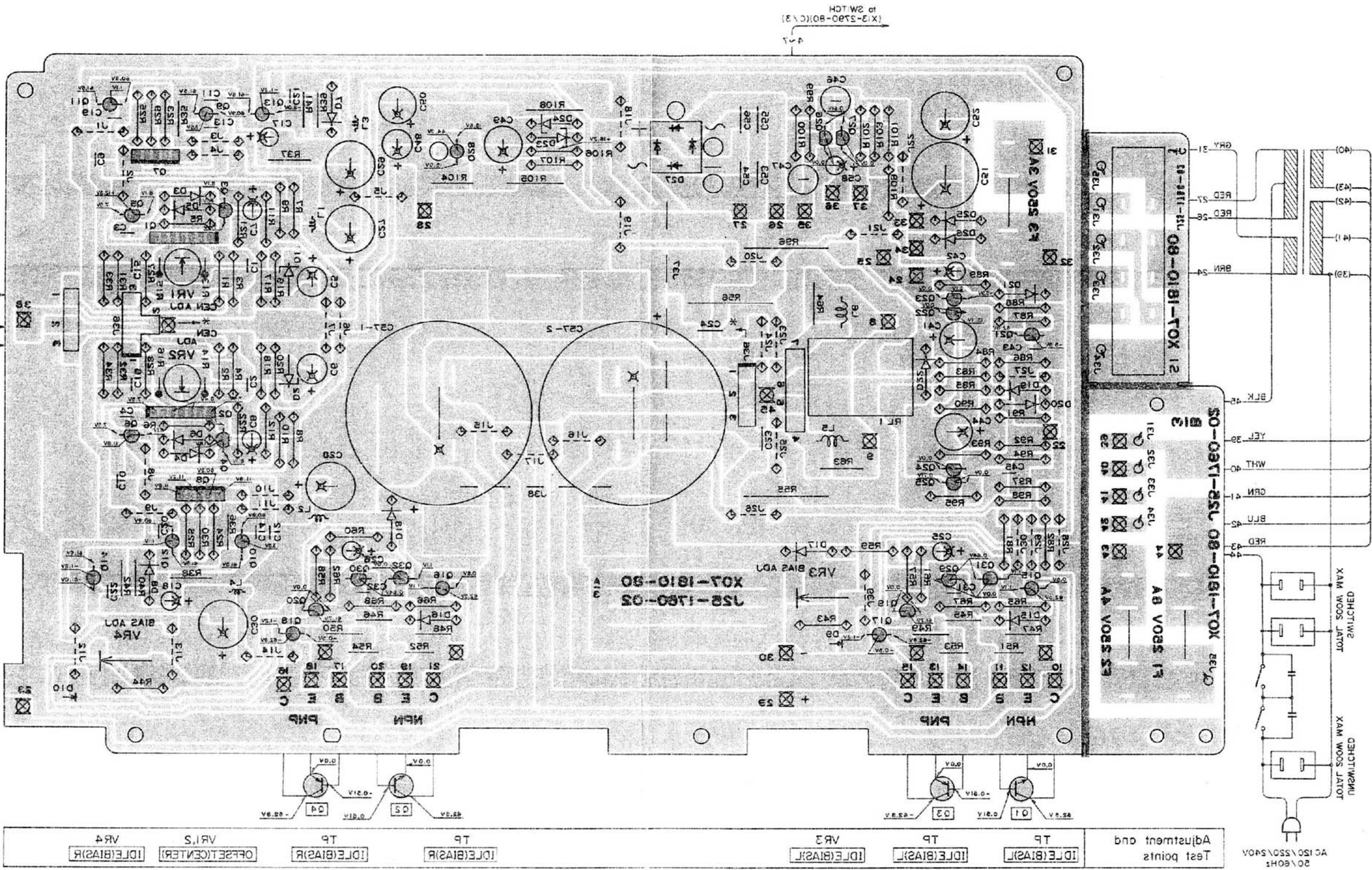
- 2SB600
- 2SD555



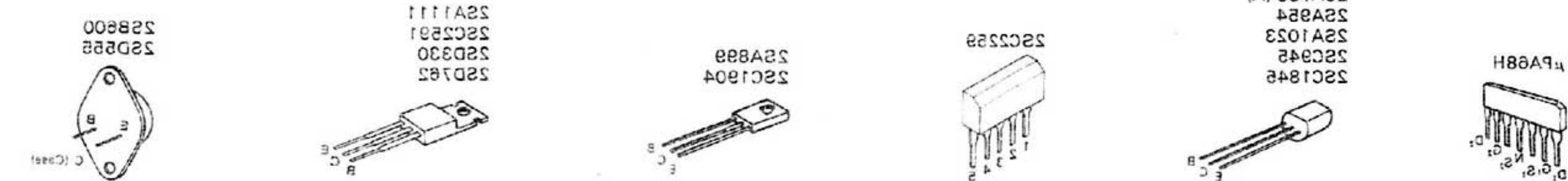
PC BOARD

POWER AMP (X07-1810-80) Component side view

Refer to the schematic diagram for the values of resistors and capacitors.



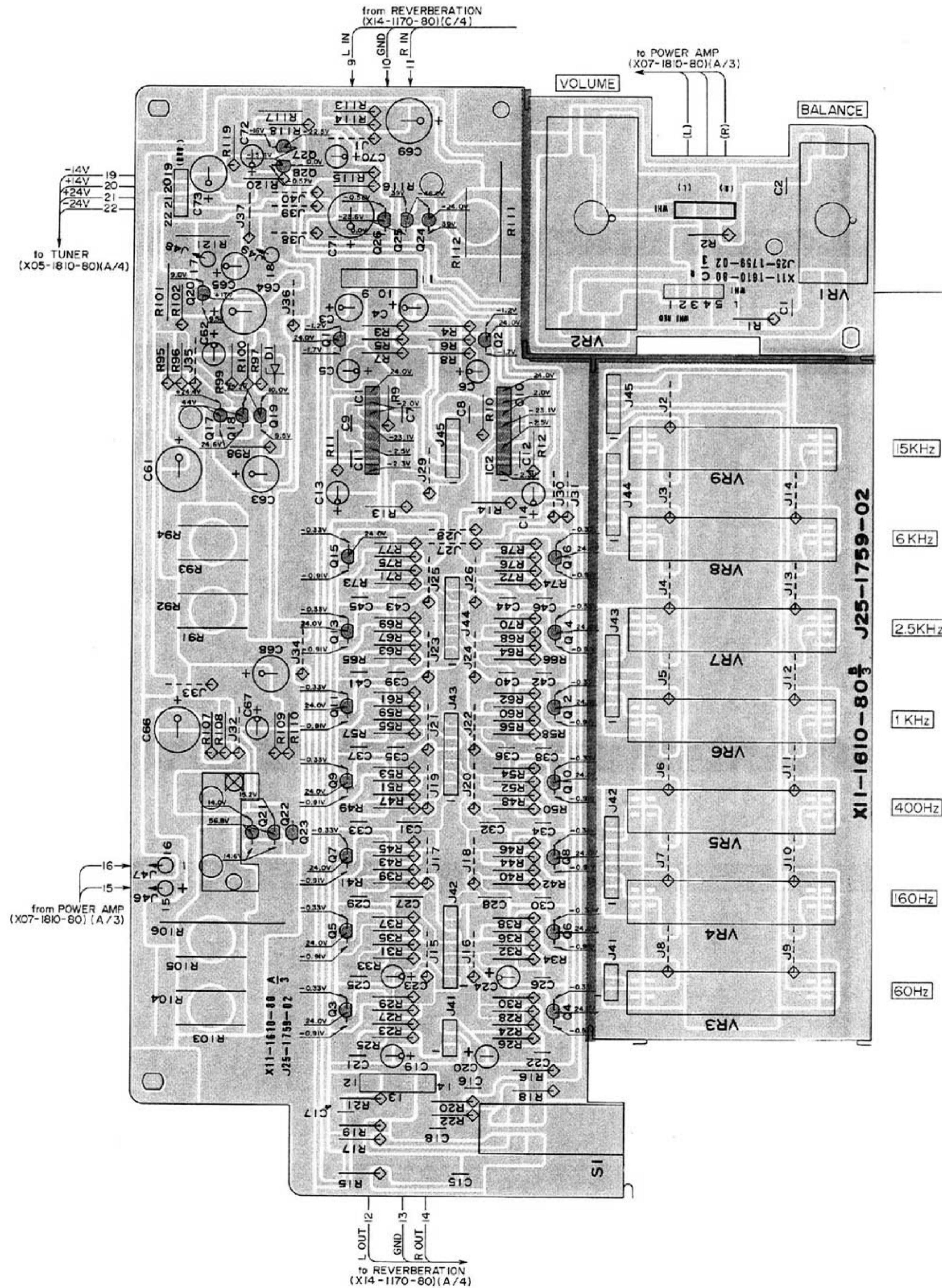
- Q34 1S28900
- Q35 1S28900
- Q36 1S28900
- Q37 1S28900
- Q38 1S28900
- Q39 1S28900
- Q40 1S28900
- Q41 1S28900
- Q42 1S28900
- Q43 1S28900
- Q44 1S28900
- Q45 1S28900
- Q46 1S28900
- Q47 1S28900
- Q48 1S28900
- Q49 1S28900
- Q50 1S28900
- Q51 1S28900
- Q52 1S28900
- Q53 1S28900
- Q54 1S28900
- Q55 1S28900
- Q56 1S28900
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- Q61 1S28900
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- Q67 1S28900
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- Q78 1S28900
- Q79 1S28900
- Q80 1S28900
- Q81 1S28900
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- Q83 1S28900
- Q84 1S28900
- Q85 1S28900
- Q86 1S28900
- Q87 1S28900
- Q88 1S28900
- Q89 1S28900
- Q90 1S28900
- Q91 1S28900
- Q92 1S28900
- Q93 1S28900
- Q94 1S28900
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- Q96 1S28900
- Q97 1S28900
- Q98 1S28900
- Q99 1S28900
- Q100 1S28900



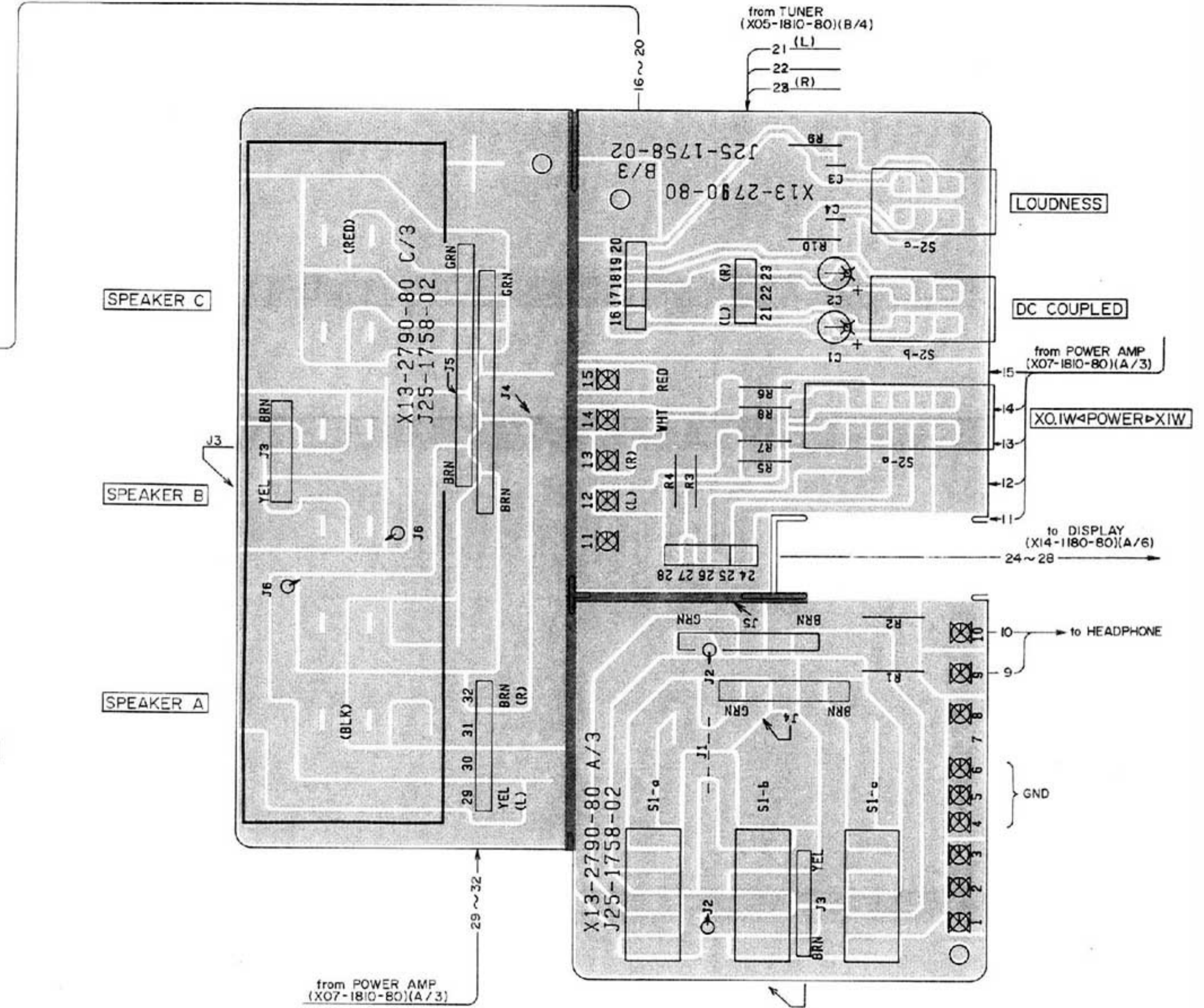
# PC BOARD

## CONTROL AMP (X11-1610-80) Component side view

Refer to the schematic diagram for the values of resistors and capacitors.



## SWITCH (X13-2790-80) Component side view

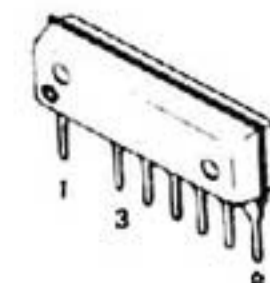
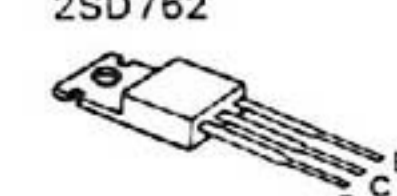
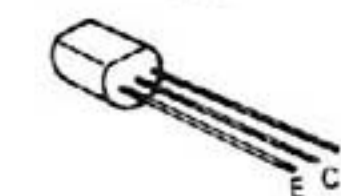


- IC1,2 : HA1457W
- Q1~16 : 2SC1845 (F,E,U)
- Q17,24 : 2SD762 or 2SD330
- Q18,19,22,23 : 2SC945
- Q20 : 2SC2003
- Q25,26,28 : 2SA733 (A)
- Q27 : 2SA954
- D1 : 1EQA01-10 (R)
- Q21 : 2SD613

- 2SA733A
- 2SA954
- 2SC945
- 2SC1845
- 2SC2003

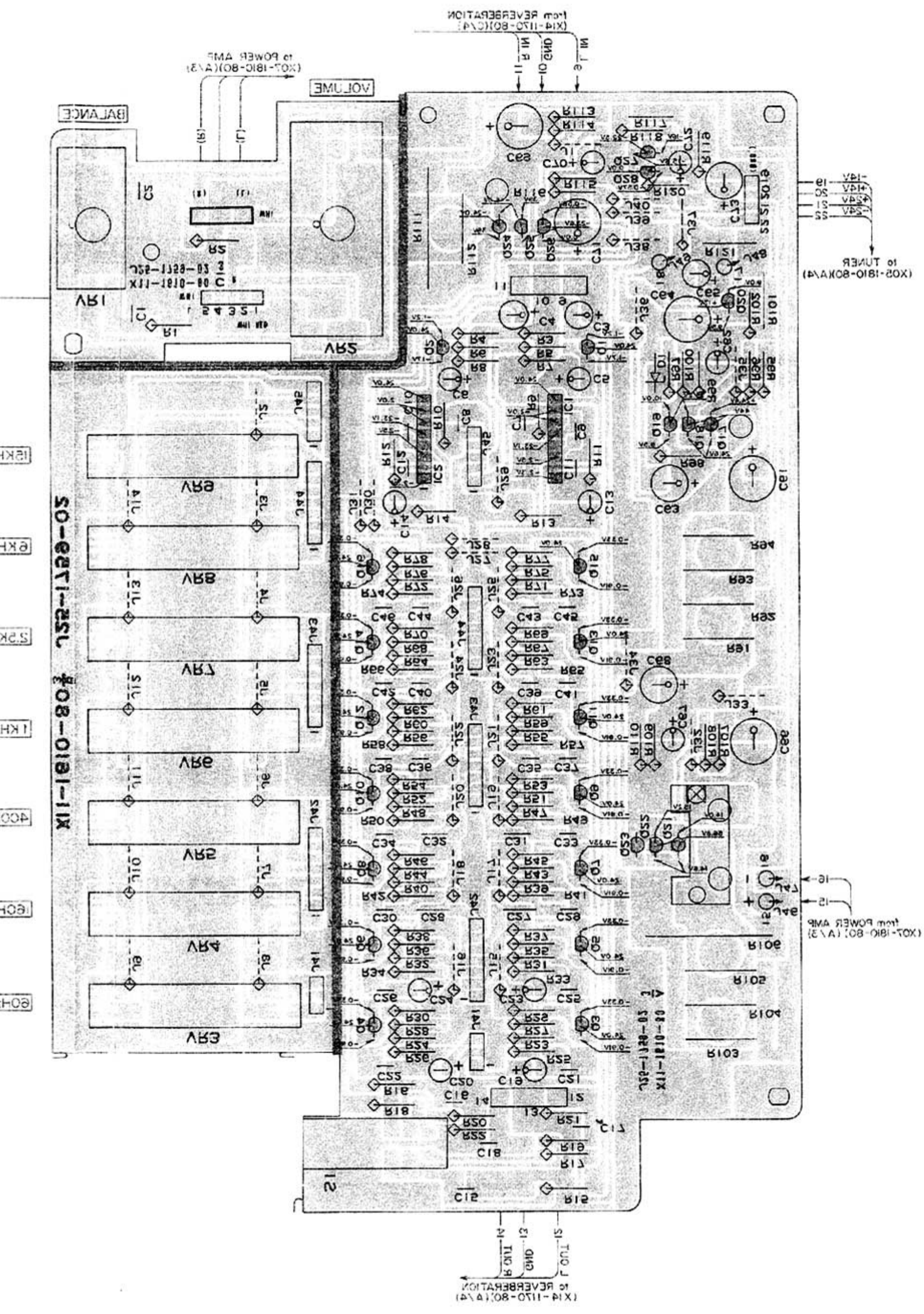
- 2SD330
- 2SD613
- 2SD762

HA1457W



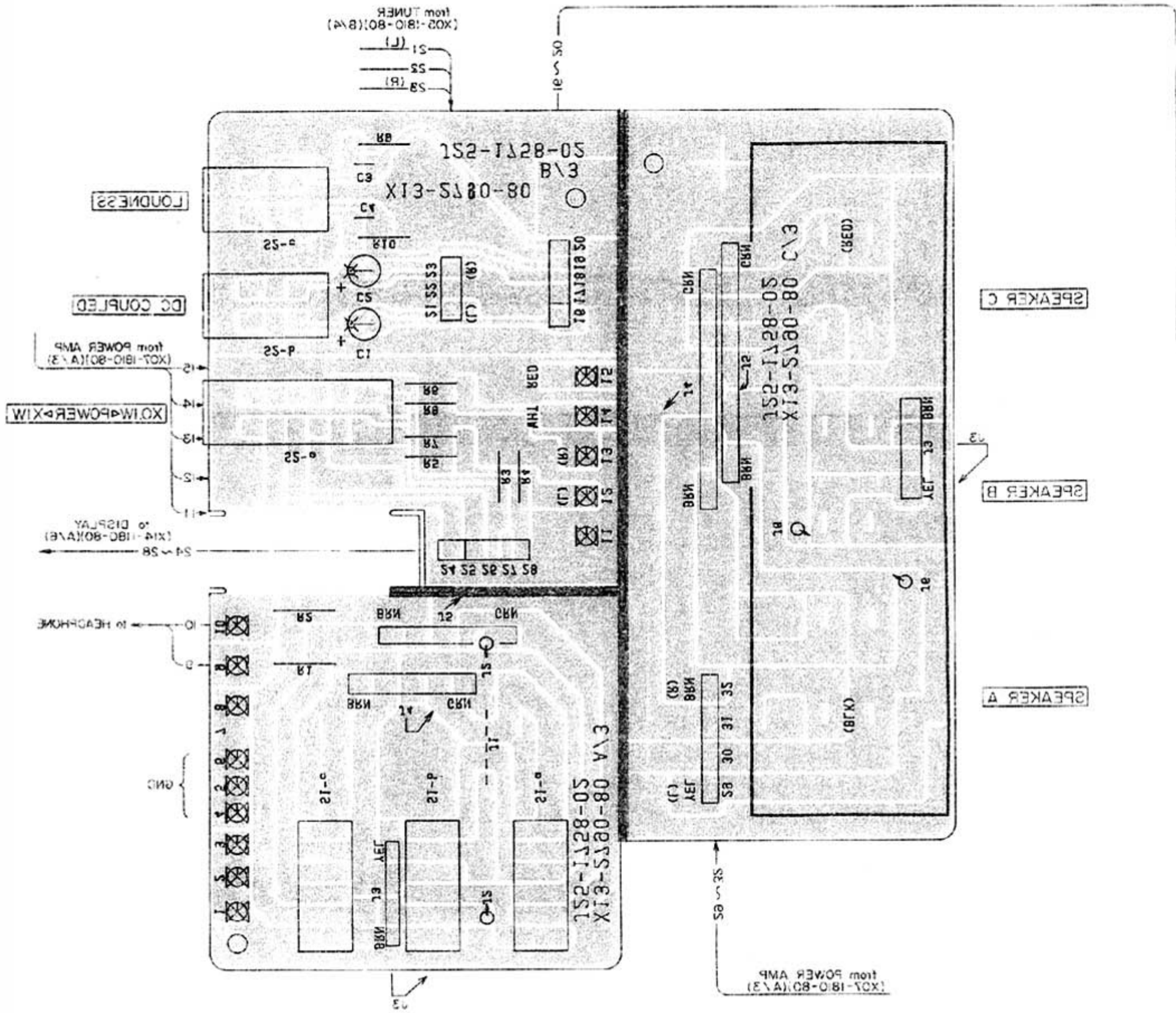
CONTROL AMP (X11-1610-80) Component side view

Refer to the schematic diagram for the values of resistors and capacitors

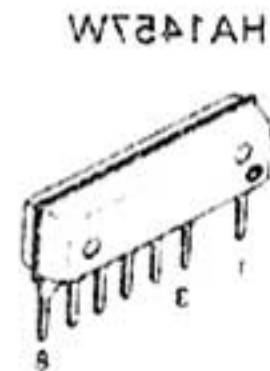
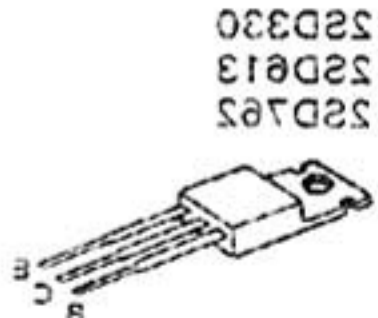
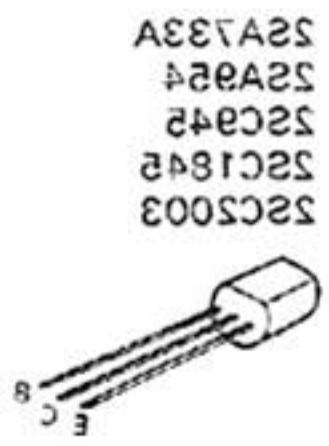


PC BOARD

SWITCH (X13-270-80) Component side view



- 520E13
- 520E10 (R)
- 52A824
- 52A732 (A)
- 52A732 (A)
- 52C5003
- 050
- 52C442
- 52D165 or 52D330
- 017 24
- 52C1649 (F.E.U)
- 017 24
- IC's
- 52A133A

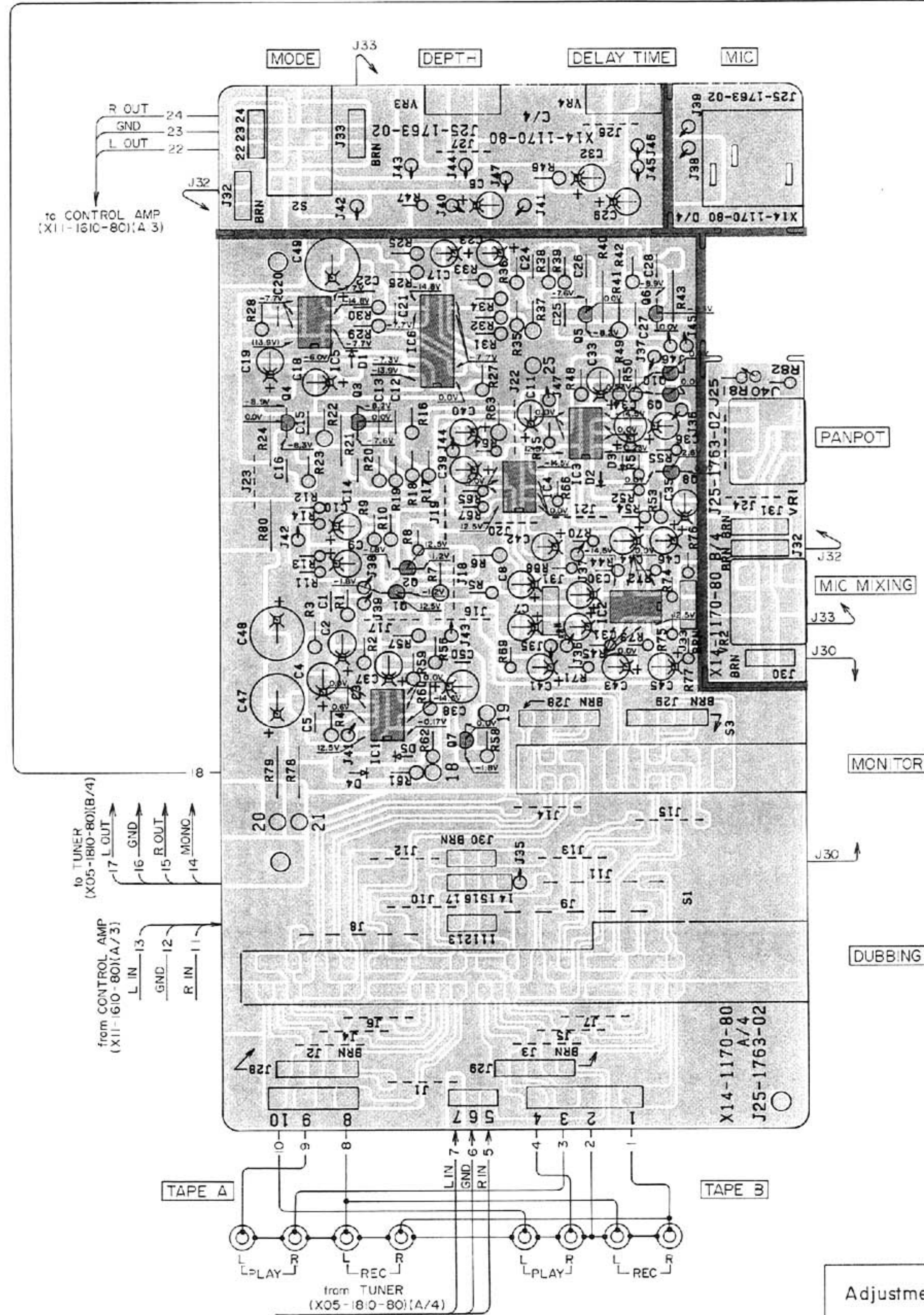




# PC BOARD

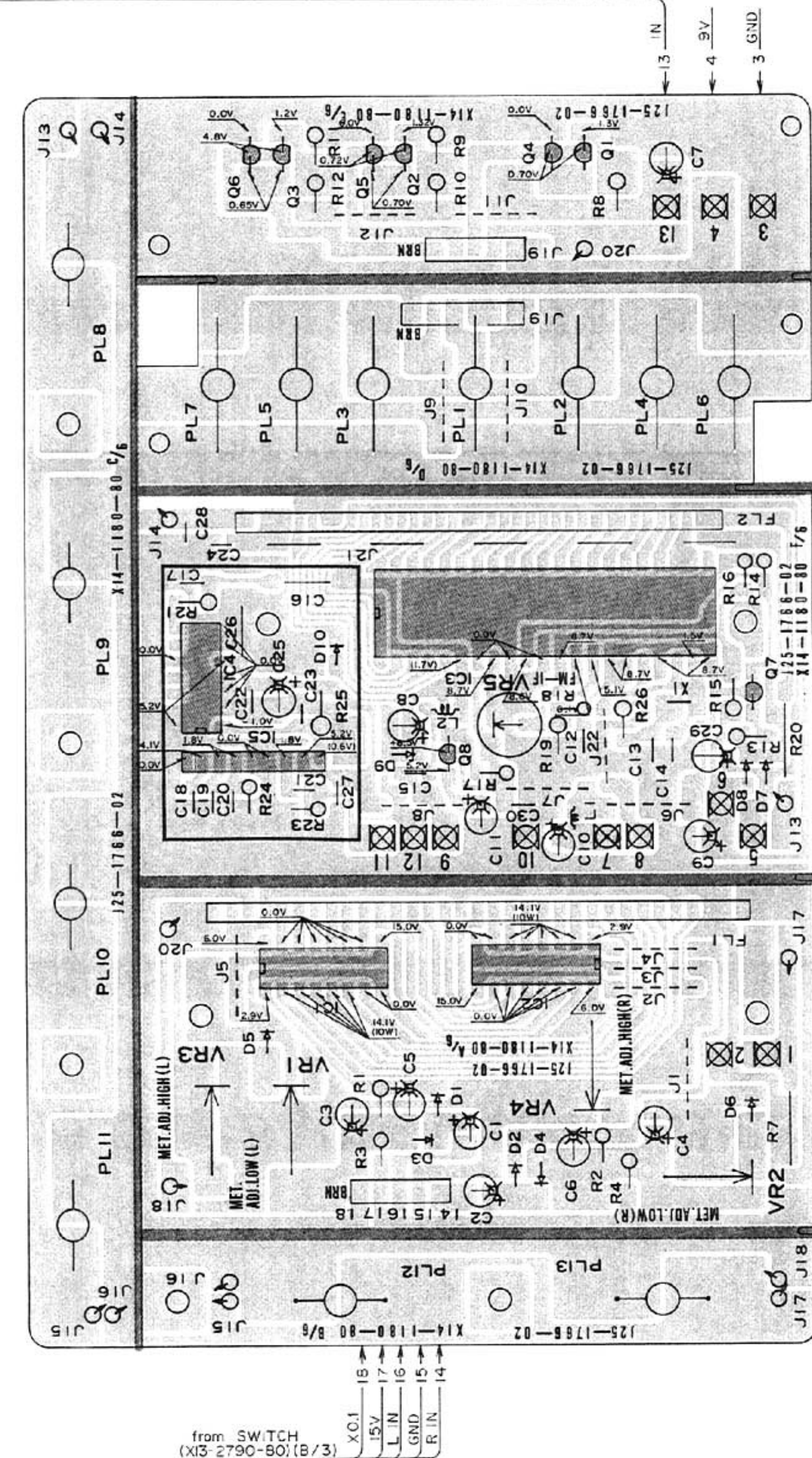
## REVERBERATION (X14-1170-80) Component side view

Refer to the schematic diagram for the values of resistors and capacitors.

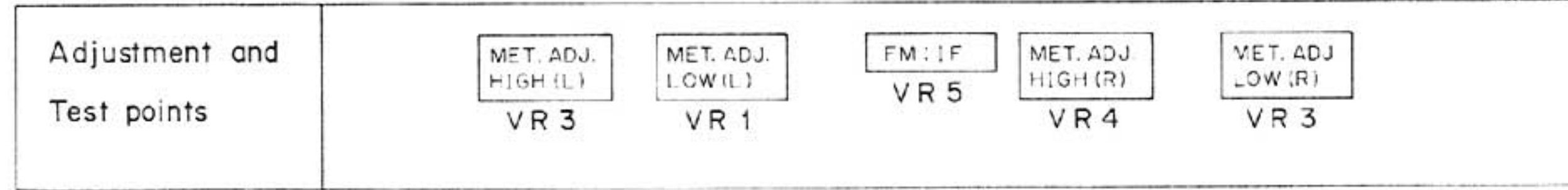
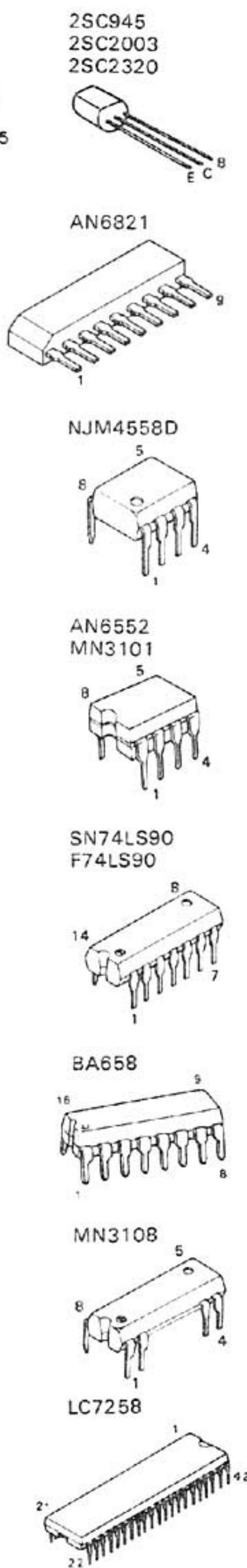


- IC1~4 : AN6552 or NJM4558D
- IC5 : MN3101
- IC6 : MN3008
- Q1~10 : 2SC945(R,Q) or 2SC2320(E,F)
- D1~5 : IS2076 or IS1555

## DISPLAY (X14-1180-80) Component side view

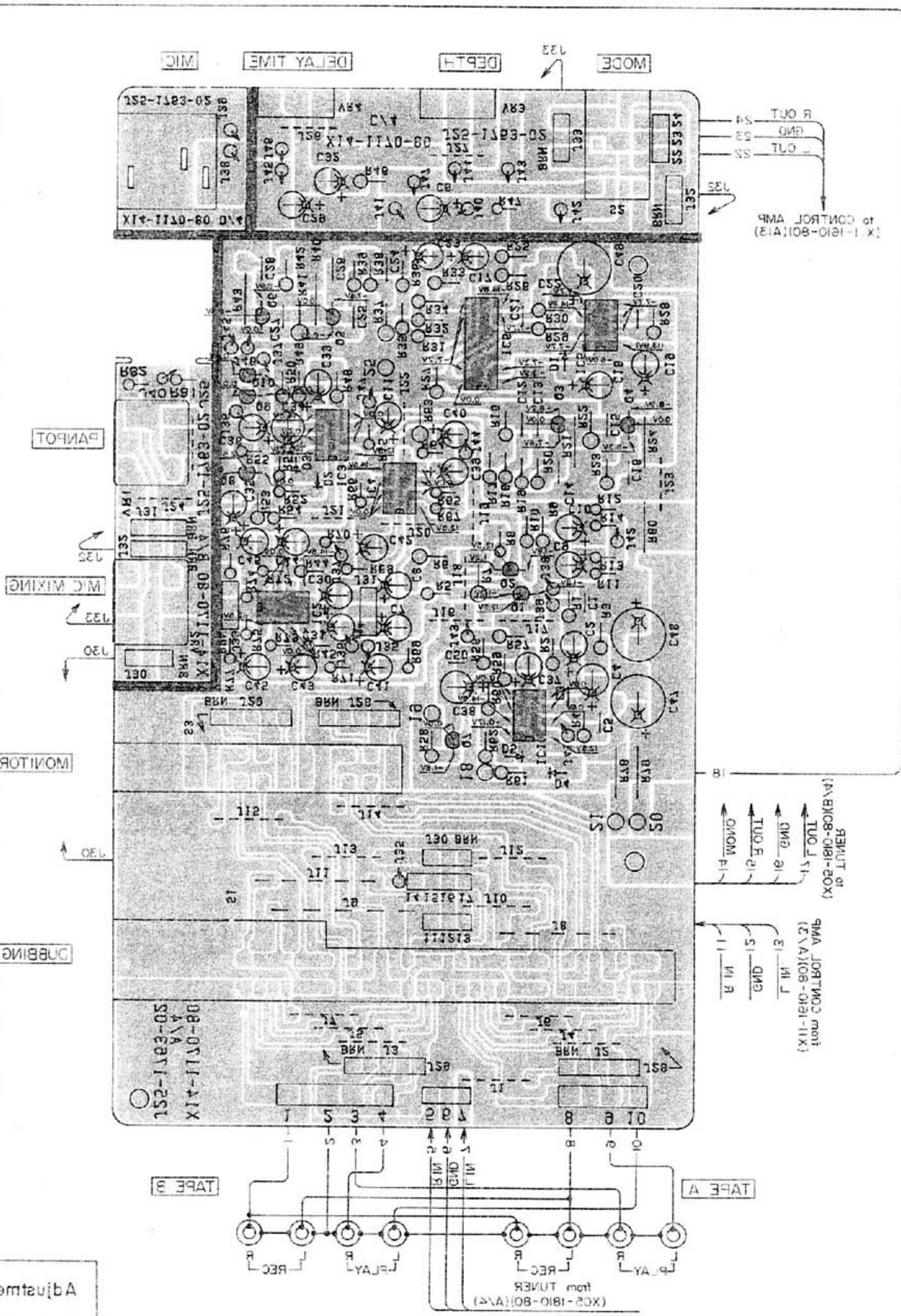


- IC1,2 : BA658
- IC3 : LC7258
- IC4 : SN74LS90N or F74LS90PC
- IC5 : AN6821
- Q1~3,7,8 : 2SC945(R,Q) or 2SC2320(E,F)
- Q4~6 : 2SC2003
- D1~4 : IN60
- D5~8,10 : IS2076 or IS1555
- D9 : XZ-057
- FL1 : FIP24A15YS
- FL2 : FIP7B8S
- X1 : L77-0574-05



REVERBERATION (X14-170-80) Component side view

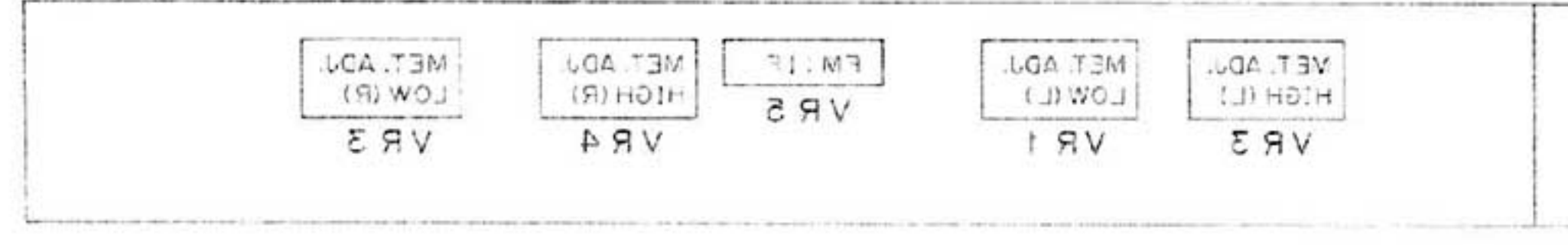
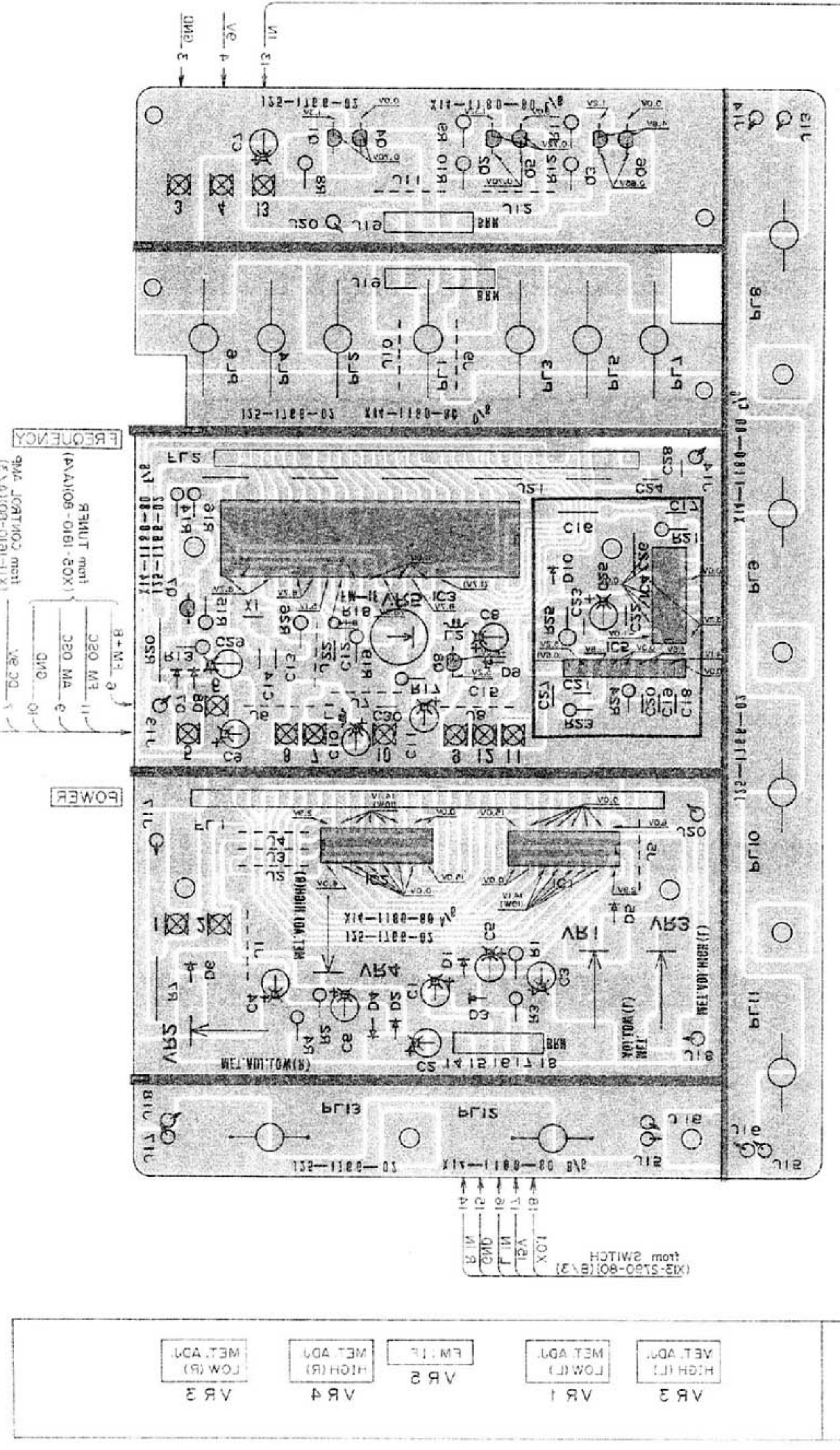
Refer to the schematic diagram for the values of resistors and capacitors



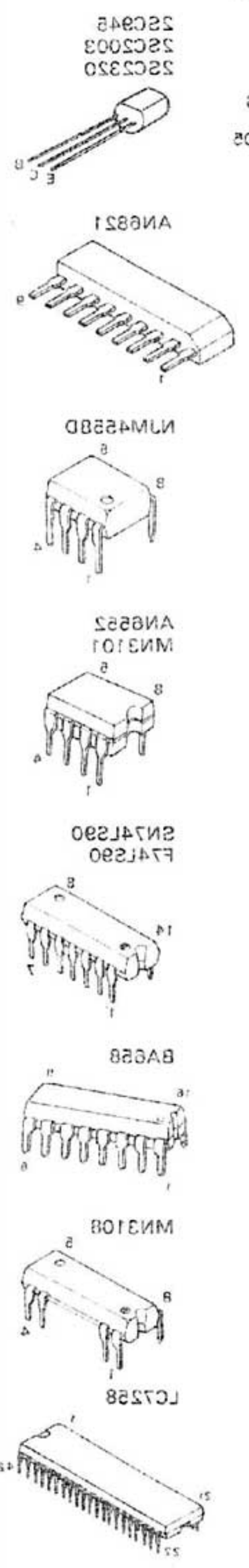
- IC1-4 : AN652 or N1M4280
- IC5 : MN3101
- IC6 : MN3008
- IC7 : SCS3501E (L)
- IC8 : SCS3501E (L)
- IC9 : SCS3501E (L)
- IC10 : SCS3501E (L)
- IC11 : SCS3501E (L)
- IC12 : SCS3501E (L)
- IC13 : SCS3501E (L)
- IC14 : SCS3501E (L)
- IC15 : SCS3501E (L)
- IC16 : SCS3501E (L)
- IC17 : SCS3501E (L)
- IC18 : SCS3501E (L)
- IC19 : SCS3501E (L)
- IC20 : SCS3501E (L)
- IC21 : SCS3501E (L)
- IC22 : SCS3501E (L)
- IC23 : SCS3501E (L)
- IC24 : SCS3501E (L)
- IC25 : SCS3501E (L)
- IC26 : SCS3501E (L)
- IC27 : SCS3501E (L)
- IC28 : SCS3501E (L)
- IC29 : SCS3501E (L)
- IC30 : SCS3501E (L)
- IC31 : SCS3501E (L)
- IC32 : SCS3501E (L)
- IC33 : SCS3501E (L)
- IC34 : SCS3501E (L)
- IC35 : SCS3501E (L)
- IC36 : SCS3501E (L)
- IC37 : SCS3501E (L)
- IC38 : SCS3501E (L)
- IC39 : SCS3501E (L)
- IC40 : SCS3501E (L)
- IC41 : SCS3501E (L)
- IC42 : SCS3501E (L)
- IC43 : SCS3501E (L)
- IC44 : SCS3501E (L)
- IC45 : SCS3501E (L)
- IC46 : SCS3501E (L)
- IC47 : SCS3501E (L)
- IC48 : SCS3501E (L)
- IC49 : SCS3501E (L)
- IC50 : SCS3501E (L)
- IC51 : SCS3501E (L)
- IC52 : SCS3501E (L)
- IC53 : SCS3501E (L)
- IC54 : SCS3501E (L)
- IC55 : SCS3501E (L)
- IC56 : SCS3501E (L)
- IC57 : SCS3501E (L)
- IC58 : SCS3501E (L)
- IC59 : SCS3501E (L)
- IC60 : SCS3501E (L)
- IC61 : SCS3501E (L)
- IC62 : SCS3501E (L)
- IC63 : SCS3501E (L)
- IC64 : SCS3501E (L)
- IC65 : SCS3501E (L)
- IC66 : SCS3501E (L)
- IC67 : SCS3501E (L)
- IC68 : SCS3501E (L)
- IC69 : SCS3501E (L)
- IC70 : SCS3501E (L)
- IC71 : SCS3501E (L)
- IC72 : SCS3501E (L)
- IC73 : SCS3501E (L)
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- IC85 : SCS3501E (L)
- IC86 : SCS3501E (L)
- IC87 : SCS3501E (L)
- IC88 : SCS3501E (L)
- IC89 : SCS3501E (L)
- IC90 : SCS3501E (L)
- IC91 : SCS3501E (L)
- IC92 : SCS3501E (L)
- IC93 : SCS3501E (L)
- IC94 : SCS3501E (L)
- IC95 : SCS3501E (L)
- IC96 : SCS3501E (L)
- IC97 : SCS3501E (L)
- IC98 : SCS3501E (L)
- IC99 : SCS3501E (L)
- IC100 : SCS3501E (L)

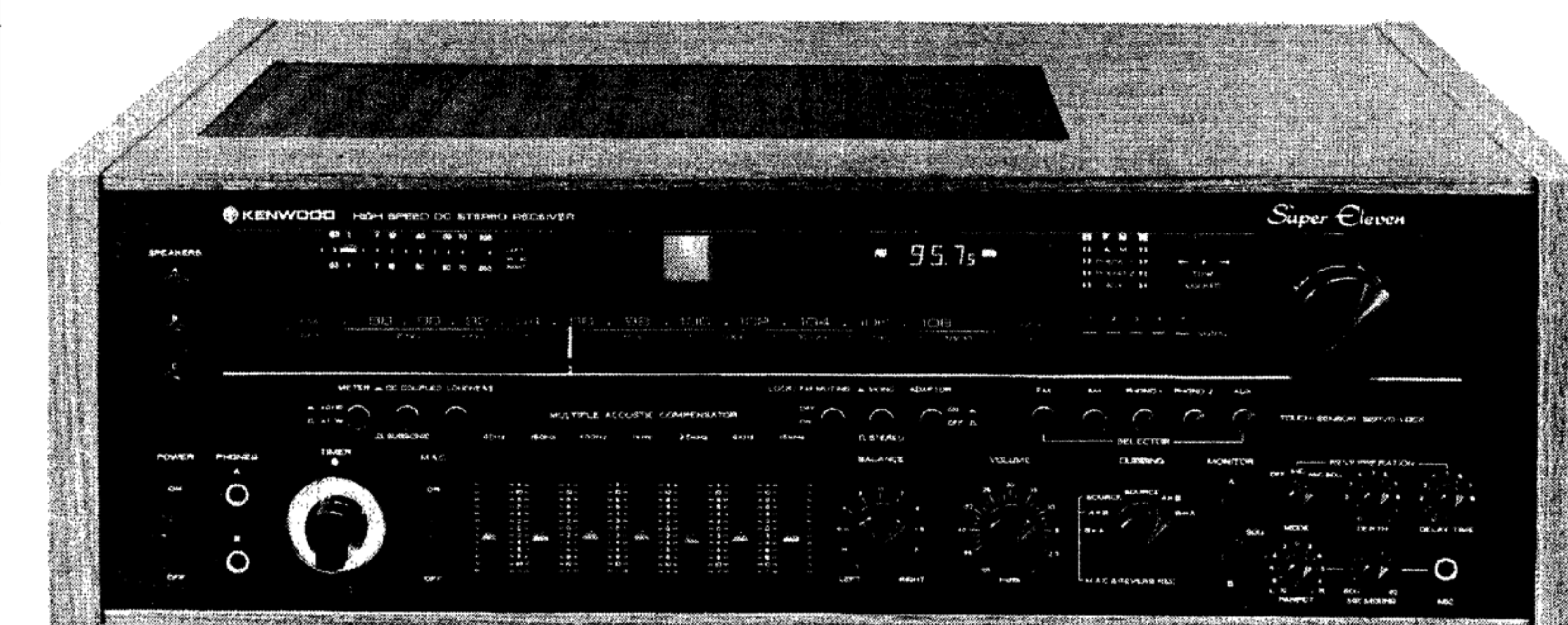
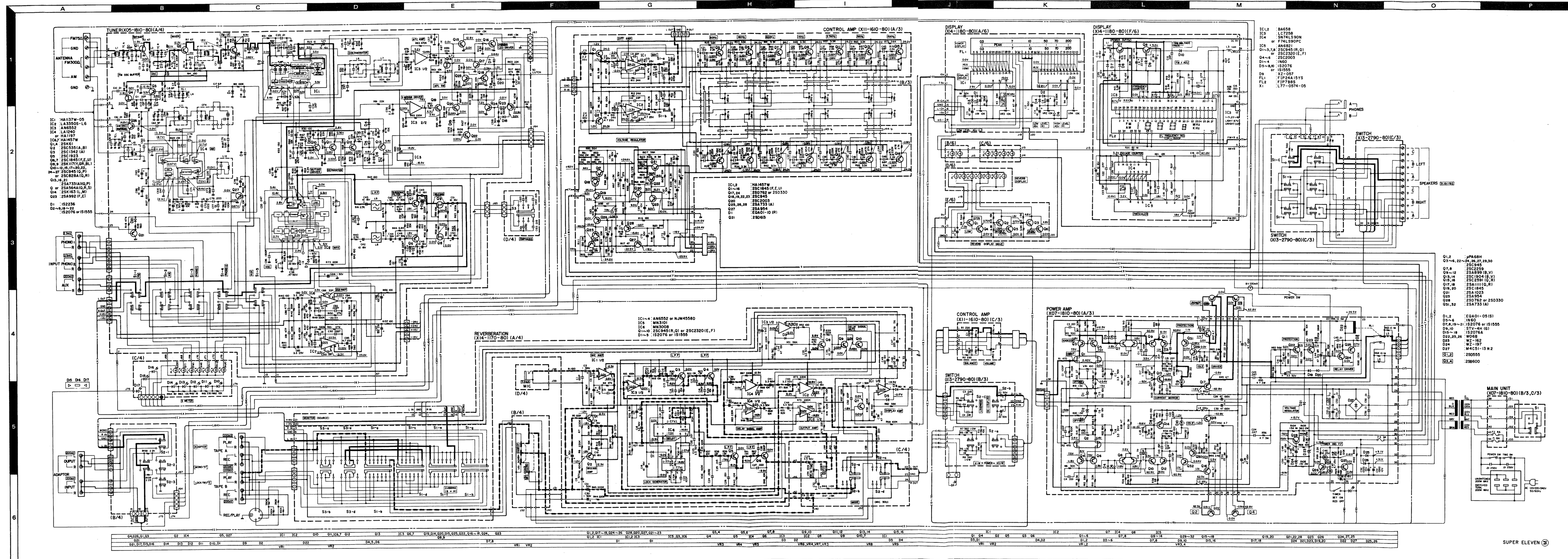
PC BOARD

DISPLAY (X14-180-80) Component side view



- X1 : L14-0274-02
- F1 : F1P188
- F2 : F1P188
- D1-4 : X1-027
- D2-8/10 : I25076
- D3-4 : I25076
- D4 : I25076
- D5 : I25076
- D6 : I25076
- D7 : I25076
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- D99 : I25076
- D100 : I25076





**SPECIFICATIONS**

| AUDIO SECTION                             |                                                                                                                                               | FM TUNER SECTION                             |                                                   |
|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|---------------------------------------------------|
| <b>Power Output</b>                       | 125 watts* per channel minimum RMS, both channels driven at 8 ohms from 20 Hz to 20,000 Hz with no more than 0.02% total harmonic distortion. | <b>Usable Sensitivity</b>                    | 103 dB (1.8 μV)                                   |
| <b>Total Harmonic Distortion</b>          | (20 Hz to 20,000 Hz from TAPE)<br>rated power into 8 ohms 0.02%<br>1 watt power into 8 ohms 0.008%                                            | <b>50 dB Quieting Sensitivity</b>            | Mono 14.7 dB (3.0 μV)<br>Stereo 37.2 dB (140 μV)  |
| <b>Intermodulation Distortion</b>         | (80 Hz, 7 kHz = 4:1 SMPTE)<br>rated power into 8 ohms 0.01%<br>1 watt power into 8 ohms ±140 μsec                                             | <b>Signal to Noise Ratio at 85 dB</b>        | Mono 78 dB<br>Stereo 73 dB                        |
| <b>Slew Rate</b>                          | 0.95 μsec                                                                                                                                     | <b>Total Harmonic Distortion at 1,000 Hz</b> | Mono 0.1%<br>Stereo 0.15%                         |
| <b>Frequency Response</b>                 | 20 Hz to 15,000 Hz                                                                                                                            | <b>Frequency Response</b>                    | 20 Hz to 15,000 Hz                                |
| <b>Input Sensitivity/Impedance</b>        | PHONO 2.5 mV/50k ohms<br>TAPE AUX 200 mV/50k ohms<br>MIC 3.0 mV/50k ohms                                                                      | <b>Capture Ratio</b>                         | +0.5 dB, -1.0 dB                                  |
| <b>Signal to Noise Ratio (A weighted)</b> | PHONO 80 dB for 2.5 mV input<br>TAPE AUX 88 dB for 200 mV input<br>MIC 70 dB for 3.0 mV input                                                 | <b>Image Rejection Ratio</b>                 | 60 dB                                             |
| <b>Maximum PHONO Input Level</b>          | at 1,000 Hz 180 mV (rms), THD 0.02%                                                                                                           | <b>Spurious Response Ratio</b>               | 80 dB                                             |
| <b>Frequency Response</b>                 | Standard Curve 20 Hz to 20,000 Hz ±0.3 dB<br>Tape Curve DC Hz to 230,000 Hz -3 dB                                                             | <b>IF Response Ratio</b>                     | 80 dB                                             |
| <b>Multiple Acoustic Compensator</b>      | 60 Hz, 160 Hz, 400 Hz, 1 kHz, 2.5 kHz, 6 kHz and 15 kHz ±1.0 dB at each frequency                                                             | <b>Alternate Channel Selectivity</b>         | 75 dB at 400 Hz<br>65 dB at 100 Hz to 10,000 Hz   |
| <b>Loudness Control</b>                   | (VOL -20 dB)                                                                                                                                  | <b>AM Suppression Ratio</b>                  | 65 dB                                             |
| <b>Subsonic Filter</b>                    | 18 Hz 6 dB/oct                                                                                                                                | <b>Stereo Separation Ratio</b>               | at 1,000 Hz 50 dB<br>at 100 Hz to 10,000 Hz 40 dB |
| <b>Output Level/Impedance</b>             | TAPE REC Out (Pin) 200 mV/300 ohms<br>TAPE REC Out (Rin) 40 mV/75k ohms                                                                       | <b>Subcarrier Product Ratio</b>              | 46 dB                                             |
| <b>REVERB SECTION</b>                     |                                                                                                                                               | <b>Antenna Impedance</b>                     | 300 ohms balanced and<br>75 ohms unbalanced       |
| <b>Reverberating Time</b>                 | 0 to 3 sec at 400 Hz                                                                                                                          | <b>FM Frequency Range</b>                    | 88 MHz to 108 MHz                                 |
| <b>Delay Time</b>                         | 100 msec                                                                                                                                      |                                              |                                                   |

- DC voltages are measured by a VOM of 20 kΩ/V input impedance.
- 2SA564A, 2SA733A, 2SA945, 2SA954, 2SA992
  - 2SA1023, 2SC828A, 2SC1845, 2SC1923, 2SC2003
  - 2SC2320, 2SA899, 2SC1904
  - 2SC535, 2SC1342
  - 2SA1111, 2SA733A, 2SD330, 2SD613, 2SD762
  - 2SK117, 2SK163
  - 2SK61
  - 2SC2259
  - HA1457W, LA1240, LA3350S
  - AN6821
  - HA1137W, HA1197
  - NJM4558D
  - AN6552, MN3101
  - SN74LS90, F74LS90
  - BA65E, μPA68H
  - 2SB600, 2SD555
  - MN3108
  - LC7258

# PARTS LIST

## INSTRUCTION FOR PARTS LIST

| Ref. No.        | Parts No.   | Description            | Remarks   |
|-----------------|-------------|------------------------|-----------|
| 参照番号            | 部品番号        | 部品名/規格                 | 備考        |
| ②<br>①<br>18 1A | A01-0608-12 | METALLIC CABINET       | *K<br>*③  |
| 19 2A           | A20-1979-11 | FRONT PANEL ASSY       | *PM<br>*④ |
| 19 2A           | A20-1979-11 | FRONT PANEL ASSY       | *SU<br>*④ |
| 19 2A           | A20-1979-11 | FRONT PANEL ASSY       | *XW<br>*④ |
| ⑤<br>R221       | R43-1333-15 | FL-PROOF RD330 J 2H    | *         |
| R222            | R43-1368-15 | FL-PROOF RD680 J 2H    | *         |
| VR1 2           | R12-3301-05 | TRIMMING POT, 20K(8)   | *         |
| VR3 4           | R19-4305-05 | POTENTIOMETER (OUTPUT) | *         |
| VR5 6           | R12-2302-05 | TRIMMING POT, 5K(8)    | *         |

- Exploded view drawing No.
- Position in exploded view.
- Symbol of new parts.
- Area to which parts are shipped. Example: A20-1979-11 is the part No. of FRONT PANEL ASSY for the "K" type products (for U.S.A.). When this column is blank, it means that the same type of parts (same parts No.) are used for the products shipped to all areas.
- Reference No. in schematic diagram.
- Abbreviation of "ceramic capacitor".  
All capacitors and resistors are listed using abbreviations.  
Abbreviations:  
\* Abbreviations of capacitors (Parts No. with initial letter "C").  
ELECTRO..... Electrolytic capacitor  
LL-ELEC..... Low leak electrolytic capacitor  
NP-ELEC..... Non-pole electrolytic capacitor  
MICA..... Mica capacitor  
POLYSTY..... Polystyrene capacitor  
MYLAR..... Mylar capacitor  
CERAMIC..... Ceramic capacitor  
TANTAL..... Tantalum capacitor  
MF..... Metallized film capacitor  
MP..... Metallized paper capacitor  
OIL..... Oil capacitor  
The unit "UF" is used in lieu of "μF"
- Abbreviations of resistors (Parts No. with initial letters "R").  
RC..... Carbon composition resistor  
RD..... Carbon film resistor  
FL-PROOF RD..... Flame-proof carbon film resistor  
RW..... Wire wound power resistor  
FL-PROOF RS..... Flame-proof metal oxide film resistor  
RN..... Metal film resistor  
FUSE-RESIST..... Resistor with fuse function  
2B..... Rated wattage 1/8W  
2E..... Rated wattage 1/4W  
2H..... Rated wattage 1/2W  
3A..... Rated wattage 1W  
3D..... Rated wattage 2W  
3F..... Rated wattage 3W  
3G..... Rated wattage 4W  
3H..... Rated wattage 5W  
All resistor values are indicated with the unit (Ω) omitted.  
\* Abbreviations common to capacitors and resistors.  
C..... ±0.25pF (Used for capacitors only)  
D..... ±0.5pF (Used for capacitors only)  
F..... ±1%  
G..... ±2%  
J..... ±5%  
K..... ±10%  
M..... ±20%  
Z..... +80%,-20%(Used for capacitors only)  
P..... +100%,-0%(Used for capacitors only)  
Resistors RD (carbon composition resistors) are not listed in the parts list. For values, refer to the schematic diagram.

| Ref. No.                   | Parts No. | Description | Remarks                 |
|----------------------------|-----------|-------------|-------------------------|
| 参照番号                       | 部品番号      | 部品名/規格      | 備考                      |
| <b>UNIT (SUPER ELEVEN)</b> |           |             |                         |
| 1                          | 2E        | -           | -                       |
| 2                          | 1E        | -           | -                       |
| 3                          | 2E        | -           | -                       |
| 4                          | 1B        | -           | -                       |
| 5                          | 3D        | -           | -                       |
| 6                          | 3B        | -           | -                       |
| 7                          | 2C        | -           | -                       |
| 8                          | 2D,3D     | -           | -                       |
| 9                          | 1C-3F     | -           | -                       |
| 11                         | 3A        | A20-1625-03 | FRONT PANEL             |
| 12                         | 2A        | A50-0069-03 | SIDE PLATE (L)          |
| 13                         | 2B        | A50-0070-03 | SIDE PLATE (R)          |
| 14                         | 1A        | A54-0175-02 | WOODEN TOP BOARD        |
| -                          | -         | B46-0062-20 | WARRANTY CARD           |
| -                          | -         | B46-0062-20 | WARRANTY CARD           |
| -                          | -         | B46-0063-13 | WARRANTY CARD           |
| -                          | -         | B46-0063-13 | WARRANTY CARD           |
| -                          | -         | B50-3151-00 | INSTRUCTION MANUAL      |
| -                          | -         | B59-0018-00 | SERVICE STATIONS LIST   |
| -                          | -         | B59-0018-00 | SERVICE STATIONS LIST   |
| 15                         | 3C        | B01-0171-03 | PANEL ESCUTCHEON        |
| 16                         | 3C        | B01-0172-04 | PANEL ESCUTCHEON        |
| 17                         | 3C        | B01-0173-04 | PANEL ESCUTCHEON        |
| 18                         | 1A        | B04-0069-03 | MESH PLATE              |
| 19                         | 3A        | B07-0234-03 | ESCUTCHEON              |
| 20                         | 3A        | B07-0235-04 | ESCUTCHEON              |
| 21                         | 3D        | B08-9022-04 | INDICATOR               |
| 22                         | 2A        | B10-0268-04 | FRONT GLASS             |
| 23                         | 3D        | B11-0005-04 | FILTER                  |
| 24                         | 3C        | B20-0467-03 | DIAL CALIBRATIONS       |
| 25                         | 3C        | B21-0023-14 | DIAL POINTER            |
| 26                         | 2C        | B30-0158-05 | LAMP                    |
| 27                         | 3A        | B30-0191-05 | LED (TIMER)             |
| 28                         | 2C        | C91-0023-05 | CERAMIC 0.01UF AC250V   |
| 29                         | 2F        | D15-0171-03 | PULLEY                  |
| 30                         | 2E        | D15-0172-04 | PULLEY                  |
| 31                         | 1D,2E     | D15-0175-05 | PULLEY                  |
| 32                         | 3F        | D20-0156-03 | DIAL SHAFT ASSY         |
| 33                         | 2C        | D21-0450-03 | SHAFT                   |
| 34                         | 2C        | D22-0033-04 | COUPLING                |
| 35                         | 1B        | D32-0082-04 | STOPPER                 |
| 36                         | 1C,1D     | E02-0001-05 | SOCKET                  |
| 37                         | 1B        | E03-0007-05 | AC OUTLET               |
| 38                         | 2B        | E06-0501-05 | DIN CONNECTOR           |
| 39                         | 2C        | E11-0060-15 | PHONE JACK (HEADPHONE)  |
| 40                         | 2B        | E13-0415-05 | PHONO JACK (TAPE,ADAPT) |
| 41                         | 2B        | E13-0609-05 | PHONO JACK              |
| 42                         | 1B        | E14-0107-05 | PHONO PLUG              |
| 43                         | 2B        | E29-0082-05 | ANTENNA TERMINAL        |
| 44                         | 1B        | E30-0545-05 | POWER CORD              |
| 45                         | 1C,2C     | F01-0319-04 | HEAT SINK               |
| 46                         | 1C,2C     | F20-0134-04 | INSULATING PLATE        |
| 47                         | 2F        | G01-0045-24 | COILED SPRING           |
| 48                         | 2D        | G10-0017-04 | BLIND SHEET             |
| -                          | -         | H01-3153-04 | CARTON BOX              |
| -                          | -         | H10-1519-02 | POLYSTYRENE FIXTURE     |
| -                          | -         | H20-0443-04 | COVER                   |
| -                          | -         | H20-0449-04 | COVER                   |

# PARTS LIST

| Ref. No.                   | Parts No.   | Description | Remarks                 |
|----------------------------|-------------|-------------|-------------------------|
| 参照番号                       | 部品番号        | 部品名/規格      | 備考                      |
| -                          | H20-0449-04 | COVER       | UE                      |
| -                          | H20-0449-04 | COVER       | H                       |
| -                          | H25-0078-04 | BAG         | -                       |
| 49                         | 3A,3B       | J02-0104-04 | FOOT                    |
| 50                         | 1F,2D       | J19-0506-05 | PC BOARD HOLDER         |
| 51                         | 3A          | J19-0509-04 | LED HOLDER              |
| 52                         | 1B          | J19-0564-05 | LOOP ANTENNA HOLDER     |
| 53                         | 1B          | J41-0034-05 | BUSHING                 |
| 54                         | 2E          | J61-0024-05 | WIRE BAND               |
| 55                         | 1F          | J61-0045-05 | WIRE BAND               |
| 56                         | 3C          | J90-0097-03 | RAIL                    |
| 57                         | 3A          | K23-0344-04 | KNOB (TUNING)           |
| 58                         | 3A          | K23-0347-04 | KNOB (VOL,BAL,ETC)      |
| 59                         | 3A          | K23-0348-03 | KNOB (MIC,EFFECT,ETC)   |
| 60                         | 3C          | K23-0349-03 | KNOB (TIMER)            |
| 61                         | 3A          | K27-0153-04 | KNOB (POWER,ETC)        |
| 62                         | 3A          | K27-0154-04 | KNOB (M.A.C)            |
| 63                         | 2A          | K29-0354-04 | PUSHBUTTON (SPEAKER)    |
| 64                         | 2A,3B       | K29-0355-04 | PUSHBUTTON (SELECTOR)   |
| 65                         | 1D          | L01-2136-05 | POWER TRANSFORMER       |
| 66                         | 2A,3B       | N08-0127-05 | DRESSED SCREW (CABINET) |
| 67                         | 1B          | N08-0128-25 | DRESSED SCREW (GND)     |
| 68                         | 2E          | N09-0293-05 | SCREW (PULLEY)          |
| 69                         | 2D,3D       | N29-0033-05 | FASTENER                |
| 70                         | 2D          | N29-0035-05 | FASTENER                |
| 71                         | 2C          | S33-4014-05 | LEVER SWITCH (POWER)    |
| 72                         | 2D          | S46-1008-05 | LEAF SWITCH             |
| 73                         | 2C          | S59-1041-05 | SWITCH (TIMER)          |
| 74                         | 1B          | T90-0104-05 | LOOP ANTENNA            |
| 75                         | 1C,2C       | V02-0600-00 | 2SB600                  |
| 76                         | 1C,2C       | V04-0555-00 | 2SD555                  |
| 77                         | 2F,3D       | X05-1810-80 | TUNER PCB ASSY          |
| 78                         | 1F          | X07-1810-80 | POWER AMP PCB ASSY      |
| 79                         | 3E          | X11-1610-80 | CONTROL AMP PCB ASSY    |
| 80                         | 2E          | X13-2790-80 | SWITCH PCB ASSY         |
| 81                         | 3F          | X14-1170-80 | REVERBERATION PCB ASSY  |
| 82                         | 2D,3D       | X14-1180-80 | DISPLAY PCB ASSY        |
| <b>TUNER (X05-1810-80)</b> |             |             |                         |
| D10                        | -15         | B30-0198-05 | LED (S METER)           |
| D16                        | -           | B30-0237-05 | LED                     |
| D17                        | -           | B30-0198-05 | LED                     |
| PL1                        | -5          | B30-0209-05 | LAMP (SELECTOR)         |
| PL6                        | -7          | B30-0216-05 | LAMP                    |
| C1                         | -           | C71-1710-15 | CERAMIC 100PF J         |
| C2                         | -           | C71-1718-06 | CERAMIC 18PF K          |
| C3                         | -           | C55-1710-38 | CERAMIC 0.01UF Z        |
| C4                         | -           | C71-1718-06 | CERAMIC 18PF K          |
| C5                         | -           | C71-1707-02 | CERAMIC 7PF D           |
| C6                         | -           | C71-1722-15 | CERAMIC 220PF J         |
| C7                         | -           | C91-0037-05 | CERAMIC 0.47PF J        |
| C8                         | -10         | C55-1710-38 | CERAMIC 0.01UF Z        |
| C11                        | -           | C63-1722-05 | CERAMIC 22PF J          |
| C12                        | -           | C55-1710-38 | CERAMIC 0.01UF Z        |
| C13                        | -           | C63-1715-05 | CERAMIC 15PF J          |
| C14                        | -           | C63-1739-05 | CERAMIC 39PF J          |
| C15                        | -           | C62-1708-02 | CERAMIC 8PF D           |
| C16                        | -           | C60-1720-05 | CERAMIC 20PF J          |
| C17                        | -           | C63-1706-02 | CERAMIC 6PF D           |
| C18                        | -23         | C55-1710-38 | CERAMIC 0.01UF Z        |
| C24                        | -           | C71-1722-15 | CERAMIC 220PF J         |
| C25                        | -           | C24-1210-61 | ELECTRO 10UF 16WV       |
| C26                        | -           | C55-1710-38 | CERAMIC 0.01UF Z        |
| C27                        | -           | C24-1710-51 | ELECTRO 1UF 50WV        |
| C28                        | -           | C55-1747-38 | CERAMIC 0.047UF Z       |
| C30                        | ,31         | C55-1710-38 | CERAMIC 0.01UF Z        |
| C32                        | -           | C55-1747-38 | CERAMIC 0.047UF Z       |
| C33                        | -           | C24-1710-51 | ELECTRO 1UF 50WV        |
| C34                        | -           | C24-1210-71 | ELECTRO 100UF 16WV      |
| C35                        | -           | C46-1747-35 | MYLAR 0.047UF J         |
| C36                        | -           | C47-1715-25 | POLYSTY 1500PF J        |
| C37                        | -           | C25-1722-47 | LL-ELEC 0.22UF 50WV     |
| C38                        | -           | C25-1747-47 | LL-ELEC 0.47UF 50WV     |
| C39                        | -           | C24-1710-51 | ELECTRO 1UF 50WV        |
| C40                        | ,41         | C46-1756-25 | MYLAR 0.0056UF J        |
| C42                        | ,43         | C24-1210-61 | ELECTRO 10UF 16WV       |
| C44                        | ,45         | C25-1710-57 | LL-ELEC 1UF 50WV        |
| C46                        | ,47         | C25-1747-47 | LL-ELEC 0.47UF 50WV     |
| C48                        | ,49         | C24-1210-61 | ELECTRO 10UF 16WV       |
| C50                        | ,51         | C24-1210-61 | ELECTRO 10UF 16WV       |
| C52                        | -           | C24-1422-71 | ELECTRO 220UF 25WV      |
| C53                        | -           | C24-1210-61 | ELECTRO 10UF 16WV       |
| C54                        | -           | C24-1247-61 | ELECTRO 47UF 16WV       |
| C55                        | -           | C24-1233-61 | ELECTRO 33UF 16WV       |
| C56                        | -           | C24-1722-51 | ELECTRO 2.2UF 50WV      |
| C57                        | -           | C24-1222-61 | ELECTRO 22UF 16WV       |
| C58                        | -           | C24-1710-51 | ELECTRO 1UF 50WV        |
| C59                        | -           | C70-1718-05 | CERAMIC 18PF J          |
| C60                        | -62         | C55-1710-38 | CERAMIC 0.01UF Z        |
| C63                        | -           | C71-1703-01 | CERAMIC 3PF C           |
| C64                        | -           | C46-1710-35 | MYLAR 0.01UF J          |
| C65                        | ,66         | C24-1210-61 | ELECTRO 10UF 16WV       |
| C67                        | -           | C46-1710-25 | MYLAR 0.001UF J         |
| C68                        | -           | C55-1747-38 | CERAMIC 0.047UF Z       |
| C69                        | -           | C24-1210-61 | ELECTRO 10UF 16WV       |
| C70                        | -           | C24-1710-51 | ELECTRO 1UF 50WV        |
| C71                        | -           | C46-1710-35 | MYLAR 0.01UF J          |
| C72                        | -           | C55-1722-38 | CERAMIC 0.022UF Z       |
| C73                        | -           | C52-1739-16 | CERAMIC 390PF K         |
| C74                        | -           | C46-1710-35 | MYLAR 0.01UF J          |
| C75                        | -           | C55-1710-38 | CERAMIC 0.01UF Z        |
| C76                        | -           | C46-1733-35 | MYLAR 0.033UF J         |
| C77                        | -           | C55-1710-38 | CERAMIC 0.01UF Z        |
| C78                        | -           | C24-1210-61 | ELECTRO 10UF 16WV       |
| C80                        | ,81         | C71-1747-05 | CERAMIC 47PF J          |
| C82                        | ,83         | C25-1433-57 | LL-ELEC 3.3UF 25WV      |
| C84                        | ,85         | C24-1047-61 | ELECTRO 47UF 10WV       |
| C86                        | ,87         | C71-1710-15 | CERAMIC 100PF J         |
| C88                        | ,89         | C71-1733-06 | CERAMIC 33PF K          |
| C90                        | ,91         | C46-1710-35 | MYLAR 0.01UF J          |
| C92                        | ,93         | C46-1727-25 | MYLAR 0.0027UF J        |
| C94                        | ,95         | C25-1447-57 | LL-ELEC 4.7UF 25WV      |
| C96                        | ,97         | C24-1410-71 | ELECTRO 100UF 25WV      |
| C100,101                   | -           | C46-1782-25 | MYLAR 0.0082UF J        |
| C102,103                   | -           | C46-1715-35 | MYLAR 0.015UF J         |
| C104,105                   | -           | C46-1747-25 | MYLAR 0.0047UF J        |
| C106                       | -           | C24-1710-51 | ELECTRO 1UF 50WV        |
| C107                       | -           | C24-1222-61 | ELECTRO 22UF 16WV       |
| C108                       | -           | C71-1705-01 | CERAMIC 5PF C           |
| C109                       | -           | C24-1233-61 | ELECTRO 33UF 16WV       |
| TC1                        | -           | C05-0055-05 | TRIMMER CAPACITOR       |

## PARTS LIST

| Ref. No.<br>参照番号               | Parts No.<br>部品番号 | Description<br>部品名/規格  | Re-<br>marks<br>備考 |
|--------------------------------|-------------------|------------------------|--------------------|
| CF1 -3                         | L72-0052-15       | CERAMIC FILTER         |                    |
| CF4                            | L72-0030-05       | CERAMIC FILTER         |                    |
| L1                             | L31-0361-05       | RF COIL                |                    |
| L2                             | L31-0410-05       | RF COIL                |                    |
| L3                             | L40-1091-41       | INDUCTOR               |                    |
| L4                             | L32-0210-05       | OSCILLATING COIL       |                    |
| L5                             | L30-0282-05       | IFT                    |                    |
| L6                             | L30-0316-05       | IFT                    |                    |
| L7                             | L30-0317-05       | IFT                    |                    |
| L8 ,9                          | L79-0126-05       | FILTER                 | *                  |
| L10                            | L31-0458-05       | RF COIL                | *                  |
| L11                            | L32-0225-05       | OSCILLATING COIL       |                    |
| L12                            | L30-0284-05       | IFT                    |                    |
| L13                            | L40-1021-03       | INDUCTOR               |                    |
| R58 ,59                        | R40-8310-67       | RC 10M M 2H            |                    |
| R111                           | R40-8310-67       | RC 10M M 2H            |                    |
| VR1                            | R12-1040-05       | TRIMMING POTENTIOMETER |                    |
| VR2                            | R12-1038-05       | TRIMMING POTENTIOMETER |                    |
| S1                             | S42-5010-05       | PUSH SWITCH            |                    |
| S2                             | S42-3038-05       | PUSH SWITCH            | *                  |
| S3                             | S31-2048-05       | SLIDE SWITCH           |                    |
| D1                             | V11-3100-50       | 1S2236                 | *                  |
| D2 -9                          | V11-0271-05       | 1S2076                 |                    |
| D18 -21                        | V11-0271-05       | 1S2076                 |                    |
| D22                            | V11-0271-05       | 1S2076                 |                    |
| IC1                            | V30-0192-05       | HA1137W-05             |                    |
| IC2                            | V30-0244-10       | LA3350S-L6             |                    |
| IC3                            | V30-0405-10       | AN6552                 |                    |
| IC4                            | V30-0245-10       | LA1240                 |                    |
| IC6 ,7                         | V30-0264-30       | HA1457W                |                    |
| Q1                             | V09-0124-10       | 2SK61                  |                    |
| Q2                             | V03-0535-10       | 2SC535(A,B)            |                    |
| Q3                             | V03-0357-05       | 2SC1342(A)             |                    |
| Q4                             | V09-0124-10       | 2SK61                  |                    |
| Q5                             | V03-1923-00       | 2SC1923                |                    |
| Q6 ,7                          | V03-1845-20       | 2SC1845(F,E,U)         |                    |
| Q8 ,9                          | V09-0126-60       | 2SK117(Y,GR,BL)        |                    |
| Q10 -12                        | V03-0348-05       | 2SC945(Q,P)            |                    |
| Q13                            | V01-0733-40       | 2SA733(A)(Q,P)         |                    |
| Q14                            | V09-0144-60       | 2SK163(L,M)            |                    |
| Q15                            | V03-0348-05       | 2SC945(Q,P)            |                    |
| Q16                            | V01-0733-40       | 2SA733(A)(Q,P)         |                    |
| Q17 -20                        | V03-0348-05       | 2SC945(Q,P)            |                    |
| Q21                            | V01-0733-40       | 2SA733(A)(Q,P)         |                    |
| Q22                            | V03-0348-05       | 2SC945(Q,P)            |                    |
| Q23                            | V01-0992-10       | 2SA992(F,E)            |                    |
| Q24 -27                        | V03-0348-05       | 2SC945(Q,P)            |                    |
| <b>POWER AMP (X07-1810-80)</b> |                   |                        |                    |
| C1 ,2                          | C71-1710-15       | CERAMIC 100PF J        |                    |
| C3 ,4                          | C46-1710-26       | MYLAR 0.001UF K        |                    |
| C5 ,6                          | C24-1010-71       | ELECTRO 100UF 10WV     |                    |
| C7 ,8                          | C24-1733-51       | ELECTRO 3.3UF 50WV     |                    |
| C9 ,10                         | C71-1715-06       | CERAMIC 15PF K         |                    |
| C11 ,12                        | C71-1707-02       | CERAMIC 7PF D          |                    |
| C13 ,14                        | C71-1710-15       | CERAMIC 100PF J        |                    |
| C15 ,16                        | C71-1722-06       | CERAMIC 22PF K         |                    |
| C17 ,18                        | C24-2010-51       | ELECTRO 1UF 100WV      |                    |
| C19 ,20                        | C71-1705-01       | CERAMIC 5PF C          |                    |
| C21 ,22                        | C71-1722-15       | CERAMIC 220PF J        |                    |
| C23 ,24                        | C46-1747-35       | MYLAR 0.047UF J        |                    |
| C25 ,26                        | C24-1710-51       | ELECTRO 1UF 50WV       |                    |

| Ref. No.<br>参照番号 | Parts No.<br>部品番号 | Description<br>部品名/規格  | Re-<br>marks<br>備考 |
|------------------|-------------------|------------------------|--------------------|
| C27 -30          | C24-2047-61       | ELECTRO 47UF 100WV     |                    |
| C31 ,32          | C71-1768-06       | CERAMIC 68PF K         |                    |
| C41              | C24-1222-71       | ELECTRO 220UF 16WV     |                    |
| C42              | C24-1733-51       | ELECTRO 3.3UF 50WV     |                    |
| C43              | C46-1710-35       | MYLAR 0.01UF J         |                    |
| C44              | C25-1447-67       | LL-ELEC 47UF 16WV      |                    |
| C45              | C46-1710-35       | MYLAR 0.01UF J         |                    |
| C46              | C26-1410-67       | NP-ELEC 10UF 25WV      |                    |
| C47              | C26-1447-57       | NP-ELEC 4.7UF 25WV     |                    |
| C48              | C24-1247-61       | ELECTRO 47UF 16WV      |                    |
| C49 ,50          | C24-1447-61       | ELECTRO 47UF 25WV      |                    |
| C51              | C24-1233-89       | ELECTRO 3300UF 16WV    |                    |
| C52              | C24-1010-81       | ELECTRO 1000UF 10WV    |                    |
| C53 -56          | C54-2710-39       | CERAMIC 0.01UF P       |                    |
| C57              | C90-0473-05       | ELECTROLYTIC CAPACITOR | *                  |
| C58              | C24-1210-61       | ELECTRO 10UF 16WV      |                    |
| F1               | F05-8021-05       | FUSE                   |                    |
| F2               | F05-4022-05       | FUSE                   |                    |
| F3               | F05-3022-05       | FUSE                   |                    |
| L1 -4            | L40-1011-03       | INDUCTOR               |                    |
| L5 ,6            | L39-0085-05       | COIL                   |                    |
| R35 ,36          | R43-1268-05       | FL-PROOF RD68 J 2E     |                    |
| R37 ,38          | R47-1482-25       | FL-PROOF RS8.2K J 3A   |                    |
| R39 ,42          | R43-1215-15       | FL-PROOF RD150 J 2E    |                    |
| R45 ,46          | R43-1212-15       | FL-PROOF RD120 J 2E    |                    |
| R47 -50          | R43-1247-95       | FL-PROOF RD4.7 J 2E    |                    |
| R51 -54          | R92-0167-05       | FIXED RESISTOR         |                    |
| R55 ,56          | R47-1647-95       | FL-PROOF RS4.7 J 3F    |                    |
| R63 ,64          | R47-1410-05       | FL-PROOF RS10 J 3A     |                    |
| R96              | R47-1610-25       | FL-PROOF RS1K J 3F     |                    |
| R104             | R47-1415-25       | FL-PROOF RS1.5K J 3A   |                    |
| R105             | R47-1556-15       | FL-PROOF RS560 J 3D    |                    |
| R107             | R40-8382-26       | RC 8.2K K 2H           |                    |
| R108             | R47-1515-25       | FL-PROOF RS1.5K J 3D   |                    |
| VR1 ,2           | R12-0502-05       | TRIMMING POTENTIOMETER |                    |
| VR3 ,4           | R12-0052-05       | TRIMMING POTENTIOMETER |                    |
| RL1              | S51-2038-05       | RELAY                  |                    |
| S1               | S31-2046-05       | SLIDE SWITCH           |                    |
| D1 ,2            | V11-0462-05       | EQA01-05(S)            |                    |
| D3 -6            | V11-0051-05       | 1N60                   |                    |
| D7 ,8            | V11-0271-05       | 1S2076                 |                    |
| D9 ,10           | V11-5100-40       | STV-4H(G)              |                    |
| D15 -18          | V11-0273-05       | 1S2076A                |                    |
| D19 -21          | V11-0271-05       | 1S2076                 |                    |
| D22              | V11-0295-05       | W06B                   |                    |
| D23              | V11-9979-05       | WZ-162                 |                    |
| D24              | V11-4100-30       | WZ-197                 |                    |
| D25 ,26          | V11-0295-05       | W06B                   |                    |
| D27              | V11-2100-80       | M4C-51-13*2            |                    |
| Q1 ,2            | V09-0145-10       | UPA68H                 |                    |
| Q3 -6            | V03-0297-05       | 2SC945                 |                    |
| Q7 ,8            | V03-2259-10       | 2SC2259                |                    |
| Q9 -12           | V01-0199-05       | 2SA899(B,V)            |                    |
| Q13 ,14          | V03-0460-05       | 2SC1904(B,V)           |                    |
| Q15 ,16          | V03-2591-10       | 2SC2591(Q,R)           |                    |
| Q17 ,18          | V01-1111-10       | 2SA1111(Q,R)           |                    |
| Q19 ,20          | V03-2378-00       | 2SC1845                |                    |
| Q21              | V01-1023-00       | 2SA1023                |                    |
| Q22 -24          | V03-0297-05       | 2SC945                 |                    |
| Q25              | V01-0954-00       | 2SA954                 |                    |

## PARTS LIST

| Ref. No.<br>参照番号                 | Parts No.<br>部品番号 | Description<br>部品名/規格       | Re-<br>marks<br>備考 |
|----------------------------------|-------------------|-----------------------------|--------------------|
| Q26 ,27                          | V03-0297-05       | 2SC945                      |                    |
| Q28                              | V04-0762-00       | 2SD762                      |                    |
| Q29 ,30                          | V03-0297-05       | 2SC945                      |                    |
| Q31 ,32                          | V01-0733-90       | 2SA733(A)                   |                    |
| <b>CONTROL AMP (X11-1610-80)</b> |                   |                             |                    |
| -                                | -                 | HEAT SINK MOUNTING HARDWARE | *                  |
| C1 ,2                            | C71-1733-16       | CERAMIC 330PF J             |                    |
| C3 ,4                            | C25-6522-57       | LL-ELEC 2.2UF 35WV          |                    |
| C5 ,6                            | C25-1447-57       | LL-ELEC 4.7UF 25WV          |                    |
| C7 ,8                            | C71-1710-15       | CERAMIC 100PF J             |                    |
| C9 -12                           | C71-1722-06       | CERAMIC 22PF J              |                    |
| C13 ,14                          | C25-1447-57       | LL-ELEC 4.7UF 25WV          |                    |
| C15 ,16                          | C52-1715-26       | CERAMIC 0.0015UF K          |                    |
| C17 ,18                          | C71-1710-15       | CERAMIC 100PF J             |                    |
| C19 ,20                          | C25-1747-47       | LL-ELEC 0.47UF 50WV         |                    |
| C21 ,22                          | C46-1712-35       | MYLAR 0.012UF J             |                    |
| C23 ,24                          | C25-1722-47       | LL-ELEC 0.22UF 50WV         |                    |
| C25 ,26                          | C46-1768-25       | MYLAR 0.0068UF J            |                    |
| C27 ,28                          | C46-1782-35       | MYLAR 0.082UF J             |                    |
| C29 ,30                          | C46-1727-25       | MYLAR 0.0027UF J            |                    |
| C31 ,32                          | C46-1733-35       | MYLAR 0.033UF J             |                    |
| C33 ,34                          | C46-1710-25       | MYLAR 0.001UF J             |                    |
| C35 ,36                          | C46-1712-35       | MYLAR 0.012UF J             |                    |
| C37 ,38                          | C52-1747-16       | CERAMIC 470PF K             |                    |
| C39 ,40                          | C46-1756-25       | MYLAR 0.0056UF J            |                    |
| C41 ,42                          | C71-1718-16       | CERAMIC 180PF J             |                    |
| C43 ,44                          | C46-1722-25       | MYLAR 0.0022UF J            |                    |
| C45 ,46                          | C71-1768-06       | CERAMIC 68PF J              |                    |
| C61                              | C24-1733-61       | ELECTRO 33UF 50WV           |                    |
| C62                              | C24-1710-51       | ELECTRO 1UF 50WV            |                    |
| C63                              | C24-1010-71       | ELECTRO 100UF 10WV          |                    |
| C64                              | C24-1447-61       | ELECTRO 47UF 25WV           |                    |
| C65                              | C24-1047-61       | ELECTRO 47UF 10WV           |                    |
| C66                              | C24-1733-61       | ELECTRO 33UF 50WV           |                    |
| C67                              | C24-1710-51       | ELECTRO 1UF 50WV            |                    |
| C68                              | C24-1247-61       | ELECTRO 47UF 16WV           |                    |
| C69                              | C24-1733-61       | ELECTRO 33UF 50WV           |                    |
| C70                              | C24-1710-51       | ELECTRO 1UF 50WV            |                    |
| C71                              | C24-1447-61       | ELECTRO 47UF 25WV           |                    |
| C72                              | C24-1710-51       | ELECTRO 1UF 50WV            |                    |
| C73                              | C24-1247-61       | ELECTRO 47UF 16WV           |                    |
| -                                | G10-0017-04       | BLIND SHEET                 |                    |
| -                                | G10-0018-04       | BLIND SHEET                 |                    |
| R91 ,92                          | R47-1533-15       | FL-PROOF RS330 J 3D         |                    |
| R93 ,94                          | R47-1568-15       | FL-PROOF RS680 J 3D         |                    |
| R101                             | R40-8318-16       | RC 180 K 2H                 |                    |
| R103-105                         | R47-1556-15       | FL-PROOF RS560 J 3D         |                    |
| R106                             | R47-1610-25       | FL-PROOF RS1K J 3F          |                    |
| R111                             | R47-1633-15       | METAL OXID FILM RESISTO     |                    |
| R112                             | R47-1547-15       | FL-PROOF RS470 J 3D         |                    |
| R121                             | R40-8368-16       | RC 680 K 2H                 |                    |
| VR1                              | R06-5039-05       | POTENTIOMETER               |                    |
| VR2                              | R08-5047-05       | POTENTIOMETER               | *                  |
| VR3 -9                           | R13-3009-05       | POTENTIOMETER               | *                  |
| S1                               | S33-2035-05       | LEVER SWITCH                |                    |
| D1                               | V11-7101-50       | EQA01-10(R)                 |                    |
| IC1 ,2                           | V30-0264-30       | HA1457W                     |                    |
| Q1 -16                           | V03-1845-20       | 2SC1845(F,E,U)              |                    |
| Q17                              | V04-0762-00       | 2SD762                      |                    |

| Ref. No.<br>参照番号                   | Parts No.<br>部品番号 | Description<br>部品名/規格 | Re-<br>marks<br>備考 |
|------------------------------------|-------------------|-----------------------|--------------------|
| Q18 ,19                            | V03-0297-05       | 2SC945                |                    |
| Q20                                | V03-2003-00       | 2SC2003               |                    |
| Q21                                | V04-0613-00       | 2SD613                |                    |
| Q22 ,23                            | V03-0297-05       | 2SC945                |                    |
| Q24                                | V04-0762-00       | 2SD762                |                    |
| Q25 ,26                            | V01-0733-90       | 2SA733(A)             |                    |
| Q27                                | V01-0954-00       | 2SA954                |                    |
| Q28                                | V01-0733-90       | 2SA733(A)             |                    |
| <b>SWITCH (X13-2790-80)</b>        |                   |                       |                    |
| C1 ,2                              | C25-1722-47       | LL-ELEC 0.22UF 50WV   |                    |
| C3 ,4                              | C46-1718-35       | MYLAR 0.018UF K       |                    |
| -                                  | E20-1206-05       | SPEAKER TERMINAL      |                    |
| R1 ,2                              | R47-1456-15       | FL-PROOF RS560 J 3A   |                    |
| R5 ,6                              | R47-1415-25       | FL-PROOF RS1.5K J 3A  |                    |
| R7 ,8                              | R40-8356-16       | RC 560 K 2H           |                    |
| S1                                 | S42-3040-05       | PUSH SWITCH           | *                  |
| S2                                 | S42-3041-05       | PUSH SWITCH           | *                  |
| <b>REVERBERATION (X14-1170-80)</b> |                   |                       |                    |
| -                                  | 029-2662-05       | STRANDED WIRE         |                    |
| C1                                 | C71-1710-15       | CERAMIC 100PF J       |                    |
| C2                                 | C24-1710-51       | ELECTRO 1UF 50WV      |                    |
| C3                                 | C71-1710-15       | CERAMIC 100PF J       |                    |
| C4                                 | C24-1047-61       | ELECTRO 47UF 10WV     |                    |
| C5                                 | C71-1739-16       | CERAMIC 390PF K       |                    |
| C6                                 | C24-1210-61       | ELECTRO 10UF 16WV     |                    |
| C7 ,8                              | C24-1710-51       | ELECTRO 1UF 50WV      |                    |
| C9 ,10                             | C24-1210-61       | ELECTRO 10UF 16WV     |                    |
| C11                                | C24-1733-51       | ELECTRO 3.3UF 50WV    |                    |
| C12                                | C46-1782-25       | MYLAR 0.0082UF J      |                    |
| C13                                | C46-1715-35       | MYLAR 0.015UF J       |                    |
| C14                                | C46-1710-25       | MYLAR 0.001UF J       |                    |
| C15                                | C46-1722-35       | MYLAR 0.022UF J       |                    |
| C16                                | C71-1739-16       | CERAMIC 390PF K       |                    |
| C17 ,18                            | C24-1733-51       | ELECTRO 3.3UF 50WV    |                    |
| C19                                | C24-1210-61       | ELECTRO 10UF 16WV     |                    |
| C20                                | C71-1710-15       | CERAMIC 100PF J       |                    |
| C21 ,22                            | C52-1710-26       | CERAMIC 0.001UF K     |                    |
| C23                                | C24-1733-51       | ELECTRO 3.3UF 50WV    |                    |
| C24                                | C46-1782-25       | MYLAR 0.0082UF J      |                    |
| C25                                | C46-1715-35       | MYLAR 0.015UF J       |                    |
| C26                                | C46-1710-25       | MYLAR 0.001UF J       |                    |
| C27                                | C46-1722-35       | MYLAR 0.022UF J       |                    |
| C28                                | C71-1739-16       | CERAMIC 390PF K       |                    |
| C29                                | C24-1733-51       | ELECTRO 3.3UF 50WV    |                    |
| C30 ,31                            | C24-1710-51       | ELECTRO 1UF 50WV      |                    |
| C32                                | C24-1733-51       | ELECTRO 3.3UF 50WV    |                    |
| C33                                | C24-1710-51       | ELECTRO 1UF 50WV      |                    |
| C34                                | C24-1047-61       | ELECTRO 47UF 10WV     |                    |
| C35                                | C24-1733-51       | ELECTRO 3.3UF 50WV    |                    |
| C36                                | C24-1210-61       | ELECTRO 10UF 16WV     |                    |
| C37                                | C24-1710-51       | ELECTRO 1UF 50WV      |                    |
| C38                                | C24-1047-61       | ELECTRO 47UF 10WV     |                    |
| C39 ,40                            | C24-1710-51       | ELECTRO 1UF 50WV      |                    |
| C41 ,42                            | C24-1733-51       | ELECTRO 3.3UF 50WV    |                    |
| C43 ,44                            | C24-1733-51       | ELECTRO 3.3UF 50WV    |                    |
| C45 ,46                            | C24-1210-61       | ELECTRO 10UF 16WV     |                    |
| C47                                | C24-1222-71       | ELECTRO 220UF 16WV    |                    |
| C48 ,49                            | C24-1210-71       | ELECTRO 100UF 16WV    |                    |
| C50                                | C71-1710-15       | CERAMIC 100PF J       |                    |

# PARTS LIST

| Ref. No.<br>参照番号             | Parts No.<br>部品番号 | Description<br>部品名 / 規格 | Re-<br>marks<br>備考 |
|------------------------------|-------------------|-------------------------|--------------------|
| -                            | E11-0065-05       | PHONE JACK (MIC)        |                    |
| VR1                          | R06-4046-05       | POTENTIOMETER           | *                  |
| VR2                          | R06-5056-05       | POTENTIOMETER           | *                  |
| VP3 ,4                       | R01-5030-05       | POTENTIOMETER           | *                  |
| S1                           | S29-1126-05       | ROTARY WAFER SWITCH     | *                  |
| S2                           | S29-1127-05       | ROTARY WAFER SWITCH     | *                  |
| S3                           | S33-4018-05       | LEVER SWITCH            |                    |
| D1 -5                        | V11-0271-05       | 1S2076                  |                    |
| IC1 -4                       | V30-0405-10       | AN6552                  |                    |
| IC5                          | V30-0471-10       | MN3101                  | *                  |
| IC6                          | V30-0470-10       | MN3008                  | *                  |
| Q1 -10                       | V03-0270-05       | 2SC945 (R,Q)            |                    |
| <b>DISPLAY (X14-1180-80)</b> |                   |                         |                    |
| PL1 -7                       | B30-0234-05       | LAMP                    |                    |
| PL8 ,9                       | B30-0075-05       | LAMP 8V 0.3A            |                    |
| PL10,11                      | B30-0233-05       | LAMP 8V 0.2A            |                    |
| PL12,13                      | B30-0075-05       | LAMP 8V 0.3A            |                    |
| -                            | C71-1733-06       | CERAMIC 33PF            | 50WV               |
| C1 ,2                        | C24-1710-51       | ELECTRO 10UF            | 50WV               |
| C3 ,4                        | C24-1210-61       | ELECTRO 10UF            | 16WV               |
| C5 ,6                        | C24-1710-51       | ELECTRO 10UF            | 50WV               |
| C7                           | C24-1210-61       | ELECTRO 10UF            | 16WV               |
| C8                           | C24-1022-61       | ELECTRO 22UF            | 10WV               |
| C9 -11                       | C24-1210-61       | ELECTRO 10UF            | 16WV               |
| C12                          | C55-1747-38       | CERAMIC 0.047UF         | Z                  |
| C13 ,14                      | C63-1727-05       | CERAMIC 27PF            | J                  |
| C15 ,16                      | C55-1710-38       | CERAMIC 0.01UF          | Z                  |
| C17                          | C71-1710-15       | CERAMIC 100PF           | J                  |
| C18 -21                      | C52-1715-26       | CERAMIC 0.0015UF        | K                  |
| C22                          | C55-1747-38       | CERAMIC 0.047UF         | Z                  |
| C23                          | C71-1733-05       | CERAMIC 33PF            | J                  |
| C24                          | C52-1715-26       | CERAMIC 0.0015UF        | K                  |
| C25                          | C24-1210-61       | ELECTRO 10UF            | 16WV               |
| C26                          | C52-1756-16       | CERAMIC 560P            | K                  |
| C27 ,28                      | C52-1715-26       | CERAMIC 0.0015UF        | K                  |
| C29                          | C24-1210-61       | ELECTRO 10UF            | 16WV               |
| C30                          | C55-1747-38       | CERAMIC 0.047UF         | Z                  |
| L1                           | L40-1021-13       | INDUCTOR 1MH            | K                  |
| L3                           | L40-1021-03       | INDUCTOR 1MH            | K                  |
| X1                           | L77-0574-05       | CRYSTAL RESONATOR       | *                  |
| R7                           | R47-5447-05       | FL-PROOF RS 47          | J 3A               |
| R20                          | R47-5482-05       | FL-PROOF RS 82          | J 3A               |
| VR1 -4                       | R12-3030-05       | TRIMMING POT. 10K       |                    |
| VRS                          | R12-3045-05       | TRIMMING PGT. 10K       |                    |
| D1 -4                        | V11-0051-05       | 1N60                    |                    |
| D5 -8                        | V11-0076-05       | 1S1555                  |                    |
| D5 -8                        | V11-0271-05       | 1S2076                  |                    |
| D9                           | V11-4176-76       | XZ-057                  |                    |
| D10                          | V11-0076-05       | 1S1555                  |                    |
| D10                          | V11-0271-05       | 1S2076                  |                    |
| FL1                          | V40-4400-10       | FL DISPLAY (POWER)      |                    |
| FL2                          | V40-4400-20       | FL DISPLAY (FREQUENCY)  |                    |
| IC1 ,2                       | V30-0347-10       | BA658                   |                    |
| IC3                          | V30-0474-10       | LC7258                  |                    |
| IC4                          | V30-1005-26       | SN74LS90N OR F74LS90PC  |                    |
| IC5                          | V30-0409-10       | AN6821                  |                    |
| Q1 -3                        | V03-0293-05       | 2SC945 (R,Q)            |                    |
| Q1 -3                        | V03-2320-20       | 2SC2320 (E,F)           |                    |
| Q4 -6                        | V03-2003-30       | 2SC2003                 |                    |
| J7 ,8                        | V03-0293-05       | 2SC945 (R,Q)            |                    |

| Ref. No.<br>参照番号 | Parts No.<br>部品番号 | Description<br>部品名 / 規格 | Re-<br>marks<br>備考 |
|------------------|-------------------|-------------------------|--------------------|
| Q7 ,8            | V03-2320-20       | 2SC2320 (E,F)           |                    |