

## V. DESCRIPTION OF CIRCUIT

### 5-1 FADER

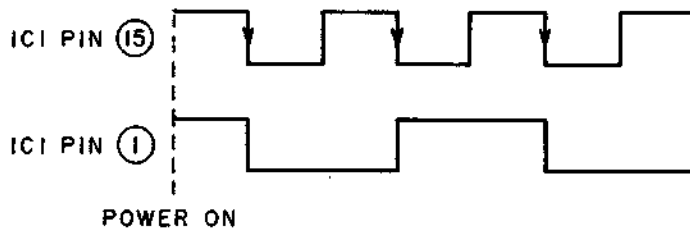
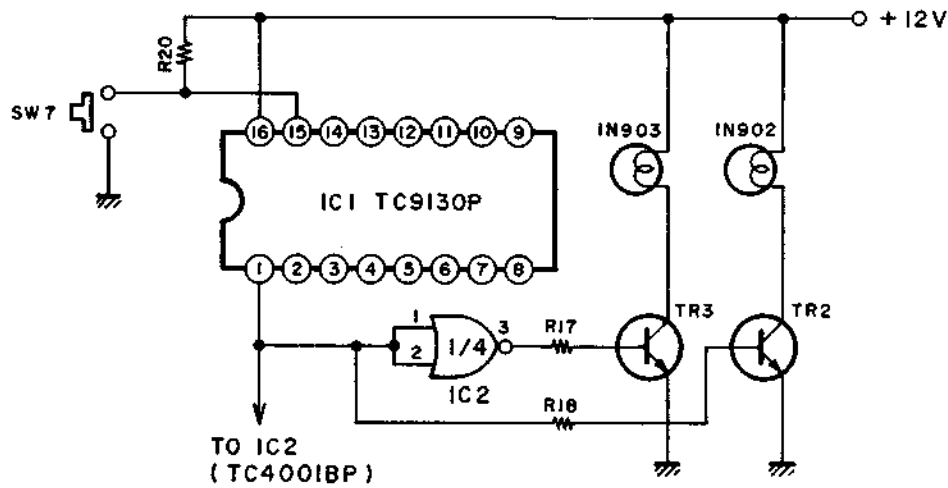


Fig. 5-1

When the tactile switch (SW7) is pushed, the IC1 (TC9130P) input pin ⑮ will detect falling edges, and the IC1 (TC9130P) output pin ① will repeat attaining "L" and "H" levels alternately.

With the fader "on", the IC1 (TC9130P) output pin ① will attain an "L" level and the IC2 (TC4001BP) pin ③

output an "H" level, as a result of which TR3 will turn on and the fade-out indicator lamp (IN903) light up. With the fader "off", since the IC1 (TC9130P) output pin ① is at an "H" level, TR3 will turn off and TR2 on, as a result of which the fade-in indicator lamp (IN902) will light up.

## 5-2 FADE IN AND FADE OUT

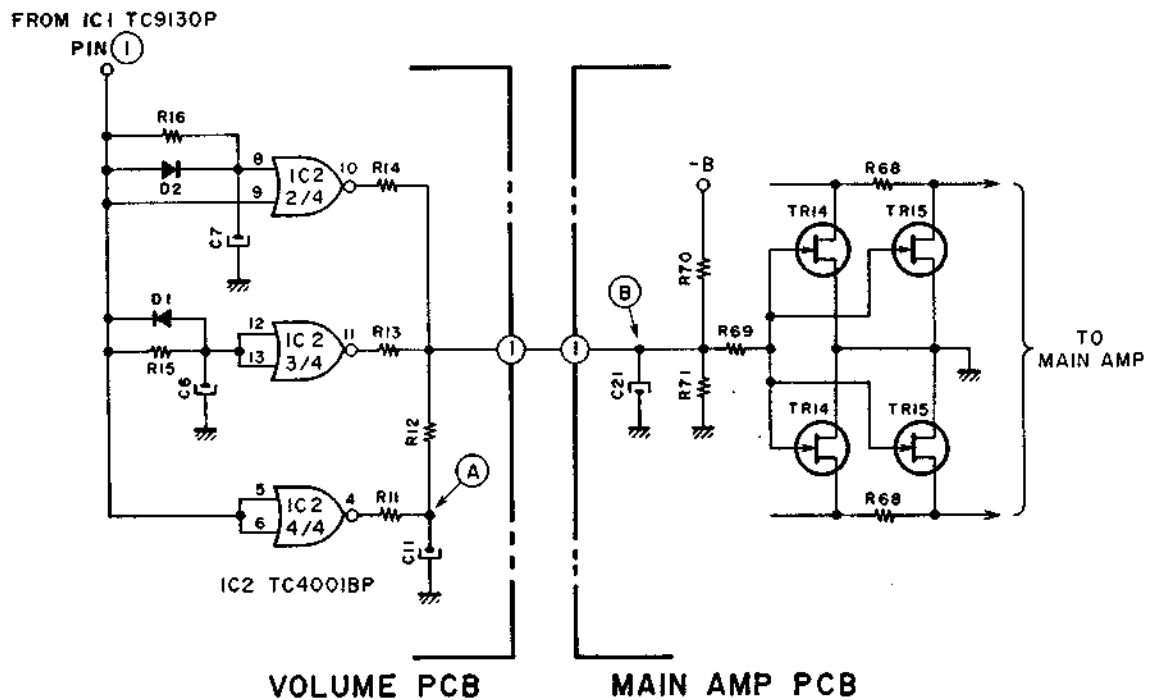


Fig. 5-2

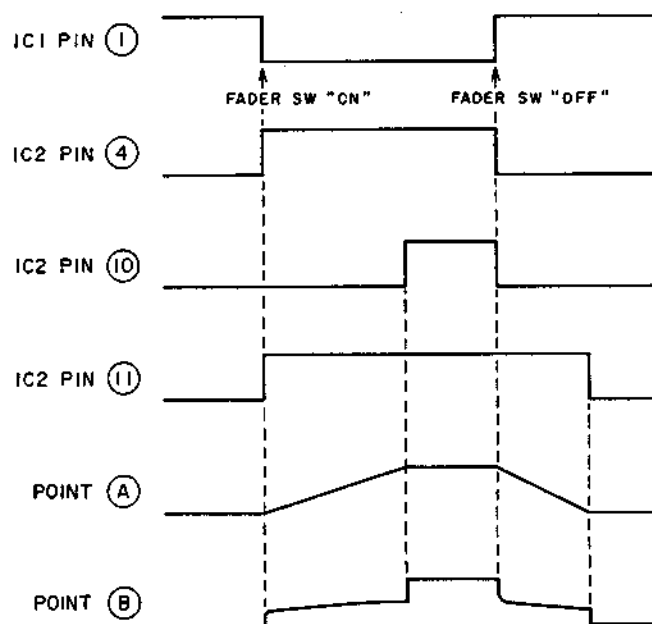


Fig. 5-3

### 1) FADE IN

When an "H" level is output by IC1 (TC9130P) pin ①, IC2 (TC4001BP) pin ④ will attain an "L" level, after which IC2 (TC4001BP) pin ⑩ will attain an "L" level, and lastly, IC2 (TC4001BP) pin ⑪ will attain an "L" level. C11 and C21 will then slowly discharge, drawing the TR14 and TR15 gates toward -B, and TR14 and TR15 will slowly turn off.

### 2) FADE OUT

When an "L" level is output by IC1 (TC9130P) pin ①, IC2 (TC4001BP) pins ④ and ⑪ will attain "H" levels, slowly raising the TR14 and TR15 gate voltages, and ultimately IC2 (TC4001BP) pin ⑩ will attain an "H" level, at which time, the TR14 and TR15 voltages will reach the levels set in advance.

5-3 FADE-IN/OUT WHEN RELAY IS ON:

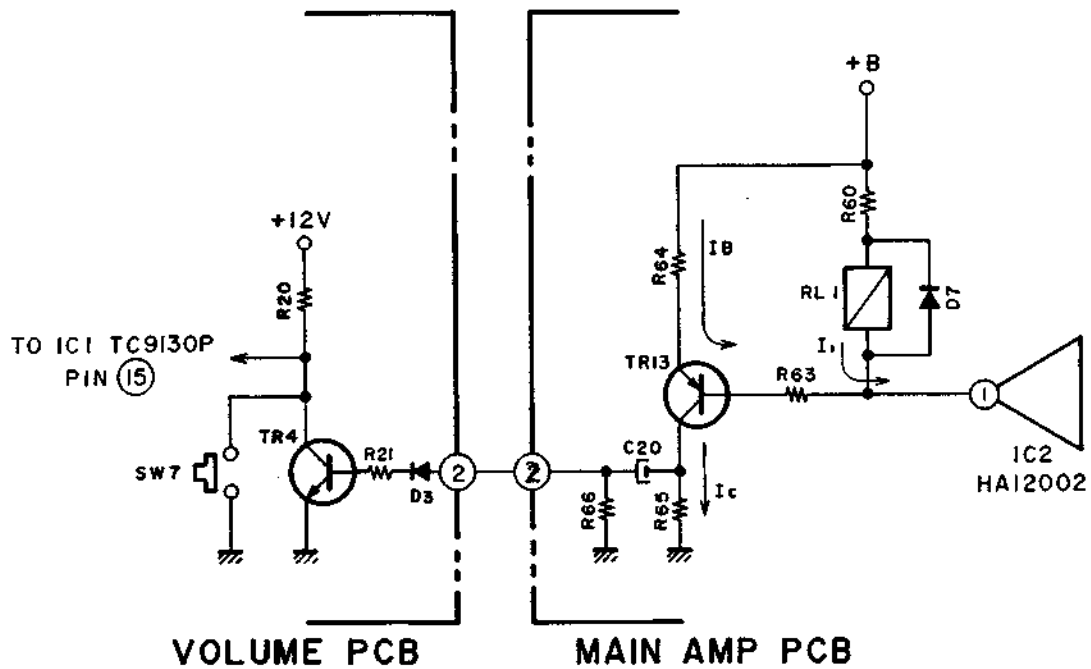


Fig. 5-4

When relay (RL1) is off, TR13 will not turn on, and since the TR13 collector is at an "L" level, TR4 will not turn on either. When relay (RL1) is on, the TR3 base will attain an "L" level, and TR13 will turn on. When TR13 turns on, a collector current will flow, and by the voltage drop across R65, a voltage will be applied to the TR4 base. Accordingly, TR4 will turn on, exerting the same effect as when the tactile switch (SW7) has been pushed, and the fader will operate.

## 5-4 ZERO DRIVE

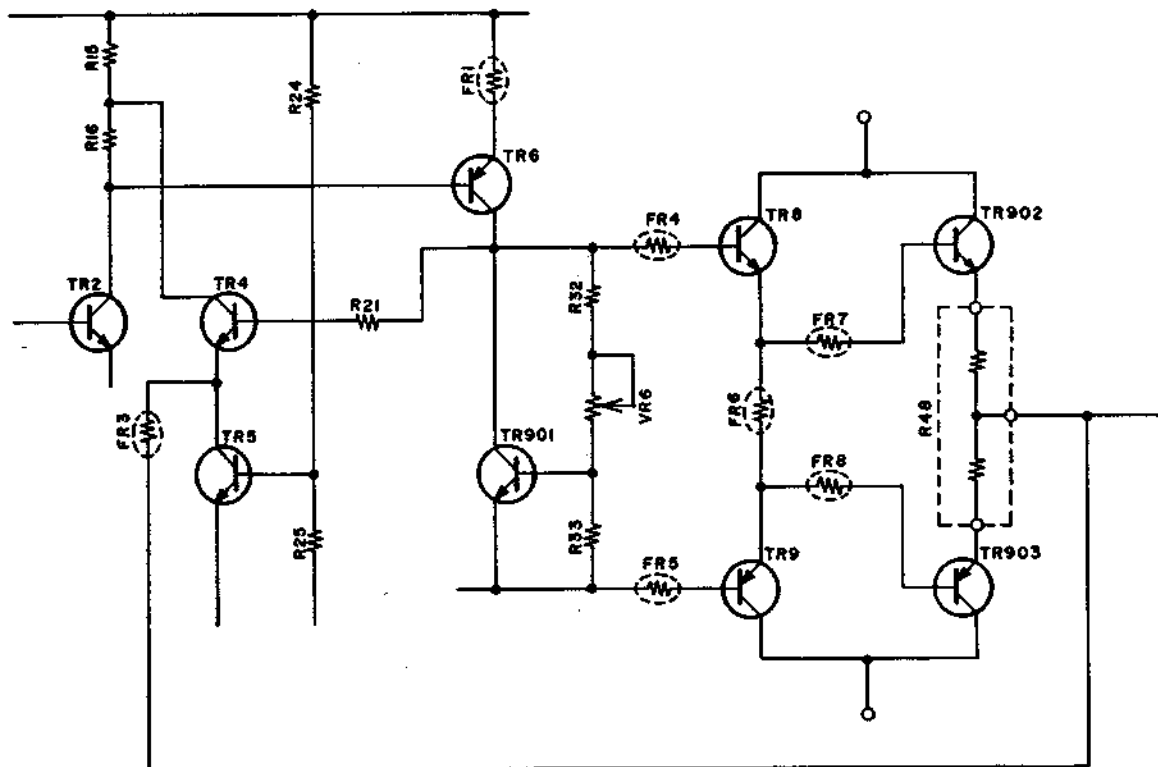


Fig. 5-5

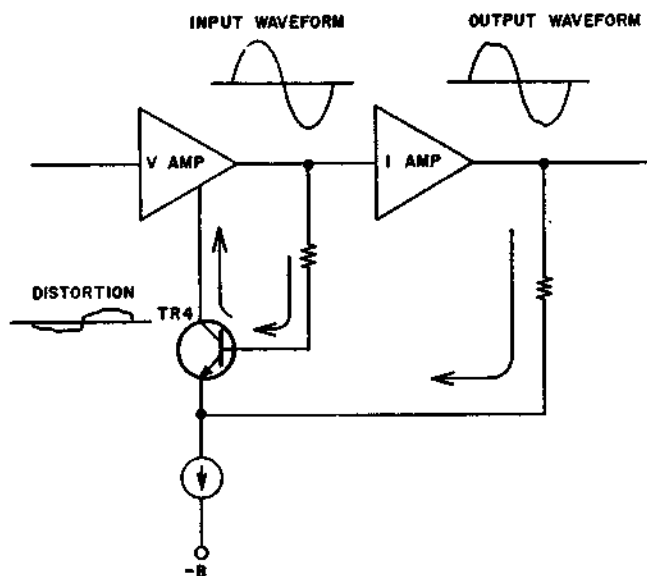


Fig. 5-6

This is intended to reduce distortions in the current amplifier stage. Voltage differences (distortion components) between the current amplifier stage (I Amp) input (TR8) and the main amp output (R48) when

signals have been input, are detected with TR4, and signals will be applied to the voltage amplifier stage loads (R15 and R16) in a manner to cancel off the distortion components detected.

## 5-5 OVERCURRENT DETECTING CIRCUIT:

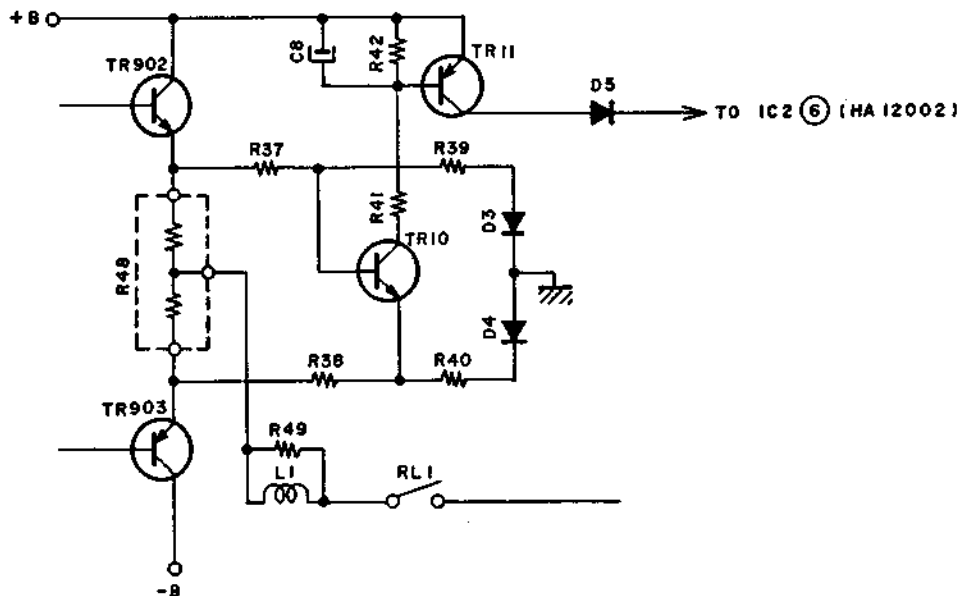


Fig. 5-7

Relay (RL1) is turned off for the protection of transistors against destruction and internal temperature rises, in the event that the load is shorted or the load impedance has dropped, causing an excessive current to flow. The voltage drop across R48 upon the flowing of an overcurrent turns TR10 on. Then, the TR11 base will be drawn to the ground potential, turning TR11 on. This draws the TR11 collector toward +B, and will activate the IC2 (HA12002) overcurrent detection, turning off relay (RL1). In this case, the relay (RL1) will not be reset until after the power switch has been pushed off at least once.

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## VI. ADJUSTMENTS

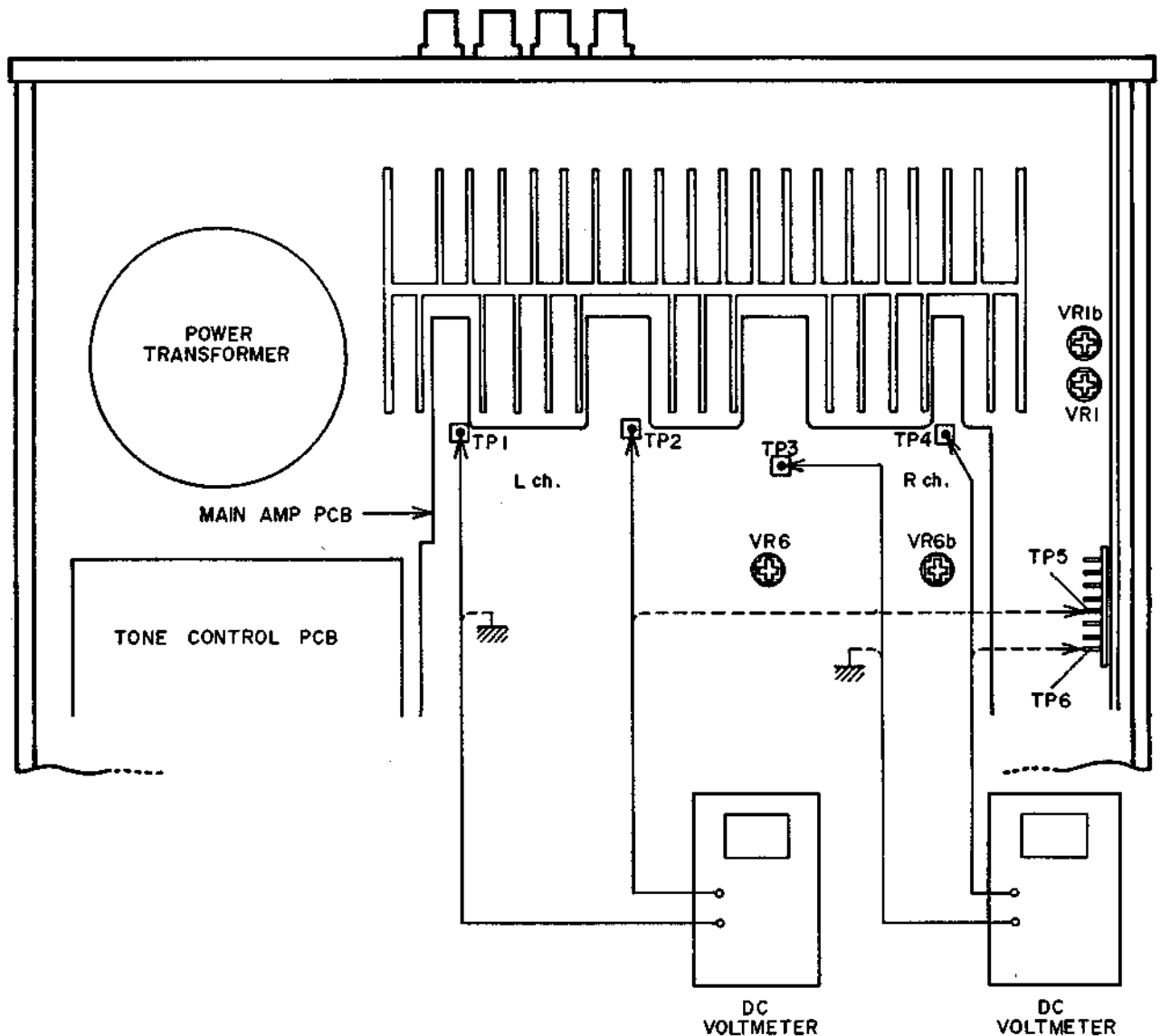


Fig. 6-1 Adjustment Points

### 6-1 IDLING CURRENT ADJUSTMENT

After power switch is "ON", connect the DC Voltmeter to the Test points as shown Fig. 6-1.

Adjust VR6 (left channel), VR6b (right channel) so that the DC Voltmeter Reading is  $8 \text{ mV} \pm 2 \text{ mV}$ .

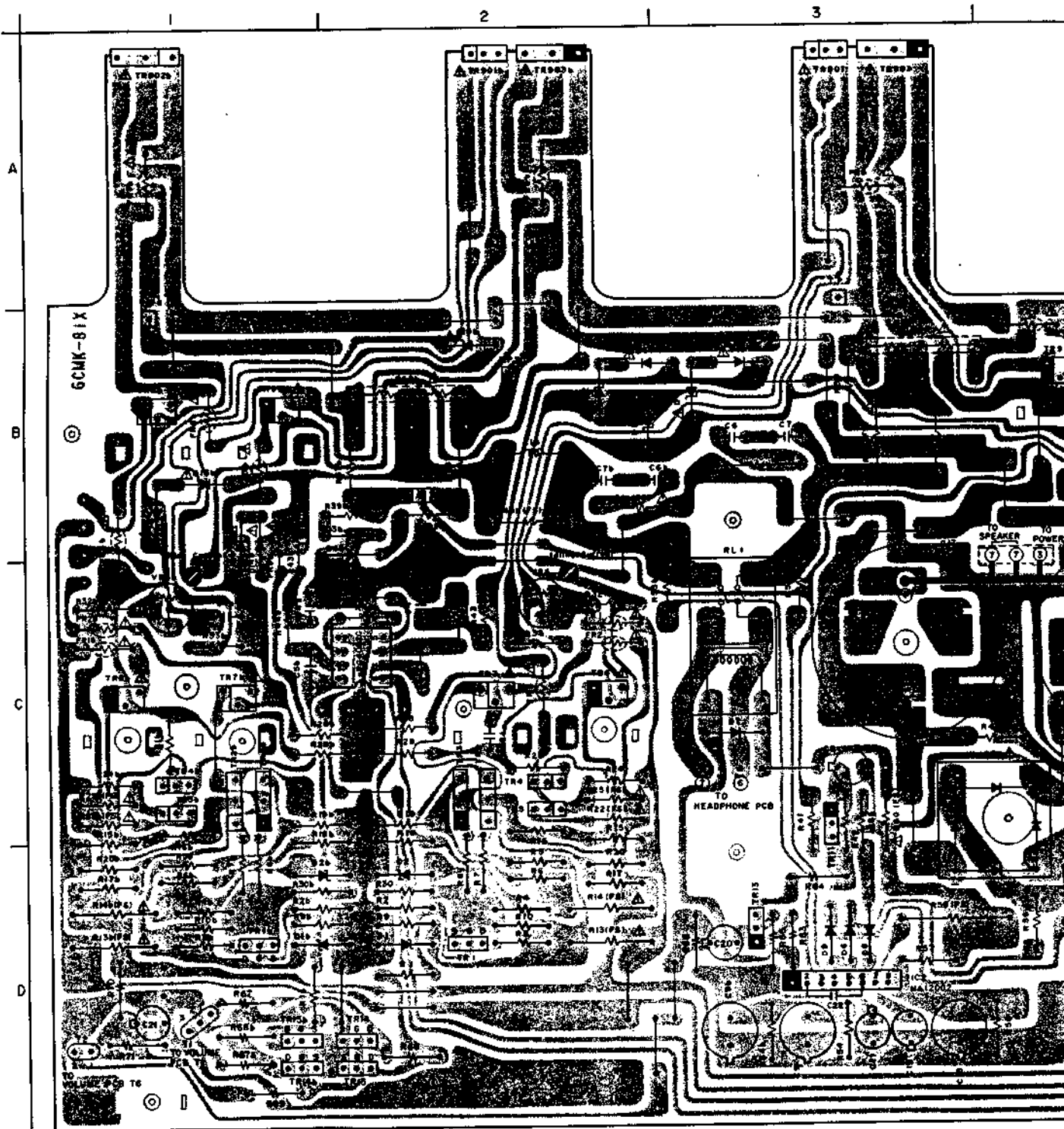
### 6-2 EQ AMP DC BALANCE ADJUSTMENT

Function switch to PHONO (MC Range), Connect DC Voltmeter between TP5 (left channel), or TP6 (right channel) and GND, as shown Fig. 6-1 (Broken line).

Adjust VR1 (left channel), VR1b (right channel) so that DC Voltmeter Reading is  $\text{DC } 0\text{V} \pm 1 \text{ mV}$ .

## 2. COMPOSITION OF VARIOUS P.C BOARDS

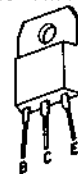
### 1) MAIN AMP P.C BOARD A2020A503A and VOLUME P.C BOARD A2020A503B



MAIN AMP PCB A2020A503A

TR1, TR14, TR15...FET 2SK117(Y)  
 TR2..... 2SC2690 (Q, P)  
 TR3..... 2SA1220 (Q, P)  
 TR4, TR5..... 2SC2909 (S, T)  
 TR6..... 2SA1209 (S, T)  
 TR7..... 2SC2911 (S, T)  
 TR8..... 2SC3116 (S, T)

TR9..... 2SA1248 (S, T)  
 TR10..... 2SC2909 (S, T)  
 TR11, TR13..... 2SA1207 (S, T)  
 TR901..... 2SC3116 (S, T)  
 TR902..... 2SC2581 (O, Y)  
 TR903..... 2SA1106 (O, Y)



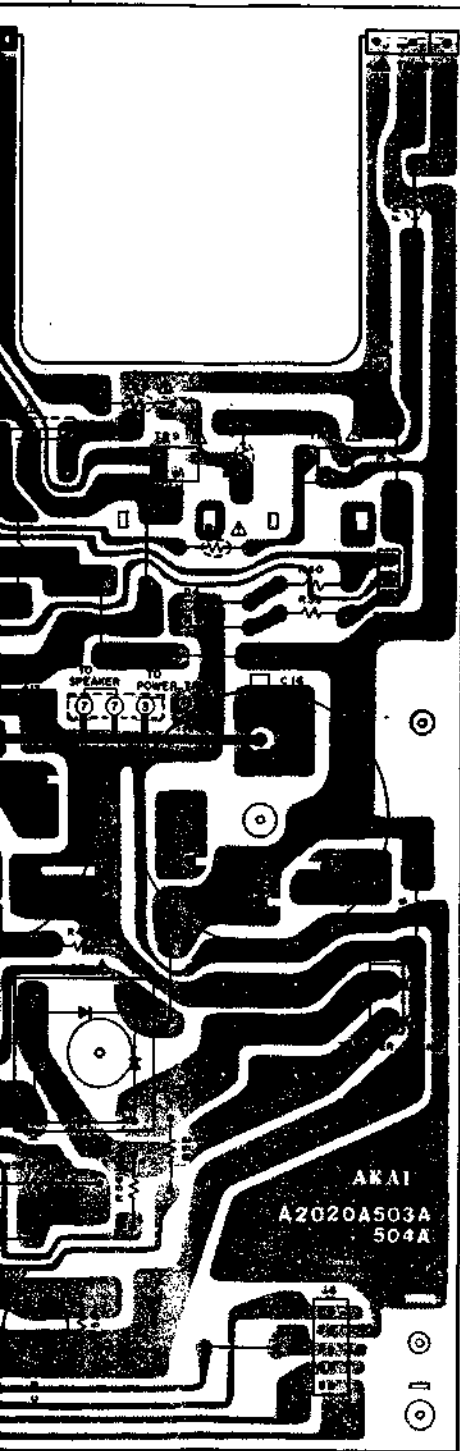
2SC2581  
 2SA1106



2SA1207  
 2SC2909



2SA1220  
 2SC2690



LOCATION OF COMPONENTS

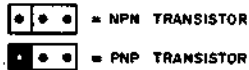
TR1.....D2	TR1b.....D1
TR2 to 7...C2	TR2b to 7b...C1
TR8,9.....B4	TR8b,9b.....B1
TR10.....B4	TR10b.....B2
TR11.....C3	TR901b.....A2
TR13.....D3	TR902.....A1
TR901.....A3	TR903.....A2
TR902.....A4	
TR903.....A3	

IC

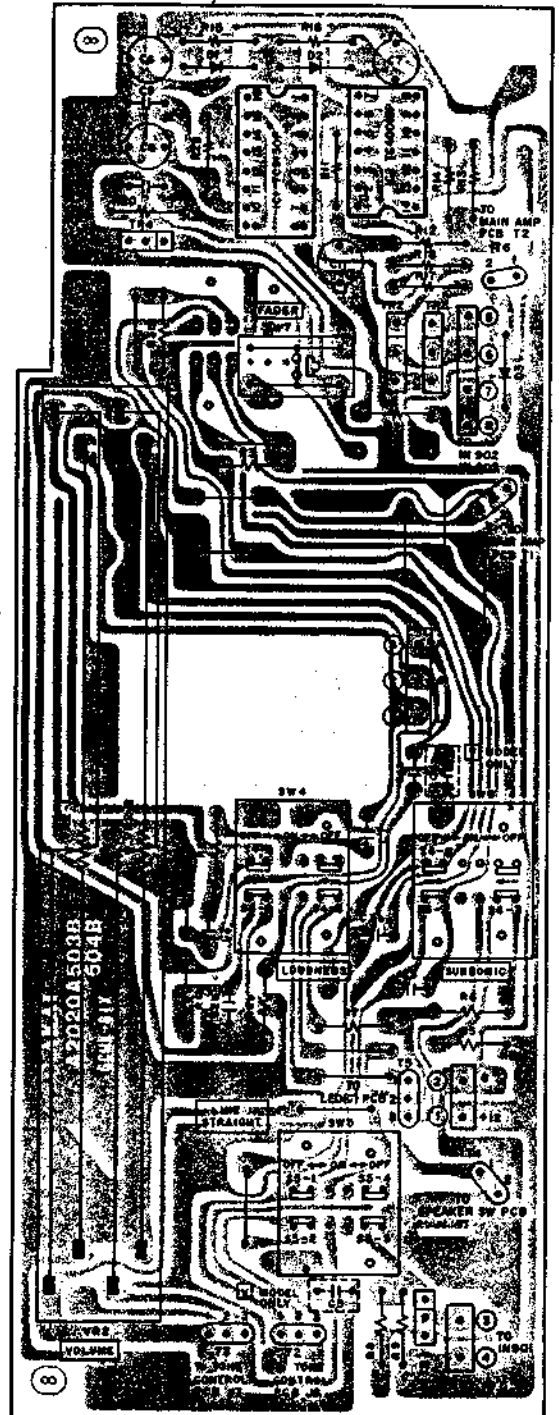
IC1.....C2
IC2.....D3

CONNECTOR

T1,T2.....D1
J6.....D4
3, 4, 5, 7...C4
6, 8.....C3



TR1, 2, 3...2SD467C (C)  
 TR4.....2SC536K-NP (B, F)



VOLUME PCB A2020A503B



2SA1220  
 2SC2690



2SA1209  
 2SA1248  
 2SC2911  
 2SC3116



2SK117

WARNING: Δ INDICATES SAFETY CRITICAL COMPONENTS FOR CONTINUED SAFETY. REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS

AVERTISSEMENT: Δ IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDÉES PAR LE FABRICANT



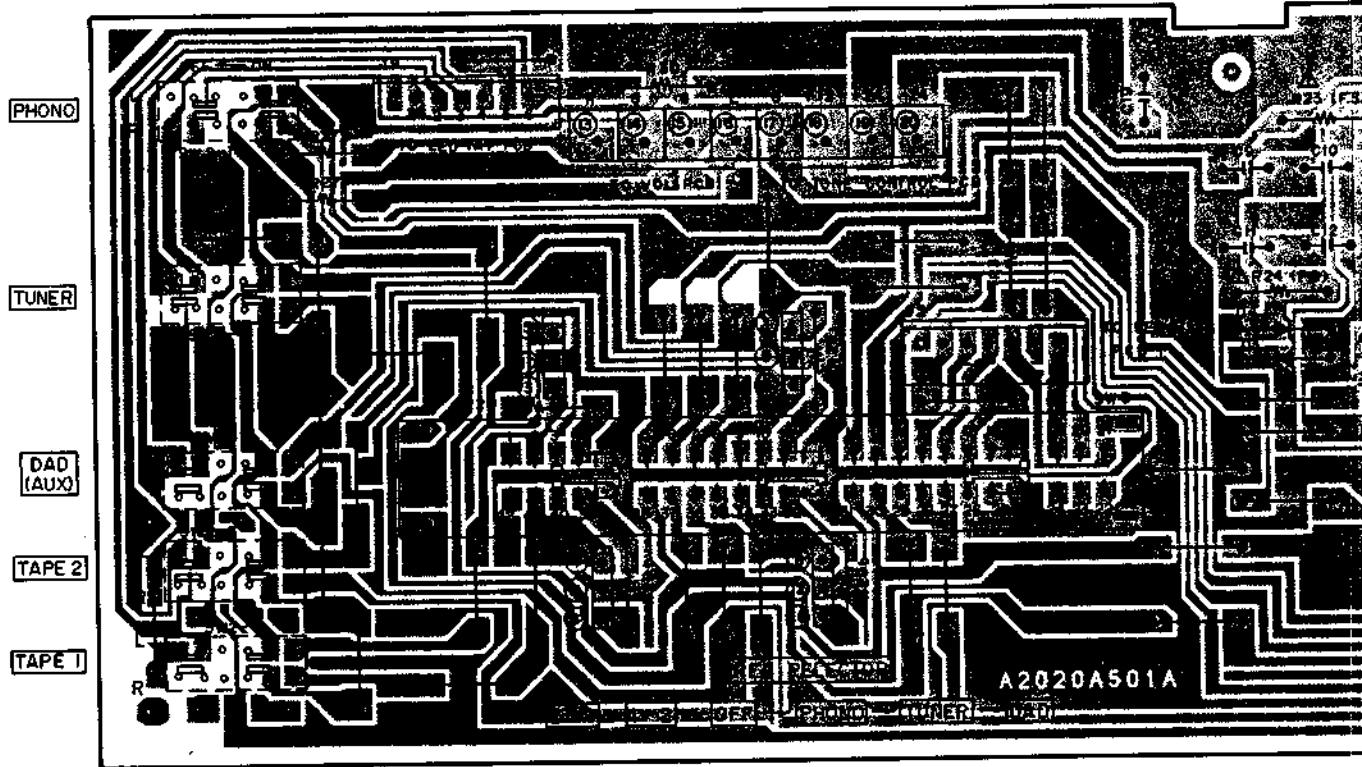
2SD467C



2SC536K - NP



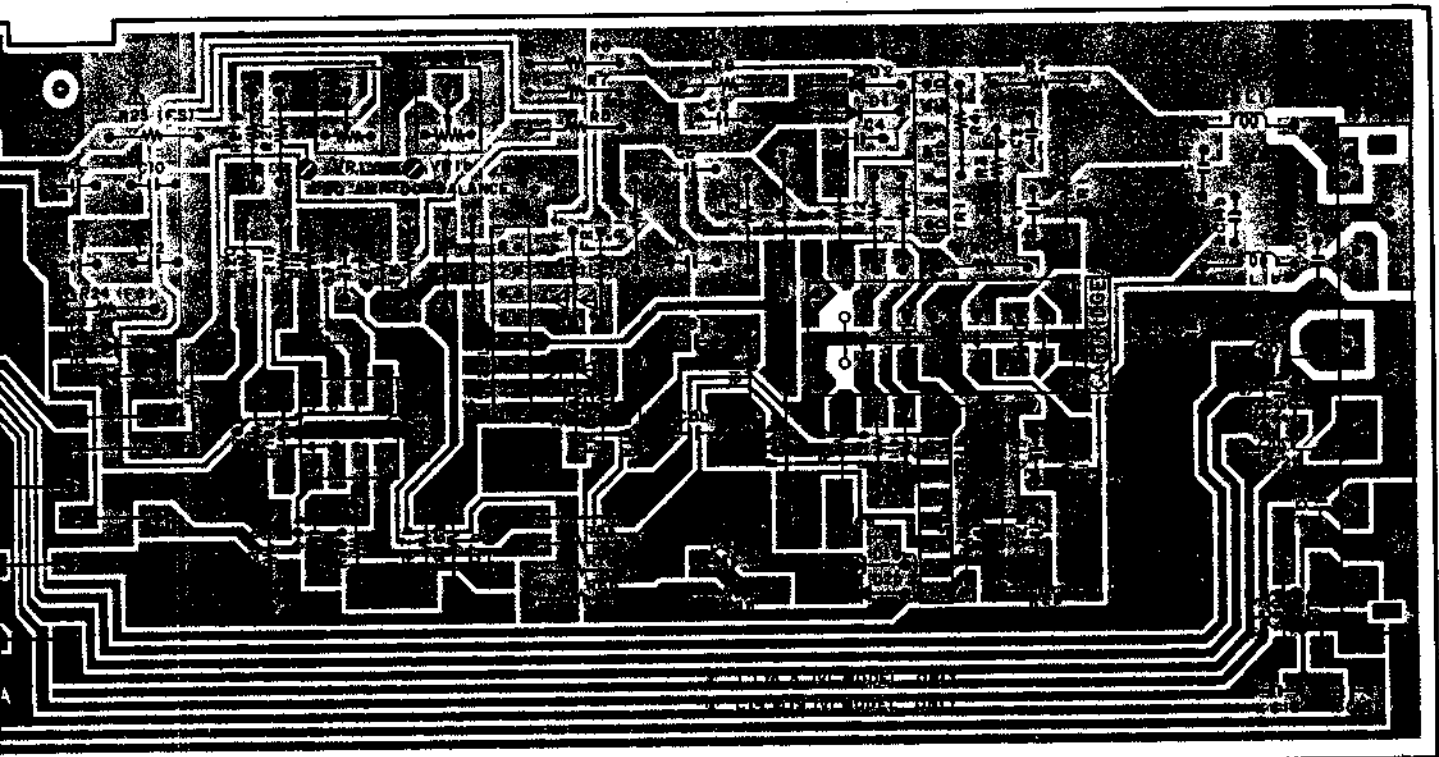
2) EQUALIZER P.C BOARD A2020A501A



EQUALIZER PCB A2020A501A

WARNING:  $\Delta$  INDICATES SAFETY CRITICAL  
REPLACE SAFETY CRITICAL COMPONENTS WITH  
RECOMMENDED PARTS

AVERTISSEMENT:  $\Delta$  IL INDIQUE LES COMPOSANTS  
POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ  
NE REMPLACER QUE DES PIÈCES RECOMMANDÉES



(L)  
PHONO  
(R)

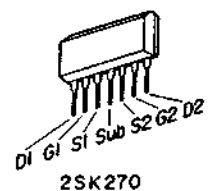
(L)  
TUNER  
(R)

(L)  
AUX  
(R)

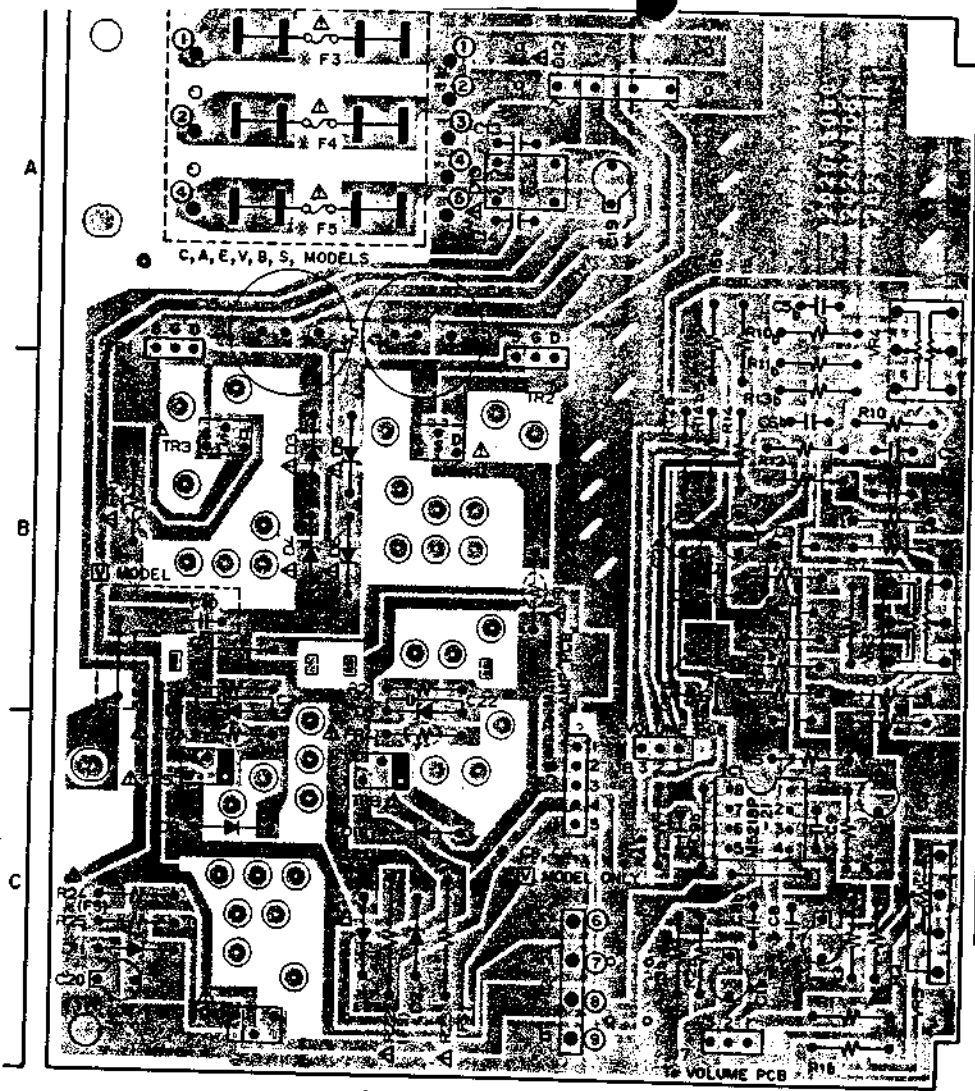
TR1, 1D -- 2SK270 (BL, V)

AVOID SAFETY CRITICAL COMPONENTS FOR CONTINUED SAFETY.  
USE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S  
RECOMMENDED PARTS

△ IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ.  
MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL.  
UTILISER SEULEMENT DES PIÈCES RECOMMANDÉES PAR LE FABRICANT



2SK270



- TR3 2SK2
- TR4 2SK2
- TR5 2SJ76
- TR6 2SC3116
- TR7 2SA1248
- TR8 2SD612K

LOCATION OF COMPONENTS

- TR
- TR1 A1
  - TR2 A2
  - TR3 B1
  - TR4 B2
  - TR5 C1
  - TR6 C2
  - TR7 C1

- IC
- IC1 C3

- CONNECTOR
- ① to ⑤ A2
  - (①, ②, ④) A1
  - ⑥ to ⑧ C2
  - J7 C3
  - J8 C3
  - J9 C2

BASS

TREBLE

BALANCE



2SK213  
2SJ76



2SC3116  
2SA1248  
2SD612K



2SK246

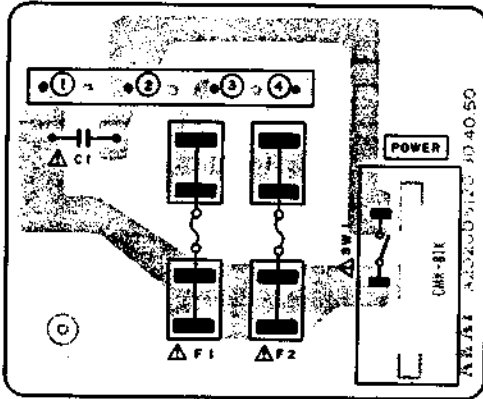
TONE CONTROL PCB

- A2020A5050 U
- A2020A5060 C.A
- A2020A5070 E.V.B.S

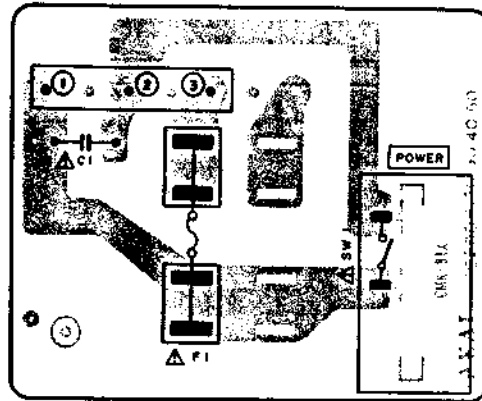
- = NPN TRANSISTOR
- = PNP TRANSISTOR

⚡	F3	F4	F5
C, A	1A 125V	1A 125V	1A 125V
E, V, B, S	T1A	T1A	T1A

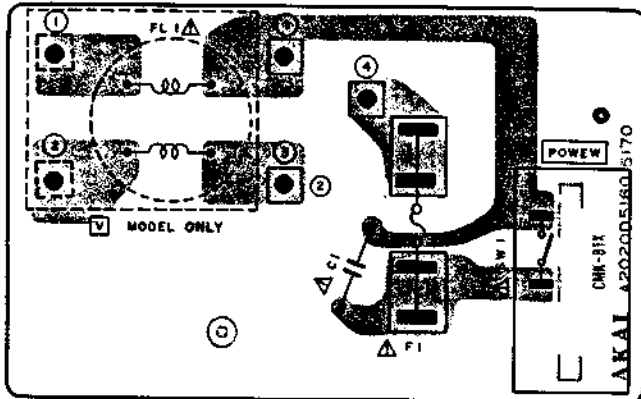
4) POWER SUPPLY P.C BOARD A2020D5120 [U], A2020D5130 [C, A] and A2020D5160 [E, V, B, S]



POWER SUPPLY PCB  
A2020D5120 [U]



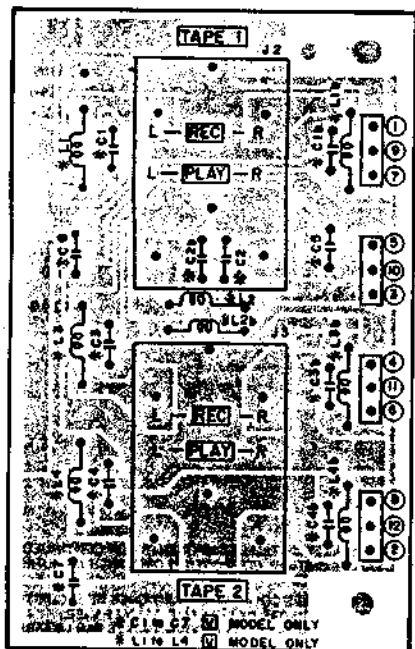
POWER SUPPLY PCB  
A2020D5130 [C, A]



POWER SUPPLY PCB  
A2020D5160 [E, V, B, S]

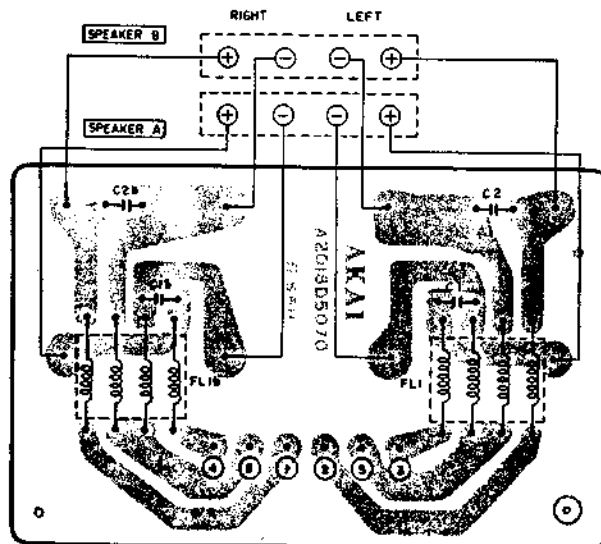
WARNING: Δ INDICATES SAFETY CRITICAL COMPONENTS FOR CONTINUED SAFETY. REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS.  
AVERTISSEMENT: Δ IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDÉES PAR LE FABRICANT.

5) INPUT P.C BOARD A2020A501B



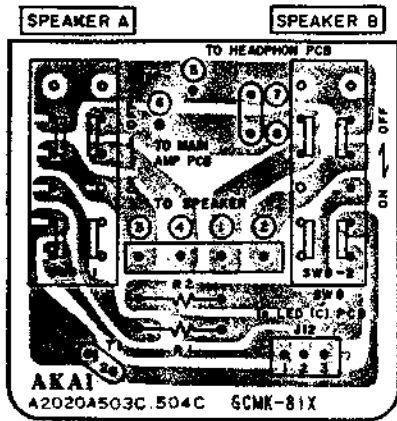
INPUT PCB A2020A501B

6) TERMINAL P.C BOARD A2018D5070 [V] MODEL

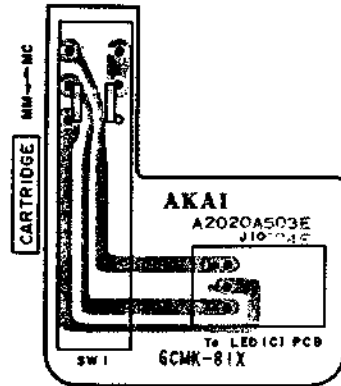


TERMINAL PCB A2018D5070 [V] MODEL

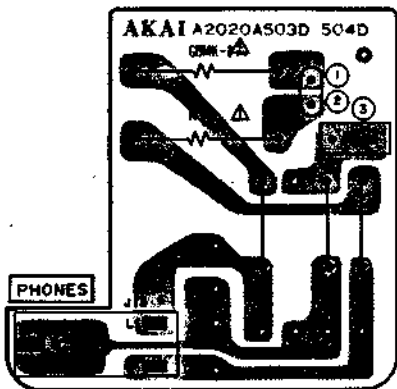
7) OTHER P.C BOARDS



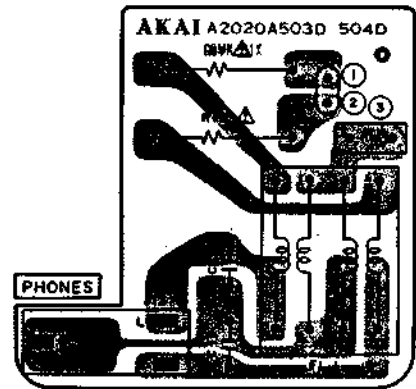
SPEAKER SW PCB  
A2020A503C



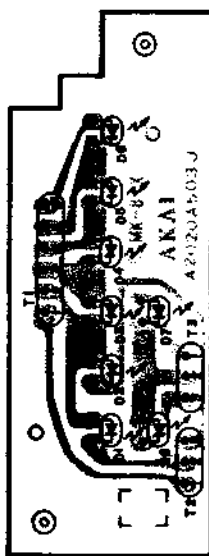
SWITCH PCB  
A2020A503E



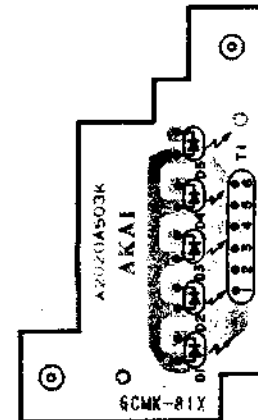
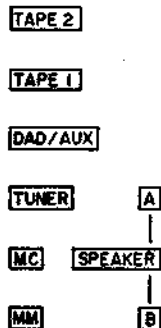
HEAD PHONE PCB  
A2020A503D



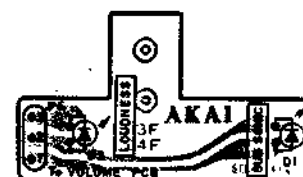
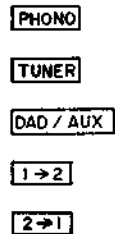
HEAD PHONE PCB  
A2020A503D V MODEL



LED(A) PCB  
A2020A503J



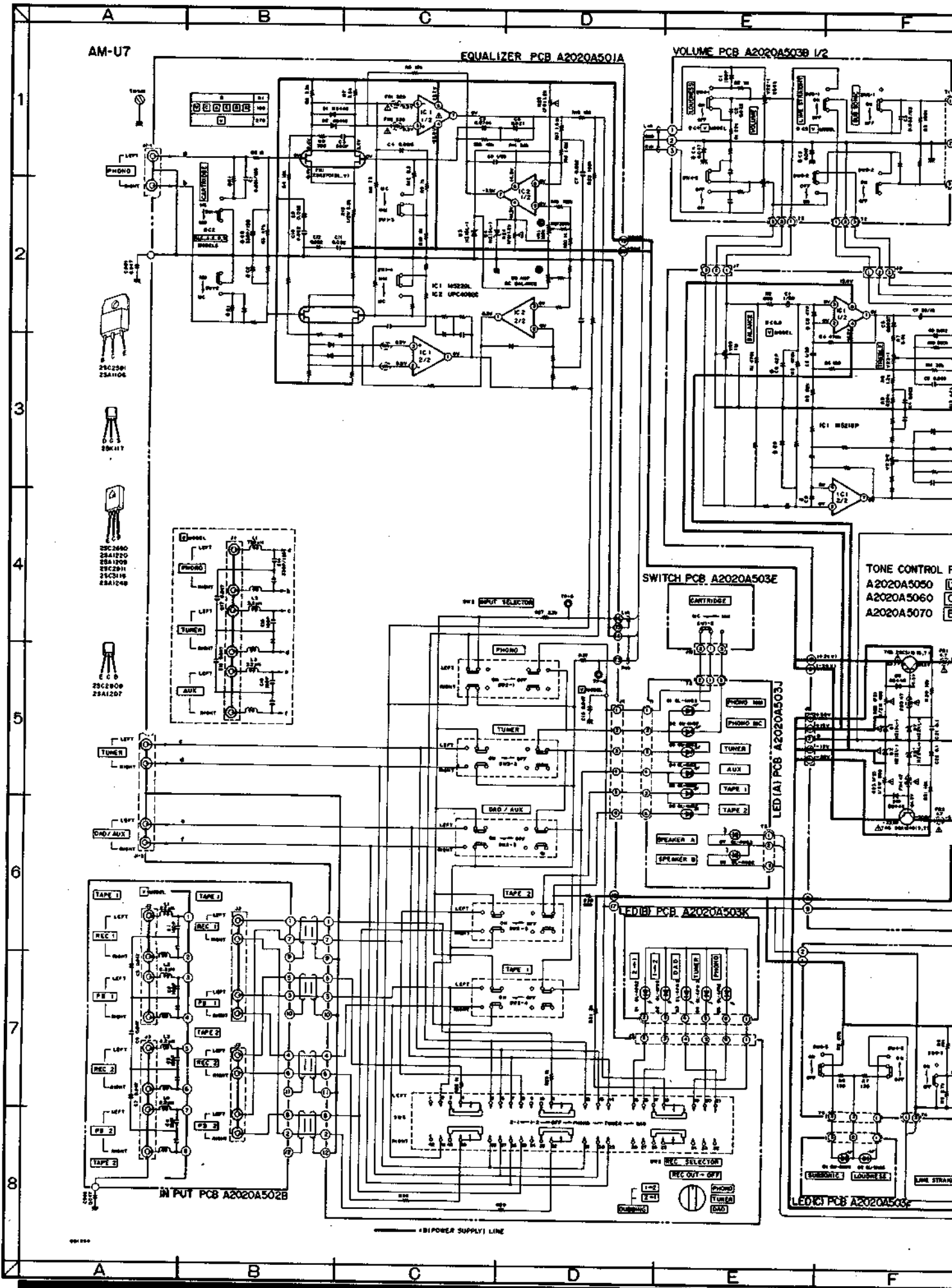
LED(B) PCB  
A2020A503K

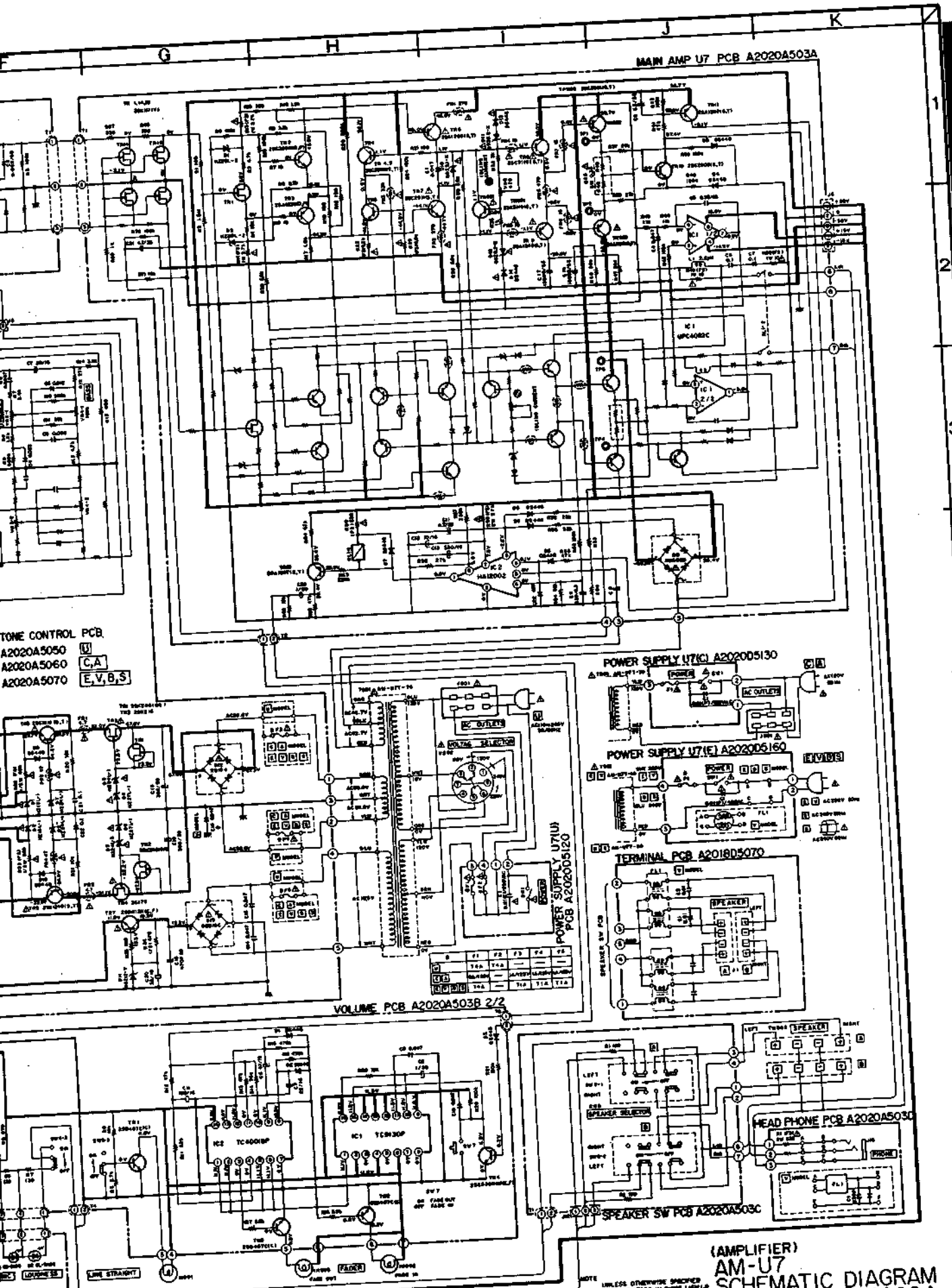


LED(A) PCB  
A2020A503F

WARNING: Δ INDICATES SAFETY CRITICAL COMPONENTS FOR CONTINUED SAFETY. REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS

AVERTISSEMENT: Δ IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDÉES PAR LE FABRICANT





TONE CONTROL PCB  
 A2020A5050 U  
 A2020A5060 C,A  
 A2020A5070 E,V,B,S

MAIN AMP U7 PCB A2020A503A

POWER SUPPLY U7(C) A2020D5130

POWER SUPPLY U7(C) A2020D5160

TERMINAL PCB A2018D5070

VOLUME PCB A2020A503B 2/2

POWER SUPPLY U7(U)  
 PCB A2020D5120

(AMPLIFIER)  
 AM-U7  
 SCHEMATIC DIAGRAM  
 No. 830920A

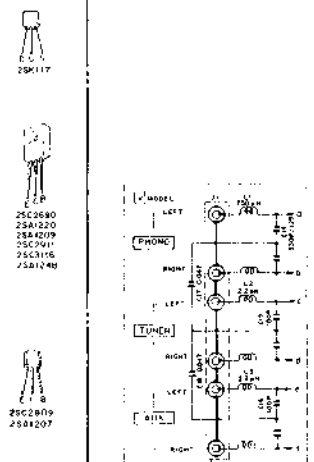
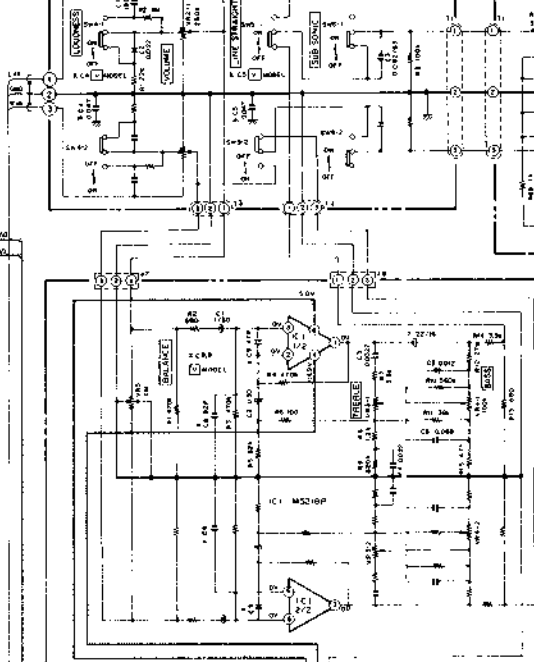
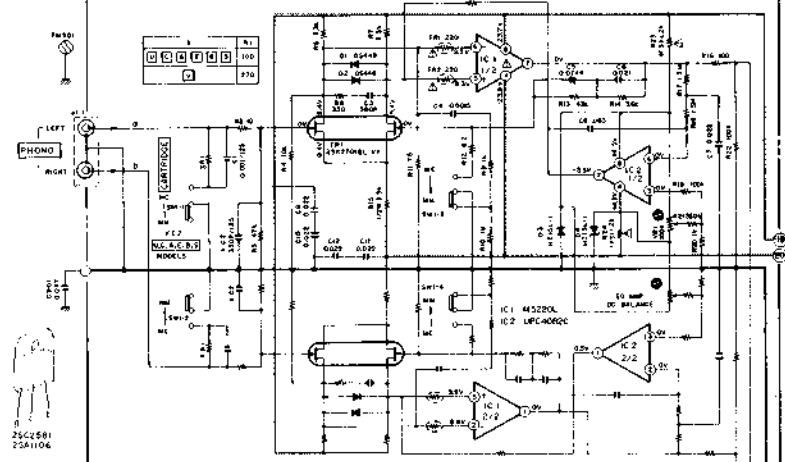
WARNING: INDICATES SAFETY CRITICAL COMPONENTS FOR CONTINUED SAFETY.  
 REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S  
 RECOMMENDED PARTS.  
 AVERTISSEMENT: ΔΔ INDIQUE LES COMPOSANTS CRITIQUES DE SECURITE.  
 POUR MAINTENIR LE DEGRE DE SECURITE DE L'APPAREIL,  
 REEMPLACEZ QUE LES PIECES RECOMMANDEES PAR LE FABRICANT

NOTE  
 UNLESS OTHERWISE SPECIFIED  
 ALL RESISTORS IN OHMS UNLESS  
 ALL CAPACITORS IN UF UNLESS  
 (50) = 50K OHMS RESISTORS

AM-U7

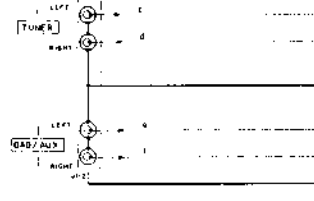
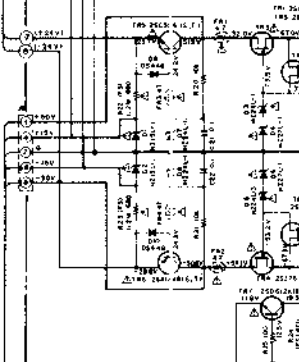
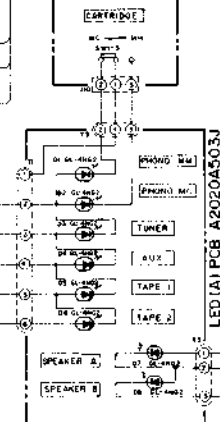
EQUALIZER PCB A2020A501A

VOLUME PCB A2020A503B 1/2

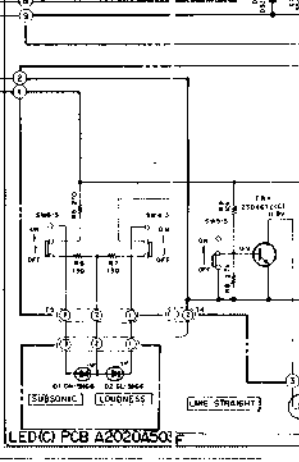
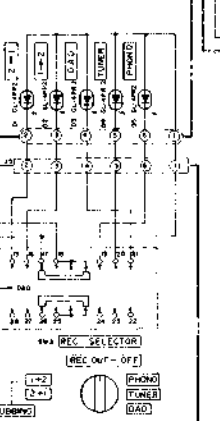
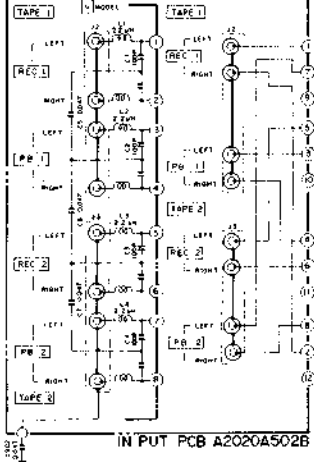


SWITCH PCB A2020A503E

TONE CONTROL PCB  
 A2020A:050 U  
 A2020A:060 C,A  
 A2020A:070 E,V,B,S



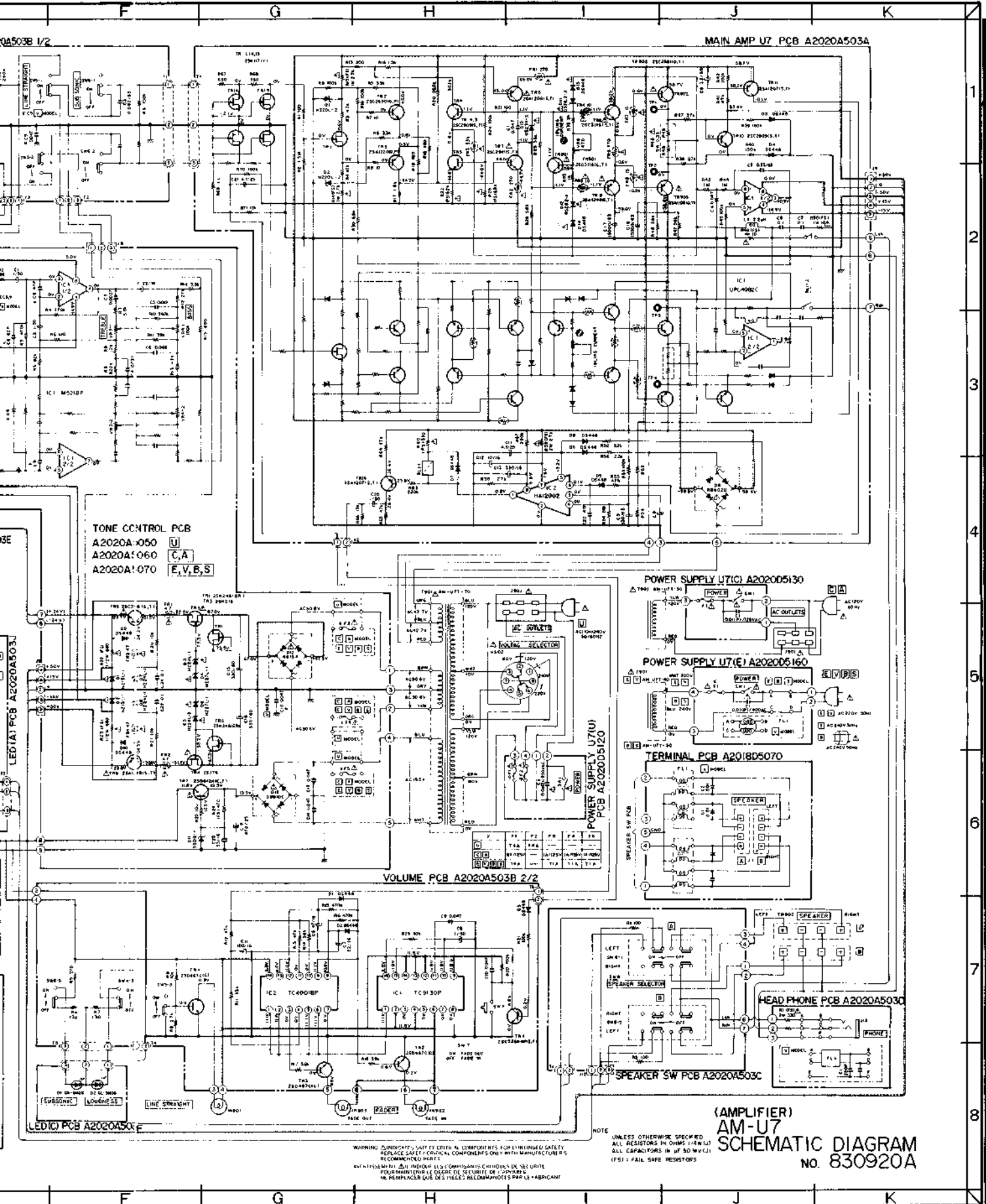
LED(I) PCB A2020A503K



\*B1 POWER SUPPLY LINE

004994





MAIN AMP U7 PCB A2020A503A

TONE CONTROL PCB  
 A2020A5050 U  
 A2020A5060 C, A  
 A2020A5070 E, V, B, S

POWER SUPPLY U7(C) A2020D5130

POWER SUPPLY U7(E) A2020D5160

VOLUME PCB A2020A503B 2/2

TERMINAL PCB A2018D5070

POWER SUPPLY U7(U)  
 PCB A2020D5120

HEAD PHONE PCB A2020A503C

(AMPLIFIER)  
 AM-U7  
 SCHEMATIC DIAGRAM  
 No. 830920A

NOTE  
 UNLESS OTHERWISE SPECIFIED  
 ALL RESISTORS IN OHMS (R) IN K (K) IN M (M)  
 ALL CAPACITORS IN P (P) IN U (U) IN M (M)  
 (ES) = FAIL SAFE RESISTORS

WARNING: SUPPLY VOLTAGE EXCEEDS RATED VOLTAGE FOR COMPONENTS. FOR CONTINUED SAFETY  
 REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S  
 RECOMMENDED PARTS.

AVERTISSEMENT: LA TENSION ALIMENTAIRE EXCÈDE LA TENSION NOMINALE DE CERTAINS  
 COMPOSANTS. POUR ASSURER LA SÉCURITÉ, REMPLACEZ SEULEMENT LES PIÈCES RECOMMANDÉES PAR LE FABRICANT.