

Service Manual

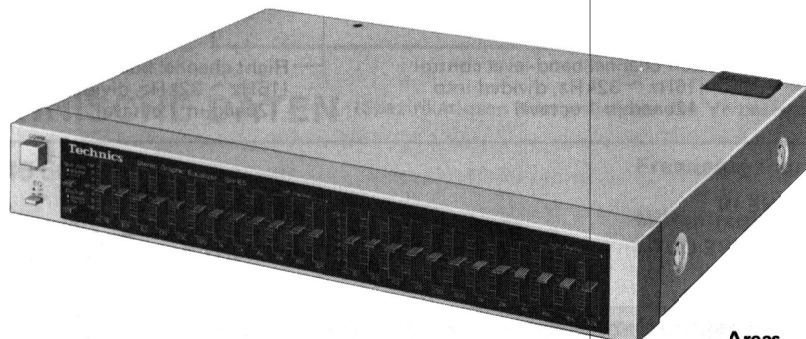
Stereo Graphic Equalizer

SH-E5

[D],[EK],[EW],[EB],
[EF],[EGA],[EH],[XA],[XL]

SH-E5(K)

[D],[EK],[EW],[EB],
[EF],[EGA],[EH],[XA],[XL]



Areas

- * [D] is available in Scandinavia.
- * [EK] is available in United Kingdom.
- * [EW] is available in Switzerland.
- * [EB] is available in Belgium.
- * [EF] is available in France.
- * [EGA] is available in F.R. Germany.
- * [EH] is available in Holland.
- * [XA] is available in Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
- * [XL] is available in Australia.

- * The cabinet and front panel are available in black color and silver types.
- * The black type model is provided with (K) in the Service Manual.

Specifications

(Specifications are subject to change without notice for further improvement.)

(DIN 45 500)

Frequency response (center position)	: 5 Hz~100 kHz, -1 dB
Maximum output voltage	: 8 V (1 kHz, THD 0.01%)
Rated output voltage	: 1 V
Rated total harmonic distortion	: 0.005% (20 Hz~20 kHz) 0.003% (1 kHz)
Input sensitivity	: 1 V
Signal-to-noise ratio	: 100 dB (110 dB, IHF 'A')
Maximum input voltage	: 8 V (1 kHz)
Input impedance	: 47 kΩ
Gain	: 0±1 dB
Channel balance 250 Hz~6300 Hz	: ±0.5 dB
Channel separation 1kHz	: 60 dB

Band level controls	: +12 dB~-12 dB (12 elements continuously variable per channel)
Center frequency	: 16 Hz, 31.5 Hz, 63 Hz, 125 Hz, 250 Hz, 500 Hz, 1 kHz, 2 kHz, 4 kHz, 8 kHz, 16 kHz, 32 kHz

GENERAL	
Power supply	: AC 240 V 50 Hz only (For Australia and for United Kingdom) AC 220 V 50 Hz only (For Germany and for Switzerland) AC 110 V/120 V/220 V/240 V, 50 Hz/60 Hz. (For areas)
Power consumption	: 17 W

Dimensions (H×W×D)	: 50×315×240 mm (2"×12-13/32"×9-7/16")
Weight	: 2.0 kg (4.4 lb)

CONTENTS

LOCATION OF CONTROLS	Page 2
TOTAL FREQUENCY RESPONSE	3
DISASSEMBLY INSTRUCTIONS	3
BLOCK DIAGRAM	5
CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM	6

SCHEMATIC DIAGRAM	Page 9
EXPLODED VIEW	13
REPLACEMENT PARTS LIST	15
RESISTORS & CAPACITORS	16

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 228, Central Osaka Japan

Stereo Graphic Equalizer SH-E5/SH-E5(K)

This booklet contains the specifications for SH-E5, written in Germany, France and Spanish, and the circuits to be changed according to the areas.
File this manual together with the SH-E5 service manual (Order No. SD82062214C8).

DEUTSCH

DEUTSCH

FRANÇAIS

TECHNISCHE DATEN (Spezifikationen Können infolge von Verbesserungen ohne Ankündigung geändert werden.)

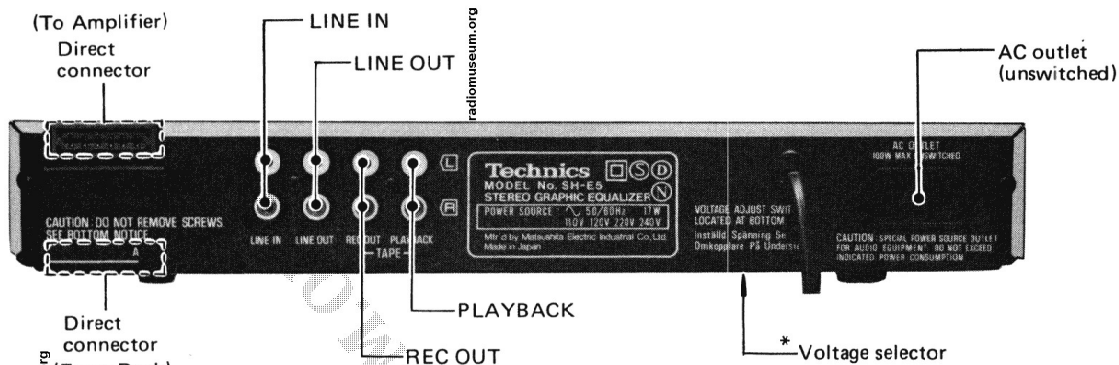
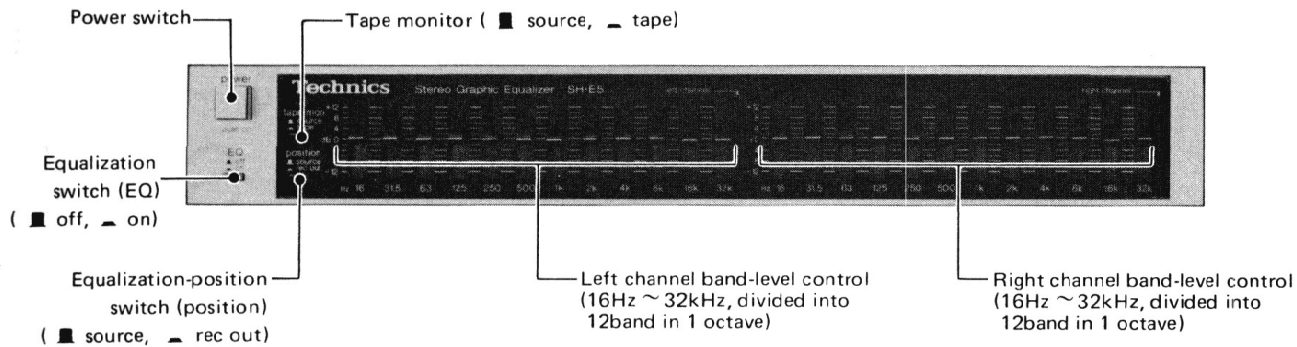
(DIN 45 500)		Frequenzgangregler	: +12 dB ~ -12 dB (12 Regler, stufenlos verstellbar)
Frequenzgang (mittelstellung)	: 5 Hz ~ 100 kHz, -1 dB	Mittelfrequenzen	: 16 Hz, 31,5 Hz, 63 Hz, 125 Hz, 250 Hz, 500 Hz, 1 kHz, 2 kHz, 4 kHz, 8 kHz, 16 kHz, 32 kHz
Maximalausgangsspannung	: 8 V (1 kHz, THD 0,01%)	ALLGEMEINE DATEN	
Nennausgangsspannung	: 1 V	Stromversorgung	: Wechselstrom, 240 V, 50 Hz nur (Für Austral und für England) Wechselstrom, 220 V, 50 Hz nur (Für Deutsch und für Schweizerisch) Wechselstrom, 110 V/120 V/220 V/240 V, 50 Hz/60 Hz (Für andere Länder)
Nennklirrfaktor	: 0,005% (20 Hz ~ 20 kHz) 0,003% (1 kHz)	Leistungsaufnahme	: 17 W
Eingangsspannung	: 1 V	Abmessungen (H×B×T)	: 50×315×240 mm (2"×12-13/32"×9-7/16")
Geräuschabstand	: 100 dB (110 dB, IHF, A)	Gewicht	: 2,0 kg (4,4 lb)
Maximaleingangsspannung	: 8 V (1 kHz)		
Eingangsimpedanz	: 47 kΩ		
Verstärkung	: 0±1 dB		
Kanalsymmetrie	: ±0,5 dB		
250 Hz ~ 6300 Hz	: ±0,5 dB		
Kanaltrennung 1kHz	: 60 dB		

FRANÇAIS

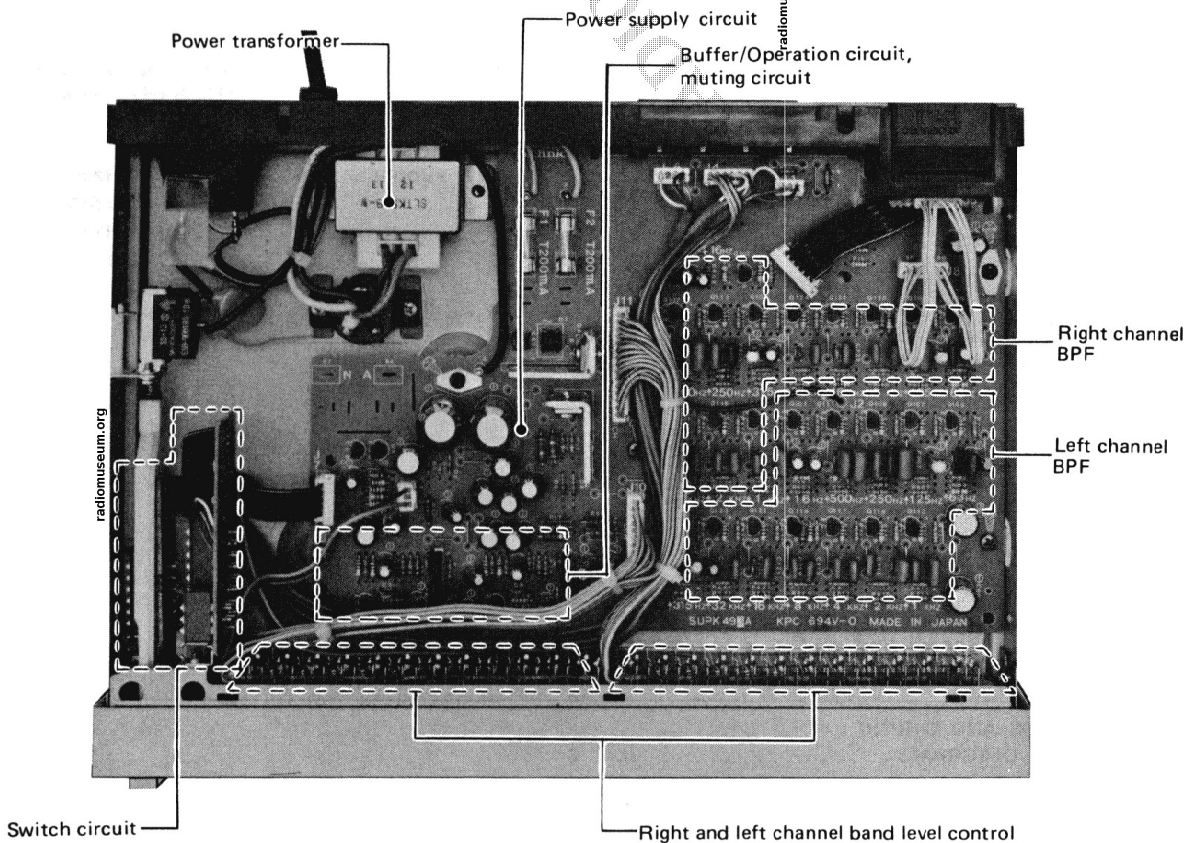
CARACTERISTIQUES (Sujet à changement sans préavis.)

(DIN 45 500)		Commandes de niveau de gamme	: +12 dB ~ -12 dB (12 éléments, continuellement variables)
Courbe de réponse (position centrale)	: 5 Hz ~ 100 kHz, -1 dB	Fréquences charnières	: 16 Hz, 31,5 Hz, 63 Hz, 125 Hz, 250 Hz, 500 Hz, 1 kHz, 2 kHz, 4 kHz, 8 kHz, 16 kHz, 32 kHz
Tension de sortie maximale	: 8 V (1 kHz, THD 0,01%)	GENERALITES	
Tension de sortie nominale	: 1 V	Alimentation	: CA. 240 V, 50 Hz seul (Pour Australie et pour Angleterre) CA. 220 V, 50 Hz seul (Pour Allemagne et pour Suisse) CA. 110 V/120 V/220 V/240 V, 50 Hz/60 Hz (Autres)
Distortion harmonique totale	: 0,005% (20 Hz ~ 20 kHz) 0,003% (1 kHz)	Consommation	: 17 W
Sensibilité d'entrée	: 1 V	Dimensions (h×l×pr) mm	: 50×315×240 mm (2"×12-13/32"×9-7/16")
Signal/Bruit	: 100 dB (110 dB, IHF' A)	Poids	: 2,0 kg (4,4 lb)
Tension d'entrée maximale	: 8 V (1 kHz)		
Impédance d'entrée	: 47 kΩ		
Gain	: 0±1 dB		
Equilibrage de canal	: ±0,5 dB		
250 Hz ~ 6300 Hz	: ±0,5 dB		
Séparation de canal	: 60 dB		
1 kHz	: 60 dB		

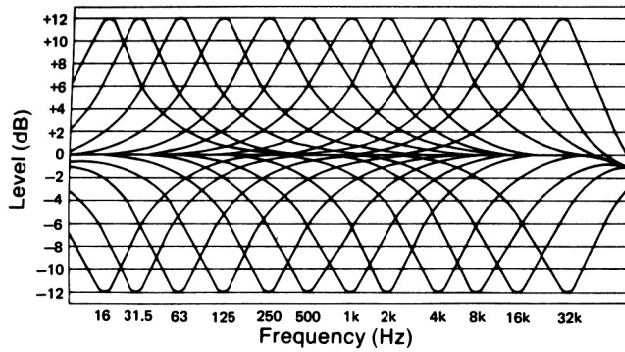
LOCATION OF CONTROLS



- * This power supply for this unit varies depending the areas. Also, the parts use for power supply are different. So, refer to the circuit diagram and replacement parts list.
- * [D], [EB], [EF], [EH] and [XA] areas are provided with voltage selector.



TOTAL FREQUENCY RESPONSE



DISASSEMBLY INSTRUCTIONS

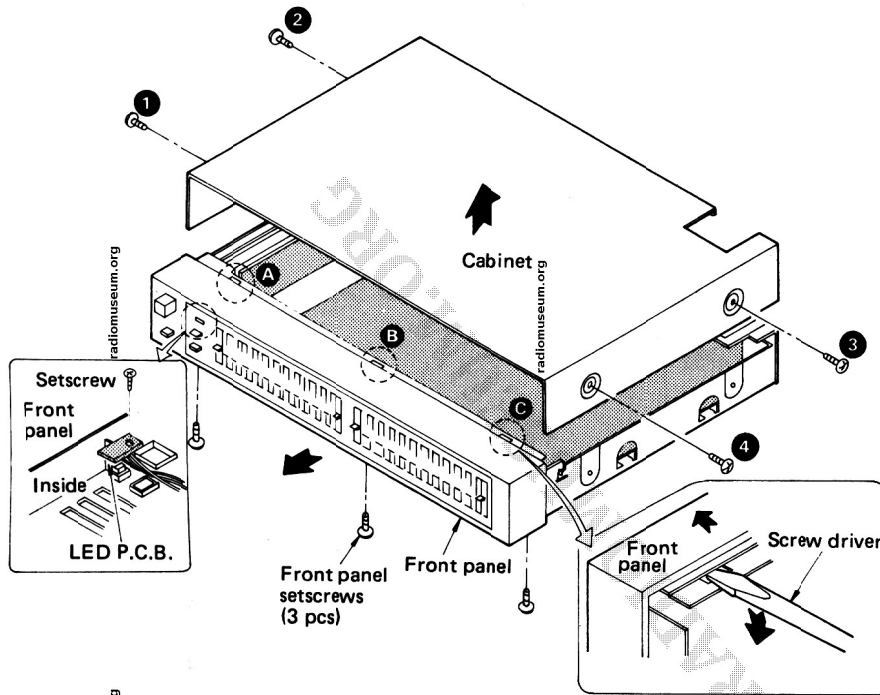


Fig. 1

How to remove the front panel

1. Remove the setscrew (Fig. 1: ① ~ ④), and then the cabinet can be removed.
2. Shift the band level knobs (24 pcs) up (+12dB).
3. Remove the 3 setscrews of the front panel.
4. Release the claws (A ~ C) at top of the front panel by a screwdriver. Pull the front panel toward you with care not to scratch the knobs.
5. Remove the LED P.C.B. inside the front panel. Then the front panel can be removed.

Note: When remove the band level control knobs, remove the front panel first.

How to remove the P.C.B.

1. Remove the cabinet.
2. Pull out the 3 connectors (J8, 9, 11).
3. Remove the rear terminal setscrews (Fig. 2: ⑤, ⑥) and the 5 setscrews (Fig. 2: ⑦ ~ ⑪) of the P.C.B.
4. Pull the P.C.B. toward you and lift it.

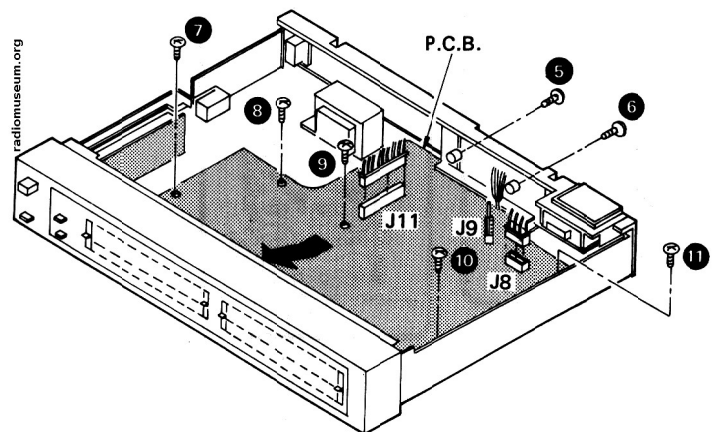


Fig. 2

● How to remove the slide volume

1. Remove the cabinet and front panel.
2. Remove the 2 setscrews of front plate, and 3 connectors (J7, 10, 11). (Fig. 3)
3. Remove the power supply knob.
4. Release the chassis stopper from inside, and lift the front plate to remove.
5. Pull out the 24 knobs for the right and left channels, and then remove the film. (Fig. 4)
6. Push the claw of the ornament from inside as in Fig. 4 to remove the ornament.
- (There are 4 ornaments, so remove the other ornaments in the same way.)
7. Remove the 16 setscrews of the slide volume and remove them from the front chassis along with the P.C.B.

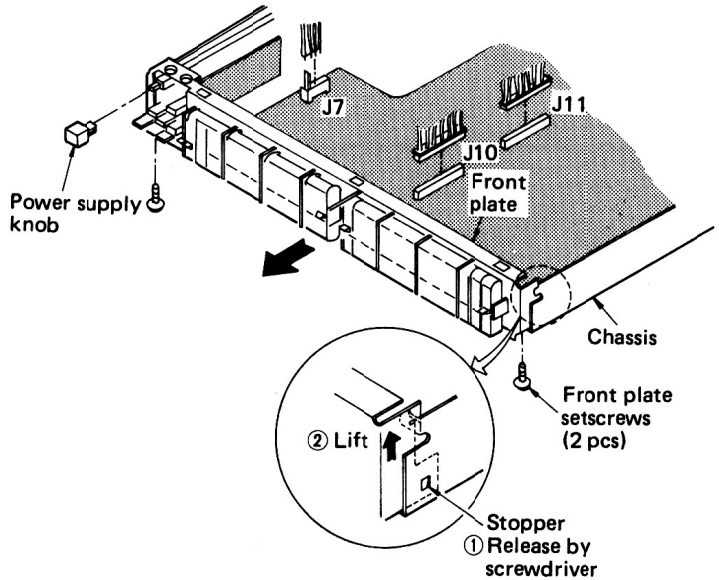


Fig. 3

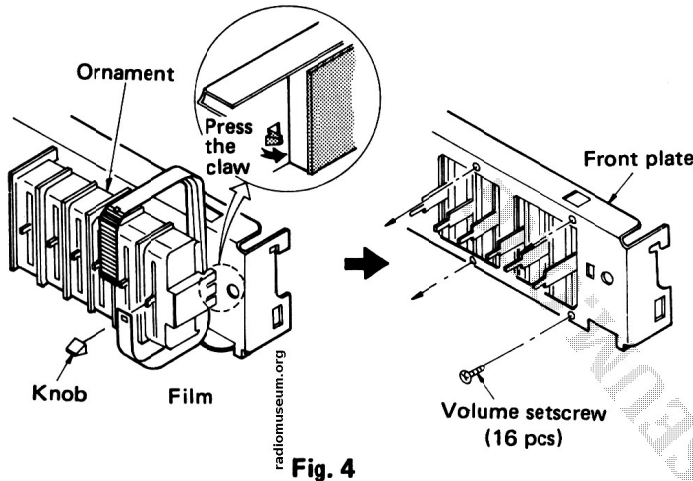


Fig. 4

● How to set the film

Set the film onto each volume lever with the face (printed side) down as shown in Fig. 5. Next, fit in the ornament and then set the film as in Fig. 5.

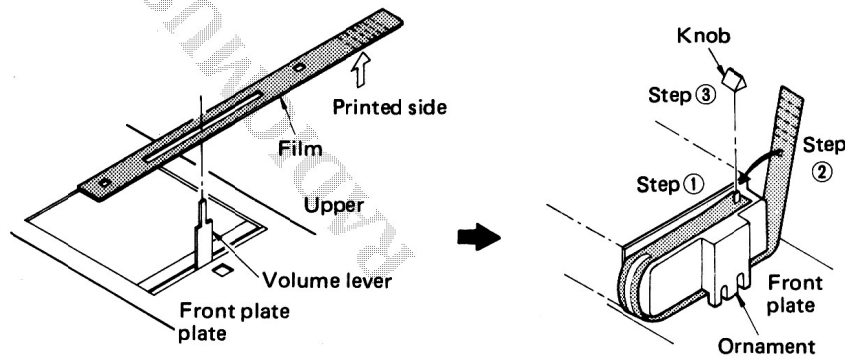


Fig. 5

● How to remove the direct connector

1. Remove the cabinet.
2. Remove the terminal setscrews (Fig. 6: 12, 13) and 6 setscrews (Fig. 6: 14 ~ 19) of the rear panel, and then draw out the rear panel.
3. Pull out the direct connector and remove it in the numerical order 1 ~ 3.

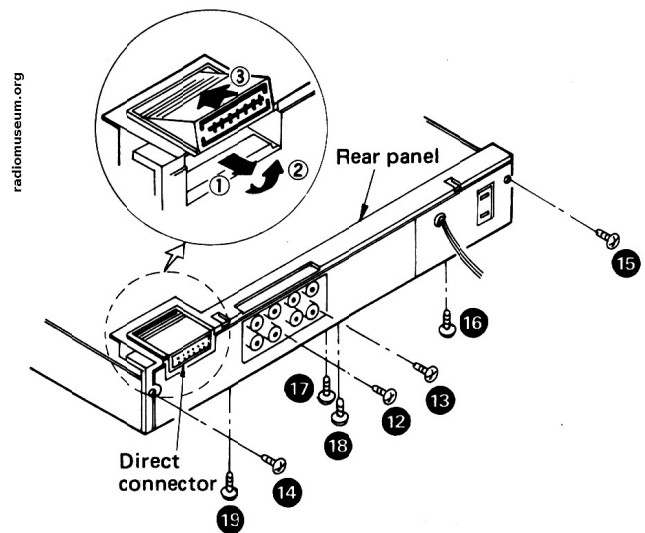
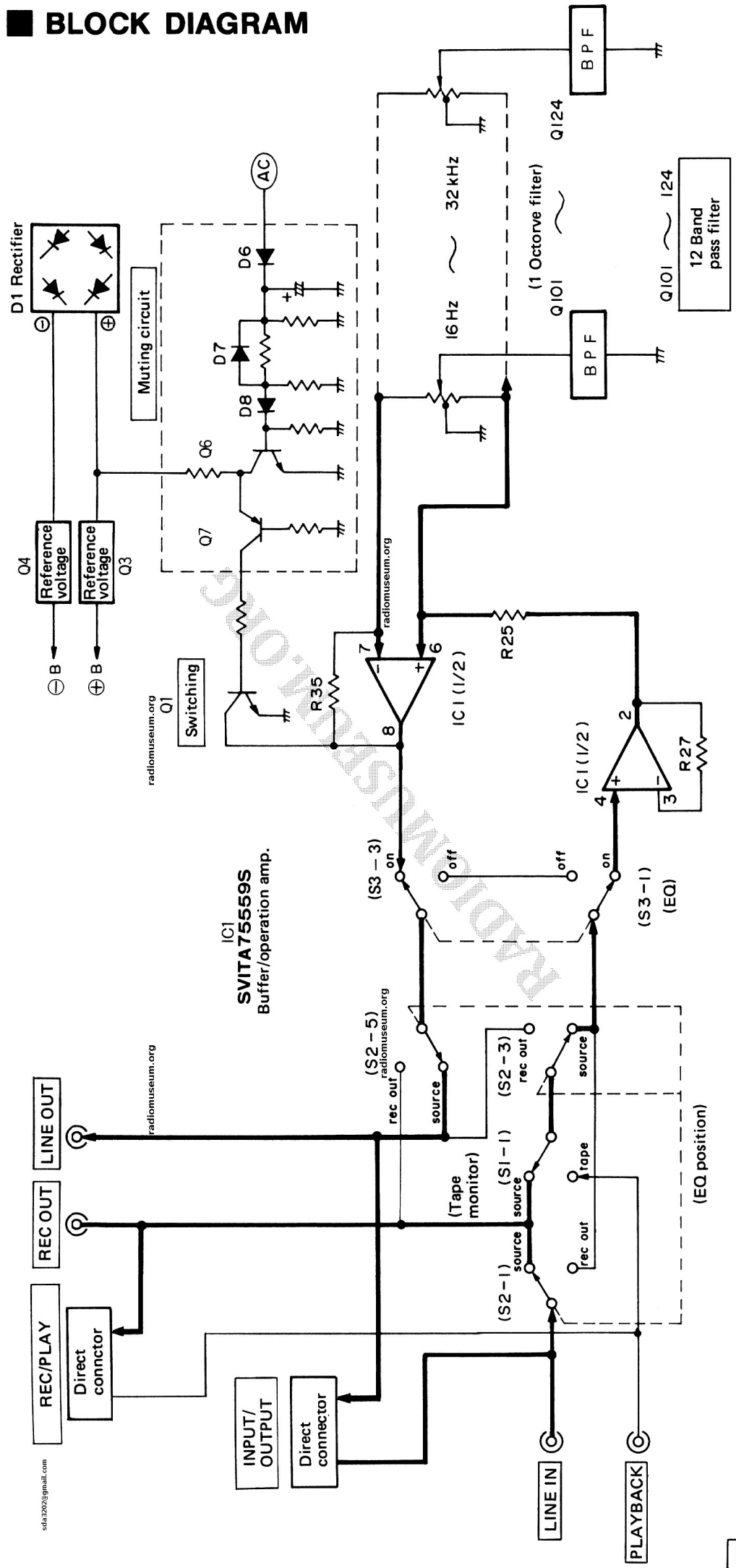


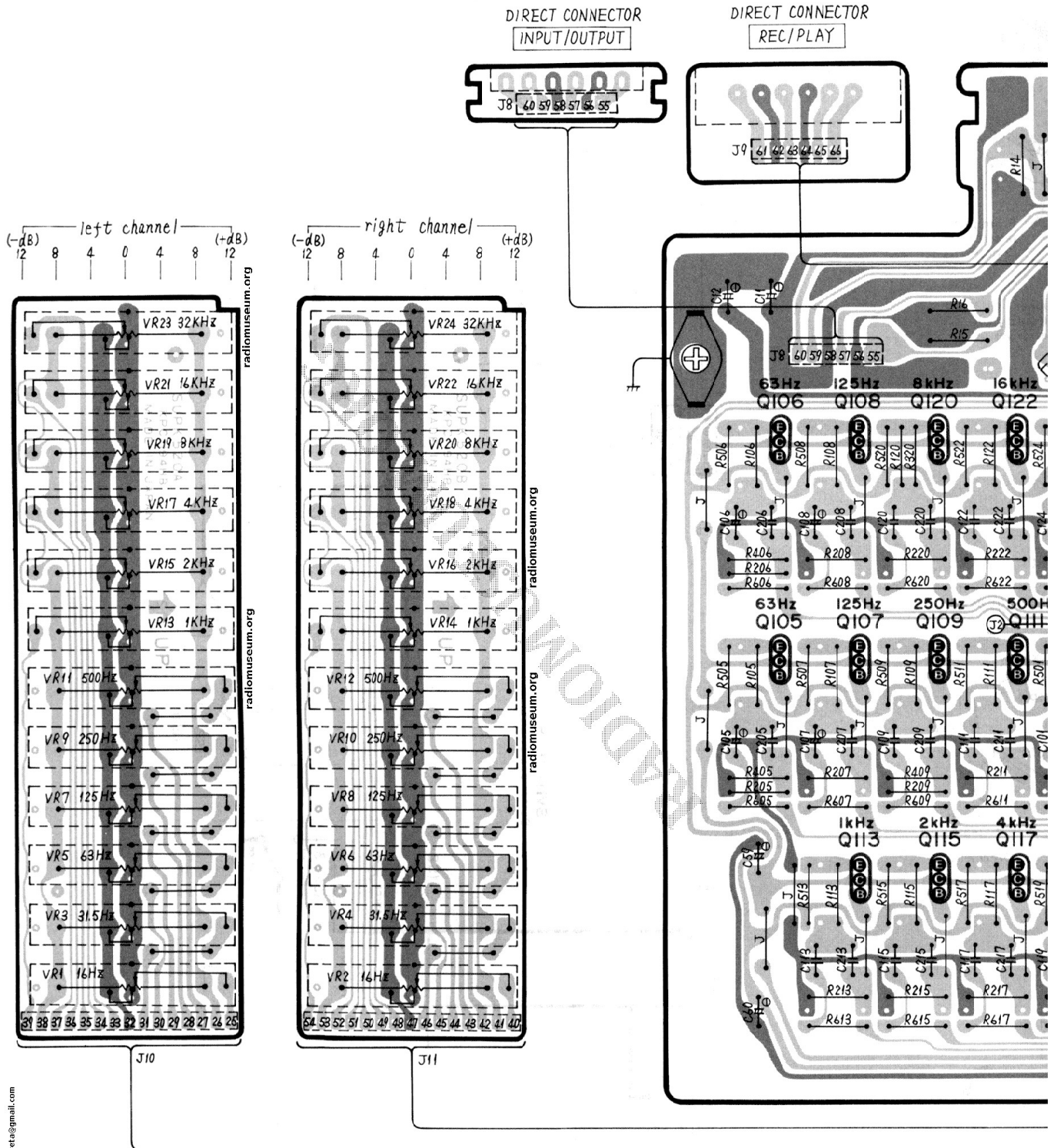
Fig. 6

BLOCK DIAGRAM



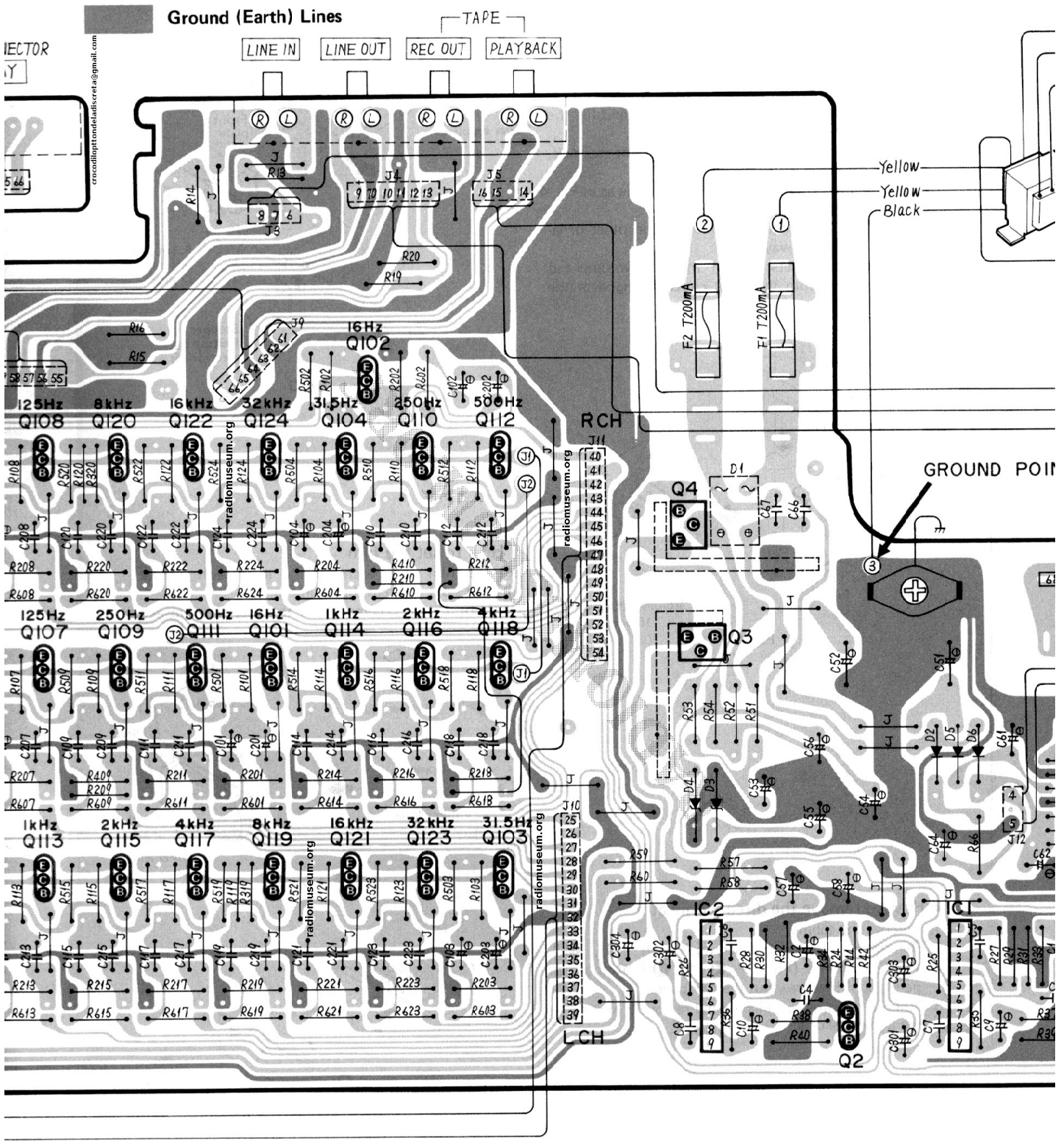
CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM

Ground



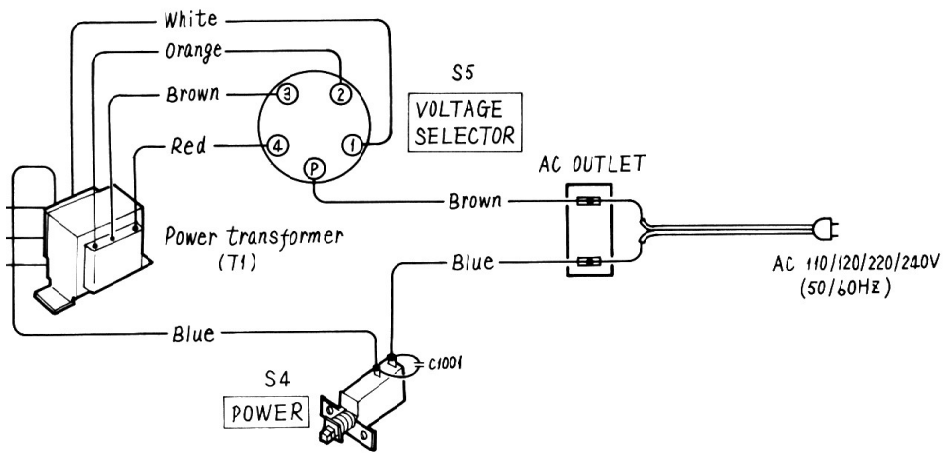
crocodilopttondelufrecta@gmail.com

106	108	120	122
105	107	109	111
	113	115	117

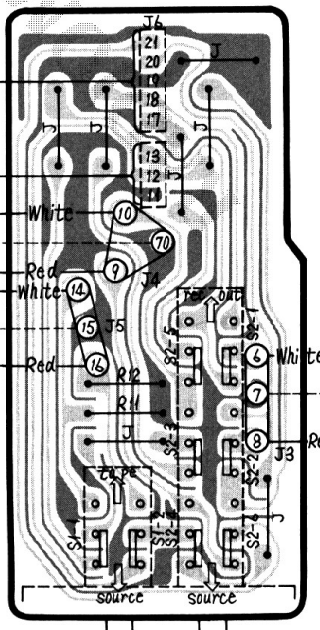
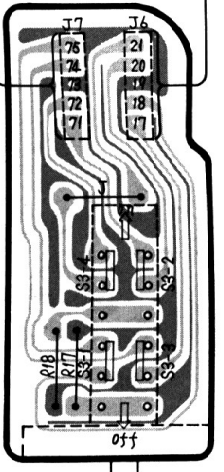
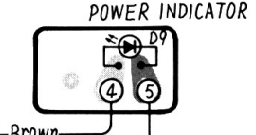
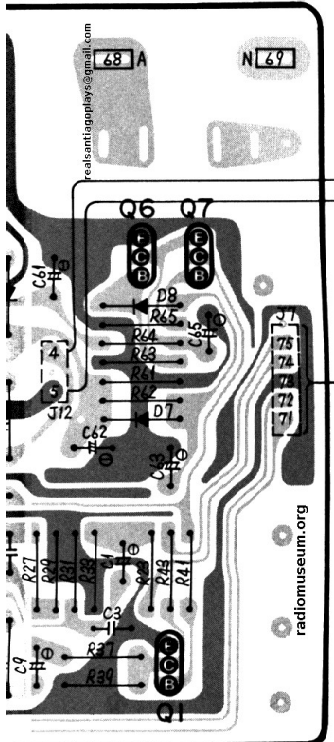


				102				
108	120	122	124	104	110	112		4
107	109	111	101	114	116	118		3
113	115	117	119	121	123	103		2

SH-E5

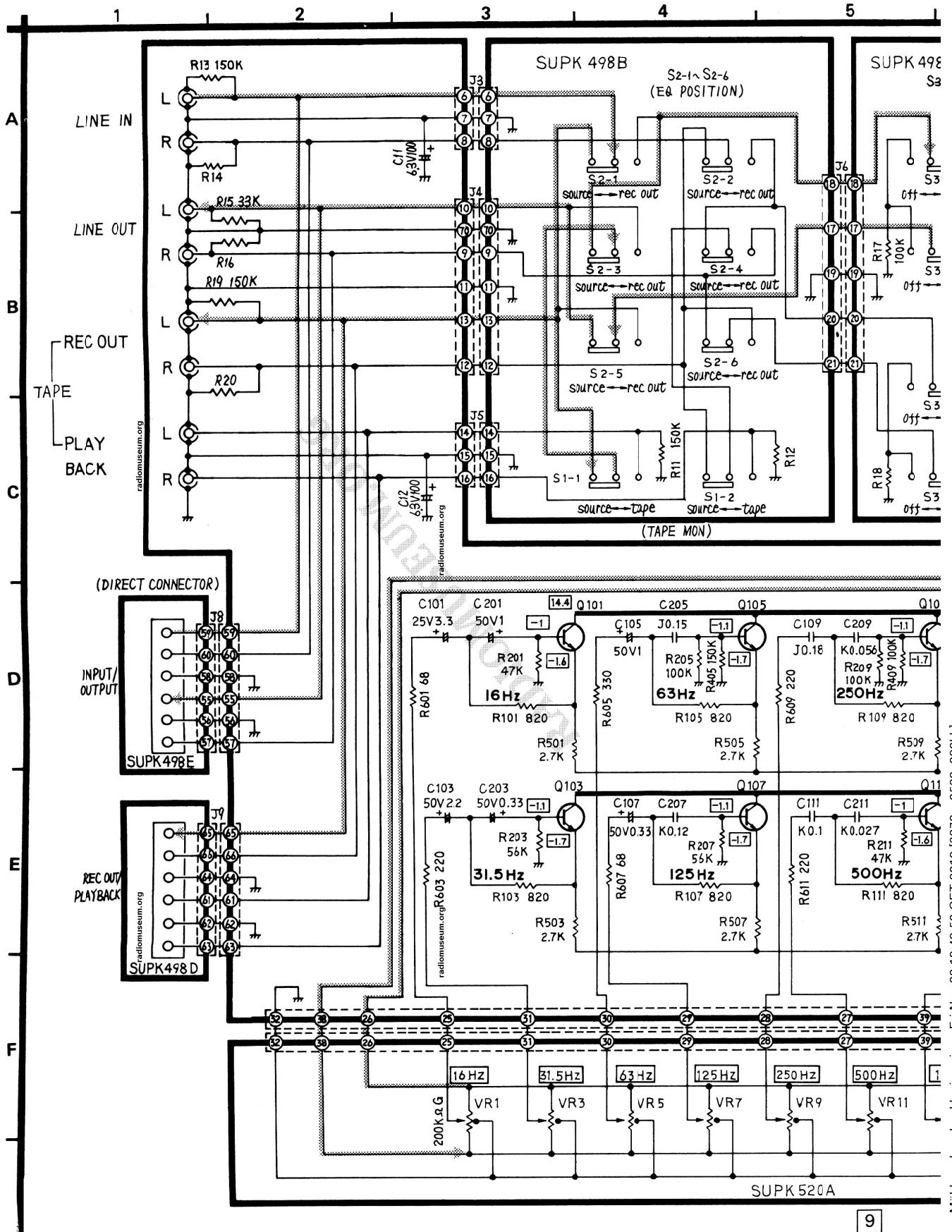


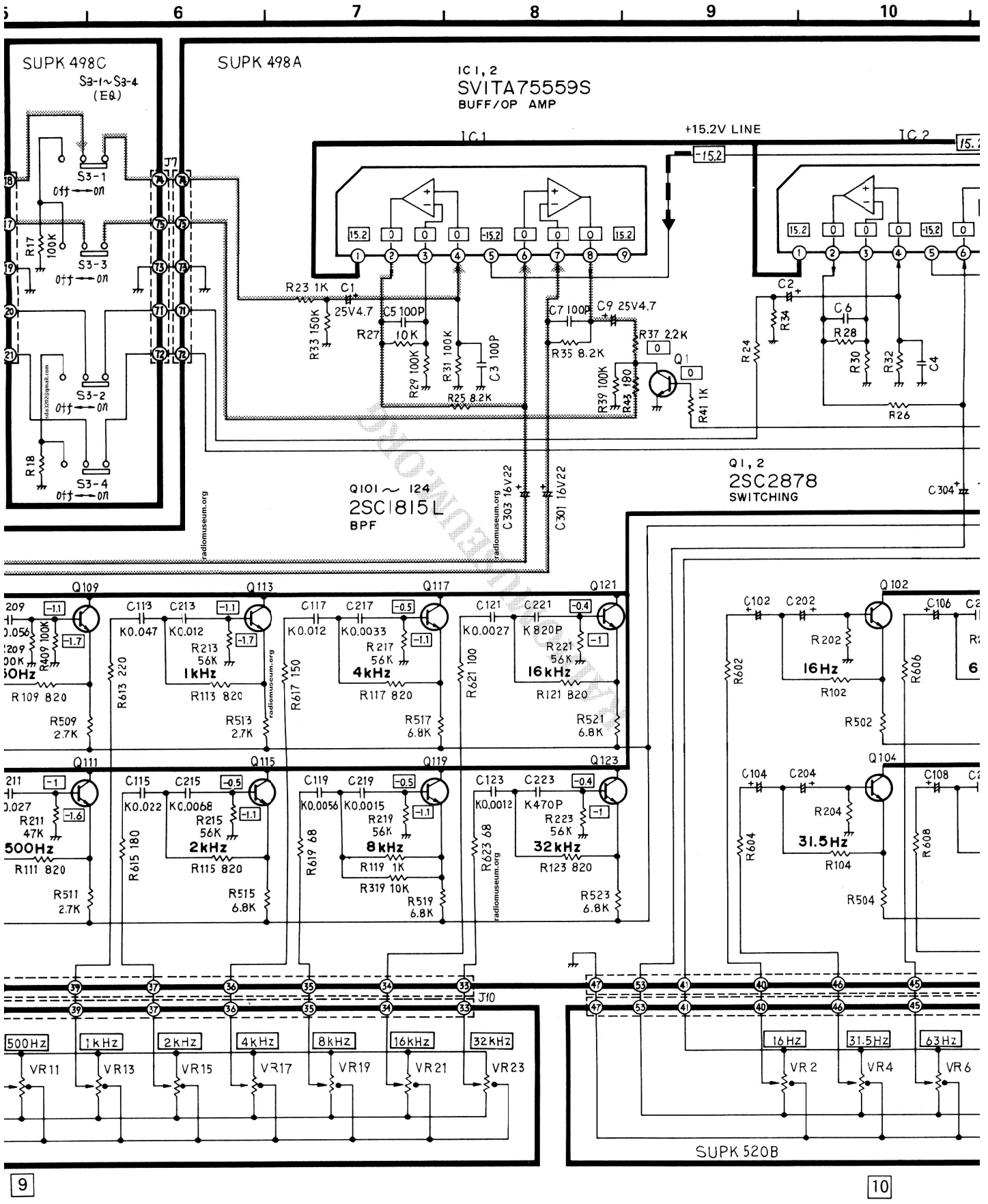
GROUND POINT

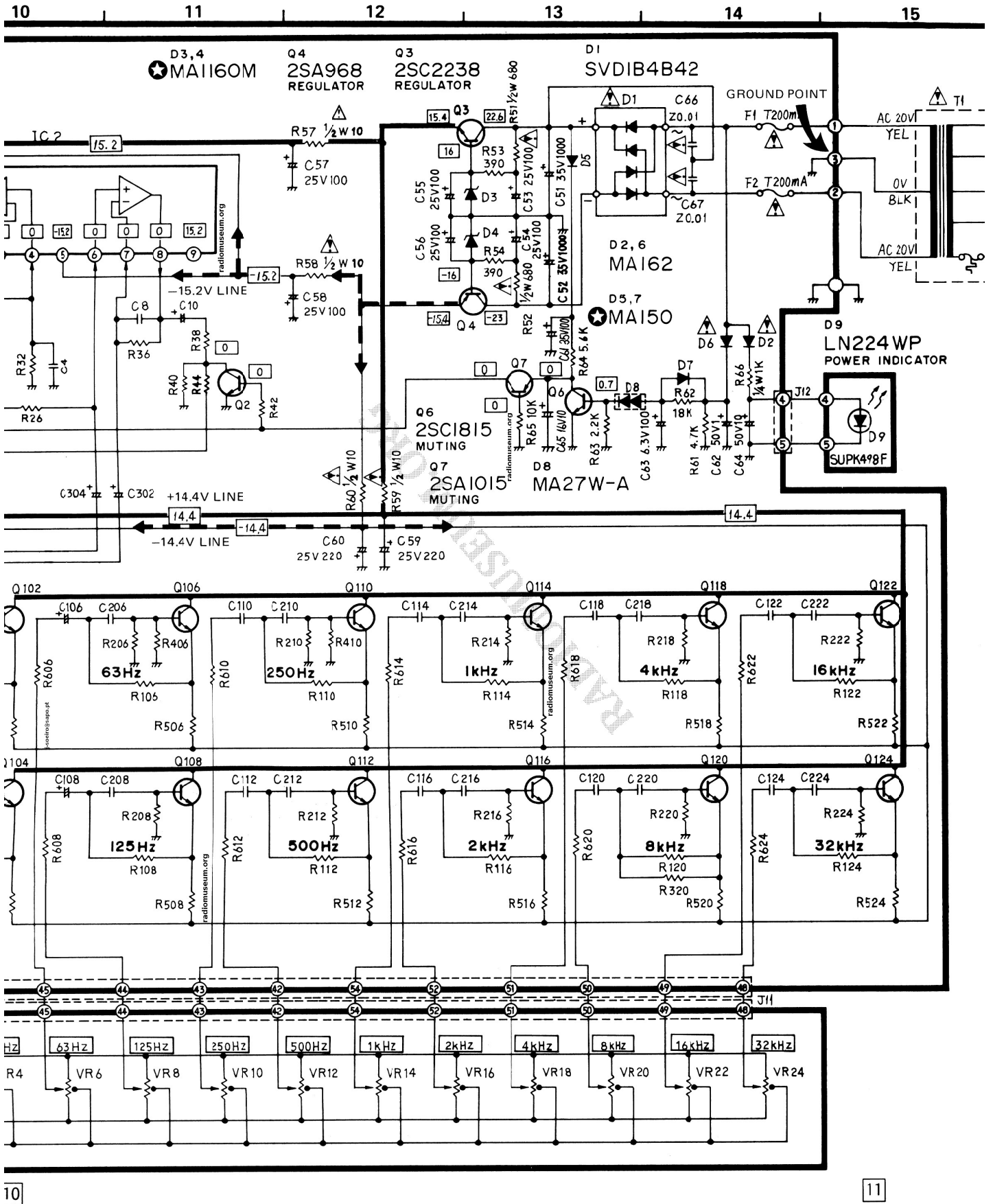


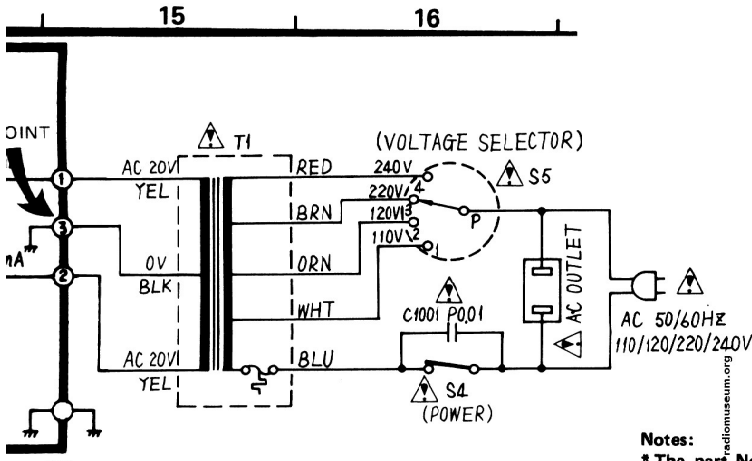
SCHEMATIC DIAGRAM

(This schematic diagram may be modified at any time with the development of new techno

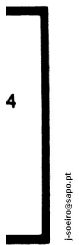
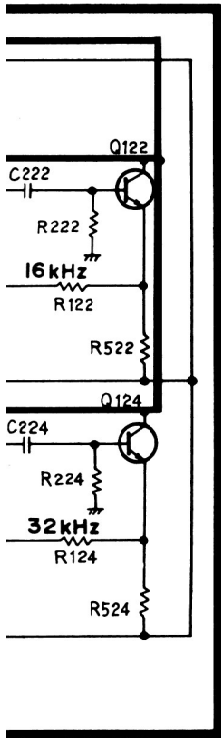
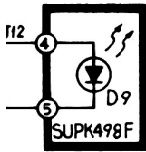








D9
LN224WP
POWER INDICATOR



11

Notes:

* The part No. of transistors, IC and diodes mentioned in the schematic diagram stand for production part No. Regarding the part No. with Ⓞ mark, the production part No. are different from the replacement part No. Therefore, when placing an order for replacement parts, please use the part No. in the replacement parts list.

- This is the basic circuit diagram (For continental Europe) of this unit. Note that part of the circuit is subject to change depending on the areas.
- Regarding the circuits to be changed in the basic circuit diagram (For continental Europe) and related areas [EK], [EW], [EGA] and [XL], refer to separated service manual (Order No. SD82062214 C8-A).
- S1-1 ~ S1-2** : Tape monitor switch in "source" position.
source → tape
- S2-1 ~ S2-6** : Equalization position (position) switch in "source" position.
source → rec out
- S3-1 ~ S3-4** : Equalization (EQ) switch in "on" position.
- S4** : Power switch in "on" position.
- S5** : Voltage selector switch in "220V" position.
110V → 120V → 220V → 240V
- The R and L channels use the same circuit. For the resistance and capacity of R channel, refer to the L channel.
- Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.
- Signal lines of left channel.
- Positive (+B) voltage lines. Negative (-B) voltage lines.
- Important safety notice:
Components identified by Δ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

• Terminal guide of transistors, IC and diodes

<p>SV1TA75559S</p>	<p>2SA1015, 2SC1815, 2SC2827</p>	<p>2SA968, 2SC2238</p>	<p>SVD1B4B42</p>
<p>MA1160</p>	<p>MA162A, MA150</p>	<p>MA27W-A</p>	<p>LN224WP</p>

12