

Service Manual

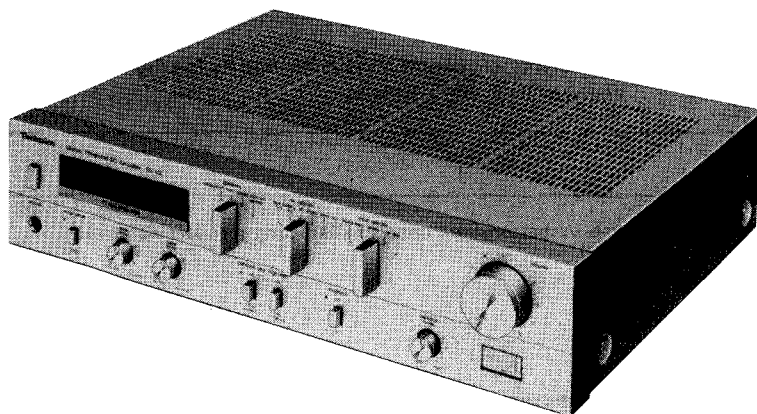
Stereo Integrated DC Amplifier

SU-V3

[E],[EG],[EK],[EF],[EH],
[EB],[Ei],[XA],[XL]

SU-V3(K)

[E],[EG],[EH],[EB],
[Ei],[XA]



- * 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.

Areas

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

English

Specifications

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

(DIN 45 500)

■ AMPLIFIER SECTION

20 Hz~20 kHz continuous power output both channels driven	2 × 45W (4Ω) 2 × 40W (8Ω)
40 Hz~16 kHz continuous power output both channels driven	2 × 45W (4Ω) 2 × 40W (8Ω)
1 kHz continuous power output both channels driven	2 × 50W (4Ω) 2 × 45W (8Ω)
Total harmonic distortion	
rated power at 20 Hz~20 kHz	0.03% (4Ω) 0.007% (8Ω)
rated power at 40 Hz~16 kHz	0.03% (4Ω) 0.007% (8Ω)
rated power at 1 kHz	0.007% (4Ω) 0.003% (8Ω)
half power at 20 Hz~20 kHz	0.007% (8Ω)
half power at 1 kHz	0.003% (8Ω)
-26 dB power at 1 kHz	0.05% (4Ω)
50 mW power at 1 kHz	0.08% (4Ω)
Intermodulation distortion	
rated power at 250 Hz: 8 kHz=4:1, 4Ω	0.03%
rated power at 60 Hz: 7 kHz=4:1, SMPTE, 8Ω	0.007%
Power bandwidth	
both channels driven, -3 dB	5 Hz~30 kHz (4Ω THD 0.03%) 5 Hz~30 kHz (8Ω THD 0.02%)
Residual hum and noise	0.5 mV
Damping factor	20 (4Ω), 40 (8Ω)

Input sensitivity and impedance

PHONO	2.5 mV/47kΩ
TUNER, AUX	150 mV/22kΩ
TAPE 1 REC/PLAY	180 mV/27kΩ
TAPE 2	150 mV/22kΩ
PHONO maximum input voltage (1 kHz, RMS)	150 mV
S/N	
rated power (4Ω)	
PHONO	78 dB (IHF, A: 82dB)
TUNER, AUX	89 dB (IHF, A: 100 dB)
-26 dB power (4Ω)	
PHONO	68 dB
TUNER, AUX	68 dB
50 mW power (4Ω)	
PHONO	64 dB
TUNER, AUX	65 dB

Frequency response

PHONO	RIAA standard curve ±0.8 dB (30 Hz~15 kHz)
TUNER, AUX, TAPE	2 Hz~100 kHz (-3 dB) +0 dB (20 Hz~20 kHz) -0.2 dB (20 Hz~20 kHz)

Tone controls

BASS	50 Hz, +10 dB~-10 dB
TREBLE	20 kHz, +10 dB~-10 dB
Subsonic filter	30 Hz, -6 dB/oct.
High-cut filter	7 kHz, -6 dB/oct.
Loudness control (volume at -30 dB)	50 Hz, +9 dB

Continued on page 2

Technics

Matsushita Electric Trading Co., Ltd.

P.O. Box 288, Central Osaka Japan

Output voltage and impedance

REC OUT	150 mV
REC/PLAY	30 mV/82kΩ
Channel balance, AUX 250 Hz~6,300 Hz	±1.0 dB
Channel separation, AUX 1 kHz	55 dB
Headphones output level and impedance	420 mV/330Ω
Load impedance	
MAIN or REMOTE	4Ω~16Ω
MAIN and REMOTE	8Ω~16Ω

■ GENERAL

Power consumption	460W
Power supply	AC 50 Hz/60 Hz, 110V/120V/220V/240V
Dimensions (W×H×D)	430 × 97 × 310 mm (16-15/16" × 3-13/16" × 12-7/32")
Weight	7.2 kg (15.9 lb.)

Note:

Total harmonic distortion is measured by the digital spectrum analyzer (H.P. 3045 system).

Deutsch

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

(DIN 45 500)

■ VERSTÄRKERTEIL

Dauerton-Ausgangsleistung bei 20 Hz ~ 20 kHz

beide Kanäle angesteuert	2 × 45W (4 Ω)
	2 × 40W (8 Ω)

Dauerton-Ausgangsleistung bei 40 Hz ~ 16 kHz

beide Kanäle angesteuert	2 × 45W (4 Ω)
	2 × 40W (8 Ω)

Dauerton-Ausgangsleistung bei 1 kHz

beide Kanäle angesteuert	2 × 50W (4 Ω)
	2 × 45W (8 Ω)

Gesamtklirrfaktor

Nennleistung bei 20 Hz ~ 20 kHz	0,03% (4 Ω)
	0,007% (8 Ω)
Nennleistung bei 40 Hz ~ 16 kHz	0,03% (4 Ω)
	0,007% (8 Ω)
Nennleistung bei 1 kHz	0,007% (4 Ω)
	0,003% (8 Ω)
halbe Nennleistung bei 20 Hz ~ 20 kHz	0,007% (8 Ω)
halbe Nennleistung bei 1 kHz	0,003% (8 Ω)
-26 dB Leistung bei 1 kHz	0,05% (4 Ω)
50 mW Leistung bei 1 kHz	0,08% (4 Ω)

Intermodulationsfaktor

Nennleistung bei 250 Hz: 8 kHz = 4:1, 4 Ω	0,03%
Nennleistung bei 60 Hz: 7 kHz = 4:1, nach SMPTE, 8 Ω	0,007%

Leistungsbandbreite

beide Kanäle angesteuert bei -3 dB	
5 Hz ~ 30 kHz (4 Ω, THD 0,03%)	
5 Hz ~ 30 kHz (8 Ω, THD 0,02%)	

Restbrumm und Geräusch

Dämpfungsfaktor 0,5 mV

Dämpfungsabstand

Nennleistung (4 Ω)	
Phono	78 dB (82 dB nach IHF, A)
Tuner, Aux	89 dB (nach IHF, A: 100 dB)

-26 dB Leistung (4 Ω)

Phono	68 dB
Tuner, Aux	68 dB

50 mW Leistung (4 Ω)

Phono	64 dB
Tuner, Aux	65 dB

Maximale TA-Eingangsspannung (1 kHz, eff.) 150 mV

Eingangsempfindlichkeit und -impedanz

Phono	2,5 mV/47 kΩ
Tuner, Aux	150 mV/22 kΩ
Tape 1 Aufnahme/Wiedergabe (TAPE 1 REC/PLAY)	
	180 mV/27 kΩ
Tape 2 (TAPE 2)	150 mV/22 kΩ

Frequenzgang

Phono	RIAA-Standardkurve
	±0,8 dB (30 Hz ~ 15 kHz)
Tuner, Aux, Tape	2 Hz ~ 100 kHz (-3 dB)
	+0 dB (20 Hz ~ 20 kHz)
	-0,2 dB (20 Hz ~ 20 kHz)

Klangregler

Baßregler (BASS)	50 Hz, +10 dB ~ -10 dB
Höhenregler (TREBLE)	20 kHz, +10 dB ~ -10 dB
Tiefenfilter	30 Hz, -6 dB/Okt.
Rauschfilter	7 kHz, -6 dB/Okt.

Gehörriichtige Lautstärkekorektur (Loudness)

(bei -30 dB Ausgangsleistung) 50 Hz, +9 dB

Ausgangsspannung und -impedanz

Aufnahme (REC OUT)	150 mV
Aufnahme/Wiedergabe (REC/PLAY)	30 mV/82 kΩ

Kanalabweichung (Aux, 250 Hz ~ 6300 Hz)

±1,0 dB

Übersprechdämpfung (Aux, 1 kHz)

55 dB

Kopfhörerpegel und -impedanz

420 mV/330 Ω

Lautsprecherimpedanz

MAIN oder REMOTE	4 Ω ~ 16 Ω
MAIN und REMOTE	8 Ω ~ 16 Ω

■ ALLGEMEINE DATEN

Leistungsaufnahme

460 W

Netzspannung

Wechselstrom 50 Hz/60 Hz, 110V/120V/220V/240V

Abmessungen (B×H×T)

430 × 97 × 310 mm

Gewicht

7,2 kg

Bemerkung:

Der Gesamtklirrfaktor wurde mit einem digitalen Rauschspektrometer (Anlage H.P. 3045) gemessen.

Français

CARACTERISTIQUES

(Sujet à changement sans préavis.)

(DIN 45 500)**■ SECTION AMPLIFICATEUR**

Puissance de sortie continue de 20 Hz~20 kHz,
les deux canaux en circuit 2 × 45W (4Ω)
2 × 40W (8Ω)

Puissance de sortie continue de 40 Hz~16 kHz,
les deux canaux en circuit 2 × 45W (4Ω)
2 × 40W (8Ω)

Puissance de sortie continue à 1 kHz
les deux canaux en circuit 2 × 50W (4Ω)
2 × 45W (8Ω)

Distorsion harmonique totale
à puissance nominale (20 Hz~20 kHz) 0,03% (4Ω)
0,007% (8Ω)

à puissance nominale (40 Hz~16 kHz) 0,03% (4Ω)
0,007% (8Ω)

à puissance nominale (1 kHz) 0,007% (4Ω)
0,003% (8Ω)

à demi-puissance (20 Hz~20 kHz) 0,007% (8Ω)

à demi-puissance (1 kHz) 0,003% (8Ω)

puissance de -26 dB à 1 kHz 0,05% (4Ω)

puissance de 50 mW à 1 kHz 0,08% (4Ω)

Distorsion d'intermodulation
à puissance nominale à 250 Hz: 8 kHz=4:1, 4Ω 0,03%
à puissance nominale à 60 Hz: 7 kHz=4:1, SMPTE, 8Ω 0,007%

Réponse de fréquences
les deux canaux en circuit, -3 dB
5 Hz~30 kHz (4Ω, THD 0,03%)
5 Hz~30 kHz (8Ω, THD 0,02%)

Bruit et ronflement résiduels 0,5 mV

Coefficient d'amortissement 20 (4Ω), 40 (8Ω)

Signal/Bruit
à puissance nominale (4Ω)
PHONO 78 dB (82 dB, IHF, A)
SYNTHONISATEUR, AUX (TUNER, AUX) 89 dB (IHF, A: 100 dB)

puissance de -26 dB (4Ω)

PHONO 68 dB

SYNTHONISATEUR, AUX (TUNER, AUX) 68 dB

puissance de 50 mW (4Ω)

PHONO 64 dB

SYNTHONISATEUR, AUX (TUNER, AUX) 65 dB

PHONO (tension d'entrée maximum, 1 kHz RMS) 150 mV

Sensibilité et impédance d'entrée

PHONO 2,5 mV/47kΩ

SYNTHONISATEUR, AUX (TUNER, AUX) 150 mV/22kΩ

BANDE 1, ENREGISTREMENT/LECTURE
(TAPE 1 REC/PLAY) 180 mV/27kΩ

BANDE 2 (TAPE 2) 150 mV/22kΩ

Réponse de fréquence

PHONO Courbe nominale RIAA
±0,8 dB (30 Hz~15 kHz)

SYNTHONISATEUR, AUX, BANDE (TUNER, AUX, TAPE)
2 Hz~100 kHz (-3 dB)
+0 dB (20 Hz~20 kHz)
-0,2 dB (20 Hz~20 kHz)

Réglage de la tonalité

BASSES (BASS) 50 Hz, +10 dB~ -10 dB

AIGUS (TREBLE) 20 kHz, +10 dB~ -10 dB

Filtre subsonique 30 Hz, -6 dB/oct.

Filtre coupe-hauts 7 kHz, -6 dB/oct.

Compensateur physiologique (volume à -30 dB)
50 Hz, +9 dB

Tension de sortie et impédance

SORTIE ENREGISTREMENT (REC OUT) 150 mV

ENREGISTREMENT/LECTURE (REC/PLAY) 30 mV/82kΩ

Equilibrage des canaux, AUX 250 Hz~6 300 Hz ±1,0 dB

Séparation des canaux, AUX 1 kHz 55 dB

Niveau de sortie des casques et impédance 420 mV/330Ω

Impédance de charge

PRINCIPALE ou AUXILIAIRE (MAIN or REMOTE)
4Ω~16Ω

PRINCIPALE et AUXILIAIRE (MAIN and REMOTE)
8Ω~16Ω

■ DIVERS

Consommation 460W

Alimentation CA 50 Hz/60 Hz, 110V/120V/220V/240V

Dimensions (L×H×Pr) 430 × 97 × 310 mm

Poids 7,2 kg

Remarque:

On mesure la distorsion harmonique totale au moyen d'un analyseur de spectre digital (Système H.P. 3045).

Español

ESPECIFICACIONES

(Estas especificaciones están sujetas a cualquier cambio sin previo aviso.)

(DIN 45 500)**■ SECCION AMPLIFICADOR**

Potencia continua de 20 Hz~20 kHz
en ambos canales 2 × 45W (4Ω)
2 × 40W (8Ω)

Potencia continua de 40 Hz~16 kHz
en ambos canales 2 × 45W (4Ω)
2 × 40W (8Ω)

Potencia continua de 1 kHz
en ambos canales 2 × 50W (4Ω)
2 × 45W (8Ω)

Distorsión armónica total

potencia de régimen a 20 Hz~20 kHz 0,03% (4Ω)
0,007% (8Ω)

potencia de régimen a 40 Hz~16 kHz 0,03% (4Ω)
0,007% (8Ω)

potencia de régimen a 1 kHz 0,007% (4Ω)
0,003% (8Ω)

mitad de potencia a 20 Hz~20 kHz 0,007% (8Ω)

mitad de potencia a 1 kHz 0,003% (8Ω)

-26 dB de potencia a 1 kHz 0,05% (4Ω)

50 mW de potencia a 1 kHz 0,08% (4Ω)

Continuado en la página 4.

Distorsión por intermodulación

potencia de régimen a 250 Hz: 8 kHz=4:1, 4Ω 0,03%
 potencia de régimen a 60 Hz: 7 kHz=4:1, SMPTE, 8Ω 0,007%

Ancho de banda de potencia con ambos canales, -3 dB

5 Hz~30 kHz (4Ω, THD 0,03%)
 5 Hz~30 kHz (8Ω, THD 0,02%)

Zumbido residual y ruido

Factor de amortiguamiento 20 (4Ω), 40 (8Ω) 0,5 mV

Sensibilidad e impedancia de entrada

TOCADISC. (PHONO) 2,5 mV/47kΩ
 SINTON., AUX. (TUNER, AUX) 150 mV/22kΩ
 GRAB. 1 GRAB./REPR. (TAPE 1 REC/PLAY) 180 mV/27kΩ

GRAB. 2 (TAPE 2)

150 mV/22kΩ

Voltaje máximo de entrada de PHONO (1 kHz, RMS) 150 mV

Relación de señal a ruido

potencia de régimen (4Ω)
 TOCADISC. (PHONO) 78 dB (82 dB, IHF, A)
 SINTON., AUX. (TUNER, AUX) 89 dB (IHF, A: 100 dB)

-26 dB de potencia (4Ω)

TOCADISC. (PHONO) 68 dB
 SINTON., AUX. (TUNER, AUX) 68 dB

50 mW de potencia (4Ω)

TOCADISC. (PHONO) 64 dB
 SINTON., AUX. (TUNER, AUX) 65 dB

Respuesta de frecuencia

TOCADISC. (PHONO) curva RIAA estándar
 ±0,8 dB (30 Hz~15 kHz)

SINTON., AUX., GRAB. (TUNER, AUX, TAPE)

2 Hz~100 kHz (-3 dB)
 +0 dB (20 Hz~20 kHz)
 -0,2 dB (20 Hz~20 kHz)

Controles de tono

BAJOS (BASS) 50 Hz, +10 dB~-10 dB

AGUDOS (TREBLE) 20 kHz, +10 dB~-10 dB

Filtro subsónico 30 Hz, -6 dB/oct.

Filtro de corte de altos 7 kHz, -6 dB/oct.

Control de sonoridad (volumen a -30 dB) 50 Hz, +9 dB

Voltaje e impedancia de salida

SAL. GRAB. (REC OUT) 150 mV

GRAB./REPR. (REC/PLAY) 30 mV/82kΩ

Equilibrio de canales, AUX 250 Hz~6 300 Hz ±1,0 dB

Separación de canales, AUX 1 kHz 55 dB

Impedancia y nivel de salida de los auriculares 420 mV/330Ω

Impedancia de carga

MAIN o REMOTE 4Ω~16Ω

MAIN y REMOTE 8Ω~16Ω

■ GENERAL

Consumo de energía 460W

Alimentación de energía

CA 50 Hz/60 Hz, 110V/120V/220V/240V

Dimensiones (An.×Al.×Prof.) 430 × 97 × 310 mm

Peso 7,2 kg

Nota:

La distorsión armónica total se mide con el analizador de espectro digital (sistema H.P. 3045).

■ PROTECTION CIRCUITRY

The protection circuitry may have operated if either of the following conditions are noticed:

- No sound is heard when the power is turned on.
- Sound stops during a performance.

The function of this circuitry is to prevent circuitry damage if, for example, the positive and negative speaker connection wires are "shorted", or if speaker systems with an impedance less than the indicated rated impedance of this unit are used.

If this occurs, follow the procedure outlined below:

1. Turn off the power.
2. Determine the cause of the problem and correct it.
3. Turn on the power once again.

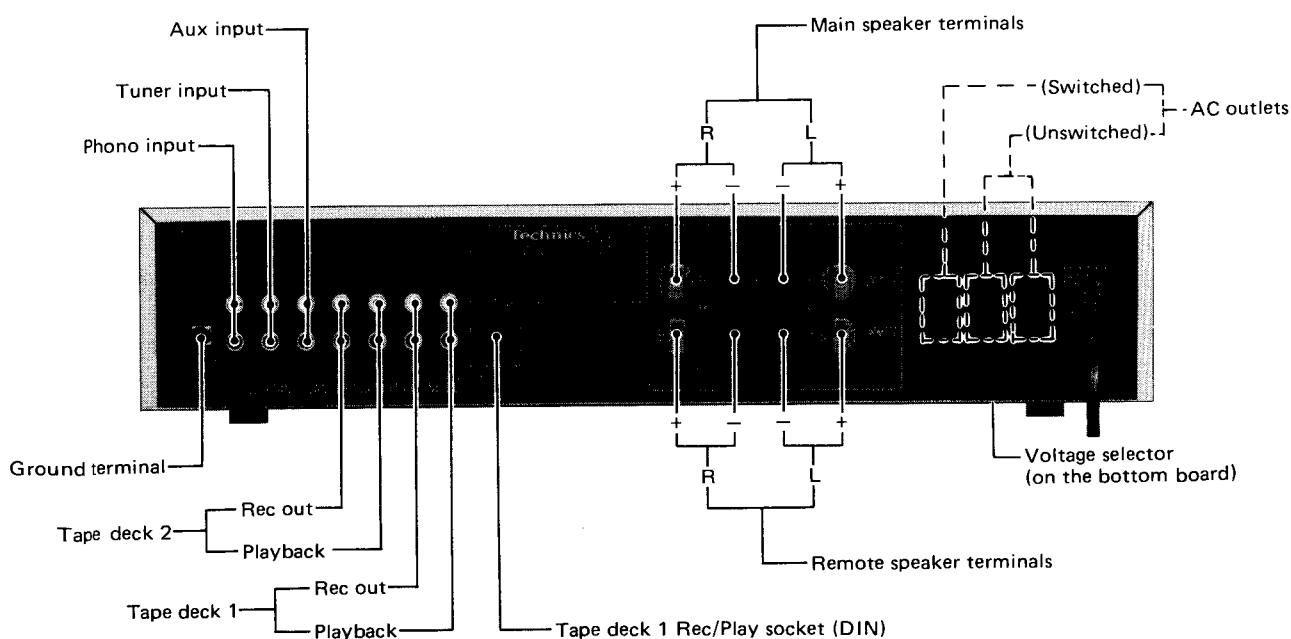
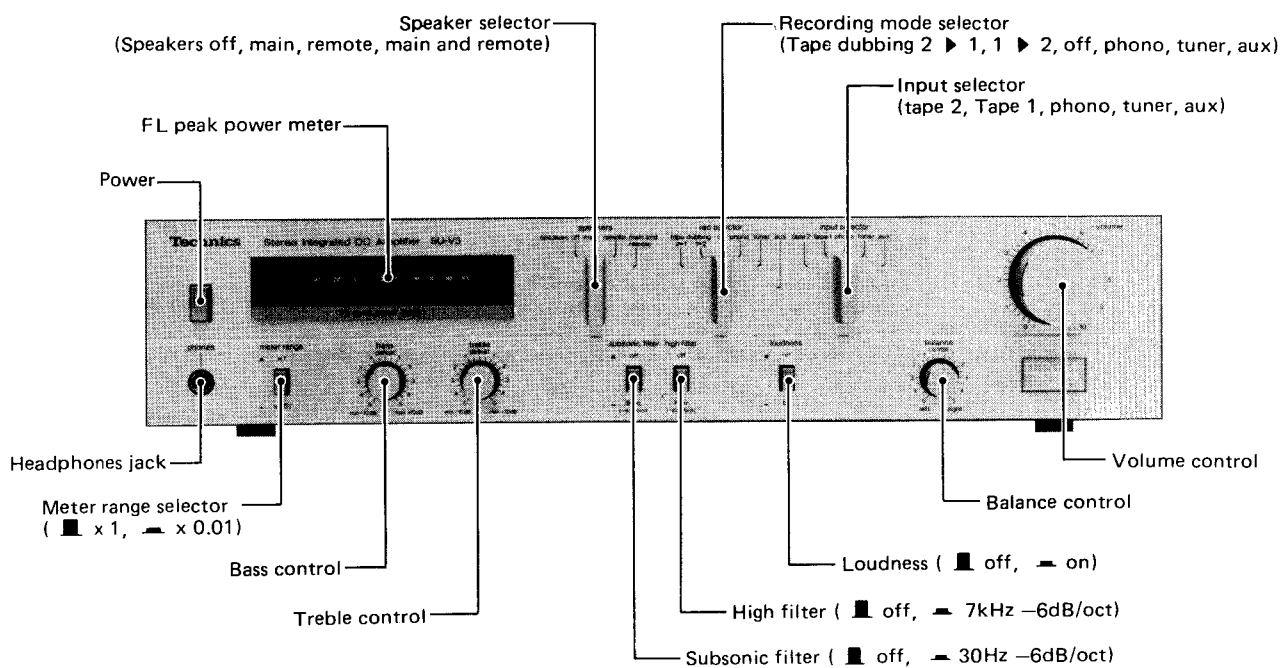
Note:

When the protection circuitry functions, the unit will not operate unless the power is first turned off and then on again.

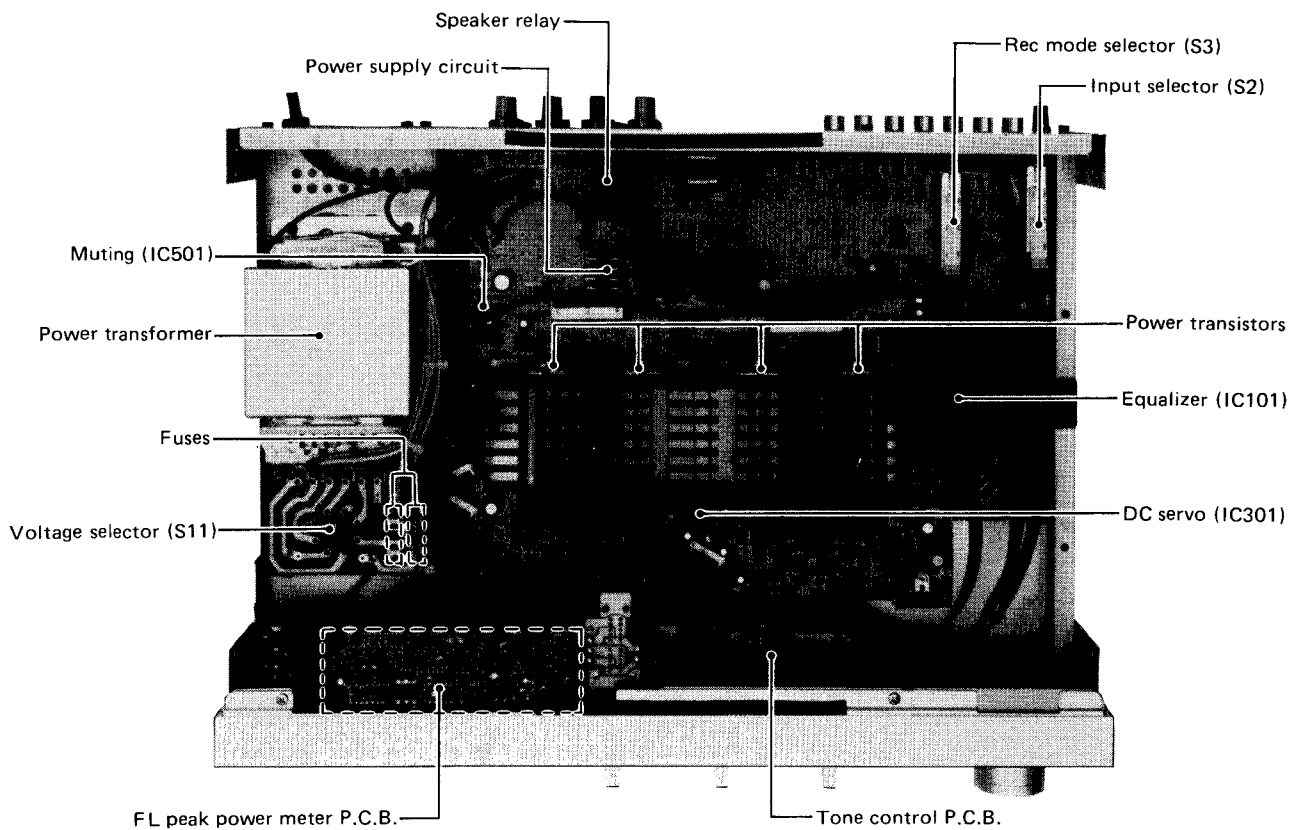
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LOCATION OF CONTROLS



* The product for destination [XA] is equipped with AC outlets.



■ TECHNICAL GUIDE

DESCRIPTION OF MUTING/RELAY DRIVE IC (SVITA7317P)

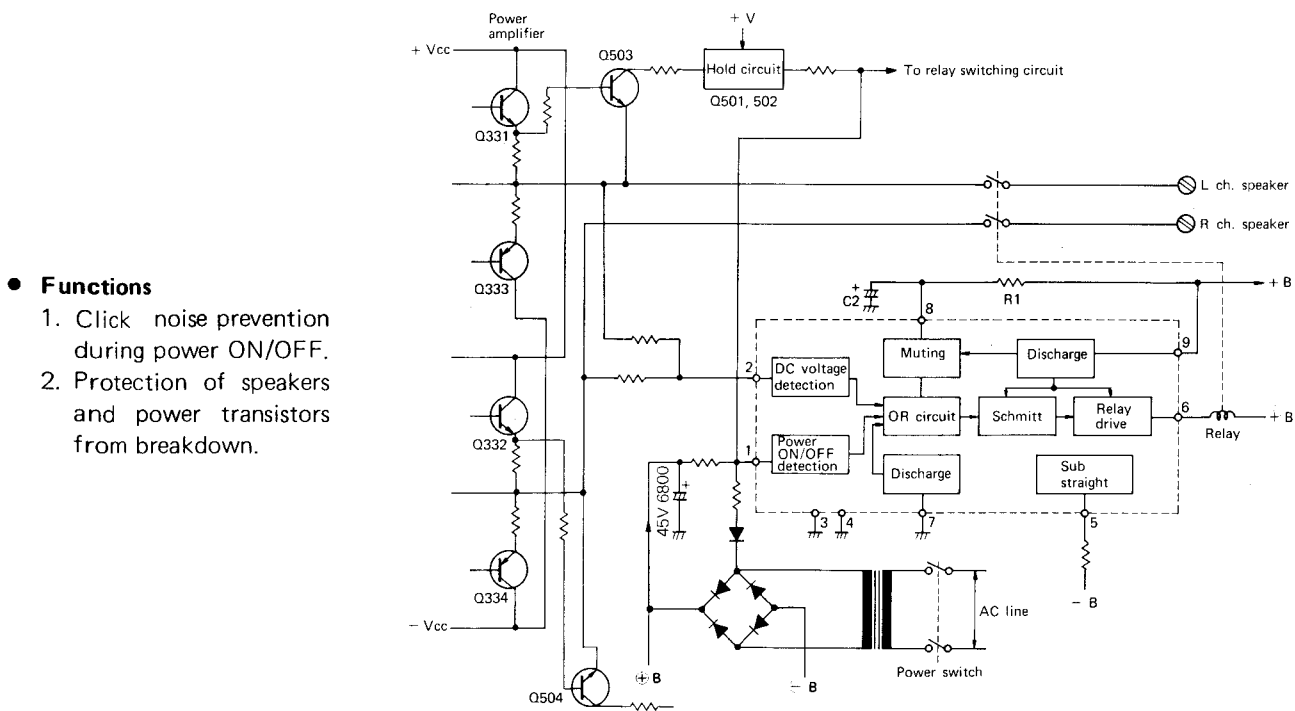
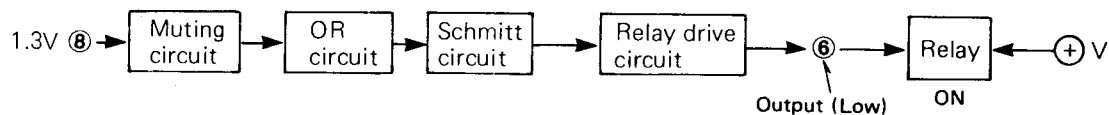


Fig. 1

● Operation

1-1 Relay (RLY401) turns ON about 5 seconds after power ON. Therefore, no click noise is produced from the speaker.



- About 5 seconds after power ON, about 1.3V is applied to terminal (8). This voltage is applied to "OR circuit", turning the "Schmitt circuit" ON, "Relay drive circuit" ON, and the voltage of terminal (6) to "Low", then the relay turns ON.
At that time, $-0.7V$ is applied to terminal (1), causing "power ON/OFF detection circuit" to turn OFF, and the voltage (1.3V) to be applied to the "Schmitt circuit".

(Note) Voltage of terminal (8) is determined by R1 and C2.

(Complete charge characteristic curve)

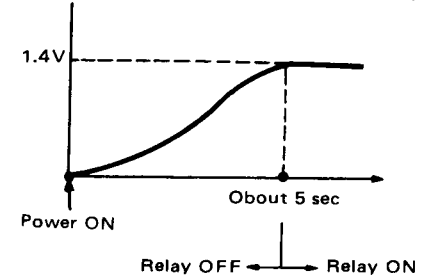
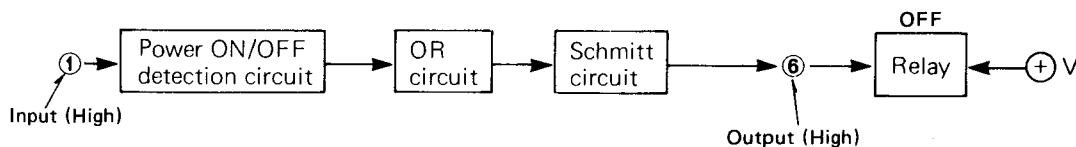
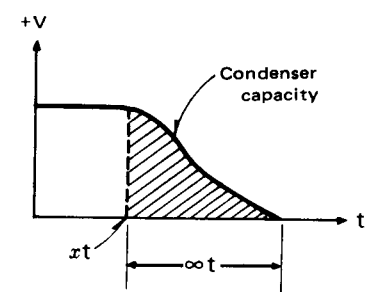
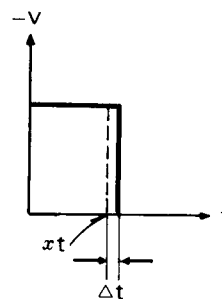


Fig. 2

1-2. No click noise is produced from the speaker when power supply is turned OFF.



- When power supply is turned OFF, the negative (−) voltage drops faster than the positive (+) voltage. At that instant, the positive (+) voltage is applied to terminal (1), turning the "Power ON/OFF detection circuit" ON, "OR circuit" OFF, "Schmitt circuit" ON, "Relay drive circuit" OFF, and the voltage of terminal (6) to "High", then the relay turns OFF.



(Voltage drop time comparison)

Fig. 3

1-3. Difference in drop speed between negative and positive voltages

- No condenser is located on the negative (−) side, while a condenser (45V, 6800 μ F) is on the positive (+) side. Therefore, the voltage drop speed is faster on the negative (−) side.

xt : power switch OFF-time
 Δt : negative (−) voltage drop time
 ∞t : positive (+) voltage drop time
 $\Delta t < \infty t$

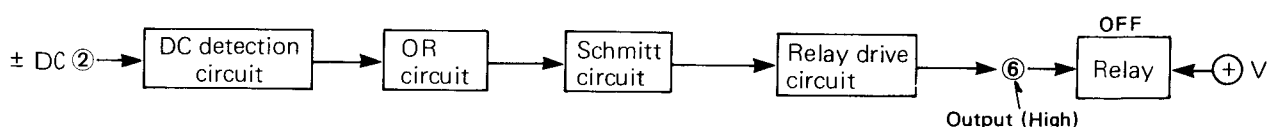
2-1. Protection of power transistor in case of speaker terminal shortcircuit

When speaker terminal is short-circuited, a large amount of current flows into the emitter resistor of power transistor, causing Q503 (in case of Lch) to turn ON. Then, the collector potential becomes zero, and the hold circuit (Q501, 502) is turned ON. As the hold circuit is ON, the voltage level of pin (1) of SVITA7317P becomes high, and so becomes the output of pin (6), causing the relay to turn OFF.

Through these operations, the relay is turned OFF, and the speaker terminal and power amplifier connecting circuit is opened. However, the relay remains turned OFF by the hold circuit (Q501, 502) even in case of no abnormality. So, reset the relay by turning off the power switch.

2-2. It protects the speakers when main amplifier becomes defective

When DC voltage is applied to terminal (2) due to main amplifier trouble, the "DC detection circuit" turns ON, "OR circuit" turns OFF, "Schmitt circuit" ON, "Relay drive circuit" OFF, and the voltage of terminal (6) to "High", then the relay turns OFF, thus protecting the speakers.



DISASSEMBLY INSTRUCTIONS

1. How to remove the cabinet and bottom board

1. Remove the 4 setscrews (1 ~ 4) in Fig. 4) of the cabinet.
2. Remove the 7 setscrews (5 ~ 11) in Fig. 5) of the bottom board.

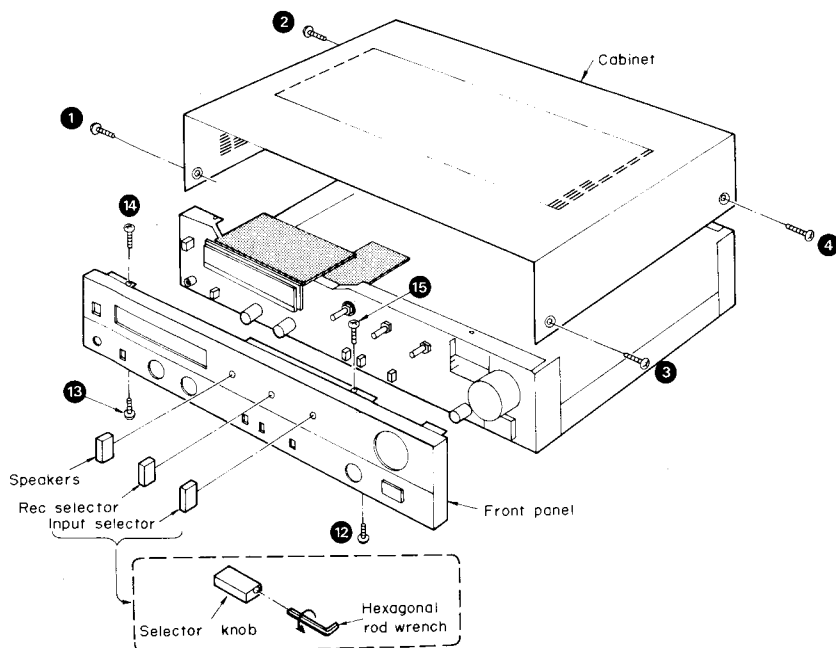


Fig. 4

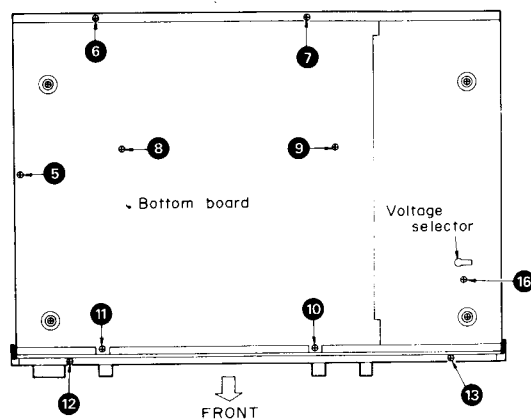


Fig. 5

2. How to remove the front panel

1. Remove the cabinet.
2. Remove the 3 selector knobs. (Use hexagonal rod wrench for M3 screws.) Refer to Fig. 4.
3. Remove the 4 setscrews (12 ~ 15) in Fig. 4) of the front panel.
4. Remove the front panel from the chassis, holding its right and left sides, taking care not to damage the knobs, etc.
5. Fit the transparent cover of FL meter in the front panel window as in Fig. 7 by moving it with fingers as in Fig. 6.

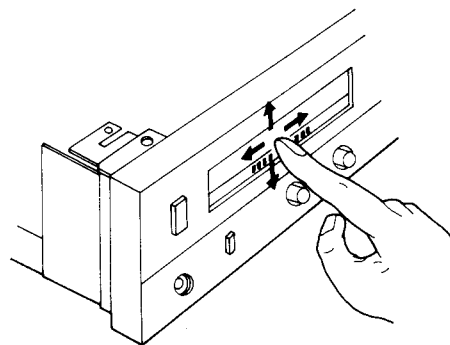


Fig. 6

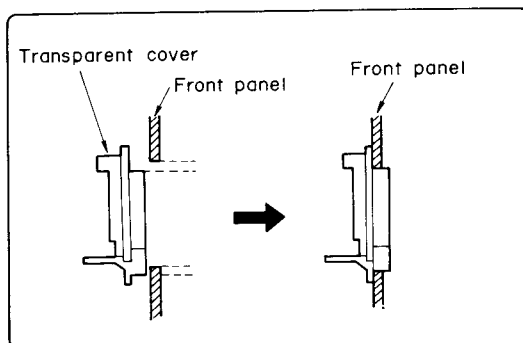
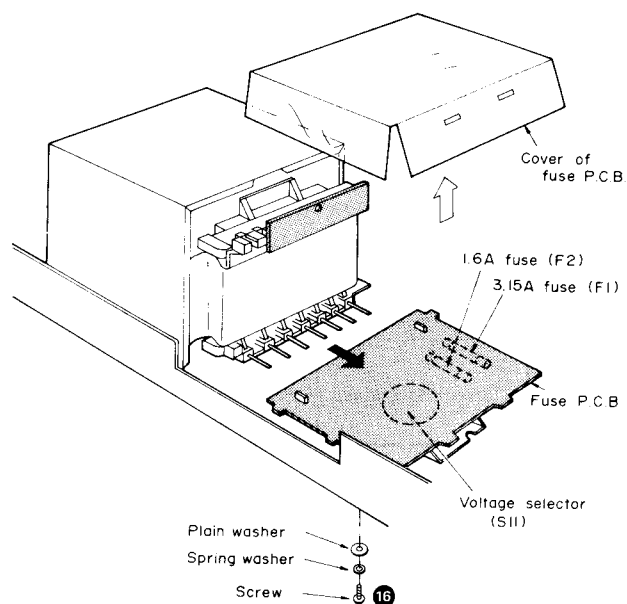


Fig. 7

3. How to remove fuse and voltage selector

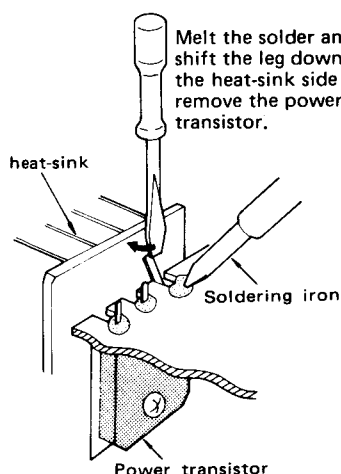
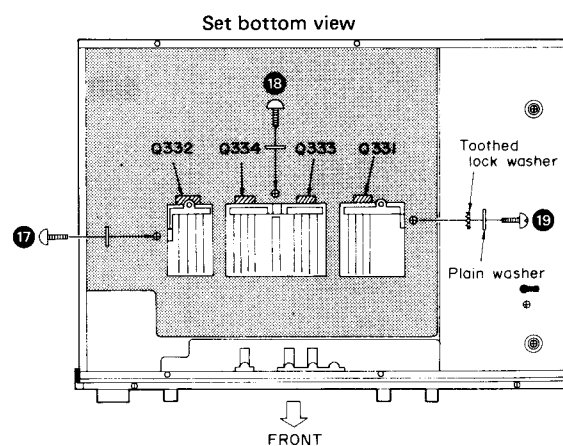
1. Remove the cabinet.
2. Take off the fuse cover.
3. Remove the screw No. 16. (Refer to Fig. 5 and 8)
4. Remove the fuse printed circuit board as in Fig. 8.
5. Replace the fuse.


Fig. 8

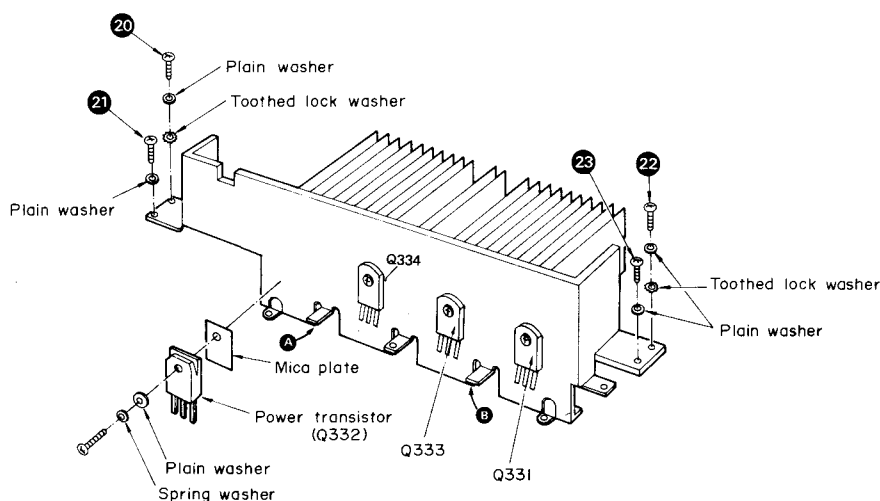
4. How to remove the power transistor

1. Unsolder the power transistor as shown in Fig. 9.
2. Remove the 7 setscrews (17 ~ 23 in Fig. 10 and 11) of heat-sink and then lift the heat-sink along with the power transistor.
3. When installing the power transistor, apply heat diffusing agent (silicon powder, etc.) to both sides of the mica plate, and secure it on the heat-sink with setscrews. Next, secure the heat-sink on the chassis and then solder the power transistors.

Also, when installing heat-sink, apply heat diffusing compound (silicon powder, etc.) to **A** and **B** point. (Refer to Fig. 11)


Fig. 9


FRONT

Fig. 10

Fig. 11

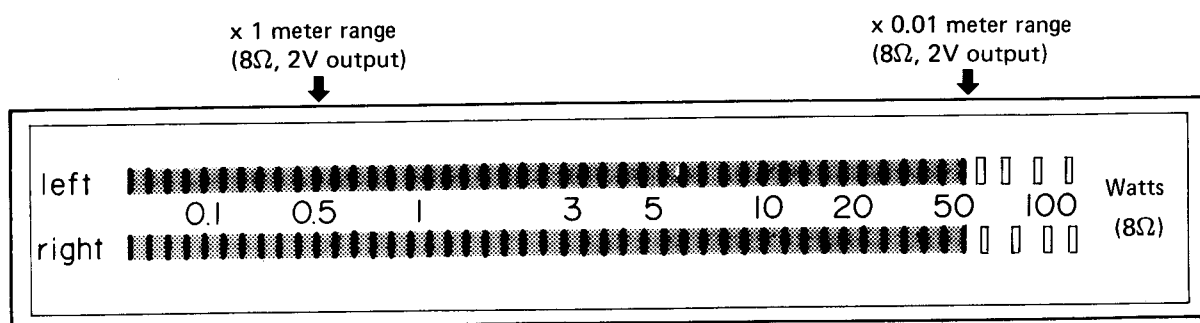
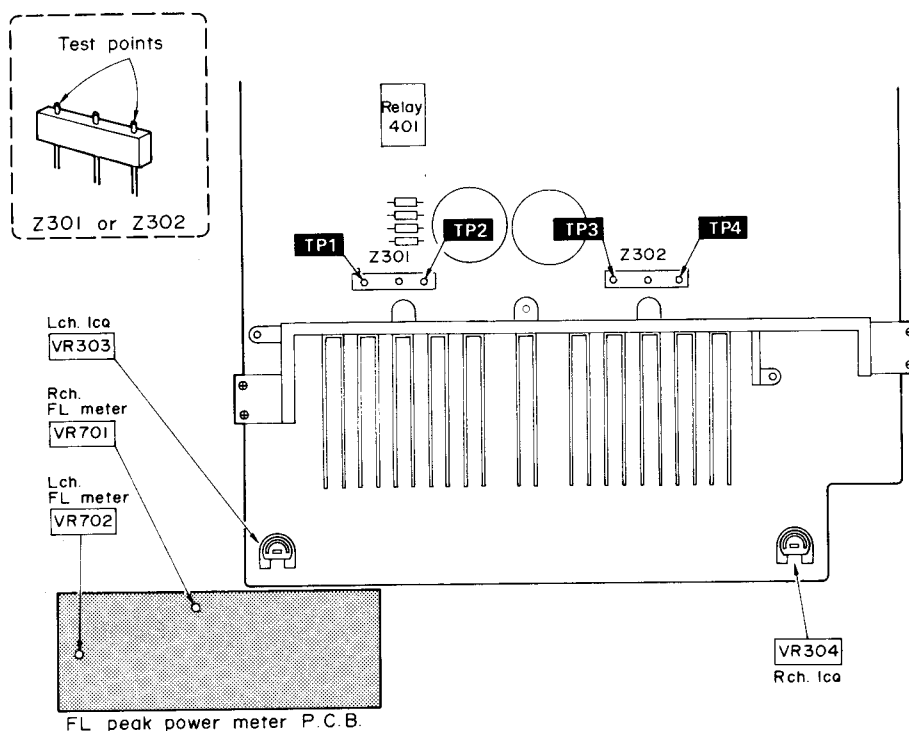
BEFORE REPAIR AND ADJUSTMENT

Turn off the power supply and short-circuit both ends of power supply condensers (C601, C602, 6800 μ F) at resistance (about 10 Ω , 5W) in order to discharge the charged voltage. Avoid short-circuit with a screwdriver or the like, otherwise the transistors or diodes may break down.

Before turning on the power supply after completion of repair, slowly apply the primary voltage by using a voltage regulator to make sure that the current consumed is free of abnormality. The current consumed at 60Hz/50Hz in no-signal mode is shown below with respect to supply voltage 110V/120V/220V/240V.

Power supply voltage		AC 110V	AC 120V	AC 220V	AC 240V
Current consumed	50Hz	200 ~ 400mA	190 ~ 380mA	110 ~ 220mA	100 ~ 200mA
	60Hz	180 ~ 360mA	170 ~ 340mA	90 ~ 180mA	85 ~ 170mA

ADJUSTMENT POINTS



FL peak power meter

Fig. 12 (Abb. 12)

MEASUREMENTS AND ADJUSTMENTS — English

1. Idling current of power transistor (ICQ)

● Setting and instruments used

1. Speaker selector main

2. Sound volume 0 (minimum)
3. DC voltmeter (able to measure 4mV)

4. Instruments for circuit operation check
(AC voltmeter, 1kHz oscillator, 8Ω load, 5W 0.33Ω resistor).

Item	Connection of DC voltmeter	VR adjusted	Adjustment
Adjustment of ICQ	L channel Connect voltmeter to TP1 (+) and TP2 (–)	VR303	① Completely turn VR303 and VR304 anticlockwise beforehand ② Adjust VR303 (L channel) and VR304 (R channel) so that the voltage is 20mV, about 10 min. after power supply ON.
	R channel Connect voltmeter to TP3 (–) and TP4 (+)	VR304	

2. Fluorescent peak power meter

Setting

- Connect a low frequency oscillator to the tuner input terminal, and 8-ohm load resistor and AC electronic voltmeter to the speaker terminal.
- Add 1kHz signal from the low frequency oscillator to the set.
- Set the sound volume to the maximum point.

Item	Meter range select switch position	VR adjusted	Adjustment
Peak-power indicators	Range switch ... X0.01	VR702 (L ch)	1. Adjust the input level so that the AC voltmeter indicates 2 volts.
		VR701 (R ch)	2. Adjust the semi-fixed variable resistors VR702 (L ch.) and VR701 (R ch.) so that the 50W segment of FL meter lights up dimly. (Fig. 12)

3. Check points

● DC balance

- ① Make the sound volume minimum.
- ② Connect DC voltmeter and 8Ω load to speaker terminal.
- ③ Make sure that output voltage is within ±30mV.

● Overload detection circuit

- ① Connect 8Ω load to "main" speaker terminal and 5W 0.33Ω resistance to "remote" speaker terminal.
- ② Apply 1kHz 40mV signal to "TUNER" terminal.
- ③ Make the sound volume maximum.
- ④ With speaker selector set at main and remote, make sure that relay in the set is OFF and no output is delivered.

* If protection relay turns OFF due to overload, the circuit and load will not restore their normal conditions unless power supply is once turned OFF and again turned ON.

MESSUNGEN UND JUSTIERUNGEN — Deutsch

1. ICQ

● Einstellungen und verwendete Instrumente

1. Lautsprecher-Wahlschalter "main"

2. Lautstärke 0 (Minimum)
3. Gleichstrom-Voltmeter (zum Messen von 4mV geeignet)

4. Instrumente für die Schaltungsbetrieb-Prüfung (Wechselstrom-Voltmeter, 1kHz-Oszillator, 8Ω-Belastung, 5W 0,33Ω-Widerstand)

Gegenstand	Anschluß des Voltmeters	Zu justierender Drehwiderstand	Justierung
Justierung von ICQ	Linker Kanal Voltmeter an TP1 (+) und TP2 (–) anschließen.	VR303	① VR303 und VR304 vorher bis zum Anschlag entgegen dem Uhrzeigersinn drehen. ② VR303 (linker Kanal) und VR304 (rechter Kanal) so justieren, daß die Spannung, ca. 10 Minuten nach dem Einschalten der Stromzufuhr, 20mV beträgt.
	Rechter Kanal Voltmeter an TP3 (–) und TP4 (+) anschließen.	VR304	

2. Spitzenwertanzeigen

Einstellung:

- Einen Niederfrequenzoszillator an die Eingangsklemme des Tuners schließen und parallel zu 8-ohm Belastungswiderstand den elektronischen Wechselstrom-Voltmeter an die Lautsprecherklemme schließen.
- 1 kHz Signal aus dem Niederfrequenzoszillator in das Gerät speisen.
- Lautstärkeregler auf den minimalen Punkt einstellen.

Gegenstand	Stellung des Meterbereichswählers	Zu justierender widerstand	Justierung
Spitzenwertanzeigen	Bereichswähler auf X0.01	VR702 (Linker Kanal) VR701 (Rechter Kanal)	1. Den Eingangspegel so justieren, daß der Wechselstrom-Voltmeter 2,0V anzeigt. 2. Die halbfix eingestellten Widerstände VR702 (linker Kanal) und VR701 (rechter Kanal) so einstellen, daß das 50W-Segment des Fluoreszenz-Aussteuerungsinstrumentes schwach aufleuchtet. (Abb. 12) *

3. Prüfpunkte

● Gleichstrom-Balance

- ① Den Lautstärkeregler ganz zudrehen.
- ② Das Gleichstrom-Voltmeter und eine 8Ω-Last an den Lautsprecheranschluß anschließen.
- ③ Überprüfen, daß die Ausgangsspannung innerhalb ±30mV liegt.

● Überbelastungs-Detektorschaltung

- ① Eine 8Ω-Last an den "main"-Lautsprecheranschluß und einen 5W, 0,33Ω-Widerstand an den "remote"-Lautsprecheranschluß anschließen.
- ② Ein Signal von 1kHz, 40mV an den "TUNER"-Anschluß anlegen.
- ③ Den Lautstärkeregler ganz aufdrehen.
- ④ Mit auf "main and remote" eingestelltem Lautsprecher-Wahlschalter überprüfen, daß das Relais ausgeschaltet ist, und keine Ausgangsleistung ausgegeben wird.

* Nachdem das Schutzrelais aufgrund von Überbelastung ausgeschaltet wurde, muß der Netzschalter einmal aus- und wieder eingeschaltet werden, damit die Schaltung und die Last wieder in ihren normalen Zustand versetzt werden.

MESURAGES ET RÉGLAGES Français

1. ICQ

● Réglages et appareils utilisés

1. Sélecteur de haut-parleurs principal (main)

2. Volume sonore 0 (minimum)
3. Voltmètre à C.C. (capable de mesurer 4mV)

4. Appareils pour la vérification du fonctionnement du circuit.
(Voltmètre à C.A., oscillateur de 1kHz, charge de 8Ω, résistance de 5W 0,33Ω)

Article	Branchement du voltmètre à C.C.	VR à régler	Réglage
Réglage de ICQ	Canal de gauche Brancher le voltmètre à TP1 (+) et TP2 (–).	VR303	① Tourner préalablement complètement dans le sens inverse des aiguilles d’une montre VR303 et VR304. ② Régler VR303 (canal de gauche) et VR304 (canal de droite) de façon à ce que la tension soit de 20mV, environ 10 minutes après la mise en marche de la tension d’alimentation.
	Canal de droite Brancher le voltmètre à TP3 (–) et à TP4 (+).	VR304	

2. Indicateurs de puissance de crête fluorescents

Réglage:

- Brancher un oscillateur à basse fréquence à la borne de sortie du tuner et une résistance de charge de 8 ohms et un voltmètre électronique à la borne de l’enceinte.
- Par l’oscillateur à basse fréquence, appliquer un signal de 1 kHz à l’appareil.
- Régler le volume du son au maximum.

Article	Position du commutateur de sélection de la gamme du compteur	VR à régler	Réglage
Indicateurs de puissance de crête fluorescents	Commutateur de gamme X0,01	VR702 (CG)	1. Régler le niveau de sortie de telle sorte que la voltmètre CA indique 2,0V. 2. Régler les résistances variables semi-fixes VR702 (canal de gauche) et VR701 (canal de droite), de façon à ce que le segment de 50W de l’appareil de mesure FL s’éclaire faiblement. (Fig. 12)
		VR701 (CD)	

3. Points de vérification

1. Compensation du C.C.

- ① Diminuer le volume sonore au minimum.
- ② Brancher le voltmètre à C.C. et une charge de 8Ω à la prise de haut-parleurs.
- ③ S’assurer que la tension de sortie est en deçà de ±30mV.

● Circuit de détection d’une surcharge

- ① Connecter une charge de 8Ω à la prise de haut-parleurs “principale” (“main”) et une résistance de 5W 0,33Ω à la prise de haut-parleurs “auxiliaire” (“remote”).
- ② Appliquer un signal de 1kHz 40mV à la borne du “TUNER”.
- ③ Augmenter le volume sonore au maximum.
- ④ Avec le sélecteur de haut-parleurs réglé sur “main” (principal) et sur “remote” (auxiliaire), s’assurer que le relais dans l’appareil soit mis hors circuit et qu’aucune sortie ne soit livrée.

* Si le relais de protection est mis hors circuit à cause d’une surcharge, le circuit et la charge ne récupéreront pas leurs conditions normales à moins que l’alimentation secteur soit une fois mise hors circuit et remise à nouveau en marche.

MEDICIONES Y AJUSTES Español

1. Corriente de reposo de transistor de potencia (ICQ)

● Puesta e instrumentos usados

1. Selector de altavoz principal

2. Volumen de sonido 0 (mínimo)
3. Voltímetro de CC (capaz de medir 4mV)

4. Instrumentos para verificación de operación de circuito
(Voltímetro de CA, oscilador 1kHz, carga 8Ω, resistor 5W 0,33Ω)

Item	Conexión de voltímetro de CC	RV ajustado	Procedimiento de ajuste
Ajuste de ICQ	Canal I Conectar voltímetro a TP1 (+) y TP2 (–)	VR303	① Girar completamente VR301 y VR304 a la izquierda de antemano ② Ajustar VR303 (canal I) y VR304 (canal D) de manera que el voltaje sea 20mV, unos 10 min. después de conectar el suministro de energía.
	Canal D Conectar voltímetro a TP3 (–) y TP4 (+)	VR304	

2. Medidor fluorescente de potencia de cresta

Puesta

- Conectar un oscilador de baja frecuencia al terminal de entrada de sintonizador, y el resistor de carga 8-ohmios y voltímetro electrónico de CA al terminal del altavoz.
- Añadir señal 1kHz del oscilador de baja frecuencia al aparato.
- Poner el volumen de sonido al punto máximo.

Item	Posición de interruptor selector de gama de medidor	RV ajustado	Procedimiento de ajuste
Indicadores de potencia-cresta	Interruptor de gama ... X0.01	VR702 (Canal I) VR701 (Canal D)	1. Ajustar el nivel de entrada de manera que el voltímetro de CA indique 2 voltios. 2. Ajustar los resistores variables semifijos VR702 (C.I.) y VR701 (C.D.) de manera que el segmento de 50W del medidor FI se ilumine débilmente (Fig. 12)

3. Puntos de verificación

● Equilibrio de CC

- ① Hacer el volumen de sonido mínimo.
- ② Conectar el voltímetro de CC y carga de 8Ω al terminal del altavoz.
- ③ Asegurarse de que el voltaje de salida esté dentro de ±30mV.

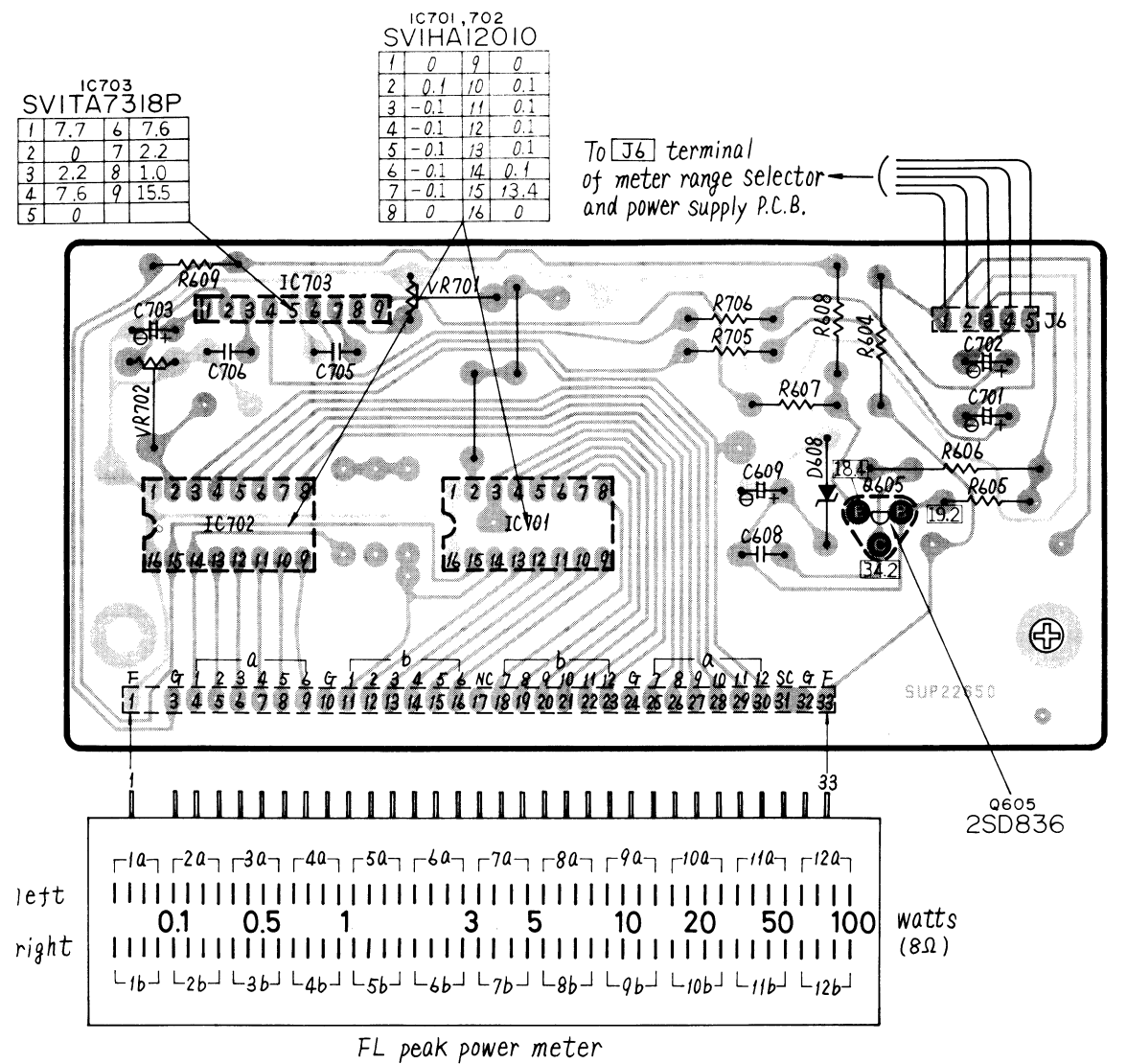
● Circuito de detección de sobrecarga

- ① Conectar la carga de 8Ω al terminal del altavoz “principal” (main) y la resistencia de 5W 0,33Ω al terminal del altavoz “remoto” (remote).
- ② Aplicar señal de 1kHz 40mV al terminal del “SINTONIZADOR” (TUNER).
- ③ Hacer el volumen de sonido máximo.
- ④ Con el selector del altavoz puesto en principal y remoto, asegurarse de que el relé del aparato esté en OFF (desconectado) y no se transmita potencia de salida.

* Si el relé de protección se desconecta debido a sobrecarga, el circuito y la carga no se repondrán a sus condiciones normales, a no ser que el suministro de energía se desconecte una vez y se conecte de nuevo.

CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM

Fluorescent peak power meter circuit

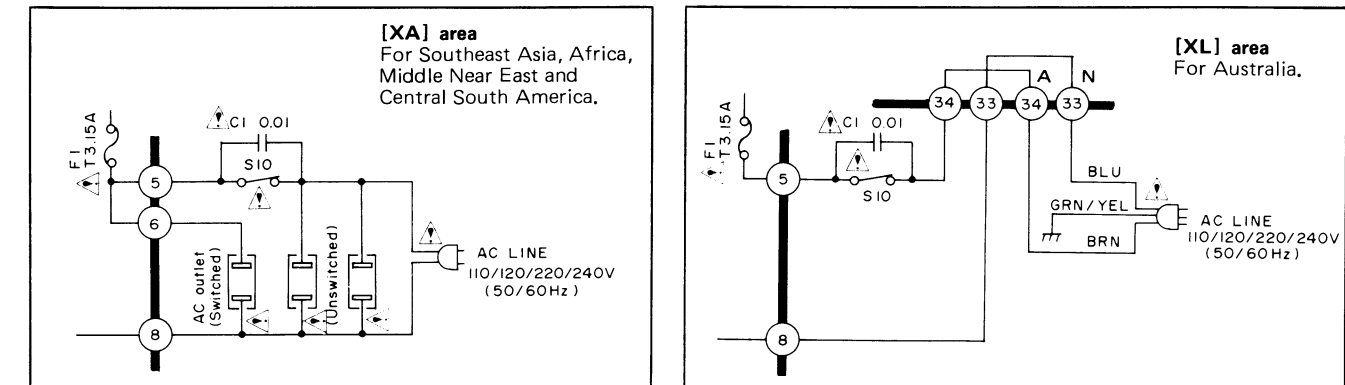


NOTES OF SCHEMATIC DIAGRAM

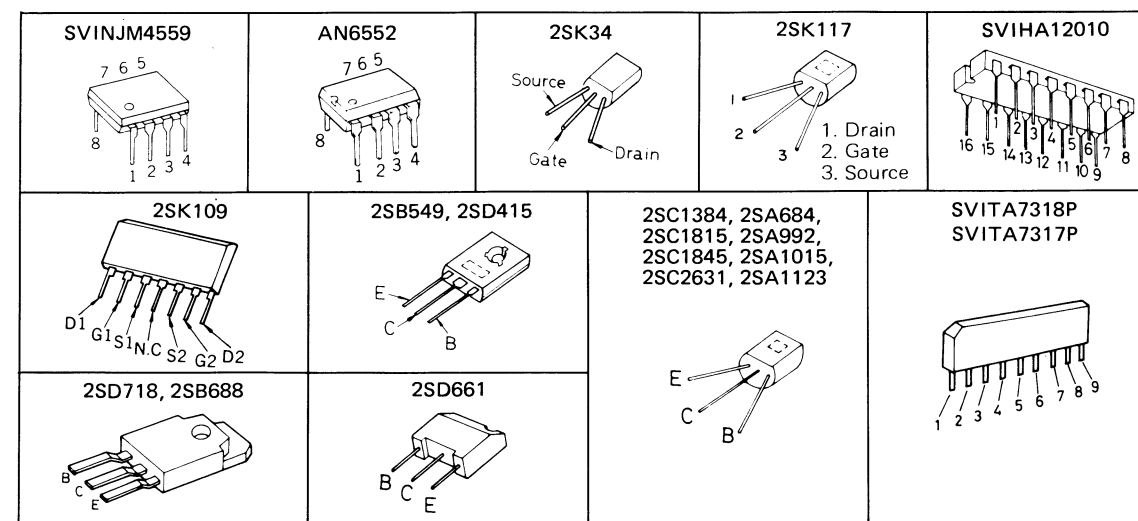
Notes:

- S2-1, S2-2:** Input selector switch in "phono" position. (1 aux ↔ 2 tuner ↔ 3 phono ↔ 4 tape 1 ↔ 5 tape 2)
- S3-1~S3-4:** Recording output selector switch in "phono" position. (1 aux ↔ 2 tuner ↔ 3 phono ↔ 4 off ↔ 5 tape dubbing 1 ▶ 2 ↔ 6 tape dubbing 2 ▶ 1)
- S4:** Loudness switch in "off" position.
- S5:** Subsonic filter switch in "off" position (off ↔ 30Hz, -6dB/oct.)
- S6:** High filter switch in "off" position. (off ↔ 7kHz, -6dB/oct.)
- S8:** Meter range selector switch in "x0.01" position. (x0.01 ↔ x1)
- S9:** Speakers selector switch in "main" position. (1 speakers off ↔ 2 main ↔ 3 remote ↔ 4 main and remote)
- S10:** Power source switch in "on" position.
- S11:** Voltage selector switch in "220V" position. (120V ↔ 110V ↔ 220V ↔ 240V)
- Same circuit is used for both L and R channels. For the resistance and capacity of R channel (lower of circuit diagram), refer to L channel. For the voltage value, refer to R channel.
- Indicated voltage values are the standard values for 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.
* Figures in () stand for DC voltage in FL light up condition.
- Phono 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.

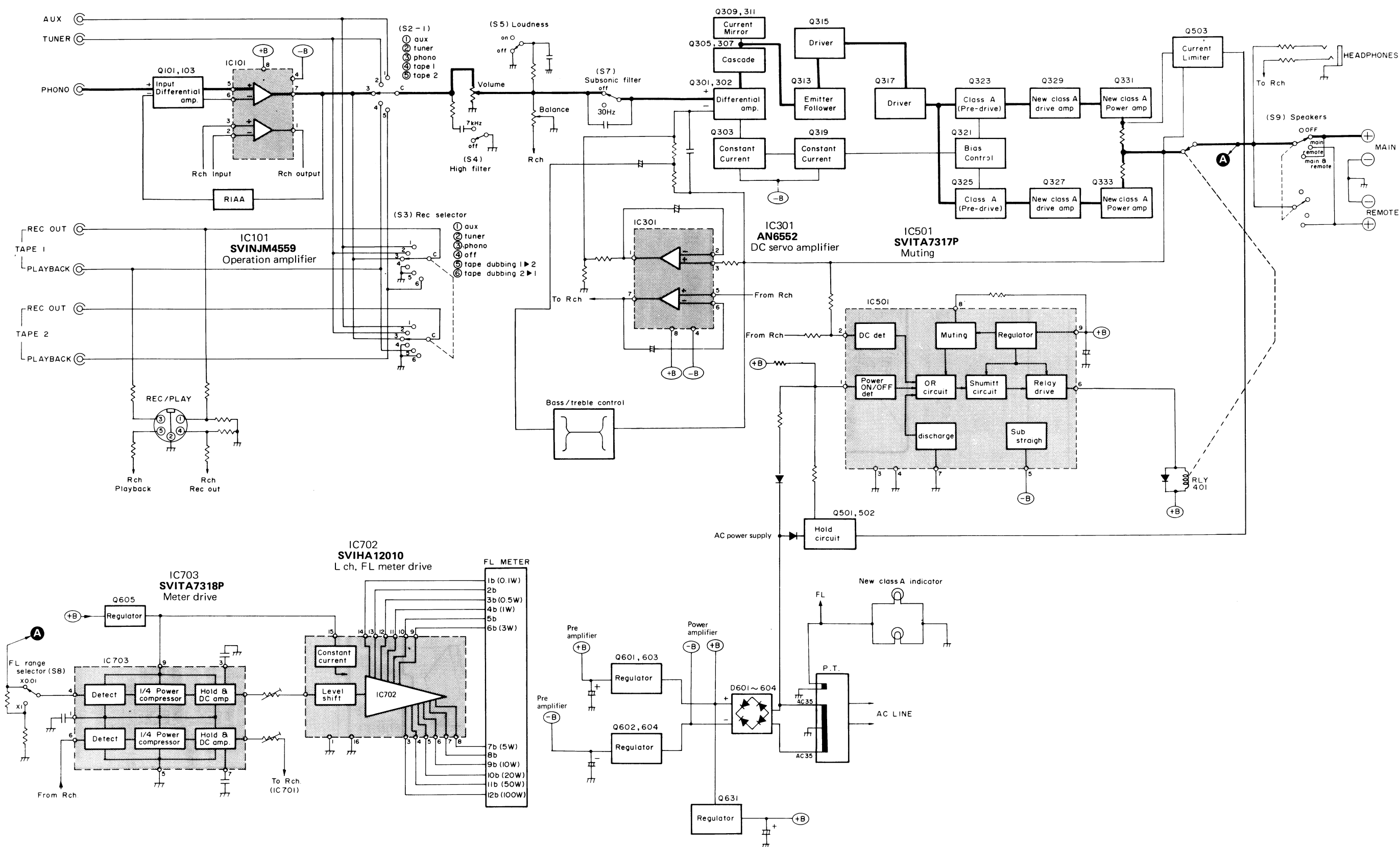
Power source circuit for [XA] and [XL] area only



TERMINAL GUIDE OF TRANSISTORS AND IC'S



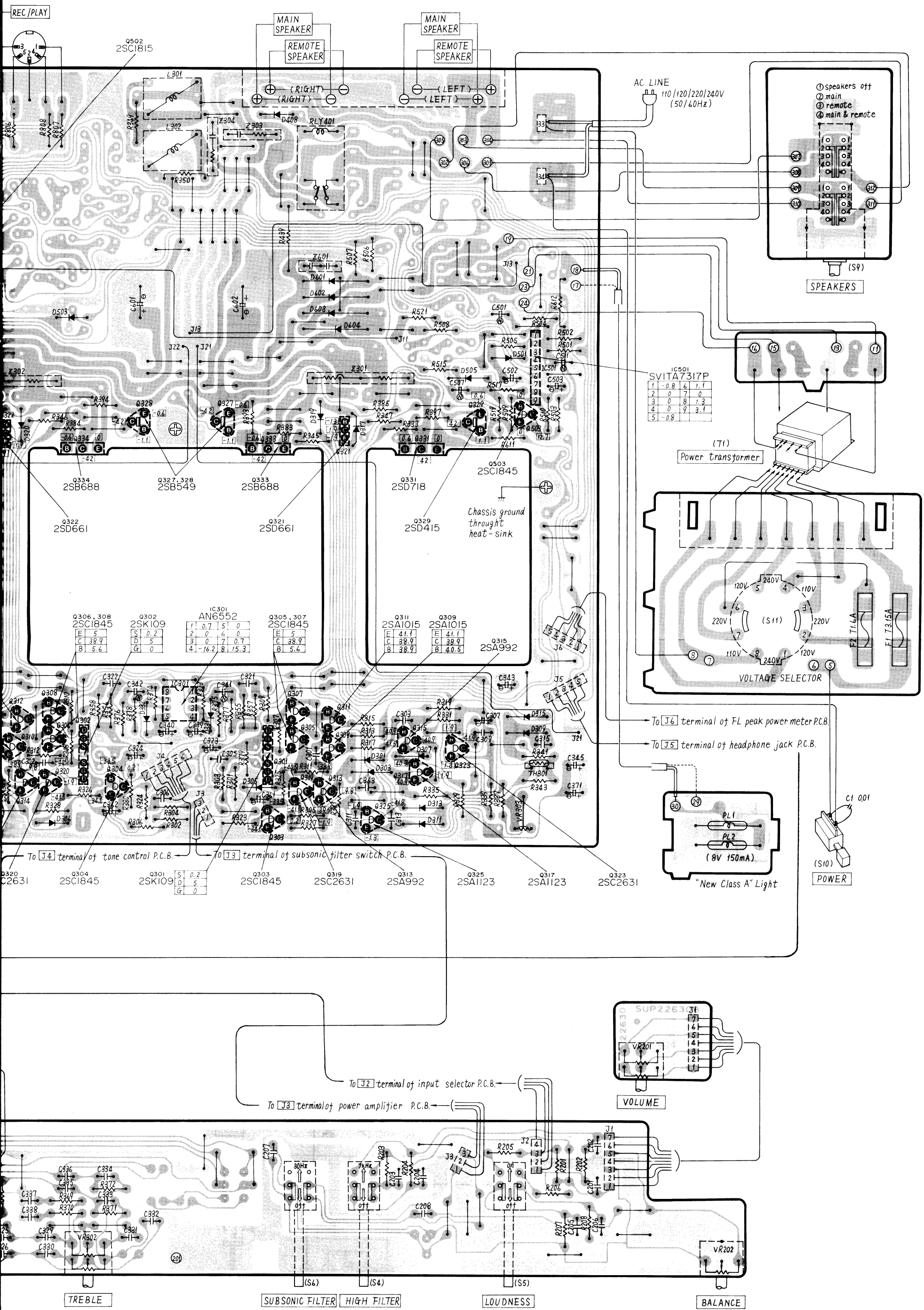
BLOCK DIAGRAM

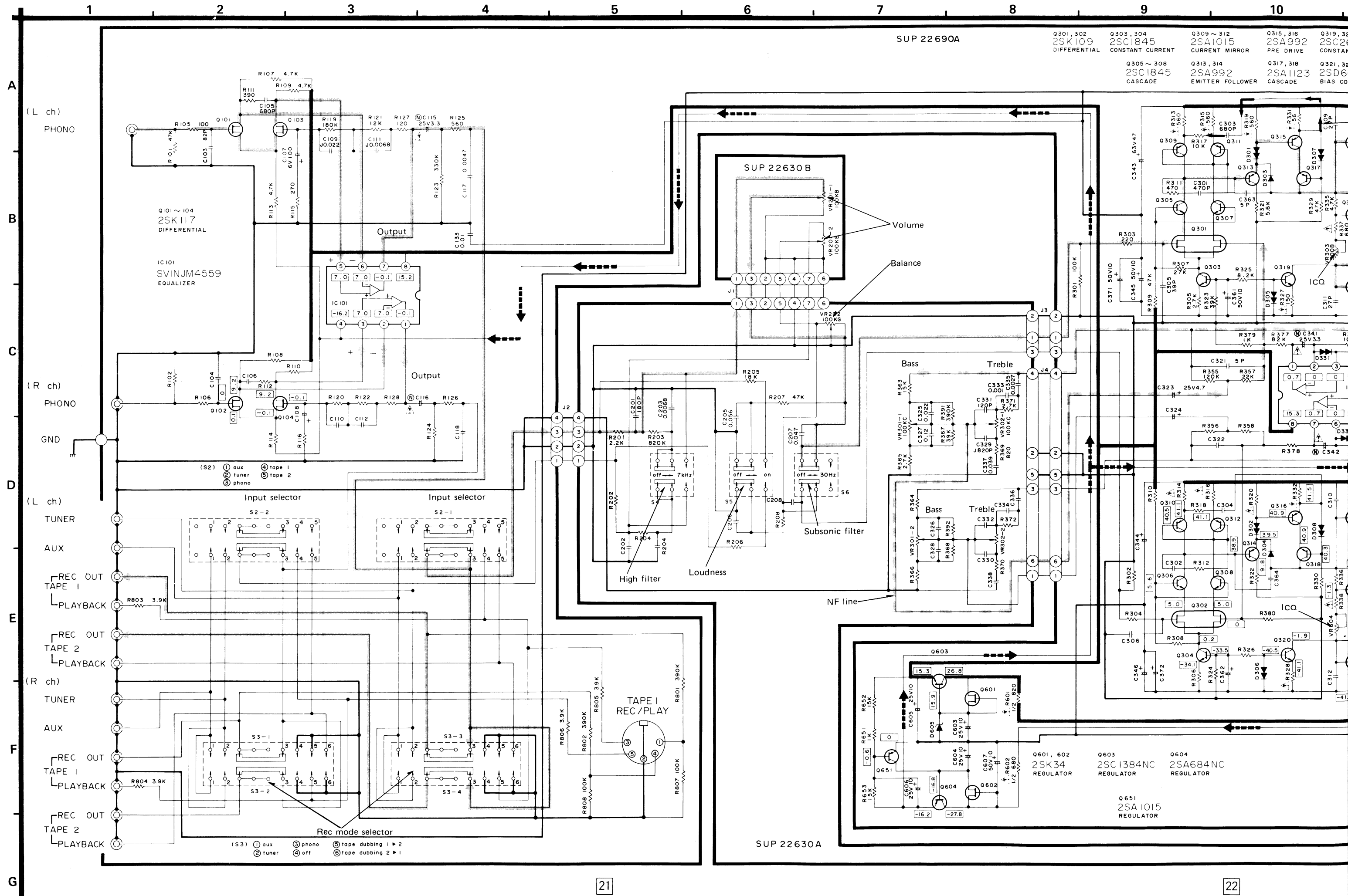


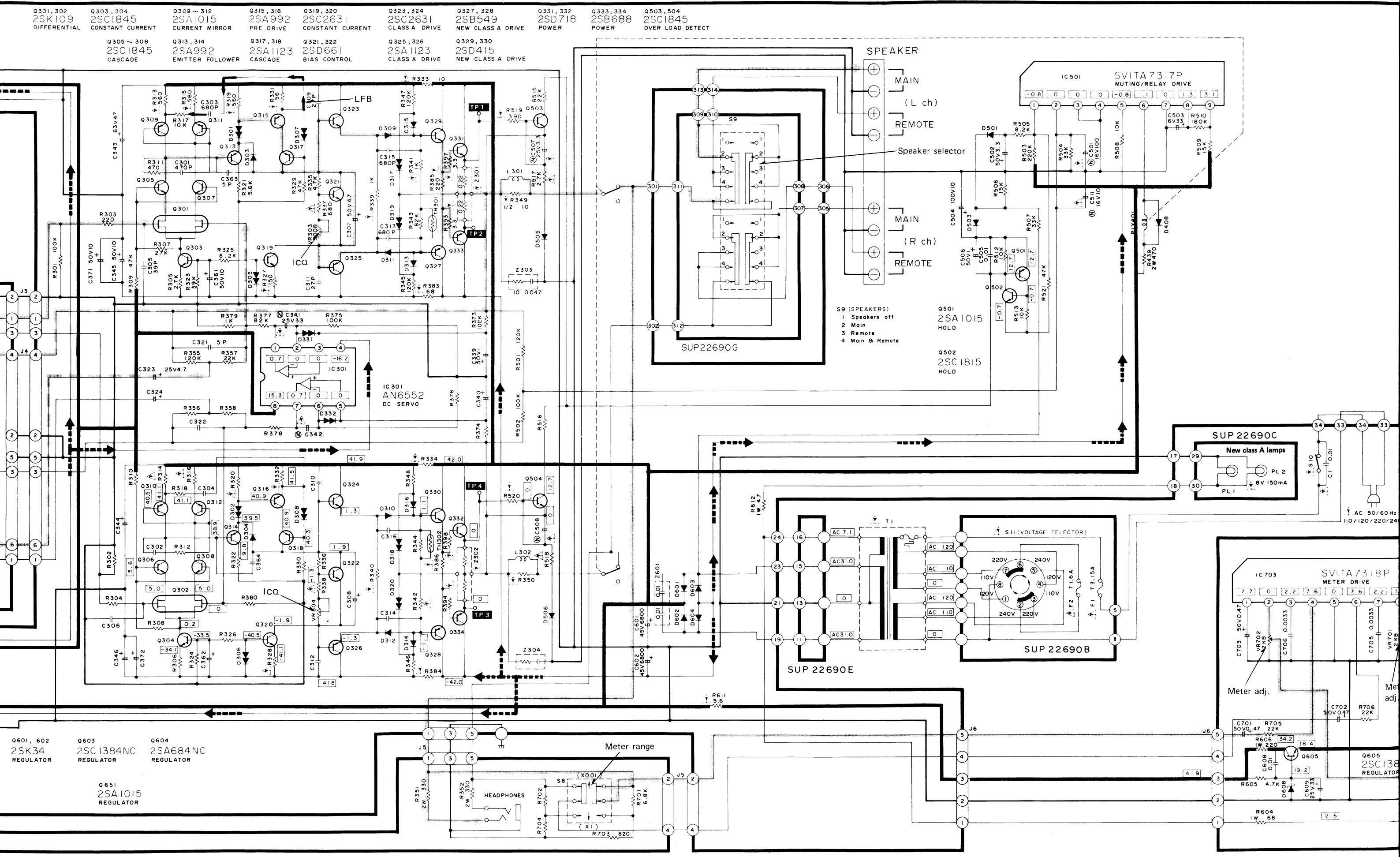
Ground (Earth) lines

- Equalizer, power amplifier, protection and power supply circuits









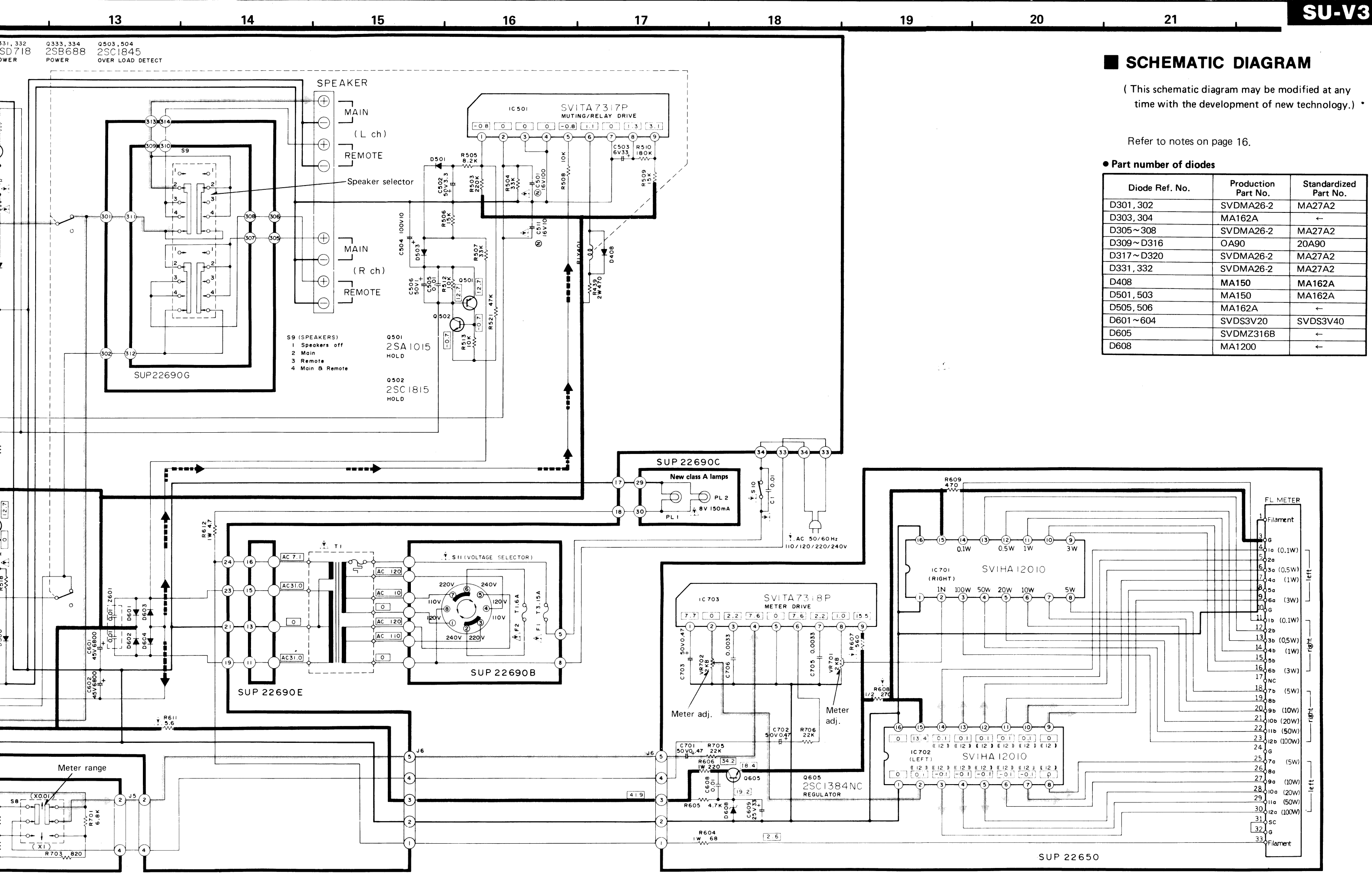
SCHEMATIC DIAGRAM

(This schematic diagram may be modified at any time with the development of new technology.)

Refer to notes on page 16.

Part number of diodes

Diode Ref. No.	Production Part No.	Standardized Part No.
D301, 302	SVDMA26-2	MA27A2
D303, 304	MA162A	←
D305~308	SVDMA26-2	MA27A2
D309~D316	OA90	20A90
D317~D320	SVDMA26-2	MA27A2
D331, 332	SVDMA26-2	MA27A2
D408	MA150	MA162A
D501, 503	MA150	MA162A
D505, 506	MA162A	←
D601~604	SVDS3V20	SVDS3V40
D605	SVDMZ316B	←
D608	MA1200	←



REPLACEMENT PARTS LIST

- Notes:** 1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. 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.
3. $\blacksquare$ -marked parts are used for black only, while $\circ$ marked parts are for silver type only.

4. Parts other than $\blacksquare$ - and $\circ$ -marked are used for both black and silver types.
5. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.

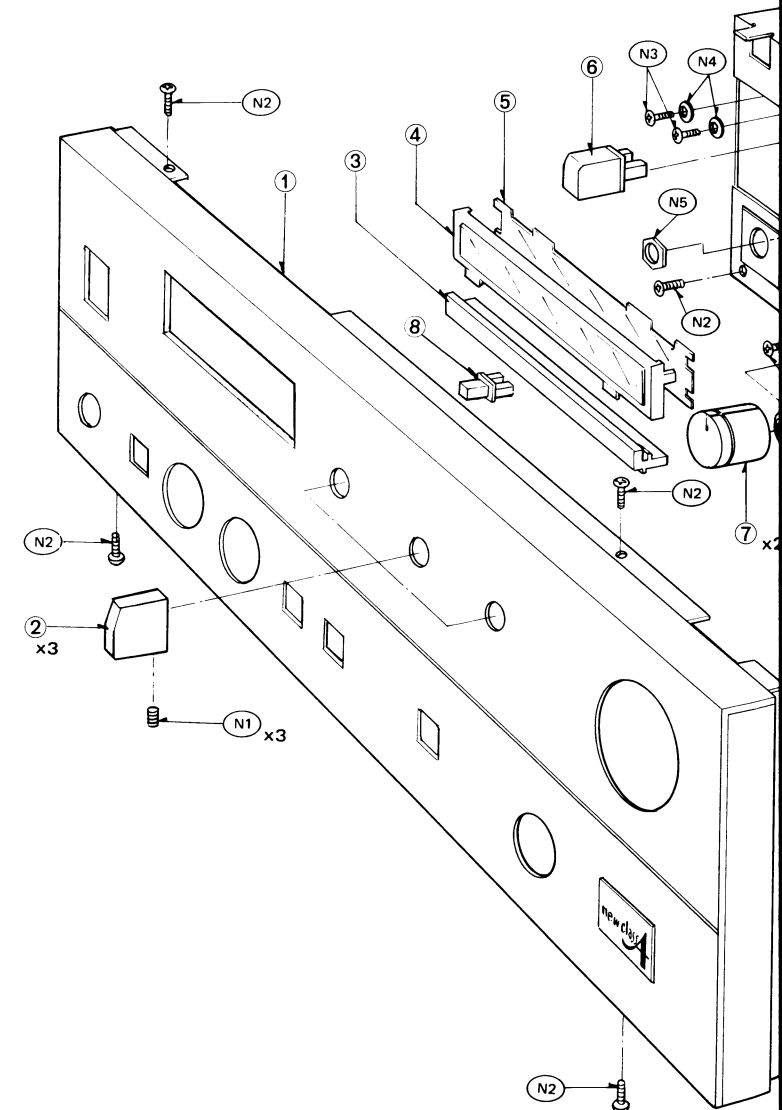
Black type model No.: SU-V3 (K)

Ref. No.	Part No.	Part Name & Description
INTEGRATED CIRCUITS		
IC101 IC301 IC501 IC701, 702 IC703	SVINJM4559DD AN6552F SVITA7317P SVIHA12010 SVITA7318P	IC, Equalizer Amplifier IC, DC Servo IC, Muting/Relay Drive IC, FL Driver IC, FL Driver
TRANSISTORS		
Q101~104 Q301, 302 Q303~308 503, 504 Q309~312, 501, 651 Q313~316 Q317, 318 Q319, 320 Q321, 322	2SK117-GR 2SK109-D 2SC1845 2SA1015-Y 2SA992 2SA1123-R 2SC2631-R 2SD661-S	Transistor, Differential Amplifier Transistor, Buffer Transistor, Differential Amplifier, Over Load Detect Transistor, Differential Amplifier, Hold (Use in ranks Y or O) Transistor, Emitter Follower Transistor, Pre Drive Transistor, Pre Drive Transistor, Bias Supply
Q323, 324 Q325, 326 Q327, 328 Q329, 330 Q331, 332 Q333, 334 Q502 Q601, 602	2SC2631-R 2SA1123-R 2SB549-Q 2SD415-Q 2SD718-O 2SB688-O 2SC1815-Y 2SK34-D1	Transistor, Pre Drive Transistor, Pre Drive } Use in pair ranks Transistor, Driver } Transistor, Driver } Use in pair ranks Transistor, Power } Transistor, Power } Use in pair ranks Transistor, Hold Transistor, Current Stabilizer (Use in ranks D1 or D2)
Q603, 605 Q604	2SC1384AR 2SA684-QNC	Transistor, Regulator Transistor, Regulator
DIODES		
D301, 302, 305~308, 317~320, 331, 332 D303, 304, 505, 506 D309~316 D408, 501, 503 D601~604 D605 D608	MA27A2 MA162A 20A90 MA162A SVDS3V40 SVDMM2316B MA1200	Diode, Bias Supply Diode, Bias Supply, Switching Diode, Bias Supply Diode, Switching Rectifier Diode, 16V Zener Diode, 20V Zener
COIL and TRANSFORMER		
L301, 302 T1	SLQY15G-30 SLTYN365	Coil, Choke Transformer, Power Source
VARIABLE RESISTORS		
VR201 VR202 VR301 VR302 VR303, 304 VR701, 702	EWJGFA066B15 EWHHMA541G15 EWGJCY067530 EWGJC0067C15 EVNK6AA00B52 EVNK6AA00B23	Volume Control, 100k Ω (B) Balance Control, 100k Ω (G) Bass Control Treble Control, 100k Ω (C) ICQ Adjustment, 500 Ω (B) FL Meter Level Adjustment, 2k Ω (B)
THERMISTOR		
TH301, 302	ERTD2ZHL103S	Thermistor, Thermal Compensation 10k Ω
COMPONENT COMBINATIONS		
Z301, 302 Z303, 304 Z601	ERF3GBKR22N ECQJ0517 SXRFS203ZSM	Component Combination, 3W, 0.22 Ω (x2) Component Combination, 0.047 μ F, 10 Ω Component Combination, 0.01 μ F (x2)
FUSES		
F1 F2	XBA2C31TRO XBA2C16TRO	Fuse, Power Source T3.15A (250V) Fuse, Power Source T1.6A (250V)
RELAY		
RLY401	SSY69	Relay, Speaker Output
FLUORESCENT DISPLAY TUBE		
FL	SADBG89Z	Fluorescent Display Tube

Ref. No.	Part No.	Part Name & Description
SWITCHES		
S2, 3 S4, 6 S5, 8	ESA2682 SSH2019 SSH197	Switch, Input Selector, Rec. Selector Switch, High Filter and Subsonic Filter Switch, Loudness Control and FL Range Selector
S9 S10 S11	SSR151-1 ESB90259S ESE37219	Switch, Speaker Selector Switch, Power Source Switch, Voltage Selector
LAMP		
PL1, 2	XAMR81S10	Lamp, New Class A, 150mA (8V)
RESISTORS		
R101, 102 R105, 106 R107, 108 R109, 110 R111, 112 R113, 114 R115, 116 R119, 120 R121, 122 R123, 124	ERD25TJ473 ERD25FJ101 ERD25FJ472 ERD25FJ472 ERD25FJ391 ERD25FJ472 ERD25FJ271 ERD25TJ184 ERD25TJ123 ERD25TJ334	Carbon, 1/4W, 47k Ω , $\pm$ 5% Carbon, 1/4W, 100 Ω , $\pm$ 5% Carbon, 1/4W, 4.7k Ω , $\pm$ 5% Carbon, 1/4W, 4.7k Ω , $\pm$ 5% Carbon, 1/4W, 390 Ω , $\pm$ 5% Carbon, 1/4W, 4.7k Ω , $\pm$ 5% Carbon, 1/4W, 270 Ω , $\pm$ 5% Carbon, 1/4W, 180k Ω , $\pm$ 5% Carbon, 1/4W, 12k Ω , $\pm$ 5% Carbon, 1/4W, 330k Ω , $\pm$ 5%
R125, 126 R127, 128 R201, 202 R203, 204 R205, 206 R207, 208 R301, 302 R303, 304 R305, 306 R307, 308	ERD25FJ561 ERD25FJ121 ERD25FJ222 ERD25TJ824 ERD25TJ183 ERD25TJ473 ERD25TJ104 ERD25FJ221 ERD25FJ272 ERD25TJ273	Carbon, 1/4W, 560 Ω , $\pm$ 5% Carbon, 1/4W, 120 Ω , $\pm$ 5% Carbon, 1/4W, 2.2k Ω , $\pm$ 5% Carbon, 1/4W, 820k Ω , $\pm$ 5% Carbon, 1/4W, 18k Ω , $\pm$ 5% Carbon, 1/4W, 47k Ω , $\pm$ 5% Carbon, 1/4W, 100k Ω , $\pm$ 5% Carbon, 1/4W, 220 Ω , $\pm$ 5% Carbon, 1/4W, 2.7k Ω , $\pm$ 5% Carbon, 1/4W, 27k Ω , $\pm$ 5%
R309, 310 R311, 312 R313, 314 R315, 316 R317, 318 R319, 320 R321, 322 R323, 324 R325, 326 R327, 328	ERD25TJ473 ERD25FJ471 ERD25FJ561 ERD25FJ561 ERD25FJ103 ERD25FJ561 ERD25TJ562 ERD25TJ393 ERD25FJ822 ERD25FJ151	Carbon, 1/4W, 47k Ω , $\pm$ 5% Carbon, 1/4W, 470 Ω , $\pm$ 5% Carbon, 1/4W, 560 Ω , $\pm$ 5% Carbon, 1/4W, 560 Ω , $\pm$ 5% Carbon, 1/4W, 10k Ω , $\pm$ 5% Carbon, 1/4W, 560 Ω , $\pm$ 5% Carbon, 1/4W, 5.6k Ω , $\pm$ 5% Carbon, 1/4W, 39k Ω , $\pm$ 5% Carbon, 1/4W, 8.2k Ω , $\pm$ 5% Carbon, 1/4W, 150 Ω , $\pm$ 5%
R329, 330 R331, 332 R333, 334 R335, 336 R337, 338 R339, 340 R341, 342 R343, 344 R345, 346 R347, 348	ERD25TJ473 ERD25FJ560 ERD25FJ100 ERD25FJ472 ERD25FJ681 ERD25FJ102 ERD25FJ102 ERD25TJ823 ERD25TJ124 ERD25TJ124	Carbon, 1/4W, 47k Ω , $\pm$ 5% Carbon, 1/4W, 56 Ω , $\pm$ 5% Carbon, 1/4W, 10 Ω , $\pm$ 5% Carbon, 1/4W, 4.7k Ω , $\pm$ 5% Carbon, 1/4W, 680 Ω , $\pm$ 5% Carbon, 1/4W, 1k Ω , $\pm$ 5% Carbon, 1/4W, 1k Ω , $\pm$ 5% Carbon, 1/4W, 82k Ω , $\pm$ 5% Carbon, 1/4W, 120k Ω , $\pm$ 5% Carbon, 1/4W, 120k Ω , $\pm$ 5%
R349, 350 R351, 352 R355, 356 R357, 358 R363, 364 R365, 366 R367, 368 R369, 370 R371, 372 R373, 374	ERD50FJ100 ERG2ANJ331 ERD25TJ124 ERD25TJ223 ERD25TJ153 ERD25FJ272 ERD25TJ393 ERD25FJ821 ERD25FJ272 ERD25TJ104	Carbon, 1/2W, 10 Ω , $\pm$ 5% Metal Oxide, 2W, 330 Ω , $\pm$ 5% Carbon, 1/4W, 120k Ω , $\pm$ 5% Carbon, 1/4W, 22k Ω , $\pm$ 5% Carbon, 1/4W, 15k Ω , $\pm$ 5% Carbon, 1/4W, 2.7k Ω , $\pm$ 5% Carbon, 1/4W, 39k Ω , $\pm$ 5% Carbon, 1/4W, 820 Ω , $\pm$ 5% Carbon, 1/4W, 2.7k Ω , $\pm$ 5% Carbon, 1/4W, 100k Ω , $\pm$ 5%
R375, 376 R377, 378 R379, 380 R383, 384	ERD25TJ104 ERD25TJ823 ERD25FJ102 ERD25FJ680	Carbon, 1/4W, 100k Ω , $\pm$ 5% Carbon, 1/4W, 82k Ω , $\pm$ 5% Carbon, 1/4W, 1k Ω , $\pm$ 5% Carbon, 1/4W, 68 Ω , $\pm$ 5%

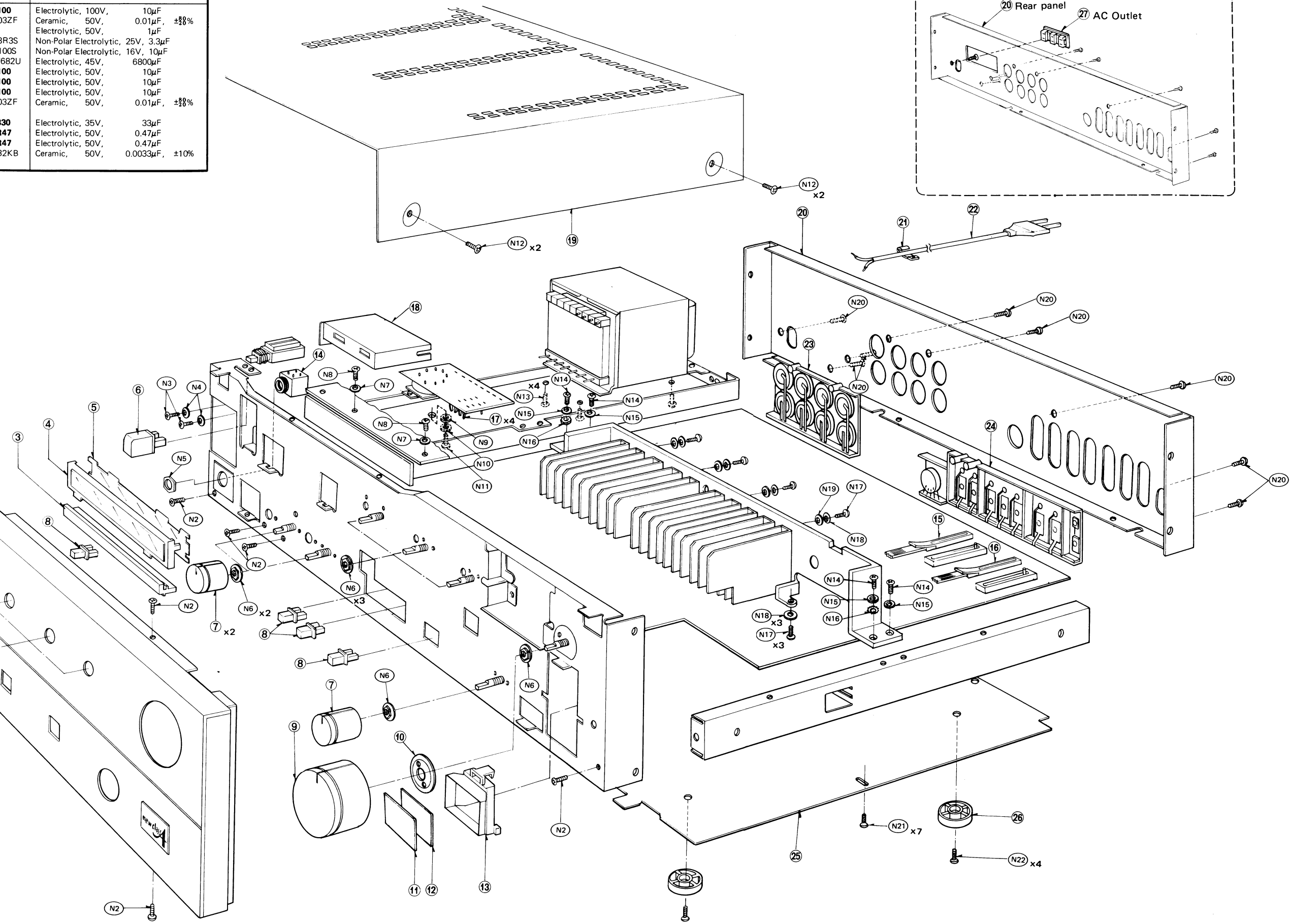
Ref. No.	Part No.	Part Name & Description
R385, 386 R391, 392 R393, 394 R397, 398 R439 R501	ERD25FJ221 ERD25TJ394 ERD25FJ3R3 ERD25FJ3R3 ERG2ANJ471 ERD25TJ124	Carbon, 1/4W, 220 Ω , $\pm$ 5% Carbon, 1/4W, 390k Ω , $\pm$ 5% Carbon, 1/4W, 3.3 Ω , $\pm$ 5% Carbon, 1/4W, 3.3 Ω , $\pm$ 5% Metal Oxide, 2W, 470 Ω , $\pm$ 5% Carbon, 1/4W, 120k Ω , $\pm$ 5%
R502 R503 R504 R505 R506 R507 R508 R509 R510 R512, 513	ERD25TJ104 ERD25TJ224 ERD25TJ333 ERD25FJ822 ERD25TJ153 ERD25TJ333 ERD25FJ103 ERD25TJ153 ERD25TJ184 ERD25FJ103	Carbon, 1/4W, 100k Ω , $\pm$ 5% Carbon, 1/4W, 220k Ω , $\pm$ 5% Carbon, 1/4W, 33k Ω , $\pm$ 5% Carbon, 1/4W, 8.2k Ω , $\pm$ 5% Carbon, 1/4W, 15k Ω , $\pm$ 5% Carbon, 1/4W, 33k Ω , $\pm$ 5% Carbon, 1/4W, 10k Ω , $\pm$ 5% Carbon, 1/4W, 15k Ω , $\pm$ 5% Carbon, 1/4W, 180k Ω , $\pm$ 5% Carbon, 1/4W, 10k Ω , $\pm$ 5%
R515, 516 R517, 518 R519, 520 R521 R601 R602 R604 R605 R606 R607	ERD25TJ223 ERD25FJ272 ERD25FJ391 ERD25TJ473 ERD50FJ821 ERD50FJ681 ERG1ANJ680 ERD25FJ472 ERG1ANJ221 ERD25FJ561	Carbon, 1/4W, 22k Ω , $\pm$ 5% Carbon, 1/4W, 2.7k Ω , $\pm$ 5% Carbon, 1/4W, 390 Ω , $\pm$ 5% Carbon, 1/4W, 47k Ω , $\pm$ 5% Carbon, 1/2W, 820 Ω , $\pm$ 5% Carbon, 1/2W, 680 Ω , $\pm$ 5% Metal Oxide, 1W, 68 Ω , $\pm$ 5% Carbon, 1/4W, 4.7k Ω , $\pm$ 5% Metal Oxide, 1W, 220 Ω , $\pm$ 5% Carbon, 1/4W, 560 Ω , $\pm$ 5%
R608 R609 R611 R612 R651 R652, 653 R701, 702 R703, 704 R705, 706 R801, 802	ERD50FJ271 ERD25FJ471 ERD25FJ5R6 ERX1ANJ4R7 ERD25FJ102 ERD25TJ153 ERD25FJ682 ERD25FJ821 ERD25TJ223 ERD25TJ394	Carbon, 1/2W, 270 Ω , $\pm$ 5% Carbon, 1/4W, 470 Ω , $\pm$ 5% Carbon, 1/4W, 5.6 Ω , $\pm$ 5% Metal Film, 1W, 4.7 Ω , $\pm$ 5% Carbon, 1/4W, 1k Ω , $\pm$ 5% Carbon, 1/4W, 15k Ω , $\pm$ 5% Carbon, 1/4W, 6.8k Ω , $\pm$ 5% Carbon, 1/4W, 820 Ω , $\pm$ 5% Carbon, 1/4W, 22k Ω , $\pm$ 5% Carbon, 1/4W, 390k Ω , $\pm$ 5%
R803, 804 R805, 806 R807, 808	ERD25FJ392 ERD25FJ392 ERD25TJ104	Carbon, 1/4W, 3.9k Ω , $\pm$ 5% Carbon, 1/4W, 3.9k Ω , $\pm$ 5% Carbon, 1/4W, 100k Ω , $\pm$ 5%
CAPACITORS		
C1 C103, 104 C105, 106 C107, 108 C109, 110 C111, 112 C115, 116 C117, 118 C133 C201, 202	ECKDKC103PF ECCD1H820K ECKD1H681KB ECEA1AS101 ECQM1H223JZ ECQM1H682JZ ECEA1EN3R3S ECQM1H472KZ ECKD1H103ZF ECCD1H181K	Ceramic, 400VAC, 0.01 μ F, $\pm$ 10% Ceramic, 50V, 82pF, $\pm$ 10% Ceramic, 50V, 680pF, $\pm$ 10% Electrolytic, 10V, 100 μ F Polyester, 50V, 0.022 μ F, $\pm$ 5% Polyester, 50V, 0.0068 μ F, $\pm$ 5% Non-Polar Electrolytic, 25V, 3.3 μ F Polyester, 50V, 0.0047 μ F, $\pm$ 10% Ceramic, 50V, 0.01 μ F, $\pm$ 10% Ceramic, 50V, 180pF, $\pm$ 10%
C203, 204 C205, 206 C207, 208 C301, 302 C303, 304	ECQM1H682KZ ECQM1H563KZ ECQM1H473KZ ECKD1H471KB ECKD1H681KB	Polyester, 50V, 0.0068 μ F, $\pm$ 10% Polyester, 50V, 0.056 μ F, $\pm$ 10% Polyester, 50V, 0.047 μ F, $\pm$ 10% Ceramic, 50V, 470pF, $\pm$ 10% Ceramic, 50V, 680pF, $\pm$ 10%
C305, 306 C307, 308 C309, 310 C311, 312 C313, 314	ECCD1H390K ECEA50Z4R7 ECCD1H270K ECCD1H270K ECKD1H681KB	Ceramic, 50V, 39pF, $\pm$ 10% Electrolytic, 50V, 4.7 μ F Ceramic, 50V, 27pF, $\pm$ 10% Ceramic, 50V, 27pF, $\pm$ 10% Ceramic, 50V, 680pF, $\pm$ 10%
C315, 316 C321, 322 C323, 324 C325, 326 C327, 328 C329, 330 C331, 332 C333, 334 C335, 336 C337, 338	ECKD1H681KB ECCD1H050C ECEA25Z4R7 ECQM1H223KZ ECQM1H124KZ ECQS1821JZ ECCD1H121K ECQM1H102KZ ECQM1H272KZ ECQM1H393KZ	Ceramic, 50V, 680pF, $\pm$ 10% Ceramic, 50V, 5pF, $\pm$ 0.25pF Electrolytic, 25V, 4.7 μ F Polyester, 50V, 0.022 μ F, $\pm$ 10% Polyester, 50V, 0.12 μ F, $\pm$ 10% Styrol, 125V, 820pF, $\pm$ 5% Ceramic, 50V, 120pF, $\pm$ 10% Polyester, 50V, 0.001 μ F, $\pm$ 10% Polyester, 50V, 0.0027 μ F, $\pm$ 10% Polyester, 50V, 0.039 μ F, $\pm$ 10%
C339, 340 C341, 342 C343, 344 C345, 346 C361, 362 C363, 364 C371, 372 C501 C502 C503	ECEA50Z1 ECEA1EN3R3S ECEA1HS470 ECEA1HS100 ECEA1HS100 ECCD1H050C ECEA1HS100 ECEA1CN101S ECEA50Z3R3 ECEA1CS330	Electrolytic, 50V, 1 μ F Non-Polar Electrolytic, 25V, 3.3 μ F Electrolytic, 50V, 47 μ F Electrolytic, 50V, 10 μ F Electrolytic, 50V, 10 μ F Ceramic, 50V, 5pF, $\pm$ 0.25pF Electrolytic, 50V, 10 μ F Non-Polar Electrolytic, 16V, 100 μ F Electrolytic, 50V, 3.3 μ F Electrolytic, 16V, 33 μ F

Ref. No.	Part No.	Part Name & Description
C504 C505 C506 C507, 508 C511 C601, 602 C603, 604 C605, 606 C607 C608	ECEA2AS100 ECKD1H103ZF ECEA50Z1 ECEA1EN3R3S ECEA1CN100S ECETS45V682U ECEA1HS100 ECEA1HS100 ECEA1HS100 ECKD1H103ZF	Electrolytic, 100V, 10 μ F Ceramic, 50V, 0.01 μ F, $\pm$ 10% Electrolytic, 50V, 1 μ F Non-Polar Electrolytic, 25V, 3.3 μ F Non-Polar Electrolytic, 16V, 10 μ F Electrolytic, 45V, 6800 μ F Electrolytic, 50V, 10 μ F Electrolytic, 50V, 10 μ F Electrolytic, 50V, 10 μ F Ceramic, 50V, 0.01 μ F, $\pm$ 10%
C609 C701, 702 C703 C705, 706	ECEA1VS330 ECEA50Z4R7 ECEA50Z4R7 ECKD1H332KB	Electrolytic, 35V, 33 μ F Electrolytic, 50V, 0.47 μ F Electrolytic, 50V, 0.47 μ F Ceramic, 50V, 0.0033 μ F, $\pm$ 10%



o.	Part Name & Description		
00	Electrolytic, 100V,	10μF	
03ZF	Ceramic, 50V,	0.01μF, ±38%	
	Electrolytic, 50V,	1μF	
3R3S	Non-Polar Electrolytic, 25V, 3.3μF		
100S	Non-Polar Electrolytic, 16V, 10μF		
682U	Electrolytic, 45V,	6800μF	
00	Electrolytic, 50V,	10μF	
00	Electrolytic, 50V,	10μF	
00	Electrolytic, 50V,	10μF	
03ZF	Ceramic, 50V,	0.01μF, ±38%	
30	Electrolytic, 35V,	33μF	
147	Electrolytic, 50V,	0.47μF	
147	Electrolytic, 50V,	0.47μF	
32KB	Ceramic, 50V,	0.0033μF, ±10%	

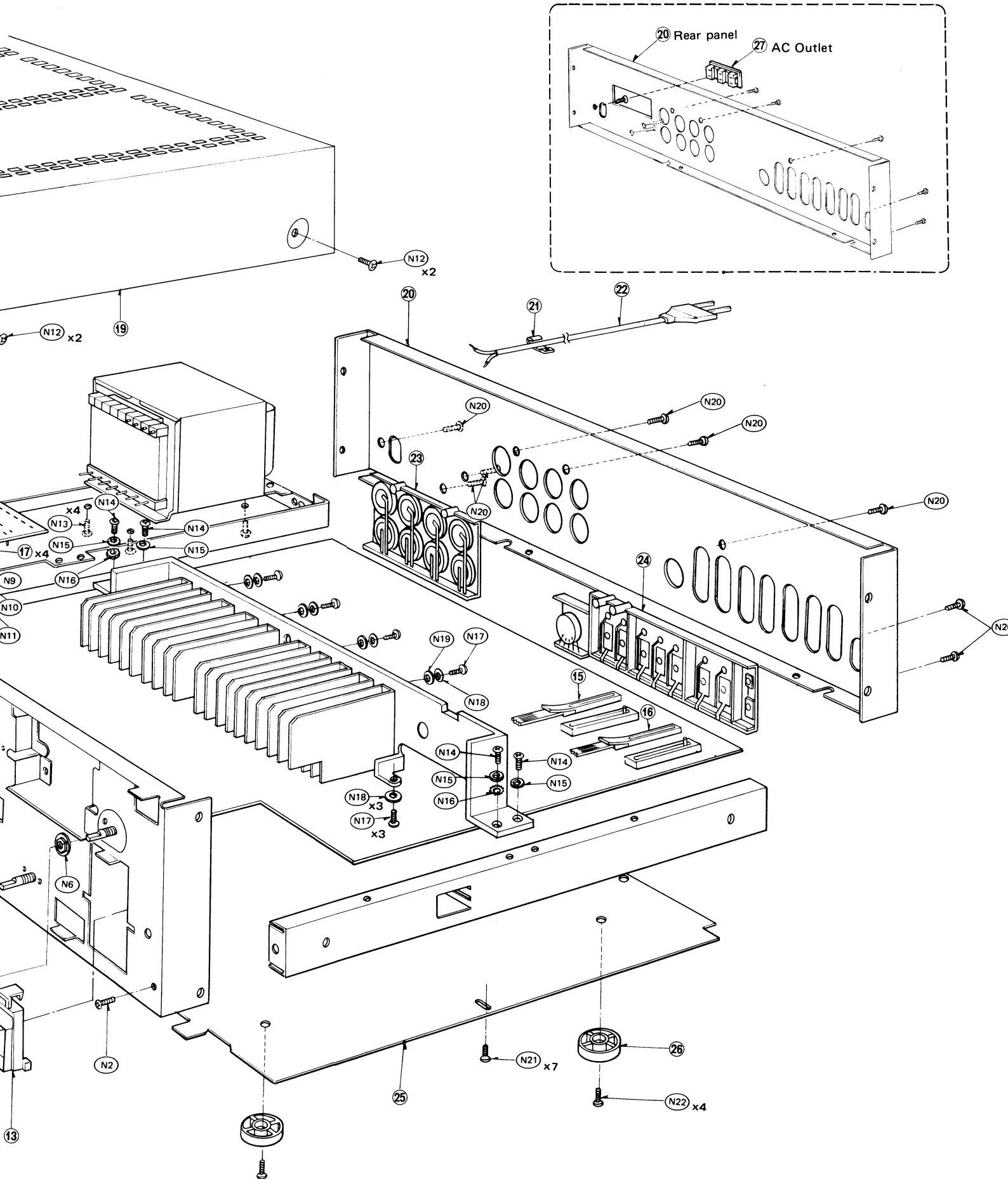
EXPLODED VIEW



Rear Panel and AC Outlet . . . for [XA]

Ref. No.	Part No.	Part Name & Description
CABINET and CHASSIS PARTS		
1	SYW485	Front Panel Ass'y
1	SYW485-1	Front Panel Ass'y (Black)
2	SBN995	Knob, Speaker, Input, Rec S
3	SGX7133	Ornament, FL
3	SGX7133-1	Ornament, FL (Black)
4	SGU237	Transparent Cover, FL
5	SDU81	Filter, FL
5	SDU81-1	Filter, FL (Black)
6	SBC337	Button, Power Source
7	SBN1065	Knob, Bass, Treble and Balan
8	SBC409	Button, Push Switch
9	SBN999-1	Knob, Main Volume
10	SHP9301-1	Spacer, Knob (Main Volume)
11	SDU59-1	Filter, Lamp (new class A)
12	SDE259-1	Tinted Cover
13	SMP305	Case, Lamp (new class A)
14	XCJS6P21B-A1	Jack, Headphone
15	ESA3385B	Remote Control, Rec Selecto
16	ESA3386B	Remote Control, Input Select
17	SJT347	Holder, Fuse
18	SMX455	Cover, PCB
19 [EK] only	SKCUV3EK	Cabinet Cover
19	SKC810S1	Cabinet Cover
19	SKC810B1	Cabinet Cover (Black)
20 [E] only	SGP2790A	Rear Panel
20	SGPUV3E	Rear Panel
20 [XL] only	SGP2790-1A	Rear Panel
20 [XA] only	SGP2790-2A	Rear Panel
21	SHR127	Bushing, AC Cord
21 [EK] only	SHR129	Bushing, AC Cord
21 [XL] only	SHR131	Bushing, AC Cord
22	SJA88	AC Cord
22 [EK] only	QFC1205M	AC Cord
22 [XL] only	QFC1207MA	AC Cord
22 [XA] only	SJA111	AC Cord
23	SJF4813-1	Terminal Board, Speaker
24	SJF3045-10N	Terminal Board, Input
25	SKU9330	Bottom Board
26	SKL227-1	Foot
27 [XA] only	SJS601-3	Socket, AC Outlet
SCREWS, WASHERS and NUTS		
N1	XXE4D5FZ	Screw, Selector Switch
N2	XTB3+8BFZ	Screw, Tapping ⊕ 3x8
N3	XSN3+6S	Screw, ⊕ 3x6
N4	XWA3B	Washer, Spring φ3
N5	XNS12	Nut, φ12
N6	SNE4021	Nut, Volume
N7	XWG3	Washer, Plain φ3
N8	XTN3+8B	Screw, Tapping ⊕ 3x8
N9	XWG3	Washer, Plain φ3
N10	XWA3B	Washer, Spring φ3
N11	XSN3+10S	Screw, ⊕ 3x10
N12	XTB4+8BFN	Screw, Tapping ⊕ 4x8
N12	XTB4+8BFZ	Screw, Tapping ⊕ 4x8
N13	XTB4+10BFZ	Screw, Tapping ⊕ 4x10
N14	XTN3+10B	Screw, Tapping ⊕ 3x10
N15	XWG3	Washer, Plain φ3
N16	XWC4B	Washer, External Toothed Lo
N17	XTN3+12B	Screw, Tapping ⊕ 3x12
N18	XWG3	Washer, Plain φ3
N19	XWA3B	Washer, Spring φ3
N20	XTBS3+8BFZ1	Screw, Tapping with Detent
N21	XTB3+8BFZ	Screw, Tapping ⊕ 3x8
N21 [XL] only	XTBS3+8BFZ1	Screw, Tapping with Detent
N22	XTB3+10BFZ	Screw, Tapping ⊕ 3x8
ACCESSORIES		
A1 [XA] only	SJP5213-1	Plug Adapter, AC Power
A2 [XA] only	SJP5215	Plug Adaptor, AC Power
A3	SQF10835	Instructions Book, Printed Ma
A3 [XL] only	SQF10837	Instructions Book, Printed Ma
A3 [XA] only	SQF10839	Instructions Book, Printed Ma
A3 [EI] only	SQF10931	Instructions Book, Printed Ma

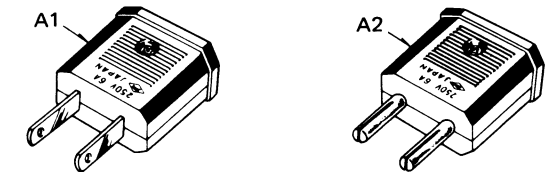
Rear Panel and AC Outlet . . . for [XA]



Ref. No.	Part No.	Part Name & Description
CABINET and CHASSIS PARTS		
1	SYW485	Front Panel Ass'y
1	SYW485-1	Front Panel Ass'y (Black)
2	SBN995	Knob, Speaker, Input, Rec Selector
3	SGX7133	Ornament, FL
3	SGX7133-1	Ornament, FL (Black)
4	SGU237	Transparent Cover, FL
5	SDU81	Filter, FL
5	SDU81-1	Filter, FL (Black)
6	SBC337	Button, Power Source
7	SBN1065	Knob, Bass, Treble and Balance
8	SBC409	Button, Push Switch
9	SBN999-1	Knob, Main Volume
10	SHP9301-1	Spacer, Knob (Main Volume)
11	SDU59-1	Filter, Lamp (new class A)
12	SDE259-1	Tinted Cover
13	SMP305	Case, Lamp (new class A)
14	XCJS6P21B-A1	Jack, Headphone
15	ESA3385B	Remote Control, Rec Selector
16	ESA3386B	Remote Control, Input Selector
17	SJT347	Holder, Fuse
18	SMX455	Cover, PCB
19 [EK] only	SKCUV3EK	Cabinet Cover
19	SKC810S1	Cabinet Cover
19	SKC810B1	Cabinet Cover (Black)
20 [E] only	SGP2790A	Rear Panel
20	SGPUV3E	Rear Panel
20 [XL] only	SGP2790-1A	Rear Panel
20 [XA] only	SGP2790-2A	Rear Panel
21	SHR127	Bushing, AC Cord
21 [EK] only	SHR129	Bushing, AC Cord
21 [XL] only	SHR131	Bushing, AC Cord
22	SJA88	AC Cord
22 [EK] only	QFC1205M	AC Cord
22 [XL] only	QFC1207MA	AC Cord
22 [XA] only	SJA111	AC Cord
23	SJF4813-1	Terminal Board, Speaker
24	SJF3045-10N	Terminal Board, Input
25	SKU9330	Bottom Board
26	SKL227-1	Foot
27 [XA] only	SJS601-3	Socket, AC Outlet
SCREWS, WASHERS and NUTS		
N1	XXE4D5FZ	Screw, Selector Switch
N2	XTB3+8BFZ	Screw, Tapping $\oplus$ 3x8
N3	XSN3+6S	Screw, $\oplus$ 3x6
N4	XWA3B	Washer, Spring ϕ 3
N5	XNS12	Nut, ϕ 12
N6	SNE4021	Nut, Volume
N7	XWG3	Washer, Plain ϕ 3
N8	XTN3+8B	Screw, Tapping $\oplus$ 3x8
N9	XWG3	Washer, Plain ϕ 3
N10	XWA3B	Washer, Spring ϕ 3
N11	XSN3+10S	Screw, $\oplus$ 3x10
N12	XTB4+8BFN	Screw, Tapping $\oplus$ 4x8
N12	XTB4+8BFZ	Screw, Tapping $\oplus$ 4x8
N13	XTB4+10BFZ	Screw, Tapping $\oplus$ 4x10
N14	XTN3+10B	Screw, Tapping $\oplus$ 3x10
N15	XWG3	Washer, Plain ϕ 3
N16	XWC4B	Washer, External Toothed Lock ϕ 4
N17	XTN3+12B	Screw, Tapping $\oplus$ 3x12
N18	XWG3	Washer, Plain ϕ 3
N19	XWA3B	Washer, Spring ϕ 3
N20	XTBS3+8BFZ1	Screw, Tapping with Detent $\oplus$ 3x8
N21	XTB3+8BFZ	Screw, Tapping $\oplus$ 3x8
N21 [XL] only	XTBS3+8BFZ1	Screw, Tapping with Detent $\oplus$ 3x8
N22	XTB3+10BFZ	Screw, Tapping $\oplus$ 3x8
ACCESSORIES		
A1 [XA] only	SJP5213-1	Plug Adapter, AC Power
A2 [XA] only	SJP5215	Plug Adaptor, AC Power
A3	SQF10835	Instructions Book, Printed Matter
A3 [XL] only	SQF10837	Instructions Book, Printed Matter
A3 [XA] only	SQF10839	Instructions Book, Printed Matter
A3 [Ei] only	SQF10931	Instructions Book, Printed Matter

Ref. No.	Part No.	Part Name & Description
PACKING PARTS		
P1	SPP689	Polyethylene Bag
P2	SPS3257	Pad, Left Side
P2 [XL] only	SPS3257-1	Pad, Left Side
P3	SPS3259	Pad, Right Side
P3 [XL] only	SPS3259-1	Pad, Right Side
P4	SPG3221	Carton Box
P4 [XL] only	SPG3223	Carton Box
P4 [EF] only	SPG3225	Carton Box
P4	SPG3227	Carton Box

● Accessories



Areas

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