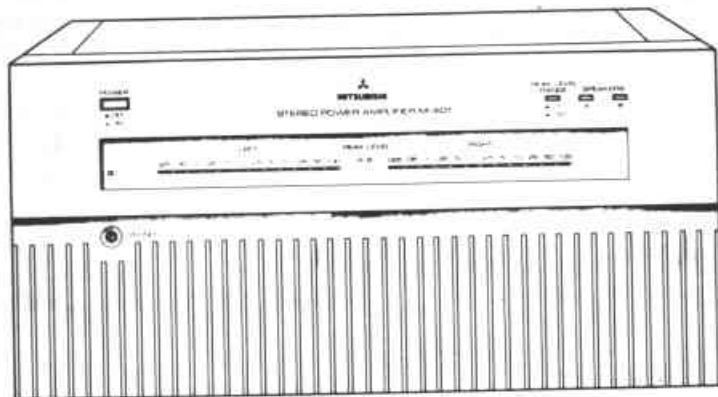


SERVICE MANUAL

STEREO POWER AMPLIFIER
MODEL M-A01



CONTENTS

SPECIFICATIONS	2
FRONT PANEL	3
REAR PANEL	3
DISASSEMBLY	4
ADJUSTMENTS	6
SCHEMATIC DIAGRAM	7
PRINTED CIRCUIT BOARD	9
SERVICE PARTS LIST	11

SPECIFICATIONS

Power output . . . . .	.70W continuous power per channel, both channels driven into 8 ohms from 15 Hz to 20kHz, with 0.01% THD	Input sensitivity/impedance	1 V/50 kohms
	85W continuous power per channel, both channels driven into 4 ohms from 15 Hz to 20kHz, 0.02% THD	Damping factor . . . . .	.100 from 20Hz to 20kHz, 8 ohms
Total harmonic distortion .	0.004% at 30W per channel, both channels driven into 8 ohms 15 Hz to 20kHz	Hum and noise . . . . .	.80 μ V (unweighted, closed circuit)
	0.006% at 1W per channel, both channels driven into 8 ohms from 15 Hz to 20kHz	Signal to noise ratio	109 dB (unweighted, closed circuit)
Intermodulation distortion .	0.008% at rated power, 8 ohms (70Hz and 7kHz 4:1)	(at rated power)	123 dB (IHF, A network, closed circuit)
Power bandwidth (IHF) . . .	.10 Hz to 60kHz at 0.05% THD, 8 ohms		109 dB (DIN, 47 kohms/250 pF terminated)
Frequency response	\pm 0.1 dB from 20 Hz to 20kHz at rated power, 8 ohms	Slew rate . . . . .	.30 V/ μ S
	0 ~ -1 dB from 20 Hz to 20kHz at 0.5W per channel, 8 ohms	Power consumption . . . . .	.220W (IEC nominal) 200W (UL nominal) 260VA (CSA nominal)
		Matching impedance	4 to 16 ohms
		Headphone output . . . . .	.01 W/8 ohms
		Output systems	A, B, A-B
		Semiconductors . . . . .	.9 ICs, 2 FETs, 37 Transistors 65 Diodes
		Dimensions (W x H x D) . . .	.270 x 130 x 243 mm (10-5/8" x 6-11/16" x 9-9/16")
		Weight . . . . .	.10 kg (22 lb)
		(Supplied with RCA audio cable)	

* Design and specifications are subject to change without notice for improvements.

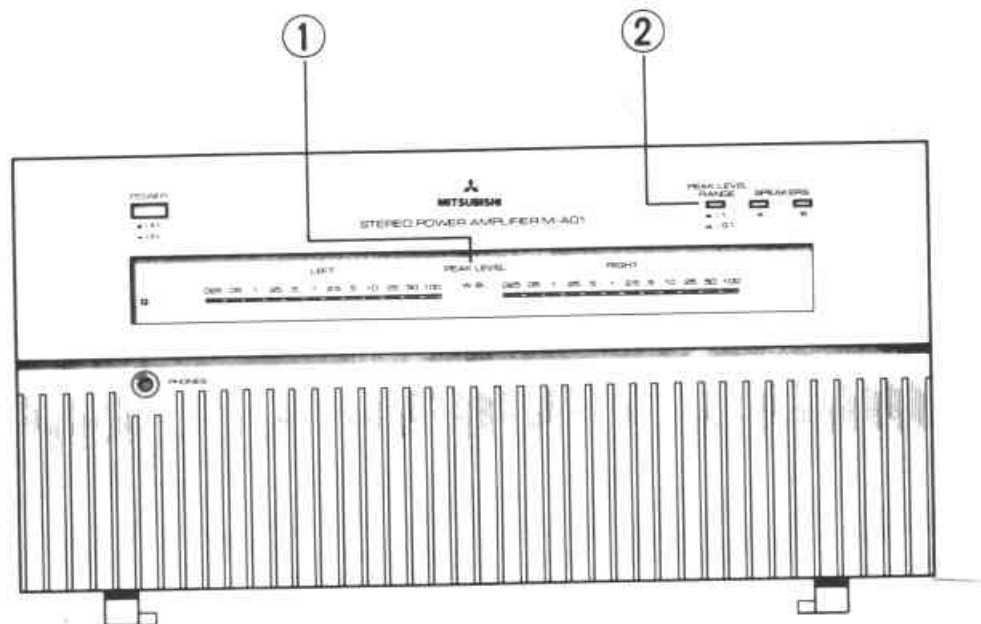
FRONT PANEL

① PEAK LEVEL indicator

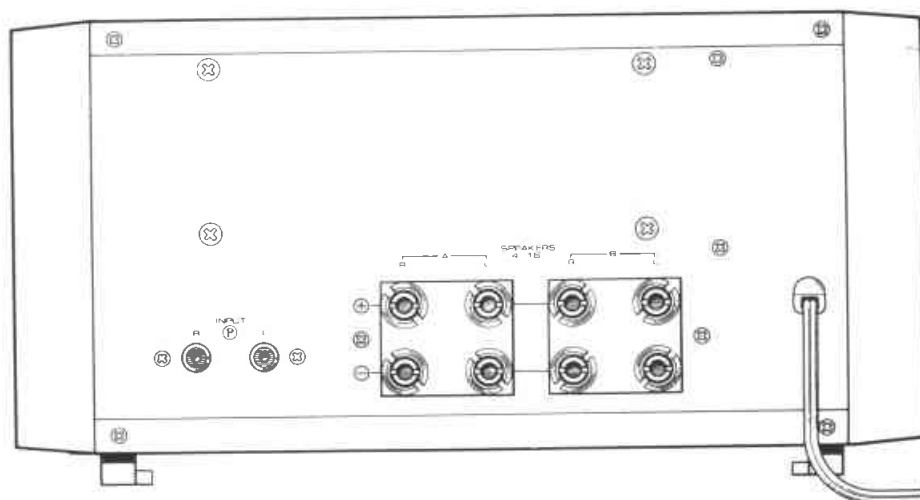
This shows the peak level of the output signal of the music being reproduced.

② PEAK LEVEL RANGE selector

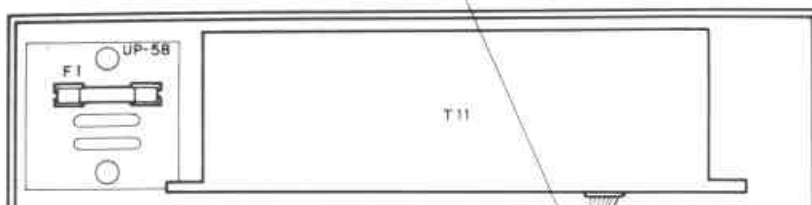
When this selector is depressed to the ON position, the peak level is enlarged 10-fold and displayed. Depress this selector when you want to listen under low-volume conditions.



REAR PANEL



- 6) Rotate the power transformer 90° to the rear along with the rear panel. Take care with the power transformer's leads since they may catch on the input pin jacks.



Note) The power transformer's leads can easily catch on the corner of the J1 input terminal board. Take care with disassembly and re-assembly.

DISASSEMBLY

Procedure

- 1) Remove the top and bottom panel screws.
- 2) Remove the four screws of the speaker terminals and input pin jacks on the rear panel. (Refer to Fig. 1)
- 3) Remove the two screws at the left and the right of the rear panel. (Refer to Fig. 1)

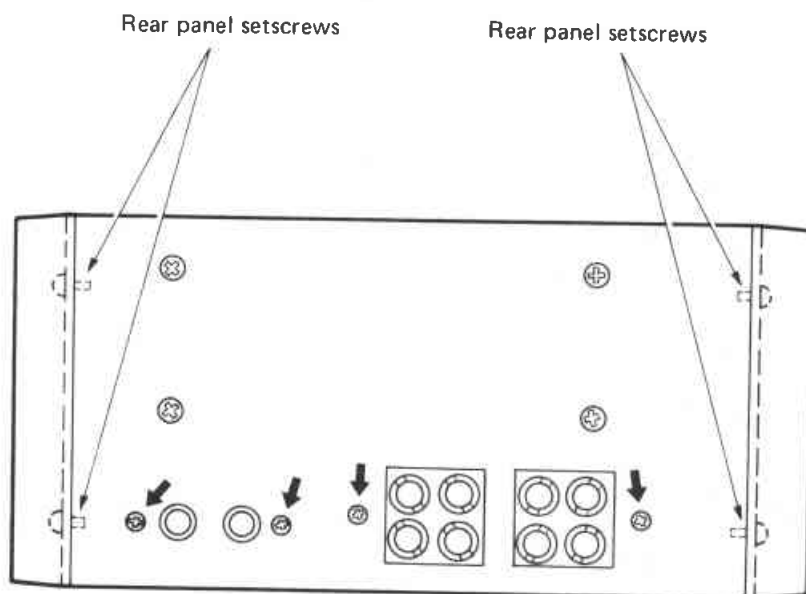


Fig. 1

- 4) Remove the two screws of the power transformer. (Refer to Fig. 2)
- 5) The leads from the power switch are clamped. Cut the clammer with cutters. (Refer to Fig. 2)

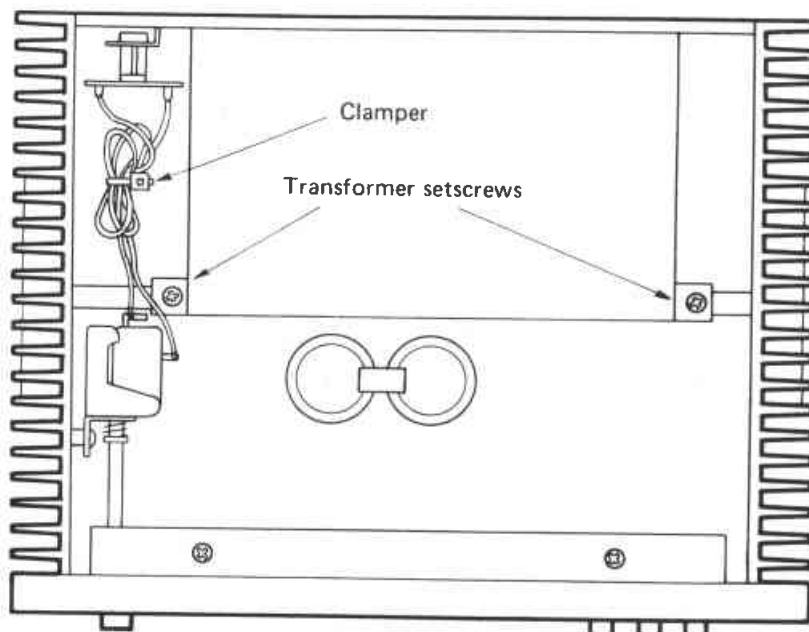


Fig. 2

ADJUSTMENTS

1. Idling current adjustment

- 1) Connect a DC voltmeter across the emitters of transistors Q116 and Q117, and Q216 and Q217.
- 2) Rotate the VR103 and VR203 semi-fixed resistors in the counterclockwise direction as far as they will go.
- 3) Set the power switch of the amplifier to ON.
- 4) Rotate VR103 and VR203 in the direction of the arrow (clockwise) so that the pointer on the DC voltmeter deflects to $35 \pm 5\text{mV}$.

2. Mid-point potential adjustment

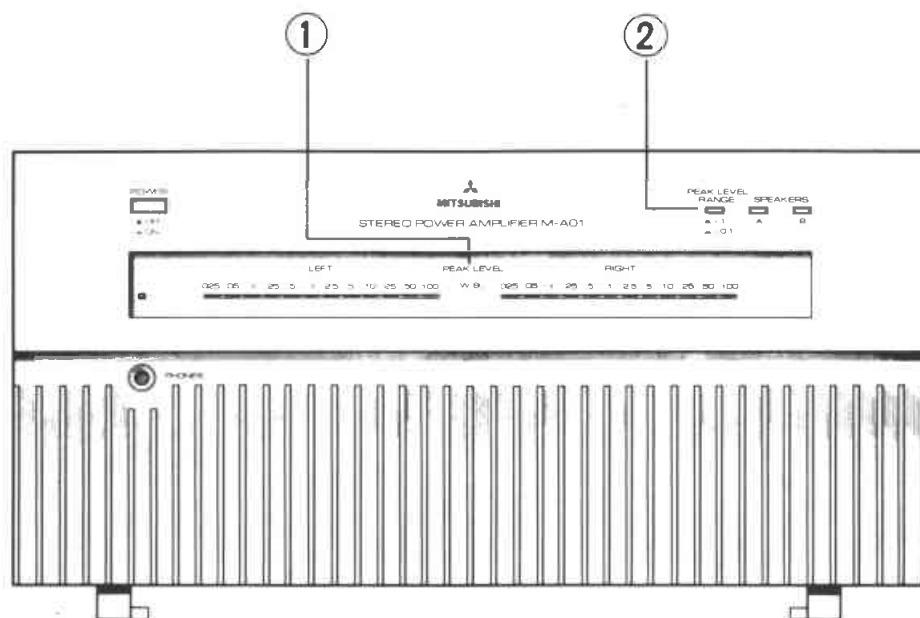
FRONT PANEL

① PEAK LEVEL indicator

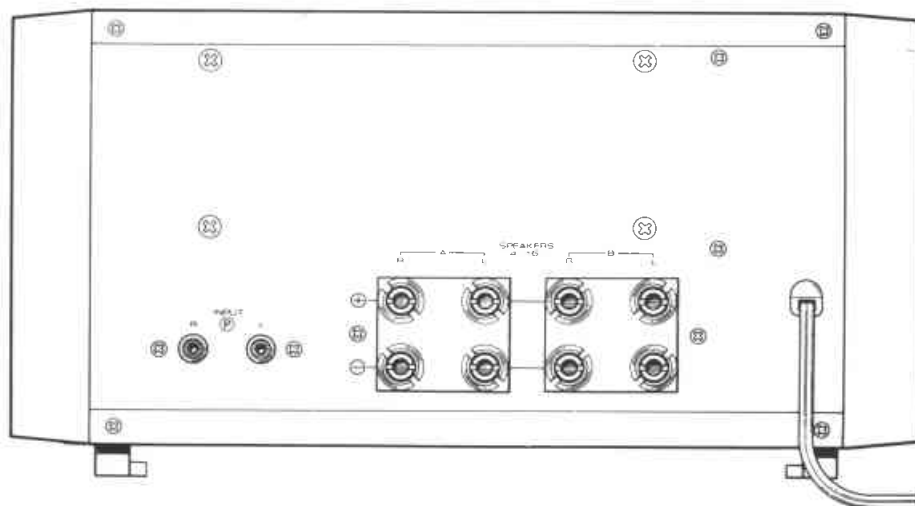
This shows the peak level of the output signal of the music being reproduced.

② PEAK LEVEL RANGE selector

When this selector is depressed to the ON position, the peak level is enlarged 10-fold and displayed. Depress this selector when you want to listen under low-volume conditions.



REAR PANEL



DISASSEMBLY

Procedure

- 1) Remove the top and bottom panel screws.
- 2) Remove the four screws of the speaker terminals and input pin jacks on the rear panel. (Refer to Fig. 1)
- 3) Remove the two screws at the left and the right of the rear panel. (Refer to Fig. 1)

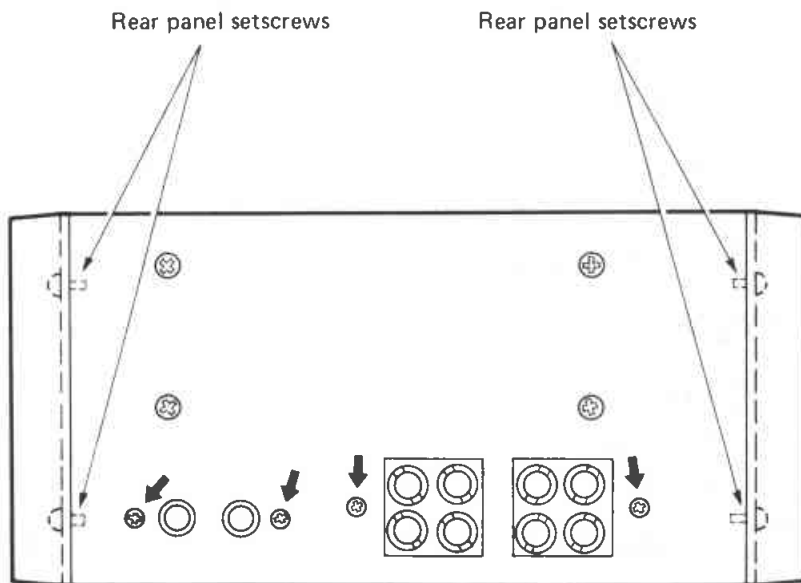


Fig. 1

- 4) Remove the two screws of the power transformer. (Refer to Fig. 2)
- 5) The leads from the power switch are clamped. Cut the clammer with cutters. (Refer to Fig. 2)

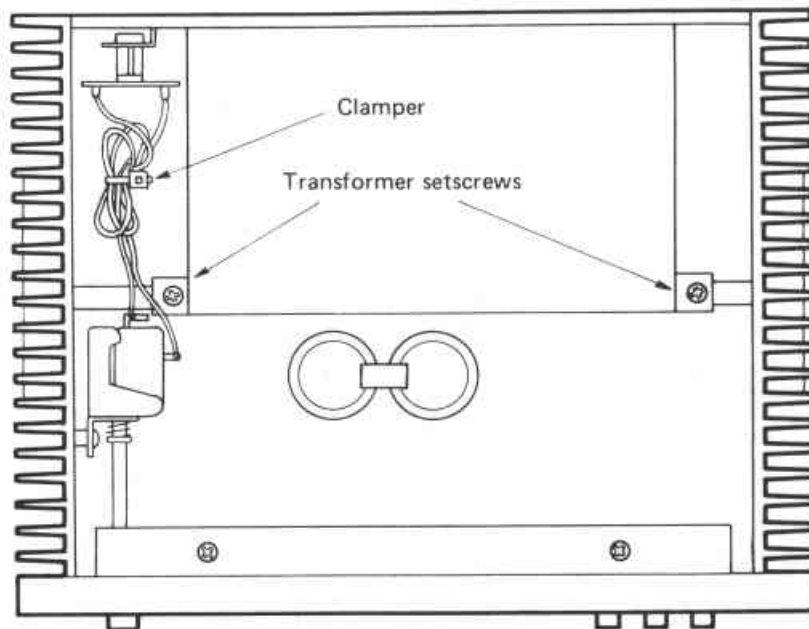
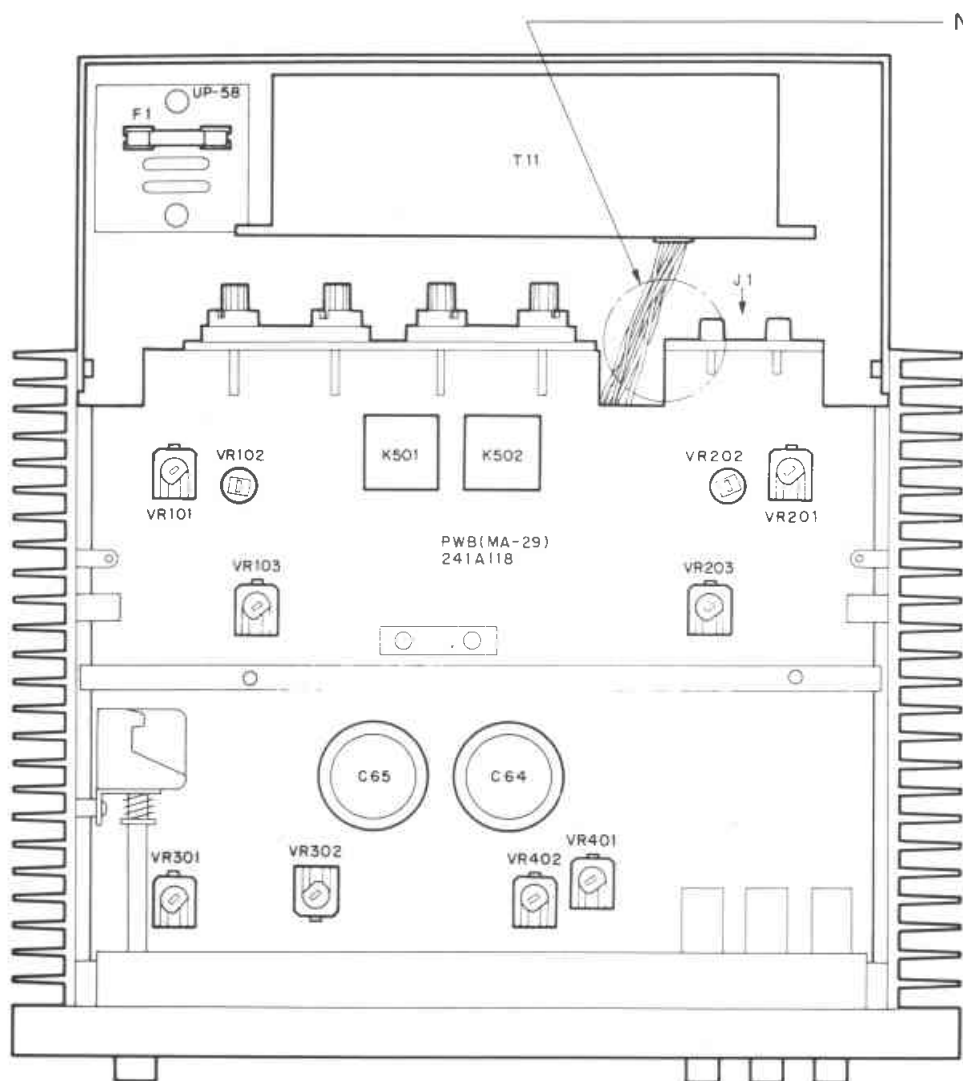


Fig. 2

- 6) Rotate the power transformer 90° to the rear along with the rear panel. Take care with the power transformer's leads since they may catch on the input pin jacks.

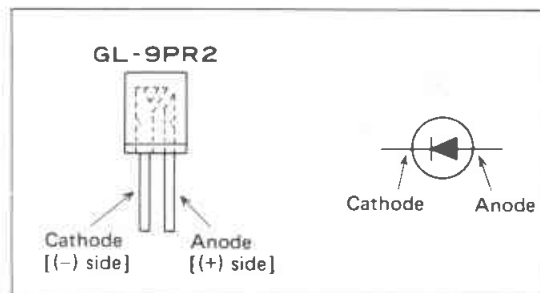


Note) The power transformer's leads can easily catch on the corner of the J1 input terminal board. Take care with disassembly and re-assembly.

Fig. 3

*** Peak indicator diode polarities**

The internal construction of the diode used for the peak indicator is shown in the figure. The anode and cathode can be differentiated. Take care when replacing.



ADJUSTMENTS

1. Idling current adjustment

- 1) Connect a DC voltmeter across the emitters of transistors Q116 and Q117, and Q216 and Q217.
- 2) Rotate the VR103 and VR203 semi-fixed resistors in the counterclockwise direction as far as they will go.
- 3) Set the power switch of the amplifier to ON.
- 4) Rotate VR103 and VR203 in the direction of the arrow (clockwise) so that the pointer on the DC voltmeter deflects to $35 \pm 5\text{mV}$.

2. Mid-point potential adjustment

- 1) Connect a DC voltmeter across the output terminal and ground.
- 2) Rotate semi-fixed resistors VR101 and VR201 to their center positions.
- 3) Set the power switch of the amplifier to ON.
- 4) Adjust the VR102 and VR202 coarsely and then adjust VR101 and VR201 finely so that the pointer on the DC voltmeter deflects to $0 \pm 5\text{mV}$.

3. Standard voltage adjustment

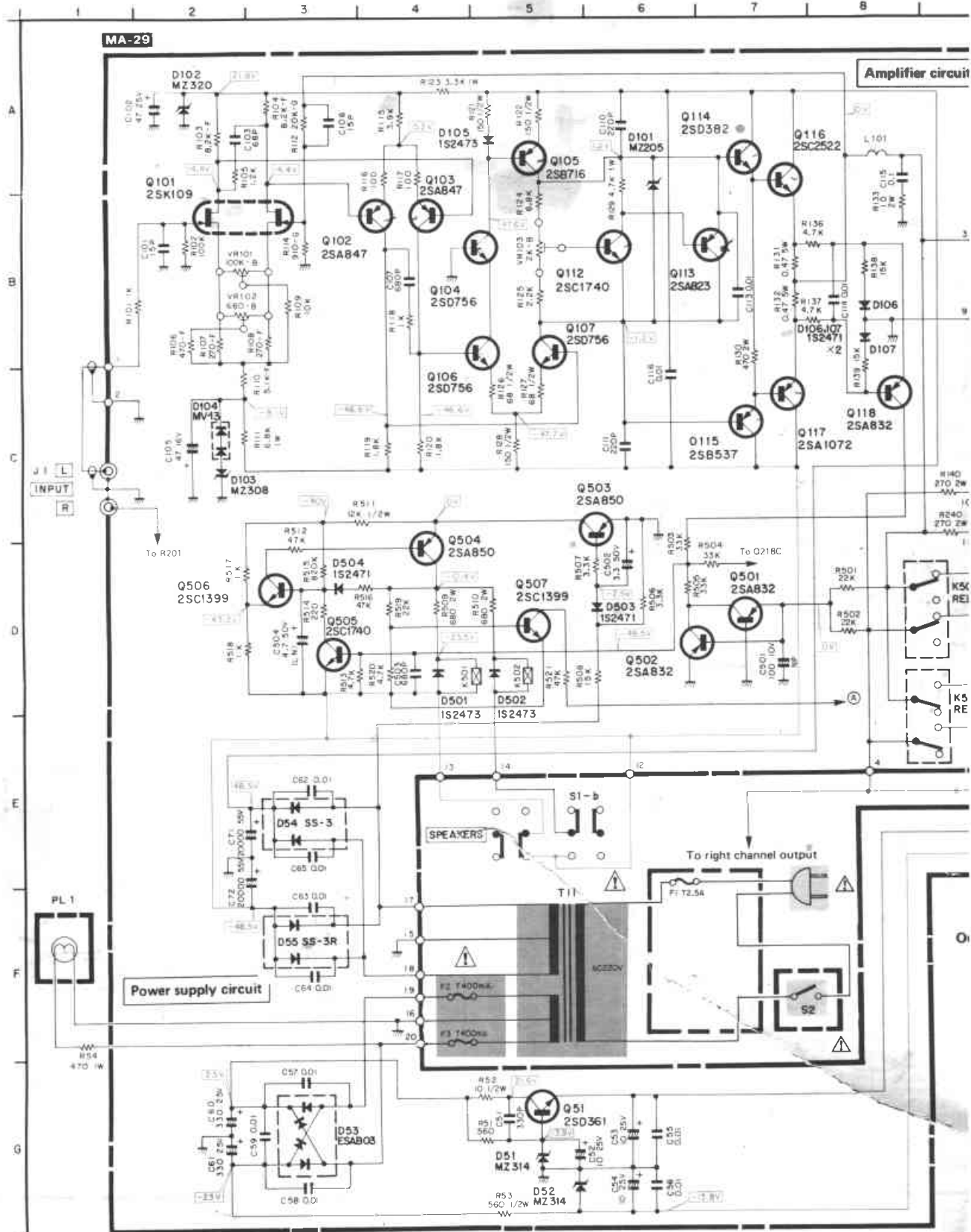
- 1) Connect the DC voltmeter to both ends of C302 and C402.
- 2) Adjust semi-fixed resistors VR302 and VR402 so that the pointer on the DC voltmeter deflects to 2 V.

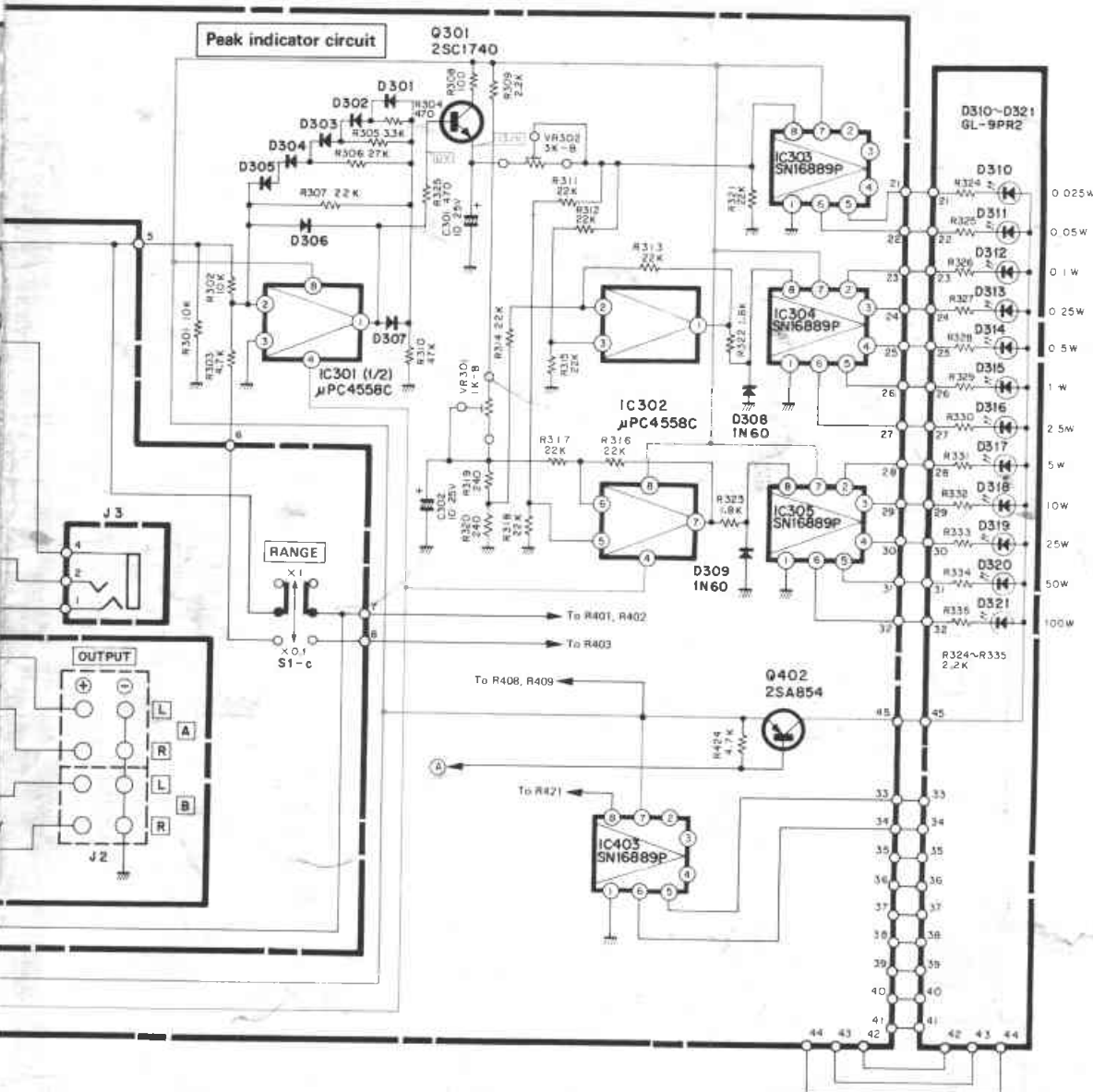
4. Indicator display voltage adjustment

- 1) Apply a 1 kHz signal to the input terminal and connect a AC voltmeter to the speaker terminals. Do not connect either the speakers or a load resistance to the terminals.
- 2) Adjust the input so that the pointer of the AC voltmeter deflects to 28.3 V.
- 3) Connect the DC voltmeter (tester) to both ends of R321 and R421, and adjust VR302 and VR402 so that pointer on the voltmeter deflects to 3 V.
- 4) All the indicators will now come on.

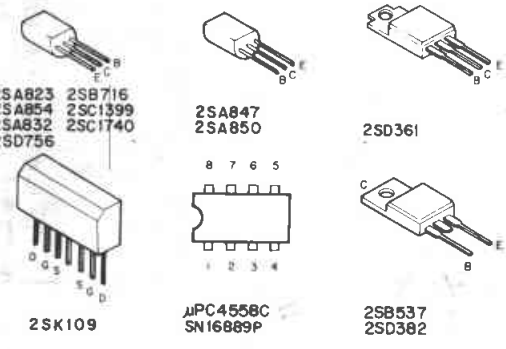
SCHEMATIC DIAGRAM

20000
634
55V





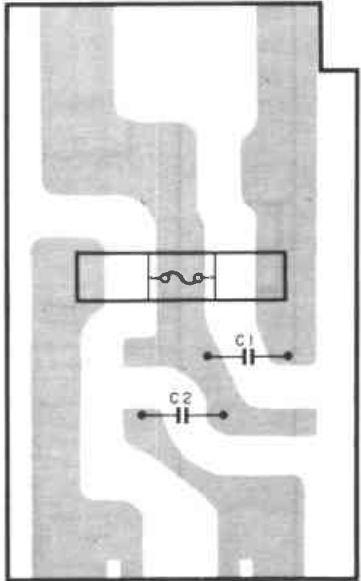
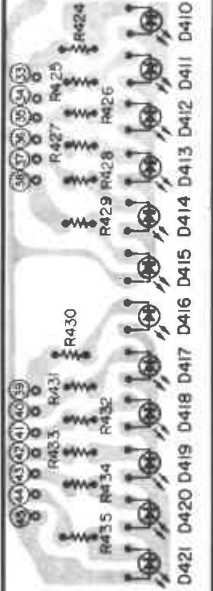
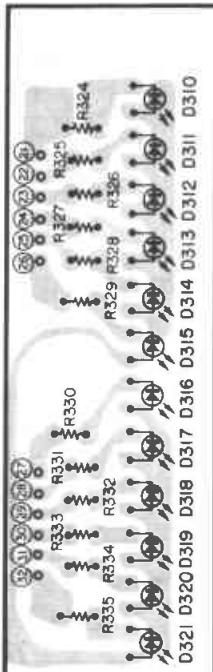
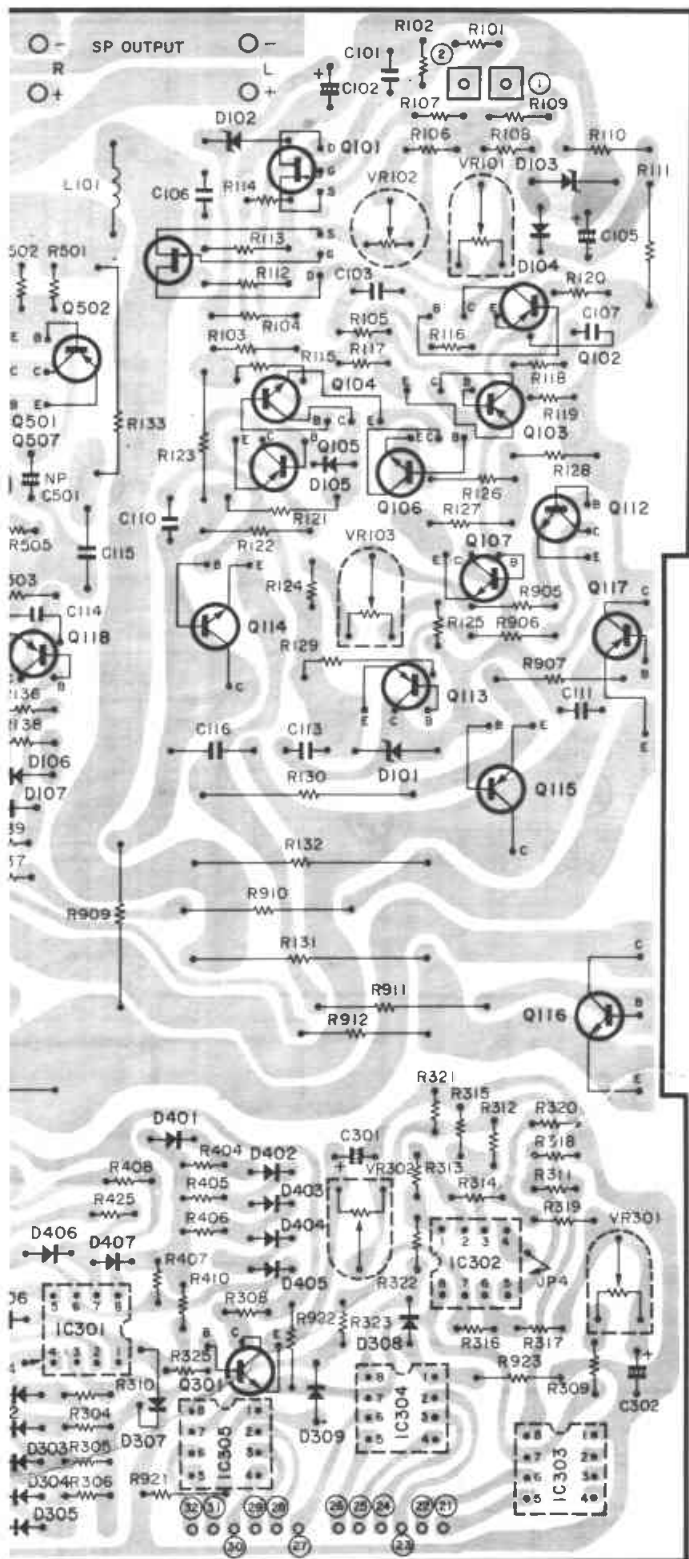
types and polarities of transistors and ICs



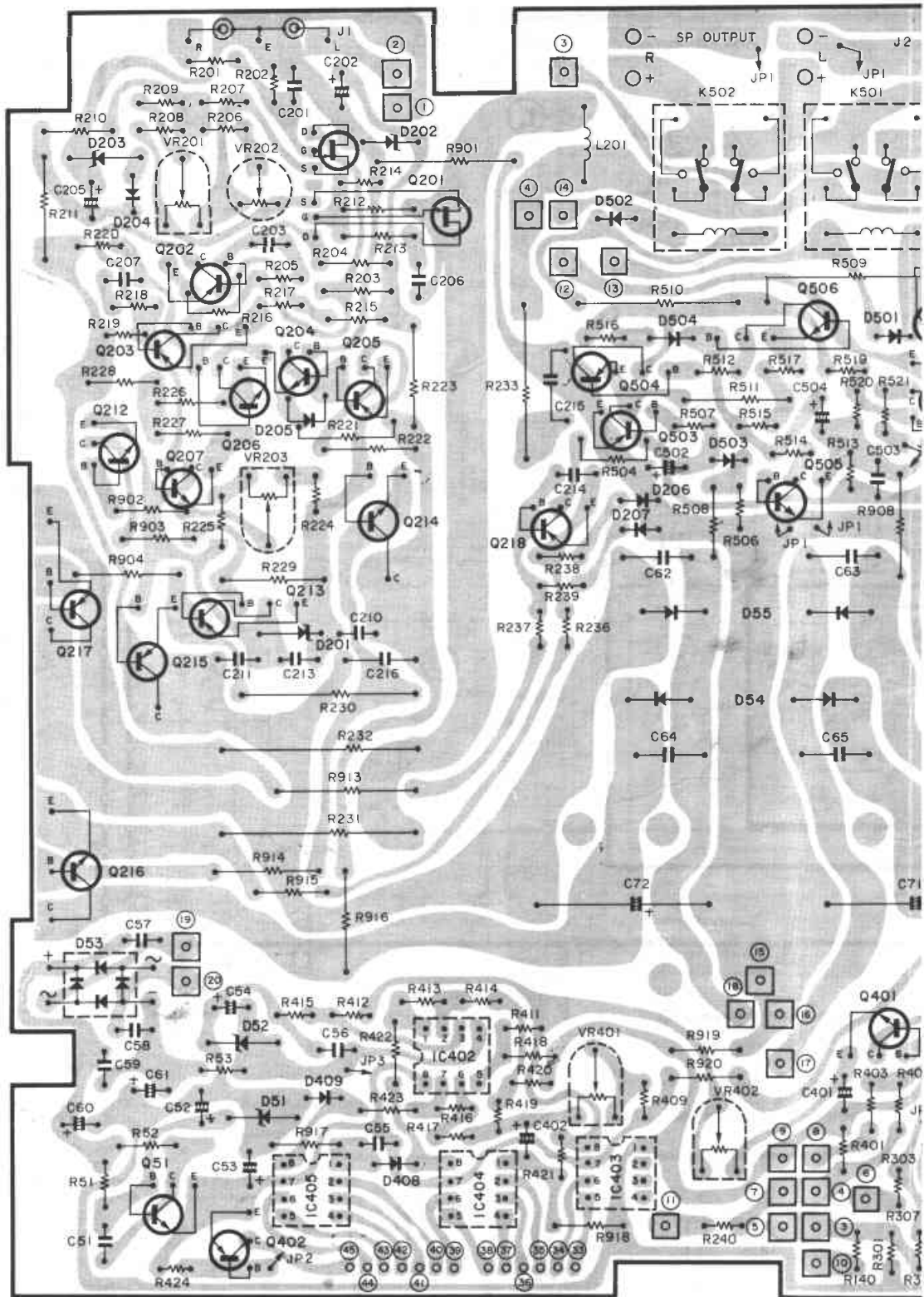
- Note 1. S1-a, b SPEAKERS switch OUTPUT A position
 S1-c RANGE switch X1 position
2. Capacitor and resistor units
 C no-signal: μ F R no-signal: Ω
 p symbol: pF K symbol: K Ω
3. All the resistors are carbon 1/4 W units unless otherwise specified.
4. The voltages are the values measured with a DC 20 k Ω /V tester under 100 V no-signal conditions.
5. The right channel is omitted from the circuits below.
 Amplifier circuit Specifications are on 200 level
 Peak indicator circuit Specifications are on 400 level

This schematic is the basic schematic diagram and the constants are subject to change due to improvements.



NOTE: Δ and \square marks components on Parts list are for performance of this unit, replace them, uses safety critical components or designed component as specified.



PRINTED CIRCUIT BOARD



SERVICE PARTS LIST

NOTE:  and  marked components on Parts list have special characteristics to keep safety performance of this unit. When replacing any of these parts, be sure to use only specified parts.

Symbol No.	Part. No.	Description	Symbol No.	Part. No.	Description
Q51	M05067315	TRANSISTOR 2SD361	D105	M07060320	DIODE 1S2473
Q101	M07213303	TRANSISTOR 2SK109	D106	M07142320	DIODE 1S2471
Q102	M07140303	TRANSISTOR 2SA847	D107	M07142320	DIODE 1S2471
Q103	M07140303	TRANSISTOR 2SA847			
Q104	M07370305	TRANSISTOR 2SD756	D201	M07240321	DIODE MZ205
Q105	M07370306	TRANSISTOR 2SB716	D202	M07140320	DIODE MZ320
Q106	M07370305	TRANSISTOR 2SD756	D203	M07133322	DIODE MZ308
Q107	M07370305	TRANSISTOR 2SD756	D204	M04091331	VARISTOR MV-13
Q112	M05104313	TRANSISTOR 2SC1740	D205	M07060320	DIODE 1S2473
Q113	M05104312	TRANSISTOR 2SA823	D206	M07142320	DIODE 1S2471
Q114	M07113304	TRANSISTOR 2SD382	D207	M07142320	DIODE 1S2471
Q115	M07113305	TRANSISTOR 2SB537			
Q116	M07370303	TRANSISTOR 2SC2522	D301	M07060320	DIODE 1S2473
Q117	M07370304	TRANSISTOR 2SA1072	D302	M07060320	DIODE 1S2473
Q118	M07142312	TRANSISTOR 2SA832	D303	M07060320	DIODE 1S2473
			D304	M07060320	DIODE 1S2473
Q201	M07213303	TRANSISTOR 2SK109	D305	M07060320	DIODE 1S2473
Q202	M07140303	TRANSISTOR 2SA847	D306	M07060320	DIODE 1S2473
Q203	M07140303	TRANSISTOR 2SA847	D307	M07060320	DIODE 1S2473
Q204	M07370305	TRANSISTOR 2SD756	D308	M04097320	DIODE 1N60
Q205	M07370306	TRANSISTOR 2SB716	D309	M04097320	DIODE 1N60
Q206	M07370305	TRANSISTOR 2SD756	D310	M05142322	LED GL-9PR2
Q207	M07370305	TRANSISTOR 2SD756	D311	M05142322	LED GL-9PR2
Q212	M05104313	TRANSISTOR 2SCI740	D312	M05142322	LED GL-9PR2
Q213	M05104312	TRANSISTOR 2SA823	D313	M05142322	LED GL-9PR2
Q214	M07113304	TRANSISTOR 2SD382	D314	M05142322	LED GL-9PR2
Q215	M07113305	TRANSISTOR 2SB537 47, 5	D315	M05142322	LED GL-9PR2
Q216	M07370303	TRANSISTOR 2SC2522	D316	M05142322	LED GL-9PR2
Q217	M07370304	TRANSISTOR 2SA1072	D317	M05142322	LED GL-9PR2
Q218	M07142312	TRANSISTOR 2SA832	D318	M05142322	LED GL-9PR2
Q301	M05104313	TRANSISTOR 2SC1740	D319	M05142322	LED GL-9PR2
Q401	M05104313	TRANSISTOR 2SC1740	D320	M05142322	LED GL-9PR2
Q402	M07137308	TRANSISTOR 2SA854	D321	M05142322	LED GL-9PR2
Q501	M07142312	TRANSISTOR 2SA832			
Q502	M07142312	TRANSISTOR 2SA832	D401	M07060320	DIODE 1S2473
Q503	M07133304	TRANSISTOR 2SA850	D402	M07060320	DIODE 1S2473
Q504	M07133304	TRANSISTOR 2SA850	D403	M07060320	DIODE 1S2473
Q505	M05104313	TRANSISTOR 2SC1740	D404	M07060320	DIODE 1S2473
Q506	M07240303	TRANSISTOR 2SC1399	D405	M07060320	DIODE 1S2473
Q507	M07240303	TRANSISTOR 2SC1399	D406	M07060320	DIODE 1S2473
			D407	M07060320	DIODE 1S2473
D51	M07141322	DIODE MZ314	D408	M04097320	DIODE 1N60
D52	M07141322	DIODE MZ314	D409	M04097320	DIODE 1N60
D53	M07300323	DIODE ESAB03	D410	M05142322	LED GL-9PR2
D54	M07143320	DIODE SS-3	D411	M05142322	LED GL-9PR2
D55	M07143321	DIODE SS-3R	D412	M05142322	LED GL-9PR2
			D413	M05142322	LED GL-9PR2
D101	M07240321	DIODE MZ205	D414	M05142322	LED GL-9PR2
D102	M07140320	DIODE MZ320	D415	M05142322	LED GL-9PR2
D103	M07133322	DIODE MZ308	D416	M05142322	LED GL-9PR2
D104	M04091331	VARISTOR MV-13	D417	M05142322	LED GL-9PR2

Symbol No.	Part. No.	Description
D418	M05142322	LED GL-9PR2
D419	M05142322	LED GL-9PR2
D420	M05142322	LED GL-9PR2
D421	M05142322	LED GL-9PR2
D501	M07060320	DIODE 1S2473
D502	M07060320	DIODE 1S2473
D503	M07142320	DIODE 1S2471
D504	M07142320	DIODE 1S2471
IC301 (IC302)	M07370343	IC- μ PC4558C
IC401 (IC402)	M07370343	IC- μ PC4558C
IC303	M07236344	IC-SN16889P
IC304	M07236344	IC-SN16889P
IC305	M07236344	IC-SN16889P
IC403	M07236344	IC-SN16889P
IC404	M07236344	IC-SN16899P
IC405	M07236344	IC-SN16899P
K501	M05053431	RELAY
K502	M05053431	RELAY
J3	M05104441	JACK (HEADPHONES)
S1	M07470450	PUSH SWITCH (PEAK LEVEL RANGE, SPEAKERS)
S2	M07366455	PUSH SWITCH (POWER) ⚠
PL1	M07370250	LAMP
T11	M07440549	POWER TRANSFORMER ⚠
F1	M07329490	FUSE 2.5A-SEMKO ⚠
	M07357211	KNOB (PEAK LEVEL RANGE, SPEAKERS)
	M05147120	KNOB (POWER)