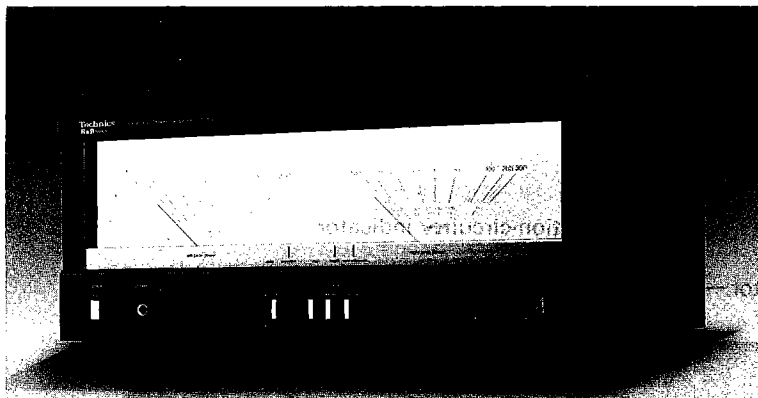


Service Manual

Stereo DC Power Amplifier

SE-A3K

[M], [MC]



Areas

- * [M] is available in U.S.A.
- * [MC] is available in Canada.

TECHNICAL SPECIFICATIONS Specifications are subject to change without notice for further improvement.

(IHF '78)

■ AMPLIFIER SECTION

Rated minimum sine wave RMS power output

20 Hz~20 kHz both channels driven

0.002% total harmonic distortion

200W per channel (8 ohms)

20 Hz~20 kHz both channels driven

0.003% total harmonic distortion

320W per channel (4 ohms)

1 kHz continuous power output

both channels driven

0.001% total harmonic distortion

220W per channel (8 ohms)

0.003% total harmonic distortion

350W per channel (4 ohms)

Dynamic headroom

1.1 dB (8 ohms)

1.8 dB (4 ohms)

Total harmonic distortion

rated power at 20 Hz~20 kHz

0.002% (8 ohms)

half power at 20 Hz~20 kHz

0.001% (8 ohms)

half power at 1 kHz

0.0003% (8 ohms)

SMPTE intermodulation distortion

0.002% (8 ohms)

TIM (Transient Intermodulation Distortion)

unmeasurably small

Frequency response

+0 dB, -0.1 dB (DC~20 kHz)

DC~300 kHz, (+0 dB, -3 dB)

Input sensitivity

70 mV (1V, IHF '66)

S/N (IHF, A)

100 dB (123 dB, IHF '66)

Input impedance

47 kilohms

Low frequency damping factor

200 (8 ohms)

100 (4 ohms)

Load impedance

MAIN or REMOTE

4~16 ohms

MAIN and REMOTE

8~16 ohms

Meter

reading range

0.0001 W~300 W (8 ohms)

-60 dB~+5 dB

(logarithmic compression)

frequency response (reading accuracy)

10 Hz~20 kHz ± 1 dB (more than -40 dB)10 Hz~10 kHz ± 1 dB (less than -40 dB)

attack time

50 μ sec.

recovery time

750 msec. (0 dB~-20 dB)

■ GENERAL

Power consumption

1150W, 1400 VA

Power supply

AC 120V, 60 Hz

Dimensions (W×H×D)

430 × 208 × 507 mm

(16-15/16" × 8-3/16" × 19-31/32")

Weight

35.2 kg

(78.3 lb.)

Note:

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

Technics

R&B series

Panasonic Company
Division of Matsushita Electric
Corporation of America
One Panasonic Way, Secaucus,
New Jersey 07094

Panasonic Hawaii, Inc.
320 Waiakamilo Road, Honolulu,
Hawaii 96817

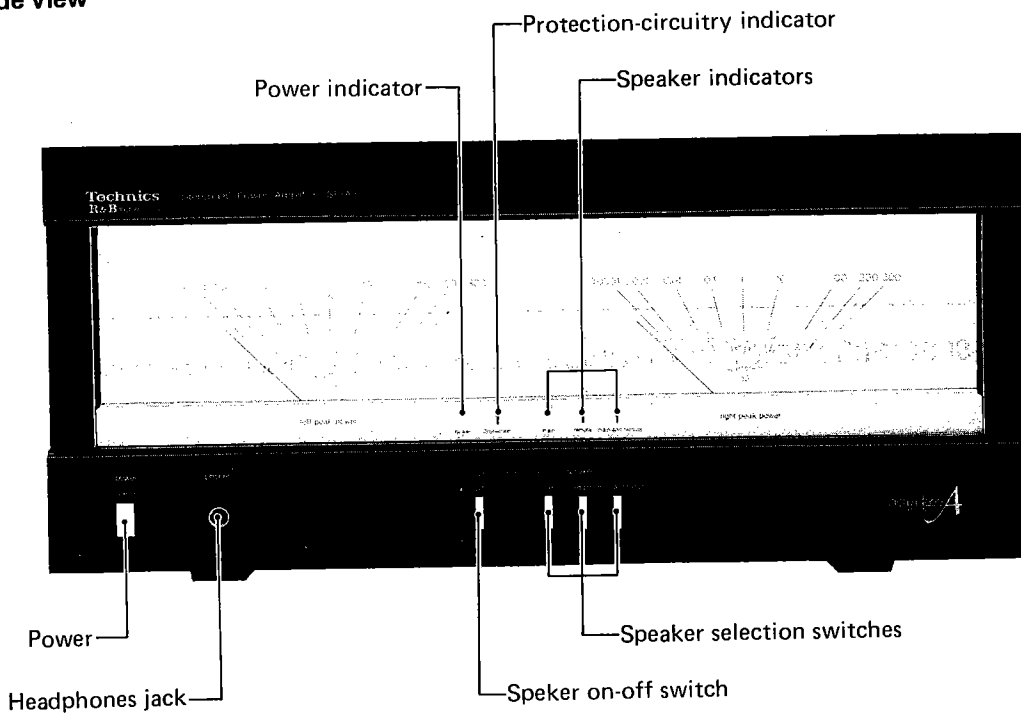
Panasonic Canada
Division of Matsushita Electric,
of Canada Ltd.
5770 Ambler Drive,
Mississauga, Ontario L4W 2T3

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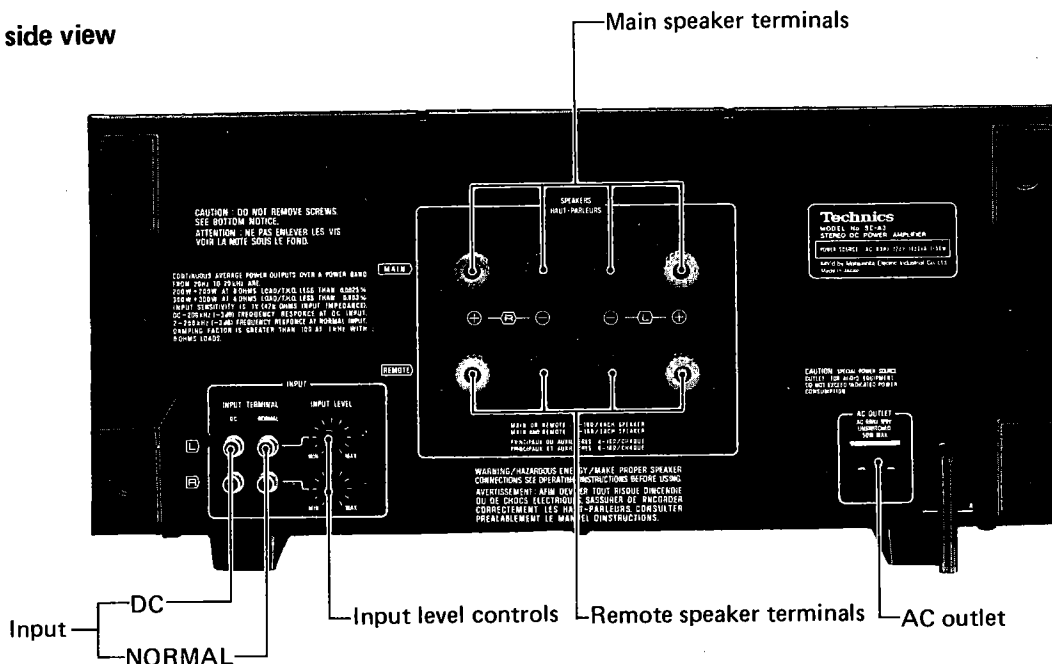
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REPLACEMENT PARTS LIST (Electric Parts)	9, 10	(Cabinet and Chassis Parts)	23

LOCATION OF CONTROLS

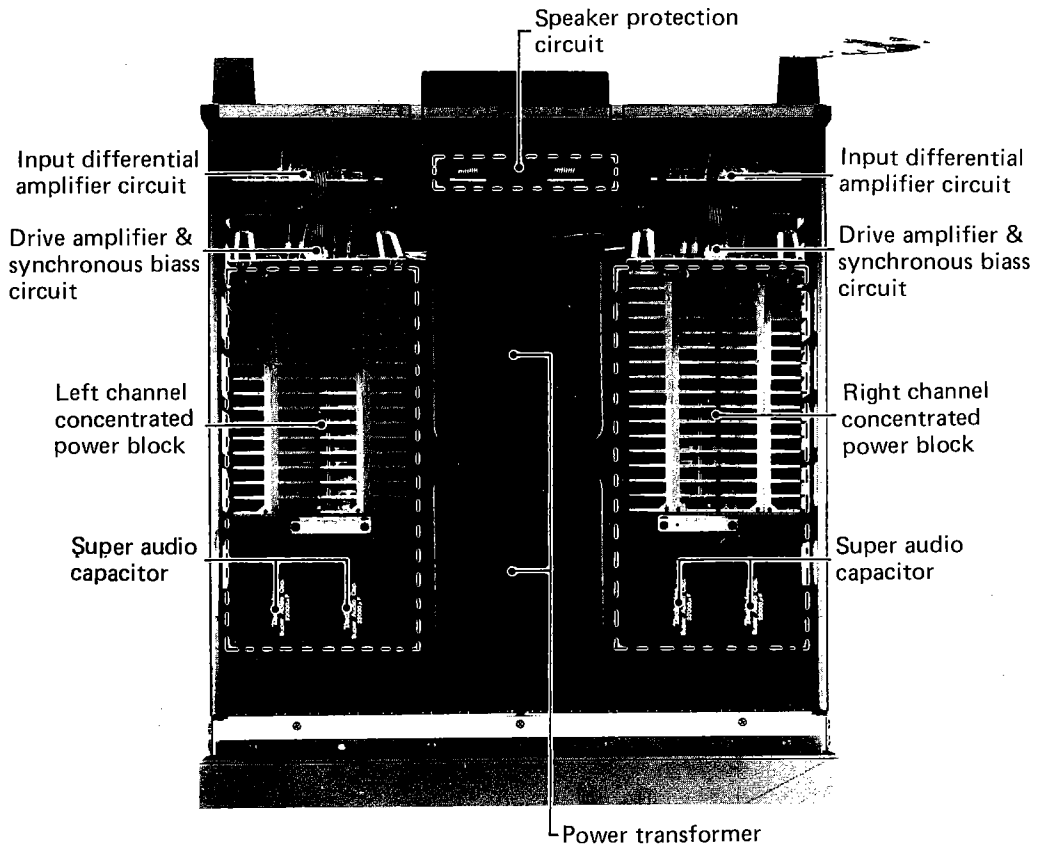
• Front side view



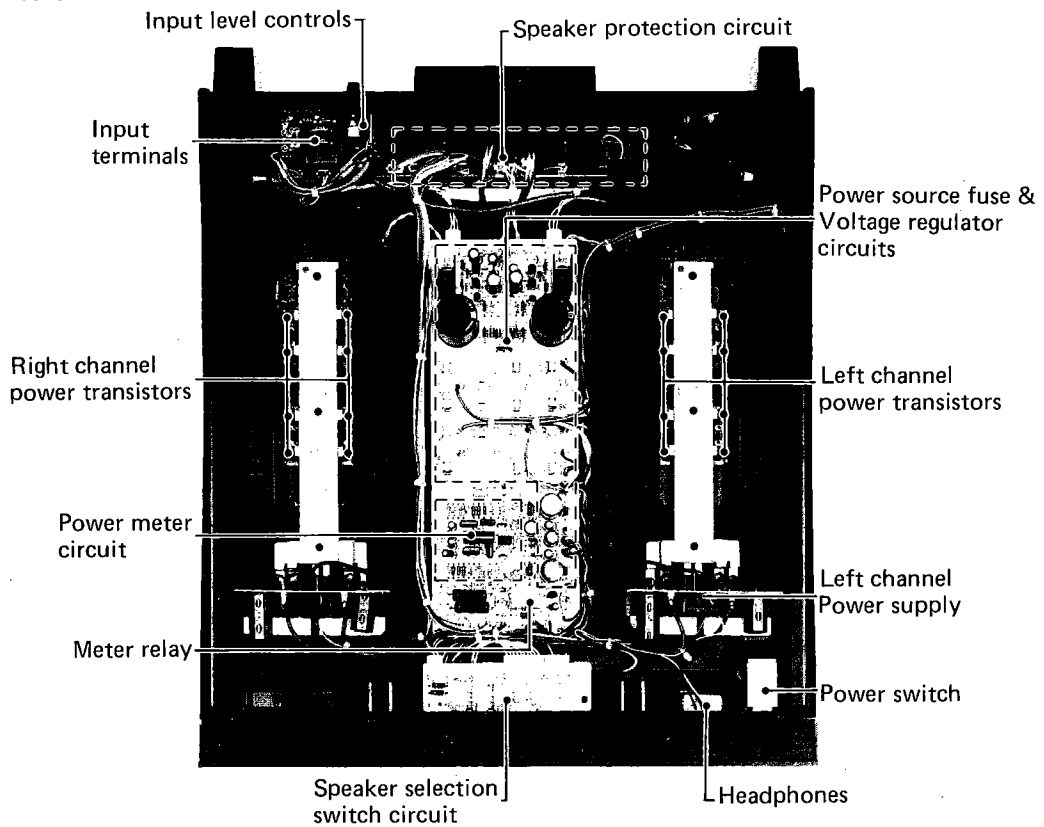
• Rear side view



• **Top view**



• **Bottom view**



DISASSEMBLY INSTRUCTIONS

How to remove the cabinet

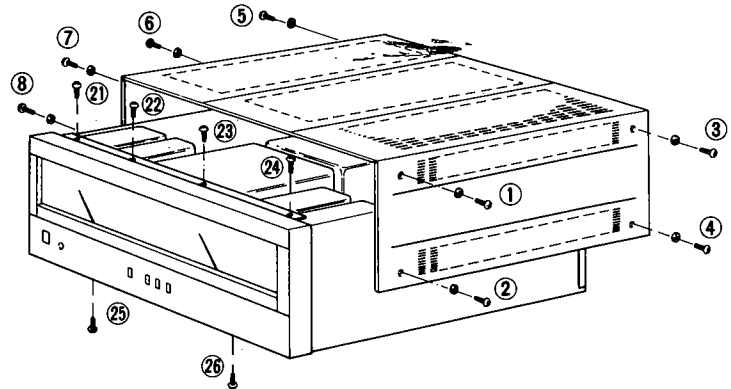
Remove the 8 setscrews (① ~ ⑧) in Fig. 1 on the side of the cabinet, and then the cabinet can be removed.

How to remove the bottom board

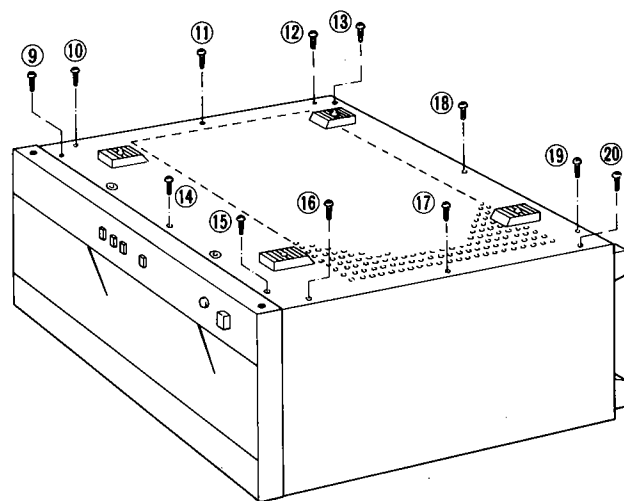
Remove the 12 setscrews (⑨ ~ ⑳) in Fig. 2 to remove the bottom board.

How to remove the front panel

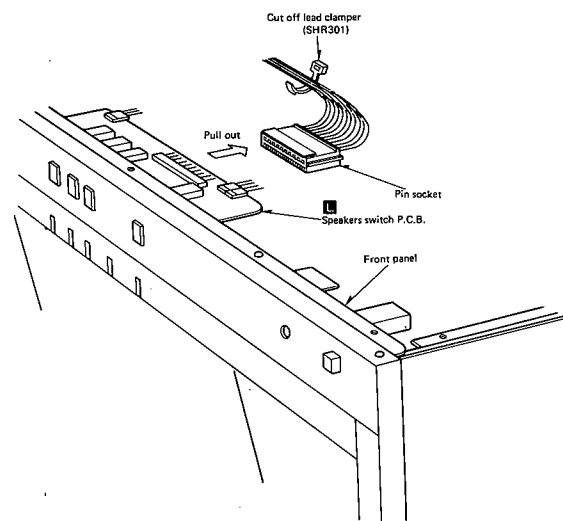
1. Remove the cabinet and bottom board. (Refer to "How to remove the cabinet" and "How to remove the bottom board".)
2. Pull out the pin socket of **L** printed circuit board (Speaker selection switch and indicator circuits) [Fig. 3].
3. Remove the 6 setscrews (㉑ ~ ㉒) in Fig. 1 of the front panel.



[Fig. 1]



[Fig. 2]



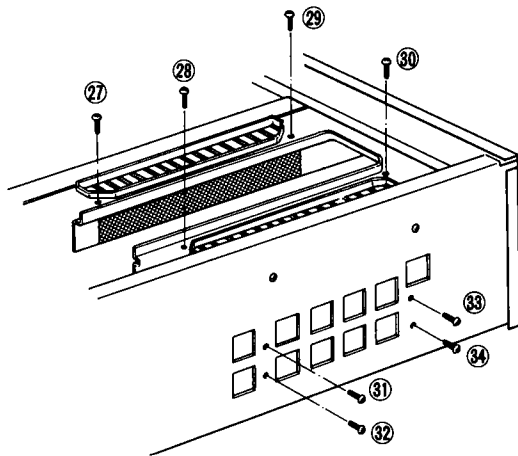
[Fig. 3]

How to remove the power transistor

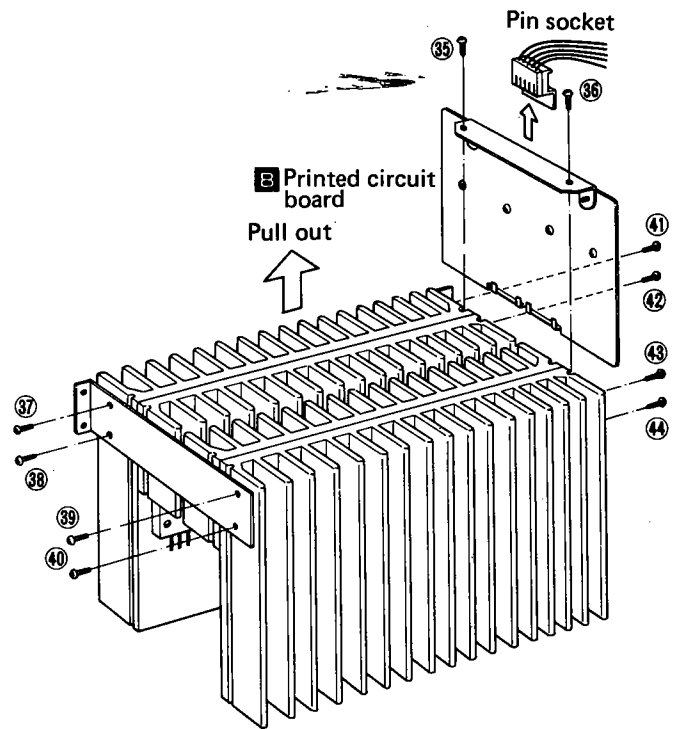
1. Remove the cabinet and bottom board. (Refer to "How to remove the cabinet" and "How to remove the bottom board".)
2. Pull out the pin socket of **E** printed circuit board (driver stage, synchro bias circuit).
Next, remove the 2 setscrews (㉓, ㉔) in Fig. 5 of the printed circuit board. Then remove the printed circuit board by lifting it upward.
3. Unsolder the 4 power transistors (Q125 ~ Q128).
4. Remove the 4 setscrews (㉕ ~ ㉘) in Fig. 4 which secure the heat sink from the power block chassis bottom.
5. Remove the 4 setscrews (㉙ ~ ㉚) in Fig. 4 which secure the heat sink from the side of the set.
6. Remove the heat sink from the chassis by lifting it upward.
7. Remove the 8 setscrews (㉛ ~ ㉞) in Fig. 5 which secure the heat sink connector.
8. Remove the 2 setscrews (㉟, ㊱) in Fig. 6 to remove the power transistor.
9. When installing the power transistor, apply silicone compound (or equivalent heat diffuser) to the back and the mica plate (heat sink side of the power transistor, and then reverse the procedure 1 ~ 8.

Note: 1. When the temperature compensating transistor (Q113, Q114 - Q119, Q120) are replaced, install the transistors at an angle of 90° as in Fig. 6 (A).

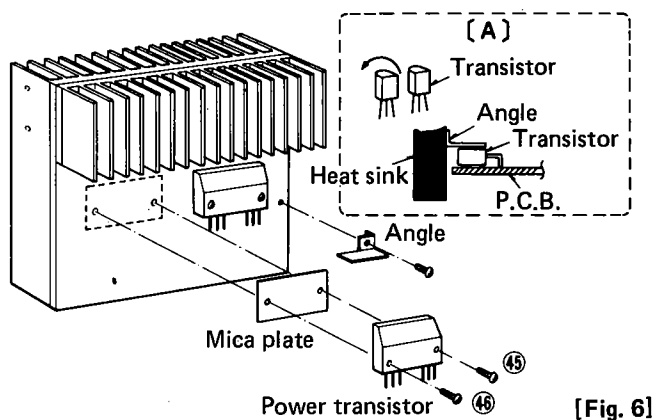
2. When installing the temperature compensating transistor holders, apply silicone compound (or equivalent heat diffuser) to them.



[Fig. 4]



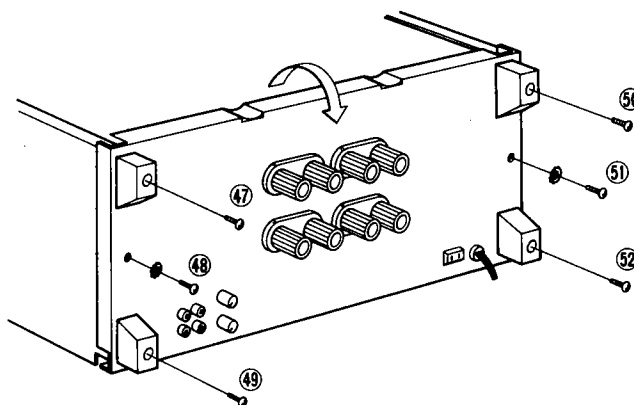
[Fig. 5]



[Fig. 6]

● How to remove the speaker protection circuit printed board

1. Remove the cabinet and bottom board. (Refer to "How to remove the cabinet" and "How to remove the bottom board".)
2. Remove the 6 setscrews (47)~(52) in Fig. 7) of the rear panel. Then open the rear panel in the direction of the arrow.
3. Unsolder the speaker terminals. (8 portions)
4. Remove the 4 setscrews of the printed circuit board and then the board can be removed.



[Fig. 7]

● Before starting the repairing

Before adjusting or repairing, be sure to short-circuit opposite poles of the 22000 μ F capacitors (C3, 4) with a resistor approximately of 10 Ω , 10W" for discharging the charged voltage.

Short-circuiting with a screw driver and the like is not only dangerous, but may destroy transistors and diodes, and should therefore be avoided.

■ ADJUSTING INSTRUCTIONS

When adjusting and measuring this set, perform ageing of the set in normal position for about 10 minutes beforehand.

● Setting of controls and instruments to be used

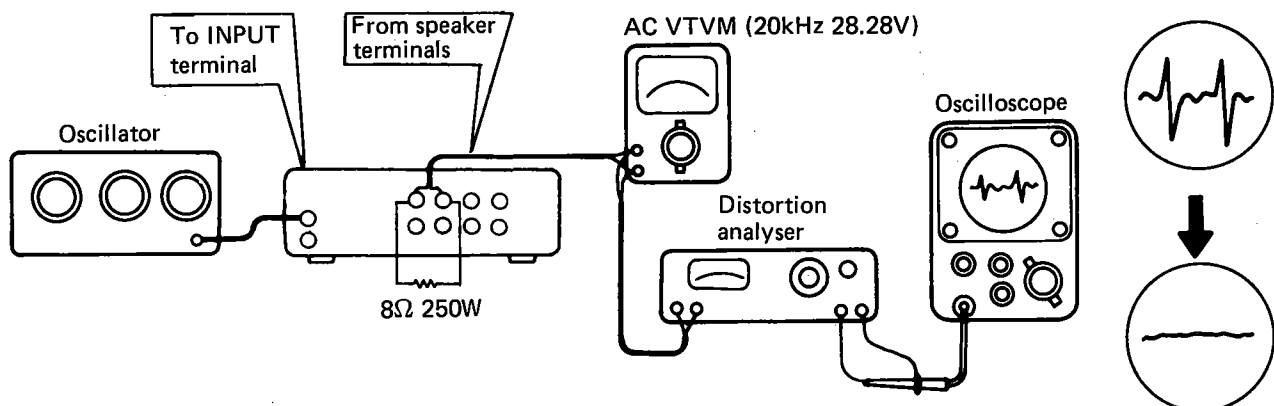
- | | |
|---|----------------------------|
| 1. Speakers on/off switch on | 6. Oscillator |
| 2. Speaker switch main | 7. Distortion analyser |
| 3. Input Level volume (rear side) MIN | 8. AC electronic voltmeter |
| 4. DC voltmeter (capable to measure 5mV) | 9. 8-ohm load resistor |
| 5. Oscilloscope | |

1. Adjustment of Voltage regulator and DC balance

Adjustments	DC Voltmeter Connections	Adjusting Point	Adjustment Procedure
Voltage regulator	Between TP 5 and TP4 (minus probe)	VR201	* Turn voltage regulator semi-fixed resistor VR201 to minimum. (counterclockwise direction) * Adjust VR201 so that voltage is 85.5V.
DC balance	Main Speaker terminals (L & R channels)	VR103 (L & R channels)	* Adjust it to 0mV with DC voltmeter set to 30mV range. * Cut off the jumper wire if adjustment is not possible.

2. Adjustment of Clamp Voltage and Ica

- 1) Set the clamp voltage semi-fixed resistor VR105 to minimum.
- 2) Apply 20kHz sine wave to INPUT DC terminals.
- 3) Set the input level control volume to MAX.
- 4) Connect the distortion analyser to the speaker terminals and connect the output from the distortion analyser to the vertical input of the oscilloscope.
- 5) Turn the oscillator attenuator so that the output of the speaker terminal is 28.28V.
- 6) Turn the Ica semi-fixed resistor VR104 so that the distorted waveform is minimized.
- 7) Furthermore, turn the clamp voltage semi-fixed resistor VR105 so that the distorted waveform is minimized.



PROTECTION CIRCUITRY INDICATOR

The indicator lights up when a trouble occurs in this unit.

With the power switch set to "on", the indicator lights up, and it goes out when the unit is in normal operation (about 7 sec. later). If abnormality takes place during operation, the indicator lights up or blinks. In that case, set the power switch to "off" and check the cause according to the following procedure.

When the indicator lights up:

(Cause)

1. Due to troubles in other equipment (preamp, etc.), direct current is applied to the input, causing the protection circuit to operate.
2. This unit is in trouble, causing the protective circuit to operate.

(Check of the cause)

Set the power switch of this unit to "off", shift the input terminal connection on the back side from "DC" to "NOR-MAL", and then set the power switch to "on".

1. Indicator does not light up

Equipment (preamp side) other than this unit is abnormal.

2. Indicator lights up

This unit is abnormal. Then check the following points.

- 1) Middle point potential detection circuit _____ Constant voltage power source circuit (Q201 ~ Q208, D203 ~ D206, F3, F4)
(* Refer to "Adjustment" on page 6.) Adjustment of DC balance
- 2) Overcurrent detection circuit _____ Temperature compensation circuit (Q113, Q114, Q119, Q120)
- 3) Power ON/OFF detection circuit _____ Muting circuit (R309 ~ R311, C304, D301)
- 4) Over-load limit circuit _____ Current limiter circuit (Q305, D311)

When the indicator blinks:

(Cause)

The speaker terminals or the power cord cable (positive and negative) are short-circuited, causing the protection circuit to operate.

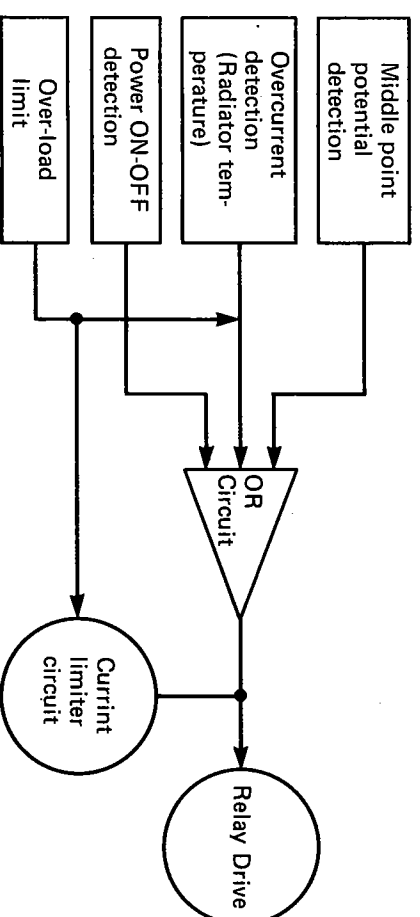
(Check of the cause)

Set the power switch of this unit to "off", check the speaker terminal and the cord, and then set the power switch to "on".

1. Indicator does not blink Speaker terminal and cord connections are correct and normal.

2. Indicator blinks Speaker terminal or cord cable short-circuit trouble is possible. In this case, take proper measures, replacing the cord, etc., and check for trouble again.

The block diagram of the protection circuit is shown below

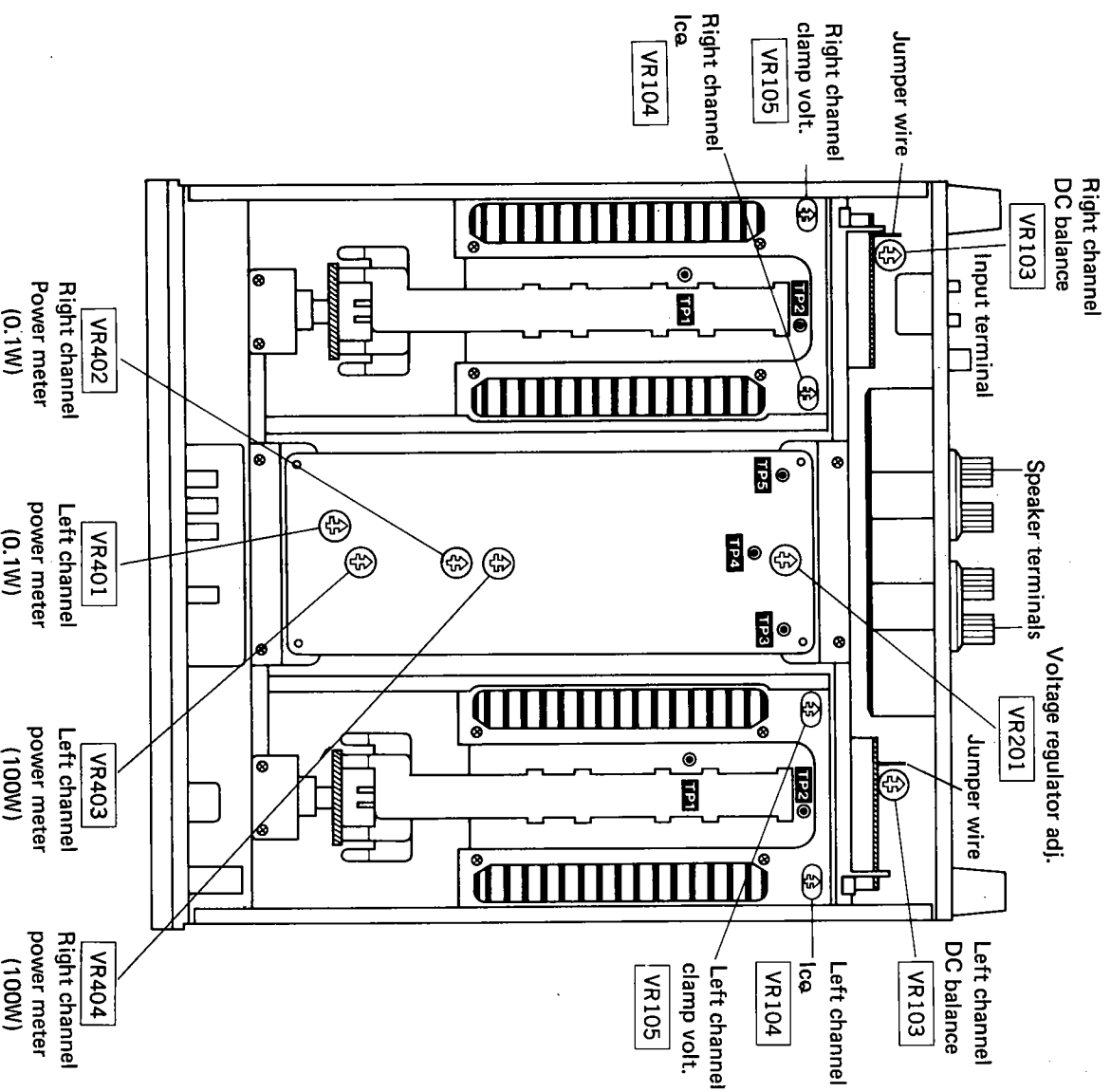


* If the speaker impedance is too (low less than 4Ω), the limiter circuit operates and power is extremely reduced. (Relay does not operate.)

3. Adjustment of Peak power meter

- 1) Connect the oscillator to INPUT DC terminal, and the AC electronic voltmeter to the speaker terminals in parallel with the load resistor.
- 2) Set the input level control volume to MAX.
- 3) Apply 1kHz signal from the oscillator, and turn the attenuator of the oscillator so that the AC electronic voltmeter indicates 0.894V.
- 4) Adjust VR401 (left channel) so that the power meter indicates 0.1W.
- 5) Similarly, make the adjustment of VR402 (right channel).
- 6) Apply 1kHz signal from the oscillator, and turn the attenuator of the oscillator so that the AC electronic voltmeter indicates 28.28V.
- 7) Adjust VR403 (left channel) so that the power meter indicates 100W.
- 8) Similarly, make the adjustment of VR404 (right channel).
- 9) Perform the adjustments, repeating the procedure (3) ~ (8) in order.

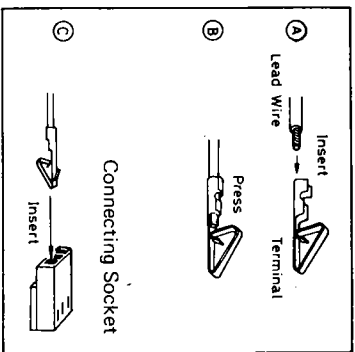
ADJUSTING POINTS



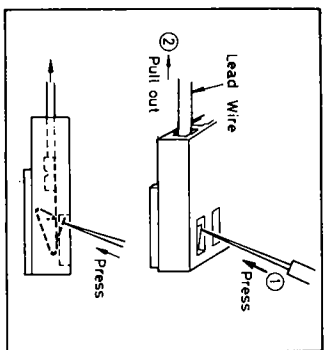
HOW TO PREPARE LEAD-CONNECTOR SOCKETS

shown in figure 8 (A), insert the lead wire into the terminal.
shown in figure 8 (B), press the terminal to the lead wire.
shown in figure 8 (C), insert into a connector socket.

remove from the socket, hold the terminal with a sharp-point tool such as a needle, as shown in figure 9, and pull out the lead wire at the same time.



[Fig. 8]



[Fig. 9]

PRECAUTIONS FOR CONNECTIONS

making connections, be absolutely sure that the power to this unit and all other connected equipment is first off.
connections are made while the power is on, a large input will be applied to the speaker systems, which might damage so special care should be taken concerning this point.

REPLACEMENT PARTS LIST... Electric Parts

1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Δ indicates that only parts specified by the manufacturer be used for safety.

Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description
TED CIRCUIT				
SV1TA7317P	IC, Speaker Protection Operation Amplifier	Q125 ~ 128 (X2)	OD503A-P	Transistor, Power Amplifier (Use in ranks Q, P or Q)
SV1TA7318P	IC, Logarithm Amplifier	Q130 (X2)	ZSC1885-R	Transistor, Bias Supply & Current Limiter (Use in ranks Q, R or S)
AN6552F	IC, Power Meter Operation Amplifier	Q131 (X2)	ZSA1015-Y	Transistor, Bias Supply & Current Limiter (Use in ranks Y or O)
ORS				
SV1UPA68H-M	Transistor, Input Differential Amplifier (Use in ranks L or M) [FET]	Q201	ZSA921-T	Transistor, Voltage Stabilizer (Use in ranks R, S or T)
ZSC1980-T	Transistor, Current Stabilizer (Use in ranks R, S or T)	Q202	ZSC1980-T	Transistor, Voltage Stabilizer (Use in ranks R, S or T)
ZSC2291N-G	Transistor, Current Stabilizer (Use in ranks F or G)	Q203, 307	ZSC1885-R	Transistor, Voltage Stabilizer (Use in ranks Q, R or S)
ZSA995N-G	Transistor, Current Mirror (Use in ranks F or G)	Q204, 208	ZSA912-R	Transistor, Voltage Stabilizer (Use in ranks Q, R or S)
ZSA902S-F	Transistor, Differential Amplifier (Product Part No. ZSA722-S, T or U)	Q205	ZSD381A-L9	Transistor, Voltage Stabilizer (Product Part No. ZSD381-K, L or M)
ZSA964-Q	Transistor, Current Stabilizer (Use in ranks P, Q or R)	Q206	ZSB536A-L9	Transistor, Voltage Stabilizer (Product Part No. ZSB536-K, L or M)
ZSC2224-Q	Transistor, Drive Amplifier (Use in ranks P, Q or R)	Q209	ZSC1509F-R	Transistor, Voltage Stabilizer (Product Part No. ZSC1509-P, Q or R)
ZSC1328-T	Transistor, Current Mirror (Use in ranks S, T or U)	Q301, 302	ZSA777-Q	Transistor, Relay Driver (Use in ranks Q or R)
ZSA1015-Y	Transistor, Temperature Detection (Use in ranks Y or O)	Q303, 304	ZSC1815-Y	Transistor, Relay Driver (Use in ranks Y or O)
ZSC1815-Y	Transistor, Temperature Detection (Use in ranks Y or O)	Q305	ZSA921-T	Transistor, Protection Circuit (Use in ranks R, S or T)
ZSC2224-Q	Transistor, Drive Amp. (Use in ranks P, Q or R) same as Q115	DIODES		
ZSA964-Q	Transistor, Drive Amp. (Use in ranks P, Q or R) same as Q117 and Q118.	D101 (X2)	MA27A1	Diode, Bias Supply
ZSA1112-R	Transistor, Drive Amp. (Use in ranks Q, R or S) same as Q121	D102, 103, 104	MA27A2	Diode, Bias Supply
ZSC2592-R	Transistor, Drive Amp. (Use in ranks Q, R or S) same as Q123 and Q124.	D106, 107, 122 (X2)	MA162A	Diode, Bias Supply & Current Limiter Circuit
		D108, 109, 114 ~ 117, 123 ~ 124, 130, 311 (X2)		

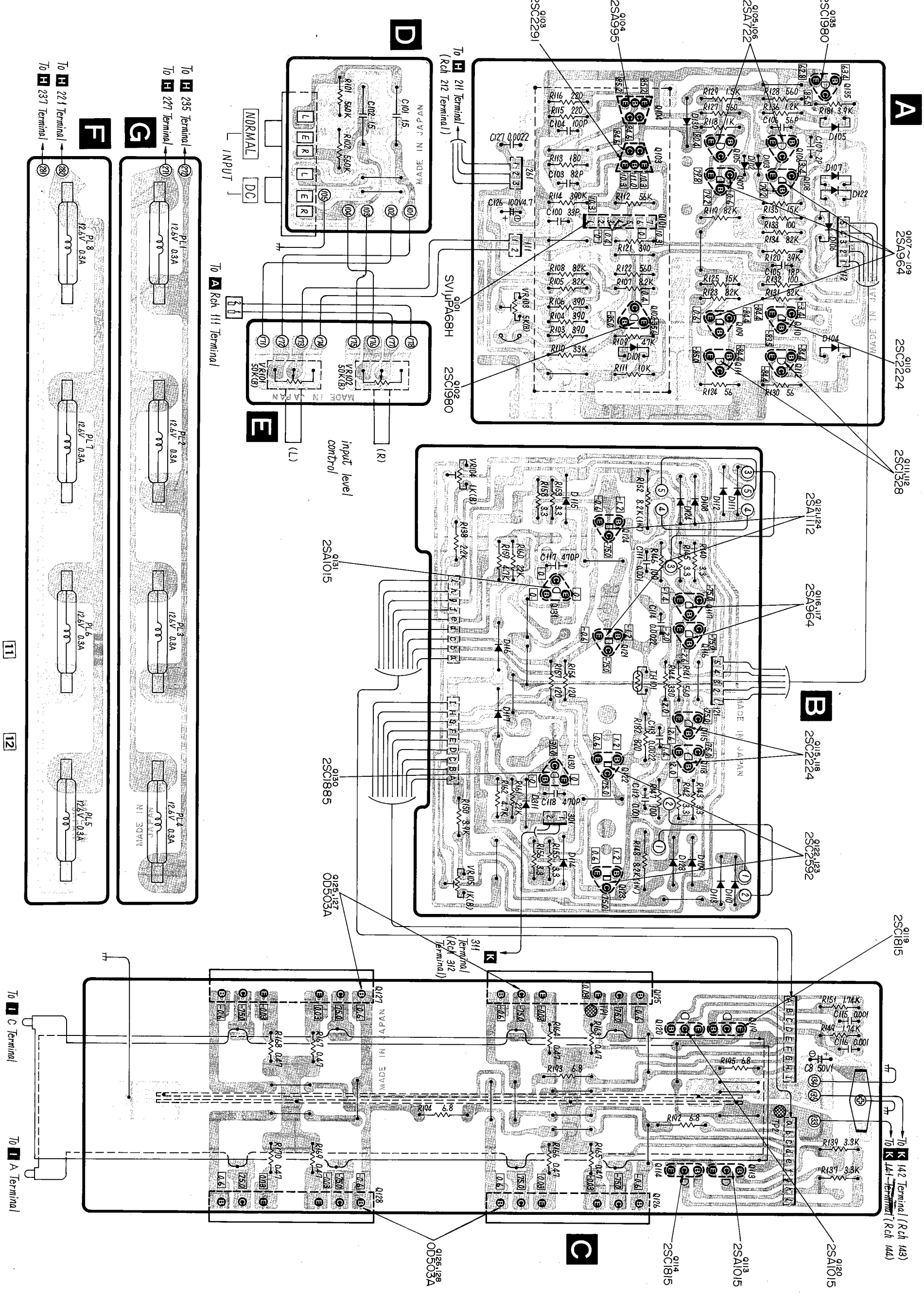
Ref. No.	Part No.	Part Name & Description
D110 ~ 113 (X2)	20A90	Diode, Synchronous Bias Switching
D201 (X2)	SVDS10VB20	Rectifier
D203 ~ 206, 210, 211	SVDSR1K2	Rectifier
D207, 208	MA27A2	Diode
D209	SVDMZ339A	Diode, 33V Zener
D212, 213	SVDMZ310B	Diode, 10V Zener
D215	SVDMZ324A	Diode, 24V Zener
D301, 307	MA162A	Diode, Protection Circuit
D302, 303	SVDSR1K2	Diode, Pulse Cancel
305, 306	MA162A	Diode, Power Meter Circuit
D401 ~ 404	MA162A	Diode, Power Meter Circuit
D405, 406	20A90	Diode, Power Meter Circuit
VARIABLE RESISTORS		
VR101, 102	EVH6UA524B54	Input Level Control, 50K Ω (B)
VR103 (X2)	EVMH86GA00B53	DC Unbalance Adjustment, 5K Ω (B)
VR104 (X2)	EVMH86GA00B13	Power Amp. Idling Current Adjustment & Clamp Voltage Adjustment, 1K Ω (B)
105 (X2)	EVMH96GA00B53	Voltage Control Adjustment, 5K Ω (B)
VR201	EVMH96GA00B53	Power Meter Adjustment, 3K Ω (B)
VR401 ~ 404		
THERMISTERS		
TH101 (X2)	ERTD2FHL103S	Thermistor, Thermal Compensation, 10K Ω
401, 402		
RELAYS		
RLV301 ~ 303	SSY47	Relay, Speaker Output
RLV305	SSY31	Relay, Meter Output
RLV501, 502	SSY77	Relay, Protection

Ref. No.	Part No.	Part Name & Description
METER		
	SSM153-N	Meter, Peak Power
COMPONENT COMBINATIONS		
Z201 (X2)	EXRFES203ZS	Component Combination, 0.01 μ F (X2)
203		
FUSES		
F1, 2	XBAS2A10001	Fuse, 10A (250V)
F3, 4	XBAZFE08NU100	Fuse, 800mA (250V)
F5, 6	XBA1F25NU14	Fuse, 2.5A (125V)
SWITCHES		
S1 ~ S4	SSH429	Switch, Speaker Selection
S5	ESB9939C	Switch, Power Source
LAMPS		
PL1 ~ 8	XAMR43P	Lamp, Peak Power Meter
PL9 ~ 13	XAMR48T250	Lamp, Speaker Indicator
COILS and TRANSFORMER		
L101, 102	SLQV07G-10	Coil, Power Amplifier Output Choke
T1	SLT5541-1	Transformer, Power Source
T2	SLT5541	Transformer, Power Source

PRINTED CIRCUIT BOARD

- [A] 1st Differential amplifier circuit,
- [B] Drive amplifier & synchronous bias circuits,
- [C] Power amplifier,
- [D] Input terminals,
- [E] Input level controls,
- [F] Drive amplifier & synchronous bias circuits,
- [G] Peak-power meter lamps

Ground (Earth) circuit



A

B

C

D

E

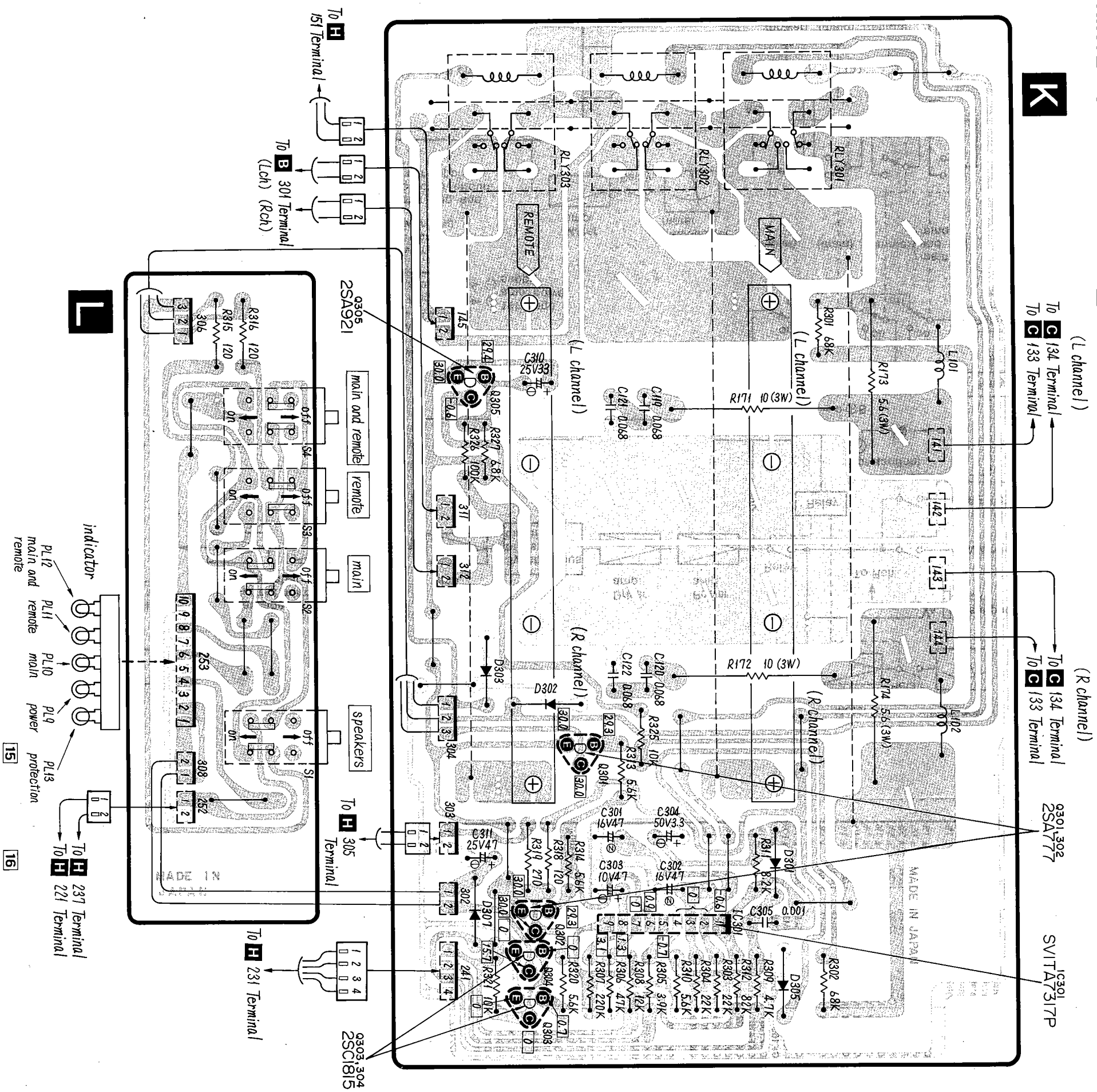
F

G

11

12

PRINTED CIRCUIT BOARD (K) Speakers protection, Speaker selection switches & speaker indicators



TERMINAL GUIDE OF TRANSISTORS AND IC'S

<p>SVTA7317P SVTA7318P</p>	<p>2SA1112, 2SC2592</p>
<p>AN6552</p>	<p>2SA1722, 2SC1328 2SA777, 2SC1509 2SA912, 2SC1815 2SA921, 2SC1885 2SA1015, 2SC1980</p>
<p>SV1A/PA68H</p>	<p>2SB536, 2SD381</p>
<p>2SA995, 2SC2291</p>	<p>2SA964, 2SC2224</p>
<p>OD503A</p>	

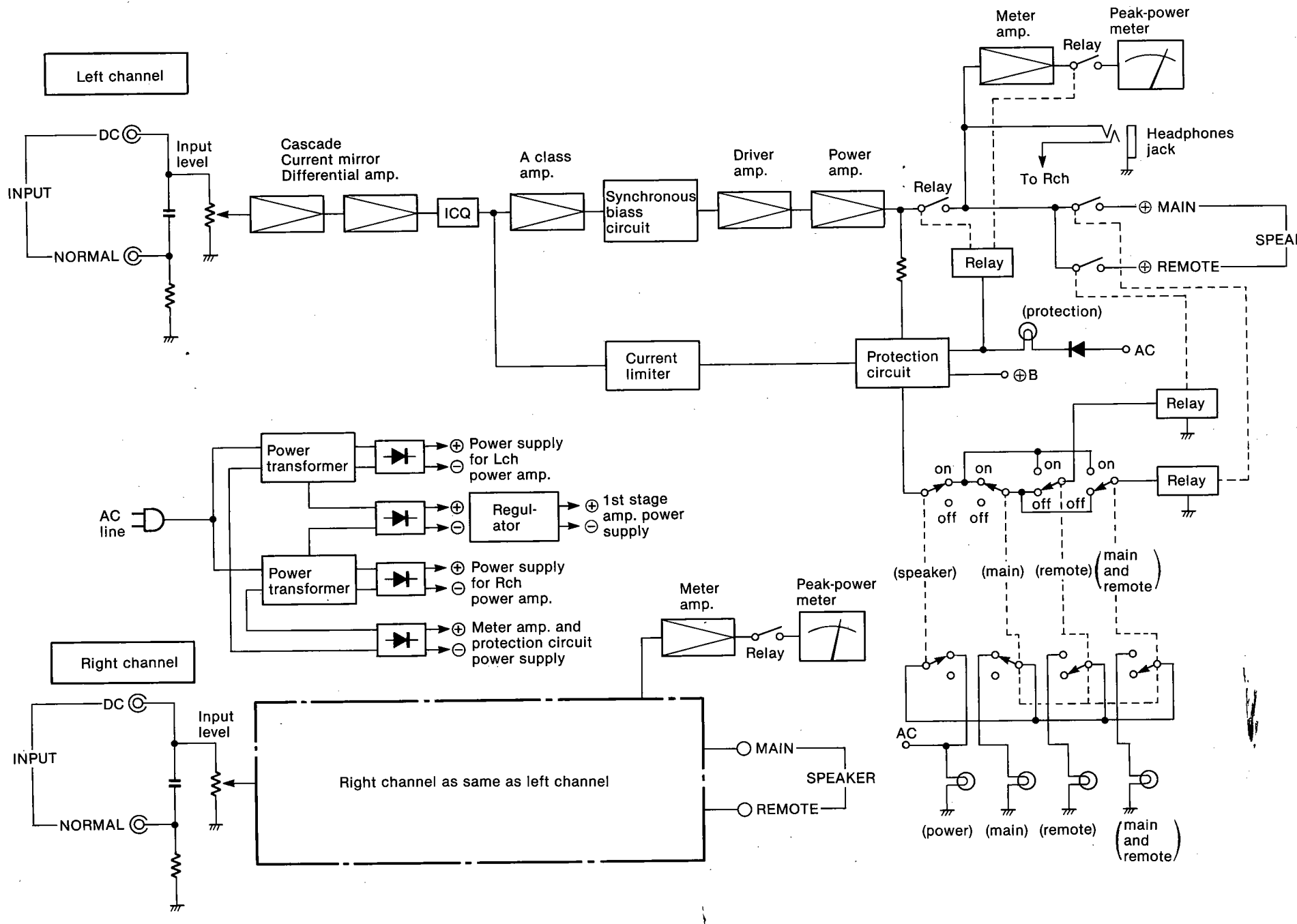
SISTOR AND CAPACITOR PARTS LIST

Note: Δ indicates that only parts specified by the manufacturer be used for safety.

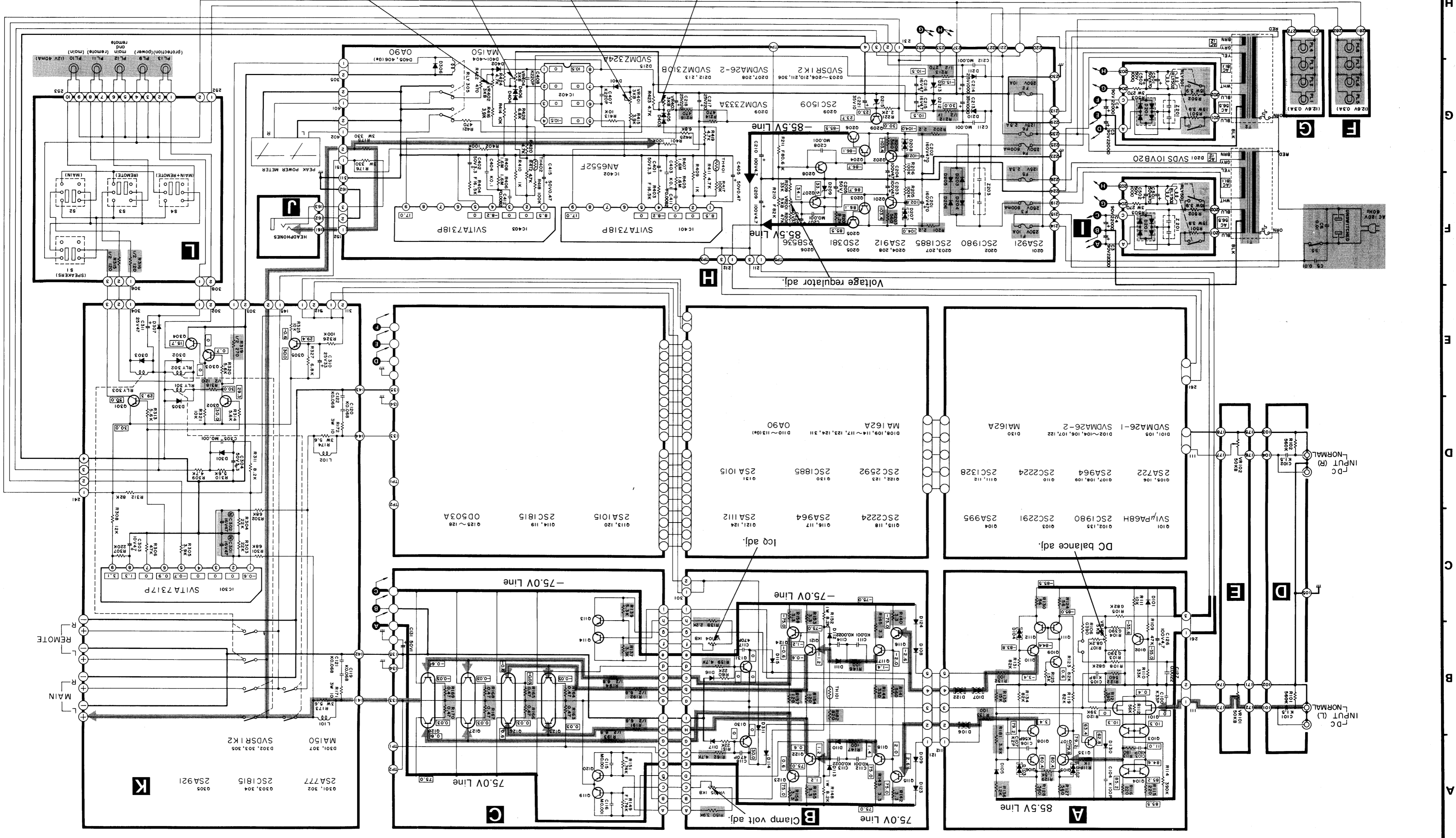
BLOCK DIAGRAM

Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description
ERO25CKF5603	Metal Film, 560k Ω , 1/4W, $\pm 1\%$	R305	ERO25CKF3901	Metal Film, 3.9k Ω , 1/4W, $\pm 1\%$
ERO25CKF3900	Metal Film, 390k Ω , 1/4W, $\pm 1\%$	R306	ERO25CKF4702	Metal Film, 4.7k Ω , 1/4W, $\pm 1\%$
ERO25CKF8202	Metal Film, 82k Ω , 1/4W, $\pm 1\%$	R307	ERO25CKF2203	Metal Film, 220k Ω , 1/4W, $\pm 1\%$
ERO25CKF3900	Metal Film, 390k Ω , 1/4W, $\pm 1\%$	R308	ERO25CKF1202	Metal Film, 12k Ω , 1/4W, $\pm 1\%$
ERO25CKF8201	Metal Film, 8.2k Ω , 1/4W, $\pm 1\%$	R309	ERO25CKF4701	Metal Film, 4.7k Ω , 1/4W, $\pm 1\%$
ERO25CKF8202	Metal Film, 82k Ω , 1/4W, $\pm 1\%$	R310	ERO25CKF5601	Metal Film, 5.6k Ω , 1/4W, $\pm 1\%$
ERO25CKF4702	Metal Film, 47k Ω , 1/4W, $\pm 1\%$	R311	ERO25CKF8201	Metal Film, 8.2k Ω , 1/4W, $\pm 1\%$
ERO25CKF3302	Metal Film, 33k Ω , 1/4W, $\pm 1\%$	R312	ERO25CKF8202	Metal Film, 82k Ω , 1/4W, $\pm 1\%$
ERO25CKF1002	Metal Film, 10k Ω , 1/4W, $\pm 1\%$	R313, 314	ERO25CKF5601	Metal Film, 5.6k Ω , 1/4W, $\pm 1\%$
ERO25CKF5602	Metal Film, 56k Ω , 1/4W, $\pm 1\%$	R315, 316	ERD50FJ121	Carbon, 120 Ω , 1/2W, $\pm 5\%$
ERO25CKF1801	Carbon, 180k Ω , 1/4W, $\pm 5\%$	R318	ERD50FJ271	Carbon, 270 Ω , 1/2W, $\pm 5\%$
ERO25CKF3903	Metal Film, 390k Ω , 1/4W, $\pm 1\%$	R319	ERO25CKF5601	Metal Film, 5.6k Ω , 1/4W, $\pm 1\%$
ERO25CKF102	Carbon, 1k Ω , 1/4W, $\pm 5\%$	R320	ERO25CKF1002	Metal Film, 10k Ω , 1/4W, $\pm 1\%$
ERO25CKF8202	Metal Film, 82k Ω , 1/4W, $\pm 1\%$	R321	ERO25CKF1002	Metal Film, 10k Ω , 1/4W, $\pm 1\%$
ERO25CKF3902	Metal Film, 390k Ω , 1/4W, $\pm 1\%$	R325	ERO25CKF1003	Metal Film, 100k Ω , 1/4W, $\pm 1\%$
ERO25CKF3901	Carbon, 390k Ω , 1/4W, $\pm 5\%$	R326	ERO25CKF8801	Metal Film, 6.8k Ω , 1/4W, $\pm 1\%$
ERO25CKF3902	Metal Film, 390k Ω , 1/4W, $\pm 1\%$	R327	ERO25CKF1003	Metal Film, 100k Ω , 1/4W, $\pm 1\%$
ERO25CKF1502	Metal Film, 15k Ω , 1/4W, $\pm 1\%$	R401, 402	ERO25CKF1652	Metal Film, 16.5k Ω , 1/4W, $\pm 1\%$
ERO25CKF3903	Metal Film, 390k Ω , 1/4W, $\pm 1\%$	R403, 404	ERC14GK165	Carbon, 1.6M Ω , 1/4W, $\pm 10\%$
ERO25CKF1502	Carbon, 15k Ω , 1/4W, $\pm 5\%$	R405, 406	ERC14GK165	Carbon, 1.6M Ω , 1/4W, $\pm 10\%$
ERO25CKF1502	Carbon, 15k Ω , 1/4W, $\pm 5\%$	R407, 408	ERO25CKF1001	Metal Film, 1k Ω , 1/4W, $\pm 1\%$
ERO25CKF1502	Carbon, 15k Ω , 1/4W, $\pm 5\%$	R409, 410	ERO25CKF4701	Metal Film, 4.7k Ω , 1/4W, $\pm 1\%$
ERO25CKF1502	Carbon, 15k Ω , 1/4W, $\pm 5\%$	R411, 412	ERO25CKF1002	Metal Film, 10k Ω , 1/4W, $\pm 1\%$
ERO25CKF1502	Carbon, 15k Ω , 1/4W, $\pm 5\%$	R413, 414	ERO25CKF3901	Metal Film, 3.9k Ω , 1/4W, $\pm 1\%$
ERO25CKF1502	Carbon, 15k Ω , 1/4W, $\pm 5\%$	R415, 416	ERO25CKF1003	Metal Film, 100k Ω , 1/4W, $\pm 1\%$
ERO25CKF1502	Carbon, 15k Ω , 1/4W, $\pm 5\%$	R417, 418	ERO25CKF4701	Metal Film, 4.7k Ω , 1/4W, $\pm 1\%$
ERO25CKF1502	Carbon, 15k Ω , 1/4W, $\pm 5\%$	R419, 420	ERO25CKF4701	Metal Film, 4.7k Ω , 1/4W, $\pm 1\%$
ERO25CKF1502	Carbon, 15k Ω , 1/4W, $\pm 5\%$	R421, 422	ERO25CKF4700	Metal Film, 470 Ω , 1/4W, $\pm 1\%$
ERO25CKF1502	Carbon, 15k Ω , 1/4W, $\pm 5\%$	R423, 424	ERO25CKF4701	Metal Film, 4.7k Ω , 1/4W, $\pm 1\%$
ERO25CKF1502	Carbon, 15k Ω , 1/4W, $\pm 5\%$	R425, 426	ERO25CKF6801	Metal Film, 6.8k Ω , 1/4W, $\pm 1\%$
ERO25CKF1502	Carbon, 15k Ω , 1/4W, $\pm 5\%$	R501, 502	ERF15ZK39R9	Non-Flammable, 3.9 Ω , 15W, $\pm 10\%$
ERO25CKF1502	Carbon, 15k Ω , 1/4W, $\pm 5\%$	R503	ERG3ANJ271	Metal Oxide, 270 Ω , 3W, $\pm 5\%$

Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description
ECEA1H222KZ	Electrolytic, 22000 μ F, 90V, $\pm 10\%$	C(3, 4) X2	ECCD1H330K	Ceramic, 33pF, 50V, $\pm 10\%$
ECCDMY109PF	Ceramic, 0.01 μ F, 125VAC, $\pm 10\%$	C5, 6	ECCD1H330K	Ceramic, 33pF, 50V, $\pm 10\%$
ECCD1H330K	Ceramic, 33pF, 50V, $\pm 10\%$	C(100) X2	ECCOE1155KZ	Polyester, 1.5 μ F, 100V, $\pm 10\%$
ECCD1H330K	Ceramic, 33pF, 50V, $\pm 10\%$	C101, 102	ECCD1H820K	Ceramic, 82pF, 50V, $\pm 10\%$
ECCD1H820K	Ceramic, 82pF, 50V, $\pm 10\%$	C(104) X2	ECCD1H101K	Ceramic, 100pF, 50V, $\pm 10\%$
ECCD1H101K	Ceramic, 100pF, 50V, $\pm 10\%$	C1105, X2	ECCD1H180K	Ceramic, 18pF, 50V, $\pm 10\%$
ECCD1H180K	Ceramic, 18pF, 50V, $\pm 10\%$	C1106, X2	ECCD1H560K	Ceramic, 56pF, 50V, $\pm 10\%$
ECCD1H560K	Ceramic, 56pF, 50V, $\pm 10\%$	C(107) X2	ECCD1H020CC	Ceramic, 2pF, 50V, $\pm 0.25pF$
ECCD1H020CC	Ceramic, 2pF, 50V, $\pm 0.25pF$	C1111, 1121 X2	ECCQ1H102KZ	Polyester, 0.001 μ F, 50V, $\pm 10\%$
ECCQ1H102KZ	Polyester, 0.001 μ F, 50V, $\pm 10\%$	C1113, 1141 X2	ECCM1H222KZ	Polyester, 0.0022 μ F, 50V, $\pm 10\%$
ECCM1H222KZ	Polyester, 0.0022 μ F, 50V, $\pm 10\%$	C1115, 1161 X2	ECCD1H102MD	Ceramic, 0.001 μ F, 50V, $\pm 20\%$
ECCD1H102MD	Ceramic, 0.001 μ F, 50V, $\pm 20\%$	C1117, 1181 X2	ECCM1H683KZ	Polyester, 0.068 μ F, 50V, $\pm 10\%$
ECCM1H683KZ	Polyester, 0.068 μ F, 50V, $\pm 10\%$	C1119, 120	ECCM1H883KZ	Polyester, 0.088 μ F, 50V, $\pm 10\%$
ECCM1H883KZ	Polyester, 0.088 μ F, 50V, $\pm 10\%$	C121, 122	ECEA2A54R7	Electrolytic, 4.7 μ F, 100V, $\pm 10\%$
ECEA2A54R7	Electrolytic, 4.7 μ F, 100V, $\pm 10\%$	C(126) X2	ECCD2H222KB	Ceramic, 0.0022 μ F, 500V, $\pm 10\%$
ECCD2H222KB	Ceramic, 0.0022 μ F, 500V, $\pm 10\%$	C(127) X2	ECEA50Z1	Electrolytic, 1 μ F, 50V
ECEA50Z1	Electrolytic, 1 μ F, 50V	C201, 202	ECEA2A54R7	Electrolytic, 4.7 μ F, 160V
ECEA2A54R7	Electrolytic, 4.7 μ F, 160V	C203, 204	ECEA2A54R7	Electrolytic, 4.7 μ F, 100V
ECEA2A54R7	Electrolytic, 4.7 μ F, 100V	C205	ECCD1H102MD	Ceramic, 0.001 μ F, 50V, $\pm 20\%$
ECCD1H102MD	Ceramic, 0.001 μ F, 50V, $\pm 20\%$	C207, 208	ECEA2A54R7	Electrolytic, 4.7 μ F, 100V
ECEA2A54R7	Electrolytic, 4.7 μ F, 100V	C209, 210	ECCD1H102MD	Ceramic, 0.001 μ F, 50V, $\pm 20\%$
ECCD1H102MD	Ceramic, 0.001 μ F, 50V, $\pm 20\%$	C211, 212	ECEA1VS102	Electrolytic, 1000 μ F, 35V
ECEA1VS102	Electrolytic, 1000 μ F, 35V	C213	ECEA1VS102	Electrolytic, 1000 μ F, 35V
ECEA1VS102	Electrolytic, 1000 μ F, 35V	C214	ECEA1VS470	Electrolytic, 47 μ F, 25V
ECEA1VS470	Electrolytic, 47 μ F, 25V	C215, 216	ECEA1VS470	Electrolytic, 47 μ F, 50V
ECEA1VS470	Electrolytic, 47 μ F, 50V	C217, 218	ECEA1ES221	Electrolytic, 220 μ F, 25V
ECEA1ES221	Electrolytic, 220 μ F, 25V	C221	ECEA1HS100	Electrolytic, 10 μ F, 50V
ECEA1HS100	Electrolytic, 10 μ F, 50V	C225	ECEA1HS330	Electrolytic, 33 μ F, 50V
ECEA1HS330	Electrolytic, 33 μ F, 50V	C301, 302	ECEA1HS470	Electrolytic, 47 μ F, 16V
ECEA1HS470	Electrolytic, 47 μ F, 16V	C303	ECEA1AS470	Electrolytic, 47 μ F, 10V
ECEA1AS470	Electrolytic, 47 μ F, 10V	C304	ECEA50Z3R3	Electrolytic, 3.3 μ F, 50V
ECEA50Z3R3	Electrolytic, 3.3 μ F, 50V	C305	ECCD1H102MD	Ceramic, 0.001 μ F, 50V, $\pm 20\%$
ECCD1H102MD	Ceramic, 0.001 μ F, 50V, $\pm 20\%$	C310	ECEA1VS330	Electrolytic, 33 μ F, 35V
ECEA1VS330	Electrolytic, 33 μ F, 35V	C311	ECEA1HS470	Electrolytic, 47 μ F, 50V
ECEA1HS470	Electrolytic, 47 μ F, 50V	C401, 402	ECEA1HN3R3SE	Electrolytic, 3.3 μ F, 50V
ECEA1HN3R3SE	Electrolytic, 3.3 μ F, 50V	C403, 404	ECCM1H104KZ	Polyester, 0.1 μ F, 50V, $\pm 10\%$
ECCM1H104KZ	Polyester, 0.1 μ F, 50V, $\pm 10\%$	C405	ECEA50ZR47	Electrolytic, 0.47 μ F, 50V, $\pm 10\%$
ECEA50ZR47	Electrolytic, 0.47 μ F, 50V, $\pm 10\%$	C407, 408	ECCD1H221KB	Ceramic, 220pF, 50V, $\pm 10\%$
ECCD1H221KB	Ceramic, 220pF, 50V, $\pm 10\%$	C411, 412	ECCP1822FZ	Polypropylene, 0.0082 μ F, 100V, $\pm 1\%$
ECCP1822FZ	Polypropylene, 0.0082 μ F, 100V, $\pm 1\%$	C415	ECEA50ZR47	Electrolytic, 0.47 μ F, 50V
ECEA50ZR47	Electrolytic, 0.47 μ F, 50V	C(501) X2	ECEA1HS471	Electrolytic, 470 μ F, 50V
ECEA1HS471	Electrolytic, 470 μ F, 50V	C(502) X2	ECEA1HS102	Electrolytic, 1000 μ F, 50V
ECEA1HS102	Electrolytic, 1000 μ F, 50V			



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

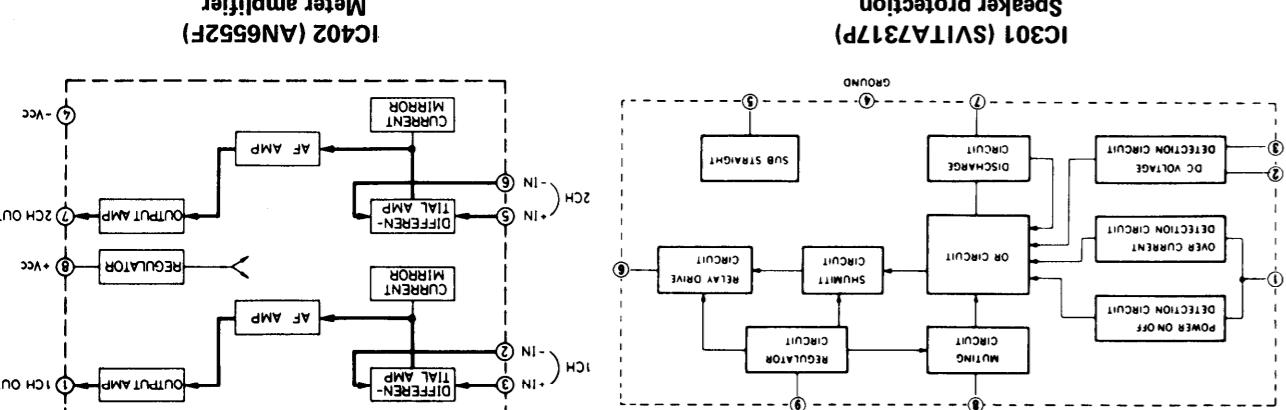


- Notes:
- 1: Speakers on/off switch in "on" position.
 - 2: Main speaker switch in "on" position.
 - 3: Remote speaker switch in "off" position.
 - 4: Main and Remote speaker switch in "off" position.
 - 5: Power switch in "on" position.
 - 6: Indicated voltage values are the standard values for the DC electronic circuit tester (high impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending of the internal impedance of the DC circuit tester.
 - 7: The left and right channels use the same type of circuit.
 - 8: Signal lines of left channel.
 - 9: Positive (+B) voltage lines.

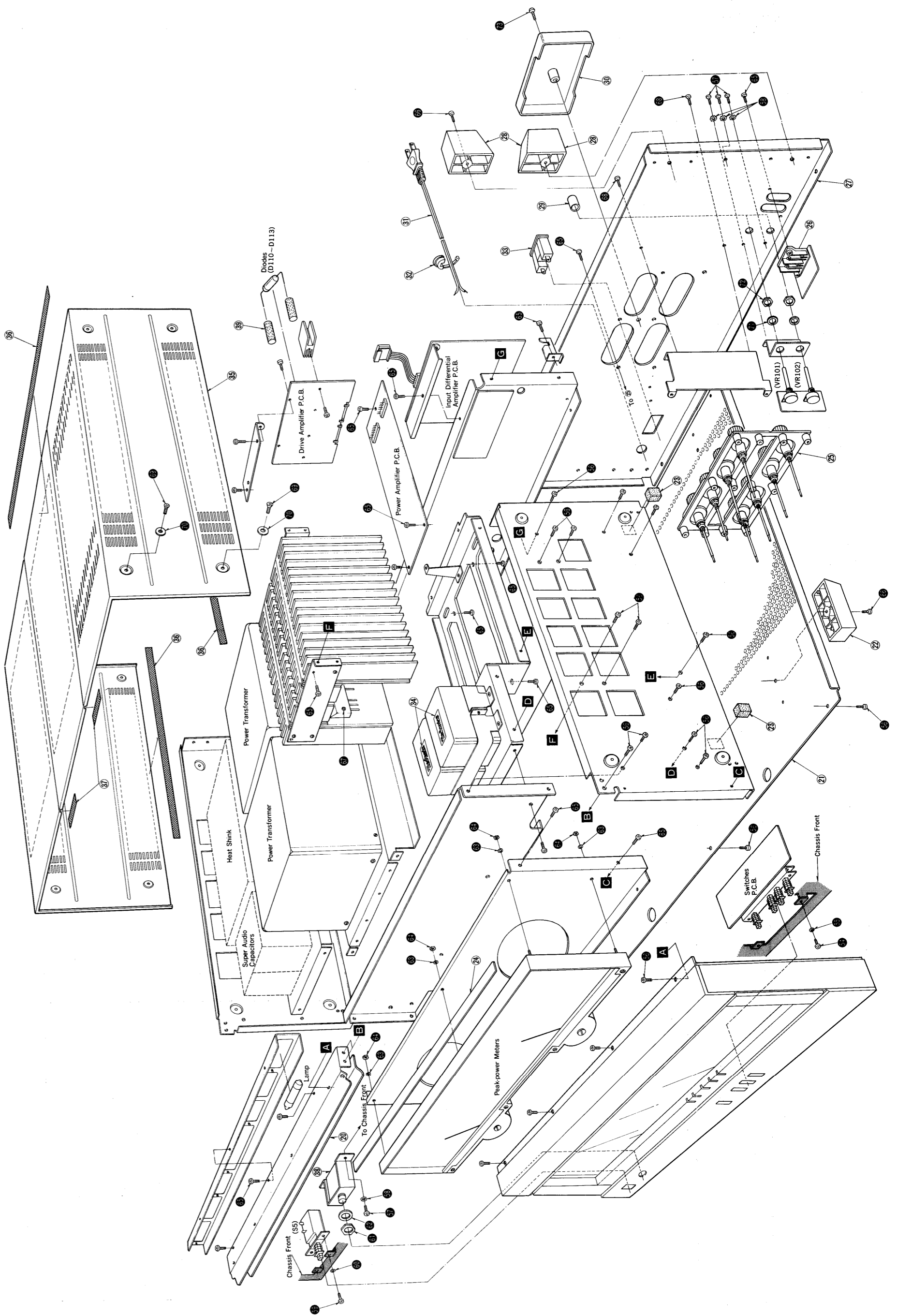
IMPORTANT SAFETY NOTICE
 THE SHADED AREA ON THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR SAFETY. WHEN SERVICING IT IS ESSENTIAL THAT ONLY MANUFACTURER SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SHADED AREAS OF THE SCHEMATIC.

■ BLOCK DIAGRAM OF IC'S

Power meter adj. (100W) Power meter adj. (0.1W) Power meter adj. (100W) Power meter adj. (0.1W)



A B C D E F G H

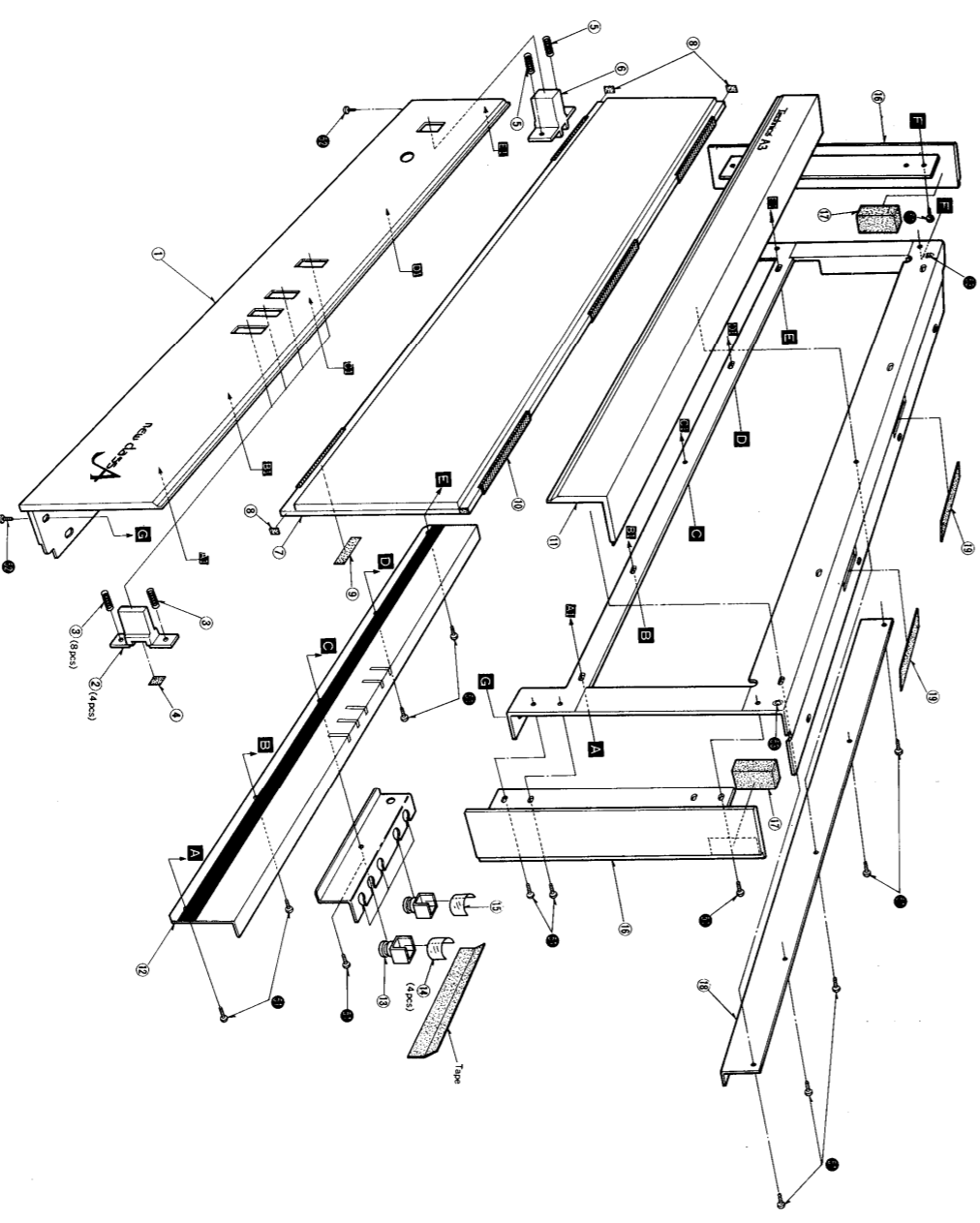


■ EXPLODED VIEWS

SE-A3K SE-A3K

■ EXPLODED VIEWS

• Front Panel



Ref. No.	Part No.	Part Name & Description
SCREWS, NUTS and WASHERS		
1	XTB3-48BFZ	Screw, Tapping, ϕ 3 x 8 (Front Panel)
2	XTB4-48BFZ	Screw, Tapping, ϕ 4 x 8 (Front Panel)
3	XWE3F-Z	Washer, Plain, ϕ 3
4	XWN3-4S	Washer, Spring, ϕ 3 x 6
5	XMA3B	Washer, Spring, ϕ 3 x 8
6	XTB3-48BFZ	Screw, Tapping, ϕ 3 x 8
7	XMC3B	Washer, Toothed Lock, ϕ 3
8	XNA3-4S	Washer, Spring, ϕ 3 x 6
9	XMA3B	Washer, Spring, ϕ 3 x 8
10	XNE59-1	Nut, M12 (Headphones Jack)
11	XMA3BFZ	Washer, Spring, ϕ 3 (Meter)
12	XN312	Nut, M3
13	XTB3-48BFZ	Screw, Tapping, ϕ 3 x 8
14	XTB4-48BFZ	Screw, Tapping, ϕ 4 x 8
15	XSS5-4FZS	Screw, Tapping, ϕ 3 x 6
16	SNE4Q33	Washer (Cabinet)
17	XMOC8B	Washer, Toothed Lock, ϕ 8

Ref. No.	Part No.	Part Name & Description
1	XNS8	Nut, M8
2	XTB4-30BFN	Screw, Tapping, ϕ 4 x 30
ACCESSORIES		
A1	SJP2237-1	Cord, Stereo Pin-Type Connection
PACKING PARTS		
P1	SPH4279	Polyethylene Bag
P2	SPH4281	Polyethylene Bag
P3	SP2605-1	Pack, Bottom Side
P4	SP2607	Pack, Top Side
P5	SP2789	Pack, Rear Side
P6	SP2259	Carton Box
P7	SDF10569	Instructions Book, Printed Matter
P7 [MC]	SDF10571	Instructions Book, Printed Matter

■ REPLACEMENT PARTS LIST (Cabinet and Chassis Parts)

Notes: 1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
 2. Δ indicates that only parts specified by the manufacturer be used for safety.
 3. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.

* [M] is available in U.S.A.
 * [MC] is available in Canada.

Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description
CABINET and CHASSIS PARTS					
1	SGWEA3N	Panel, Front Asy (Bottom)	20	SPH39	Paper, Reflector Plate
2	SDC219-1	Button, Push Switches (Speaker)	21	SKLU8270	Bottom Board
3	SUS191	Spring, Push Switches (Speaker)	22	SKLU239	Foot, Set Bottom Side
4	SGU145	Panel, Front Asy (Top)	23	SHG1191	Rubber Cushion, Chassis Side
5	SUS195	Spring, Push Switch (Power)	24	SDU51	Terminal, Input
6	SGUC281	Button, Push Switch (Power)	25	SUP3431A	Rear Panel
7	SGU145	Panel, Front Panel	27	SCP27150-1A	Front, Rear Panel Side
8	SHG6123	Rubber, Glass Plate	28	SKL241	Knob, Input Level
9	SHR081	Spacer, Glass Plate	29	SBN613	Cover, Speaker Terminals
10	SHCA971	Rubber Cushion, Glass Plate	30	SJVA705	AC Cord, Power Source
11	SGW23108B	Panel, Front Panel (Top)	31	SJAH129	Bushing, AC Cord
12	SGEEA3N	Ornament, Indicator Board	32		
13	SHG1595	Rubber, Indicator Lamp	33	SJSA466-2	Socket, AC Outlet
14	SGU039	Fiber, Indicator Lamp (Yellow)	34	SKC3308	Fiber, Cabinet
15	SGW23506	Panel, Front Panel (Side)	35	SHS1009	Rubber Cushion, Cabinet
16	SHCA629	Rubber, Front Panel	36	SHG6089	Jack, Headphones
17	SUW1651	Reflector Plate	37	XCA9721B-A	Speaker, Diodes
18	SHSA27-1	Fiber, Front Panel	38		
19			39		