

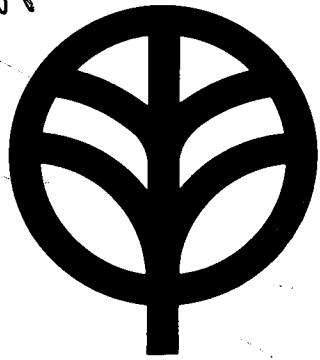
CONTENTS

EXTERNAL VIEW	3
INTERNAL VIEW	4
DISASSEMBLY FOR REPAIR	5
BLOCK DIAGRAM	6
CIRCUIT DESCRIPTION	6
DESTINATIONS' PARTS LIST	11
PARTS LIST	12
SEMICONDUCTOR SUBSTITUTIONS	13
TROUBLESHOOTING	14
ADJUSTMENT	15
PC BOARD	
POWER SUPPLY (X00-1940-10)	16
POWER AMP (A) (X07-1550-10)	16
POWER AMP (B) (X07-1560-10)	16
SCHEMATIC DIAGRAM	17
SPECIFICATIONS	18

Note:

The products are subject to modification in components and circuits in different countries and regions. This is because each product must be used under the best condition. This manual provides information of modification based on the standard in the U.S., for the convenience of ordering associated components and parts.

U.S.A.	K
Canada	P
PX	U
Australia	X
Europe	W
England	T
Scandinavia	L
South Africa	S
Other Areas	M



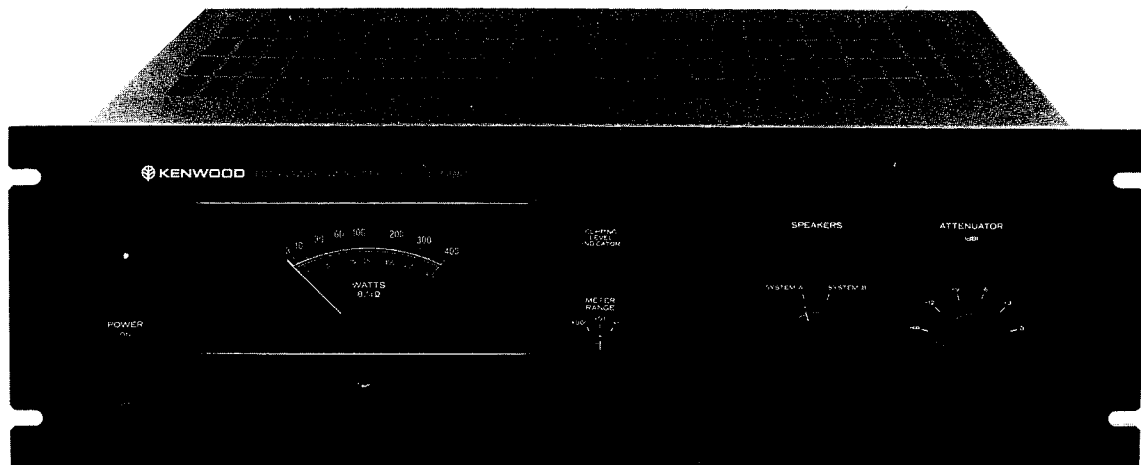
KENWOOD
HI/FI STEREO COMPONENTS

SERVICE MANUAL

L-09M

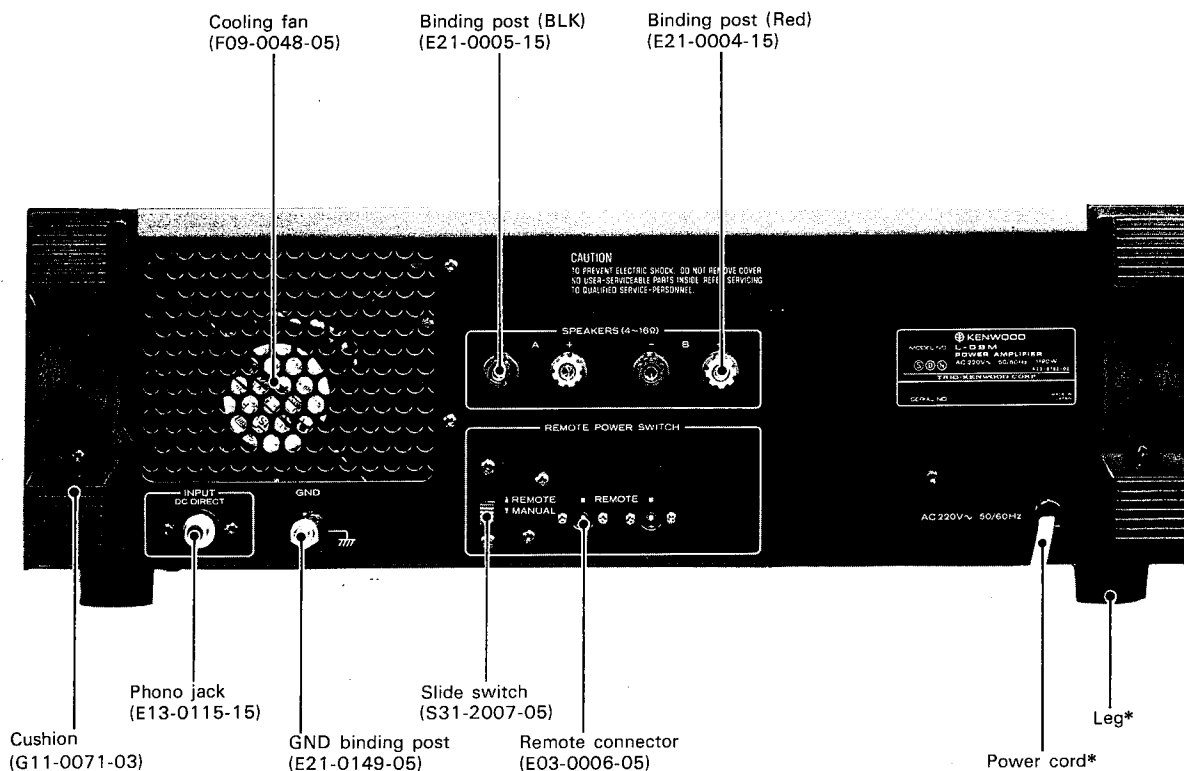
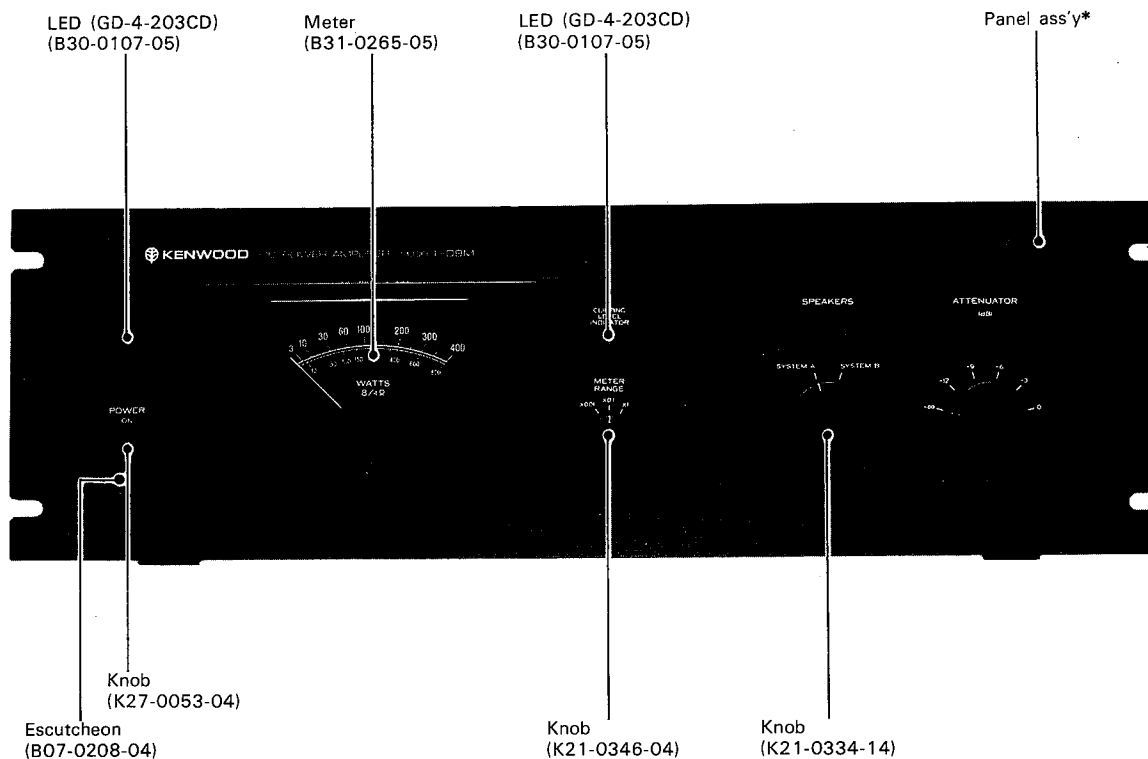
— NOTE —

The detailed description on "Circuit descriptions" — Cascode, Constant current, and ASO circuitry — is written in the L-07M and the KA-8100 service manual.



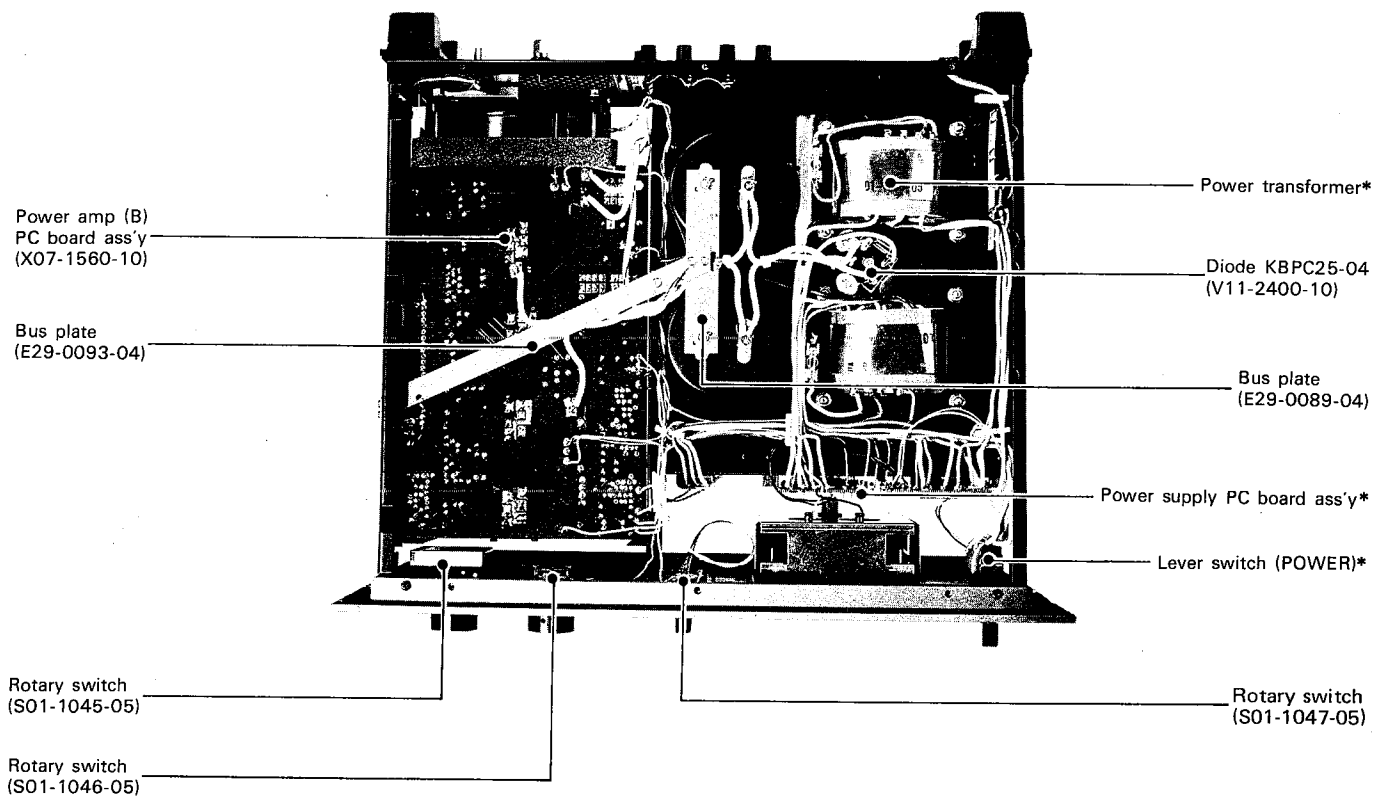
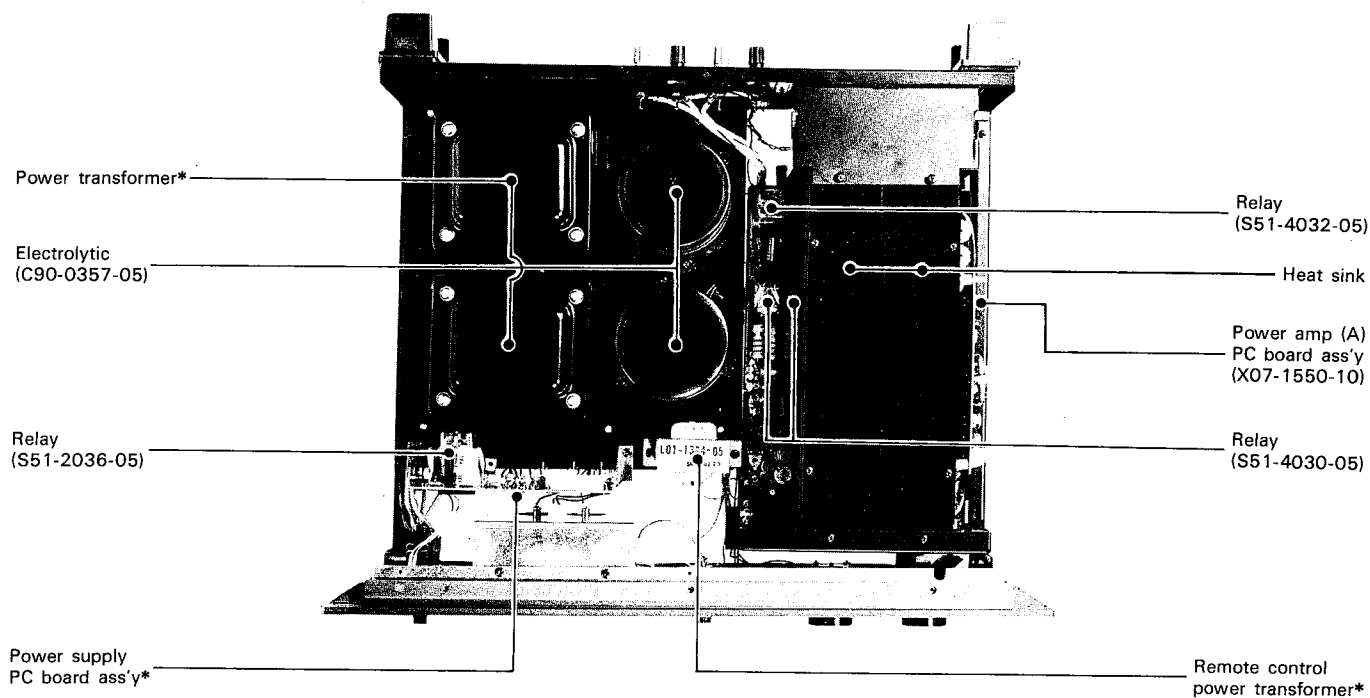
DC POWER AMPLIFIER

EXTERNAL VIEW



* Refer to Destinations' Parts List.

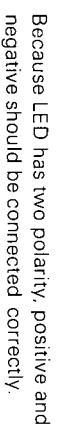
INTERNAL VIEW



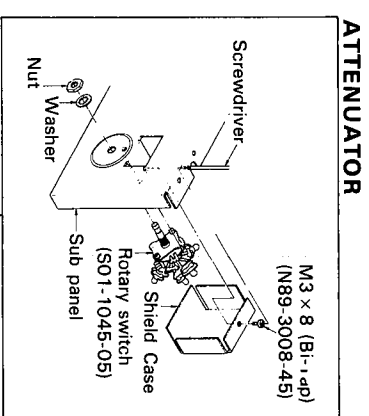
* Refer to Destinations' Parts List.



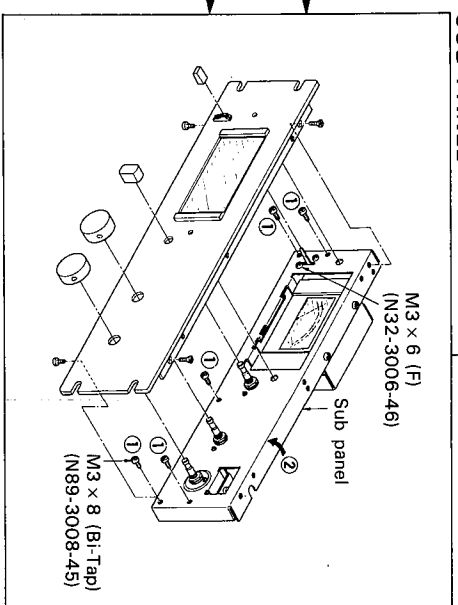
Pull out the LEDs from the LED holders after removing the front panel.



* Should remove the case, bottom plate, and meter shield case before disassembling for repair.

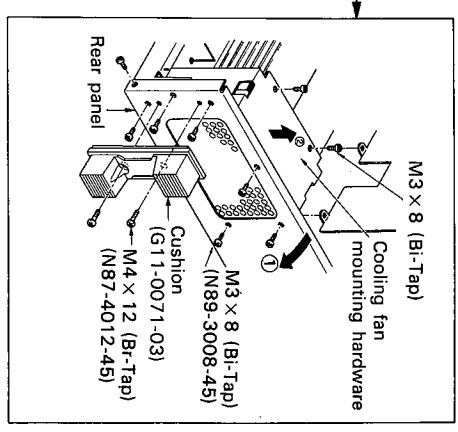


ATTENUATOR



PANEL

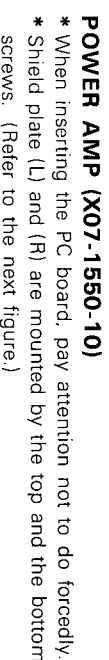
SUB PANEL



POWER METER

COOLING FAN

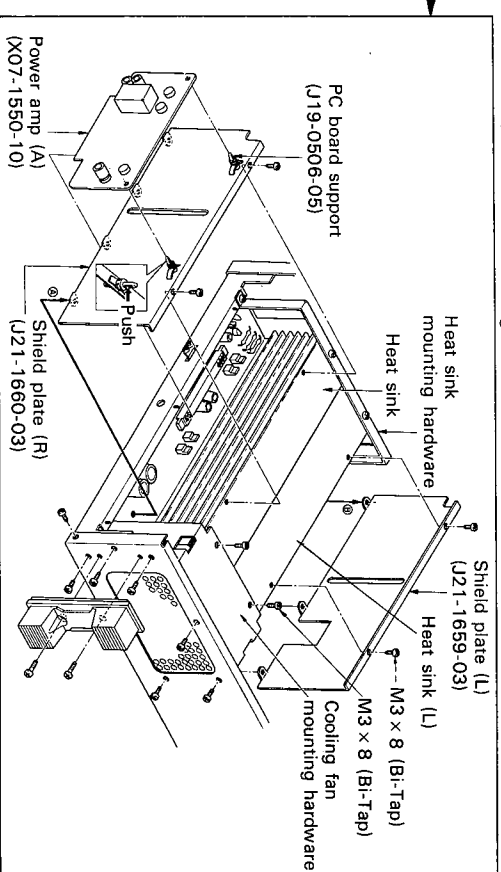
When it is difficult to remove the cooling fan without inclining the rear panel, remove the side and rear screws of rear panel and incline it.



POWER AMP (X07-1550-10)

**** When inserting the PC board, pay attention not to do forcibly.**

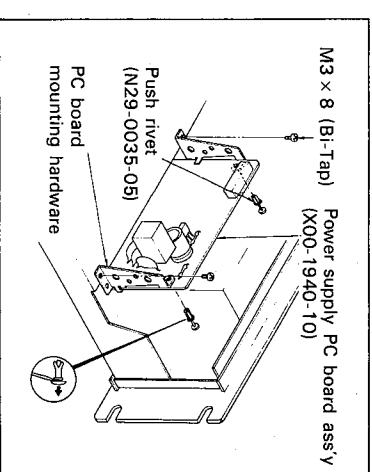
*** Shield plate (L) and (R) are mounted by the top and the bottom screws. (Refer to the next figure.)**



**Shield case of
INPUT stage**

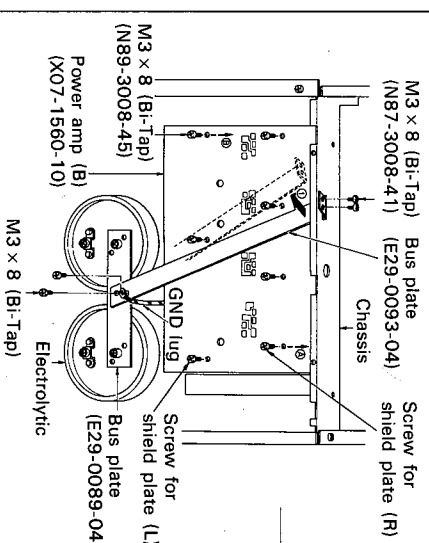
POWER SUPPLY

Power supply PC board ass'y is mounted by PC board mounting hardware with push rivets.

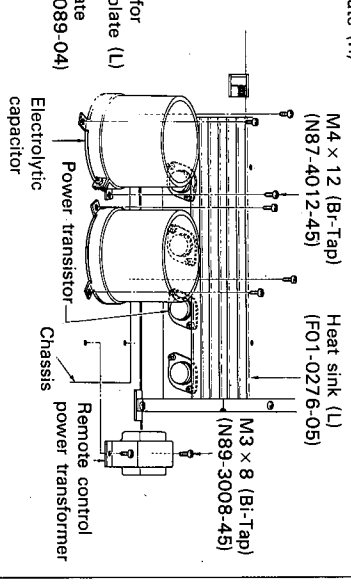


POWER TRANSISTOR (Q19 ~ 12)

When replace the power the transistors (Qf9 ~ 12), remove electrolytic capacitor and remote control power transformer.

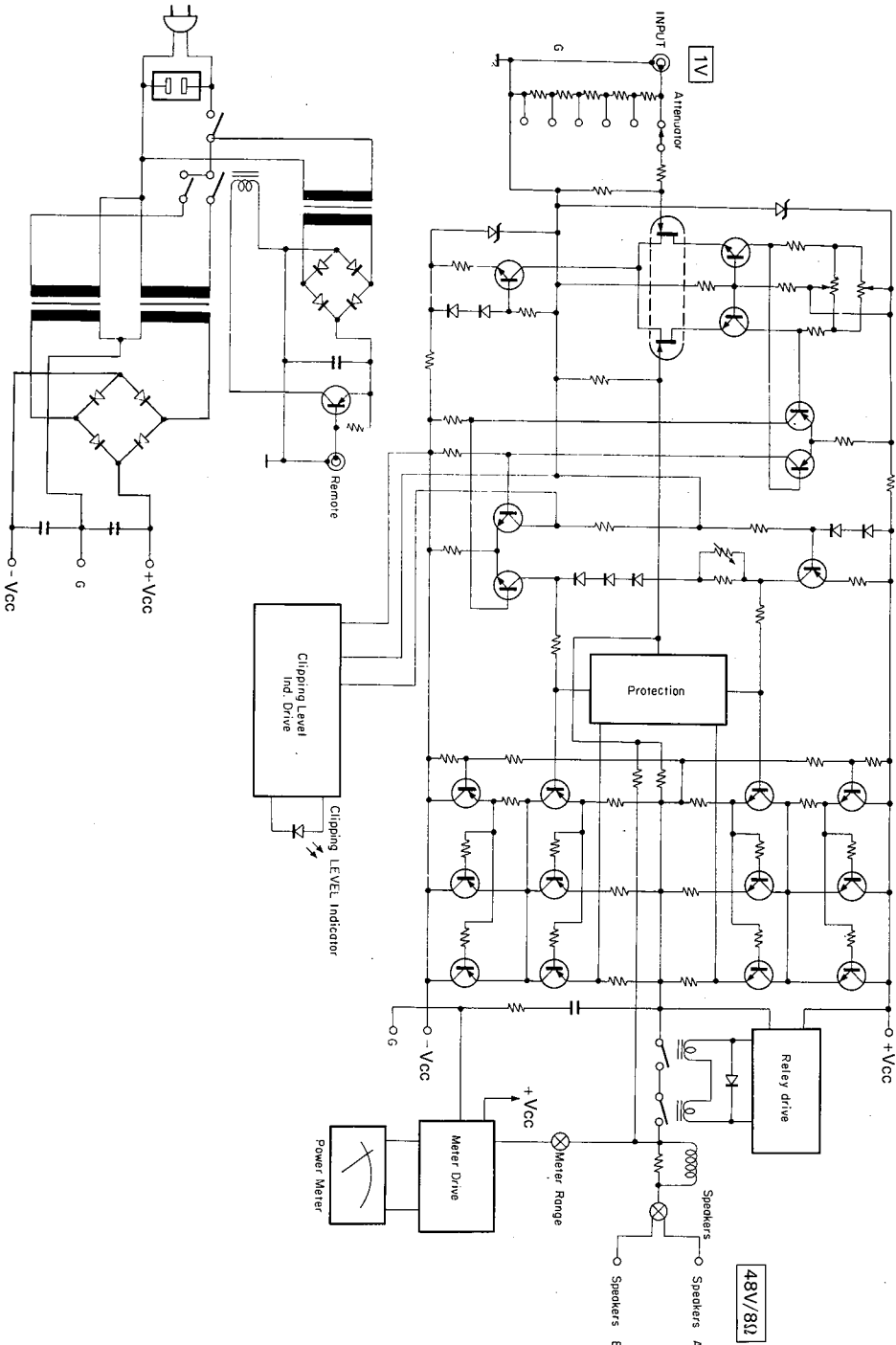


< BOTTOM VIEW >



<TOP VIEW>

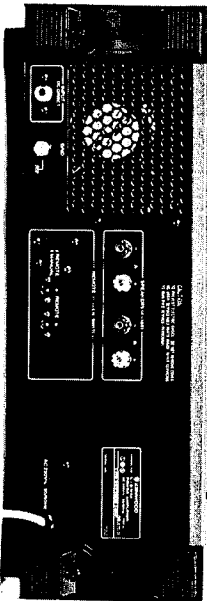
BLOCK DIAGRAM/CIRCUIT DESCRIPTION



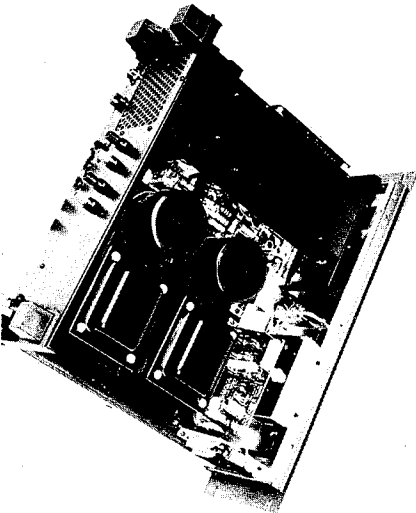
CIRCUIT DESCRIPTION

The model may also be used as a public amplifier because of its high output power (300W). The use of a direct reading watt meter and a clipping indicator enables monitoring of power. The meter ranges can be selected in 3 steps so that the meter deflects even with a small output. The meter has output ranges for both 4-ohms and 8-ohms.

3. Rear Panel

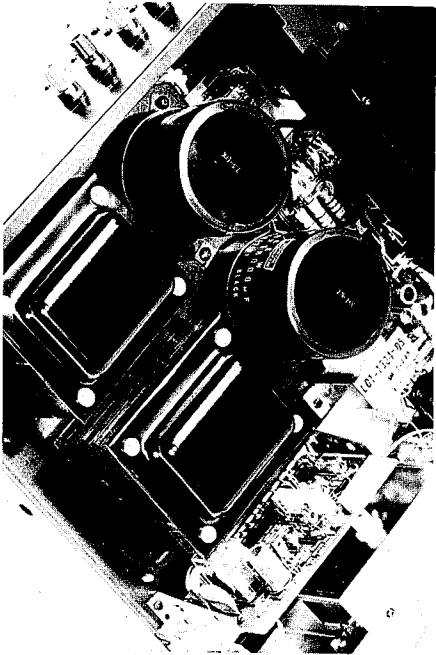


5. Internal View



A heat sink and power transistors are located on the left side and a power supply on the right side.

6. Power Supply PC board ass'y



On the rear panel there are a fan, input terminal, GND terminal, terminals for large size speakers, remote power switch and remote jack. The input phono jack is gold plated to prevent poor contacts. This jack is of the self-locked type so that the audio cord is not disconnected accidentally. Note that if the audio cord is disconnected while in use, the result may be damage to the speaker due to a large output. With the remote switch set to the MANUAL position, the power can be turned on and off by the power switch on the front panel. If it is desired to control the power remotely from L-07C, this switch should be set to the REMOTE position. On the panel there are two remote terminals for driving as multi-amp system.

4. Cooling Fan



Since the amplifier delivers a high output power, it requires highly efficient ventilation. To ensure proper ventilation, it is provided with a fan and large sized heat sink. The fan is designed to be switched automatically.

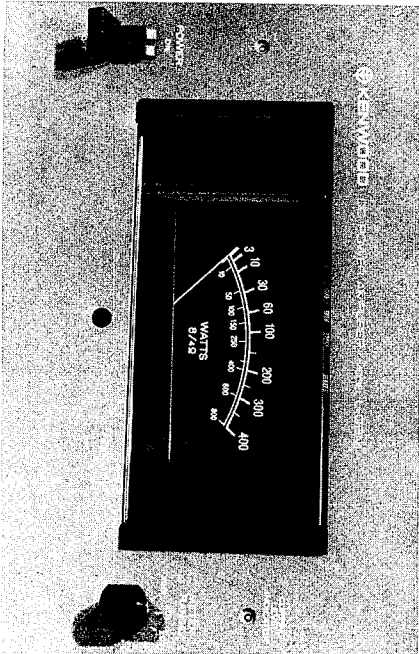
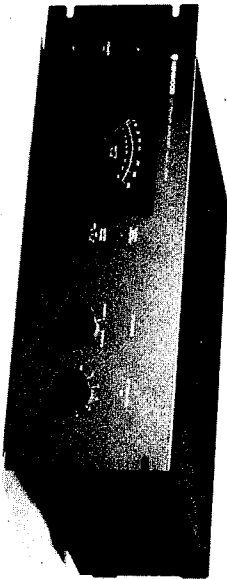
INTRODUCTION TO L-09M

Model L-09M is designed to deliver high output power up to 300W. This model is equipped with a large sized power meter and a clipping level indicator to permit monitoring of output level. Two pairs of speaker system, A and B, can be connected for selective use according to application. The input circuit is provided with an attenuator so that the speakers can be driven from any type of preamplifier. Because of a high output power amplifier, selected parts are used in the circuits to ensure high reliability.

2. Meter

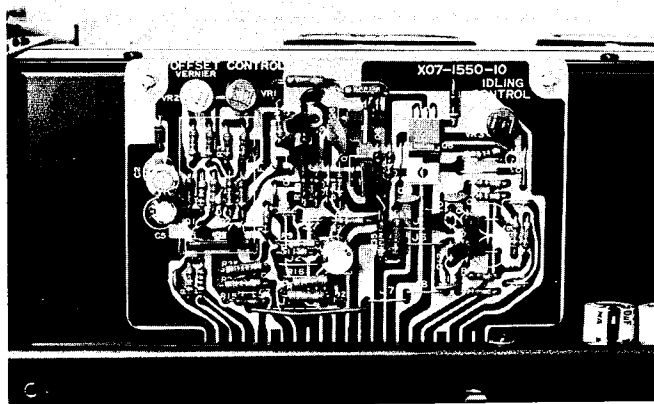
The panel is designed to be mounted on an EIA rack. The panel includes a power switch, LED (pilot lamp), a large sized power meter, a clipping level indicator and a 3-position range selector switch. Selection of speakers is accomplished by a relay, instead of using a rotary switch which is subject to wear of contacts.

1. Panel



CIRCUIT DESCRIPTION

The power supply includes a large capacity electrolytic capacitors based on the KENWOOD's dynamic crosstalk theory and a bus plate earth line to reduce the impedance.



7. Power Amplifier

The power amplifier is a series-parallel push-pull, ICL, OCL DC amplifier of pure complementary series, featuring FET differential amplifier and Darlington connection plus 3-stage differential circuit and constant current circuit. The input stage is composed of a one-chip dual FET having high impedance and excellent thermal characteristic. It features a constant current circuit and cascode circuit to improve the stability. Sufficient loop gain is assured by the constant current circuit used as a pre-driver in the third stage differential amplifier. The darlington power circuit includes a series of push-pull driver, a series-parallel push-pull power transistors operated on low voltage to reduce the current by half. The use of selected parts has also improved the reliability. The power transistors provide excellent linearity over the high frequency range and perfectly matched characteristics, thus minimizing the distortion which normally occur in high output power amplifiers.



Series-Parallel Connection

The power amplifier of L-09M delivers a high output (300W) so the power transistors are driven by a special circuit. The relationship between output power and power supply voltage is normally expressed by the following formula:

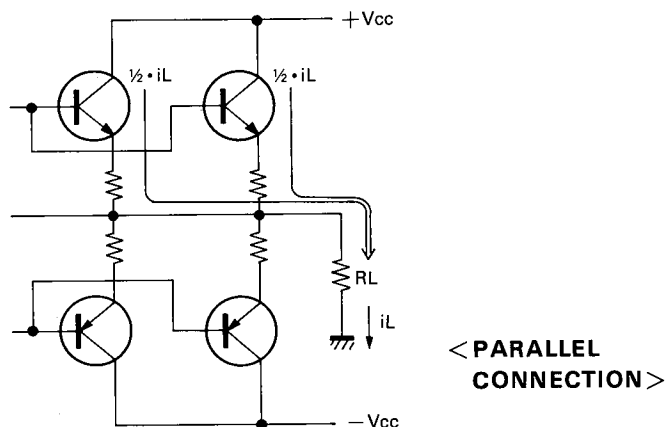
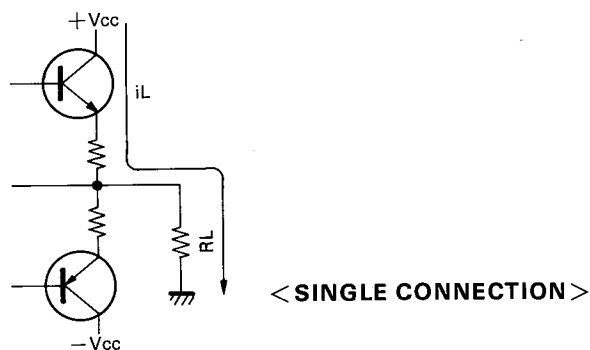
$$P_{O \max} = \frac{V_{CC}^2}{8 \times R_L} \quad R_L = \text{Load}$$

$$P_{O \max} = \text{Maximum output}$$

If we get high power output, as will be understood from the above formula, either the load should be reduced or V_{CC} should be increased. Most of speakers available from markets are rated at 8 to 16 ohms, and 8 ohm speakers are usually used for transistor amplifiers. Therefore, the value of V_{CC} needs to be increased. Today, power transistors which have excellent withstand voltage and switching characteristics are limited and hardly obtained. Accordingly, a series-parallel connection system has been employed to improve the VCE characteristic and reduce the load of each power transistor. Parallel connection system has been used in power amplifiers for a long time, and this system is normally called the parallel push-pull or triple push-pull system. Output power varies directly with the current flowing into the load as shown in the formula below:

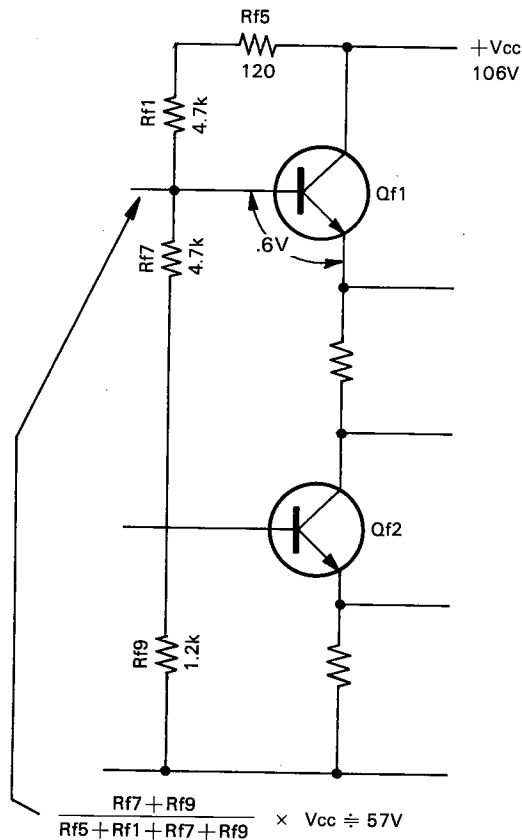
$$P_{O \max} = i_L^2 \times R_L \quad i_L = \text{Current flow to load}$$

Since the output power of L-09M is as high as 300W, the power transistors cannot be driven properly by single complementary power transistors circuit (PNP and NPN). The use of parallel connection circuit will reduce " i_L " of each transistor.

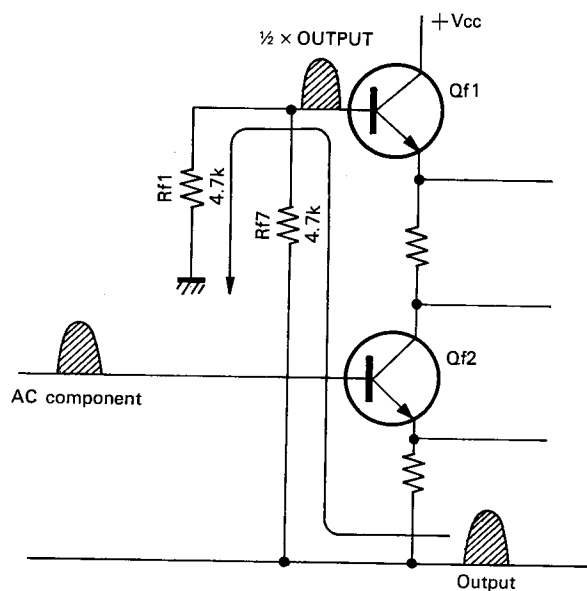


CIRCUIT DESCRIPTION

The series connection system was used in the early times of transistor amplifier circuits. The power transistors in its early times were not suitable for high power amplifiers because of low V_{CE0} and the series connection system was sometimes employed for increasing output power.



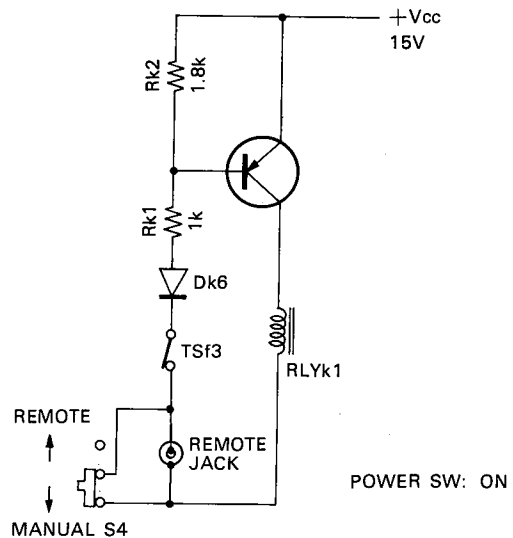
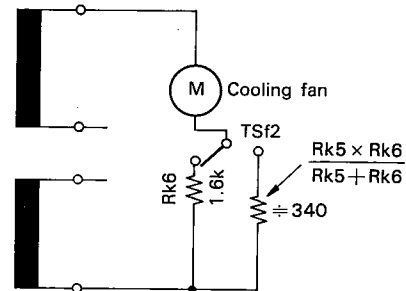
< DC QUIESCENT OPERATING CONDITION >



< AC OPERATING CONDITION >

Temperature Sensor

In the schematic diagram, TSf2 and TSf3 represent temperature sensors. Since L-09M is a high power amplifier that delivers 300W output, it incorporates a cooling fan to prevent temperature rise and to ensure stabilized operation. Temperature sensor has two types; one is the make type shown by TSf2 and the other is the break type shown by TSf3. If the temperature inside the case increases during operation, the temperature sensor TSf2 (70°C make type) mounted on the heat sink is activated.

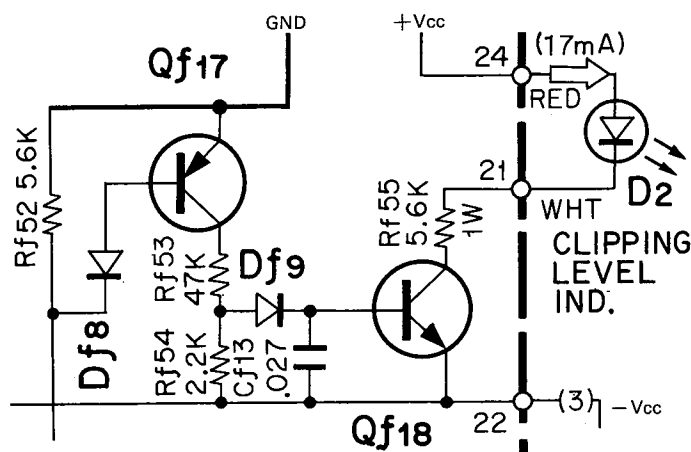


When TSf2 is activated, the value of the resistor in series with the cooling fan is varied, causing the fan to run faster. However, if the temperature of the heat sink increases further, TSf3 (90°C break type) is activated, turning off Qk1 of the power supply unit to shut off the power supply to the amplifier. The temperature sensor is of the automatic reset type; it is reset as the temperature lowers.

CIRCUIT DESCRIPTION

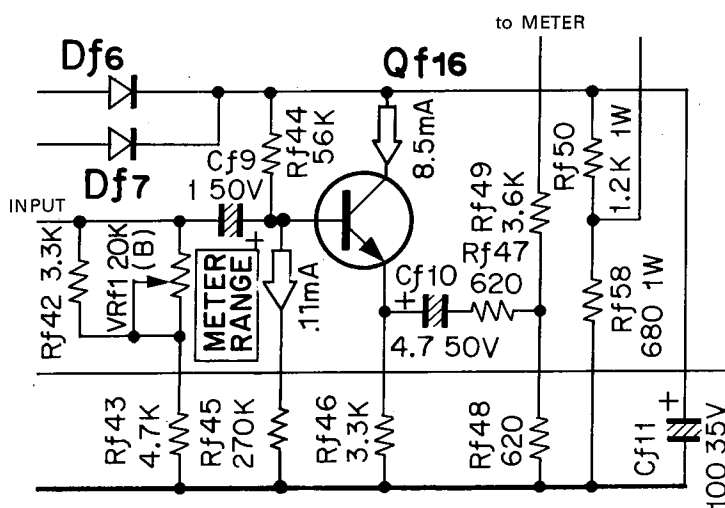
Clipping Indicator Circuit

Qf17 at the input stage of the clipping indicator circuit is usually reverse biased. Like Qf18, it is in OFF state and LED of the indicator remains OFF. If a large input signal is fed to the amplifier, the collector voltage of Qe6 at the third stage of the differential amplifier is lowered, causing Qf17 to be forward biased. Since Qf17 turns to ON, the voltage drop across Rf54 is increased due to the collector current and thus Qf18 turns to ON and LED D2 lights up, in turn.



Meter Amplifier Circuit

The meter amplifier Qf16 is an emitter-follower, high input impedance circuit to minimize the effect of the output stage. The output is attenuated by a resistor and is fed to the meter amplifier. The power supply to Qf16 is separated from that to the power amplifier.

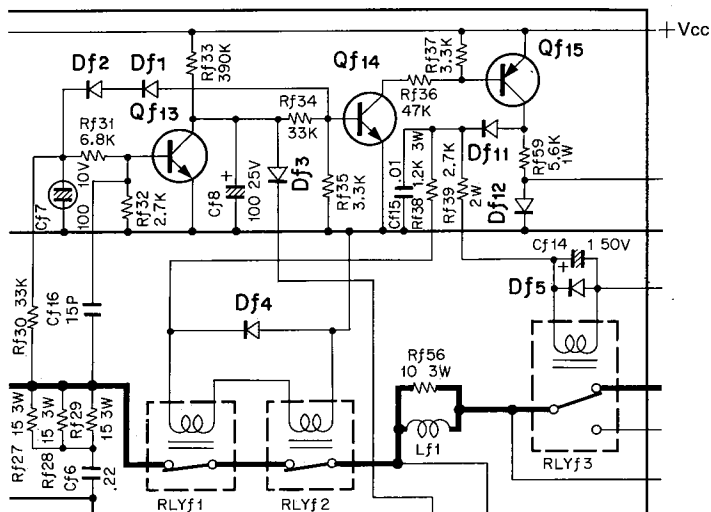


DC Protection

The DC potential at the output terminal (speaker terminal) is always maintained at zero volt by the positive and negative power supply circuits and the differential amplifier. However, if a DC potential appears for a certain reason, the differential amplifier cannot reduce this potential to zero volt and DC current flows into the speaker load which is therefore destroyed. Hence, the DC protection circuit is installed. If a DC potential is generated and cannot be compensated by the differential amplifier, the DC protection circuit actuates a relay to separate the load (speaker) from the load circuit to protect it against destruction.

Assume that there is a DC potential at the output terminal and cannot be compensated by the differential amplifier. Then current begins to flow through Rf30 and Cf7 is charged. If they are positively charged, the base potential rises at Qf13 which is therefore turned on. When Qf13 is turned on, the collector potential of Qf13 is lowered and the base voltage of Qf14 is also lowered and then Qf15 is raised. Thus Qf14 and Qf15 are turned off and the relay separates the load from the circuit. If Cf7 is negatively charged, the diodes Df1 and 2 are biased in the forward direction to lower the base potential of Qf14. Thus Qf14 and Qf15 are turned off and the relay also functions to separate the load from the circuit.

This DC protection circuit is devised to prevent shock noise which may occur after power switch is on. When the power supply circuit is switched on, +Vcc current flows through Rf33 and Cf8. The relay remains to separate the load until Cf8 is charged up, since the base potential at Qf14 is not raised. When Cf8 is completely charged, Qf14 is turned on and the relay is set. No shock noise occurs since this time period (dependent on the time constant of Rf33 and Cf8) is longer than the circuit stabilizing time after power switch is on.



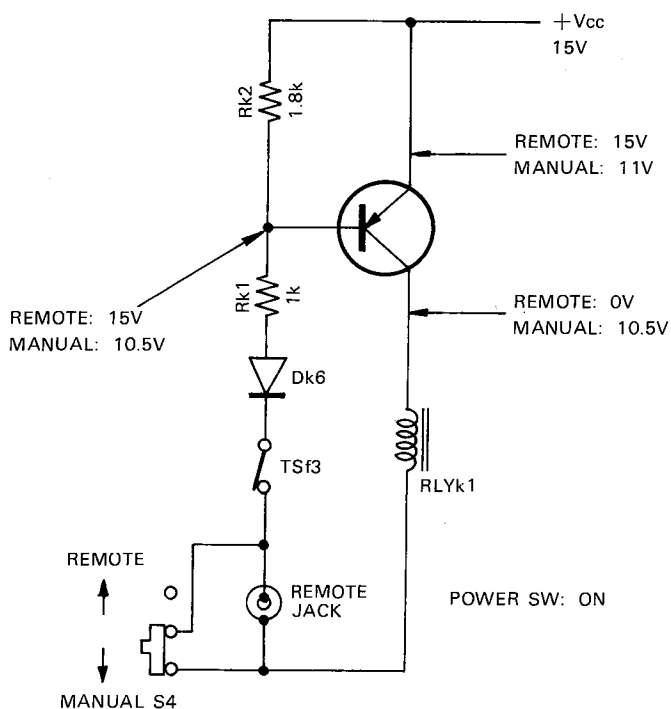
CIRCUIT DESCRIPTION

Remote Circuit

It is also possible L-09M is located near the speaker system. Then there is much distance between the power amplifier and the control amplifier, L-07C, and switching on and off the L-09M unit is very troublesome. Hence this remote circuit is devised. The remote circuit enables the L-09M unit to be switched on and off through a remote cord simultaneously when the L-07C unit is switched on and off. The circuit diagram of the remote circuit is shown below.

When S4 (or the reed relay of L-07C) is short-circuited, voltage is applied to the base of Qk1, which is therefore turned on, the power relay operates. The power relay has the same function as for the power switch. In other words, the working of the power relay is equivalent to the switching on of the power switch.

When S4 (or the reed relay) is open, Qk1 is turned off since voltage is not applied to its base. Thus the power relay is released and also the power switch is OFF and power supply does not feed to the power amplifier.



< CONDITION FOR Qk1 OPERATION >

Qk1	TSf3	S4	REMOTE JACK
ON	ON	MANUAL	OPEN or SHORT
	ON	—	SHORT
OFF	OFF	—	—
	ON	REMOTE	OPEN

DESTINATIONS' PARTS LIST

☆ : new parts

Ref. No.	U.S.A. (K)	Canada (P)	PX (U)	Australia (X)	Europe (W)	Scandinavia (L)	England (T)	South Africa (S)	Other Areas (M)	Descriptions
—	A20-1163-02	A20-1163-02	A20-1163-02	—	A20-1163-02	A20-1163-02	A20-1164-02	—	A20-1163-02	Panel ass'y ☆
—	B46-0061-10	B46-0055-20	B46-0062-10	—	—	—	B46-0060-00	—	—	Warranty card
—	—	—	B46-0063-00	—	—	—	—	—	—	Warranty card
—	B50-1648-00	B50-1649-00	B50-1648-00	—	B50-1648-00	B50-1648-00	B50-1650-00	—	B50-1648-00	Instruction manual ☆
—	—	—	B59-0018-00	—	—	—	—	—	—	KENWOOD service stations' list
C12	C90-0145-05	C91-0025-05	—	—	—	—	—	—	—	Film capacitor 0.01 μ F AC 125WV
C12, 13	—	—	C91-0023-05	—	—	—	—	—	C91-0023-05	Ceramic 0.01 μ F AC 250WV
—	—	—	—	—	—	—	—	—	—	Ceramic 0.01 μ F DC 2kV
—	—	—	D32-0083-04	—	D32-0083-04	—	—	—	D32-0083-04	Switch stopper ☆
—	E08-0225-05	E08-0225-05	E08-0225-05	—	—	—	—	—	E08-0225-05	AC outlet
—	E30-0290-05	E30-0290-05	E30-0291-25	—	E30-0580-05	E30-0292-05	E30-0602-05	—	E30-0291-25	Power cord
F1, 2, 3, 4	—	—	—	—	F05-4025-05	F05-4025-05	F05-4024-05	—	—	Fuse 4A
—	—	—	—	—	F05-4025-05	—	—	—	—	Fuse 4A
—	H01-1725-04	H01-1726-04	H01-1726-04	—	H01-1726-04	H01-1726-04	H01-1727-04	—	H01-1725-04	Carton case ☆
—	H20-0394-04	H20-0394-04	H20-0394-04	—	H20-0394-04	H20-0394-04	H20-0394-04	—	H20-0416-04	Polyethylene bag
—	J02-0088-05	J02-0089-05	J02-0089-05	—	J02-0089-05	J02-0089-05	J02-0089-05	—	J02-0089-05	Leg x 4
—	—	—	—	—	J13-0053-05	J13-0053-05	J13-0053-05	—	—	Fuse holder ☆
—	J41-0032-05	J41-0032-05	J41-0032-05	—	J41-0033-05	J41-0033-05	J41-0024-15	—	J41-0032-05	Cord bushing
—	L01-1361-05	L01-1361-05	L01-1366-05	—	L01-1366-05	L01-1366-05	L01-1366-05	—	L01-1366-05	Power transformer x 2 ☆
—	L01-1381-05	L01-1381-05	L01-1384-05	—	L01-1384-05	L01-1384-05	L01-1384-05	—	L01-1384-05	Remote control power transformer ☆
S5	S33-2022-05	S33-2022-05	S33-2021-05	—	S33-2023-05	S33-2023-05	S33-2023-05	—	S33-2021-05	lever switch (Power)
S6	—	—	S31-2001-05	—	S31-2001-05	—	—	—	S31-2001-05	Slide switch (power voltage selector)
S7	—	—	S31-3004-05	—	S31-3004-05	—	—	—	S31-3004-05	Slide switch (power voltage selector)
—	X00-1940-10	X00-1941-01	X00-1940-01	—	X00-1940-61	X00-1940-61	X00-1940-61	—	X00-1940-01	Power supply PC board ass'y ☆

PARTS LIST

☆ : new parts

POWER SUPPLY (X00-1940-10)

Ref. No.	Parts No.	Description	Re- marks
CAPACITOR			
C1	CK45SL1H101K	Ceramic 100pF ±10%	
C2	CK45B1H391K	Ceramic 390pF ±10%	
C3	CK45B1H471K	Ceramic 470pF ±10%	
C4	CK45B1H681K	Ceramic 680pF ±10%	
C5	CK45B1H122K	Ceramic 0.0012μF ±10%	
C6,7	C90-0357-05	Electrolytic 18000μF 120WV	☆
C8~11	CK45E2H103P	Ceramic 0.01μF +100%—0%	
SEMICONDUCTOR			
D1	V11-2400-10	Diode KBPC25-04	☆
D2,3	B30-0107-05	LED (GD-4-203CD)	
SWITCH			
S1	S01-1045-05	Rotary (INPUT)	☆
S2	S01-1046-05	Rotary (SPEAKERS)	☆
S3	S01-1047-05	Rotary (METER)	☆
S4	S31-2007-05	Slide (REMOTE)	
MISCELLANEOUS			
—	A01-0322-03	Case	☆
—	B07-0208-04	Escutcheon (POWER SW)	
—	B07-0215-03	Escutcheon (frontglass) × 2	☆
—	B10-0225-04	Frontglass	☆
—	B19-0198-03	Lighting acrylic resin board	☆
—	B30-0095-05	Pilot lamp (8V, 300 mA)	
—	B31-0265-05	Meter	☆
—	B42-0009-04	Passed sticker	
—	E03-0006-05	Remote connector × 2	
—	E13-0115-15	Phono jack (screw lock type)	
—	E21-0004-15	Binding post (SPEAKERS, red)	
—	E21-0005-15	Binding post (SPEAKERS, black)	
—	E21-0149-05	GND binding post	
—	E29-0089-04	Bus plate (capacitor)	☆
—	E29-0093-04	Bus plate (capacitor and chassis)	☆
—	E30-0594-05	Remote control cord ass'y	
—	E30-0595-15	Speaker cord	
—	F07-0401-05	Shield case (meter)	☆
—	F09-0048-05	Cooling fan	☆
—	G11-0071-03	Cushion × 2	
—	H12-0060-03	Right buffer fixture	☆
—	H12-0061-03	Left buffer fixture	☆
—	H25-0078-00	Instruction bag	
—	J19-0509-04	LED holder × 2	
—	J42-0076-05	Buffer bushing (fan) × 4	☆
—	K21-0334-14	Knob × 2 (SPEAKER, ATTENUATOR)	
—	K21-0346-04	Knob (METER RANGE)	☆
—	K27-0053-04	Knob (POWER)	
—	N08-0125-05	Dress screw × 4 (case)	
—	X07-1550-10	Power amp (A) PC board ass'y	☆
—	X07-1556-10	Power amp (B) PC Board ass'y	☆

Ref. No.	Parts No.	Description	Re- marks
CAPACITOR			
Ck1~4	C90-0145-05	Film 0.01μF AC 125WV (X00-1940-10)	
	C91-0025-05	Film 0.01μF AC 125WV (X00-1941-01)	
	CK45E3D103PMU	Ceramic 0.01μF DC 2KWV (X00-1940-61)	
Ck5	CE04W1C102	Electrolytic 1000μF 16WV	
RESISTOR			
Rk4	RS14GB3D100J	Metal film 10Ω ±5% 2W	
Rk5	R92-0168-05	Cement 430Ω ±10% 7W	☆
Rk6	R92-0170-05	Cement 1.6kΩ ±10% 10W	☆
SEMICONDUCTOR			
Qk1	V01-0119-05	Transistor 2SA743A (B) or (C)	
Dk1~5	V11-0295-05	Diode W06B	
Dk6	V11-0271-05	Diode 1S2076	
MISCELLANEOUS			
Fk1	F05-1021-05	Fuse (1A) UL (X00-1940-10, X00-1941-01)	
	F06-1021-05	Fuse (1A) SEMKO (X00-1940-61)	
Fk2,3	F05-8022-05	Fuse (8A) UL (X00-1940-10, X00-1941-01)	
—	J13-0055-05	Fuse clip × 6 (X00-1940-10, X00-1941-01)	
—	J13-0055-05	Fuse clip × 2 (X00-1940-61)	
RLYk1	S51-2036-05	Relay	☆

POWER AMP (A) (X07-1550-10)

Ref. No.	Parts No.	Description	Re- marks
CAPACITOR			
Ce1	CK45B1H391K	Ceramic 390pF ±10%	
Ce2,3	CE04W1V101EL	Electrolytic 100μF 35WV	
Ce4	CK45D1H102M	Ceramic 0.001μF ±20%	
Ce5	CE04W1H100EL	Electrolytic 10μF 50WV	
Ce6	CC45SL2H100D	Ceramic 10pF ±0.5pF	
Ce7	CC45SL1H270J	Ceramic 27pF ±5%	
Ce8	CC45SL1H470J	Ceramic 47pF ±5%	
Ce9	CQ93M2D332K	mylar 0.0033μF ±10%	
Ce10	CC45SL1H050D	Ceramic 5pF ±0.5pF	
Ce11	CK45F1H103Z	Ceramic 0.01μF +80%—20%	
Ce12	CC45SL1H181K	Ceramic 180pF ±10%	
Ce13,14	CE04W1H010EL	Electrolytic 1μF 50WV	
Ce15	CC45SL1H181K	Ceramic 180pF ±10%	
Ce16	CK45F1H473Z	Ceramic 0.047μF +80%—20%	
Ce17	CC45SL1H470K	Ceramic 47pF ±10%	
Ce18	CE04W2C010EL	Electrolytic 1μF 160WV	
Ce19	CK45B1H821K	Ceramic 820pF ±10%	
Ce20	CC45SL1H390K	Ceramic 39pF ±10%	
Ce21,22	CK45B1H821K	Ceramic 820pF ±10%	
RESISTOR			
Re4	RD14GY2E682JMA	Carbon 6.8kΩ ±5% 1/4W	
Re9	RD14GY2E472JMA	Carbon 4.7kΩ ±5% 1/4W	

PARTS LIST

☆ : new parts

Ref. No.	Parts No.	Description	Re- marks
Re13	RD14GY2E682JMA	Carbon 6.8kΩ ±5%	1/4W
Re16,17	RS14GB3A332JMA	Metal film 3.3kΩ ±5%	1W
Re18	RD14GY2E102JMA	Carbon 1kΩ ±5%	1/4W
Re19	RD14GY2E332JMA	Carbon 3.3kΩ ±5%	1/4W
Re21	RD14GY2E102JMA	Carbon 1kΩ ±5%	1/4W
Re22,23	RS14GB3A332JMA	Metal film 3.3kΩ ±5%	1W
Re24	RS14GB3A303JMA	Metal film 30kΩ ±5%	1W
Re25	RS14GB3A123JMA	Metal film 12kΩ ±5%	1W
Re27	RD14GY2E102JMA	Carbon 1kΩ ±5%	1/4W
Re28	RD14GY2E820JMA	Carbon 82Ω ±5%	1/4W
Re29	RD14GY2E910JMA	Carbon 91Ω ±5%	1/4W
Re34,35	RS14GB3A331JMA	Metal film 330Ω ±5%	1W
SEMICONDUCTOR			
Oe1~3	V03-0500-05	Transistor 2SC1776(E) or (F)	☆ ☆
Oe4,5	V01-0162-05	Transistor 2SA912(S) or (R)	
Oe6,7	V03-1507-10	Transistor 2SC1507(L)	
Oe8	V01-0964-10	Transistor 2SA964A(O) or (R)	
Oe9	V03-0270-05	Transistor 2SC945(O) or (R)	
Oe10,11	V01-0084-05	Transistor 2SA733(O) or (R)	
Oe12	V03-0270-05	Transistor 2SC945(O) or (R)	
De1,2	V11-0467-05	Zener diodeEOA01-28R	
De3~6	V11-0271-05	Diode 1S2076	
De9~12	V11-0273-05	Diode 1S2076A	
Ic61	V30-0232-05	IC μPA 63H (L) or (M)	
POTENTIOMETER			
VRe1	R12-1028-05	PC trimmer 4.7kΩ(B) FINE OFFSET ADJ.	
VRe2	R12-1004-05	PC trimmer 4.7kΩ(B) ROUGH OFFSET ADJ.	
VRe3	R12-0058-05	PC trimmer 470Ω(B) BIAS ADJ.	

POWER AMP (B) (X07-1560-10)

Ref. No.	Parts No.	Description	Re- marks
CAPACITOR			
Cf1,2	CE04W2A101EL	Electrolytic 100μF 100WV	
Cf3,4	CE04W1A101EL	Electrolytic 100μF 10WV	
Cf5	CC45SL1H101K	Ceramic 100pF ±10%	
Cf6	CO93M2D224K	Mylar 0.22μF ±10%	
Cf7	CE04BW1C101	Non-pole electrolytic 100μF 16WV	
Cf8	C90-0349-05	Electrolytic 100μF 25WV	
Cf9	CE04W1H010	Electrolytic 1μF 50WV	
Cf10	CE04W1H4R7	Electrolytic 4.7μF 50WV	
Cf11	CE04W1V101	Electrolytic 100μF 35WV	
Cf12	CE04W1H010	Electrolytic 1μF 50WV	
Cf13	CO93M1H273K	Mylar 0.027μF ±10%	
Cf14	CE04W1H010	Electrolytic 1μF 50WV	
Cf15	CK45E2H103P	Ceramic 0.01μF +100%—0%	
Cf16	CC45SL1H150K	Ceramic 15pF ±10%	
Cf17	CC45SL1H331K	Ceramic 330pF ±10%	
RESISTOR			
Rf1,2	RS14GB3A472JMA	Metal film 4.7kΩ ±5%	1W
Rf3,4	RS14GB3D472JMA	Metal film 4.7kΩ ±5%	2W
Rf5,6	RS14GY3D121JMA	Metal film 120Ω ±5%	2W

Ref. No.	Parts No.	Description	Re- marks
Rf7,8	RS14GB3A472JMA	Metal film 4.7kΩ ±5%	1W
Rf9	RS14GB3A122JMA	Metal film 1.2kΩ ±5%	1W
Rf10	RS14GB3A561JMA	Metal film 560Ω ±5%	1W
Rf11~14	RS14GB3A181JMA	Metal film 180Ω ±5%	1W
Rf15~18	RS14GB3A4R7JMA	Metal film 4.7Ω ±5%	1W
Rf19,20	R92-0111-05	Cement 0.47Ω ±10%	3W
Rf21~24	RS14GB3A4R7JMA	Metal film 4.7Ω ±5%	1W
Rf25,26	R92-0111-05	Cement 0.47Ω ±10%	3W
Rf27~29	RS14GB3F150JMA	Metal film 15Ω ±5%	3W
Rf38	RS14GB3F122J	Metal film 1.2kΩ ±5%	3W
Rf39	RS14GB3D272JMA	Metal film 2.7kΩ ±5%	2W
Rf40,41	RS14GB3D152JMA	Metal film 1.5kΩ ±5%	2W
Rf50	RS14GB3A122JMA	Metal film 1.2kΩ ±5%	1W
Rf55	RS14GB3A562J	Metal film 5.6kΩ ±5%	1W
Rf56	RS14GB3F100JMA	Metal film 10Ω ±5%	3W
Rf58	RS14GB3A681J	Metal film 680Ω ±5%	1W
Rf59	RS14GB3A562J	Metal Film 5.6kΩ ±5%	1W
SEMICONDUCTOR			
Qf1,2	V04-0061-05	Transistor 2SD381 (M)	
Qf3,4	V02-0536-30	Transistor 2SB536 (M)	
Qf5,6	V03-1116-20	Transistor 2SC1116 (O)	
Qf7,8	V01-0747-20	Transistor 2SA747 (O)	
Qf5,6	V03-1116-30	Transistor 2SC1116 (Y)	
Qf7,8	V01-0747-30	Transistor 2SA747 (Y)	
Qf9,10	V03-1116-20	Transistor 2SC1116 (O)	
Qf11,12	V01-0747-20	Transistor 2SA747 (O)	
Qf9,10	V03-1116-30	Transistor 2SC1116 (Y)	
Qf11,12	V01-0747-30	Transistor 2SA747 (Y)	
Qf13	V03-0270-05	Transistor 2SC945 (P) or (Q)	
Qf14	V03-1775-10	Transistor 2SC1775A (F)	
Qf15	V01-0218-05	Transistor 2SA915	
Qf16	V03-0408-05	Transistor 2SC1222 (U)	
Qf17	V01-0189-05	Transistor 2SA872A (E) or (F)	
Qf18	V03-0481-05	Transistor 2SC1775A (E) or (F)	
Df1~3	V11-0273-05	Diode 1S2076A	
Df4~7	V11-0295-05	Diode W06B	
Df8,9	V11-0273-05	Diode 1S2076A	
Df10	V21-0013-05	Varistor STV-3H (Y)	
Df11,12	V11-0295-05	Diode W06B	
POTENTIOMETER			
VfR1	R12-3028-05	PC trimmer 20k (Ω)	
RELAY			
RLYf1,2	SE1-4030-05	Relay (24V, make)	
RLYf3	SE1-4032-05	Relay (48V)	
MISCELLANEOUS			
—	E02-0002-05	Transistor socket × 8	
—	E10-2206-05	Mini-connector	
—	F20-0066-05	Mica plate × 8	
—	J19-0506-05	PC board support × 2	
Lf1	L39-0082-05	Phase compensation coil	
TSf2	SS9-1046-05	Thermal sensor (70°C make)	☆
TSf3	SS9-1045-05	Thermal sensor (90°C break)	☆

SEMICONDUCTOR SUBSTITUTIONS

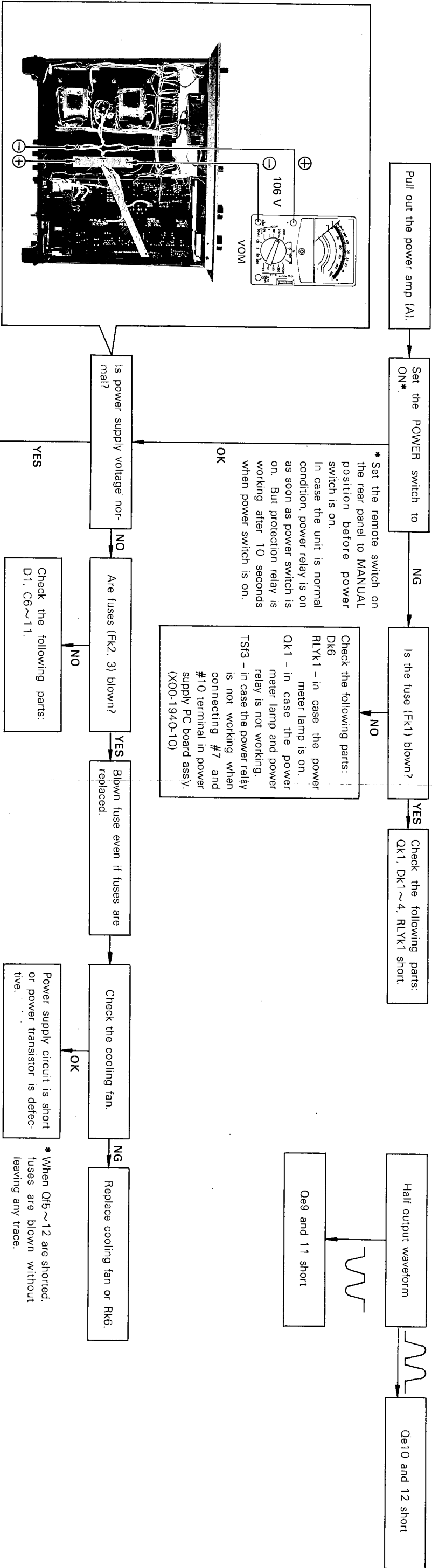
SEMICONDUCTOR NAME	SUBSTITUTIONS
(X00-1940-10)	
2SA743A (B) or (C)	—
(X07-1560-10)	
2SA733 (R) or (Q)	2SA673A, 2SA640, 2SA750
2SA912 (R) or (S)	2SA899(B) or (V), 2SA810
2SA964A (Q) or (R)	—
2SC945 (Q) or (R)	2SC1345 (E) or (F)
2SC1507 (L)	—
2SC1775 (E) or (F)	2SC1400 (U) or (E), 2SC1222 (U) or (E), 2SC1000, 2SC1681
μPA-63H	—
(X07-1560-10)	
2SA747 (Y) or (O)	2SB655, 2SA747A, 2SB554
2SA872A (E) or (F)	—
2SA915	—
2SB536 (M)	2SA913 (Q) or (R)
2SC945 (P) or (Q)	2SC1345 (E) or (F)
2SC116 (Y) or (O)	2SC1116A, 2SD675, 2SD424
2SC1222 (U)	2SC1345 (F)
2SC1775A (E) or (F)	—
2SD381 (M)	2SC1913 (Q) or (R)

ABSOLUTE MAX. RATINGS

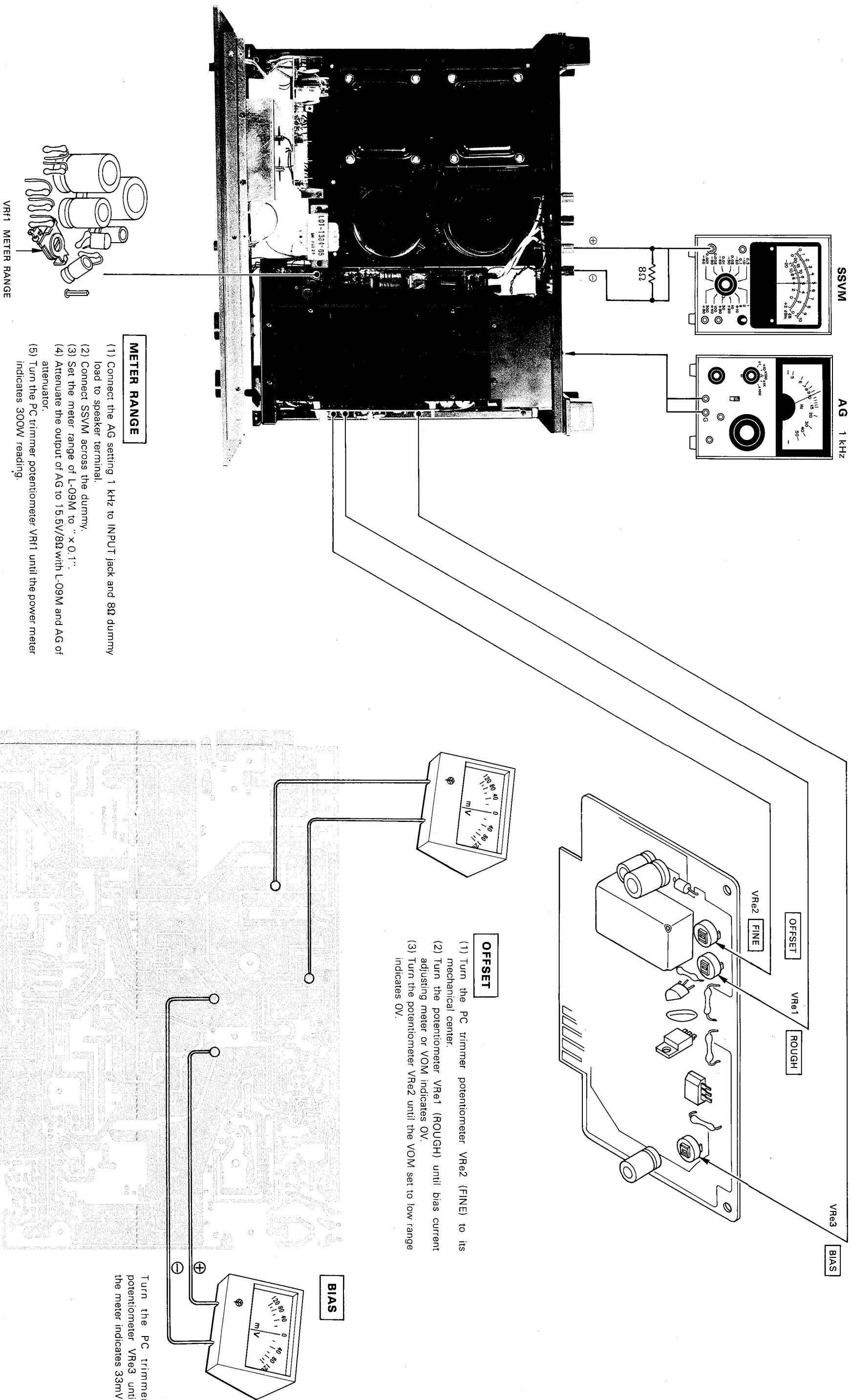
DIODE	VRM	VR	IF	IO	Isurge	P	Tj	Tstg
KBPC25-04	400V	—	—	25A	300A	—	—	—55~+150°C
TRANSISTOR								
2SA964A	—250V	—5V	—250V	—200mA	1.5W (Ta=25°C)	150°C	—55~+150°C	50 MHz VCE:—50V, IC:—10 mA
2SC1507	300V	7V	300V	200 mA	1.2W (Ta=25°C)	150°C	—55~+150°C	80 MHz VCE: 30V, IE:—10 mA

TROUBLESHOOTING

This troubleshooting is written by data that we dare to misoperate semiconductors.



ADJUSTMENT



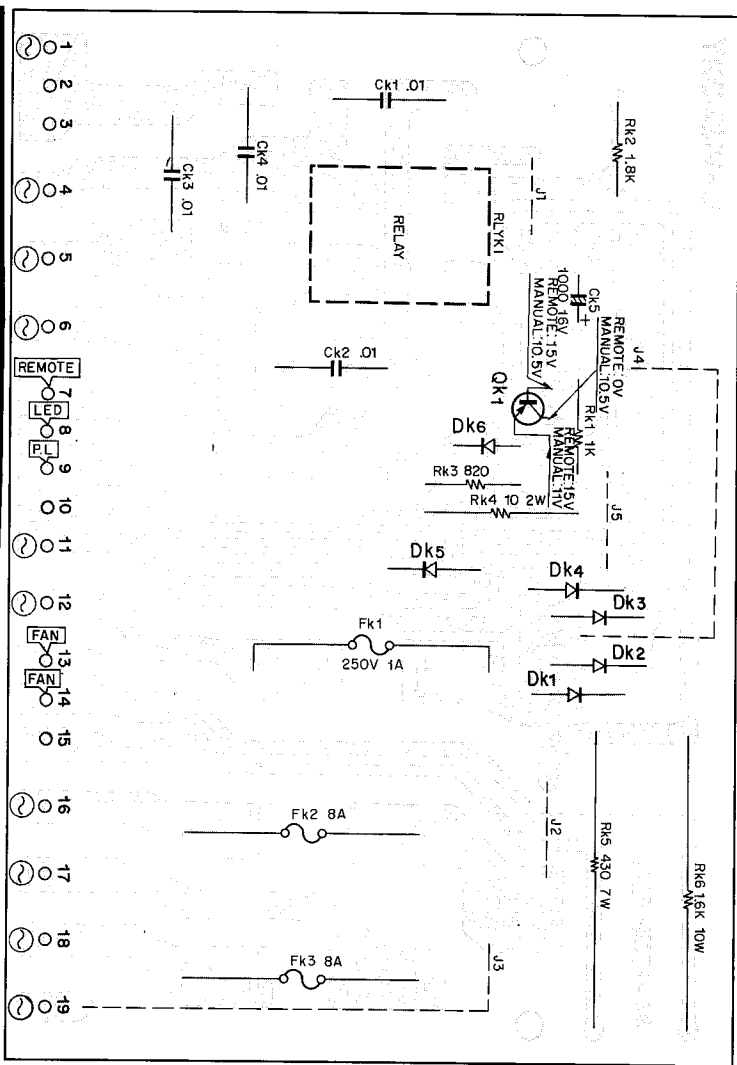
- METER RANGE**
- (1) Connect the AG setting 1 kHz to INPUT jack and 8Ω dummy load to speaker terminal.
 - (2) Connect SSVM across the dummy.
 - (3) Set the meter range of L-09M to "x 0.1".
 - (4) Attenuate the output of AG to 15.5V/8Ω with L-09M and AG of attenuator.
 - (5) Turn the PC trimmer potentiometer VRf1 until the power meter indicates 300W reading.

< REAR VIEW OF X07-1560-10 BOARD >

PC BOARD

▼ POWER SUPPLY (X00-1940-10)

Note: X00-1940-61 for Europe does not have Fk2, 3.
Negative line of remote control circuit (terminal #10) does not connect to the chassis.

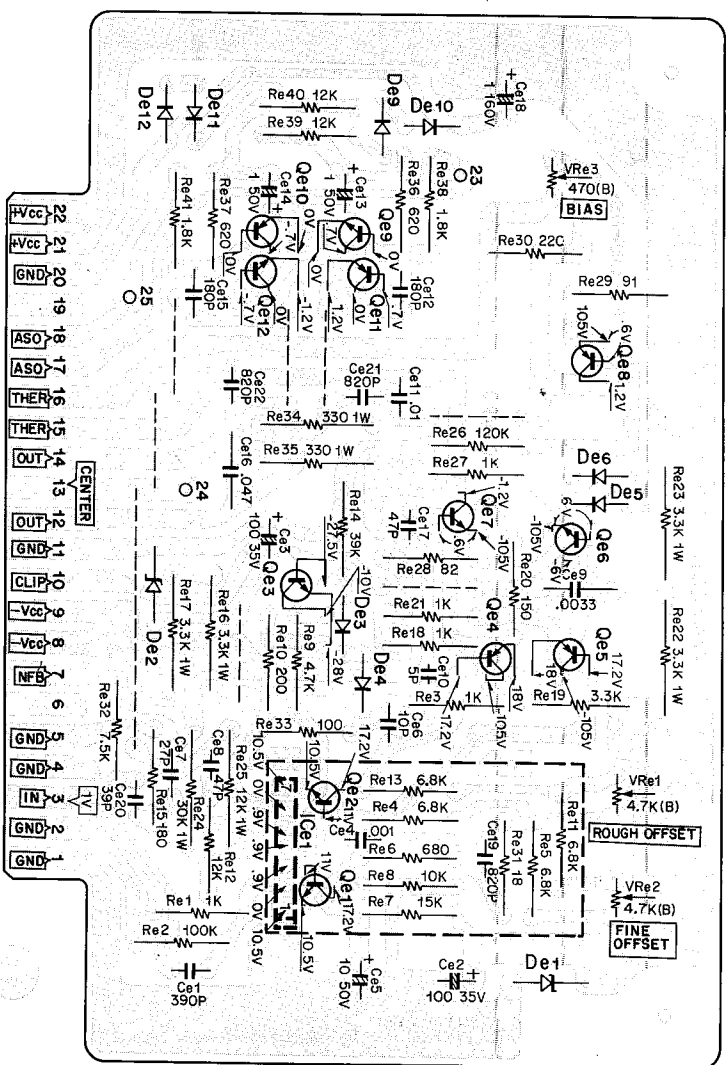


QK1: 2SA743A(B) or (C), DK1~5: W06B, DK6: 1S2076

Caution: On the X00-1940-10, some unit of the first lot has difference between the schematic (right) and PC board (wrong) as following:

▼ POWER AMP (A) (X07-1550-10)

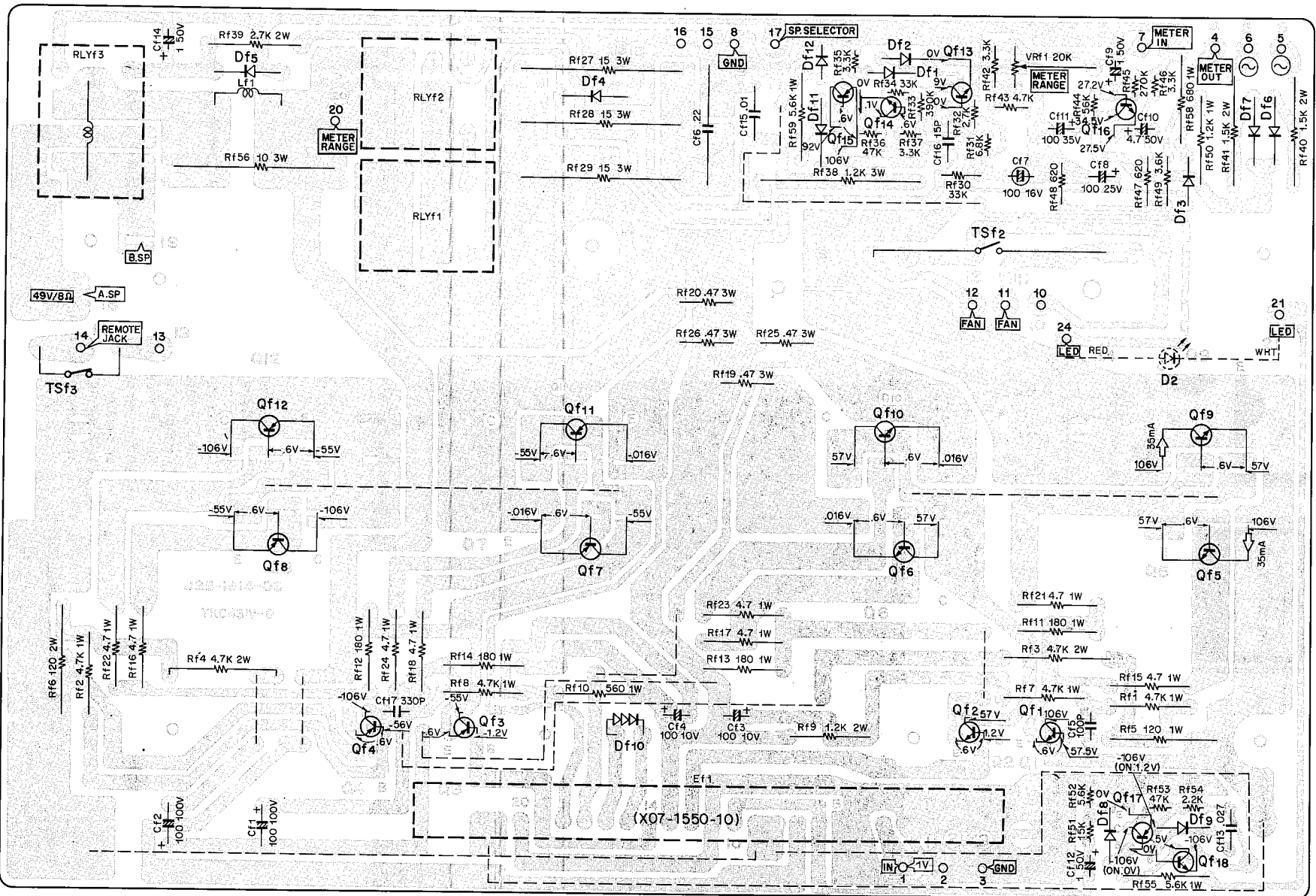
1. Rk3 is installed to R4 position.
2. Rk4 is installed to R3 position.
3. D3 is connected to #9 and #10 terminals.
4. Pilot lamp is connected to #8 and #10 terminals.



Qe1~3: 2SC1775(E) or (F), Qe4,5: 2SA912(S) or (R), Qe6,7: 2SC1507(L),
Qe8: 2SA964A(O) or (R), Qe9,12: 2SC945(O) or (R), Qe10,11: 2SA733(O) or (R),
Ic1: μ PA63H(L) or (M), De1,2: EQA01-28R, De3~6: 1S2076, De9~12: 1S2076A

▼ POWER AMP (B) (X07-1560-10)

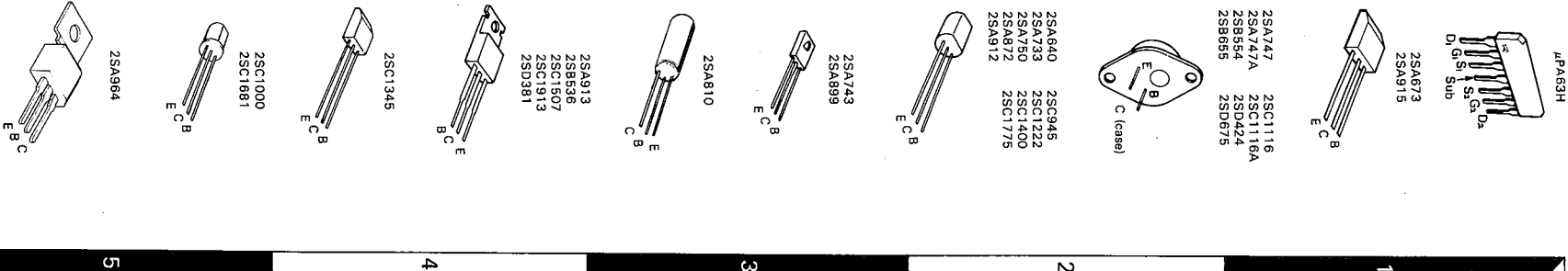
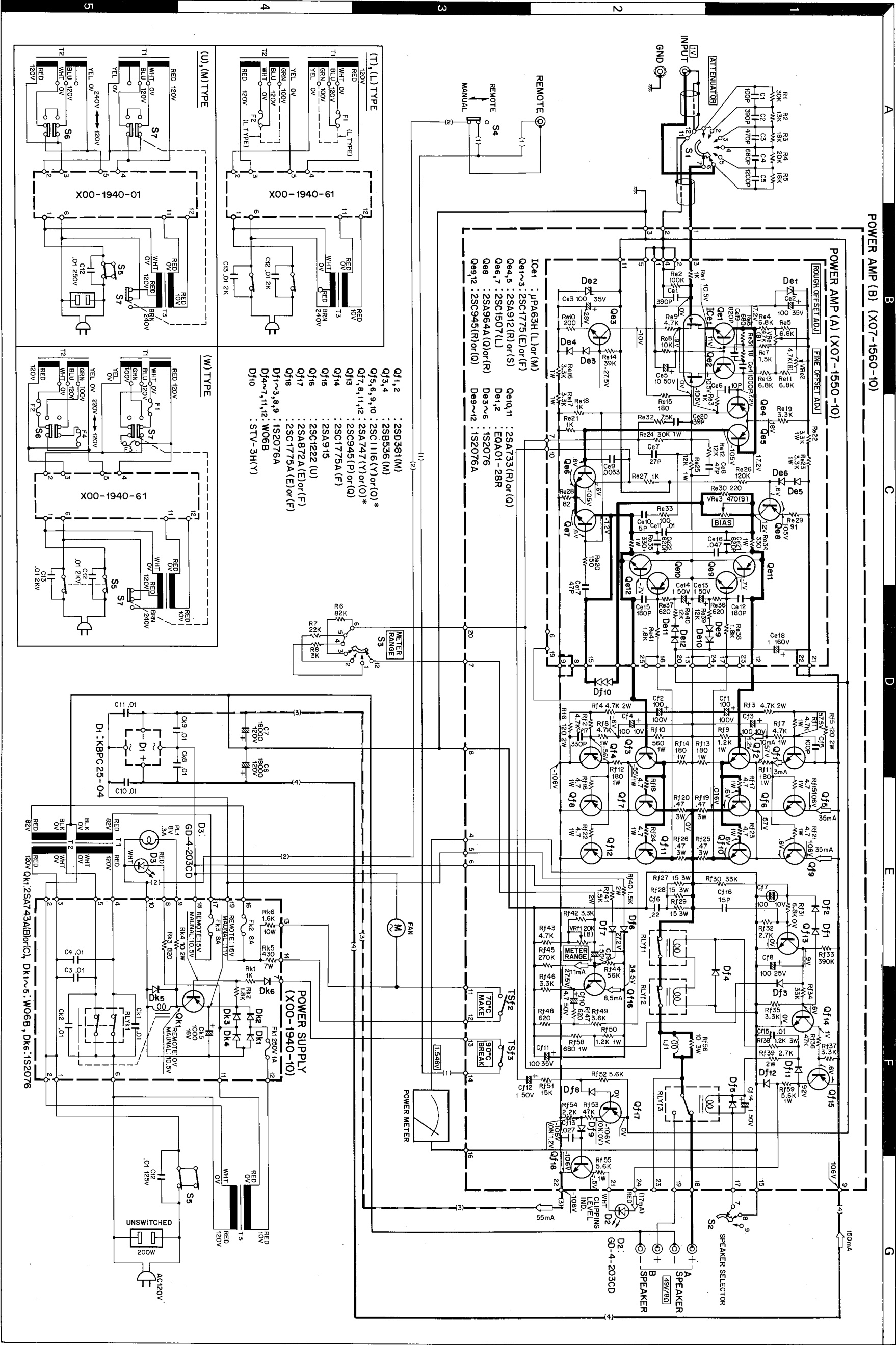
Note: When using 2SC1116(O) as Qf5, 6, 9, 10, 2SA747(O) should be employed as Qf7, 8, 11, 12, also when using 2SC1116(Y) as Qf5, 6, 9, 10, 2SA747(Y) should be done as Qf7, 8, 11, 12.



Qf1,2: 2SD381(M), Qf3,4: 2SB536(M), Qf5,6,9,10: 2SC1116(O) or (Y), Qf7,8,11,12: 2SA747(O) or (Y), Qf13: 2SC945(P) or (Q), Qf14: 2SC1775A(F),
Qf15: 2SA915, Qf16: 2SC1222(U), Qf17: 2SA872A(E) or (F), Qf18: 2SC1775A(E) or (F), Df1~3,8,9: 1S2076A, Df4~7,11,12: W06B, Df10: STV-3H(Y)

Note: When using 2SC1116(O) as Qf5, 6, 9, 10, 2SA747(O) should be employed as Qf7, 8, 11, 12, also when using 2SC1116(Y)as Qf5, 6, 9, 10, 2SA747(Y) should be done as Qf7, 8, 11, 12.

SCHEMATIC DIAGRAM



Semiconductor substitution table is written on page 13.

Note: Negative line of remote control circuit (terminal #10) does not connect to the chassis. Resistor values are in ohms, K = 1000 ohms, M = 1000k ohms. Capacitor values are in μF unless specified, P = pF = $\mu\text{F} \times 10^{-6}$. DC voltage are measured with 20 k Ω /V meter under no signal.

SPECIFICATIONS

Model L-09M (Single Channel Power Amplifier)

Specifications described here are based on the measured values at the tip of the Special Speaker Cable provided, at its connection to Model L-09M.

PERFORMANCE

Power Output

*** 300 watts minimum power, RMS at 8 ohms from 20 Hz to 20,000 Hz with no more than 0.02% total harmonic distortion.**

Continuous Power 300 watts 8 ohms at 1,000 Hz
400 watts 4 ohms at 1,000 Hz
Dynamic Power Output 1,000 watts 4 ohms at 1,000 Hz
Total Harmonic Distortion 0.02% at rated power output into 8 ohms (T.H.D.)
20 Hz ~ 20 kHz
0.01% at 30 watts into 8 ohms 20 Hz ~ 20 kHz

0.003% at rated power into 8 ohms 1 kHz
0.003% at 30 watts into 8 ohms 1 kHz
0.02% at rated power into 4 ohms 1 kHz

Intermodulation Distortion 0.007% at rated power into 8 ohms
(60 Hz : 7 kHz = 4 : 1)
0.003% at 30 watts into 8 ohms

Frequency Response 0.02% at rated power into 4 ohms
DC ~ 50,000 Hz +0, -1.0 dB
DC ~ 100,000 Hz +0, -2.0 dB

Signal to Noise Ratio 120 dB (short-circuited)

(IHF - A Curve)

Residual Noise (IHF - A Curve) 50 μ V

Damping Factor 200 into 8 ohms load
250 into 8 ohms load without Speaker Cable

Input Sensitivity/Impedance 1 V/50 k ohms

Speaker Impedance Accept 4 ohms to 16 ohms

Speaker Cable Loss 0.01 ohms

GENERAL

Power Consumption 1,190 watts at full power
60 watts at non-signal

AC Outlet 1 UNSWITCHED (Maximum 200 watts)

Dimensions W 18-29/32" (480 mm)

H 6-16/32" (154 mm)

D 16-1/8" (409.5 mm)

Weight (Net) 47.2 lbs. (21.4 kg)
(Gross) 49.81 lbs. (22.6 kg)

* Measured pursuant to Federal Trade Commission's Trade Regulation rule in U.S.A. on Power Output Claims for Amplifier.

Note: Kenwood follows a policy of continuous advancements in development. For this reason specifications may be changed without notice.

KENWOOD ELECTRONICS, INC.

- 15777 SOUTH BROADWAY, GARDENA, CALIFORNIA 90248 U.S.A.
- 75 SEAVIEW DRIVE SECAUCUS, NEW JERSEY 07094 U.S.A.

TRIO-KENWOOD ELECTRONICS N.V.

- LEUVENSESTEENWEG 184, B-1930 ZAVENTEM, BELGIUM.

TRIO-KENWOOD ELECTRONICS GmbH.

- 6056 HEUSENSTAMM, RUDOLF-BRAAS-STR. 20, WEST GERMANY.

TRIO-KENWOOD FRANCE S.A.

- 5, BOULEVARD NEY 75018 PARIS, FRANCE.

TRIO-KENWOOD CORPORATION

- 3-6-17 AOBADAI, MEGURO-KU, TOKYO, JAPAN.