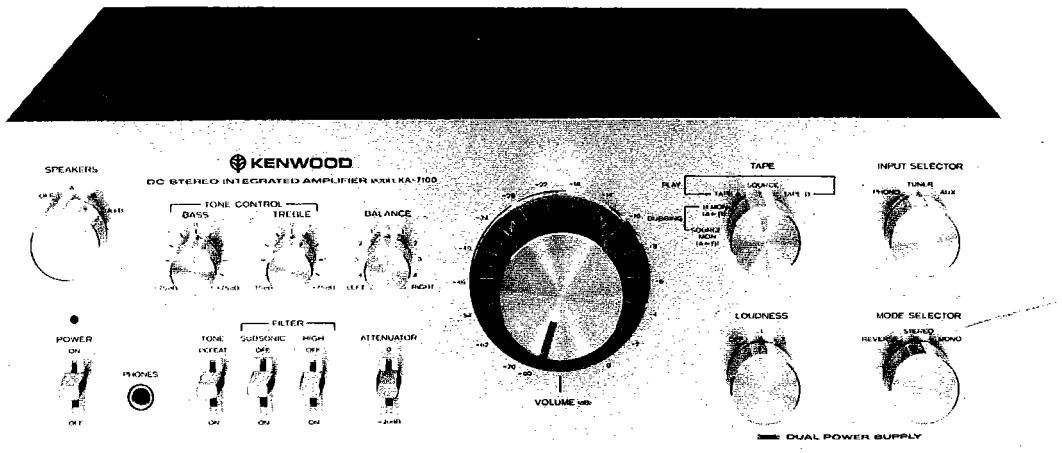
KENWOOD

HI/FI STEREO COMPONENTS

SERVICE MANUAL

KA-7100



DC STEREO INTEGRATED AMPLIFIER

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Note 1:

The products are subject to modification in components and circuits in different countries and regions. This is because each products must be used under the best condition.

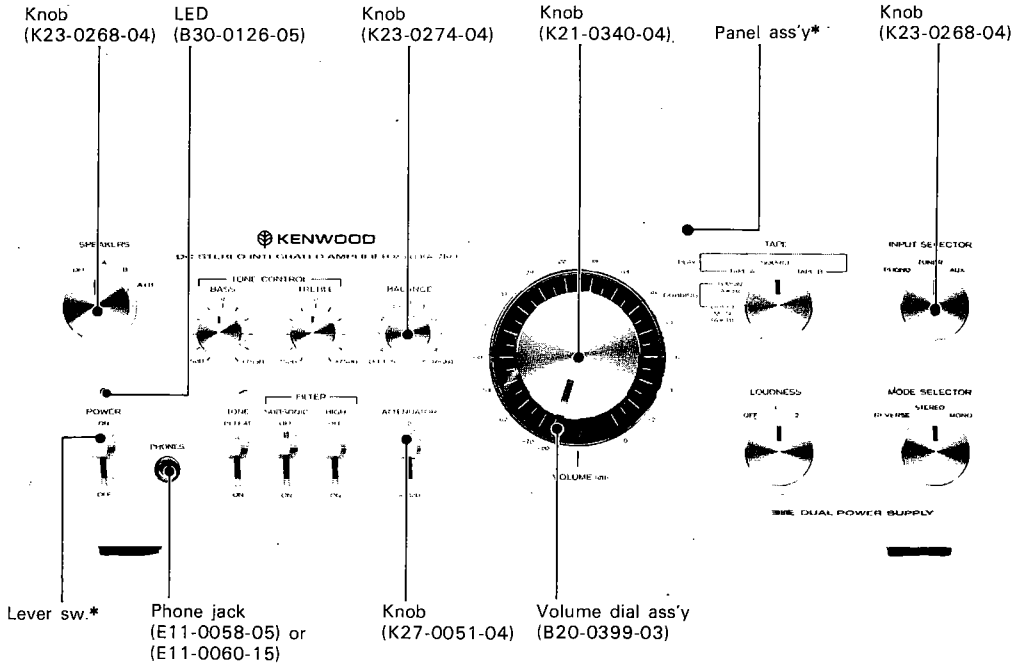
This manual provides information of modification based on the standard in the U.S. for the convenience of ordering associated components and parts.

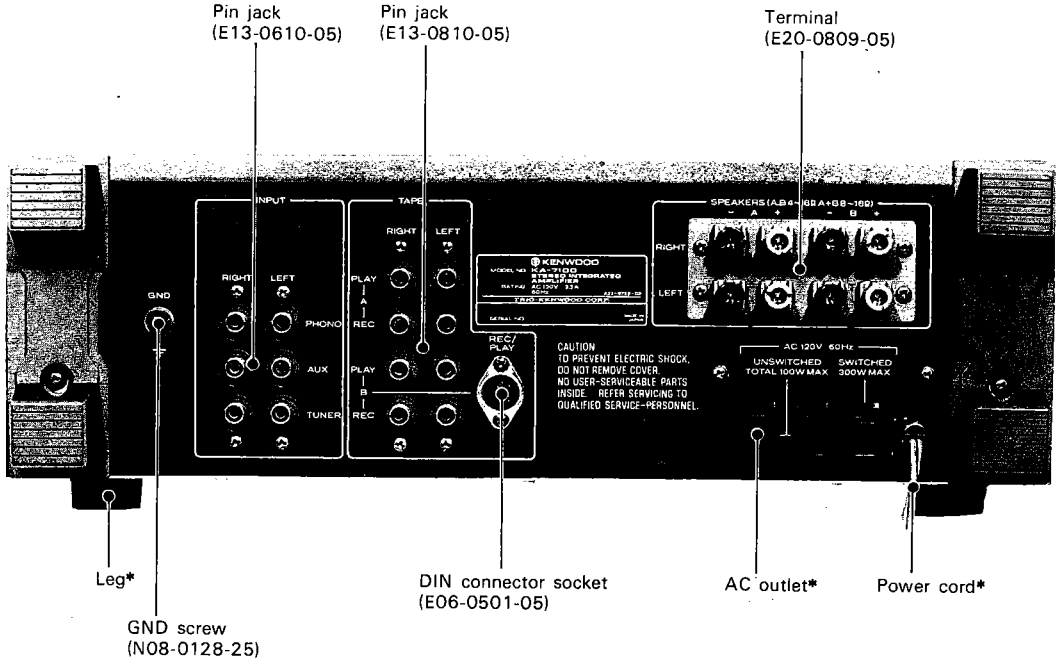
U.S.A.	K
Canada	P
PX	U
Australia	X
Europe	W
England	T
Scandinavia	L
South Africa	S
Other Areas	M

Note 2:

Symbol ☆ in parts list means the new parts.

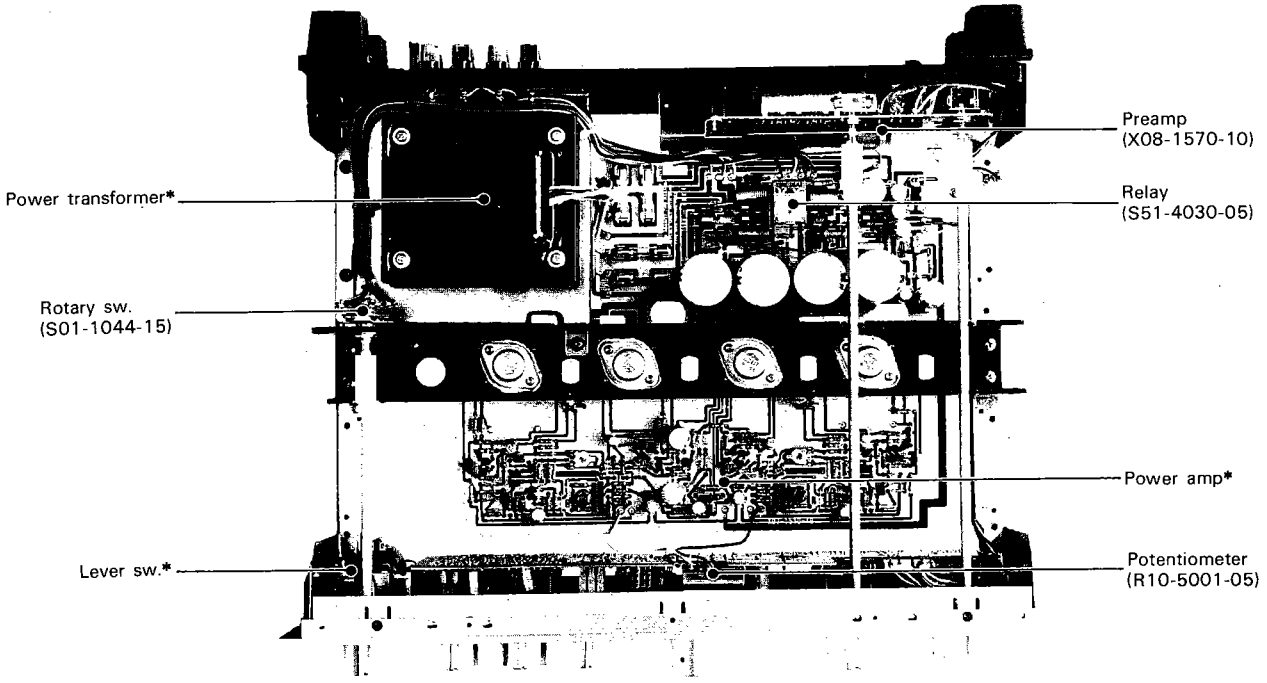
EXTERNAL VIEW

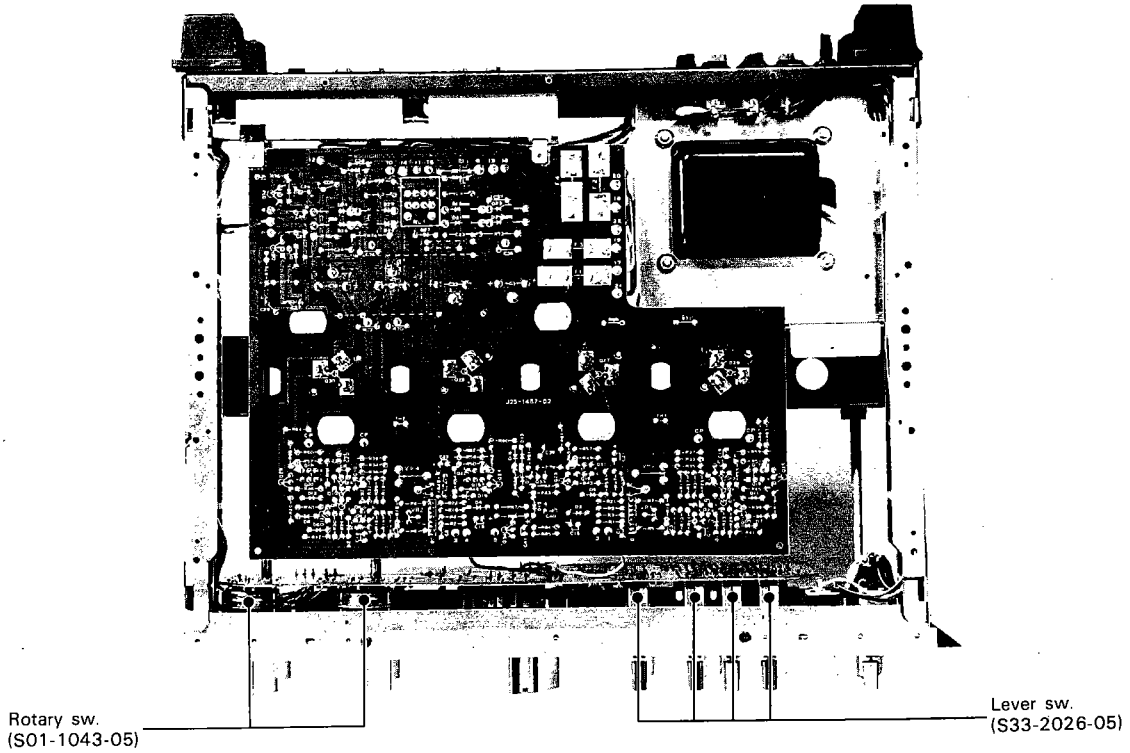




* Refer to Destinations' Parts List.

INTERNAL VIEW





* Refer to Destinations' Parts List.

DISASSEMBLY FOR REPAIR

CONTROL UNIT:

When checking the control unit, perform the following sequences.

① Remove the case.
② Loosen the screws fixing the sub-panel and remove one pair of screws on each side.
③ Remove the shaft-couplers of the selector switch, the tape switch and the speaker switch.
④ Remove 2 screws fixing the panel and the bottom plate. (lower side)
⑤ Incline the panel frontward. When repairing a PC board detached from the body, remove the panel assembly from the sub-panel.
⑥ Pull out the knobs. (For Volume knob, use a hexagon wrench.)
⑦ Remove 5 screws fixing the panel assembly on the subpanel.
⑧ Remove nuts of Volume and switches.
⑨ Remove the screws fixing lever switches.

POWER AMPLIFIER UNIT:

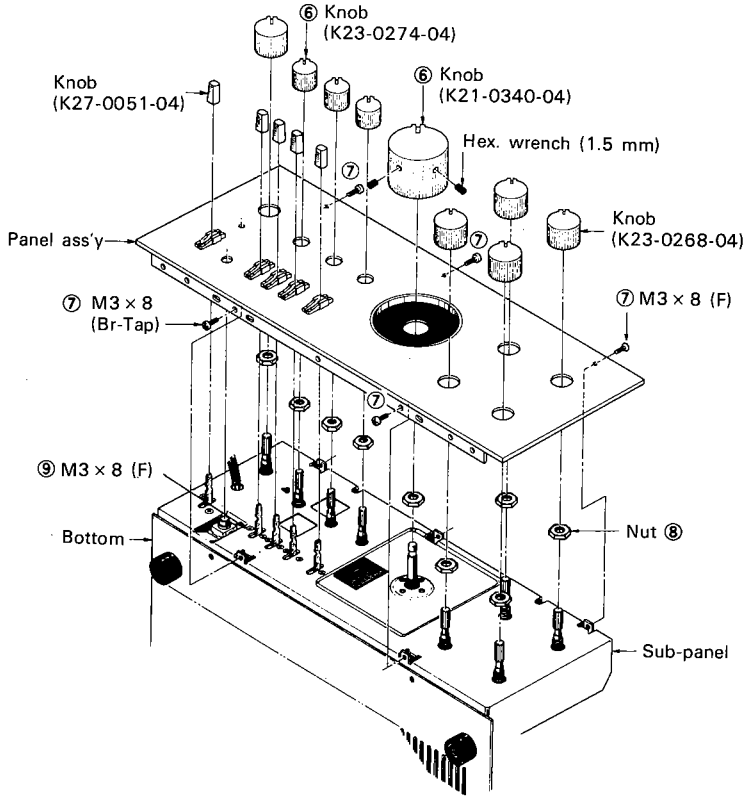
The power amplifier unit includes the power supply and the protection circuit. The power amplifier unit can be checked and repaired with the case and the bottom plate removed. If necessary to take out the unit, remove four screws on the heat sink and two screws fixing the shield plate of the preamplifier unit. At this time, inclining the control unit frontward facilitates the work. (See the foregoing paragraph.)

PREAMP UNIT:

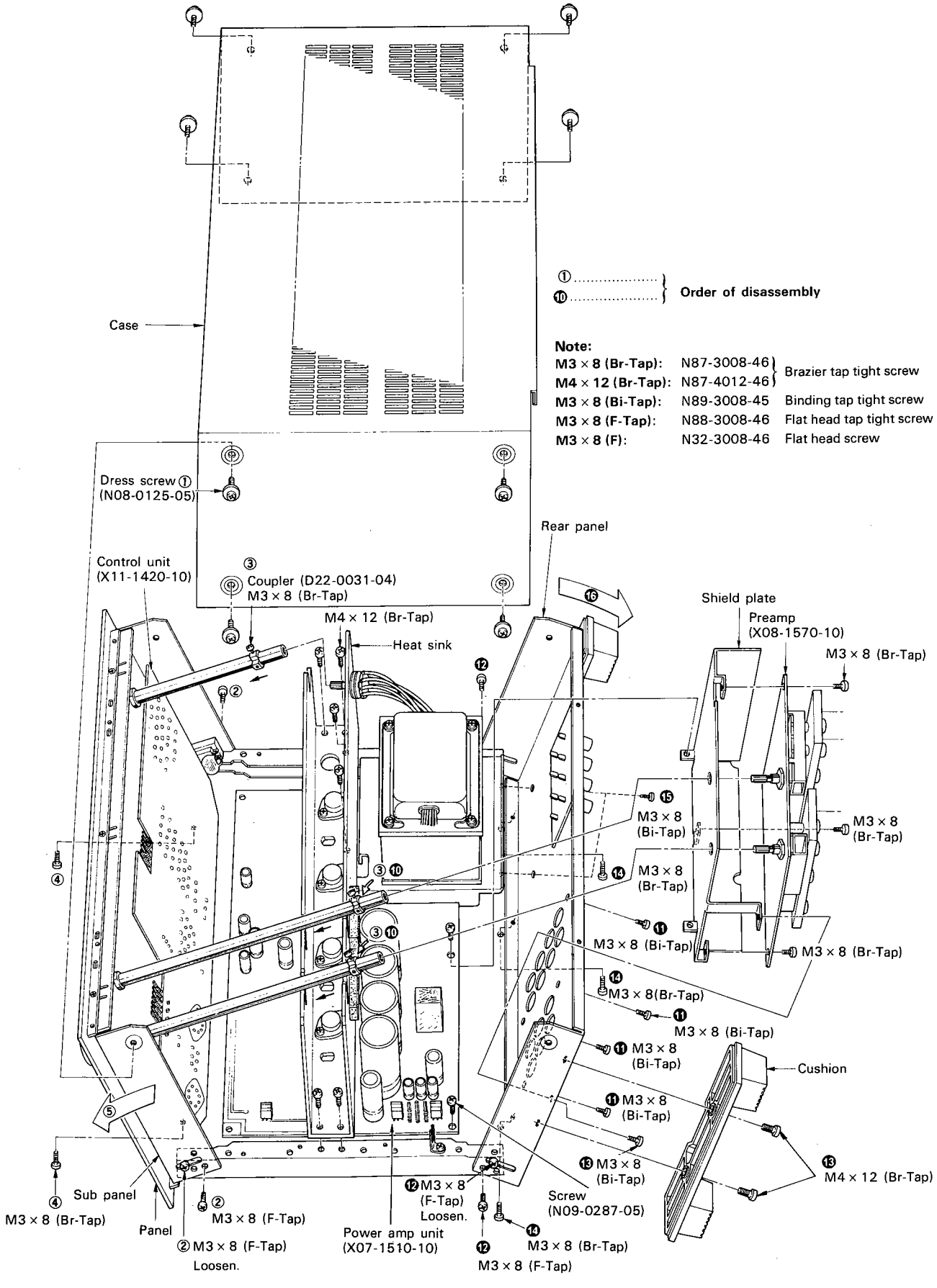
The equalizer unit includes pin jacks. When disassembling it, perform the following sequences.

⑩ Loosen screws of couplers and slide them to the panel side.
⑪ Remove 4 screws fixing the pin jacks.
⑫ Loosen screws fixing the rear panel on the chassis and remove one pair of them on each side.
⑬ Remove the cushion which is on the left side when viewed from the backside. Then, remove screws fixing the shield plate of the preamplifier on the rear panel.
⑭ Remove 3 screws fixing the rear panel on the bottom plate.
⑮ Remove 2 screws fixing the transofrmer mounting hardware on the rearpanel.
⑯ Incline the rear panel backward.
⑰ Take out the preamp unit.

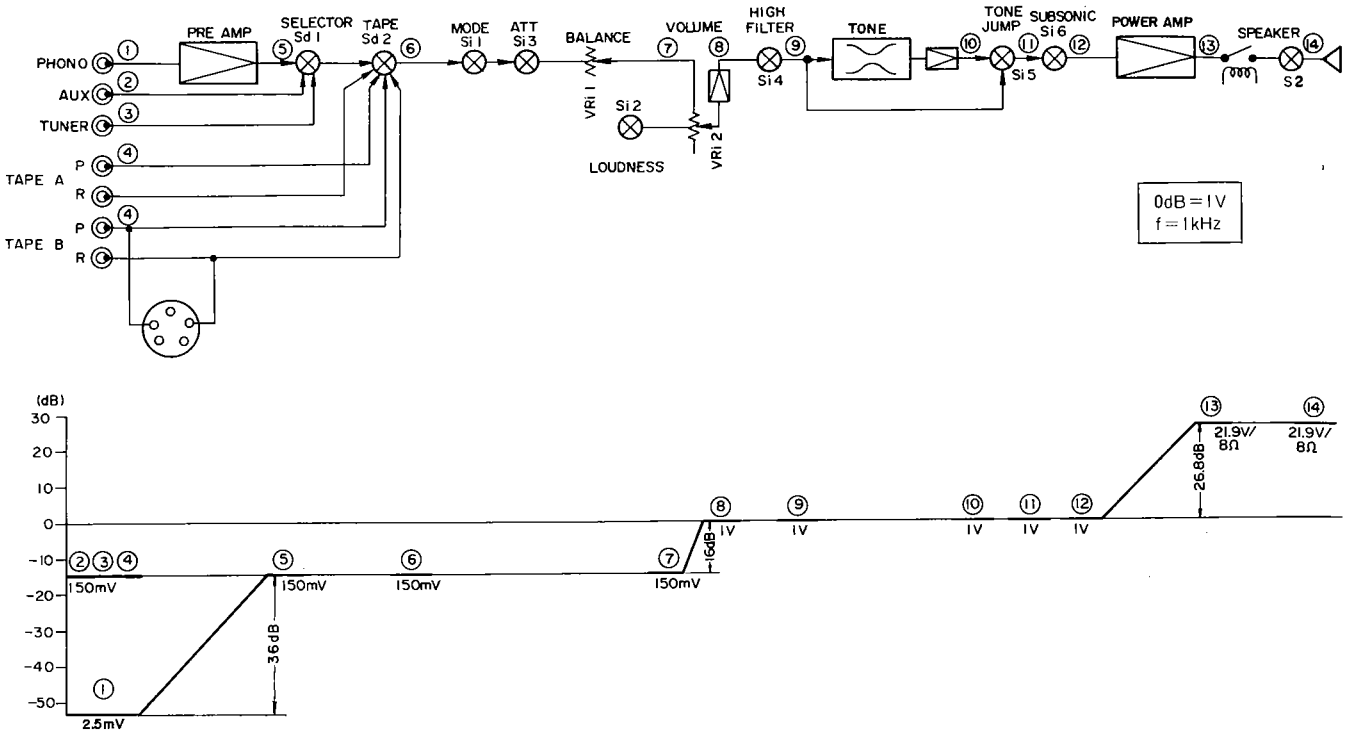
Further, if necessary to take out the PC board from shield plate, remove 3 screws fixing the shield plate.



DISASSEMBLY FOR REPAIR



BLOCK AND LEVEL DIAGRAM/CIRCUIT DESCRIPTION



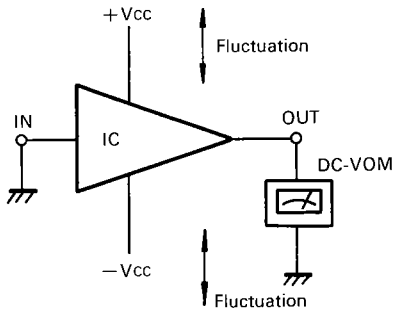
PREAMPLIFIER:

The equalizer consists of a differential amplifier, class A amplifier and a constant current circuit. The ICL circuit using a low-noise FET (refer to KA-9100) is employed in the first stage to improve the phase and transient characteristics. Further, a zener diode is used in the negative voltage supply of the differential amplifier to regulate voltage, so that SVRR is improved.

SVRR (Supply Voltage Rejection Ratio)

SVRR is the ratio of change of output voltage and change of supply voltage when the supply voltage varies. It is generally used to indicate the performance of IC

$$\text{SVRR} = \frac{\text{Change of Output Voltage}}{\text{Change of Supply Voltage}}$$



MEASUREMENT OF SVRR

If the supply voltage of equalizer is affected by the power amplifier, the dynamic crosstalk, S/N and the dynamic range will be changed for the worse. To resolve these problems, the dual power supply is used and SVRR is set to a high value.

FLAT-AMPLIFIER:

The flat-amplifier is a 3-stage direct-coupled amplifier consisting of an FET and a transistor inverted-Darlington circuit. The ICL circuit using a low-noise FET is employed in the first stage to improve the distortion factor and the phase characteristic.

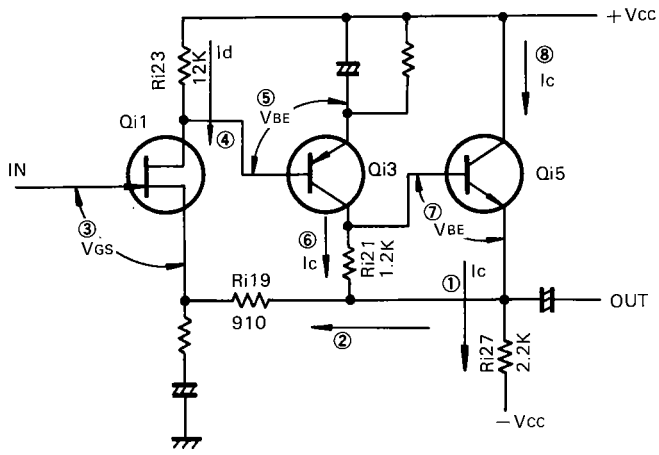
Stabilization of Flat-amplifier

The source of the first stage of flat-amplifier is grounded not through a resistor but through a capacitor and resistor, so that the bias is stabilized.

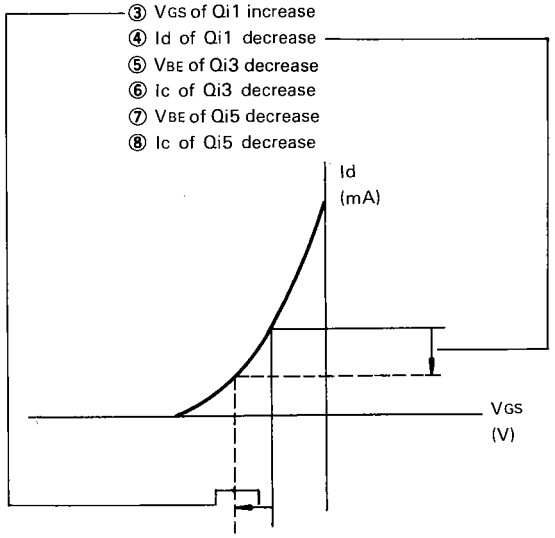
When the collector current of Qi5 is increased by some cause, voltage drop of emitter resistor, Ri27 (2.2K), is increased. This voltage is applied to the source of Qi1 via Ri19 (910). That is to say, 100% of DC is negatively fed back.

When the source voltage of FET is increased, the drain current of Qi1 is decreased since the bias is increased. When the drain current of Qi1 is decreased, voltage drop across Ri23 (12K) is decreased, the base voltage of Qi3 is increased and so the collector current of Qi3 is decreased. Therefore, the collector current of Qi5 is decreased, so that the circuit is stabilized. The gain of circuit is about 16 dB.

CIRCUIT DESCRIPTION



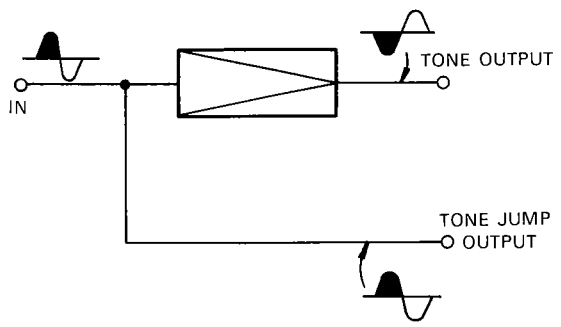
In the case of increasing Ic of Qi5.
① Ic of Qi5 increase
② Voltage drop across Ri27 increase
③ VGS of Qi1 increase
④ Id of Qi1 decrease
⑤ VBE of Qi3 decrease
⑥ Ic of Qi3 decrease
⑦ VBE of Qi5 decrease
⑧ Ic of Qi5 decrease



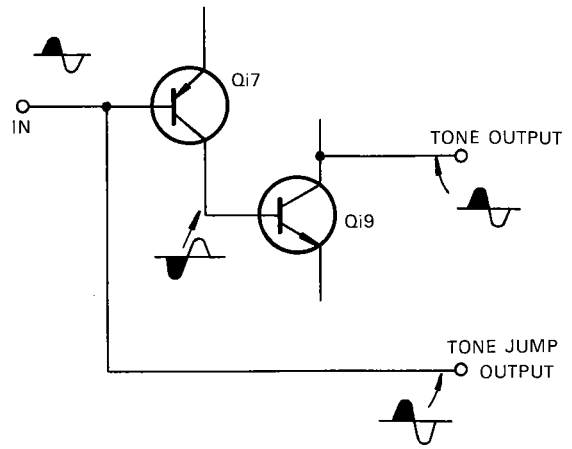
BIAS STABILITY OF FALT AMP

TONE CONTROL:

When an NF type tone control circuit is used, the output may be out of phase with the input. KA-7100 is designed so that phase change does not occur even if the TONE JUMP is used.



UNCONSIDERATED CIRCUIT FOR PHASE CHARACTERISTIC



KA-7100

POWER AMPLIFIER:

The power amplifier is a DC power amplifier consisting of three differential amplifiers including a dual FET input, a complementary circuit and a final stage. Further this unit includes ASO and constant-current circuits. A one-chip dual FET μPA63H is used in the first stage to decrease DC leakage current caused by temperature drift to a very small extent. Furthermore, to improve SVRR, a Zener diode is used. For the differential amplifier, the protection and ICL circuitry, refer to KA-9100 Service Manual.

POWER SUPPLY:

The dual power supply circuit with one transformer is used. Two independent power supply based on the dynamic crosstalk theory are used for both right and left channels of power amplifier. A constant-voltage power supply consisting of a transistor and a Zener diode is used for each channel of preamplifiers to reduce effect of power amplifier.

☆: 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)	Description
—	A20-1143-02	A20-1143-02	—	A20-1143-02	A20-1143-02	A20-1143-02	A20-1144-02	A20-1143-02	A20-1143-02	Panel ass'y ☆
—	B46-0061-00	B46-0055-10	—	—	—	—	B46-0060-00	—	—	Warranty card
—	B50-1620-00	B50-1621-00	—	B50-1620-00	B50-1620-00	B50-1620-00	B50-1622-00	B50-1620-00	B50-1620-00	Instruction manual ☆
C1, 2	C91-0001-05	C91-0025-05	—	C91-0023-05	CK45E3D103 PMU	CK45E3D103 PMU	CK45E3D103 PMU	C91-0023-05	C91-0023-05	Capacitor 0.01μF
C3	—	—	—	—	CK45E3D103 PMU	CK45E3D103 PMU	CK45E3D103 PMU	—	—	Capacitor 0.01μF
—	—	—	—	D32-0075-04	D32-0075-04	—	—	D32-0075-04	D32-0075-04	Switch stopper
—	E08-0225-05	E08-0225-05	—	E08-0225-05	—	—	—	E08-0225-05	E08-0225-05	AC outlet × 3
—	—	—	—	E22-0421-05	E22-0421-05	—	—	E22-0421-05	E22-0421-05	Lug
—	—	—	—	E22-6424-05	—	E22-0424-05	E22-0424-05	—	—	Lug
—	E30-0181-05	E30-0181-05	—	E30-0185-05	E30-0580-05	E30-0292-05	040-0306-05	040-0306-05	E30-0515-05	Power cord
—	H01-1682-04	H01-1683-04	—	H01-1682-04	H01-1682-04	H01-1682-04	H01-1684-04	H01-1682-04	H01-1682-04	Carton case ☆
—	H20-0444-04	H20-0444-04	—	H20-0444-04	H20-0444-04	H20-0444-04	H20-0444-04	H20-0444-04	H20-0416-04	Polyethylene cover
—	J02-0088-05	J02-0089-05	—	J02-0089-05	J02-0089-05	J02-0089-05	J02-0089-05	J02-0089-05	J02-0089-05	Leg × 4
—	J41-0034-05	J41-0034-05	—	J41-0024-15	J41-0033-05	J41-0033-05	J41-0024-15	J41-0024-15	J41-0033-05	Power cord bushing
—	L01-1331-05	L01-1331-05	—	L01-1335-05	L01-1336-05	L01-1332-05	L01-1337-05	L01-1335-05	L01-1335-05	Power transformer ☆
S1	S33-2022-05	S33-2022-05	—	S33-2021-05	S33-2023-05	S33-2023-05	S33-2023-05	S33-2021-05	S33-2021-05	Lever switch (POWER)
S3	—	—	—	S31-2001-05	S31-2001-05	—	—	S31-2001-05	S31-2001-05	Slide switch (power voltage selector)
—	X07-1510-10	X07-1510-10	—	X07-1510-21	X07-1510-61	X07-1510-61	X07-1510-61	X07-1510-21	X07-1510-21	Power amp unit ☆

PARTS LIST

☆: new parts

Ref. No.	Parts No.	Description	Re-marks
		SWITCH	
S2	S01-1044-15	Rotary (SPEAKERS)	☆
		MISCELLANEOUS	
—	A01-0318-03	Case	☆
—	B07-0205-04	Escutcheon (lever sw) × 5	
—	B20-0399-03	Volume dial ass'y	☆
—	B30-0126-05	LED ass'y (GD-4-207RD)	☆
—	B42-0009-04	Passed sticker	
—	D21-0441-04	Shaft (l: 271 mm) × 2	☆
—	D21-0442-04	Shaft (l: 152 mm)	☆
—	D22-0031-04	Coupler × 3	
—	E06-0501-05	DIN connector socket	
—	E20-0809-05	Terminal (8P) SPEAKER	
—	E31-0089-05	7 parallel cord	☆
—	H10-1484-02	Polyethylene foamed fixture (L)	☆
—	H10-1485-02	Polyethylene foamed fixture (R)	☆
—	H25-0078-00	Instruction bag	
—	J19-0509-04	LED holder	
—	K21-0340-04	Knob (VOLUME)	☆
—	K23-0268-04	Knob (MODE, LOUDNESS, MONITOR, SELECTOR) × 5	
—	K23-0274-04	Knob (TONE × 2, BALANCE)	☆
—	K27-0051-04	Knob (lever) × 5	
—	N08-0125-05	Dress screw × 8	
—	N08-0128-25	GND screw	
—	X08-1570-10	Preamp unit	☆
—	X11-1420-10	Control unit	☆

POWER AMP (X07-1510-10)

Ref. No.	Parts No.	Description	Re-marks
		CAPACITOR	
Ce1,2	CK45B1H471K	Ceramic 470pF ±10%	
Ce3,4	CC45SL1H101K	Ceramic 100pF ±10%	
Ce5,6	CC45SL1H050D	Ceramic 5pF ±0.5pF	
Ce7,8	CC45SL1H101K	Ceramic 100pF ±10%	
Ce9,10	CC45SL1H150K	Ceramic 15pF ±10%	
Ce11,12	CC45SL1H050D	Ceramic 5pF ±0.5pF	
Ce13,14	CC45SL1H100D	Ceramic 10pF ±0.5pF	
Ce15～18	CE04W1H100EL	Electrolytic 10μF 50WV	
Ce19～22	CE04W1E100EL	Electrolytic 10μF 25WV	
Ce23,24	CQ93M1H224M	Mylar 0.22μF ±20%	
Ce25～28	CE04W1V101EL	Electrolytic 100μF 35WV	
Ce29,30	CE04W1H471EL	Electrolytic 470μF 50WV	
Ce31～34	C90-0354-05	Electrolytic 6800μF 50WV	☆
Ce35～38	CK45E2H103P	Ceramic 0.01μF +100%−0%	
Ce39	CE04BW1C101MEL	Non-pole electrolytic 100μF 16WV	
Ce40	C90-0349-05	Electrolytic 100μF 25WV	
Ce41	C90-0344-05	Electrolytic 10μF 50WV	

Ref. No.	Parts No.	Description	Re-marks
		RESISTOR	
Re17,18	RD14GY2E182JMA	Carbon 1.8kΩ ±5% 1/4W	
Re19,20	RD14GY2E152JMA	Carbon 1.5kΩ ±5% 1/4W	
Re29,30	RD14GY2E102JMA	Carbon 1kΩ ±5% 1/4W	
Re31,32	RD14GY2E121JMA	Carbon 120Ω ±5% 1/4W	
Re39,40	RD14GY2E121JMA	Carbon 120Ω ±5% 1/4W	
Re43～46	RD14GY2E271JMA	Carbon 270Ω ±5% 1/4W	
Re57～60	RD14GY2E331JMA	Carbon 330Ω ±5% 1/4W	
Re61～64	RD14GY2E4R7JMA	Carbon 4.7Ω ±5% 1/4W	
Re69～72	R92-0111-05	Cement 0.47Ω ±5% 3W	
Re73,74	RS14GB3D4R7JMA	Metal film 4.7Ω ±5% 2W	
Re75,76	RD14GY2E102JMA	Carbon 1kΩ ±5% 1/4W	
Re77,78	RD14GY2E101JMA	Carbon 100Ω ±5% 1/4W	
Re86	RS14GB3A561JMA	Metal film 560Ω ±5% 1W	
Re87	RS14GB3A182JMA	Metal film 1.8kΩ ±5% 1W	
Re88	RD14GY2E681JMA	Carbon 680Ω ±5% 1/4W	
Re89,90	RC05GF2H221K	Carbon 220Ω ±10% 1/2W	
Re91,92	RS14GB3A100JMA	Metal film 10Ω ±5% 1W	
		SEMICONDUCTOR	
Qe1,2	V30-0232-05	Dual FET μPA 63H (L) or (M)	
Qe3～6	V03-0500-05	Transistor 2SC1775 (E) or (F)	
Qe7～10	V01-0218-05	Transistor 2SA915 (L) or (K) or	☆
	V01-0188-05	Transistor 2SA912 (R) or (S)	
Qe11,12	V03-0506-05	Transistor 2SC1940 (L) or (K) or	☆
	V03-0439-05	Transistor 2SC1885 (R) or (S)	
Qe13,14	V01-0219-05	Transistor 2SA842 or	
	V01-0220-05	Transistor 2SA721	
Qe15～18	V01-0084-05	Transistor 2SA733	
Qe19～22	V03-0270-05	Transistor 2SC945	
Qe23,24	V03-0467-05	Transistor 2SC1567 (Q) or (R) or (S)	
Qe25,26	V01-0187-05	Transistor 2SA794 (Q) or (R) or (S)	
Qe27,28	V04-0086-05	Transistor 2SD427	
Qe29,30	V02-0064-05	Transistor 2SB557	
Qe31	V03-0344-05	Transistor 2SC1419 (B) or (C) or	
	V04-0042-05	Transistor 2SD234 (O) or (Y)	
Qe32	V01-0116-05	Transistor 2SA755 (B) or (C)	
Qe33	V03-0447-05	Transistor 2SC1681 or	
	V03-0456-05	Transistor 2SC1222	
Qe34	V03-0215-05	Transistor 2SC1213A (C)	
De1,2	D11-0435-05	Zener diode EQA01-24R	
De3,4	V11-0467-05	Zener diode EQA01-28R	
De5～8	V11-0271-05	Diode 1S2076	
De9～12	V11-0273-05	Diode 1S2076A	
De13～15	V11-0271-05	Diode 1S2076	
De16	V11-0273-05	Diode 1S2076A	
De17,18	V11-0467-05	Zener diode EQA01-28R	
De19～26	V11-0465-05 or	Diode GP25D or	☆
	V11-0466-05 or	Diode S3V10 or	☆
	V11-2100-10	Diode U05C (S)	
De27	V11-0295-05	Diode V06B	
THe1,2	V22-0016-05	Thermistor 5TP-41L	
		POTENTIOMETER	
VRe1,2	R12-0058-05	PC trimmer 470Ω (Center voltage)	
VRe3,4	R12-0047-05	PC trimmer 500Ω (Bias)	
		MISCELLANEOUS	
—	E02-0209-05	Transistor socket (To-3) × 4	
Fe1～4	F05-4021-05	Fuse (4A) (X07-1510-10)	
	F05-4022-05	Fuse (4A) (X07-1510-21)	
	F05-4024-05	Fuse (4A) (X07-1510-61)	

PARTS LIST

☆: new parts

Ref. No.	Parts No.	Description	Remarks
—	F20-0066-05	Mica plate (To-3) × 4	
—	J13-0052-05	Fuse clip × 8	
Le1,2	L39-0080-05	Coil	
RLe1	S51-4030-05	Relay	

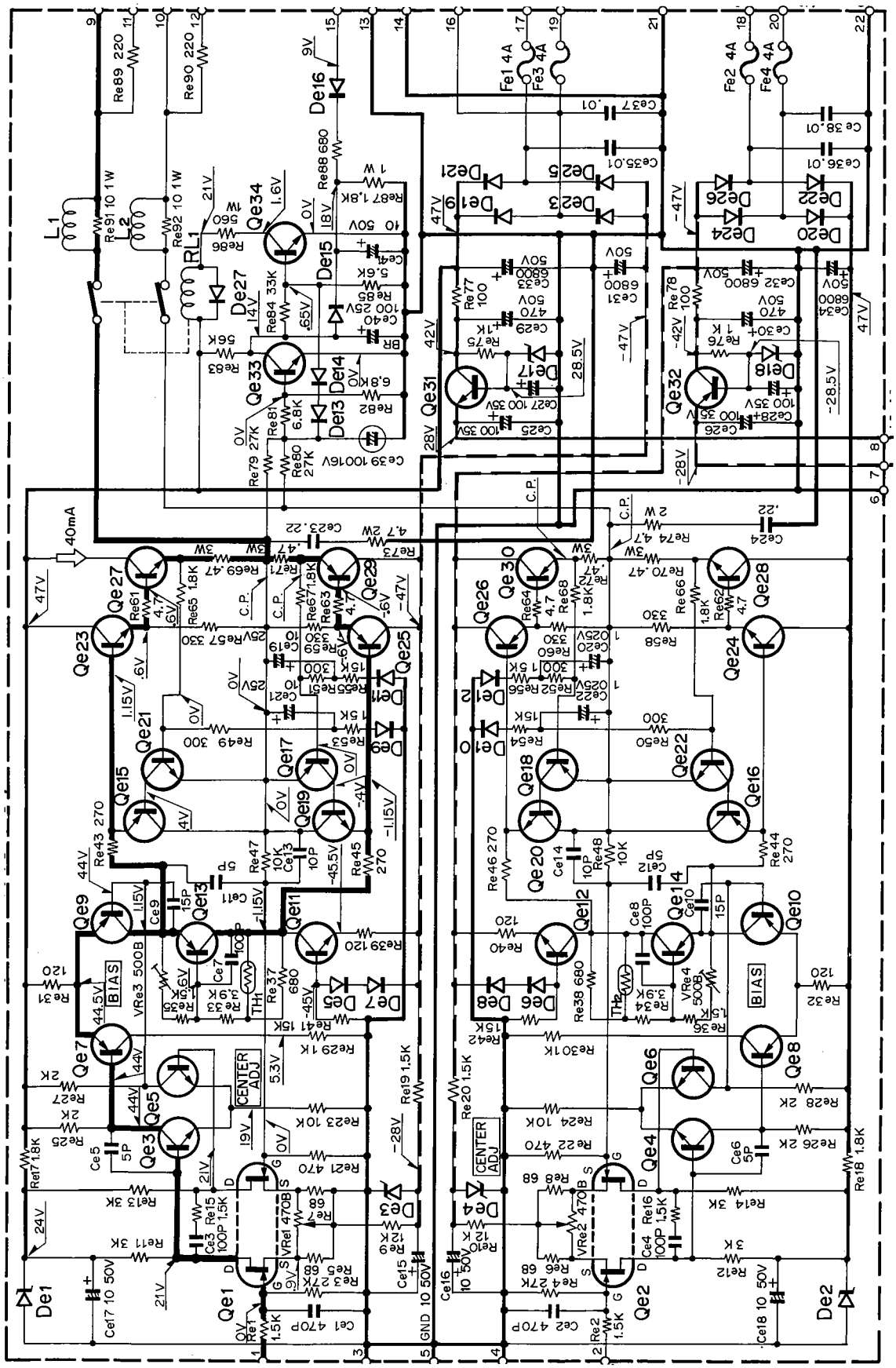
PRE AMP (X08-1570-10)

Ref. No.	Parts No.	Description	Remarks
		CAPACITOR	
Cd1,2	CC45SL1H101K	Ceramic 100pF ±10%	
Cd3	CE04W1C101EL	Electrolytic 100μF 16WV	
Cd5,6	CE04W1A470EL	Electrolytic 47μF 10WV	
Cd7,8	CQ09FS1H822G	Polystyrene 8200pF ±2%	
Cd9,10	CQ09FS1H222G	Polystyrene 2200pF ±2%	
Cd11,12	CC45SL1H101J	Ceramic 100pF ±5%	
Cd13,14	CC45SL1H050D	Ceramic 5pF ±0.5pF	
Cd15,16	CE04W0J221EL	Electrolytic 220μF 6.3WV	
Cd17,18	CE04AW1E3R3MEL	Electrolytic 3.3μF 25WV	
Cd19,20	CE04W1E221EL	Electrolytic 220μF 25WV	
Cd21～23	CK45F1H403Z	Ceramic 0.04μF +80%−20%	
Cd24	CK45D1H561M	Ceramic 560pF ±20%	
		RESISTOR	
Rd15,16	RN14BK2H4303F	Metal film 430kΩ ±1% 1/2W	
Rd17,18	RN92BC2E333F	Metal film 33kΩ ±1% 1/4W	
Rd31	RD14GY2E391JMA	Carbon 390Ω ±5% 1/4W	
Rd32	RD14GY2E331JMA	Carbon 330Ω ±5% 1/4W	
		SEMICONDUCTOR	
Qd1,2	V09-0098-05	FET 2SK68A (L) or (K)	
Qd3,4	V09-0094-05	FET 2SK68A (N) or (M)	
Qd5,6	V01-0191-05	Transistor 2SA872	
Qd7,8	V03-0456-05	Transistor 2SC1222	
Dd1～4	V11-0271-05	Diode 1S2076	
Dd5	V11-0349-05	Zener diode EQA01-10	
		SWITCH	
Sd1	S29-1097-05	Slide-rotary (SELECTOR)	☆
Sd2	S29-1098-05	Slide-rotary (TAPE)	☆
		MISCELLANEOUS	
—	E13-0610-05	Pin jack (6P)	☆
—	E13-0810-05	Pin jack (8P)	☆

CONTROL (X11-1420-10)

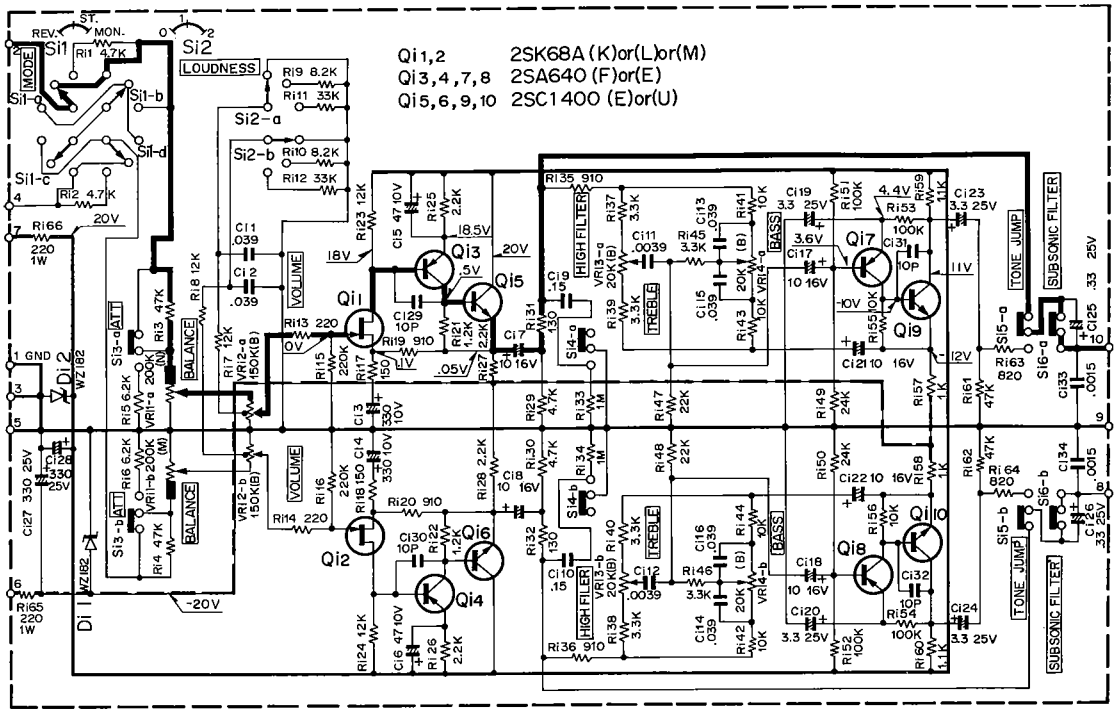
Ref. No.	Parts No.	Description	Remarks
		CAPACITOR	
Ci1,2	CQ93M1H393M	Mylar 0.039μF ±20%	
Ci3,4	CE04W1A331EL	Electrolytic 330μF 10WV	
Ci5,6	CE04W1A470EL	Electrolytic 47μF 10WV	
Ci7,8	CE04AW1C100MEL	Electrolytic 10μF 16WV	
Ci9,10	CQ93M1H154M	Mylar 0.15μF ±20%	
Ci11,12	CQ93M1H392M	Mylar 0.0039μF ±20%	
Ci13～16	CQ93M1H393M	Mylar 0.039μF ±20%	
Ci17,18	CE04AW1C100MEL	Electrolytic 10μF 16WV	
Ci19,20	CE04AW1E3R3MEL	Electrolytic 3.3μF 25WV	
Ci21,22	CE04AW1C100MEL	Electrolytic 10μF 16WV	
Ci23,24	CE04AW1E3R3MCC	Electrolytic 3.3μF 25WV	
Ci25,26	CS15E1ER33M	Tantalum 0.33μF 25WV	
Ci27,28	CE04W1E331EL	Electrolytic 330μF 25WV	
Ci29～32	CC45SL1H100D	Ceramic 10pF ±0.5pF	
Ci33,34	CQ93M1H152M	Mylar 0.0015μF ±20%	
		RESISTOR	
Ri65,66	RS14GB3A221J	Metal film 220Ω ±5% 1W	
		SEMICONDUCTOR	
Qi1,2	V09-0092-05	FET 2SK68A (K) or (L) or (M)	
Qi3,4	V01-0146-05	Transistor 2SA640 (E) or (F)	
Qi5,6	V03-0424-05	Transistor 2SC1400 (E) or (U)	
Qi7,8	V01-0146-05	Transistor 2SA640 (E) or (F)	
Qi9,10	V03-0424-05	Transistor 2SC1400 (E) or (F)	
Di1,2	V11-4100-10	Zener diode WZ-182	
		POTENTIOMETER	
VRi1	R06-5025-05	Potentiometer 200kΩ (MN) BALANCE	☆
VRi2	R10-5001-05	Potentiometer 150kΩ (B) VOLUME	☆
VRi3,4	R06-3013-05	Potentiometer 20kΩ (B) × 2 TONE	☆
		SWITCH	
Si1,2	S01-1043-05	Rotary × 2 (MODE, LOUDNESS	☆
Si3～6	S33-2026-05	Lever × 4 (ATT, HIGH FILTER, TONE JUMP, SUBSONIC FILTER)	

POWER AMP (X07-1510-10)



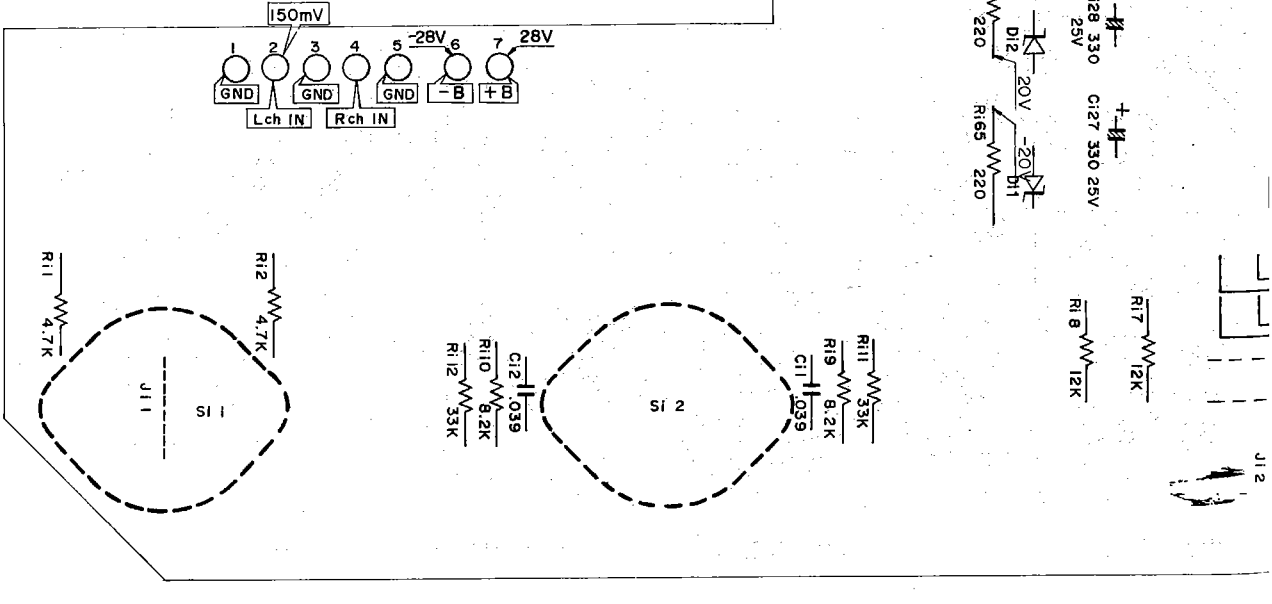
KA-7100

CONTROL (X



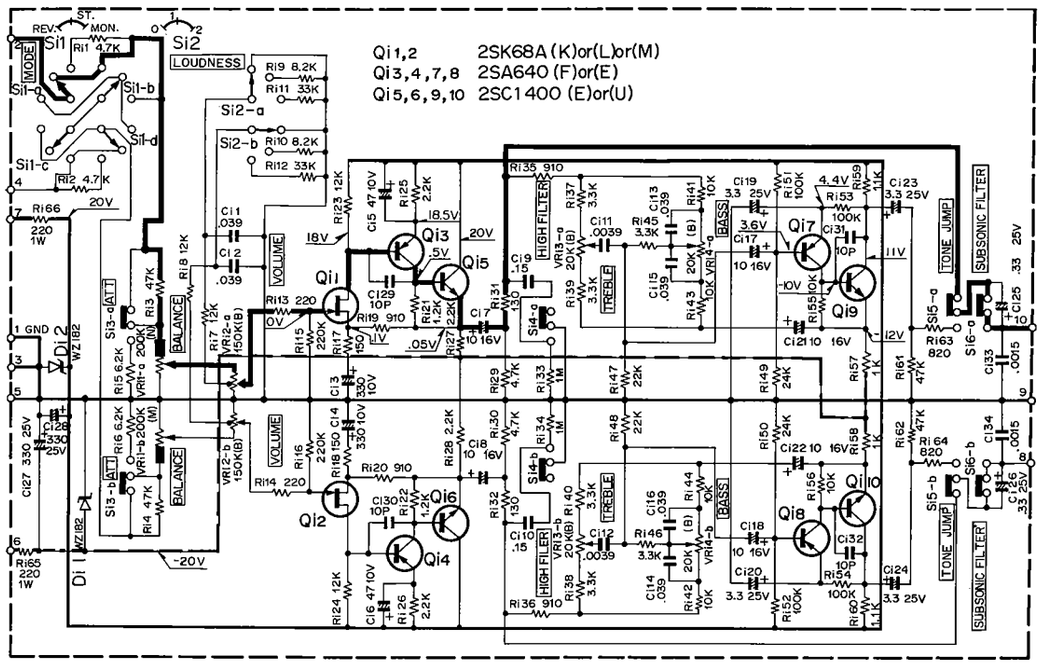
Audio Signal (Reference value).

DC voltages indicated here are measured with 20 kΩ/V meter.

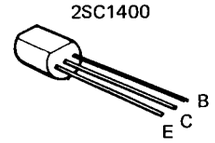


Qi1,2: 2SK68(K) or (L) or (M), Qi3,4,7,8: 2SA640(E) or (F), Qi5,6,9,10: 2SC1400(E) or (U), Di1,2: WZ-182

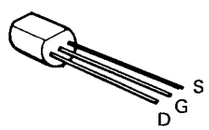
CONTROL (X11-1420-10)

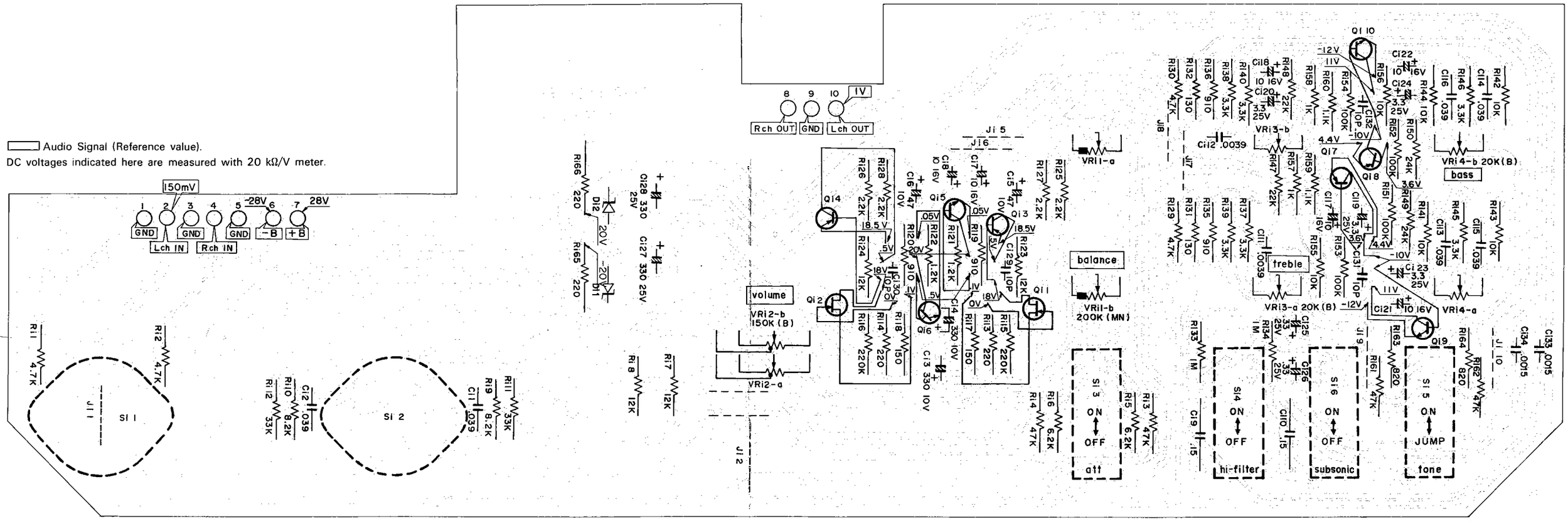


2SA640
2SA872
2SC1222
2SC1400



2SK68

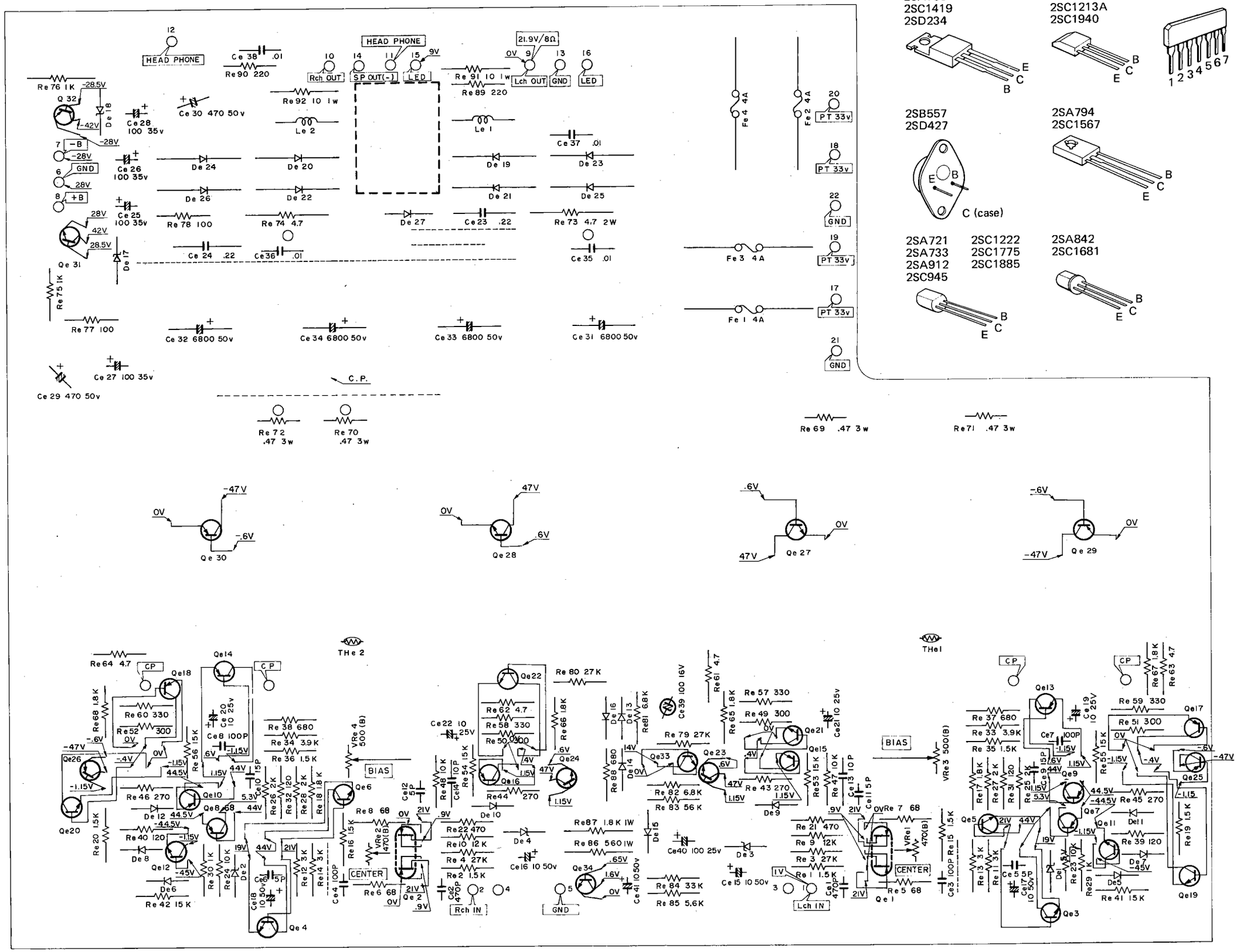




Qi1,2: 2SK68(K) or (L) or (M), Qi3,4,7,8: 2SA640(E) or (F), Qi5,6,9,10: 2SC1400(E) or (U), Di1,2: WZ-182

POWER AMP (X07-1510-10)

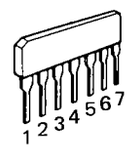
Audio Signal (Reference value).
DC voltages indicated here are measured with 20kΩ/V meter.



2SA755
2SC1419
2SD234

2SA915
2SC1213A
2SC1940

μPA63H



2SB557
2SD427

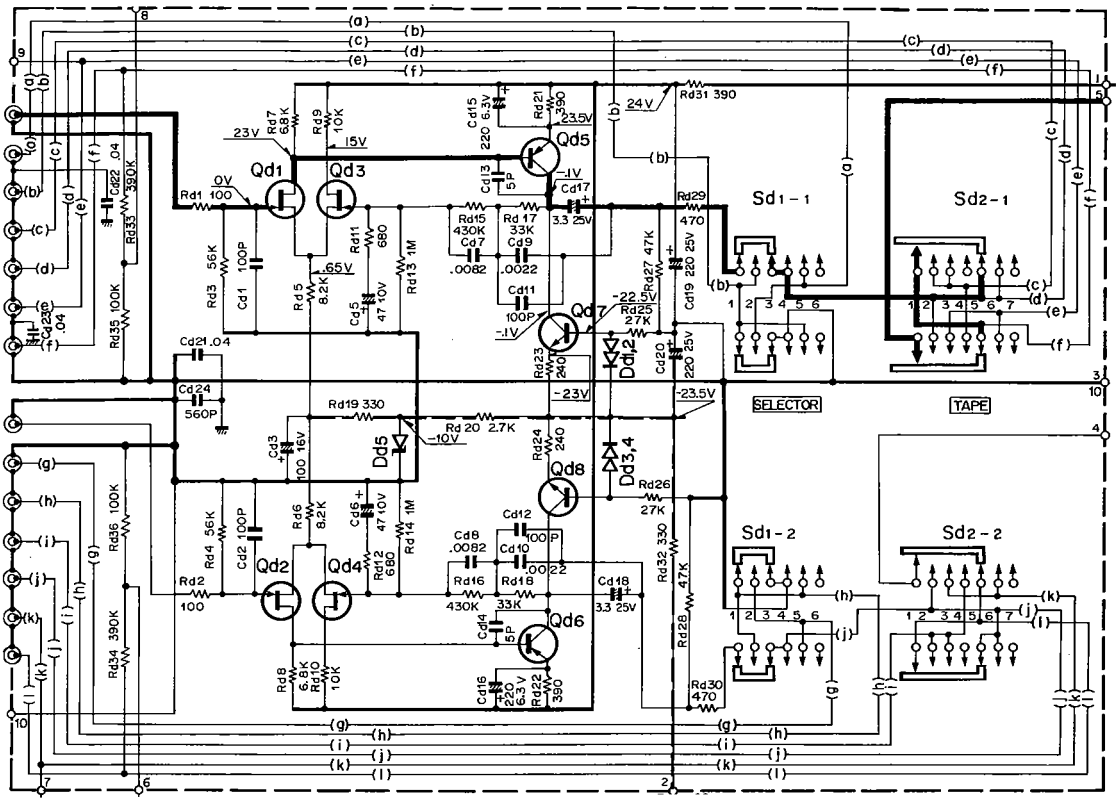
2SA794
2SC1567

2SA721
2SA733
2SA912
2SC945
2SC1222
2SC1775
2SC1885

2SA842
2SC1681

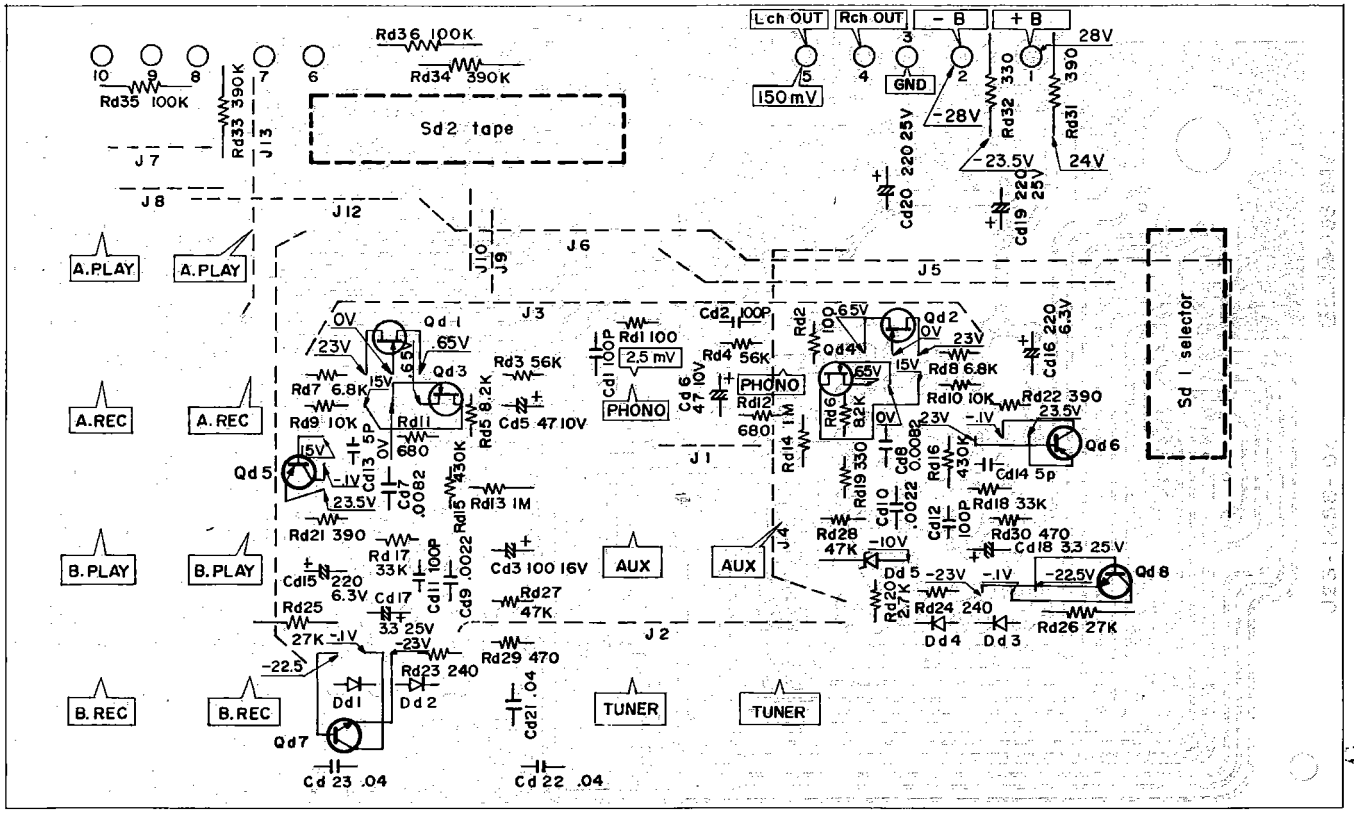
Qe1, 2: μPA63H(L) or (M), Qe3～6: 2SC1775(E) or (F), Qe7～10: 2SA915(L) or (K) or 2SA912(R) or (S), Qe11, 12: 2SC1940(L) or (K) or 2SC1885(R) or (S), Qe13, 14: 2SA842 or 2SA721, Qe15～18: 2SA733, Qe19～22: 2SC945, Qe23, 24: 2SC1567(Q) or (R) or (S), Qe25, 26: 2SA794(Q) or (R) or (S), Qe27, 28: 2SD427, Qe29, 30: 2SB557, Qe31: 2SC1419(B) or (C) or 2SD234(O) or (Y), Qe32: 2SA755(B) or (C), Qe33: 2SC1681 or 2SC1222, Qe34: 2SC1213A(C), De1, 2: EQA01-24R, De3, 4, 17, 18: EQA01-28R, De5～8, 13～15: 1S2076, De9～12, 16: 1S2076A, De19～26: GP25D or S3V10 or U05C(S), De27: W06B, THe1, 2: 5TP-41L

PREAMP (X08-1570-10)



Audio Signal (Reference value).

DC voltages indicated here are measured with 20 kΩ/V meter.

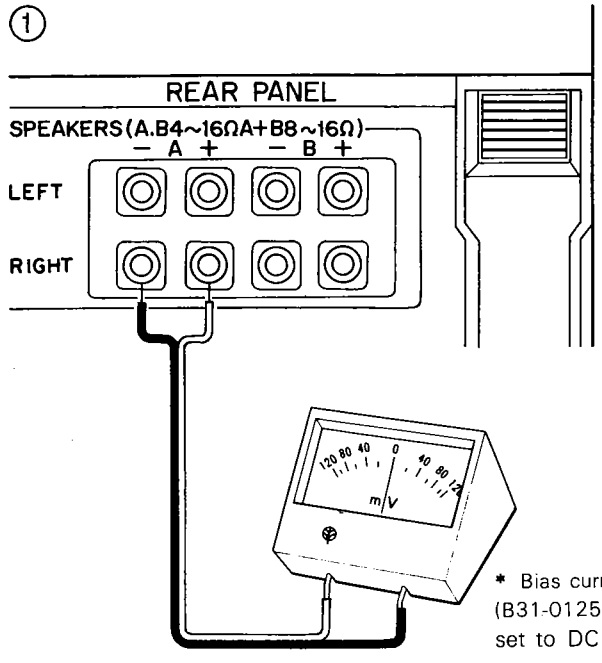


Qd1, 2: 2SK68A(L) or (K), Qd3, 4: 2SK68A(M) or (N), Qd5, 6: 2SA872, Qd7, 8: 2SC1222, Dd1～4: 1S2076, Dd5: EQA01-10

ADJUSTMENT (1)

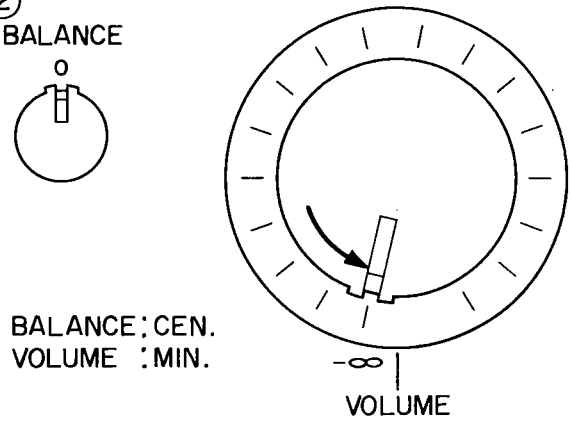
CENTER VOLTAGE

①



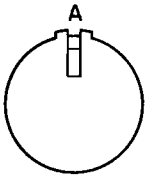
* Bias current meter (B31-0125-05) or VOM set to DC 0.3V range.

②



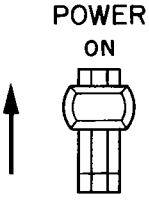
BALANCE : CEN.
VOLUME : MIN.

③



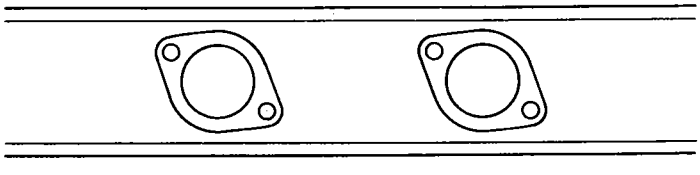
SPEAKERS : A

④

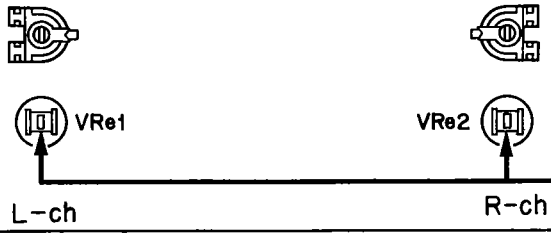


POWER : ON

⑤



X07-1510-10



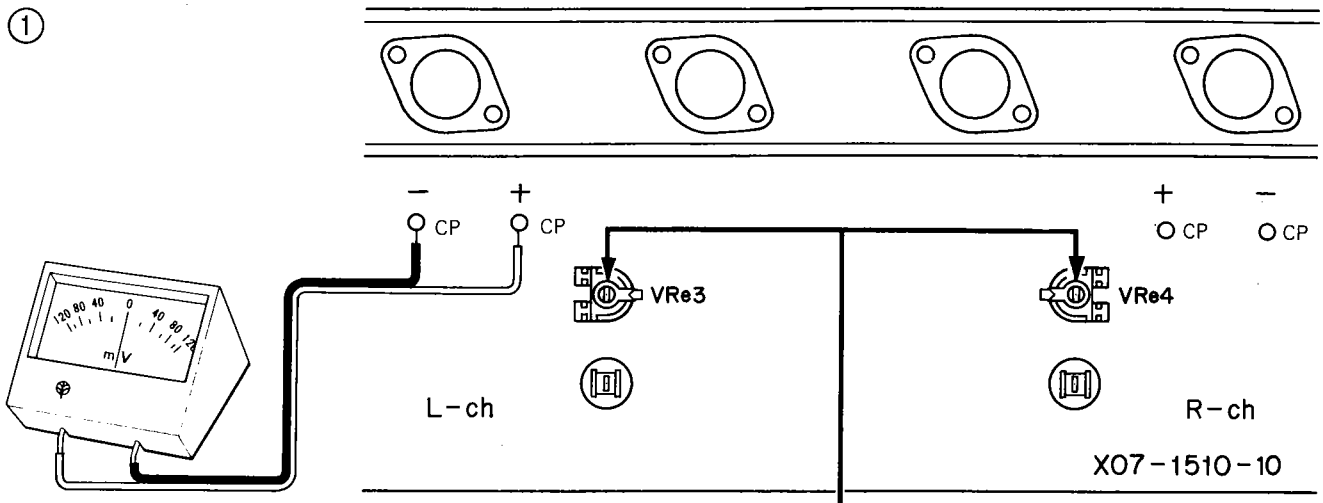
Turn the pc trimmer potentiometer until meter indicates 0 mV.

ADJUSTMENT (2)

Caution: You must adjust the center voltage, referring previous page, before this adjustment.

BIAS CURRENT

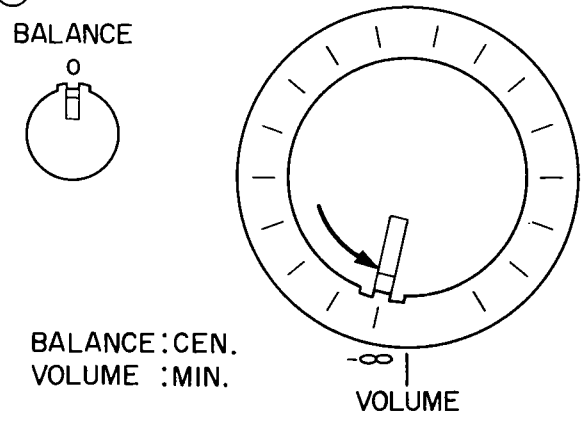
①



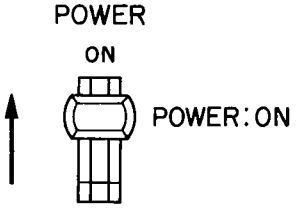
* Bias current meter (B31-0125-05) or VOM set to DC 0.3V range.

CP: Check Point.

②



③



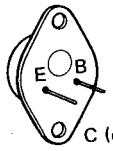
④

Turn the pc trimmer potentiometer until meter indicates 20 mV.

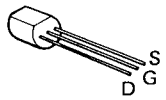
SEMICONDUCTOR SUBSTITUTIONS

SEMI-CONDUCTOR	SUBSTITUTIONS
(X07-1510-10)	
2SA733	2SA640, 2SA750, 2SA841
2SA755	2SB595
2SA794 (Q), (R), (S)	—
2SA842	2SA721
2SA915 (L), (K)	2SA912 (R), (S), 2SA899
2SB557	2SA745, 2SA747
2SC945	2SC having more than 50V of V_{CEO}
2SC1213A	—
2SC1419 (B), (C)	2SD234 (O), (Y), 2SD525
2SC1567 (Q), (R), (S)	—
2SC1681	2SC1222
2SC1775 (E), (F)	2SC1345
2SC1940 (L), (K)	2SC1885 (R), (S), 2SC1904, 2SC1451, 2SC1452
2SD427	2SC1403, 2SC1116
μPA63H (L), (M)	—
(X08-1570-10)	
2SA872	—
2SC1222	2SC1400, 2SC1345, 2SC1681, 2SC1775
2SK68A (L), (K)	—
2SK68A (M), (N)	—
(X11-1420-10)	
2SA640 (E), (F)	2SA620WL (4), (5), 2SA763WL, 2SA750, 2SA841, 2SA872
2SC1400 (E), (U)	2SC1775, 2SC1681
2SK68A (L), (M), (K)	

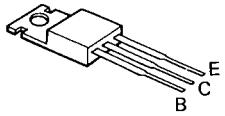
2SA745 2SC1116
2SA747 2SC1403
2SB557 2SD427



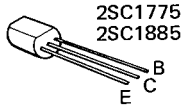
2SK68



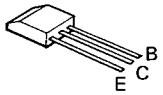
2SA755 2SD234
2SB595 2SD525
2SC1419



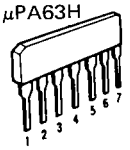
2SA640 2SA872
2SA721 2SA912
2SA733 2SC945
2SA750 2SC1222
2SA763 2SC1400
2SC1775
2SC1885



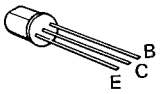
2SA915
2SC1213A
2SC1940



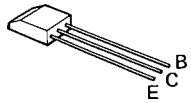
μPA63H



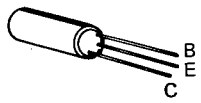
2SA841
2SA842
2SC1681



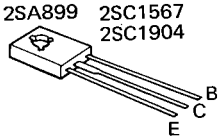
2SC1345



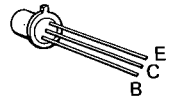
2SC1451
2SC1452



2SA794 2SC1212A
2SA899 2SC1567
2SC1904



2SA620WL



When replacing the power transistors 2SB557 and 2SD427 to substitutions, power transistor should be paired as shown in the right table.

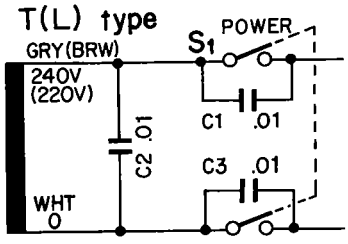
PNP	NPN	Remarks
2SB557	2SD427	Ce 11, 12..... 5 pF Ce 13, 14..... 10 pF
2SA745	2SC1403	Ce 11, 12..... 8 pF Ce 13, 14..... 5 pF
2SA747	2SC1116	Ce 11, 12..... 8 pF Ce 13, 14..... 5 pF

ABSOLUTE MAX. RATINGS

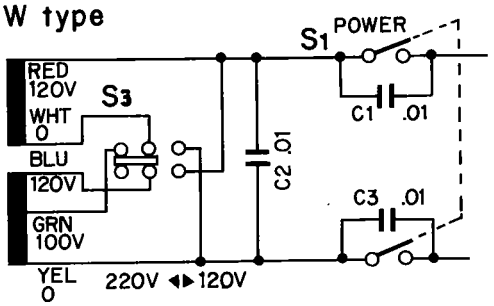
TRANSISTOR	V_{CBO}	V_{EBO}	V_{CEO}	I_C	P_C	Tj	Tstg	fT
2SA915	−120V	−5V	−120	−50 mA	800 mW	150°C	−55 ~ +150°C	—
2SC1940	120V	5V	120V	50 mA	800 mW	150°C	−55 ~ +150°C	—

DIODE	V_{RM}	V_R	I_F	Io	Isurge	P	Tj	Tstg
GP-25D	200V	200V	—	2.5A	100A	—	—	—
S3V10	100V	—	—	2.6A	120A	—	+150°C	−30 ~ +150°C

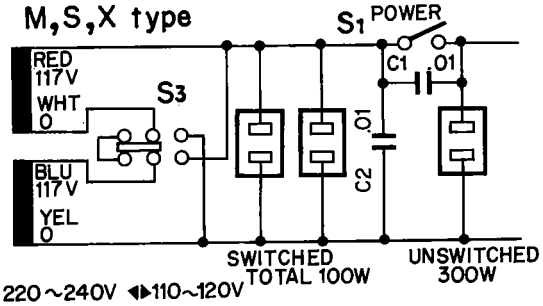
T(L) type



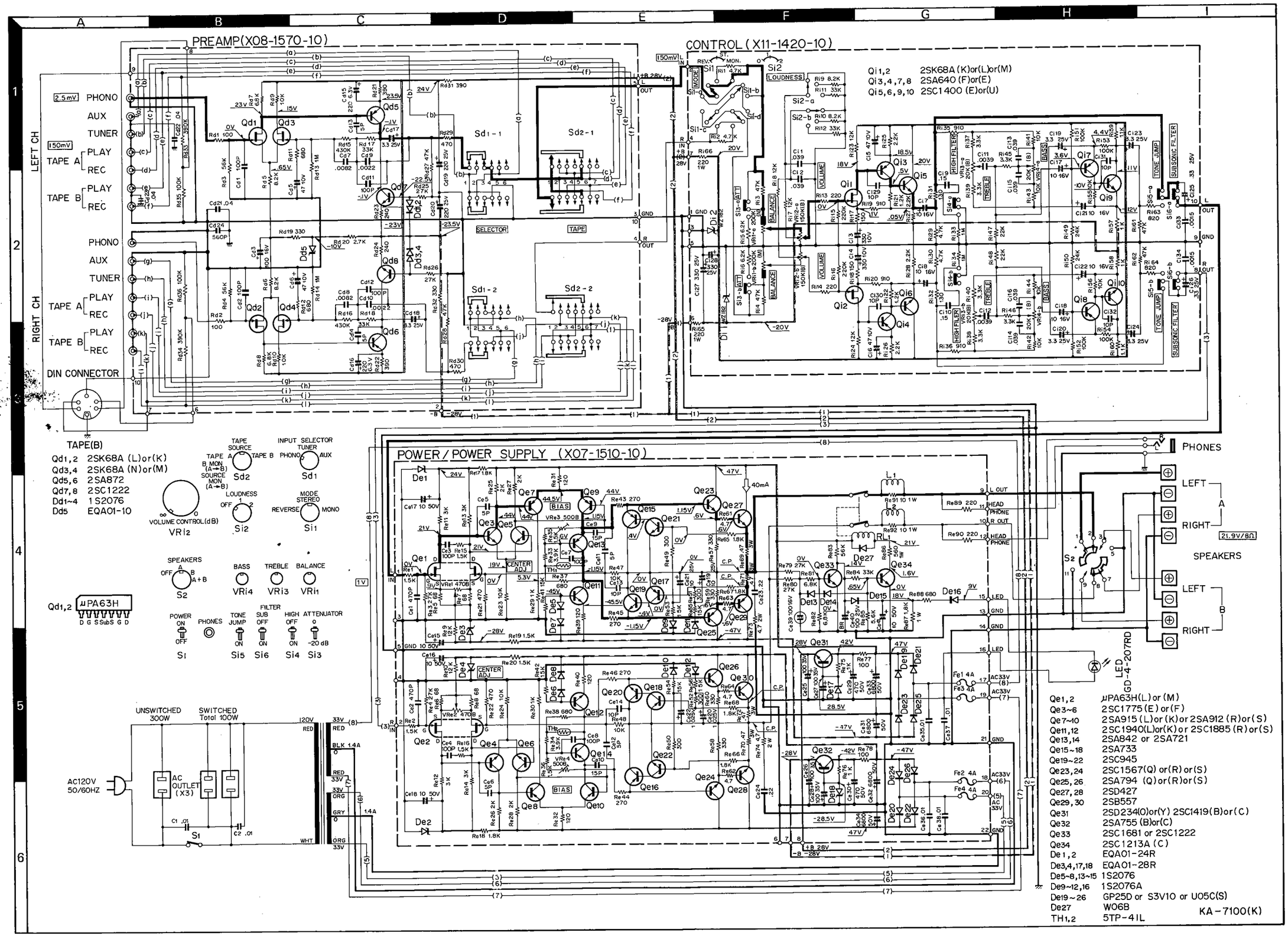
W type



M,S,X type



SCHEMATIC DIAGRAM



Note: Resistor values are in ohms. K = 1000 ohms, M = 1000k ohms.
Capacitor values are in μF unless specified, P = pF = μF × 10^{-6}.
DC voltage are measure with 20kΩ/V under no signal.

SPECIFICATIONS

POWER AMPLIFIER SECTION

POWER OUTPUT

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

Both Channel Driven		60 + 60 watts 8 ohms at 1,000 Hz
		80 + 80 watts 4 ohms at 1,000 Hz
Dynamic Power Output		250 watts 4 ohms
Total Harmonic Distortion		0.02% at rated power into 8 ohms
		0.02% at 1 watt into 8 ohms
Intermodulation Distortion		0.01% at rated power into 8 ohms
(60 Hz : 7 kHz = 4 : 1)		0.01% at 1 watt into 8 ohms
Power Bandwidth		5 Hz to 45,000 Hz
Frequency Response		D.C. to 100,000 Hz +0 dB, −1.5 dB
Signal to Noise Ratio		120 dB (short circuited)
Damping Factor		50 at 8 ohms
Speaker Impedance		Accept 4 ohms to 16 ohms

PRE AMPLIFIER SECTION

Input Sensitivity/Impedance/Signal to Noise Ratio (IHF A curve)		
Phono		2.5 mV/ 50 k ohms/ 80 dB
Tuner		150 mV/ 50 k ohms/ 110 dB
AUX		150 mV/ 50 k ohms/ 110 dB
Tape		150 mV/ 50 k ohms/ 110 dB
Maximum Input Level for Phono		200 mV (rms), T.H.D. 0.02% at 1,000 Hz
Output Level/Impedance		
Tape REC (Pin)		150 mV/ 450 ohms
(DIN)		30 mV 80 k ohms
Frequency Response		
Phono		RIAA standard curve +0.2 dB, −0.2 dB
AUX & Tape		10 Hz to 100,000 Hz +0 dB, −1.8 dB
Tone Control		
Bass		±7.5 dB at 100 Hz
Treble		±7.5 dB at 10,000 Hz
Loudness Control (−30 dB)	(1)	+ 3 dB at 100 Hz.
	(2)	+ 6 dB at 100 Hz
Subsonic Filter		20 Hz, 6 dB/oct
High Filter		8 kHz, 6 dB/oct

GENERAL

Power Consumption	460 watts at full power
A.C. Outlet	Switched 2, Unswitched 1
Dimensions	W 16-15/16" (430 mm)
	H 5-7/8" (149 mm)
	D 14-15/16" (379 mm)
Weight (Net)	25.4 lbs. (11.5 kg)

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

: Specifications and the design subject to possible modification without notice due to improvements.

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