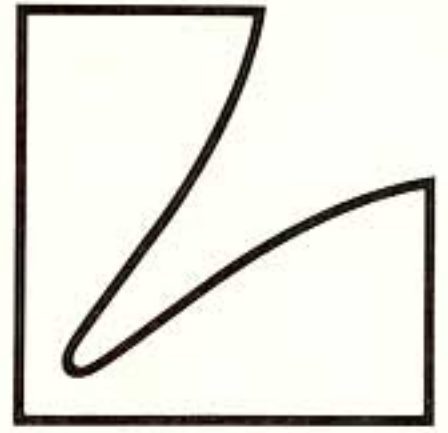
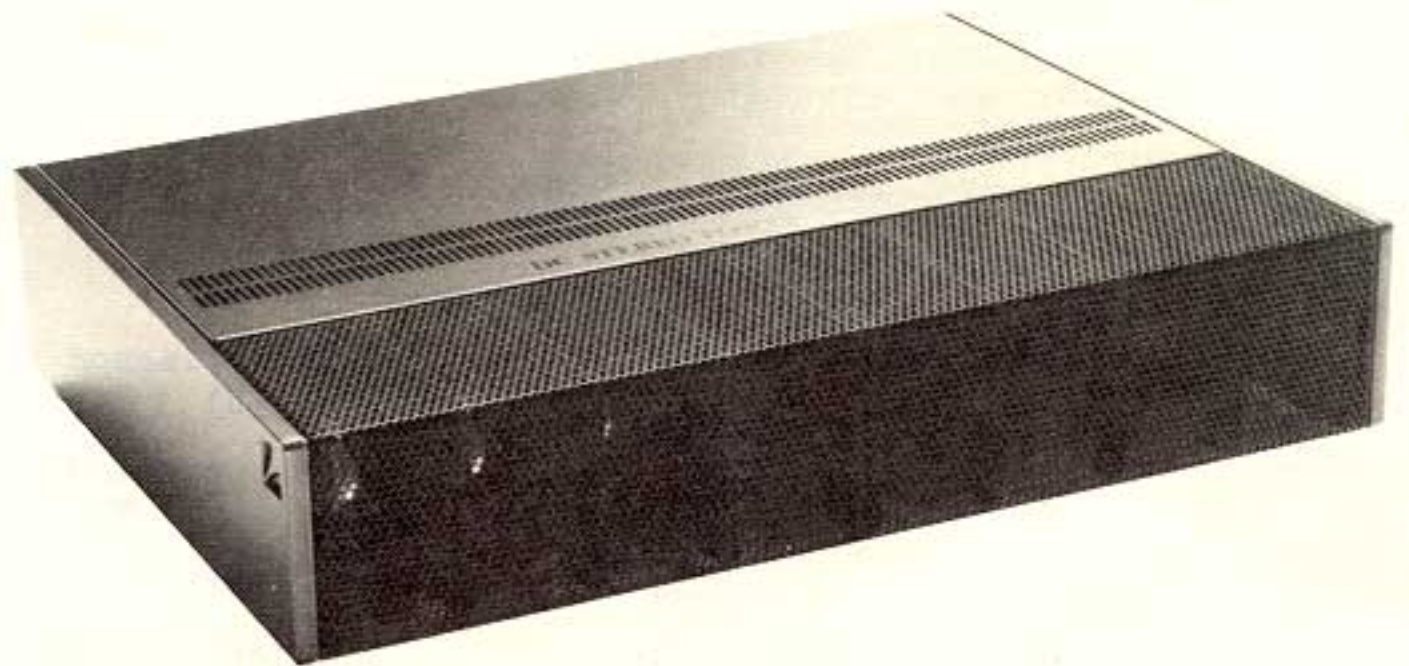


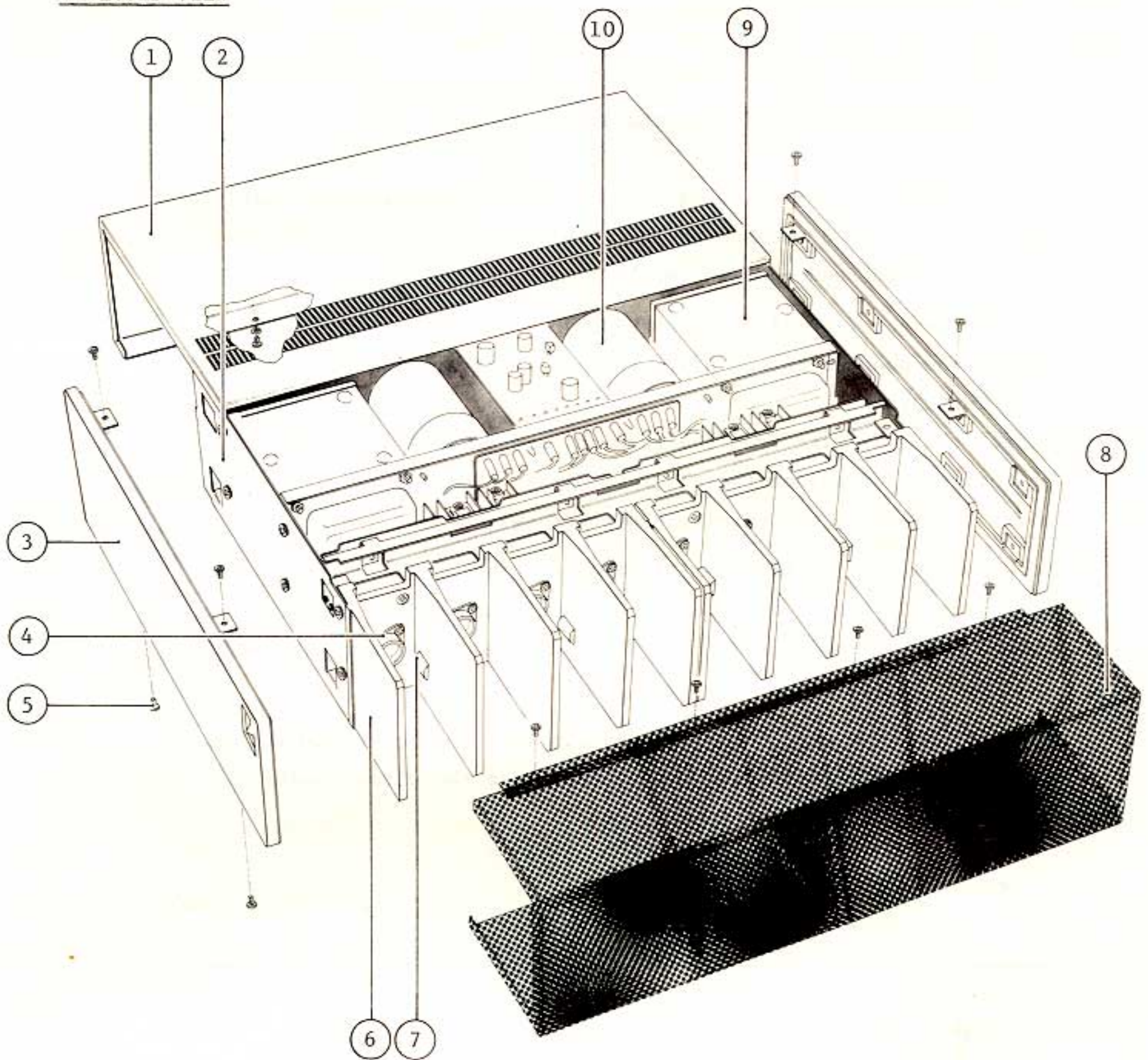
SERVICE MANUAL



SOLID STATE DC STEREO
POWER AMPLIFIER **M-12**



EXPLODED VIEW



1. UG1009	Bonnet (J) (S)	6. BE1043	Heat Sink
UG1020	" (U)	7. WG1016	Pilot
2. UA1036 (6480)	Chassis	8. UG1003	Bonnet
UA1047 (6481)	"	9. PT2232	Power Trans. (J)
3. WC1043	Side Panel	PT2233	" " (U)
4. BE1049	Heat Sink	PT2234	" " (S)
5. YAA30C06	Screw 3x6	10. CE1411	Elrctrolytic x 2
			10000 μ F x 2

Semi-fixed VR Adjustment

(1) AVR Output Voltage / PB-1132

Connect a DC volt meter (100V meter) in between the printed terminals of silk-printed "5,6,7,8" and the ground to confirm that the output is $\pm 58V \pm 5V$.

Also confirm that the value should be $\pm 58V \pm 5V$ even in case that the mains voltage is decreased by 10%. (The value should be -58V on terminals "5,8" and +58V on "6,7").

(2) Idling Current / PB-1133 (1K(B) RT302)

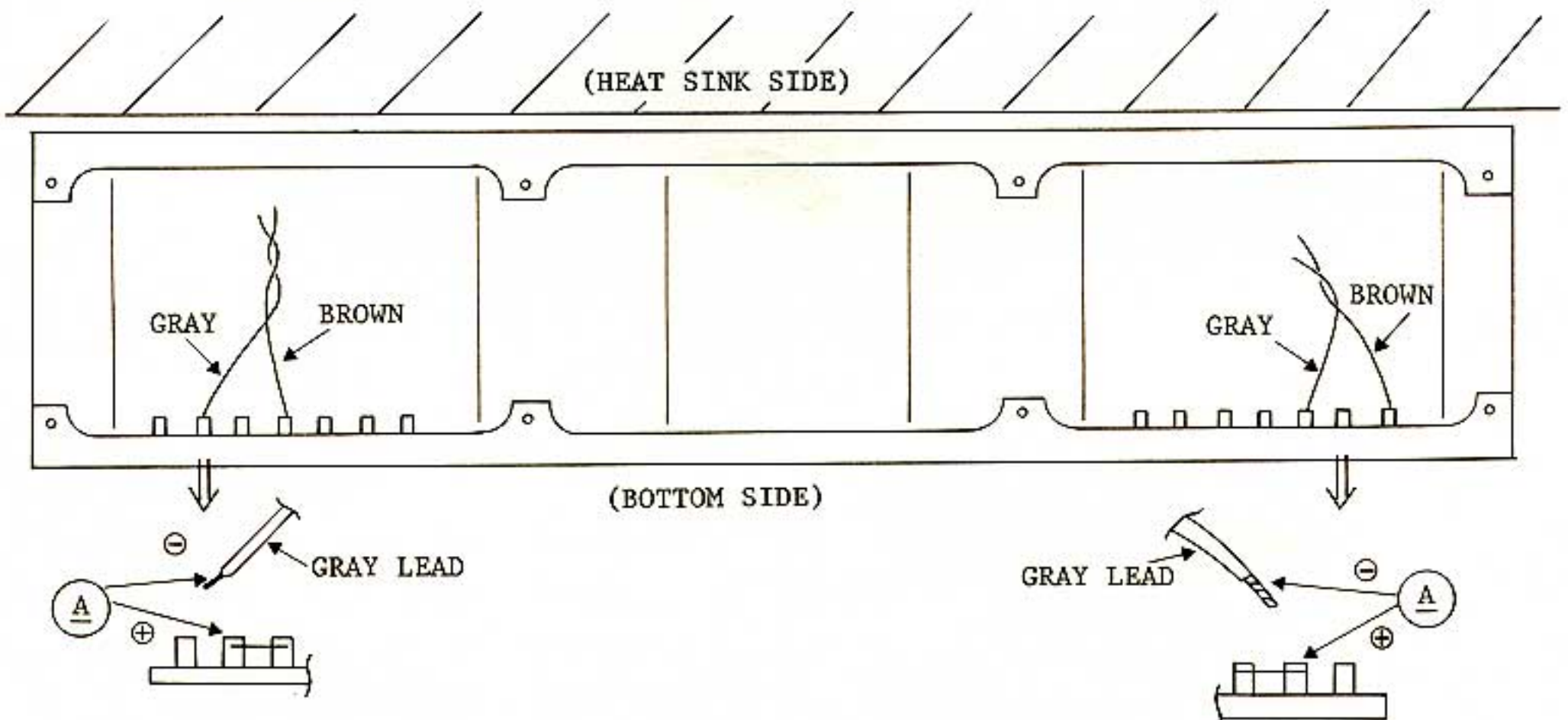
Detach the punched bottom palte to find the gray wire fixed on No.2 or 3 lug-terminal.

Detach the gray wire from the terminal and connect a DC ampere meter to the wire and adjust the RT302 to obtain $60\text{mA} \begin{matrix} +10 \\ -0 \end{matrix}$ mA reading on the meter 5 minutes after turning the power switch on. See Fig. 1.

(3) DC Offset / PB-1133 (500-ohm(B) RT301)

Connect a DC volt to the speaker terminals and adjust the RT301 to obtain $0V \pm 20\text{mV}$ reading on the meter 5 minutes after turning the power switch on. See Fig. 1.

(4) The gray wires should be soldered again onto the lug-terminals after Idling Current adjustment. But in that case the wires should be entirely discharged before soldering.



Replacement Parts List

Remarks

Capacitors: C.....Ceramic, E.....Electrolytic, MY....Mylar, G.....G Capacitor
 S.....Styrol, T.....Tantalum MI....Mica, MP....MP capacitor
 O.....Oil capacitor, TRIM.....Trimmer capacitor, AC....AC Capacitor
 BP....Electrolytic Bi-Polar type

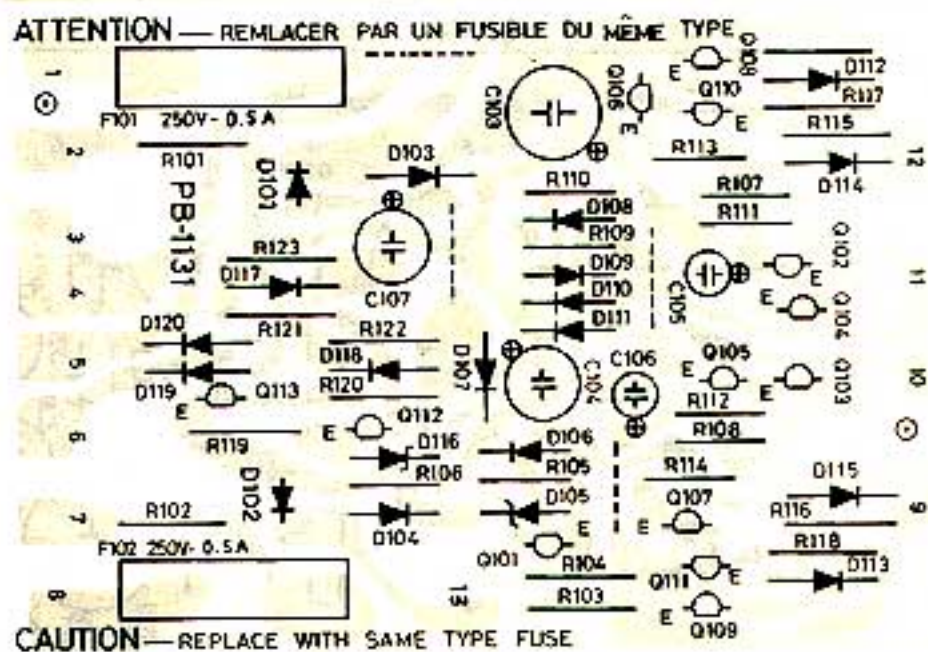
Resistors: ±10%, ±5%, 1/4W, unless specified otherwise

Type: (S).....Model for north European countries
 (U).....Model for U.S.A. and CANADA
 (E).....Standard model
 (J).....Model for JAPAN

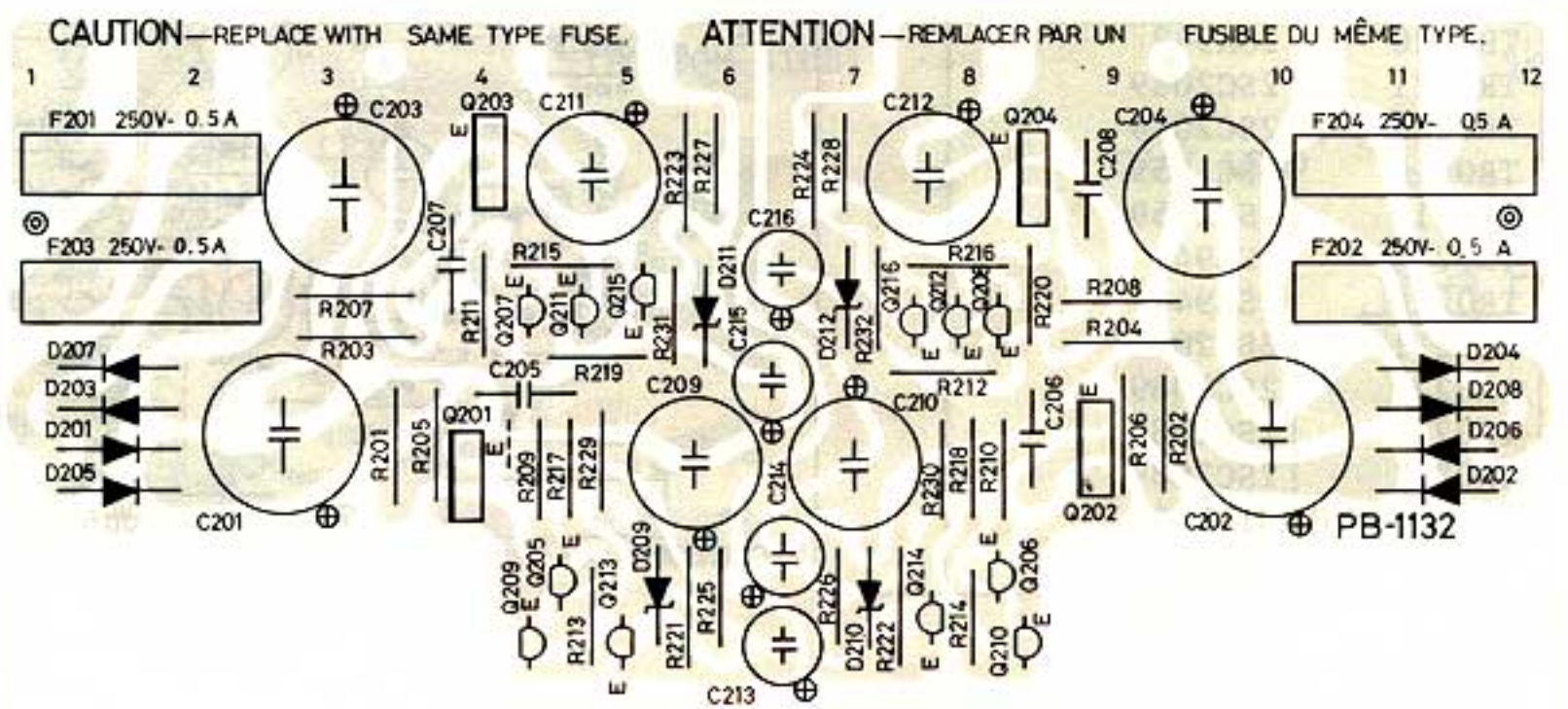
PB-1131

SYMBOL NO.	Stock NO.	DESCRIPTION	LOCATION
R101	RD0071	2.2	
102	RD0071	2.2	
103	RD0037	3.3K	
104	RD0029	12K	
105	RB0230	100K	
106	RB0242	330K	
107	RB0232	120K	
108	RB0232	120K	
109	RB0238	220K	
110	RB0238	220K	
111	RB0190	2.2K	
112	RB0190	2.2K	
113	RB0118	2.2	
114	RB0118	2.2	
115	RD0028	15K	
116	RD0028	15K	
117	RD0029	12K	
118	RD0029	12K	
119	RD0037	3.3K	
120	RD0032	8.2K	
121	RD0017	100K	
122	RD0017	100K	
123	RD0016	120K	
C103	CE0078	100µ 16V E	
104	CE0077	47µ 16V E	
105	CE0084	4.7µ 25V E	
106	CE0084	4.7µ 25V E	
107	CE0077	47µ 16V E	
Q101	TR0220	2SA942	
102	TR0221	2SC2089	
103	TR0221	2SC2089	
104	TR0219	2SC1959	
105	TR0219	2SC1959	
106	TR0220	2SA942	
107	TR0220	2SA942	
108	TR0221	2SC2089	
109	TR0221	2SC2089	
110	TR0221	2SC2089	
111	TR0221	2SC2089	
112	TR0220	2SA942	
113	TR0219	2SC1959	

SYMBOL NO.	STOCK NO.	DESCRIPTION	LOCATION
D101	TD0003	1N4003	
102	TD0003	1N4003	
103	TD0003	1N4003	
104	TD0003	1N4003	
105	TD0117	02BZ-3.3	
106	TD0116	1S2075	
107	TD0116	1S2075	
108	TD0116	1S2075	
109	TD0116	1S2075	
110	TD0116	1S2075	
111	TD0116	1S2075	
112	TD0018	1K188FM-1	
113	TD0018	1K188FM-1	
114	TD0018	1K188FM-1	
115	TD0018	1K188FM-1	
116	TD0117	02BZ-3.3	
117	TD0116	1S2075	
118	TD0116	1S2075	
119	TD0116	1S2075	
120	TD0116	1S2075	
F101	BF0206	5X20 0.5A(T)(S)	
101	BF0308	MF51NR-0.5A(J)	
101	BF0308	MF51NR-0.5A(J)	
102	BF0206	5X20 0.5A(T)(S)	
102	BF0308	MF51NR-0.5A(J)	
102	BF0308	MF51NR-0.5A(J)	

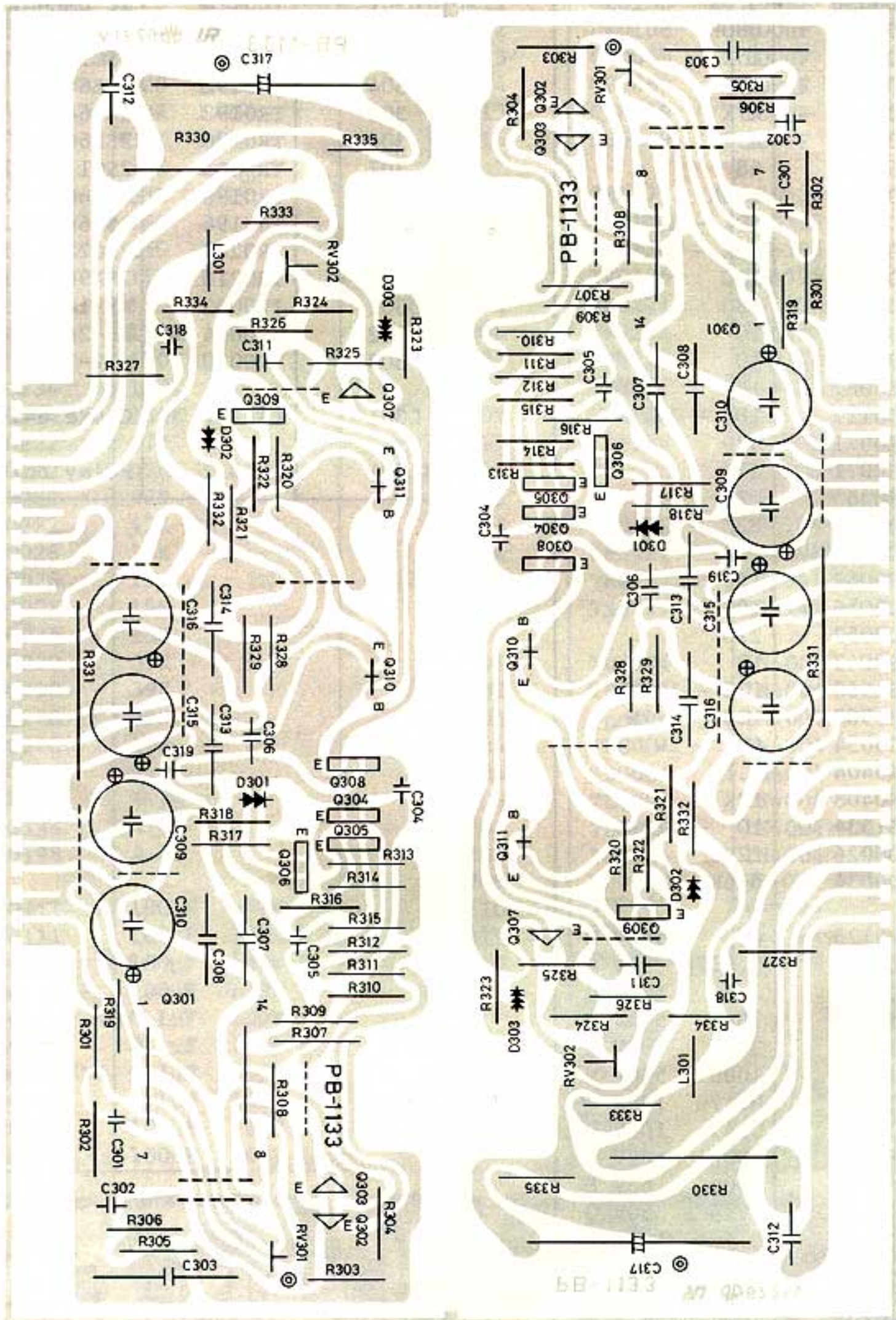


SYMBOL NO.	STOCK NO.	DESCRIPTION	LOCATION	SYMBOL NO.	STOCK NO.	DESCRIPTION	LOCATION
R201	RD0362	220 1/2W		211	CE0108	100μF 63V E	
202	RD0362	220 1/2W		212	CE0108	100μF 63V E	
203	RD0362	220 1/2W		213	CE0069	100μF 10V E	
204	RD0362	220 1/2W		214	CE0069	100μF 10V E	
205	RD0111	33K 1/2W		215	CE0069	100μF 10V E	
206	RD0111	33K 1/2W		216	CE0069	100μF 10V E	
207	RD0111	33K 1/2W		Q201	TR0177	2SD525	
208	RD0111	33K 1/2W		202	TR0177	2SD525	
209	RB0162	150		203	TR0176	2SB595	
210	RB0162	150		204	TR0176	2SB595	
211	RB0162	150		205	TR0221	2SC2089	
212	RB0162	150		206	TR0221	2SC2089	
213	RB0234	150K		207	TR0227	2SA941	
214	RB0234	150K		208	TR0227	2SA941	
215	RB0234	150K		209	TR0227	2SA941	
216	RB0234	150K		210	TR0227	2SA941	
217	RB0222	47K		211	TR0221	2SC2089	
218	RB0222	47K		212	TR0221	2SC2089	
219	RB0222	47K		213	TR0221	2SC2089	
220	RB0222	47K		214	TR0221	2SC2089	
221	RD0028	15K		215	TR0227	2SA941	
222	RD0028	15K		216	TR0227	2SA941	
223	RD0028	15K		D201	TD0004	1N4004	
224	RD0028	15K		202	TD0004	1N4004	
225	RB0220	39K		203	TD0004	1N4004	
226	RB0220	39K		204	TD0004	1N4004	
227	RB0220	39K		205	TD0004	1N4004	
228	RB0220	39K		206	TD0004	1N4004	
229	RB0198	4.7K		207	TD0004	1N4004	
230	RB0198	4.7K		208	TD0004	1N4004	
231	RB0198	4.7K		209	TD0060	WZ-061	
232	RB0198	4.7K		210	TD0060	WZ-061	
C201	CE0111	100μF 100V E		211	TD0060	WZ-061	
202	CE0111	100μF 100V E		212	TD0060	WZ-061	
203	CE0111	100μF 100V E		F101	BF0206	0.5A Fuse (S)	
204	CE0111	100μF 100V E			BF0308	0.5A Fuse (J)	
205	CQ0613	0.1μF 100V Q			BF0308	0.5A Fuse (U)	
206	CQ0613	0.1μF 100V Q		102	BF0206	0.5A Fuse (S)	
207	CQ0613	0.1μF 100V Q			BF0308	0.5A Fuse (J)	
208	CQ0613	0.1μF 100V Q			BF0308	0.5A Fuse (U)	
209	CE0108	100μF 63V E					
210	CE0108	100μF 63V E					



SYMBOL NO.	STOCK NO.	DESCRIPTION	LOCATION
R301	RD0036	3.9K	
302	RD0007	680K	
303	RD0028	15K	
304	RD0028	15K	
305	RD0022	47K	
306	RD0032	8.2K	
307	RS1054	68	
308	RD0017	100K	
309	RD0110	39K - 1/2W	
310	RD0110	39K - 1/2W	
311	RD0056	100	
312	RD0046	680	
313	RD0069	10	
314	RD0069	10	
315	RS0087	1K	
316	RD0112	18K - 1/2W	
317	RS0071	470	
318	RS0071	470	
319	RN0360	120	
320	RD0111	33K - 1/2W	
321	RD0071	2.2	
322	RS0067	150	
323	RD0056	100	
324	RD0052	220	
327	RS0043	10	
328	RS1560	120 - 1/2W	
329	RS1560	120 - 1/2W	
330	RG0054	4.7 - 2W	
331	RN0404	8.2K	
332	RN0408	12K	
333	RS1534	10 - 1/2W	
334	RD0026	22K	
335	RD0034	5.6K	
C301	CM0125	47p 500V M	
302	CQ0123	0.027 μ 50V Q	
303	CQ0605	2.2 μ 100V Q	
304	CM0119	33p 500V M	
305	CM0119	33p 500V M	
306	CM0134	100p 500V M	
307	CQ0609	0.47 μ 100V Q	
308	CQ0609	0.47 μ 100V Q	
309	CE0108	100 μ 63V E	
310	CE0108	100 μ 63V E	
311	CQ0253	0.1 μ 50V Q	
312	CQ0613	0.1 μ 100V Q	
313	CQ0609	0.47 μ 100V Q	
314	CQ0609	0.47 μ 100V Q	
315	CE0108	100 μ 63V E	
316	CE0108	100 μ 63V E	
317	CE0400	100 μ 16V E (B.P)	
318	CQ0126	0.01 μ 50V Q	
319	CM0106	10p 500V M	
RV301	RT0068	500 Ω (B)	
302	RT0015	1K(Ω)(B)	

SYMBOL NO.	STOCK NO.	DESCRIPTION	LOCATION
Q301	TC0114	IC DML-01	
302	TR0165	2SC1775A	
303	TR0165	2SC1775A	
304	TR0192	2SB648	
305	TR0192	2SB648	
306	TR0196	2SD668	
307	TR0165	2SC1775A	
308	TR0196	2SD668	
309	TR0196	2SD668	
310	TR0209	2SC2238	
311	TR0210	2SA968	
D301	TV0003	KB-165	
302	TV0004	KB-265	
303	TV0020	STV-3H	
L301	LAL177	Choke 6415	
RL301	AY0032	Relay DC/12V	



CHASSIS UNIT

SYMBOL NO.	STOCK NO.	DESCRIPTION	LOCATION
R001	RG0032	0.18 - 5W	
002	RG0032	0.18 - 5W	
003	RG0032	0.18 - 5W	
004	RG0032	0.18 - 5W	
005	RG0032	0.18 - 5W	
006	RG0032	0.18 - 5W	
007	RG0032	0.18 - 5W	
008	RG0032	0.18 - 5W	
009	RS0043	10	
010	RS0043	10	
011	RS0043	10	
012	RS0043	10	
013	RS0043	10	
014	RS0043	10	
015	RS0043	10	
016	RS0043	10	
017	RG2230	6 20W (J)	
C001	CU0006	0.022μ 250V U (S)	
	CU0033	0.022μ 250V U (J)	
	CU0065	0.022μ 120V U (U)	
002	CU0006	0.022μ 250V U (S)	
	CU0006	0.022μ 250V U (J)	
	CU0065	0.022μ 120V U (U)	
003	CU0006	0.022μ 250V U (S)	
	CU0033	0.022μ 250V U (J)	
	CU0065	0.022μ 120V U (U)	
Q001	TR0244	2SB681	
002	TR0244	2SB681	
003	TR0245	2SD551	
004	TR0245	2SD551	
005	TR0244	2SB681	
006	TR0244	2SB681	
007	TR0245	2SD551	
008	TR0245	2SD551	
D001	TD0110	S5VB40-F	
002	TD0110	S5VB40-F	
F001	BF0082	5A Fuse (J)	
	BF0082	5A Fuse (U)	
	BF0212	3.15A Fuse(D)	
002	BF0082	5A Fuse (J)	
	BF0082	5A Fuse (U)	
	BF0212	3.15A Fuse(S)	

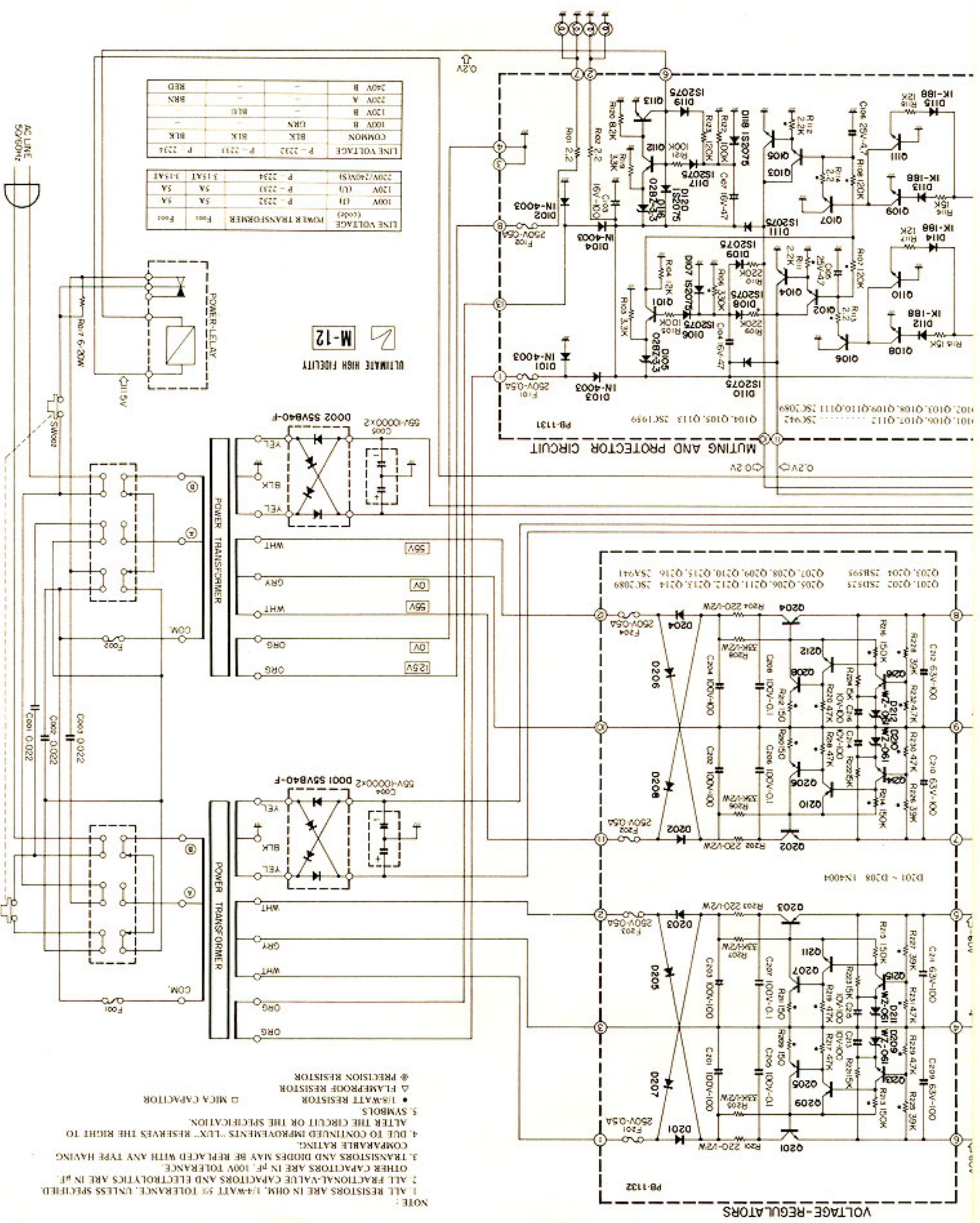
REAR-PANEL UNIT

SYMBOL NO.	STOCK NO.	DESCRIPTION	LOCATION
C007	CQ0609	0.47μ 100V Q	
008	CQ0609	0.47μ 100V Q	
VR001	RV0171	20KB	
002	RV0171	20KB	
SW001	SS0014	Slide SW	
002	SS0015	Slide SW (J)	
	SS0015	Slide SW (U)	
	SS0016	Slide SW (S)	
F004	BF0213	4A Fuse (S)	
	BF0302	4A Fuse (J)	
	BF0082	5A Fuse (U)	
005	BF0213	4A Fuse (S)	
	BF0320	4A Fuse (J)	
	BF0082	5A Fuse (U)	

M-12 SPECIFICATIONS

Power Output:	80W minimum continuous per channel into 8-ohm loads, both channels driven at any frequency from 20Hz to 20,000Hz with no more than 0.006% total harmonic distortion.
Rated I.M.:	no more than 0.006% (8 ohms, 80W, 60Hz : 7kHz = 4 : 1)
Frequency Response:	DC - 100,000Hz (within -1dB)
Input Sensitivity:	600mV
Input Impedance:	20k ohms
Signal-to-Noise Ratio:	better than 110dB (IHF-A weighted, input short-circuited)
Channel Separation:	better than 80dB (20Hz - 30kHz)
Damping Factor:	150 (8 ohms, 1kHz)
Protection Circuits:	Speaker Protection Circuit by sensing DC drift, Overcurrent Protection Circuit.
Additional Features:	Input Capacitor IN/OUT Selector, Attenuator for both channels
Power Consumption:	320W (8 ohms, at maximum output) 400VA (CSA rated)
Dimensions:	436(W) x 328(D) x 95(H)mm (17-3/16" x 12-15/16" x 3-3/4")
Weight:	Net 14.5kgs (31.9 lbs.) Gross 16.5kgs (36.3 lbs.)

Specifications and appearance and design are subject to possible change without notice.

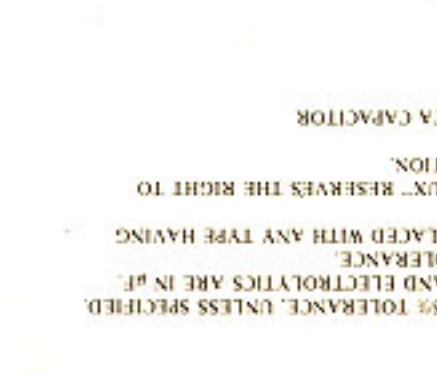
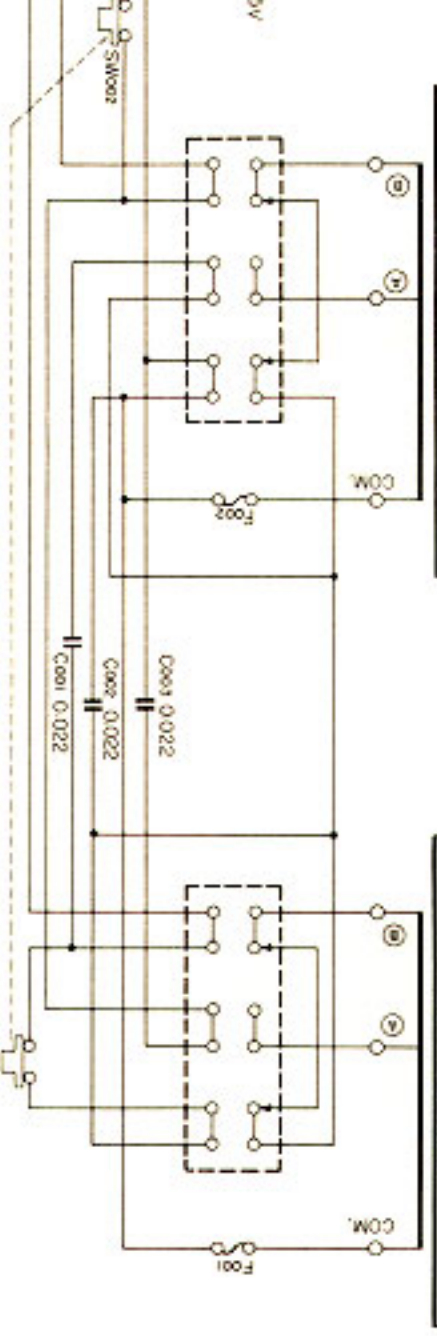
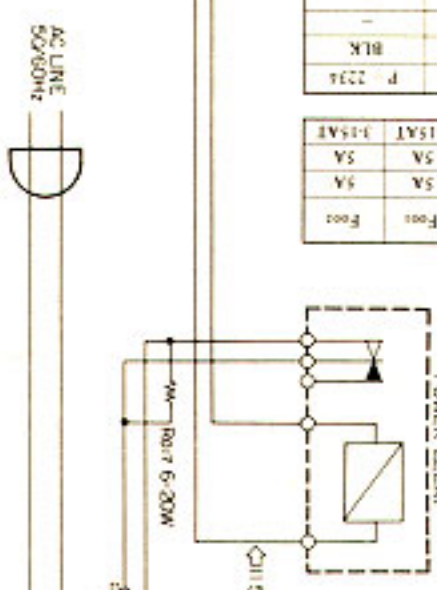


NOTE:

1. ALL RESISTORS ARE IN OHM, 1/4-WATT 5% TOLERANCE, UNLESS SPECIFIED.
2. ALL FRACTIONAL-VALUE CAPACITORS AND ELECTROLYTICS ARE IN μ F.
3. TRANSISTORS AND DIODES MAY BE REPLACED WITH ANY TYPE HAVING COMPARABLE RATING.
4. DUE TO CONTINUED IMPROVEMENTS "LUX" RESERVES THE RIGHT TO ALTER THE CIRCUIT OR THE SPECIFICATION.
5. SYMBOLS:
 - ▲ 1/8-WATT RESISTOR
 - △ FLAMPROOF RESISTOR
 - ⊠ MICA CAPACITOR
 - ⊙ PRECISION RESISTOR

LINE VOLTAGE (code)	POWER TRANSFORMER	FOOT
100V (H)	P-2232	5A
120V (L)	P-2233	5A
220V/240V(S)	P-2234	3.15AT

LINE VOLTAGE	P-2232	P-2233	P-2234
COMMON	BLK	BLK	BLK
100V B	GRN	GRN	GRN
120V B	GRN	GRN	GRN
220V A	BRN	BRN	BRN
240V B	RED	RED	RED

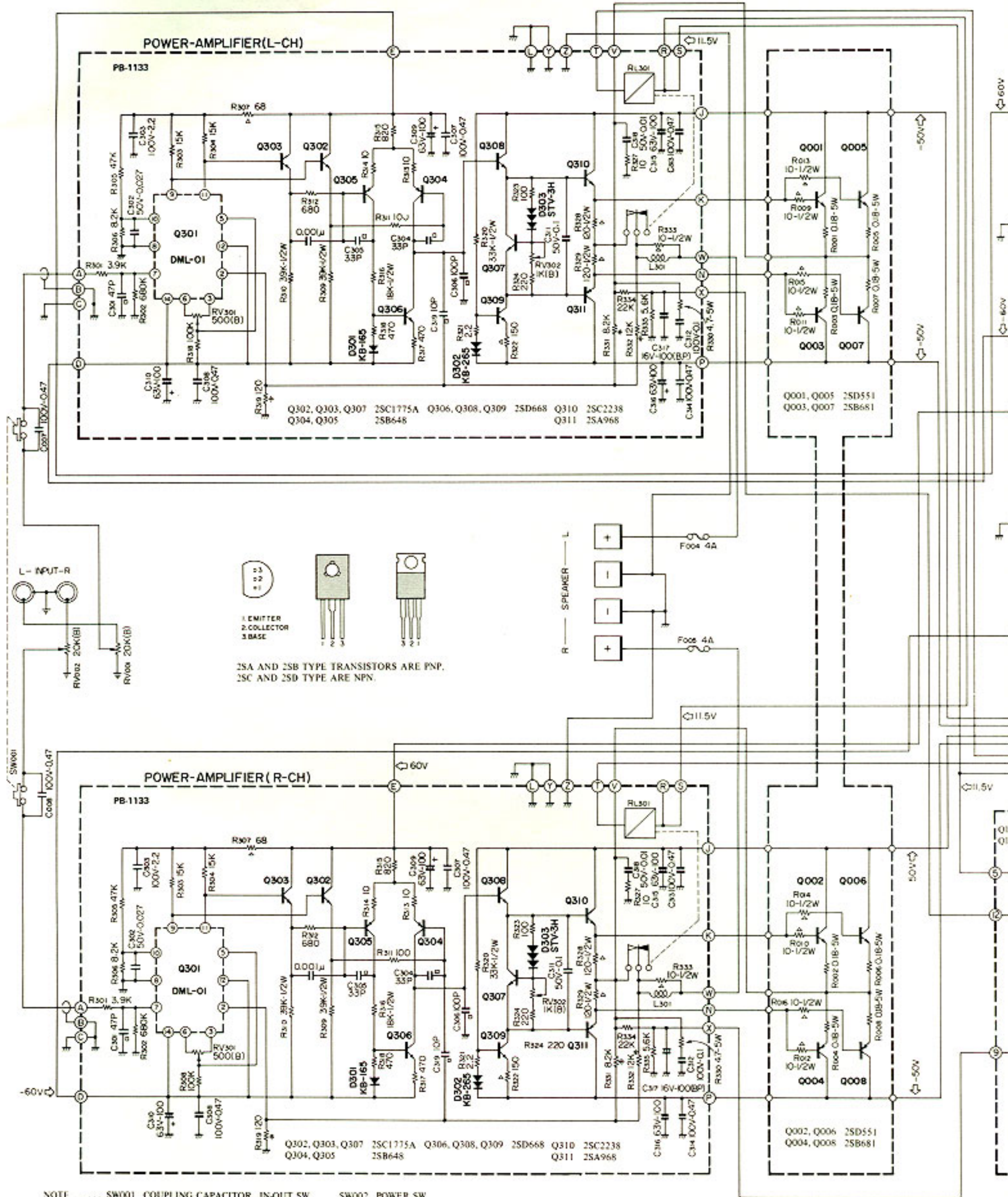


POWER TRANSFORMER

POWER-DELAY

MUTING AND PROTECTOR CIRCUIT

VOLTAGE-REGULATORS

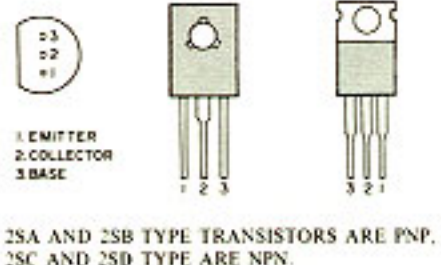


Q302, Q303, Q307 2SC1775A Q306, Q308, Q309 2SD668 Q310 2SC2238
 Q304, Q305 2SB648 Q311 2SA968

Q001, Q005 2SD551
 Q003, Q007 2SB681

Q302, Q303, Q307 2SC1775A Q306, Q308, Q309 2SD668 Q310 2SC2238
 Q304, Q305 2SB648 Q311 2SA968

Q002, Q006 2SD551
 Q004, Q008 2SB681



NOTE SW001 COUPLING CAPACITOR IN-OUT SW. SW002 POWER SW.

Ample Power Output and Perfect Elimination of Notch Distortion:

Parallel push-pull operation at the output stage easily yields the rated output of 80W per channel into 8 ohms loads, 20 - 20,000Hz, with total harmonic distortion no more than 0.006%. Under this parallel push-pull system, the amount of current per one transistor can be set at low level, and good treble response is procured along with excellent linearity against electric current. Another feature is the large amount of Pdc(collector dissipation). Furthermore, specially selected high speed transistors at the output stage in combination with a unique circuit device to accelerate overall switching speed make it possible to perfectly eliminate notch distortion inherent in a class "B" amp. Thus, despite basic class "B" amp design the notch distortion is kept as low as that of a class "A" amp.

Realtime Processed DC Amp:

In the case of an audio amplifier which deals with ever-changing music signals, the problem of transient distortion, that is of vital importance to sonic quality (though difficult to define specification) has to be solved in addition to harmonic distortion shown in the form of a measurable specification. With conventional AC amp circuitry, a large amount of NFB is applied to suppress harmonic distortion, and the large capacitor in this NFB loop induces time lag, thus causing transient distortion. Removal of this harmful capacitor led us to the unique concept of a "Realtime Processed DC amp".

At the main amp circuit, an emitter-follower driven by constant current is provided to make the most of our exclusive DML-IC's (where differential amp circuit of dual FET and its auxiliary circuits are packed into a block) and also to improve load condition in the treble range at the pre-driver stage. Another emitter-follower with a constant current circuit is placed to isolate the pre-driver stage of class "A" operation immune from the influence of the pure complementary output stage of class "AB" operation.

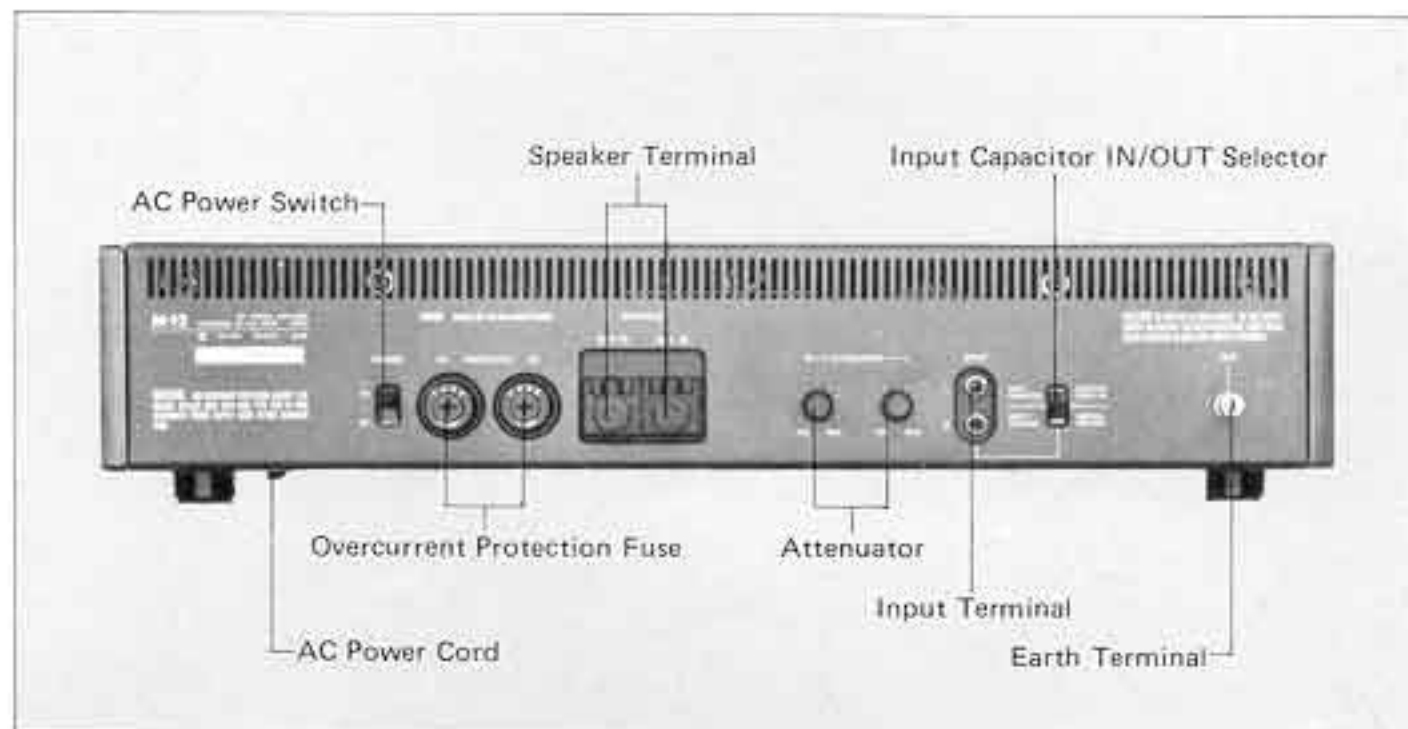
Perfect Independent Power Supply for Right and Left Channels:

In the power supply section, 2 large-sized toroidal power transformers are combined with 2

huge electrolytic capacitors (10,000 μ F x 2), and even the constant current power supply section is separated into right and left channels. Such a perfect independent power supply system eliminates mutual interference between right and left channels at the power supply section ensuring a stable power supply to all circuits of amplifier.

Special DML-IC and Strictly Selected Componentry:

To remedy DC drift - the only drawback of a DC amp, we developed the exclusive DML-IC and the drift was suppressed to a low level equalling that of conventional AC amps. Stringent selection is applied to all componentry employed, and needless to say, sonic excellence is always taken into account.



M-12 SPECIFICATIONS

Power Output:	80W minimum continuous per channel into 8-ohm loads, both channels driven at any frequency from 20Hz to 20,000Hz with no more than 0.006% total harmonic distortion.
Rated I.M.:	no more than 0.006% (8 ohms, 80W, 60Hz : 7kHz = 4 : 1)
Frequency Response:	DC - 100,000Hz (within -1dB)
Input Sensitivity:	600mV
Input Impedance:	20k ohms
Signal-to-Noise Ratio:	better than 110dB (IHF-A weighted, input short-circuited)
Channel Separation:	better than 80dB (20Hz - 30kHz)
Damping Factor:	150 (8 ohms, 1kHz)
Protection Circuits:	Speaker Protection Circuit by sensing DC drift, Overcurrent Protection Circuit.
Additional Features:	Input Capacitor IN/OUT Selector, Attenuator for both channels
Power Consumption:	320W (8 ohms, at maximum output) 400VA (CSA rated)
Dimensions:	436(W) x 328(D) x 95(H)mm (17-3/16" x 12-15/16" x 3-3/4")
Weight:	Net 14.5kgs (31.9 lbs.) Gross 16.5kgs (36.3 lbs.)

Specifications and appearance and design are subject to possible change without notice.

LUX CORPORATION, JAPAN

1-1, 1-CHOME, SHINSENRI-NISHIMACHI, TOYONAKA-SHI, OSAKA PHONE: 06-834-2222 CABLE: LUXELECT OSAKA TELEX: J63694

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