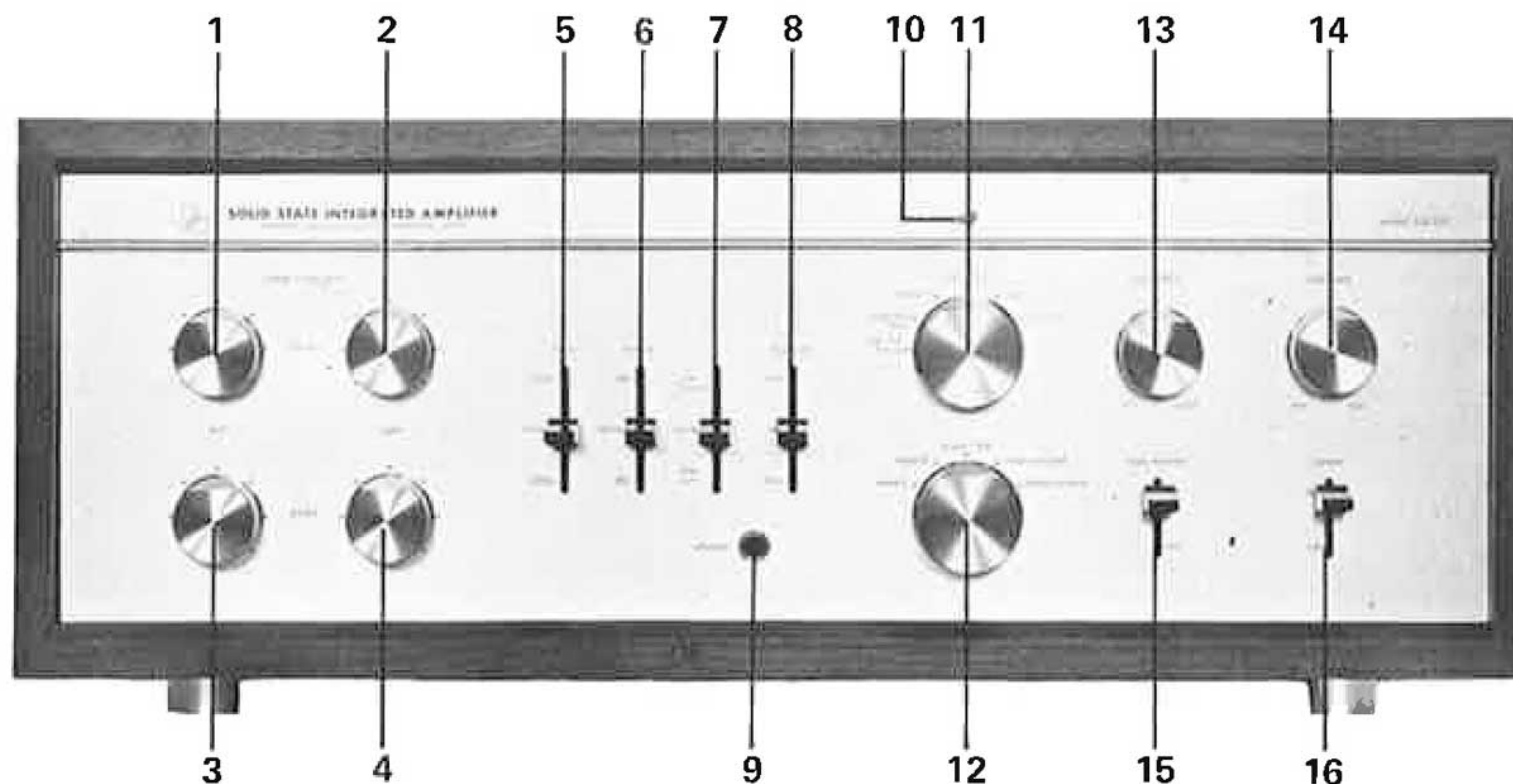


SQ1220 service manual

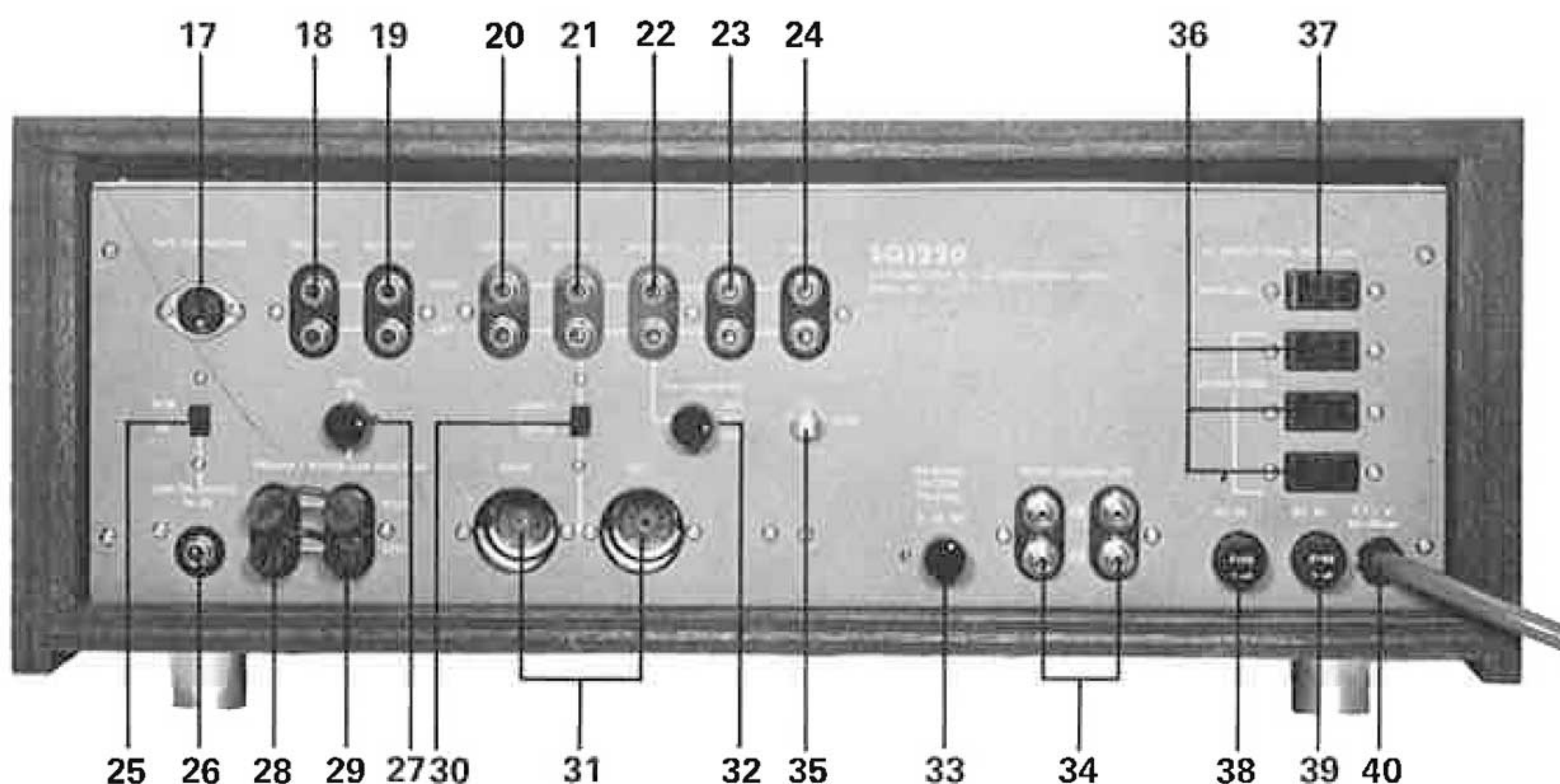
LUX CORPORATION



FRONT PANEL CONTROLS



REAR PANEL CONTROLS



- | | |
|---|---|
| 1.2. TREBLE CONTROLS (TREBLE) | 22. PHONOGRAPH INPUT CONNECTOR (PHONO-2) |
| 3.4. BASS CONTROLS (BASS) | 23. AUXILIARY INPUT CONNECTOR (AUX-1) |
| 5. BASS FREQUENCY SELECTOR (BASS CONTROL) | 24. AUXILIARY INPUT CONNECTOR (AUX-2) |
| 6. TREBLE FREQUENCY SELECTOR (TREBLE CONTROL) | 25. 3-D FILTER SELECTION SWITCH |
| 7. BASS BOOST. BASS CUT | 26. 3-D BASS FREQUENCY OUTPUT TERMINAL |
| 8. TREBLE CUT FILTER (HIGH CUT) | 27. MAIN AMP LEVEL SET |
| 9. HEADPHONE JACK (PHONES) | 28. PREAMP OUTPUT CONNECTOR |
| 10. PILOT LIGHT | 29. MAIN AMP INPUT CONNECTOR |
| 11. INPUT SELECTION SWITCH | 30. STEP-UP TRANSFORMER SELECTION SWITCH |
| 12. MODE SELECTOR (MODE) | 31. STEP-UP TRANSFORMER SOCKET |
| 13. BALANCE CONTROL (BALANCE) | 32. INPUT IMPEDANCE SELECTION SWITCH |
| 14. VOLUME CONTROL (VOLUME) | 33. DAMPING FACTOR CHANGEOVER SWITCH |
| 15. TAPE MONITOR SWITCH (tape monitor) | 34. OUTPUT LOAD CONNECTORS (right-SPEAKER-left) |
| 16. POWER SWITCH (power) | 35. EARTH TERMINAL (GND) |
| 17. TAPE CONNECTOR (TAPE CONNECTOR) | 36. EXTRA AC POWER OUTLETS (UNSWITCHED) |
| 18. RECORDING OUTPUT CONNECTOR (REC OUT) | 37. CONVENIENCE AC POWER OUTLET (SWITCHED) |
| 19. TAPE MONITOR INPUT CONNECTOR (MONITOR) | 38. FUSE HOLDER (AC) |
| 20. TAPE HEAD INPUT CONNECTOR (TAPE HEAD) | 39. FUSE HOLDER (DC) |
| 21. PHONOGRAPH INPUT CONNECTOR (PHONO-1) | 40. AC POWER CORD |

CIRCUIT DESCRIPTION

POWER SUPPLY

- Power supply for main amp.** The power supply consists of two parts designed for supply of power to the main amplifier and the preamplifier respectively. For the main amplifier driven by a high current load, silicon diodes D_1 , D_2 (DS13B) are used. Zero load voltage obtained by the full wave rectification is 80V. (B_1).
- Power supply for other than main amp.** Power sources other than for the power amplifier are obtainable by D_3 (IS 558) with the half wave rectification circuit. Supply voltage values at each section are: equalizer stage; 15V. (B_4), tone control stage and emitter-follower stages; 22V (B_3) and 3D filter circuit; 20V (B_5).

PREAMPLIFIER

- Equalizer** The preamplifier consists of an equalizer, an intermediate amplifier, a tone control, an emitter-follower, and an annexed circuit of 3D filter. The amplifier is so designed that the preamplifier section can be isolated from the power amplifier section if exclusive use of the preamplifier is desired. Preamplifier output signals can be taken out from the PRE OUT terminals (No.28). The equalizer adopts the NF circuitry using two silicon transistors, 2SC 693 GU (Q_{101} , Q_{102} , Q_{101} , Q_{102} ,) per channel and is designed to provide proper equalizations on input signal from various sources (PHONO-RIAA, TAPE HEAD - NARTB, 19cm/sec, 9.5cm/sec). The selection of matching equalization circuit can be made by the rotary switch S_1 provided on the front panel of this amplifier. Major circuits to constitute the equalizer are integrated in the printed circuit boards PB611 (respectively for the right and left channels) which are directly coupled with the above rotary switch (S_1). Input signals given through the AUX-1 or AUX-2 terminals bypass the equalizer and are fed directly to the later stages of this amplifier.
- Intermediate amplifier** Controls arranged after the equalizer are; REC OUT CONNECTOR, TAPE MONITOR SWITCH, MODE SELECTOR, BALANCE CONTROL, and VOLUME CONTROL. The intermediate amplifier consisting of Q_{201} , Q_{203} , (Q_{202} , Q_{204}) is a flat amplifier adopting 2-stage NF circuitry which is designed to boost the equalizer or AUX. output to sufficiently cover the insertion loss by the tone control in the next stage and lead low impedance output to the tone control for its smooth function. The tone control adopts the CB circuit of transistors, Q_{205} , Q_{207} (Q_{206} , Q_{208}). Any desired frequency responses are adjusted by the following controls: Variable resistors, VR_{3a} , VR_{3b} , lever switches, S_{4a} , S_{4b} (BASS), and variable resistors, VR_{4a} , VR_{4b} , lever switches, S_{5a} , S_{6b} (TREBLE).
- Tone control** Major components of the intermediate amplifier and the tone control are arranged on a printed circuit board PB 615 common to both channels, which is, together with necessary adjustors (switches and resistors), directly fixed onto the front sub-panel.
- After the tone control stage the switches S_{7a} , S_{7b} , S_{6a} , S_{6b} , for the high and low cut filters, and the variable resistor for volume control are provided.
- Volume control** The volume control having the coaxial shaft with what is provided after the equalizer stage for completely coupled movement, is intended to reduce residual noises to the irreducibly minimum level without impairing the overload characteristics.
- Emitter follower** Then the emitter-follower is provided for the both channels consisting of transistors, Q_{301} , Q_{302} which are arranged on the common printed circuit board, PB618. This circuit is necessary because the preamplifier output should be taken out in low impedance so that the preamplifier can be used independently.

3-D filter In this amplifier, the filter for 3-dimension stereophonic playback system (for details refer to the operating manual for this amplifier) is incorporated as an accessory circuit. (Cut-off characteristic; 12dB/oct., crossover frequency; 100Hz). The low pass filter with transistor Q_{403} for the center channel, and the high pass filters for the both channels with transistors Q_{401} , Q_{402} constitute the filter circuitry which are arranged on the common printed circuit board PB613.

MAIN AMPLIFIER

The main amplifier adopts SEPP OTL (single ended push-pull output transformerless) circuitry, which consists of the heat sink with high output power transistors, Q_1 , Q_2 , Q_3 , Q_4 (B-170008) (2 transistors per channel), the two printed circuit boards, PB621 (one each for the both channel) with several component parts designed to drive the above power transistors and so on, high capacity coupling capacitors C_{32} , C_{33} (C_{34} , C_{35}).

Power transistors

Q_1 , Q_3 and Q_2 , Q_4 are independently fixed to the heat sink by means of 7-pin lead sockets. Therefore in case necessity for replacement of the power transistors arises, replacement of this entire bloc is also feasible.

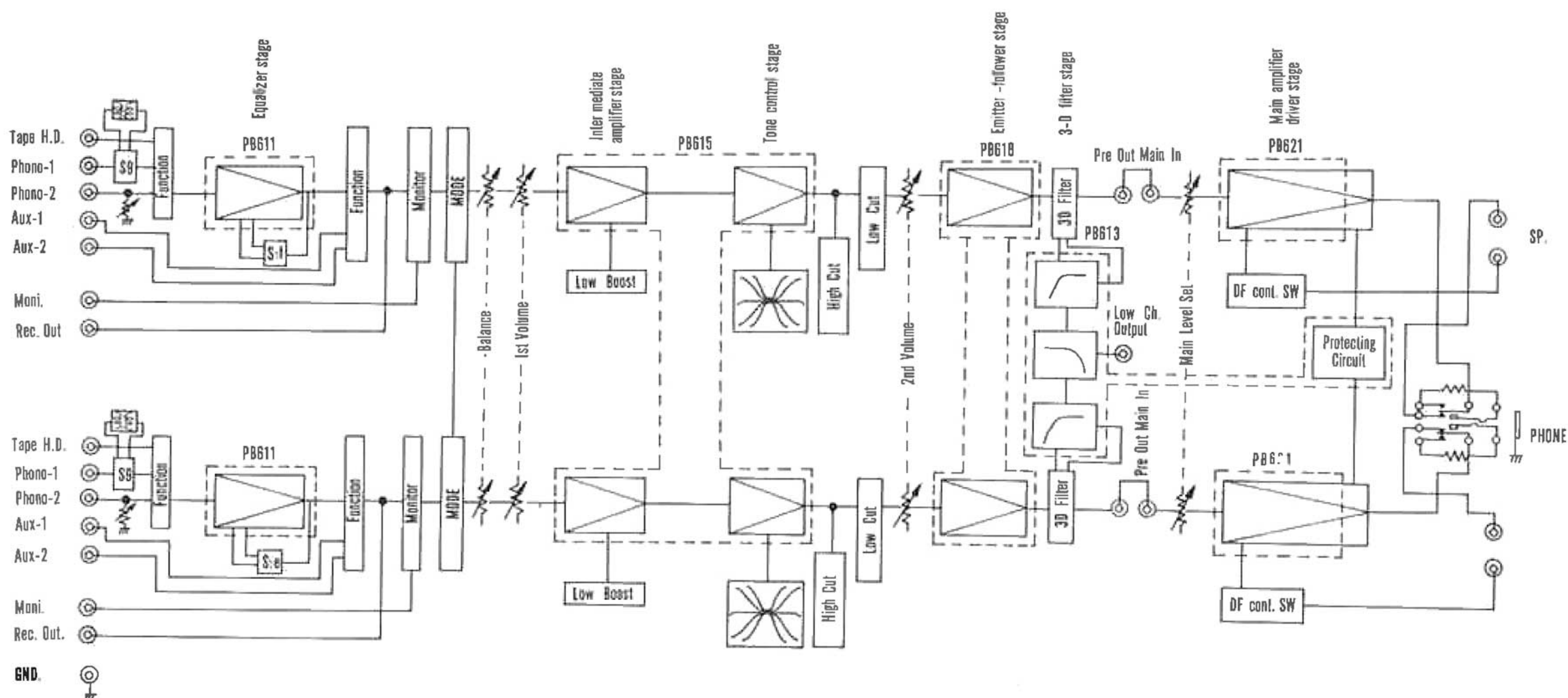
Other transistors (printed circuit board PB621)

The printed circuit boards, PB621 consist of the first stage transistors, Q_{501} (Q_{501}'), the pre-driver transistors, Q_{502} , Q_{502}' , and the transistors, Q_{503} , Q_{504} (Q_{503}' , Q_{504}') connected with the power transistors by the complementary Darlington system. These printed circuit boards are fixed by exclusive use connectors for easy replacement or repair of the bloc.

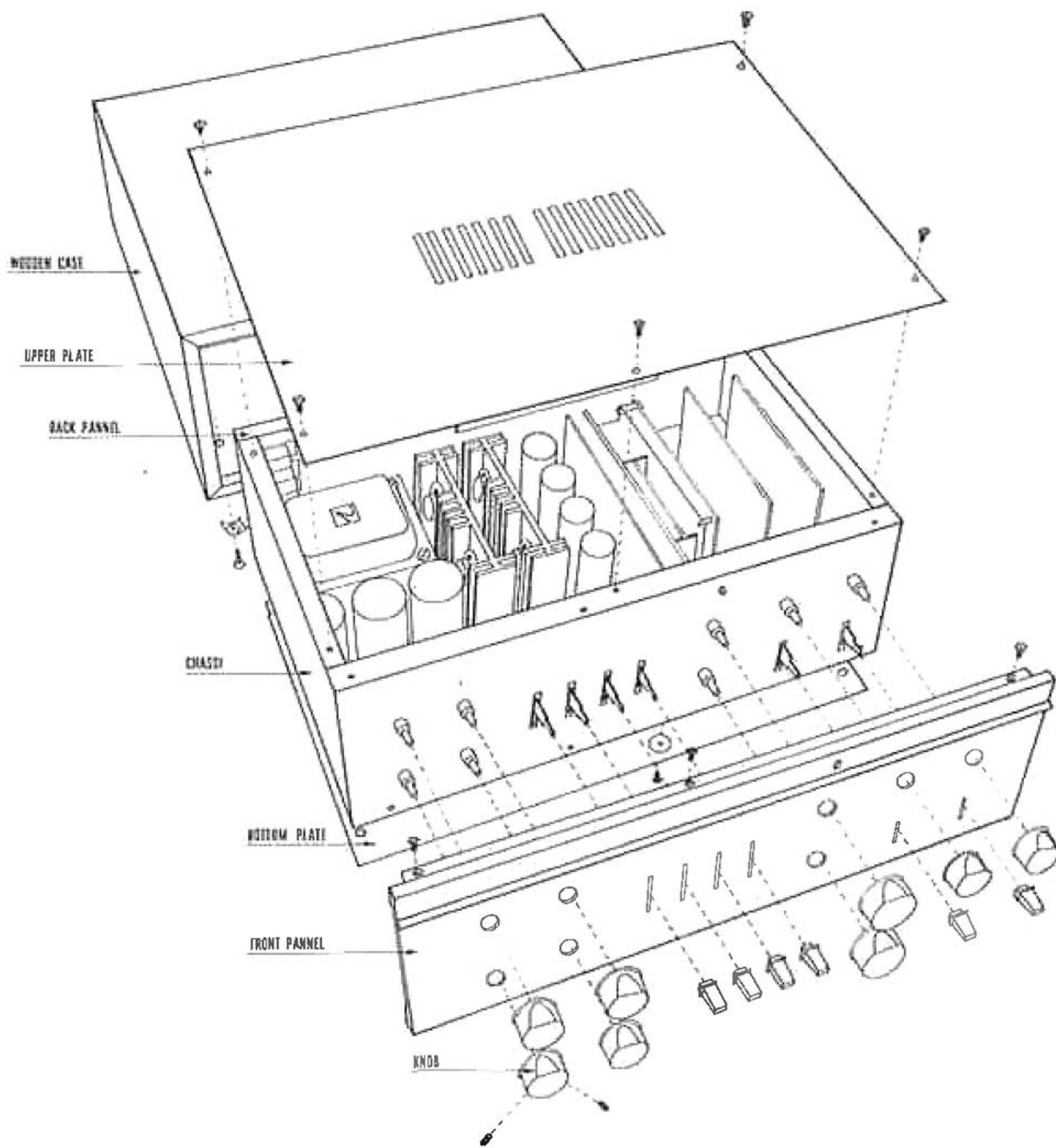
Protective circuit

The printed circuit board, PB613 is equipped with, besides the 3D filter circuit, the protective circuit to protect the transistors from breakdown trouble caused by short circuit at the output circuit and its resulting overloading. This protective circuit picks up such abnormal current load through the resistors, R_{73} (R_{74}) for the power transistor emitters and instantly cuts off the function of the main amplifier first stage by means of the SCR (silicon controlled rectifier).

POWER CIRCUIT

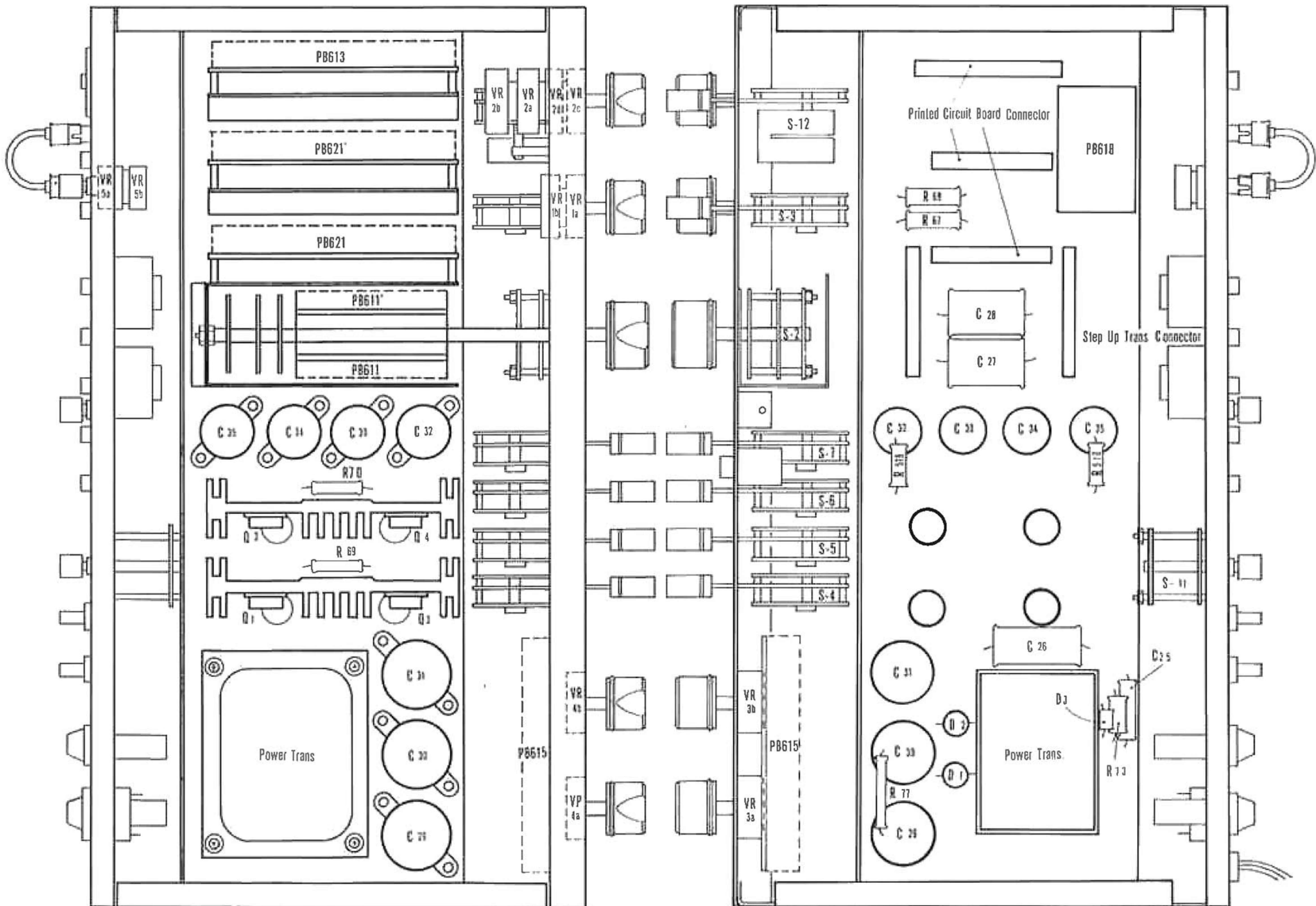


CABINET DISASSEMBLY

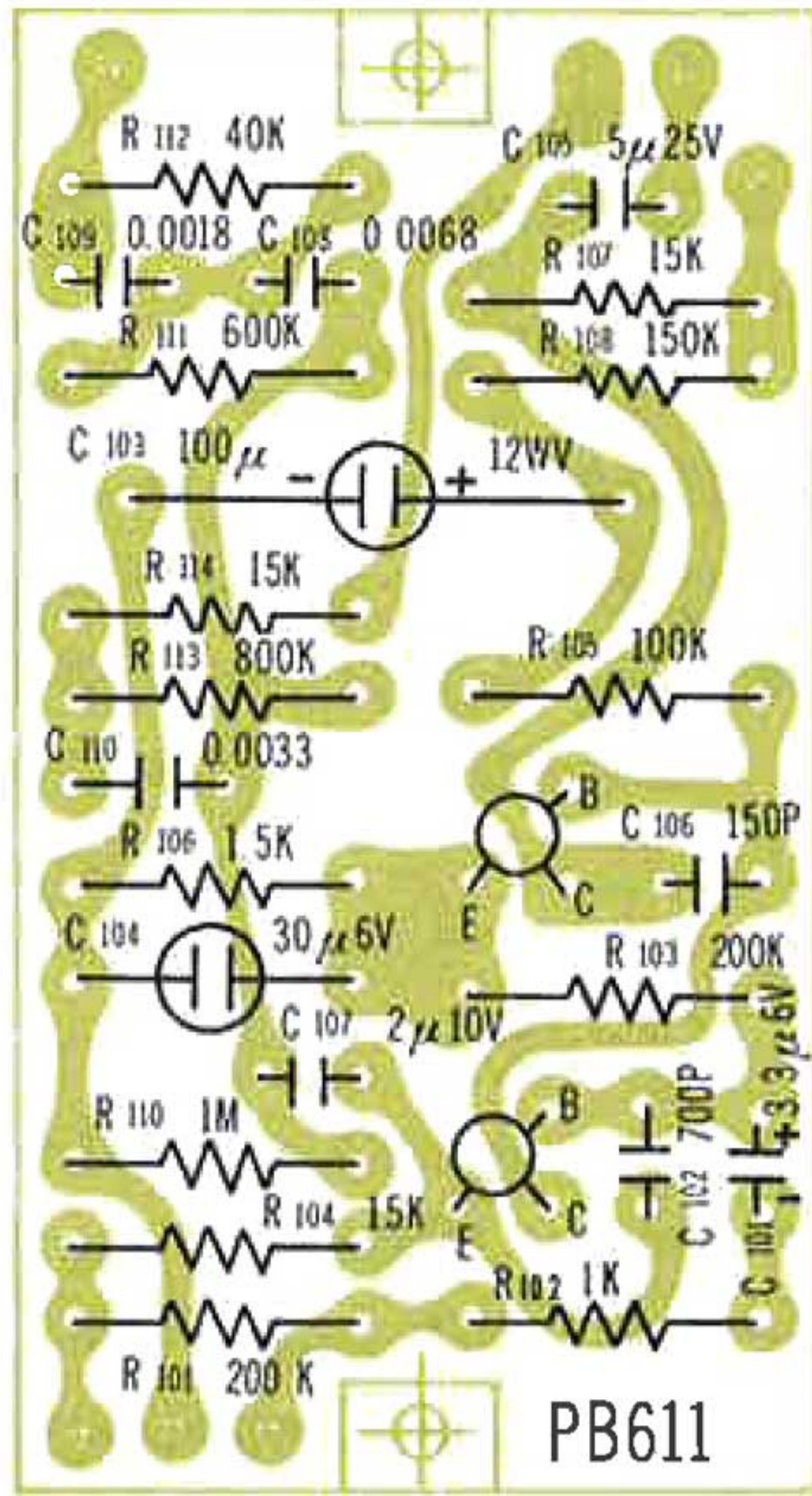


CHASSIS LAYOUT (TOP)

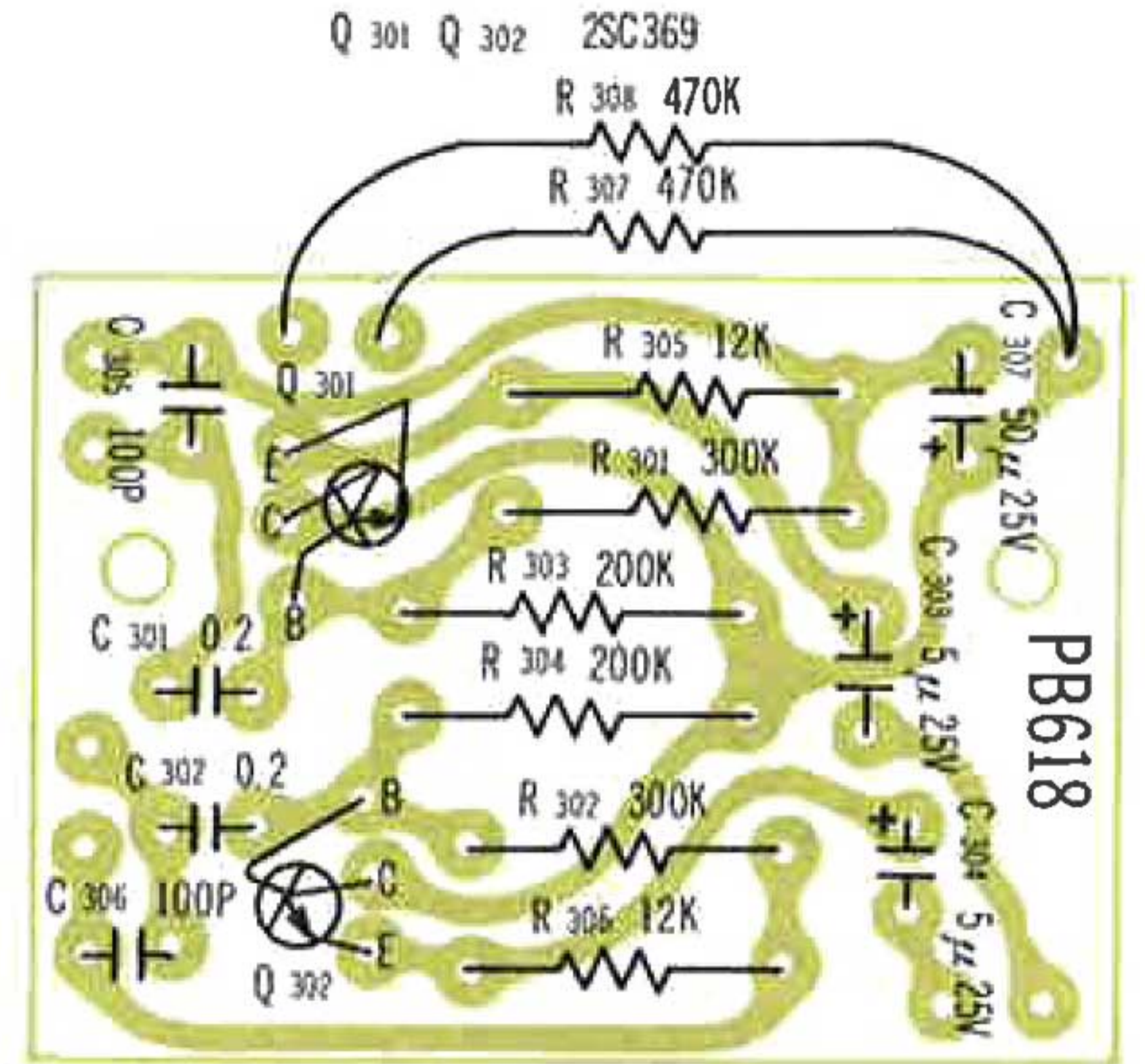
CHASSIS LAYOUT (BOTTOM)



EQUALIZER BOARD

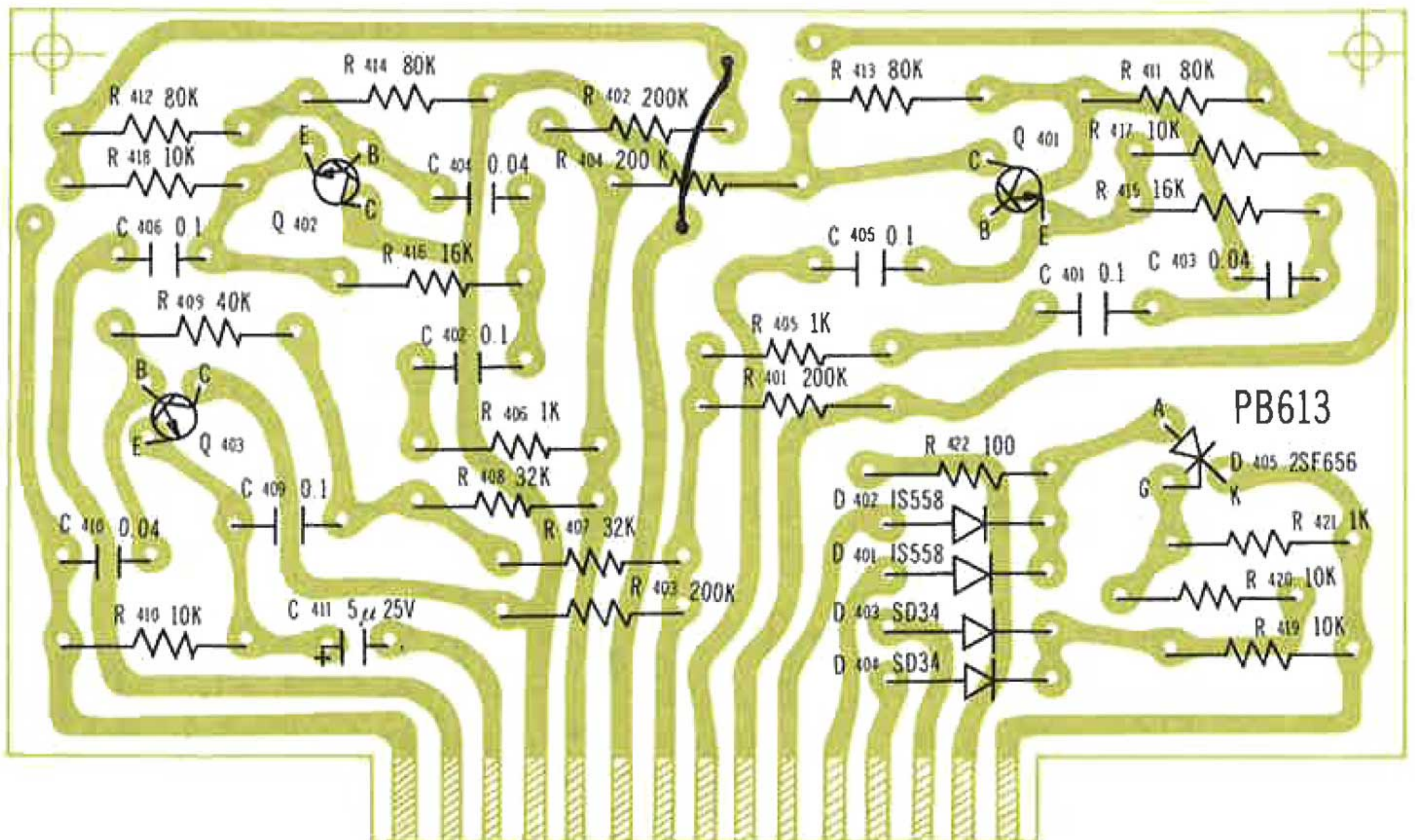


EMITTER FOLLOWER BOARD



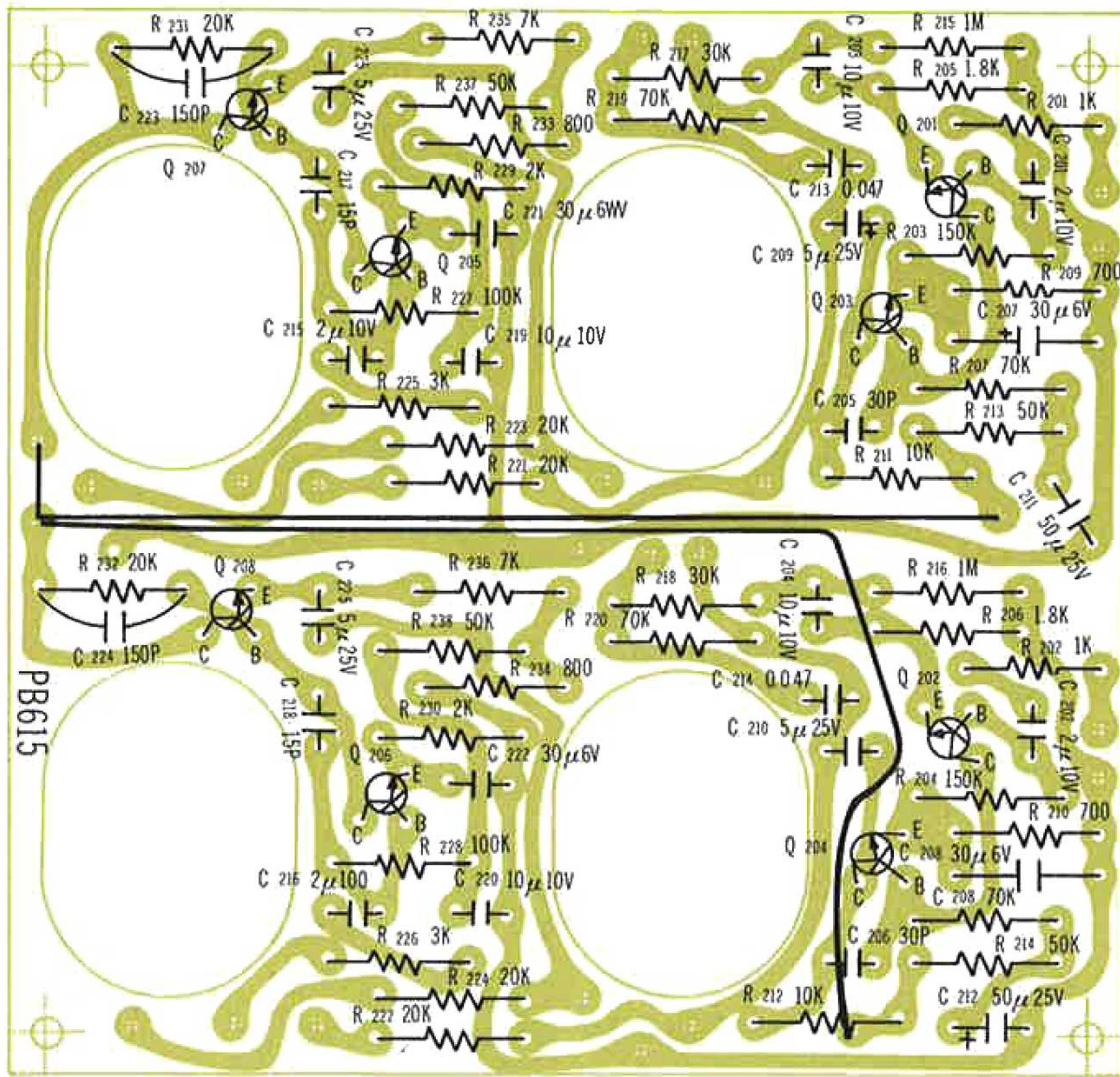
PROTECTIVE CIRCUIT & 3-D FILTER BOARD

Q 401 , Q 402 , Q 403 2SC373



IF AMPLIFIER & TONE CONTROL BOARD

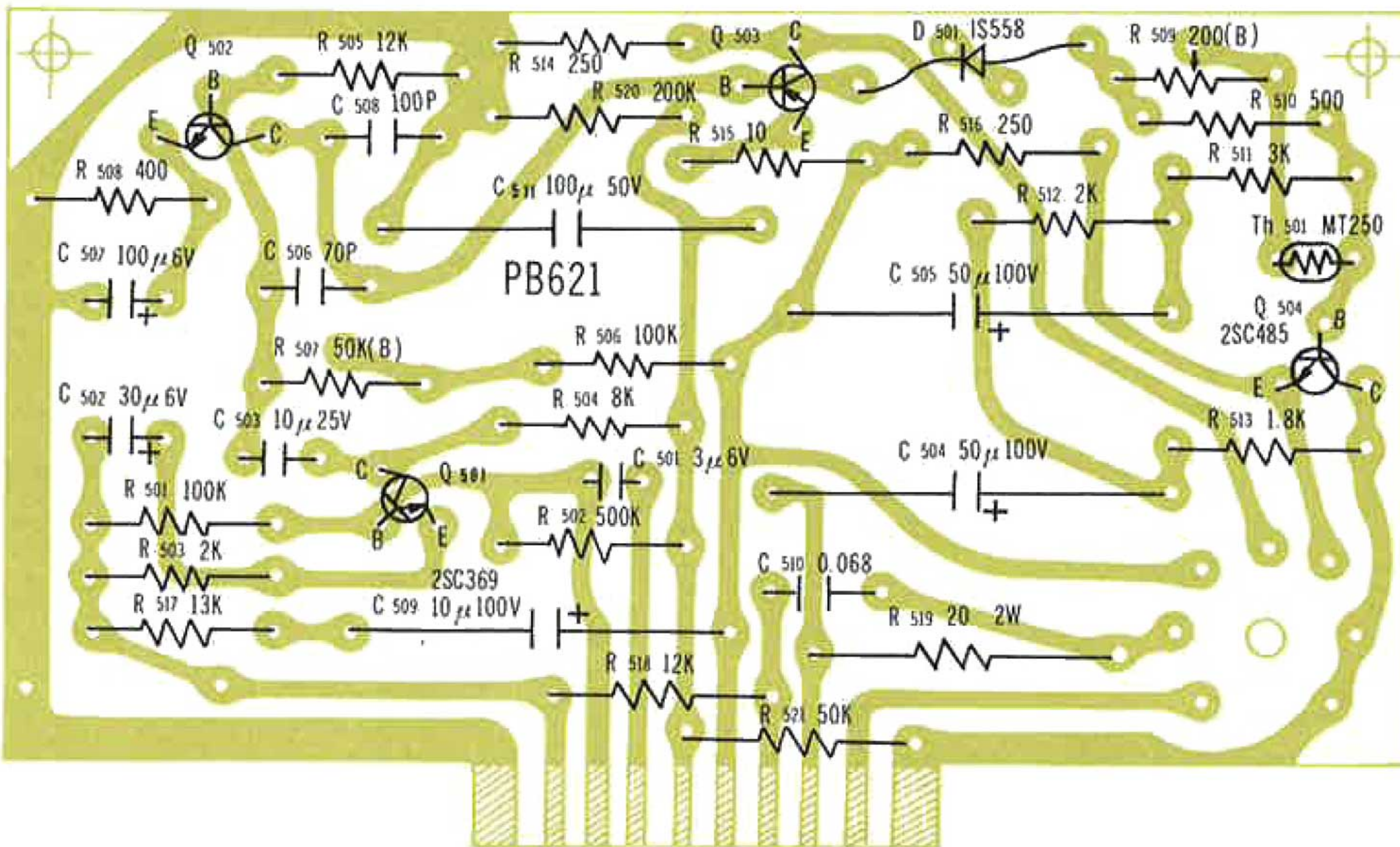
Q 201~8 2SC369



MAIN AMPLIFIER BOARD

2SC627

2N4036



TROUBLESHOOTINGS AND MEASURES

Symptoms	Causes	Measures
1. Pilot lamp does not light	<ol style="list-style-type: none"> 1. Defective AC power connector 2. Defective power switch(S₁₂) 3. Cut-off of AC fuse 	<ol style="list-style-type: none"> 1. Replace or repair 2. Replace or repair 3. Replace
2. Pilot lamp remains lighted even when power switch is off	<ol style="list-style-type: none"> 1. Welding of power switch(S₁₂) contacts (owing to abnormal high current load) 2. Short-circuit on shock prevention condenser(C₂₃) 	<ol style="list-style-type: none"> 1. Replace 2. Replace
3. No output signals	<ol style="list-style-type: none"> 1. Disorder in power supply circuit, cut-off of rectifier diodes, D₁, D₂, D₃, etc. 2. Blow-out of DC fuse 3. Break-down of power transistor (or driver transistor) 4. Failure on other components, such as switches (defective contacts), faulty wiring (for example poor withstand voltage on circuit stabilizer condenser, C₅₀₆, C_{506'}), short circuit of earth lead of shielded cable on signal circuit, etc. 5. Misuse of amplifier <ol style="list-style-type: none"> i. PRE-OUT & MAIN-IN connectors are not properly linked by connection cord provided. ii. FUNCTION SWITCH not selected at proper position 	<ol style="list-style-type: none"> 1. Check and correct 2. Replace DC fuse. Caution, however, if blowout takes place even after fuse replacement, thorough check on causes inducing such fuse blow-out. 3. Replace. In this case DC fuse may have been blown out too. 4. Check and correct. In some cases, playback from one of the both channels is possible. <ol style="list-style-type: none"> i. Provide firm connection ii. Correct.

	<ul style="list-style-type: none"> iii. MONITOR SWITCH (S_3) is on. iv. Incomplete speaker cords connection. v. Failure on program source equipment, such as record player, tuner, tape recorder, etc. 	<ul style="list-style-type: none"> iii. Off the switch. iv. Correct the connection. v. Repair such malfunctioning program source equipment.
<p>4. Tone quality is abnormal</p>	<ul style="list-style-type: none"> 1. Considerable distortion <ul style="list-style-type: none"> i. Abnormal functioning of transistors ii. Oscillation ... specifications of components parts, such as coupling condensers, deviate from rated specified values. Layout of earth lead is not correctly made, etc. iii. Distortion caused by external audio components 2. Unbalanced volume <ul style="list-style-type: none"> i. Error in coupling movement between variable resistor VR_2 for volume control and variable resistor VR_5 for level set. ii. Drop out of negative feed back circuit in one of the channels, such as defective condenser C_{203}, etc. iii. Incomplete switch contacts, etc. iv. Defects of other component parts. Unbalance with external audio components. 3. Inferior frequency response <ul style="list-style-type: none"> i. Defective coupling condensers ii. Defective condenser in tone control circuit. iii. Excessive length of shielded cable for connection with external audio components. iv. 3D filter switch (S_{10}) is on. 4. Excessive cross-talk 	<ul style="list-style-type: none"> i. Check for specified load voltages. ii. Replace or repair. iii. Correct such distortion source. i. Correct such error ii. Replace defective parts. iii. Replace or correct. iv. Check and correct. i. Check and replace. ii. Check and replace. iii. Shorten the length. iv. Switch off the switch.

	<p>i. Layout of components parts too close each other -- abnormal.</p> <p>ii. Oscillation is caused.</p> <p>iii. Setting of DF control switch S₁₁ at DF₁₀ DF₂ position with common connection of speaker leads in negative side.</p> <p>5. Noises.</p> <p>i. Hum Very frequently, causes of hum pick-up consist in external program source equipment (such as record player). If hum is caused even after disconnection of input connectors from program sources, then the amplifier should be checked -- Cut-off or defect of capacitors, C₂₉, C₃₀, C₃₁ in power supply circuit, or one of the rectifier diodes, D₁ or D₂. Also, hum induction from AC leads because of incorrect wiring.</p> <p>2. Irregular noises</p> <p>i. Noise figure of transistor is deteriorated.</p> <p>ii. Capacitance of input condensers at any stage deviates from specified values.</p> <p>iii. Noise from resistors</p> <p>3. Noises in case of switch selection. Leak. current of coupling condenser exceeds the limit.</p>	<p>i. Correct the parts layout (refer to parts Layout Diagrams in this Service Manual).</p> <p>ii. Check and correct.</p> <p>iii. Isolate the connection in the negative side.</p> <p>i. Replace.</p> <p>ii. Check and replace.</p> <p>iii. Check and replace.</p> <p>3. Replace.</p>
6. Operation of protective circuit	<p>1. Causes at output loads side. When special low impedance speakers such as electro-static speakers are used, or when multiple numbers of speakers are</p>	<p>1. In such cases, it is recommended to insert, resistors(say 2Ω 5W) in series to speaker leads.</p>

connected in parallel, the amplifier is driven under rigorous operating conditions. This therefore frequently causes to operate the protective circuit.

2. Errors in use.

If the amplifier is operated while output loads are accidentally short circuited, the protective circuit functions.

3. Presetting of the protective circuit operation is incorrect -- specifications of SCR, capacitors, resistors, etc. in the protective circuit deviate from the specified values.

2. Thoroughly check output terminals, speaker leads to eliminate such short circuiting.

3. Check, replace or correct.

PARTS LIST

REF. No.	PARTS NAME	RATING	REMARK
RESISTORS			
1	R101 R101'	RT 1/4 SG 200K	200Kohms Low Noise
2	R102 R102'	RT 1/4 SG 1K	1Kohms Low Noise
3	R103 R103'	RT 1/4 SG 200K	200Kohms Low Noise
4	R104 R104'	RT 1/4 SG 1.5K	1.5Kohms Low Noise
5	R105 R105'	RT 1/4 SG 100K	100Kohms Low Noise
6	R106 R106'	RT 1/4 AG 1.5K	1.5Kohms
7	R107 R107'	RT 1/4 AG 15K	15Kohms
8	R108 R108'	RT 1/4 AG 150K	150Kohms
9	R109 R109'	RT 1/4 AG 500K	500Kohms
10	R110 R110'	RT 1/4 AG 1M	1M ohm
11	R111 R111'	RT 1/4 AG 600K	600Kohms
12	R112 R112'	RT 1/4 AG 40K	40Kohms
13	R113 R113'	RT 1/4 AG 800K	800Kohms
14	R114 R114'	RT 1/4 AG 15K	15Kohms
15	R201 R202'	RT 1/4 SG 1K	1Kohm Low Noise
16	R203 R204'	RT 1/4 AG 150K	150Kohms
17	R205 R206'	RT 1/4 SG 1.8K	1.8Kohms Low Noise
18	R207 R208'	RT 1/4 SG 70K	70Kohms Low Noise
19	R209 R210'	RT 1/4 AG 700	700 ohms
20	R211 R212'	RT 1/4 AG 10K	10Kohms
21	R213 R214'	RT 1/4 AG 50K	50Kohms
22	R215 R216'	RT 1/4 AG 1M	1M ohm
23	R217 R218'	RT 1/4 AG 30K	30Kohms
24	R219 R220'	RT 1/4 AG 70K	70Kohms
25	R221 R222'	RT 1/4 AG 20K	20Kohms
26	R223 R224'	RT 1/4 AG 20K	20Kohms
27	R225 R226'	RT 1/4 AG 3K	3Kohms
28	R227 R228'	RT 1/4 AG 100K	100Kohms
29	R229 R230'	RT 1/4 AG 2K	2Kohms
30	R231 R232'	RT 1/4 AG 20K	20Kohms
31	R233 R234'	RT 1/4 AG 800	800 ohms
32	R235 R236'	RT 1/4 AG 7K	7Kohms
33	R237 R238'	RT 1/4 AG 50K	50Kohms
34	R301 R302'	RT 1/4 AG 10K	10Kohms
35	R303 R304'	RT 1/4 AG 200K	200Kohms
36	R305 R306'	RT 1/4 AG 12K	12Kohms
37	R307 R308'	RT 1/4 AG 470K	470Kohms
38	R401 R402'	RT 1/4 AG 200K	200Kohms
39	R403 R404'	RT 1/4 AG 200K	200Kohms
40	R405 R406'	RT 1/4 AG 1K	1Kohm
41	R407 R408'	RT 1/4 AG 32K	32Kohms
42	R409	RT 1/4 AG 40K	40Kohms
43	R410	RT 1/4 AG 10K	10Kohms
44	R411 R412'	RT 1/4 AG 80K	80Kohms
45	R413 R414'	RT 1/4 AG 80K	80Kohms
46	R415 R416'	RT 1/4 AG 16K	16Kohms
47	R417 R418'	RT 1/4 AG 10K	10Kohms
48	R R419	RT 1/4 AG 10K	10Kohms
49	R420	RT 1/4 AG 10K	10Kohms
50	R R421	RT 1/4 AG 1K	1Kohm
51	R501 R501'	RT 1/4 AG 100K	100Kohms
52	R502 R502'	RT 1/4 AG 500K	500Kohms

53	R503	R503'	RT 1/4 AG 2K	2Kohms	
54	R504	R504'	RT 1/4 AG 8K	8Kohms	
55	R505	R505'	RT 1/4 AG 12K	12Kohms	
56	R506	R506'	RT 1/4 AG 100K	100Kohms	
57	R507	R507'	V18K-2(4US) 50KB	50Kohms	Semi-fixed variable resistor
58	R508	R508'	RT 1/4 AG 400	400 ohms	
59	R509	R509'	V18K3-2(4US) 200B	200 ohms	Semi-fixed variable resistor
60	R510	R510'	RT 1/4 AG 500	500 ohms	
61	R511	R511'	RT 1/4 AG 3K	3Kohms	
62	R512	R512'	RT 1/4 AG 2K	2Kohms	
63	R513	R513'	RT 1/4 AG 1.8K	1.8Kohms	
64	R514	R514'	RT 1/4 AG 250	250 ohms	
65	R515	R515'	RT 1/4 AG 10	10 ohms	
66	R516	R516'	RT 1/4 AG 250	250 ohms	
67	R517	R517'	RT 1/4 AG 13K	13Kohms	
68	R518	R518'	RT 2 AG 20	20 ohms - 2W	
69	R519	R519'	RT 1/4 AG 12K	12Kohms	
70	R520	R520'	RT 1/4 AG 200K	200Kohms	Parallel connection, 100Kohms x 2
71	R1	R2	RT 1/4 AG 100K	100Kohms	
72	R3	R4	RT 1/4 AG 50K	50Kohms	
73	R5	R6	RT 1/4 AG 100K	100Kohms	
74	R7	R8	RT 1/4 AG 20K	20Kohms	
75	R9	R10	RT 1/4 AG 90K	90Kohms	
76	R11	R12	RT 1/4 AG 15K	15Kohms	
77	R13	R14	RT 1/4 AG 100	100 ohms	
78	R15	R16	RT 1/4 AG 12K	12Kohms	
79	R17	R18	RT 1/4 AG 70K	70Kohms	
80	R19	R20	RT 1/4 AG 150K	150Kohms	
81	R21	R22	RT 1/4 AG 150K	150Kohms	
82	R23	R24	RT 1/4 AG 40K	40Kohms	
83	R25	R26	RT 1/4 AG 10K	10Kohms	
84	R27	R28	RT 1/4 AG 3K	3Kohms	
85	R29	R30	RT 1/4 AG 3K	3Kohms	
86	R31	R32	RT 1/4 AG 2K	2Kohms	
87	R33	R34	RT 1/4 AG 500	500 ohms	
88	R35	R36	RT 1/4 AG 2.4K	2.4Kohms	
89	R37	R38	RT 1/4 AG 500K	500Kohms	
90	R39	R40	RT 1/4 AG 50K	50Kohms	
91	R41	R42	RT 1/4 AG 10K	10Kohms	
92	R43	R44	RT 1/4 AG 400K	400Kohms	
93	R45	R46	RT 1/4 AG 1M	1M ohms	
94	R47	R48	RT 1/4 AG 1M	1M ohm	
95	R49	R	RT 1/4 AG 1M	1M ohm	
96	R51	R52	RT 1/4 AG 3K	3Kohms	
97	R53	R54	RT 1/4 AG 600	600 ohms	
98	R55	R56	RT 1/4 AG 250	250 ohms	
99	R57	R58	WI - 0.2	0.2 ohms - 1W	Wire wound resistor
100	R59	R60		0.05 ohms	DC resistance at lead wire
101	R61	R62	RT 1/4 AG 500	500 ohms	
102	R63	R64	RT 1 AG 1K	1Kohm - 1W	
103	R65	R66	RT 1 AG 500	500 ohms - 1W	
104	R67	R68	W2 - 1	1 ohm - 2W	Wire wound resistor
105	R69	R70	W2 - 1	1 ohm - 2W	Wire wound resistor
106	R71	R72	RT 1/4 AG 5K	5Kohms	
107		R73	RT 1 AG 1K	1Kohm - 1W	
108		R74	RT 1/4 AG 600	600 ohms	

109	R75	RT 1/4 AG 8K	8Kohms	
110	R76	RT 1/4 AG 400	400 ohms	
111	R77	W5 - 5	5Kohms - 5W	
112	R422	RT 1/4 AG 100	100 ohms	
113	R521 R521'	RT 1/4 AG 50K	50Kohms	Parallel connection, 25Kohms
114				
115				

CAPACITORS

116	C101 C101'	6TU - 3.3	3.3 mfd	6v	
117	C102 C102'	DT 204 - 700	700 pfd		
118	C103 C103'	12E - 100	100 mf	12v	
119	C104 C104'	6E - 10	10 mfd	6v	
120	C105 C105'	25U - 5	5 mfd	25v	
121	C106 C106'	OT 204 - 150	150 pfd		
122	C107 C107'	10U - 2	2 mfd	10v	
123	C108 C108'	MFL 05 D 68(K)	0.0068 mfd		
124	C109 C109'	MFL 05 D 18(K)	0.0018 mfd		
125	C110 C110'	MFL 05 D 33(K)	0.0033 mfd		
126	C201 C202	10E - 2	2 mfd	10v	
127	C203 C204	10U - 10	10 mfd	10v	
128	C205 C206	DT204 - 30	30 pfd		
129	C207 C208	6U - 30	30 mfd	6v	
130	C209 C210	25U - 5	5 mfd	25v	
131	C211 C212	25U - 50	50 mfd	25v	
132	C213 C214	MFL 05 S 47(K)	0.047 mfd		
133	C215 C216	10U - 2	2 mfd	10v	
134	C217 C218	DT204 - 15	15 pfd		
135	C219 C220	10U - 10	10 mfd	10v	
136	C221 C222	6U - 30	30 mfd	6v	
137	C223 C224	DT204 - 150	150 pfd		
138	C225 C226	25U - 5	5 mfd	25v	
139	C301 C302	MFL 0.5 P 22(M)	0.22 mfd		
140	C303 C304	25U - 5	5 mfd	25v	
141	C305 C306	DT204 - 100	100 pfd		
142	C307 C308	25U - 50	50 mfd	25v	
143	C401 C402	MFL 05 P 1(K)	0.1 mfd		
144	C403 C404	MFL 05 S 4(K)	0.04 mfd		
145	C405 C406	MFL 05 P 1(K)	0.1 mfd		
146	C C407	MFL 05 P 1(K)	0.1 mfd		
147	C408	MFL 05 S 4(K)	0.04 mfd		
148	C409	25U - 5	5 mf	25v	
149	C501 C501'	6U - 3 NP	3 mfd	6v	Non-polarized electrolytic capacitor
150	C502 C502'	6U - 30	30 mfd	6v	
151	C503 C503'	25U - 10 NP	10 mfd	25v	non-polarized electrolytic capacitor
152	C504 C504'	100E - 50	50 mfd	100v	
153	C505 C505'	100E - 50	50 mfd	100v	
154	C506 C506'	DT204 - 70	70 pfd		
155	C507 C507'	6U - 100	100 mfd	6v	
156	C508 C508'	DT204 - 100	100 pfd		
157	C509 C509'	100E - 10	10 mfd	100v	
158	C1 C2	MFL 05 P 33(M)	0.33 mfd		
159	C3 C4	MFL 05 D 18(K)	0.0018 mfd		
160	C5 C6	MFL 05 D 39(K)	0.0039 mfd		
161	C7 C8	MFL 05 S 39(K)	0.039 mfd		

162	C9	C10	MFL 05 S 18(K)	0.018 mfd	
163	C11	C12	MFL 05 S 15(K)	0.015 mfd	
164	C13	C14	MFL 05 D 68(K)	0.0068 mfd	
165	C15	C16	MFL 05 D 47(M)	0.47 mfd	
166	C17	C18	MFL 05 S 39(K)	0.039 mfd	
167	C19	C20	DT204 - 100	100 pfd	
168	C21	C22	DT204 - 50	50 pfd	
169		C23	PMA - E 104	0.1 mfd 400v	
170		C24	PMA - E 472	0.0047 mfd 400v	
171		C25	50E - 100	100 mfd - 50v	
172		C26	25E - 1000	1000 mfd 25v	
173		C27	25E - 1000	1000 mfd 25v	
174		C28	25E - 1000	1000 mfd 25v	
175	C29	C30 C31	100L - 500	500 mfd 100v	parallel connection, 500 mfd x 3=1500 mfd
176	C32	C33	75L - 500	500 mfd 75v	parallel connection, 500 mfd x 2=1000 mfd
177	C34	C35	75L - 500	500 mfd 75v	parallel connection, 500 mfd x 2=1000 mfd
178	C510	C510'	MFL 05 S 68(K)	0.068 mfd	
179	C511	C511'	50E - 100	100 mfd 50v	parallel connection, 100 mfd x 2=100 mfd
180	C36	C37	DT204 - 500	500 mfd	
181					
182					
183					
184					

SEMICONDUCTORS

185	Q101	Q101'	2SC 369	equalizer circuit	or 2SC693 GU
186	Q102	Q102'	2SC 369	equalizer circuit	or 2SC693 GU
187	Q201	Q202	2SC 369	intermediate amplification	or 2SC693 GU
188	Q203	Q204	2SC 369	intermediate amplification	or 2SC693 GU
189	Q205	Q206	2SC 369	tone control circuit	or 2SC693 GU
190	Q207	Q208	2SC 369	tone control circuit	or 2SC693 GU
191	Q301	Q302	2SC 369	emitter-follower circuit	or 2SC693 GU
192	Q401	Q402 Q403	2SC 373	3D filter circuit	or 2SC694 G
193	Q501	Q501'	2SC 369	main amplifier first stage	or 2SC693 GU
194	Q502	Q502	2SC 627	main amplifier predrivers	or 2SC826, 2SC485
195	Q503	Q503'	2N4036	main amplifier drivers	or 2SA485
196	Q504	Q504'	2SC 485	main amplifier drivers	or 2SC826, 2SC696A
197	Q1	Q2 Q3 Q4	B - 170008	power transistors	or 2SD118, ST615
198	D401	D402	IS 558	protective circuit	or DS 16B
199	D403	D404	SD 34	protective circuit	
200	D405		V 312 B	protective circuit	SCR or 2SF 656
201	D1	D2	DS - 13	power supply (main amp.)	
202	D3		IS 558	power supply (pre- amp.)	or DS 16B
203	D501	D502	IS 558	thermal cont.	or DS 16B
204					
205					
206					
207					

CONTROLS

208	S1	Y466	rotary switch	6-circuit, 6-contact
209	S2	F343	rotary switch	4-circuit, 5-contact
210	S3	LC-122B	rotary switch	4-circuit, 2-contact
211	S4	LC-123A	rotary switch	2-circuit, 3-contact
212	S5	LC-123A	rotary switch	2-circuit, 3-contact
213	S6	LC-143A	rotary switch	4-circuit, 3-contact
214	S7	LC-143A	rotary switch	4-circuit, 3-contact
215	S8	S18 - 123	rotary switch	2-circuit, 3-contact
216	S9	SL - 8	rotary switch	4-circuit, 2-contact
217	S10	SL - 8	rotary switch	4-circuit, 2-contact
218	S11	F 243	rotary switch	4-circuit, 3-contact
219	S12	LD - 2	rotary switch	2-circuit, 2-contact
220	VR1a VR1b	G24T2-1-100KA	variable resistors	100kohm A 100kohm C 2-gang
221	VR2a VR2b 2c 2d	G24T4-50KB	variable resistors	50Kohm B 4-gang
222	VR3a VR3b	V24N-100KB	variable resistors	100Kohm B
223	VR4a VR4b	V24N-50KB	variable resistors	50Kohm B
224	VR5a VR5b	V18T-50KB	variable resistors	50Kohm B 2-gang
225				
226				
227				
228				
229				
230				

MISCELLANEOUS

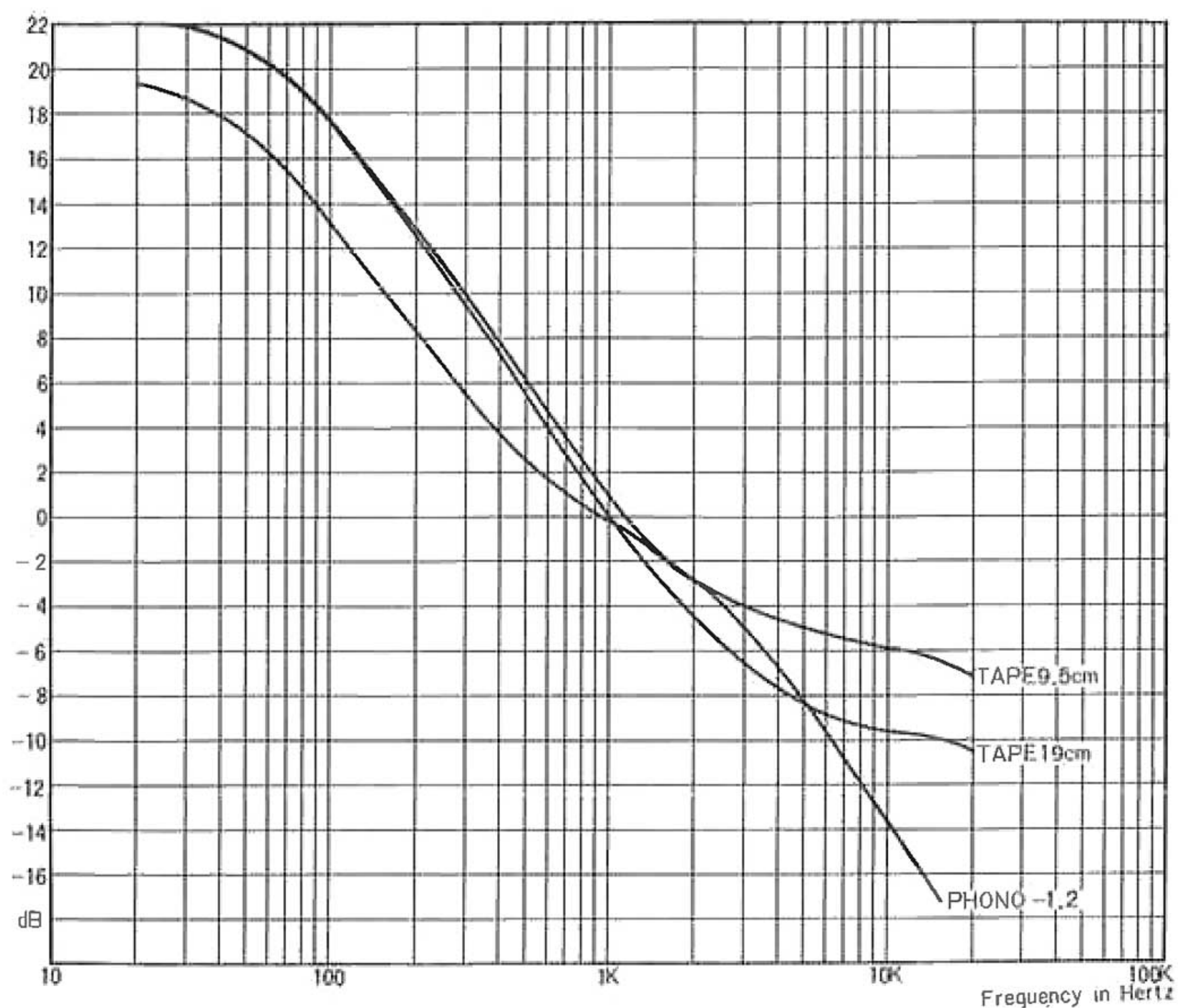
231		PB611	printed circuit board	for equalizer circuit
232		PB615	printed circuit board	for intermediate amp., tone control
233		PB613	printed circuit board	for 3D filter, protective circuit
234		PB621	printed circuit board	for main amp. driver
235		PB618	printed circuit board	for emitter-follower
236		S-1432	power transformer	
237	TH501 TH502	MT 25	thermister	
238		143-015-08	connector for printed circuit board	
239		143-010-08	connector for printed circuit board	
240			tape connector	5P
241			input terminals	10P
242			input terminals	4P
243			input terminals	5P
244			output terminals	4P
245		4-Type	fuse holder	
246			fuse	3A, 2A
247		345 Y	lead socket	9P
248			pilot light	6V
249		MLS1-75	heat sink	
250		NO 3230	AC bushing	
251		#530	AC connector	250V 6A
252		SG8300	phone jack	
253				

THE LUX SQ1220 AMPLIFIER SPECIFICATIONS & CHARACTERISTICS

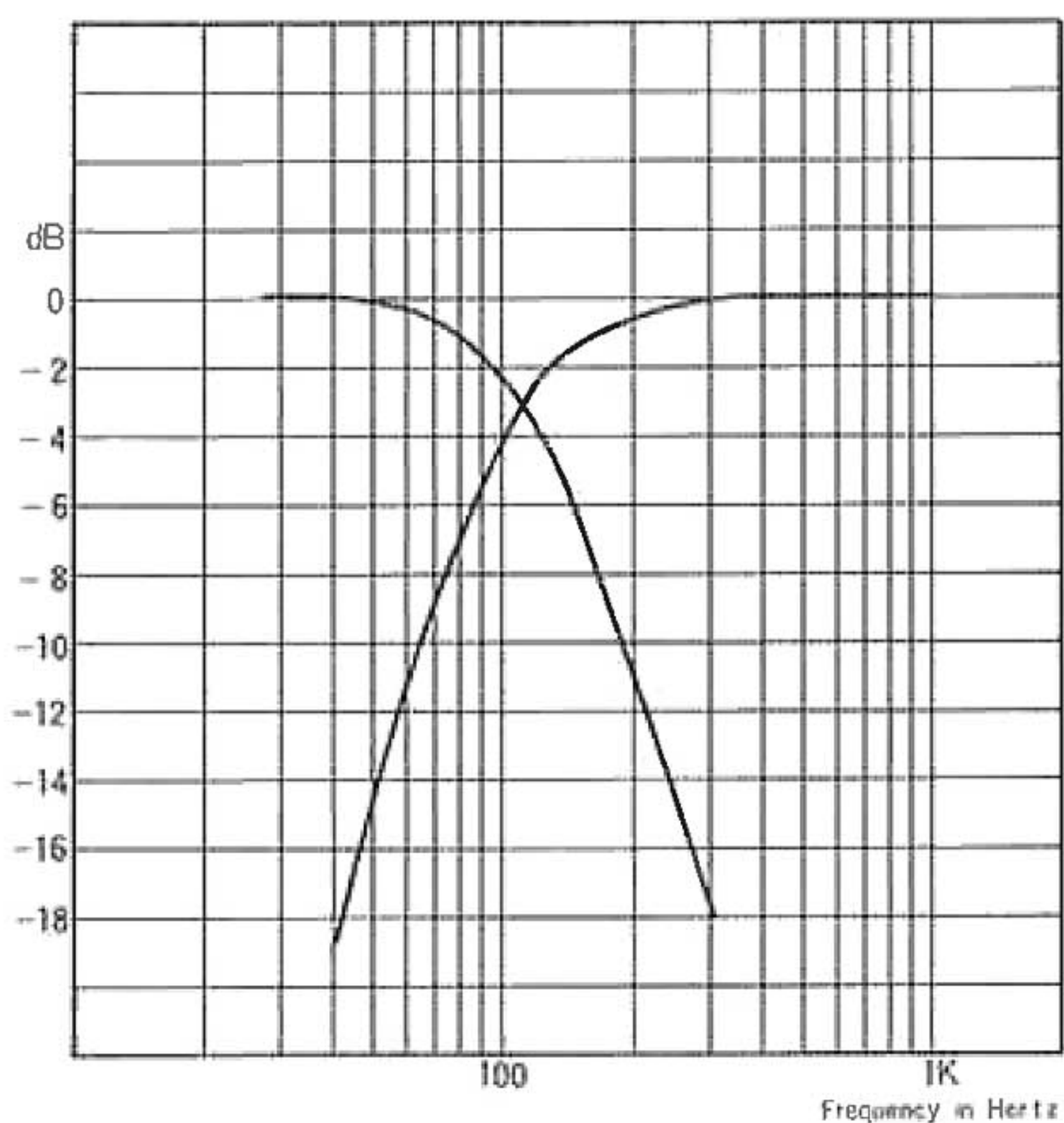
specifications

Type:	Semicomplementary, single ended push pull OTL (output transformerless), all silicon transistor stereophonic integrated amplifier.	
Transistors & Diodes:	B170008 (or B170007) x 4, 2N4036 x 2, 2SC485 x 2, 2SC627 x 2, 2SC373 x 3, 2SC369 x 16, DS-13 x 2, IS-558 x 5, SD-34 x 4, 2SF-656 (SCR) x 1 (total 29 transistors, 9 diodes and 1 SCR)	
Main Amp Section:		
RMS:	70 watts (35wpc); 16ohms, 100 watts (50wpc); 8ohms	
Music Power:	120 watts (60wpc), 8ohms	
Distortion:	less than 0.1% (30 watts/16ohms, 40watts/ 8ohms, 1KHz)	
Frequency Response:	10 – 50,000 Hz, less than ±1dB	
Input Impedance:	more than 30Kohms	
Input Sensitivity:	730mVolts (20 watts/16ohms)	
Damping Factor:	80, 10 & 2 (16ohms, variable)	
Residual Noise:	less than 1m Volt	
Preamp Section:		
Frequency Response:	20 – 20,000 Hz, less than –1dB	
Distortion:	less than 0.1% (1 volt, 1KHz)	
Output Voltage:	Preamp:	730m Volts
	Recording output:	70m Volts
	Tape connector:	30m Volts
Output Impedance:	Preamp:	less than 100ohms
	Recording output:	1,000ohms
	Tape Connector:	75Kohms
Input Sensitivity:	TAPE (9.5cm/sec.):	1.8m Volts
(at 750m Volt	TAPE (19cm/sec.):	2m Volts
output)	PHONO-1:	2m Volts
	PHONO-2:	2m Volts
	AUX-1:	110m Volts
	AUX-2:	750m Volts
	TAPE MONITOR:	200m Volts
	TAPE CONNECTOR:	200m Volts
Input Impedance:	TAPE (9.5cm/sec.):	100Kohms
	TAPE (19cm/sec.):	100Kohms
	PHONO-1:	50Kohms
	PHONO-2:	30, 50K & 100Kohms (1KHz, variable)
	AUX-1:	50Kohms
	AUX-2:	100Kohms
	TAPE MONITOR:	100Kohms
	TAPE CONNECTOR:	100Kohms
Headphone Impedance:	4 – 16ohms	
S/N ratio:	TAPE HEAD:	better than 60dB
	PHONO:	better than 60dB
	AUX:	better than 75dB
Equalizer:	TAPE HEAD:	NARTB 9.5cm, 19cm
	PHONO:	RIAA
Tone Control:	LUX NF type	
	Turnover or roll-off frequency selection:	
	Treble:	2KHz, 4KHz, normal
	Bass:	200Hz, 400Hz, normal
Filters:	HIGH CUT:	5KHz, 9KHz, 6dB/octave
	LOW CUT:	120Hz, 6dB/octave
Bass Boost:	120Hz, 6dB/octave	
Filter for 3-D System:	Cut-off frequency, 110Hz	
(high pass filter & inte-	Cut-off characteristic:	12dB/octave
grated low pass filter)	Output impedance:	100ohms
Power consumption:	with peak power:	200 watts
	with zero signal:	35 watts
Dimensions:	180mm x 476mm x 275mm (H.W.D.)	
	(6-1/4")	(18") (11")
Weight:	13.6kgs (30 lbs)	

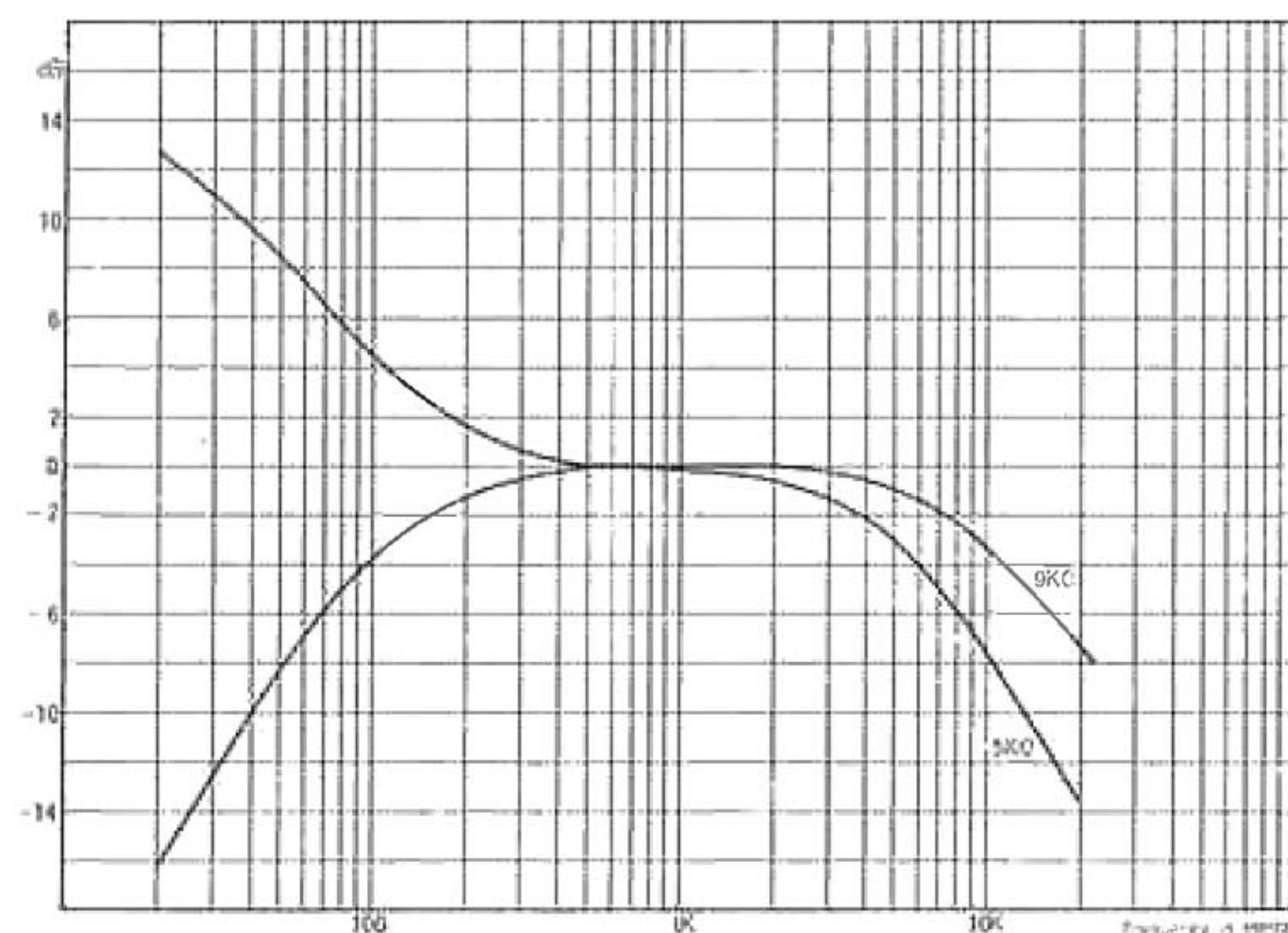
EQUALIZER



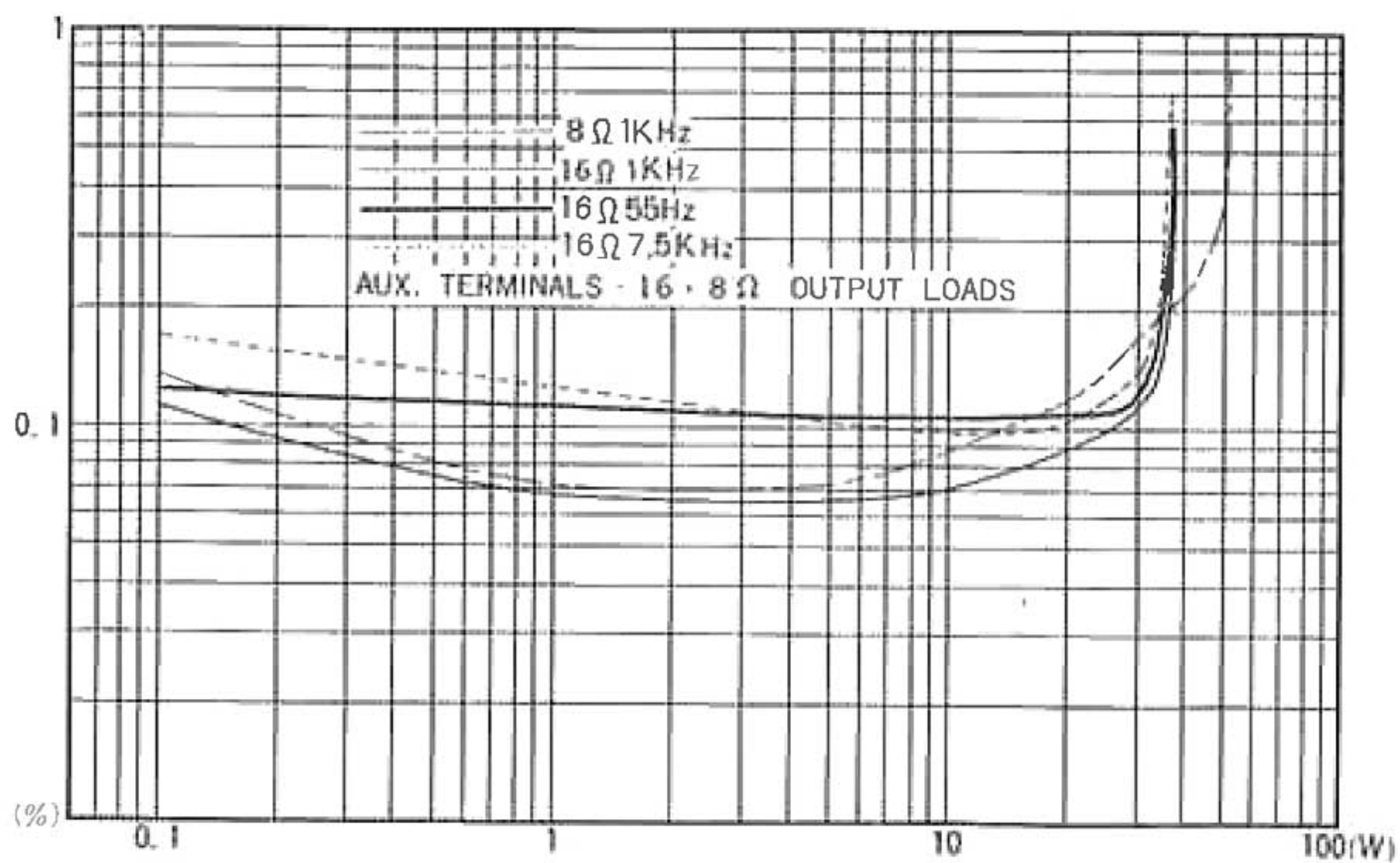
3-D FILTER



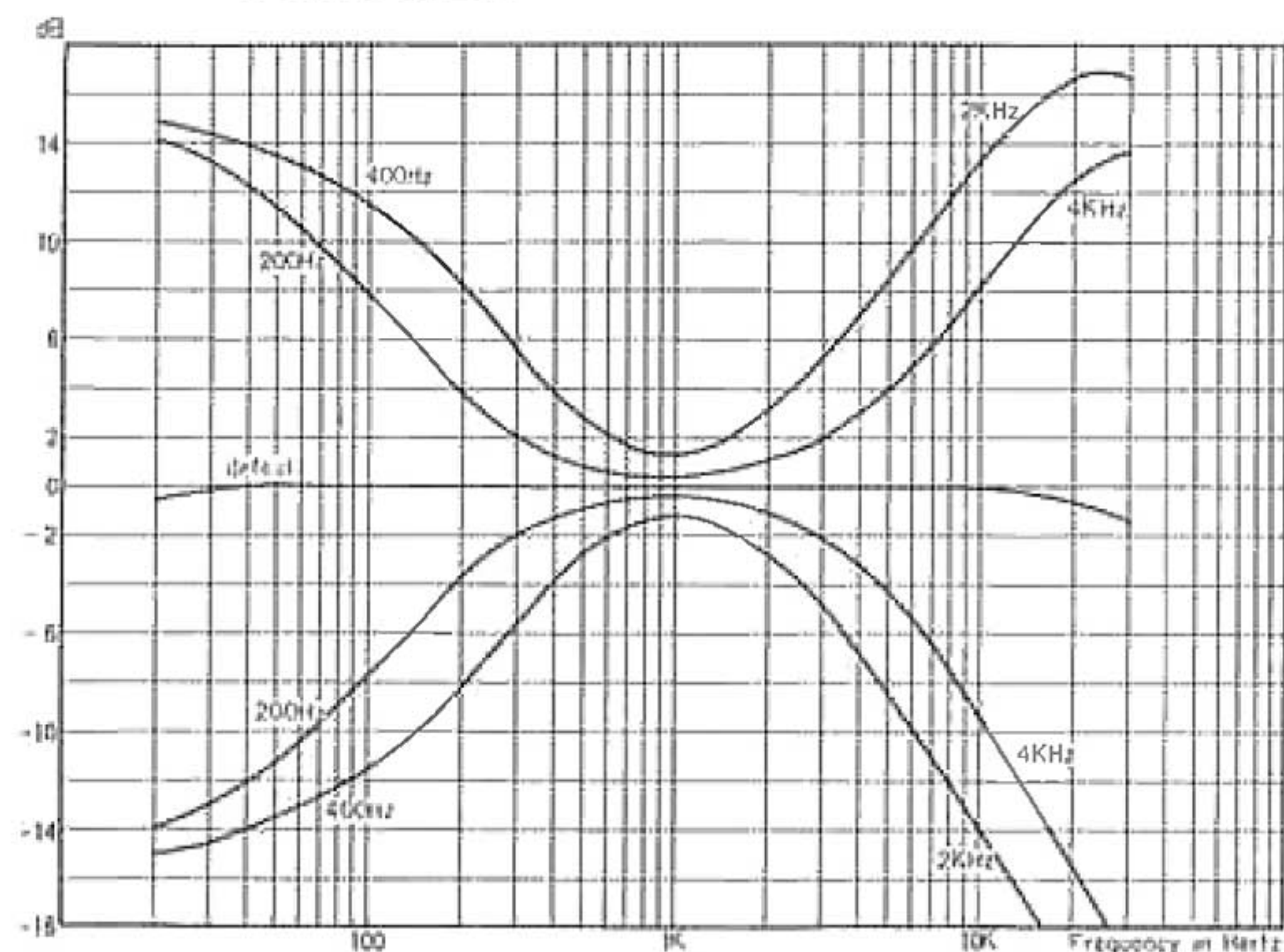
FILTER & BASS BOOST



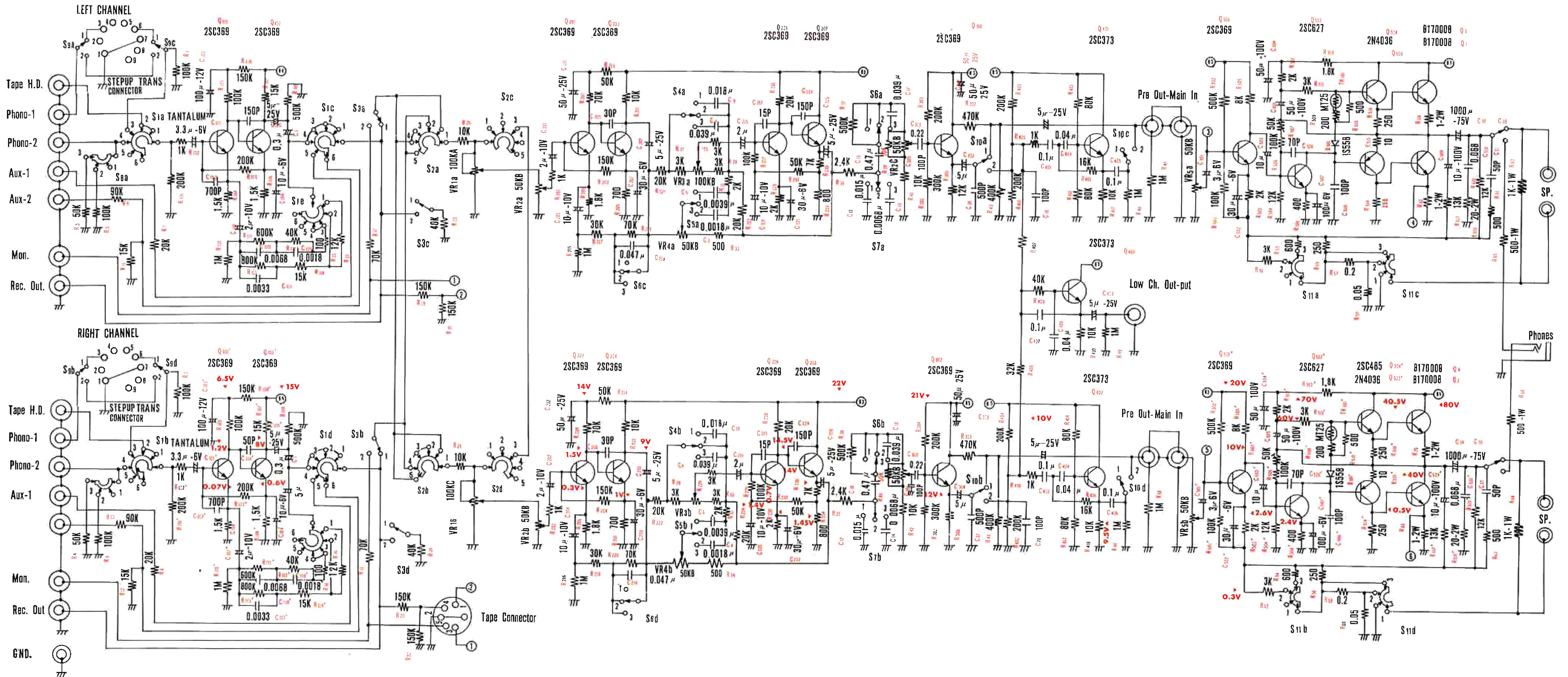
DISTORTION



TONE CONTROL

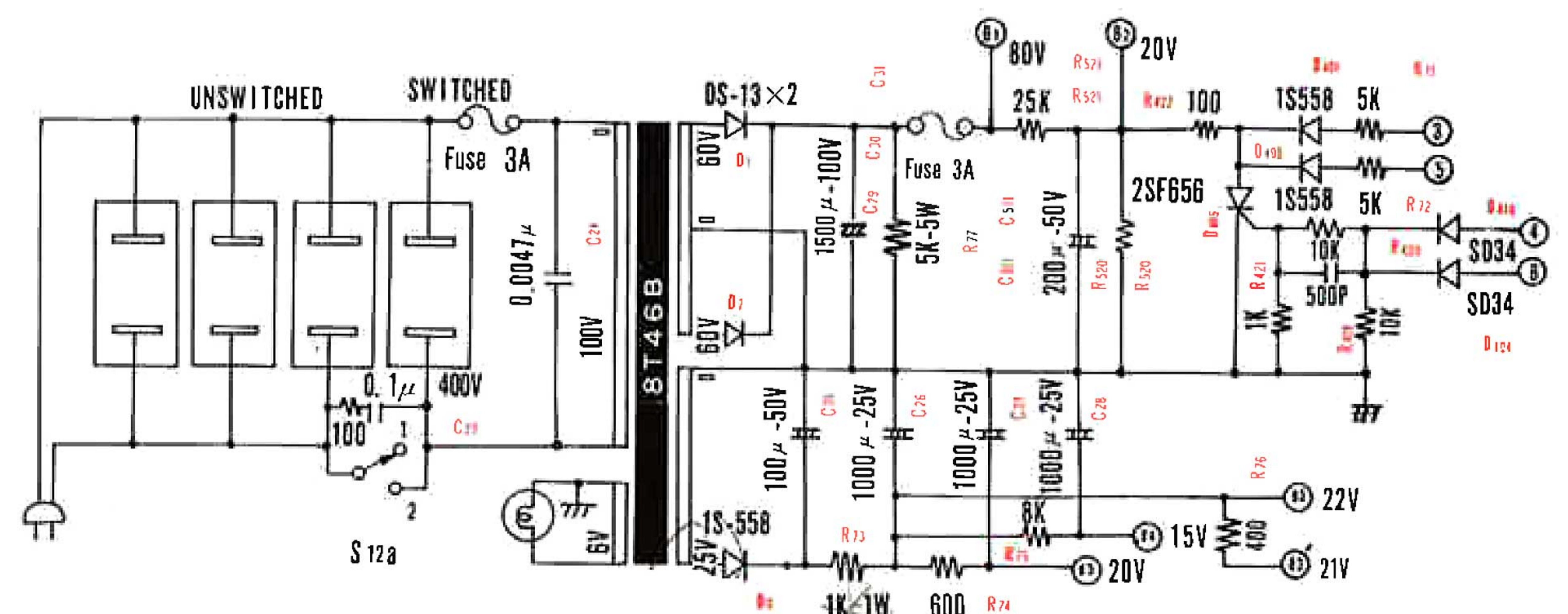


CIRCUIT DIAGRAM



- S1a, S1b, S1c, S1d, S1e, S1f
Function (1-9.5cm Tape, 2-19cm Tape, 3-Phono-1, 4-Phono-2, 5-Aux-1 6-Aux-2)
- S2a, S2b, S2c, S2d
Mode: (1-L, 2-R, 3-L+R, 4-Stereo, 5-Rev.)
- S3a, S3b, S3c, S3d Monitor (1-OFF, 2-ON)
- S4a, S4b Bass: (1-400c/s, 2-Defeat 3-200c/s)
- S5a, S5b Treble: (1-2,000c/s, 2-Defeat, 3-4,000c/s)
- S6a, S6b, S6c, S6d
Low Freq. Cont.: (1-Boost, 2-Nor., 3-Cut)
- S7a, S7b High Cut Filter: (1-5,000c/s, 2-OFF, 3-9,000c/s)
- S8a, S8b Impedance: (1-100K Ω , 2-50K Ω , 3-30K Ω)

- S9a, S9b, S9c, S9d
Step-up Trans.: (1-Step-up, 2-Direct)
- S10a, S10b, S10c, S10d
3D Filter (1-Nor., 2-3D)
- S11a, S11b, S11c, S11d
Damping Cont. (16-ohm load) : (1-80, 2-10, 3-2)
- S12a, S12b Power: (1-OFF, 2-ON)
- VR1a, VR1b: Balance Cont.
- VR2a, VR2b, VR2c, VR2d: Volume Cont.
- VR3a, VR3b: Bass Cont.
- VR4a, VR4b: Treble Cont.
- VR5a, VR5b: Level Set.



SQ 1220

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