

The Harman Kardon Model AP2500 STEREO PREAMPLIFIER

Manual 189A

AP2500

Technical Manual



The following marks found in the parts list of this manual identify the models as follows.

- BK** : North America area model Black version
- IB** : International model Black version

CONTENTS

SPECIFICATIONS	2	GENERAL UNIT AND PARTS LIST	5
LEAKAGE TEST	2	P. C. BOARDS	6
DISASSEMBLY PROCEDURES	3	ELECTRICAL PARTS LIST	7
POWER CORD REPLACEMENT	3	SCHEMATIC DIAGRAMS	11
CONTROLS AND FUNCTIONS	4	WIRING DIAGRAM	13

harman/kardon

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SPECIFICATIONS

	Nominal	Limit
Input Sensitivity (at 1V output, 1kHz) CD, Aux, Tuner, Video, Tape		
Normal	134mV	135mV ±15mV/35 kohm
Gain -10dB	453mV	450mV ±15mV
Phono (MC)	120.0µV	125µV ±10µV/56 kohm
Phono (MM)	2.2mV	2.2mV ±0.2mV/49kohm
Frequency Response (-3dB down)		
Normal	0.2Hz - 380kHz	0.25Hz - 350kHz
Gain -10dB	0.2Hz - 510kHz	0.25Hz - 450kHz
Input Overload Level (at 1kHz, THD 0.1%)		
Phono (MC)	8.8mV	> 5.5mV
Phono (MM)	154.0m	> 150mV
Signal to Noise Ratio (IHF A)		
CD, Aux, Tuner, Video, Tape	105dB	> 95 dB
Phono (MC)	78.0 dB	> 74.0dB
Phono (MM)	81.0dB	> 75.0dB

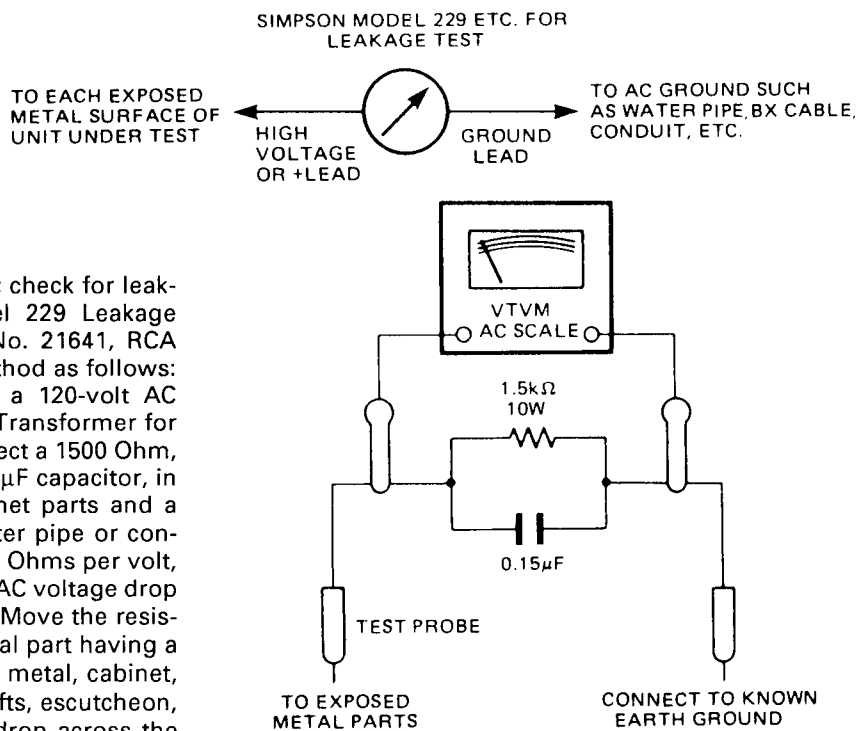
	Nominal	Limit
Channel Separation (at 10kHz) CD, Aux, Tuner, Video, Tape	66.0 dB	> 50.0 dB
Phono (MC)	65.0 dB	> 55.0 dB
Phono (MM)	65.0 dB	> 60.0 dB
Harmonic Distortion (at 1V, 1 kHz)		
Normal	0.0067%	< 0.01%
Gain -10dB	0.0036%	< 0.01%
RIAA Equalization (at Tape out) 20Hz -20kHz	0 dB	±0.5 dB
DIMENSIONS (W x H x D)	17.4" x 4.1" x 13.7"	(443 x 105 x 347 mm)
WEIGHT	12.8lbs/5.8kg	
POWER SUPPLY		
North America area model	AC120V, 60 Hz	
International model	AC230/240V, 50/60Hz	
POWER CONSUMPTION	25W	

These specifications are service target specs.
 Specifications and components are subject to change without notice.
 Overall performance will be maintained or improved.

LEAKAGE TEST (FOR SERVICE ENGINEERS IN THE U.S.A)

Before returning the unit to the user, perform the following safety checks:

1. Inspect all lead dress to make certain that leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the unit.
2. Be sure that any protective devices such as nonmetallic control knobs, insulating fishpapers, cabinet backs, adjustment and compartment covers or shields, isolation resistor-capacity networks, mechanical insulators, etc. which were removed for servicing are properly reinstalled.
3. Be sure that no shock hazard exists; check for leakage current using Simpson Model 229 Leakage Tester, standard equipment item No. 21641, RCA Model WT540A or use alternate method as follows: Plug the power cord directly into a 120-volt AC receptacle (do not use an Isolation Transformer for this test). Using two clip leads, connect a 1500 Ohm, 10-watt resistor paralleled by a 0.15 µF capacitor, in series with all exposed metal cabinet parts and a known earth ground, such as a water pipe or conduit. Use a VTVM or VOM with 1000 Ohms per volt, or higher sensitivity to measure the AC voltage drop across the resistor. (See Diagram.) Move the resistor connection to each exposed metal part having a return path to the chassis (antenna, metal, cabinet, screw heads, knobs and control shafts, escutcheon, etc.) and measure the AC voltage drop across the resistor. (This test should be performed with the power switch in both the On and Off positions.) A reading of 0.35 volt RMS or more is excessive and indicates a potential shock hazard which must be corrected before returning the unit to the owner.



DISASSEMBLY PROCEDURES (REFER TO PAGES 5 AND 13)**1 CABINET TOP (AB) REMOVAL**

Remove 6 screws (A) and then remove the Cabinet Top (AB).

2 FRONT PANEL ASS'Y (AA) REMOVAL

1. Remove the Cabinet Top (AB), referring to the previous step 1.
2. Remove 5 screws (B) and then remove the Front Panel Ass'y (AA).

3 MAIN P. C. BOARD (PCB-1) REMOVAL

1. Remove the Cabinet Top (AB), referring to the previous step 1.
2. Remove the Front Panel Ass'y (AA), referring to the previous step 2.
3. Remove 2 screws (C) and then remove the Rotary Knobs (150).
4. Remove 20 screws (D) and then remove the Main P.C. Board (PCB-1).

At this time, unsolder the lead wires connected to the Main P.C.Board (PCB-1).

4 POWER SWITCH P. C. BOARD (PCB-6) REMOVAL

1. Remove the Front Panel Ass'y (AA), referring to the previous step 2.

2. Remove 3 screws (E) and then remove the Power Switch P. C. Board (PCB-6).
If necessary unsolder the lead wire.

5 VOLUME P. C. BOARD (PCB-2) REMOVAL

1. Remove the Front Panel Ass'y (AA), referring to the previous step 2.
2. Pull out the Volume Knob (149).
3. Remove hexagon nut (F) and then remove the Volume P.C.Board (PCB-2).
If necessary unsolder the lead wire.

6 GAIN SWITCH P. C. BOARD (PCB-3) REMOVAL

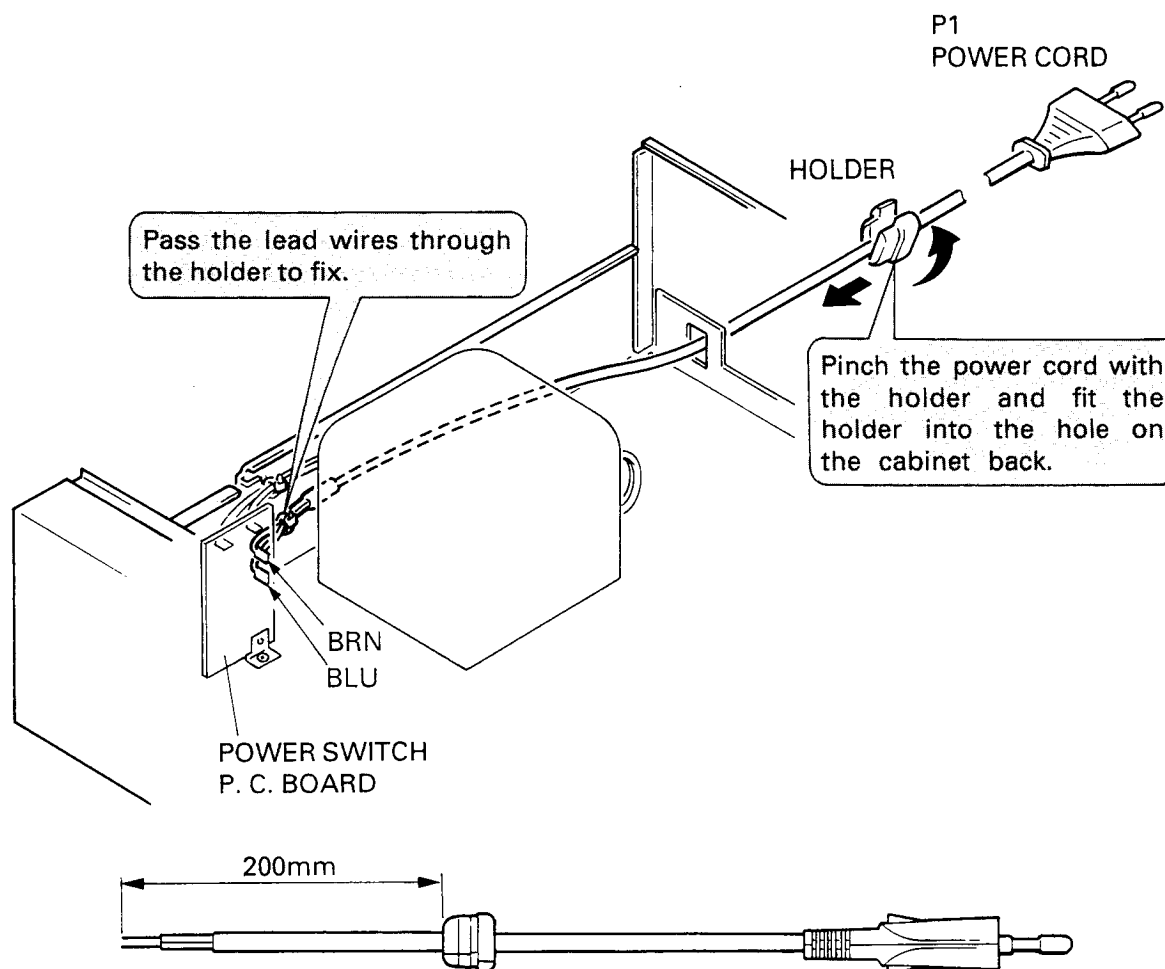
1. Remove the Front Panel Ass'y (AA), referring to the previous step 2.
2. Remove 2 screws (G) and then remove the Gain Switch P.C.Board (PCB-3).
If necessary unsolder the lead wire.

7 HEADPHONES P.C.BOARD (PCB-4) REMOVAL

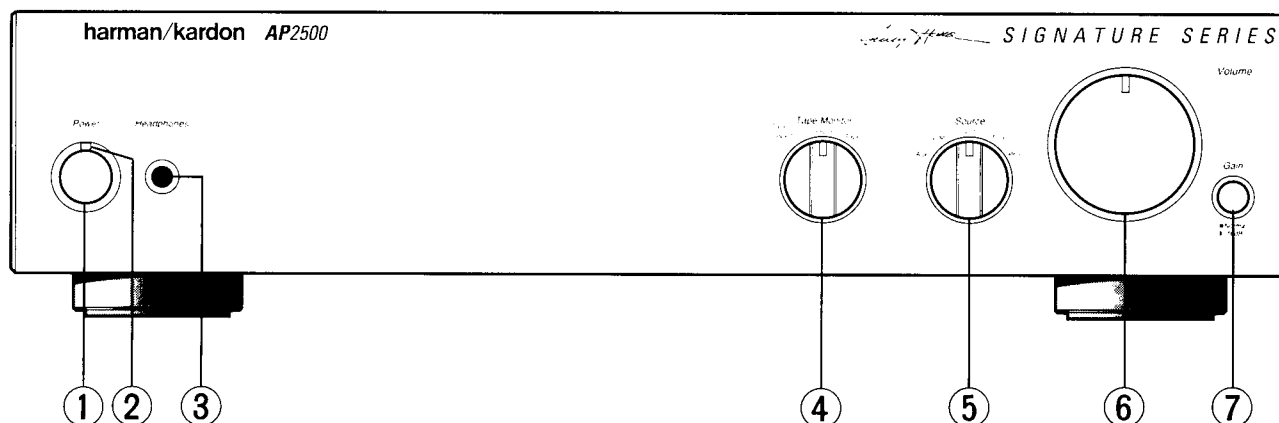
1. Remove the Front Panel Ass'y (AA), referring to the previous step 2.
2. Remove the Metal Fixture (H) fixing the Headphones P.C.Board (PCB-4) and then remove it.

POWER CORD REPLACEMENT (FOR SERVICE ENGINEERS OTHER THAN NORTH AMERICA)

In order to prevent fire or shock hazard when replacing the power cord, follow the procedure below to replace the parts with the standard supply parts.



CONTROLS AND FUNCTIONS



① Power Switch

Pressing this switch will turn on the power and the POWER indicator lights up. Press the switch again to turn the power off.

② Power Indicator

When the POWER switch is pressed, this indicator lights up in green.

③ Headphones Jack

Stereo headphones with a standard 1/4 inch plug can be connected to this jack.

④ Tape Monitor Selector

This selector is used when playing a tape deck, or monitoring during recording.

Tape 1/Copy 1→2: Select this position to play a tape or to monitor the recording on the tape deck connected to the TAPE 1 jacks. This is also the position to use to copy a tape from Tape 1 to Tape 2.

Source: Select this position to listen to a program source other than a tape.

Tape 2: Select this position to play a tape, or to monitor during recording on the tape deck connected to the TAPE 2 jacks.

⑤ Source Selector

This selector is used to select a program source other than a tape.

Aux: Select this position to listen to a source connected to the AUX jacks.

Video: Select this position to listen to the sound of a TV, VCR or Laserdisc player connected to the VIDEO jacks.

CD: Select this position to listen to a CD player connected to the CD jacks.

Tuner: Select this position to listen to a Tuner connected to the TUNER jacks.

Phono: Select this position to listen to a disc played on the turntable connected to the PHONO jacks.

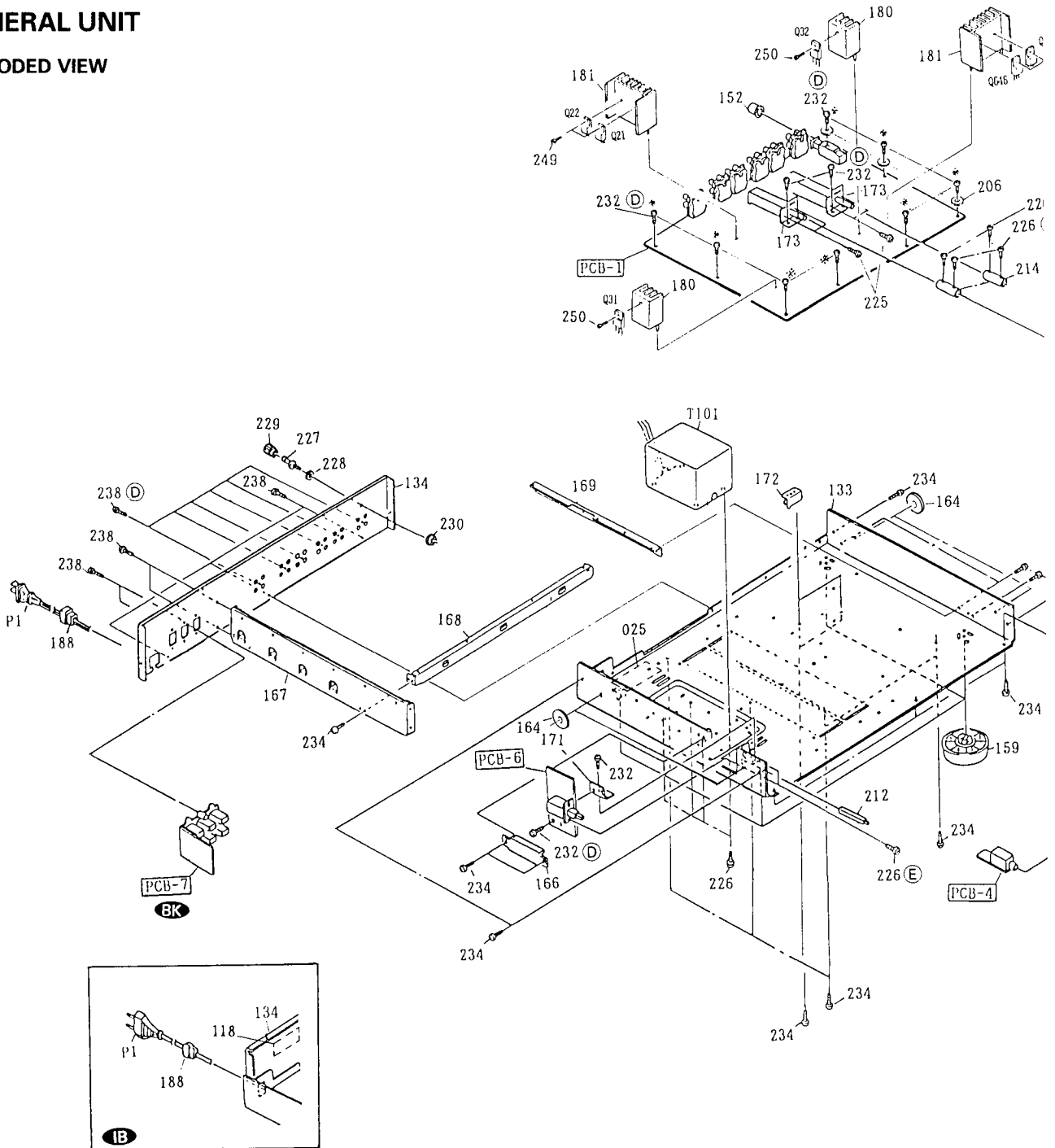
⑥ Volume Control

This knob controls the sound level. Turning clockwise increases the sound volume, and turning counterclockwise decreases it. Set this control at a minimum level before turning the power on, changing the sound source or changing the GAIN switch to protect the speakers from being damaged by a sudden high level sound.

⑦ Gain Switch

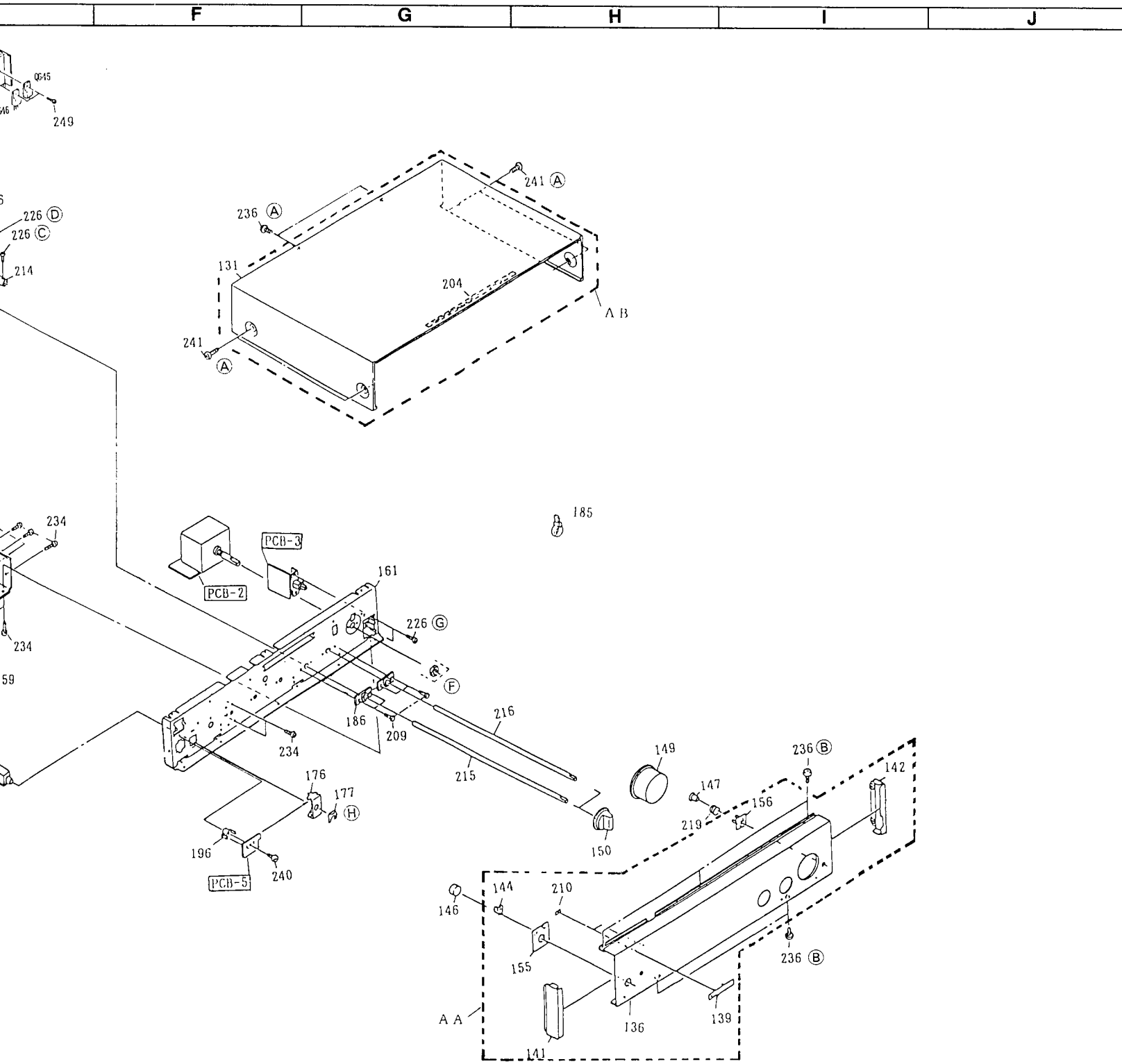
The GAIN Switch changes both the input sensitivity (amount of amplification) and the input overload level of the preamplifier circuitry. The "Normal" position provides an input sensitivity that is typical of other high quality integrated amplifiers and preamplifiers. This mode has an input overload level of 2.5 Volts, which is high enough to use with nearly any high fidelity source. The "-10dB" position both decreases the input sensitivity and increases the input overload level by 10 dB (approximately 3 times). This allows very strong input signals to be amplified without distortion. It also provides a wider dynamic range. Some listeners may prefer this position for listening to CD players, for example.

**GENERAL UNIT
EXPLODED VIEW**



GENERAL UNIT PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
AA	A443-AP2500A	FRONT PANEL ASSEMBLY	150	1632-21502	ROTARY KNOB, TAPE MONITOR, SOURCE (x2)
AB	A414-AP2500A	CABINET TOP ASSEMBLY	152	1662-52601	PUSH BUTTON, MM/MC
025	1756-CSA	LABEL, CSA BK	155	1742-08302	ORNAMENT, POWER BUTTON
118	1756-21911	LABEL, FTZ IB	156	1742-08402	ORNAMENT, GAIN BUTTON
131	1414-17501	CABINET TOP COVER	159	1319-03901	LEG (x4)
133	1424-37701	CABINET BOTTOM	161	2211-7328	CHASSIS
134	1424-37801	CABINET BACK BK	164	2111-1389	FELT BOTTOM (x4)
134	1424-37802	CABINET BACK IB	166	2219-8386	METAL FITTG, POWER SWITCH PCB
136	1443-14906	FRONT PANEL	167	2219-8400	METAL FITTG, CABINET BOTTOM SIDE
139	1714-02602	NAME PLATE, BAGDE	168	2219-8406	METAL FITTG, CABINET BOTTOM CENTER
141	1562-08202	FRAME, L	169	2219-8402	METAL FITTG, CABINET BOTTOM
142	1562-08302	FRAME, R	171	2219-8019	METAL FITTG, POWER SWITCH PCB
144	1732-08801	INDICATOR, POWER LED	172	2219-8348	METAL FITTG, CABINET BOTTOM (x2)
146	1662-66902	PUSH BUTTON, POWER	173	2219-8405	METAL FITTG, TAPE MONITOR, SOURCE SWITCH (x2)
147	1662-67002	PUSH BUTTON, GAIN			
149	1630-04902	ROTARY KNOB, VOLUME			



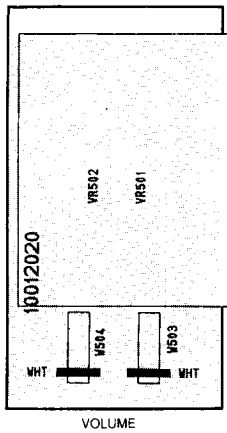
Ref. No.	Part No.	Description
176	2219-8346	METAL FITTG, HEADPHONES
177	2218-89	BRACKET, FIX, HEADPHONES
180	2222-7217	HEAT SINK, Q31, 32 (x2)
181	2222-7269	HEAT SINK, Q21/22, Q645/646 (x2)
185	2240-R0101	HOLDER, WIRING (x10)
186	2240-7409	HOLDER, SHAFT (x2)
188	2240-364	HOLDER, AC CORD
196	2360-7026	SPECIAL BOSS, LED PCB
204	2224-7137	INSULATOR, CABINET TOP
206	2401-035	WASHER, METAL (x3)
209	2459-3003511	PLASTIC RIVET (x4)
210	2431-0151	FASTENER, BAGDE (x2)
212	2672-7018	LEVER, POWER SWITCH
214	2601-7069	SHAFT, TAPE MONITOR, SOURCE (x2)
215	2601-7208	SHAFT, TAPE MONITOR
216	2601-7209	SHAFT, SOURCE

Ref. No.	Part No.	Description
219	2651-2101728	SPRING, GAIN BUTTON
225	2327-R0130062	SCREW, BND+ (3x6 mm)(x4)
226	2327-R0130062	SCREW, BND+ (3x6 mm)(x12)
227	2310-7036	SPECIAL SCREW, GND
228	2410-7018	SPECIAL WASHER
229	2440-7027	SPECIAL NUT
230	2440-7016	SPECIAL NUT
232	2347-R0130062	SCREW, BND T+ (3x6 mm)(x14)
234	2347-R0130062	SCREW, BND T+ (3x6 mm)(x22)
236	2347-R0130064	SCREW, BND T+ (3x6 mm)(x7)
238	2347-R0130084	SCREW, BND T+ (3x8 mm)(x13)
240	2347-R0130102	SCREW, BND T+ (3x10 mm)
241	2347-R0140064	SCREW, BND T+ (4x6 mm)(x4)
249	2347-R0130082	SCREW, BND T+ (3x8 mm)(x4)
250	2557-300829	SCREW, B SPW+ (x2)

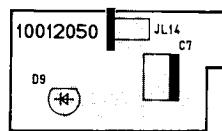
A B C D E

P. C. BOARDS

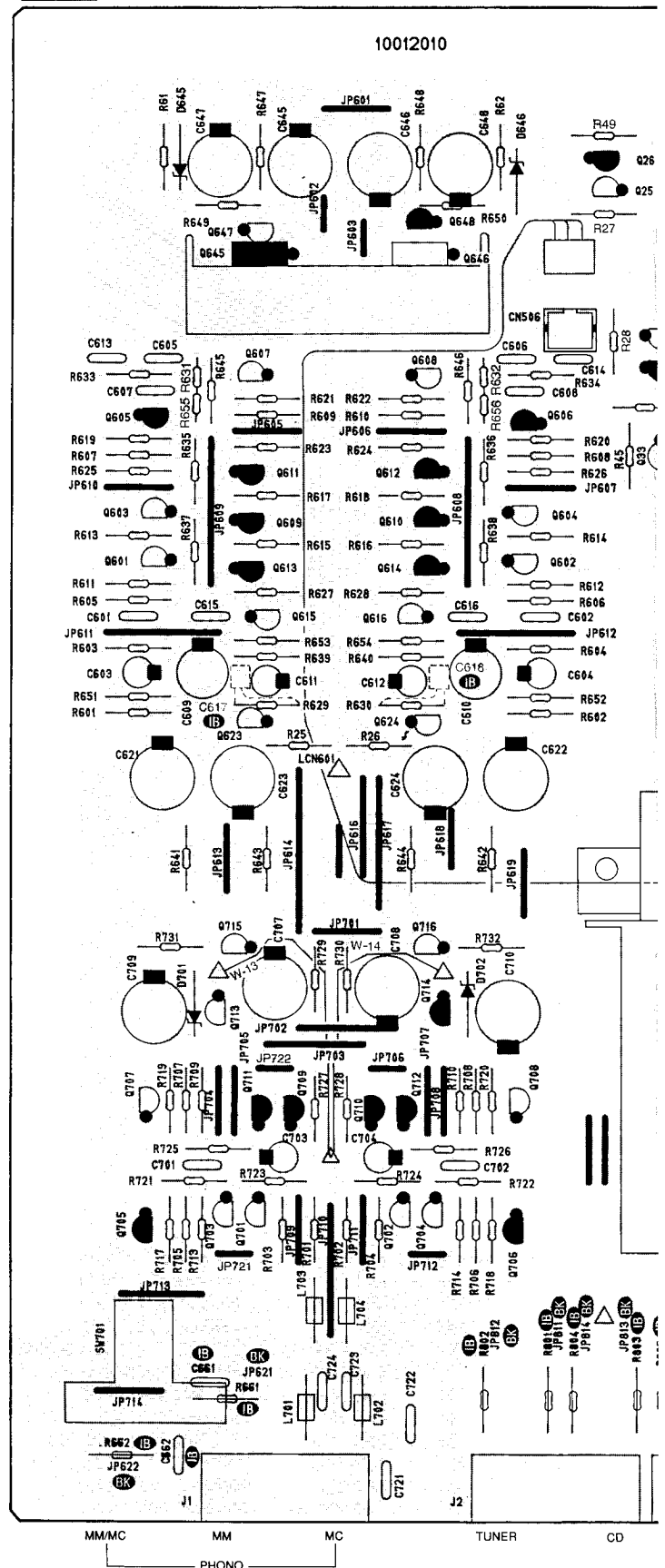
PCB-2
Volume
P. C. Board



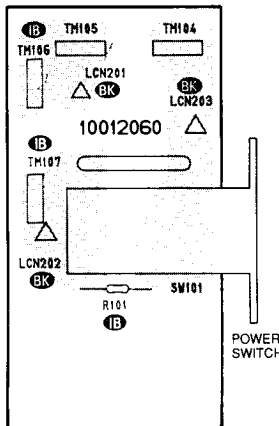
PCB-5
LED
P. C. Board



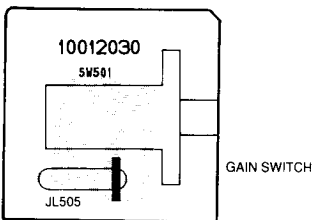
PCB-1 Main P. C. Board



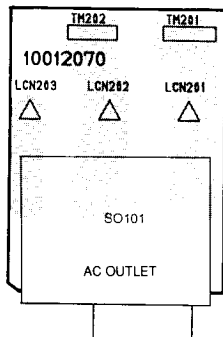
PCB-6
Power Switch
P. C. Board



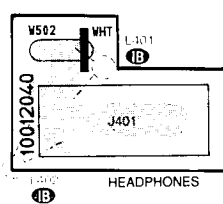
PCB-3
Gain Switch
P. C. Board



PCB-7 BK
AC Outlet
P. C. Board



PCB-4
Headphones
P. C. Board



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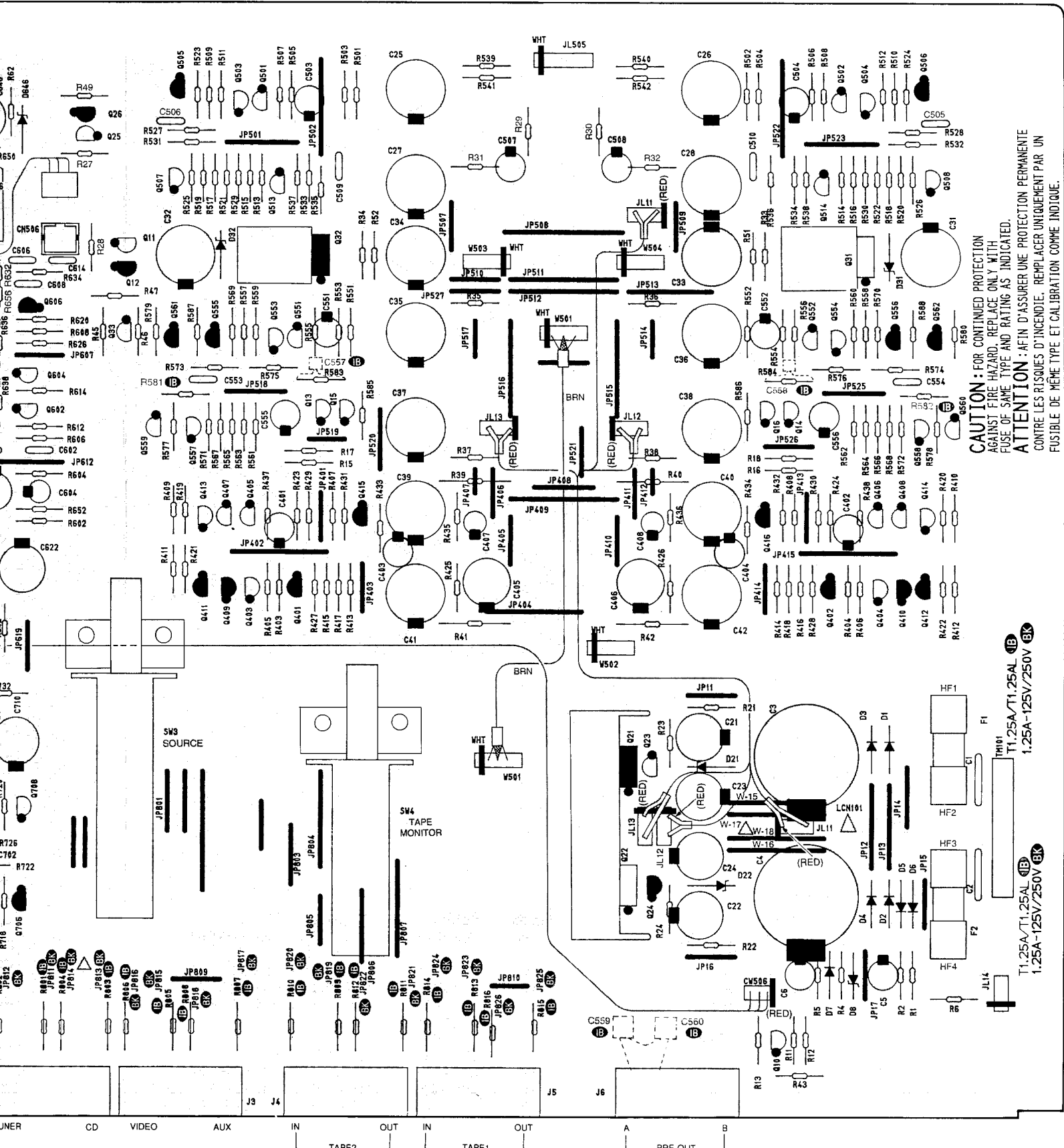
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CAUTION : FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH FUSE OF SAME TYPE AND RATING AS INDICATED.
ATTENTION : AFIN D'ASSURER UNE PROTECTION PERMANENTE CONTRE LES RISQUES D'INCENDIE, REMPLACER UNIQUEMENT PAR UN FUSIBLE DE MEME TYPE ET CALIBRAGE COMME INDIQUE.

T1.25A/T1.25AL (B)
 1.25A-125V/250V (B)

ELECTRICAL PARTS LIST

Ser. No.	Ref. No.	Part No.	Description	Ser. No.	Ref. No.	Part No.	Description
PCB-1 MAIN P.C. BOARD							
CAPACITORS							
501	C1	5352-1041957	CAP,MTL .1 μ	410	C645	5345-337D041	CAP,MINI ELE 330 μ /25V
501	C2	5352-1041957	CAP,MTL .1 μ	410	C646	5345-337D041	CAP,MINI ELE 330 μ /25V
502	△ C3	5345-S29FM228	CAP,MINI ELE 2200 μ /50V	410	C647	5345-337D041	CAP,MINI ELE 330 μ /25V
502	△ C4	5345-S29FM228	CAP,MINI ELE 2200 μ /50V	410	C648	5345-337D041	CAP,MINI ELE 330 μ /25V
503	C5	5345-106F041	CAP,MINI ELE 10 μ /50V	405	C661	5359-S010J101	CAP,PPP 100P IB
504	C6	5345-107B041	CAP,MINI ELE 100 μ /10V	405	C662	5359-S010J101	CAP,PPP 100P IB
506	C21	5345-227E041	CAP,MINI ELE 220 μ /35V	411	C701	5353-100934	CAP,MCA 10P
506	C22	5345-227E041	CAP,MINI ELE 220 μ /35V	411	C702	5353-100934	CAP,MCA 10P
506	C23	5345-227E041	CAP,MINI ELE 220 μ /35V	412	C703	5345-476C041	CAP,MINI ELE 47 μ /16V
506	C24	5345-227E041	CAP,MINI ELE 220 μ /35V	412	C704	5345-476C041	CAP,MINI ELE 47 μ /16V
507	C25	5345-337F041	CAP,MINI ELE 330 μ /50V	413	C707	5345-337C041	CAP,MINI ELE 330 μ /16V
507	C26	5345-337F041	CAP,MINI ELE 330 μ /50V	413	C708	5345-337C041	CAP,MINI ELE 330 μ /16V
507	C27	5345-337F041	CAP,MINI ELE 330 μ /50V	413	C709	5345-337C041	CAP,MINI ELE 330 μ /16V
507	C28	5345-337F041	CAP,MINI ELE 330 μ /50V	413	C710	5345-337C041	CAP,MINI ELE 330 μ /16V
508	C31	5345-337F041	CAP,MINI ELE 330 μ /50V	457	C721	5359-S010K331	CAP,PPP 330P
508	C32	5345-337F041	CAP,MINI ELE 330 μ /50V	457	C722	5359-S010K331	CAP,PPP 330P
508	C33	5345-337F041	CAP,MINI ELE 330 μ /50V	458	C723	5359-S010J103	CAP,PPP .01 μ
508	C34	5345-337F041	CAP,MINI ELE 330 μ /50V	458	C724	5359-S010J103	CAP,PPP .01 μ
508	C35	5345-337F041	CAP,MINI ELE 330 μ /50V	RESISTORS			
508	C36	5345-337F041	CAP,MINI ELE 330 μ /50V	573	R1	5130-R030J102	RES,CBN 1/2P 1K
508	C37	5345-337F041	CAP,MINI ELE 330 μ /50V	573	R2	5130-R030J102	RES,CBN 1/2P 1K
508	C38	5345-337F041	CAP,MINI ELE 330 μ /50V	565	R4	5130-R030J152	RES,CBN 1/2P 1.5K
508	C39	5345-337D041	CAP,MINI ELE 330 μ /25V	566	R5	5130-R030J104	RES,CBN 1/2P 100K
510	C40	5345-337D041	CAP,MINI ELE 330 μ /25V	567	R6	5130-R030J331	RES,CBN 1/2P 330
510	C41	5345-337D041	CAP,MINI ELE 330 μ /25V	568	R11	5130-R030J683	RES,CBN 1/2P 68K
510	C42	5345-337D041	CAP,MINI ELE 330 μ /25V	569	R12	5130-R030J273	RES,CBN 1/2P 27K
511	C401	5345-106F041	CAP,MINI ELE 10 μ /50V	570	R13	5130-R030J334	RES,CBN 1/2P 330K
511	C402	5345-106F041	CAP,MINI ELE 10 μ /50V	571	R15	5130-R030J683	RES,CBN 1/2P 68K
509	C403	5345-226F041	CAP,MINI ELE 22 μ /50V	571	R16	5130-R030J683	RES,CBN 1/2P 68K
509	C404	5345-226F041	CAP,MINI ELE 22 μ /50V	571	R17	5130-R030J683	RES,CBN 1/2P 68K
512	C405	5345-227D041	CAP,MINI ELE 220 μ /25V	571	R18	5130-R030J683	RES,CBN 1/2P 68K
512	C406	5345-227D041	CAP,MINI ELE 220 μ /25V	572	R21	5130-R030J822	RES,CBN 1/2P 8.2K
517	C407	5345-105F041	CAP,MINI ELE 1 μ /50V	572	R22	5130-R030J822	RES,CBN 1/2P 8.2K
517	C408	5345-105F041	CAP,MINI ELE 1 μ /50V	563	R23	5130-R030J102	RES,CBN 1/2P 1K
514	C503	5345-476D041	CAP,MINI ELE 47 μ /25V	563	R24	5130-R030J102	RES,CBN 1/2P 1K
514	C504	5345-476D041	CAP,MINI ELE 47 μ /25V	433	R25	5130-R030J223	RES,CBN 1/2P 22K
522	C505	5353-070934	CAP,MCA 7P	433	R26	5130-R030J223	RES,CBN 1/2P 22K
522	C506	5353-070934	CAP,MCA 7P	441	R27	5130-R030J102	RES,CBN 1/2P 1K
516	C507	5345-107D041	CAP,MINI ELE 100 μ /25V	515	R28	5130-R030J102	RES,CBN 1/2P 1K
516	C508	5345-107D041	CAP,MINI ELE 100 μ /25V	519	△ R29	5102-2205116	RES,FUSE 22
518	C509	5352-S110J224	CAP,MTL .22 μ	519	△ R30	5102-2205116	RES,FUSE 22
518	C510	5352-S110J224	CAP,MTL .22 μ	519	△ R31	5102-2205116	RES,FUSE 22
635	C551	5345-226D041	CAP,MINI ELE 22 μ /25V	519	△ R32	5102-2205116	RES,FUSE 22
635	C552	5345-226D041	CAP,MINI ELE 22 μ /25V	575	R33	5130-R030J122	RES,CBN 1/2P 1.2K
520	C553	5353-050934	CAP,MCA 5P	575	R34	5130-R030J122	RES,CBN 1/2P 1.2K
520	C554	5353-050934	CAP,MCA 5P	576	△ R35	5102-2205116	RES,FUSE 22
521	C555	5345-107D041	CAP,MINI ELE 100 μ /25V	576	△ R36	5102-2205116	RES,FUSE 22
521	C556	5345-107D041	CAP,MINI ELE 100 μ /25V	576	△ R37	5102-2205116	RES,FUSE 22
651	C557	5359-S010K271	CAP,PPP 330P IB	576	△ R38	5102-2205116	RES,FUSE 22
651	C558	5359-S010K271	CAP,PPP 330P IB	577	R39	5171-331593	RES,MTL 1P 330
650	C559	5359-S010K101	CAP,PPP 100P IB	577	R40	5171-331593	RES,MTL 1P 330
650	C560	5359-S010K101	CAP,PPP 100P IB	577	R41	5171-331593	RES,MTL 1P 330
401	C601	5359-S010J121	CAP,PPP 120P	577	R42	5171-331593	RES,MTL 1P 330
401	C602	5359-S010J121	CAP,PPP 120P	555	R43	5130-R030J103	RES,CBN 1/2P 10K
402	C603	5345-106F041	CAP,MINI ELE 10 μ /50V	524	R45	5130-R030J392	RES,CBN 1/2P 3.9K
402	C604	5345-106F041	CAP,MINI ELE 10 μ /50V	559	R46	5130-R030J224	RES,CBN 1/2P 220K
403	C605	5359-S010J182	CAP,PPP 1800P	566	R47	5130-R030J104	RES,CBN 1/2P 100K
403	C606	5359-S010J182	CAP,PPP 1800P	566	R49	5130-R030J104	RES,CBN 1/2P 100K
404	C607	5359-S010J562	CAP,PPP 5600P	564	△ R51	5102-4R75116	RES,FUSE 4.7
404	C608	5359-S010J562	CAP,PPP 5600P	564	△ R52	5102-4R75116	RES,FUSE 4.7
406	C609	5345-477A041	CAP,MINI ELE 470 μ /6.3V	434	△ R61	5102-4R75116	RES,FUSE 4.7
406	C610	5345-477A041	CAP,MINI ELE 470 μ /6.3V	434	△ R62	5102-4R75116	RES,FUSE 4.7
402	C611	5345-106F041	CAP,MINI ELE 10 μ /50V	579	R403	5130-R030J822	RES,CBN 1/2P 8.2K
402	C612	5345-106F041	CAP,MINI ELE 10 μ /50V	579	R404	5130-R030J822	RES,CBN 1/2P 8.2K
408	C613	5359-S010J101	CAP,PPP 100P	578	R405	5130-R030J102	RES,CBN 1/2P 1K
408	C614	5359-S010J101	CAP,PPP 100P	578	R406	5130-R030J102	RES,CBN 1/2P 1K
478	C615	5359-S010J681	CAP,PPP 680P	580	R407	5130-R030J562	RES,CBN 1/2P 5.6K
478	C616	5359-S010J681	CAP,PPP 680P	580	R408	5130-R030J562	RES,CBN 1/2P 5.6K
482	C617	5359-S010J221	CAP,PPP 220P IB	581	R409	5130-R030J331	RES,CBN 1/2P 330
482	C618	5359-S010J221	CAP,PPP 220P IB	581	R410	5130-R030J331	RES,CBN 1/2P 330
409	C621	5345-337D041	CAP,MINI ELE 330 μ /25V	581	R411	5130-R030J331	RES,CBN 1/2P 330
409	C622	5345-337D041	CAP,MINI ELE 330 μ /25V	581	R412	5130-R030J331	RES,CBN 1/2P 330
409	C623	5345-337D041	CAP,MINI ELE 330 μ /25V	627	R413	5130-R030J100	RES,CBN 1/2P 10
409	C624	5345-337D041	CAP,MINI ELE 330 μ /25V	627	R414	5130-R030J100	RES,CBN 1/2P 10
				632	R415	5130-R030J222	RES,CBN 1/2P 2.2K
				632	R416	5130-R030J222	RES,CBN 1/2P 2.2K

Ser. No.	Ref. No.	Part No.	Description	Ser. No.	Ref. No.	Part No.	Description
632	R417	5130-R030J222	RES,CBN 1/2P 2.2K	604	R565	5130-R030J682	RES,CBN 1/2P 6.8K
632	R418	5130-R030J222	RES,CBN 1/2P 2.2K	604	R566	5130-R030J682	RES,CBN 1/2P 6.8K
582	R419	5130-R030J2R2	RES,CBN 1/2P 2.2	605	R567	5130-R030J222	RES,CBN 1/2P 2.2K
582	R420	5130-R030J2R2	RES,CBN 1/2P 2.2	605	R568	5130-R030J222	RES,CBN 1/2P 2.2K
582	R421	5130-R030J2R2	RES,CBN 1/2P 2.2	634	R569	5130-R030J391	RES,CBN 1/2P 390
582	R422	5130-R030J2R2	RES,CBN 1/2P 2.2	634	R570	5130-R030J391	RES,CBN 1/2P 390
631	R423	5130-R030J103	RES,CBN 1/2P 10K	634	R571	5130-R030J391	RES,CBN 1/2P 390
631	R424	5130-R030J103	RES,CBN 1/2P 10K	634	R572	5130-R030J391	RES,CBN 1/2P 390
583	R425	5130-R030J102	RES,CBN 1/2P 1K	607	R573	5174-332381	RES,MTL 1/4P 3.3K
583	R426	5130-R030J102	RES,CBN 1/2P 1K	607	R574	5174-332381	RES,MTL 1/4P 3.3K
584	R427	5130-R030J683	RES,CBN 1/2P 68K	637	R575	5174-392381	RES,MTL 1/4P 3.9K
584	R428	5130-R030J683	RES,CBN 1/2P 68K	637	R576	5174-392381	RES,MTL 1/4P 3.9K
631	R429	5130-R030J103	RES,CBN 1/2P 10K	636	R577	5130-R030J102	RES,CBN 1/2P 1K
631	R430	5130-R030J103	RES,CBN 1/2P 10K	636	R578	5130-R030J102	RES,CBN 1/2P 1K
629	R431	5130-R030J223	RES,CBN 1/2P 22K	608	R579	5130-R030J332	RES,CBN 1/2P 3.3K
629	R432	5130-R030J223	RES,CBN 1/2P 22K	608	R580	5130-R030J332	RES,CBN 1/2P 3.3K
631	R433	5130-R030J103	RES,CBN 1/2P 10K	609	R581	5130-R030J221	RES,CBN 1/2P 220
631	R434	5130-R030J103	RES,CBN 1/2P 10K	609	R582	5130-R030J221	RES,CBN 1/2P 220
633	R435	5130-R030J124	RES,CBN 1/2P 120K	601	R583	5130-R030J124	RES,CBN 1/2P 120K
633	R436	5130-R030J124	RES,CBN 1/2P 120K	601	R584	5130-R030J124	RES,CBN 1/2P 120K
628	R437	5130-R030J332	RES,CBN 1/2P 3.3K	652A	R585	5130-R030J151	RES,CBN 1/2P 150
628	R438	5130-R030J332	RES,CBN 1/2P 3.3K	652	R585	5130-R030J331	RES,CBN 1/2P 330
585	R501	5130-R030J331	RES,CBN 1/2P 330	652A	R586	5130-R030J151	RES,CBN 1/2P 150
585	R502	5130-R030J331	RES,CBN 1/2P 330	652	R586	5130-R030J331	RES,CBN 1/2P 330
586	R503	5130-R030J124	RES,CBN 1/2P 120K	606	R587	5130-R030J221	RES,CBN 1/2P 220
586	R504	5130-R030J124	RES,CBN 1/2P 120K	606	R588	5130-R030J221	RES,CBN 1/2P 220
587	R505	5130-R030J473	RES,CBN 1/2P 47K	436A	R601	5130-R030J470	RES,CBN 1/2P 47
587	R506	5130-R030J473	RES,CBN 1/2P 47K	436	R601	5130-R030J331	RES,CBN 1/2P 330
588	R507	5130-R030J101	RES,CBN 1/2P 100	436A	R602	5130-R030J470	RES,CBN 1/2P 47
588	R508	5130-R030J101	RES,CBN 1/2P 100	436	R602	5130-R030J331	RES,CBN 1/2P 330
589	R509	5130-R030J472	RES,CBN 1/2P 4.7K	437	R603	5130-R030J124	RES,CBN 1/2P 120K
589	R510	5130-R030J472	RES,CBN 1/2P 4.7K	437	R604	5130-R030J124	RES,CBN 1/2P 120K
589	R511	5130-R030J472	RES,CBN 1/2P 4.7K	438	R605	5130-R030J2R2	RES,CBN 1/2P 2.2
589	R512	5130-R030J472	RES,CBN 1/2P 4.7K	438	R606	5130-R030J2R2	RES,CBN 1/2P 2.2
590	R513	5130-R030J221	RES,CBN 1/2P 220	439	R607	5130-R030J122	RES,CBN 1/2P 1.2K
590	R514	5130-R030J221	RES,CBN 1/2P 220	439	R608	5130-R030J122	RES,CBN 1/2P 1.2K
590	R515	5130-R030J221	RES,CBN 1/2P 220	439	R609	5130-R030J122	RES,CBN 1/2P 1.2K
590	R516	5130-R030J221	RES,CBN 1/2P 220	439	R610	5130-R030J122	RES,CBN 1/2P 1.2K
592	R517	5130-R030J103	RES,CBN 1/2P 10K	440	R611	5130-R030J221	RES,CBN 1/2P 220
592	R518	5130-R030J103	RES,CBN 1/2P 10K	440	R612	5130-R030J221	RES,CBN 1/2P 220
593	R519	5130-R030J222	RES,CBN 1/2P 2.2K	440	R613	5130-R030J221	RES,CBN 1/2P 220
593	R520	5130-R030J222	RES,CBN 1/2P 2.2K	440	R614	5130-R030J221	RES,CBN 1/2P 220
594	R521	5174-563381	RES,MTL 1/4P 56K	440	R615	5130-R030J221	RES,CBN 1/2P 220
594	R522	5174-563381	RES,MTL 1/4P 56K	440	R616	5130-R030J221	RES,CBN 1/2P 220
595	R523	5130-R030J391	RES,CBN 1/2P 390	440	R617	5130-R030J221	RES,CBN 1/2P 220
595	R524	5130-R030J391	RES,CBN 1/2P 390	440	R618	5130-R030J221	RES,CBN 1/2P 220
595	R525	5130-R030J391	RES,CBN 1/2P 390	443	R619	5130-R030J101	RES,CBN 1/2P 100
595	R526	5130-R030J391	RES,CBN 1/2P 390	443	R620	5130-R030J101	RES,CBN 1/2P 100
596	R527	5174-183381	RES,MTL 1/4P 18K	443	R621	5130-R030J101	RES,CBN 1/2P 100
596	R528	5174-183381	RES,MTL 1/4P 18K	443	R622	5130-R030J101	RES,CBN 1/2P 100
597	R529	5174-562381	RES,MTL 1/4P 5.6K	435	R623	5130-R030J682	RES,CBN 1/2P 6.8K
597	R530	5174-562381	RES,MTL 1/4P 5.6K	435	R624	5130-R030J682	RES,CBN 1/2P 6.8K
585	R531	5130-R030J331	RES,CBN 1/2P 330	435	R625	5130-R030J682	RES,CBN 1/2P 6.8K
585	R532	5130-R030J331	RES,CBN 1/2P 330	435	R626	5130-R030J682	RES,CBN 1/2P 6.8K
598	R533	5130-R030J105	RES,CBN 1/2P 1M	479	R627	5130-R030J102	RES,CBN 1/2P 1K
598	R534	5130-R030J105	RES,CBN 1/2P 1M	479	R628	5130-R030J102	RES,CBN 1/2P 1K
599	R535	5130-R030J104	RES,CBN 1/2P 100K	445	R629	5130-R030J104	RES,CBN 1/2P 100K
599	R536	5130-R030J104	RES,CBN 1/2P 100K	445	R630	5130-R030J104	RES,CBN 1/2P 100K
591	R537	5130-R030J335	RES,CBN 1/2P 3.3M	446	R631	5174-564381	RES,MTL 1/4P 560K
591	R538	5130-R030J335	RES,CBN 1/2P 3.3M	446	R632	5174-564381	RES,MTL 1/4P 560K
535	R539	5130-R030J394	RES,CBN 1/2P 390K	447	R633	5174-Z412238	RES,MTL 1/4P 41.2K
535	R540	5130-R030J394	RES,CBN 1/2P 390K	447	R634	5174-Z412238	RES,MTL 1/4P 41.2K
536	R541	5130-R030J563	RES,CBN 1/2P 56K	448	R635	5130-R030J102	RES,CBN 1/2P 1K
536	R542	5130-R030J563	RES,CBN 1/2P 56K	448	R636	5130-R030J102	RES,CBN 1/2P 1K
600	R551	5130-R030J224	RES,CBN 1/2P 220K	449	R637	5174-821381	RES,MTL 1/4P 820
600	R552	5130-R030J224	RES,CBN 1/2P 220K	449	R638	5174-821381	RES,MTL 1/4P 820
601	R553	5130-R030J124	RES,CBN 1/2P 120K	444	R639	5130-R030J151	RES,CBN 1/2P 150
601	R554	5130-R030J124	RES,CBN 1/2P 120K	444	R640	5130-R030J151	RES,CBN 1/2P 150
602	R555	5130-R030J331	RES,CBN 1/2P 330	450	⚠ R641	5102-2205116	RES,FUSE 22
602	R556	5130-R030J331	RES,CBN 1/2P 330	450	⚠ R642	5102-2205116	RES,FUSE 22
603	R557	5130-R030J472	RES,CBN 1/2P 4.7K	450	⚠ R643	5102-2205116	RES,FUSE 22
603	R558	5130-R030J472	RES,CBN 1/2P 4.7K	450	⚠ R644	5102-2205116	RES,FUSE 22
603	R559	5130-R030J472	RES,CBN 1/2P 4.7K	477	R645	5130-R030J332	RES,CBN 1/2P 3.3K
603	R560	5130-R030J472	RES,CBN 1/2P 4.7K	477	R646	5130-R030J332	RES,CBN 1/2P 3.3K
606	R561	5130-R030J221	RES,CBN 1/2P 220	451	R647	5130-R030J123	RES,CBN 1/2P 12K
606	R562	5130-R030J221	RES,CBN 1/2P 220	451	R648	5130-R030J123	RES,CBN 1/2P 12K
606	R563	5130-R030J221	RES,CBN 1/2P 220	452	R649	5130-R030J102	RES,CBN 1/2P 1K
606	R564	5130-R030J221	RES,CBN 1/2P 220	452	R650	5130-R030J102	RES,CBN 1/2P 1K

IB

BK

IB

IB

BK

IB

BK

IB

Ser. No.	Ref. No.	Part No.	Description
534	D21	5635-HZ20-2L	DIODE,ZENER
534	D22	5635-HZ20-2L	DIODE,ZENER
533	D31	5635-HZ27-2L	DIODE,ZENER
533	D32	5635-HZ27-2L	DIODE,ZENER
415	D645	5635-HZ20-1L	DIODE,ZENER
415	D646	5635-HZ20-1L	DIODE,ZENER
416	D701	5635-HZ11B2L	DIODE,ZENER
416	D702	5635-HZ11B2L	DIODE,ZENER
MISCELLANEOUS			
414	CN506	4443-0301140	CONNECTOR
523	CW506	4163-S0103401	CONNECTOR W/W
537A	△ F1	5732-01501122	FUSE, 1.25A 125V/250V BK
537	△ F1	5732-01601122	FUSE, T1.25A/T1.25AL 250V IB
537A	△ F2	5732-01501122	FUSE, 1.25A 125V/250V BK
537	△ F2	5732-01601122	FUSE, T1.25A/T1.25AL 250V IB
526	△ HF1	4472-04901	FUSE HOLDER, F1
526	△ HF2	4472-04901	FUSE HOLDER, F1
526	△ HF3	4472-04901	FUSE HOLDER, F2
526	△ HF4	4472-04901	FUSE HOLDER, F2
417	△ J1	4484-50	4P PIN JACK, MM/MC
538	△ J2	4484-50	4P PIN JACK, TUNER/CD
538	△ J3	4484-50	4P PIN JACK, VIDEO/AUX
538	△ J4	4484-50	4P PIN JACK, TAPE 2 IN/OUT
538	△ J5	4484-50	4P PIN JACK, TAPE 1 IN/OUT
538	△ J6	4484-50	4P PIN JACK, PRE-OUT A/B
639	JL11	4132-R0202251	CORD,2C
638	JL12	4132-R0202161	CORD,2C
638	JL13	4132-R0202161	CORD,2C
621	JL14	4132-R0202451	CORD,2C
620	JL505	4242-R0504301	JUMPER LEAD, 4 WIRE
468	L701	5597-3	CORE,BEADS
468	L702	5597-3	CORE,BEADS
468	L703	5597-3	CORE,BEADS
468	L704	5597-3	CORE,BEADS
623	LCN101	4163-0116020	CONNECTOR W/W
466	LCN601	4163-0125020	CONNECTOR W/W
611	SW3	4412-00103045	ROTARY-SLIDE SWITCH, SOURCE
612	SW4	4412-00104043	ROTARY-SLIDE SWITCH, TAPE MONITOR
465	SW701	4431-A027710	PUSH SWITCH, MM/MC SELECTOR
615	TM101	4214-11033	TERMINAL, 3 PIN
525		2240-Z031	HOLDER, W501, 502, 503, 504
527		2240-Z042	HOLDER, JL505 (X2)
626	LUG	4211-4	LUG, W-510

PCB-2 VOLUME P.C. BOARD

CONTROLS

616	VR501/502	5118-303731	RES,V CBN 40 30K, VOLUME
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PCB-3 GAIN SWITCH P.C. BOARD

MISCELLANEOUS

614	SW501	4431-S2601102	PUSH SWITCH, GAIN
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PCB-4 HEADPHONES P.C. BOARD

MISCELLANEOUS

539	J401	4451-51501	1P JACK, HEADPHONES
543	L401	5995-221J107	COIL W/CORE IB
543	L402	5995-221J107	COIL W/CORE IB

PCB-5 LED P.C. BOARD

CAPACITOR

505	C7	5345-106F041	CAP,MINI ELE 10µ/50V
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DIODE

532	D9	5637-SLR33MC	LED, POWER
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PCB-6 POWER SWITCH P.C. BOARD

CAPACITORS

513A	△ C101	5352-S010M103	CAP,MTL .01µ BK
513	△ C101	5352-1030958	CAP,MTL .01µ IB

Ser. No.	Ref. No.	Part No.	Description
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RESISTORS

556	△ R101	5130-R030J335	RES,CBN 1/2P 3.3M IB
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MISCELLANEOUS

042A	△ LCN201	4163-S5201300	CONNECTOR W/W, 1 PIN BK
043A	△ LCN202	4163-S5101300	CONNECTOR W/W, 1 PIN BK
044A	△ LCN203	4163-S5201300	CONNECTOR W/W, 1 PIN BK
613	△ SW101	4433-00401	PUSH SWITCH, POWER
625	△ TM104	4214-245	TERMINAL
625	△ TM105	4214-245	TERMINAL
625	△ TM106	4214-245	TERMINAL IB
625	△ TM107	4214-245	TERMINAL IB

PCB-7 AC OUTLET P.C. BOARD

MISCELLANEOUS

041A	△ SO101	4474-04302	SOCKET, AC OUTLET BK
052A	△ TM201	4214-245	TERMINAL BK
052A	△ TM202	4214-245	TERMINAL BK

CHASSIS MISCELLANEOUS

MISCELLANEOUS

618A	△ P1	4161-71151	CORD W/PLUG, AC CORD BK
618	△ P1	4161-7256	CORD W/PLUG, AC CORD IB
619A	△ T101	5584-701554-A	XFORMER,POWER BK
619	△ T101	5584-T2601	XFORMER,POWER IB
482	LUG	4211-4	LUG, GND

PACKING PARTS LIST

021A	1113-02501	OWNER CARD, REPLY CARD BK
022A	1116-03801	GUARANT CARD, WARRANTY BK
023A	1119-04501	ATTACH SHEET, SERVICE GUIDE BK
024A	1119-01201	ATTACH SHEET, UL BK
109A	1111-1140J152	OWNER GUIDE, IB BK
109	1111-1130J152	OWNER GUIDE, IB IB
113	1241-R0123351	POLYETHY BAG, OG
116	1756-03108	LABEL, (I) (X2) IB
122	1241-R0160601	POLYETHY BAG, SET
125	1221-28137	CARTON BOX
126	1222-7390	CUSHION, R
127	1222-7391	CUSHION, L
128	1223-R0420055	SOFT SHEET
622	4161-7114	CORD W/PLUG, RCA

ABBREVIATIONS IN PARTS LIST

CAPACITORS

CAP, MINI ELE	: Electrolytic
CAP, CER	: Ceramic
CAP, PPP	: Polypropylene
CAP, MYL	: Mylar
CAP, MCA	: Mica
	470µ : 470µF
	6800P : 6800pF
	.047µ : 0.047µF

RESISTORS

RES, CBN	1/6P	: Carbon 1/6W
	2.2K	: 2.2kΩ
	220	: 220Ω
RES, FUSE		: Fuse
RES, CEM	5P	: Cement 5W
RES, MTL	1P	: Metal 1W

TRANSISTORS

XISTOR	: Transistor
FET	: Field Effect Transistor

CONTROLS

RES, V CBN	: Variable Carbon Resistor
RES, SEMI FIX	: Semi - fixed Resistors

NOTE:

△ SAFETY RELATED COMPONENT. USE ONLY EXACT REPLACEMENT PART AS SPECIFIED.

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C

D

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SCHEMATIC DIAGRAM (1)

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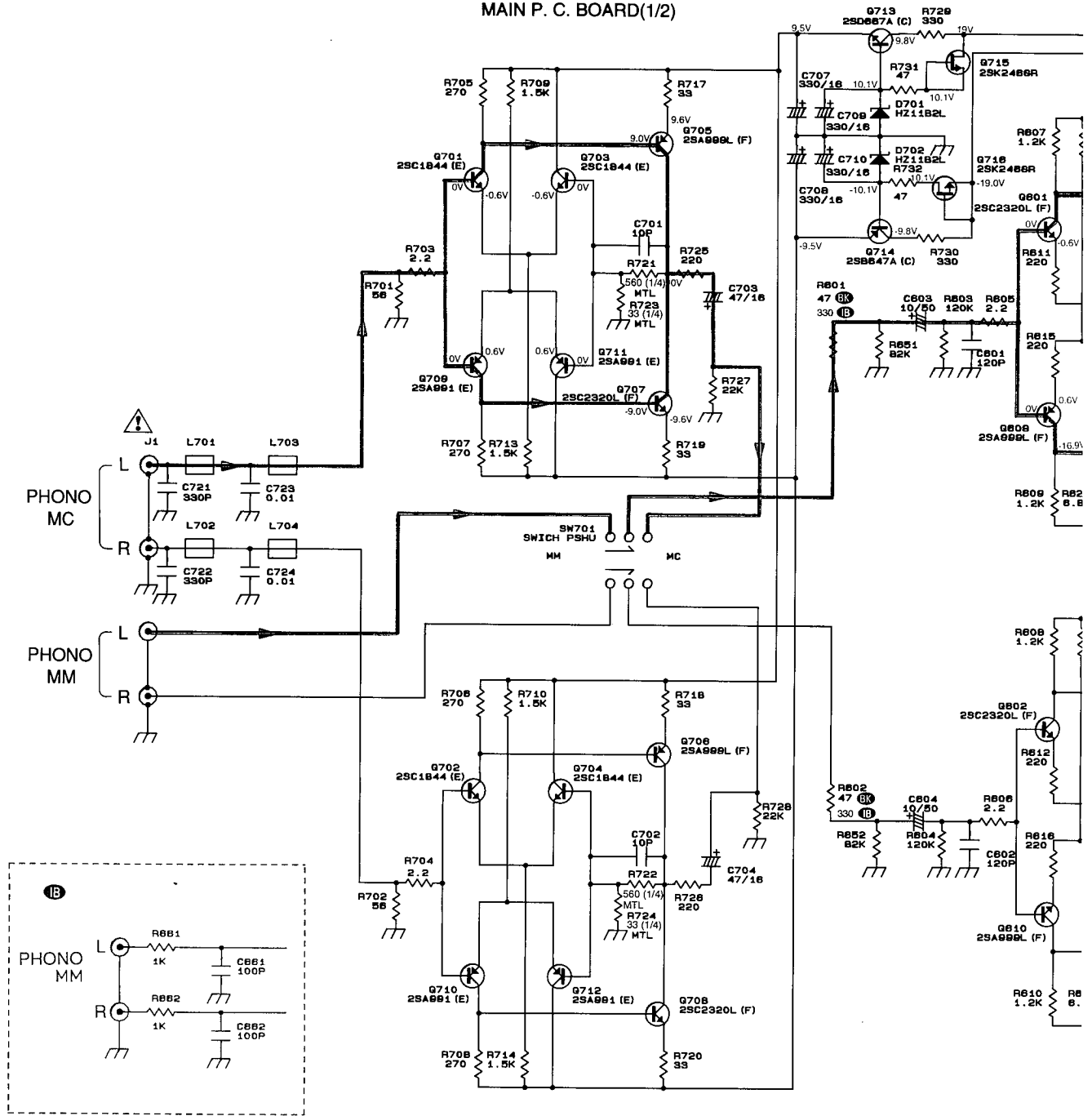
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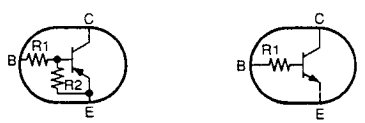
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PCB-1 MAIN P. C. BOARD(1/2)

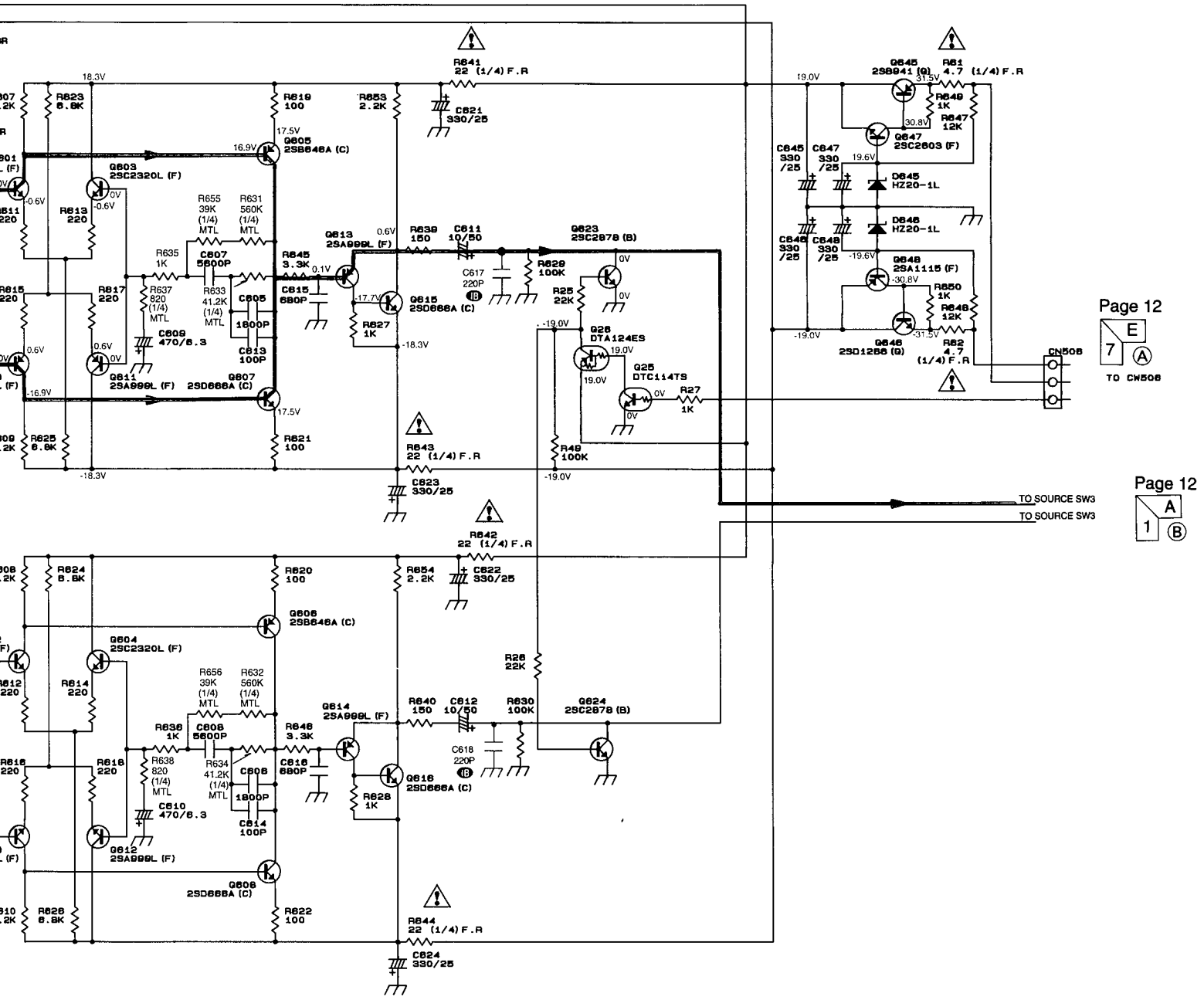




Type	R1	R2
DTA124ES	22K	22K

Type	R1
DTC114TS	10K

NOTE:
 1. ALL RESISTANCES VALUES IN
 K =1000 , M =1000K
 2. THE WATTAGE OF RESISTORS IS 1/2W UNLESS OTHERWISE NOTED.
 3. ALL CAPACITANCES VALUES ARE IN uF UNLESS OTHERWISE NOTED.
 4. ...V: DCVOLTAGE AT NO SIGNAL UNLESS OTHERWISE NOTED.
 5. SAFETY REQUIREMENTS COMPONENTS IN ACCORDANCE WITH PRESENT SAFETY REGULATIONS THSES COMPONENTS MUST ONLY BE REPLACED BY ORIGINAL PARTS.



Page 12
 E
 7 A
 TO CW508

Page 12
 A
 1 B

A

B

C

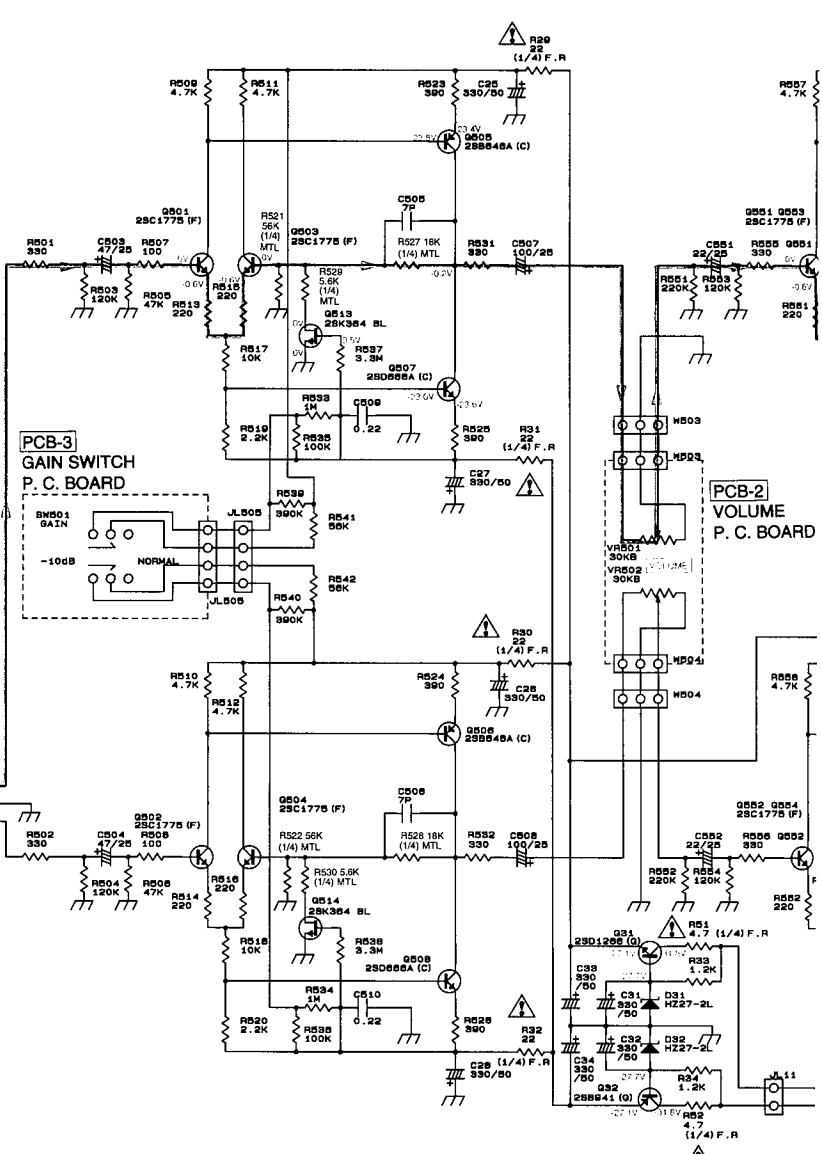
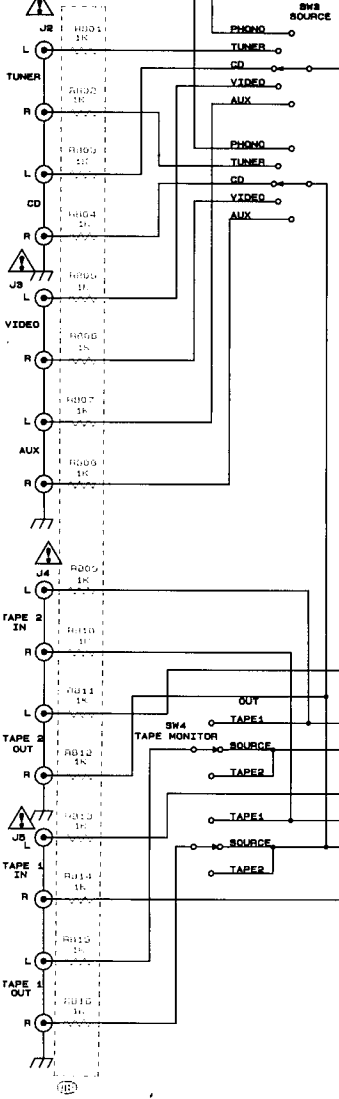
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SCHEMATIC DIAGRAM (2)

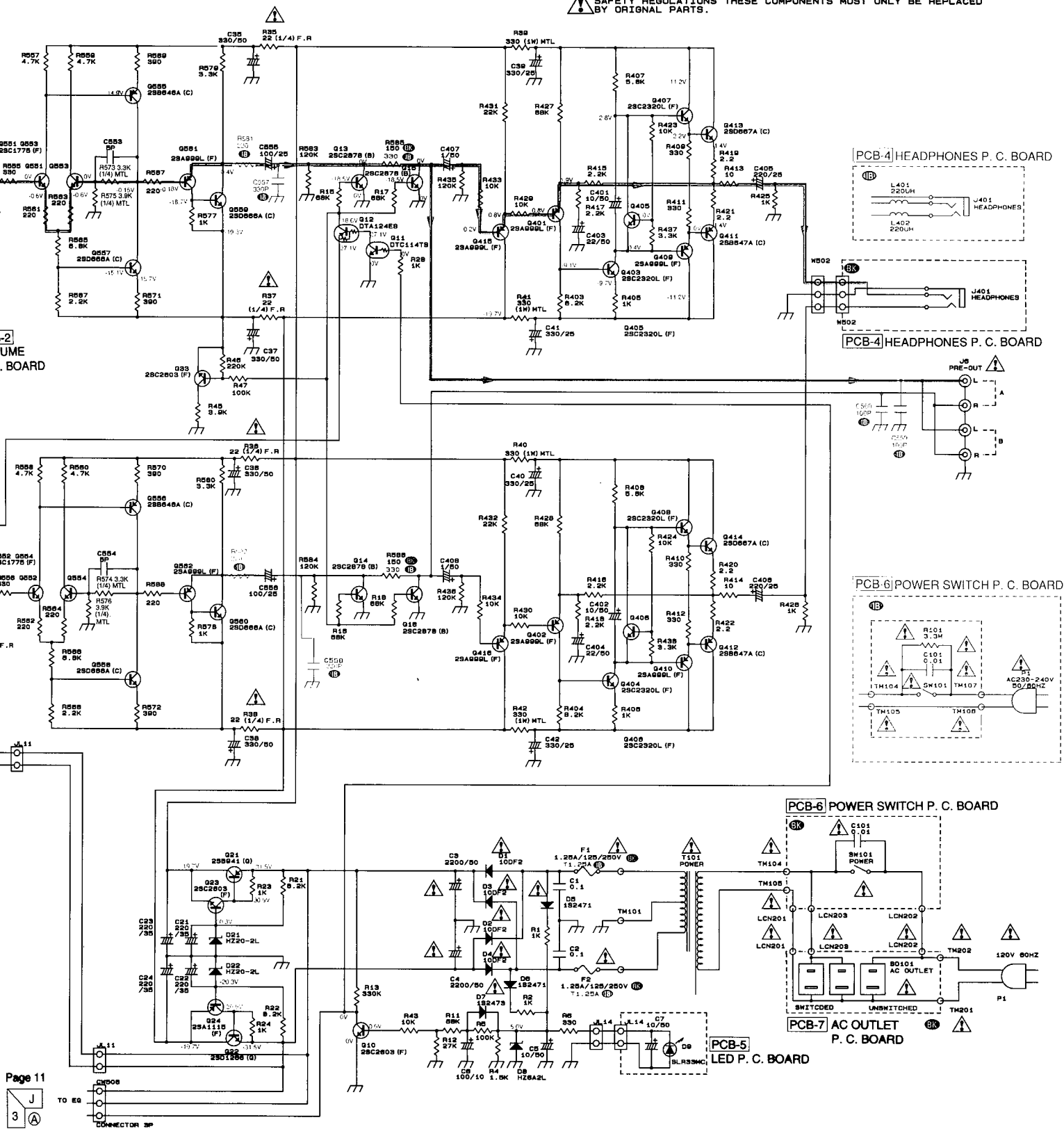
Page 11 PCB-1 MAIN P. C. BOARD(2/2)

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NOTE:

1. ALL RESISTANCES VALUES ARE IN K = 1000, M = 1000K
2. THE WATTAGE OF RESISTORS IS 1/2W UNLESS OTHERWISE NOTED
3. ALL CAPACITANCES VALUES ARE IN UF UNLESS OTHERWISE NOTED
4. ...V: DC VOLTAGE AT NO SIGNAL UNLESS OTHERWISE NOTED
5. SAFETY REQUIREMENTS COMPONENTS IN ACCORDANCE WITH PRESENT SAFETY REGULATIONS THESE COMPONENTS MUST ONLY BE REPLACED BY ORIGINAL PARTS.



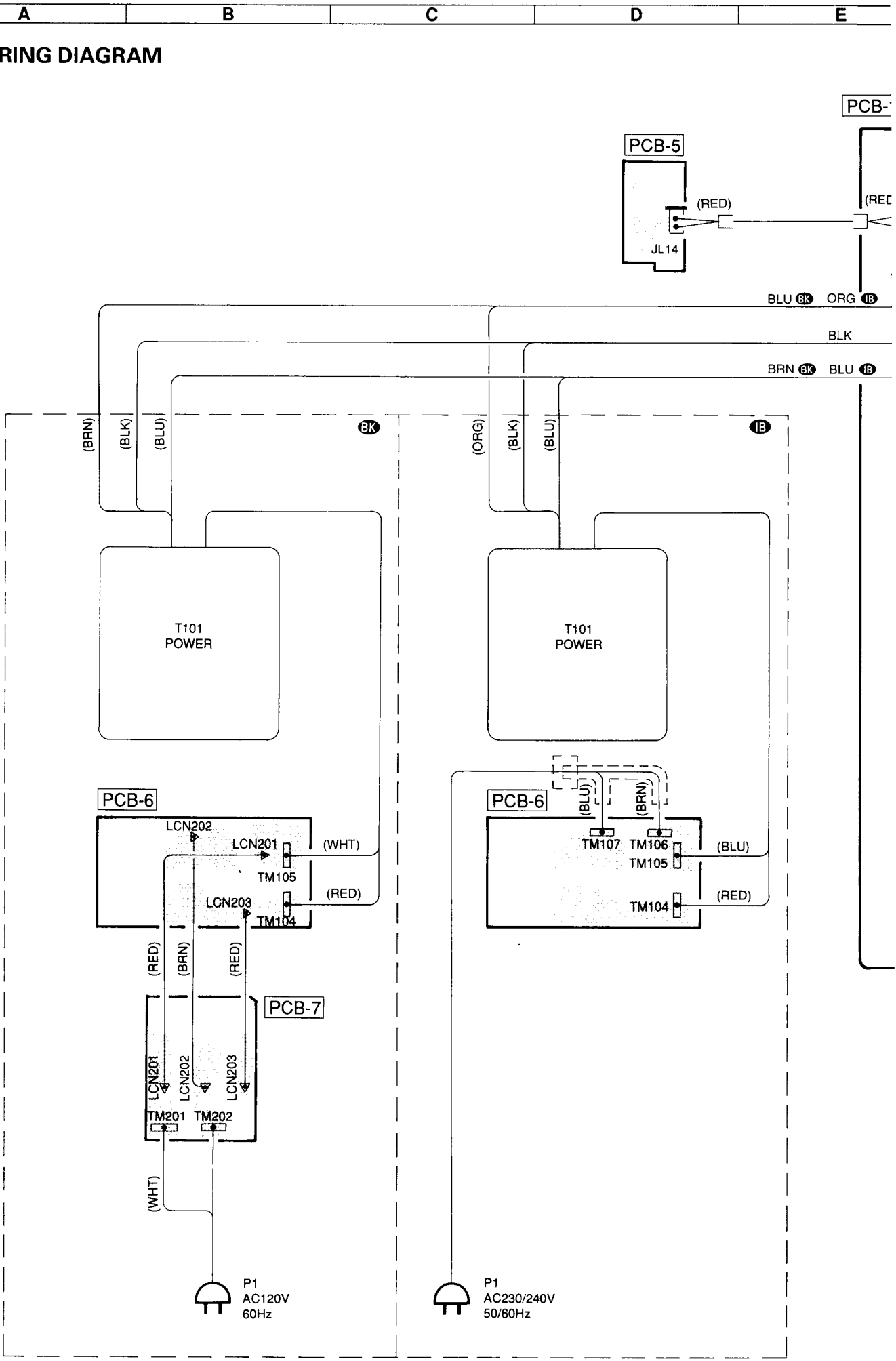
VOLUME BOARD

F.R.

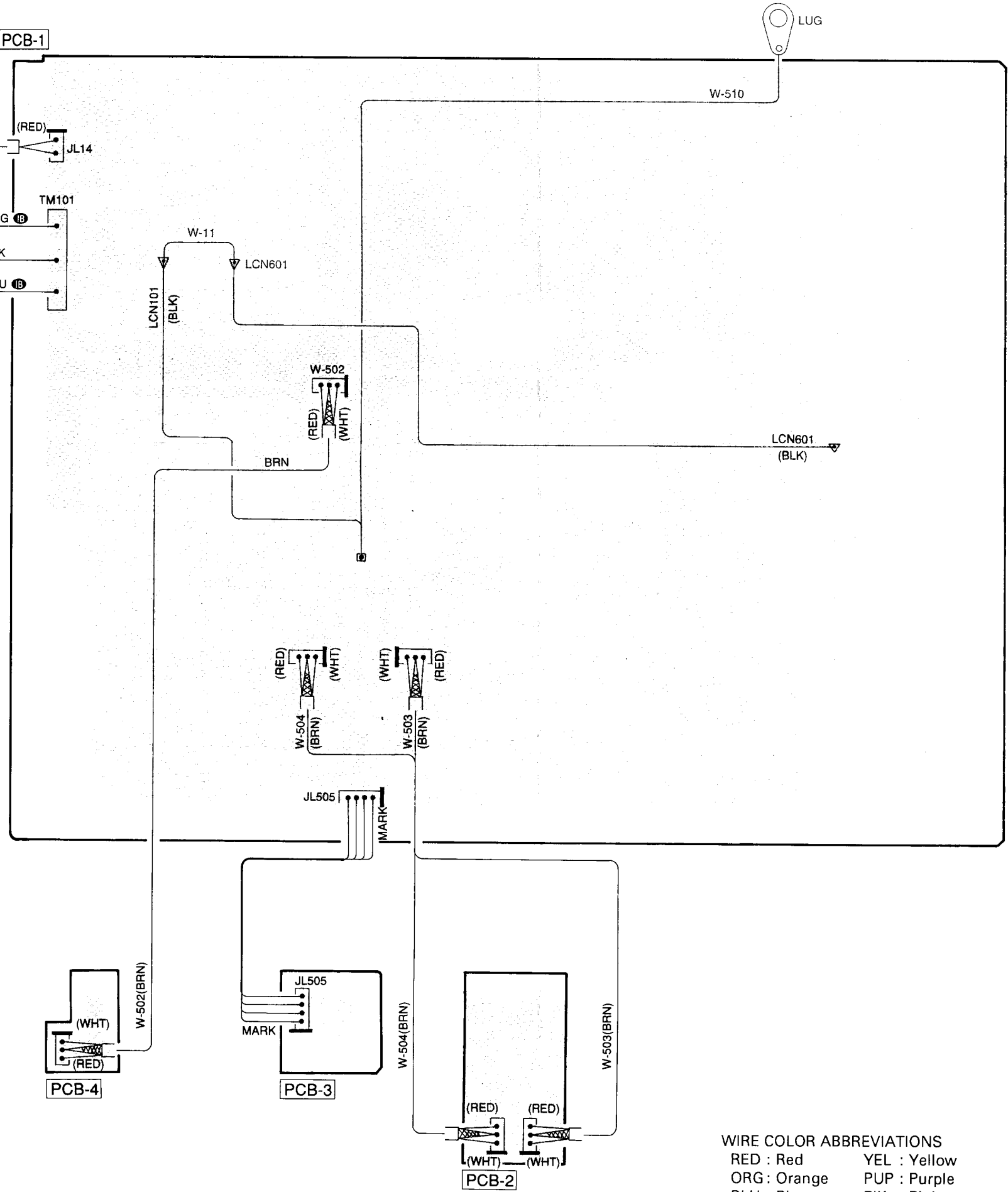
11

WIRING DIAGRAM

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F G H I J



- WIRE COLOR ABBREVIATIONS
- | | |
|--------------|--------------|
| RED : Red | YEL : Yellow |
| ORG : Orange | PUP : Purple |
| BLU : Blue | PIK : Pink |
| WHT: White | BRN : Brown |
| BLK : Black | |