

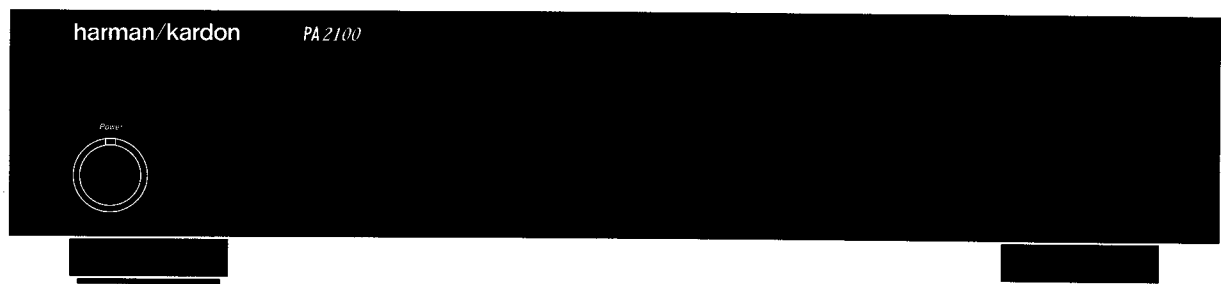
# The Harman Kardon

## Model PA2100

Manual A

### STEREO POWER AMPLIFIER

# Technical Manual



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

- ⓔK : North America area model Black version**
- ⓌB : World model Black version**

## harman/kardon

Service and Parts Department  
240 Crossways Park West, Woodbury, N. Y. 11797  
1112-PA2100-A P9310 1200 Printed in USA

## SPECIFICATIONS

### Continuous Average Power

Per Channel (FTC), from 20 Hz to 20kHz, both Channels Driven

Bridged (FTC), from 20 Hz to 20kHz, Mono

Dynamic Power (IHF, 1kHz tone burst)

High Voltage/High Current Mode:

High Current Mode:

High Instantaneous Current Capability (HCC):

Negative Feedback:

Power Bandwidth @ half-rated output, 8 Ohms

Frequency Response @ 1 Watt (+0/-3dB):

Slew Rate\*:

Rise Time:

Transient Intermodulation Distortion (TIM):

Damping Factor:

Signal-to-Noise Ratio (ref rated power, A-Wtd):

Input Sensitivity/Impedance

Dimensions (W x H x D);

## PA2100

8 Ohms 65 Watts @ < 0.09% THD

4 Ohms 65 Watts @ < 0.3% THD

8 Ohms 130 Watts @ < 0.3% THD

8 Ohms 85 Watts

4 Ohms 125 Watts

2 Ohms 165 Watts

4 Ohms 85 Watts

2 Ohms 125 Watts

±40 Amperes

12dB/12dB

< 10Hz - 100kHz

0.3Hz - 250kHz

120 Volts/Sec

1.2 Sec

unmeasurable

100

115dB

0.8 Volts/22kOhms

inches: 1 7<sup>3</sup>/<sub>8</sub> x 4<sup>1</sup>/<sub>8</sub> x 13<sup>3</sup>/<sub>4</sub>

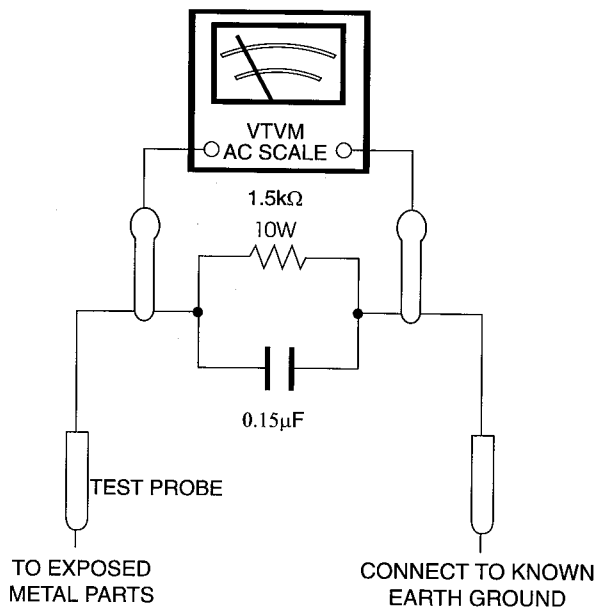
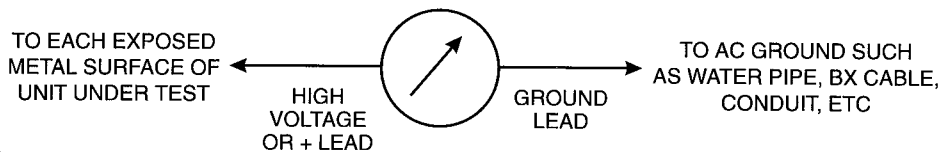
mm: 443 x 105 x 347443 x 137 x 372

## 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.)

SIMPSON MODEL 229 ETC. FOR LEAKAGE TEST



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 (REF PAGE 4)

### [1] CABINET TOP (AD) REMOVAL

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

### [2] FRONT PANEL ASSEMBLY (AA)REMOVAL

1. Remove the Cabinet Top (AD), referring to the previous step [1].
2. Remove 5 screws (B) and then remove the Front Panel Assembly (AA).

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

1. Remove the Cabinet Top (AD), referring to the previous step [1].
2. Remove 6 screws (D), then remove the Auto On/Off P.C.Board from the chassis.
3. Open the lids of connectors (CN202 and CN221) on the Auto On/Off P.C.Board (PCB-2), then disconnect lead wires (W202, W203, W401, W402, and W404) from Main P. C. Board (PCB-1).
4. Unsolder the lead wires (JL403, JL404, JL408, JL409, JL410, JL413 and JL414) from reference points (LCN403, LCN404, LCN408, LCN409, LCN410, LCN413 and LCN414) on the Main P. C. Board (PCB-1). Also unsolder the lead wires (W201 and W406) from reference point (TM415) on the Main P. C. Board (PCB-1).
5. Disconnect the connector with lead wire (CW220) from connector (CN220) on Led Power P.C Board (PCB-8).
6. Remove 8 screws (C), then remove the Main P. C. Board (PCB-1) with HeatSink (181) from the chassis.

### [4] AUTO ON/OFF P.C BOARD (PCB-2) REMOVAL

1. Remove the Cabinet Top (AD), referring to the previous step [1].
2. Remove 6 screws (D), then remove the Auto On/Off P.C.Board from the chassis.
3. Open the lids of connectors CN202 and CN221) on the Auto On/Off P.C.Board (PCB-2), then disconnect lead wires (W202, W203, W401, W402 and W404) from Main P. C. Board (PCB-1).
4. Unsolder the lead wires (W201 and W406) from reference point (TM415) on the Main P. C. Board (PCB-1).
5. Disconnect the connector with lead wire (CW205) from connector (CN205) on Led Power P. C. Board (PCB-8).

### [5] LED P.C BOARD (PCB-8) REMOVAL

1. Disconnect the connector with lead wire (CW205, CW206 AND CW220) from connector (CN205, CN206 and CN220) on Led Power P. C. Board (PCB-8).
2. Remove 2 screws (E), then remove the Led Power P. C. Board (PCB-8) from the chassis.

## PROTECTION CIRCUIT

When the power switch is turned on, there will be no sound for about 8 seconds. This is the normal operation of the "Turn-on muting protection circuit" which protects the speaker systems from turn-on transients. After about 8 seconds, the amplifier will operate. It is suggested that the preamplifier volume control be set to a low level during the turn-on period. It is also advisable to turn on all other high fidelity components in the system before turning on the power amplifier. When a short circuit or a load of less than 2 ohms is placed across the speaker terminals for more than 4 milliseconds (4/1000 of a second), the protection circuit will activate and the amplifier will be muted for about 8 seconds. The muting will turn off and the amplifier will begin operating again after 8 seconds.

When the temperature of the internal heatsink rises too high, the protection circuit will activate and the amplifier will be muted. When the unit cools off, the amplifier will automatically become operational. However, unlike the turn-on and short circuit protection, the temperature protections may not restore operation in only 8 seconds because of the time required for the unit to cool off.

While you are connecting your power amplifier to the rest of you high fidelity system, please unplug the power cords of not only the power amplifier but all the components from the AC outlet.

## AUTO-STANDBY FEATURE OPERATION

The PA2100 has a unique ability to sense when it is not receiving a music signal and it can automatically switch into a "Standby" mode. When this happens, the power amplifier circuitry completely shuts off and the front panel power indicator color changes from green (for "On") to amber (for "Standby"). When the amplifier again receives a music signal, it will return to the "On" state. The Auto-Standby feature instantly switches the amplifier "On", and switches it to "Standby" approximately 2 minutes after the incoming music signal stops. The 2 minute time before switching to "Standby" is to prevent the amplifier from unnecessarily switching between modes during use, or while the user is changing inputs or selecting software. This feature allows leaving the amplifier power switch in the "On" position when the amplifier is not in use. This can be a benefit in many systems and installations where the amplifier is not located within reach or is in another room. The "Auto-Standby" feature is also defeatable, for those customers that prefer the amplifier to behave in a conventional way. The "Auto-Standby" defeat switch is set in the "Off" position at the factory.

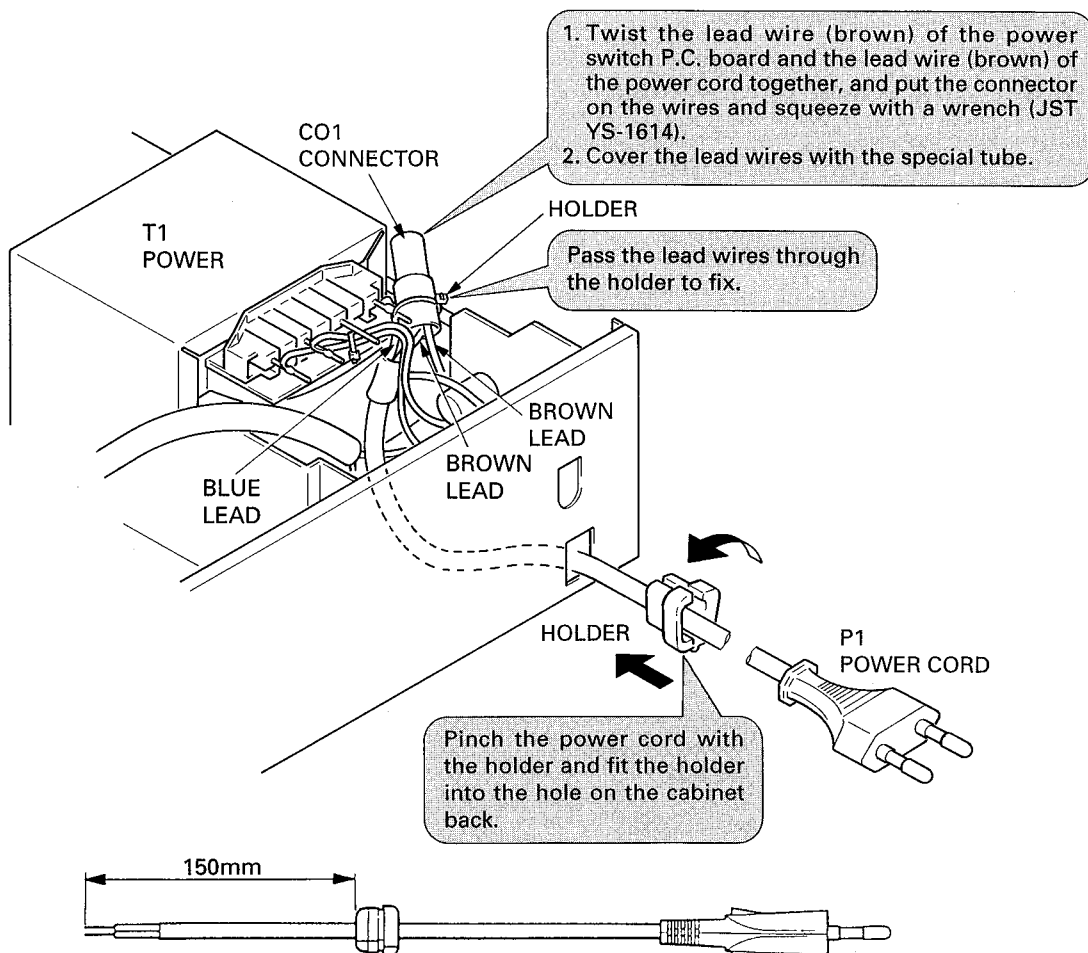
## BRIDGED MONO OPERATION

This feature permits both amplifier channels to drive one 8Ω loudspeaker. To operate the amplifier in this way, set the 8Ω/4Ω switch in the 4Ω position, set the "Bridged Mono" switch in the "On" position and connect the amplifier's Left (Mono +) speaker terminal to the loudspeaker's "+" wire and the amplifier's Right (Mono -) speaker terminal to the loudspeaker's "-" wire.

**Please note:** The amplifier is not designed to drive a 4Ω speaker in the Bridged Mono mode.

## 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.





## GENERAL PARTS LIST

			Ref.No.	Part No.	Description
AA	A443-PA2100B	FRONT PANEL ASSEMBLY <b>EK</b> <b>WB</b>	196	2360-7026	BOSS, SPE, LED PCB (X2)
AB	A424-PA2100A	CABINET BACK ASSEMBLY <b>EK</b>	197	2112-11771	SPONGE, TRANS TOP (X2) <b>EK</b>
AB	A424-PA2100C	CABINET BACK ASSEMBLY <b>WB</b>	197	2112-11802	SPONGE, TRANS TOP <b>WB</b>
AC	A424-PA2100B	CABINET BOTTOM ASSEMBLY <b>EK</b>	198	2132-7136	SPACER, HEAT METAL (X4)
AC	A424-PA2100D	CABINET BOTTOM ASSEMBLY <b>WB</b>	201	2224-7120	INSULATOR, HEAT METAL (X2)
AD	A414-PA2100A	CABINET TOP ASSEMBLY <b>EK</b>	202	2224-7120	INSULATOR, AUTO ON/OFF PCB H/S
AD	A414-PA2100B	CABINET TOP ASSEMBLY <b>WB</b>	204	2224-7137	INSULATOR, CABINET
116	175611301	LABEL, FUSE CAUTION <b>EK</b>	207	2218-R0130	BRACKET, FIX, WIRING
117	1756-R011N312	LABEL, FUSE RATING <b>EK</b>	210	2431-0151	FASTENER, BADGE (X2)
131	1414-04501	CABINET, TOP <b>EK</b>	213	△ 2672-7018	LEVER, POWER SHAFT
131	1414-04901	CABINET, TOP <b>WB</b>	218	2459-3005511	RIVET, PLASTIC, AUTO ON/OFF PCB H/S
133	1424-37001	CABINET, BOTTOM	220	2459-3003511	RIVET, PLASTIC, AC CORD PCB REAR
134	1424-36701	CABINET BACK <b>EK</b>	222	2347-400827	SCREW, BND T+ (X4)
134	1424-36703	CABINET BACK <b>WB</b>	224	2401-0373	WASHER, METAL, BIAS PCB (X2)
136	1443-14602	FRONT PANEL <b>EK</b> <b>WB</b>	228	2327-R0126044	SCREW, BND+ (2.6X4 mm)(X4)
139	1714-02602	NAME PLATE, BADGE <b>EK</b> <b>WB</b>	229	2327-R0130062	SCREW, BND+ (3X6 mm)(X4)
141	1562-08202	FRAME, L <b>EK</b> <b>WB</b>	230	2327-R0130064	SCREW, BND+ (3X6 mm)(X2)
142	1562-08302	FRAME, R <b>EK</b> <b>WB</b>	232	2347-R0130062	SCREW, BND T+ (3X6 mm)
144	1732-08801	INDICATOR, POWER LED	233	2347-R0130062	SCREW, BND T+ (3X6 mm)(X3)
146	1662-66902	PUSH BUTTON, PWER <b>EK</b> <b>WB</b>	234	2347-R0130062	SCREW, BND T+ (3X6 mm)(X17)
155	1742-08302	ORNAMENT, POWER <b>EK</b> <b>WB</b>	236	2347-R0130064	SCREW, BND T+ (3X6 mm)(X9)
159	△ 1319-03901	LEG, BOTTOM (X4)	238	2347-R0130084	SCREW, BND T+ (3X8 mm)(X8)
161	2211-7295	CHASSIS, FRONT	240	2347-R0130102	SCREW, BND T+ (3X10 mm)(X4)
163	2219-8207	METAL FITTING, BOTTOM CENTER	241	2347-R0140064	SCREW, BND T+ (4X6 mm)(X4)
164	2219-8384	METAL FITTING, MAIN HEAT	244	2347-R0130082	SCREW, BND T+ (3X8 mm)(X12)
165	2219-8385	METAL FITTING, MAIN HEAT	246	2440-7016	MUT. SPE. AUTO ON/OFF PCB H/S
166	2219-8386	METAL FITTING, BOTTOM SIDE	247	2327-R0130102	SCREW, BND (3X10 mm)
169	2219-8349	METAL FITTING, AC CORD PCB SIDE	249	2557-301429	SCREW, B SPWT (X4)
170	2219-8350	METAL FITTING, AC CORD PCB REAR	511	2224-7134	INSULATOR
171	2219-8019	METAL FITTING, POWER SW PCB	632	2240-Z031	HOLDER, HL201
174	2219-8305	METAL FITTING, DRIVER TR (X2)	739	4214-168	TERMINAL, GND
180	2222-7285	HEAT SINK, DRIVER (X2)			
181	2222-7321	HEAT SINK, MAIN			
182	2222-7229	HEAT SINK, AUTO ON/OFF			
187	2240-7395	HOLDER, BRIDGE SW, DEFEAT SW (X2)			
188	2240-7359	HOLDER, 4/8 SW			
189	2240-R0101	HOLDER, WIRING (X10)			
191	△ 2240-364	HOLDER, AC CORD			
192	△ 2240-7049	HOLDER, WIRING			
194	2362-901014	BOSS, THREAD, MAIN AMP			

## ALIGNMENT PROCEDURES

## ■ Conditions:

Set the Speaker Operating Mode switch to "8W" position.  
Make the adjustment at a room temperature of 77F (25C).

## ■ IDLING CURRENT ADJUSTMENT

Step	Connection Equipments	Adjustment	For
1	Connect the Digital Volt Meter to TP401 and TP403.	VR401	33 mV
2	Connect the Digital Volt Meter to TP402 and TP404.	VR402	33 mV

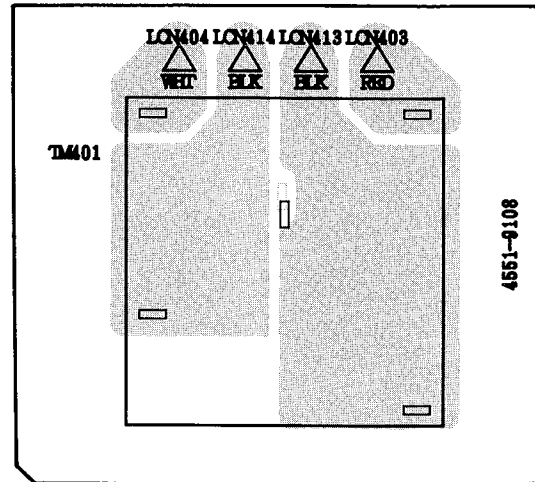
## ■ DC BALANCE CONFIRMATION

Set the Speaker Operating Mode switch to the "4W" position.

- After the above adjustment, leave the unit with its power on for longer than 20 minutes and then repeat the same adjustment.

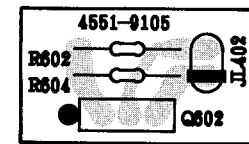
P. C. BOARDS (1)

PCB-5 Speaker P.C.Board



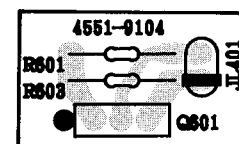
PCB-7

Bias R P.C.Board

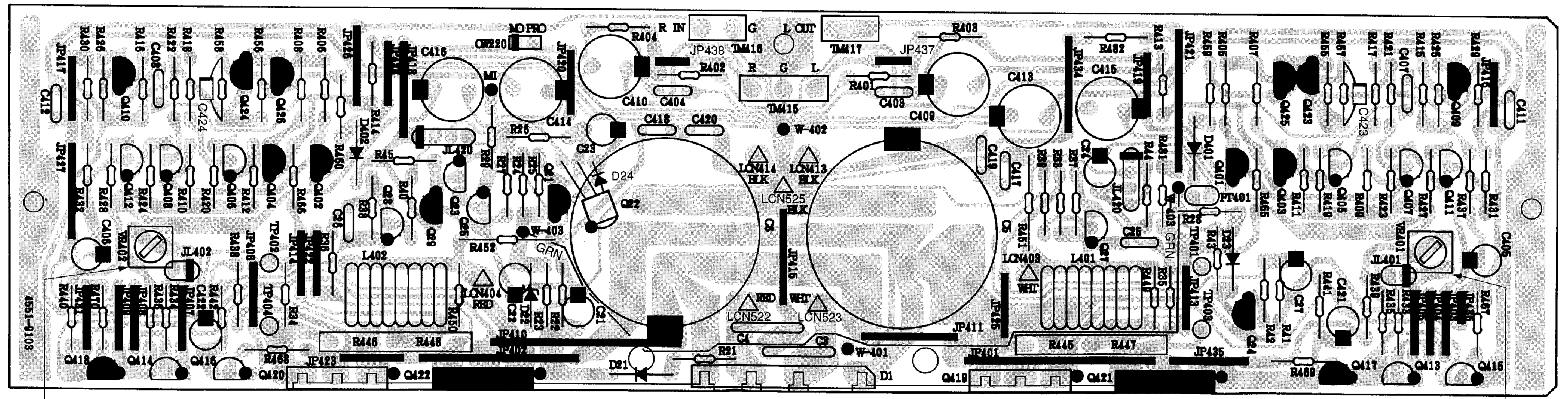


PCB-6

Bias L P.C.Board



PCB-1 Main P.C.Board

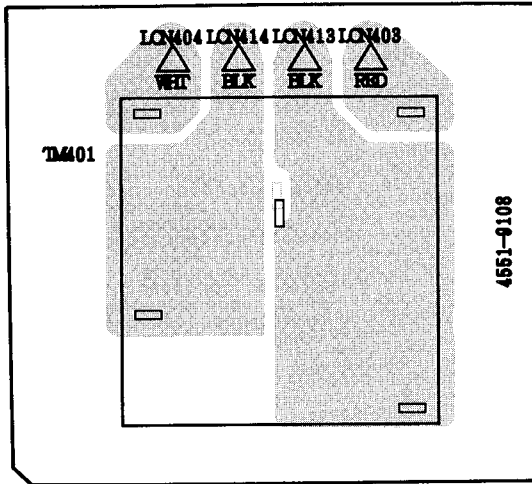


IDLING CURRENT  
ADJ. (Rch)

IDLING CURRENT  
ADJ. (Lch)

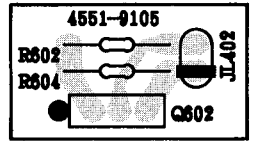
P. C. BOARDS (1)

PCB-5 Speaker P.C.Board

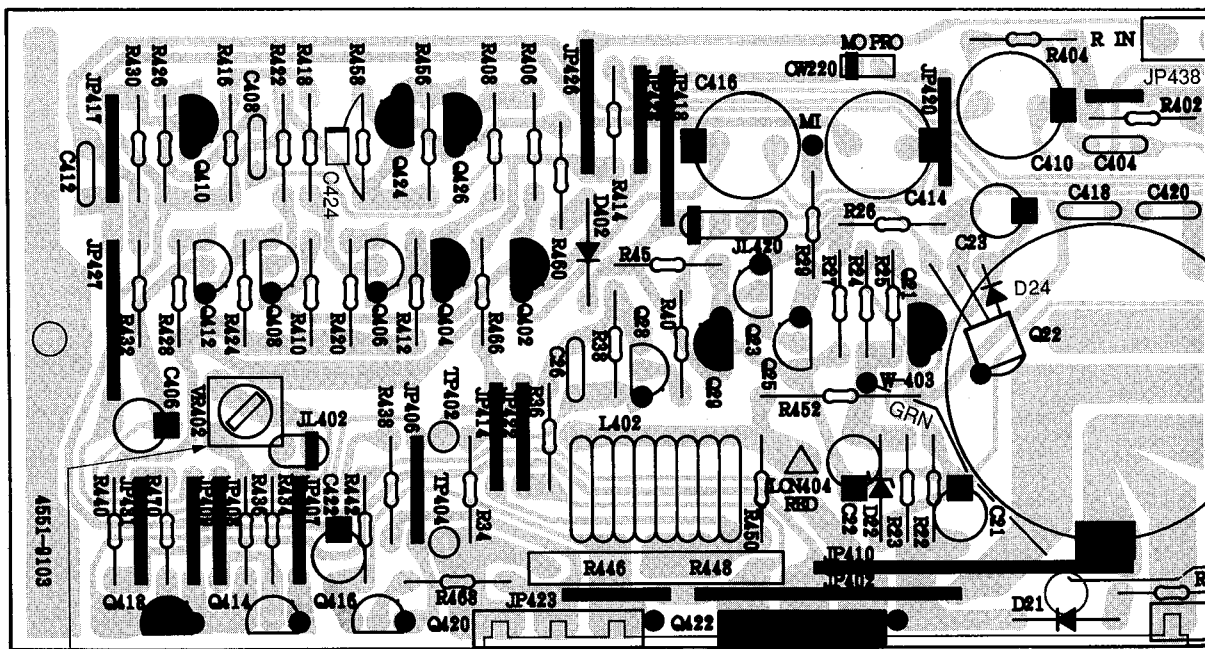


PCB-7

Bias R P.C.Board



PCB-1 Main P.C.Board



IDLING CURRENT  
ADJ. (Rch)

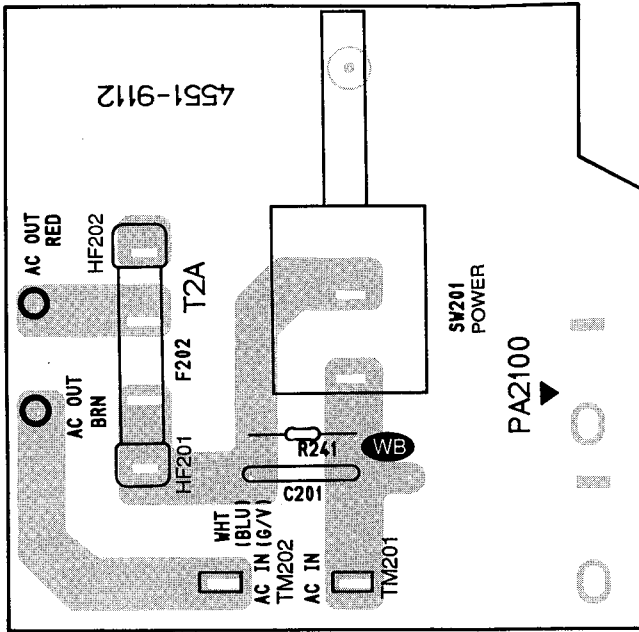




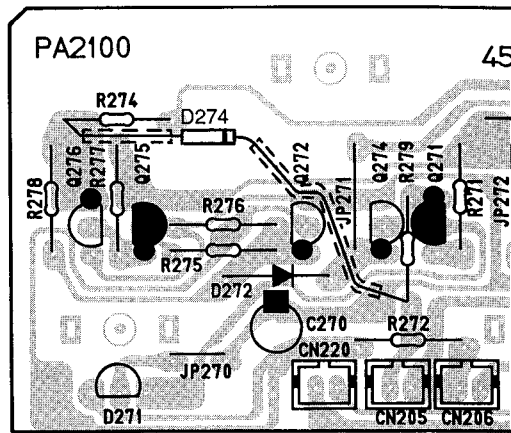


P. C. BOARDS (2)

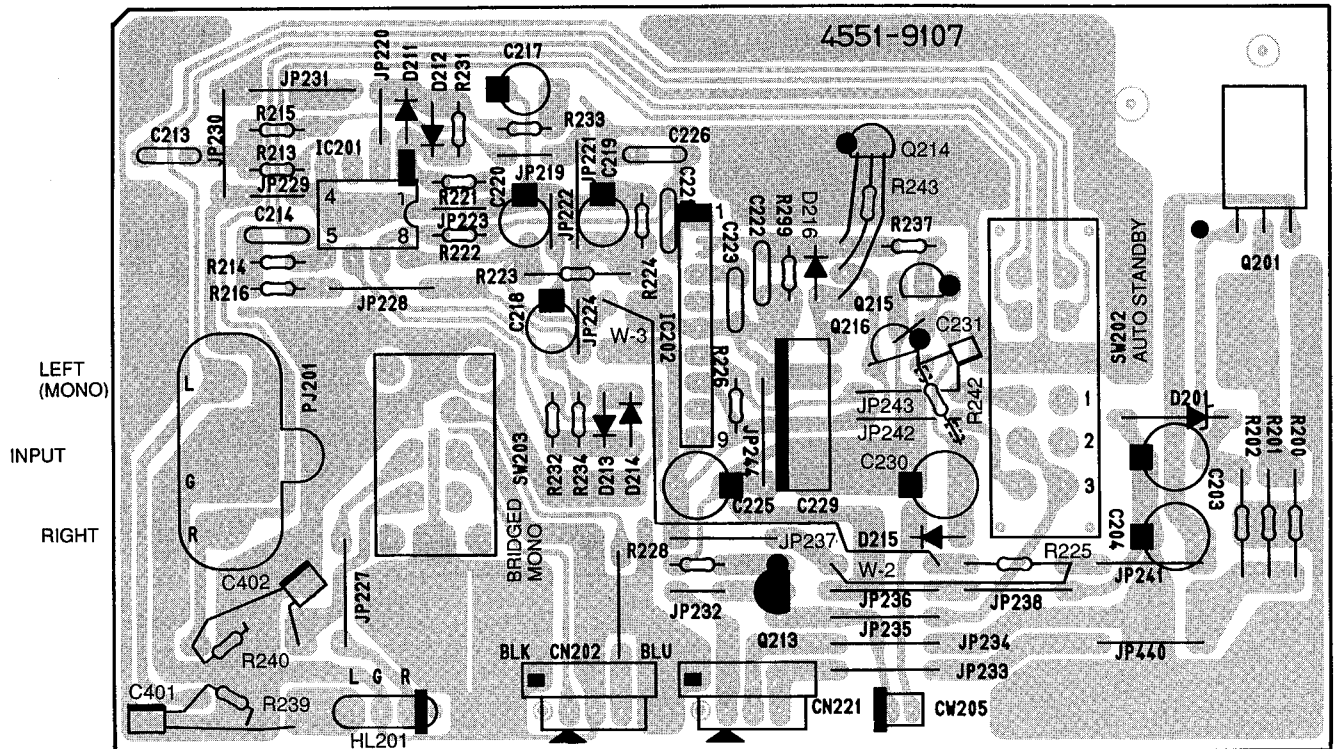
PCB-3 Power SW P.C.Board



PCB-8 LED P.C.Board

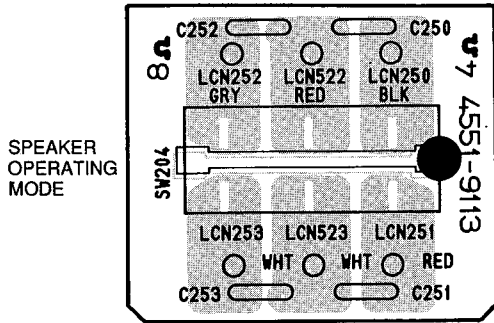


PCB-2 Auto On/Off P.C.Board

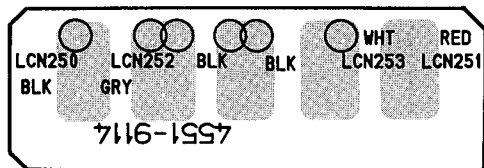




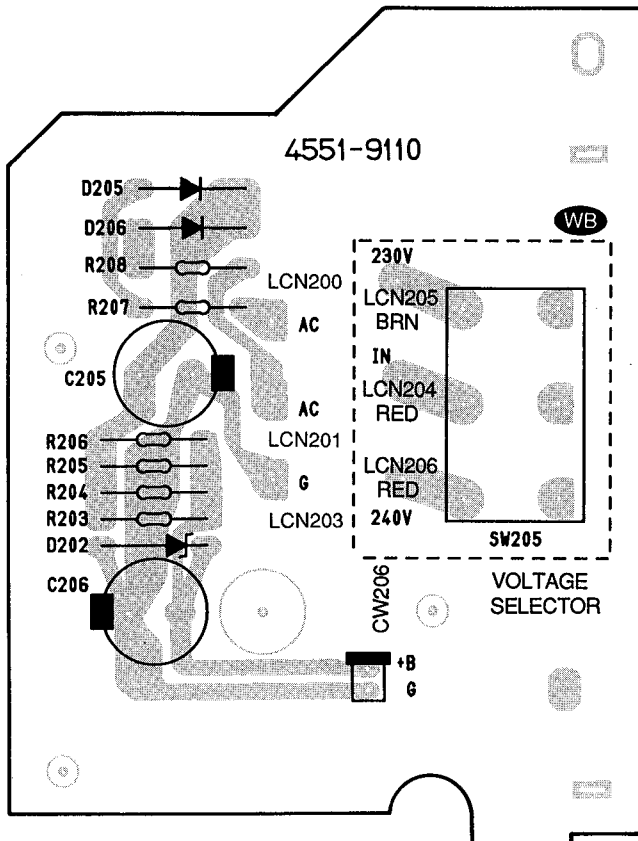
PCB-10 4/8 SW P.C.Board



PCB-9 Trans P.C.Board



PCB-4 LED Power P.C.Board



## ELECTRICAL PARTS LIST

Ser. No.	Ref. No.	Part No.	Description	Ser. No.	Ref. No.	Part No.	Description
<b>PCB-1 MAIN PC BOARD</b>							
<b>CAPACITORS</b>							
586	△ C3	5352-1041957	CAP, MTL .1μ	535	R413	5174-751381	RES, MTL 1/4 750
586	△ C4	5352-1041957	CAP, MTL .1μ	535	R414	5174-751381	RES, MTL 1/4 750
585	△ C5	5341-S21GM139	CAP, ELE 13000μ	547	R415	5130-RO30J561	RES, CBN 1/2P 560
585	△ C6	5341-S21GM139	CAP, ELE 1300μ	547	R416	5130-RO30J561	RES, CBN 1/2P 560
568	C21	5345-106F041	CAP, MINI ELE 10μ/50V	533	△ R417	5102-5615116	RES, FUSE 560
568	C22	5345-106F041	CAP, MINI ELE 10μ/50V	533	△ R418	5102-5615116	RES, FUSE 560
569	C23	5345-107B041	CAP, MINI ELE 100μ/10V	547	R419	5130-RO30J561	RES, CBN 1/2P 560
570	C24	5345-105F041	CAP, MINI ELE 1μ/50V	547	R420	5130-RO30J561	RES, CBN 1/2P 560
571	C25	5354-683J1HM	CAP, MYL .068μ	533	△ R421	5102-5615116	RES, FUSE 560
571	C26	5354-683J1HM	CAP, MYL .068μ	533	△ R422	5102-5615116	RES, FUSE 560
567	C27	5345-105JO962	CAP, MINI ELE 1μ/100V	543	R423	5130-RO30J561	RES, CBN 1/2P 560
519	C403	5359-S010J101	CAP, PPP 100P	543	R424	5130-RO30J561	RES, CBN 1/2P 560
519	C404	5359-S010J101	CAP, PPP 100P	537	△ R425	5102-5605116	RES, FUSE 56
518	C405	5345-S19CM106	CAP, MINI ELE 10μ/16V	537	△ R426	5102-5605116	RES, FUSE 56
518	C406	5345-S19CM106	CAP, MINI ELE 10μ/16V	537	△ R427	5102-5605116	RES, FUSE 56
520	C407	5353-070934	CAP, MCA 7P	537	△ R428	5102-5605116	RES, FUSE 56
520	C408	5353-070934	CAP, MCA 7P	538	R429	5130-RO30J223	RES, CBN 1/2P 22K
517	C409	5345-477A0952	CAP, MINI ELE 470μ/6.3V	538	R430	5130-RO30J223	RES, CBN 1/2P 22K
517	C410	5345-477A0952	CAP, MINI ELE 470μ/6.3V	538	R431	5130-RO30J223	RES, CBN 1/2P 22K
523	C411	5359-1015851	CAP, PPP 100P	538	R432	5130-RO30J223	RES, CBN 1/2P 22K
523	C412	5359-1015851	CAP, PPP 100P	548	R433	5130-RO30J221	RES, CBN 1/2P 220
524	△ C413	5345-476G041	CAP, MINI ELE 47μ/63V	548	R434	5130-RO30J221	RES, CBN 1/2P 220
524	△ C414	5345-476G041	CAP, MINI ELE 47μ/63V	539	R435	5130-RO30J391	RES, CBN 1/2P 390
524	△ C415	5345-476G041	CAP, MINI ELE 47μ/63V	539	R436	5130-RO30J391	RES, CBN 1/2P 390
524	△ C416	5345-476G041	CAP, MINI ELE 47μ/63V	541	△ R437	5102-5605116	RES, FUSE 82
521	C417	5354-104593	CAP, MYL .1μ	541	△ R438	5102-5605116	RES, FUSE 82
521	C418	5354-104593	CAP, MYL .1μ	541	△ R439	5102-5605116	RES, FUSE 82
521	C419	5354-104593	CAP, MYL .1μ	541	△ R440	5102-5605116	RES, FUSE 82
521	C420	5354-104593	CAP, MYL .1μ	541	△ R441	5102-5605116	RES, FUSE 82
525	C421	5345-475F041	CAP, MINI ELE 4.7μ/50V	541	△ R442	5102-5605116	RES, FUSE 82
525	C422	5345-475F041	CAP, MINI ELE 4.7μ/50V	550	R445	5275-S040JR22	RES, CEM 5P .22
526	C423	5345-475F041	CAP, MINI ELE 4.7μ/50V	550	R446	5275-S040JR22	RES, CEM 5P .22
526	C424	5345-475F041	CAP, MINI ELE 4.7μ/50V	550	R447	5275-S040JR22	RES, CEM 5P .22
<b>RESISTORS</b>							
573	R21	5130-RO30J471	RES, CBN 1/2P 470	550	R448	5275-S040JR22	RES, CEM 5P .22
574	R22	5130-RO30J392	RES, CBN 1/2P 3.9K	546	R449	5130-RO30J1R0	RES, CBN 1/2P 1
575	R23	5130-RO30J332	RES, CBN 1/2P 3.3K	546	R450	5130-RO30J1R0	RES, CBN 1/2P 1
576	R24	5130-RO30J472	RES, CBN 1/2P 4.7K	551	R451	5171-100571	RES, MTL 1 10
577	R25	5130-RO30J104	RES, CBN 1/2P 100K	551	R452	5171-100571	RES, MTL 1 10
578	R26	5130-RO30J683	RES, CBN 1/2P 68K	544	R455	5130-RO30J271	RES, CBN 1/2P 270
579	R27	5130-RO30J333	RES, CBN 1/2P 33K	544	R456	5130-RO30J271	RES, CBN 1/2P 270
580	R28	5130-RO30J123	RES, CBN 1/2P 12K	545	R457	5130-RO30J103	RES, CBN 1/2P 10K
577	R29	5130-RO30J104	RES, CBN 1/2P 100K	545	R458	5130-RO30J103	RES, CBN 1/2P 10K
583	R33	5130-RO30J122	RES, CBN 1/2P 1.2K	531	R459	5130-RO30J333	RES, CBN 1/2P 33K
583	R34	5130-RO30J122	RES, CBN 1/2P 1.2K	531	R460	5130-RO30J333	RES, CBN 1/2P 33K
583	R35	5130-RO30J122	RES, CBN 1/2P 1.2K	538	R465	5130-RO30J223	RES, CBN 1/2P 22K
583	R36	5130-RO30J122	RES, CBN 1/2P 1.2K	538	R466	5130-RO30J223	RES, CBN 1/2P 22K
572	R37	5130-RO30J331	RES, CBN 1/2P 330	542	△ R467	5102-4R75116	RES, FUSE 4.7
572	R38	5130-RO30J331	RES, CBN 1/2P 330	542	△ R468	5102-4R75116	RES, FUSE 4.7
587	R39	5130-RO30J682	RES, CBN 1/2P 6.8K	542	△ R469	5102-4R75116	RES, FUSE 4.7
587	R40	5130-RO30J682	RES, CBN 1/2P 6.8K	542	△ R470	5102-4R75116	RES, FUSE 4.7
577	R41	5130-RO30J104	RES, CBN 1/2P 100K	538	R481	5130-RO30J223	RES, CBN 1/2P 22K
578	R42	5130-RO30J683	RES, CBN 1/2P 68K	538	R482	5130-RO30J223	RES, CBN 1/2P 22K
576	R43	5130-RO30J472	RES, CBN 1/2P 4.7K	<b>TRANSISTORS</b>			
576	R44	5130-RO30J472	RES, CBN 1/2P 4.7K	561	Q21	5611-1309A(R)	XISTOR, PNP R
581	R45	5130-RO30J222	RES, CBN 1/2P 2.2K	562	Q22	5613-3311A(R)	XISTOR, NPN R
538	R401	5130-RO30J223	RES, CBN 1/2P 22K	563	Q23	5613-2240(BL)	XISTOR, NPN R
538	R402	5130-RO30J223	RES, CBN 1/2P 22K	564	Q24	5611-970(BL)	XISTOR, PNP R
532	R403	5130-RO30J681	RES, CBN 1/2P 680	563	Q25	5613-2240(BL)	XISTOR, NPN R
532	R404	5130-RO30J681	RES, CBN 1/2P 680	563	Q27	5613-2240(BL)	XISTOR, NPN R
540	R405	5130-RO30J331	RES, CBN 1/2P 330	563	Q28	5613-2240(BL)	XISTOR, NPN R
540	R406	5130-RO30J331	RES, CBN 1/2P 330	564	Q29	5611-970(BL)	XISTOR, PNP R
540	R407	5130-RO30J331	RES, CBN 1/2P 330	503	Q401	5611-970(BL)	XISTOR, PNP R
540	R408	5130-RO30J331	RES, CBN 1/2P 330	503	Q402	5611-970(BL)	XISTOR, PNP R
534	R409	5130-RO30J152	RES, CBN 1/2P 1.5K	503	Q403	5611-970(BL)	XISTOR, PNP R
534	R410	5130-RO30J152	RES, CBN 1/2P 1.5K	503	Q404	5611-970(BL)	XISTOR, PNP R
534	R411	5130-RO30J152	RES, CBN 1/2P 1.5K	501	Q405	5613-2240(BL)	XISTOR, NPN R
534	R412	5130-RO30J152	RES, CBN 1/2P 1.5K	501	Q406	5613-2240(BL)	XISTOR, NPN R
				501	Q407	5613-2240(BL)	XISTOR, NPN R
				501	Q408	5613-2240(BL)	XISTOR, NPN R
				506	Q409	5612-646A(C)	XISTOR, PNP A
				506	Q410	5612-646A(C)	XISTOR, PNP A
				505	Q411	5614-666A(C)	XISTOR, NPN A
				505	Q412	5614-666A(C)	XISTOR, NPN A
				507	Q413	5613-945(K)	XISTOR, NPN R
				507	Q414	5613-945(K)	XISTOR, NPN R
				508	Q415	5614-667A(C)	XISTOR, NPN A
				508	Q416	5614-667A(C)	XISTOR, NPN A
				509	Q417	5612-647A(C)	XISTOR, PNP A

Ser. No.	Ref. No.	Part No.	Description
509	Q418	5612-647A(C)	XISTOR, PNP A
510	△ Q419	5613-3907(O)	XISTOR, NPN R
510	△ Q419	5613-3907(O)	XISTOR, NPN R
512	△ Q421	5611-1516(O)	XISTOR, PNP R
512	△ Q422	5611-1516(O)	XISTOR, PNP R
504	Q423	5611-1115(F)	XISTOR, PNP R
504	Q424	5611-1115(F)	XISTOR, PNP R
503	Q425	5611-970(BL)	XISTOR, PNP R
503	Q426	5611-970(BL)	XISTOR, PNP R

**DIODES**

584	△ D1	5685-D5SB20	SILICON, BRIG
565	D21	5636-1S2471	DIODE, SWITCH
566	D22	5635-HZ6B1L	DIODE, ZENER
514	D23	5631-1S2473	DIODE, DET
514	D24	5631-1S2473	DIODE, DET
514	D401	5631-1S2473	DIODE, DET
514	D402	5631-1S2473	DIODE, DET

**MISCELLANEOUS**

527	L401	5991-7125	SPRING COIL
527	L402	5991-7125	SPRING COIL
718	△ CW220	4163-S0202501	CONNECTOR W/W
720	△ JL401	4132-R0102800	CORD, 2C
720	△ JL402	4132-R0102800	CORD, 2C
721	△ JL420	4242-R0104161	JUMPER LEAD
722	PT401	5192-010BD222	POSISTOR
553	TM415	4214-11032	TERMINAL
554	TM416	4214-11022	TERMINAL
554	TM417	4214-11022	TERMINAL
556	TP401	4214-132	TERMINAL
556	TP402	4214-132	TERMINAL
556	TP403	4214-132	TERMINAL
556	TP404	4214-132	TERMINAL
549	VR401	5101-50101930	RES, SEMI FIX 500
549	VR402	5101-50101930	RES, SEMI FIX 500
711	△ LCN403	4163-0123027	CONNECTOR W/W
712	△ LCN404	4163-0119025	CONNECTOR W/W
716	△ LCN522	4163-0136025	CONNECTOR W/W
717	△ LCN523	4163-0136027	CONNECTOR W/W
715	△ LCN525	4163-0141024	CONNECTOR W/W
713	△ LCN413	4163-0119024	CONNECTOR W/W
714	△ LCN414	4163-0119024	CONNECTOR W/W

**PCB-2 AUTO ON/OFF PCB BOARD**

**CAPACITORS**

626	C203	5345-106C0961	CAP, MINI ELE 10μ/16V
625	C204	5345-476C0961	CAP, MINI ELE 47μ/16V
598	C208	5359-S010J223	CAP, PPP .022μ
621	C213	5359-S010J123	CAP, PPP .012μ
621	C214	5359-S010J123	CAP, PPP .012μ
628	C217	5345-475F0961	CAP, MINI ELE 4.7μ/50V
628	C218	5345-475F0961	CAP, MINI ELE 4.7μ/50V
624	C219	5345-226C0961	CAP, MINI ELE 22μ/16V
625	C220	5345-476C0961	CAP, MINI ELE 47μ/16V
598	C221	5359-S010J223	CAP, PPP .022μ
622	C222	5354-104593	CAP, MYL .1μ
630	C223	5354-394593	CAP, MYL .39μ
625	C225	5345-476C0961	CAP, MINI ELE 47μ/16V
598	C226	5359-S010J223	CAP, PPP .022μ
597	C229	5345-337C041	CAP, MINI ELE 330μ/16V
625	C230	5345-476C0961	CAP, MINI ELE 47μ/16V
627	C231	5345-105F0961	CAP, MINI ELE 1μ/50V
629	C401	5345-S19BM476	CAP, MINI ELE 47μ/10V
629	C402	5345-S19BM476	CAP, MINI ELE 47μ/10V

**RESISTORS**

614	△ R200	5102-4704715	RES, FUSE 47
614	△ R201	5102-4704715	RES, FUSE 47
615	R202	5130-R030J822	RES, CBN 1/2P 8.2K
607	R213	5130-R010J105	RES, CBN 1/6P 1M
607	R214	5130-R010J105	RES, CBN 1/6P 1M
607	R215	5130-R010J105	RES, CBN 1/6P 1M
607	R216	5130-R010J105	RES, CBN 1/6P 1M
604	R221	5130-R010J102	RES, CBN 1/6P 1K
604	R222	5130-R010J102	RES, CBN 1/6P 1K
613	R223	5130-R030J104	RES, CBN 1/2P 100K

Ser. No.	Ref. No.	Part No.	Description
601	R224	5130-R010J104	RES, CBN 1/6P 100K
608	△ R225	5102-1014713	RES, FUSE 100
603	R226	5130-R010J473	RES, CBN 1/6P 47K
602	R228	5130-R010J224	RES, CBN 1/6P 220K
605	R229	5130-R010J224	RES, CBN 1/6P 220K
600	R231	5130-R010J683	RES, CBN 1/6P 68K
600	R232	5130-R010J683	RES, CBN 1/6P 68K
604	R233	5130-R010J102	RES, CBN 1/6P 1K
604	R234	5130-R010J102	RES, CBN 1/6P 1K
599	R237	5130-R010J101	RES, CBN 1/6P 100
612	R239	5130-R010J474	RES, CBN 1/6P 470K
612	R240	5130-R010J474	RES, CBN 1/6P 470K
603	R242	5130-R010J473	RES, CBN 1/6P 47K
599	R243	5130-R010J101	RES, CBN 1/6P 100

**INTEGRATED CIRCUITS**

591	IC201	5652-TA75072P	IC, MONO
492	IC202	5653-BA335	IC, LINEAR

**TRANSISTORS**

593	Q201	5614-1266(Q)	XISTOR, NPN A
595	Q213	5611-933S(S)	XISTOR, PNP R
619	Q214	5613-1740(S)	XISTOR, NPN R
594	Q215	5613-C144ES	XISTOR, NPN R
618	Q216	5611-A124ES	XISTOR, PNP R

**DIODES**

617	D201	5635-HZ15-1L	DIODE, ZENER
596	D211	5631-1SS133	DIODE, DET
596	D212	5631-1SS133	DIODE, DET
596	D213	5631-1SS133	DIODE, DET
596	D214	5631-1SS133	DIODE, DET
596	D215	5631-1SS133	DIODE, DET
596	D216	5631-1SS133	DIODE, DET

**MISCELLANEOUS**

633	CN202	4443-030185	CONNECTOR
633	CN221	4443-030185	CONNECTOR
723	△ CW205	4163-S0202651	CONNECTOR W/W
635	PJ201	4482-7128	PIN JACK, 2P
637	SW202	4421-02601042	SWITCH, SLIDE
638	SW203	4421-02602022	SWITCH, SLIDE

**PCB-3 POWER SW PC BOARD**

**CAPICITORS**

662	△ C201	5352-S010M103	CAP, MTL .01μ <b>Ⓚ</b>
662B	△ C201	5352-1030958	CAP, MTL .01μ <b>Ⓚ</b>

**RESISTORS**

044B	△ R241	5130-R0300J335	RES, CBN 1/2P 3.3M <b>Ⓚ</b>
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**MISCELLANEOUS**

738	△ F202	5732-312031	FUSE <b>Ⓚ</b>
738B	△ F202	5732-202030	FUSE <b>Ⓚ</b>
664	△ HF201	4472-04501	HOLDER, FUSE
664	△ HF202	4472-04501	HOLDER, FUSE
736	△ SW201	4433-00401	SWITCH, PU-PW
663	TM201	4214-122	TERMINAL
732	△ LCN204	4163-S5001300	CONNECTOR W/W <b>Ⓚ</b>
732B	LCN204	4163-S5201300	CONNECTOR W/W <b>Ⓚ</b>

**PCB-4 LED POWER PC BOARD**

**CAPACITORS**

673	C205	5345-107F041	CAP, MINI ELE 100μ/50V
675	C206	5345-476C041	CAP, MINI ELE 47μ/16V

**RESISTORS**

679	R203	5130-R030J222	RES, CBN 1/2P 2.2K
679	R204	5130-R030J222	RES, CBN 1/2P 2.2K
679	R205	5130-R030J222	RES, CBN 1/2P 2.2K
679	R206	5130-R030J222	RES, CBN 1/2P 2.2K
678	△ R207	5102-2205116	RES, FUSE 22
678	△ R208	5102-2205116	RES, FUSE 22



Ser. No.	Ref. No.	Part No.	Description
<b>DIODES</b>			
670	D202	5635-HZ12B2L	DIODE, ZENER
666	△ D205	5632-10DF2	DIODE, RECT
666	△ D206	5632-10DF2	DIODE, RECT

<b>MISCELLANEOUS</b>			
724	△ CW206	4163-S0202501	CONNECTOR W/W
041B	△ SW205	4411-00501102	SWITCH, ROTRY <sup>WB</sup>
726	△ LCN200	4163-0111025	CONNECTOR W/W
727	△ LCN201	4163-0111027	CONNECTOR W/W
725	△ LCN202	4163-0111024	CONNECTOR W/W
042B	LCN205	4163-S4901130	CONNECTOR W/W
043B	LCN206	4163-S5001160	CONNECTOR W/W

**PCB-5 SPEAKER PC BOARD**

<b>MISCELLANEOUS</b>			
694	△ TM401	4214-241	TERMINAL

**PCB-6 BIAS L PC BOARD**

<b>RESISTORS</b>			
697	R601	5130-R030J182	RES, CBN 1/2P 1.8K
698	R603	5230-R030J122	RES, CBN 1/2P 1.2K
<b>TRANSISTORS</b>			
696	Q601	5613-2682(P)	XISTOR, NPN R

**PCB-7 BIAS R PC BOARD**

<b>RESISTORS</b>			
702	R602	5130-R030J182	RES, CBN 1/2P 1.8K
703	R604	5130-R030J122	RES, CBN 1/2P 1.2K
<b>TRANSISTORS</b>			
701	Q602	5613-2682(P)	XISTOR, NPN R

**PCB-8 LED PC BOARD**

<b>CAPACITORS</b>			
646	C270	5345-106C041	CAP, MINI ELE 10μ/16V
<b>RESISTORS</b>			
651	R271	5130-R030J102	RES, CBN 1/2P 1K
652	R272	5130-R030J681	RES, CBN 1/2P 680
653	R274	5130-R030J104	RES, CBN 1/2P 100K
648	R275	5130-R030J103	RES, CBN 1/2P 10K
648	R276	5130-R030J103	RES, CBN 1/2P 10K
647	R277	5130-R030J473	RES, CBN 1/2P 47K
650	R278	5130-R030J105	RES, CBN 1/2P 1M
653	R279	5130-R030J104	RES, CBN 1/2P 47K
647	R280	5130-R030J473	RES, CBN 1/2P 47K
<b>TRANSISTORS</b>			
642	Q271	5611-A124ES	XISTOR, PNP R
641	Q272	5613-C144ES	XISTOR, NPN R
641	Q274	5613-C144ES	XISTOR, NPN R
642	Q275	5611-A124ES	XISTOR, PNP R
640	Q276	5613-1740S(S)	XISTOR, NPN R
641	Q277	5613-C144ES	XISTOR, NPN R
642	Q278	5611-A124ES	XISTOR, PNP R
<b>DIODES</b>			
645	D270	5631-IS2473	DIODE, DET
644	D271	5637-GL3ED8	LED
645	D272	5631-IS2473	DIODE, DET
645	D273	5631-IS2473	DIODE, DET
643	D274	5631-ISS133	DIODE, DET

Ser. No.	Ref. No.	Part No.	Description
<b>MISCELLANEOUS</b>			
656	CN205	4443-0201140	CONNECTOR
656	CN206	4443-0201140	CONNECTOR
656	CN220	4443-0201140	CONNECTOR

**PCB-10 4/8 SWITCH PC BOARD**

<b>CAPACITORS</b>			
709	C250	5354-104593	CAP, MYL .1μ
709	C251	5354-104593	CAP, MYL .1μ
709	C252	5354-104593	CAP, MYL .1μ
709	C253	5354-104593	CAP, MYL .1μ
<b>MISCELLANEOUS</b>			
710	△ SW204	4464-00102022	SWITCH, SEESW
728	△ LCN250	4163-0114024	CONNECTOR W/W
729	△ LCN251	4163-0114025	CONNECTOR W/W
730	△ LCN252	4163-0113026	CONNECTOR W/W
731	△ LCN253	4163-0113027	CONNECTOR W/W

**CHASSIS MISCELLANEOUS**

<b>MISCELLANEOUS</b>			
735	△ T1	5584-T0701	XFORMER, POWER <sup>EK</sup>
735B	△ T1	5584-TO703	XFORMER, POWER <sup>WB</sup>
733		4443-712	CONNECTOR
734		4150-8	TUBING, SPE
740	△	4161-71151	CORD W/ PLUG <sup>EK</sup>
740B		4161-7256	CORD W/ PLUG <sup>WB</sup>
749	PCB-9	4551-9114	PC BOARD, TRANS

**PACKAGE PARTS LIST**

021B	1756-06304	LABEL, 230V/50Hz <sup>WB</sup>
022B	1756-03101	LABEL (X2) <sup>WB</sup>
107	1111-0670J152	OWNER GUIDE
108	1113-02501	OWNER CARD, REPLY CARD <sup>EK</sup>
109	1116-03801	GUARANT CARD, WARRANTY <sup>EK</sup>
110	1119-04501	ATTACH SHEET, SERVICE GUIDE <sup>EK</sup>
111	1119-01201	ATTACH SHEET, UL <sup>EK</sup>
121	1241-R0123351	POLYETHY BAG, OG
122	1241-R0160601	POLYETHY BAG, SET
125A	1221-28135	CARTON BOX <sup>EK</sup> <sup>WB</sup>
126	1222-7390	CUSHION, R
127	1222-7391	CUSHION, L
128	1223-R0420055	SOFT SHEET

### ABBREVIATIONS IN PARTS LIST

#### CAPACITORS

CAP, MINI ELE	: Electrolytic
CAP, CER	: Ceramic
CAP, PPP	: Polypropylene
CAP, MYL	: Mylar
CAP, MCA	: Mica
CAP, MINI BP	: Bipolar
CAP, ELE BP	: Electrolytic Bipolar
CAP, STY	: Polystyrene Film
CAP, SPE	: Special
CAP, TAN	: Tantalum
470 $\mu$	: 470 $\mu$ F
6800p	: 6800pF
.047 $\mu$	: 0.047 $\mu$ F

#### RESISTORS

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

#### TRANSISTORS

XISTOR	: Transistors
FET	: Field Effect Transistor

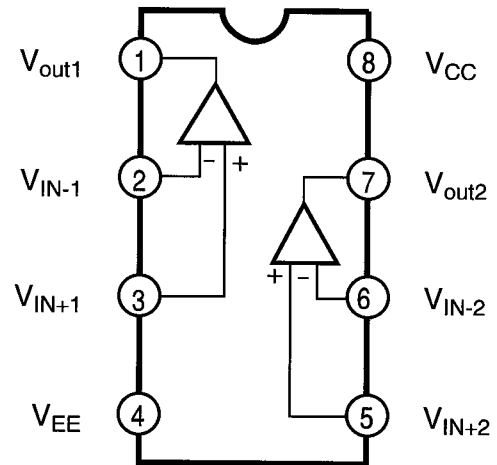
#### CONTROLS

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

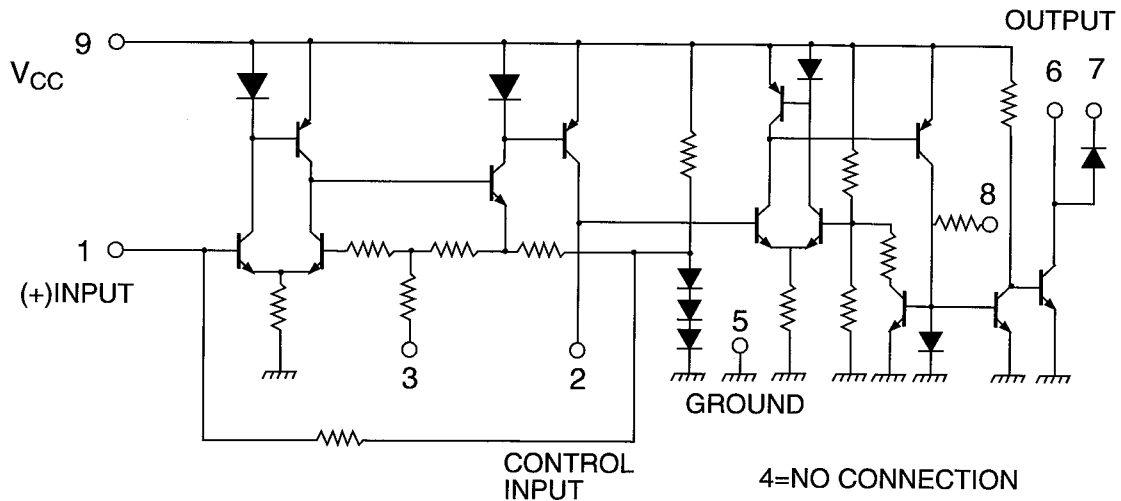
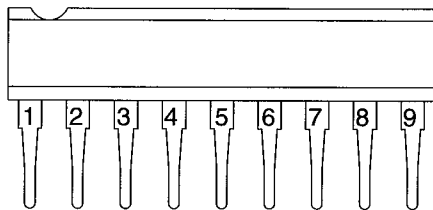
#### NOTE

$\Delta$  SAFETY-RELATED COMPONENT. USE ONLY EXACT REPLACEMENT PART AS SPECIFIED.

### IC201 TA75072P



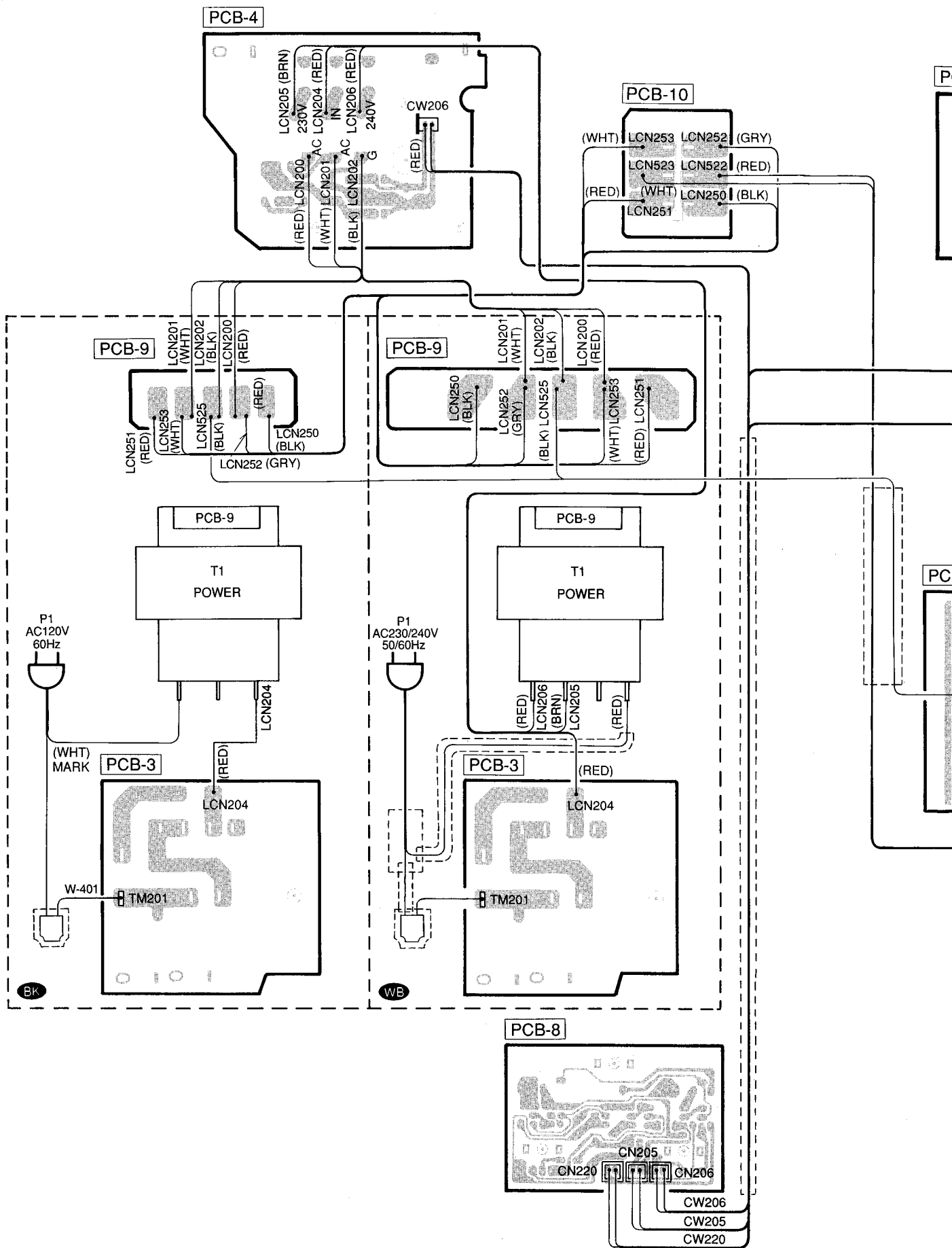
### IC202 BA335

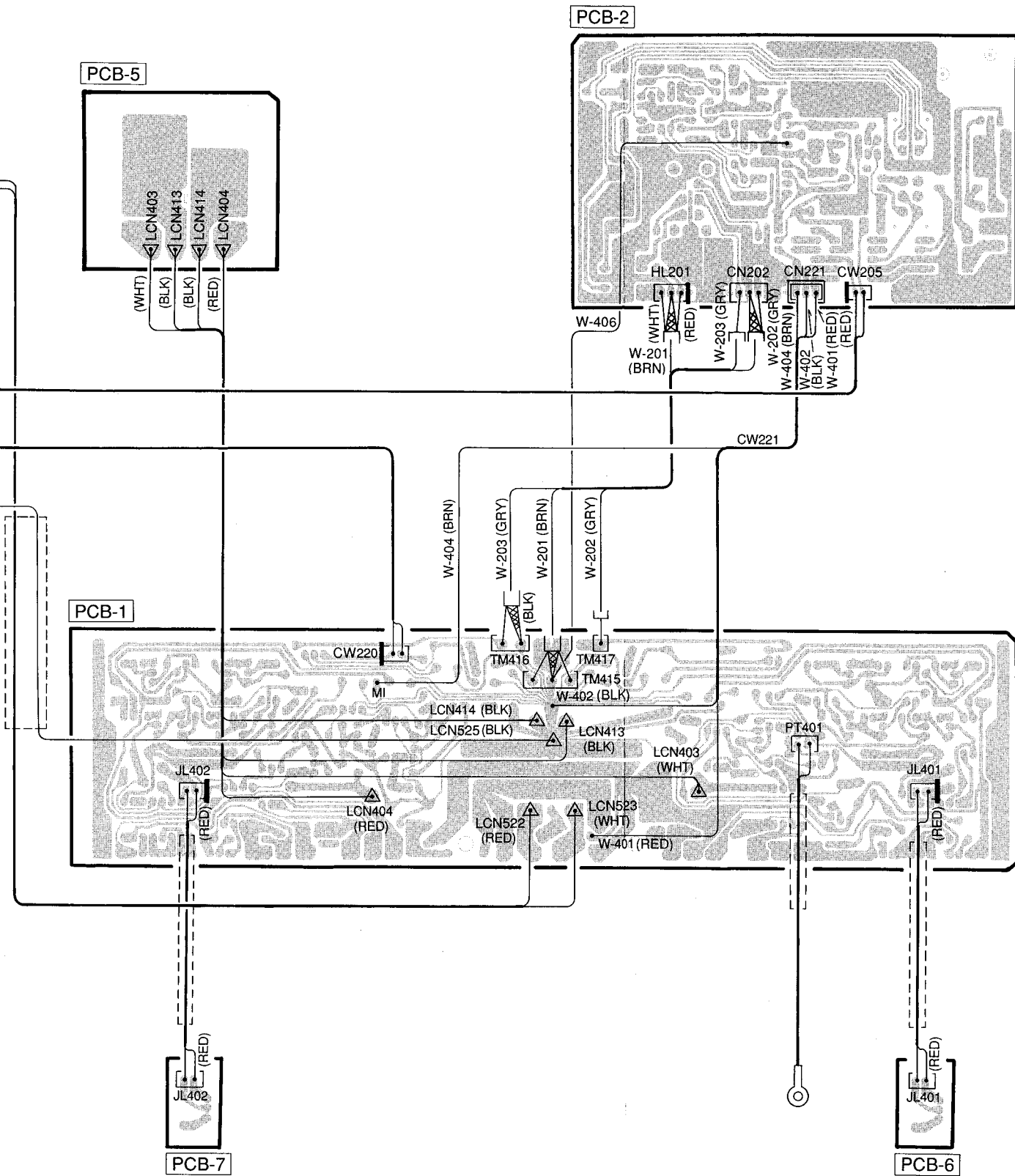






# WIRING DIAGRAM



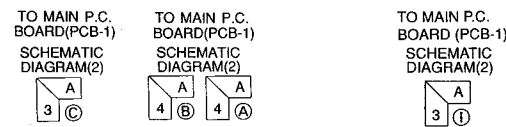
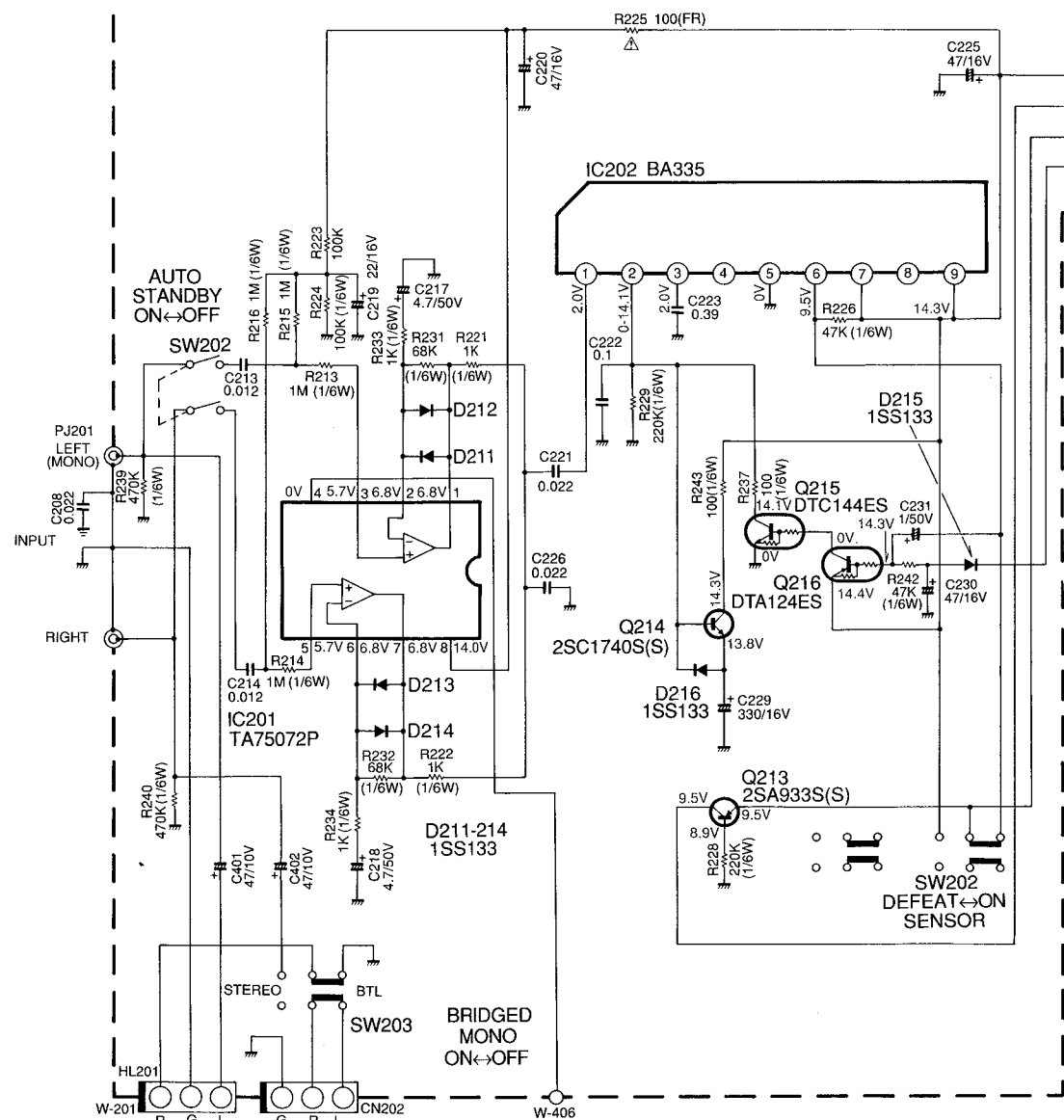


**WIRE COLOR ABBREVIATIONS**

RED : Red	YEL : Yellow
ORG : Orange	PUP : Purple
BLU : Blue	PIK : Pink
WHT: White	BRN : Brown
BLK : Black	

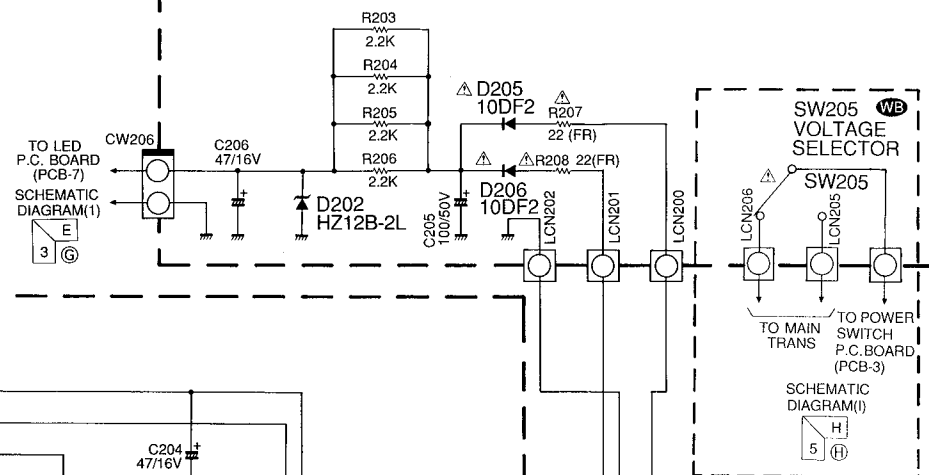
SCHEMATIC DIAGRAM (1)

PCB-2 AUTO ON/OFF P.C. BOARD

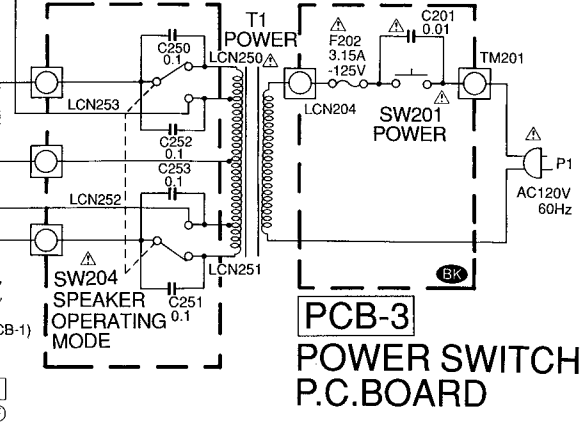


Type	R1	R2	Type	R1	R2
DTC144ES	47K	47K	DTA124ES	22K	22K

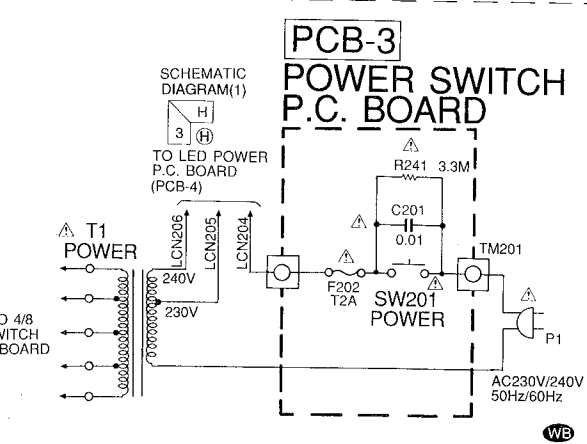
PCB-4 LED POWER P.C. BOARD



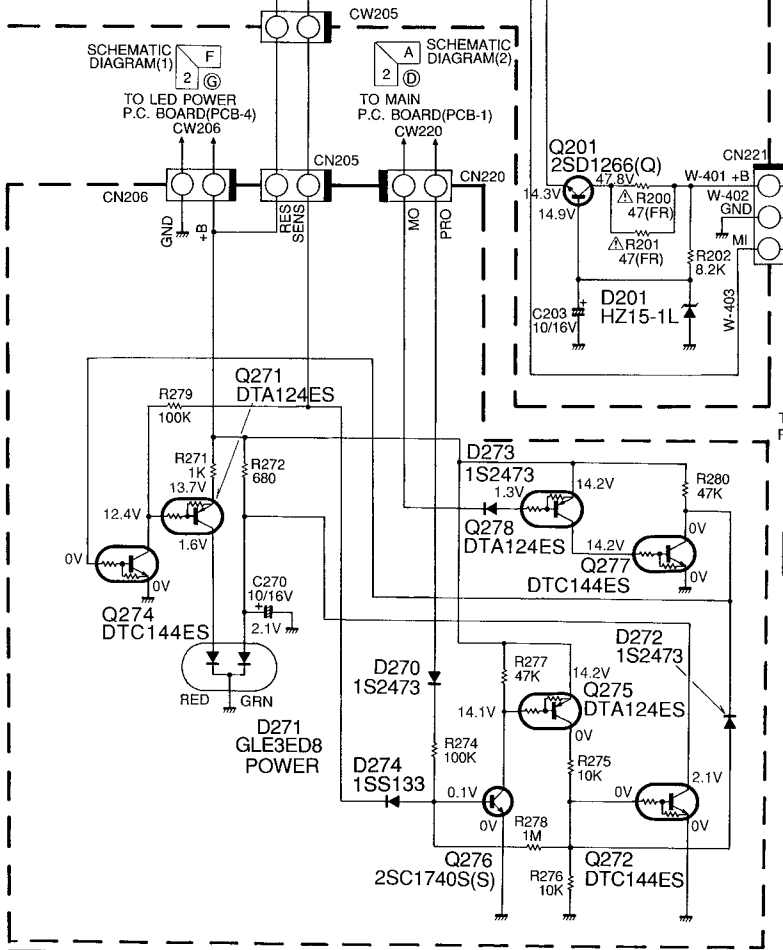
PCB-10 4/8 SWITCH P.C. BOARD



PCB-3 POWER SWITCH P.C. BOARD



PCB-8 LED P.C. BOARD

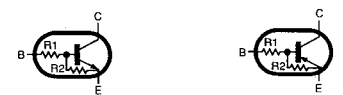


NOTE:  
 1. ALL RESISTANCE VALUES ARE IN Ω.  
 KΩ=1000Ω, MΩ=1000KΩ.  
 2. THE WATTAGE OF RESISTORS IS 1/2W UNLESS OTHERWISE NOTED.  
 3. ALL CAPACITANCE VALUES ARE IN μF UNLESS OTHERWISE NOTED. P=#μF.  
 4. ... V-DC VOLTAGE AT NO SIGNAL UNLESS OTHERWISE NOTED.  
 5. SAFETY REGULATIONS COMPONENTS IN ACCORDANCE WITH PRESENT SAFETY REGULATIONS THESE COMPONENTS MUST ONLY BE REPLACED BY ORIGINAL PARTS.

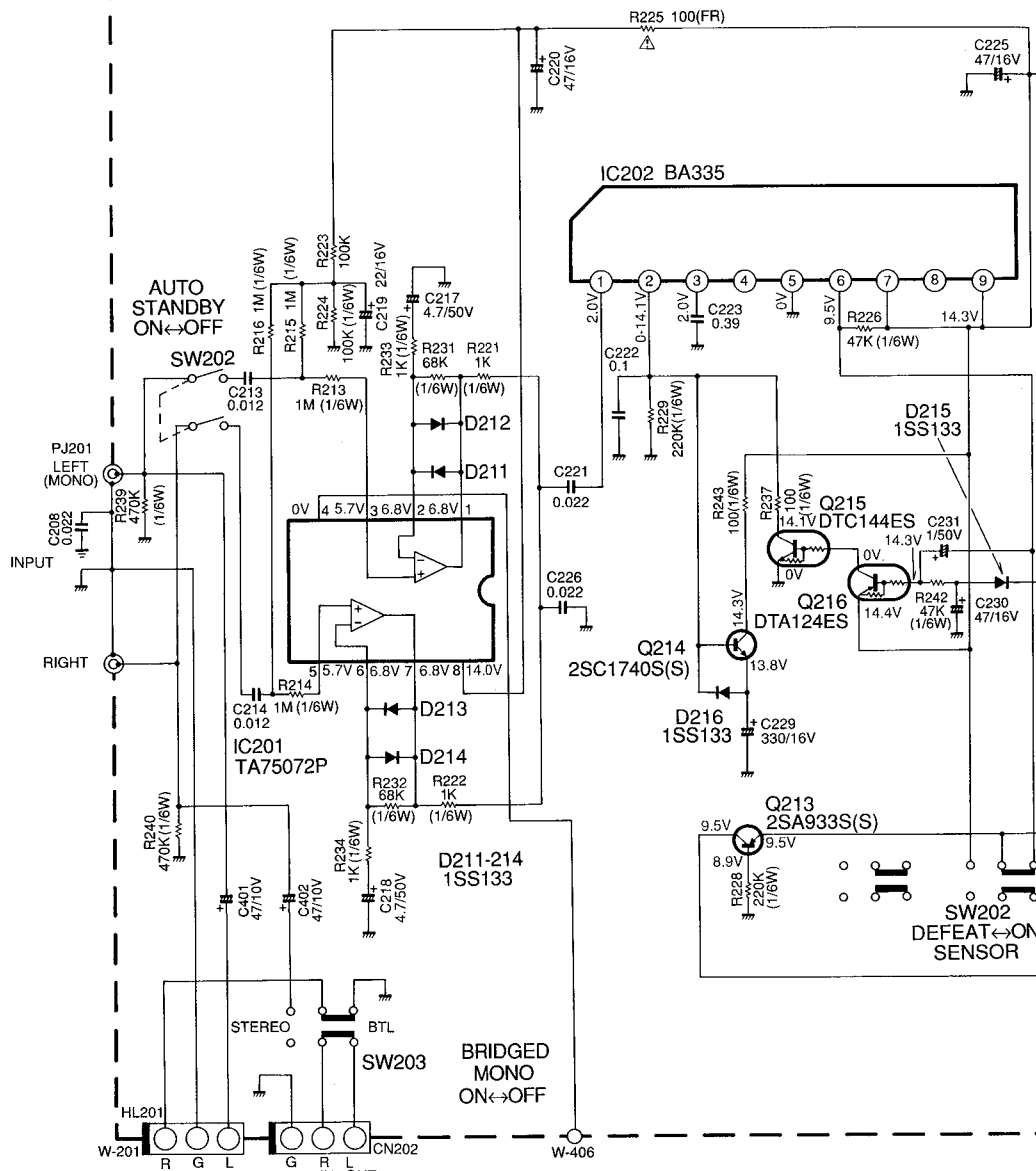
**SCHEMATIC DIAGRAM (1)**

1  
2  
3  
4  
5  
6  
7

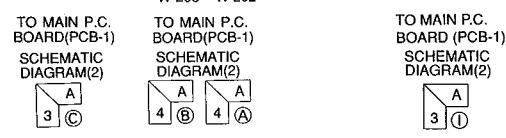
**PCB-2 AUTO ON/OFF P.C. BOARD**



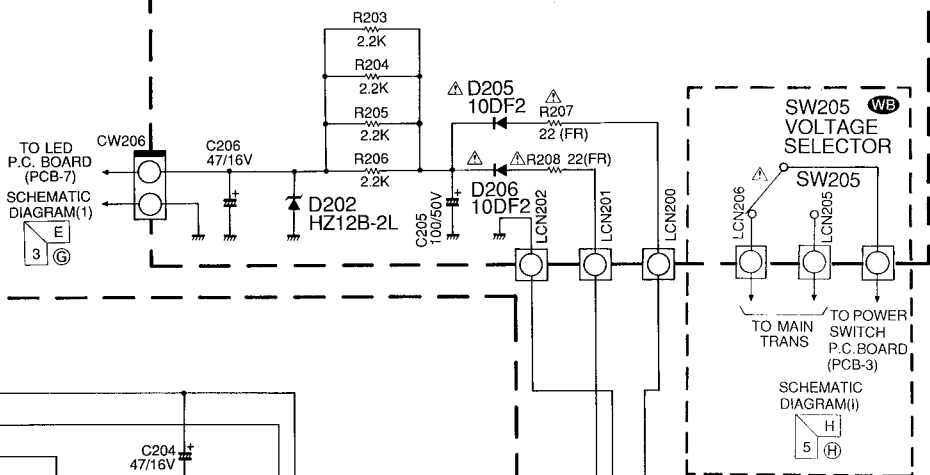
Type	R1	R2	Type	R1	R2
DTC144ES	47K	47K	DTA124ES	22K	22K



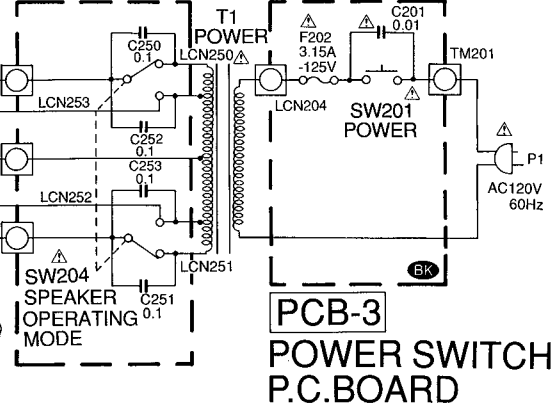
**PCB-8 LED**



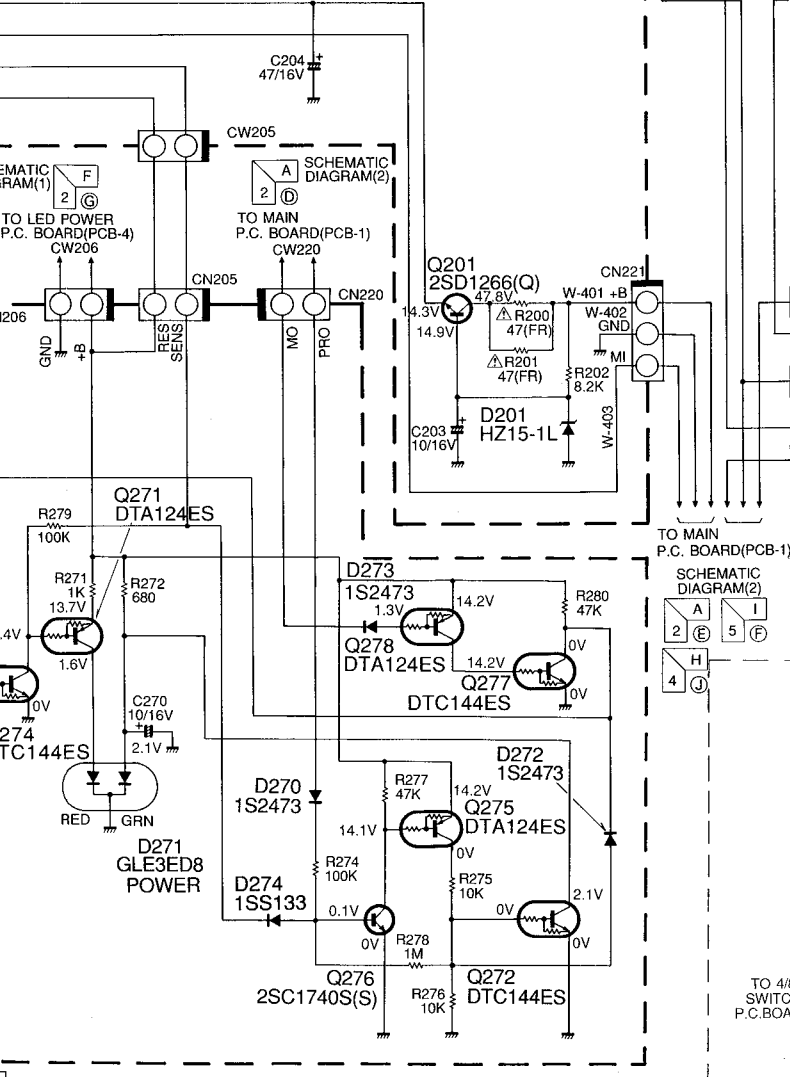
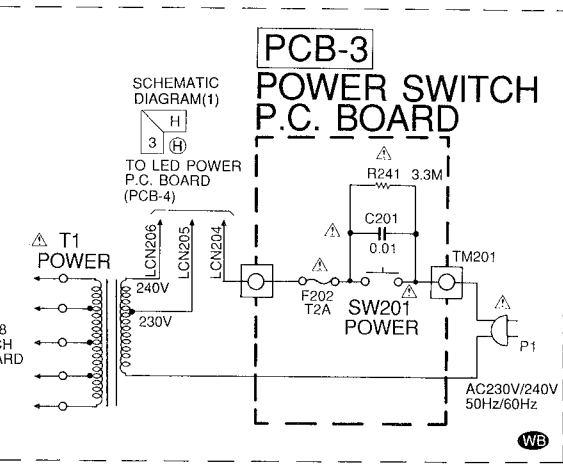
### PCB-4 LED POWER P.C. BOARD



### PCB-10 4/8 SWITCH P.C. BOARD



### PCB-3 POWER SWITCH P.C. BOARD



### LED P.C. BOARD

NOTE:

1. ALL RESISTANCES VALUES ARE IN  $\Omega$ .  
K $\Omega$ =1000 $\Omega$ , M $\Omega$ =1000K $\Omega$ .
2. THE WATTAGE OF RESISTORS IS 1/2W UNLESS OTHERWISE NOTED.
3. ALL CAPACITANCES VALUES ARE IN  $\mu$ F UNLESS OTHERWISE NOTED. P=PPF.
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.

SCHEMATIC DIAGRAM (2)

1  
2  
3  
4  
5  
6  
7

PCB-1 MAIN P.C. BOARD

PCB-6 BIAS L P.C. BOARD

PCB-5 SPEAKER P.C. BOARD

PCB-7 BIAS R P.C. BOARD

NOTE:

1. ALL RESISTANCE VALUES ARE IN  $\Omega$ .  
K=1000 $\Omega$ , M=1000K $\Omega$ .
2. THE WATTAGE OF RESISTORS IS 1/2W UNLESS OTHERWISE NOTED.
3. ALL CAPACITANCE VALUES ARE IN  $\mu$ F UNLESS OTHERWISE NOTED. P=PPF.
4. ... V:DC VOLTAGE AT NO SIGNAL UNLESS OTHERWISE NOTED.
5. SAFETY REGULATIONS COMPONENTS IN ACCORDANCE WITH PRESENT SAFETY REGULATIONS. THESE COMPONENTS MUST ONLY BE REPLACED BY ORIGINAL PARTS.

SCHEMATIC DIAGRAM(1)

3 (D)

TO LED P.C. BOARD (PCB-8)

SCHEMATIC DIAGRAM(1)

5 (E)

FROM AUTO ON/OFF P.C. BOARD (PCB-2)

SCHEMATIC DIAGRAM(1)

7 (C)

TO AUTO ON/OFF P.C. BOARD (PCB-2)

SCHEMATIC DIAGRAM(1)

7 (I)

TO AUTO ON/OFF P.C. BOARD (PCB-2)

SCHEMATIC DIAGRAM(1) TO AUTO ON/OFF P.C. BOARD (PCB-2)

7 (A)

SCHEMATIC DIAGRAM(1) TO AUTO ON/OFF P.C. BOARD (PCB-2)

7 (B)

SCHEMATIC DIAGRAM(1)

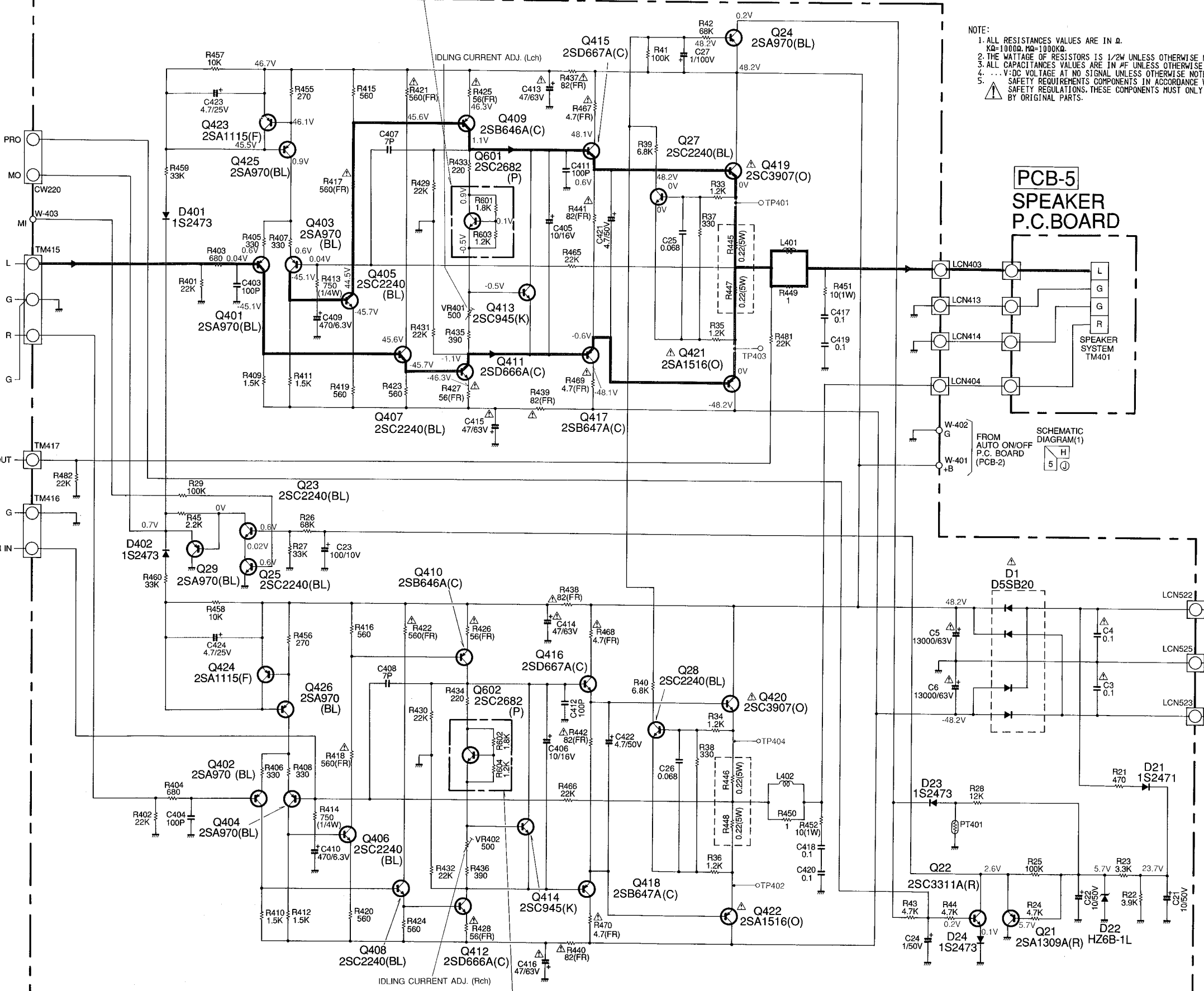
5 (H)

FROM AUTO ON/OFF P.C. BOARD (PCB-2)

SCHEMATIC DIAGRAM(1)

5 (F)

FROM 4/8 SWITCH P.C. BOARD (PCB-10)



# SCHEMATIC DIAGRAM (2)

PCB-1 MAIN P.C.BOARD

PCB-6 BIAS L P.C.BOARD

SCHEMATIC DIAGRAM(1)



TO LED P.C.BOARD (PCB-8)

SCHEMATIC DIAGRAM(1)



FROM AUTO ON/OFF P.C.BOARD (PCB-2)

SCHEMATIC DIAGRAM(1)



TO AUTO ON/OFF P.C.BOARD (PCB-2)

SCHEMATIC DIAGRAM(1)



TO AUTO ON/OFF P.C.BOARD (PCB-2)

SCHEMATIC DIAGRAM(1)

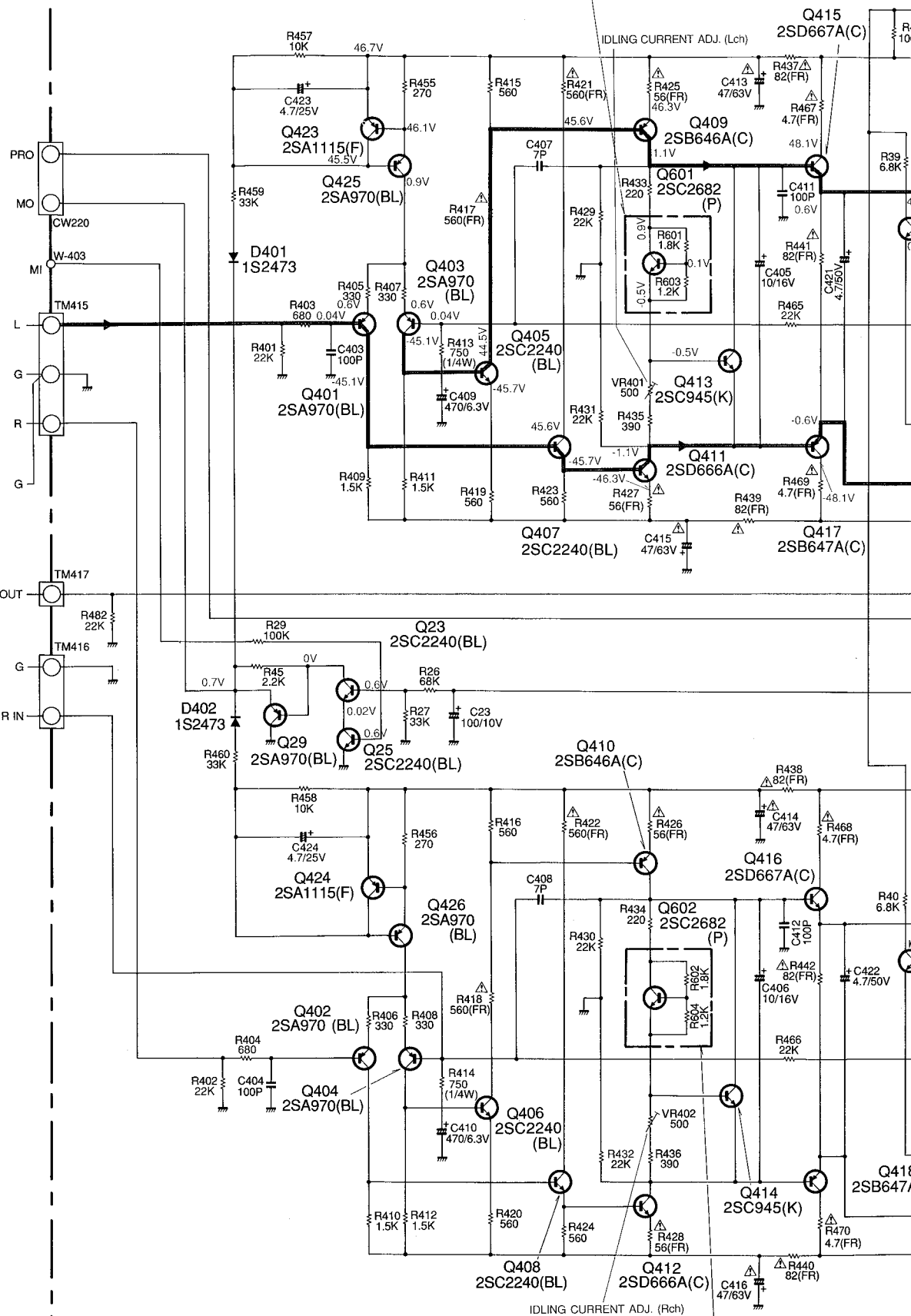


TO AUTO ON/OFF P.C.BOARD (PCB-2)

SCHEMATIC DIAGRAM(1)



TO AUTO ON/OFF P.C.BOARD (PCB-2)



PCB-7 BIAS R P.C.BOARD



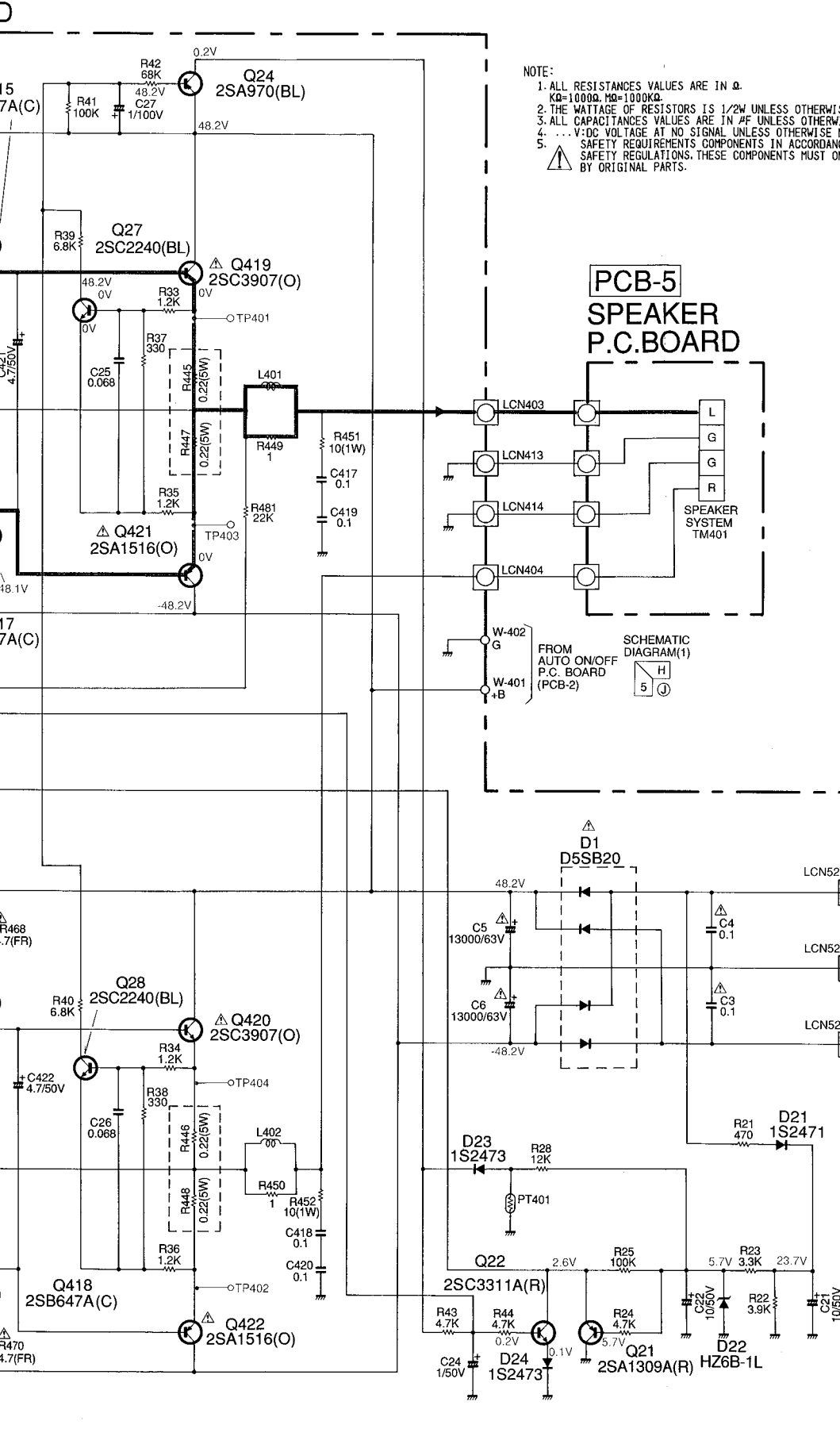
F

G

H

I

J



- NOTE:
1. ALL RESISTANCES VALUES ARE IN  $\Omega$ .  
K $\Omega$ =1000 $\Omega$ , M $\Omega$ =1000K $\Omega$ .
  2. THE WATTAGE OF RESISTORS IS 1/2W UNLESS OTHERWISE NOTED.
  3. ALL CAPACITANCES VALUES ARE IN  $\mu$ F UNLESS OTHERWISE NOTED. P=#FF.
  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.

**PCB-5**  
**SPEAKER**  
**P.C. BOARD**

FROM  
AUTO ON/OFF  
P.C. BOARD  
(PCB-2)

FROM  
4/8 SWITCH  
P.C. BOARD  
(PCB-10)