

Service
Service
Service



Service Manual



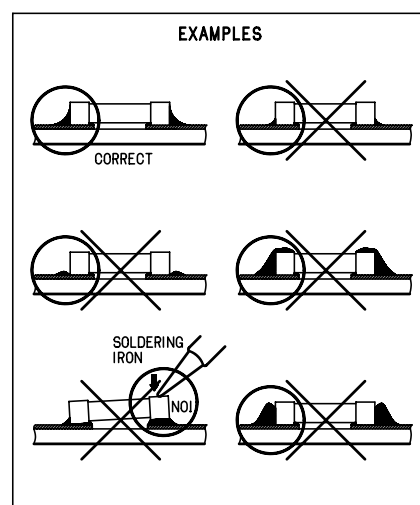
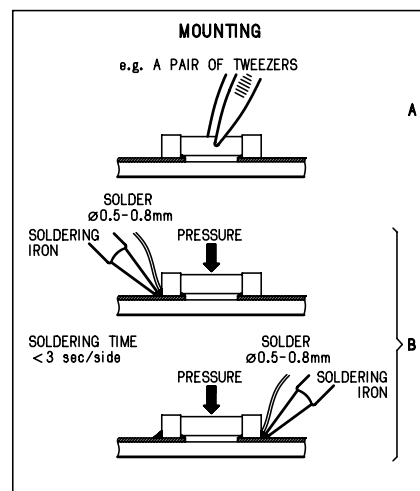
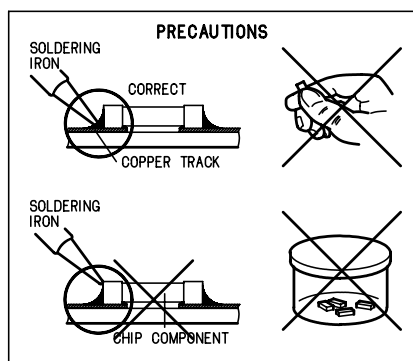
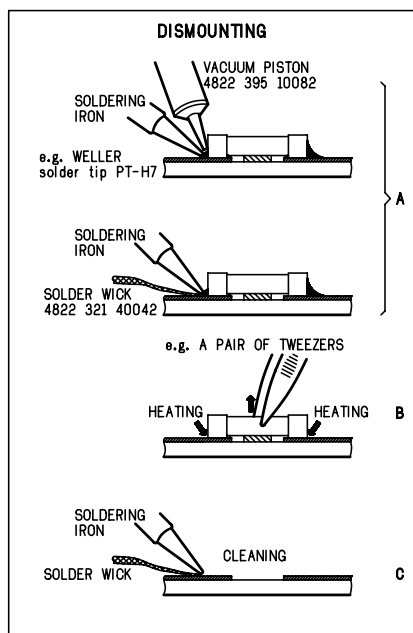
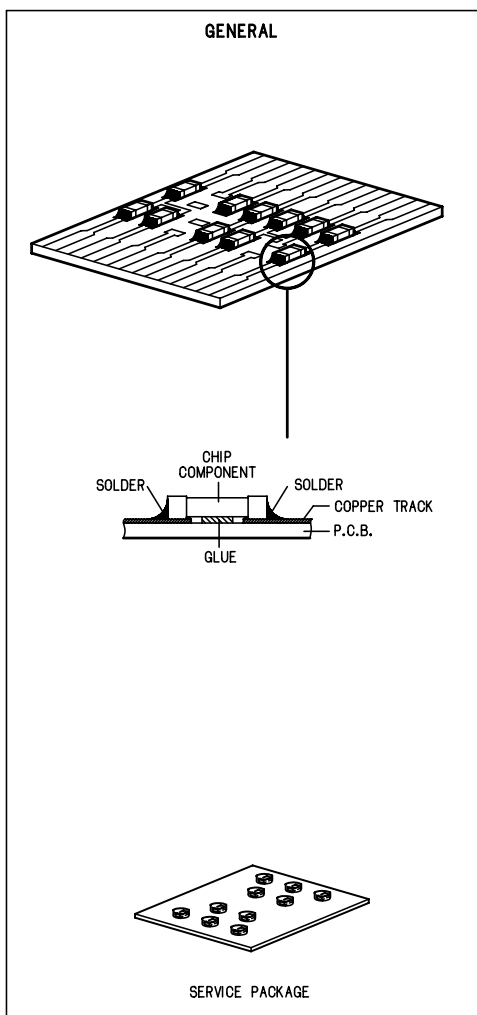
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HANDLING CHIP COMPONENTS



SERVICE TOOLS

- TORX T10 screwdriver with shaftlength 150mm.....4822 395 50423
- TORX screwdriver set SBC 163.....4822 295 50145
- Audio signal disc SBC 429.....4822 397 30184
- Playability test disc SBC 444.....4822 397 30245
- Test disc 5 (disc without errors) +
- Test disc 5A (disc with dropout errors, black spots and fingerprints)
SBC 426/426A.....4822 397 30096
- Burn in test disc (65 min. 1kHz signal at -30 dB level without "pause").....4822 397 30155
- Universal test cassette Fe SBC 420.....4822 397 30071

AVAILABLE ESD PROTECTION EQUIPMENT

- anti-static table mat large 1200x650x1.25mm 4822 466 10953
- small 600x650x1.25mm 4822 466 10958
- anti-static wristband 4822 395 10223
- connection box (3 press stud connections, 1MΩ) 4822 320 11307
- extendible cable (2m, 2MΩ, to connect wristband to connection box) 4822 320 11305
- connecting cable (3m, 2MΩ, to connect table mat to connection box) 4822 320 11306
- earth cable (1MΩ, to connect any product to mat or to connection box) 4822 320 11308
- KIT ESD3 (combining all 6 prior products - small table mat) 4822 310 10671
- wristband tester 4822 344 13999

INFORMATION ABOUT LEAD-FREE SOLDERING

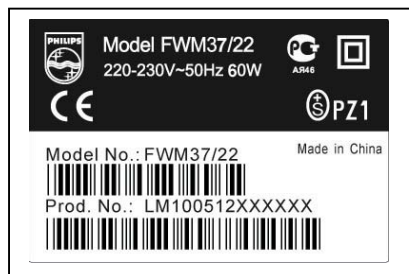
Philips CE is producing lead-free sets from 1.1.2005 onwards.

IDENTIFICATION:

Regardless of special logo (not always indicated) one must treat all sets from 1 Jan 2005 onwards, according next rules:



Example S/N:



Bottom line of typeplate gives a 14-digit S/N. Digit 5&6 is the year, digit 7&8 is the week number, so in this case 2005 wk12

So from 0501 onwards = from 1 Jan 2005 onwards

Important note: In fact also products of year 2004 must be treated in this way as long as you avoid mixing solder-alloys (lead/ lead-free). So best to always use SAC305 and the higher temperatures belong to this.

Due to lead-free technology some rules have to be respected by the workshop during a repair:

- Use only lead-free solder alloy Philips SAC305 with order code 0622 149 00106. If lead-free solder-paste is required, please contact the manufacturer of your solder-equipment. In general use of solder-paste within workshops should be avoided because paste is not easy to store and to handle.
- Use only adequate solder tools applicable for lead-free solder alloy. The solder tool must be able
 - To reach at least a solder-temperature of 400°C,
 - To stabilize the adjusted temperature at the solder-tip
 - To exchange solder-tips for different applications.
- Adjust your solder tool so that a temperature around 360°C – 380°C is reached and stabilized at the solder joint. Heating-time of the solder-joint should not exceed ~ 4 sec. Avoid temperatures above 400°C otherwise wear-out of tips will rise drastically and flux-fluid will be destroyed. To avoid wear-out of tips switch off un-used equipment, or reduce heat.
- Mix of lead-free solder alloy / parts with leaded solder alloy / parts is possible but PHILIPS recommends strongly to avoid mixed solder alloy types (leaded and lead-free).
If one cannot avoid or does not know whether product is lead-free, clean carefully the solder-joint from old solder alloy and re-solder with new solder alloy (SAC305).
- Use only original spare-parts listed in the Service-Manuals. Not listed standard-material (commodities) has to be purchased at external companies.
- **Special information for BGA-ICs:**
 - always use the 12nc-recognizable soldering temperature profile of the specific BGA (for de-soldering always use the lead-free temperature profile, in case of doubt)
 - lead free BGA-ICs will be delivered in so-called 'dry-packaging' (sealed pack including a silica gel pack) to protect the IC against moisture. After opening, dependent of MSL-level seen on indicator-label in the bag, the BGA-IC possibly still has to be baked dry. (MSL=Moisture Sensitivity Level). This will be communicated via AYS-website.
Do not re-use BGAs at all.
- For sets produced before 1.1.2005 (except products of 2004), containing leaded solder-alloy and components, all needed spare-parts will be available till the end of the service-period. For repair of such sets nothing changes.
- On our website www.atyourservice.ce.Philips.com you find more information to:
 - BGA-de-/soldering (+ baking instructions)
 - Heating-profiles of BGAs and other ICs used in Philips-sets

You will find this and more technical information within the "magazine", chapter "workshop news".

For additional questions please contact your local repair-helpdesk.

SERVICE INSTRUCTION

Safety regulations require that after a repair, the set must be returned in its original condition. Pay in particular attention to the following points:

- Route the wire trees correctly and fix them with the mounted cable clamps.
- Check the insulation of the AC Power lead for external damage.
- Check the strain relief of the AC Power cord for proper function.
- Check the electrical DC resistance between the AC Power Plug and the secondary side (only for sets which have a AC Power isolated power supply):
 1. Unplug the AC Power cord and connect a wire between the two pins of the AC Power plug.
 2. Set the AC Power switch to the "on" position (keep the AC Power cord unplugged!).
 3. Measure the resistance value between the pins of the AC Power plug and the metal shielding of the tuner or the aerial connection on the set. The reading should be larger than 4.5 Mohm (For U.S. it should be between 4.2 Mohm and 12 Mohm).
 4. Switch "off" the set, and remove the wire between the two pins of the AC Power plug.
- Check the cabinet for defects, to avoid touching of any inner parts by the customer.

SPECIFICATION

GENERAL:

Mains voltage : 110-127/220-240V Switchable
 220-230V (MAS139/77 only)
 Mains frequency : 50/60 Hz
 Power consumption : < 50W max.
 < 5W at standby
 Clock accuracy : 4 seconds per day
 Dimension center unit : 220 x 292 x 285 mm
 Dimension speaker : 190 x 292 x 182 mm
 Weight (with/without speaker box)
 : 4.9 /2.3 Kgs

TUNER:**FM**

Tuning range : 87.5 – 108 MHz
 IF Frequency : 10.7 MHz \pm 20kHz
 Aerial input : 75 Ω pigtail wire
 Sensitivity at 26sb S/N : < 18 μ V
 Selectivity at 600 kHz
 Bandwidth : > 25 dB
 IF rejection : > 75 dB
 Image rejection : > 25 dB
 Distortion : < 3%
 Crosstalk : > 18 dB

MW

Tuning range
 9 kHz grid : 531 – 1602 kHz
 10 kHz grid : 530 – 1700 kHz
 IF Frequency : 455 kHz \pm 1kHz
 Aerial input : Loop antenna
 Sensitivity at 26sb S/N : < 4.0 mV/M
 Selectivity at 18 kHz
 Bandwidth : > 18 dB
 IF rejection : > 45 dB
 Image rejection : > 28 dB
 Distortion : < 5%

AMPLIFIER:

Output power : 2 x 10 W RMS
 Speaker impedance : 8 ohm
 Frequency response
 Within \pm 3dB : 63Hz – 16 kHz
 Hyper bass sound ON : 10dB \pm 3dB at 80Hz
 Digital sound control : Rock/Pop/Jazz/Classic
 Headphone output : 32 mW \pm 2dB at 32 Ω

CASSETTE RECORDER:

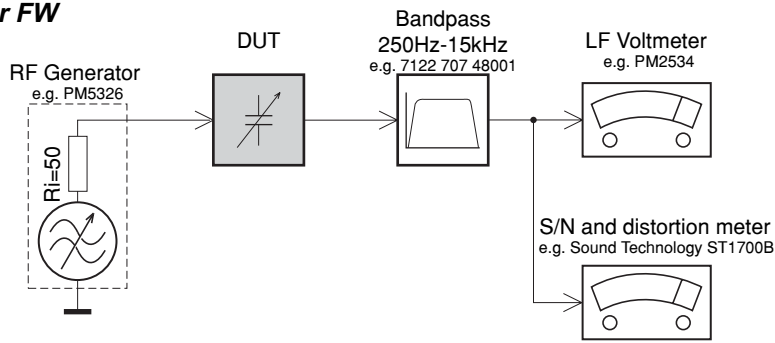
Number of tracks : 2 x 2 stereo
 Tape speed : 4.76 cm/sec +2.5/-1.5%
 Wow and flutter : < 0.4% DIN
 Fast-wind/rewind time : < 130 sec. With C-60
 Bias frequency : 75 \pm 10 kHz
 R/P frequency response : 125 – 8 kHz (8 dB)
 Signal to noise ratio : > 35 dB with type 1 tape

COMPACT DISC:

Number of programming track : 32
 Frequency response
 Within \pm 1.5 dB : 20 Hz – 20 kHz
 Signal/Noise ratio : 50 dB/A-weighted
 Distortion at 1 kHz : < 3%
 Channel separation at 1 kHz : > 25 dB
 Support disc format :
 Disc format ISO9660,
 Single session CD
 Max. albums: 25,
 Max. titles: 255
 Bit rate: 128 bits (recommended)

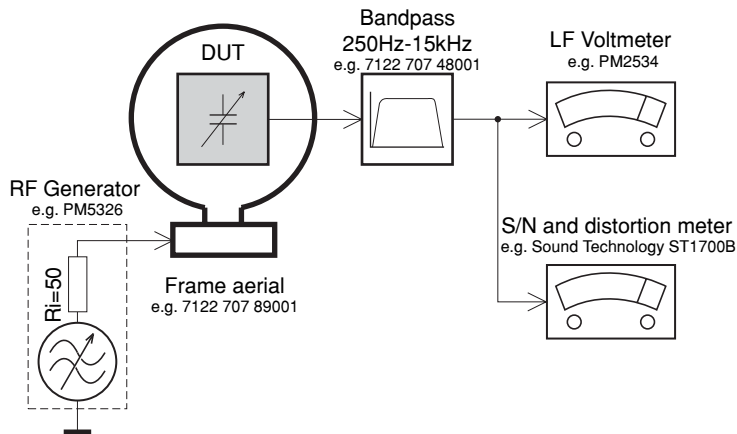
SERVICE MEASUREMENT

Tuner FW



Use a bandpass filter to eliminate hum (50Hz, 100Hz) and disturbance from the pilotone (19kHz, 38kHz).

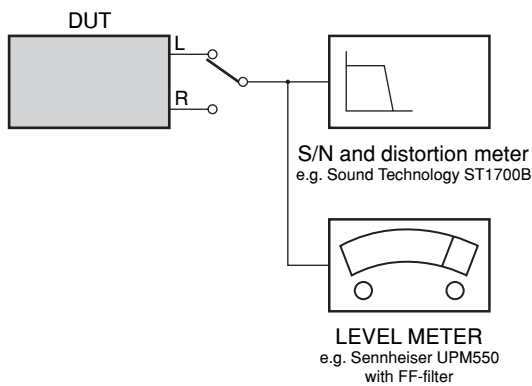
Tuner AM (MW,LW)



To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday cage. Use a bandpass filter (or at least a high pass filter with 250kHz) to eliminate hum (50Hz, 100Hz).

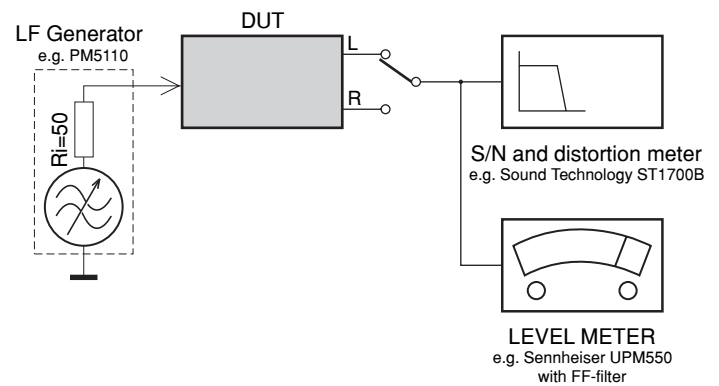
CD

Use Audio Signal Disc SBC429 4822 397 30184
(replaces test disc 3)



RECORDER

Use Universal Test Cassette Fe SBC420 4822 397 30071



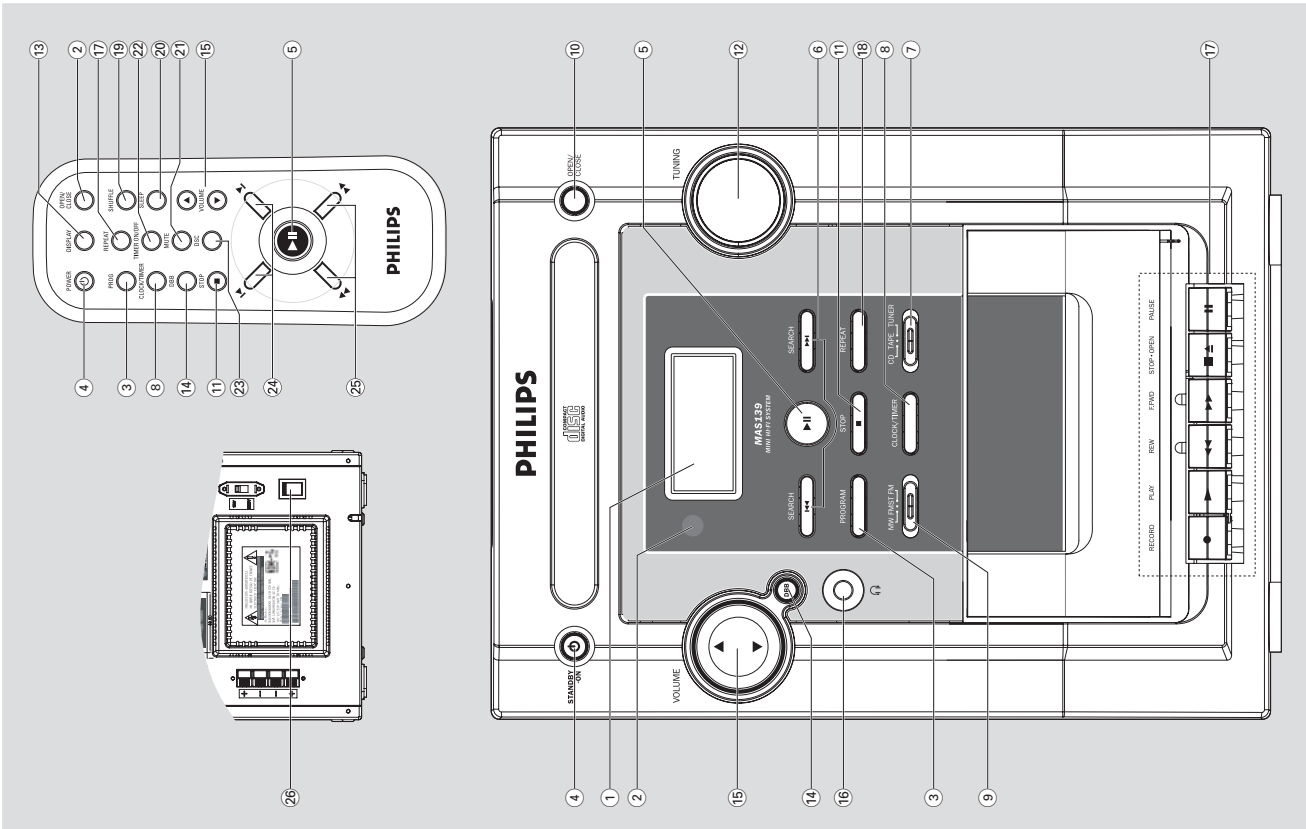
CONNECTION AND CONTROLS

Controls

Controls on the system and remote control

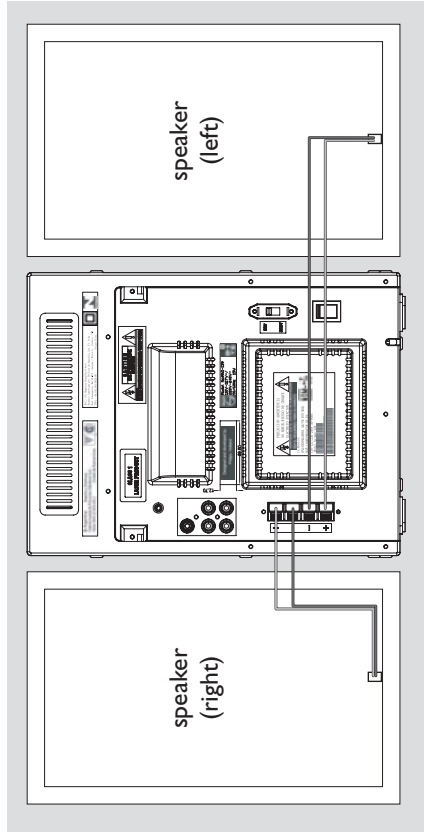
- 1 **LCD Display** shows the status of the system.
- 2 **IR SENSOR** infrared sensor for remote control.
- 3 **PROGRAM (PROG)** for CDprograms tracks and reviews the program.
- 4 **STANDBY-ON (POWER ψ)** switches the system to standby/on.
- 5 **▶||** for CDstarts or pauses CD playback.
- 6 **SEARCH ◀◀ / ▶▶** for CDskips to the beginning of a current track/previous/ next track
fast searches back and forward within a track/CD.
for clock/timer ..adjusts the hours and minutes for clock / timer functions.
- 7 **Source selector (CD/TAPE/TUNER)** selects the respective sound source for CD/ TAPE/TUNER.
- 8 **CLOCK/TIMER** sets the clock or timer function.
- 9 **Band selector (MW/FM/FMST)** for Tunerselects waveband: MW, FM (mono) or FM (stereo).
- 10 **OPEN/CLOSE** open/close the CD door.
- 11 **STOP ■** for CDstops CD playback or erase a CD program.
- 12 **TUNING** tunes to a radio station.
- 13 **DISPLAY** display the current time.
- 14 **DBB (Dynamic Bass Boost)** enhances the bass.
- 15 **VOLUME ▲/▼** adjusts the volume level.

- 16 **Headphones** connect headphones.
- 17 **Tape Deck Operation**
RECORD ● starts recording.
PLAY ▶ starts playback.
REW ◀◀ / FFW ▶▶ fast rewinds/ forwards the tape.
STOP-OPEN ■ stops the tape; opens the tape compartment.
PAUSE IIpauses recording or playback.
REPEAT for CDrepeats a track/CD programme/ entire CD.
SHUFFLE for CDplays CD tracks in random order.
SLEEP activates/deactivates or selects the sleeper time.
MUTE switches playback sound off and on.
TIMER ON/OFF activates/deactivates the timer.
DSC (Digital Sound Control) selects sound characteristics: CLASSIC/AZZI/ POP/ROCK.
◀/▶ for CDskips to the beginning of a current track/previous/next track
for clock/timer ..adjusts the hours and minutes for clock/timer functions.
◀◀/▶▶ for CDfast searches back and forward within a track/CD.
Power switch turns off the power supply to the system.



Preparations

Preparations



Rear connections

The type plate is located at the back of the system.

(A) Power

- Before connecting the AC power cord to the wall outlet, ensure that all other connections have been made.
- If your system is equipped with a Voltage Selector, set the VOLTAGE SELECTOR to the local power line voltage.

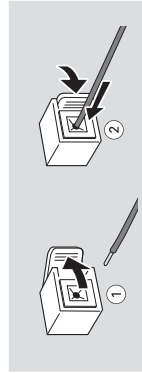
WARNING!

- For optimal performance, use only the original power cable.
- Never make or change any connections with the power switched on.

(B) Speakers Connection

Front Speakers

Connect the speaker wires to the SPEAKERS terminals, right speaker to "RIGHT" and left speaker to "LEFT", coloured (marked) wire to "+" and black (unmarked) wire to "-".



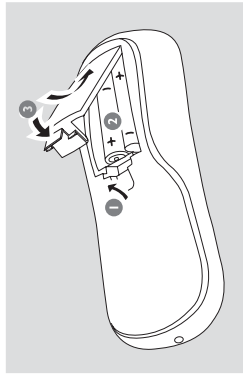
- Fully insert the stripped portion of the speaker wire into the terminal as shown.

Notes:

- For optimal sound performance, use the supplied speakers.
- Do not connect more than one speaker to any one pair of + / - speaker terminals.
- Do not connect speakers with an impedance lower than the speakers supplied. Please refer to the SPECIFICATIONS section of this manual.

Inserting batteries into the remote control

Insert two batteries type R03 or AAA into the remote control with the correct polarity as indicated by the "+" and "-" symbols inside the battery compartment.

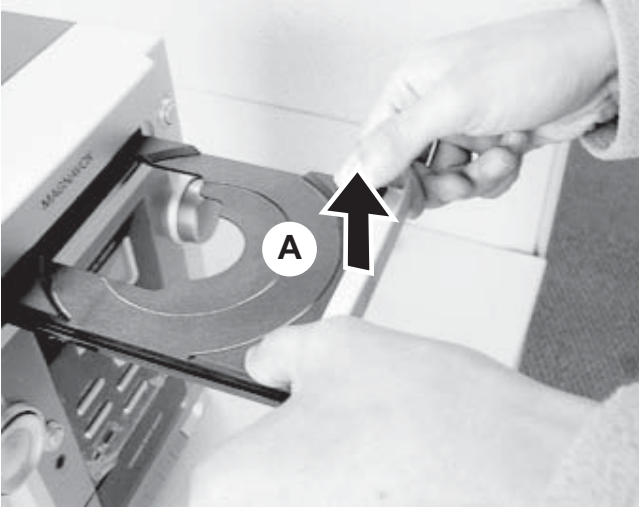


CAUTION!

- Remove batteries if they are exhausted or will not be used for a long time.
- Do not use old and new or different types of batteries in combination.
- Batteries contain chemical substances, so they should be disposed of properly.

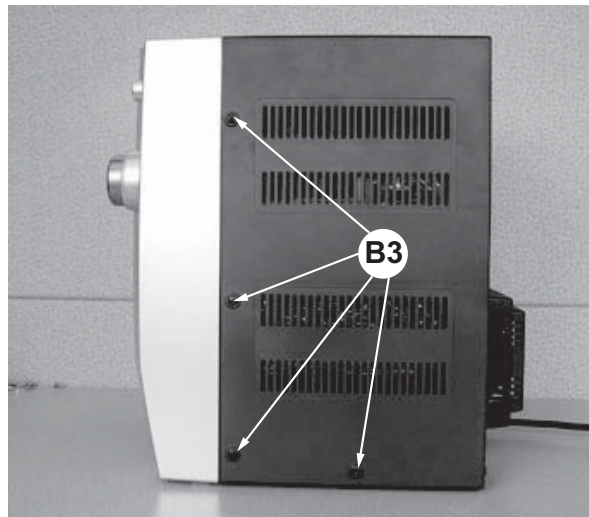
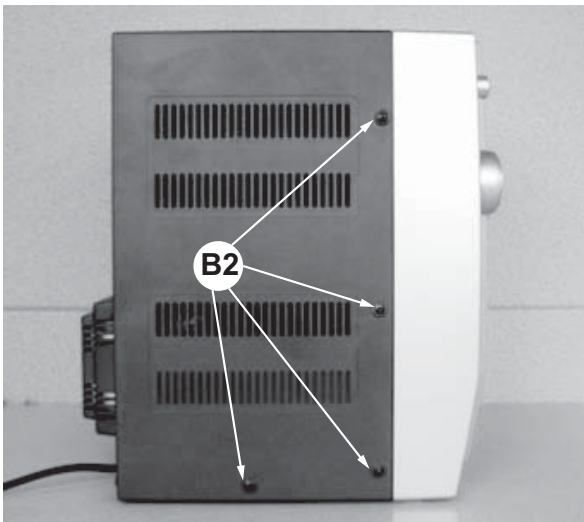
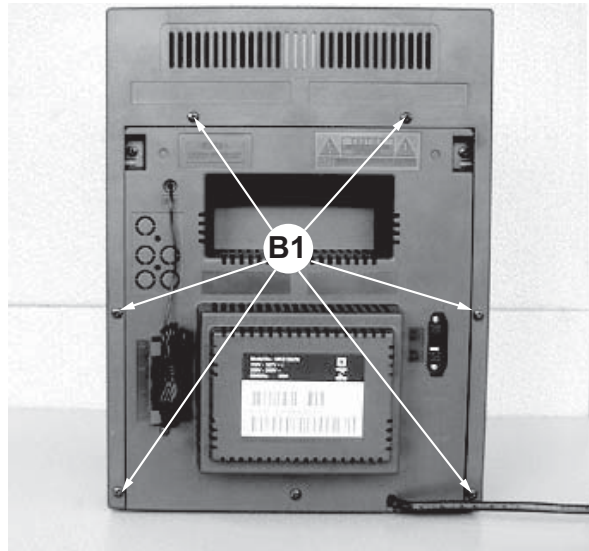
DISASSEMBLY DIADRAMS

A. Remove CD Door



B. Remove Top Cabinet

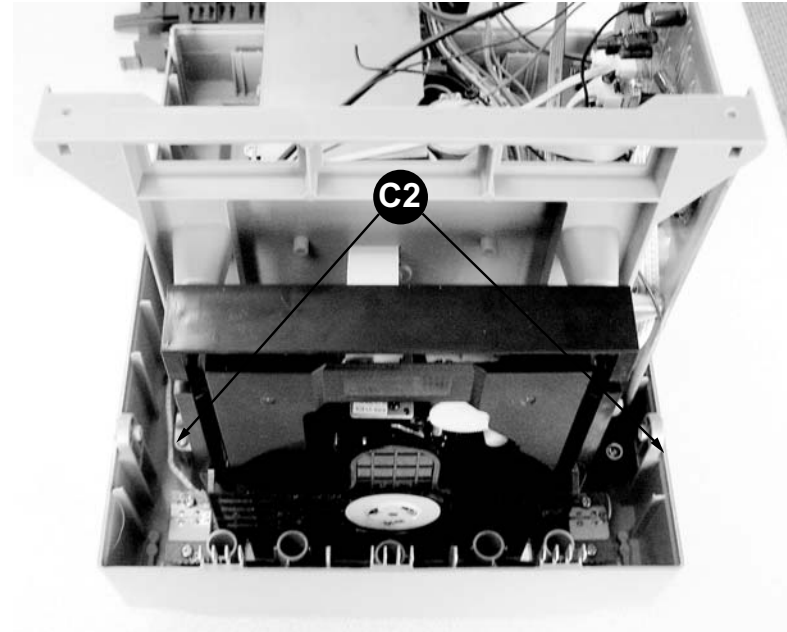
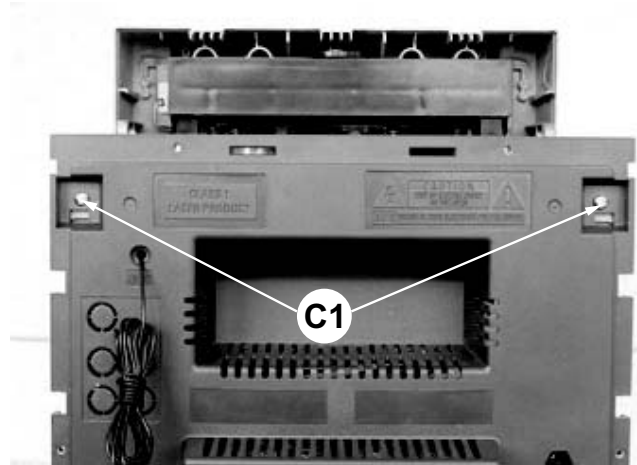
- B1: Remove screws SP 3x6 - 6 pcs.
- B2: Remove screws MP 3x10 - 4 pcs.
- B3: Remove screws MP 3x10 - 4 pcs.



DISASSEMBLY DIADRAMS

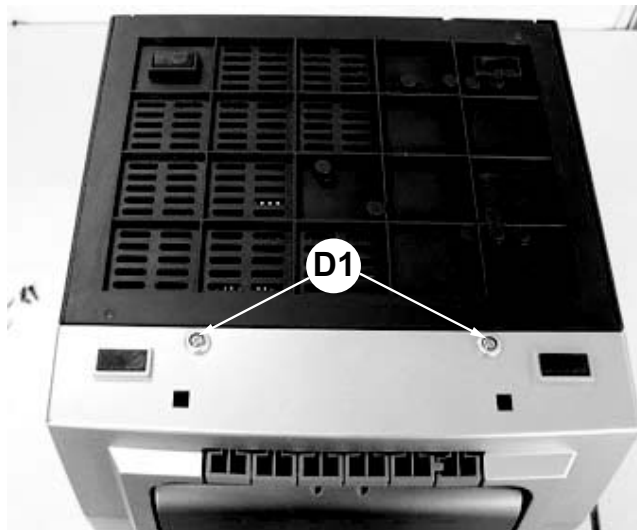
C. Remove CD Loader

- C1: Remove screws SP 3x8 - 2 pcs.
 C2: Remove screws SP 3x15 - 2 pcs.
 C3: Remove screws SP 3x10 - 1 pcs.



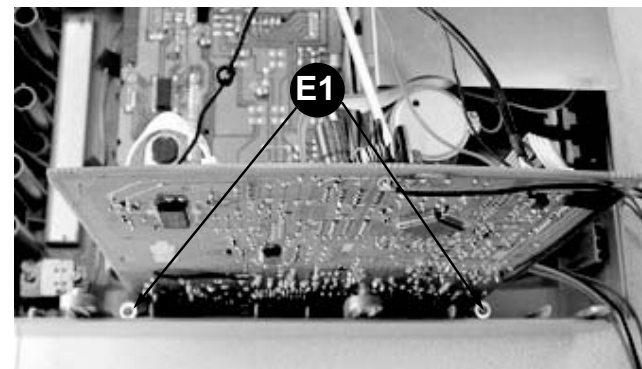
D. Remove Bottom Cabinet

- D1: Remove screws SP 3x10 - 2 pcs.



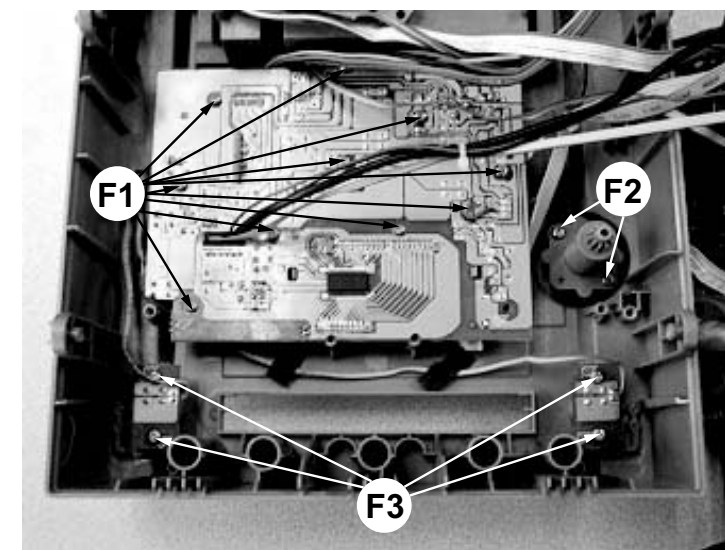
E. Remove Main PCB Assy

- D1: Remove screws SP 3x10 - 2 pcs.

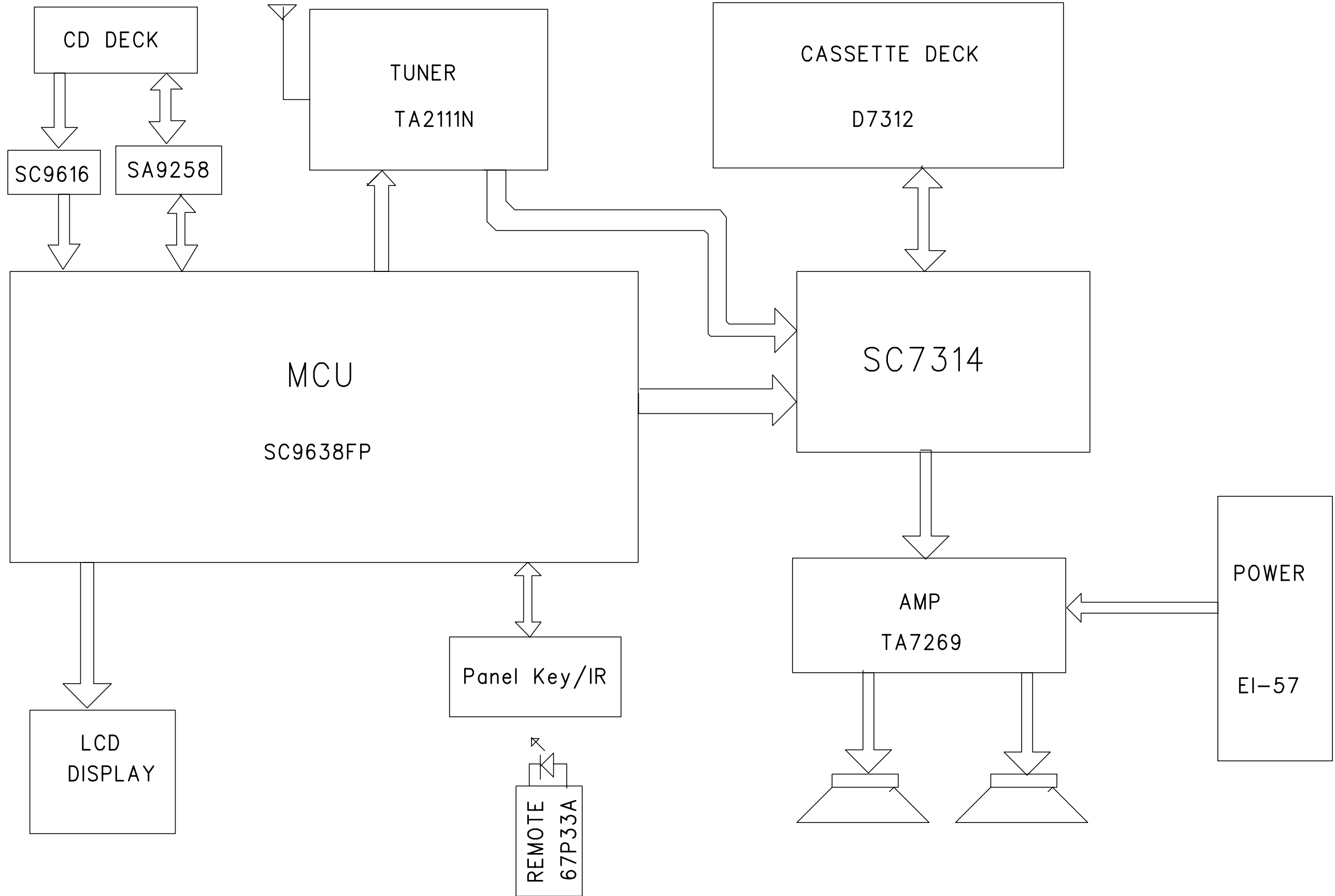


F. Remove Key Board Assembly

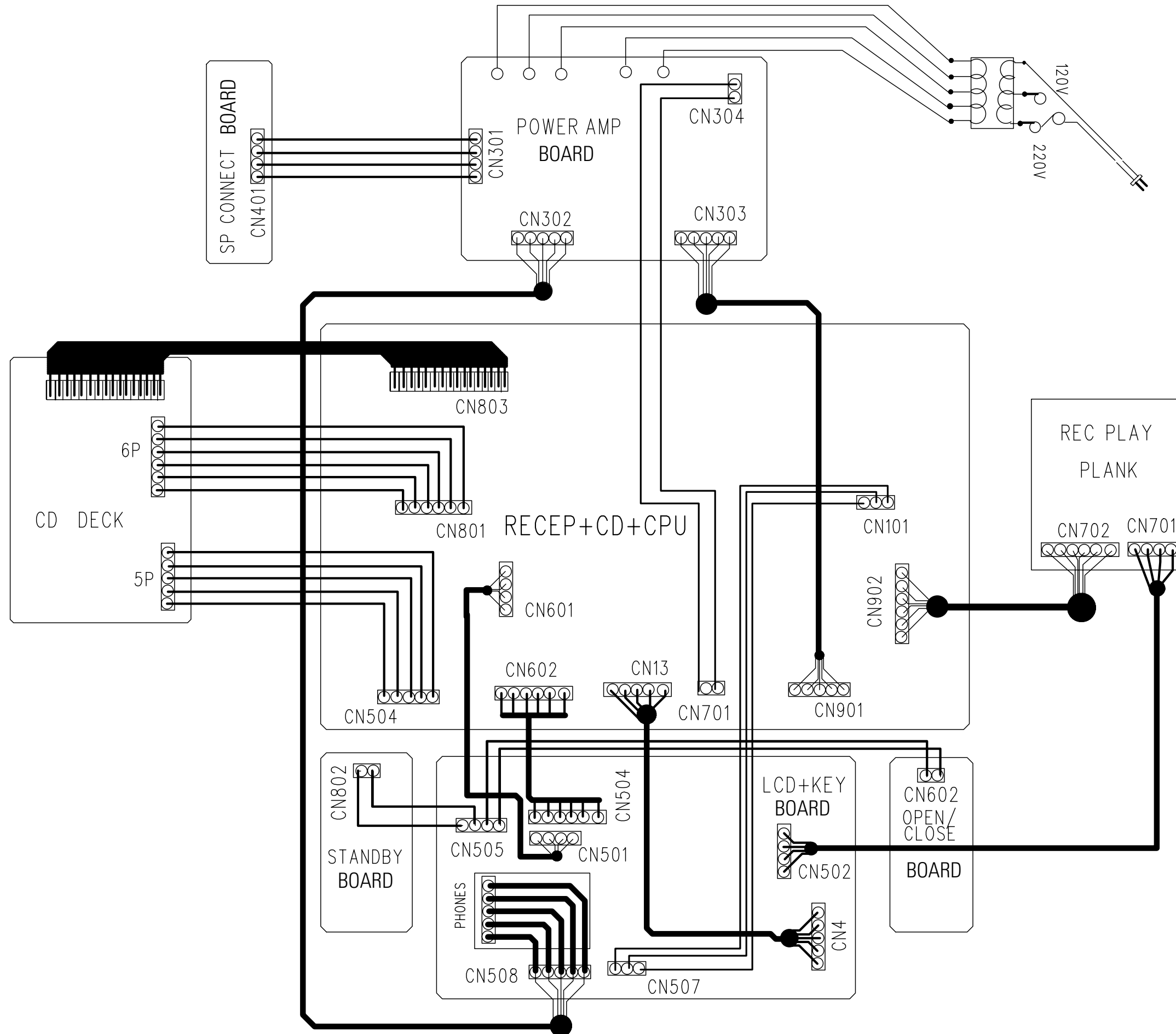
- F1: Remove screws SP 3x8 - 10 pcs.
 F2: Remove screws SP 3x8 - 2 pcs.
 F3: Remove screws SP 3x8 - 4 pcs.



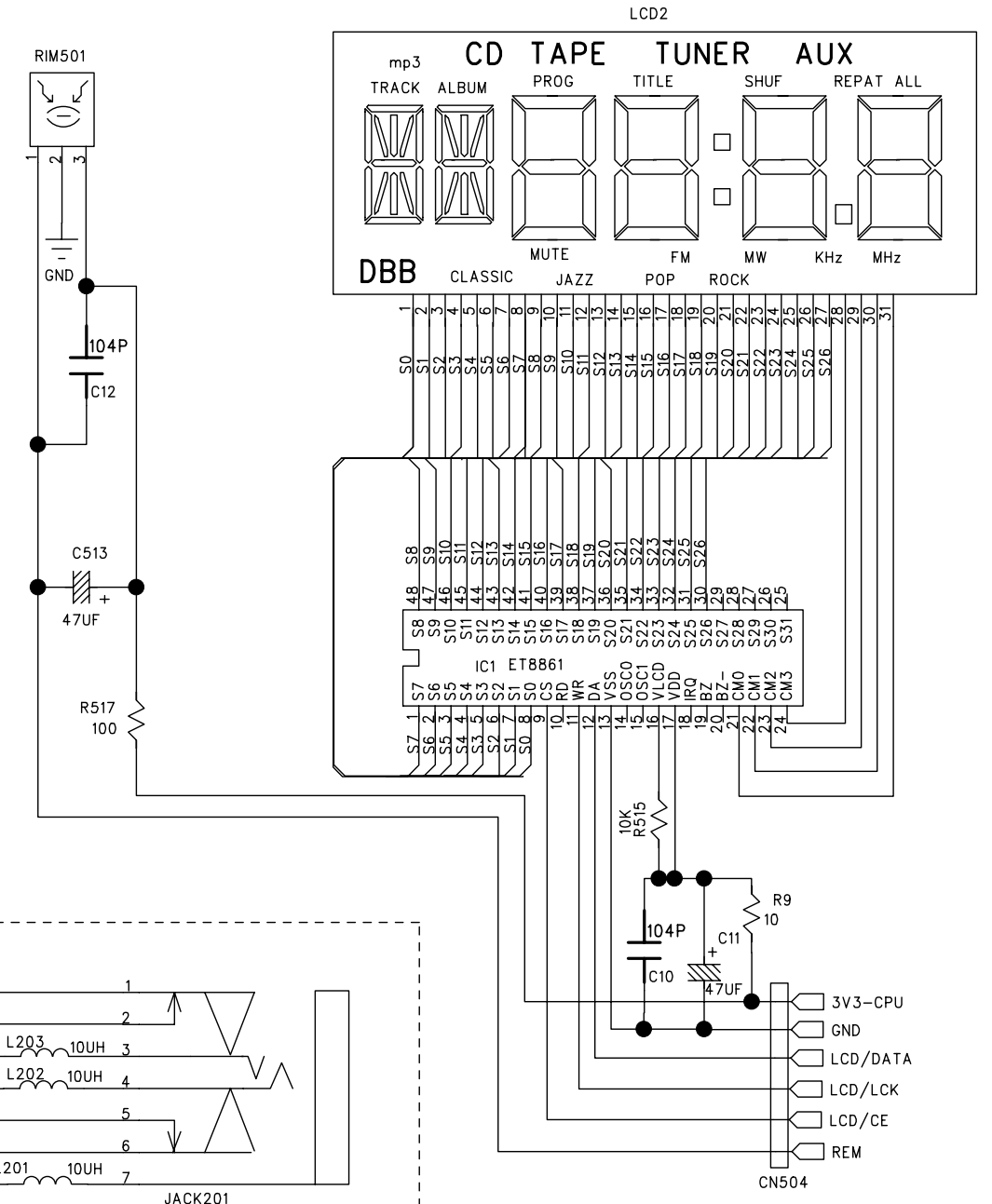
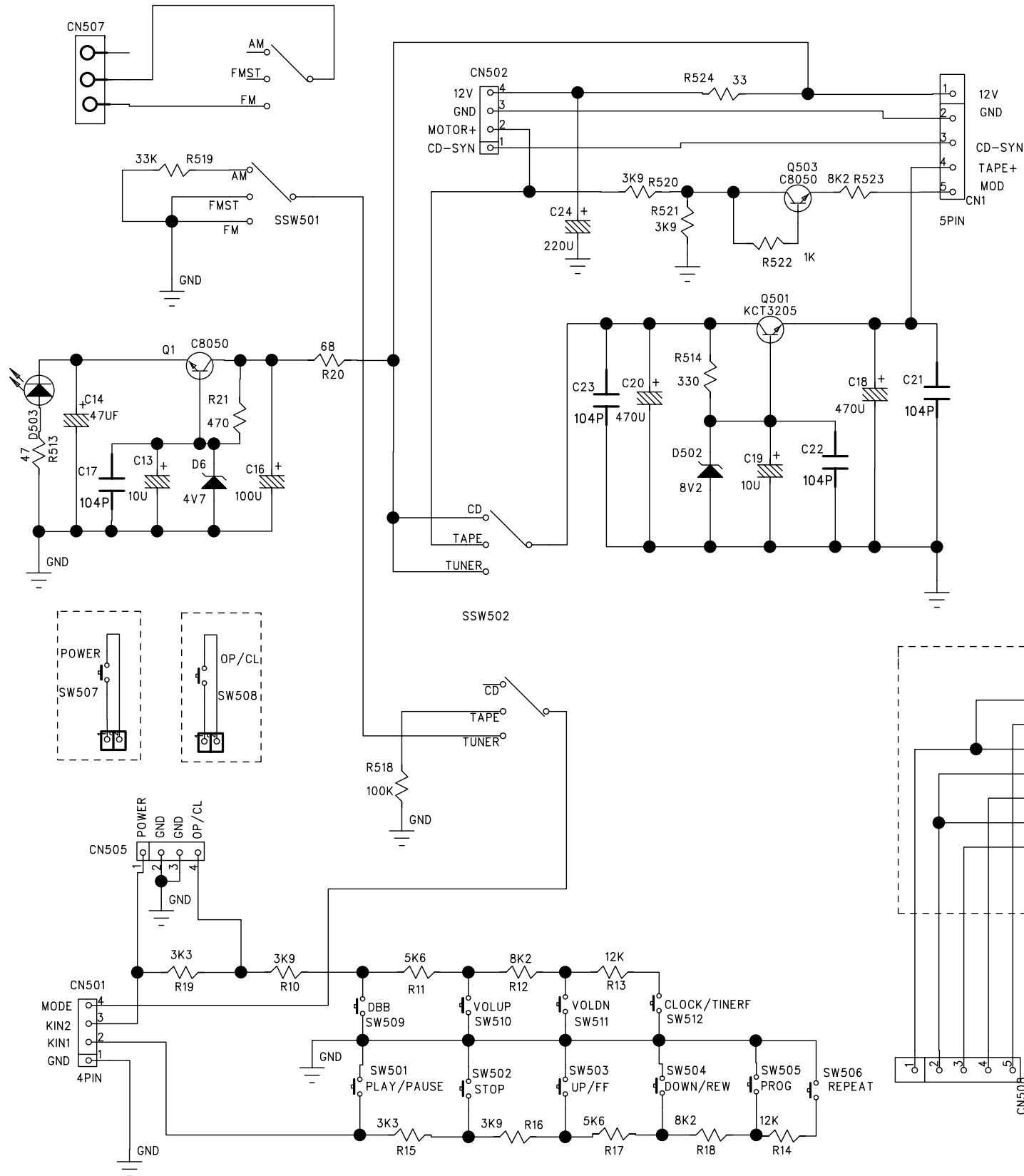
SET BLOCK DIAGRAM



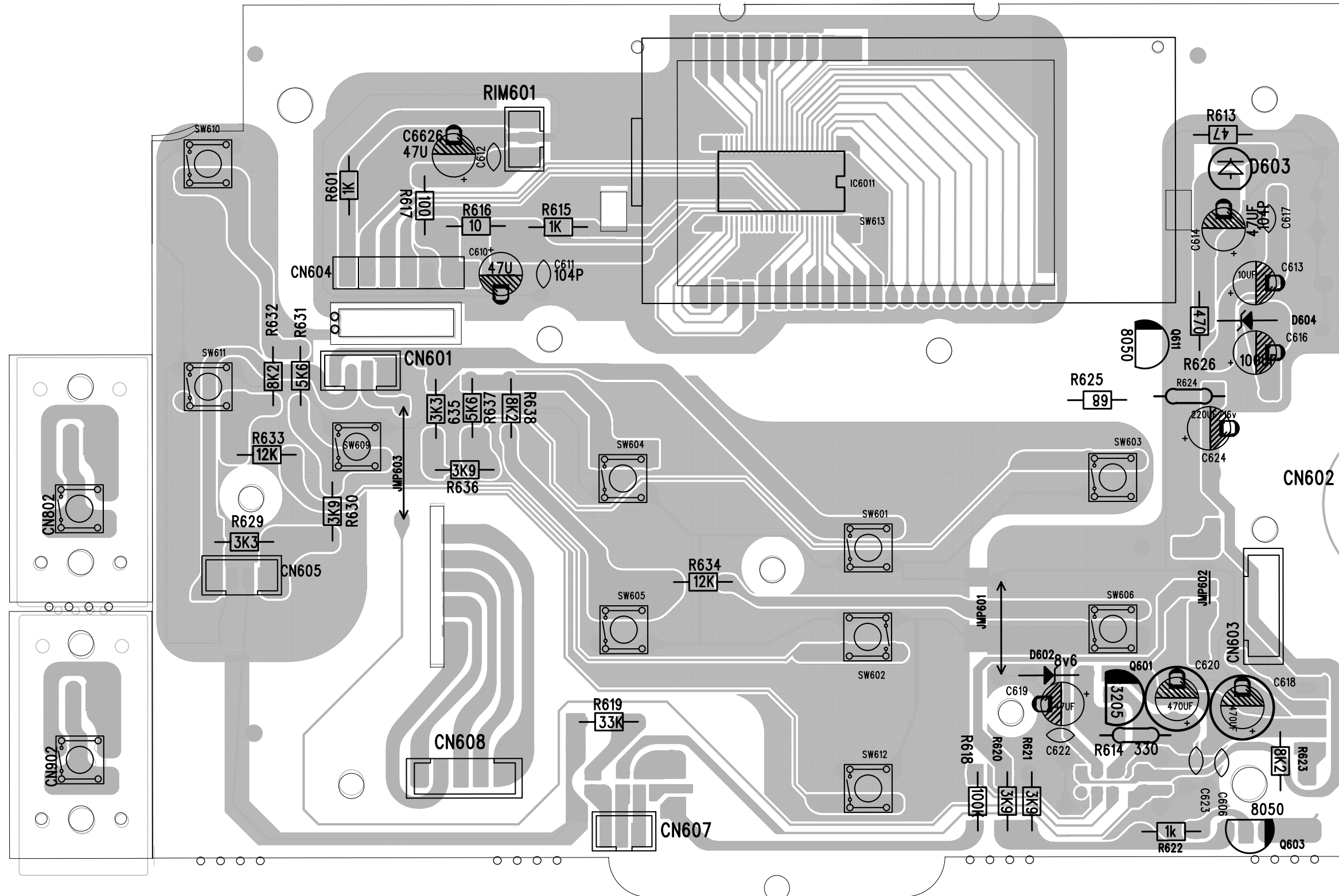
SET WIRING DIAGRAM



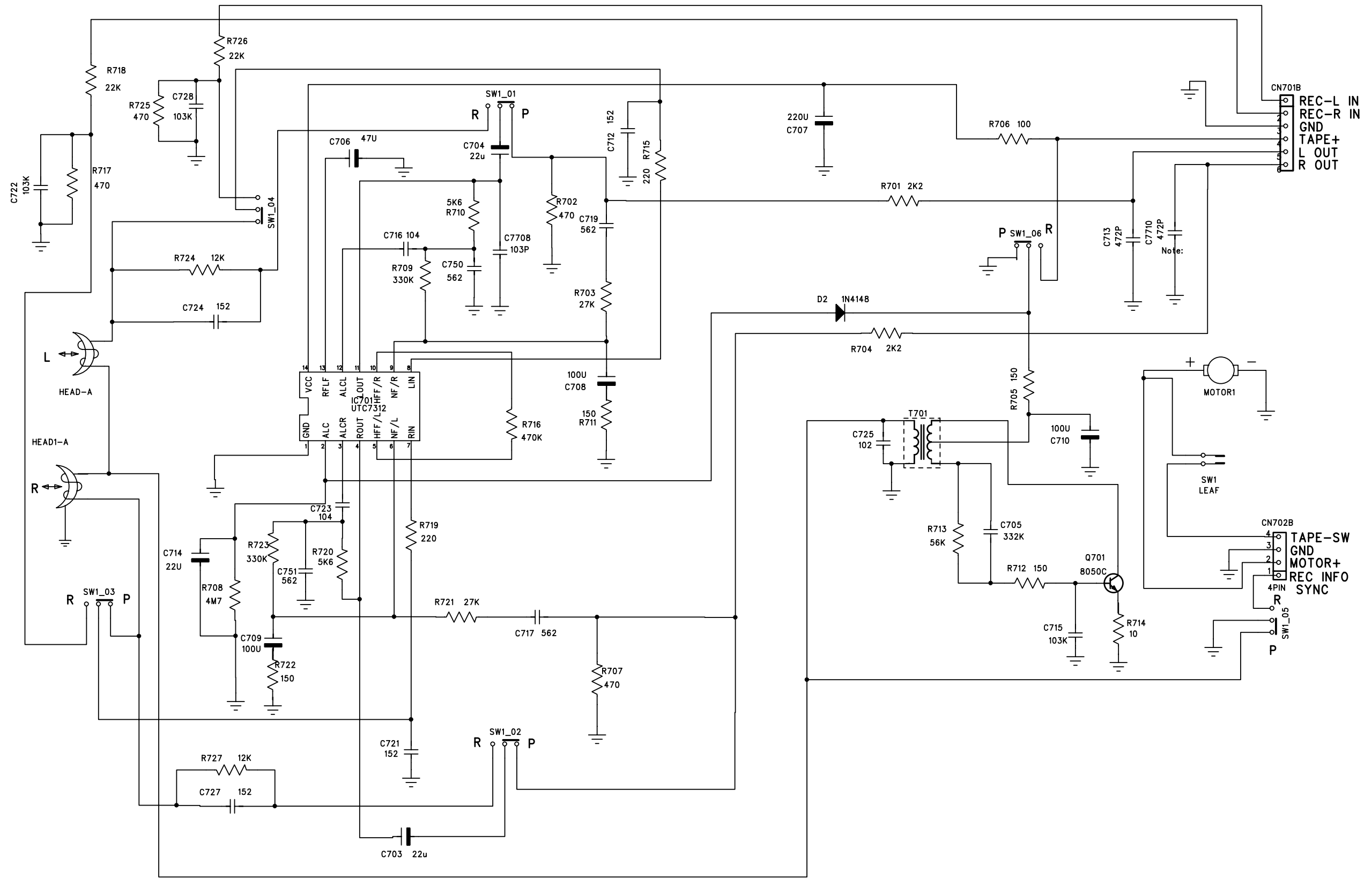
CIRCUIT DIAGRAM - KEY / LCD BOARD



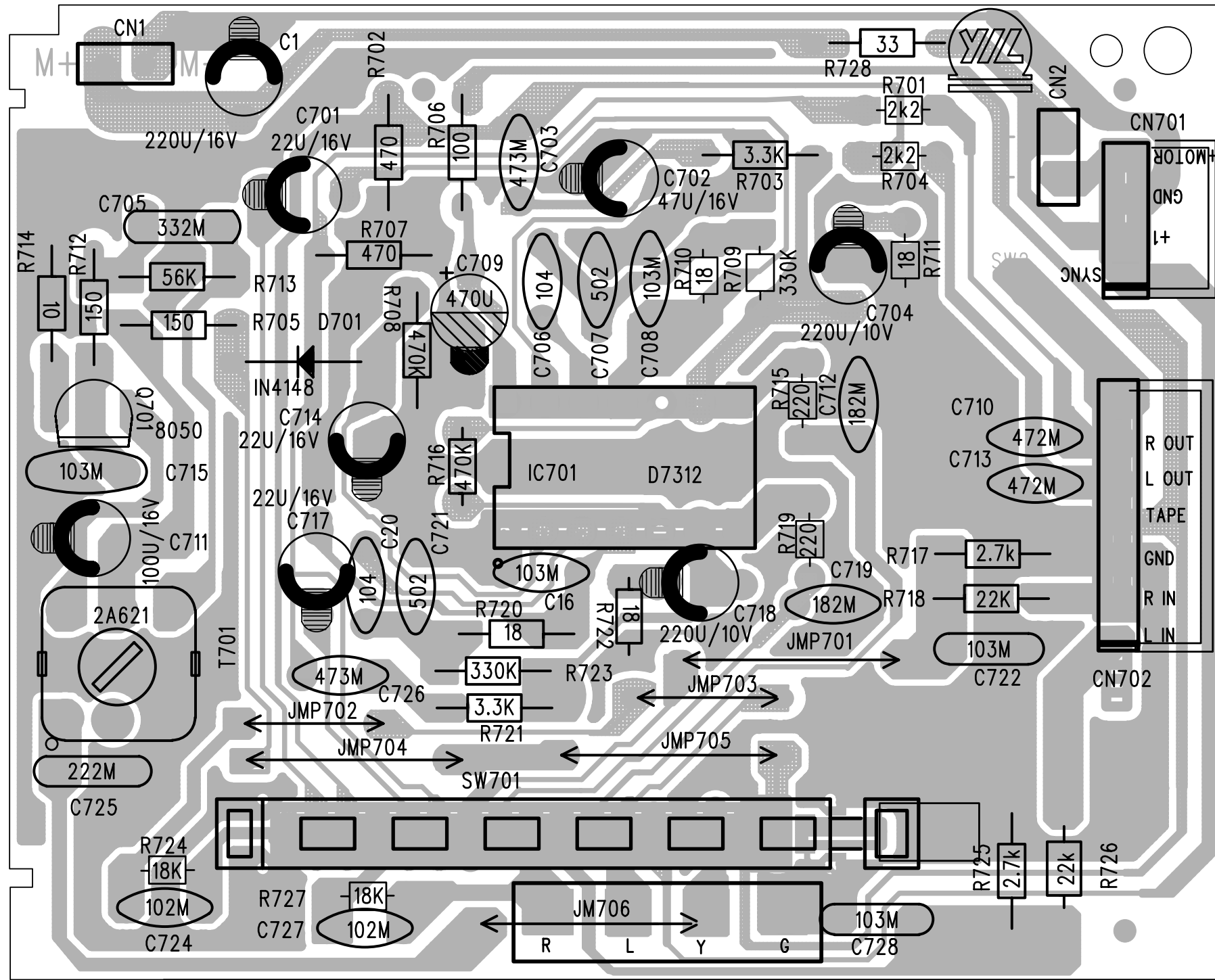
LAYOUT DIAGRAM - KEY / LCD BOARD



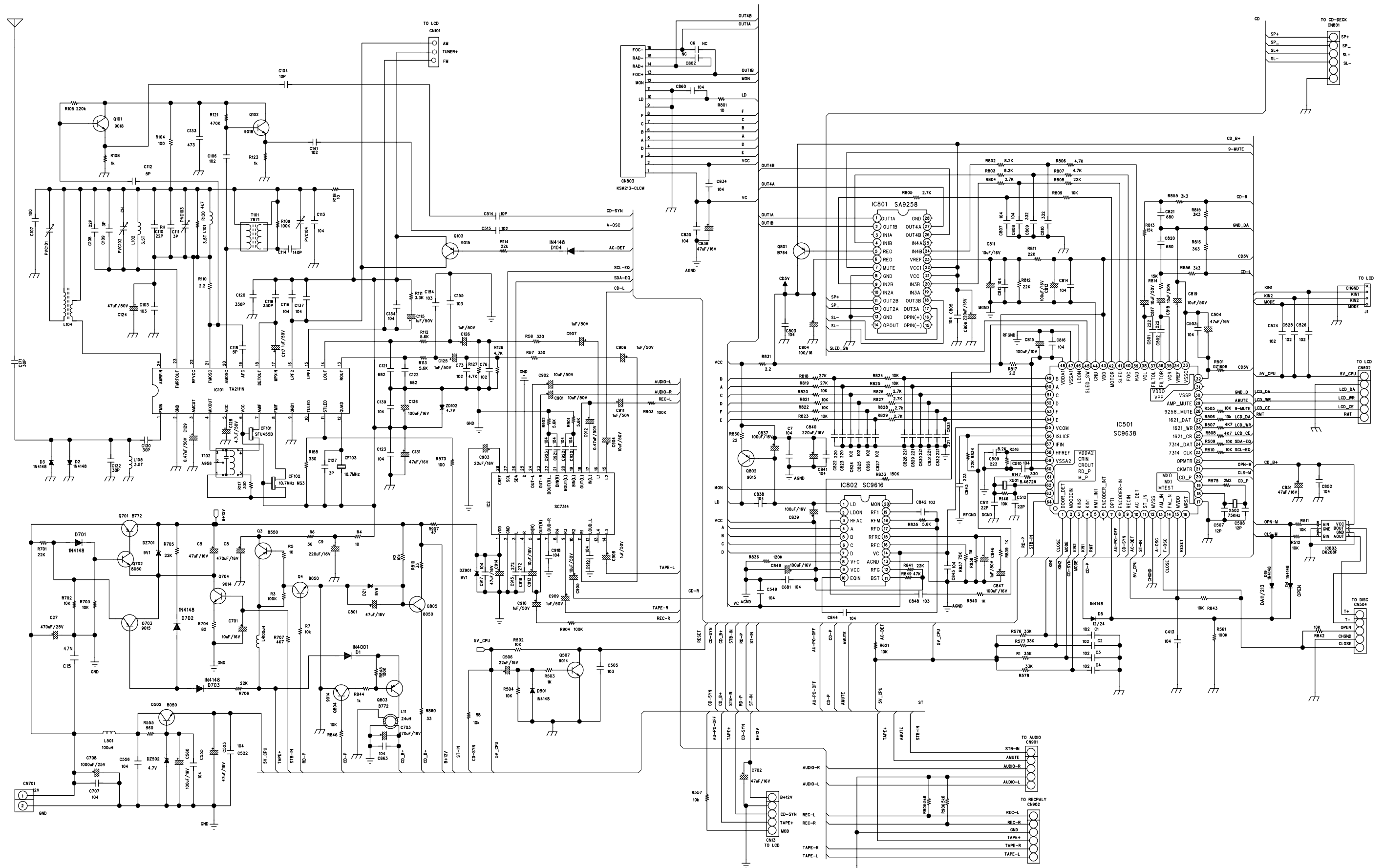
CIRCUIT DIAGRAM - CASSETTE BOARD



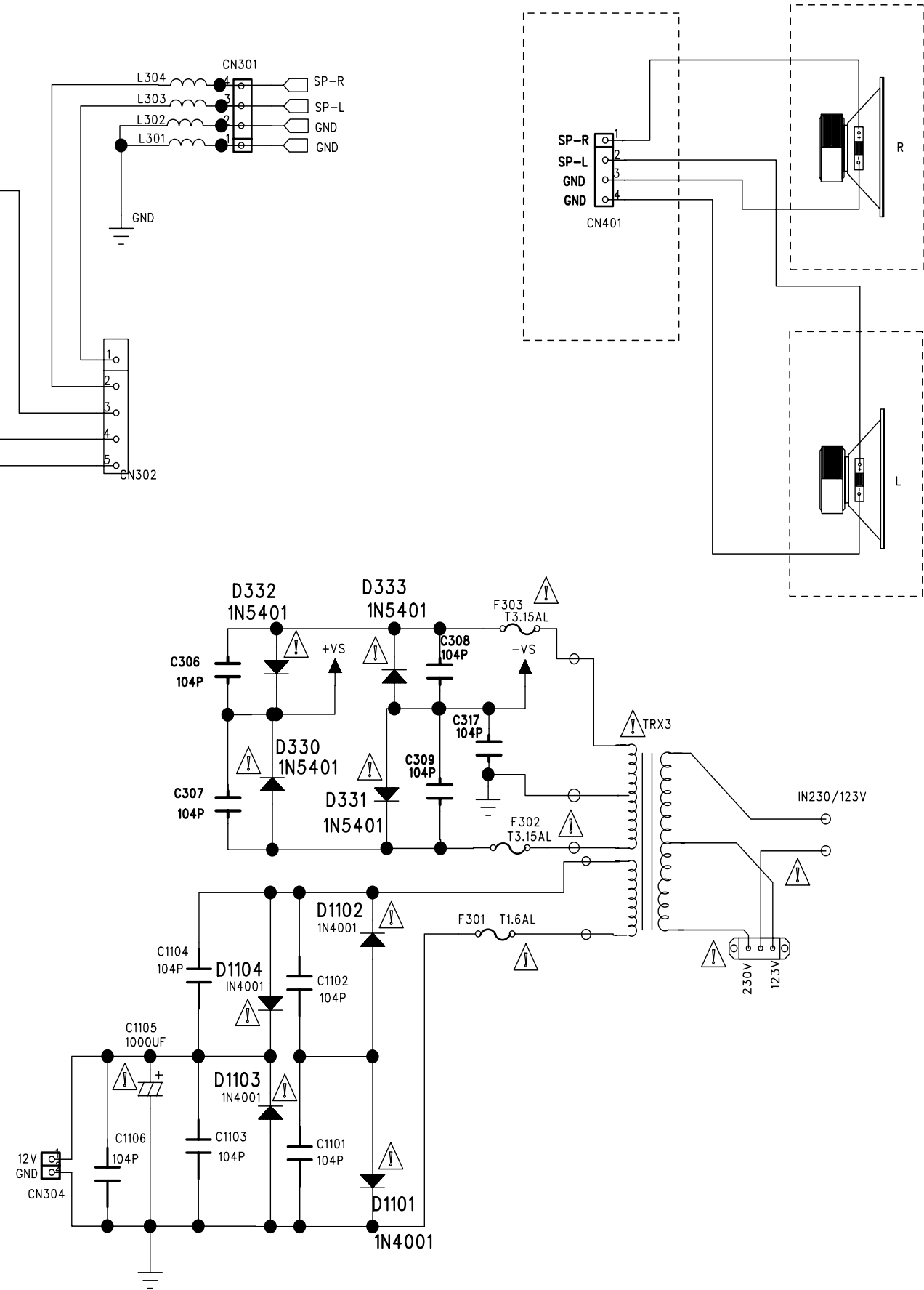
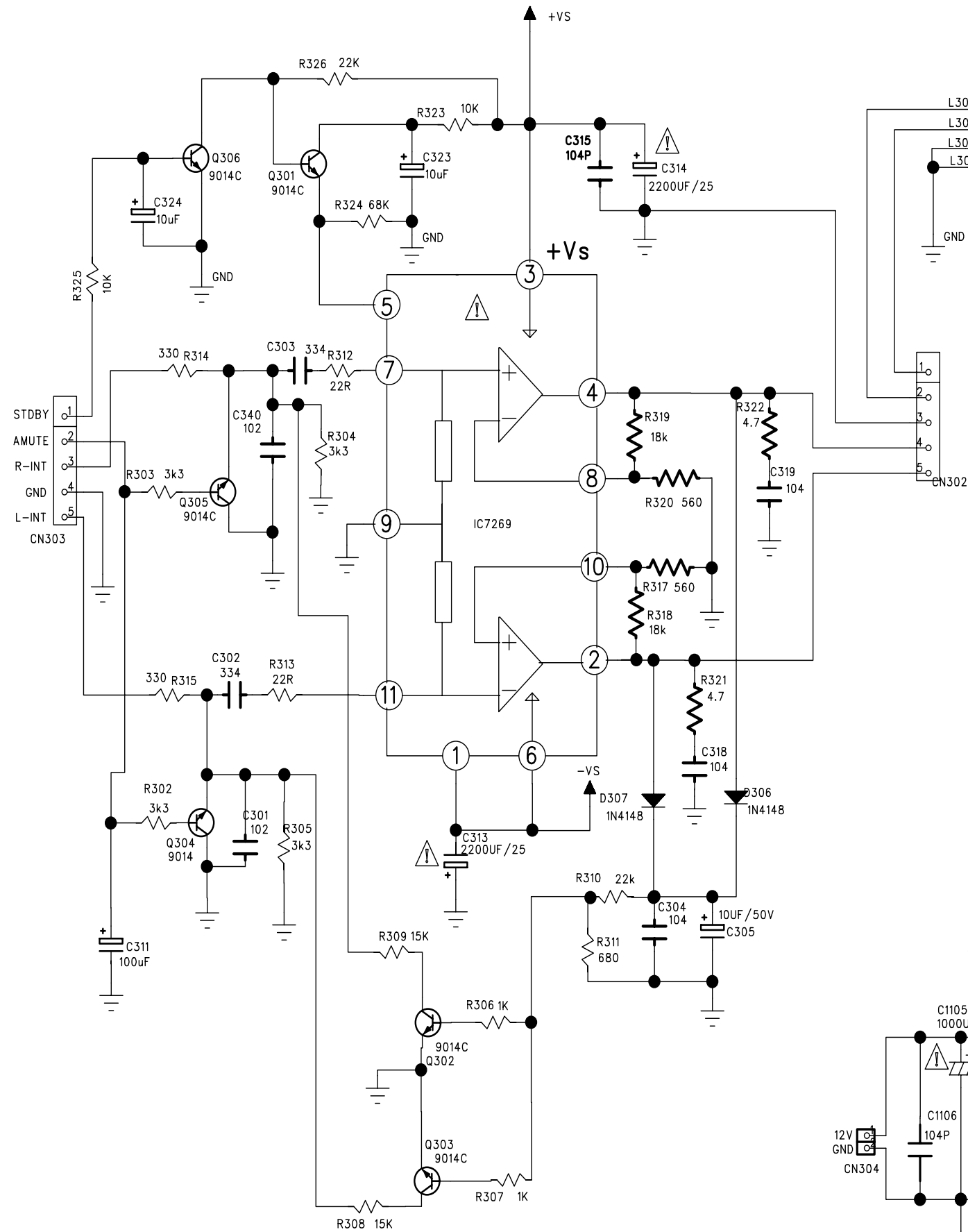
LAYOUT DIAGRAM - CASSETTE BOARD



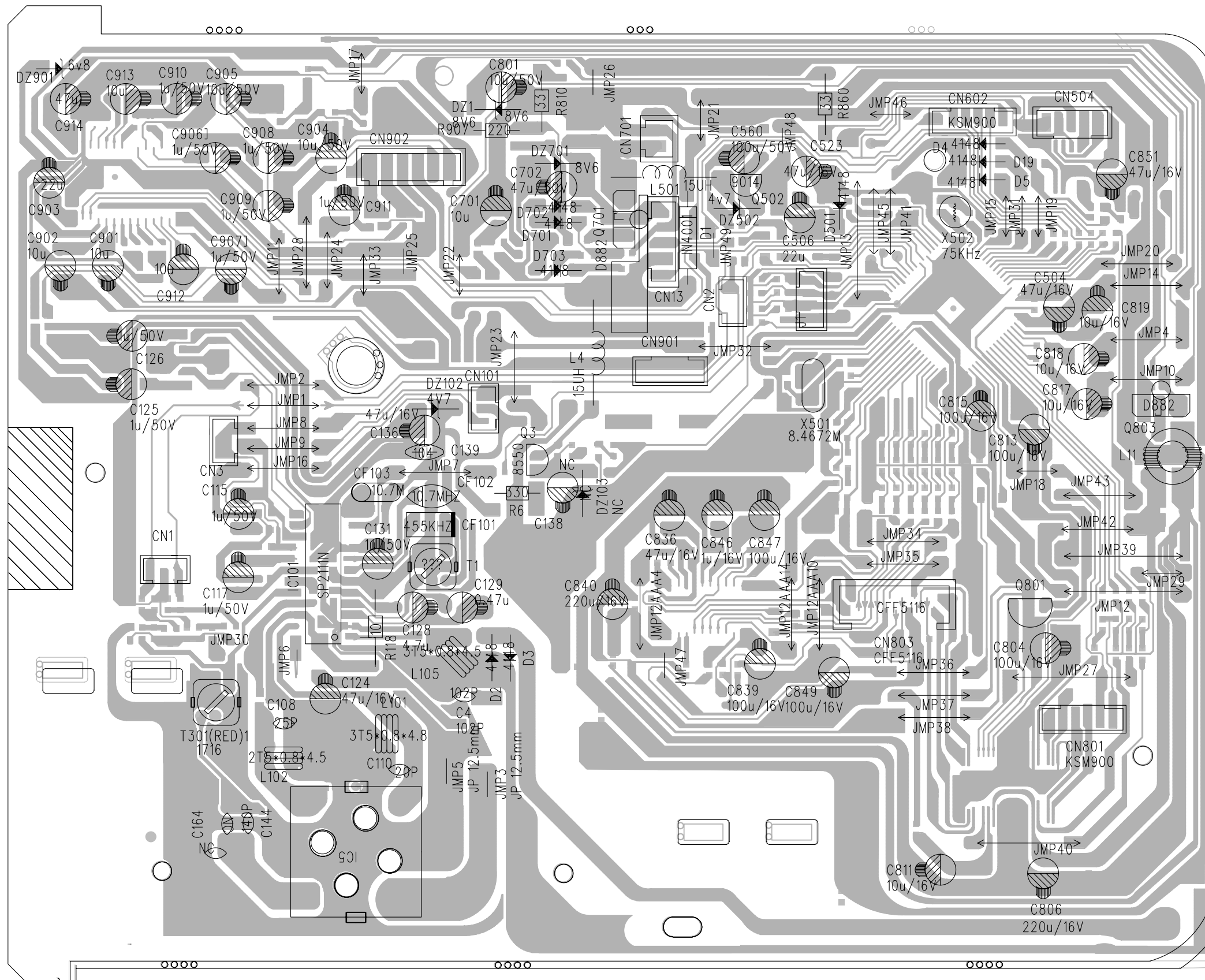
CIRCUIT DIAGRAM - TUNER & CD PART



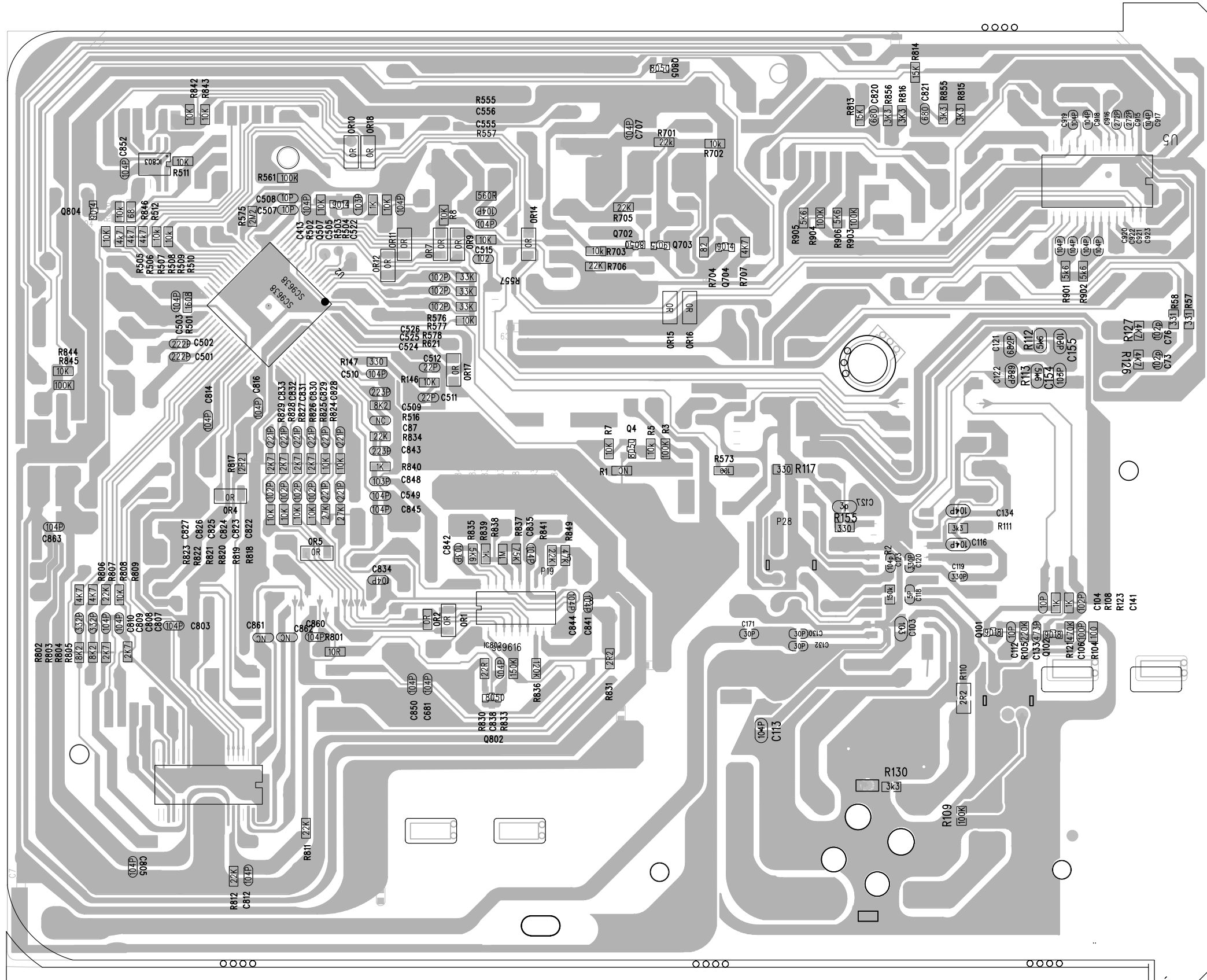
CIRCUIT DIAGRAM - POWER & SUPPLY PART



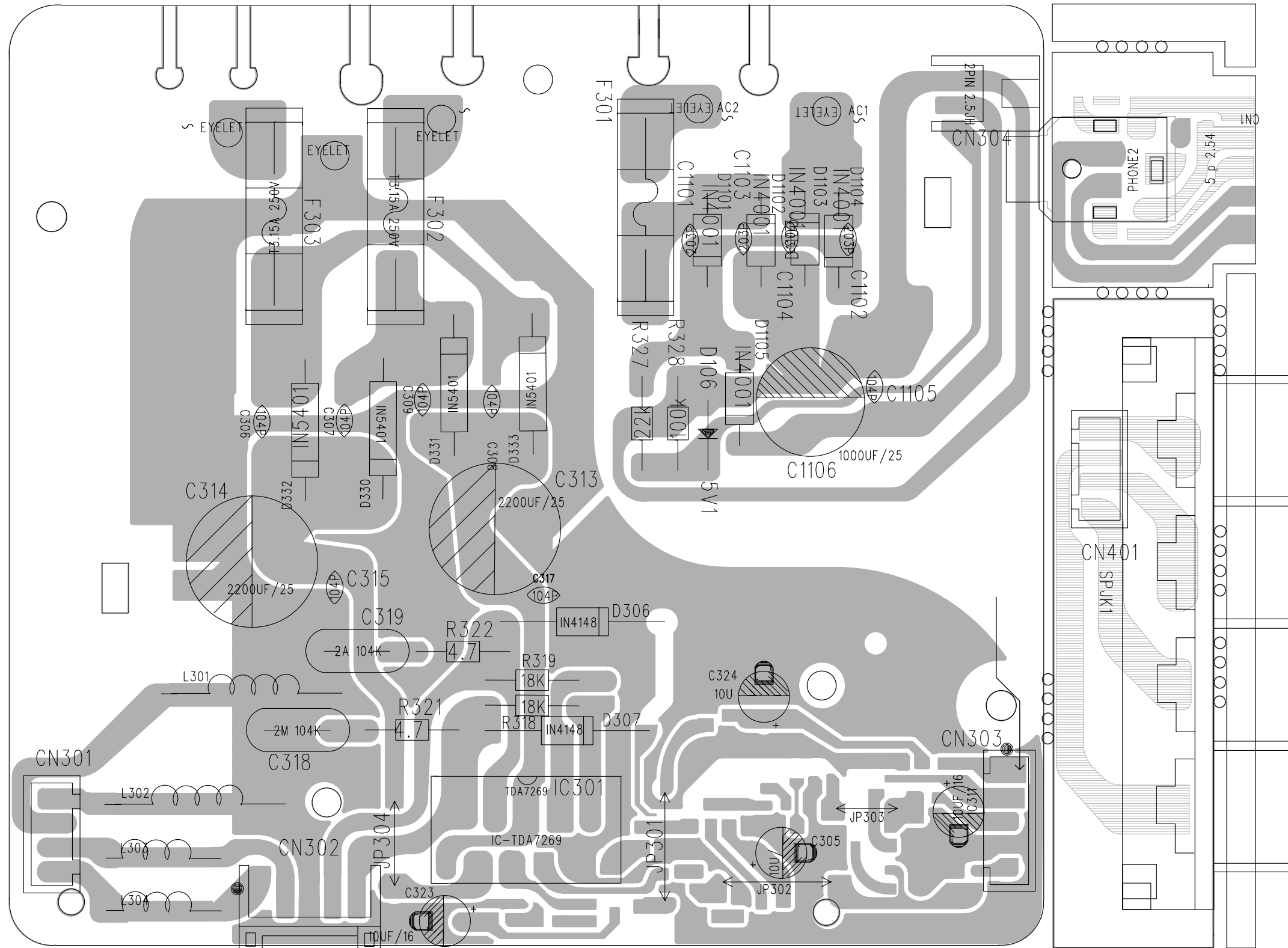
COMPONENT SIDE



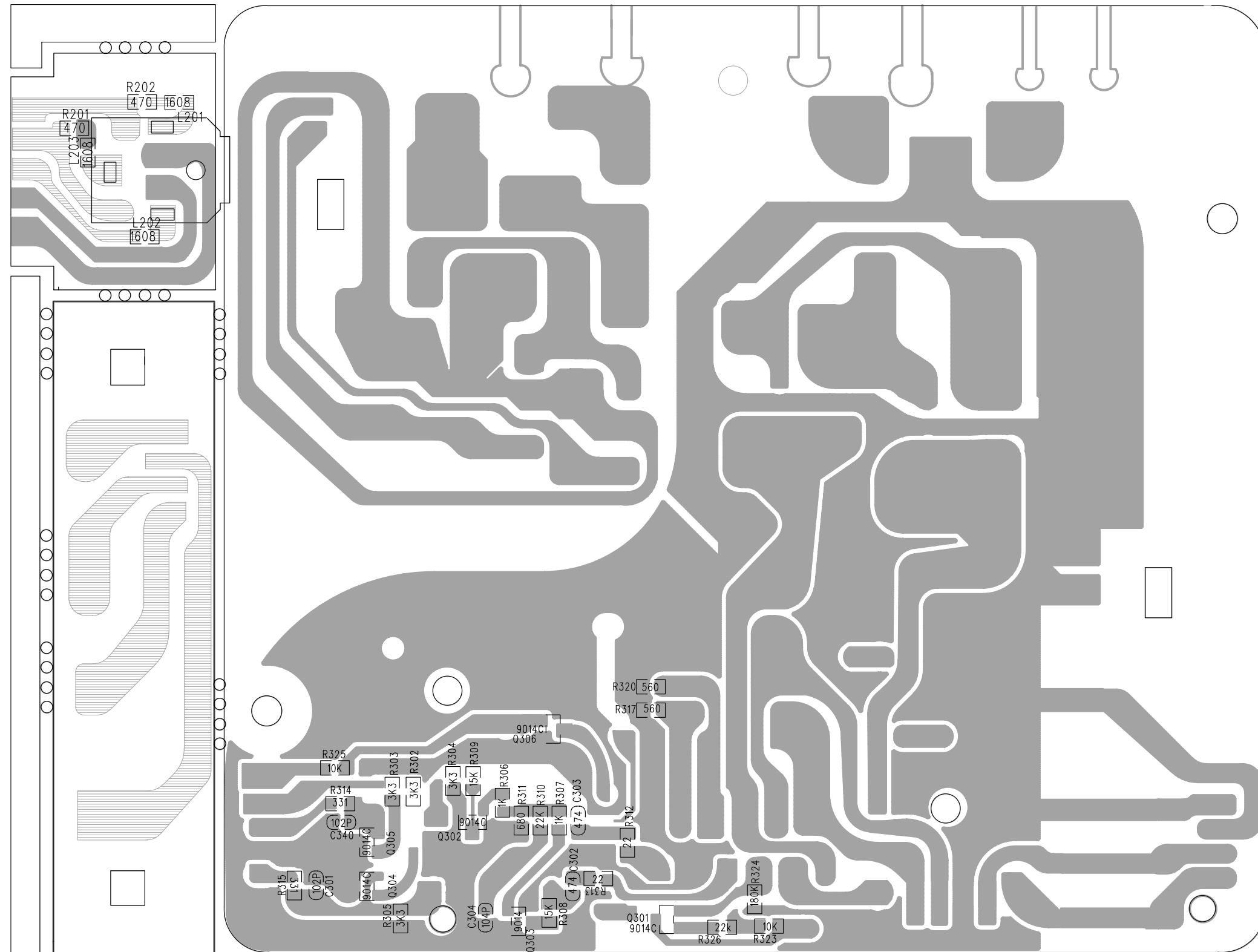
COPPER SIDE



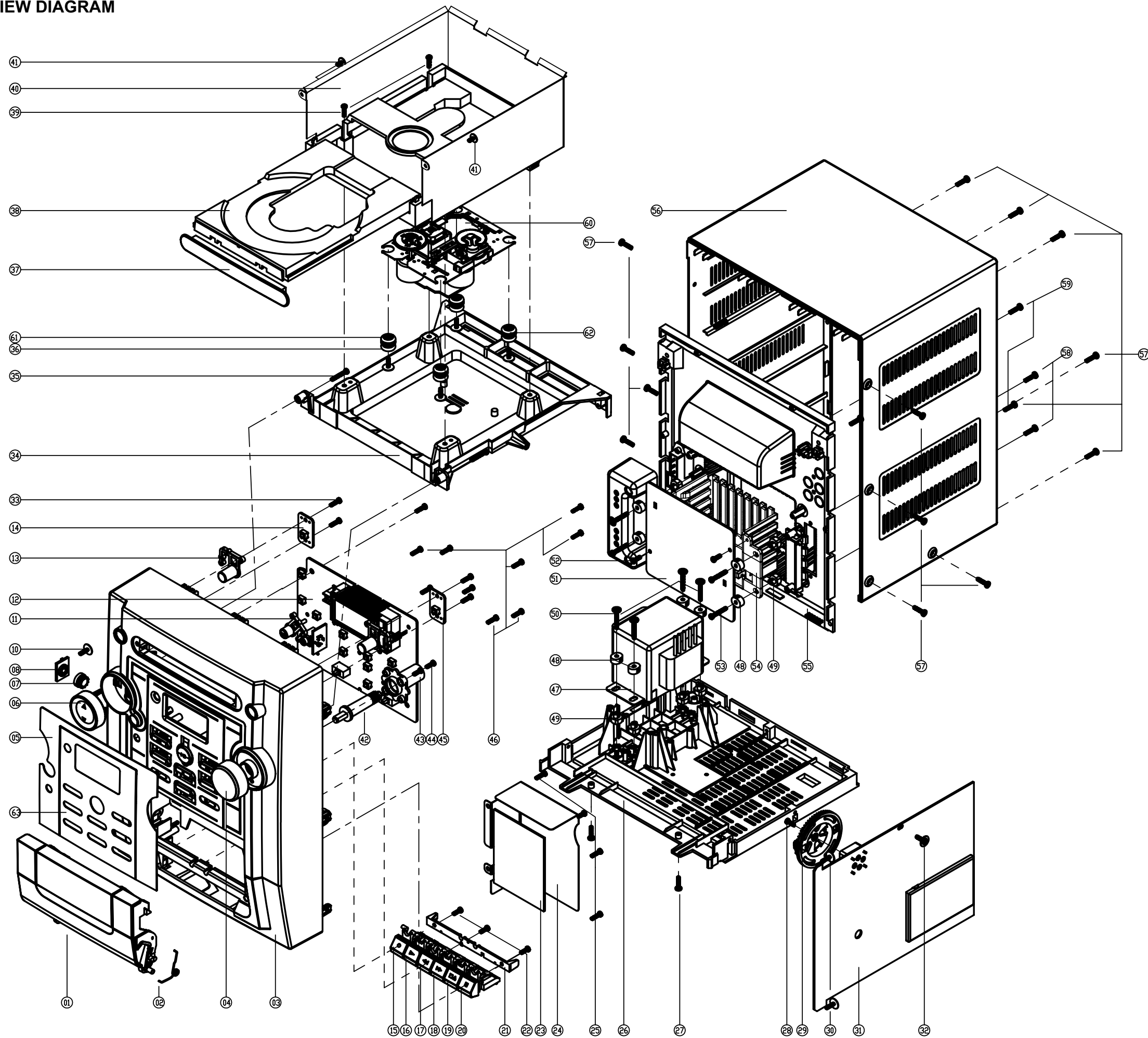
LAYOUT DIAGRAM - POWER SUPPLY BOARD (Component Side)



LAYOUT DIAGRAM - POWER SUPPLY BOARD (Copper Side)



EXPLODED VIEW DIAGRAM



ACCESSORIESMAS139FWC139

9940 000 04692	9940 000 05127	WOODEN SPEAKER
9940 000 04731	9940 000 05131	REMOTE HANDSET

MECHANICAL PARTS LIST

01	9940 000 04701	9940 000 05129	CASS DOOR
02	9940 000 05326	9940 000 05326	CASSETTE DOOR SPRING
03	9940 000 04694	9940 000 04694	F-CAB
04	9940 000 04709	9940 000 04709	TUNING KNOB
05	9940 000 04728	9940 000 04728	FRONT LENS (1)
06	9940 000 04708	9940 000 04708	VOLUME KNOB
07	9940 000 04726	9940 000 04726	7831 GEAR (MODE:0.8)
08	9940 000 04727	9940 000 04727	7831 GEAR STAND (MODE:0.8)
11	9940 000 04715	9940 000 04715	BBS KNOB
13	9940 000 04713	9940 000 04713	POWER KNOB
15	9940 000 04705	9940 000 04705	REC KNOB MOULD
16	9940 000 04704	9940 000 04704	PLAY KNOB
17	9940 000 04707	9940 000 04707	REW KNOB
18	9940 000 04706	9940 000 04706	F.FWD KNOB
19	9940 000 04703	9940 000 04703	STOP KNOB
20	9940 000 04712	9940 000 04712	PAUSE KNOB
21	9940 000 04702	9940 000 04702	7871 CASS DOOR BRACKET
26	9940 000 04697	9940 000 04697	BACK CAB (HIPS)
29	9940 000 04725	9940 000 04725	TUNING GEAR
34	9940 000 04718	9940 000 04718	CD BRACKET
37	9940 000 04699	9940 000 04699	CD DOOR
38	9940 000 04693	9940 000 04693	CD LOADER (COMPLETED)
42	9940 000 04724	9940 000 04724	TUNING KNOB GEAR
55	9940 000 04698	9940 000 04698	B-CAB (HIPS V2)
56	9940 000 04695	9940 000 04695	TOP CAB
60	9940 000 04735	9940 000 04735	CD MECH SONY KSM-213 CLCM
63	9940 000 04729	9940 000 05128	FRONT LENS (2)

others

9940 000 04711	9940 000 04711	FUNCTION SLIDE KNOB
9940 000 04714	9940 000 04714	CD SILDE KNOB
9940 000 04716	9940 000 04716	BAND SLIDE KNOB
9940 000 04717	9940 000 04717	LCD BRACKET
9940 000 04719	9940 000 04719	CASS HOLDER
9940 000 04734	9940 000 04734	CASS DECK CS-21SC-820T
9940 000 04721	9940 000 04721	RUBBER FOOT (18x8.5x3.0mm)

Note: Only these parts mentioned in the list arevnormal service parts.

ELECTRICAL PARTS LIST**MISCELLANEOUS**

⚠	9940 000 04732	TRANSFORMER 120V/230V (MAS139)
⚠	9940 000 05123	TRANSFORMER 120V/230V (FWC139)
⚠	9965 000 38578	TRANSFORMER VDE 230V
⚠	9940 000 05125	AC CORD VDE-APP 6' BLK (FWC139)
⚠	9940 000 04733	AC CORD SET BRA (MAS139/78)
⚠	9965 000 38579	AC CORD SET ARG (MAS139/77)
	9940 000 03993	16 PIN FFC CABLE 210mm P=1.0
⚠	9940 000 04736	VOLTAGE SWITCH

MAIN PCB ASSY

DZ1	9940 000 04749	ZENER DIODE+-5% 6V8
DZ102	9940 000 04748	ZENER DIODE+-5% 4V7
DZ104	9940 000 04747	ZENER DIODE+-5% 3V3
DZ502	9940 000 04748	ZENER DIODE+-5% 4V7
DZ701	9940 000 04751	ZENER DIODE+-5% 9V1
DZ901	9940 000 04751	ZENER DIODE+-5% 9V1
Q3	9940 000 02642	TR PNP 3CA8550
Q4	9940 000 03972	CHIP TR MMBT9014C
Q101	9940 000 04743	CHIP TR MMBT9018H
Q102	9940 000 04743	CHIP TR MMBT9018H
Q103	9940 000 04746	TR PNP 9015B
Q502	9940 000 04009	TR NPN 8050C
Q507	9940 000 03972	CHIP TR MMBT9014C
Q701	9940 000 04745	TR PNP KTB772
Q702	9940 000 04004	CHIP TR NPN 8050C
Q703	9940 000 03973	CHIP TR MMBT9015C
Q704	9940 000 03972	CHIP TR MMBT9014C
Q801	9940 000 04744	TR PNP 2SB764-D
Q802	9940 000 04004	CHIP TR NPN 8050C
Q802	9940 000 03973	CHIP TR MMBT9015C
Q803	9940 000 04745	TR PNP KTB772
Q804	9940 000 03972	CHIP TR MMBT9014C
Q805	9940 000 04004	CHIP TR NPN 8050C
IC101	9940 000 03962	IC TA2111NG (SDIP24)
IC802	9940 000 04738	IC SA9616
IC803	9940 000 04737	IC D6208 (MOTOR DRIVER)
U5	9940 000 04741	IC SC7314S (4 CH AUDIO)
L4	9940 000 04773	INDUCTOR (R-TYPE) 100UH
L501	9940 000 04773	INDUCTOR (R-TYPE) 100UH
L801	9940 000 04774	SMD INDUCTOR 100UH
PVC1	9940 000 04775	PVC (DF443DF04-A04)
T102	9940 000 03964	AM IFT YEL 7mm A956
X501	9940 000 03986	CRYSTAL 8.4672MHz (HC49S)
X502	9940 000 04777	CRYSTAL 75KHZ D2X6
	9940 000 05122	AM COIL 120:20T D10.5mm
	9940 000 03966	FERRITE BAR D10xL60

ELECTRICAL PARTS LIST

POWER AMP BOARD ASSY

Q301	9940 000 03972	CHIP TR MMBT9014C
Q302	9940 000 03972	CHIP TR MMBT9014C
Q303	9940 000 03972	CHIP TR MMBT9014C
Q304	9940 000 03972	CHIP TR MMBT9014C
Q305	9940 000 03972	CHIP TR MMBT9014C
Q306	9940 000 03972	CHIP TR MMBT9014C
IC301	9940 000 04778	IC TDA7269A-14W
JK401	9940 000 04779	SPEAKER TERMINAL 4P
J201	9940 000 03989	ST PHONES JACK 3.5mm
F301	⚠ 9940 000 04782	FUSE 50T D5x20 1.6A 250V
F302	⚠ 9940 000 04781	FUSE 50T-032H 3.15A 250V
F303	⚠ 9940 000 04781	FUSE 50T-032H 3.15A 250V

CASSETTE PCB ASSY

IC701	9940 000 04007	IC D7312 (PRE-AMP)
Q701	9940 000 04009	TR NPN 8050C
T701	9940 000 04783	IFT BRO 10mm (AC BIAS)
SW701	9940 000 04784	REC/PLAY SW (PS-62D01-NS)

KEY / LCD BOARD ASSY

IC601	9940 000 03955	IC ET8861S LCD DRIVER
Q601	9940 000 04785	TR NPN KTC3205Y
Q602	9940 000 04009	TR NPN 8050C
Q603	9940 000 04009	TR NPN 8050C
D601	9940 000 04786	ZENER DIODE+-5% 5.1V
D602	9940 000 04787	ZENER DIODE+-5% 8V6
D603	9940 000 04788	LED BLUE D5 (DL5NBCH-W)
IRM601	9940 000 03956	SENSOR AT136B (36KHz)
LCD1	9940 000 04789	LCD SDT-M3797-TP-4
SSW601	9940 000 04791	SLIDE SW (SSV-23-9700)
SSW602	9940 000 04791	SLIDE SW (SSV-23-9700)
SW601	9940 000 04792	TACT SW 6x6mm H4.3
SW602	9940 000 04792	TACT SW 6x6mm H4.3
SW603	9940 000 04792	TACT SW 6x6mm H4.3
SW604	9940 000 04792	TACT SW 6x6mm H4.3
SW605	9940 000 04792	TACT SW 6x6mm H4.3
SW606	9940 000 04792	TACT SW 6x6mm H4.3
SW607	9940 000 04792	TACT SW 6x6mm H4.3
SW608	9940 000 04792	TACT SW 6x6mm H4.3
SW609	9940 000 04792	TACT SW 6x6mm H4.3
SW610	9940 000 04792	TACT SW 6x6mm H4.3
SW611	9940 000 04792	TACT SW 6x6mm H4.3
SW612	9940 000 04792	TACT SW 6x6mm H4.3

Note: Only these parts mentioned in the list are normal service parts.