

Service  
Service  
**Service**



# Service Manual



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3141 785 33521

Version 1.1



# PHILIPS

## TECHNICAL SPECIFICATION

### Amplifier

Rated Output Power	4X30W RMS
Frequency Response	63 - 16000 Hz, $\pm 3$ dB
Signal to Noise Ratio	>62dB

### Disc

Laser Type	Semiconductor
Disc Diameter	12cm/8cm
Support Disc	CD-DA, CD-R, CD-RW, MP3-CD, WMA-CD
Audio DAC	24Bits / 44.1kHz
Total Harmonic Distortion	<1%
Frequency Response	63Hz - 16kHz
S/N Ratio	>65dBA

### General information

AC power	220 - 230V, 50/60Hz
Operation power consumption	55W
Standby power consumption	<2W
Eco Standby power consumption	<1W
USB direct	Version 2.0/1.1
<b>Dimensions</b>	
- Main Unit (W x H x D)	220 x 292 x 285mm
- Speaker Box (W x H x D)	207 x 292 x 186mm
<b>Weight</b>	
- With Packing	10.8 kg
- Main Unit	2.3 kg
- Speaker Box	2 x 2.8 kg

### Tuner

#### FM

Tuning Range	87.5 - 108 MHz
Tuning grid	50 KHz
<b>Sensitivity</b>	
- Mono, 26dB S/N Ratio	<22 dBu
- Stereo, 46dB S/N Ratio	<45 dBu
Search Selectivity	<28 dBu
Total Harmonic Distortion	<3%
Signal to Noise Ratio	>45 dB

#### MW

Tuning Range	531 - 1602 kHz
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### Tape deck

Frequency Response	63-8000Hz
- Normal tape (type I)	(8dB)
S/N Ratio	35dBA
- Normal tape (type I)	
Wow and flutter	$\leq 0.4\%$ DIN

### Speakers

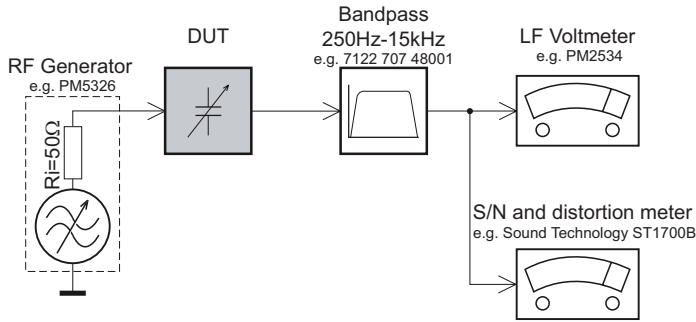
Speaker Impedance	8ohm
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## VERSION VARIATION

Type /Versions: Board in used:	FWM197										
	Service policy		/05	/12		/55	/58	/61		/93	/98
LCD BOARD	C	C									
RADIO BOARD	C	C									
CD BOARD	C	C									
AMP BOARD	C	C									
AMP EXPORT BOARD	C	C									
HEADPHONE BOARD	C	C									
CASSETTE BOARD	C	C									
LINE IN BOARD	C	C									
USB BOARD	C	C									
Type /Versions: Features	FWM197										
Feature difference		/05	/12		/55	/58	/61		/93	/98	
RDS & DAB		√	√								
VOLTAGE SELECTOR											
ECO STANDBY - DARK		√	√								
* TIPS : C -- Component Lever Repair. M -- Module Lever Repair √ -- Used											

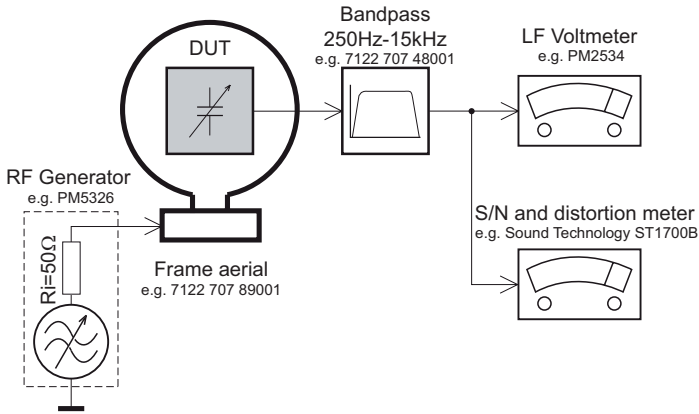
# MEASUREMENT SETUP

## Tuner FM



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

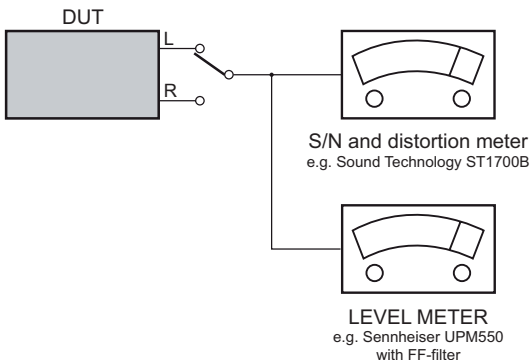
## Tuner AM (MW,LW)



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

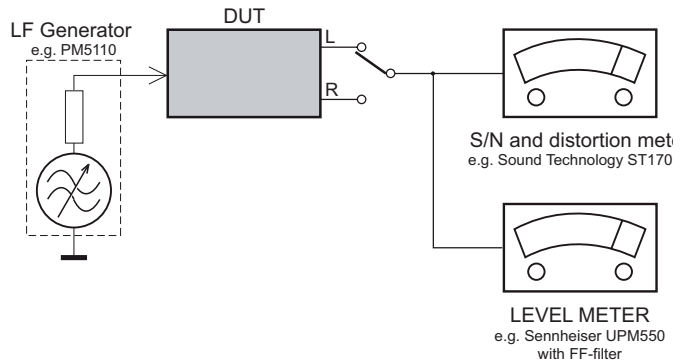
## CD

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



## Recorder

Use Universal Test Cassette Cr02 SBC419 4822 397 30069  
or Universal Test Cassette Fe SBC420 4822 397 30071



## SERVICE AIDS

### **GB** WARNING

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically.

When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance. Keep components and tools also at this potential.

### ESD



### **GB**

Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified, be used

Safety components are marked by the symbol .

**CLASS 1  
LASER PRODUCT**

## 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:



- On our website [www.atyourservice.ce.Philips.com](http://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
  - \* Lead free

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

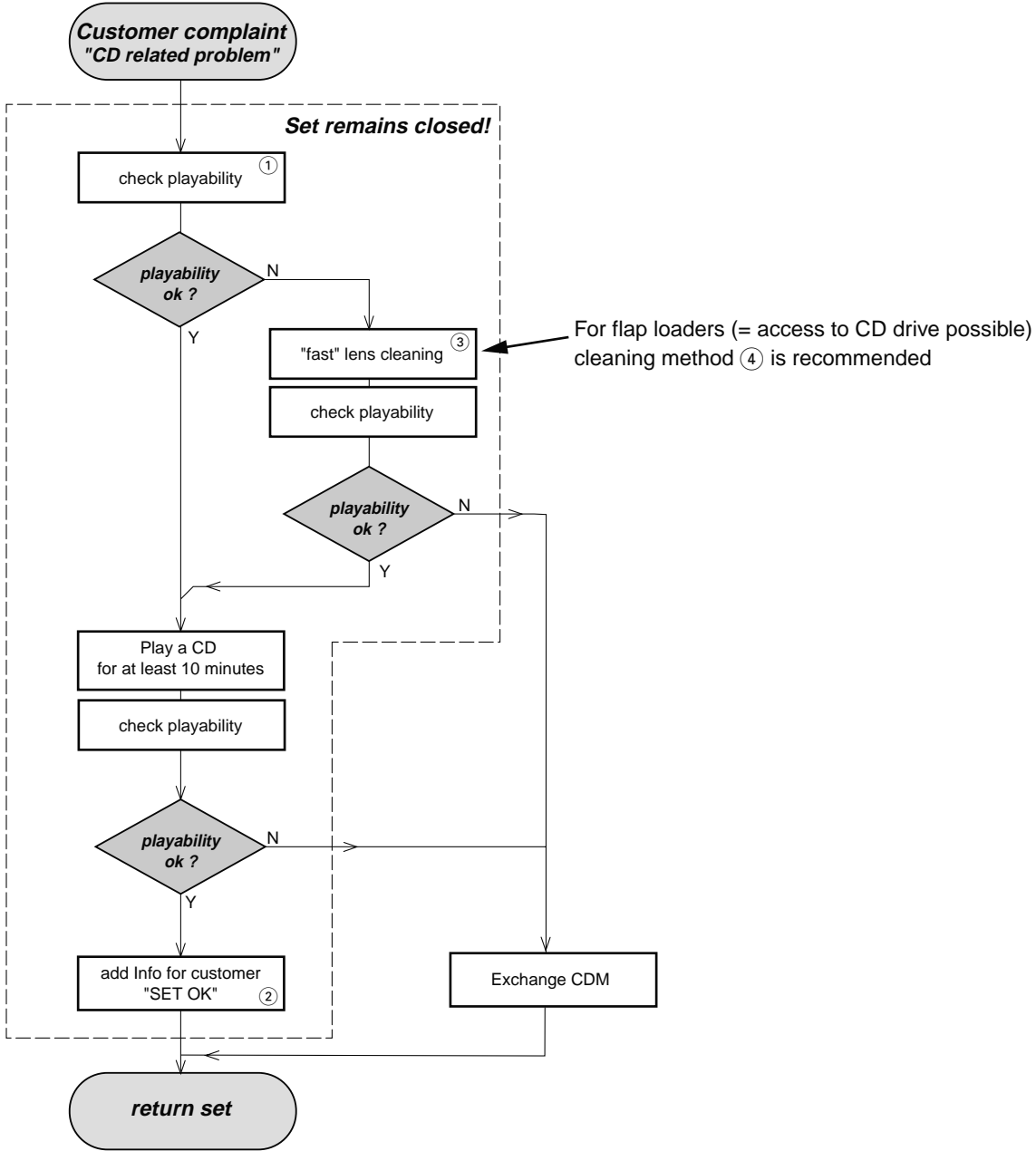
For additional questions please contact your local repair-helpdesk.

## 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.

# INSTRUCTIONS ON CD PLAYABILITY



① - ④ For description - see following pages

## INSTRUCTIONS ON CD PLAYABILITY

①

### PLAYABILITY CHECK

For sets which are compatible with **CD-RW** discs  
 use CD-RW Printed Audio Disc .....7104 099 96611  
 TR 3 (Fingerprint)  
 TR 8 (600µ Black dot) **maximum at 01:00**

- playback of these two tracks without audible disturbance  
 playing time for: Fingerprint  $\geq 10$ seconds  
 Black dot from 00:50 to 01:10
- jump forward/backward (search) within a reasonable time

For all other sets  
 use CD-DA SBC 444A .....4822 397 30245  
 TR 14 (600µ Black dot) **maximum at 01:15**  
 TR 19 (Fingerprint)  
 TR 10 (1000µ wedge)

- playback of all these tracks without audible disturbance  
 playing time for: 1000µ wedge  $\geq 10$ seconds  
 Fingerprint  $\geq 10$ seconds  
 Black dot from 01:05 to 01:25
- jump forward/backward (search) within a reasonable time

②

### CUSTOMER INFORMATION

It is proposed to add an addendum sheet to the set which informs the customer that the set has been checked carefully - but no fault was found.

The problem was obviously caused by a scratched, dirty or copy-protected CD. In case problems remain, the customer is requested to contact the workshop directly.

The lens cleaning (method ③) should be mentioned in the addendum sheet.

The final wording in national language as well as the printing is under responsibility of the Regional Service Organizations.

④

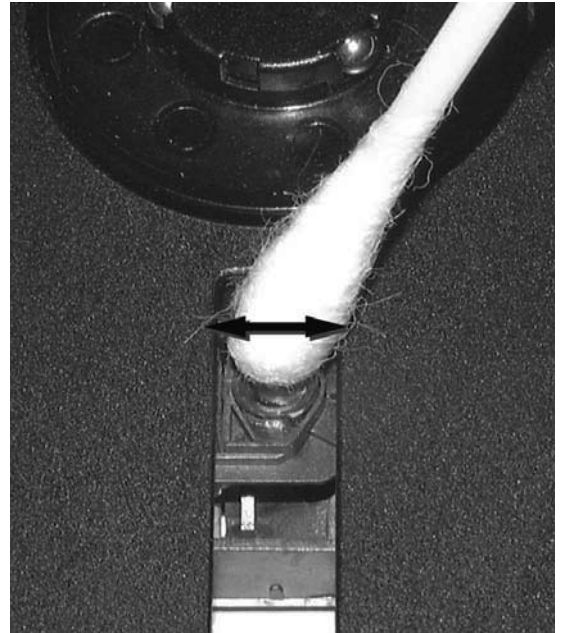
### LIQUID LENS CLEANING

**Before touching the lens it is advised to clean the surface of the lens by blowing clean air over it. This to avoid that little particles make scratches on the lens.**

Because the material of the lens is synthetic and coated with a special anti-reflectivity layer, cleaning must be done with a non-aggressive cleaning fluid. It is advised to use "Cleaning Solvent"

The actuator is a very precise mechanical component and may not be damaged in order to guarantee its full function. Clean the lens gently (don't press too hard) with a soft and clean cotton bud moistened with the special lens cleaner.

The direction of cleaning must be in the way as indicated in the picture below.

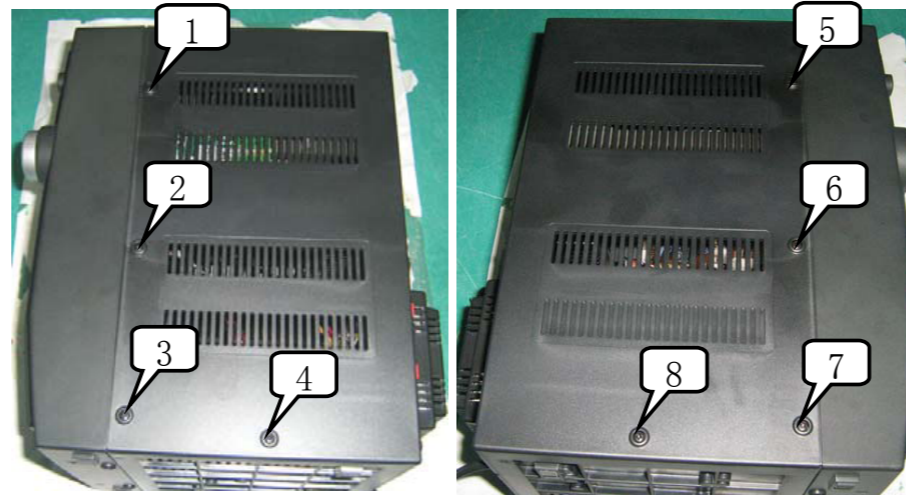


**DISASSEMBLY DIAGRAM VIEW**

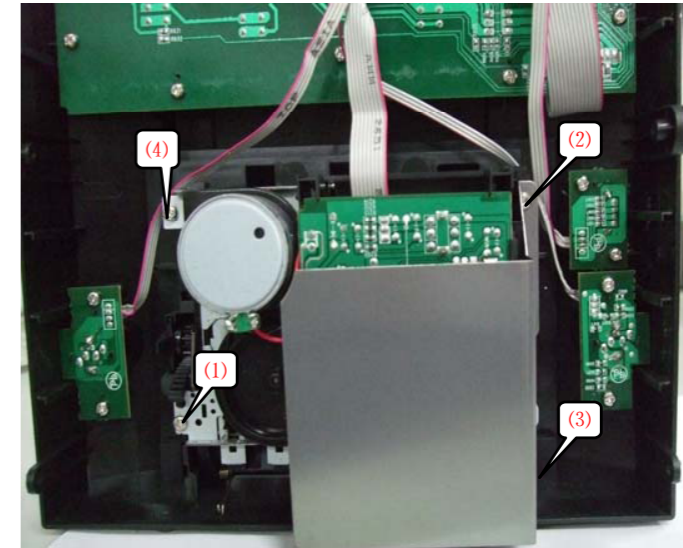
- 1) a.Plug in the 220V AC power cord , set the menu to "CD" function, and press "STANDBY-ON" button , Press "OPEN/CLOSE"to open CD door.  
b.Pull out CD door  
c.Press "OPEN/CLOSE" button to close the CD tray, power off the mainset and unplug the AC power cord.



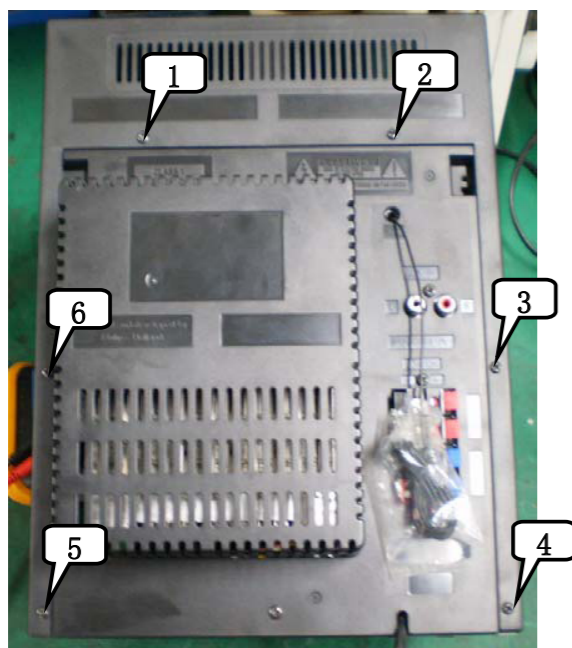
- 2) Loosen 8 screws PT3×12 in both sides.



- 5) Loosen 3 screws PT3X10 and 1 screws PT3X8 to remove CD tray.



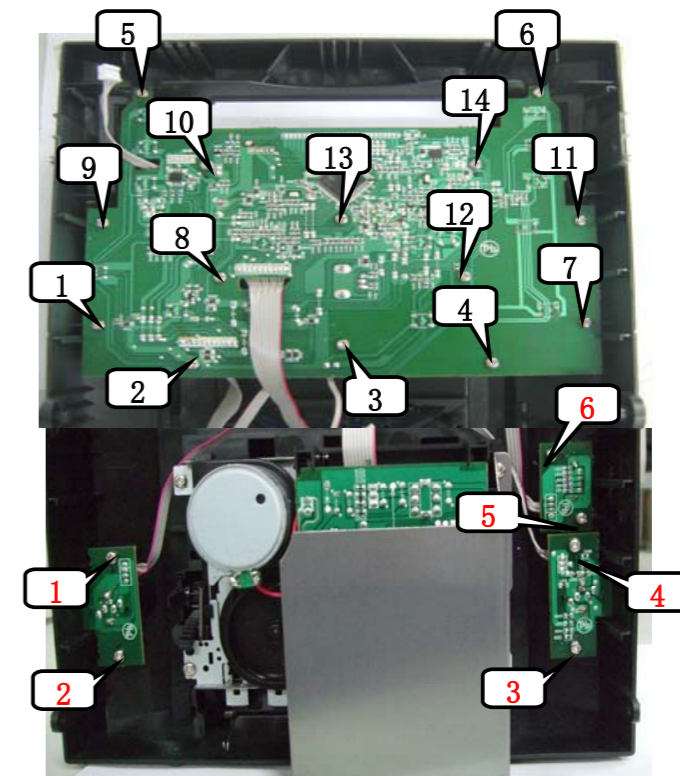
- 3) Loosen 6 screws PT3×12 in rear cabinet .



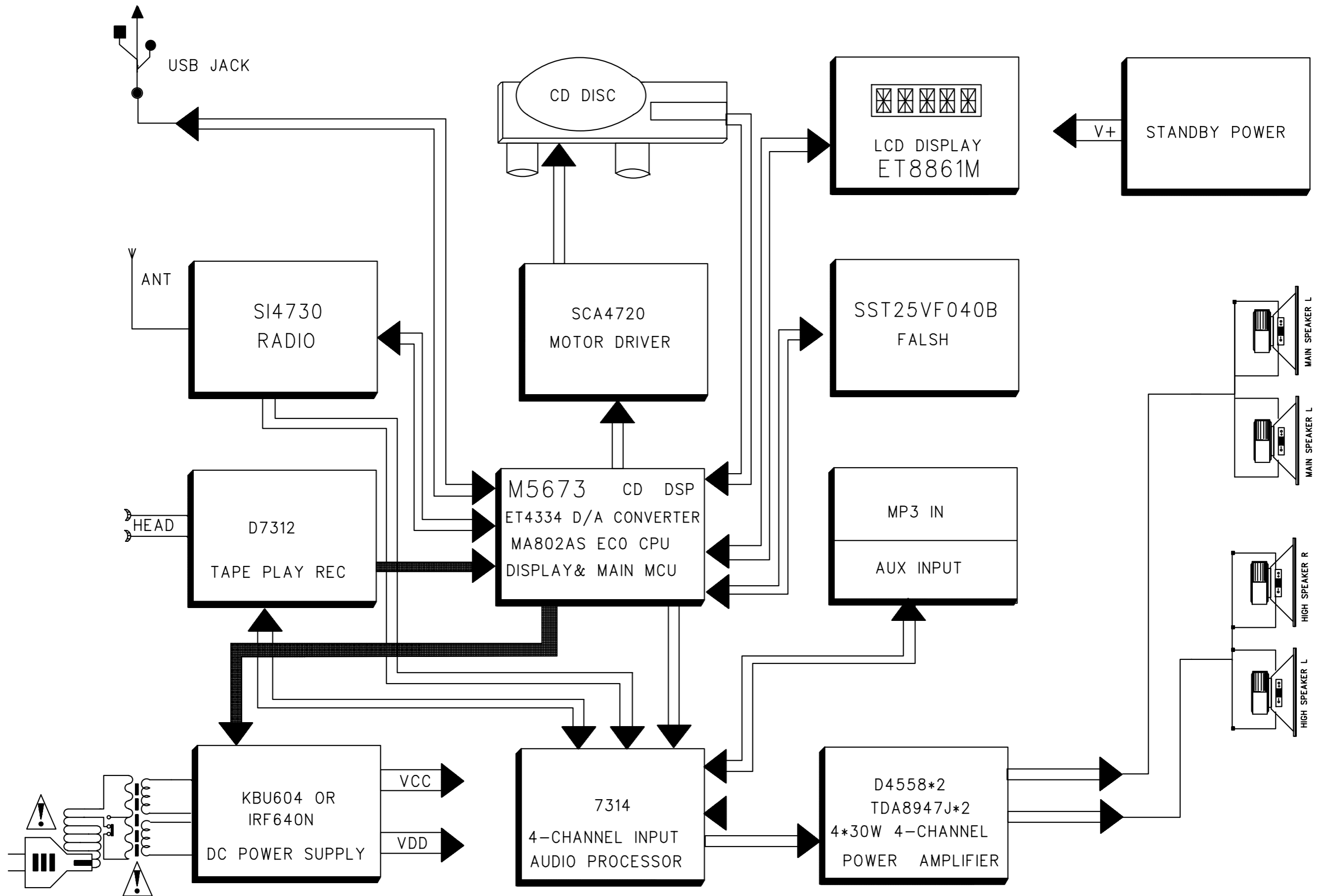
- 4) Remove top cabinet.



- 6) Loosen 14 screws T3×10 and 6 screws PT3x10 to remove CD board.

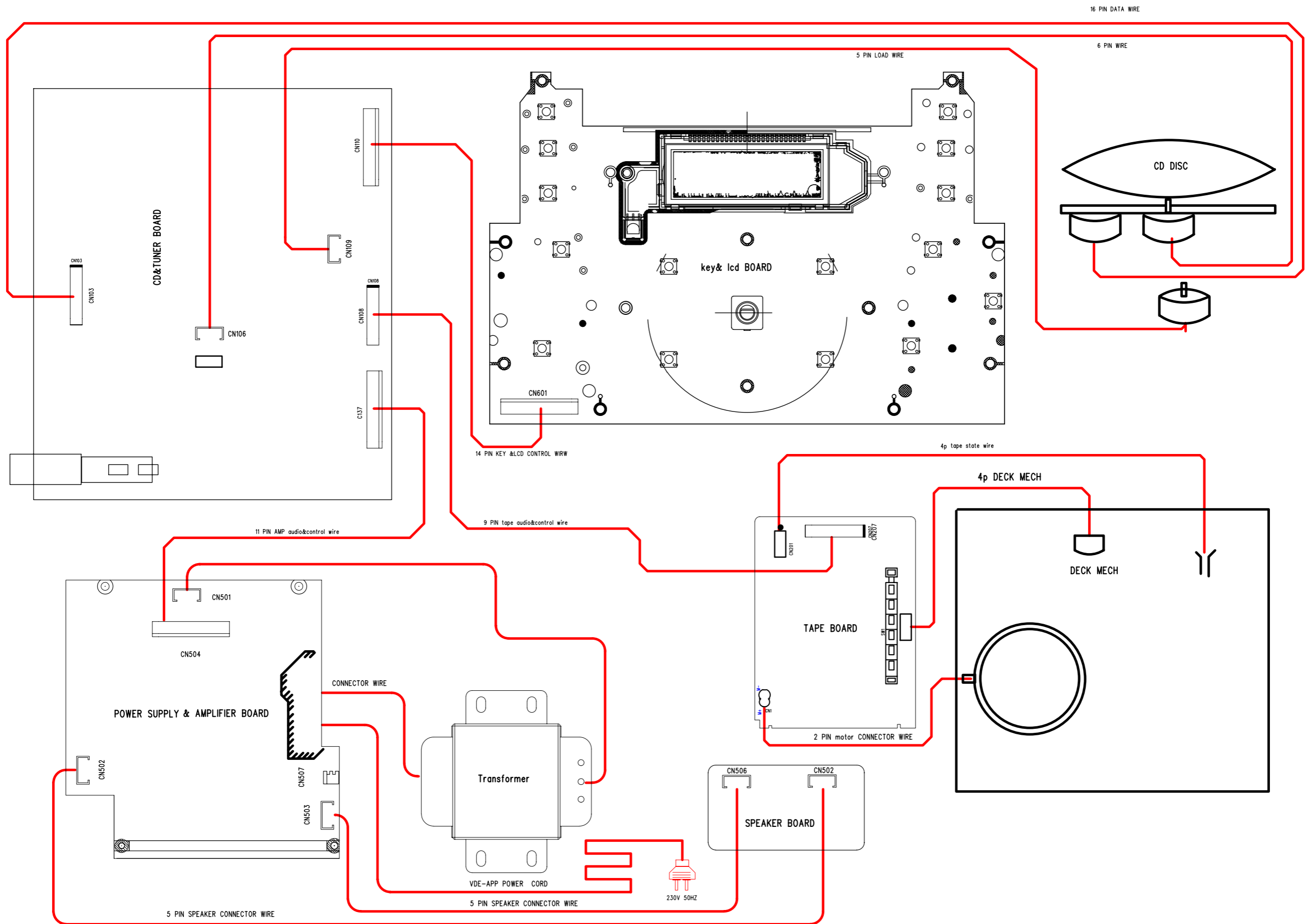


SET BLOCK DIAGRAM

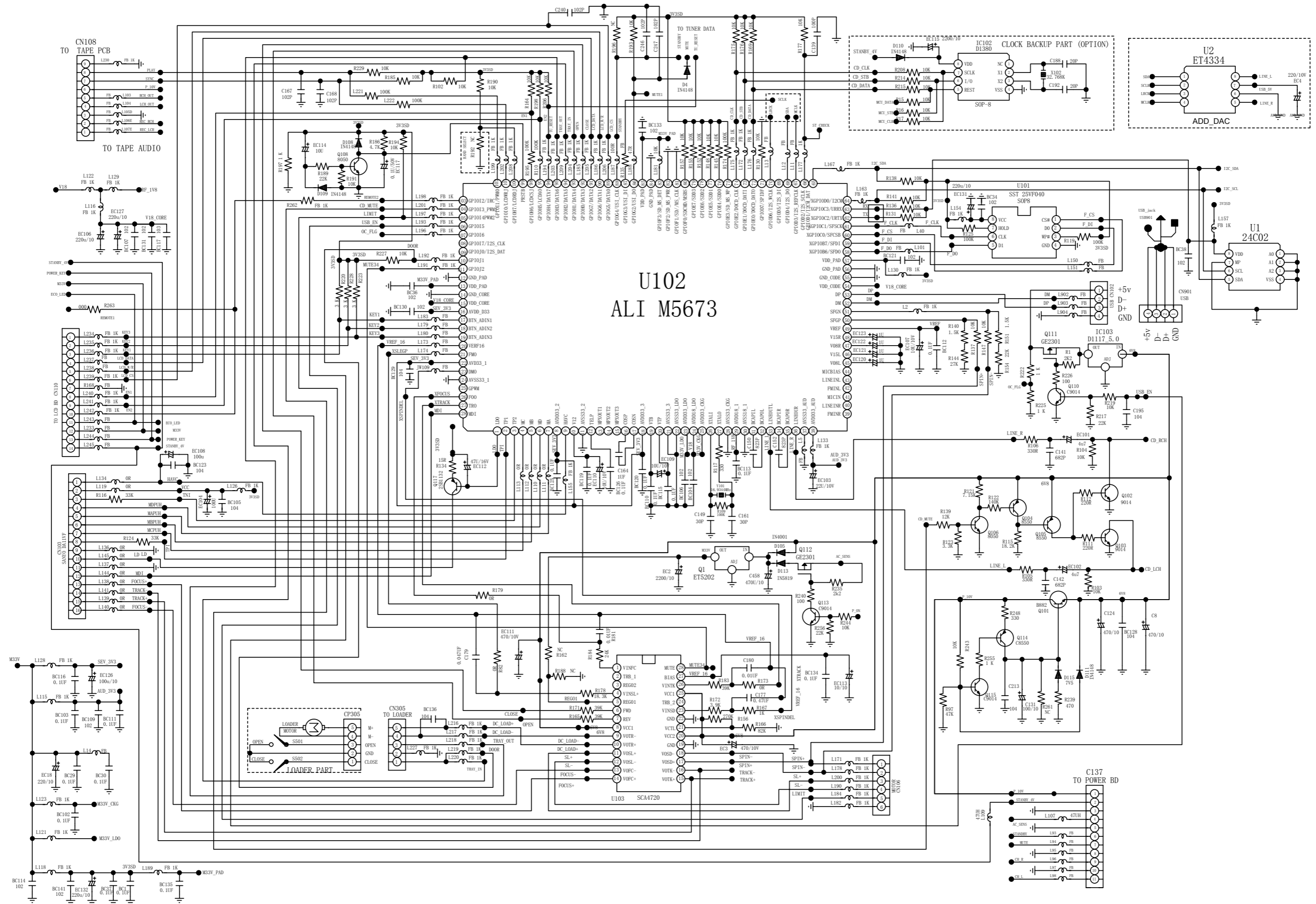




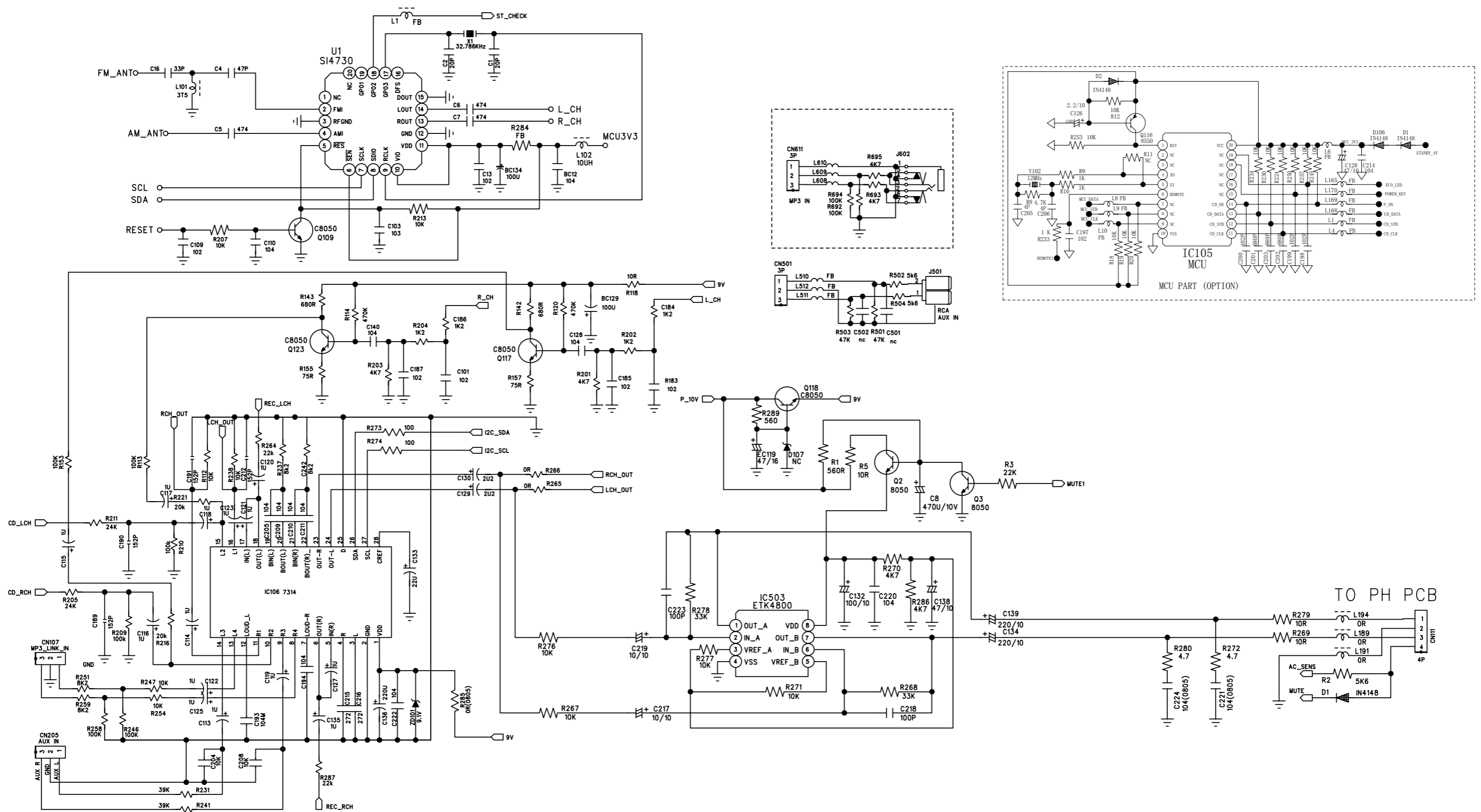
# SET WIRING DIAGRAM



# CIRCUIT DIAGRAM - CD BOARD

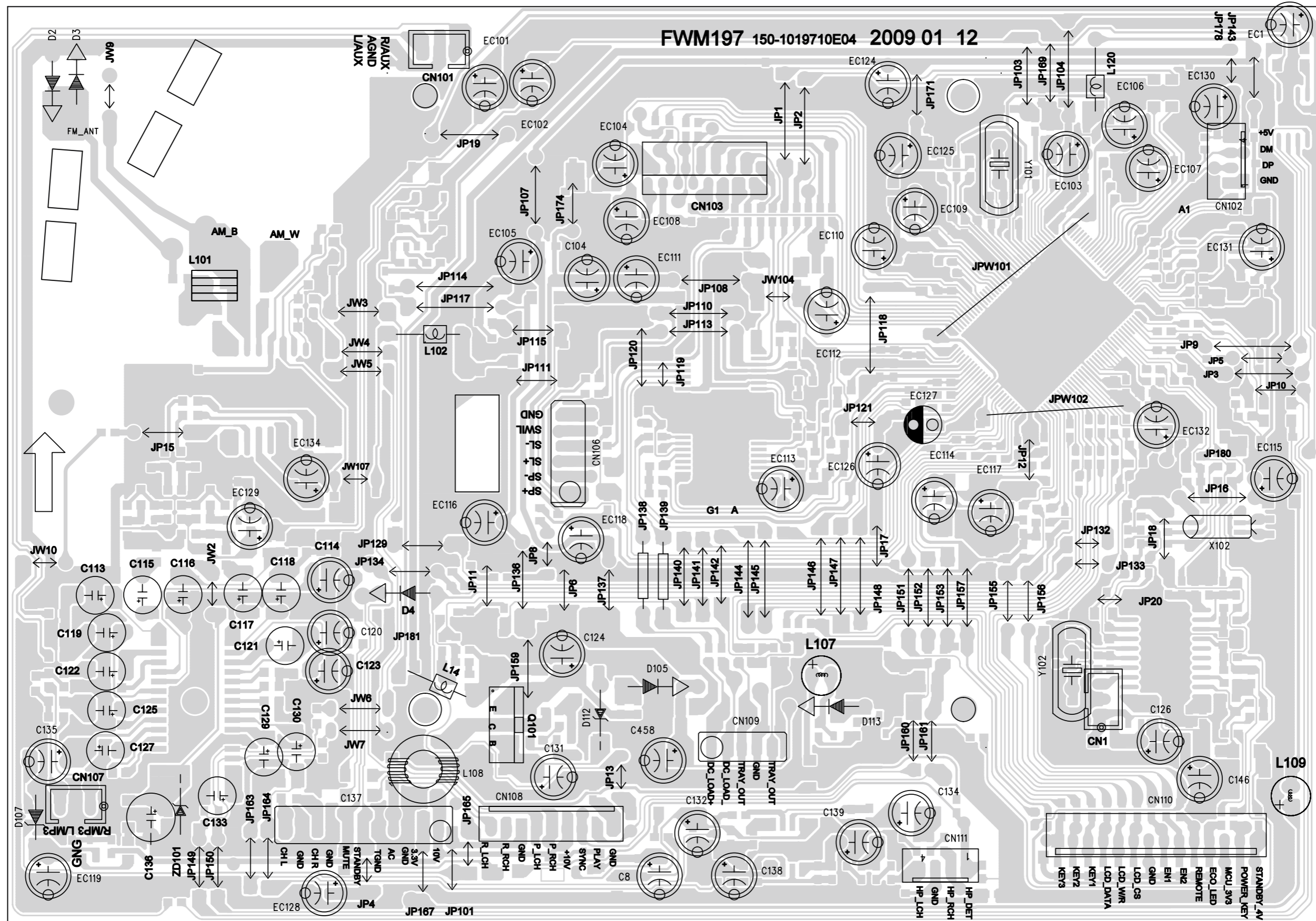


# CIRCUIT DIAGRAM - CD BOARD TUENR PART

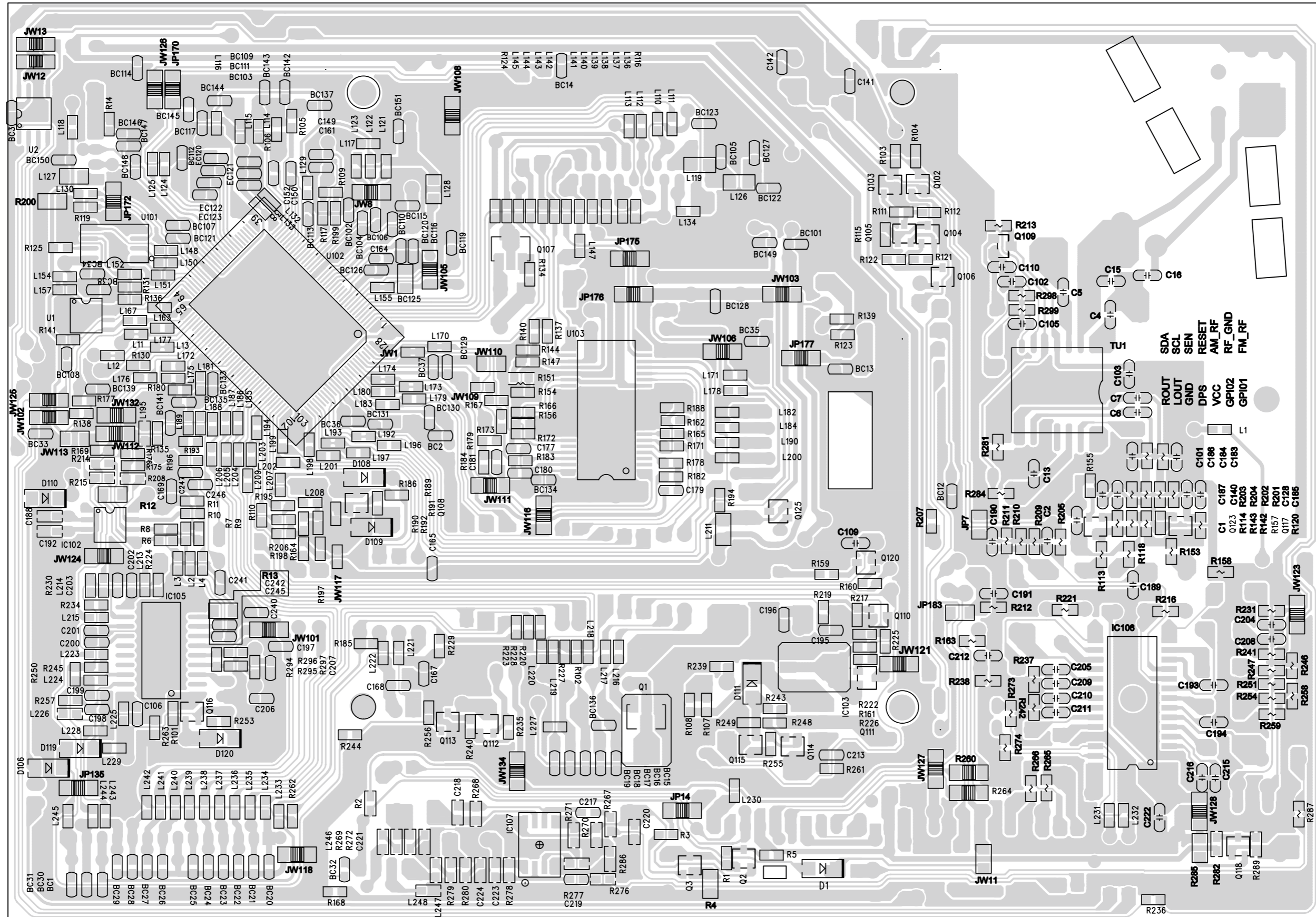


TO PH PCB

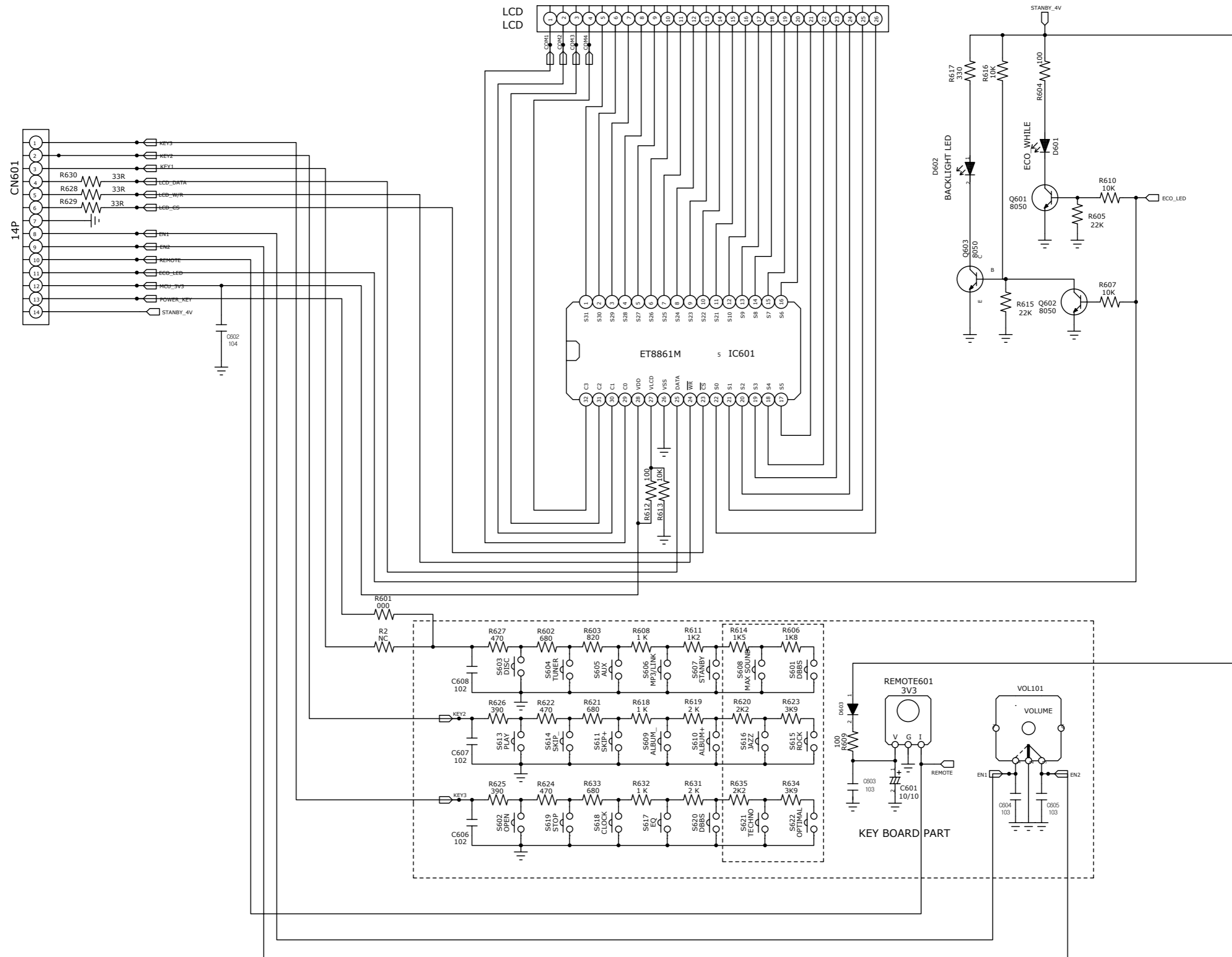
LAYOUT DIAGRAM - CD BOARD  
COMPONENT SIDE VIEW



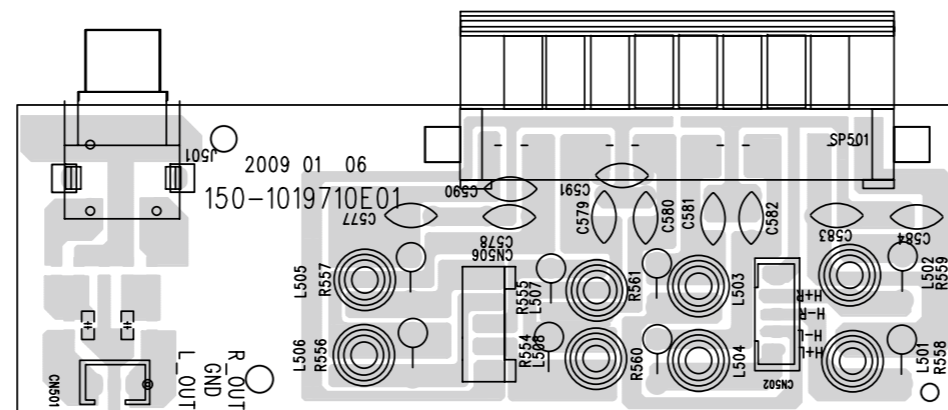
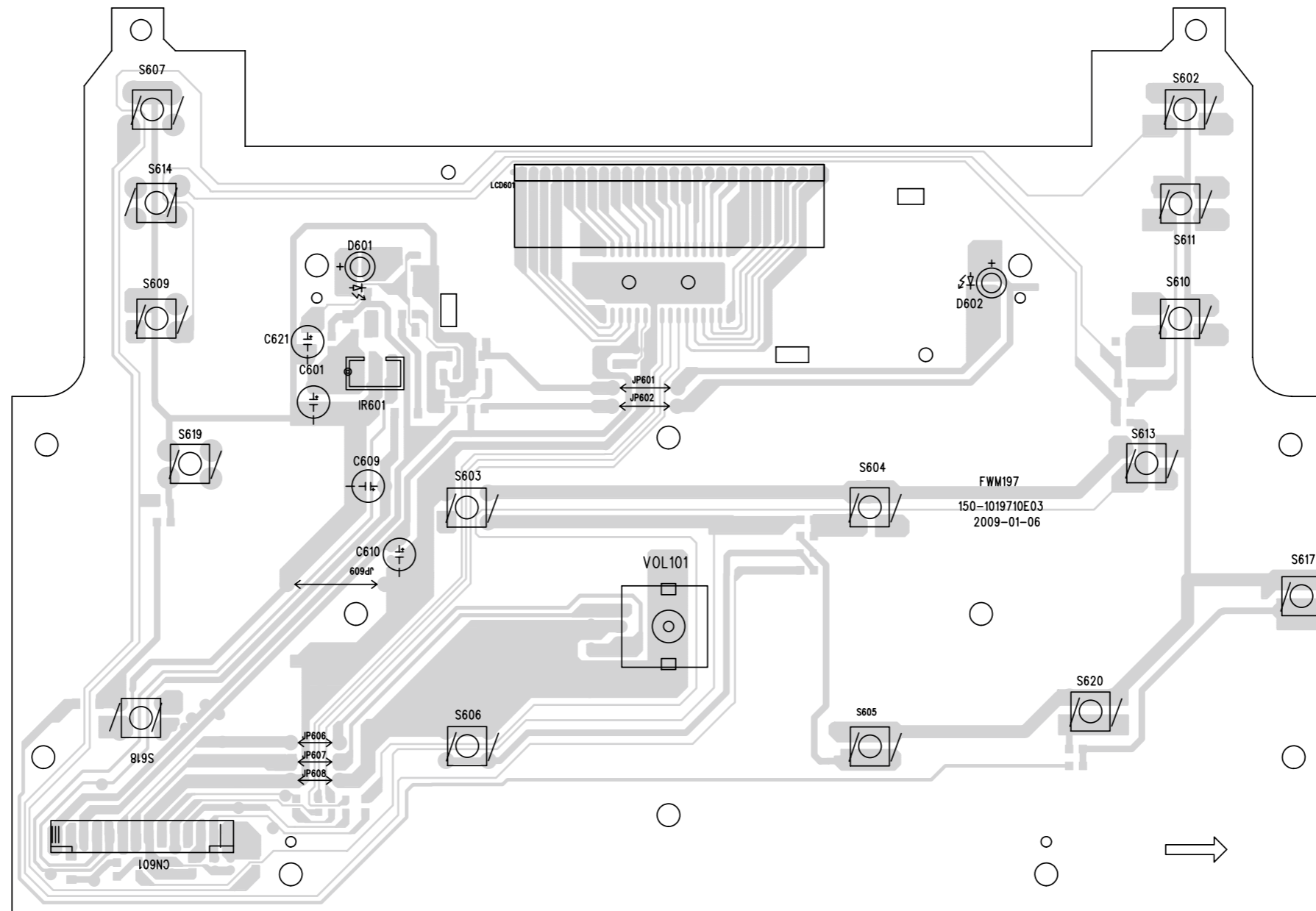
# LAYOUT DIAGRAM - CD BOARD COPPER SIDE VIEW



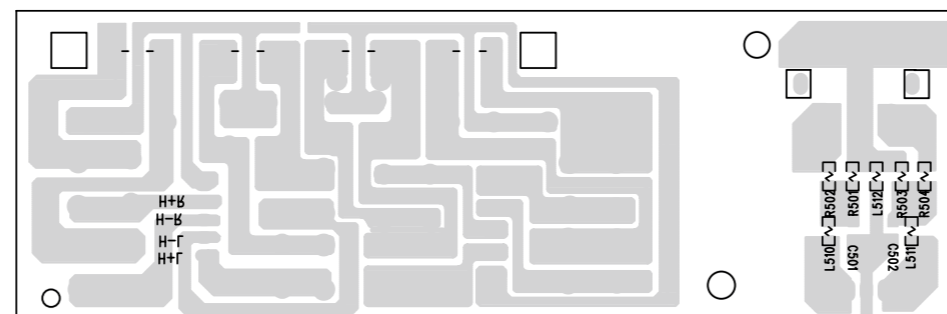
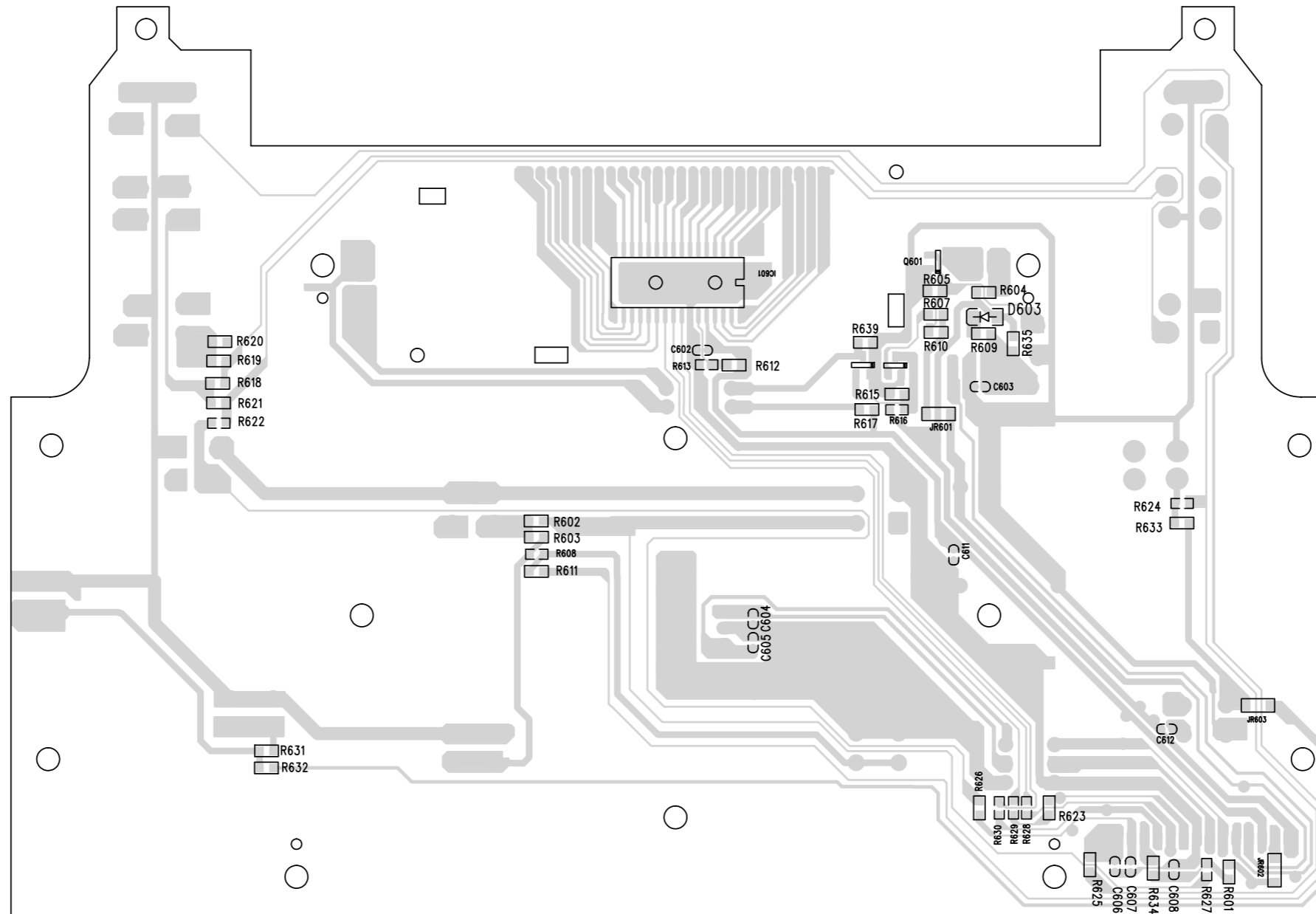
# CIRCUIT DIAGRAM - DISPLAY BOARD



# LAYOUT DIAGRAM - LCD BOARD COMPONENT SIDE VIEW

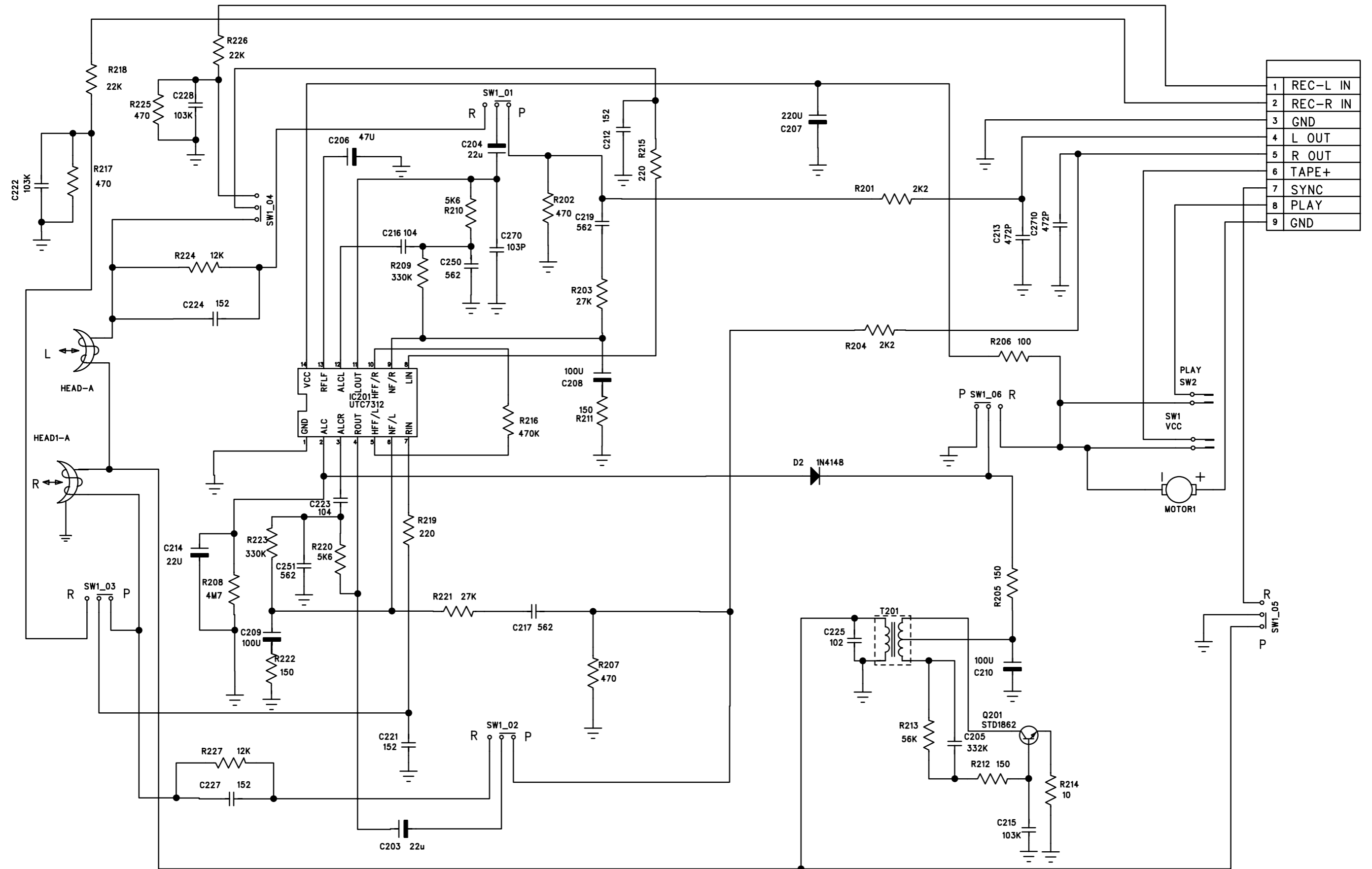


LAYOUT DIAGRAM - LCD BOARD  
COPPER SIDE VIEW



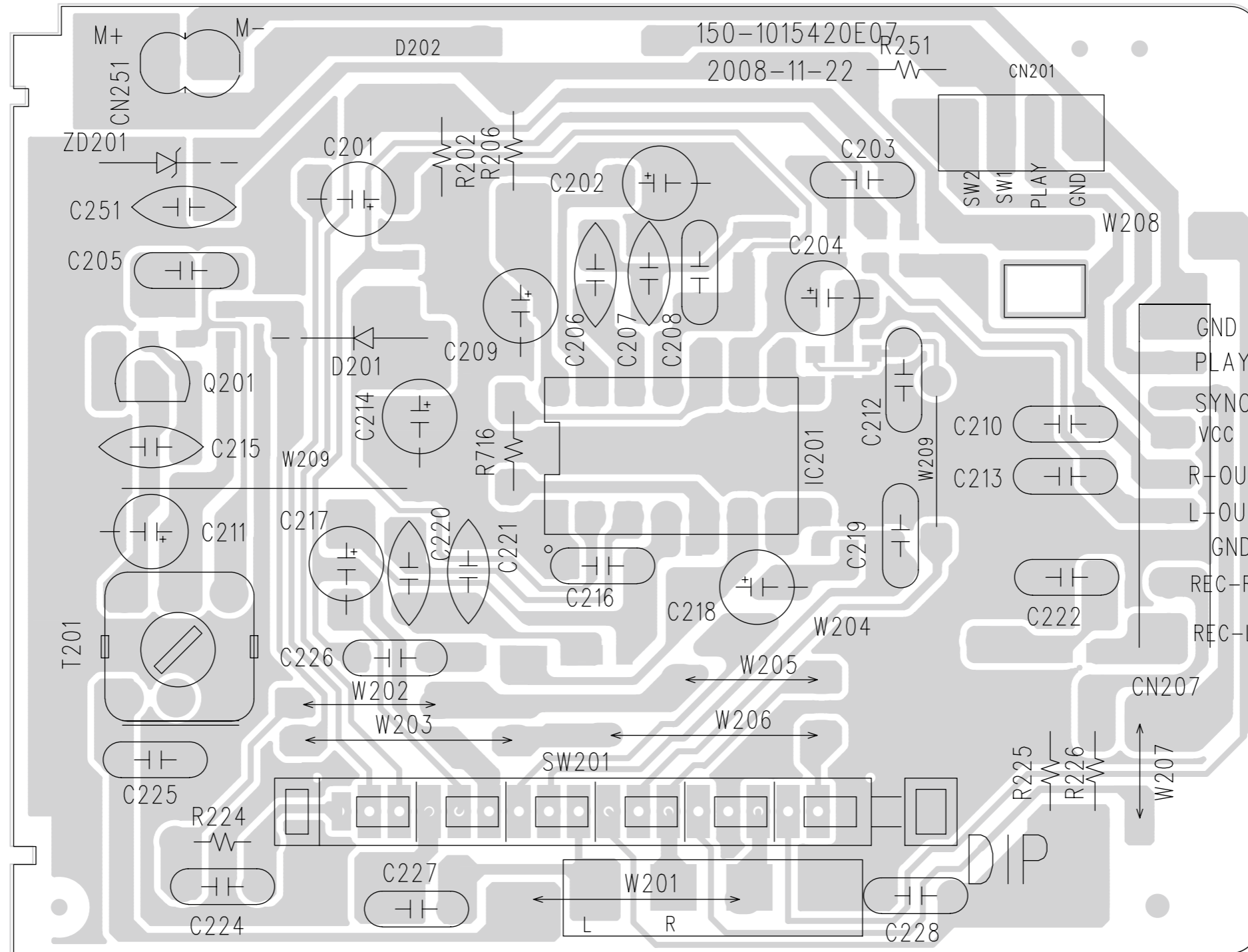


# CIRCUIT DIAGRAM - CASSETTE BOARD

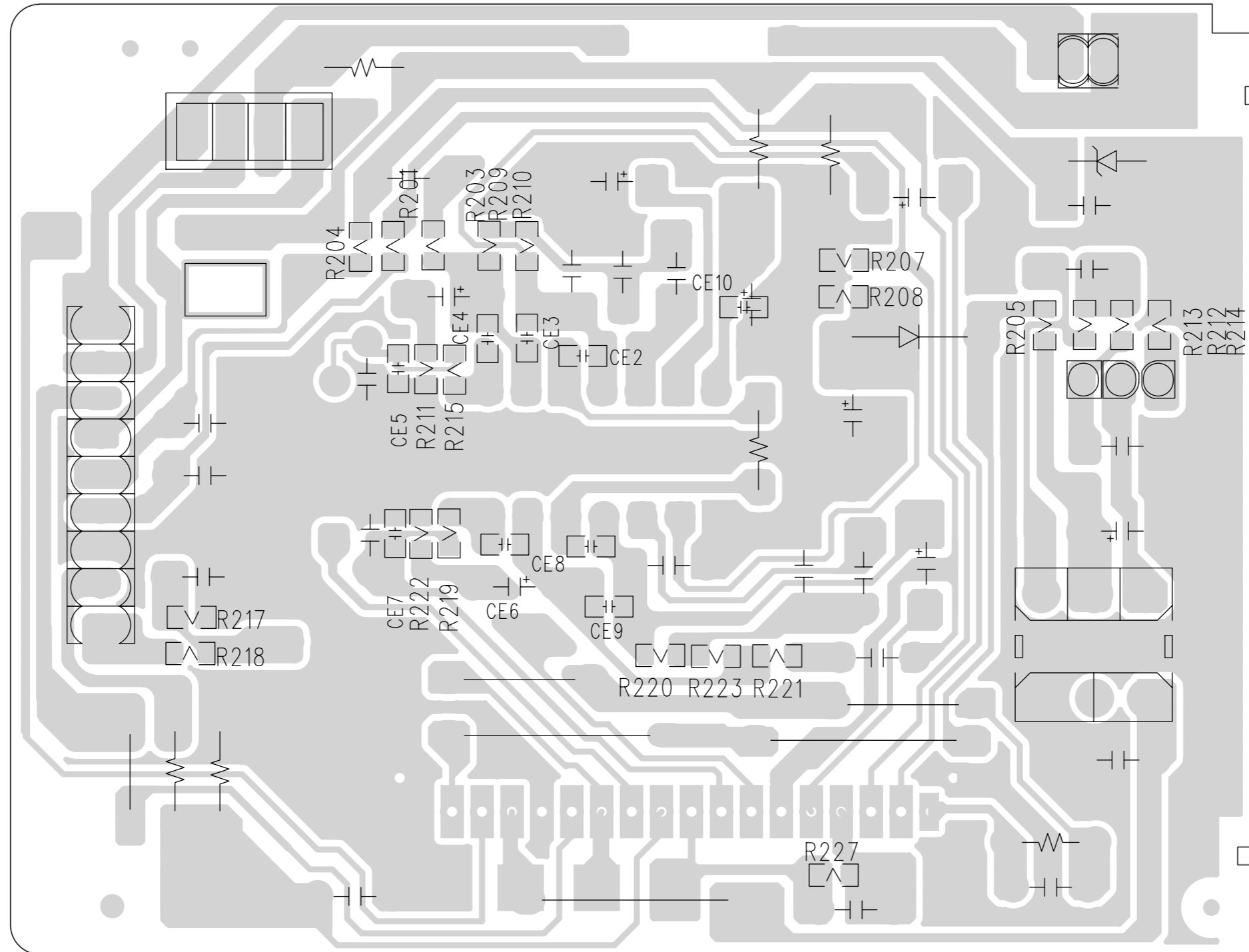


1	REC-L IN
2	REC-R IN
3	GND
4	L OUT
5	R OUT
6	TAPE+
7	SYNC
8	PLAY
9	GND

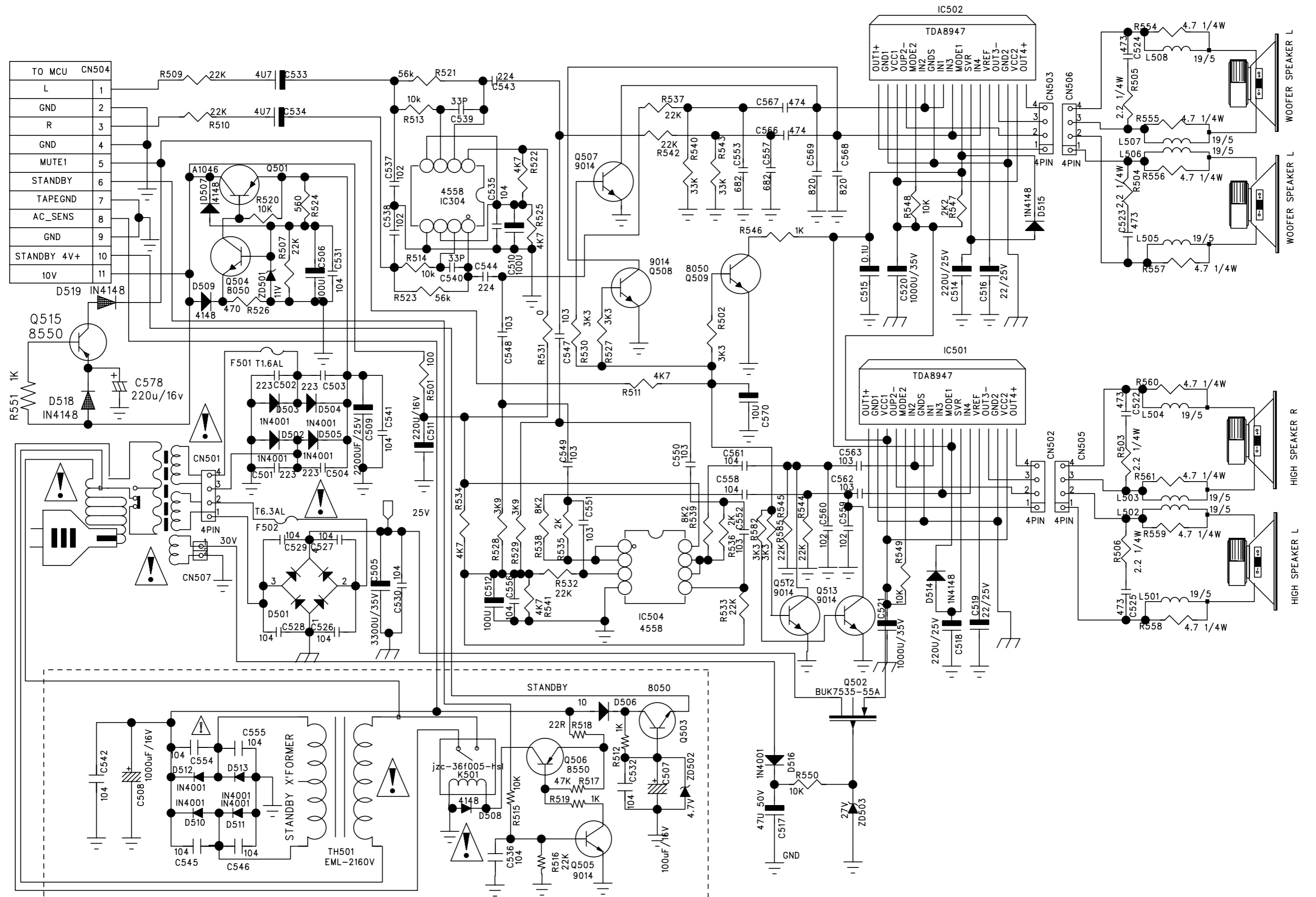
LAYOUT DIAGRAM - CASSETTE BOARD  
COMPONENT SIDE VIEW



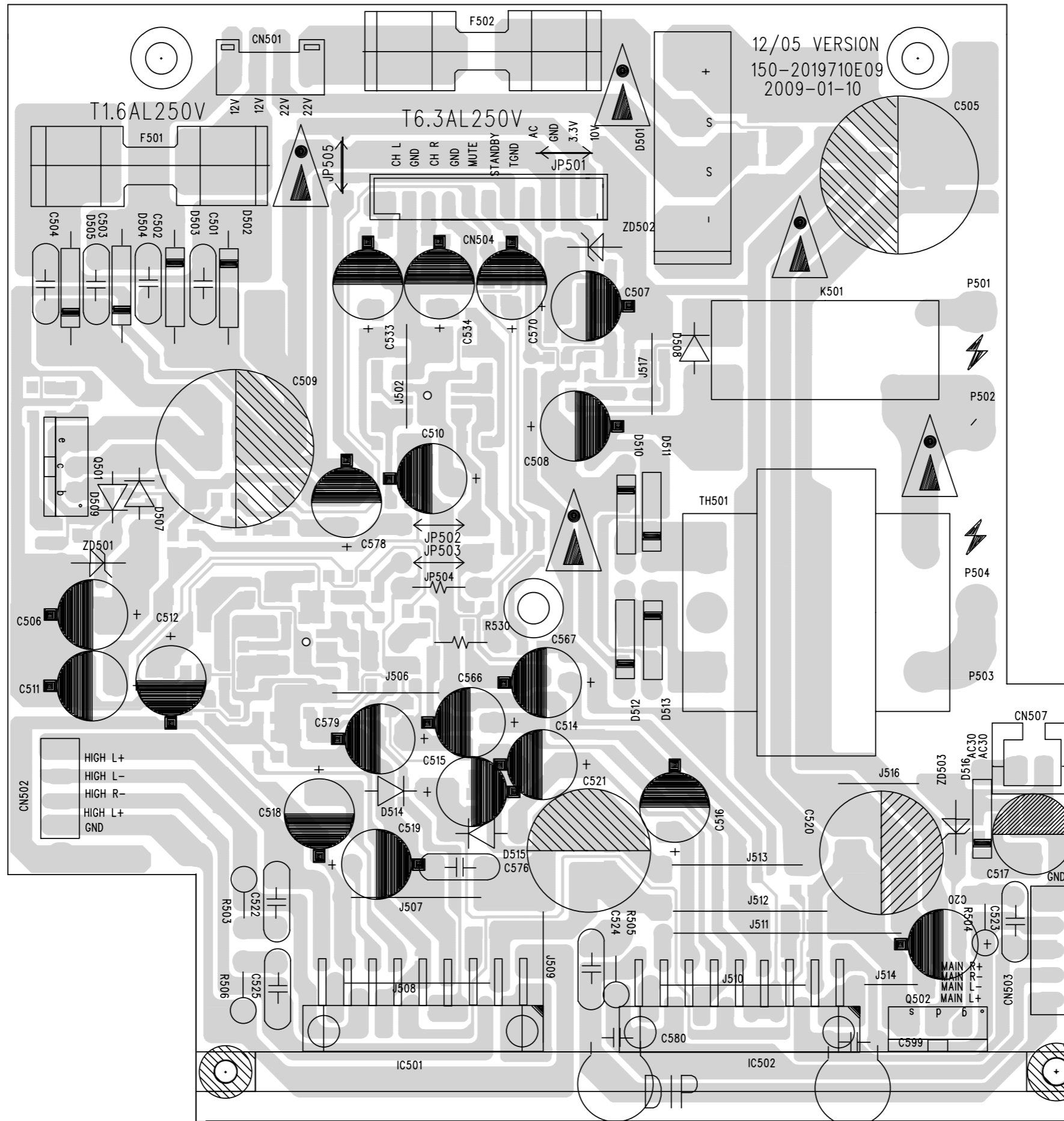
LAYOUT DIAGRAM - CASSETTE BOARD  
COPPER SIDE VIEW



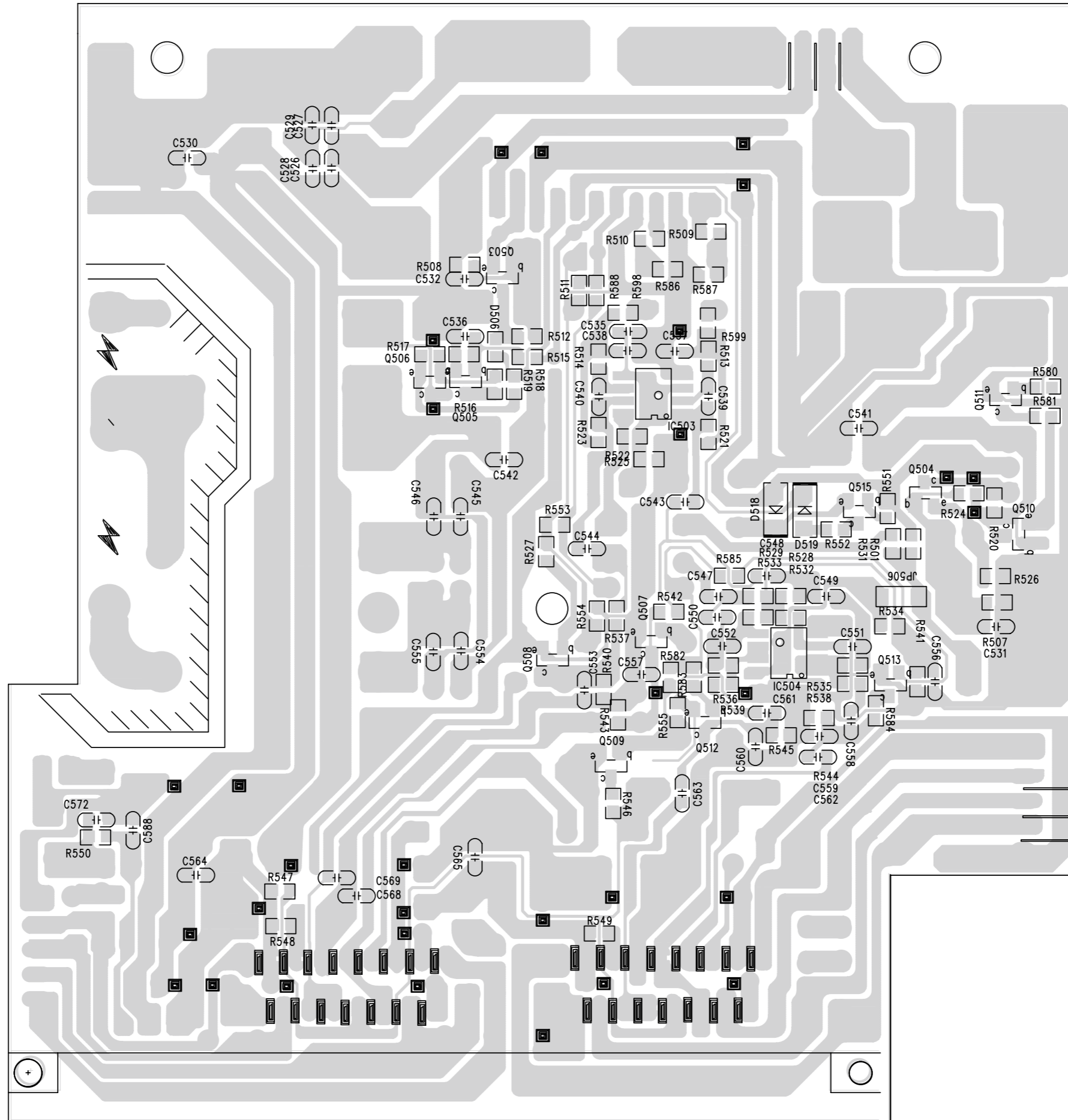
# CIRCUIT DIAGRAM - AMP BOARD



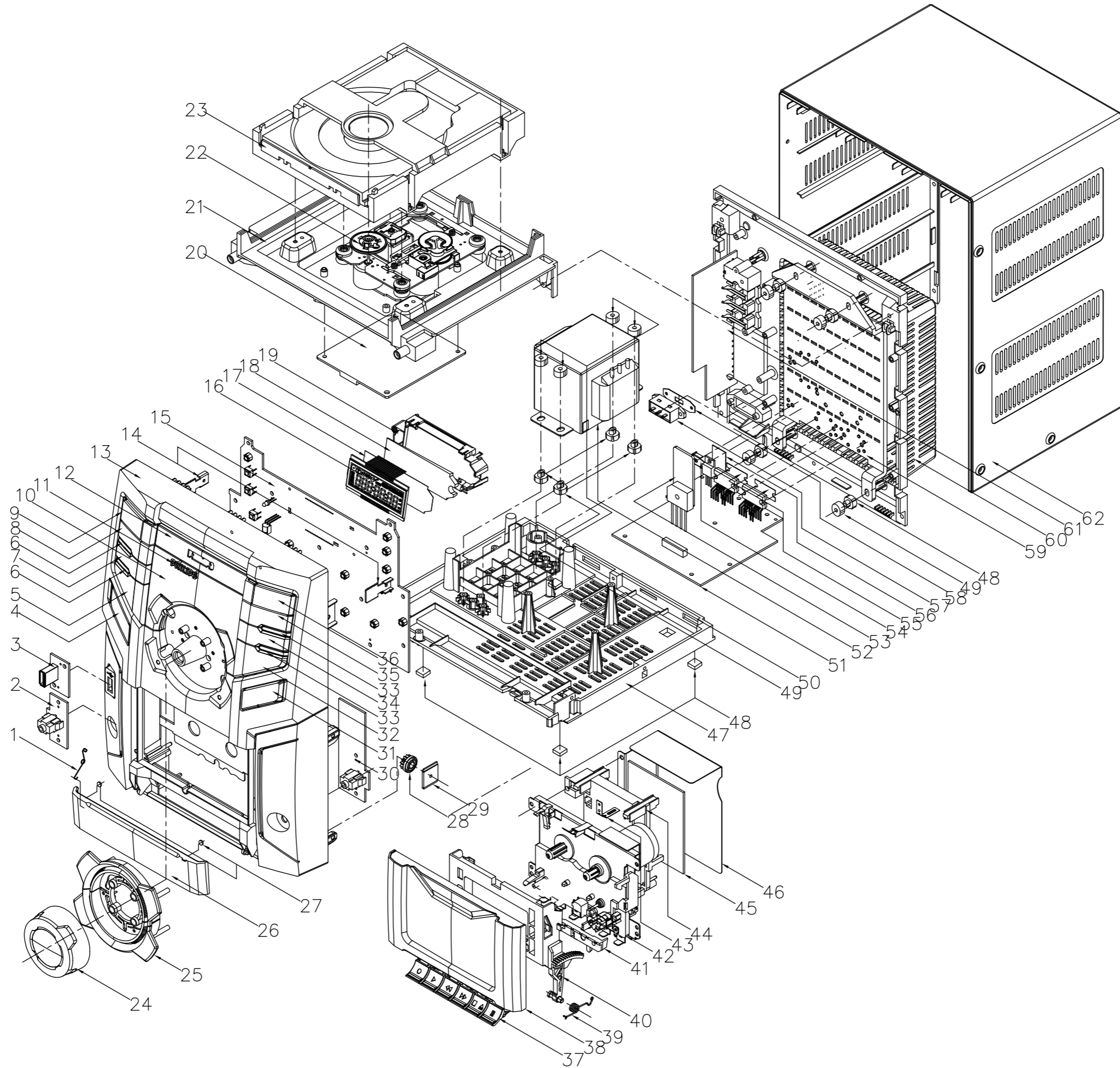
LAYOUT DIAGRAM - AMP BOARD  
COMPONENT SIDE VIEW



LAYOUT DIAGRAM - AMP BOARD  
COPPER SIDE VIEW



EXPLODED VIEW DIAGRAM



**MECHANICAL PARTSLIST**

1	996510021419	CASS KEYS DOOR SPRING
12	996510020748	CD DOOR
13	996510029705	F-CAB
22	996500038819	CD MECHANISM SANYO DA11VF (-/12)
22	996510029704	CD MECHANISM (-/05)
23	996500038820	CD LOADER WXD-8210 (COMPLETED)
24	996510021428	VOLUME BUTTON
25	996510029716	CLUSTER KNOB
26	996510021412	CASS KEYS COVER
28	996510006692	GEAR
29	996510006693	GEAR STAND
31	996510021423	DBB/DSC BUTTON
32	996510020755	PLAY BUTTON
34	996510021411	PRESET+ BUTTON
35	996510020758	F.FWD BUTTON
36	996510020745	OPEN/CLOSE BUTTON
37A	996510022755	PLAY BUTTON
37B	996510022764	REC BUTTON
37C	996510022771	F.FWD BUTTON
37D	996510022761	F.B BUTTON
37E	996510022748	STOP BUTTON
37F	996510022749	PAUSE BUTTON
38	996510029722	CASS DOOR
39	996510021429	CASSETTE DOOR SPRING
4	996510021425	CLOCK/DISPLAY
41	996510021412	CASS KEYS COVER
42	994000004734	CASS DECK CS-21SC-820T
43	996500038818	RECORD SPRING
44	994000004702	7871 CASS DOOR BRACKET
5	996510020747	STOP BUTTON
52	996510029711	TRANSFORMER (-/05)
52	⚠ 996510002303	TRANSFORMER VDE-STD 230V (-/12)
60	996510029708	REAR-CAB POWER
62	996510002240	7671 TOP CAB
7	996510020744	PRESET- BUTTON
8	996510029721	REW BUTTON
9	996510020746	POWER BUTTON
F501	⚠ 994000004782	FUSE 50T D5X20 1.6A 250V(S.B.)
F502	⚠ 996510002287	FUSE T6.3A 250V 5x20
FM1	996510003947	FM ANT L1500
FFC1	996510020749	CABLE16P FT FLEX ECTOL120P1.0
TH501	⚠ 996510002292	TRANSFORMER VDE-APP 230V (-/12)
52B	⚠ 996510002304	AC CORD VDE-APP L1650mm (-/12)

**ACCESSORIES**

RC1	996510021416	REMOTE HANDSET
SPK1	996510021427	SINGLE SPEAKER BOX(R)
SPK2	996510021409	SINGLE SPEAKER BOX(L)
AUX	996510020741	AUX WIRE 400mmW/3.5 STEREO BLK

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



**ELECTRICAL PARTSLIST****CD BOARD ASSEMBLY**

IC103	996510002299	IC LM1117 5V (SOT-223)
IC105	996510021413	IC:MA802AS(SOP-20)(ALI) (EP)
IC106	996510013420	IC 7314 (SOP 28P)(ANGUS)(EP)
IC107	996510021408	IC PT4800 (SO8) (ANSI)(EP)
Q1	996510021415	IC:ET5202-33C (SOT-89) (ETEK)
Q101	996510010554	TR NPN KTD882 (TO-126) (EP)
Q102	994000004004	CHIP TR NPN 8050C
Q103	994000004004	CHIP TR NPN 8050C
Q104	994000004005	CHIP TR PNP 8550D
Q105	994000004005	CHIP TR PNP 8550D
Q106	994000004004	CHIP TR NPN 8050C
Q107	996510021418	TR PNP 2SB1132 (SOT)(EP)
Q108	994000004004	CHIP TR NPN 8050C
Q109	994000004004	CHIP TR NPN 8050C
Q110	994000003972	CHIP TR MMBT9014C
Q111	996510021424	
Q112	996510021424	MOSFET: GE2301 (SOT23-3) (EP)
Q113	994000004004	CHIP TR NPN 8050C
Q114	994000004005	CHIP TR PNP 8550D
Q115	994000003972	CHIP TR MMBT9014C
Q116	994000004005	CHIP TR PNP 8550D
Q117	994000003972	CHIP TR MMBT9014C
Q118	994000004004	CHIP TR NPN 8050C
Q120	994000004004	CHIP TR NPN 8050C
Q123	994000003972	CHIP TR MMBT9014C
Q125	994000004005	CHIP TR PNP 8550D
U1	996510013449	IC FT24C02 (EEPROM) (SOP8)(EP)
U101	996510021422	IC: SST25VF040B (SOIC) (SST)
U102	996510021426	IC:M5673 LQFP-128PIN (ALI)(EP)
U103	996510021414	IC:SCA4720 MOTOR DRTVER(SSOP28)

**LINE IN BOARD ASSEMBLY**

J602 996510002273 ST PHONES JACK 3.5mm TC38

**USB BOARD ASSEMBLY**

USB901 996510002272 USB A TYPE (FEMALE) S/T

**HEADPHONE BOARD ASSEMBLY**

JPH901 996510002273 ST PHONES JACK 3.5mm TC38

**CASSETTE BOARD ASSEMBLY**

IC201 994000004007 IC D7312  
Q201 996500038841 TR NPN STD1862LPF

**AMP EXPORT BOARD ASSEMBLY**

J501 996510006430 AUX RCA JACK (RCA-207)(RED/WHT)  
SP501 996510002296 SPEAKER TERMINAL 8POSITION

## ELECTRICAL PARTSLIST

### LCD BOARD ASSEMBLY

IC601	996510021407	IC ET8861M 32PIN SOP(ETEK)
IR601	996510002274	SENSOR AT136BV3 (36KHz) (3.3V)
LCD601	996510018274	LCD SDH-DA1780-TN-2
Q601	994000004004	CHIP TR NPN 8050C
Q602	994000004004	CHIP TR NPN 8050C
Q603	994000004004	CHIP TR NPN 8050C
S602	994000004792	TACT SW 6X6MM H4.3
S603	994000004792	TACT SW 6X6MM H4.3
S604	994000004792	TACT SW 6X6MM H4.3
S605	994000004792	TACT SW 6X6MM H4.3
S606	994000004792	TACT SW 6X6MM H4.3
S607	994000004792	TACT SW 6X6MM H4.3
S609	994000004792	TACT SW 6X6MM H4.3
S610	994000004792	TACT SW 6X6MM H4.3
S611	994000004792	TACT SW 6X6MM H4.3
S613	994000004792	TACT SW 6X6MM H4.3
S614	994000004792	TACT SW 6X6MM H4.3
S617	994000004792	TACT SW 6X6MM H4.3
S618	994000004792	TACT SW 6X6MM H4.3
S619	994000004792	TACT SW 6X6MM H4.3
S620	994000004792	TACT SW 6X6MM H4.3

### RADIO BOARD ASSEMBLY

U1	996510021417	IC: SI4730 .QFN (SILICON LABS)
X1	996510021421	CRYSTAL SF32.768-JU2620

### AMP BOARD ASSEMBLY

IC501	996510002288	IC TDA8947J (DBS17P)(SOT243-1)
IC502	996510002288	IC TDA8947J (DBS17P)(SOT243-1)
IC503	996510002294	IC D4558 (SOP8)
IC504	996510002294	IC D4558 (SOP8)
Q501	996510021217	TR PNP 2SB1274 (TO-220F) (EP)
Q502	996510021406	MOSFET TR IRF640N (TO-220)
Q503	994000004004	CHIP TR NPN 8050C
Q504	994000004004	CHIP TR NPN 8050C
Q505	994000003972	CHIP TR MMBT9014C
Q506	994000004005	CHIP TR PNP 8550D
Q507	994000003972	CHIP TR MMBT9014C
Q508	994000003972	CHIP TR MMBT9014C
Q509	994000004004	CHIP TR NPN 8050C
Q512	994000003972	CHIP TR MMBT9014C
Q513	994000003972	CHIP TR MMBT9014C

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