

Service  
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**Service**



# Service Manual



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**PHILIPS**

## TECHNICAL SPECIFICATION

### General information

AC power	110-127V/220 - 240V, 50/60 Hz
Operation power consumption	50W
Standby power consumption	<10W
USB direct	Version 2.0/1.1
Dimensions	
- Main Unit (W x H x D)	220 x 290 x 271 mm
- Speaker Box (W x H x D)	189 x 290 x 175 mm
Weight	
- With Packing	8.5 kg
- Main Unit	3.8 kg
- Speaker Box	2 x 1.7 kg

### Amplifier

Rated Output Power	2X20W RMS
Frequency Response	63 - 16000 Hz, $\pm 3$ dB
Signal to Noise Ratio	>62dB

### Disc

Laser Type	Semiconductor
Disc Diameter	12cm/8cm
Video Decoding	MPEG-2/MPEG-1
Video DAC	10 Bits
Signal System	PAL/NTSC
Video Format	4:3/16:9
Video S/N	56 dB (minimum)
Composite Video Output	1.0 Vp-p, 75 ohm
Audio DAC	24Bits / 96 kHz
Total Harmonic Distortion	<1%
Frequency Response	4 Hz - 20 kHz (44.1 kHz) 4 Hz - 22 kHz (48 kHz) 4 Hz - 44 kHz (96 kHz)
Total harmonic distortion	< 0.1% (1 kHz)
Channel separation	40 dB minimum (1 kHz)
S/N Ratio	>65 dBA

### Tuner

#### FM

Tuning Range	87.5 - 108 MHz
Tuning grid	50 KHz
Sensitivity	
- 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

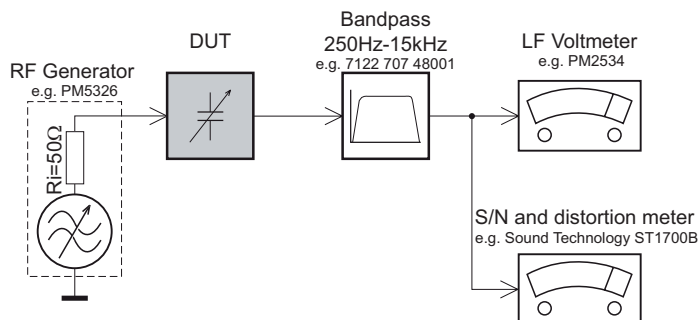
Frequency Response	63-8000Hz
- Normal tape (type I)	(8dB)
S/N Ratio	35dBA
- Normal tape (type I)	
Wow and flutter	$\leq 0.4\%$ DIN

### Speakers

Speaker Impedance	8 ohm
Speaker Driver	3.5" woofer
Sensitivity	>82 dB/m/W

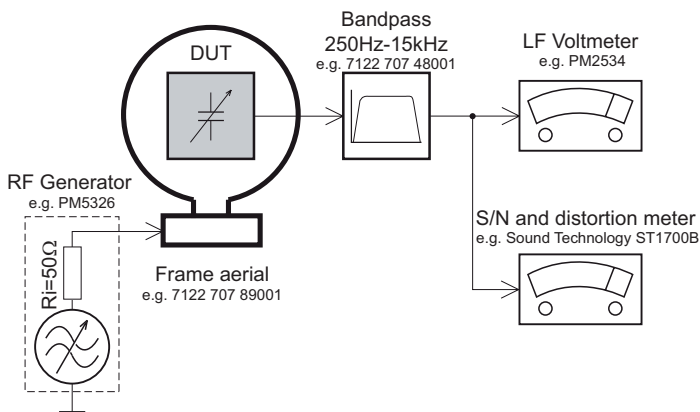
# MEASUREMENT SETUP

## Tuner FM



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

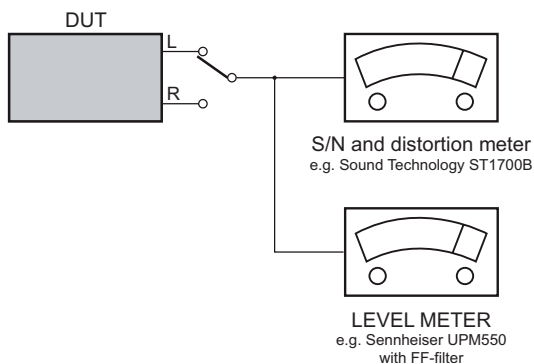
## Tuner AM (MW,LW)



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).

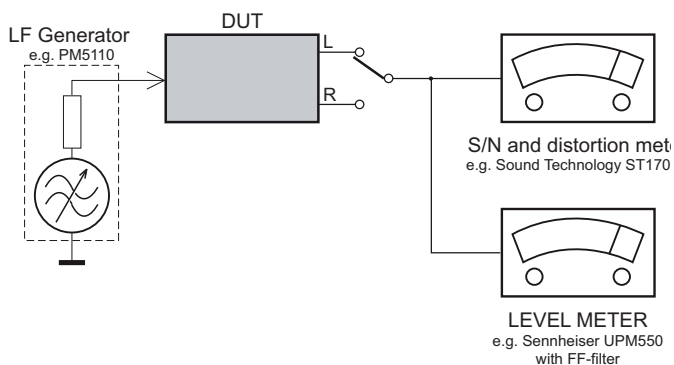
## CD

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  $\Delta$ .

**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".

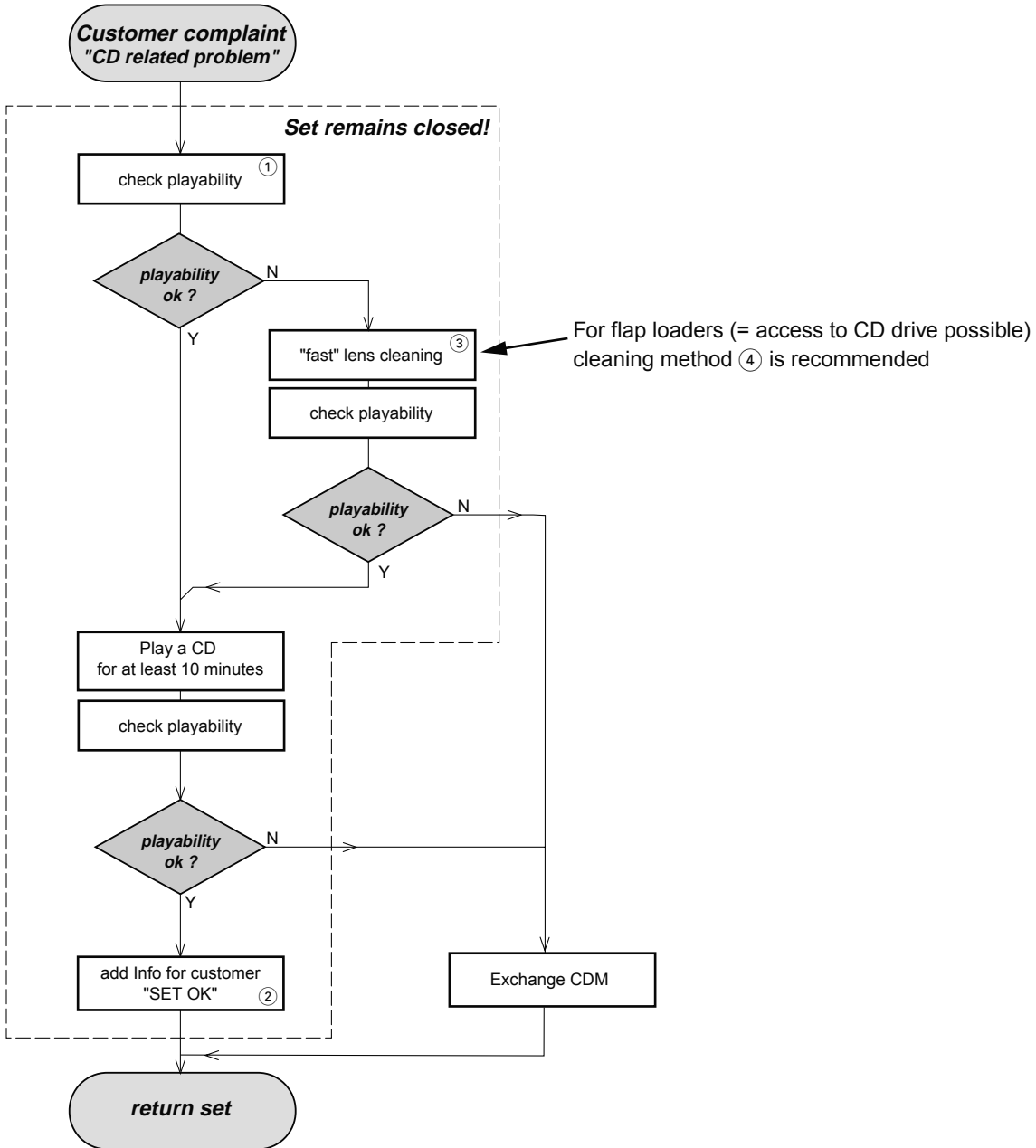
For additional questions please contact your local repair-helpdesk.

## 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

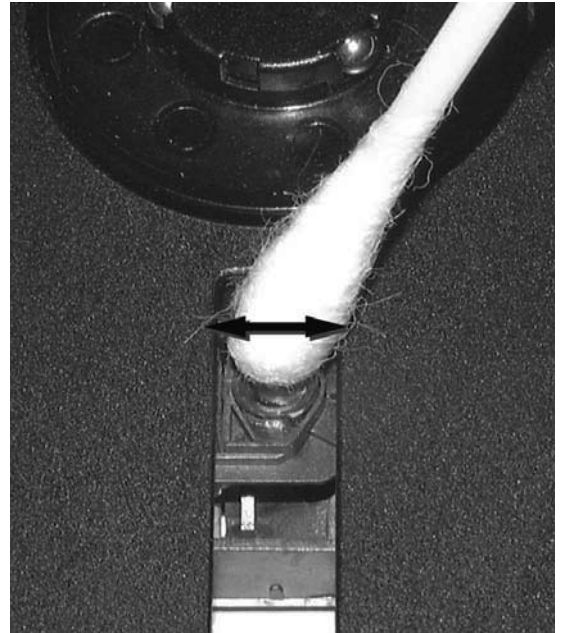
### LIQUID LENS CLEANING

**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.

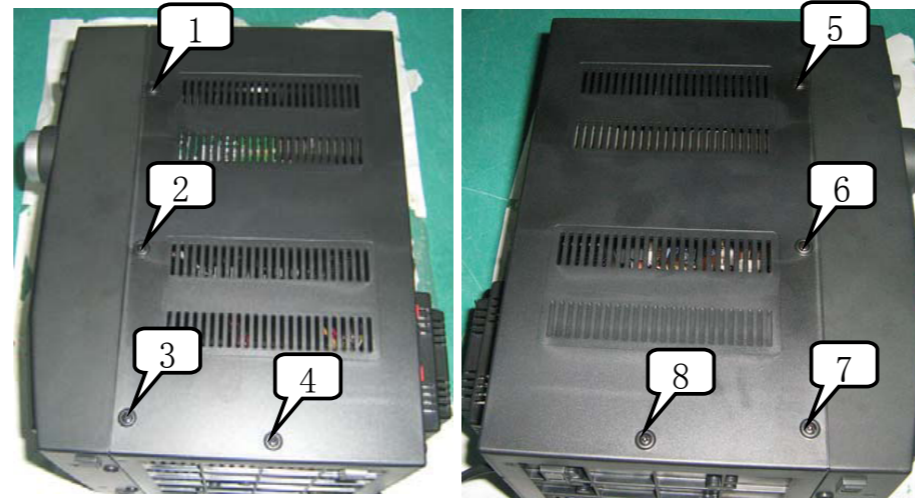


### DISASSEMBLY DIAGRAM VIEW

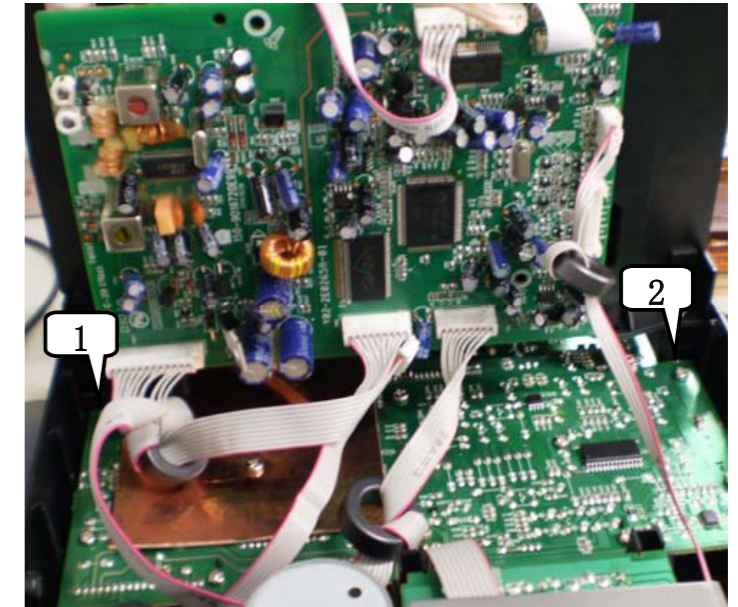
- 1) a.Plug in the 220V AC power cord , set the menu to "CD" function, and press "STANDBY-ON" button , Press "OPEN/CLOSE"to open CD door.
- b.Pull out CD door
- c.Press "OPEN/CLOSE" button to close the CD tray, power off the mainset and unplug the AC power cord.



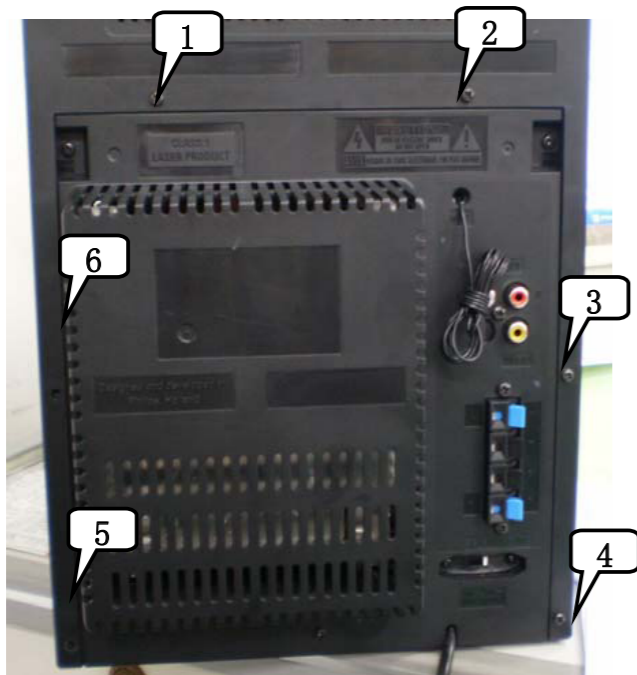
- 2) Loosen 8 screws PT3×12 in both sides.



- 5) Loosen 2 screws PA3x18 to remove CD tray.



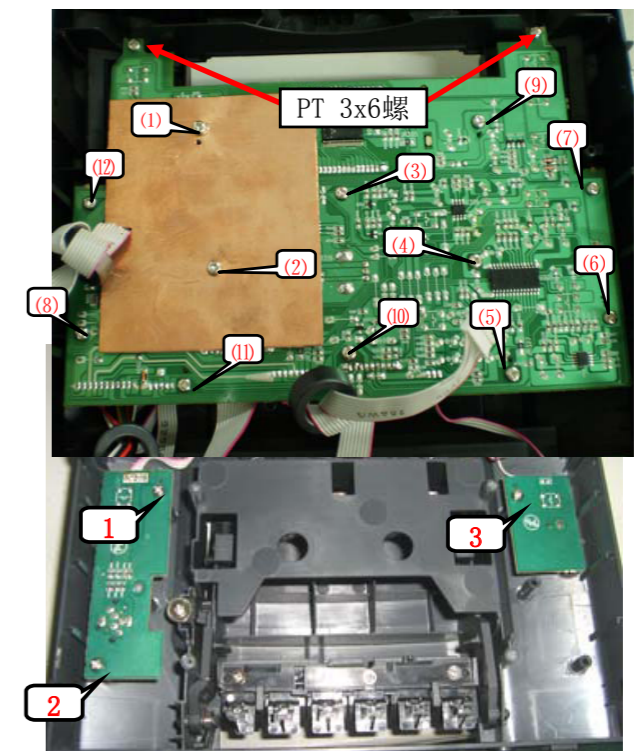
- 3) Loosen 6 screws BT3×12 in rear cabinet .



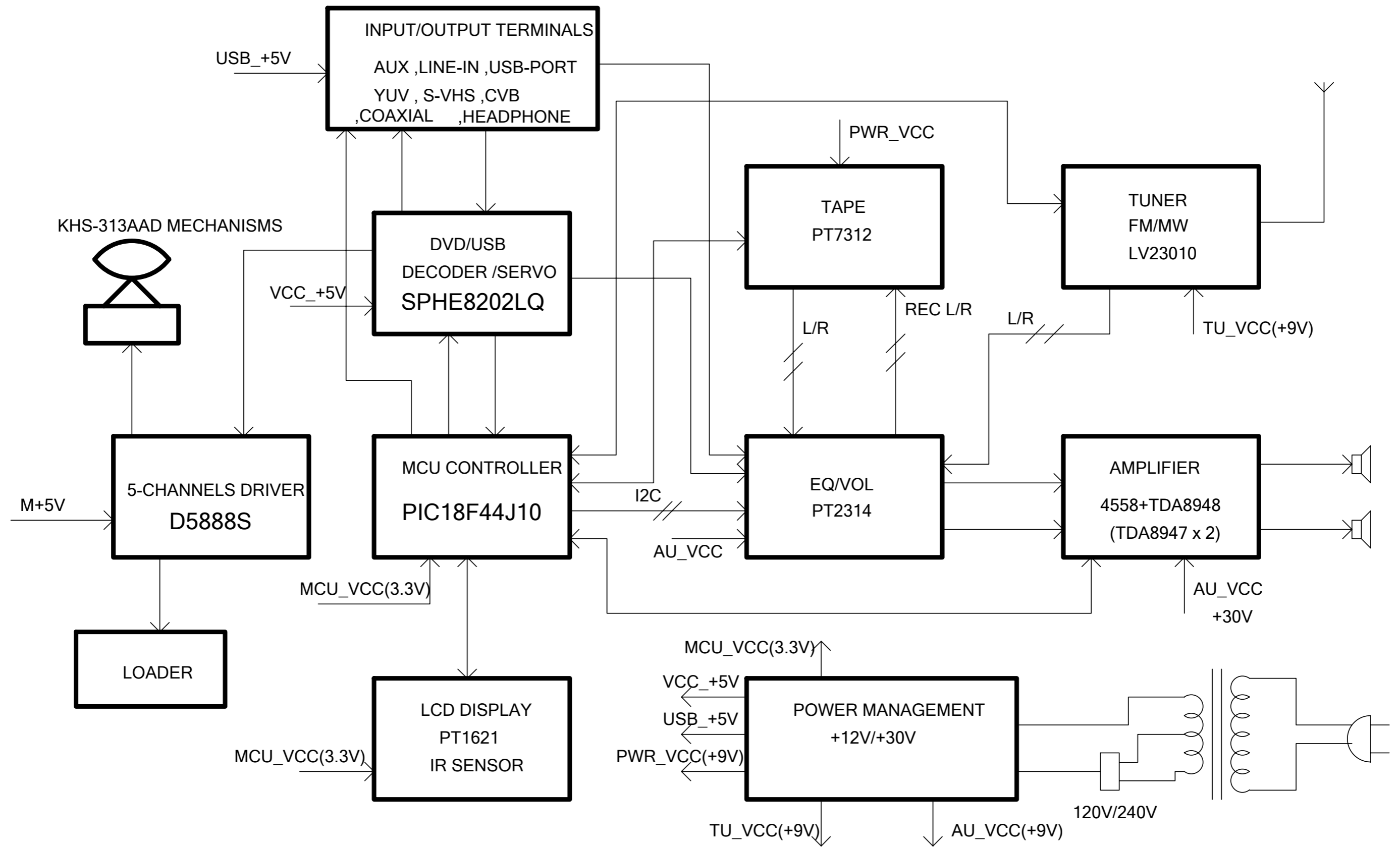
- 4) Remove top cabinet.



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

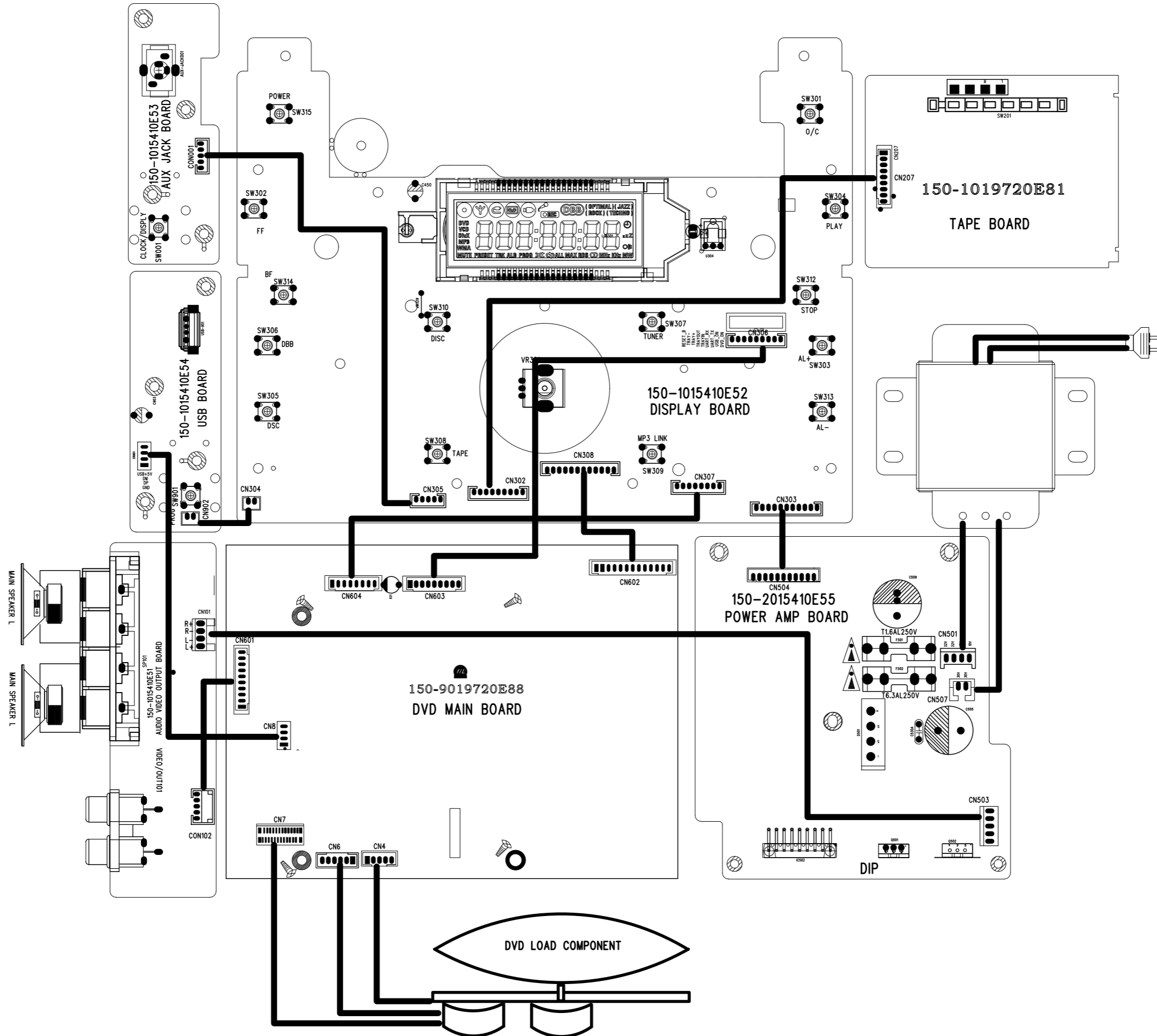


SET BLOCK DIAGRAM

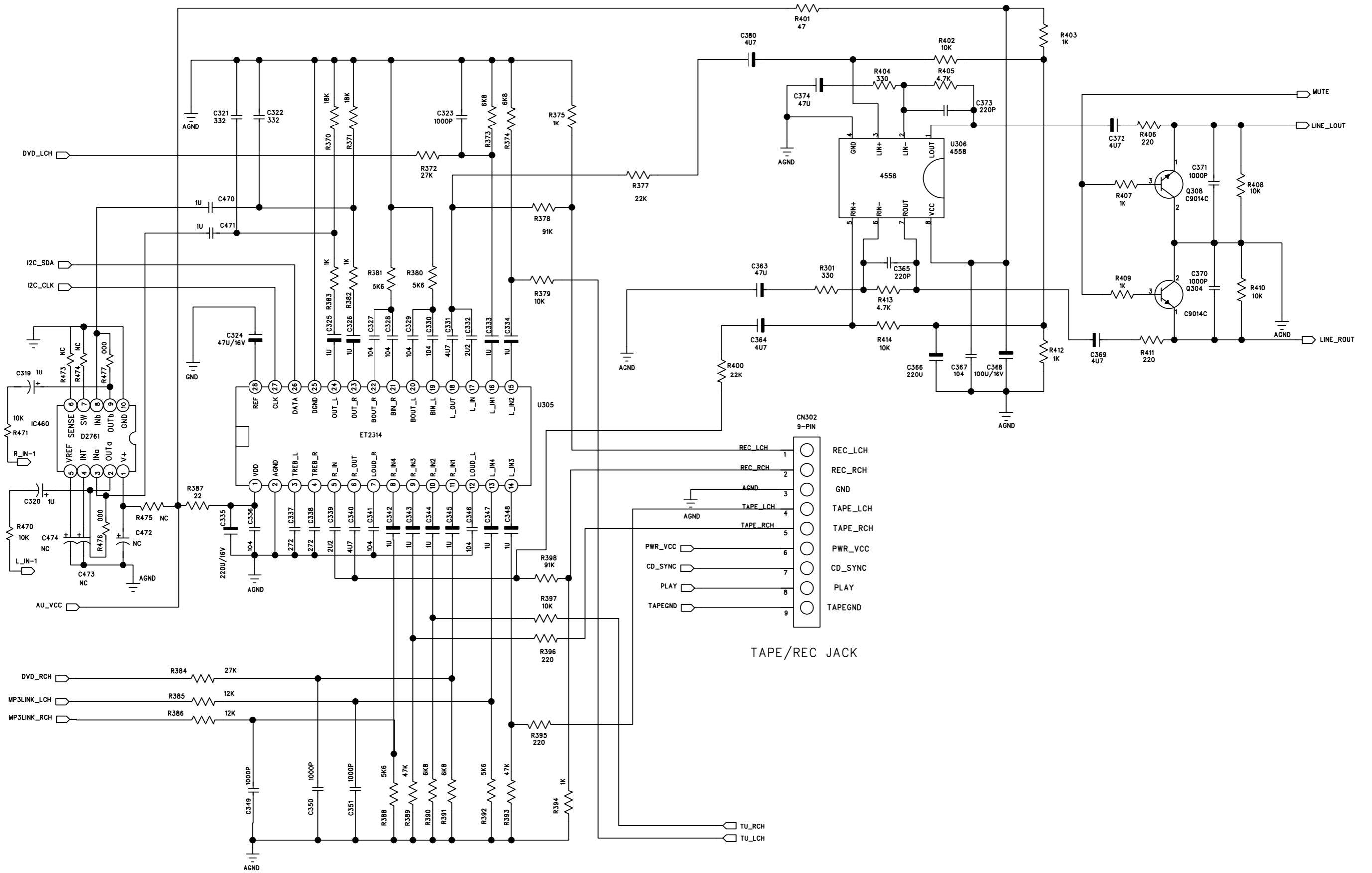




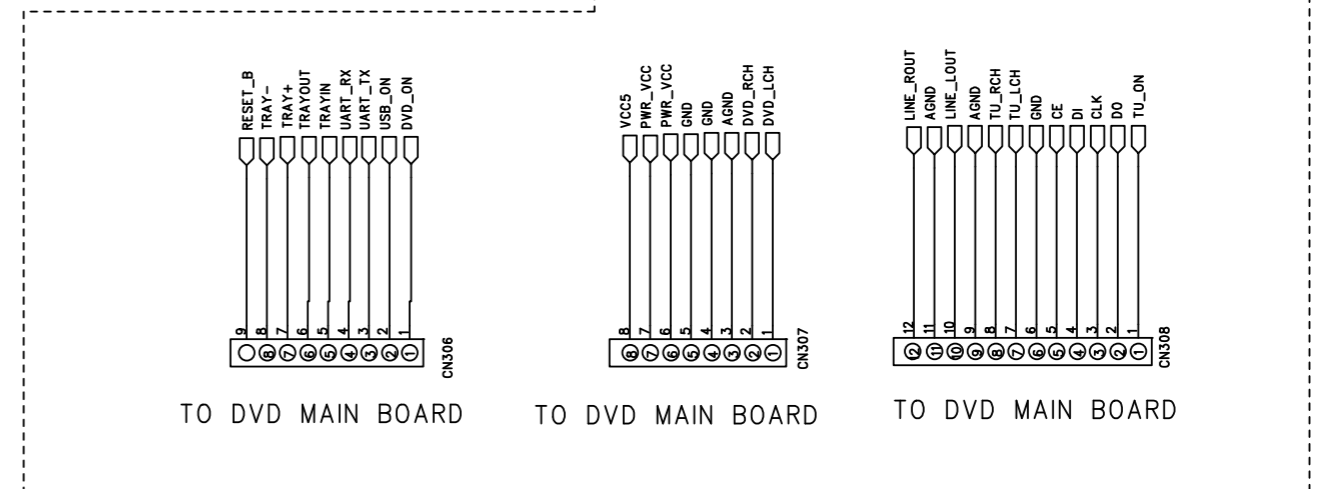
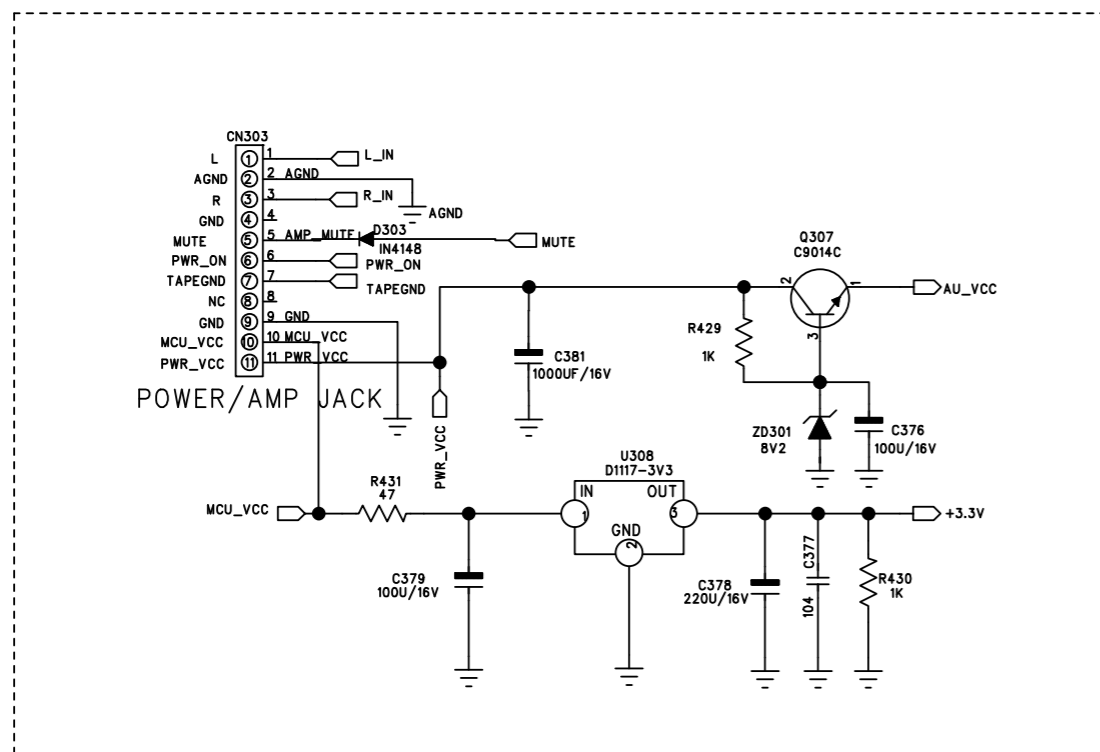
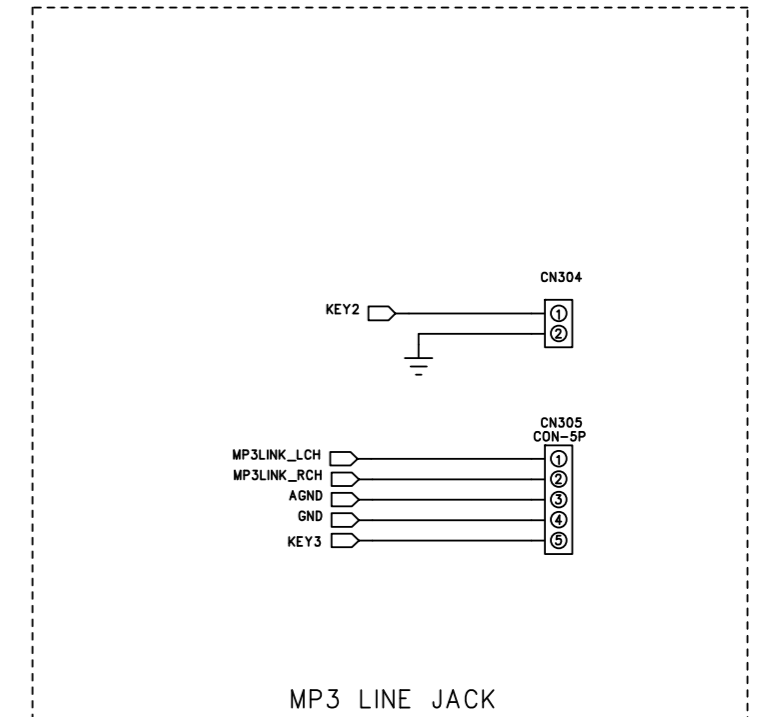
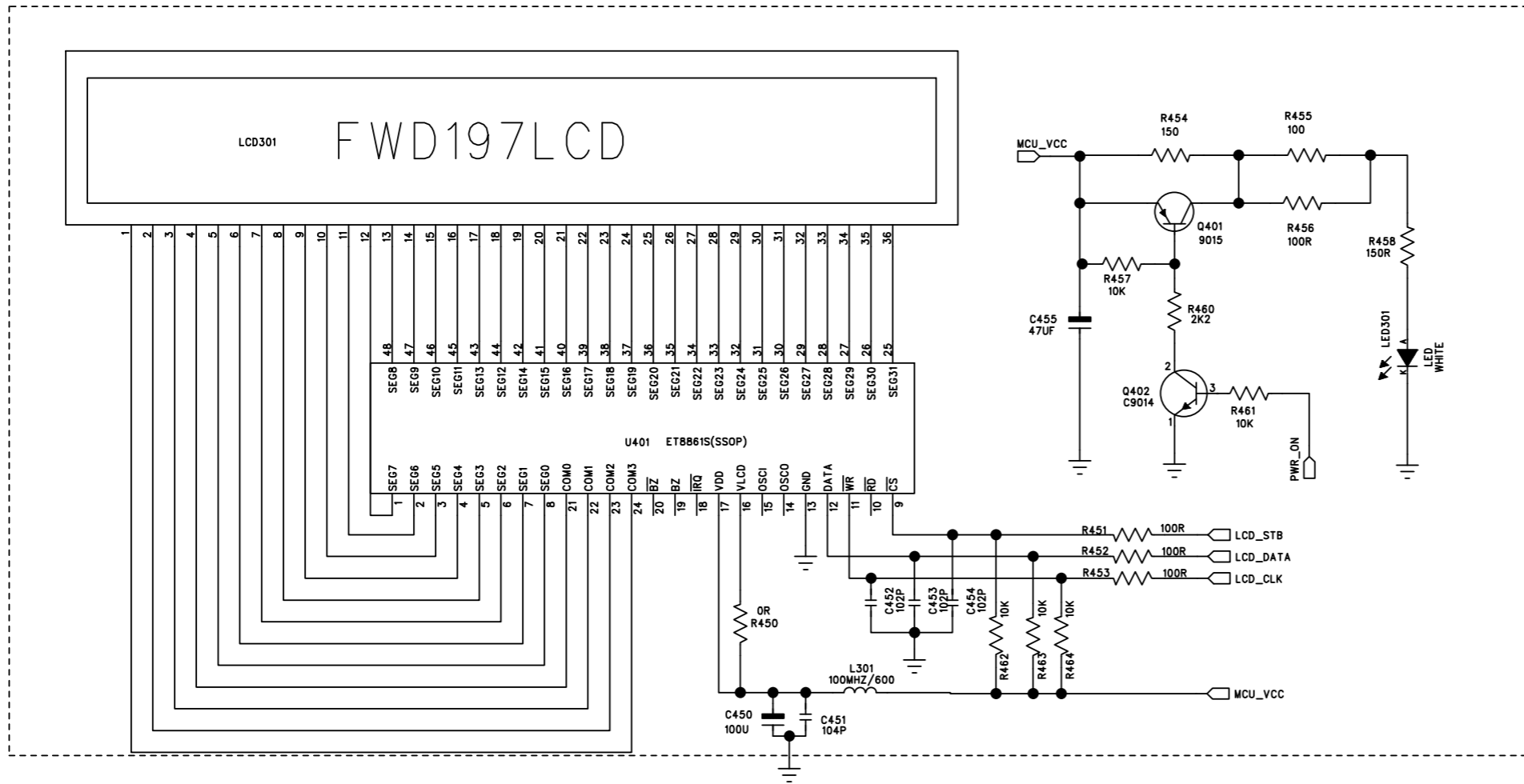
SET WIRING DIAGRAM



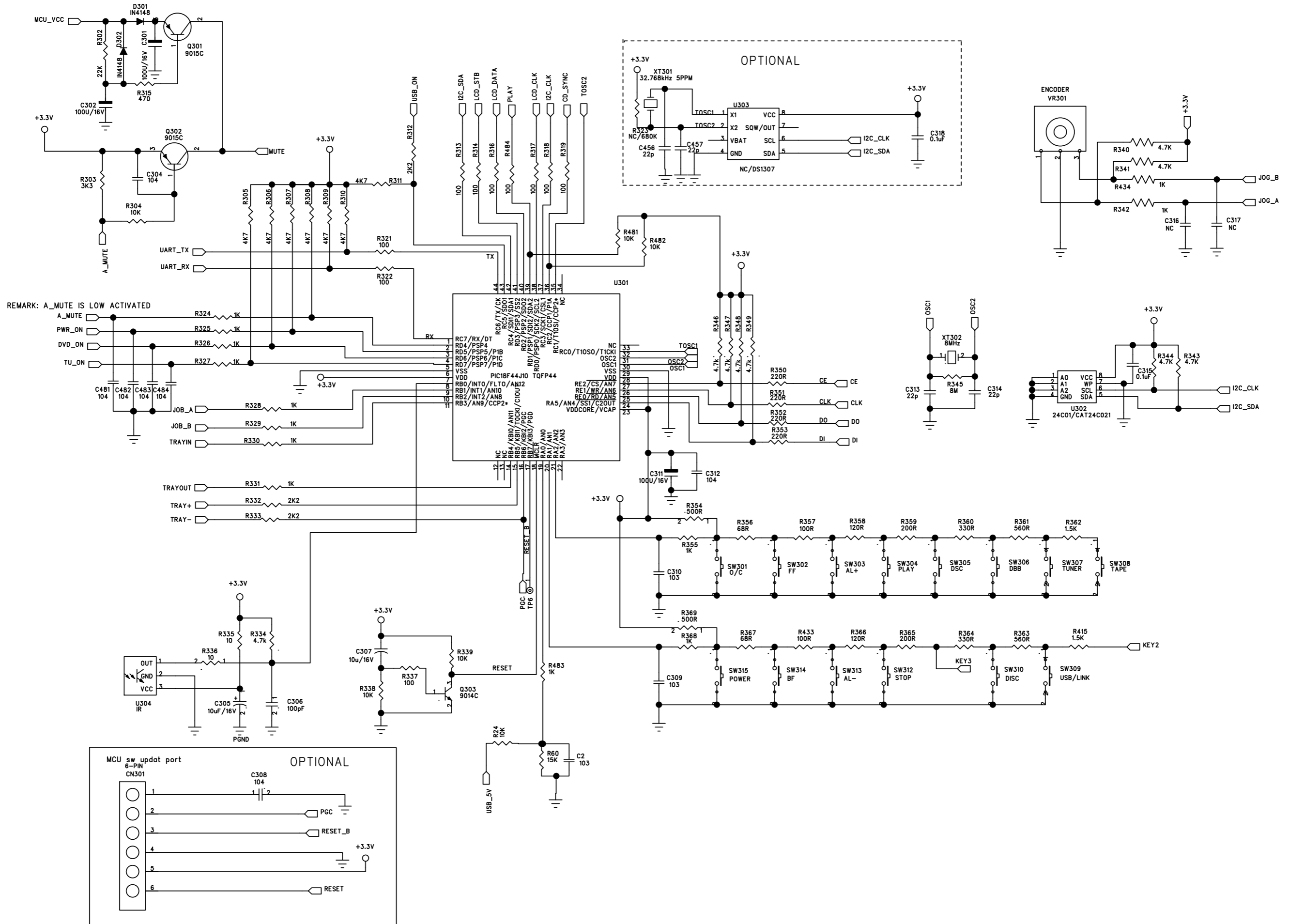
# CIRCUIT DIAGRAM - DISPLAY BOARD EQ/VOL PART



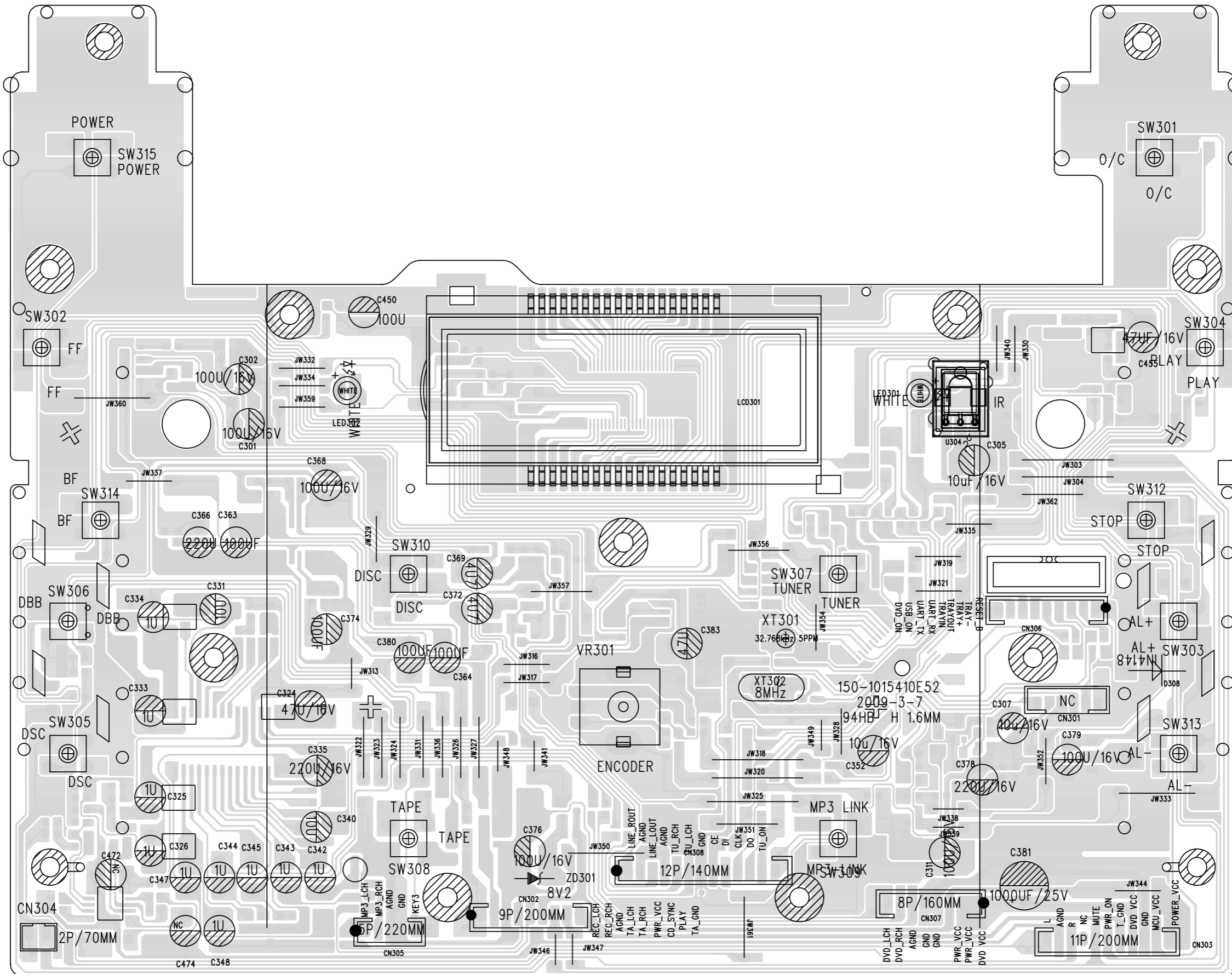
CIRCUIT DIAGRAM - DISPLAY BOARD  
LCD PART



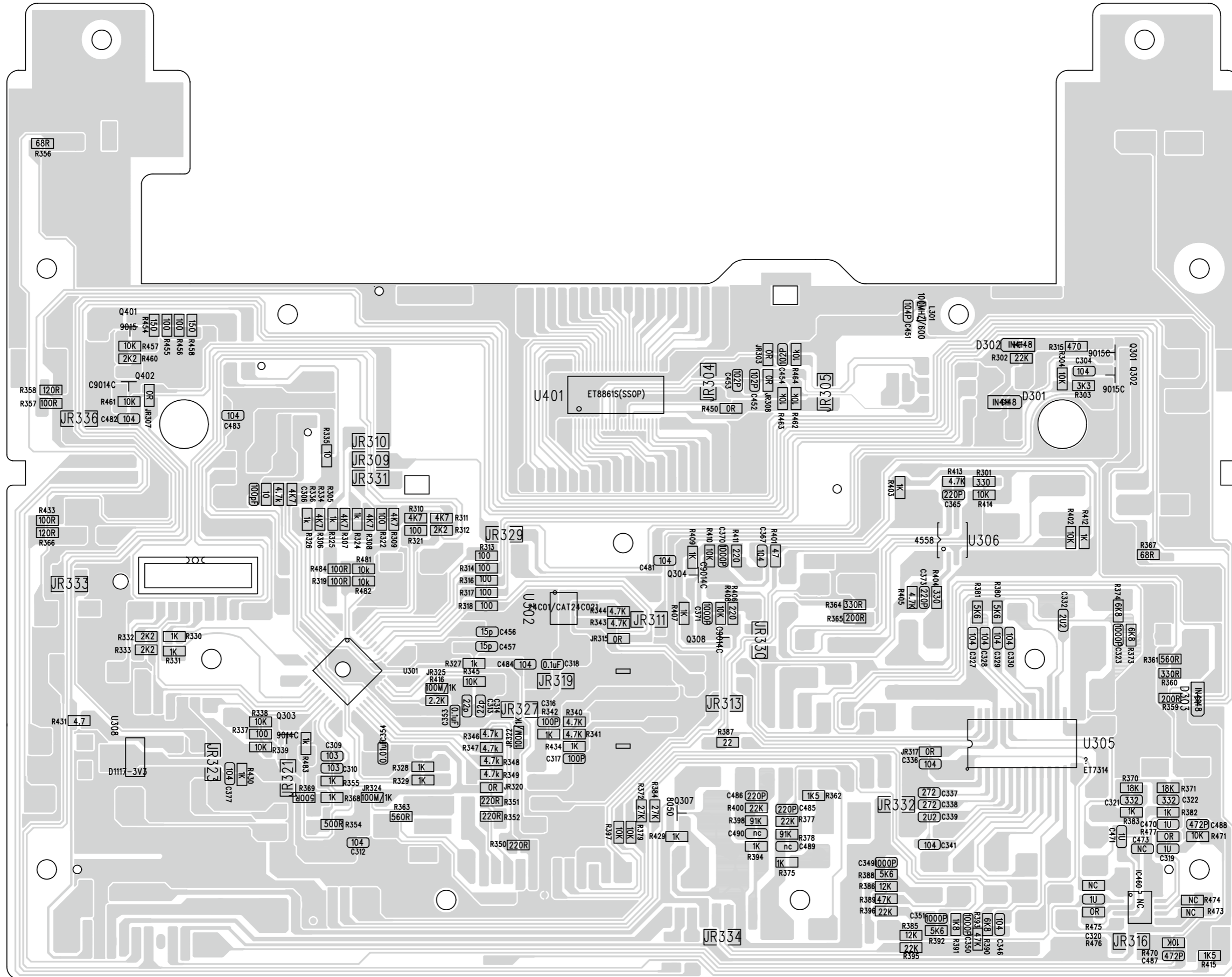
# CIRCUIT DIAGRAM - DISPLAY BOARD MCU PART



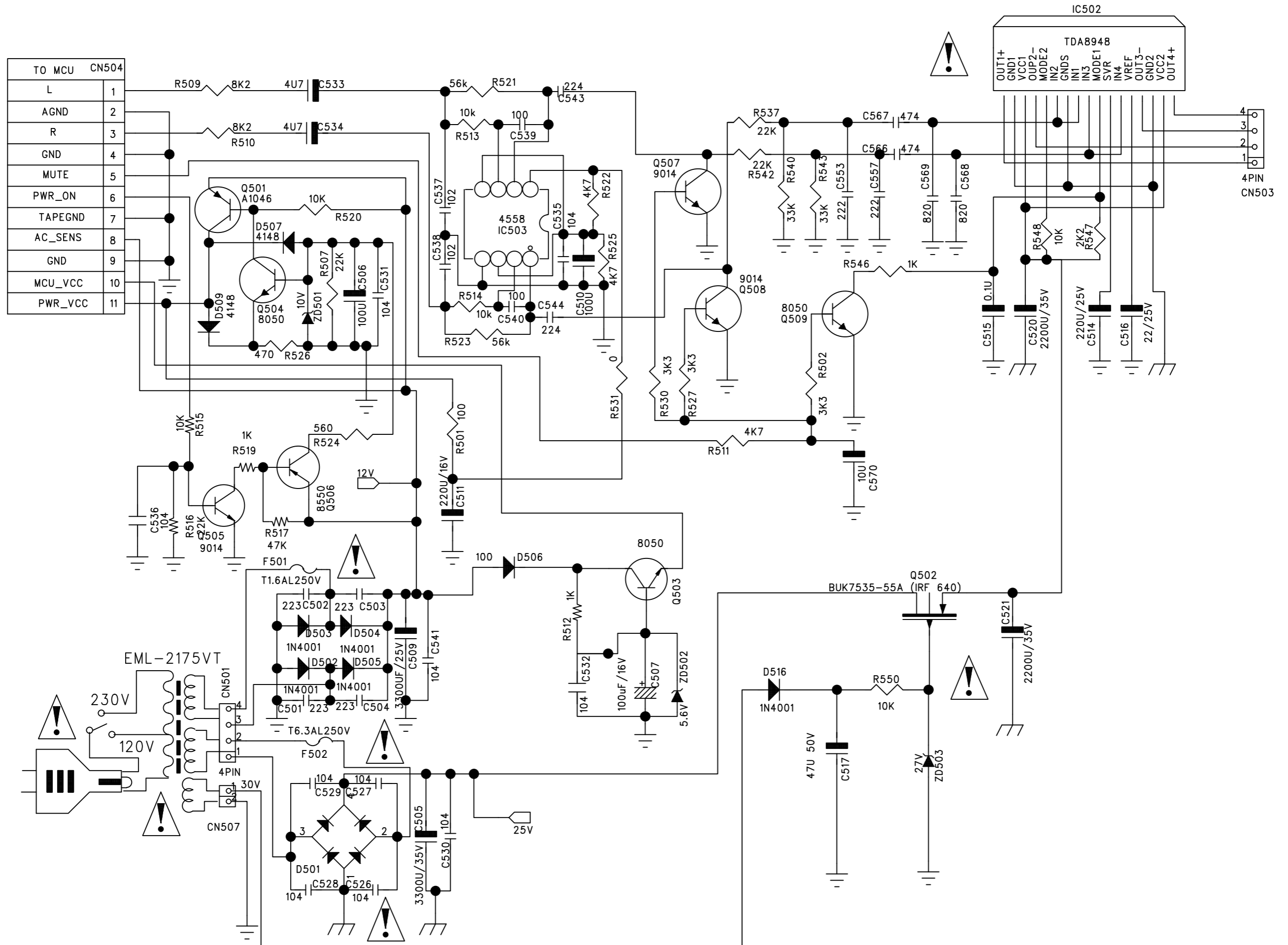
# LAYOUT DIAGRAM - DISPLAY BOARD COMPONENT SIDE VIEW



LAYOUT DIAGRAM - DISPLAY BOARD  
COPPER SIDE VIEW



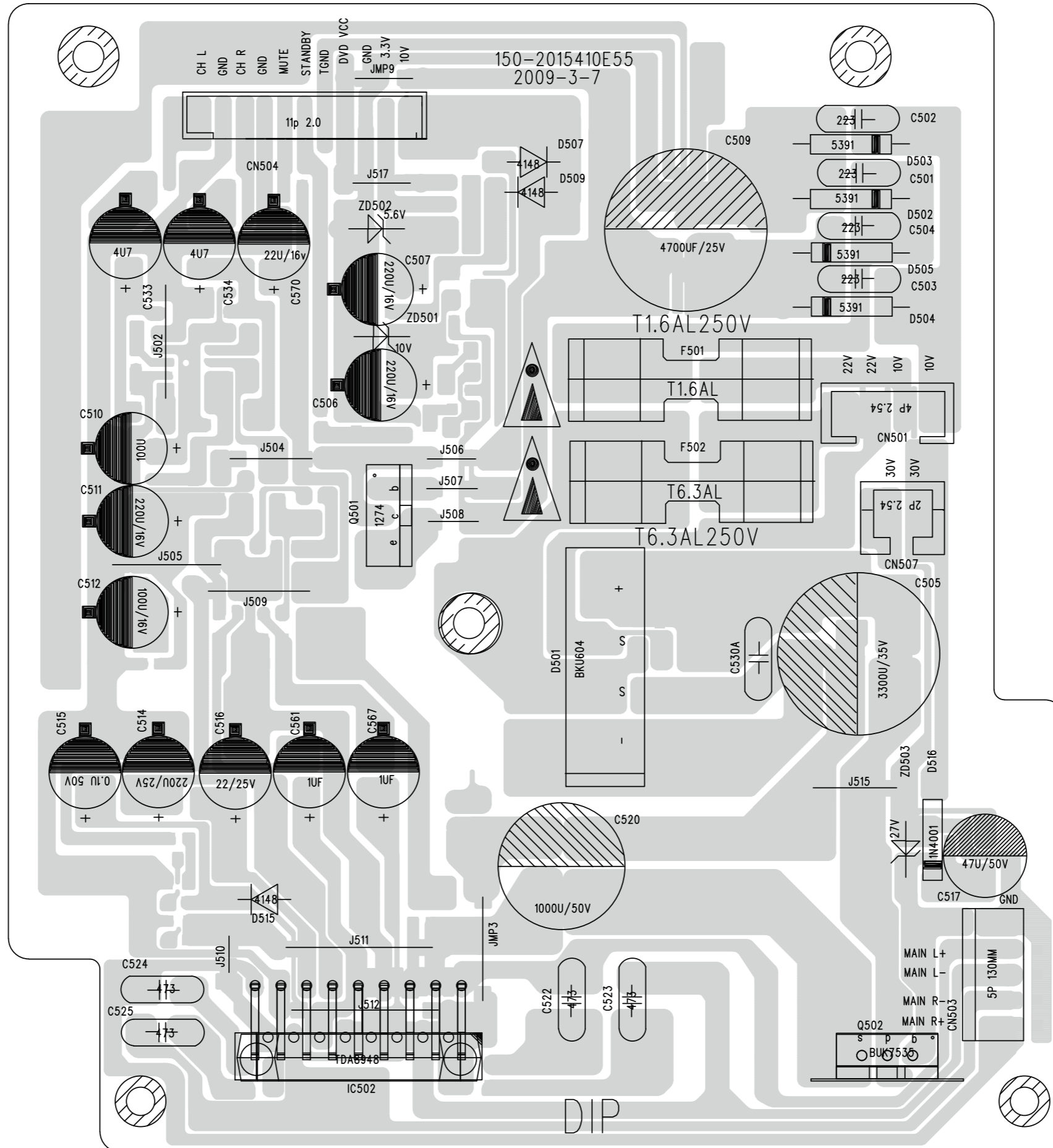
# CIRCUIT DIAGRAM - AMP BOARD



TO MCU CN504	
L	1
AGND	2
R	3
GND	4
MUTE	5
PWR_ON	6
TAPEGND	7
AC_SENS	8
GND	9
MCU_VCC	10
PWR_VCC	11

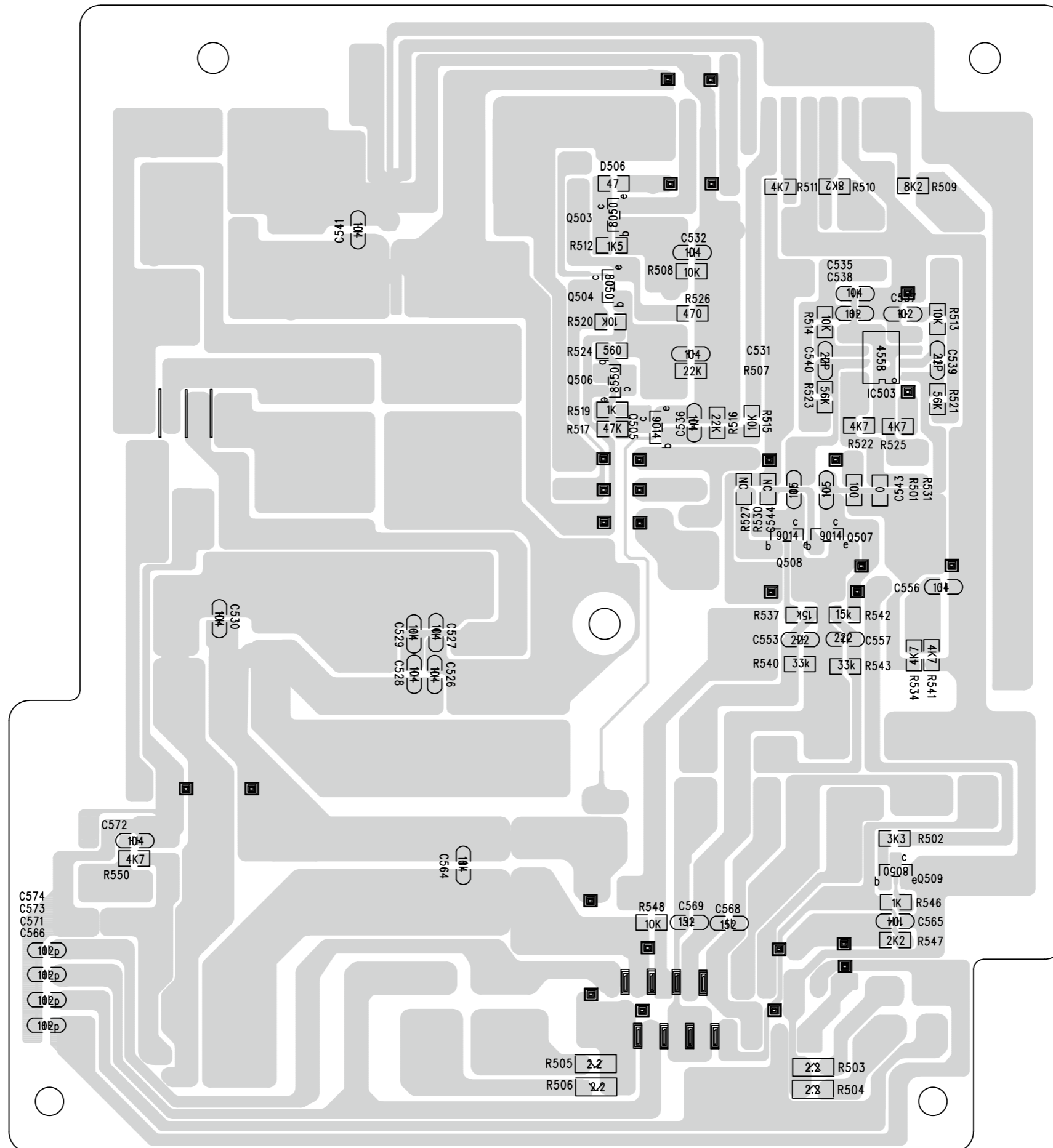
4PIN CN503	
4	○
3	○
2	○
1	○

# LAYOUT DIAGRAM - AMP BOARD COMPONENT SIDE VIEW

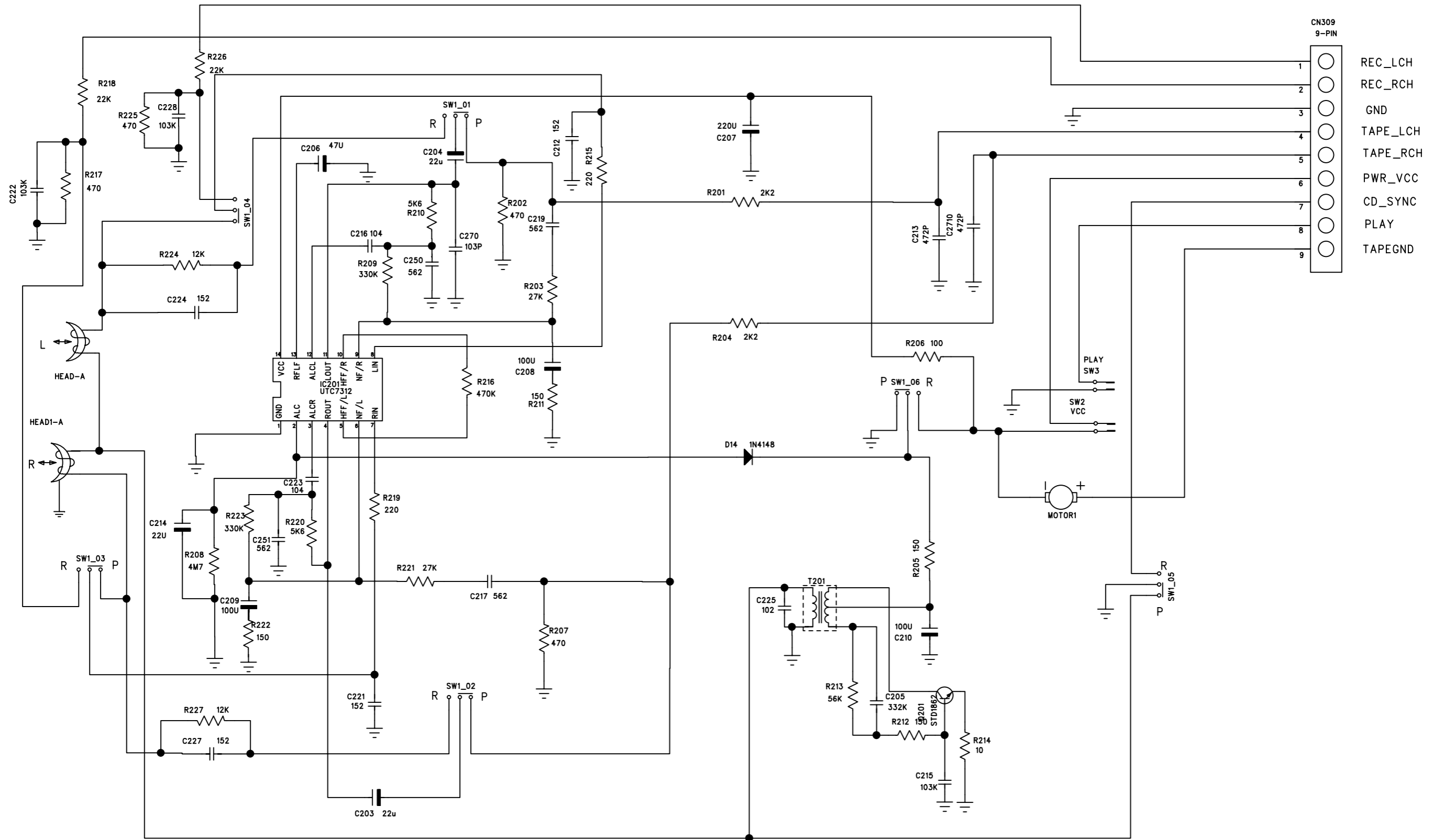




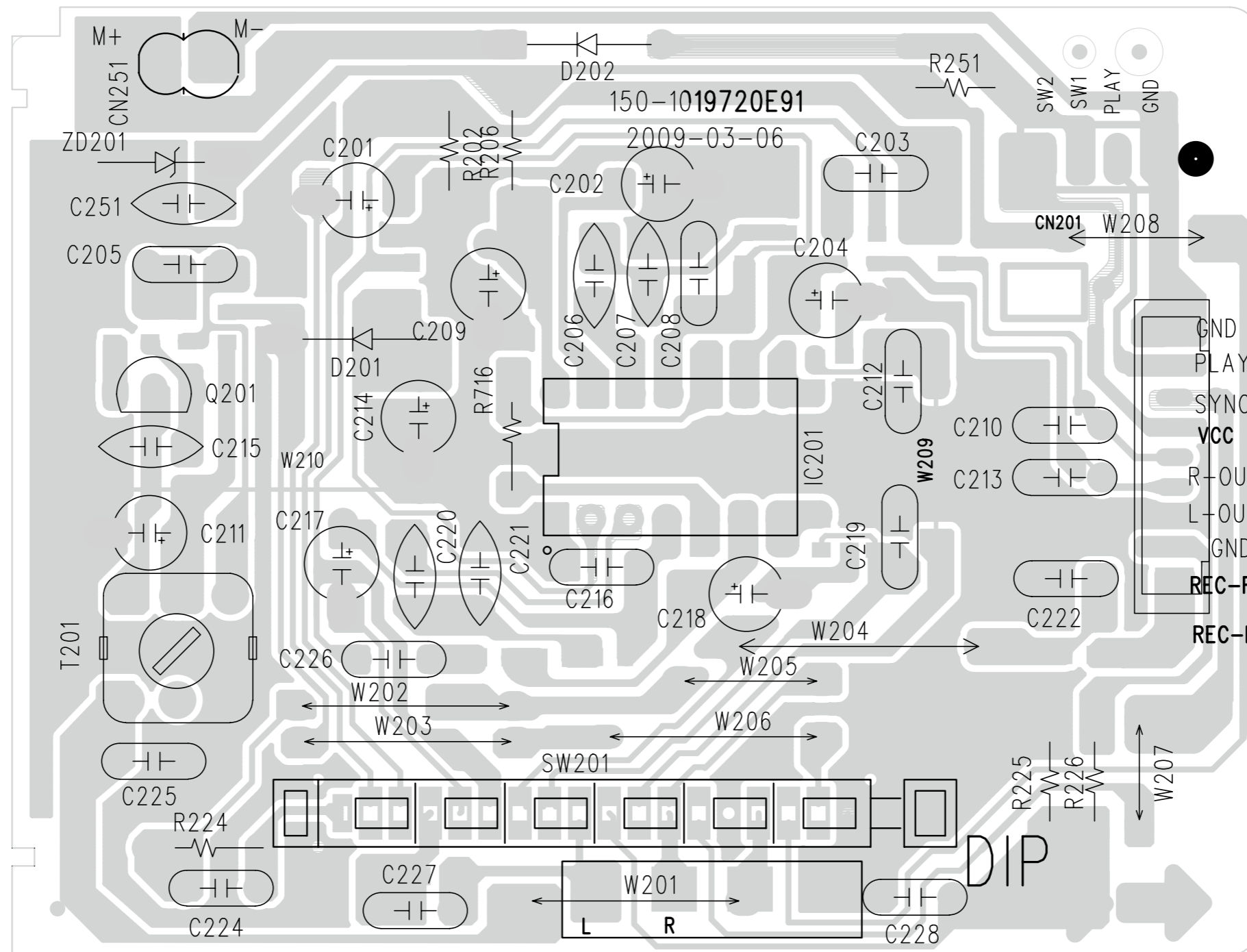
LAYOUT DIAGRAM - AMP BOARD  
COPPER SIDE VIEW



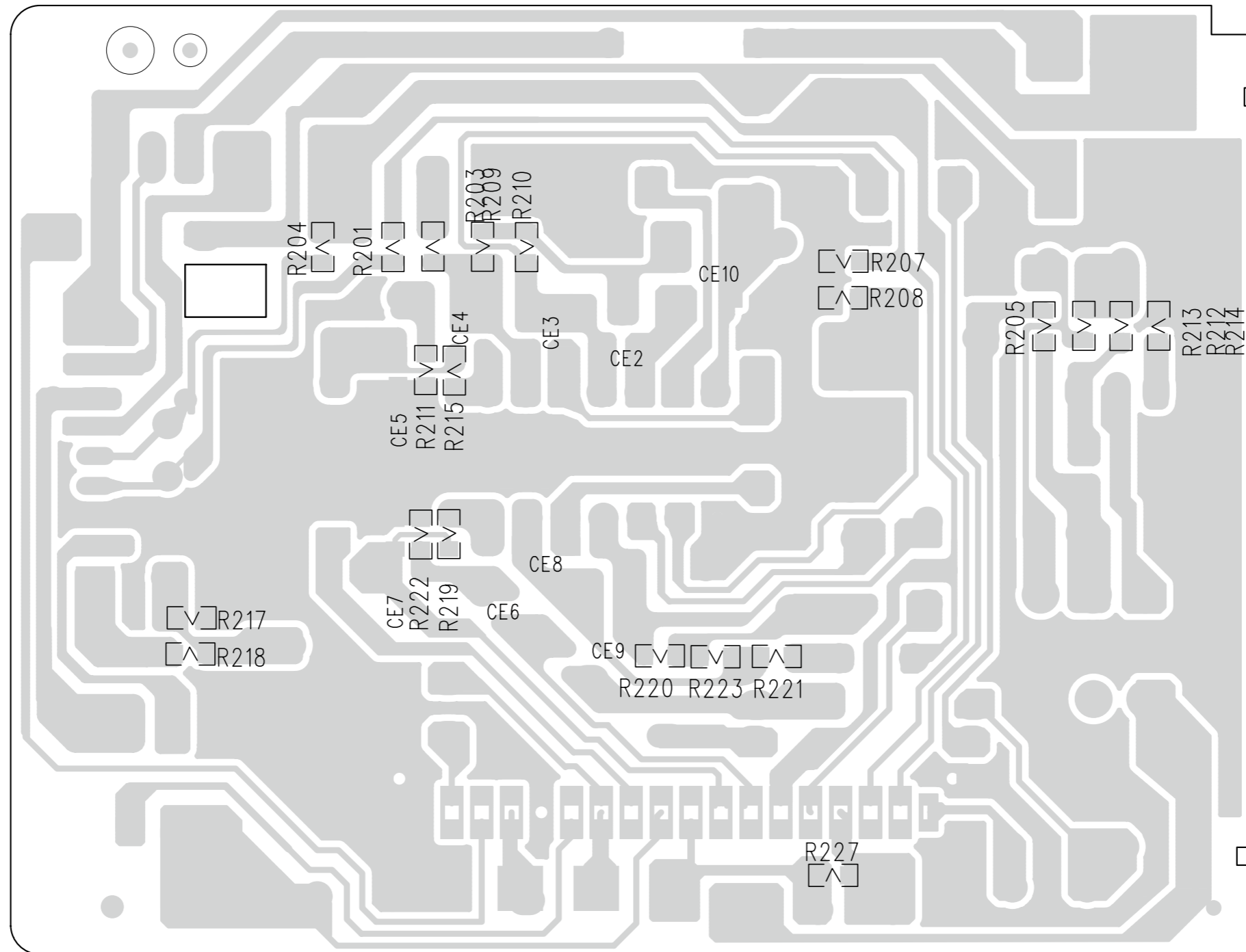
**CIRCUIT DIAGRAM - CASSETTE BOARD**  
 Cassette is not repaired, diagram for reference only.



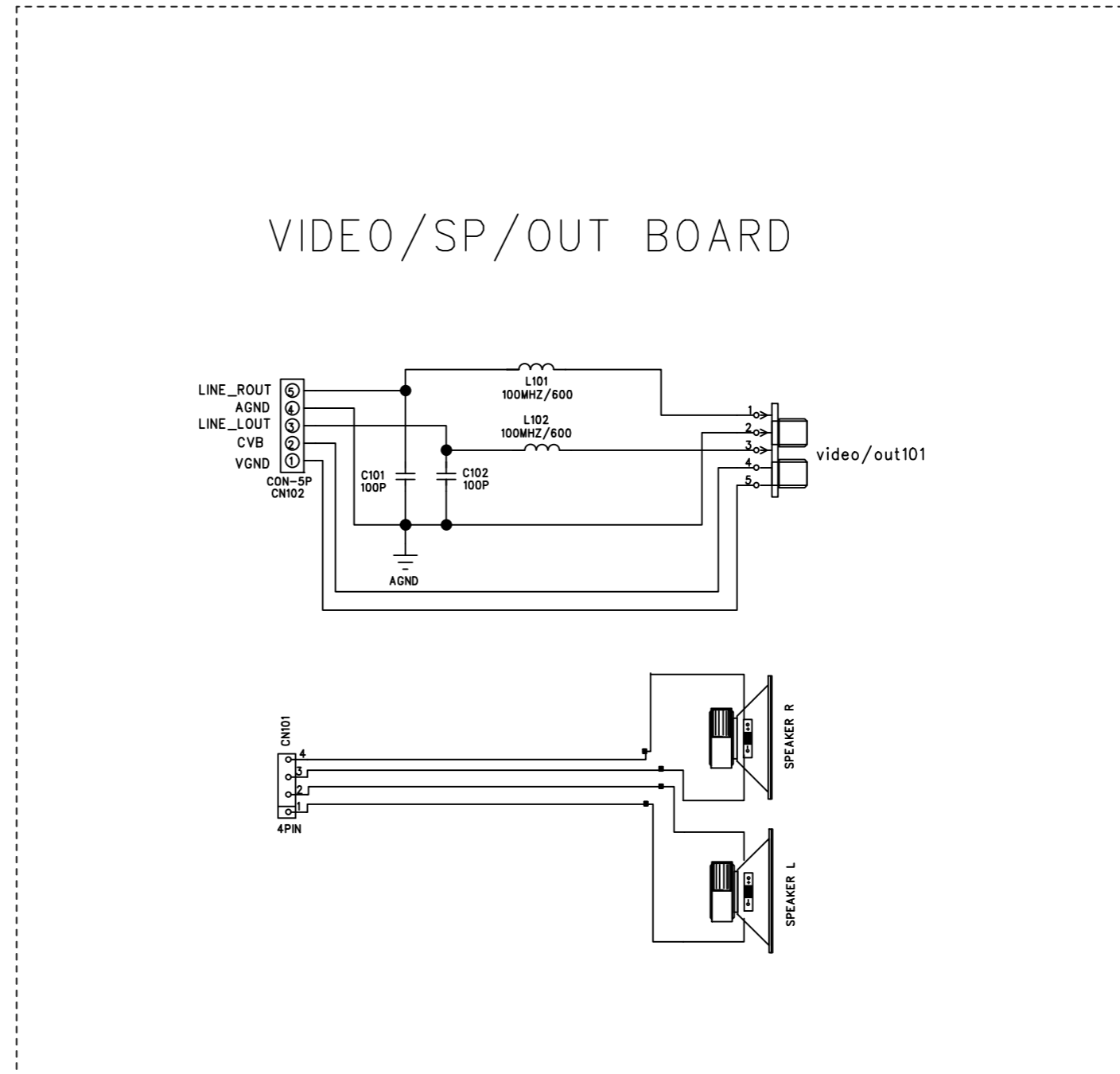
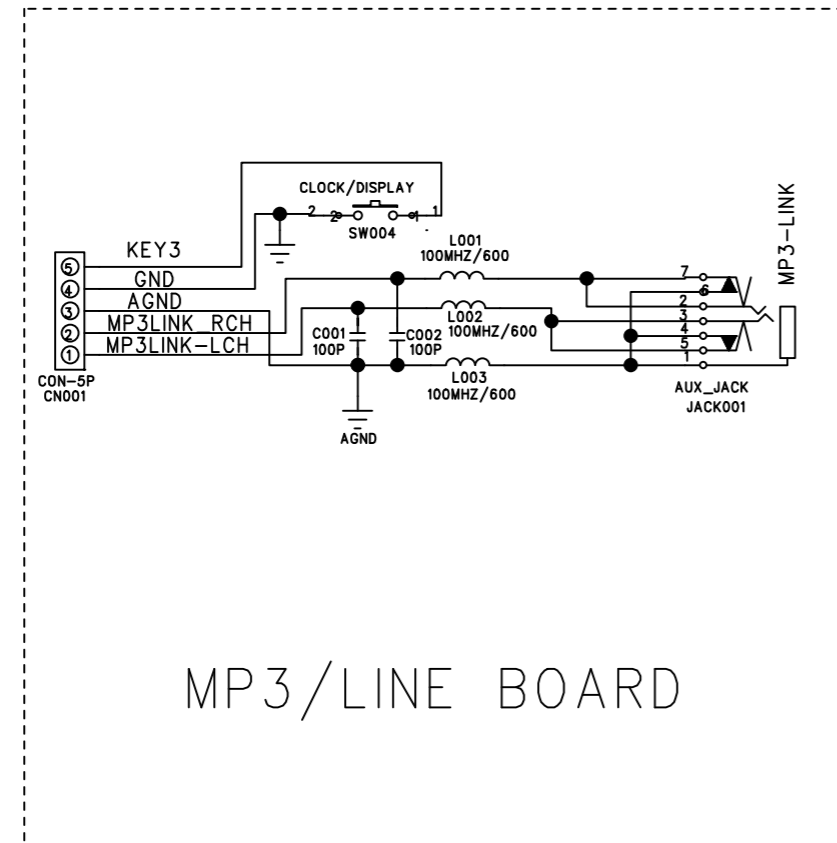
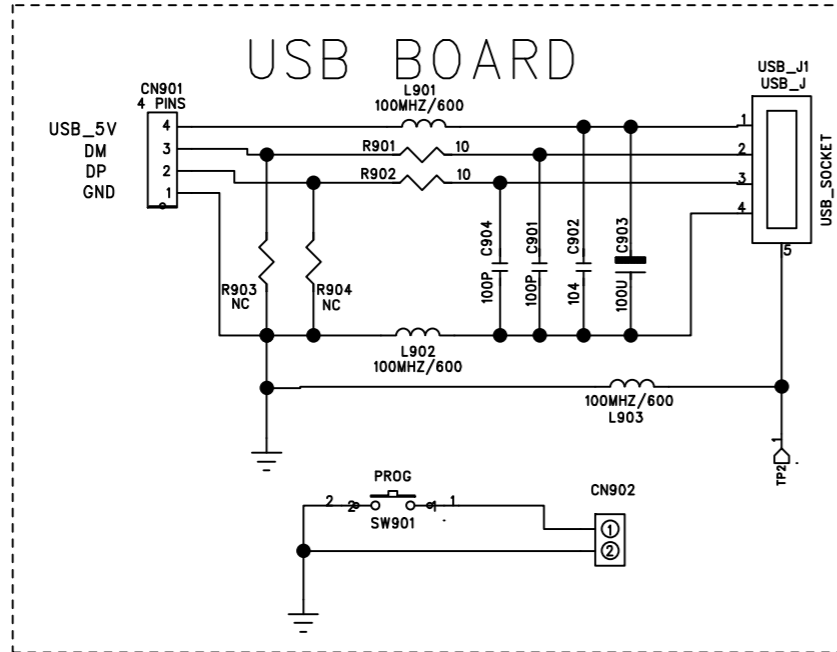
LAYOUT DIAGRAM - CASSETTE BOARD  
COMPONENT SIDE VIEW



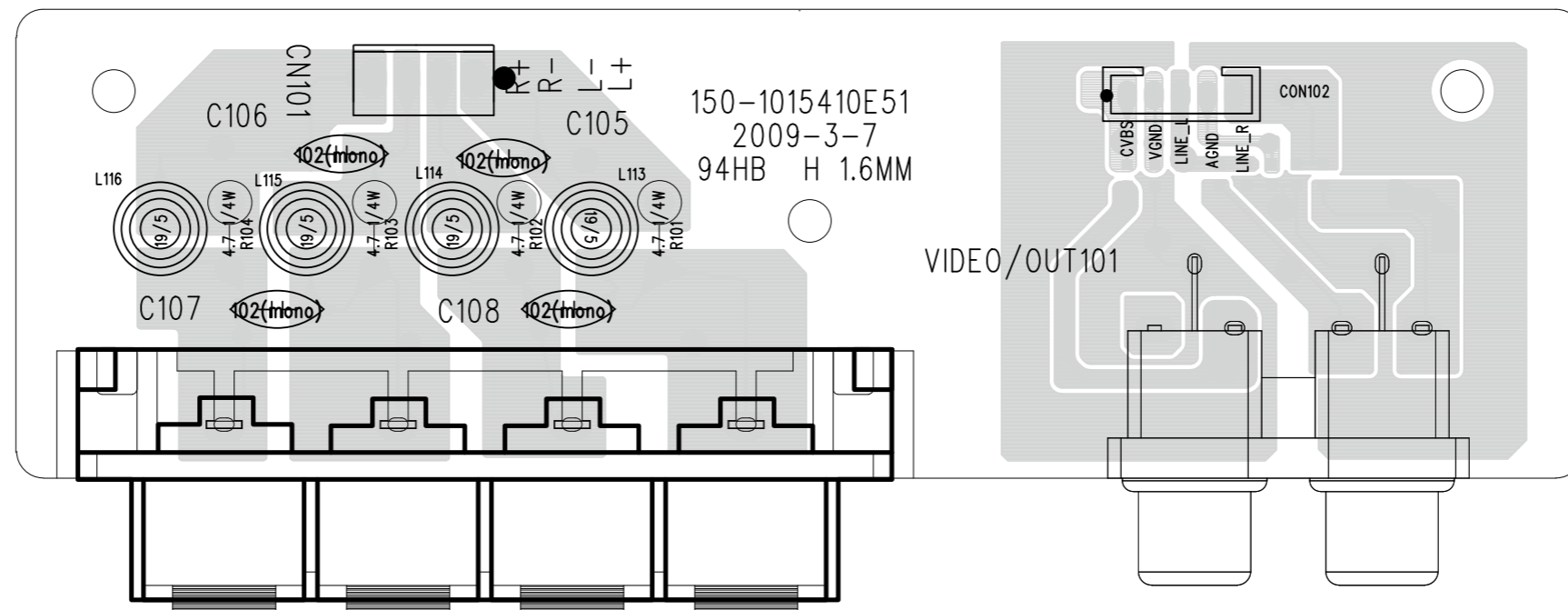
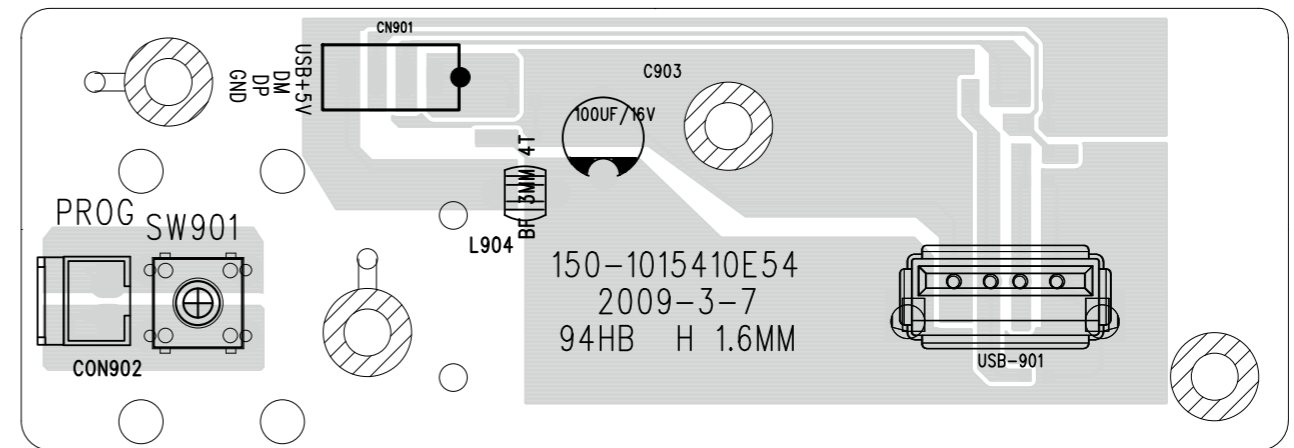
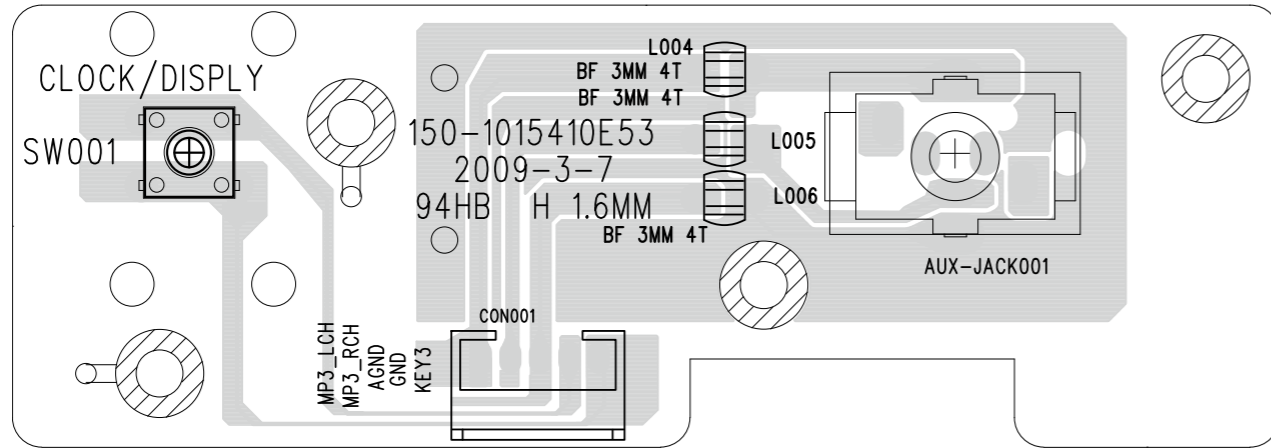
LAYOUT DIAGRAM - CASSETTE BOARD  
COPPER SIDE VIEW



### CIRCUIT DIAGRAM - USB/LINE IN/VIDEO OUT BOARD

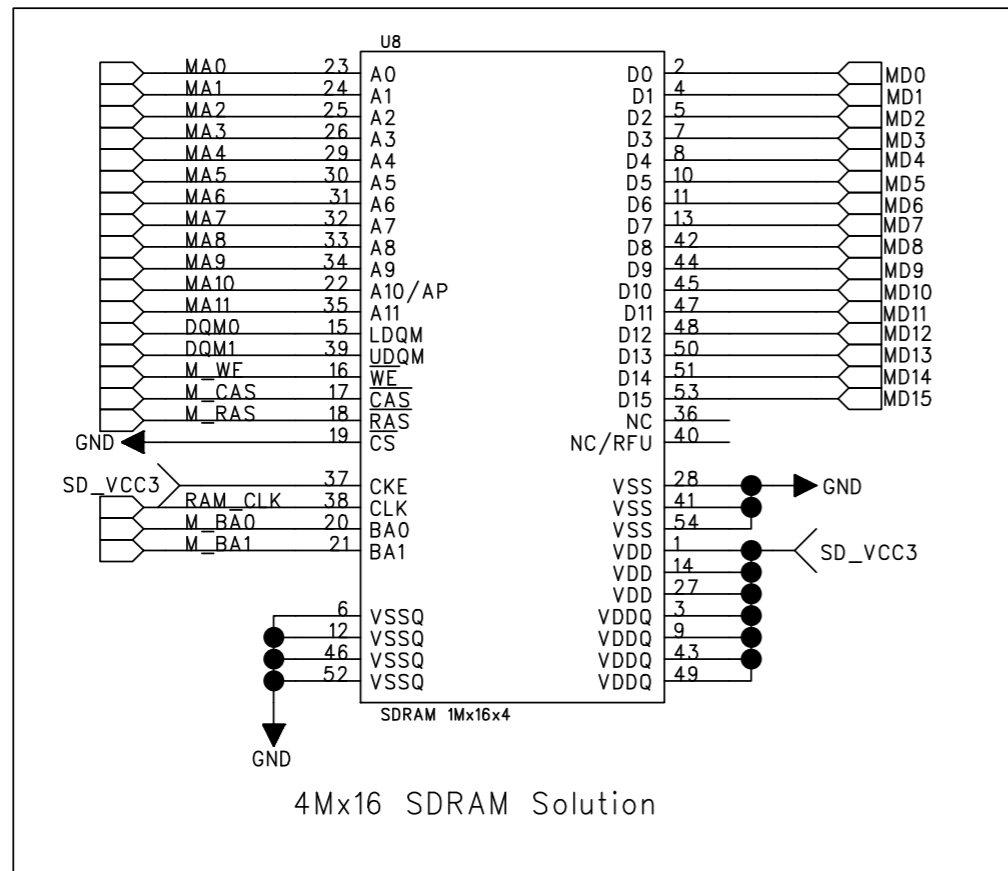
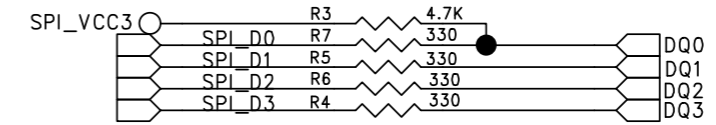
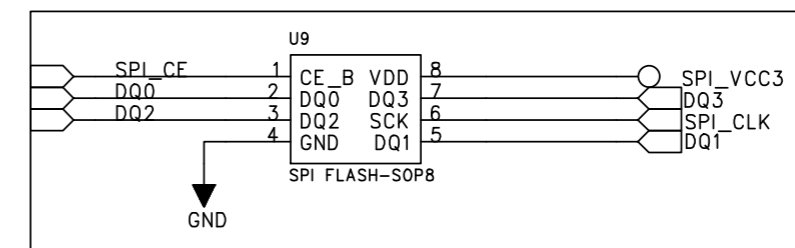
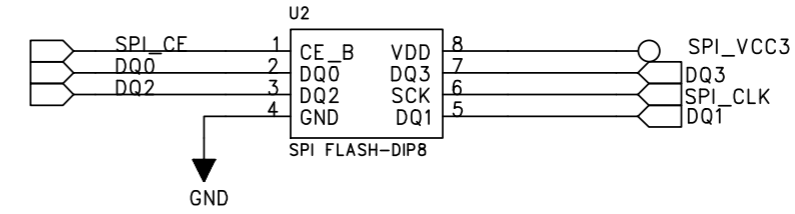
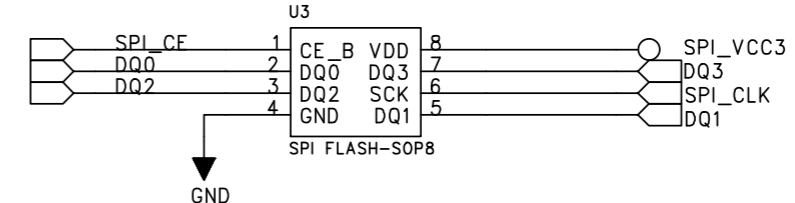
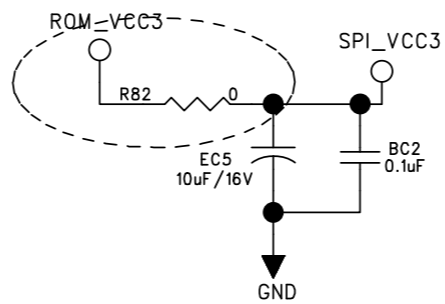
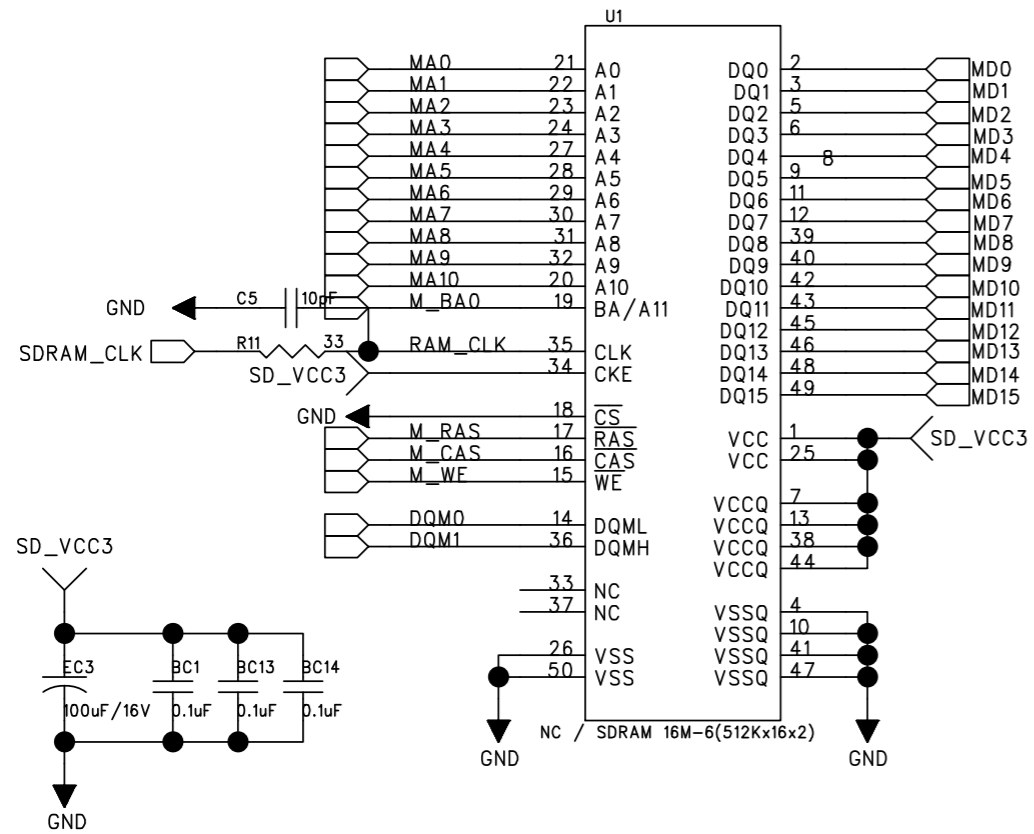


LAYOUT DIAGRAM - USB/LINE IN/VIDEO OUT BOARD

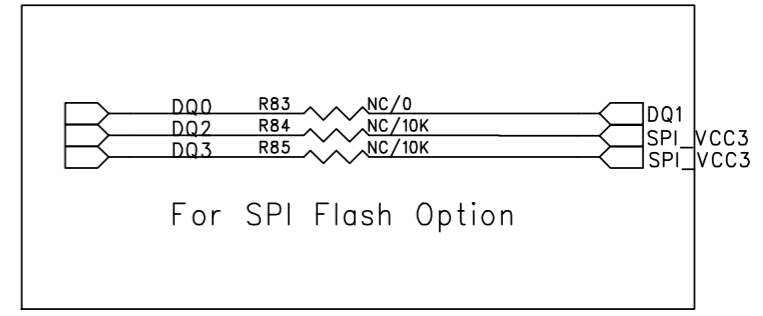
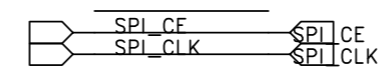
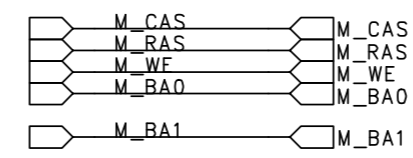
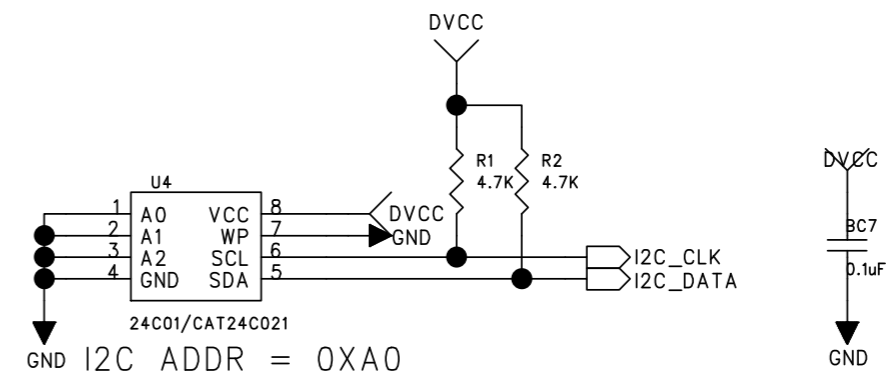


**CIRCUIT DIAGRAM - DVD BOARD**

DVD is not repaired, diagram for reference only.

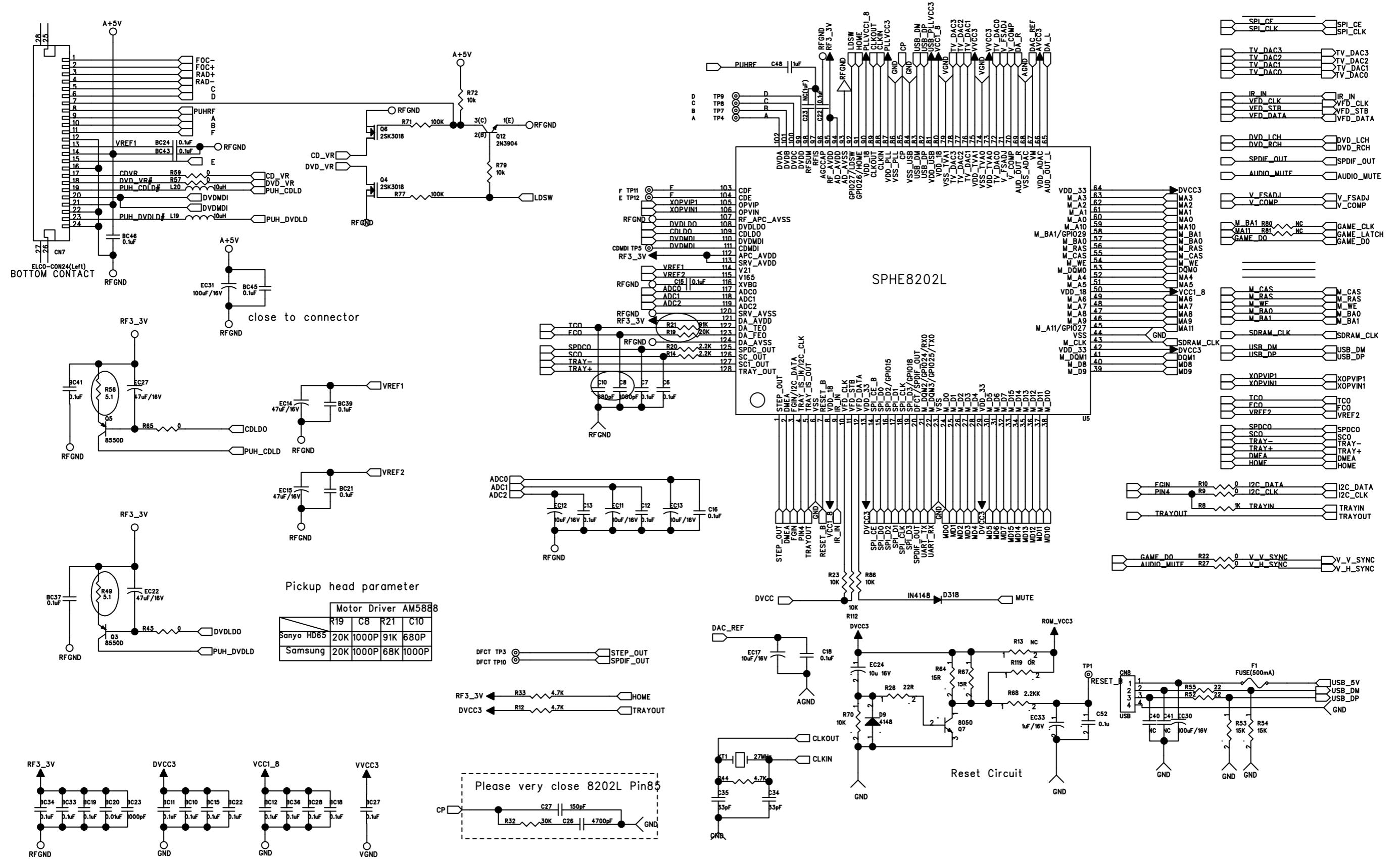


4Mx16 SDRAM Solution



# CIRCUIT DIAGRAM - DVD BOARD

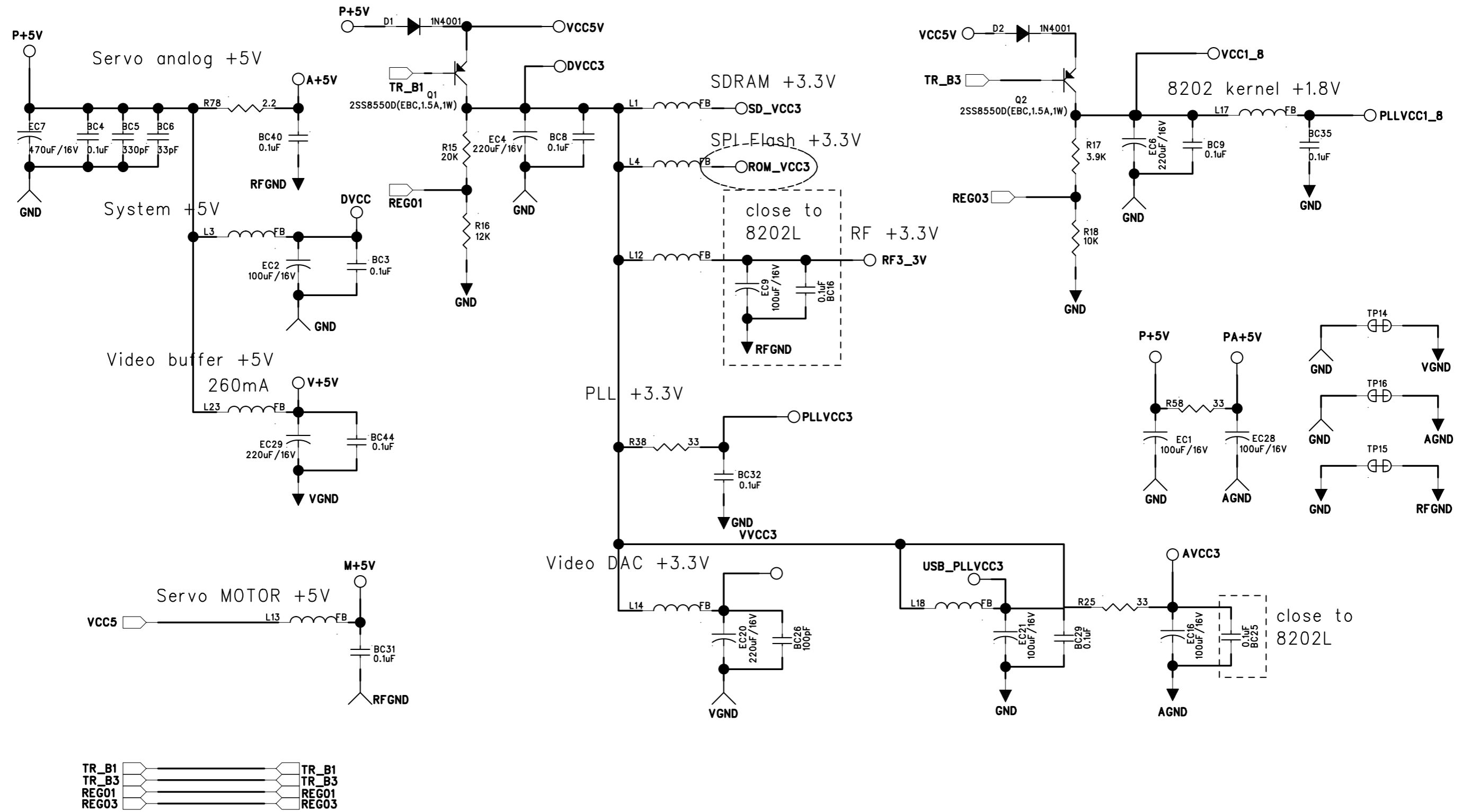
DVD is not repaired, diagram for reference only.





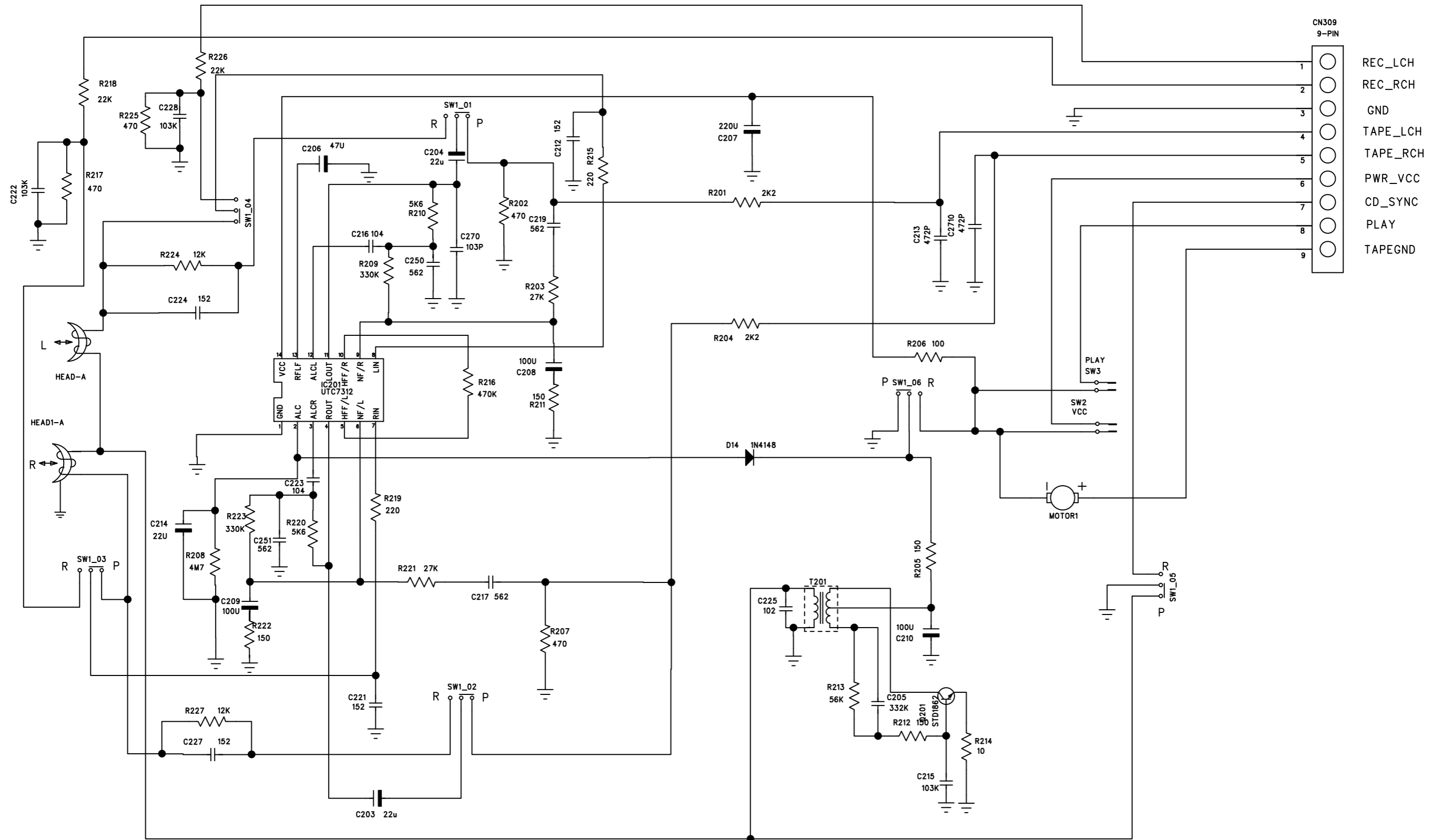
### CIRCUIT DIAGRAM - DVD BOARD

DVD is not repaired, diagram for reference only.



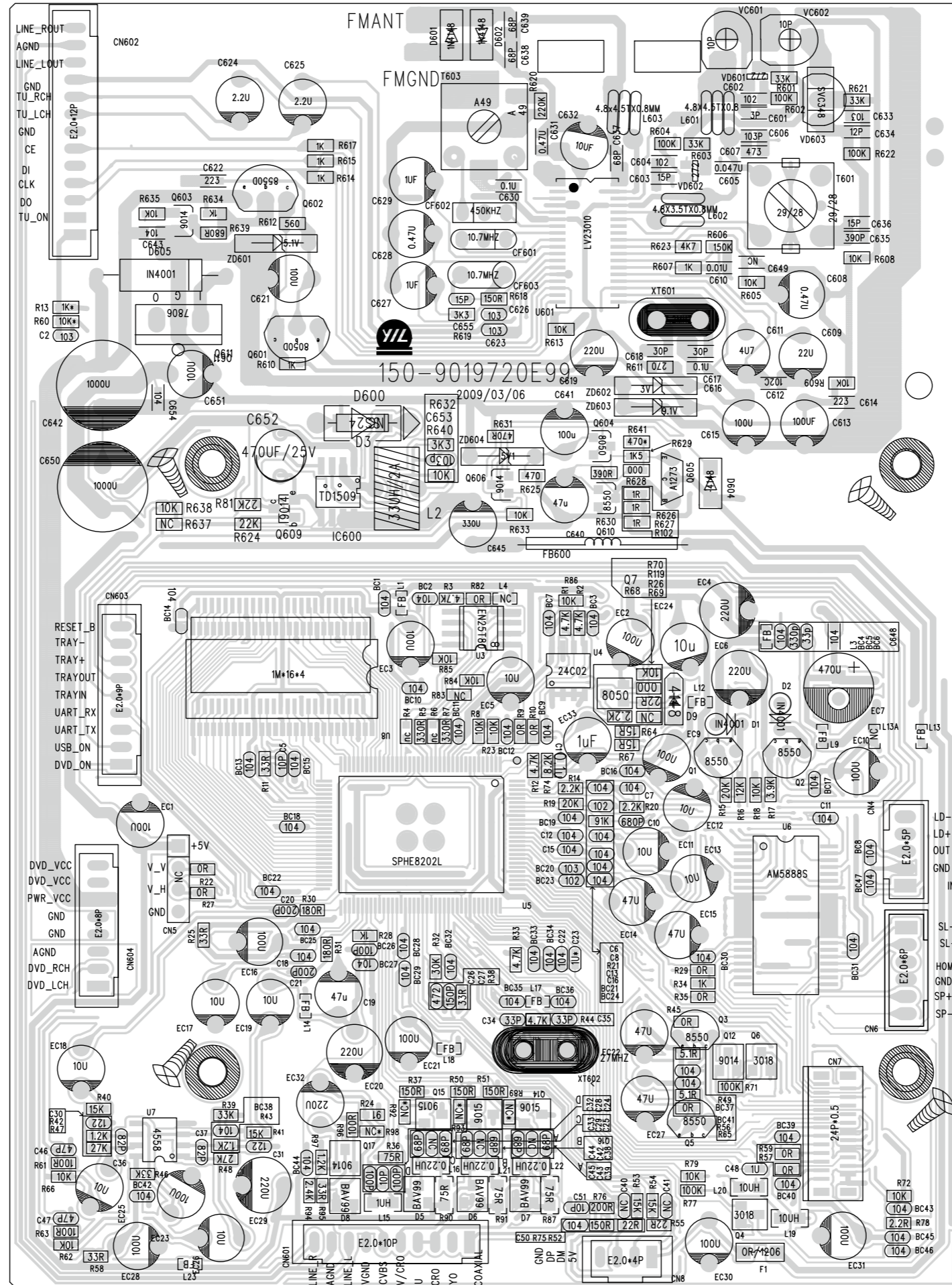
### CIRCUIT DIAGRAM - DVD BOARD

DVD is not repaired, diagram for reference only.

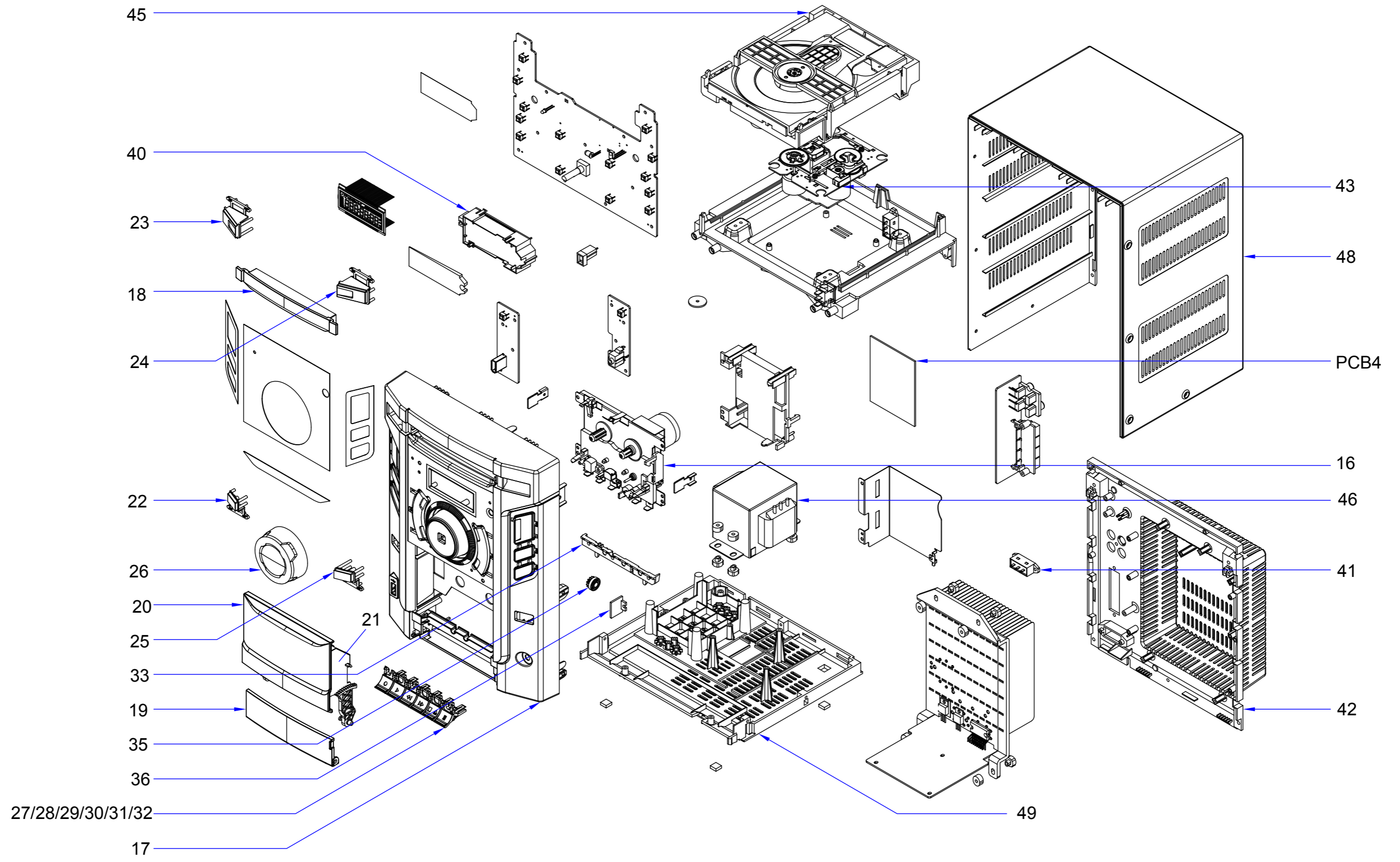


# LAYOUT DIAGRAM - DVD BOARD

DVD is not repaired, diagram for reference only.



EXPLODED VIEW DIAGRAM



**MECHANICAL PARTSLIST**

16	994000004734	CASS DECK CS-21SC-820T
17	996510022762	FRONT CABINET
18	996510021213	CD DOOR
19	996510022772	CASS KEY DOOR BLACK
20	996510022744	CASS DOOR BLACK
21	994000004702	7871 CASS DOOR BRACKET
22	996510021198	PROG. BUTTON
23	996510021196	POWER BUTTON
24	996510021207	OPEN/CLOSE BUTTON
25	996510021219	CLOCK BUTTON
26	996510021197	VOLUME BUTTON
27	996510022749	PAUSE BUTTON
28	996510022755	PLAY BUTTON
29	996510022764	REC BUTTON
30	996510022771	F.FWD BUTTON
31	996510022761	F.B BUTTON
32	996510022748	STOP BUTTON
33	996510022754	CASS KEYS BRACKET
34	996510002263	FWM185 PU CASSETTE KEYS DOOR
35	994000004726	7831 GEAR (MODE:0.8)
36	994000004727	7831 GEAR STAND (MODE:0.8)
37	996500038818	RECORD SPRING
38	996510021221	CASS DOOR SPING D0.8mm
39	996510002265	FWM185 CASS KEYS DOOR SPRING
40	996510022843	LCD BRACKET
41	994000004736	SLIDE SWITCH (SSV-12-8700S)
42	996510022765	REAR CABINET
43	996510022759	DVD MECH:SONY KHM-313AAD
44	996510022768	24 PIN FFC FLAT FLEXIBLE CABLE
45	996510022756	DVD LOADER(COMPLETED)WXD-8213
46	996510022766	TRANSFORMER UL EML662335MT
47	996510022767	AC CORD VDE-APP L=1650mm BLK
48	996510002240	7671 TOP CAB
49	996510002305	FWM185 BASE CABINET
PCB7	996510022769	FWD154/98 DVD MAIN BOARD ASSY
PCB4	996510022752	CASSETTE BOARD ASSY

**ACCESSORIES**



11	996510022758	RCA SINGLE WIRE #28 L=1500mm
12	996510020741	AUX WIRE 400mmW/3.5 STEREO BLK
13	996510025191	FWD154 SPEAKER BOX (L)
14	996510025192	FWD154 SPEAKER BOX (R)
15	996510022745	REMOTE HANDSET

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

**ELECTRICAL PARTSLIST****DISPLAY BOARD ASSEMBLY**

LCD301	996510022842	LCD DISPLAY :SDH-A1226-TN4A
LED301	996510002275	LED WHITE D5mm (DL5NWCH)
Q301	994000003973	CHIP TR MMBT9015C
Q302	994000003973	CHIP TR MMBT9015C
Q307	994000004004	CHIP TR NPN 8050C
Q401	994000003973	CHIP TR MMBT9015C
SW301	996510021215	TACT SW: 6x6mmH3.5
SW302	996510021215	TACT SW: 6x6mmH3.5
SW303	996510021215	TACT SW: 6x6mmH3.5
SW304	996510021215	TACT SW: 6x6mmH3.5
SW305	996510021215	TACT SW: 6x6mmH3.5
SW307	996510021215	TACT SW: 6x6mmH3.5
SW308	996510021215	TACT SW: 6x6mmH3.5
U301	996510022747	IC:PIC18F45J10 (TQFP-44)
U302	996510013449	IC FT24C02 (EEPROM) (SOP8)(EP)
U304	996510002274	SENSOR AT136BV3 (36KHz) (3.3V)
U305	996510013420	IC 7314 (SOP 28P)(ANGUS)(EP)
U306	996510002294	IC D4558 (SOP8)
U308	996510022763	IC CW1117CB-3.3V (SOT-223\\EP)
U401	994000003955	IC ET8861S LCD DRIVER 48P
VR301	996510018244	ENCODER:EC121102X2B-HA1-137
XT301	996500038822	CRYSTAL JF32.768kHz JU2x6
XT302	996500038823	CRYSTAL 8MHz(HC-49US)

**AMP BOARD ASSEMBLY**

F501	 994000004782	FUSE 50T D5X20 1.6A 250V(S.B.)
F502	 996510002287	FUSE T6.3A 250V 5x20
IC501	996510009066	IC TDA8948J (DBS17P)(PHILIPS)
IC503	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

**USB BOARD ASSEMBLY**

J1	996510022757	USB JACK 5070AS-04-WH-F1
SW901	996510021215	TACT SW: 6x6mmH3.5

**LINE IN BOARD ASSEMBLY**

ACK001	996510002273	ST PHONES JACK 3.5mm TC38
SW001	996510021215	TACT SW: 6x6mmH3.5

**AMP EXPORT BOARD ASSEMBLY**

OUT101	996510022746	RCA JACK:3P WHITE/YELLOW/RED
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**Note:** Only these parts mentioned in the list are normal service parts.