

Service
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Service Manual



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Published by LX 1130 Service Audio Subject to modification

3141 785 35431

Version 1.1



TECHNICAL SPECIFICATION

Sound

- Output Power: 14000W PMPO
- Total Sound Power (RMS): 1300 W
- Sound Enhancement: MAX Sound, Dynamic Bass Boost 3 steps, Incredible Surround, Digital Sound Control 4 modes, Virtual Ambience Control

Loudspeakers

- Main Speaker: Bass Reflex Speaker System, 2 way, 2" tweeter
- Subwoofer type: Passive
- Subwoofer driver: 10" woofer
- Number of Loudspeakers: 6

Audio Playback

- Loader Type: 3 CD Carousel
- Number of Discs: 3
- Playback Media: CD, CD-R, CD-RW, MP3-CD, WMA-CD, SD Card, USB flash drive
- Disc Playback Modes: 40-Track Programmable, Repeat/one/disk/program, Shuffle Play
- USB Direct / SD Modes: Fast Backward/Fast Forward, Play/Pause, Previous/Next, Repeat, Shuffle

Audio Recording

- Recording Media: USB device, SD/MMC card
- USB recording sources: CD, Tuner, Aux, Microphone in, SD Card
- SD card recording sources: Aux, CD, Microphone in, Tuner, USB device
- USB / SD card recording modes: Delete, Instant record, Programmed tracks, Schedule radio program, Single disc, Single track

Tuner/Reception/Transmission

- Auto digital tuning
- Station presets: 40
- Tuner Bands: FM, MW
- Tuner Enhancements: Auto Store, Easy Set (Plug &

Play)

Connectivity

- Audio Connections: RCA Aux in, 3.5mm stereo line in -MP3 link
- USB: USB host
- Microphone: Dual Microphone sockets
- Other connections: FM Antenna, MW Antenna

Convenience

- Alarms: CD Alarm, Radio Alarm, USB alarm, Sleep timer
- Clock: On main display
- Display Type: FTD
- Karaoke: MIC volume, Echo control

Accessories

- Remote control: 36-key with 2xAAA batteries
- User Manual: Spanish, B-Portuguese
- Guarantee booklet: Global version
- Included accessories: FM/MW Antenna, Batteries for remote control, *Flat pin adaptor
- Quick start guide: Spanish, B-Portuguese
- Cables: MP3 Line in cable

Dimensions

- Set dimensions (W x H x D): 265 x 359 x 353 mm
- Main speaker dimensions (W x H x D): 263 x 447 x 360 mm
- Subwoofer dimensions (W x H x D): 337 x 491 x 360 mm
- Surround Speaker dimensions (W x H x D): 208 x 359 x 301 mm
- Weight incl. Packaging: 51.57 kg
- Packaging dimensions (W x H x D): 1085 x 562 x 786 mm

Power

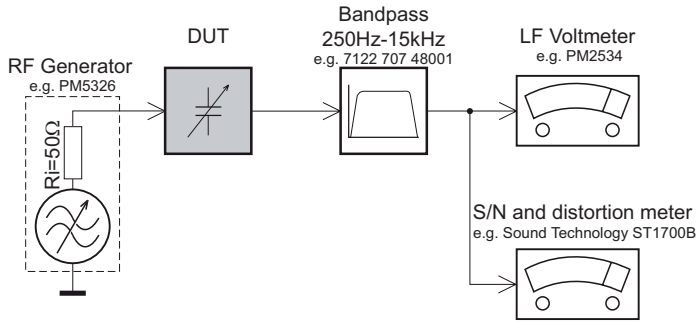
- Power supply: 100-240VAC, 50/60Hz

VERSION VARIATION

Type /Versions:	FWM998										
	Service policy		/55	/00			/BK	/93	/94		/98
Board in used:											
USB BOARD	C/M					C/M					
MAIN BOARD	C/M					C/M					
AMP BOARD	C					C/M					
DISPLAY BOARD	C/M					C/M					
CD BOARD	C/M					C/M					
MCU BOARD	C/M					C/M					
SD BOARD	C/M					C/M					
Type /Versions:	FWM998										
Features	Feature difference		/55	/00	/77	/BK	/93	/94		/98	
RDS											
VOLTAGE SELECTOR											
ECO STANDBY - DARK											
* TIPS : C -- Component Lever Repair. M -- Module Lever Repair √ -- Used											

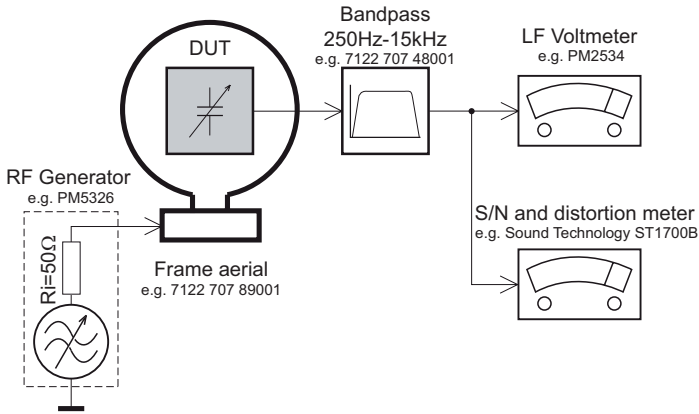
MEASUREMENT SETUP

Tuner FM



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

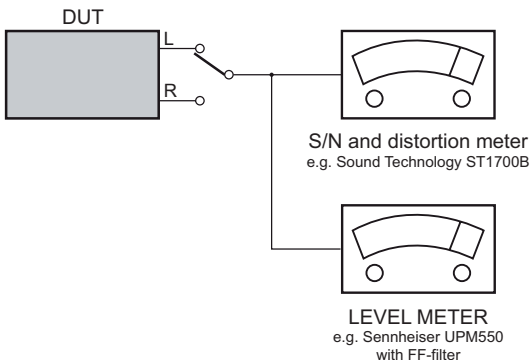
Tuner AM (MW,LW)



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).

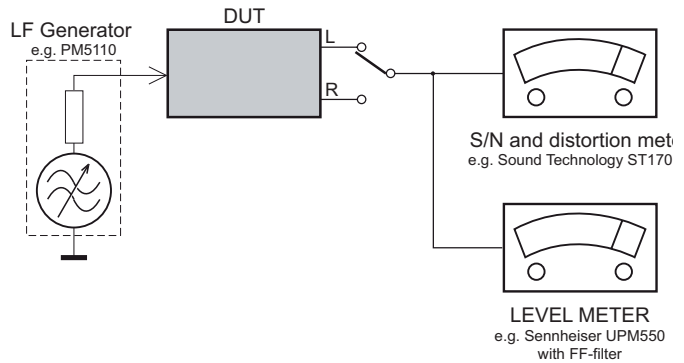
CD

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 Δ .

**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 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".

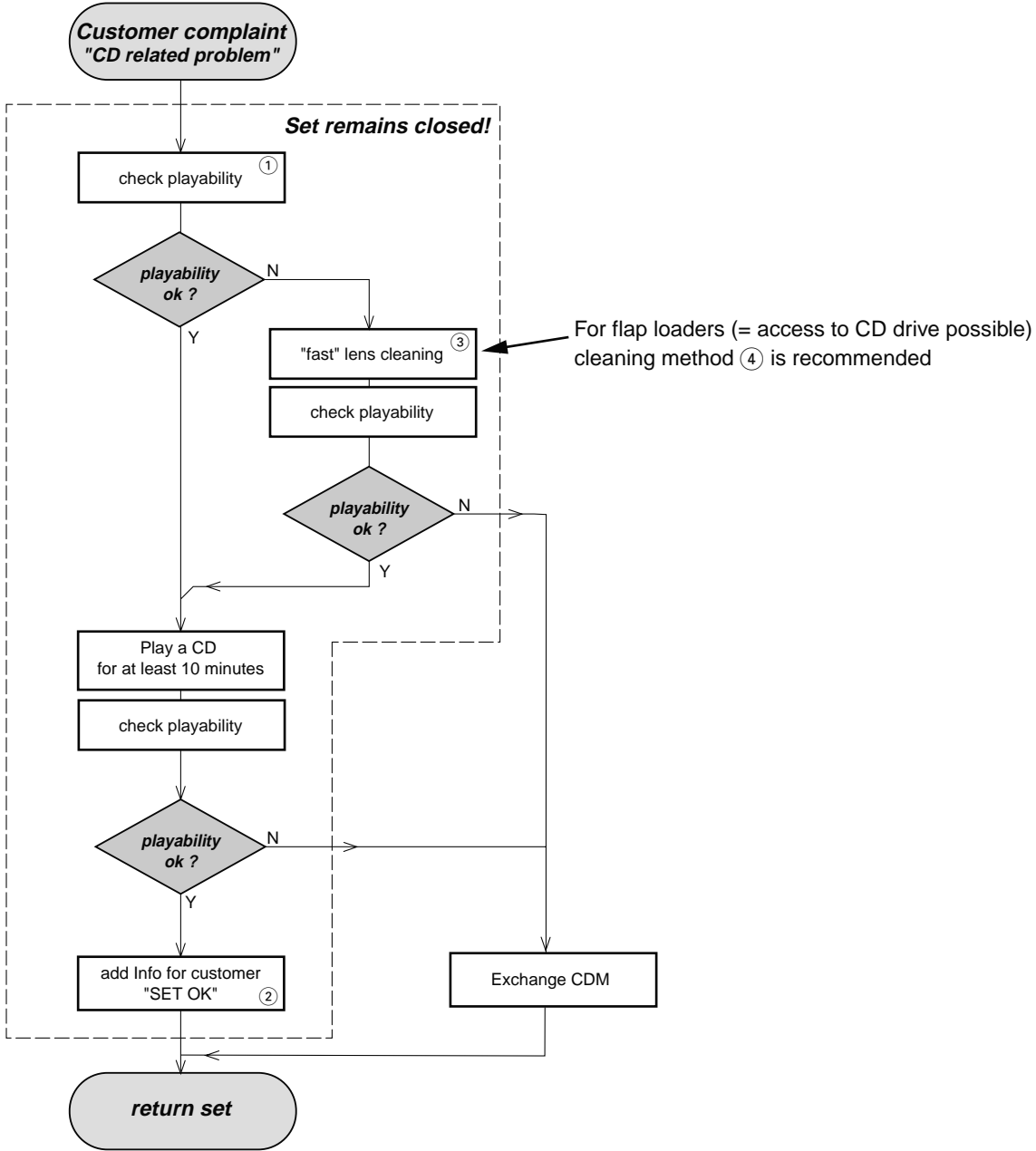
For additional questions please contact your local repair-helpdesk.

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 Disc7104 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 ≥ 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 444A4822 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 ≥ 10 seconds
 Fingerprint ≥ 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

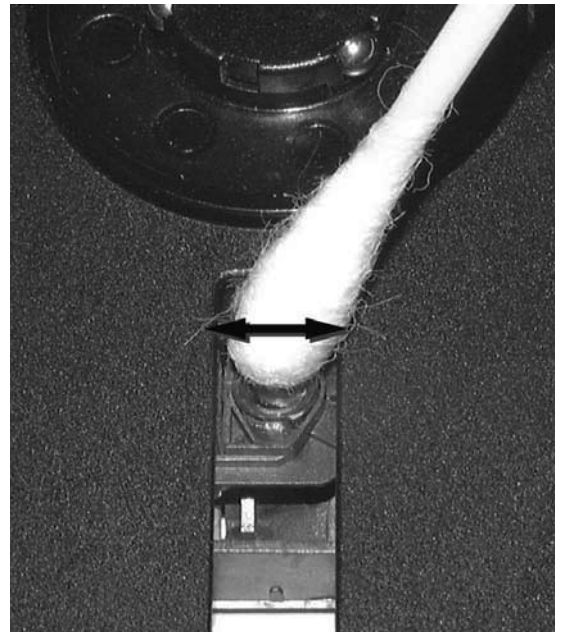
LIQUID LENS CLEANING

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.

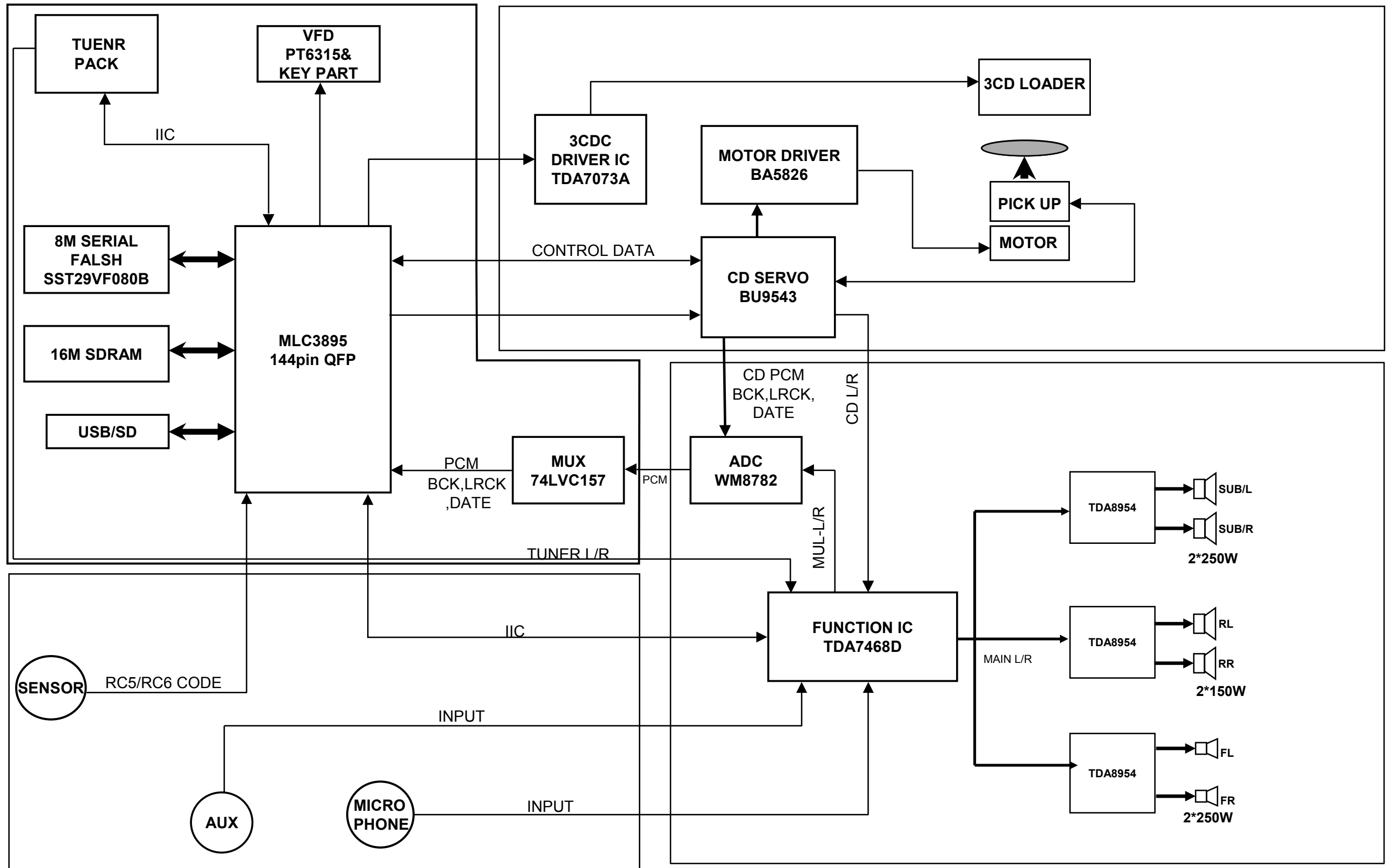
Because the material of the lens is synthetic and coated with a special anti-reflectivity layer, cleaning must be done with a non-aggressive cleaning fluid. It is advised to use "Cleaning Solvent"

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.



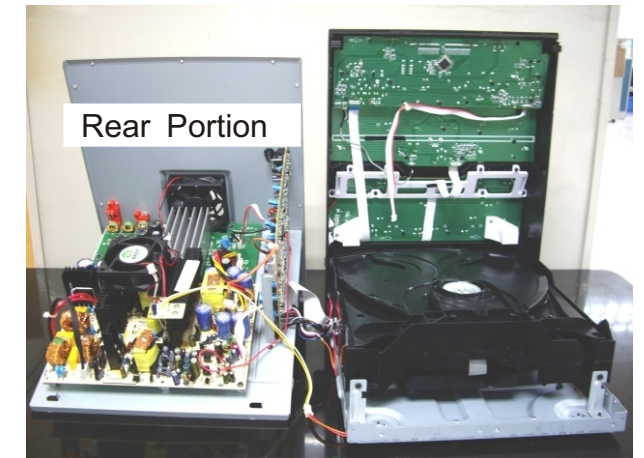
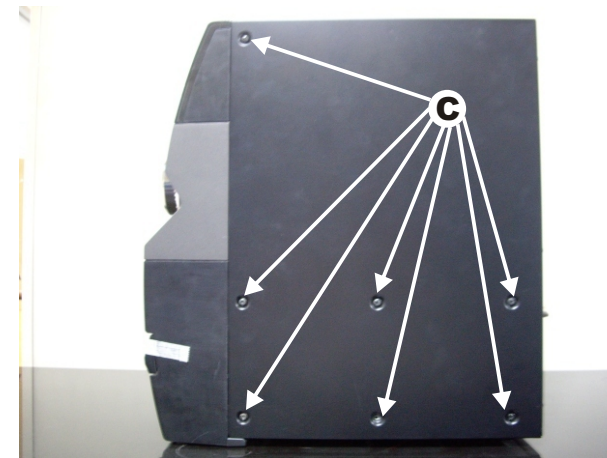
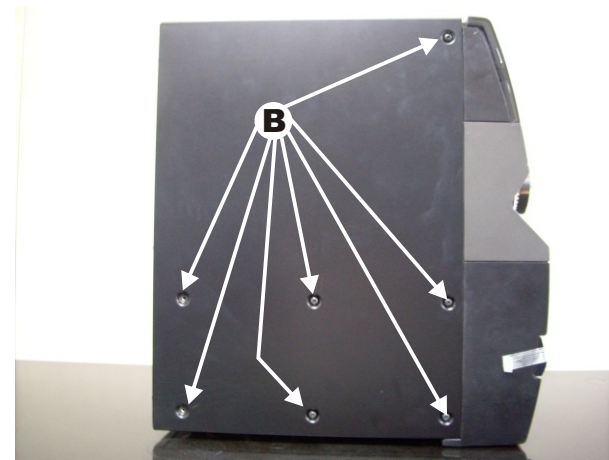
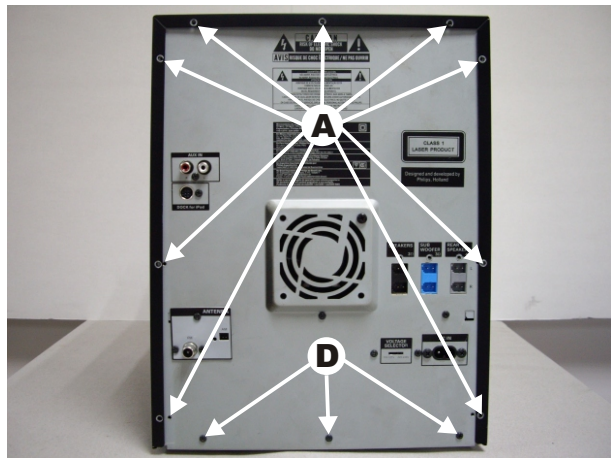
BLOCK DIAGRAM



DISASSEMBLY INSTRUCTIONS

Dismantling of Rear Portion

- 1) Remove 9 screws A and 14 screws B/C as indicated to loosen the outer plate.
- 2) Remove 3 screws D as indicated to loosen the Rear portion .



Dismantling of the CDC Module

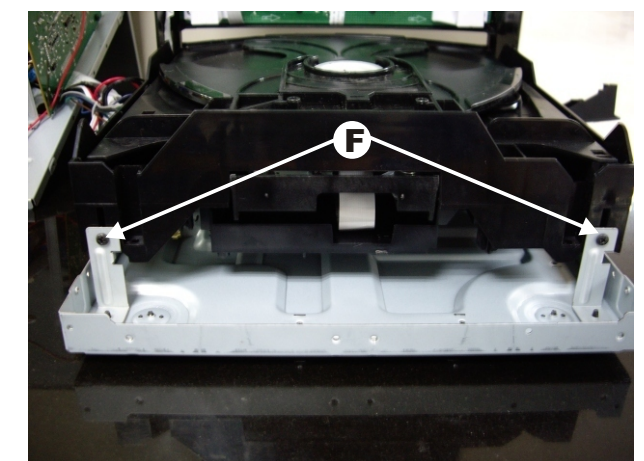
- 1) Slide out the CDC Tray as shown in the diagram below with the help of a flat head screw driver.
- 2) Remove the Cover Tray CDC as indicated.
- 3) Loosen 2 screws E and 2 screws F to remove the CDC Module as indicated.



Sliding Out The CDC Tray

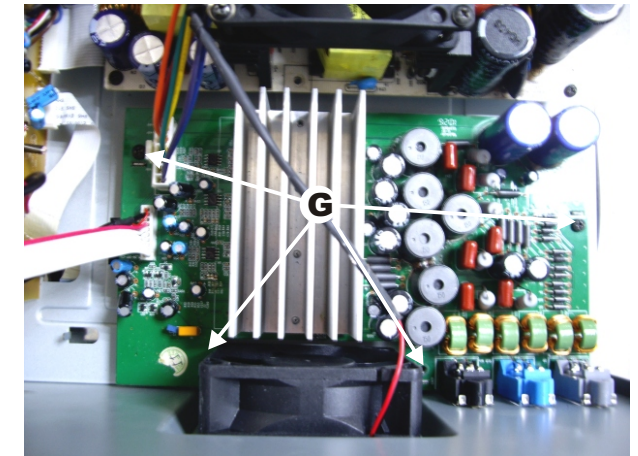
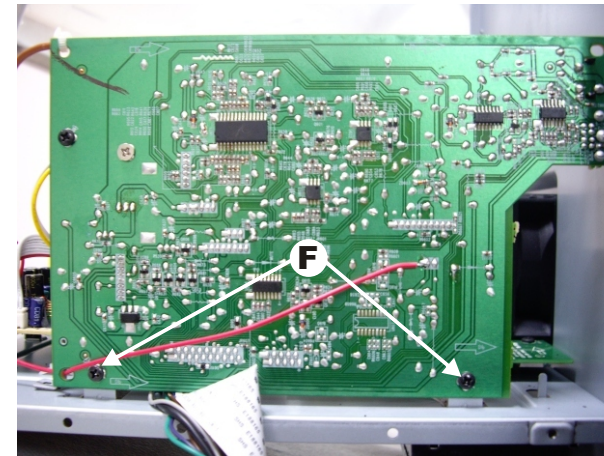
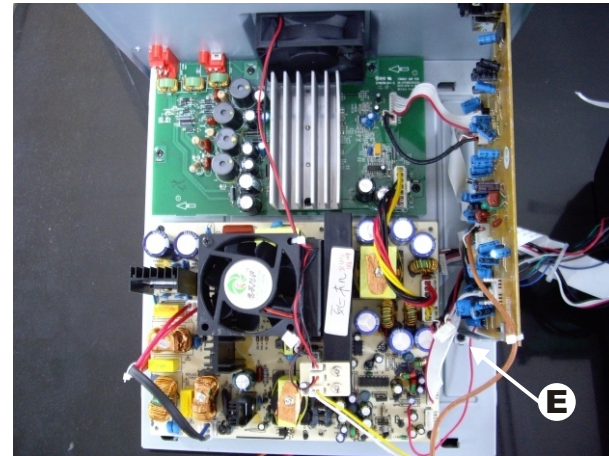
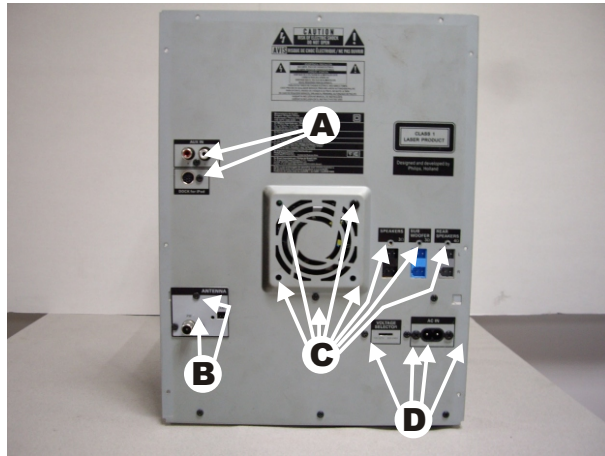


Remove Cover Tray CDC

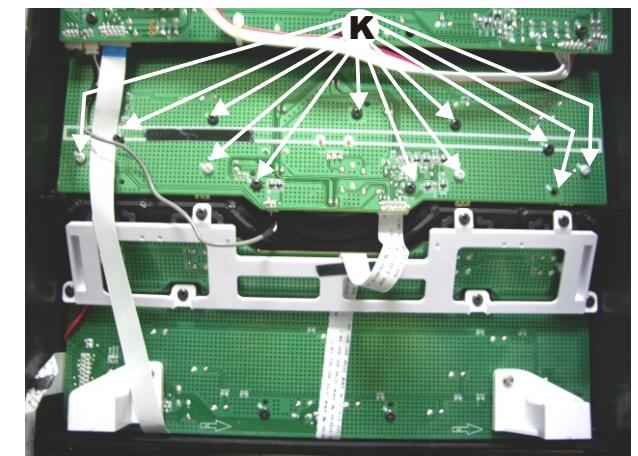
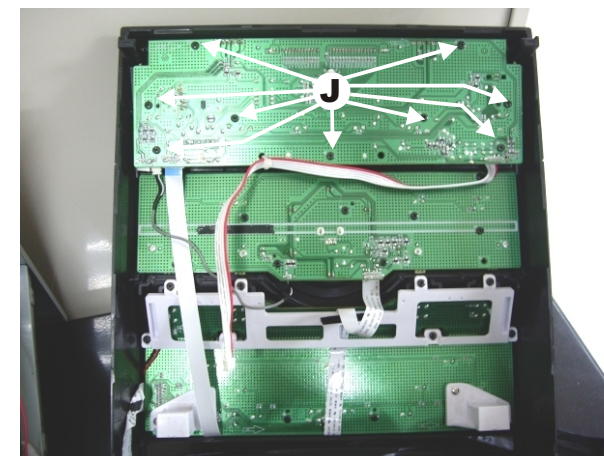
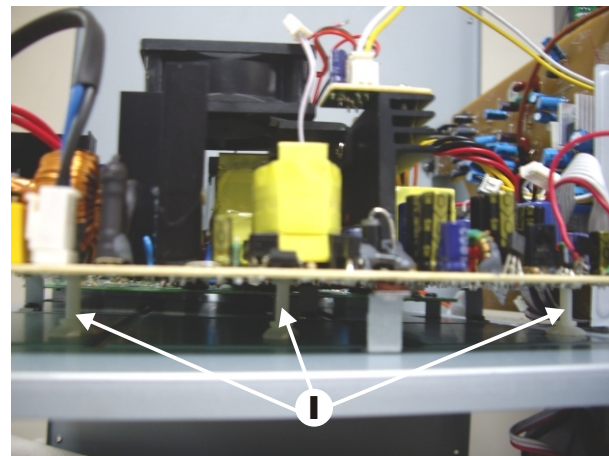
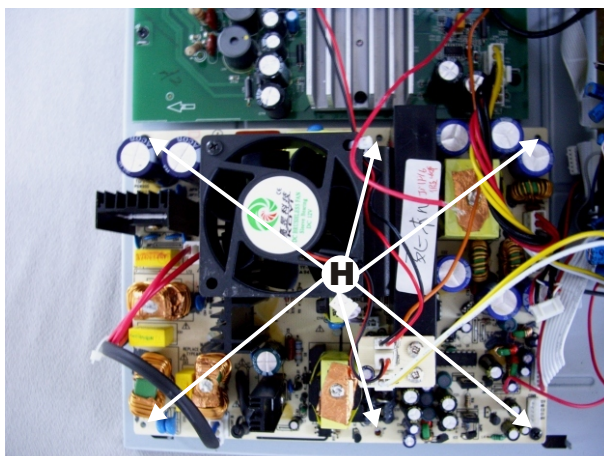


Dismantling of the PCB Board

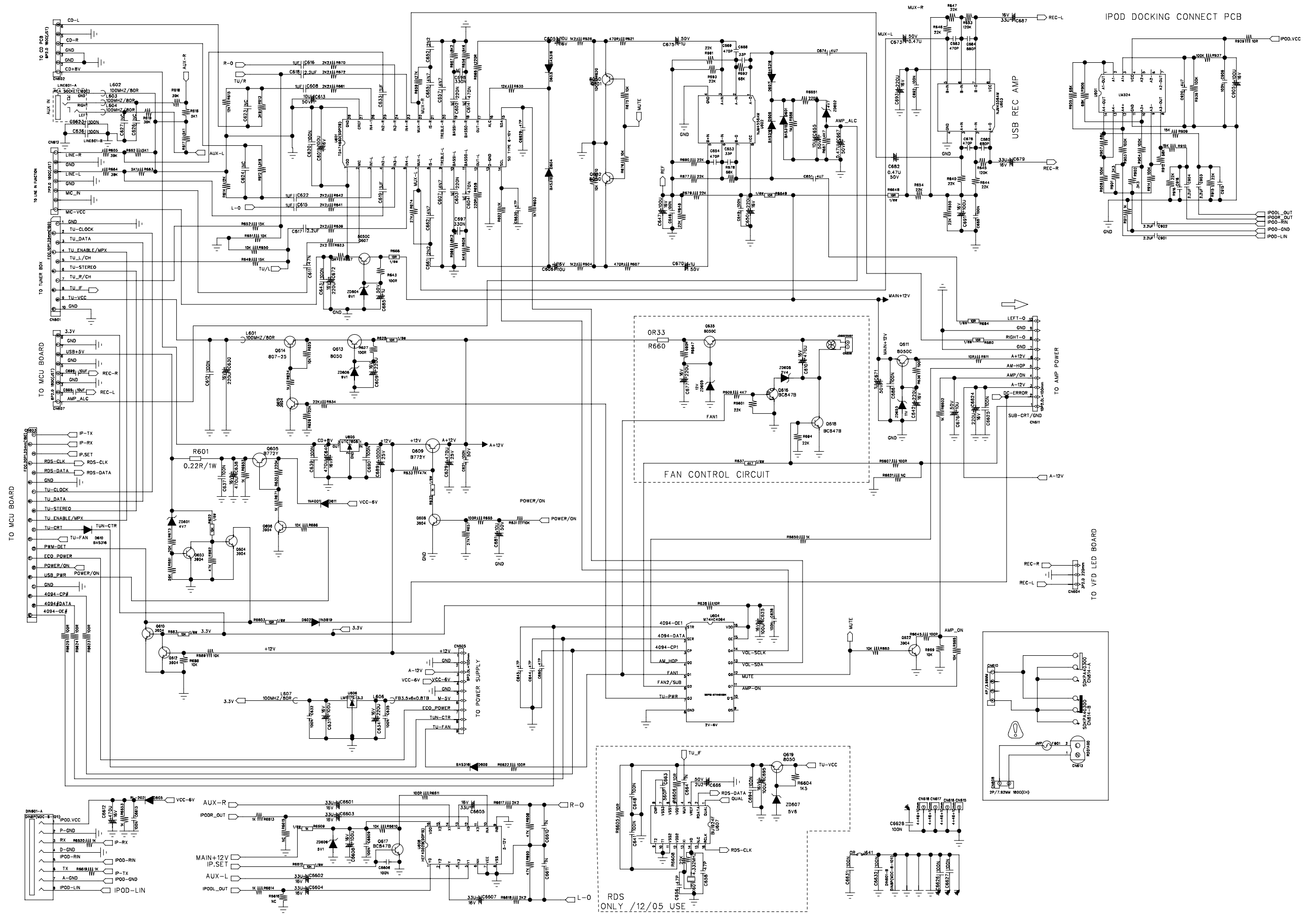
- 1) Remove 2 screws A and 3 screws E&F as indicated to loosen the Main Board.
- 2) Remove 2 screws B as indicated to loosen the Tuner Module.
- 3) Remove 8 screws C and 4 screws G as indicated to loosen the Amp Board.
- 4) Remove 4 screws D as indicated to loosen the AC Board.



- 5) Remove 6 screws H and 3 PCB Spacer I as indicated to loosen the Switch Power Board.
- 6) Remove 9 screws J as indicated to loosen the Display Board.
- 7) Remove 12 screws K as indicated to loosen the Volume Board.

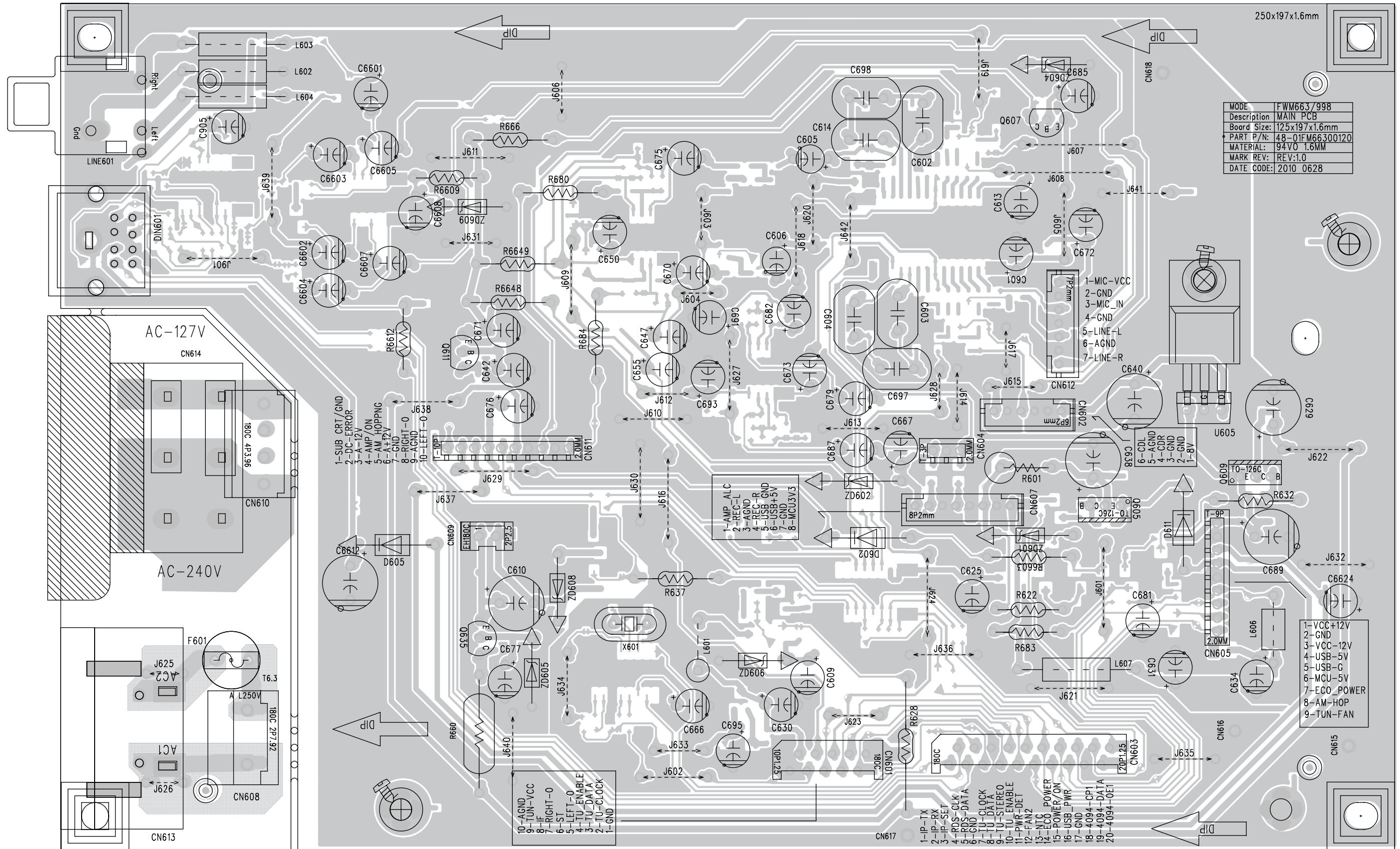


CIRCUIT DIAGRAM - MAIN BOARD



RDS ONLY / 12/05 USE

PCB LAYOUT - MAIN BOARD TOP SIDE



MODE	FWM663/998
Description	MAIN PCB
Board Size	125x197x1.6mm
PART P/N	48-01FM66300120
MATERIAL	94VO 1.6MM
MARK REV	REV:1.0
DATE CODE	2010 0628

- 1-VCC+12V
- 2-GND
- 3-VCC-12V
- 4-USB-5V
- 5-USB-G
- 6-MCU-5V
- 7-ECO_POWER
- 8-AM-HOP
- 9-TUN-FAN

- 10-AGND
- 9-TUN-VCC
- 8-TUN-FAN
- 7-RIGHT-0
- 6-ST
- 5-LEFT-0
- 4-TU-ENABLE
- 3-TU-DATA
- 2-TU-CLOCK
- 1-GND

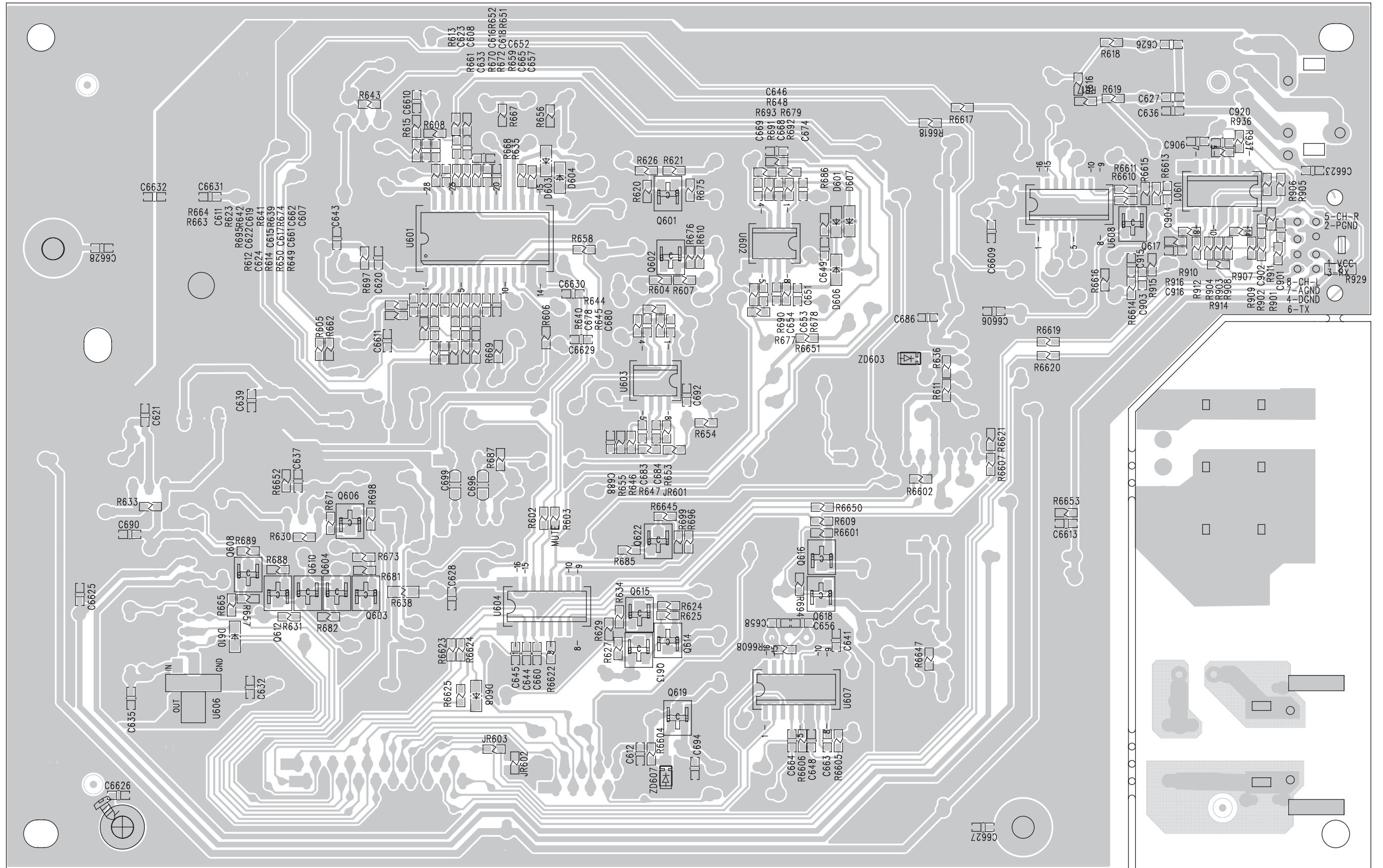
- 1-IP-TX
- 2-IP-RX
- 3-IP-SET
- 4-RDS-CLK
- 5-RDS-DATA
- 6-GND
- 7-TU-CLOCK
- 8-TU-DATA
- 9-TU-STEREO
- 10-TU-ENABLE
- 11-PWR-DET
- 12-FANZ
- 13-NTC
- 14-ECO_POWER
- 15-POWER/ON
- 16-USB_PWR
- 17-GND
- 18-4094-CP1
- 19-4094-DATA
- 20-4094-OE1

- 1-SUB CRT/GND
- 2-DC-ERROR
- 3-A-12V
- 4-AMP/ON
- 5-AM-HOPPING
- 6-A+12V
- 7-GND
- 8-RIGHT-0
- 9-AGND
- 10-LEFT-0

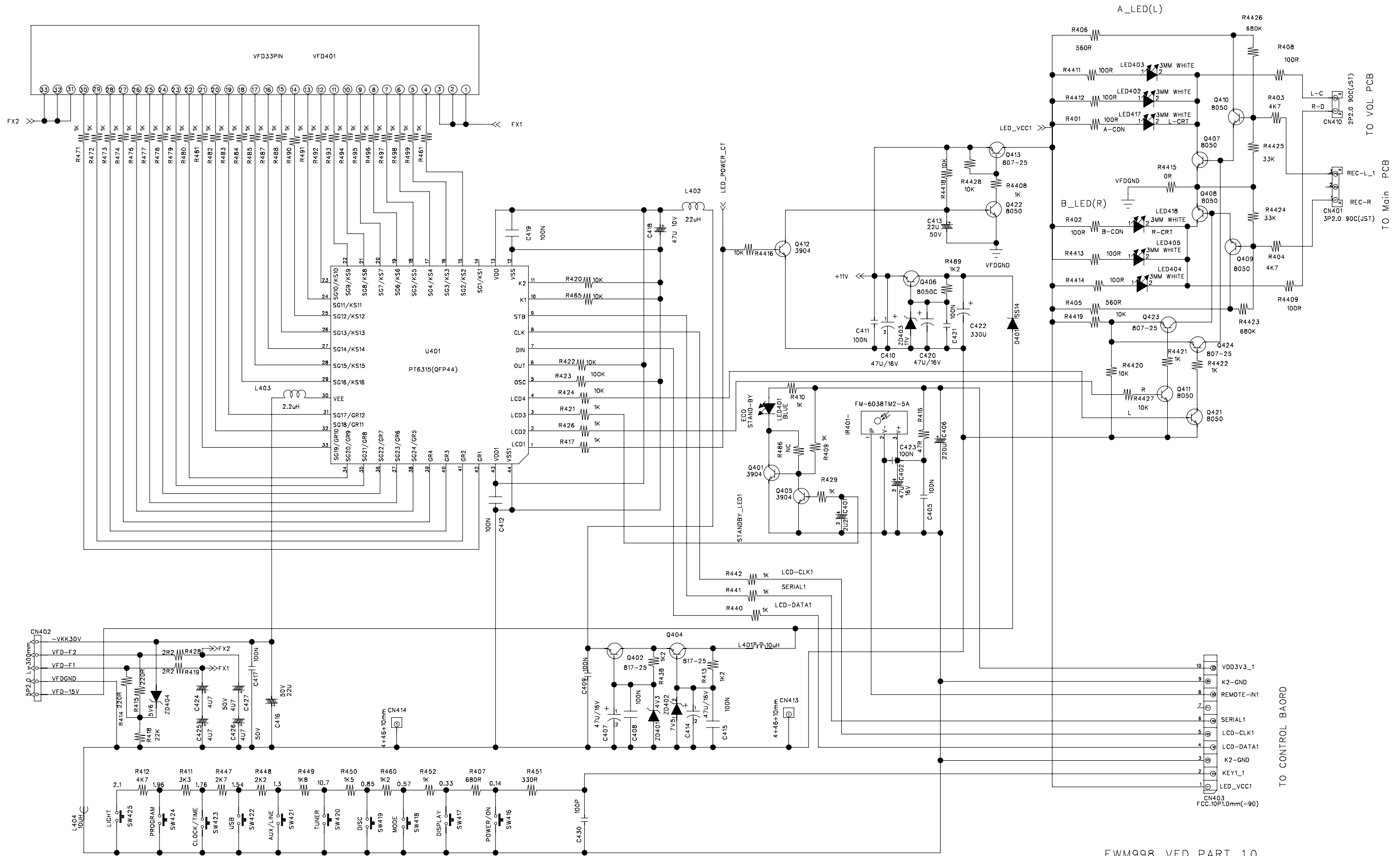
- 1-MIC-VCC
- 2-GND
- 3-MIC_IN
- 4-GND
- 5-LINE-L
- 6-AGND
- 7-LINE-R

- 6-CDL
- 5-AGND
- 4-CDR
- 3-GND
- 2-8V

PCB LAYOUT - MAIN BOARD
BOTTOM SIDE

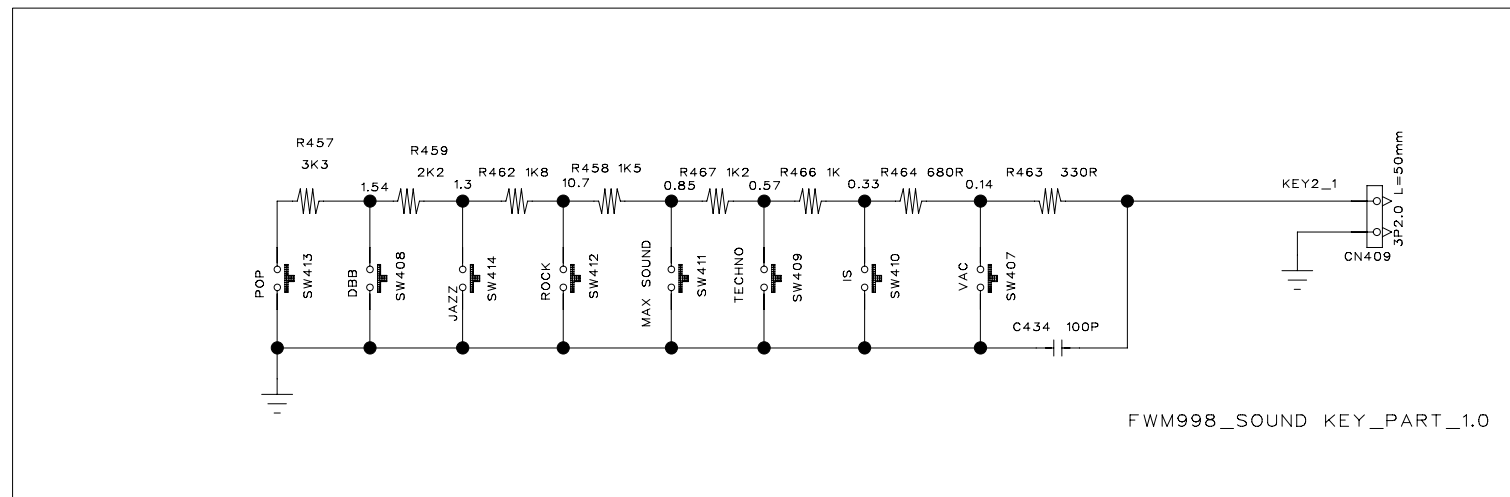
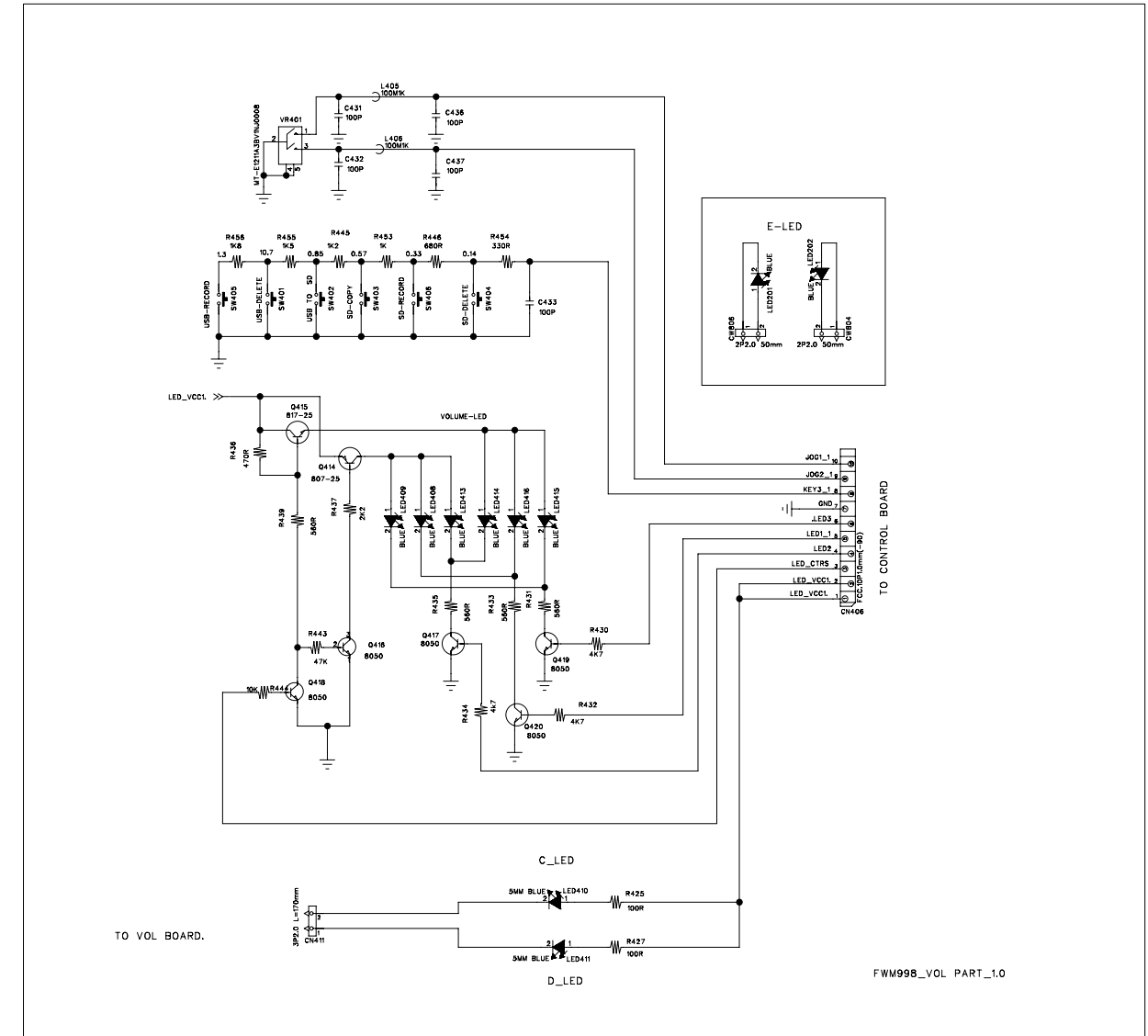
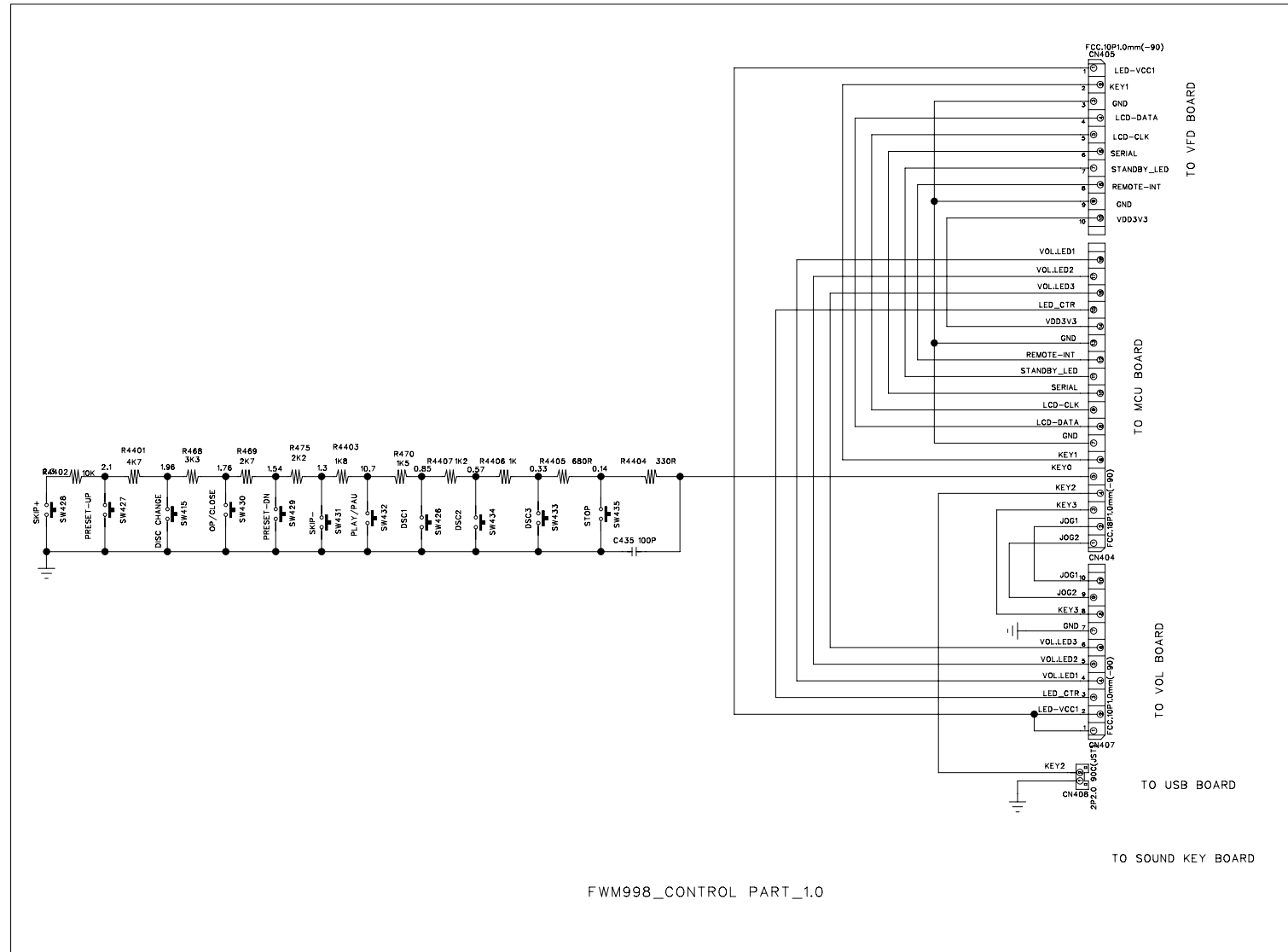


CIRCUIT DIAGRAM - DISPLAY BOARD PART1

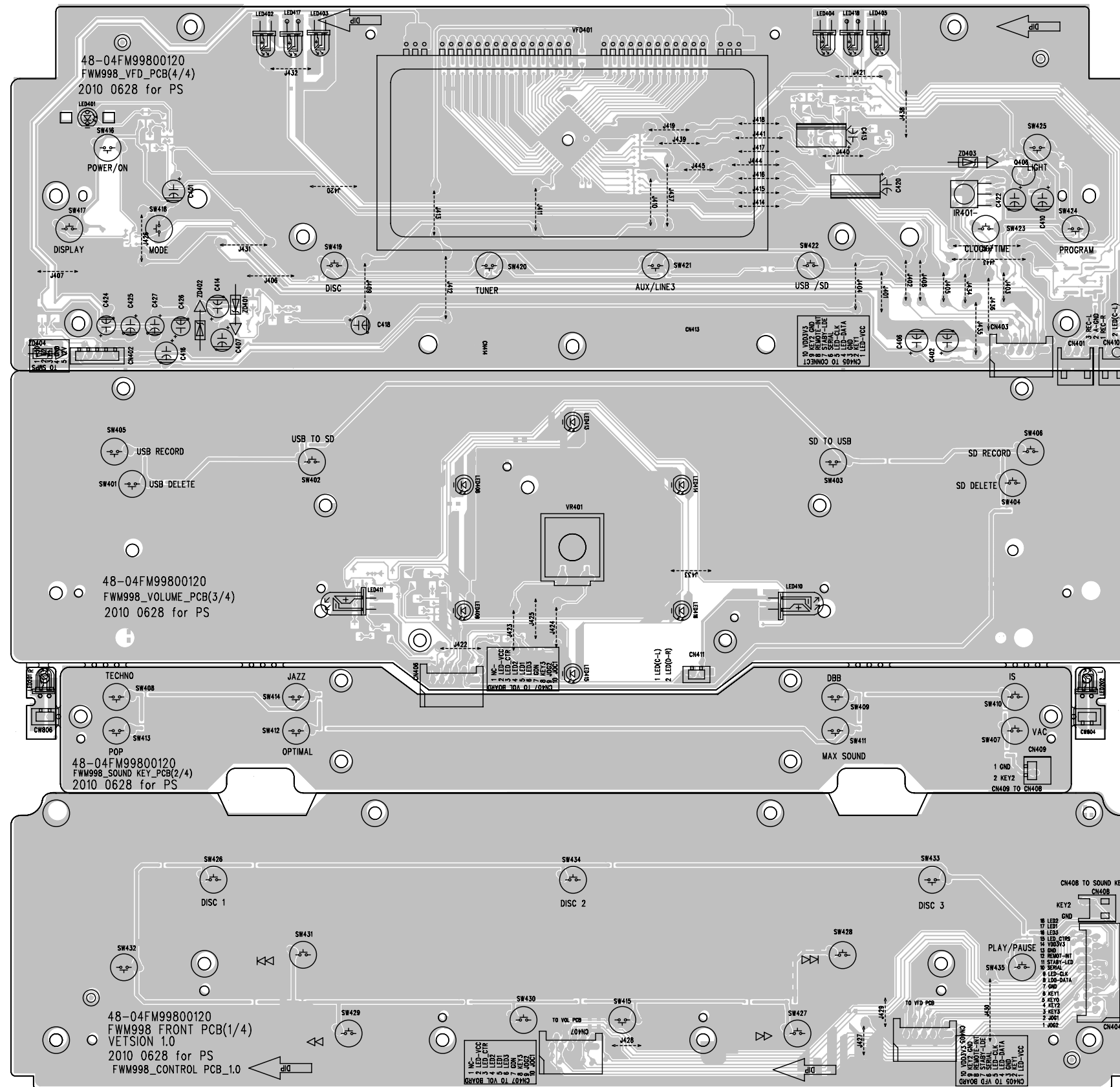


FWM998_VFD PART_1.0

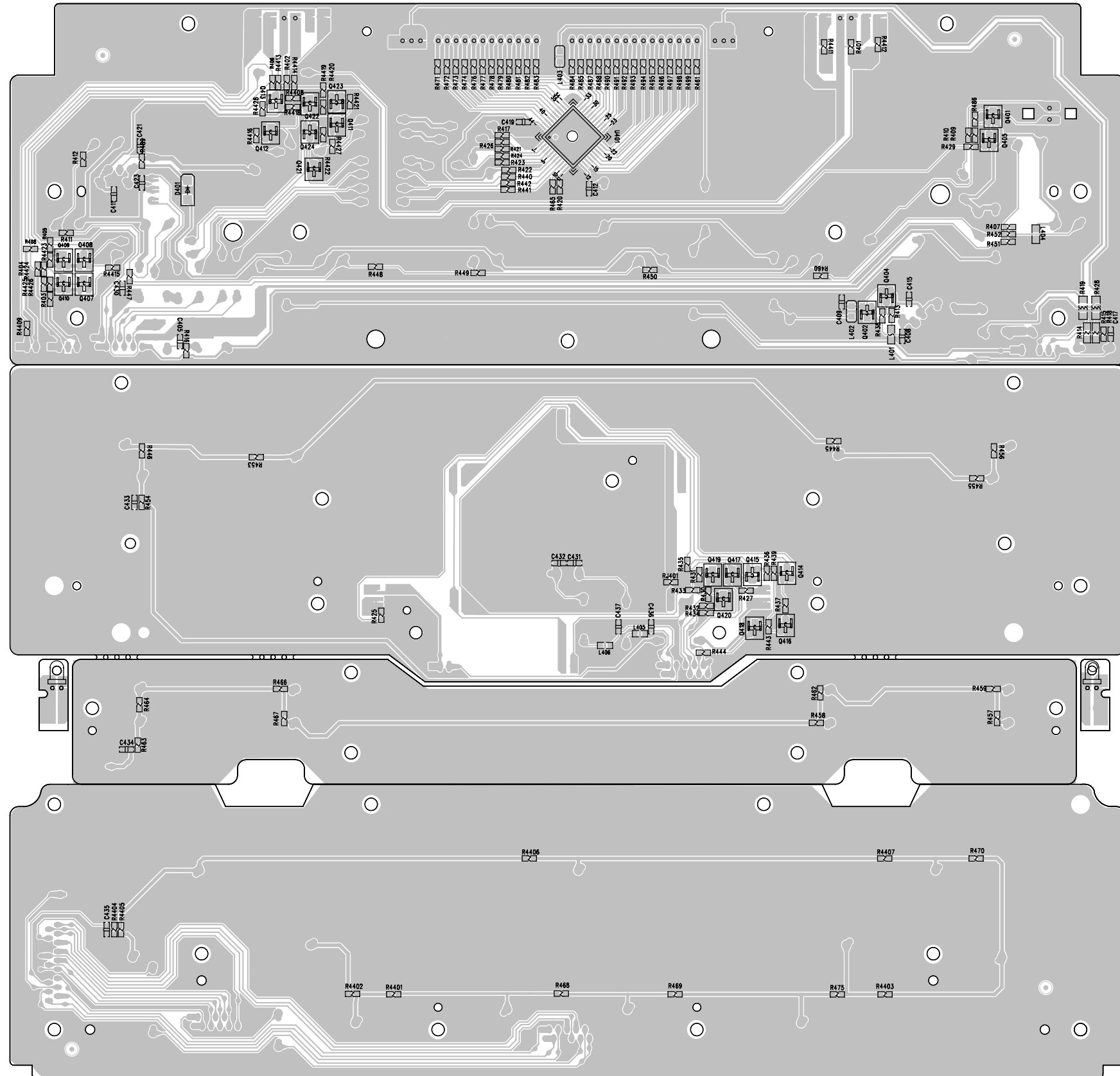
CIRCUIT DIAGRAM - DISPLAY BOARD PART2



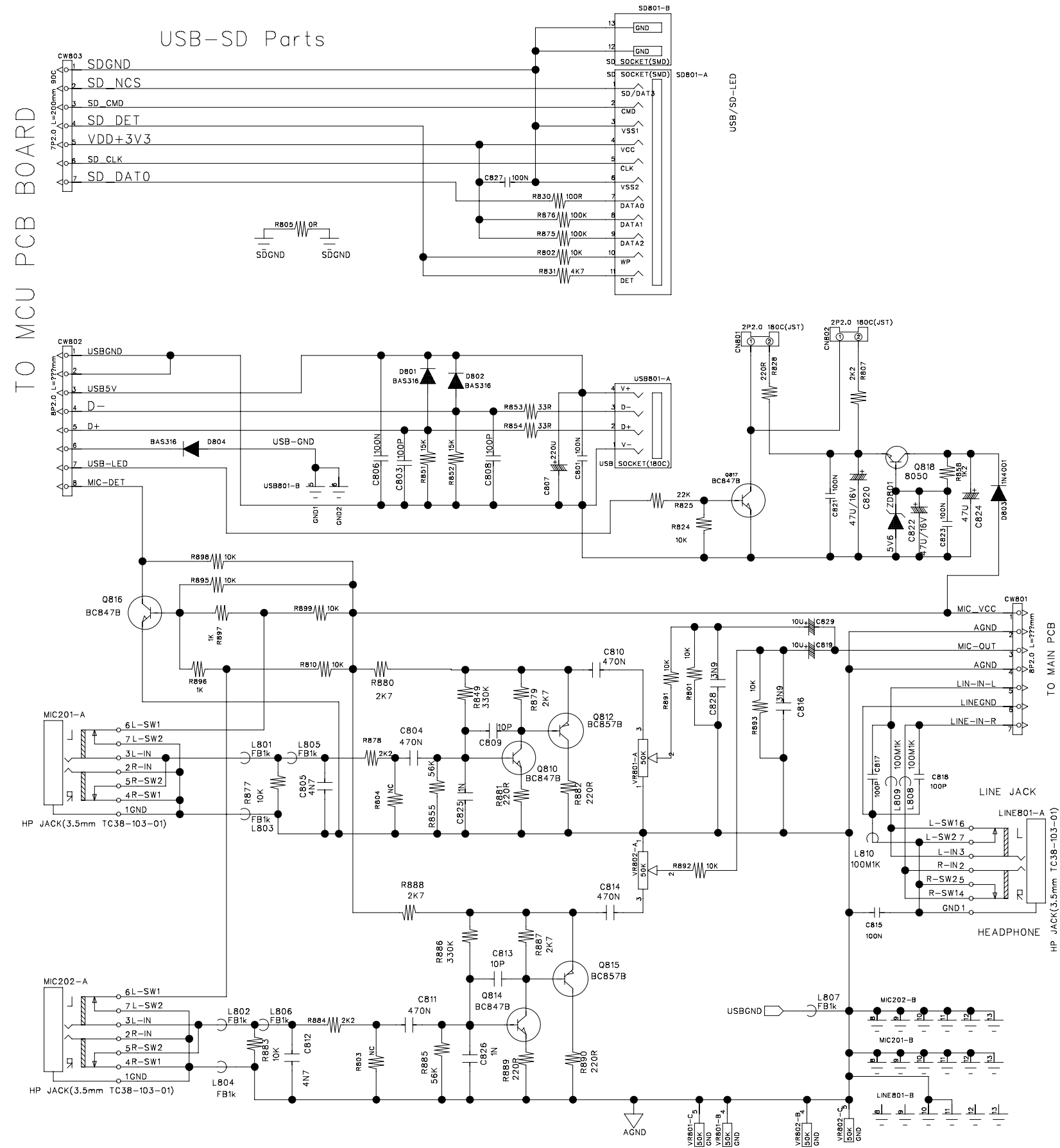
PCB LAYOUT - DISPLAY BOARD TOP SIDE



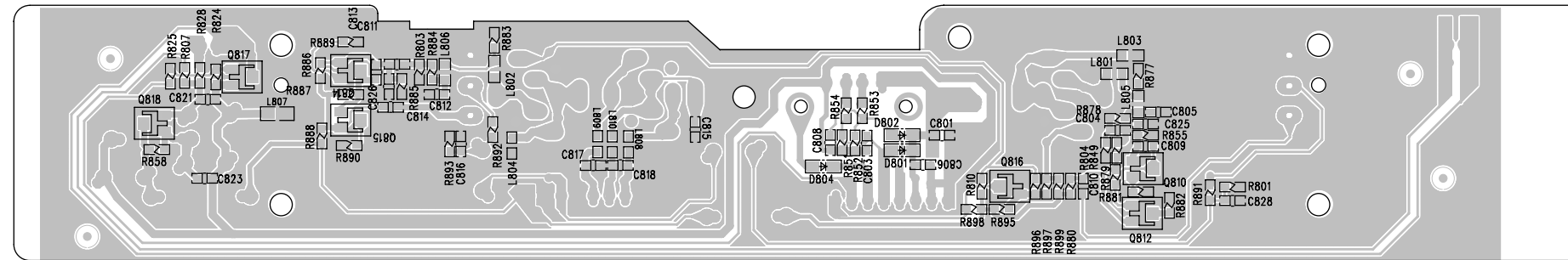
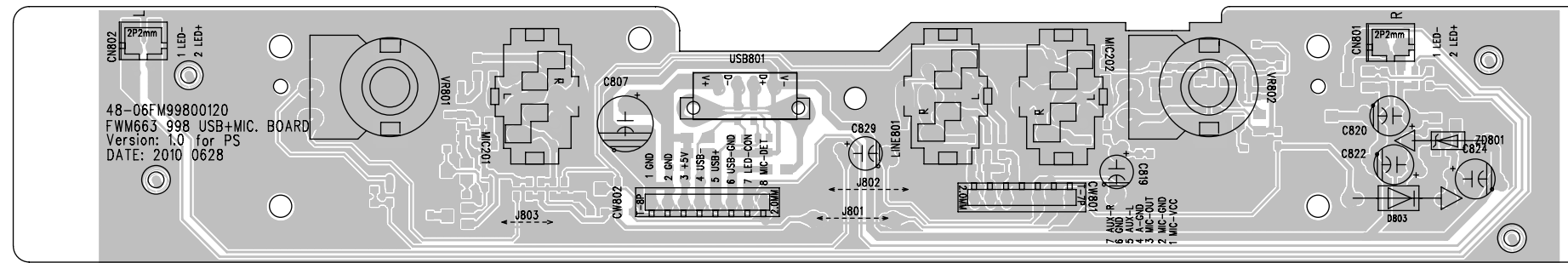
PCB LAYOUT - DISPLAY BOARD
BOTTOM SIDE



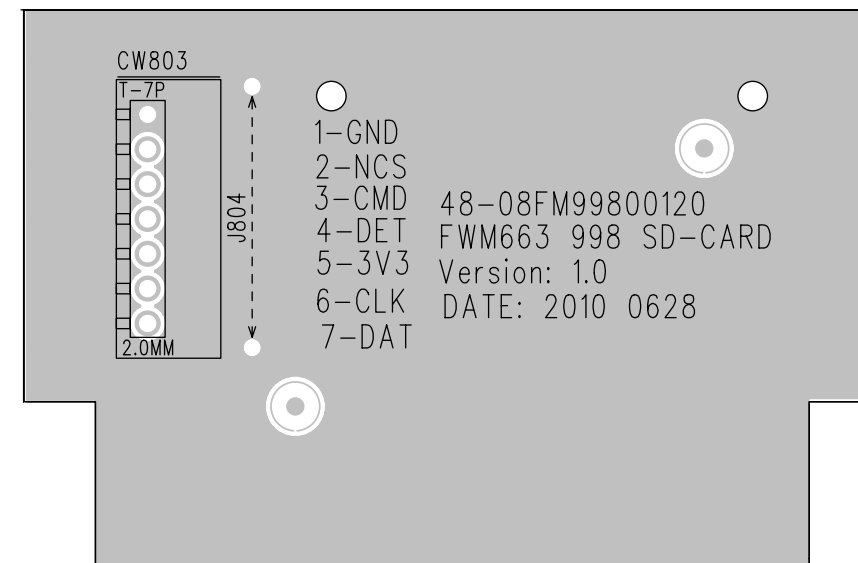
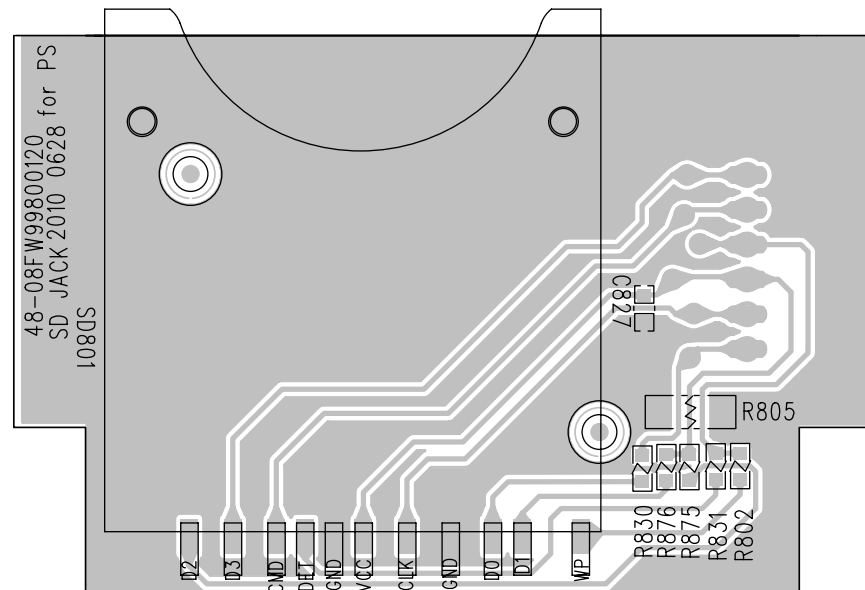
CIRCUIT DIAGRAM - USB/SD BOARD



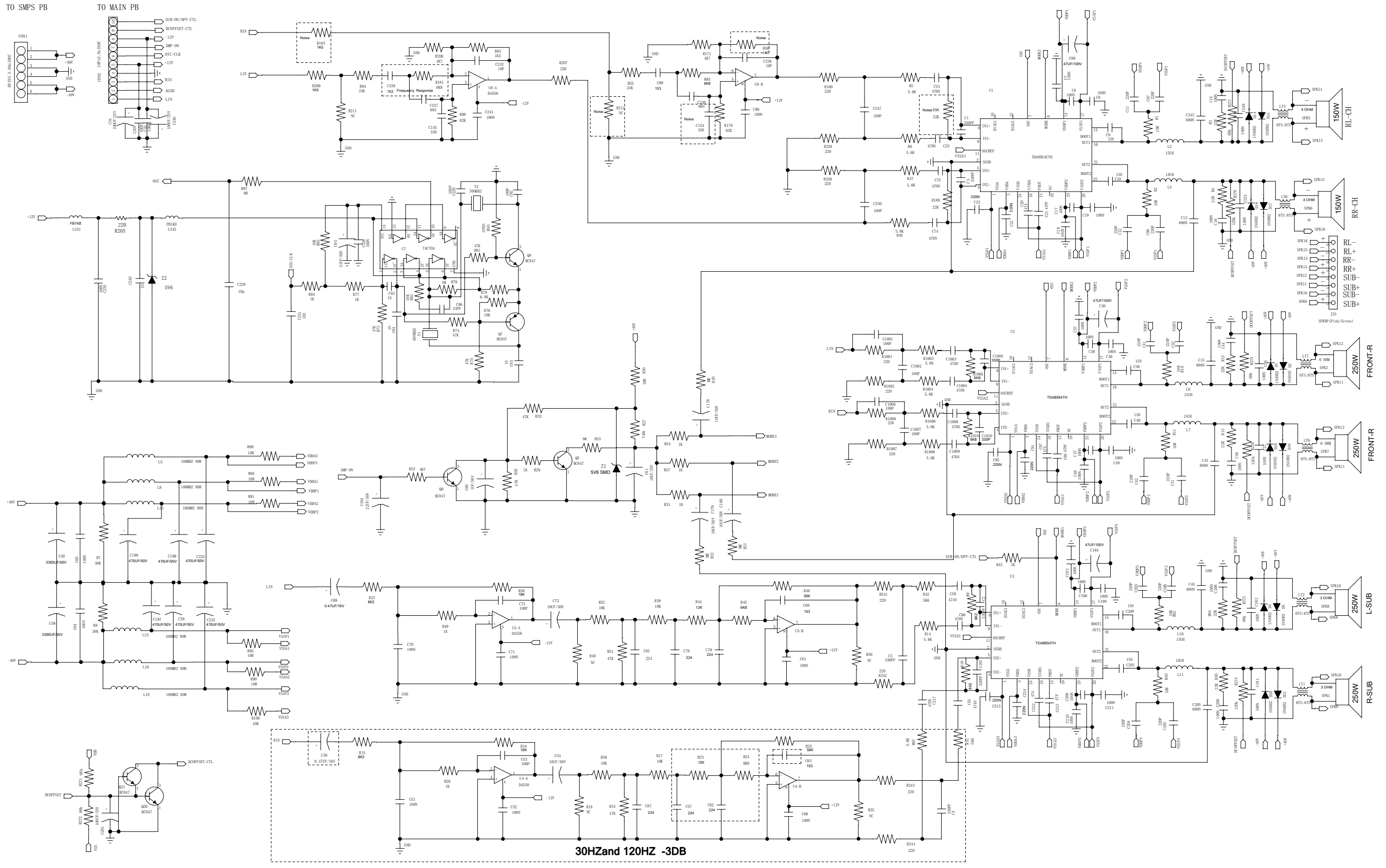
PCB LAYOUT - USB BOARD



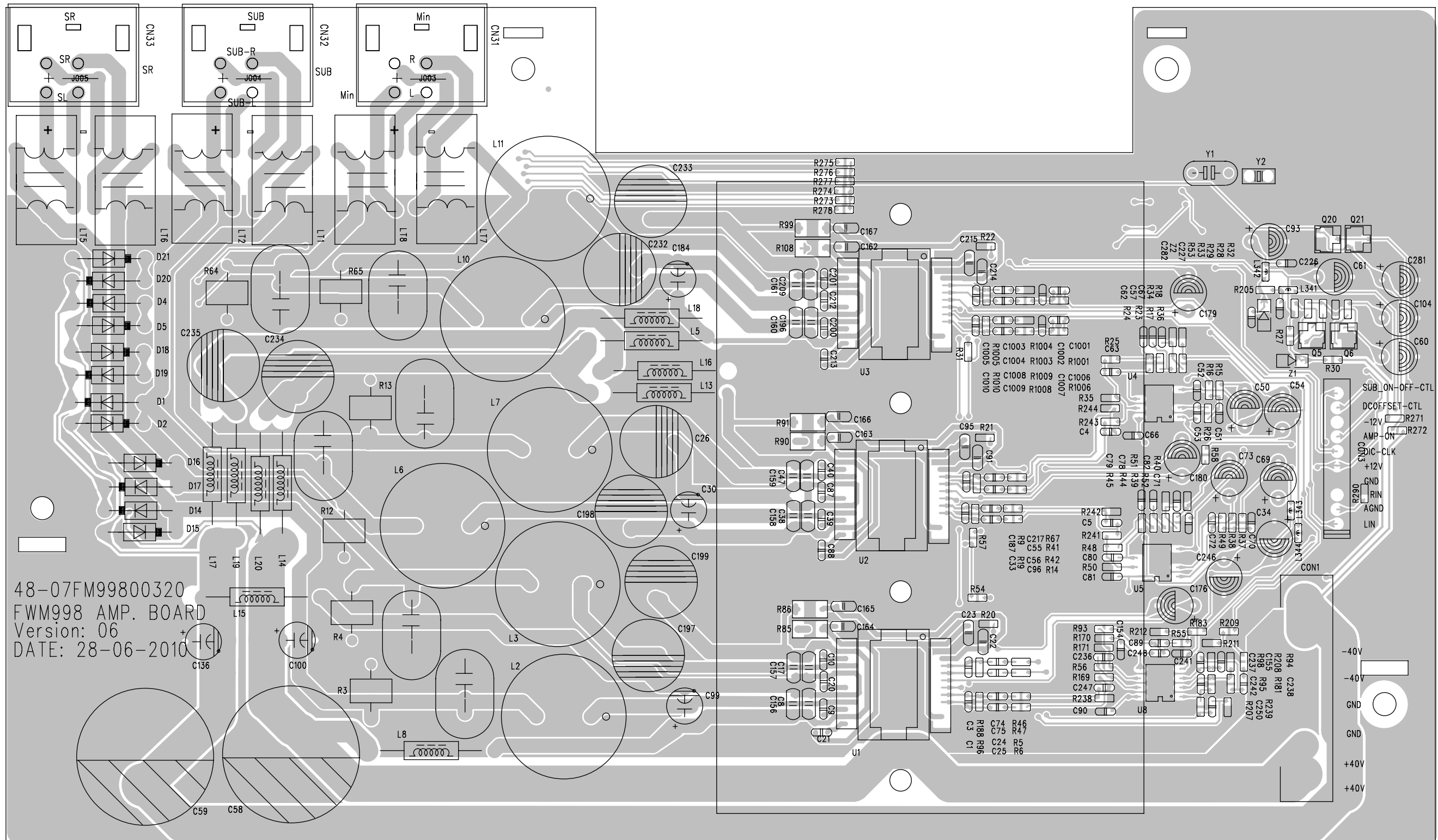
PCB LAYOUT - SD BOARD



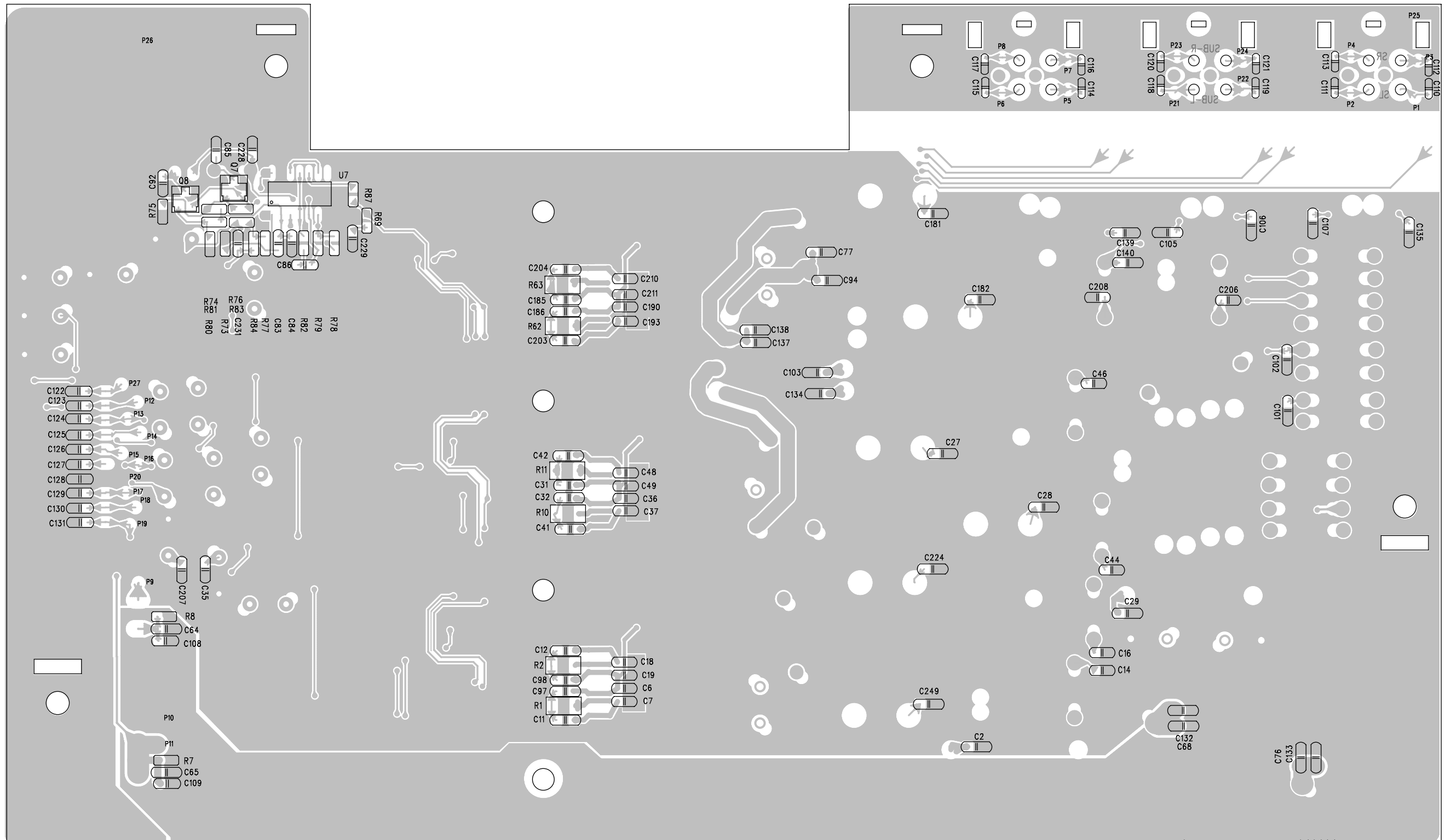
CIRCUIT DIAGRAM - AMP BOARD



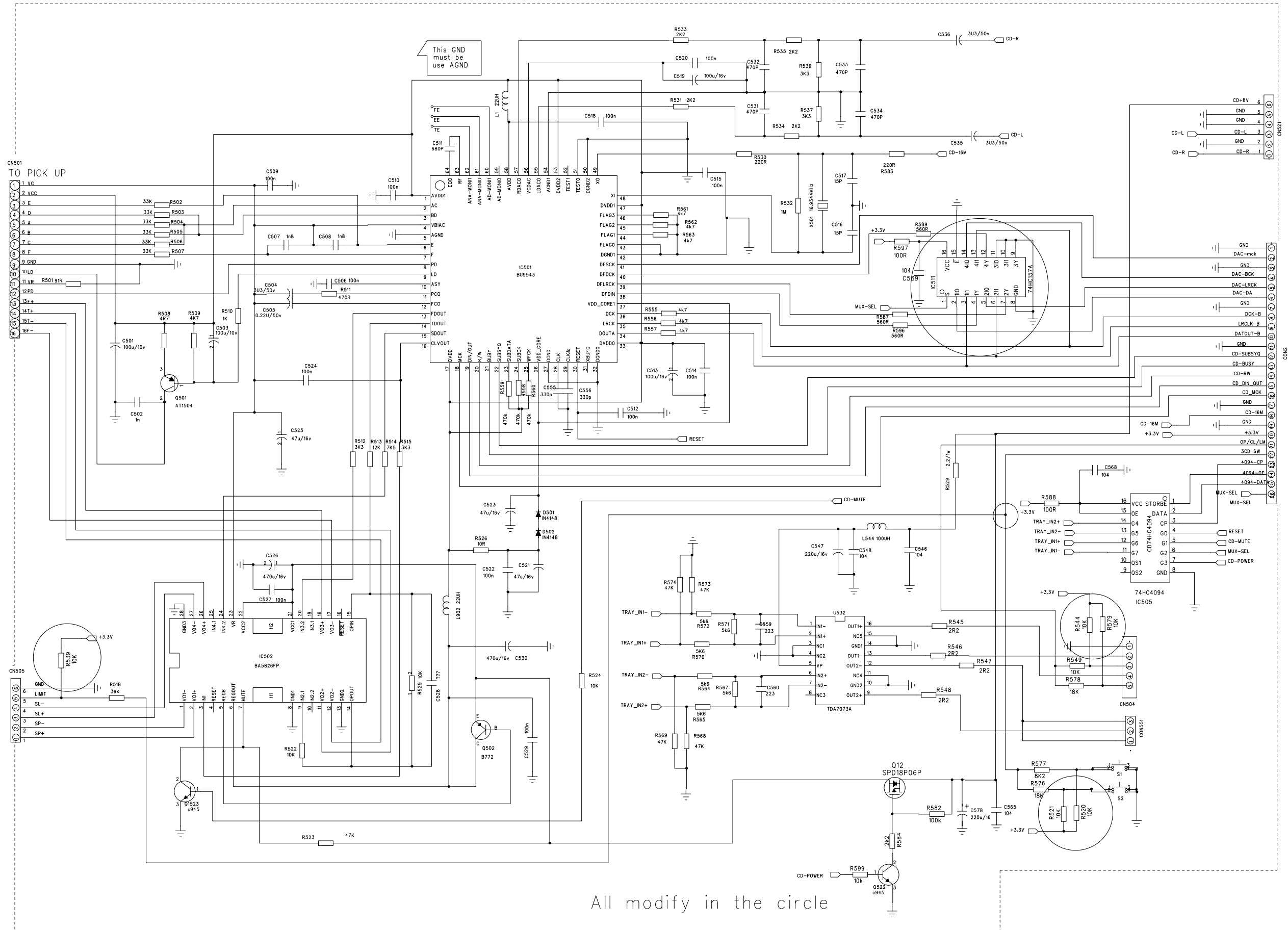
PCB LAYOUT - AMP BOARD TOP SIDE



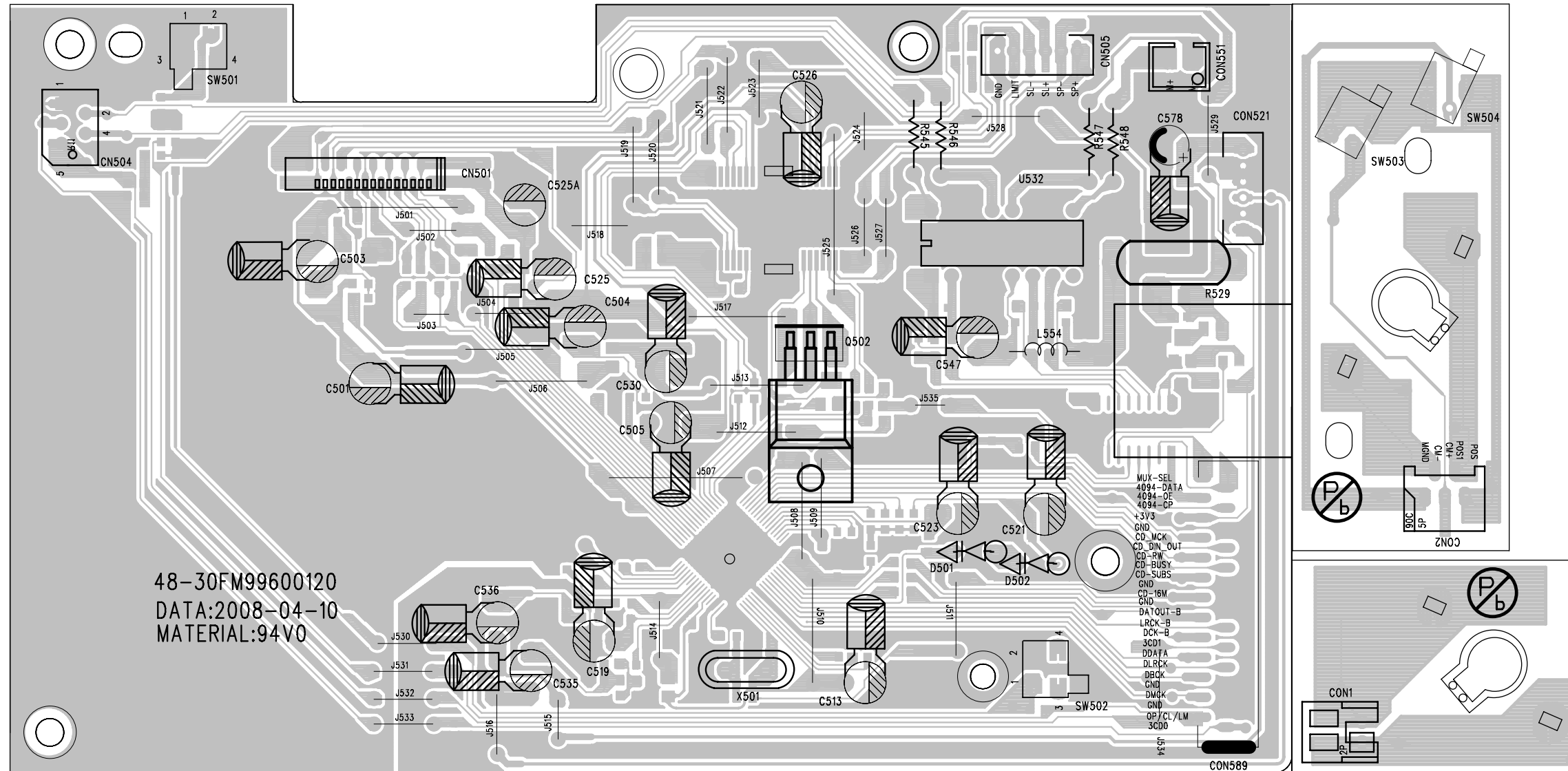
PCB LAYOUT - AMP BOARD BOTTOM SIDE



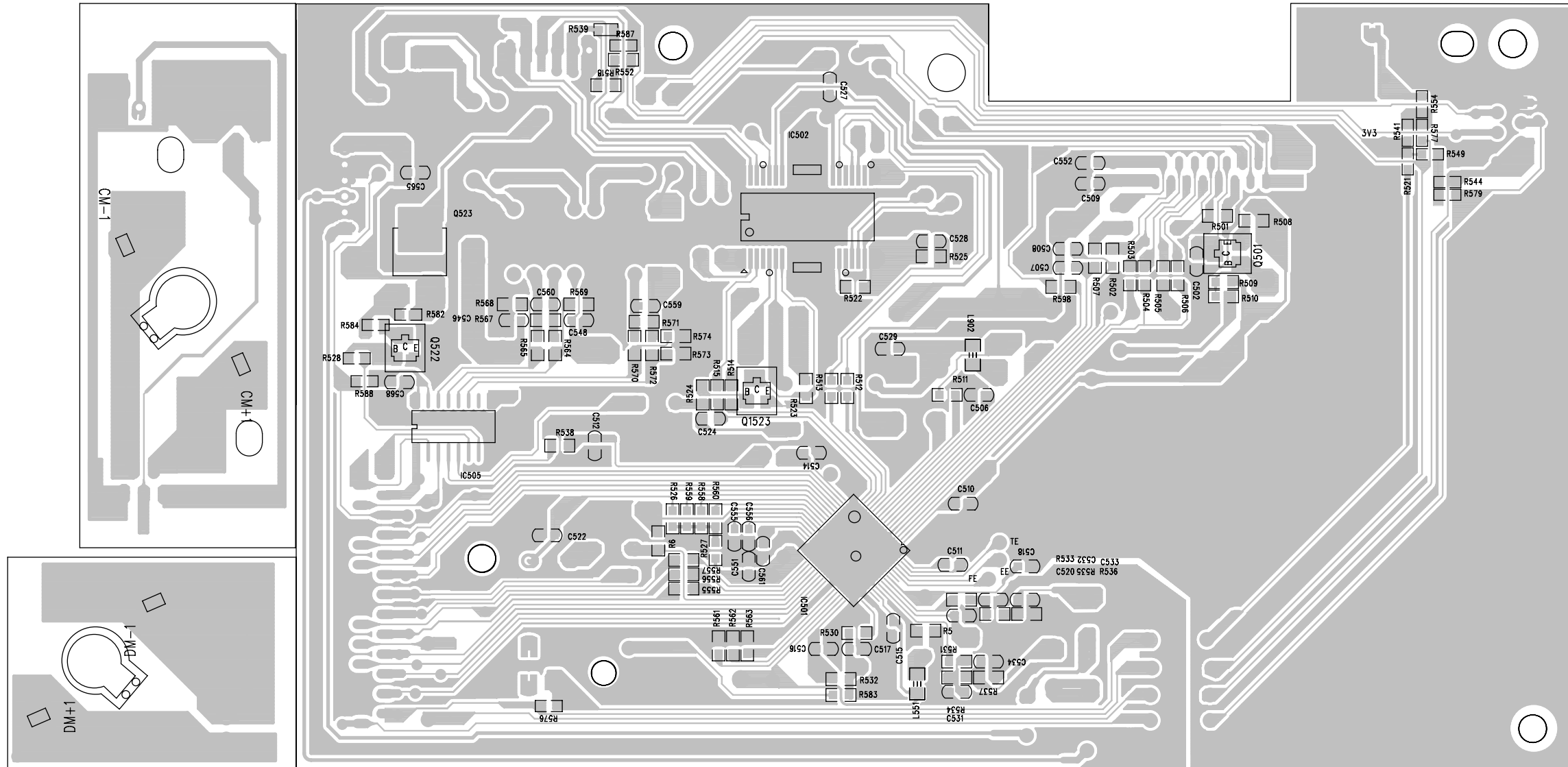
CIRCUIT DIAGRAM-CD BOARD



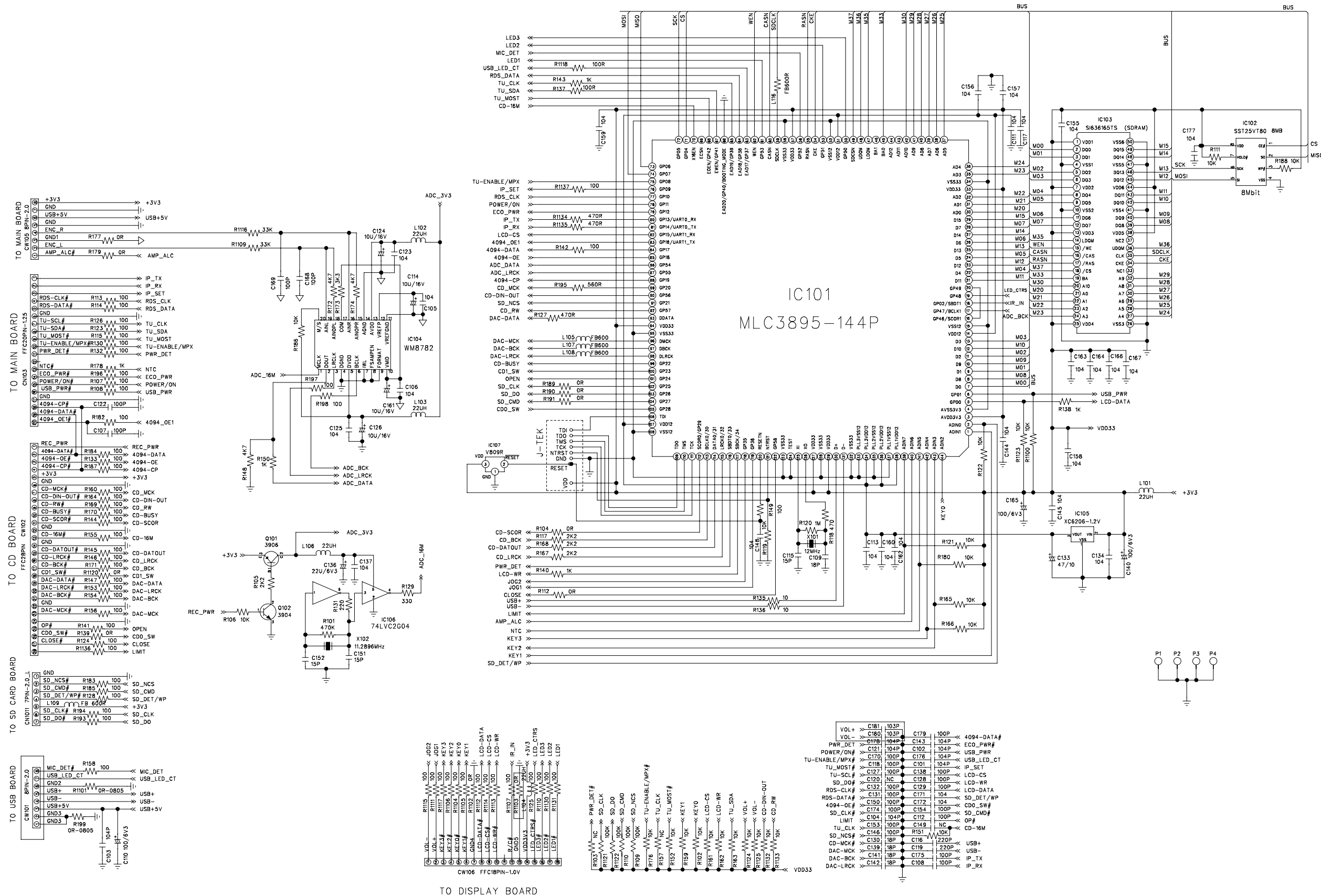
LAYOUT DIAGRAM-CD BOARD
TOP SIDE



LAYOUT DIAGRAM-CD BOARD
BOTTOM SIDE

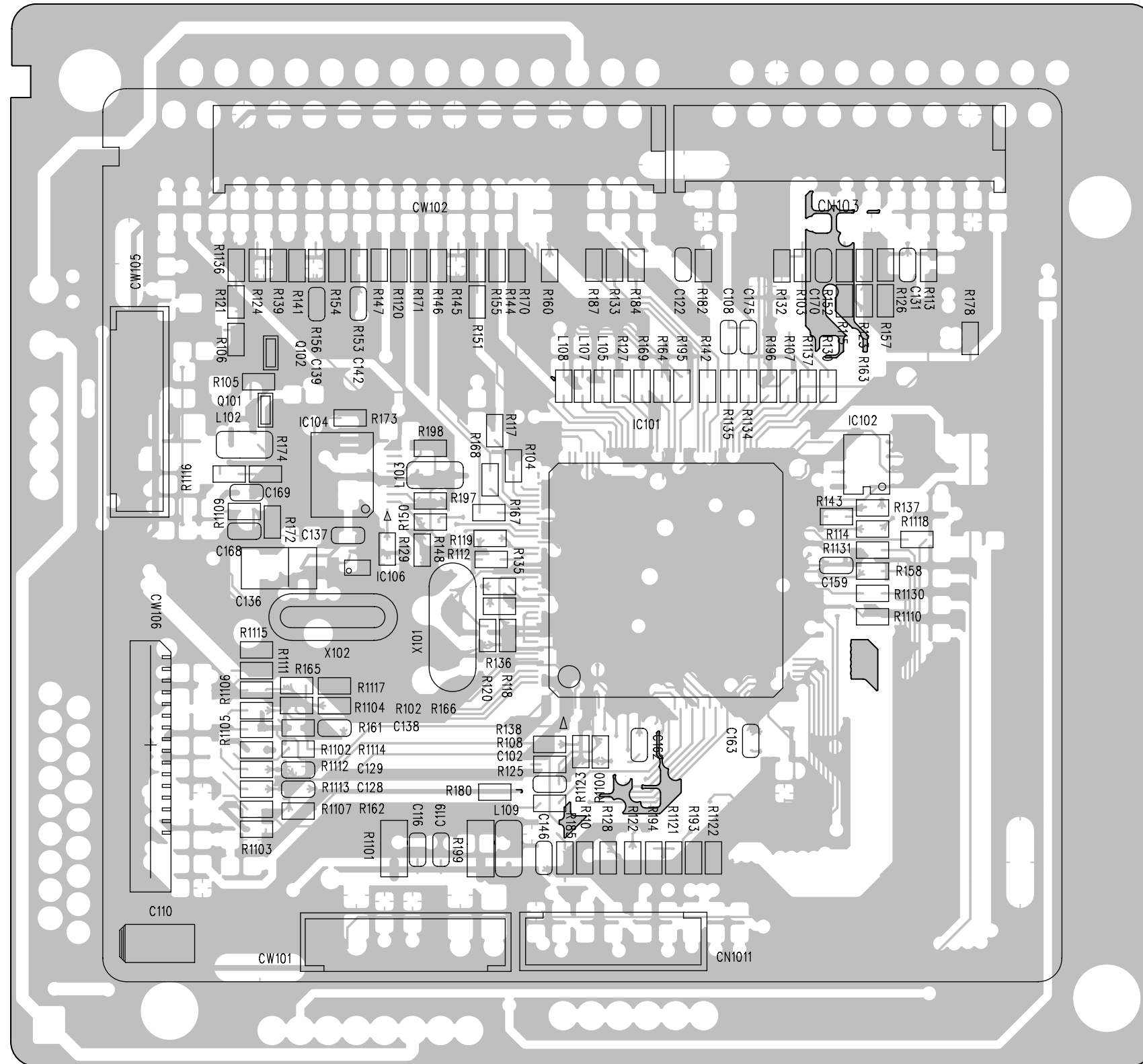


CIRCUIT DIAGRAM - MCU BOARD



TO DISPLAY BOARD

PCB LAYOUT - MCU BOARD
TOP SIDE



EXPLODED VIEW

