

Service  
Service  
**Service**



# Service Manual



## CONTENTS

Technical specification .....1-2  
 Service measurement setup.....1-3  
 Service aids .....1-4

Instructions on CD playability .....2-1..2-2  
 Block diagram.....3-1

Wiring diagram.....4-1  
 Disassembly diagram.....5-1

Main board  
 Circuit diagram .....6-1..6-4  
 Layout diagram.....6-5..6-6

Display board  
 Circuit diagram .....7-1  
 Layout diagram.....7-2..7-3

AMP board  
 Circuit diagram .....8-1  
 Layout diagram.....8-2

Exploded view diagram .....9-1  
 Mechanical parts list.....9-2

Electrical parts list.....10-1



© Copyright 2011 Philips Consumer Electronics B.V. Eindhoven, The Netherlands  
 All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise without the prior permission of Philips.



## TECHNICAL SPECIFICATION

Total Harmonic Distortion	< 3%
Signal to Noise Ratio	> 45 dBu

### Speakers

Speaker Impedance	4ohm
Speaker Driver	3.5"
Sensitivity	>82dB/m/W

### General information

AC power	110 - 127/220-240 V, 50/60 Hz
Operation Power Consumption	20 W
Standby Power Consumption	< 4 W
USB Direct	Version 2.0/1.1
Dimensions	
- Main Unit (W x H x D)	150 x 152 x 250 mm
- Speaker Box (W x H x D)	150 x 152 x 197 mm
Weight	
- With Packing	5.14 kg
- Main Unit	2.002 kg
- Speaker Box	2 x 0.895 kg

### Amplifier

Rated Output Power	2X5W RMS
Frequency Response	60 - 16kHz, ±3dB
Signal to Noise Ratio	>65dB
Aux Input	0.5 V RMS 20kohm

### 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	60Hz -16kHz (44.1kHz)
S/N Ratio	>65dBA

### Tuner

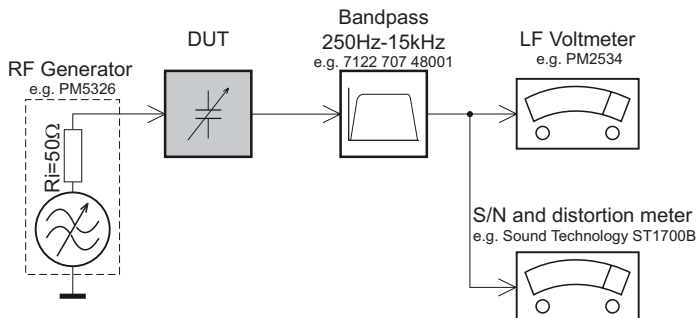
Tuning Range	FM: 87.5 - 108 MHz
Tuning Grid	50 KHz
Sensitivity	
- Mono, 26 dB S/N Ratio	< 22 dBf
Search Selectivity	< 36 dBu

## VERSION VARIATION

Type /Versions:	MCM103									
	Service policy									
Board in used:	/05	/96		/55	B/77	B/12			/93	/98
DISPLAY BOARD		C/M			C/M	C			C/M	C/M
MAIN BOARD		C/M			M	C/M			C/M	C/M
AMP BOARD		C/M			C/M	C/M			C/M	C/M
Type /Versions:	MCM103									
Features	Feature difference									
	/05	/96		/55	/58	/61			/93	/98
RDS										
VOLTAGE SELECTOR										
ECO STANDBY - DARK										
* TIPS : C -- Component Lever Repair. M -- Module Lever Repair √ -- Used										

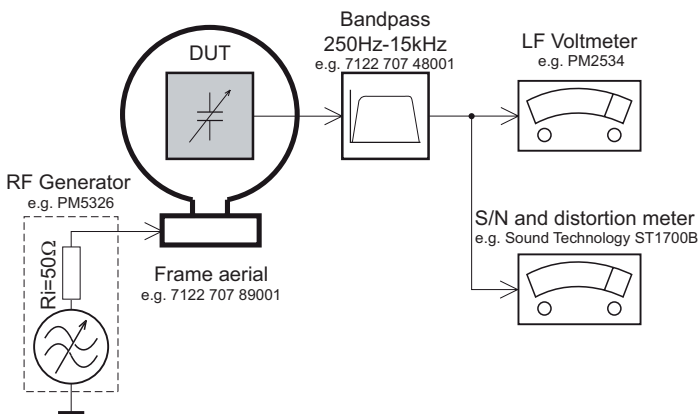
# MEASUREMENT SETUP

## Tuner FM



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

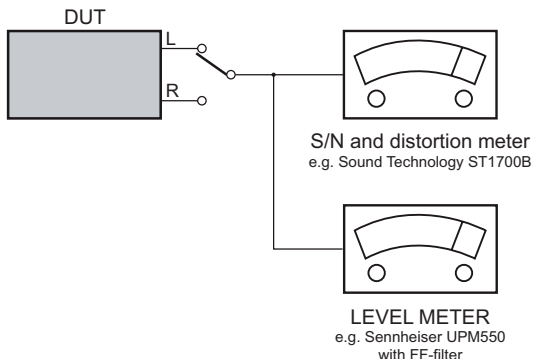
## Tuner AM (MW,LW)



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).

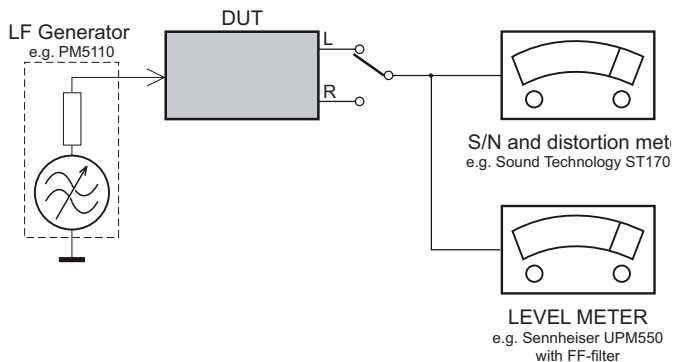
## CD

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 .

**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".

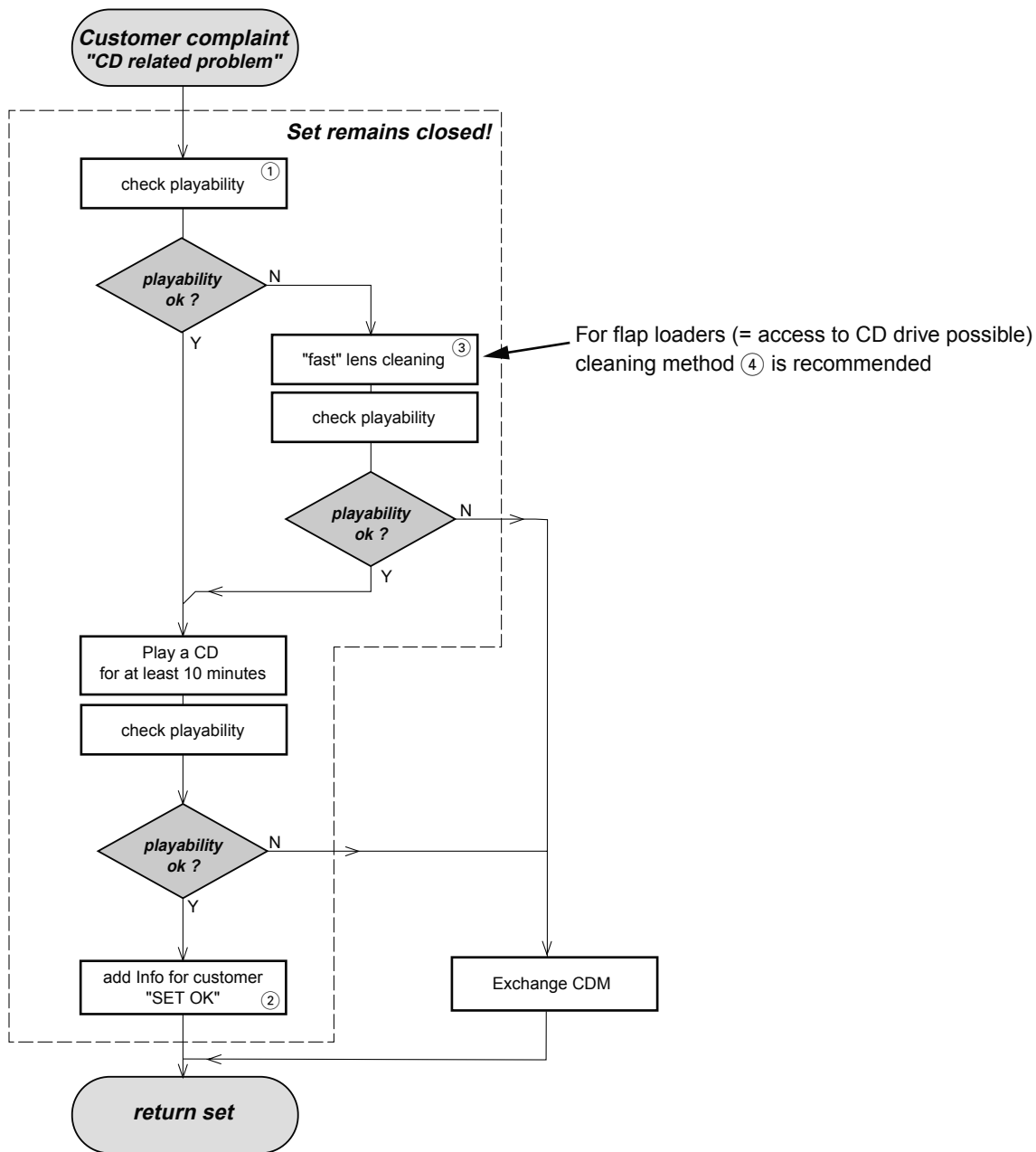
For additional questions please contact your local repair-helpdesk.

## 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

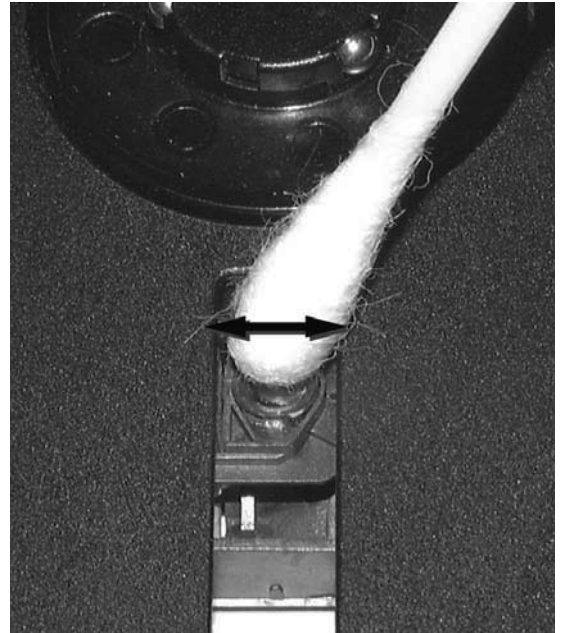
### LIQUID LENS CLEANING

**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.**

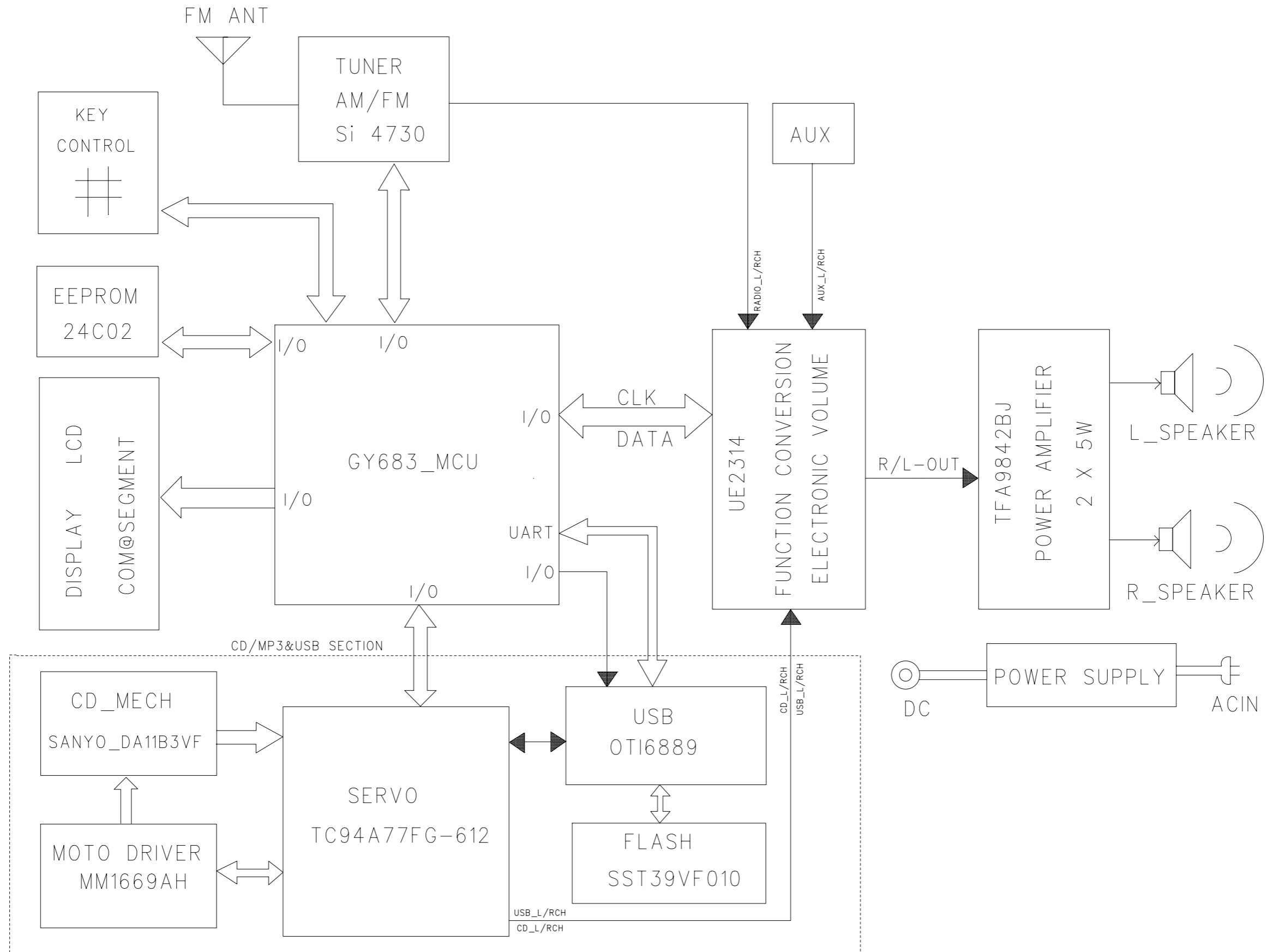
Because the material of the lens is synthetic and coated with a special anti-reflectivity layer, cleaning must be done with a non-aggressive cleaning fluid. It is advised to use "Cleaning Solvent"

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.

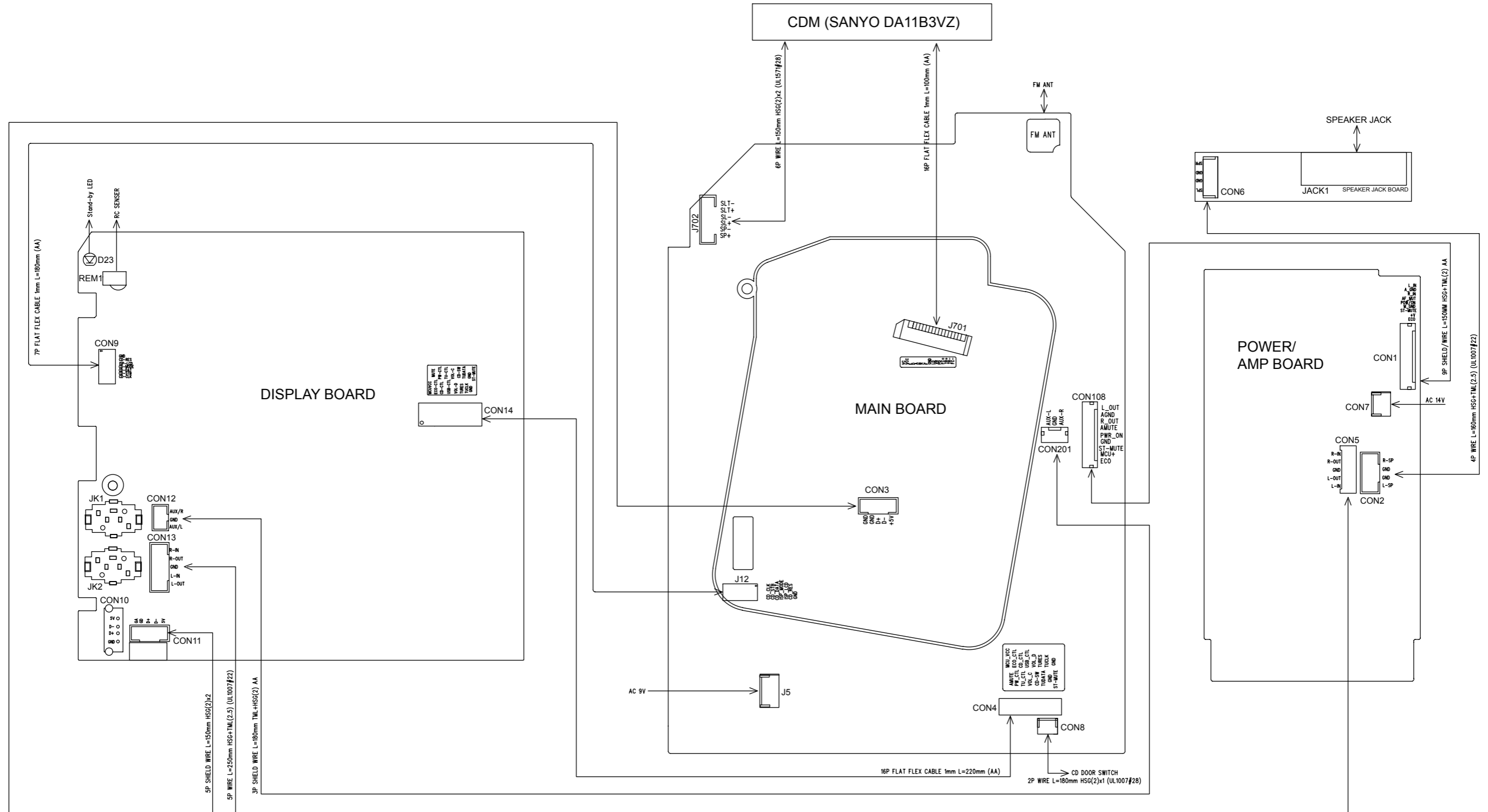
The direction of cleaning must be in the way as indicated in the picture below.



BLOCK DIAGRAM



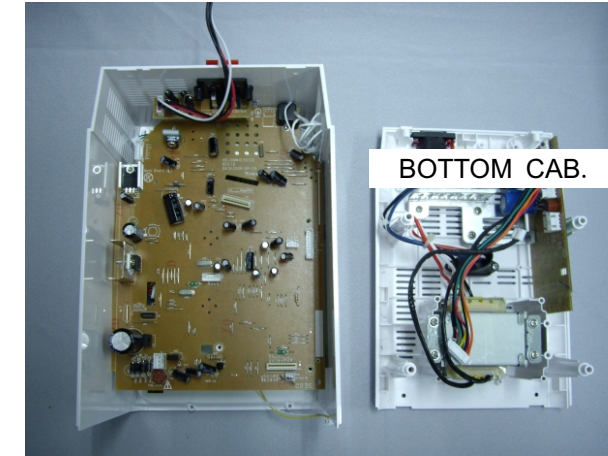
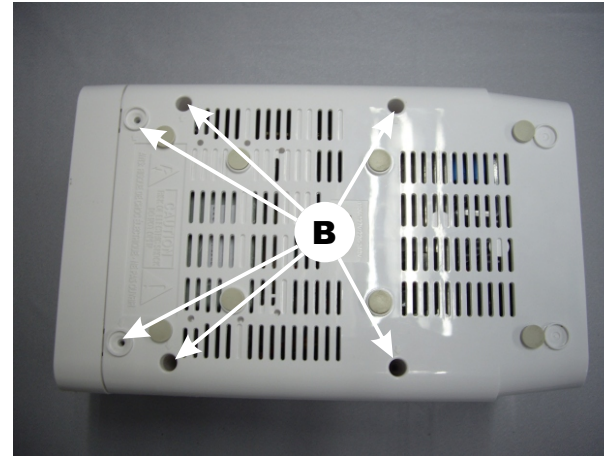
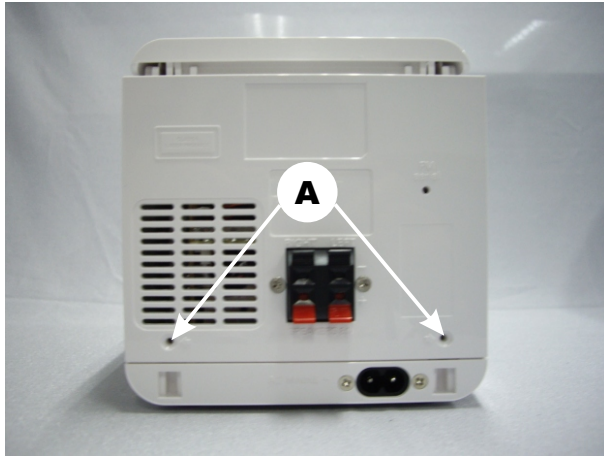
# WIRING DIAGRAM



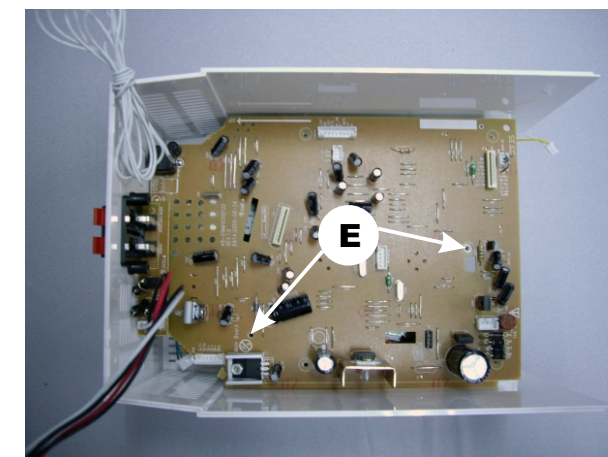
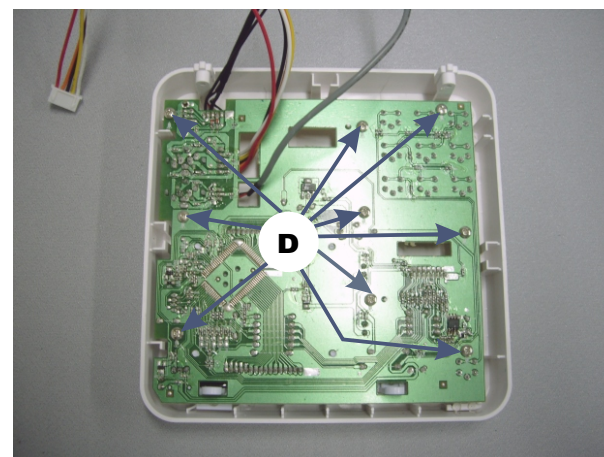
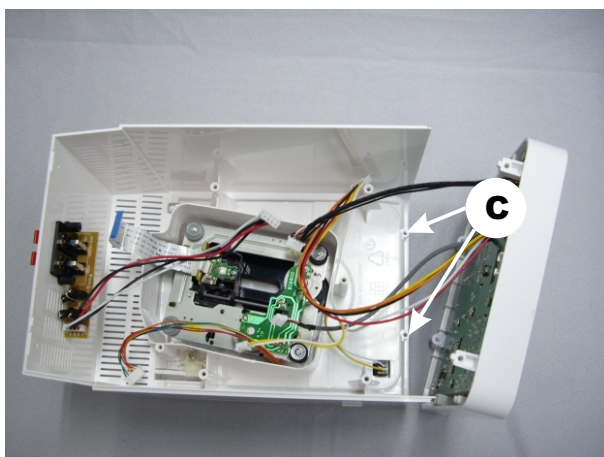


**DISASSEMBLY DIAGRAM****Dismantling of the Bottom Cabinet**

- 1) Remove 2 screws A as indicated.
- 2) Remove 6 screws B as indicated to loosen the Bottom Cabinet.

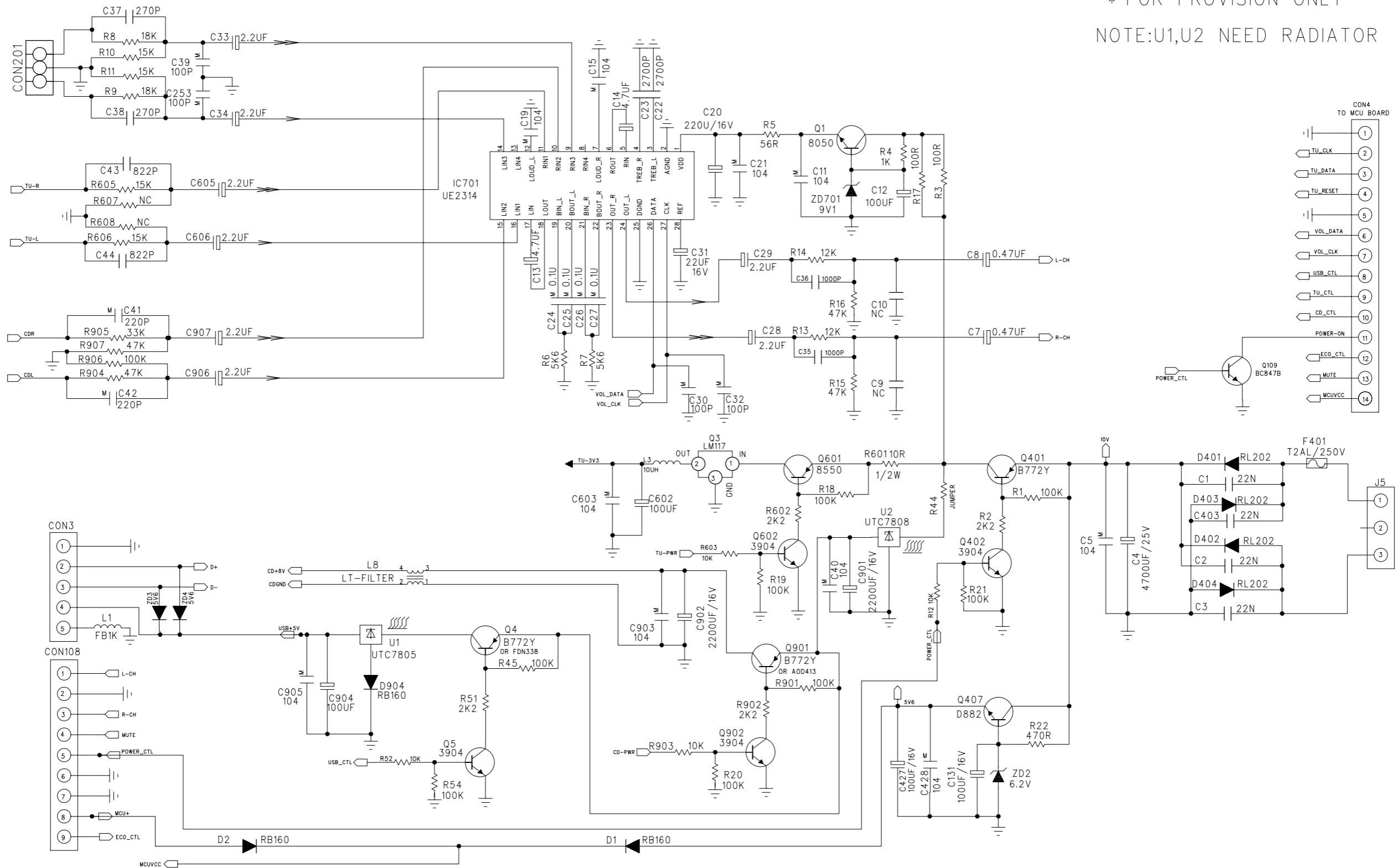
**Dismantling of the Front Cabinet and PCB Board.**

- 1) Remove 2 screws C as indicated to loosen the Front Cabinet.
- 2) Remove 9 screws D as indicated to loosen the Display Board.
- 3) Remove 2 screws E as indicated to loosen the Main Board.

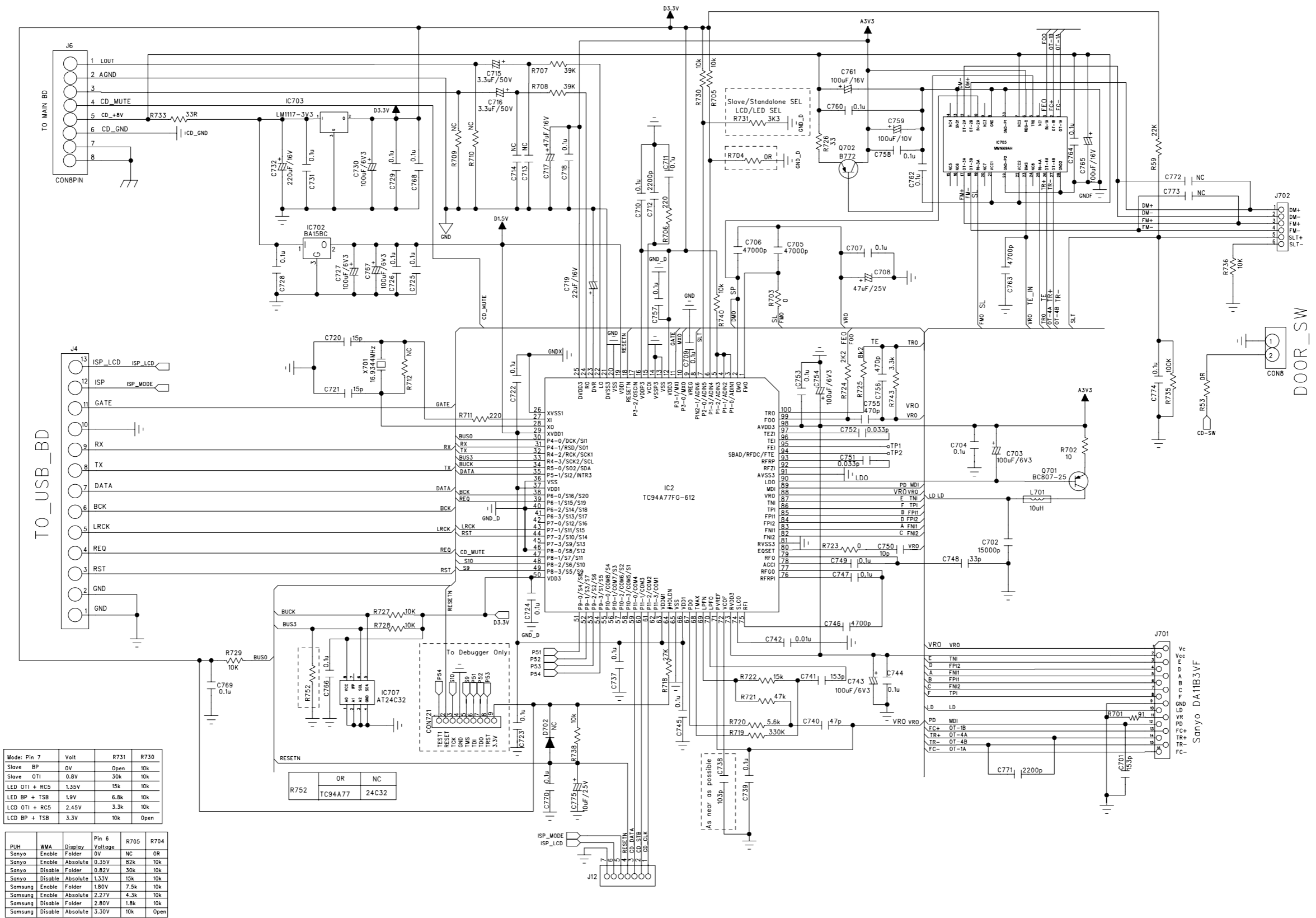


# CIRCUIT DIAGRAM - MAIN BOARD PART1

➤ SINGAL LEFT CHANNEL  
 ➤ SINGAL RIGHT CHANNEL  
 \* FOR PROVISION ONLY  
 NOTE:U1,U2 NEED RADIATOR



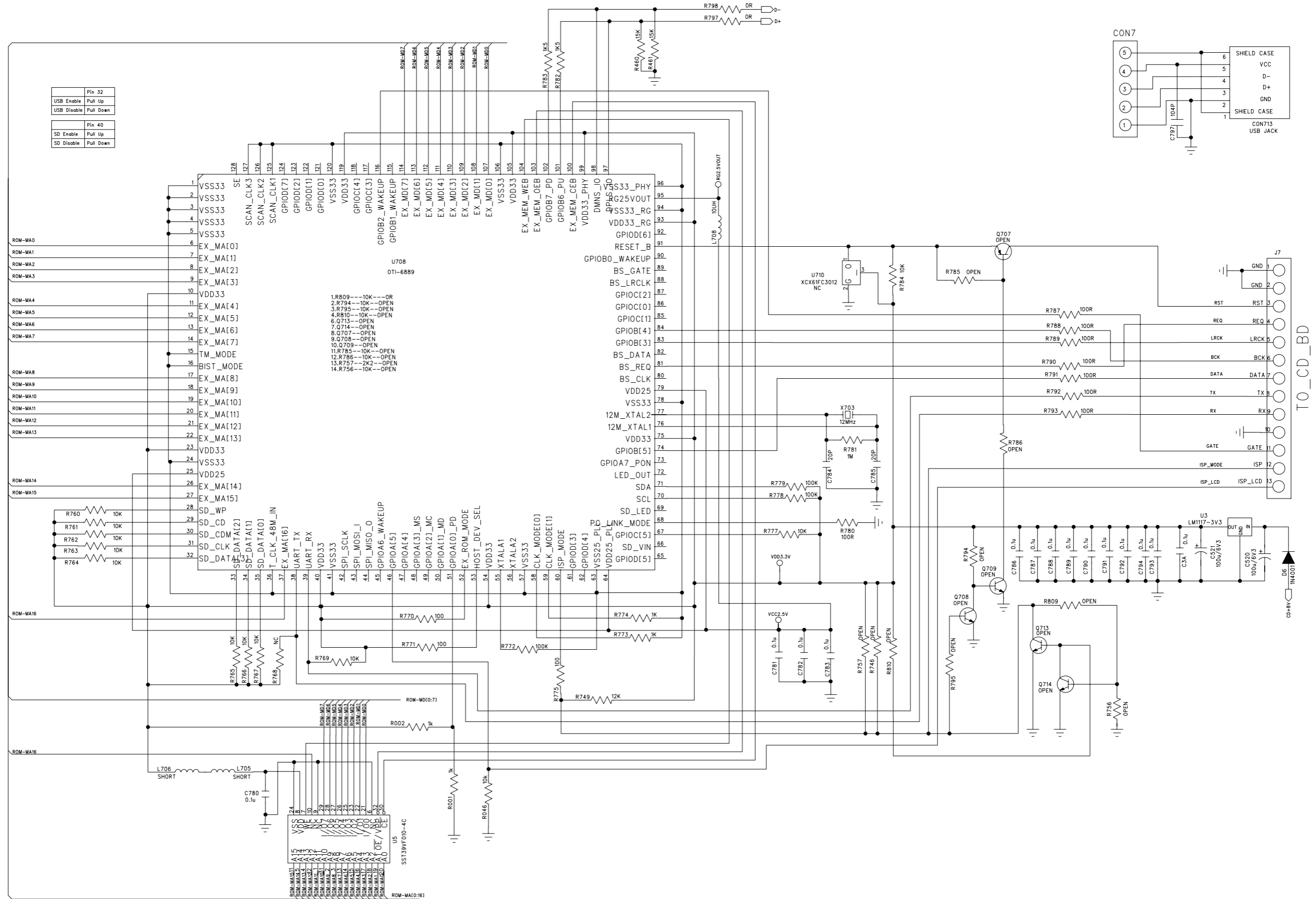
# CIRCUIT DIAGRAM - MAIN BOARD PART2



Mode:	Pin 7	Volt	R731	R730
Slave BP	0V	Open	10k	
Slave OTI	0.8V	30k	10k	
LED OTI + RCS	1.35V	15k	10k	
LED BP + TSB	1.9V	6.8k	10k	
LCD OTI + RCS	2.45V	3.3k	10k	
LCD BP + TSB	3.3V	10k	Open	

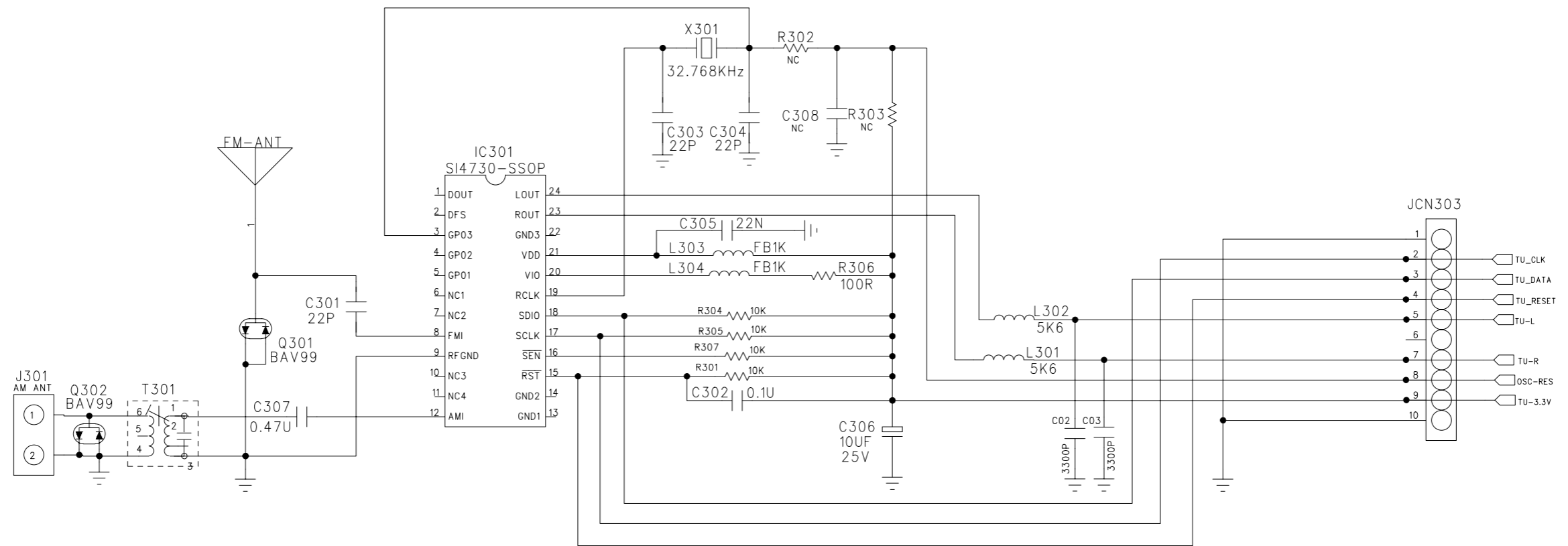
PUH	WVA	Display	Pin 6	Voltage	R705	R704
Sanyo	Enable	Folder	0V	NC	OR	
Sanyo	Enable	Absolute	0.35V	82k	10k	
Sanyo	Disable	Folder	0.82V	30k	10k	
Sanyo	Disable	Absolute	1.33V	15k	10k	
Samsung	Enable	Folder	1.80V	7.5k	10k	
Samsung	Enable	Absolute	2.27V	4.3k	10k	
Samsung	Disable	Folder	2.80V	1.8k	10k	
Samsung	Disable	Absolute	3.30V	10k	Open	

# CIRCUIT DIAGRAM - MAIN BOARD PART3

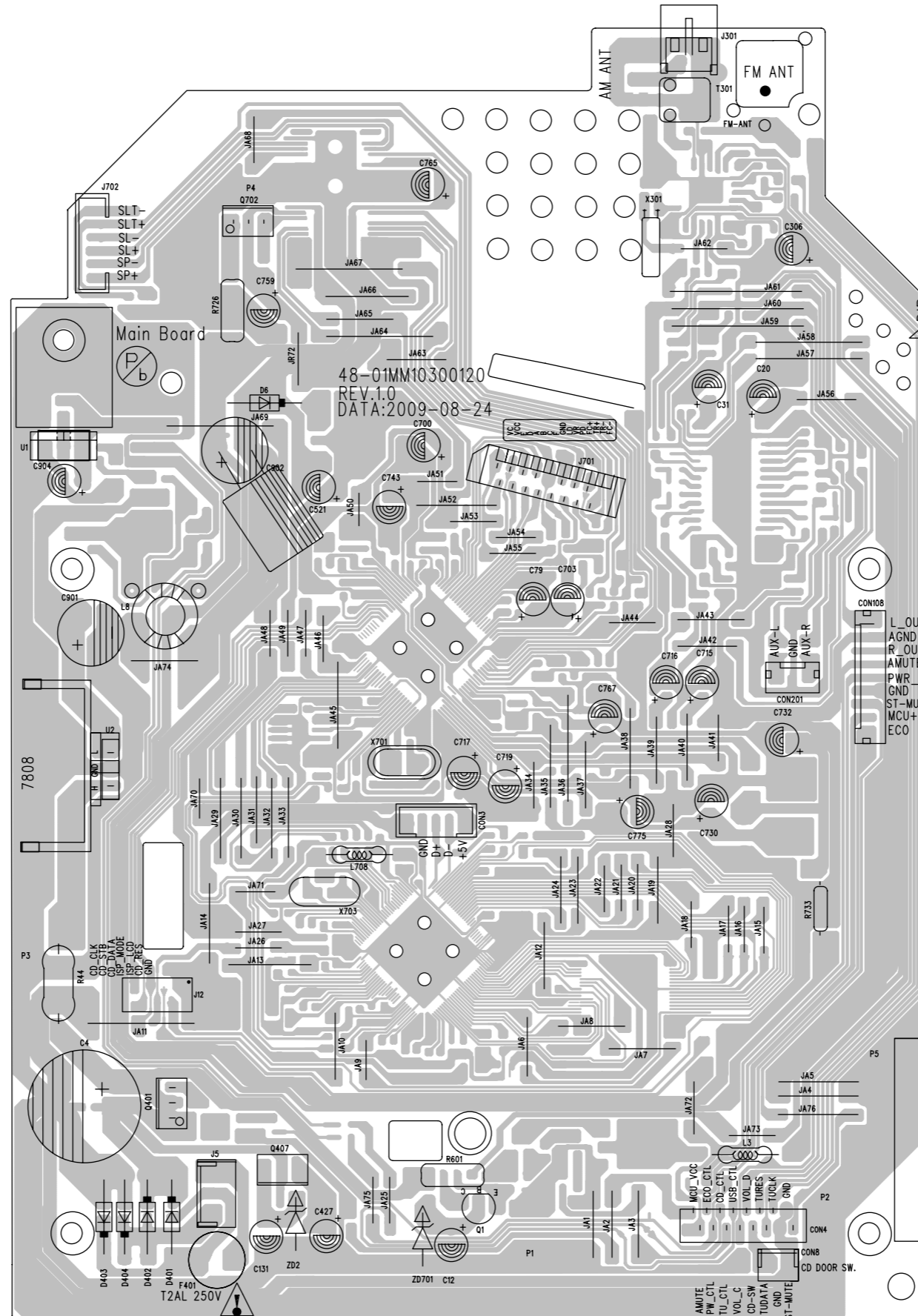


TO\_CD\_BD

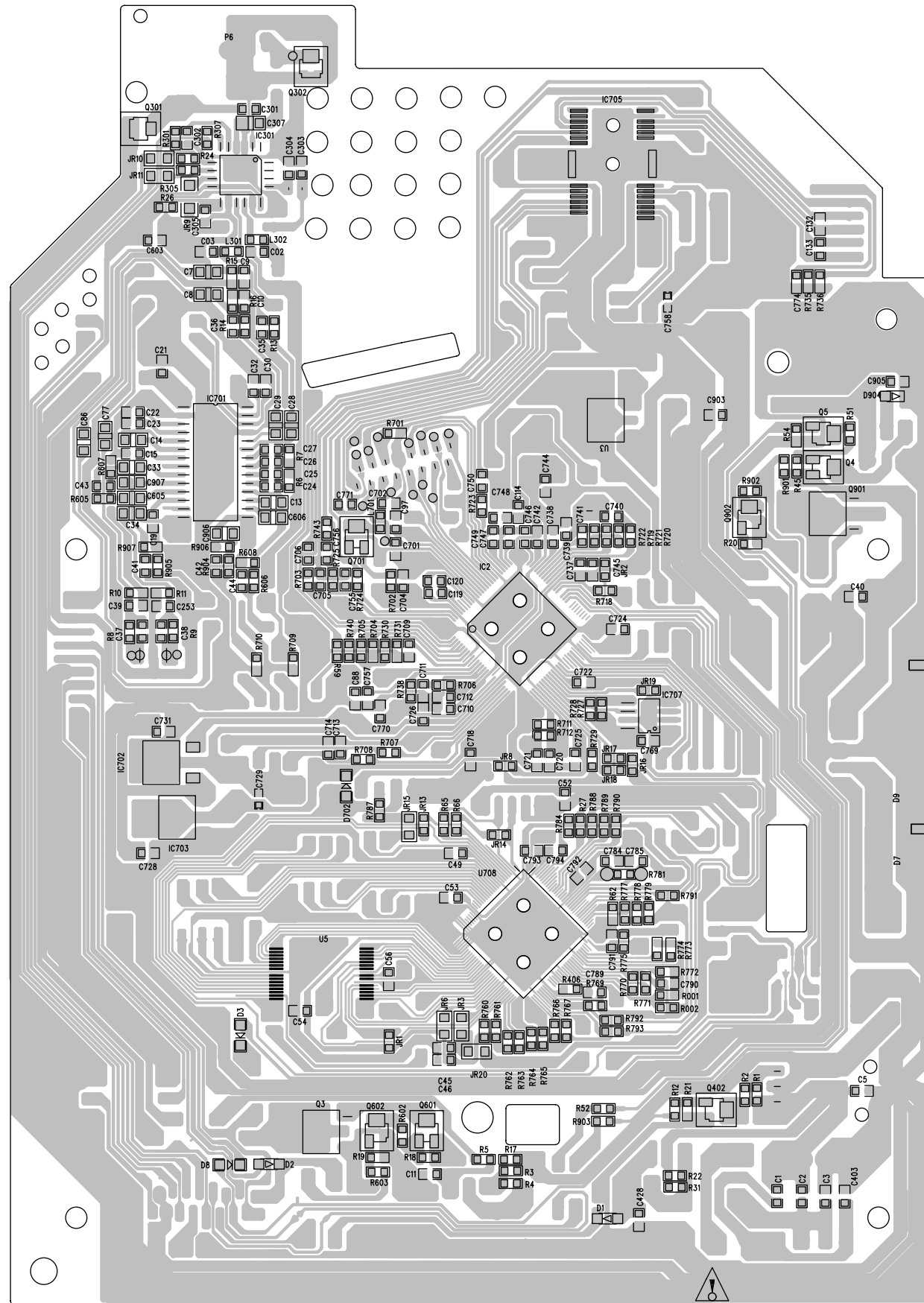
### CIRCUIT DIAGRAM - MAIN BOARD PART4



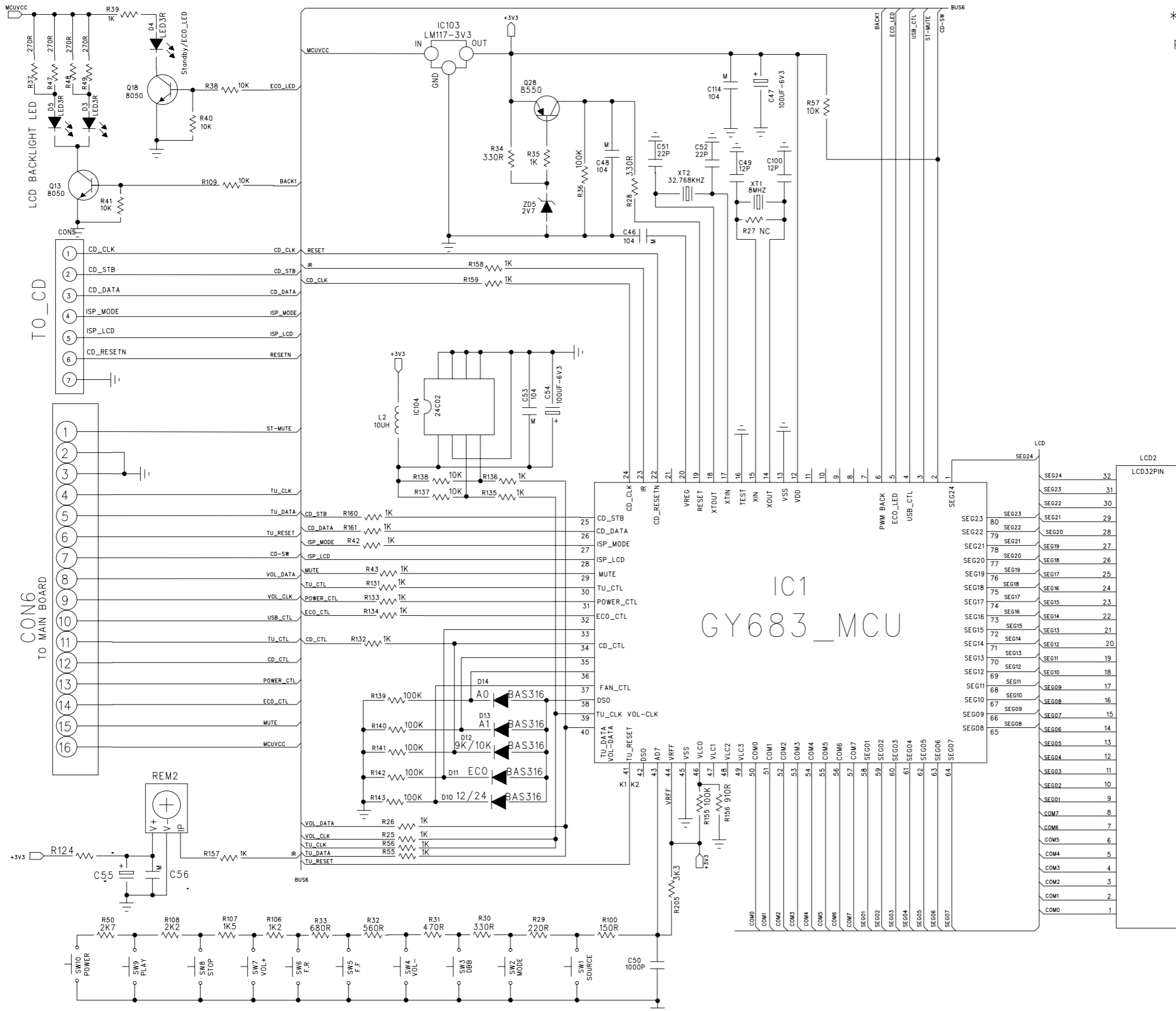
LAYOUT DIAGRAM - MAIN BOARD  
TOP SIDE



# LAYOUT DIAGRAM - MAIN BOARD BOTTOM SIDE



CIRCUIT DIAGRAM - DISPLAY BOARD

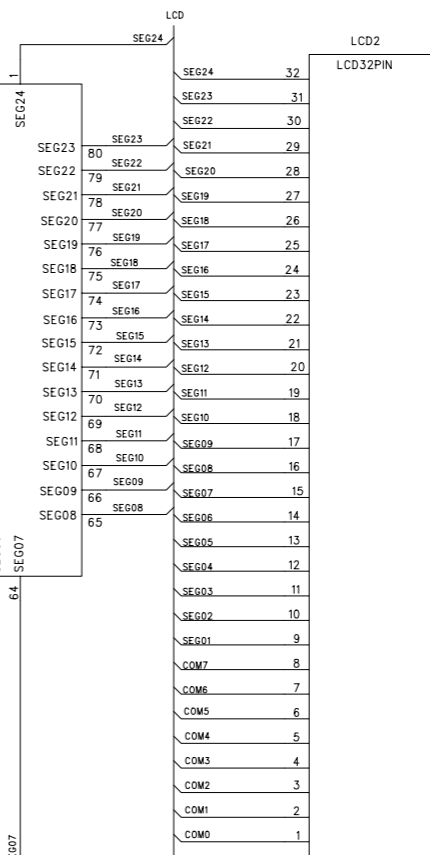


\* FOR PROVISION ONLY

PROGRAM PIN: 21PIN:DATA  
 22PIN:SCLK  
 12PIN:VDD  
 13PIN:VSS  
 16PIN:TEST  
 19PIN:RESET

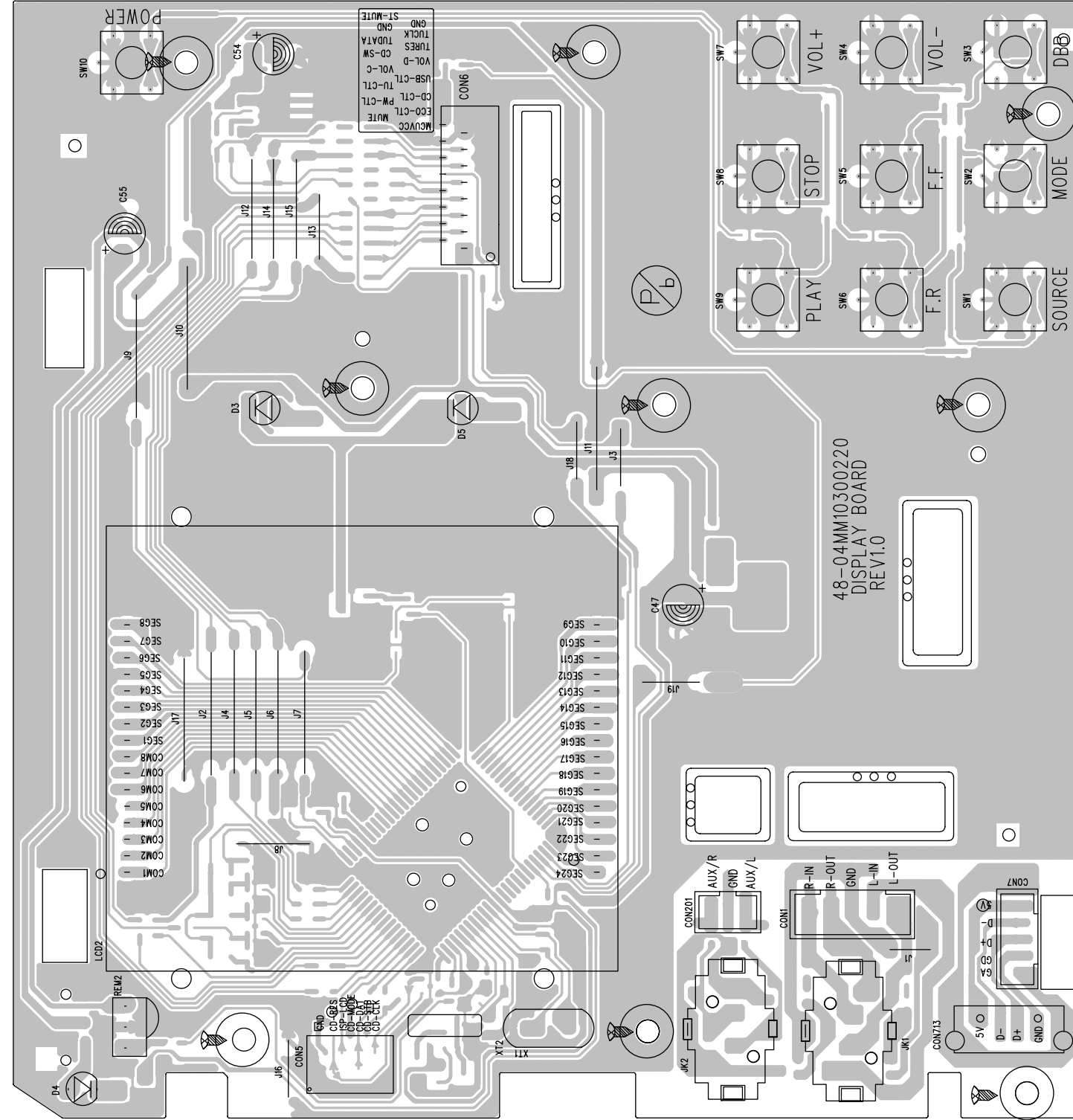
10K	530K--1700K	AM	1	1	Canada USA
100K	87.5M--108.0M	FM			
		or			
9K	531K--1602K	MW	0	1	AUST/NZ
50K	87.5M--108.0M	FM			
9K	531K--1602K	MW	1	0	Europe
50K	87.5M--108.0M	FM			
10K	530K--1700K	or			
9K	531K--1602K	MW	0	0	ASIAP PACIFIC Brazil
50K	87.5M--108.0M	FM			
Step	Frequency(Hz)	Band	A0	A1	Area

ECO		12/24H		9K/10K	
YSE	NO	12H	24H	9K	10K
1	0	1	0	0	1

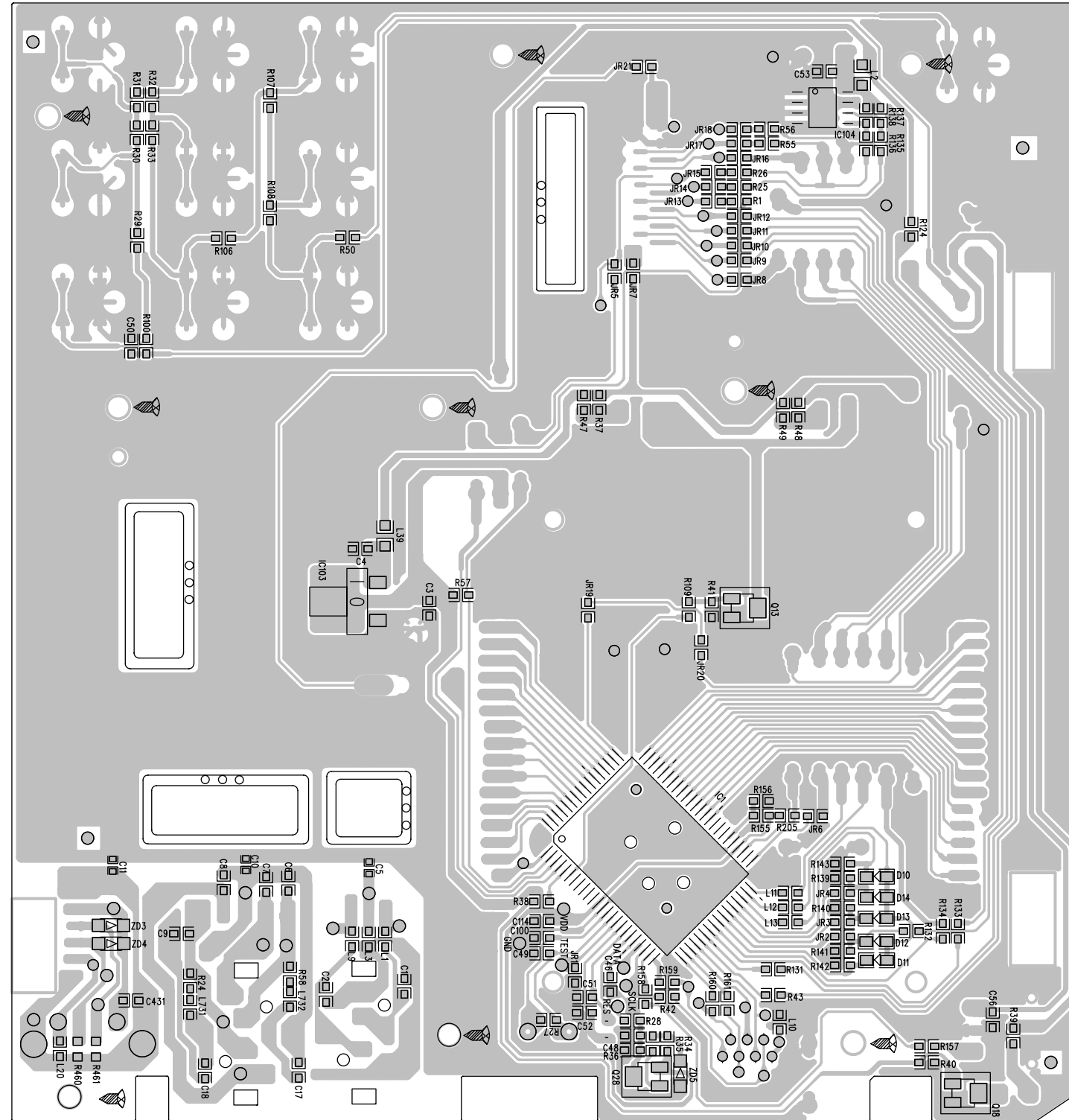




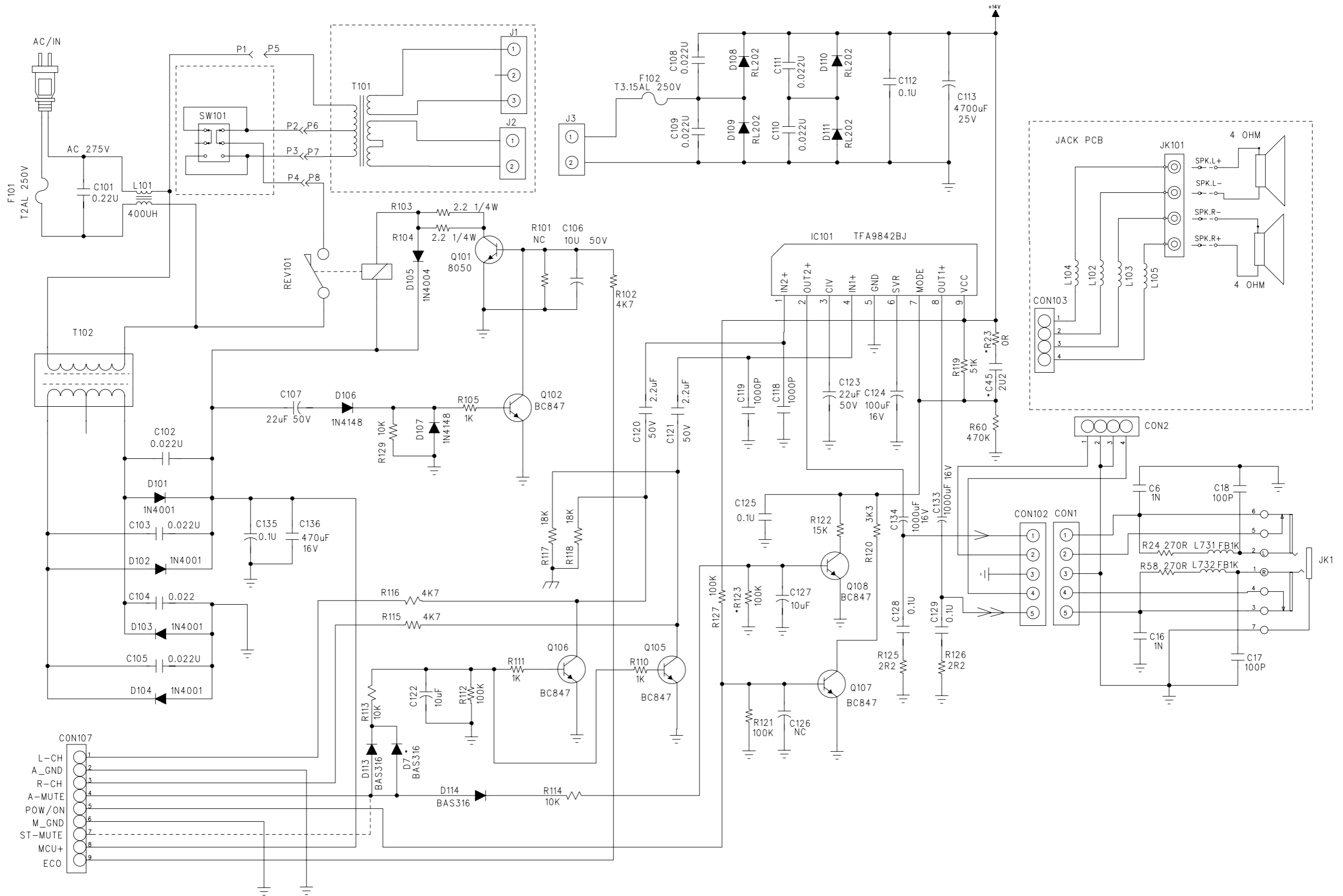
LAYOUT DIAGRAM - DISPLAY BOARD  
TOP SIDE



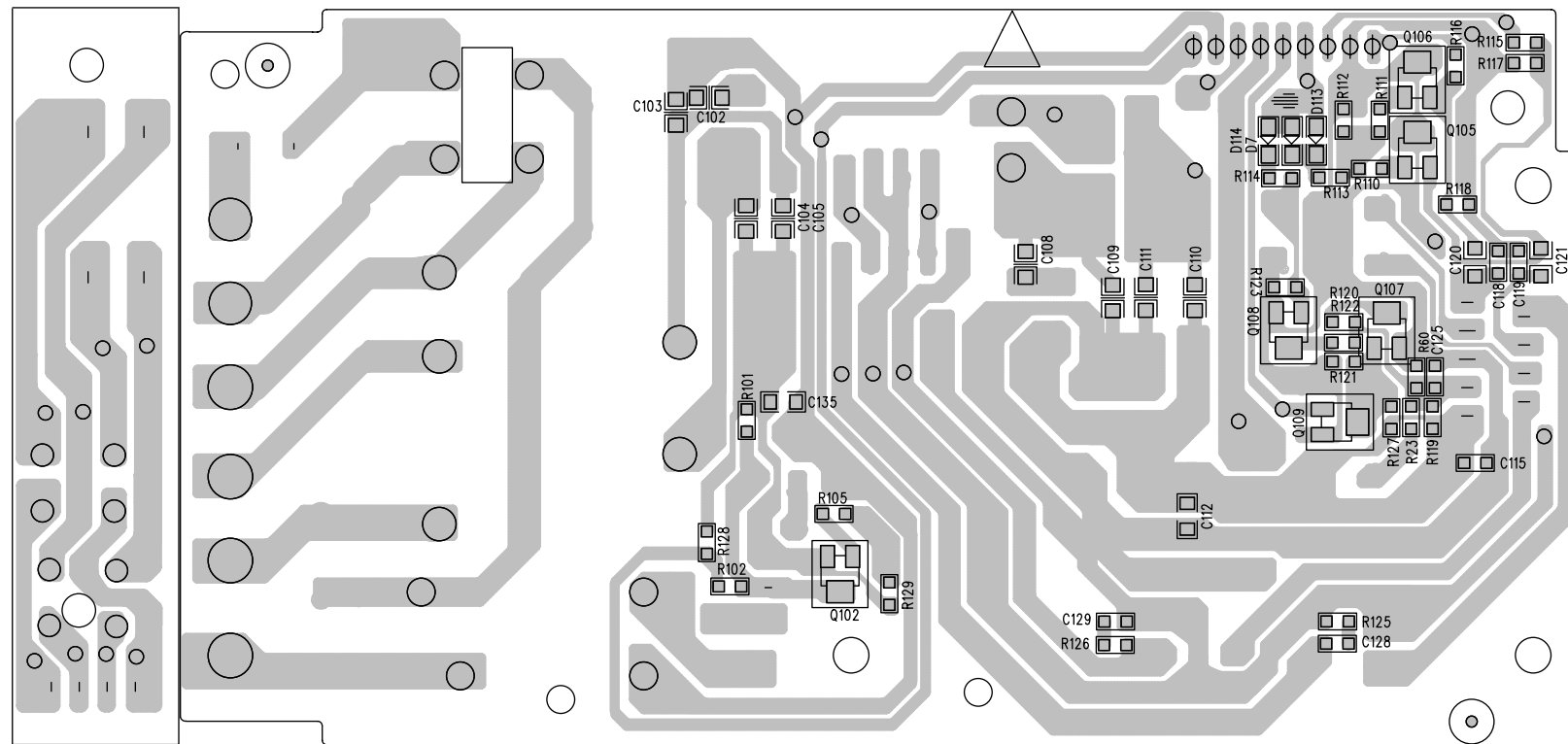
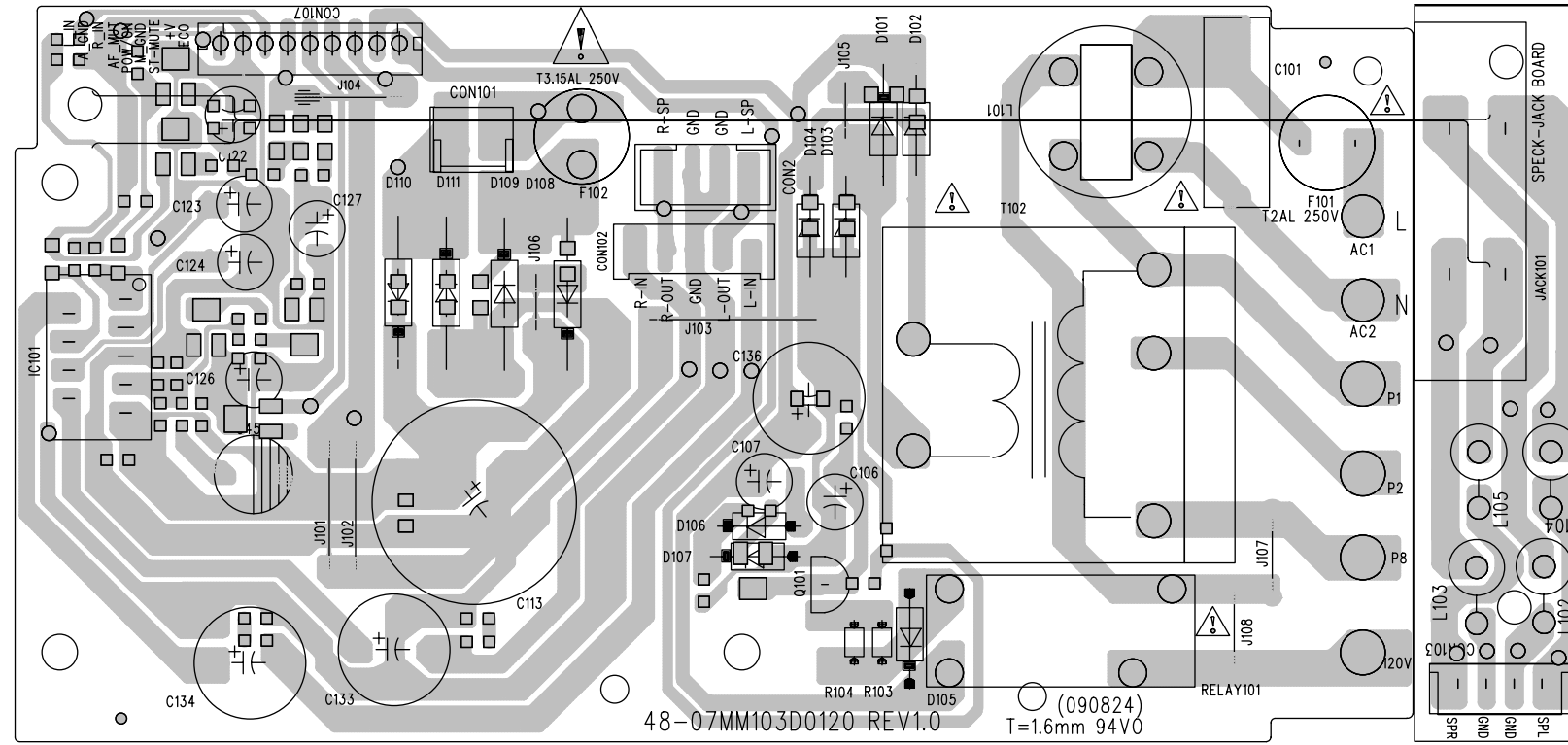
LAYOUT DIAGRAM - DISPLAY BOARD  
BOTTOM SIDE



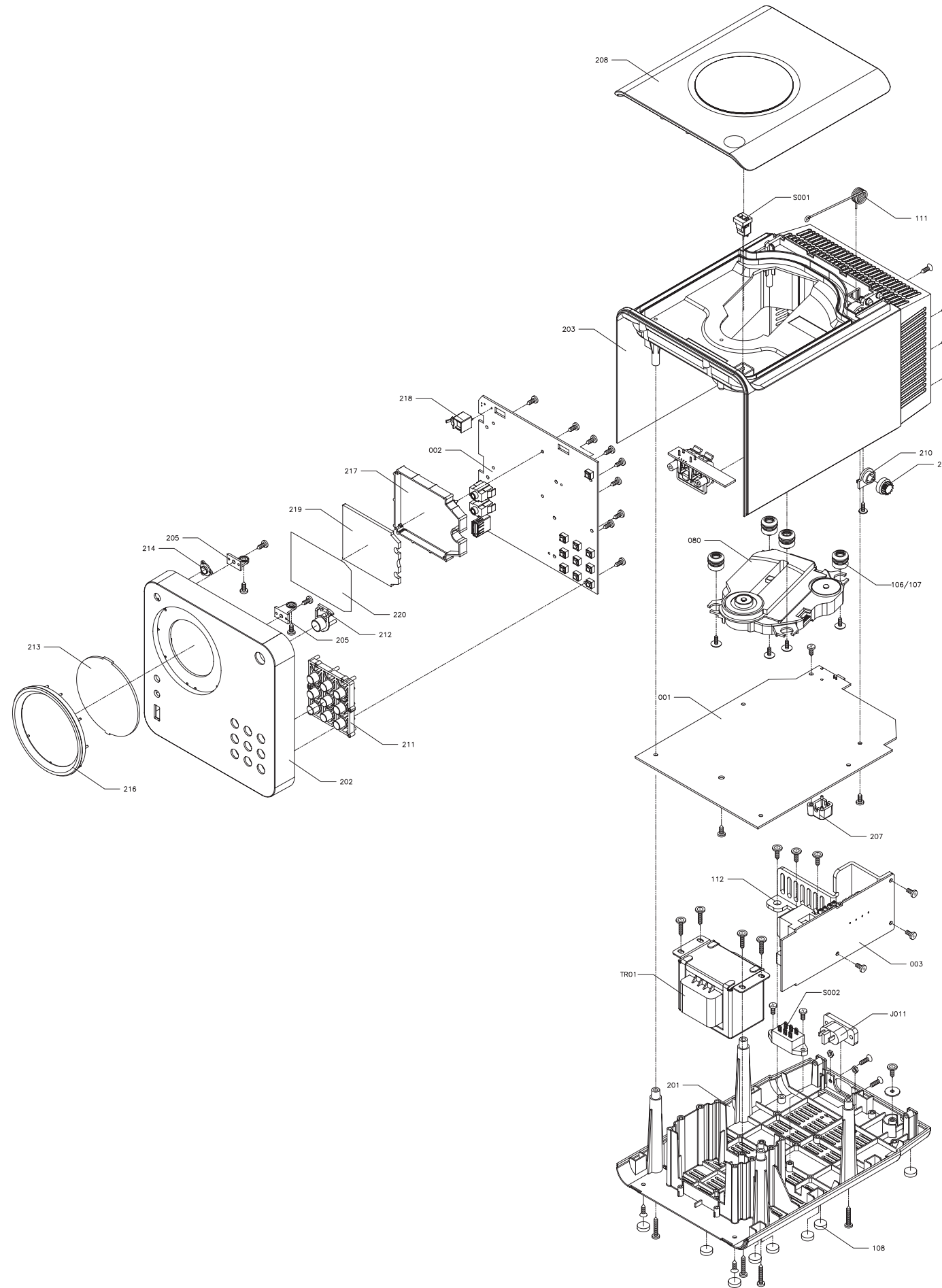
# CIRCUIT DIAGRAM - AMP BOARD



LAYOUT DIAGRAM - POWER BOARD



# SET EXPLODED VIEW DIAGRAM



**MECHANICAL PARTSLIST(not for -B/77) ACCESSORIES**

080	996510026711	CD MECHANISM	SPK	996510029292	SPK BOX PART (SINGLE L/R)
111	994000005401	CD DOOR SPRING	RC01	996510029289	REMOTE CONTROL
201	996510029295	BOTTOM CAB(-/98/96)	J010	996510000428	CONNECT CORD 3.5mmST/PLUGx2
201	996510037695	BOTTOM CAB(-/93)	J007	▲ 996510029291	AC CORD SET VDE APP 6FT (only for -/98)
202	996510029321	FRONT PANEL	J007	▲ 996510029755	AC CORD SET CNS APP 2M (only for -/96)
203	996510029293	BACK CABINET			
205	996510029071	PANEL FIXER	<b>Note:</b>	<b>Only these parts mentioned in the list are normal service parts.</b>	
207	996500039790	FM PIG TAIL HOUSING			
208	996500039334	CD DOOR(WHITE) (only for -/98)			
208	996510029752	CD DOOR (only for -/96/93)			
209	994000005406	CD GEAR			
210	994000005407	CD GEAR BRACKET			
211	996510029319	PANEL BUTTONS			
212	996510029301	POWER BUTTONS			
213	996510029022	DISPLAY LENS (only for -/98)			
213	996510029754	DISPLAY LENS (only for -/96/93)			
214	996500039338	IR LENS(WHITE)			
216	996510029298	TRIM RING			
5601	994000004392	LASER COVER (FOR SANYO CD)			
FFC1	996510029288	7P FFC 1mm L=180mm			
FFC2	996510029296	16P FFC 1mm L=220mm			
J001	996510002140	16P FLEX CABLE 1mm (MAIN-CDM)			
J008	996510018969	FM ANT L=1.5M			
J011	▲ 996510029287	AC SOCKET R-201A(B00) BLACK			
S001	994000002354	CD DOOR SWITCH DLS-02-W-1			
S002	994000004376	SWITCH SL14-22AH-5AN			
TR01	▲ 996510029299	TRANSFO VDE EI57 127/240V(-/96/98)			
TR01	▲ 996510037696	TRANSFO UP57 220V(-/93)			
0001	996510029753	PCBA-MAIN "MCM103/96"			
0001N	996510041639	PCBA-MAIN (LM1B1040030096 onwards) "MCM103/96"			
0001	996510029297	PCBA-MAIN"MCM103/98"			
0001N	996510041645	PCBA-MAIN (LM1B1040021342 onwards) "MCM103/98"			
0001	996510037698	PCBA-MAIN"MCM103/93"			
0002	996510029756	PCBA-DISPLAY/KEY (only for -/96)			
0002	996510029285	PCBA-DISPLAY/KEY (only for -/98)			
0002	996530037697	PCBA-DISPLAY/KEY (only for -/93)			
0003	996510029294	PCBA-AMP(-/98/96)			
0003N	996510041651	PCBA-AMP(LM1B1040030096 onwards) (-/96)			
0003N	996510041646	PCBA-AMP(LM1B1040021342 onwards) (-/98)			
0003	996510037701	PCBA-AMP(-/93)			
0650	996510037707	GIFT BOX(-/93)			
0651	996510034447	CARTON BOX (2SET)(-/93)			
0652	996510037694	PAPER PULP -TOP(-/93)			
0653	996510037702	PAPER PULP -BOTTOM(-/93)			
0654	996510037705	E.P.E BAG 14X17"(-/93)			
0655	996510036648	GUARANTEE BOOKLET(-/93)			
0001N	996510041708	PCBA-MAIN (LM1A1040025967 onwards) "MCM103B/12"			
0003N	996510041707	PCBA-AMP(LM1A1040025967 onwards) "MCM103B/12"			

**ELECTRICAL PARTSLIST(not for -B/77)****MAIN BOARD ASSEMBLY**

C4	994000001346	E.CAP 4700UF 25V -20%
F401	△ 994000001222	FUSE RADIAL LT 2A 250V
IC2	996510025073	IC TC94A77FG-612 -SMD
IC301	996510018861	IC SI4702
IC701	996510014303	IC UE2314
IC702	994000002838	IC BA15BC0FP
IC703	994000002839	IC LM1117S-3.3
IC705	996510009408	IC MM1669AH
IC707	996510009407	IC BR24L32F-W
Q3	994000002839	IC LM1117S-3.3
Q407	996510020216	TRANSISTORS D882F
U1	996510029286	IC UTC7805G
U2	996510018852	IC UTC7808
U3	994000002839	IC LM1117S-3.3
U5	996510018761	FLASH IC SST39VF020
U708	996520033295	IC OTI6889 (LQFP-128)
X301	996510012559	CRYSTAL 32.768KHZ
X701	994000004551	CRYSTAL 16.9344MHZ +-20PPM
X703	996510008326	CRYSTAL 12 MHzHC-49/US H=3.5mm

**DISPLAY BOARD ASSEMBLY**

CON713	996510000344	USB SOCKET
D3	994000005385	LED LAMP (WHITE)
D4	994000001965	LED LAMP 3MM (RED)
D5	994000005385	LED LAMP (WHITE)
IC1	996510029302	MCU IC(GENNY) GY683
IC103	994000002839	IC LM1117S-3.3
IC104	996510002114	IC BR24C02F-WE2
JK1	994000005394	V/PHONE JACK
JK2	994000005394	V/PHONE JACK
LCD2	996510029074	LCD DISPLAY SDM8A5788A-HPTNN
REM2	996510009320	OPTIC SENSER FM-6038TN2-5AN
SW1	996500042444	TACT SWITCH 6x6mm 4.3mm
SW10	996500042444	TACT SWITCH 6x6mm 4.3mm
SW2	996500042444	TACT SWITCH 6x6mm 4.3mm
SW3	996500042444	TACT SWITCH 6x6mm 4.3mm
SW4	996500042444	TACT SWITCH 6x6mm 4.3mm
SW5	996500042444	TACT SWITCH 6x6mm 4.3mm
SW6	996500042444	TACT SWITCH 6x6mm 4.3mm
SW7	996500042444	TACT SWITCH 6x6mm 4.3mm
SW8	996500042444	TACT SWITCH 6x6mm 4.3mm
SW9	996500042444	TACT SWITCH 6x6mm 4.3mm
XT1	994000004451	CRYSTAL 8.000MHZ +-20PPM
XT2	996510012559	CRYSTAL 32.768KHZ

**AMP BOARD ASSEMBLY**

C113	994000001346	E.CAP 4700UF 25V -20%
F102	△ 994000004599	FUSE RADIAL T3.15A 250V
IC101	996510000882	IC TFA9842BJ
JACK101	994000003661	SPK JACK PT-22V11

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