

Service  
Service  
**Service**



# Service Manual

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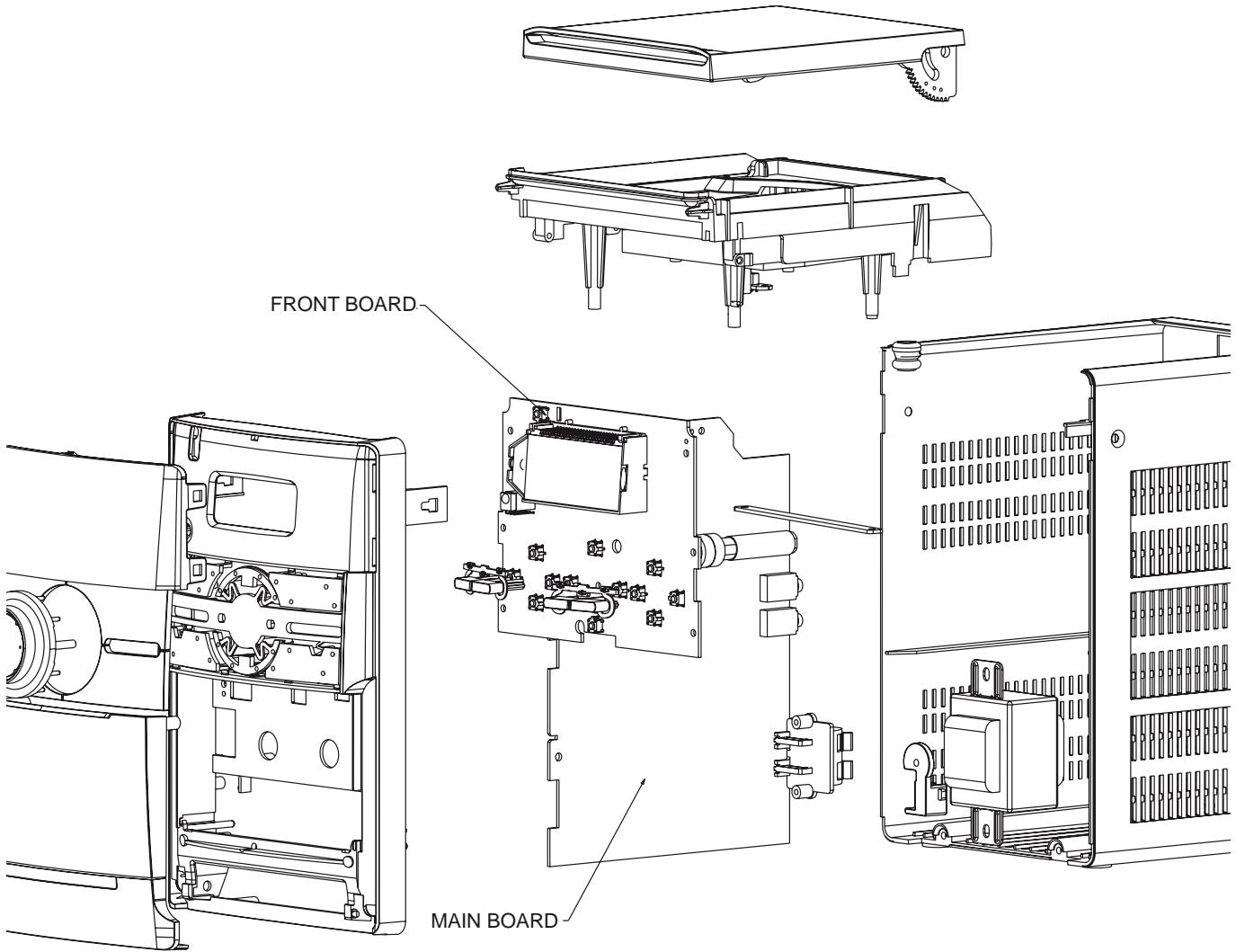


Version 1.0



# PHILIPS

# PCBS LOCATION



## SPECIFICATIONS

### AMPLIFIER

Output power ..... 2 x 2W RMS  
 Signal-to-noise ratio .....  $\geq 60$  dBA (IEC)  
 Frequency response ..... 125 – 16000 Hz  
 Impedance loudspeakers .....  $8\Omega$

### CD PLAYER

Frequency range ..... 125 – 16000 Hz  
 Signal-to-noise ratio ..... 65 dBA

### TUNER

FM wave range ..... 87.5 – 108 MHz  
 MW wave range ..... 531 – 1602 kHz  
 Sensitivity  
 – FM 26 dB sensitivity ..... 20  $\mu$ V  
 – MW 26 dB sensitivity ..... 5 mV/m  
 Total harmonic distortion .....  $\leq 5\%$

### SPEAKERS

Bass reflex system  
 Dimensions (w x h x d) . 134 x 230 x 152 (mm)

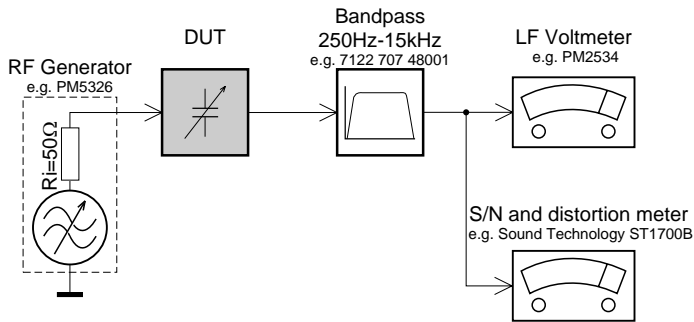
### GENERAL INFORMATION

AC Power ..... 220 – 230 V / 50 Hz  
 Dimensions (w x h x d) .. 148 x 233 x 216 (mm)  
 Weight (with/without speakers) .....  
 ..... approx. 3.65 / 1.53 kg  
 Power consumption  
 Active ..... 15 W  
 Standby .....  $< 4$  W

***Specifications and external appearance are subject to change without notice.***

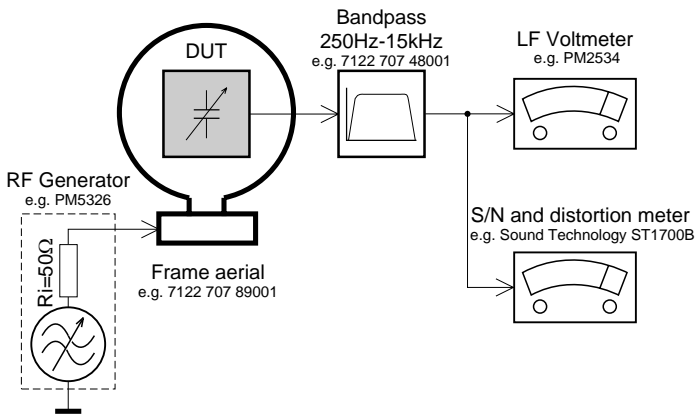
## MEASUREMENT SETUP

### Tuner FM



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

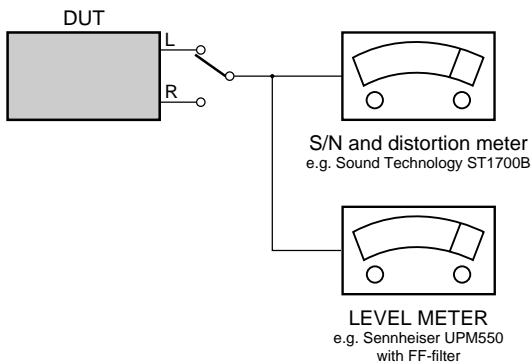
### Tuner AM (MW,LW)



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)



## SERVICE AIDS

### Service Tools:

Universal Torx driver holder .....	4822 395 91019
Torx bit T10 150mm .....	4822 395 50456
Torx driver set T6-T20 .....	4822 395 50145
Torx driver T10 extended .....	4822 395 50423

### Compact Disc:

SBC426/426A Test disc 5 + 5A .....	4822 397 30096
SBC442 Audio Burn-in test disc 1kHz .....	4822 397 30155
SBC429 Audio Signals disc .....	4822 397 30184
Dolby Pro-logic Test Disc .....	4822 395 10216

### **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".

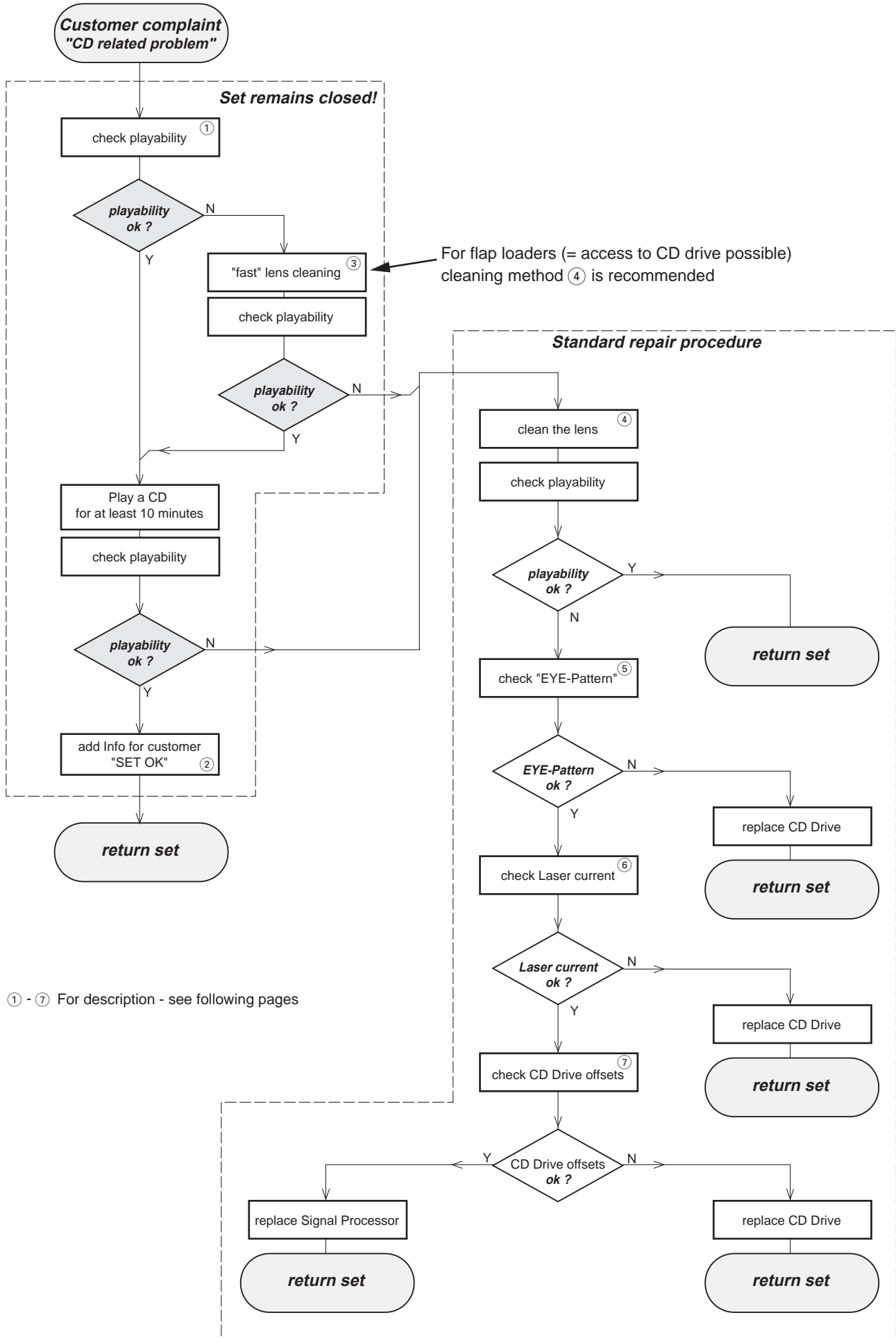
For additional questions please contact your local repair-helpdesk.

## 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



# 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 ≥10seconds  
 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 ≥10seconds  
 Fingerprint ≥10seconds  
 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.

③

## FAST LENS CLEANING (dry brush)

Use lens cleaning CD  
 SBC AC300.....9082 100 00043

Insert the lens cleaning CD, press PLAY and follow the voice guide's instructions on the CD.

④

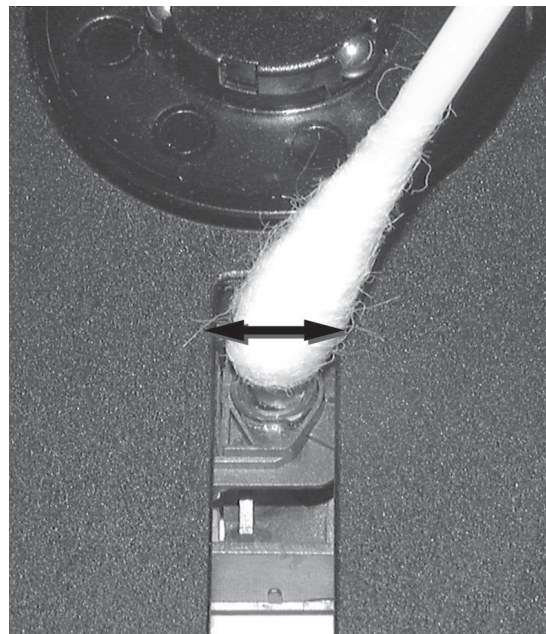
## LIQUID LENS CLEANING

**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 B4-No2", available with codenumber 4822 389 10026.

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.

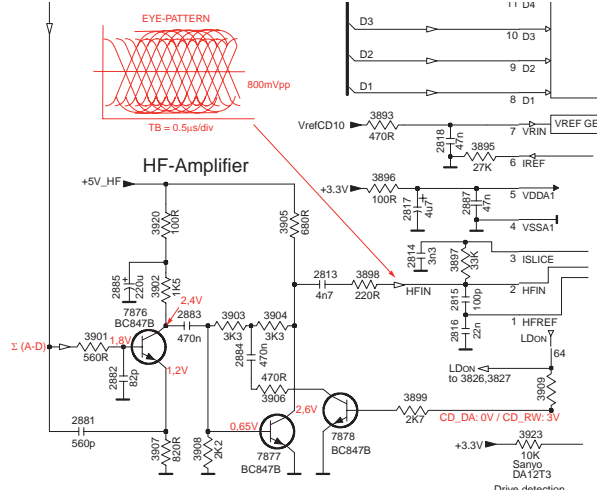


# INSTRUCTIONS ON CD PLAYABILITY

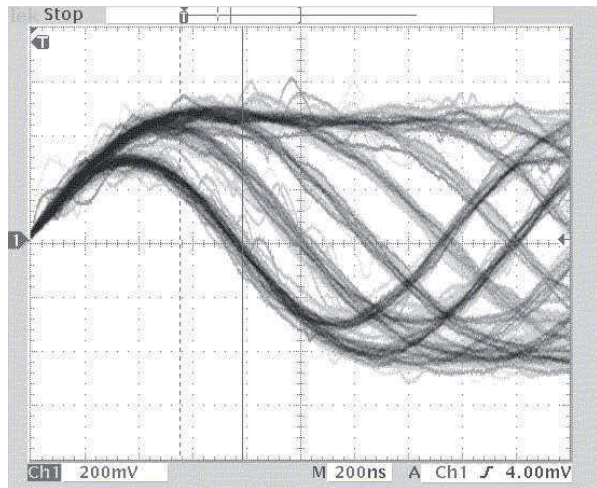
5

## EYE-PATTERN SIGNAL – JITTER MEASUREMENT

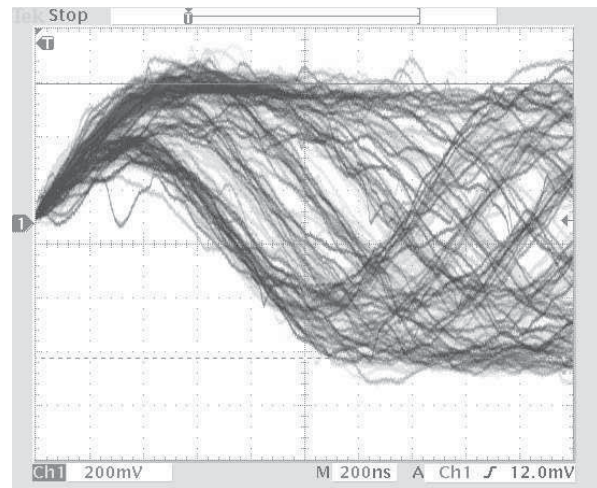
Measure the signal on the input of the Signal processor using an **analog** oscilloscope. Please find the exact measuring point in your Service Manual.



See below examples of the signal. Amplitude should read at least 700mVpp using SBC444A.



good



bad

If the oscilloscope shows a signal like the 'bad' one, and/or the amplitude decreases within 1 minute - the CD drive has to be replaced.

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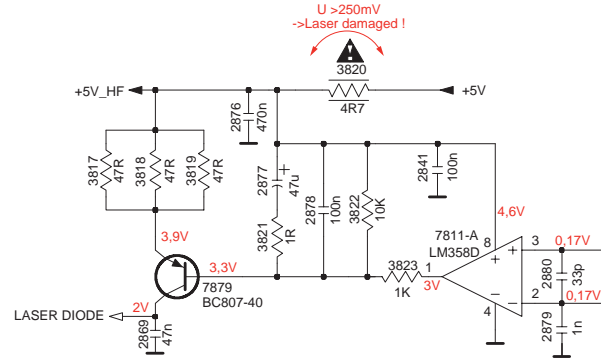
## CD DRIVE – LASER CURRENT MEASUREMENT

The laser current can be measured as a voltage drop on a resistor. The resistor is marked in every Service Manual. The value depends on the type of CD drive.

	typical value	most probably defect
VAMxxxx	: 150-230mV	≥350mV
MCDxx	: 170-230mV	≥300mV
DA1x	: 210-250mV	≥350mV
DA2x	: 175-200mV	≥250mV

Use SBC444A (CD-DA) for measurement.

### Laser power control



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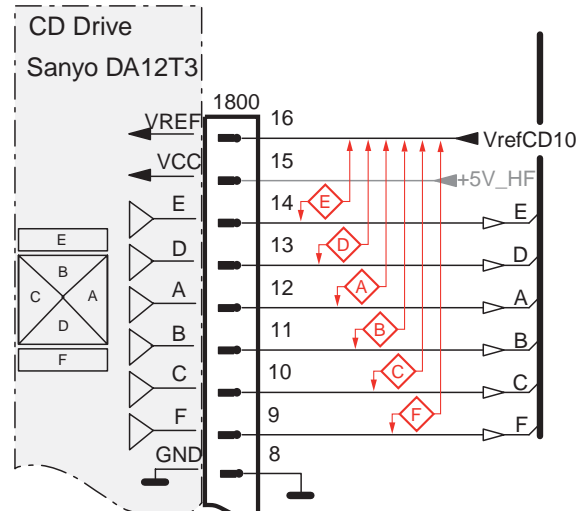
## CD DRIVE – OFFSET MEASUREMENT

The photodiodes of the CD-drive may have an offset. These offsets have to be compensated by the signal processor. High offsets can lead to poor playability of some CDs (skipping tracks).

To measure the offset values, start the **Service Test Program** - section "Focus Test" without a CD.

The offsets can be measured with a DC Millivoltmeter directly on the connector (see drawing below). Pin numbering varies from drive to drive.

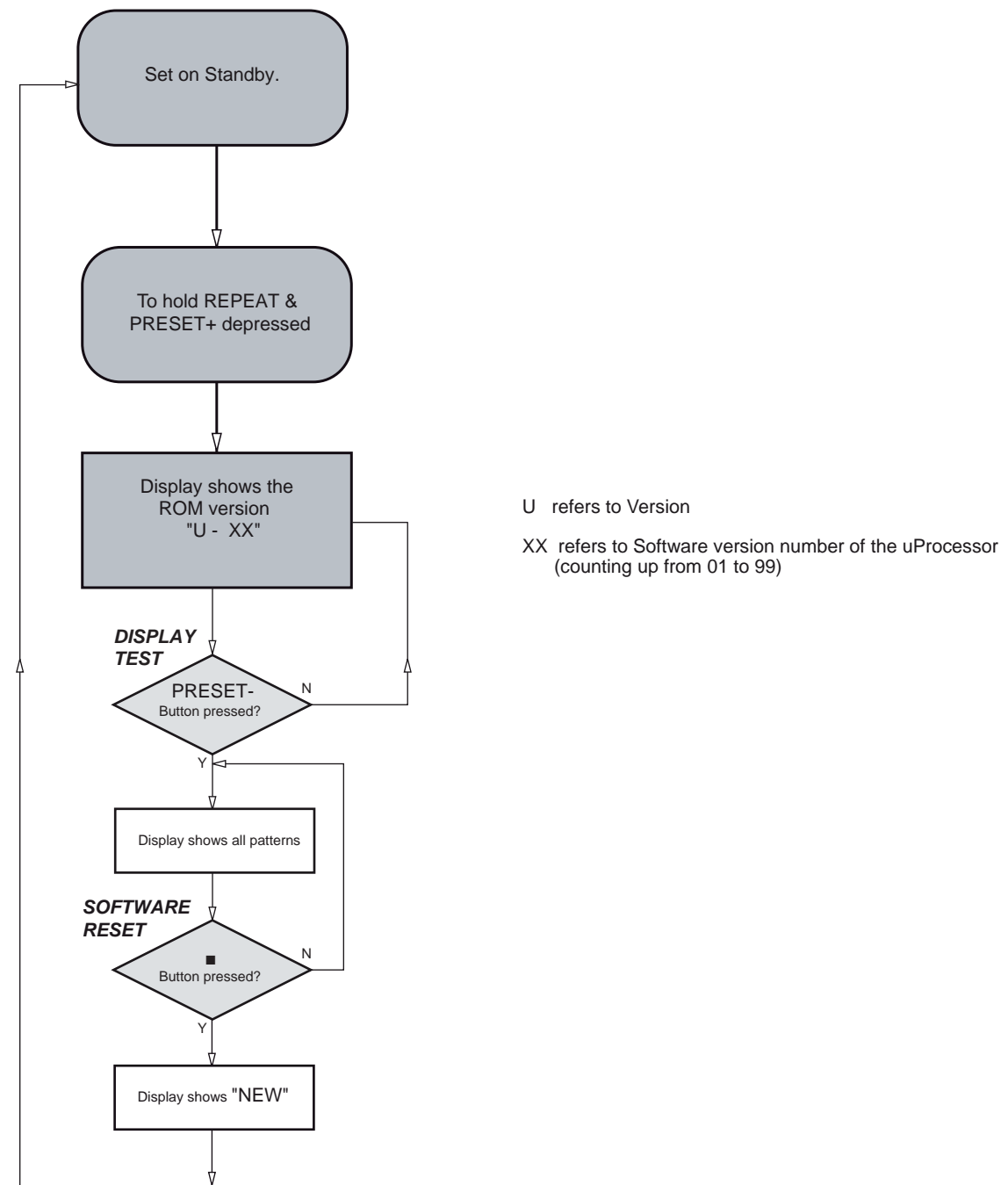
The values from diode A-D should read 0±10mV. Diodes E and F are less critical.



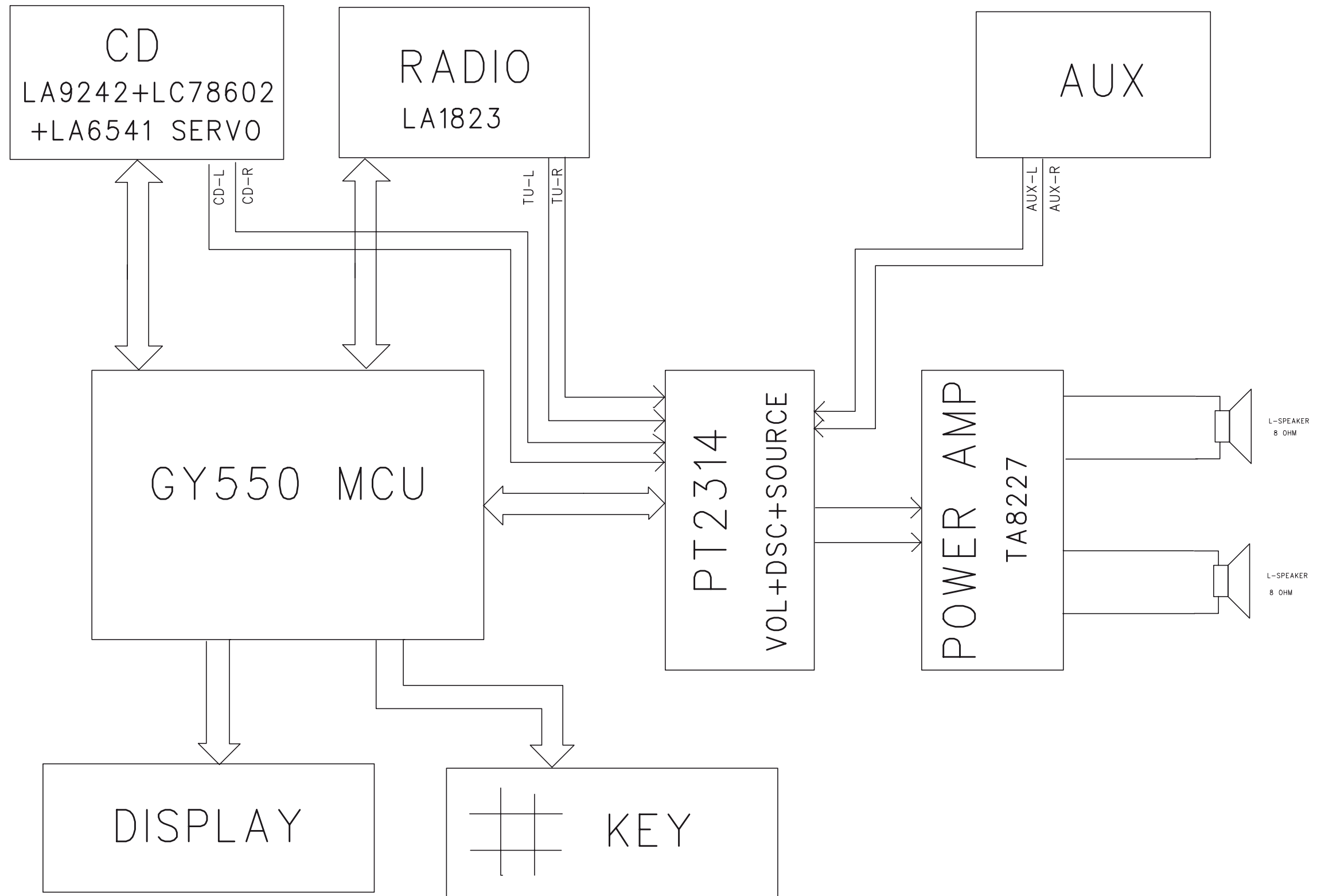
If one of the offsets is higher than ±10mV the CD drive has to be replaced. Otherwise replace the Signal Processor.



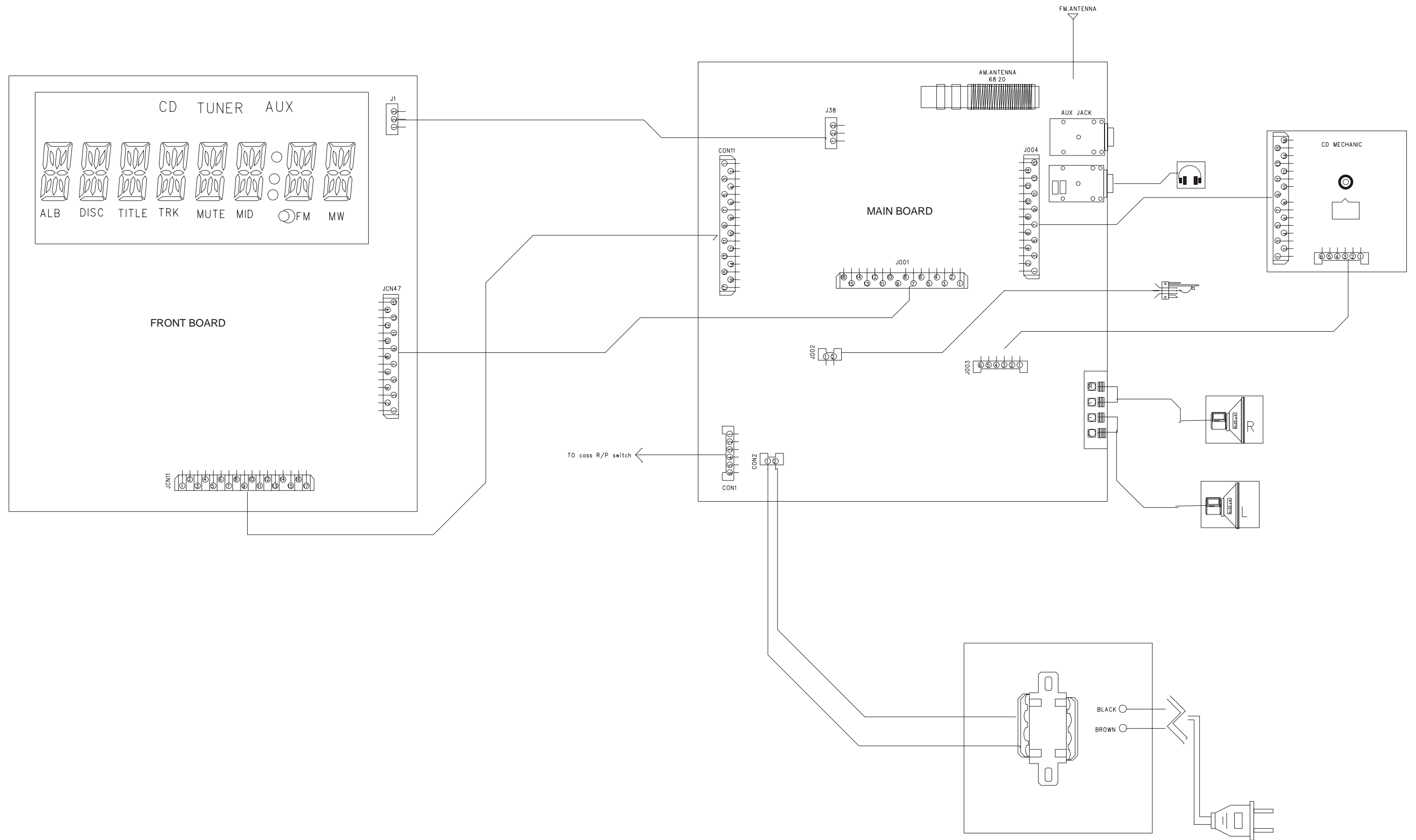
## SOFTWARE VERSION CHECKING



SET BLOCK DIAGRAM



# SET WIRING DIAGRAM



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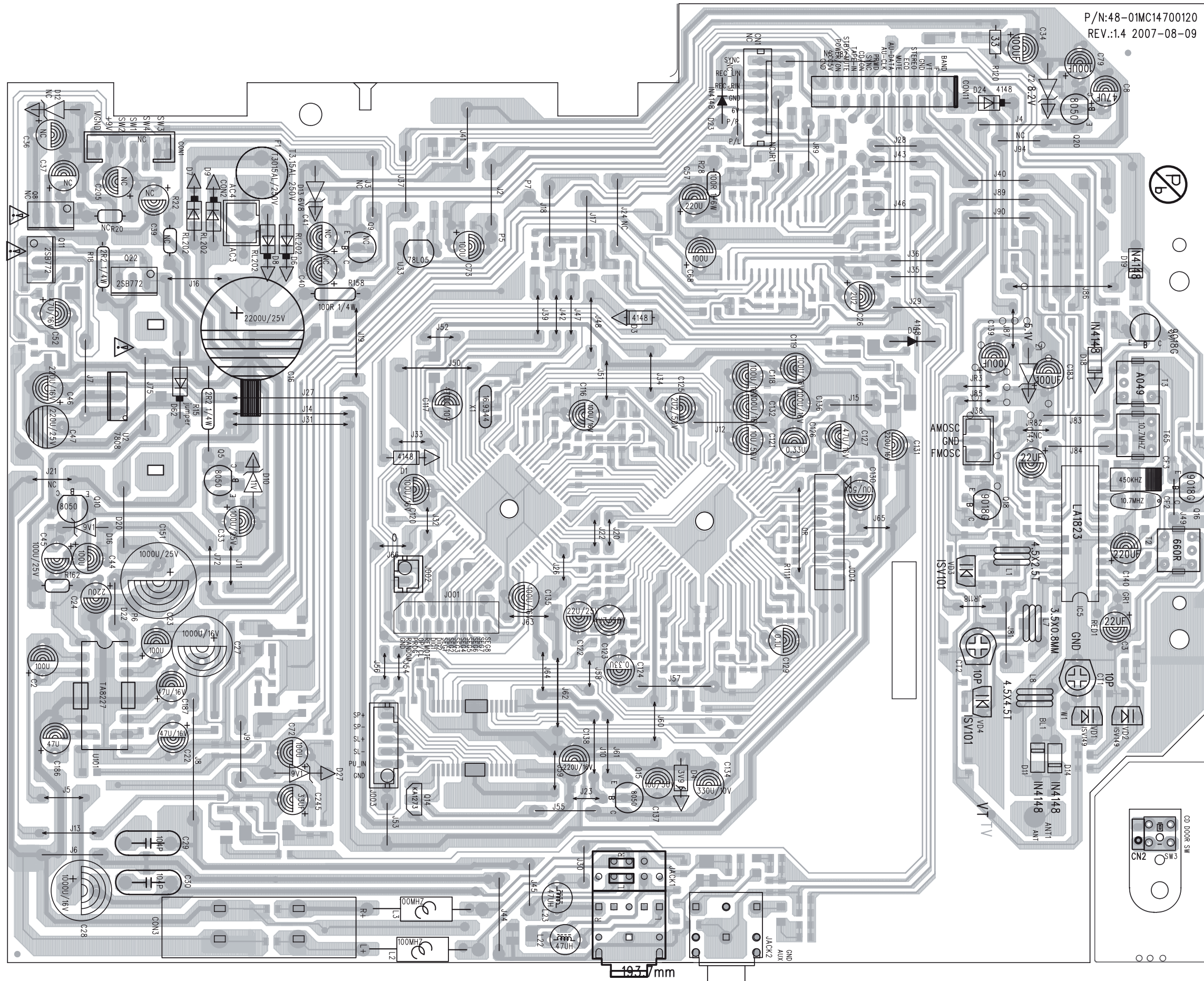
# MAIN BOARD

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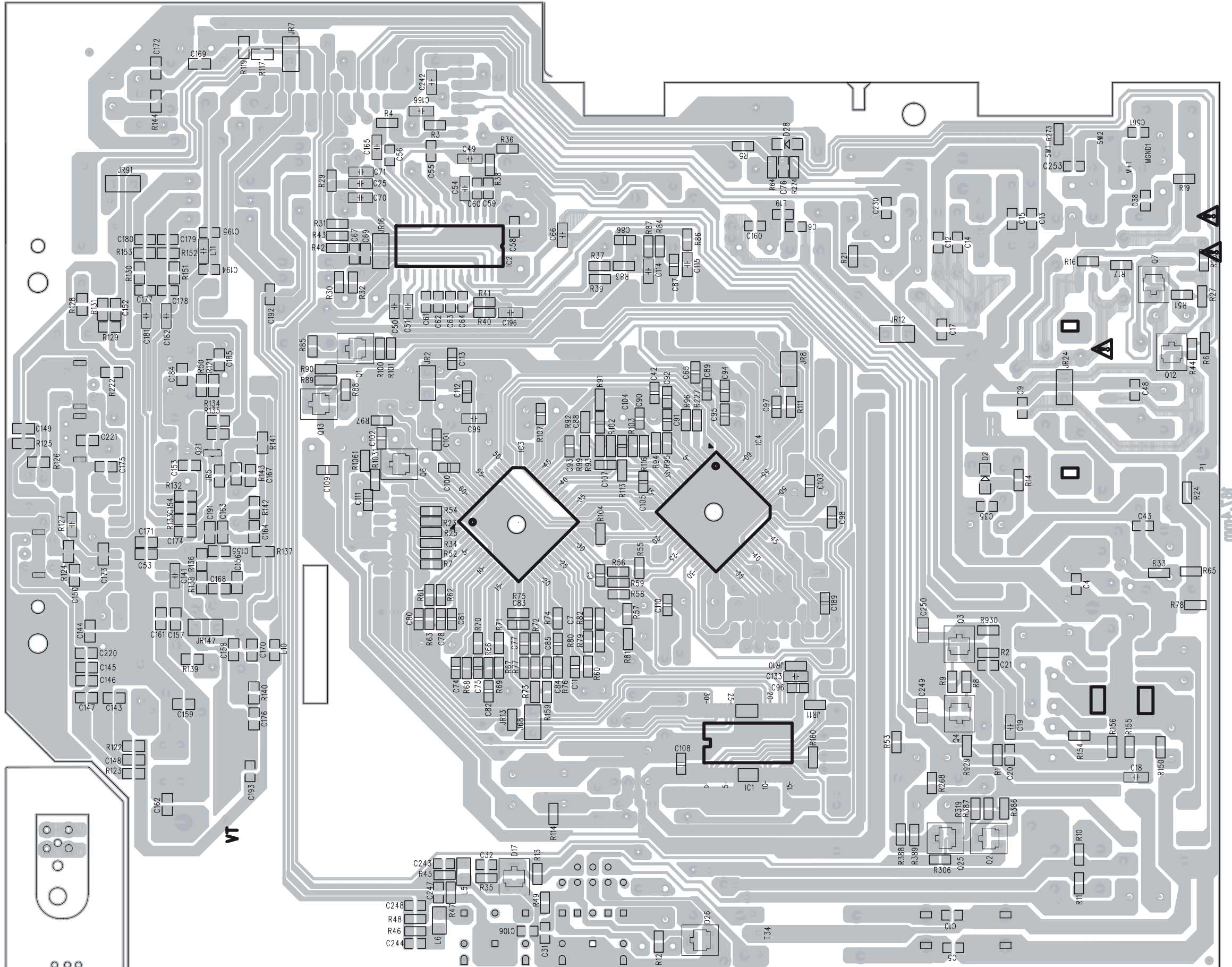
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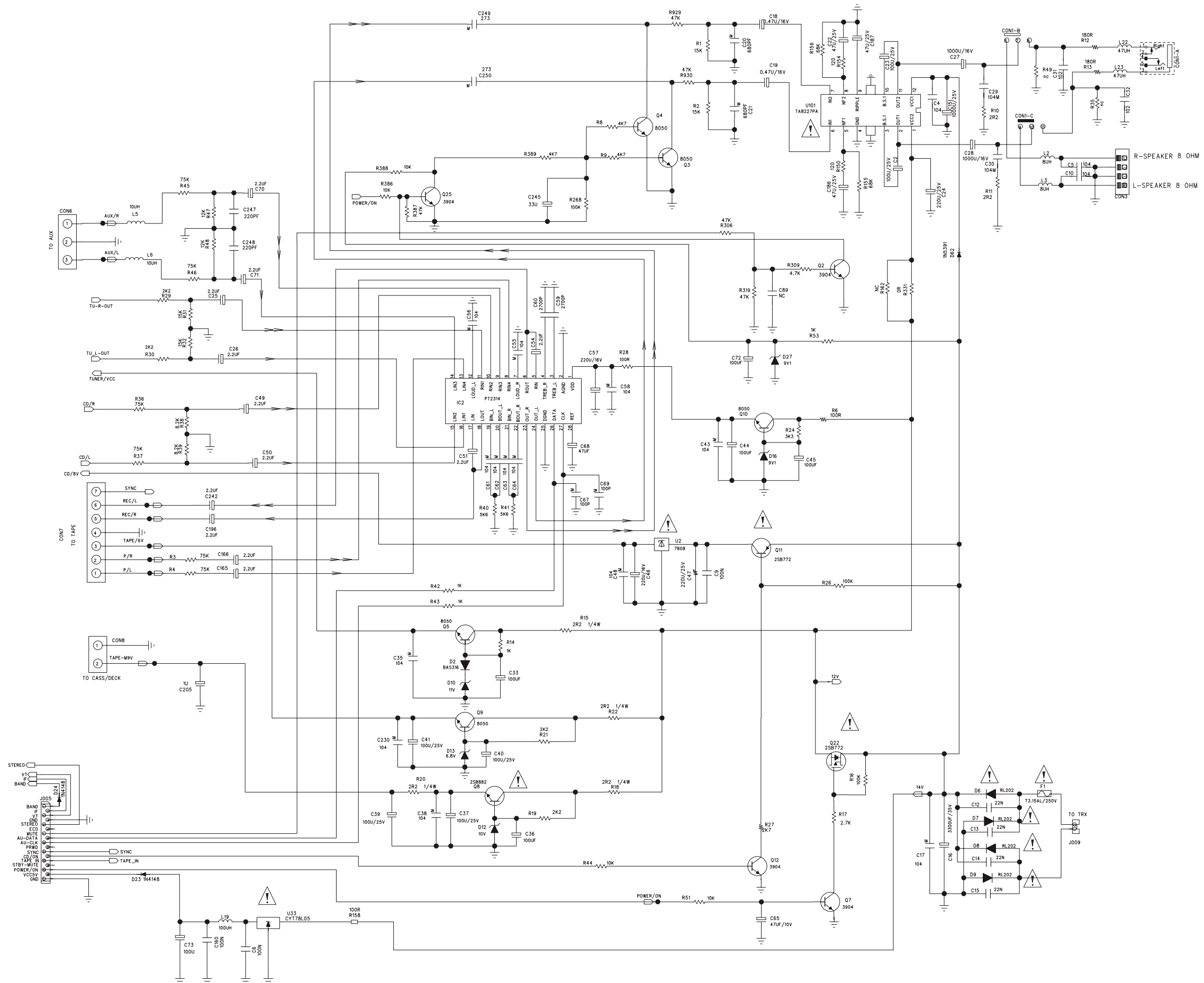
# PCB LAYOUT - MAIN BOARD TOP VIEW



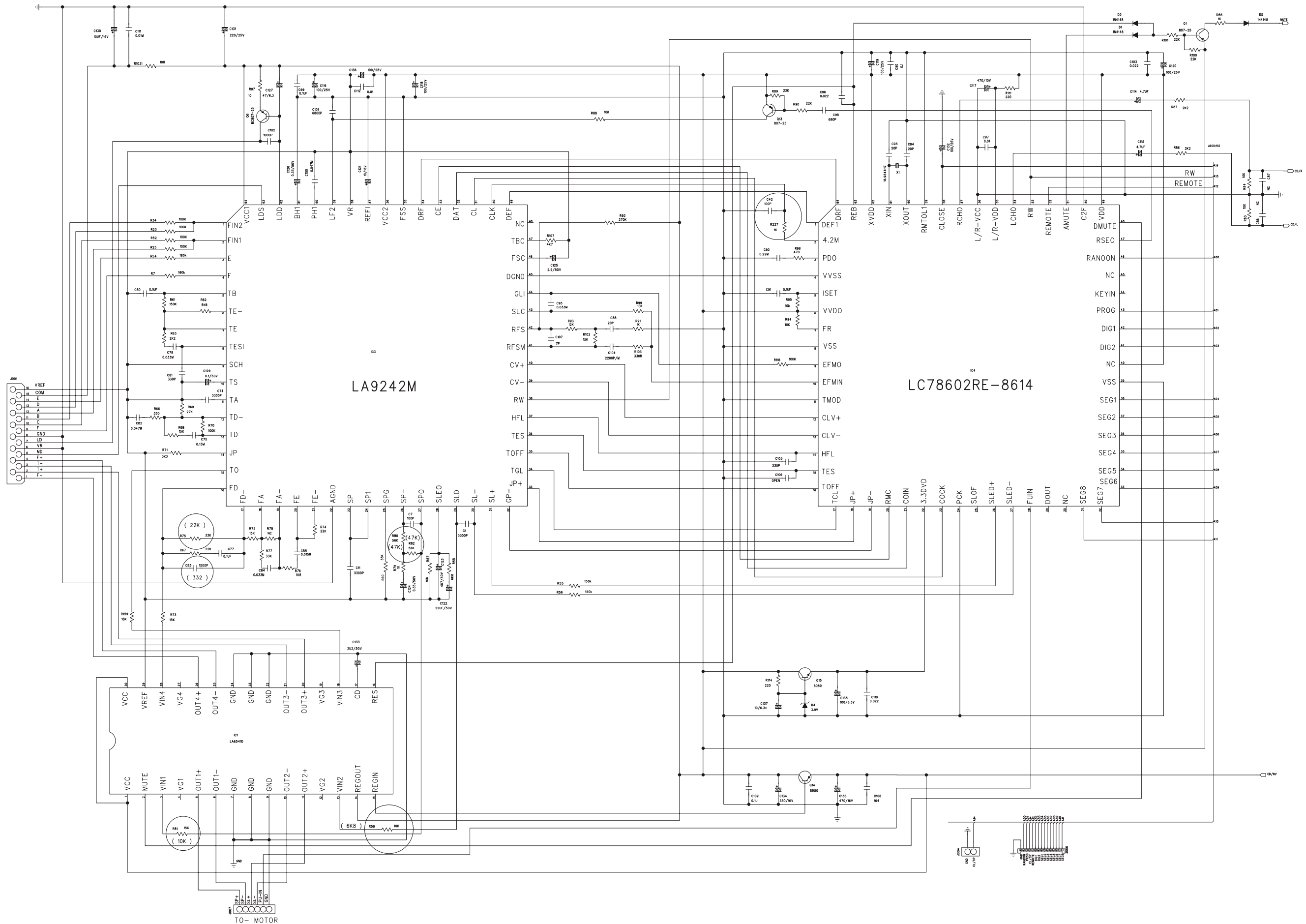
# PCB LAYOUT - MAIN BOARD BOTTOM VIEW



# CIRCUIT DIAGRAM - MAIN BOARD AF & AMP PART

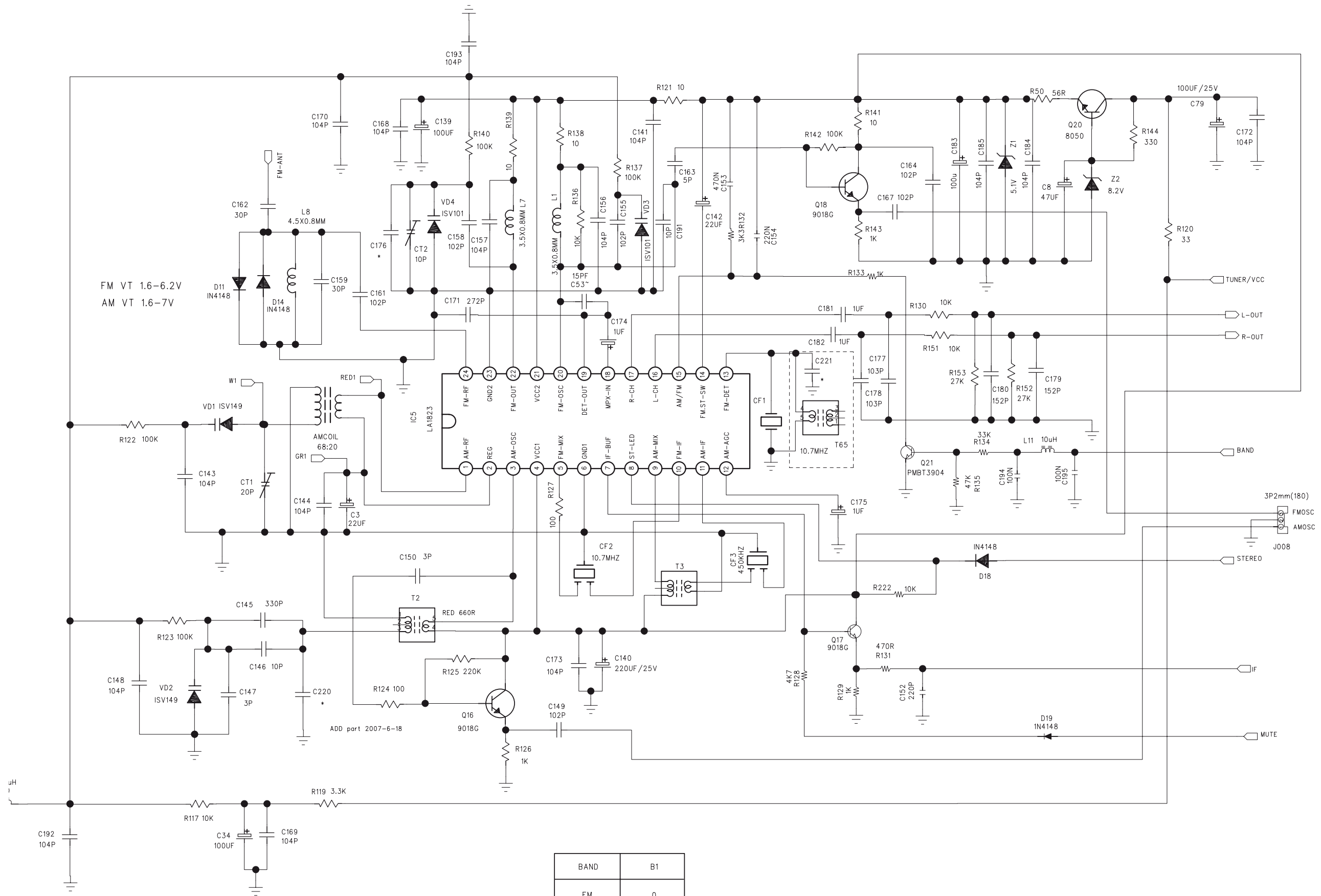


# CIRCUIT DIAGRAM - MAIN BOARD CD PART





# CIRCUIT DIAGRAM - MAIN BOARD TUNER PART



FM VT 1.6-6.2V  
AM VT 1.6-7V

ADD part 2007-6-18

BAND	B1
FM	0
AM	1

---

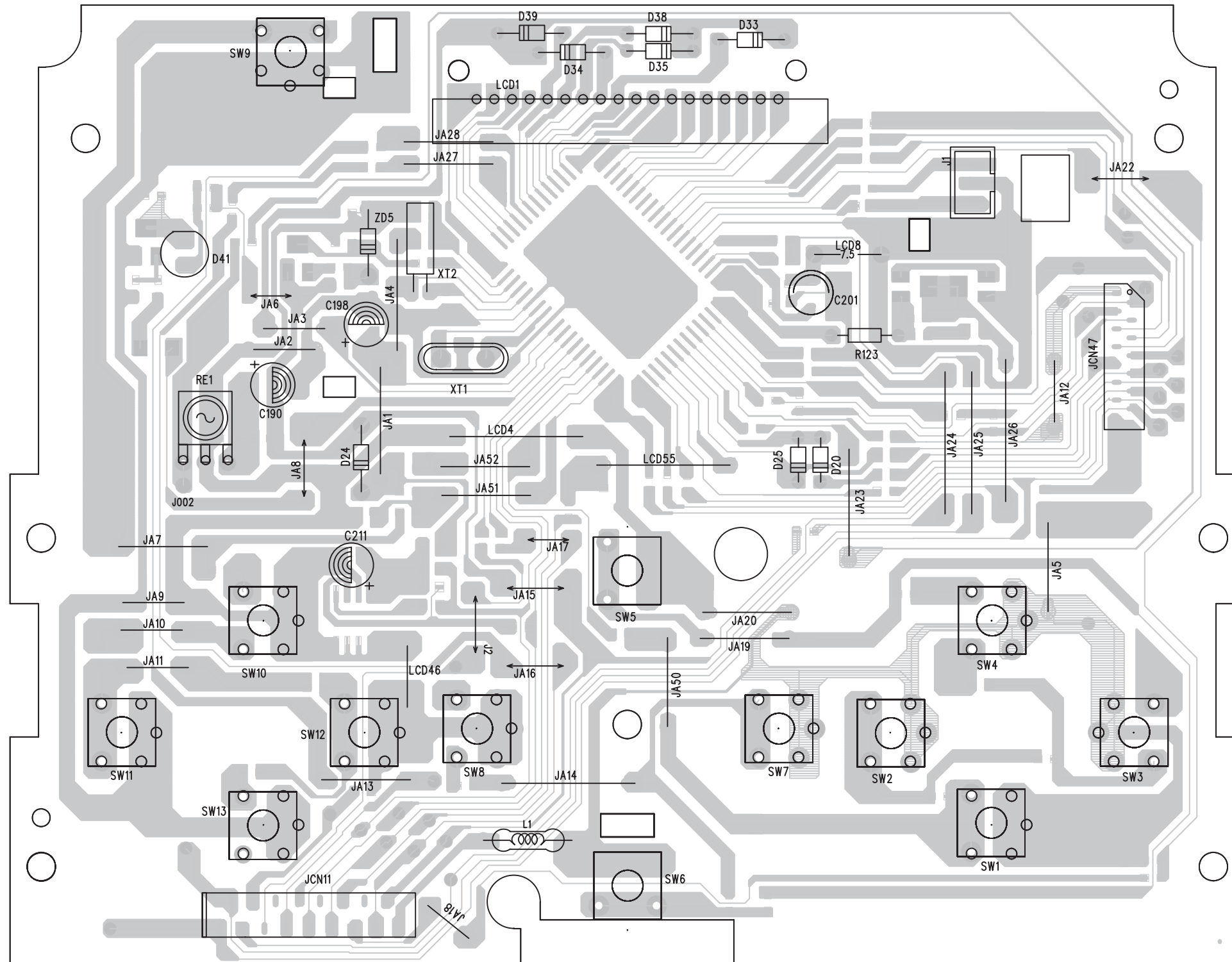
# FRONT BOARD

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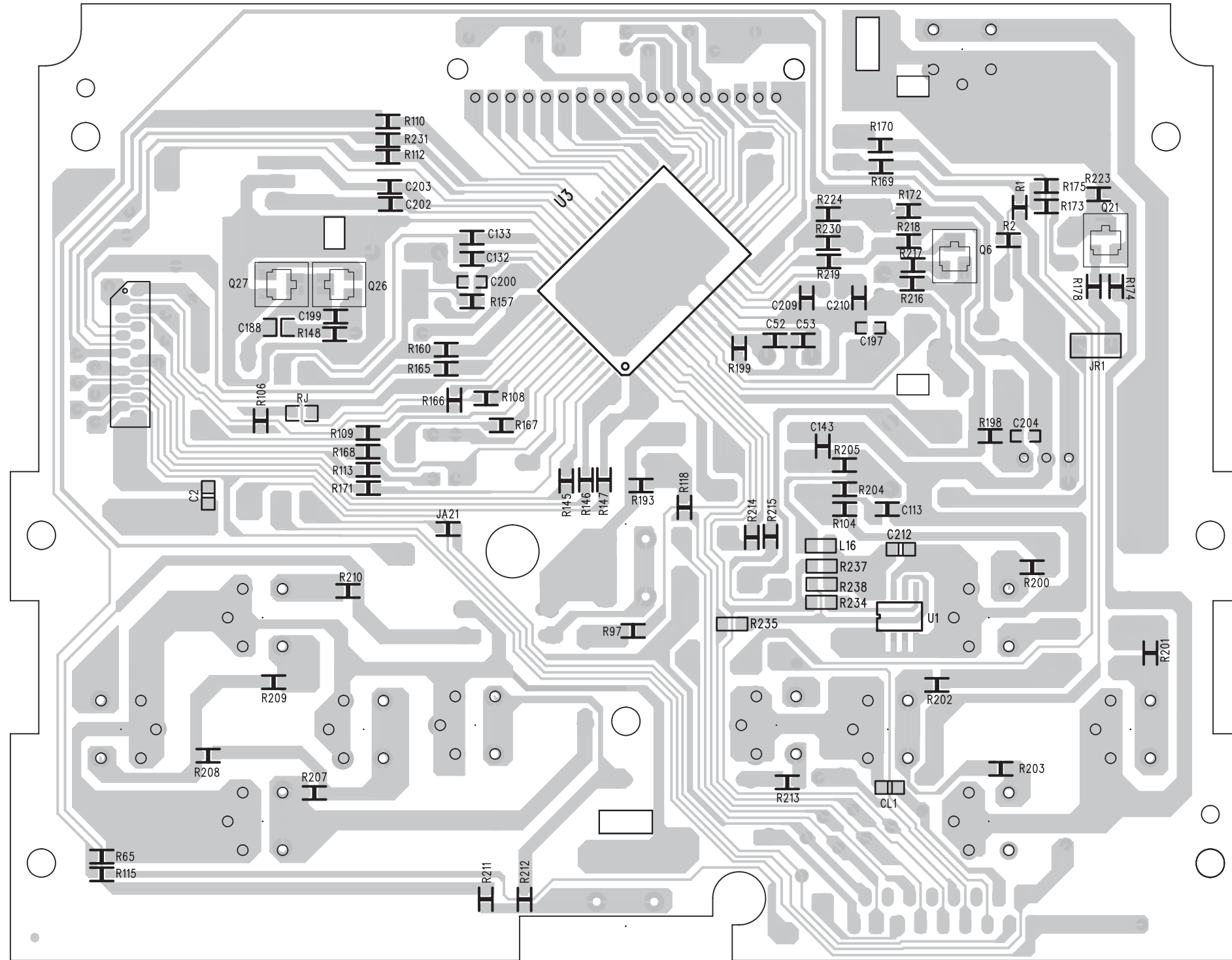
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# PCB LAYOUT - FRONT BOARD (TOP VIEW)



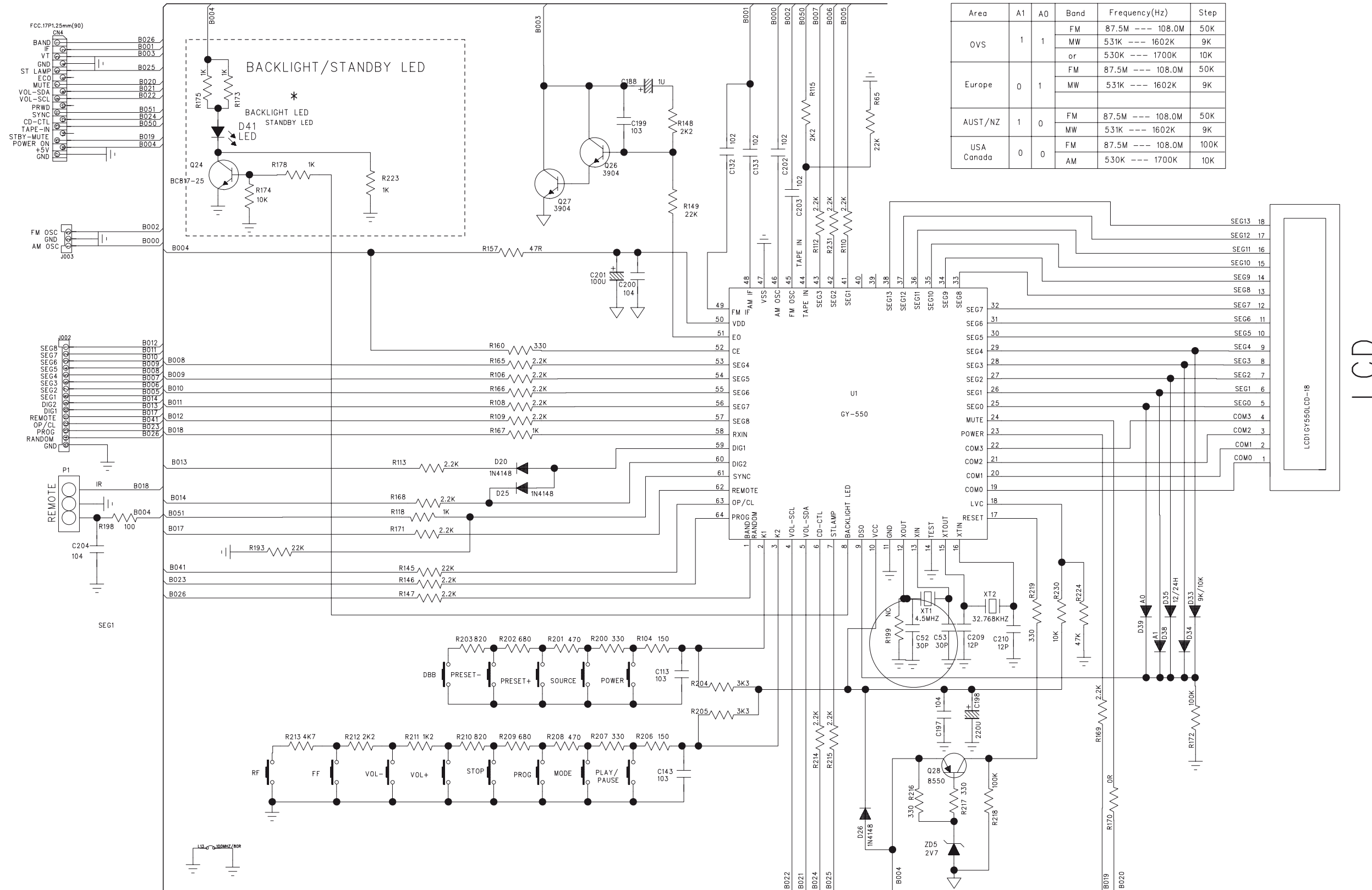
# PCB LAYOUT - FRONT BOARD (BOTTOM VIEW)



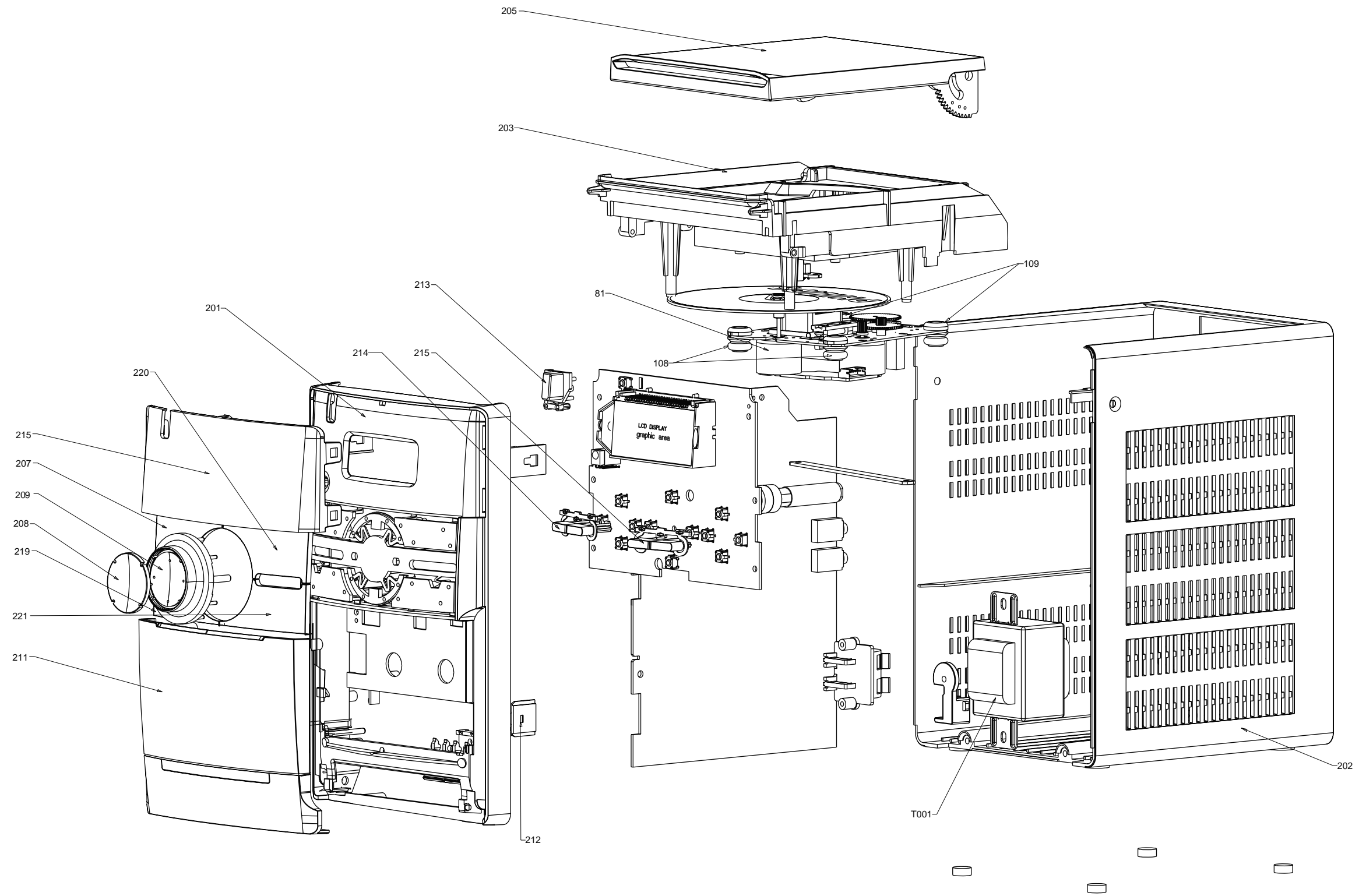
CIRCUIT DIAGRAM - FRONT BOARD

12/24H	9K/10K	D34			
12H	24H	9K	10K	YES TAPE	NO TAPE
0	1	1	0	1	0

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



# SET MECHANICAL EXPLODED VIEW



**MECHANICAL & ACCESSORIES PARTS LIST**

2	996510008380	SPK BOX PART
6	996510006838	REMOTE CONTROL
81	994000005398	CD MECHANISM DA11B3VF
105	996510006667	SPK GRILL
108	996510000860	SHOCK ABSORBER (658 TA 30C)
109	996510000861	SHOCK ABSORBER (658 TB 40C)
114	994000003674	CD DOOR SPRING
201	996510008373	FRONT CABINET
202	996510008379	REAR CABINET /05
202	996510007996	REAR CABINET /12/96
203	996510006656	CD TRAY
205	996510008374	CD DOOR
207	996510008001	SOURCE BUTTON COVER
208	996510006659	VOL COSMETIC COVER
209	996510006660	VOL BUTTON COVER
210	994000001295	DAMPER GEAR ASS'Y
211	996510008376	CASS DOOR BOGUS
212	996510006662	POWER BUTTON
213	996510006663	PRESET BUTTON
214	996510008375	PROGRAM/REPEAT BUTTON
215	996510008377	DISPLAY LENS
219	996510008002	DBB BUTTON COVER
220	996510008003	PLAY BUTTON COVER
221	996510008004	STOP BUTTON COVER
J001	994000004487	16P FFC 1MM L=170MM
J002	996510000914	17P FLAT FLEX CABLE 1.25mm
J008	996510006841	15P FFC 1mm L260mm
J011	△ 996510000859	AC CORD BS APP 2M /05
J011	△ 996510000909	AC CORD VDE APP 2M /12
J011	△ 996510006948	AC CORD CNS APP 1.8M /96
J012	996510000910	FM ANT SMF-01T-1.3 L=1.1M
S001	994000003093	CD DOOR SWITCH 1P1T DTS-03
T001	△ 996510006839	TRANSFORMER EI48 230V /05/12
T001	△ 996510006651	TRANSFORMER EI41 127V/240V /96

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

**ELECTRICAL PARTS LIST - MAIN BOARD**

C16	996510006833	E.CAP 3300UF 25V +-20%	VD1	994000002836	VARICAP DIODE 1SV-149
CF1	996510006834	DISCRI.FILTER CDA10.7MG46-A	VD2	994000002836	VARICAP DIODE 1SV-149
CF2	994000003642	CER. FILTER LT10.7MA5-A RED	VD3	994000004342	VARICAP DIODE V101
CF3	994000002857	CERAMIC FILTER SFU450B	VD4	994000004342	VARICAP DIODE V101
CON3	996510005450	SPK JACK PT-22V11A	X1	994000004551	CRYSTAL 16.9344MHZ +-20PPM
CT1	994000000254	TRIMMER 10PF 6MM (WH)			
CT2	994000000254	TRIMMER 10PF 6MM (WH)			
D6	994000003938	RECTIFIER DIODE RL-202			
D7	994000003938	RECTIFIER DIODE RL-202			
D8	994000003938	RECTIFIER DIODE RL-202			
D9	994000003938	RECTIFIER DIODE RL-202			
F1	△ 994000000586	GLASS FUSE W/LEAD 3.15A/250V			
IC1	996510006827	IC (SANYO) LA6541NHL-TE-L-E			
IC2	996500039806	IC ET2314 (SOP28)			
IC3	996510006828	IC (SANYO) LA9242M-MPB-E			
IC4	996510006829	IC (SANYO) LC78602RE-8616			
IC5	996510006832	IC (SANYO) LA1823			
JACK1	994000004369	PHONE JACK TC38-063-05-0			
JACK2	996510000889	PHONE JACK TC38-060-01 RING			
L001	996510006681	AM COIL AD/M7 65:20T			
L1	996500039350	FM COIL 4.5x2.5T (0.8mm)			
L7	994000003655	FM COIL 4.5X3.5T			
L8	994000003655	FM COIL 4.5X3.5T			
Q10	996500038609	TRANSISTORS 2W 8050C			
Q11	994000004145	TRANSISTORS B772Y (160-320)			
Q12	994000004338	SMD TRANSISTORS PMBT3904			
Q14	996510003996	TRANSISTORS KTA1273			
Q15	996500038609	TRANSISTORS 2W 8050C			
Q16	996510006831	TRANSISTORS 9018F			
Q17	996510006831	TRANSISTORS 9018F			
Q18	996510006831	TRANSISTORS 9018F			
Q2	996510008369	TRANSISTORS MMBT8050D (SOT23)			
Q20	996500038609	TRANSISTORS 2W 8050C			
Q21	994000004338	SMD TRANSISTORS PMBT3904			
Q22	994000004145	TRANSISTORS B772Y (160-320)			
Q25	994000004338	SMD TRANSISTORS PMBT3904			
Q3	996510008369	TRANSISTORS MMBT8050D (SOT23)			
Q4	996510008369	TRANSISTORS MMBT8050D (SOT23)			
Q5	996500038609	TRANSISTORS 2W 8050C			
Q7	994000004338	SMD TRANSISTORS PMBT3904			
T2	996510006835	I.F.T 7mm 660R (RED)			
T3	994000002861	I.F.T 7MM A049 (YELLOW)			
U101	994000003636	IC D8227 DIP			
U2	994000000253	IC (SAMSUNG) KA7808			
U33	996510003984	IC CYT78L05 (TO-92)			

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



**ELECTRICAL PARTS LIST - FRONT BOARD**

D41	996500042438	LED LAMP 2x5x7mm (WHITE)
L1	996510006837	AXIAL INDUCTOR 10UH +-10%
LCD1	996510008371	LCD DISPLAY SDH-DA1607-TN-1
Q21	994000004338	SMD TRANSISTORS PMBT3904
Q26	994000004338	SMD TRANSISTORS PMBT3904
Q27	994000004338	SMD TRANSISTORS PMBT3904
Q6	994000003937	SMD TRANSISTORS PMBT3906
RE1	994000004367	OPTIC SENSER FM-6038TM2-5AN
SW1	996500042444	TACT SWITCH 6x6mm 4.3mm
SW10	996500042444	TACT SWITCH 6x6mm 4.3mm
SW11	996500042444	TACT SWITCH 6x6mm 4.3mm
SW12	996500042444	TACT SWITCH 6x6mm 4.3mm
SW13	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
U1	994000004541	IC M24C02-WMN6
U3	996510006836	MCU GY550 (OTP)
XT1	994000004616	CRYSTAL 4.500MHZ
XT2	996500042441	X'TAL 32.768KHZ -20PPM

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