

Service
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Service Manual

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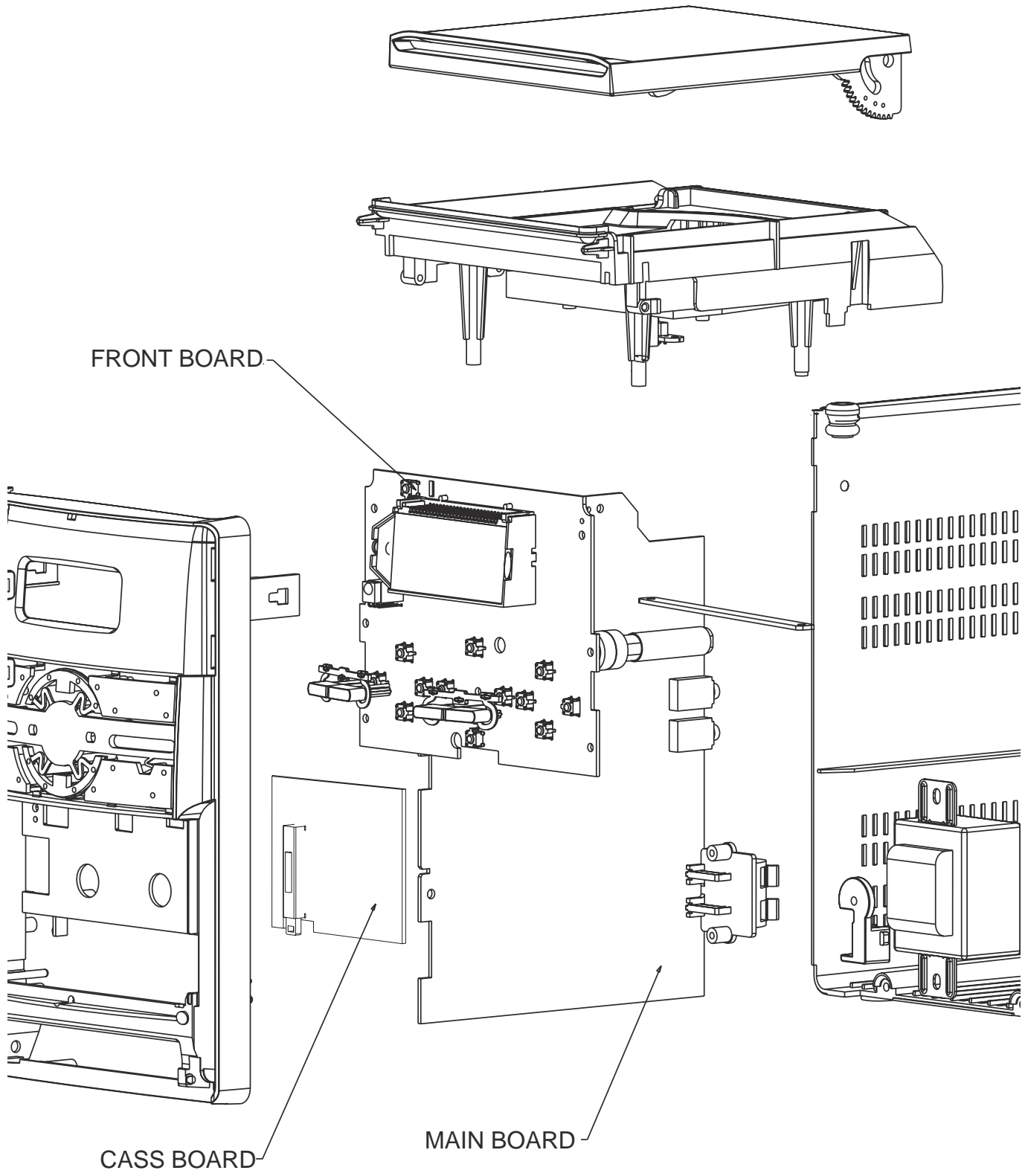


Version 1.0



PHILIPS

PCBS LOCATION



SPECIFICATIONS

AMPLIFIER

Output power 2 x 2W RMS
 Signal-to-noise ratio ≥ 60 dBA (IEC)
 Frequency response 125 – 16000 Hz
 Impedance loudspeakers 8Ω

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 μ V
 – MW 26 dB sensitivity 5 mV/m
 Total harmonic distortion $\leq 5\%$

TAPE DECK

Frequency response
 Normal tape (type I) 125 – 8000 Hz (8 dB)
 Signal-to-noise ratio
 Normal tape (type I) 40 dBA
 Wow and flutter $\leq 0.4\%$ JIS

SPEAKERS

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

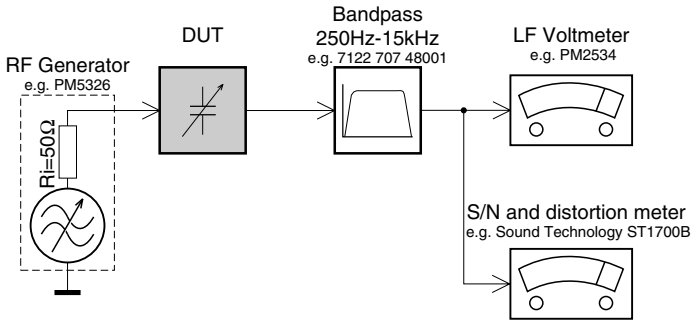
GENERAL INFORMATION

AC Power 110 – 127 / 220 – 240 V
 50/60 Hz, switchable
 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.

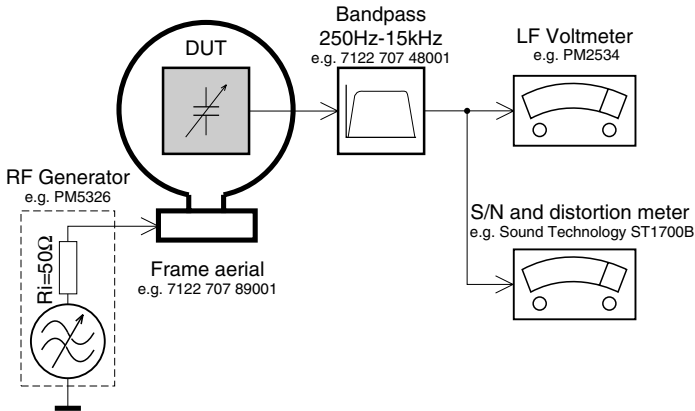
MEASUREMENT SETUP

Tuner FM



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

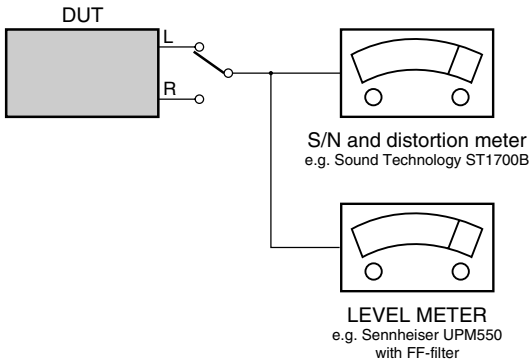
Tuner AM (MW,LW)



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).

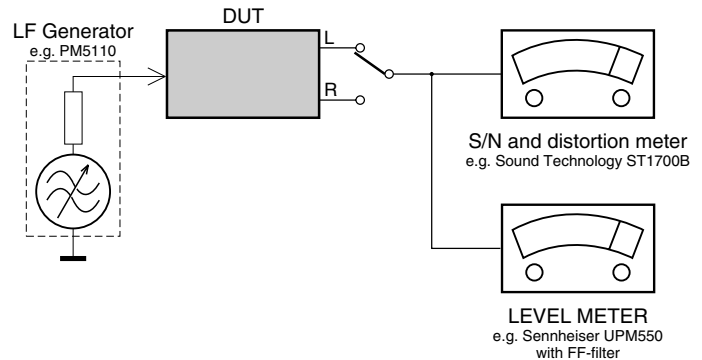
CD

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



Recorder

Use Universal Test Cassette **CrO2** SBC419 4822 397 30069
or Universal Test Cassette **Fe** SBC420 4822 397 30071



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




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



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 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".

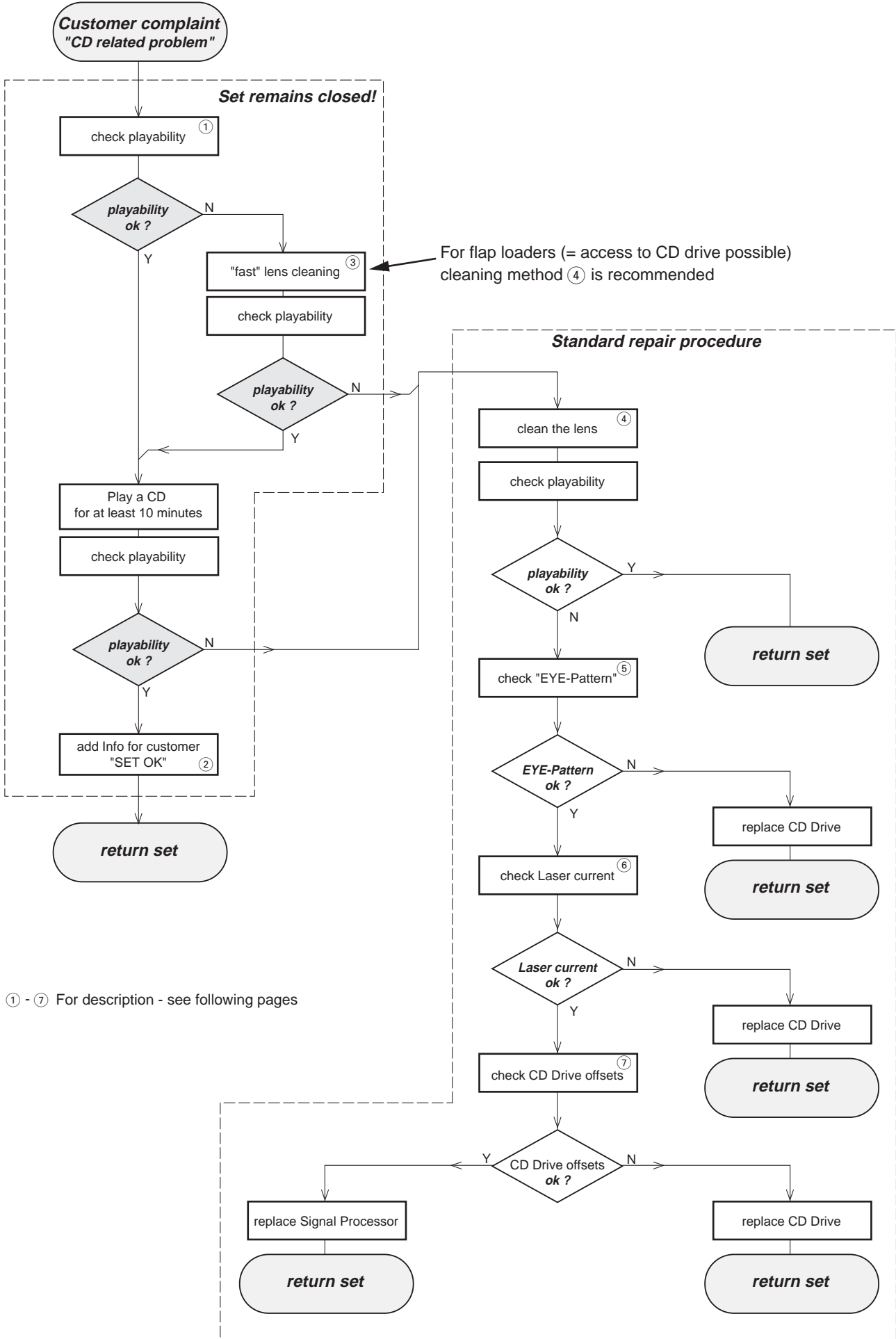
For additional questions please contact your local repair-helpdesk.

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

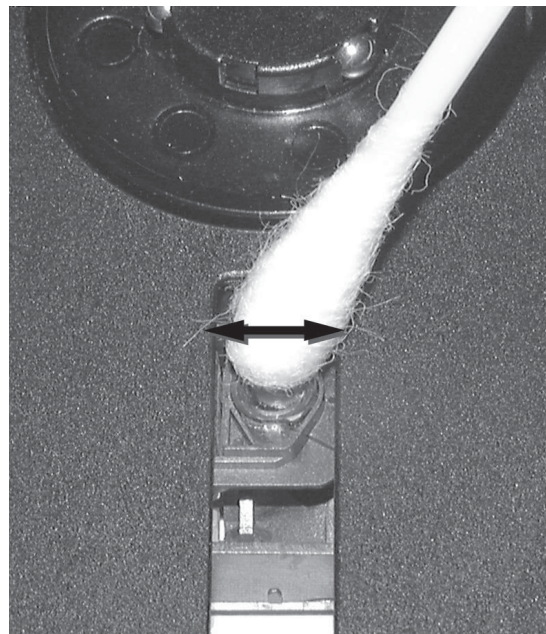
LIQUID LENS CLEANING

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.

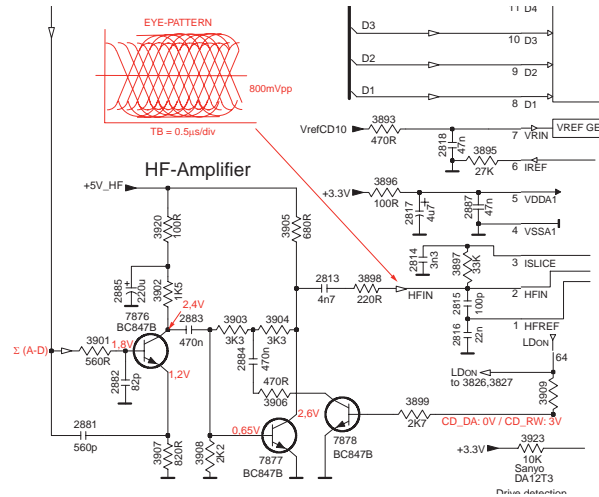


INSTRUCTIONS ON CD PLAYABILITY

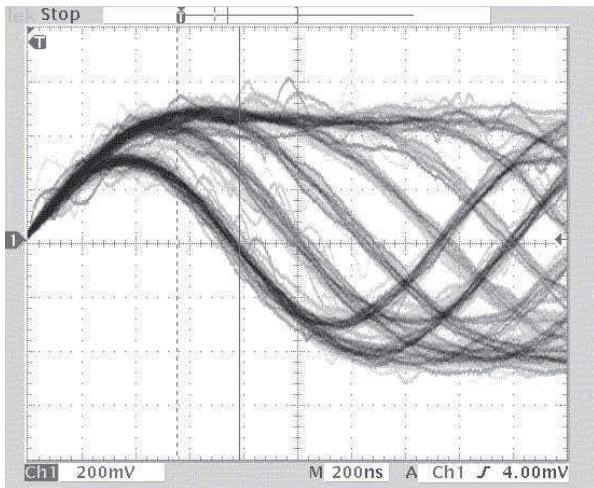
5

EYE-PATTERN SIGNAL – JITTER MEASUREMENT

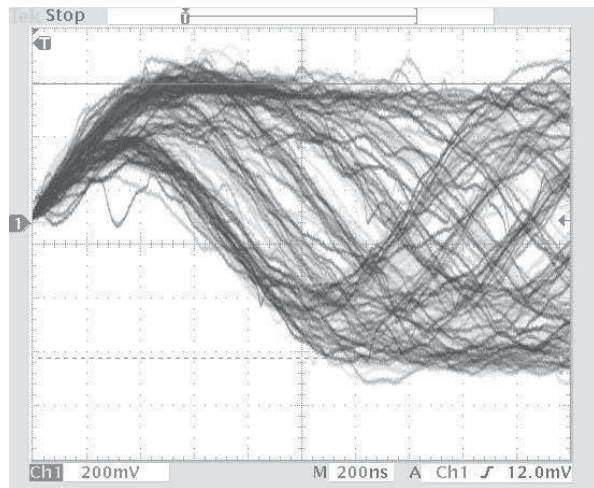
Measure the signal on the input of the Signal processor using an **analog** oscilloscope. Please find the exact measuring point in your Service Manual.



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.

6

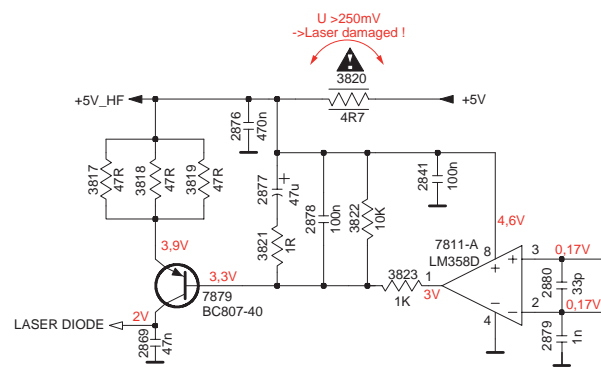
CD DRIVE – LASER CURRENT MEASUREMENT

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



7

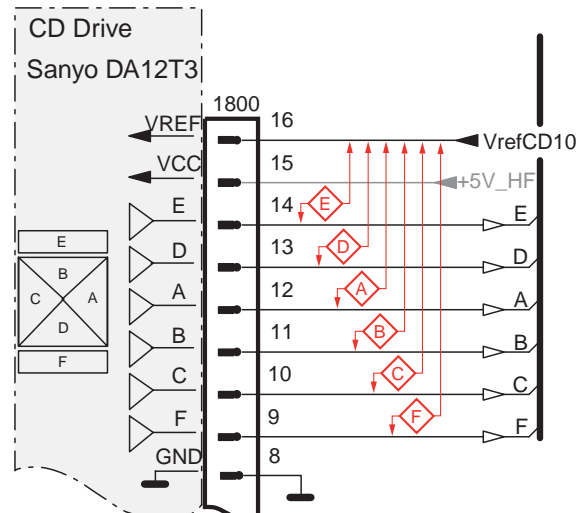
CD DRIVE – OFFSET MEASUREMENT

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.

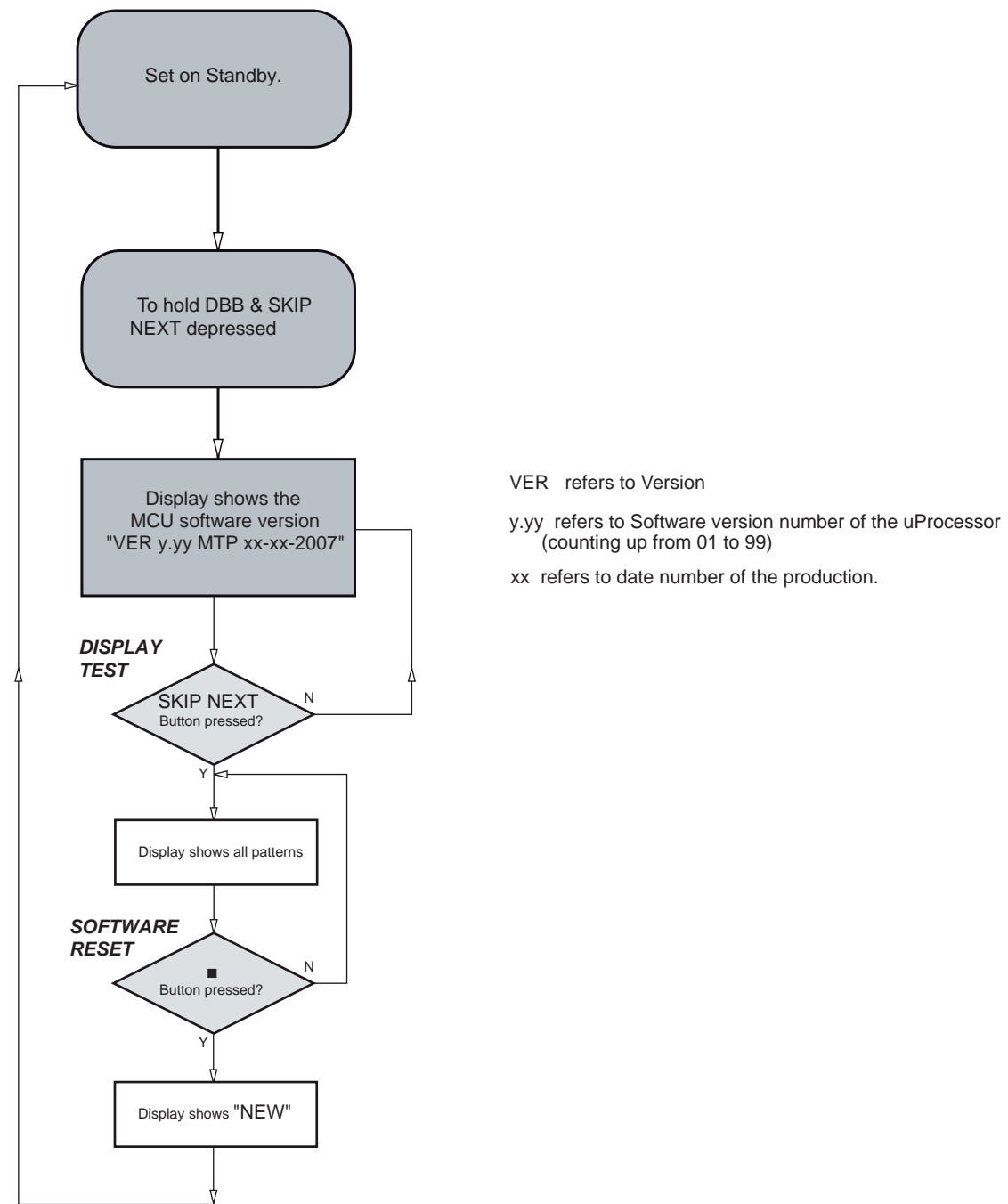
The offsets can be measured with a DC Millivoltmeter directly on the connector (see drawing below). Pin numbering varies from drive to drive.

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

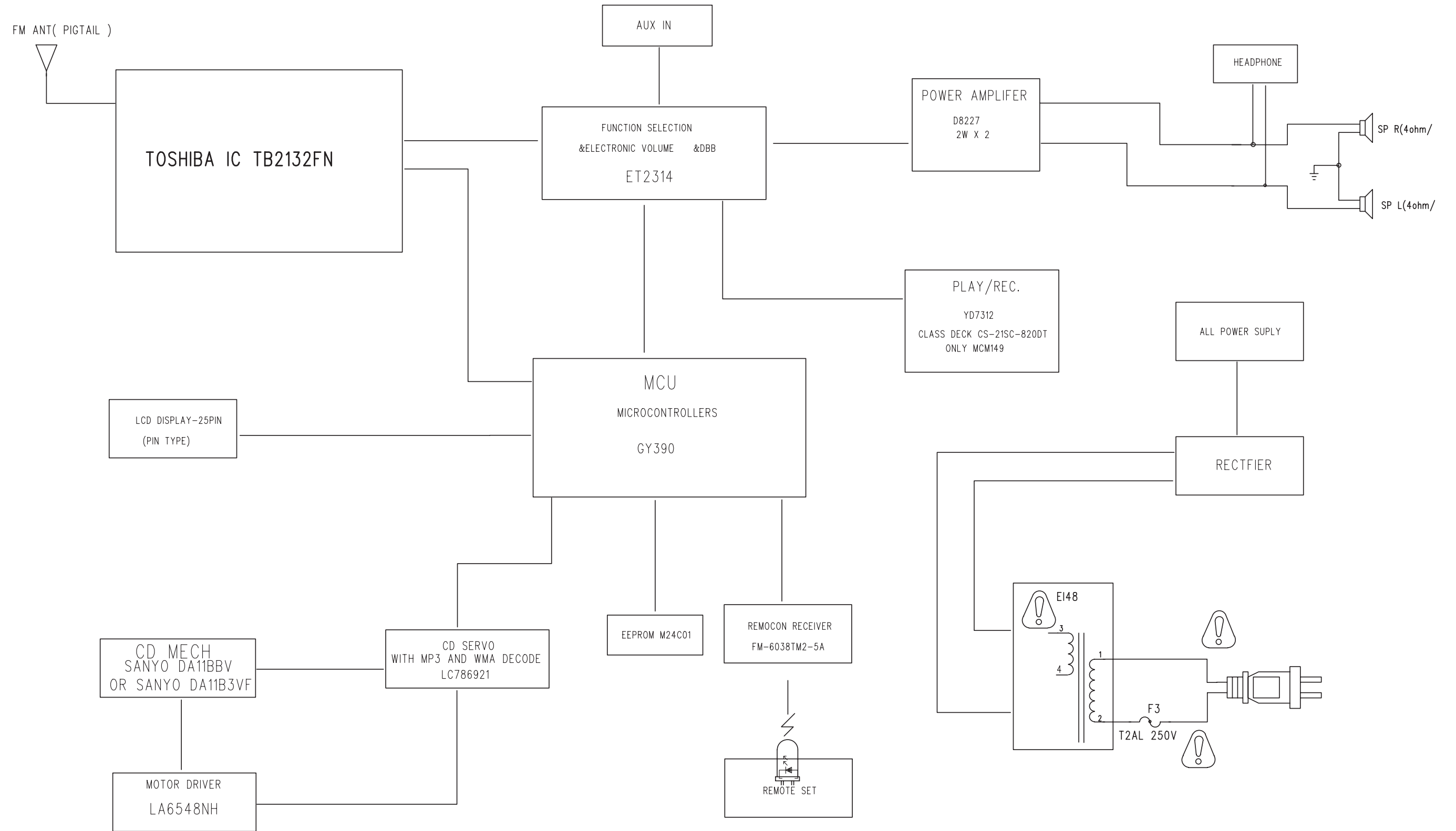


If one of the offsets is higher than $\pm 10mV$ the CD drive has to be replaced. Otherwise replace the Signal Processor.

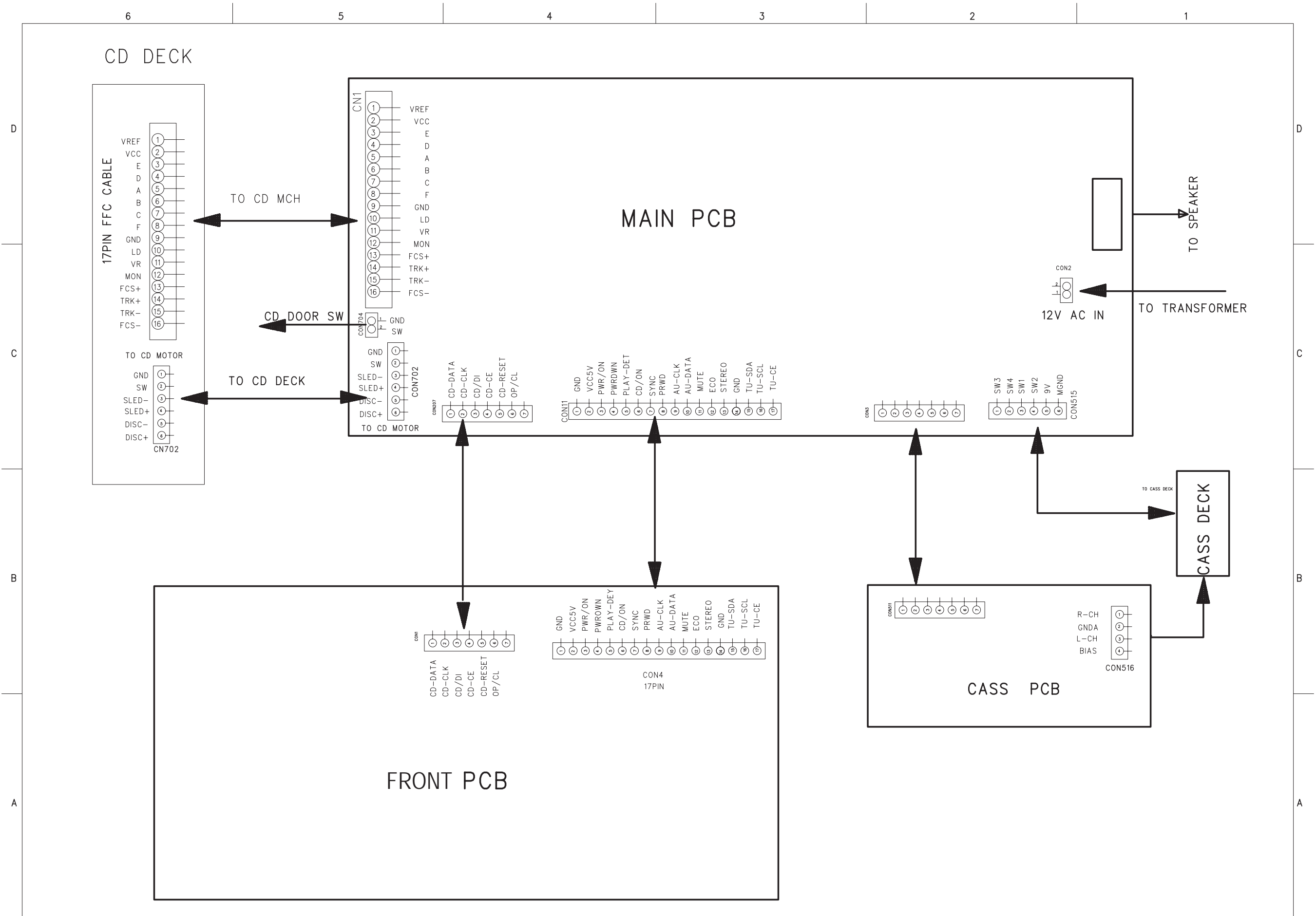
SOFTWARE VERSION CHECKING



SET BLOCK DIAGRAM



SET WIRING DIAGRAM

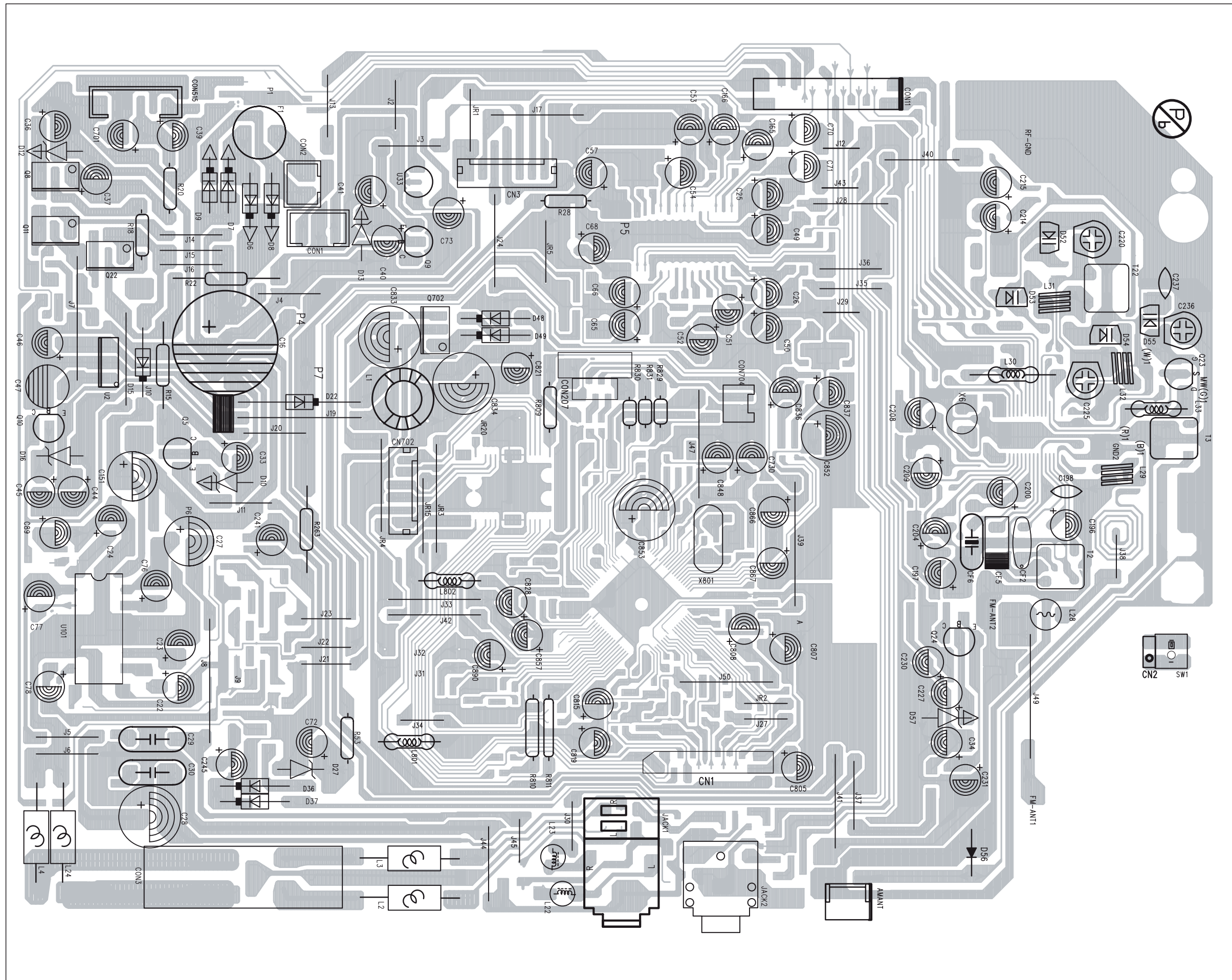


MAIN BOARD

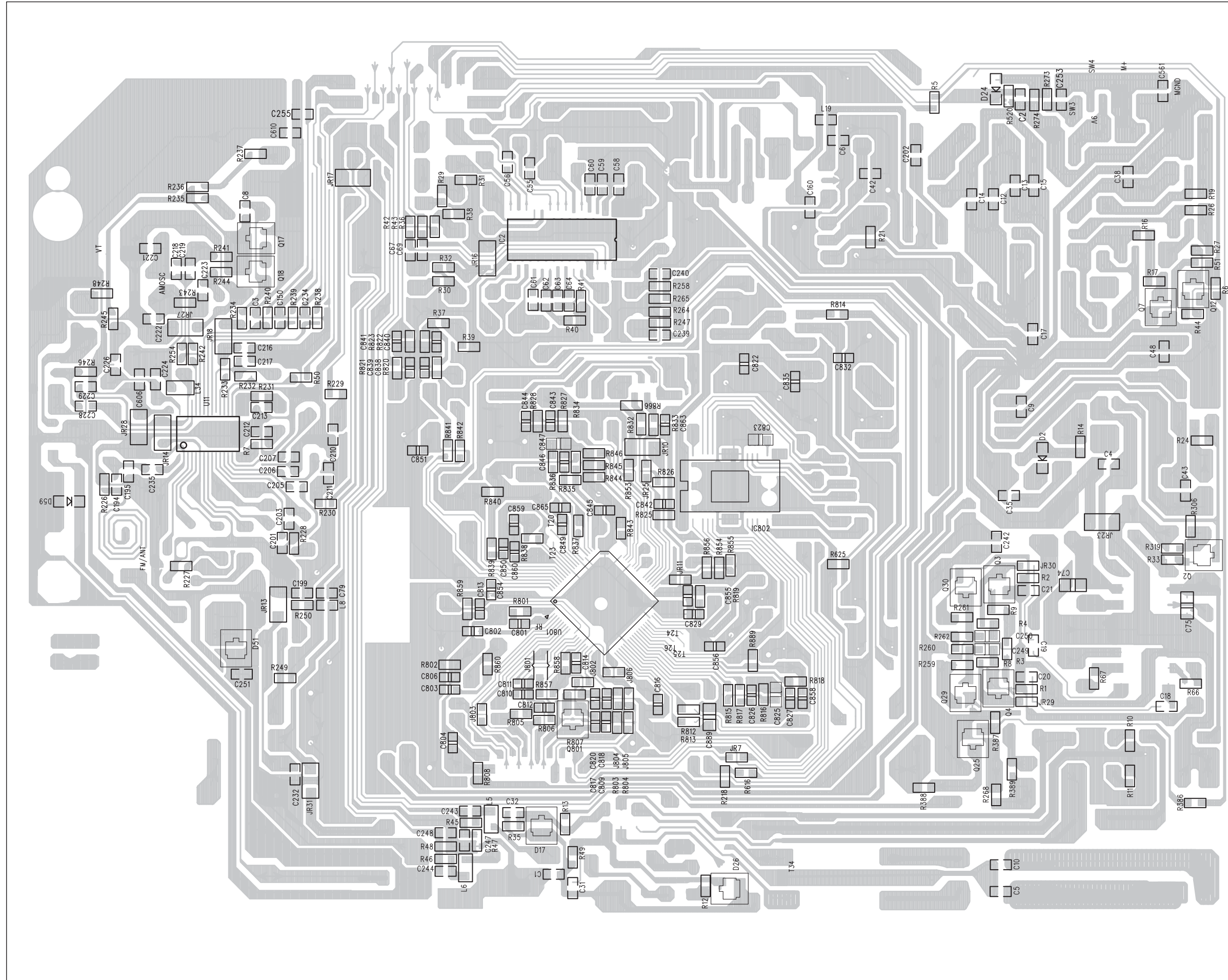
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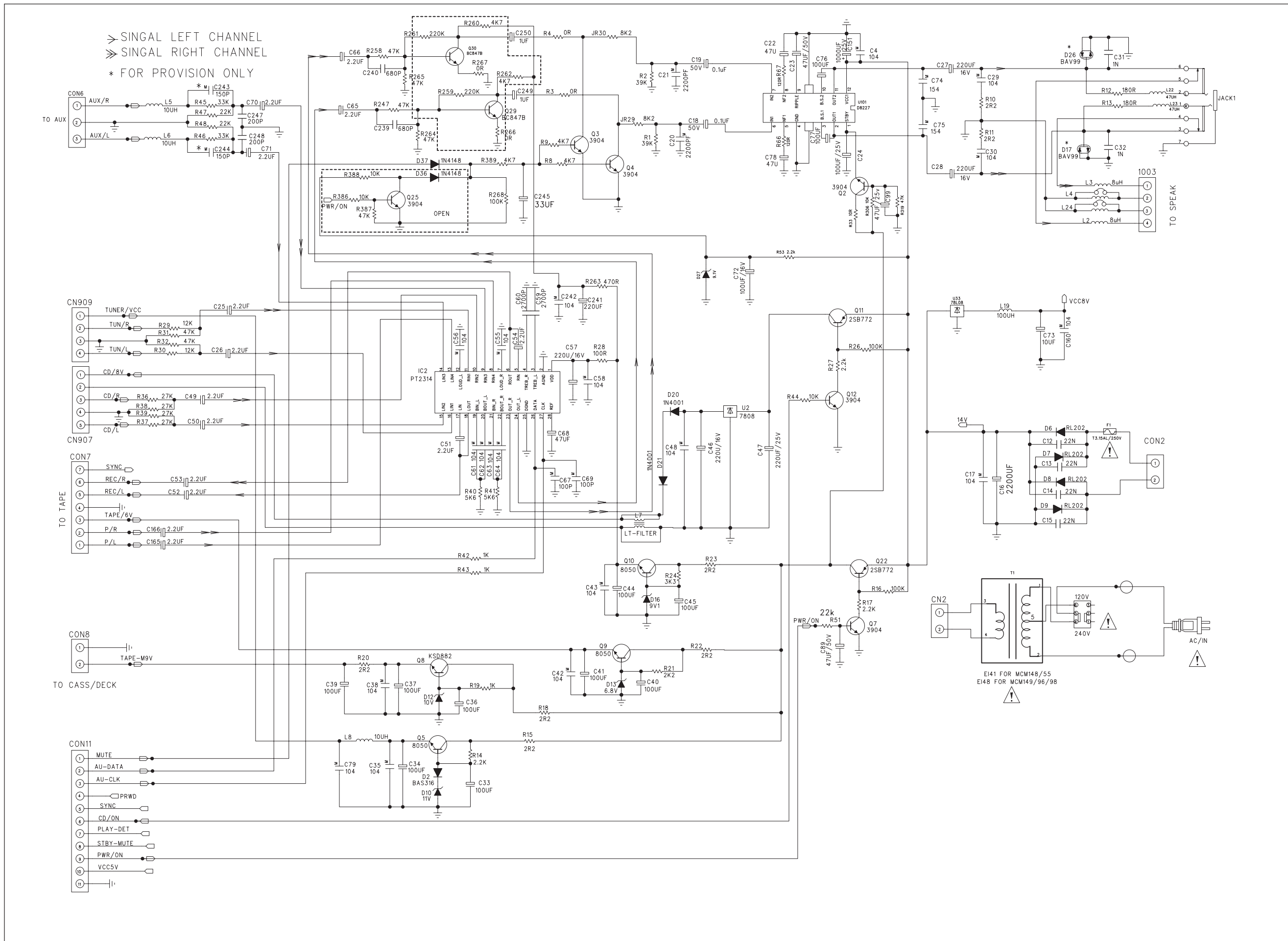
PCB LAYOUT - MAIN BOARD (TOP VIEW)



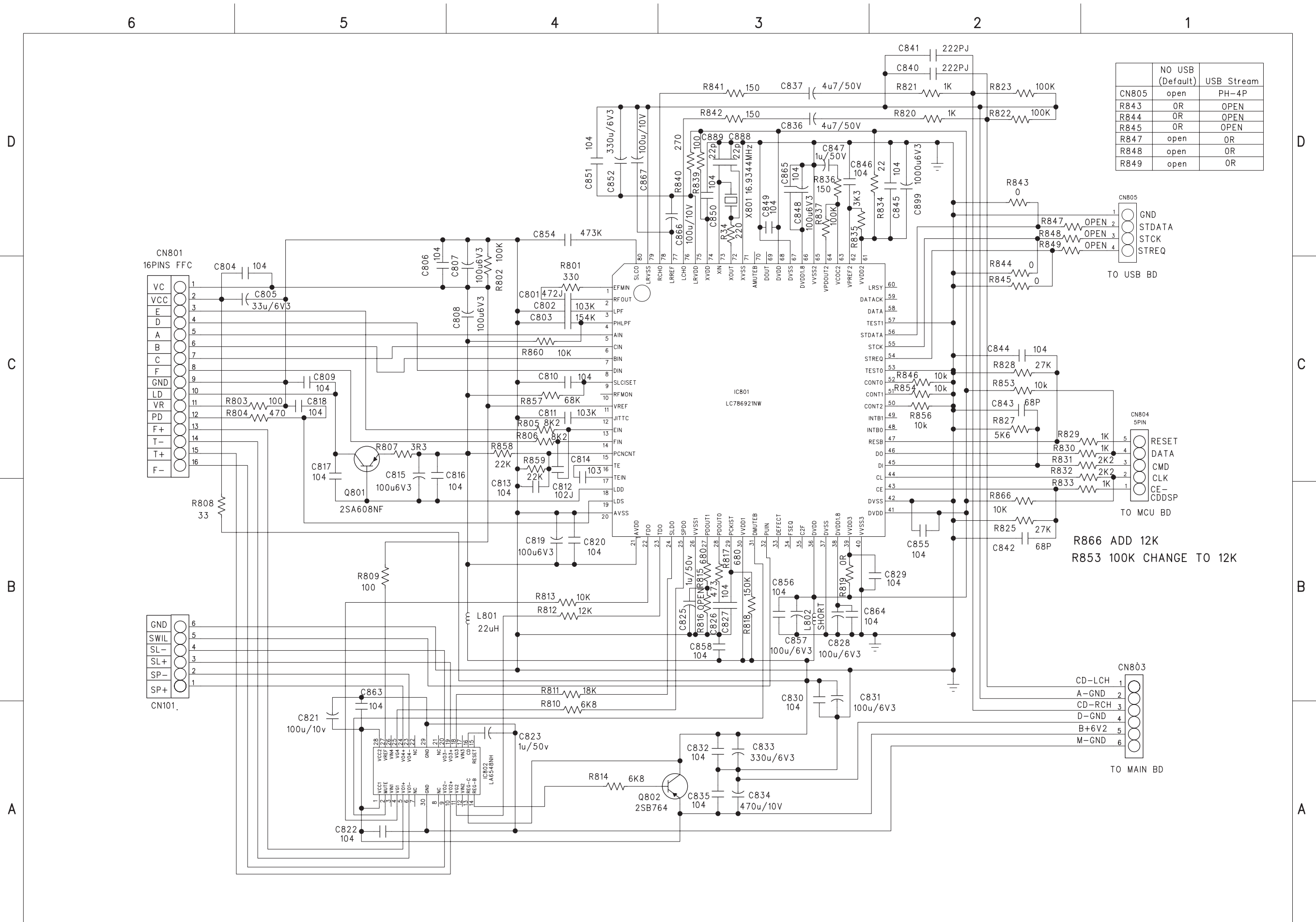
PCB LAYOUT - MAIN BOARD (BOTTOM VIEW)



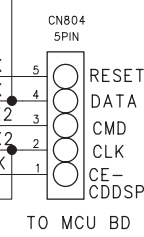
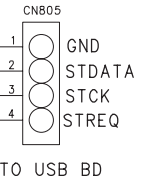
CIRCUIT DIAGRAM - MAIN & POWER BOARD AF & AMP PART



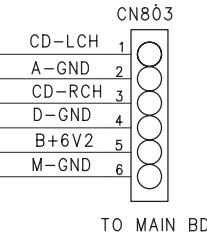
CIRCUIT DIAGRAM - MAIN BOARD CD & MP3 PART



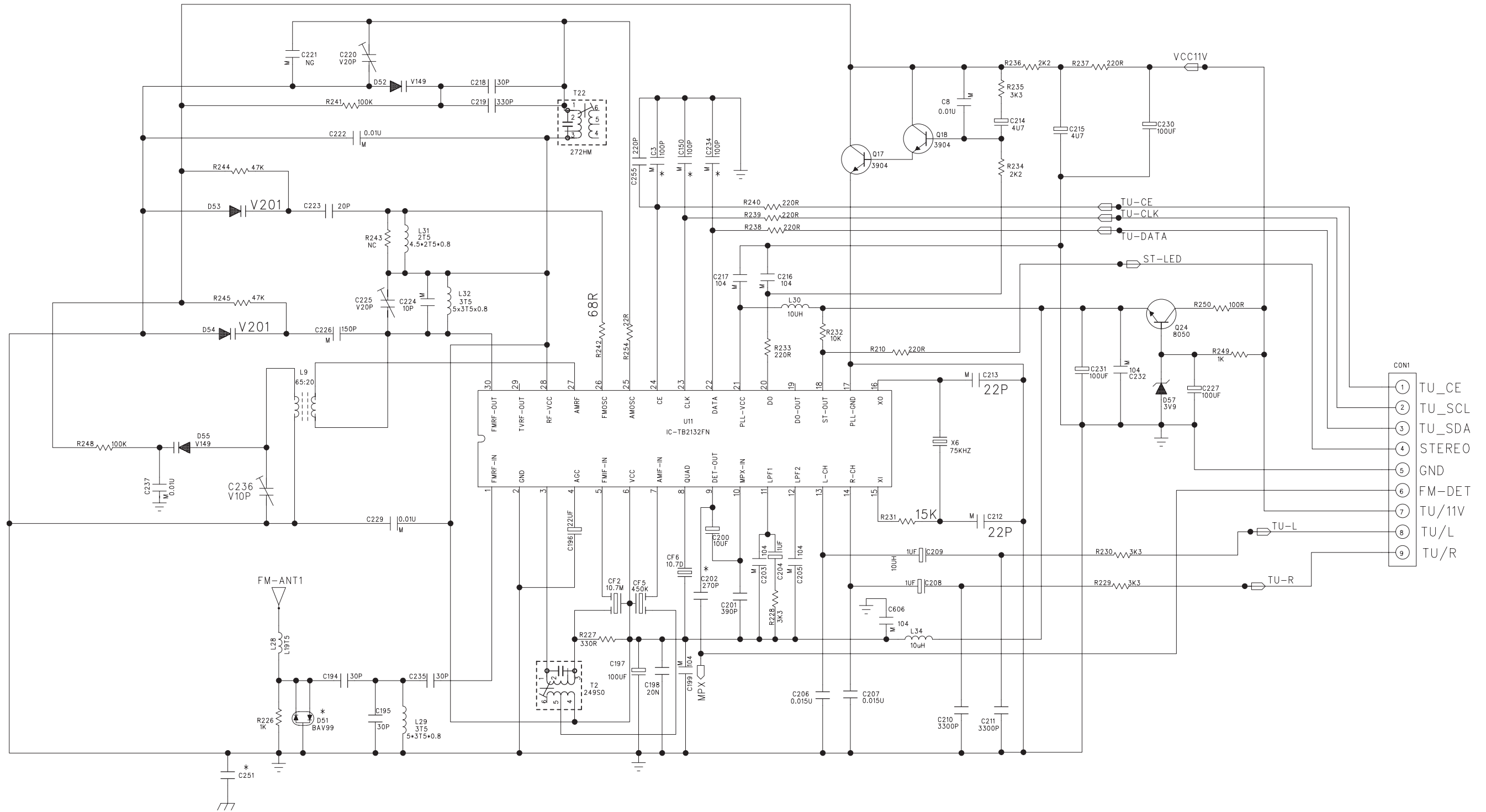
	NO USB (Default)	USB Stream
CN805	open	PH-4P
R843	OR	OPEN
R844	OR	OPEN
R845	OR	OPEN
R847	open	OR
R848	open	OR
R849	open	OR



R866 ADD 12K
R853 100K CHANGE TO 12K



CIRCUIT DIAGRAM - MAIN BOARD TUNER PART

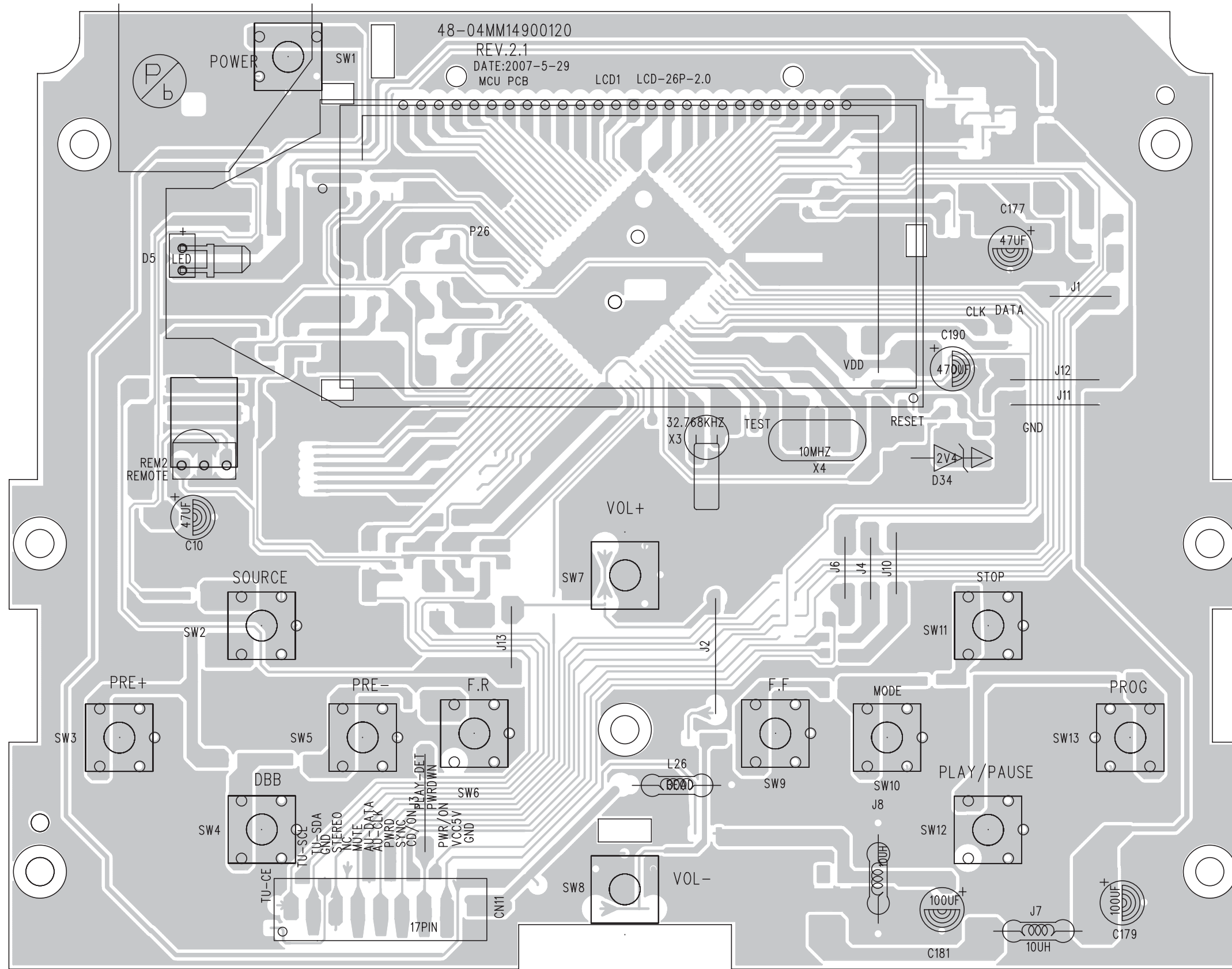


FRONT BOARD

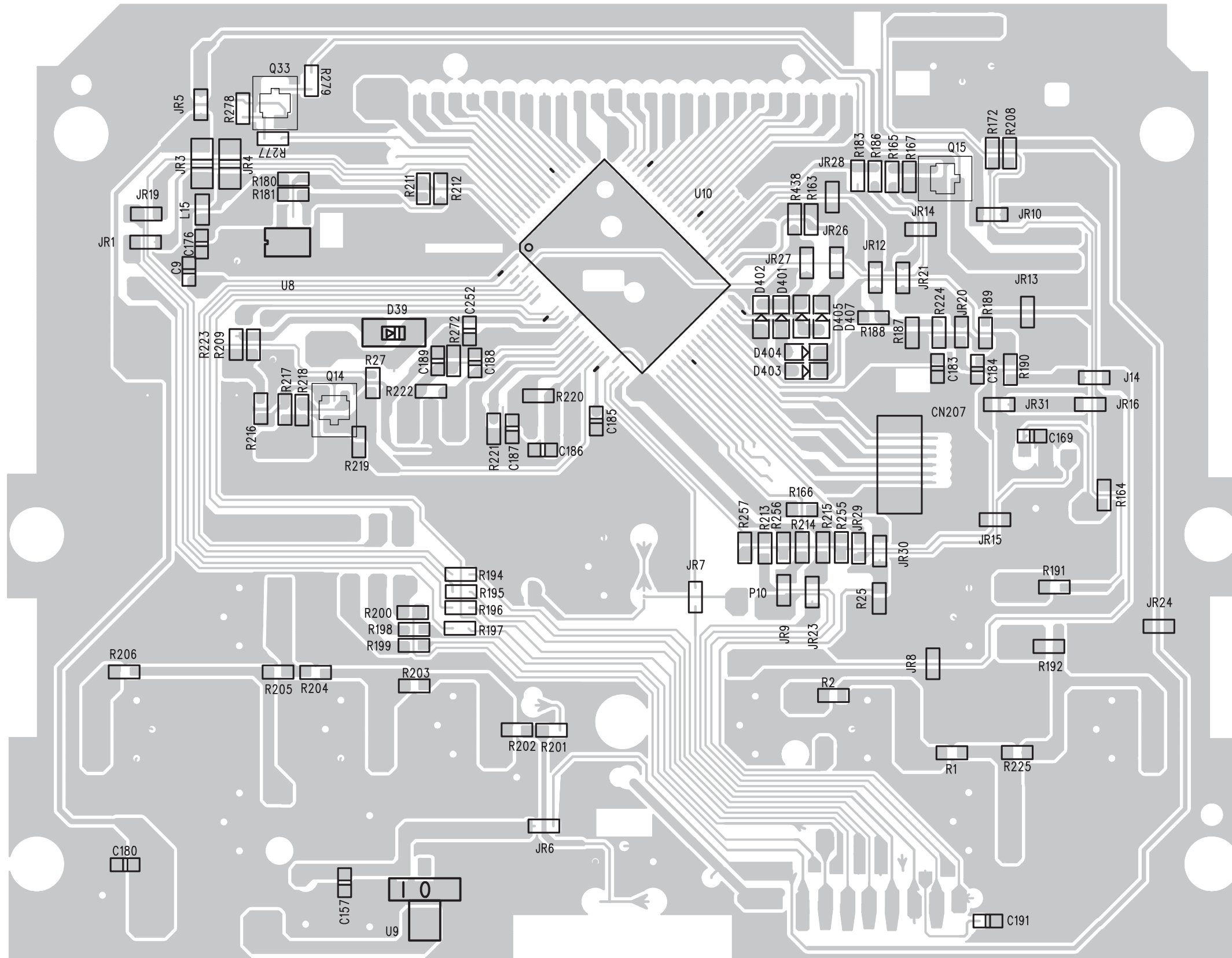
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PCB LAYOUT - FRONT BOARD (TOP VIEW)



PCB LAYOUT - FRONT BOARD (BOTTOM VIEW)

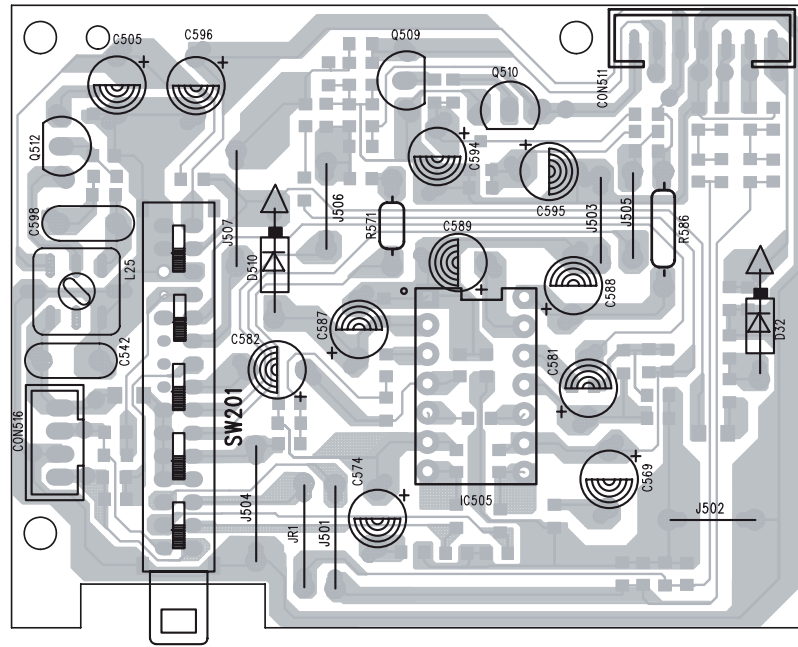


CASSETTE BOARD

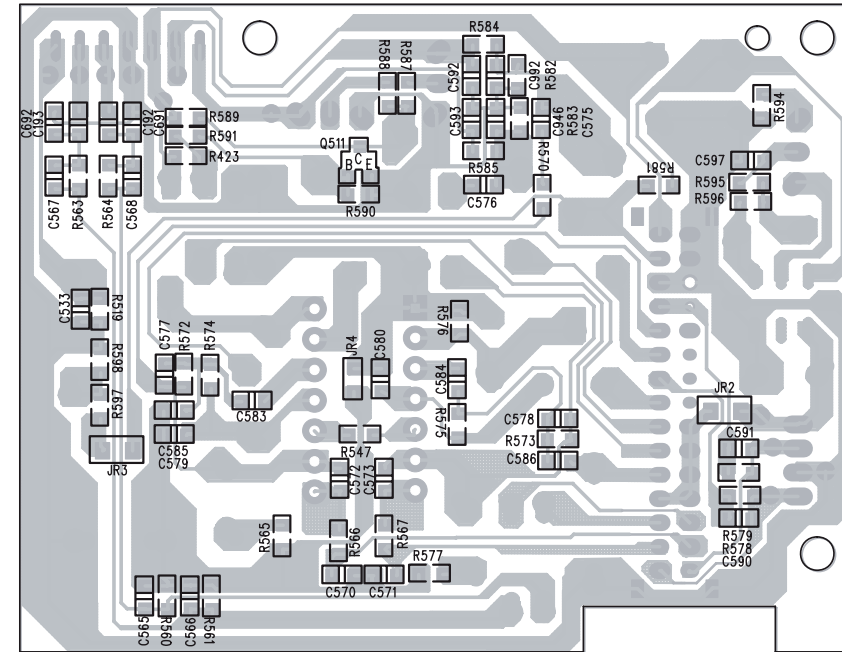
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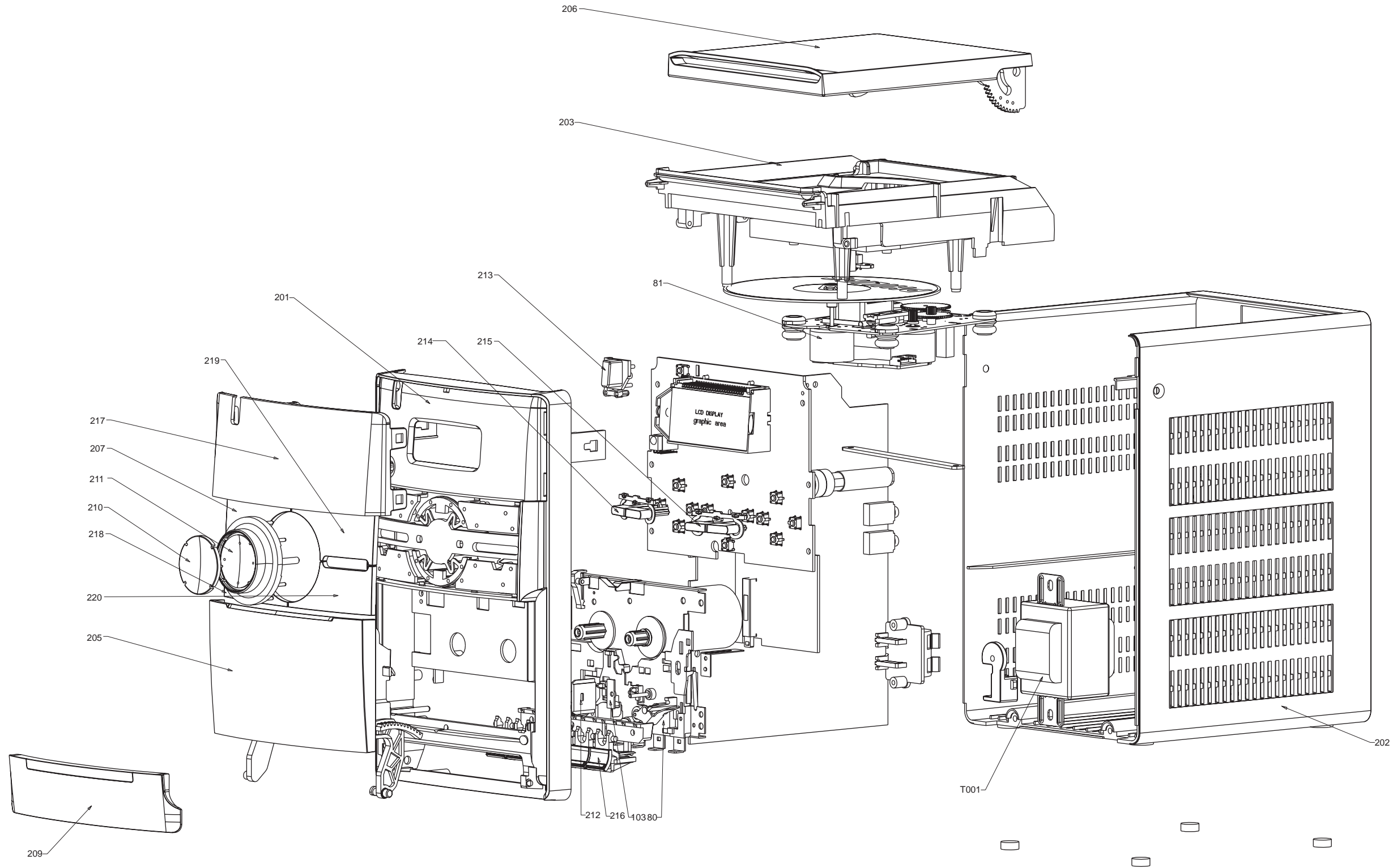
PCB LAYOUT - CASSETTE BOARD (TOP VIEW)



PCB LAYOUT - CASSETTE BOARD (BOTTOM VIEW)



SET MECHANICAL EXPLODED VIEW



MECHANICAL & ACCESSORIES PARTS LIST

2	996510008007	SPK BOX PART
6	996510006668	REMOTE CONTROL
80	996510006840	CASS DECK JS-21FB8923-SGS
81	994000005398	CD MECHANISM DA11B3VF
105	996510006667	SPK GRILL
108	996510000911	CD DAMPER-BLACK
109	996510000912	CD DAMPER-GREY
114	994000003674	CD DOOR SPRING
115	996510000917	CASS SPRING
116	996510000918	CASSETTE KEY COVER SPRING
201	996510007995	FRONT CABINET
202	996510007996	REAR CABINET /98/96
202	996510008379	REAR CABINET /61
203	996510006656	CD TRAY
205	996510006844	CASSETTE DOOR
206	996510007997	CD DOOR
207	996510007570	SOURCE BUTTON COVER /61
207	996510008001	SOURCE BUTTON COVER /98
208	996510007998	CASS KEY DOOR
210	996510007999	VOL COSMETI COVER
211	996510008000	VOL BUTTON COVER
212	994000001295	DAMPER GEAR ASS'Y
213	996510006662	POWER BUTTON
214	996510006663	PRESET BUTTON
215	996510006664	MODE PROG BUTTON
216	996510008005	CASS KEY WITH HOLDER
217	996510008006	DISPLAY LENS
218	996510008002	DBB BUTTON COVER
219	996510008003	PLAY BUTTON COVER
220	996510008004	STOP BUTTON COVER
J002	996510006652	7P FFC 1MM L=150MM (AB)
J003	994000004487	16P FFC 1MM L=170MM
J004	996510000914	17P FLAT FLEX CABLE 1.25mm
J010	△ 996510000909	AC CORD VDE APP 2M /98
J010	△ 996510006948	AC CORD CNS APP 1.8M /96
J010	△ 996510007312	AC CORD KS APP 1.92M /61
J011	996510000910	FM ANT SMF-01T-1.3 L=1.1M
S001	994000003093	CD DOOR SWITCH 1P1T DTS-03
S002	994000004376	SWITCH SL14-22AH-5AN
S003	△ 994000001478	AC PLUG ADAPTOR /96/98
T001	△ 996510006839	TRASFO. EI48 230V /61
T001	△ 996510007311	TRASFO. EI48 127/240V /96/98

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

ELECTRICAL PARTS LIST - MAIN BOARD

C220	994000004351	TRIMMER 20PF 6MM (RED)	U11	996510000881	IC TB2132FNG
C225	994000004351	TRIMMER 20PF 6MM (RED)	U2	994000000253	IC (SAMSUNG) KA7808
C236	994000000254	TRIMMER 10PF 6MM (WH)	U33	996510000880	IC LM78L08
CF2	994000003642	CER. FILTER LT10.7MA5-A RED	U801	996510006679	IC (SANYO) LC786921W-UPHI-E
CF5	996510006680	CER. FILTER SFU450B	X6	994000004352	CRYSTAL 75KHZ 12.5PF DT-381
CF6	994000004353	DISC. FILTER JT10.7MG77-A	X801	994000004551	CRYSTAL 16.9344MHZ +-20PPM
CON3	996510005450	SPK JACK PT-22V11A			
D52	994000002836	VARICAP DIODE 1SV-149			
D53	996510000879	VARACTOR DIODE SVC201SPA			
D54	996510000879	VARACTOR DIODE SVC201SPA			
D55	994000002836	VARICAP DIODE 1SV-149			
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			
FMANT1	996510002038	FM ANT CONTACT PIN			
IC2	996500039806	IC ET2314 (SOP28)			
IC802	994000004622	IC LA6548NH			
JACK1	994000004369	PHONE JACK TC38-063-05-0			
JACK2	996510000889	PHONE JACK TC38-060-01 RING			
L28	996510000887	FM COIL 3x19.5T			
L29	996510000888	FM COIL 5x3.5T			
L31	996500039350	FM COIL 4.5x2.5T (0.8mm)			
L32	996510000888	FM COIL 5x3.5T			
Q10	996500038609	TRANSISTORS 2W 8050C			
Q11	994000001193	TRANSISTORS KSB772YS			
Q12	994000004338	SMD TRANSISTORS PMBT3904			
Q17	994000004338	SMD TRANSISTORS PMBT3904			
Q18	994000004338	SMD TRANSISTORS PMBT3904			
Q2	994000004338	SMD TRANSISTORS PMBT3904			
Q22	994000001193	TRANSISTORS KSB772YS			
Q24	996500038609	TRANSISTORS 2W 8050C			
Q25	994000004338	SMD TRANSISTORS PMBT3904			
Q3	994000004338	SMD TRANSISTORS PMBT3904			
Q4	994000004338	SMD TRANSISTORS PMBT3904			
Q5	996500038609	TRANSISTORS 2W 8050C			
Q7	994000004338	SMD TRANSISTORS PMBT3904			
Q702	994000001193	TRANSISTORS KSB772YS			
Q8	994000001194	TRANSISTORS KSD882Y			
Q9	996500038609	TRANSISTORS 2W 8050C			
T001	996510006681	AM COIL AD/M7 65:20T			
T2	994000004356	I.F.T 7MM 7AC-249S0 (YELLOW)			
T22	994000004357	I.F.T 7MM 7AL-272HM (RED)			
U101	994000003636	IC D8227 DIP			

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

ELECTRICAL PARTS LIST - FRONT BOARD

D001	996510006683	LCD DISPLAY
D39	996500042437	CH-DIODE SS14 SMA/DO-214AC
D5	996500042438	LED LAMP 2x5x7mm (WHITE)
Q14	994000003937	SMD TRANSISTORS PMBT3906
Q15	994000004338	SMD TRANSISTORS PMBT3904
Q33	994000004338	SMD TRANSISTORS PMBT3904
REM2	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
U10	996510006682	MCU GY390 (FLASH)
U8	994000001236	IC M24C01-WMN6
U9	994000002839	IC LM1117S-3.3
X3	994000004615	CRYSTAL 32.768KHZ 12.5PF
X4	996500039820	CRYSTAL 10MHZ 49/US

ELECTRICAL PARTS LIST - CASS BOARD

IC505	994000004533	IC YD7312
L25	994000004538	I.F.T 10148BK7
Q511	994000004338	SMD TRANSISTORS PMBT3904
Q512	996500038609	TRANSISTORS 2W 8050C
SW201	994000003656	PUSH SWITCH PS-102D13-NS

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