

Service
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Service Manual

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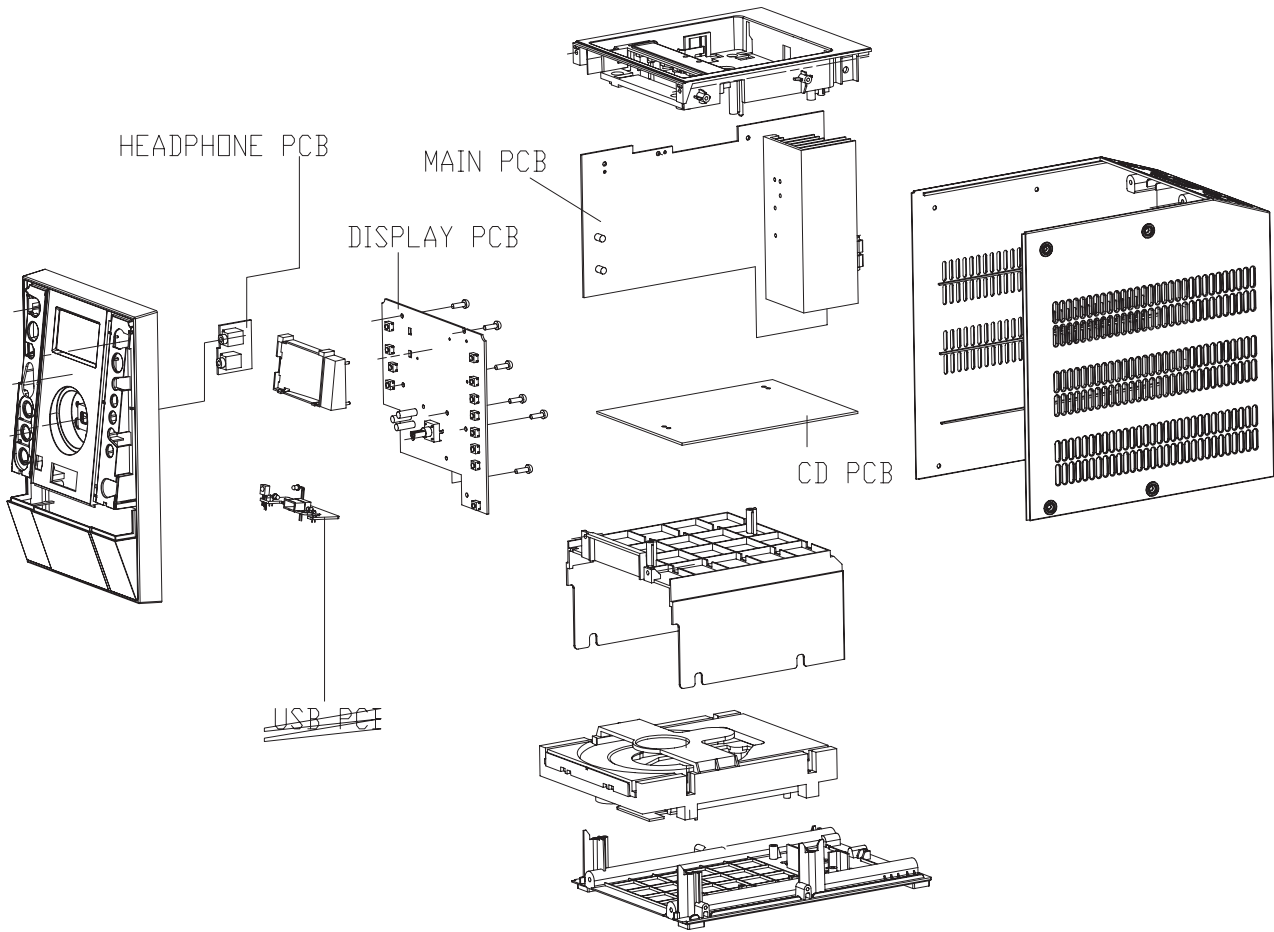


Version 1.1



PHILIPS

PCBS LOCATION



SPECIFICATIONS

AMPLIFIER

Output power
 2 x 50 W RMS / 2 x100 W music power
 Signal-to-noise ratio ≥ 62 dBA (IEC)
 Frequency response 40 – 15000 Hz, ± 3 dB
 Impedance loudspeakers 6 Ω
 Impedance headphones 32 Ω

CD/MP3/WMA-CD PLAYER

Number of programmable tracks 20
 Frequency range 20 – 20000 Hz
 Signal-to-noise ratio 75 dBA
 Channel separation ≥ 60 dB (1 kHz)
 Total harmonic distortion $< 0.003\%$
 MPEG 1 Layer 3 (MP3-CD) MPEG AUDIO
 MP3-CD bit rate 32-256 kbps
 (128 kbps advised)
 Sampling frequencies 32, 44.1, 48 kHz

USB PLAYER

USB 12 Mb/s, V1.1
 support MP3 and WMA files
 Number of albums/folders maximum 99
 Number of tracks/titles maximum 500

FM

FM wave range 87.5 – 108 MHz
 Sensitivity at 75 Ω
 – mono, 26 dB signal-to-noise ratio 2.8 μ V
 – stereo, 46 dB signal-to-noise ratio 61.4 μ V
 Selectivity ≥ 28 dB
 Total harmonic distortion $\leq 5\%$
 Frequency response 63 – 12500 Hz (± 3 dB)
 Signal-to-noise-ratio ≥ 50 dBA

SPEAKERS

2-way Bass reflex system
 Dimensions (w x h x d) . 140 x 228 x 247 (mm)

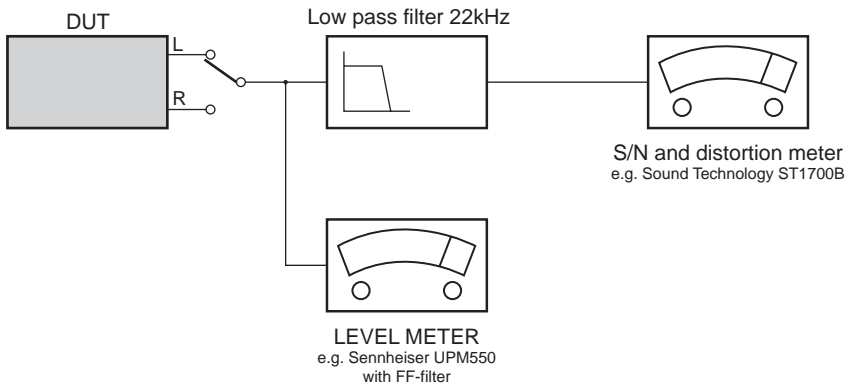
GENERAL INFORMATION

AC Power 220 – 230 V / 50 Hz
 Dimensions (w x h x d) .. 152 x 228 x 273 (mm)
 Weight (with/without speakers)
 approx. 6.2/3.65 kg
 Eco Power Standby < 1 W
 Power consumption Standby < 12 W

MEASUREMENT SETUP

CD

Use Audio Signal Disc SBC429 4822 397 30184 (replaces test disc 3)
L.P.F. = 13th order filter 4822 395 30204



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".

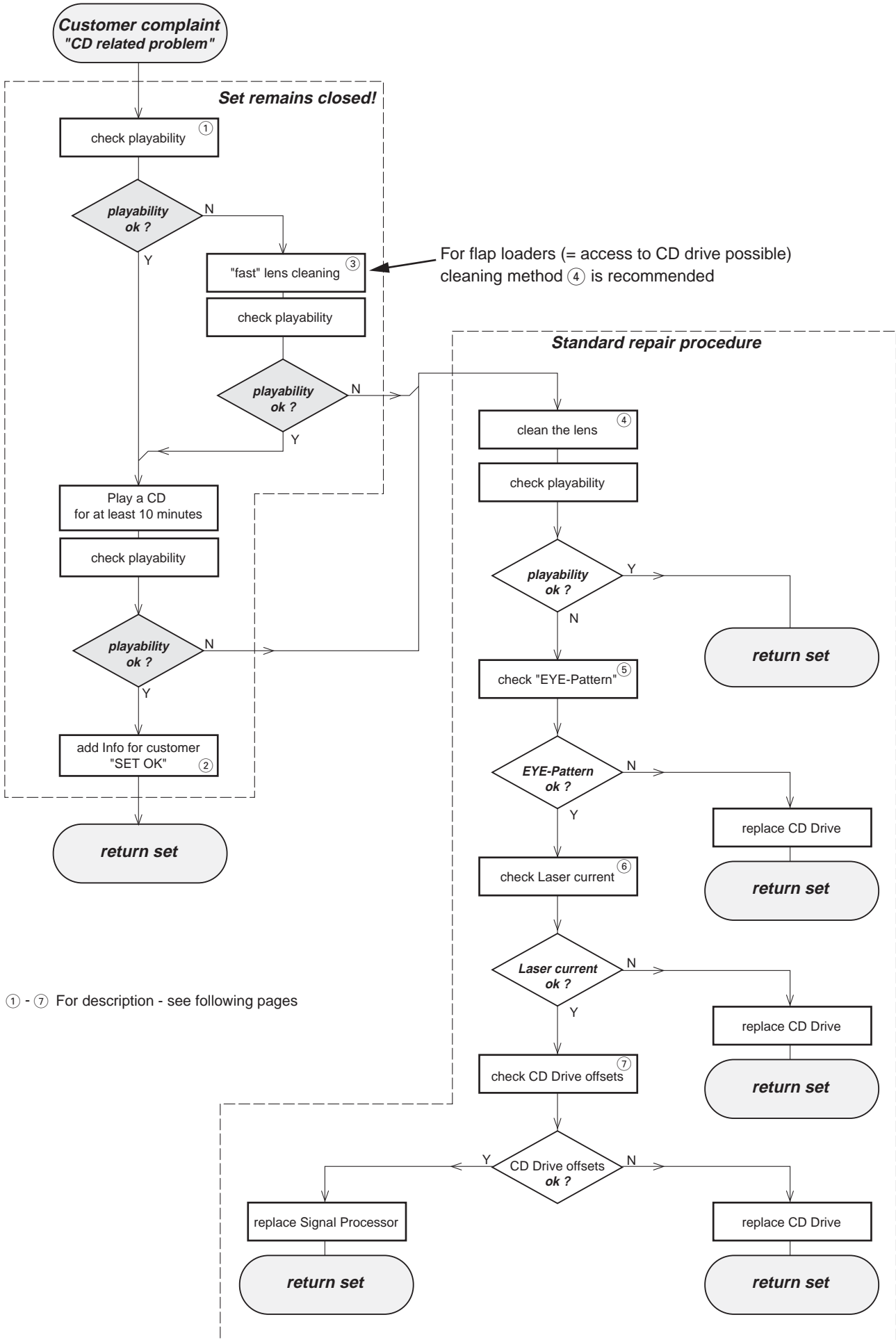
For additional questions please contact your local repair-helpdesk.

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

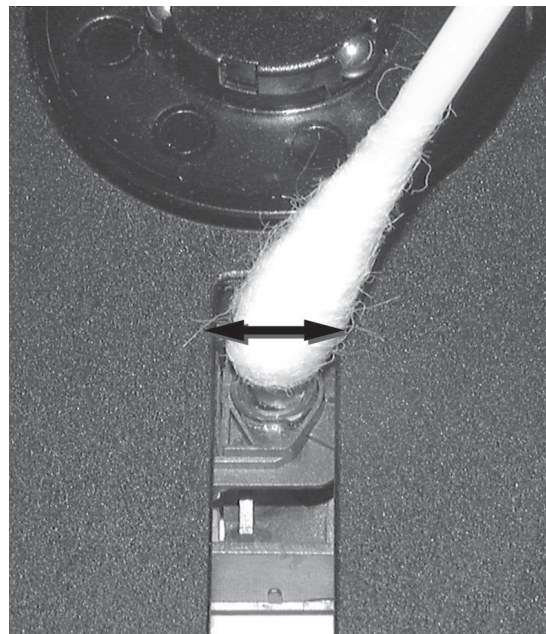
LIQUID LENS CLEANING

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.

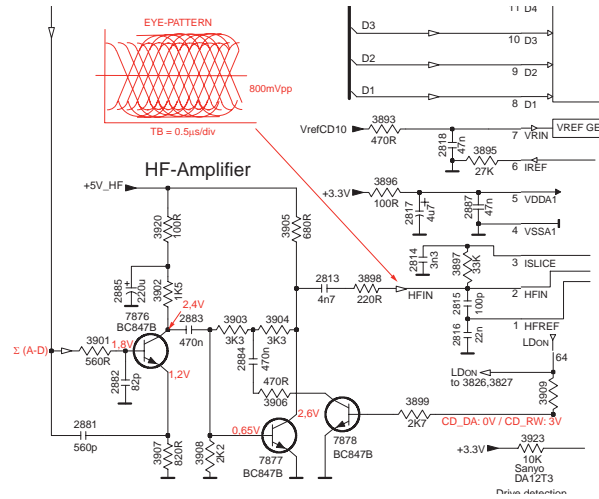


INSTRUCTIONS ON CD PLAYABILITY

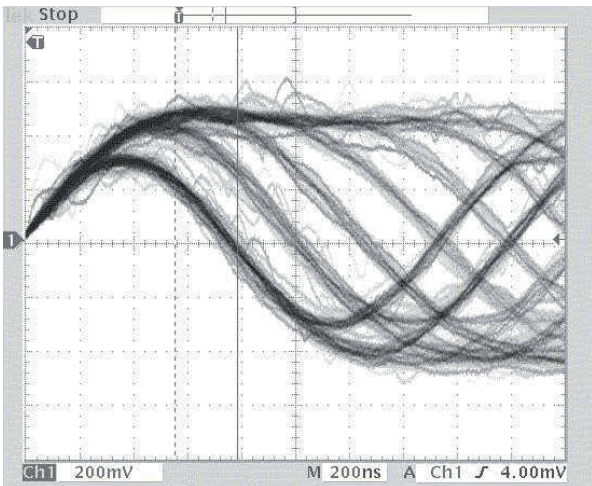
5

EYE-PATTERN SIGNAL – JITTER MEASUREMENT

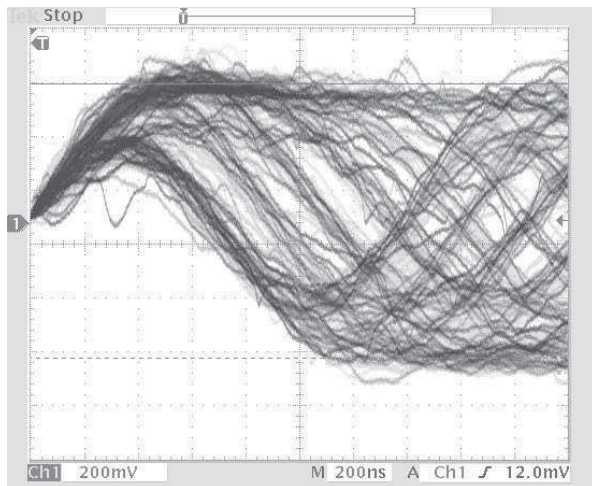
Measure the signal on the input of the Signal processor using an **analog** oscilloscope. Please find the exact measuring point in your Service Manual.



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

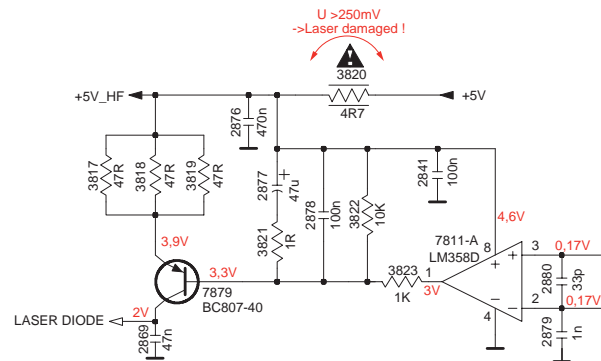
CD DRIVE – LASER CURRENT MEASUREMENT

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

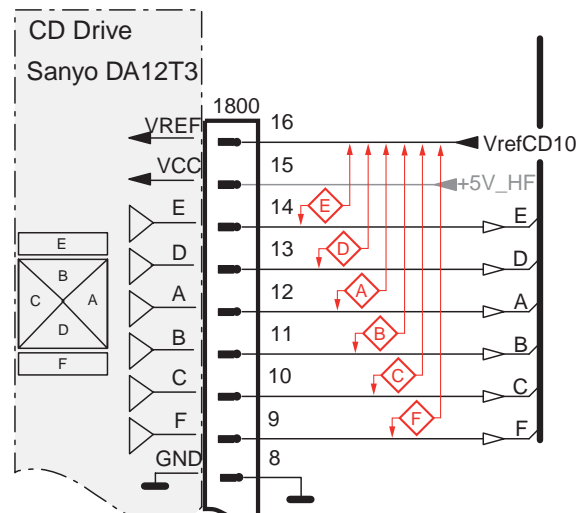
CD DRIVE – OFFSET MEASUREMENT

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.



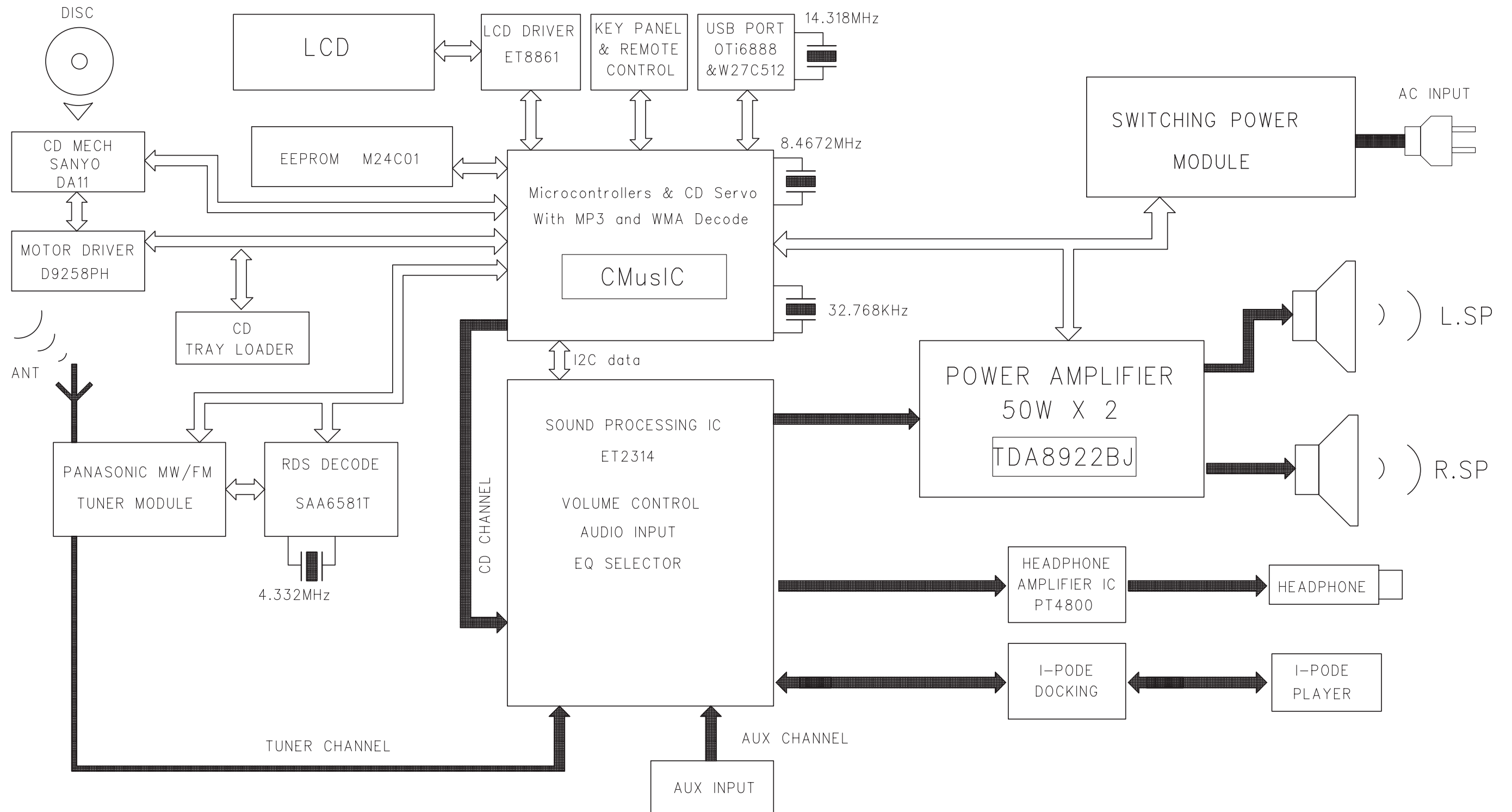
If one of the offsets is higher than $\pm 10mV$ the CD drive has to be replaced. Otherwise replace the Signal Processor.

SOFTWARE VERSION CHECKING

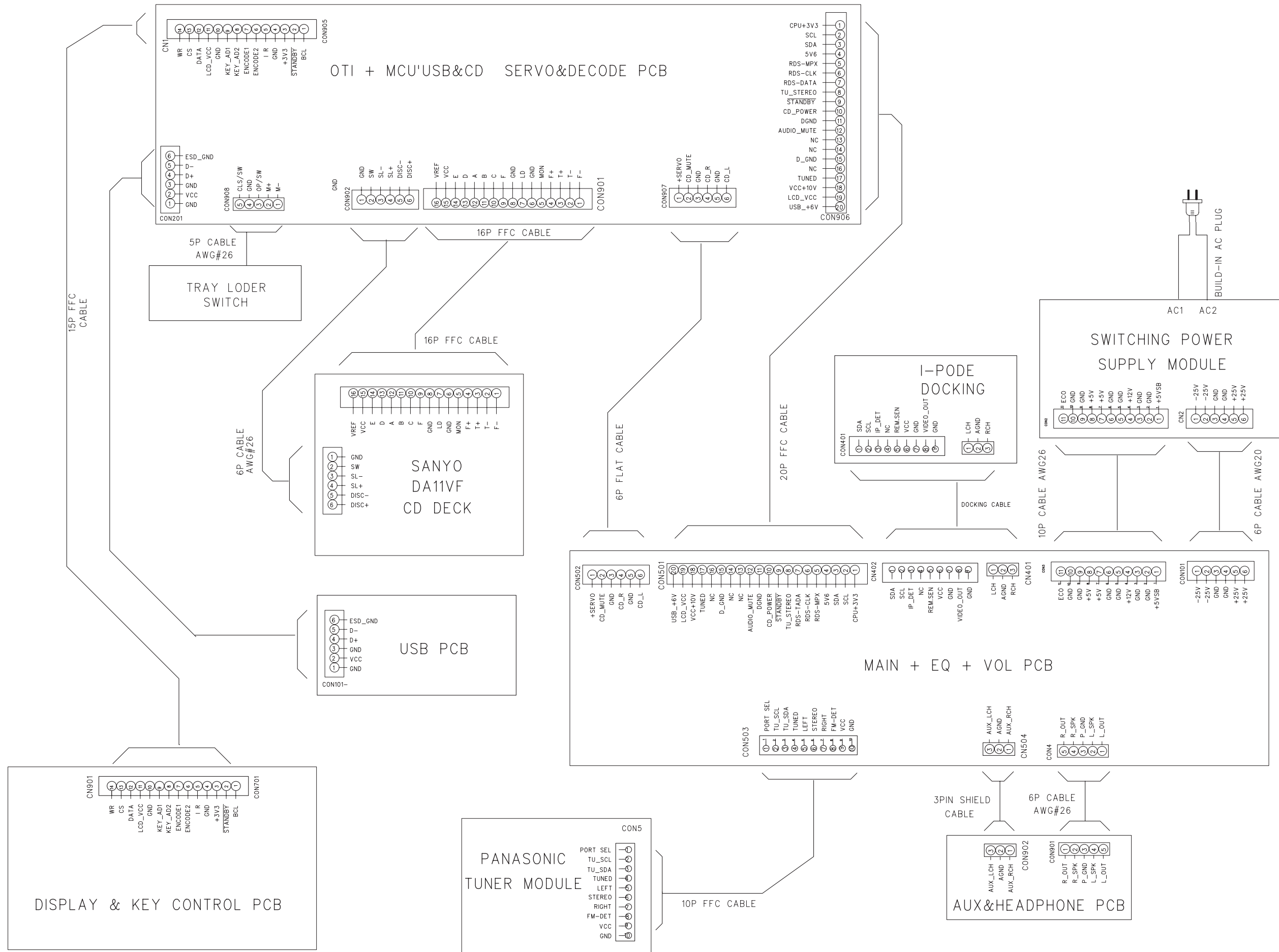
How to read software version,

1. Press and hold DISPLAY and SOURCE buttons then plug A/C to power on, LCD Display shows existing software version "S 0.12".
2. During shows "S 0.12", press "STOP" button to show firmware version.

SET BLOCK DIAGRAM



SET WIRING DIAGRAM

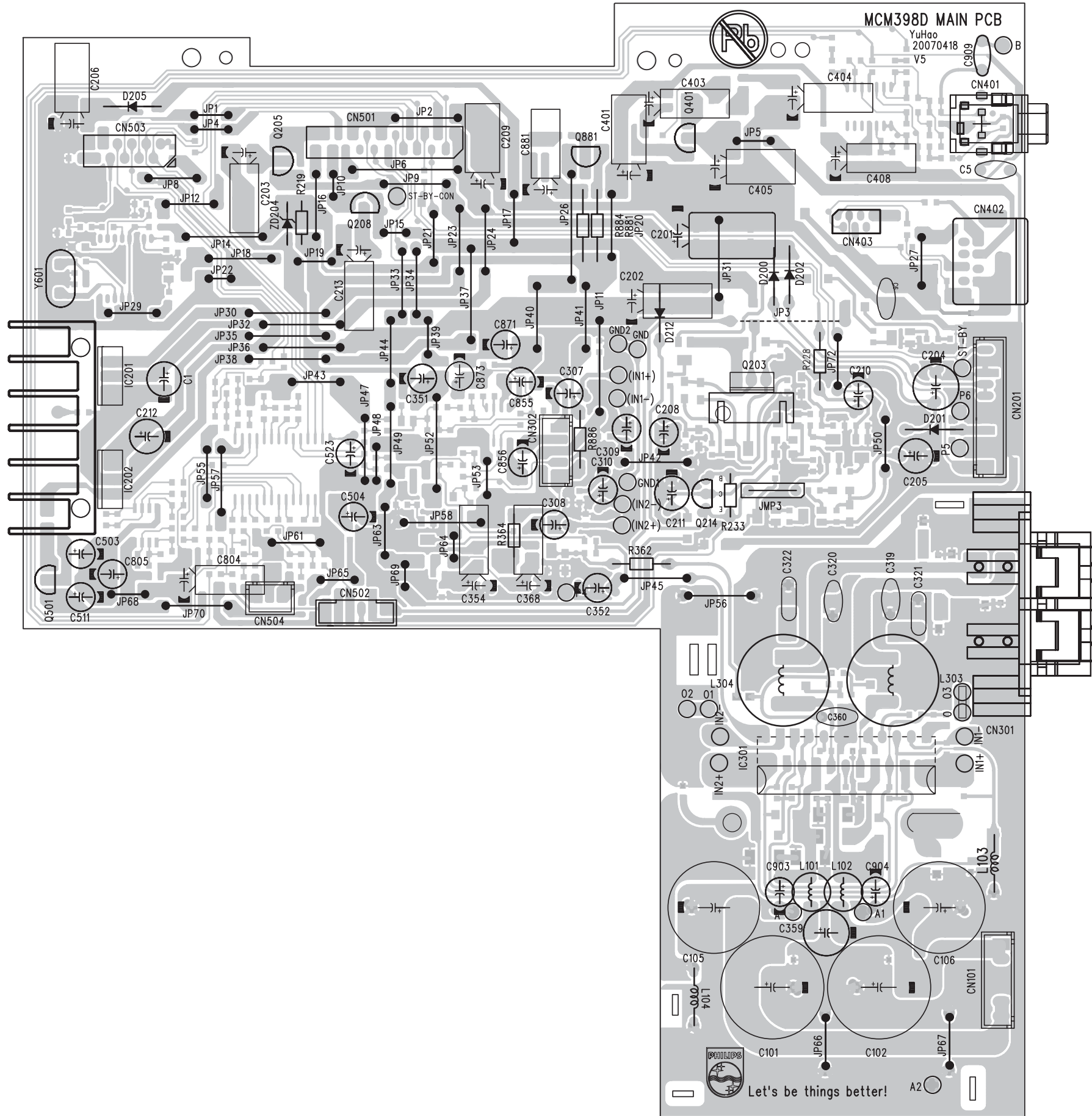


MAIN BOARD

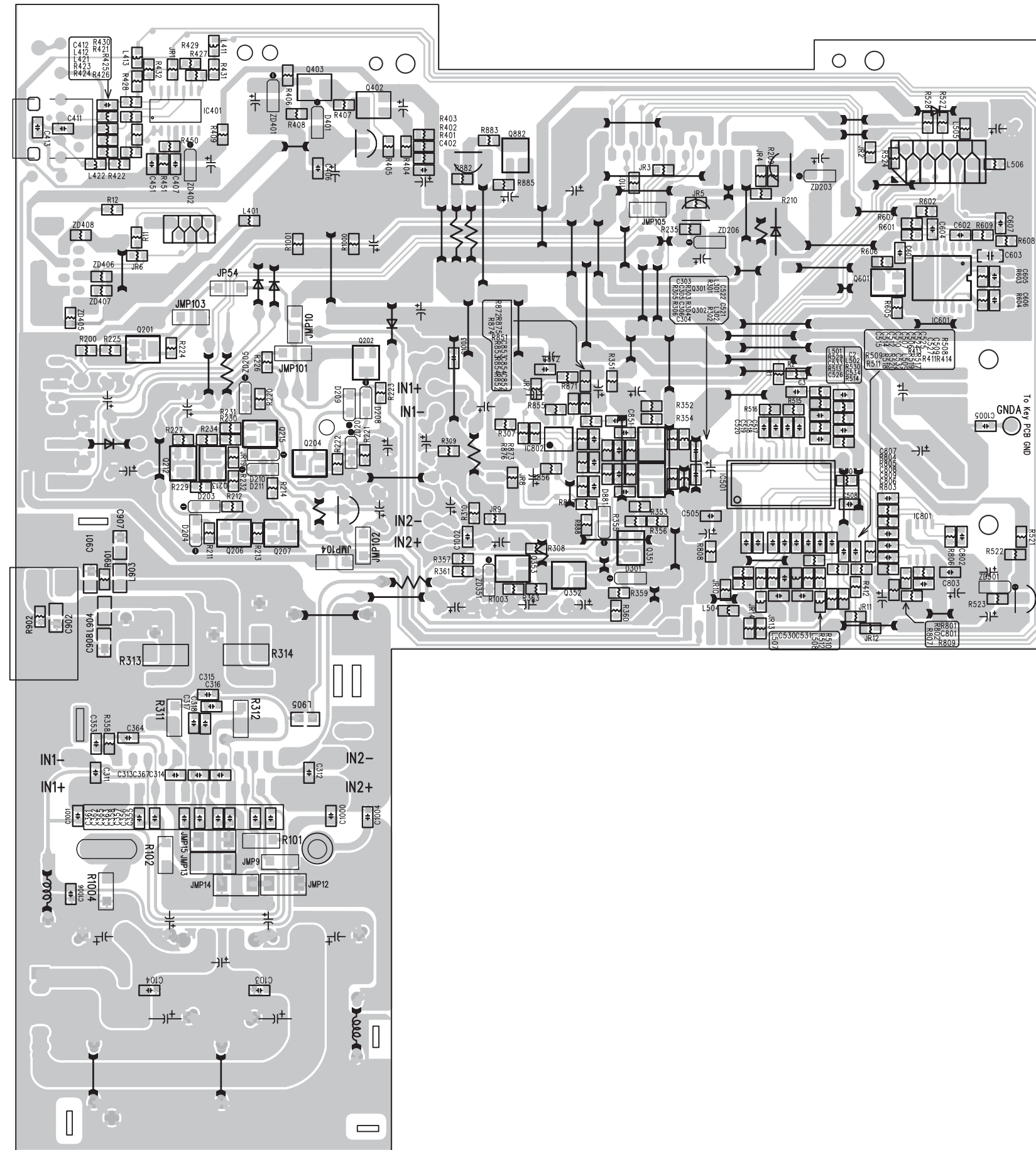
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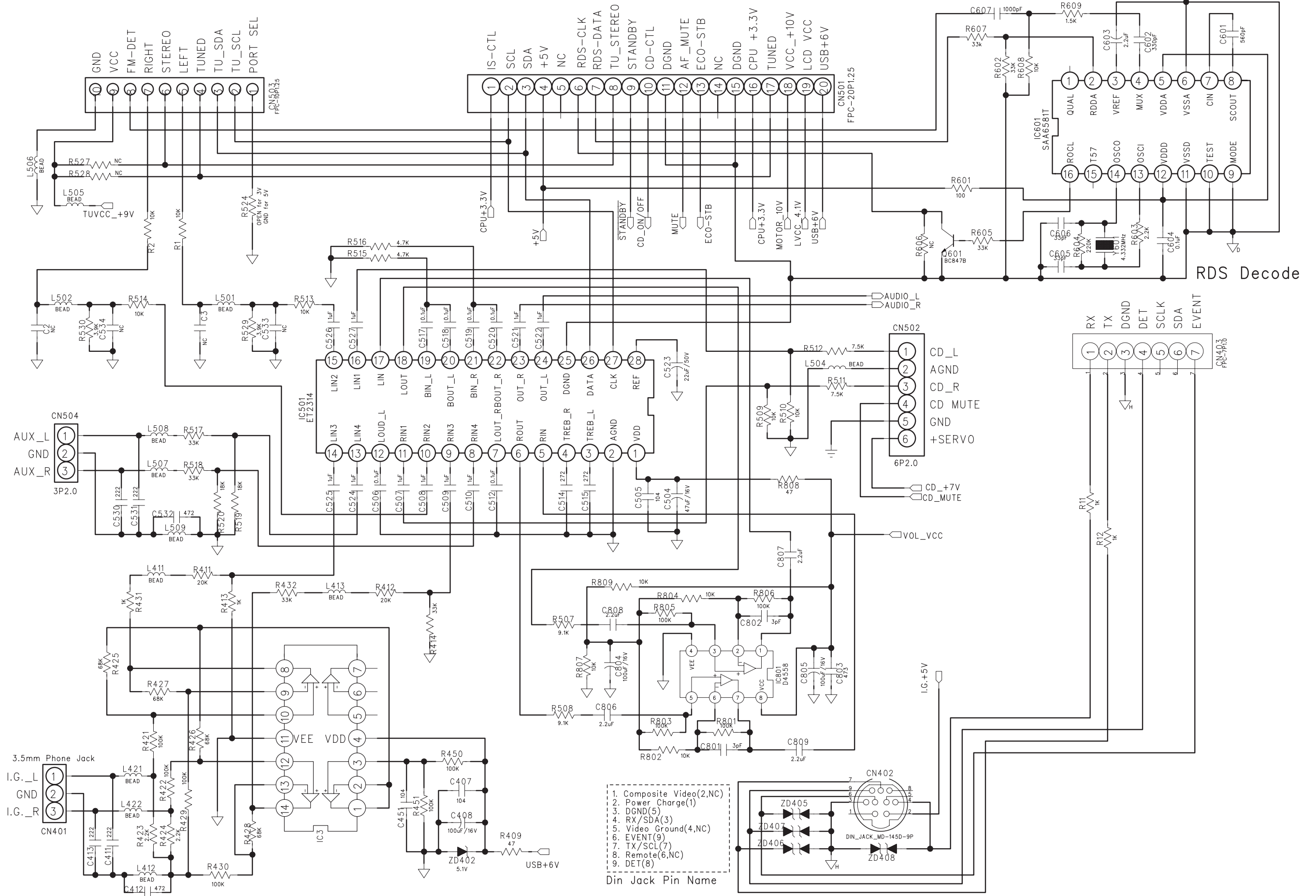
PCB LAYOUT - MAIN BOARD (TOP VIEW)



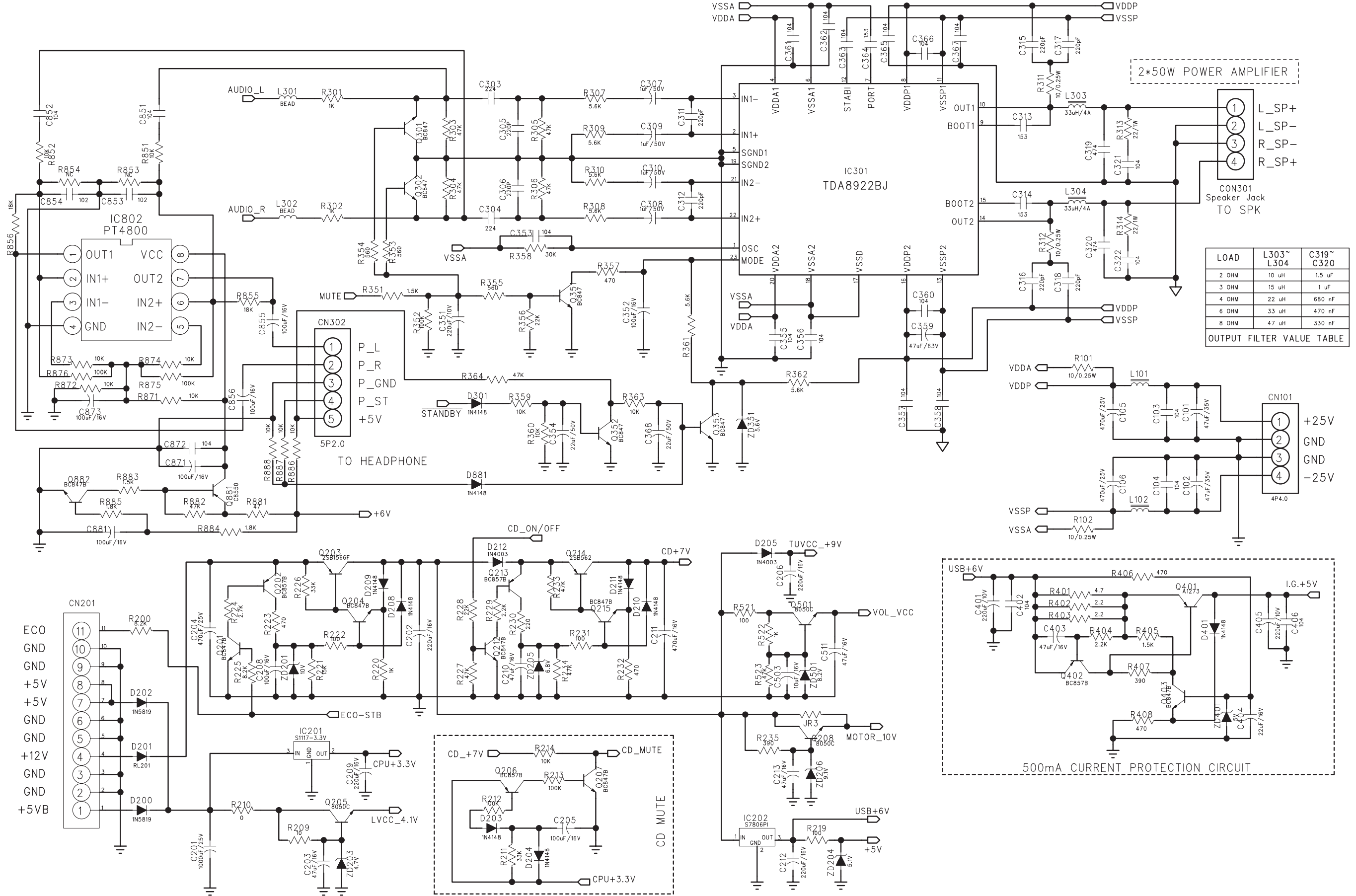
PCB LAYOUT - MAIN BOARD (BOTTOM VIEW)



CIRCUIT DIAGRAM - MAIN BOARD PART1



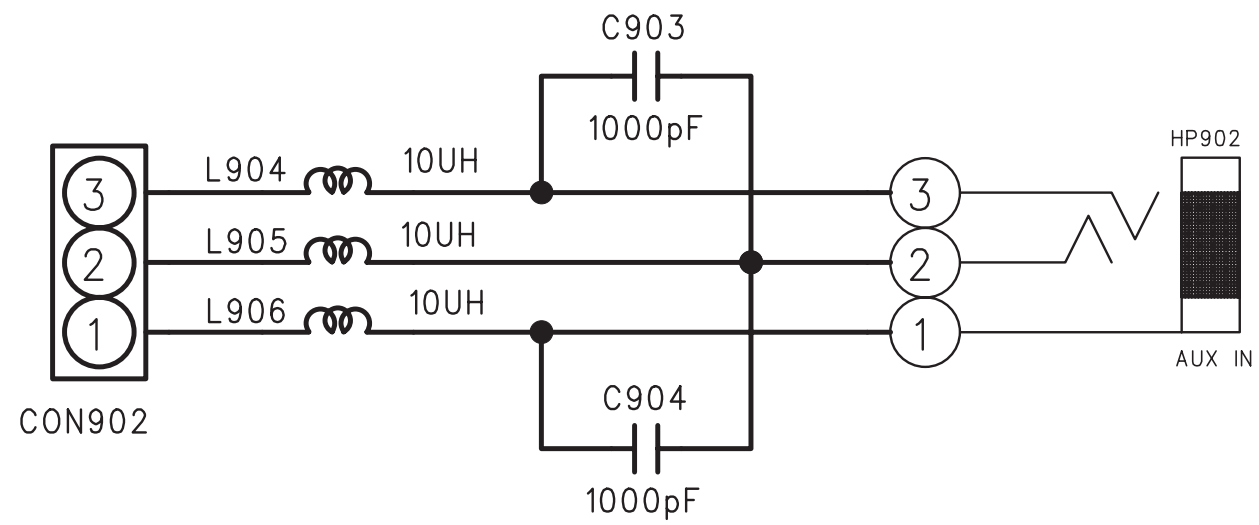
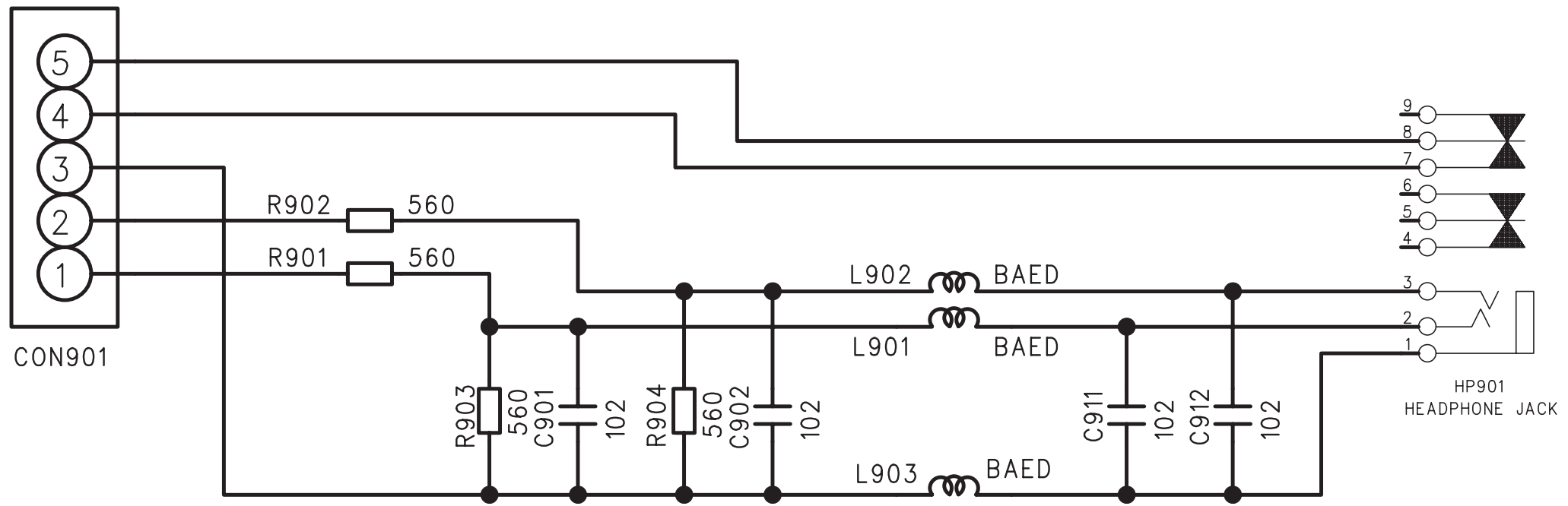
CIRCUIT DIAGRAM - MAIN BOARD PART2



LOAD	L303~L304	C319~C320
2 OHM	10 uH	1.5 uF
3 OHM	15 uH	1 uF
4 OHM	22 uH	680 nF
6 OHM	33 uH	470 nF
8 OHM	47 uH	330 nF

OUTPUT FILTER VALUE TABLE

CIRCUIT DIAGRAM - HP & AUX BOARD

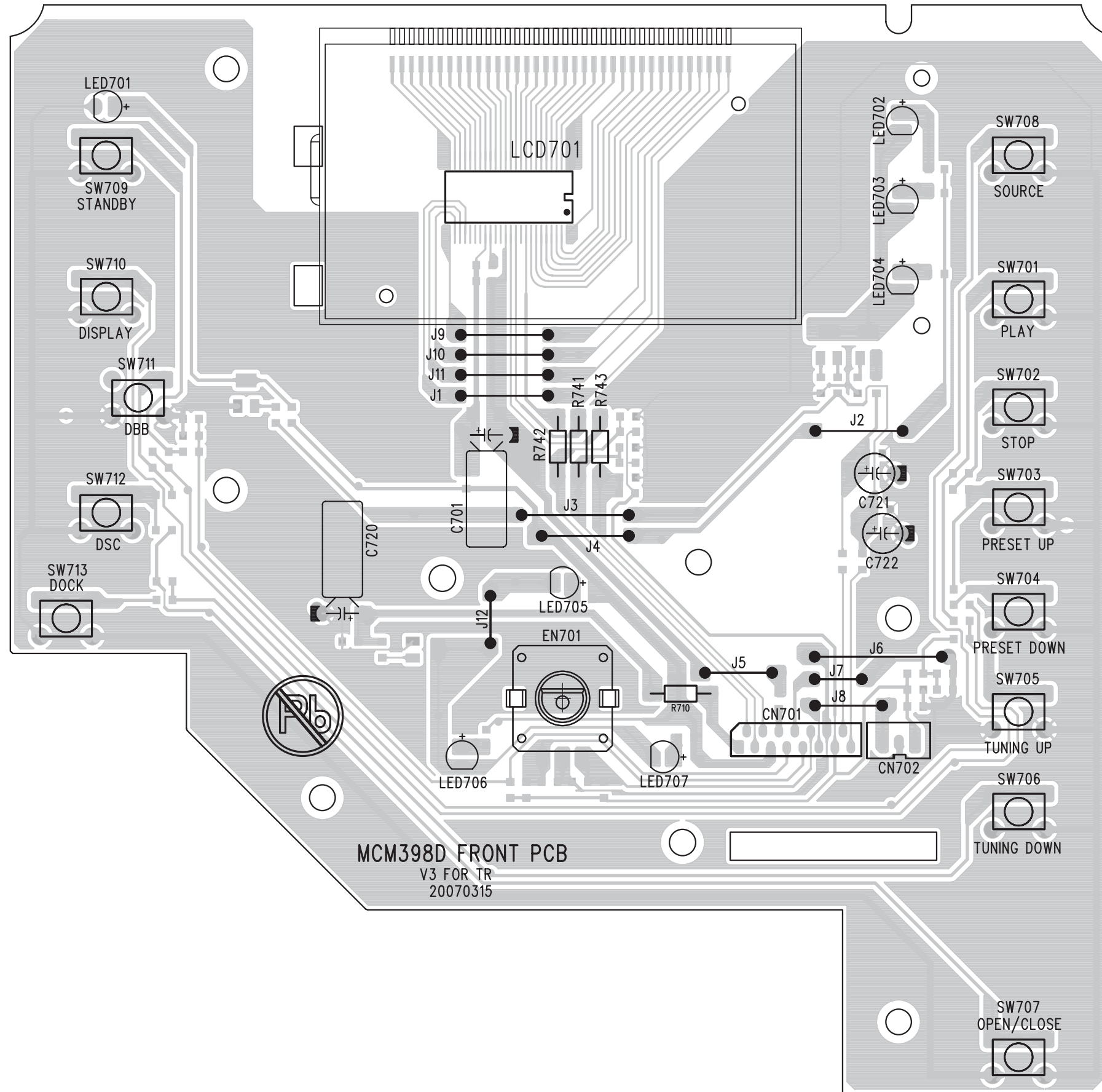


FRONT(DISPLAY) & USB JACK BOARD

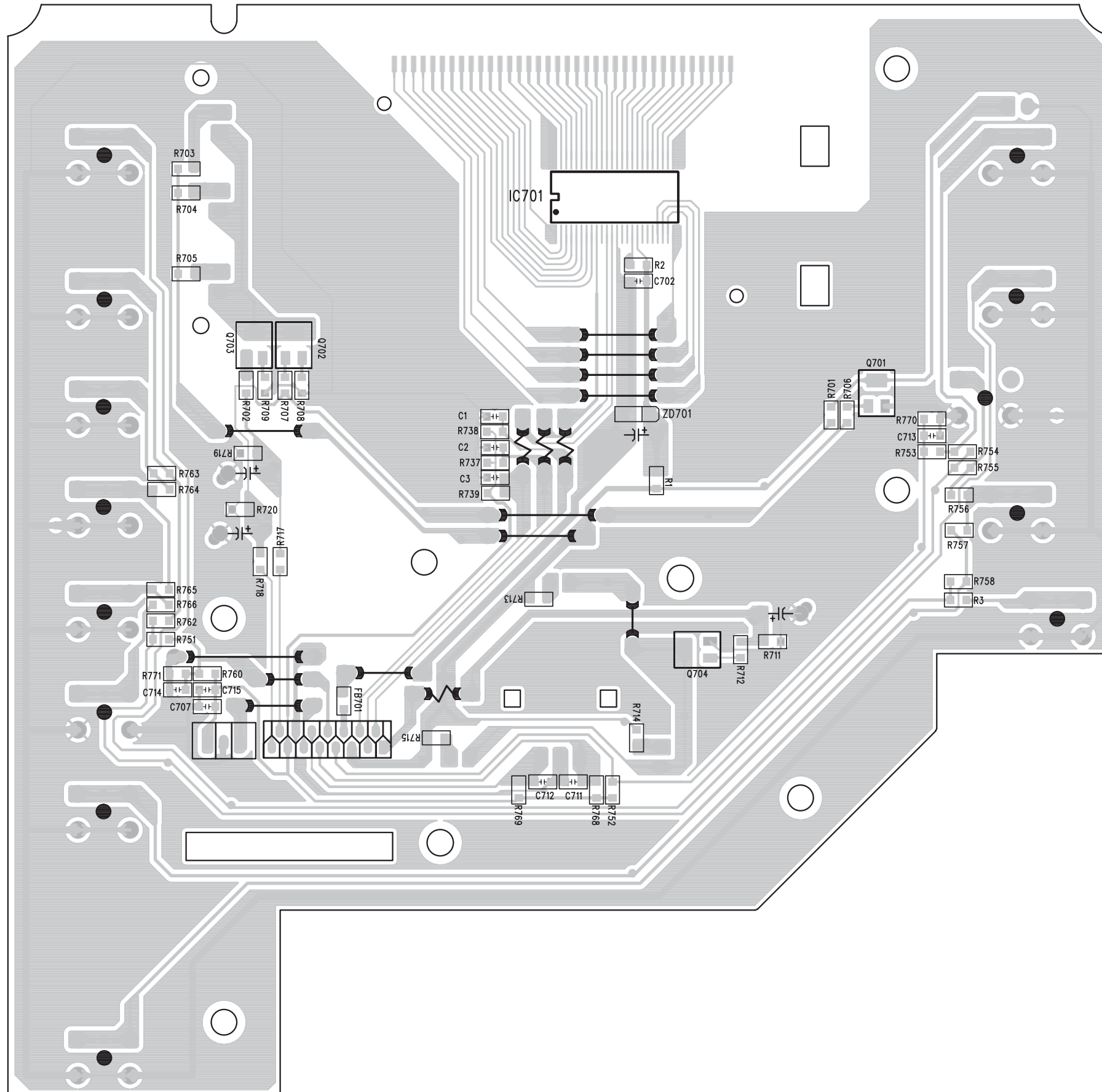
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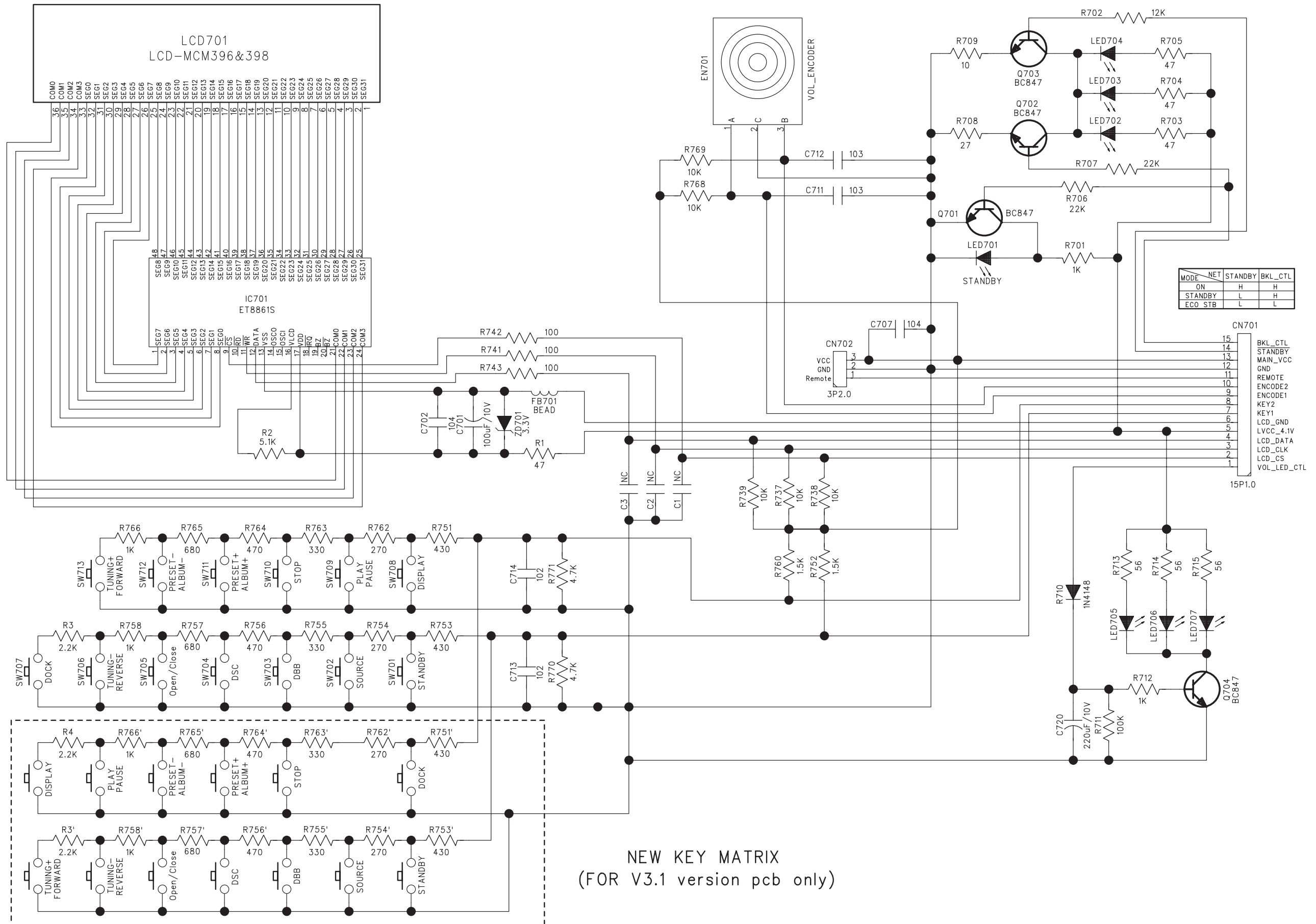
PCB LAYOUT - DISPLAY BOARD (TOP VIEW)



PCB LAYOUT - DISPLAY BOARD (BOTTOM VIEW)

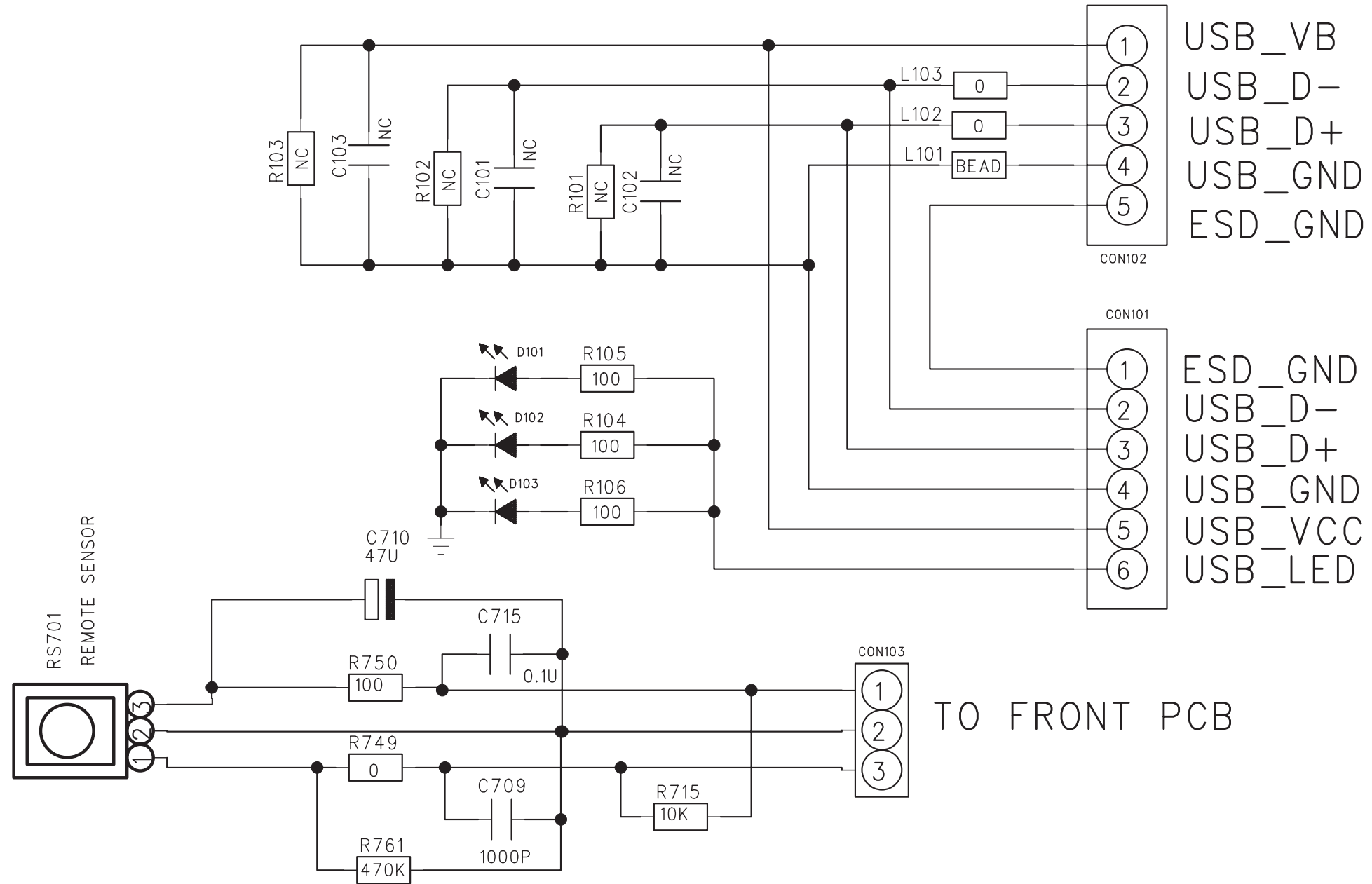


CIRCUIT DIAGRAM - FRONT(DISPLAY) BOARD



NEW KEY MATRIX
(FOR V3.1 version pcb only)

CIRCUIT DIAGRAM - USB BOARD

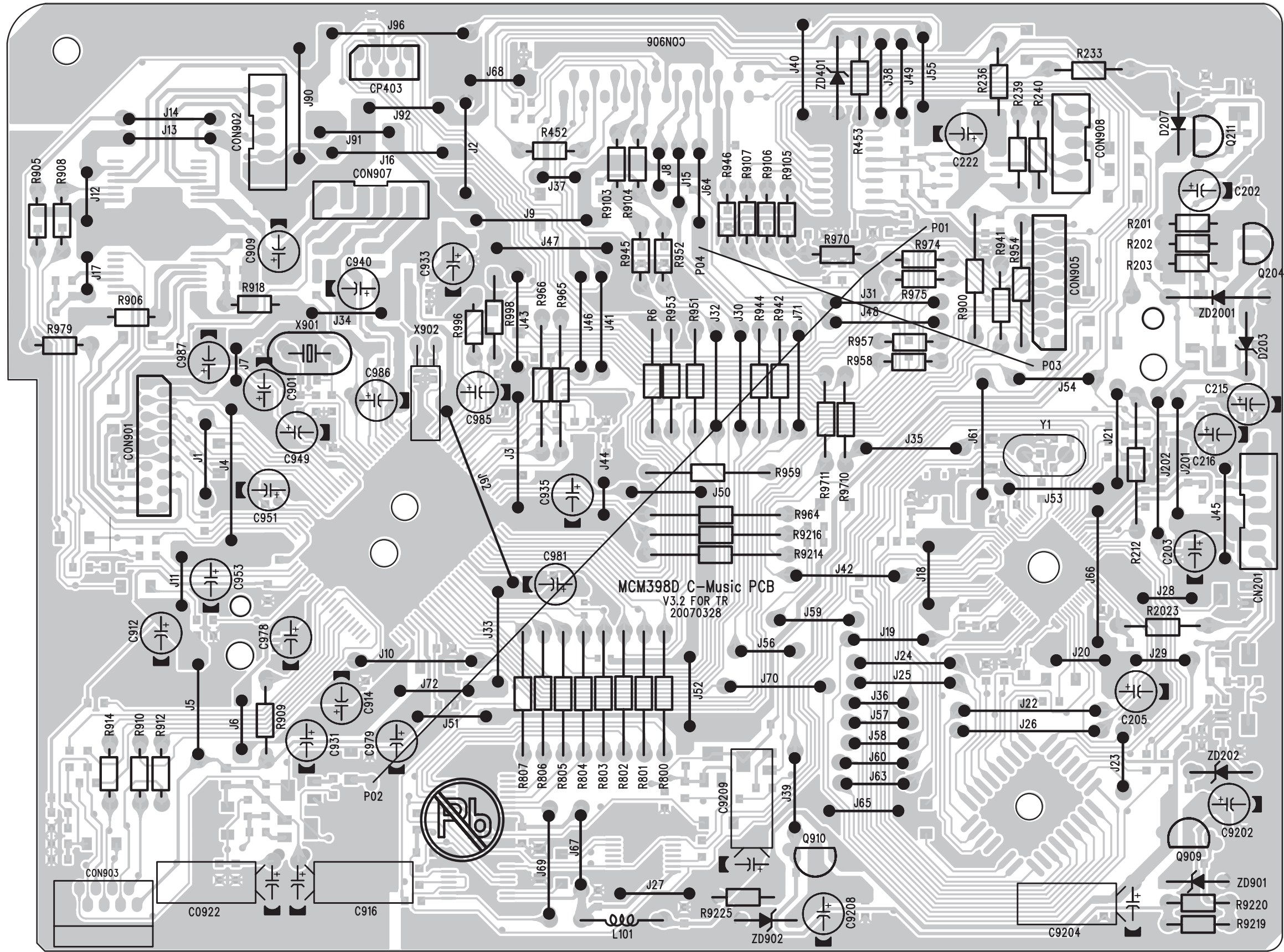


CMUSIC BOARD

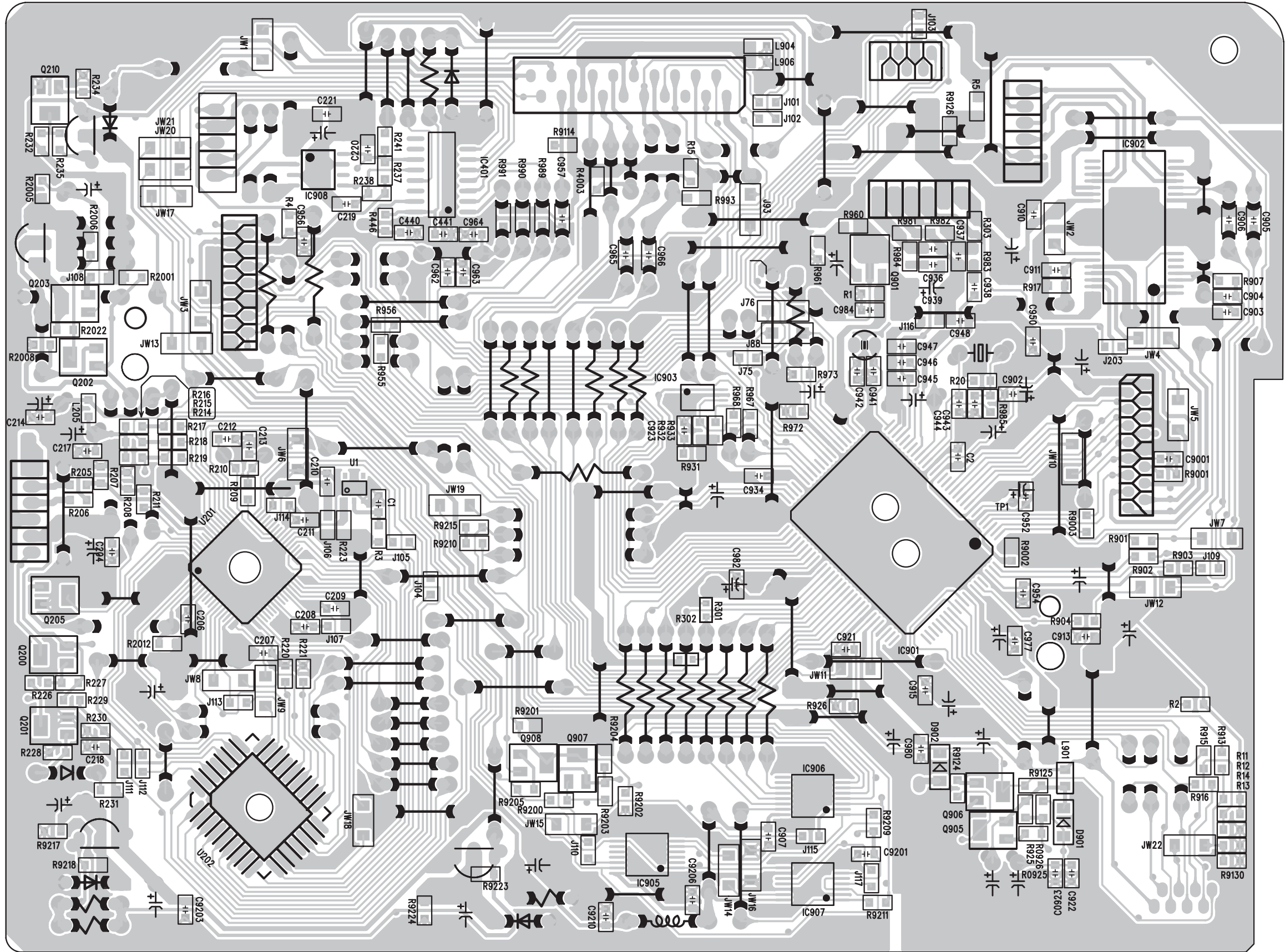
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CMUSIC PCB - Layout Bottom View 7-3
CMUSIC PCB - Circuit Diagram 7-4

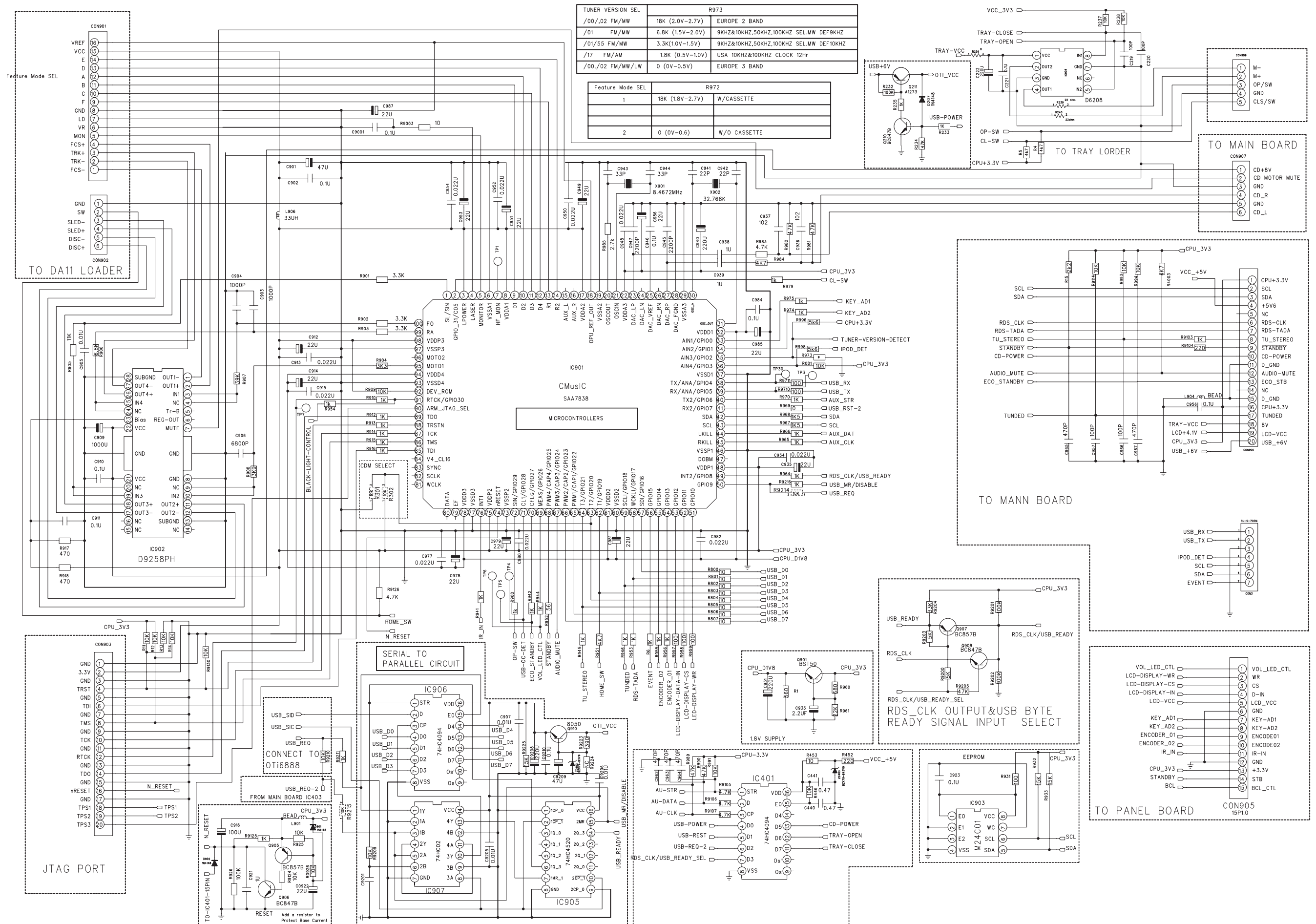
PCB LAYOUT - CMUSIC BOARD (TOP VIEW)



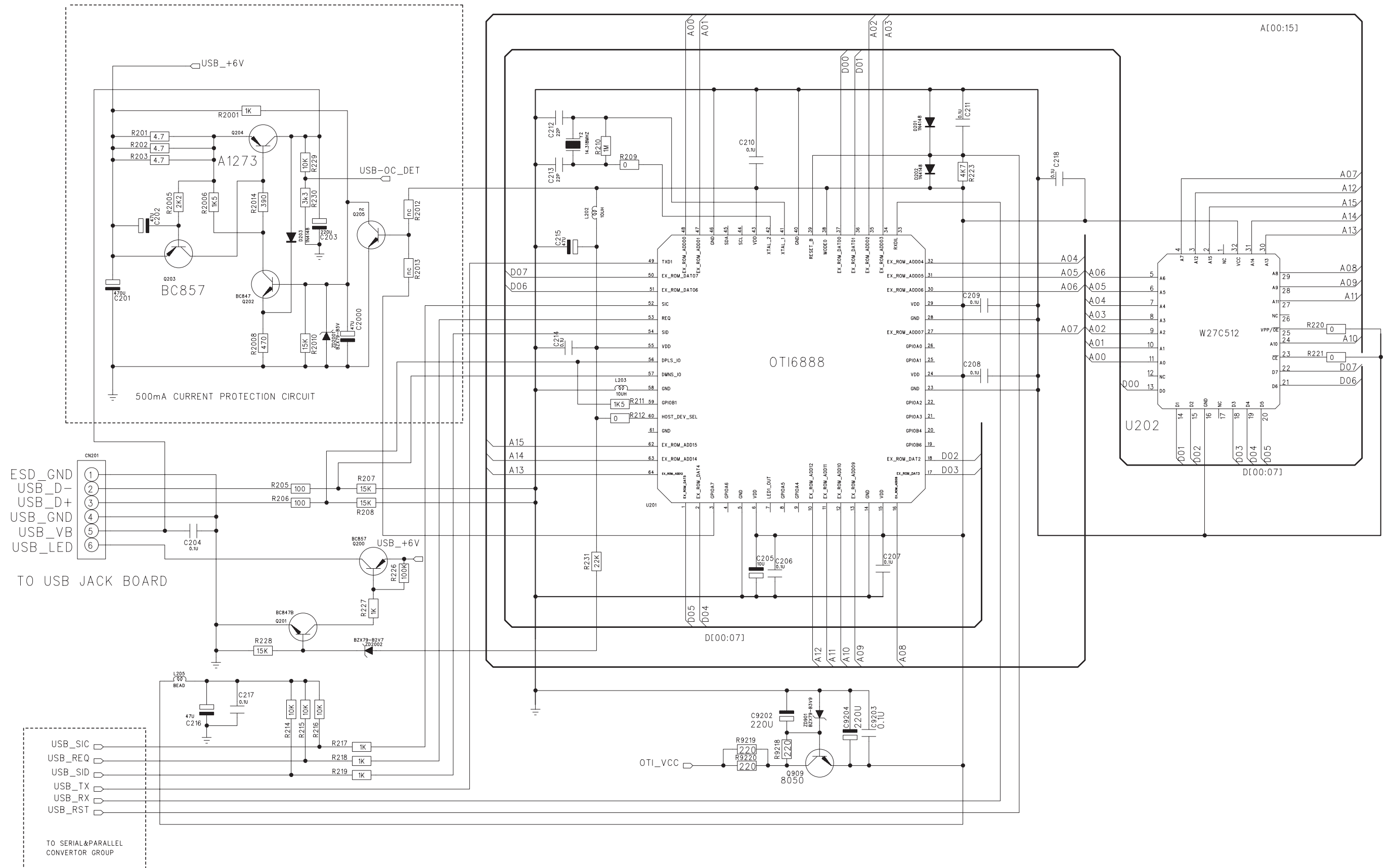
PCB LAYOUT - CMUSIC BOARD (BOTTOM VIEW)



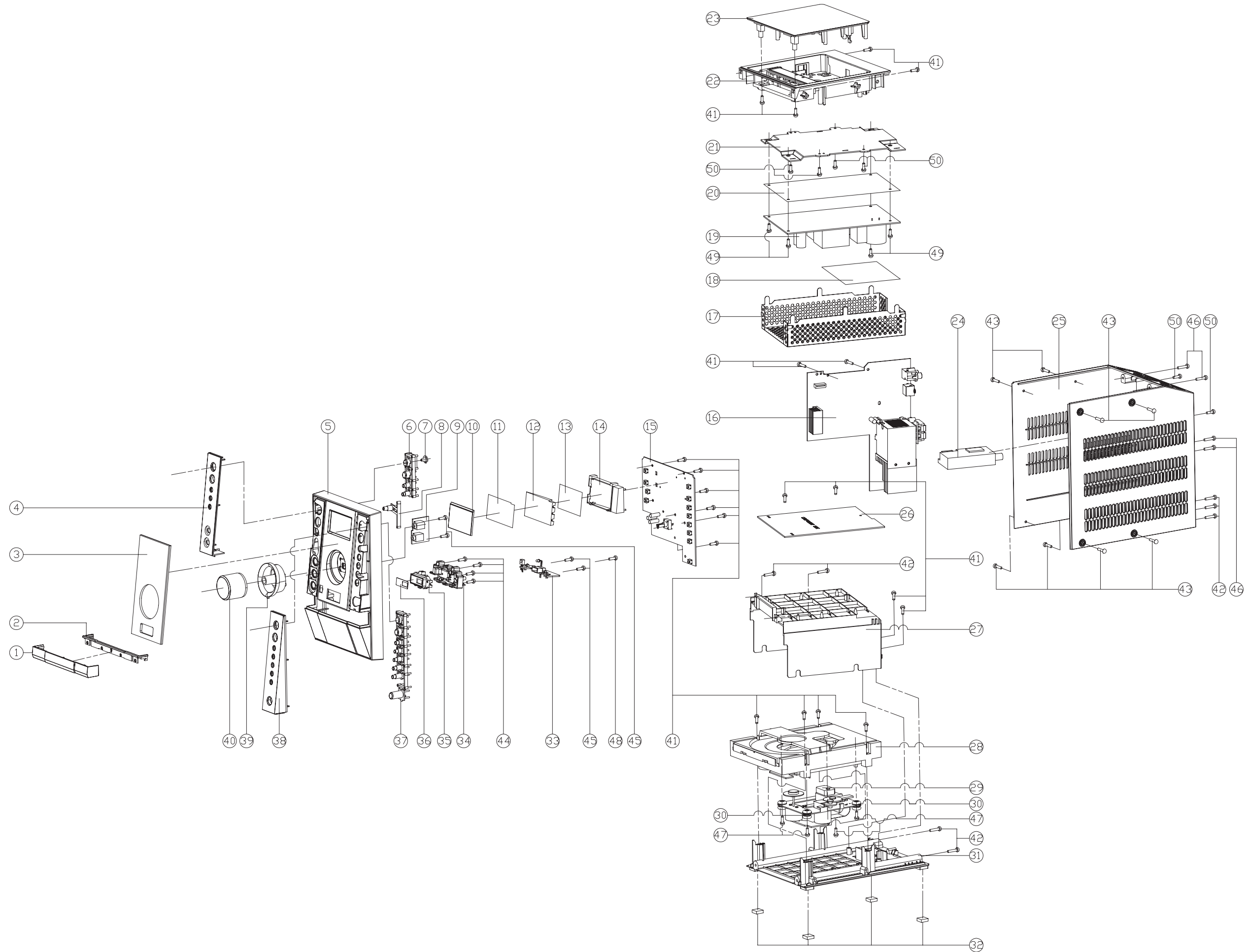
CIRCUIT DIAGRAM - CMUSIC BOARD CD & TUNER PART



CIRCUIT DIAGRAM - CMUSIC BOARD USB PART



SET MECHANICAL EXPLODED VIEW



MECHANICAL & ACCESSORIES PARTS LIST

1	996510004576	CD LOADER COVER	F	996510001099	AM LOOP FRAME ASSY
2	996510001086	CHROME RING-LOADER COVER	G	996510001911	IPOD HOLDER-40GB-INJ.
3	996510004572	DISPLAY LENS	H	996510001912	IPOD HOLDER-60GB-INJ.
4	996510004573	LEFT FRONT PANEL	I	996510001913	IPOD HOLDER-60GB-VIDEO-INJ.
5	996510004567	FRONT CABINET	J	996510001914	IPOD HOLDER-MINI-INJ.
6	996510004577	CONTROL KEY SET - LEFT	K	996510001915	IPOD HOLDER-NANO-INJ.
7	996510001448	STANDBY BOTTON LIGHT GUIDE	L	996510001916	IPOD HOLDER-20GB-INJ.
8	996510004571	CONTROL KEY-DOCKING	M	996510001917	IPOD HOLDER-30GB-PHOTO-INJ
22	996510004566	TOP CABINET	N	996510001918	IPOD HOLDER-30GB-VIDEO-INJ.
23	996510004575	TOP COVER	O	994000005786	CD MECHANISM DA11VF(SANYO)
24	996510004581	FM TUNER MODULE ENG07815QF	P1	△ 996510004579	AC POWER CORD 1.83M /12
25	996510004569	REAR CABINET	P2	△ 996510005461	BS POWER SUPPLY CORD 1.83M /05
28	996510000871	CD TRAY LOADER	Q	996510004580	IPOD+ GOGER DOCKING
30	996510000868	CD DAMPER PINK 658F	R	△ 996510004582	SWI. POWER SUPPLY MODULE
31	996510004568	BOTTOM CABINET	S	996510004583	FFC CABLE 80MM 15P P=1.0
35	996510004578	USB LIGHT GUIDE	T	996510001092	FFC R/A TYPE 16P L180MM
37	996510004570	CONTROL KEY SET - RIGHT	U	996510001093	FFC CABLE 20P P1.25MM L200MM
38	996510004574	RIGHT FRONT PANEL	V	996510004584	FFC CABLE 7P P1.0MM L230MM
39	996510001438	VOLUME KNOB RING	W	996510001095	FFC CABLE 10P L300MM P1.25
40	996510001082	VOLUME KNOB	X	996510004585	WOODEN SPEAKER (L+R)
			Y	996510004586	REMOTE CONTROL
			Z	994000003268	ANTENNA WIRE 1000MM

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

ELECTRICAL PARTSLIST**C MUSIC BOARD**

IC401	994000003199	IC HEF4094BT
IC901	996510004550	IC (PROGRAMMED) SAA7838H/N3
IC902	994000005753	I.C. D9258PH
IC903	994000003272	IC M24C01-RDW6T
Q204	994000005729	TRANSISTOR KTA1273 TO-92L
Q211	994000005729	TRANSISTOR KTA1273 TO-92L
Q901	996510000378	TRANSISTOR BST50
Q909	996500039268	TRANSISTOR KTC-8050C
Q910	996500039268	TRANSISTOR KTC-8050C
IC905	994000005751	I.C. 74HC4520DB SSOP16
IC906	994000005749	I.C. 74HC4094DB SSOP16
IC907	994000005748	I.C. 74HC02DB SSOP14
IC908	996510001069	IC D6208 SOP8
L101	994000005754	FIXED INDUCTOR 33UH-K
Q204	994000005755	TRANSISTOR KTA1273 TO-92L
Q211	994000005755	TRANSISTOR KTA1273 TO-92L
Q909	996500039268	TRANSISTOR KTC-8050C
Q910	996500039268	TRANSISTOR KTC-8050C
U201	994000005747	IC OTI6888-G LQFP-64
U202	996510000738	IC EPROM ICE27C512-70?PCW
X901	994000005742	CRYSTAL 8.4672 MHZ 20PF
X902	994000003208	CRYSTAL 32.768KHZ 12.5PF -10P
Y1	994000005741	CRYSTAL 14.318 MHZ 20PF
ZD2001	994000005744	ZENER DIODE 5V1 1/2W

FRONT & USB BOARD

CON102	996510001071	USB JACK 4P ANGLE TYPE
D101	996510001072	LED INDICATOR D3 CLEAR BLUE
D102	996510001072	LED INDICATOR D3 CLEAR BLUE
D103	996510001072	LED INDICATOR D3 CLEAR BLUE
EN701	996510004552	ENCODER E1211A3V1NE0054
FB701	996510001060	FER. BEAN SBK160808T-601Y-S
IC701	996510001064	IC ET8861S (FOR LCD DRIVER)
LCD701	996510001061	LCD DISPLAY GS-34301+HSC-A/P
LED701	996510000394	LED INDICATOR RED4.3X2.98MM
LED702	996510004553	LED INDICATOR D3mm WHITE
LED703	996510004553	LED INDICATOR D3mm WHITE
LED704	996510004553	LED INDICATOR D3mm WHITE
LED705	996510001422	LED INDICATOR BLUE 33B4SCA01
LED706	996510001422	LED INDICATOR BLUE 33B4SCA01
LED707	996510001422	LED INDICATOR BLUE 33B4SCA01
RS701	996510001070	INFRARED RECEIVER SM3385B
SW701	996500039269	TACT SWITCH
SW702	996500039269	TACT SWITCH
SW703	996500039269	TACT SWITCH

FRONT & USB BOARD

SW704	996500039269	TACT SWITCH
SW705	996500039269	TACT SWITCH
SW706	996500039269	TACT SWITCH
SW707	996500039269	TACT SWITCH
SW708	996500039269	TACT SWITCH
SW709	996500039269	TACT SWITCH
SW710	996500039269	TACT SWITCH
SW711	996500039269	TACT SWITCH
SW712	996500039269	TACT SWITCH
SW713	996500039269	TACT SWITCH
ZD701	996510004551	ZENER DIODE BZX384-C3V3

HEADPHONE BOARD

HP901	994000003229	HEADPHONE JACK D3.5MM
HP902	996510001073	EARPHONE CKX3.5-19S (3PIN)

MAIN BOARD

C319	996510004554	CBB CAP HMFS-5 0.47UF 63V
C320	996510004554	CBB CAP HMFS-5 0.47UF 63V
CN301	996510000380	PUSH TERMINAL JACK PST-418
CN401	996510001073	EARPHONE CKX3.5-19S (3PIN)
CN402	996510004561	MINI DIN JACK 9PINS
D201	996510001053	RECTIFIER DIODE RL201
IC201	996510001057	IC S1117-33PIC TO-220F-3SL
IC202	996510001058	IC S7806PI TO-220F
IC301	996510004564	POWER AMPLIFIER IC TDA8922BJ
IC401	996510004563	I.C. LM324DG SOIC-14
IC501	996510001056	IC ET2314
IC601	994000003215	RDS IC SAA6581T
IC801	996510004562	I.C. D4558
IC802	996500039259	I.C. PT4800(L) DIP-8 PIN
Q203	994000001436	TRANSISTOR 2SB1566-F
Q205	996500039268	TRANSISTOR KTC-8050C
Q208	996500039268	TRANSISTOR KTC-8050C
Q214	994000005727	TRANSISTOR 2SB562C TO-92MOD
Q401	994000005755	TRANSISTOR KTA1273 TO-92L
Q501	996500039268	TRANSISTOR KTC-8050C
Q881	994000003206	TRANSISTOR 8550D
Y601	994000003209	CRYSTAL 4.332MHZ HC-49/S
ZD201	996510004555	DIODE 10V 1/2W TCELLZ10V LL34
ZD205	996510004558	DIODE 6V8 1/2W TCELLZ6V8 LL34
ZD206	996510004560	DIODE 9V1 1/2W TCELLZ9V1 LL34
ZD351	996510004557	DIODE 5V6 1/2W TCELLZ5V6 LL34
ZD401	996510004556	DIODE 5V1 1/2W TCELLZ5V1 LL34

ELECTRICAL PARTSLIST**MAIN BOARD**

ZD402	996510004556	DIODE 5V1 1/2W TCLLZ5V1 LL34
ZD405	996510004565	CHIP VARISTOR 14V 270PF
ZD406	996510004565	CHIP VARISTOR 14V 270PF
ZD407	996510004565	CHIP VARISTOR 14V 270PF
ZD408	996510004565	CHIP VARISTOR 14V 270PF
ZD501	996510004559	DIODE 8V2 1/2W TCLLZ8V2 LL34

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

REVISION LIST

1.0 Manual 3141 785 31830

Initial Service Manual released.

1.1 Manual 3141 785 31831

In this version, version /05 added.

1) P8-2 Mechanical and Accessories Partslist updated.