

Service  
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# Service Manual

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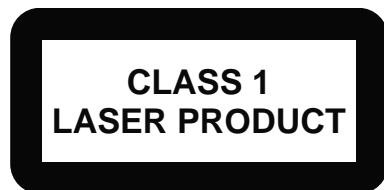
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Version 1.2



# PHILIPS



## SPECIFICATIONS

### AMPLIFIER

Output power ..... 2 x 15 W RMS  
 ..... 30 W + 30 W MPO  
 Signal-to-noise ratio .....  $\geq 62$  dBA (IEC)  
 Frequency response ..... 40 – 15000 Hz,  $\pm 3$  dB  
 Impedance loudspeakers ..... 4  $\Omega$   
 Impedance headphones ..... 32  $\Omega$  -1000  $\Omega$

### CD/MP3-CD PLAYER

Number of programmable tracks ..... 20  
 Frequency range ..... 20 – 20000 Hz  
 Signal-to-noise ratio ..... 75 dBA  
 Channel separation .....  $\geq 60$  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 ..... 12Mb/s, V1.1  
 ..... support MP3 and WMA files  
 Number of albums/folders ..... maximum 99  
 Number of tracks/titles ..... maximum 500

### TUNER

FM wave range ..... 87.5 – 108 MHz  
 MW wave range ..... 531 – 1602 kHz  
 Sensitivity at 75  $\Omega$   
 – mono, 26 dB signal-to-noise ratio ..... 2.8  $\mu$ V  
 – stereo, 46 dB signal-to-noise ratio ..... 61.4  $\mu$ V  
 Selectivity .....  $\geq 28$  dB  
 Total harmonic distortion .....  $\leq 5\%$   
 Frequency response ..... 63 – 12500 Hz ( $\pm 3$  dB)  
 Signal-to-noise-ratio .....  $\geq 50$  dBA

### SPEAKERS

2-way Bass reflex system  
 Dimensions (w x h x d) . 140 x 228 x 212 (mm)

### GENERAL INFORMATION

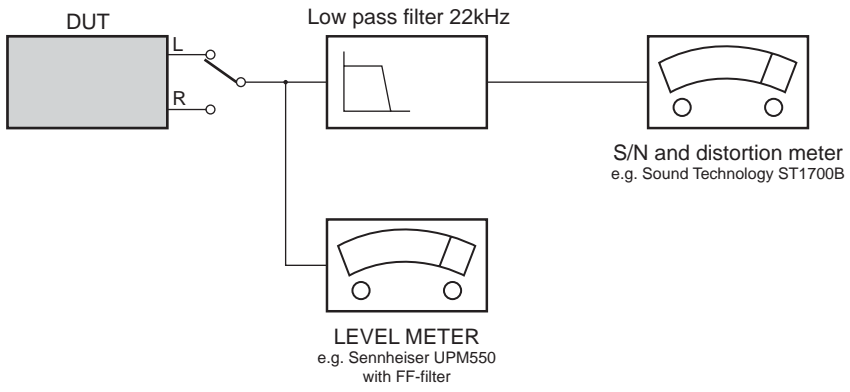
AC Power ..... 220 – 230 V / 50 Hz  
 Dimensions (w x h x d) .. 152 x 228 x 273 (mm)  
 Weight (with/without speakers)  
 ..... approx. 4.8 / 2.3 kg  
 Eco Power Standby .....  $< 1$  W  
 Power consumption Standby .....  $< 3$  W

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

## MEASUREMENT SETUP

### CD

Use Audio Signal Disc SBC429 4822 397 30184 (replaces test disc 3)  
L.P.F. = 13<sup>th</sup> 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

### Cassette:

SBC419 Test cassette CrO2 .....	4822 397 30069
SBC420 Test cassette Fe .....	4822 397 30071
MTT150 Dolby level 200nWb/M .....	4822 397 30271

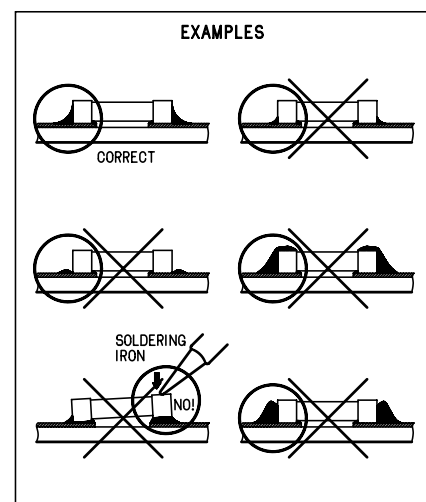
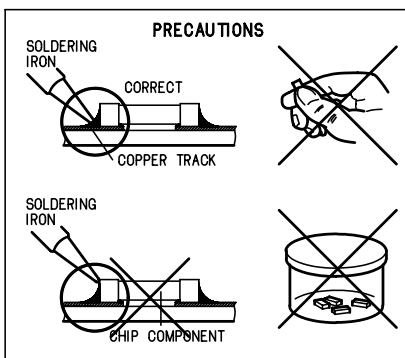
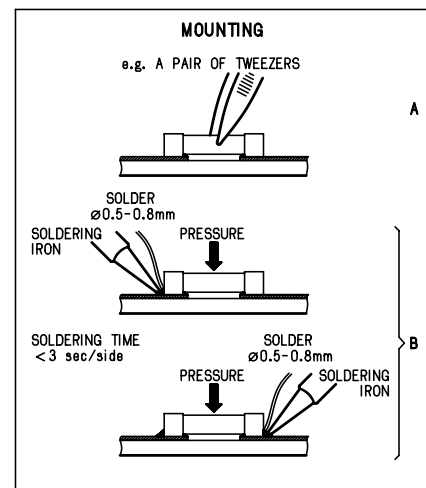
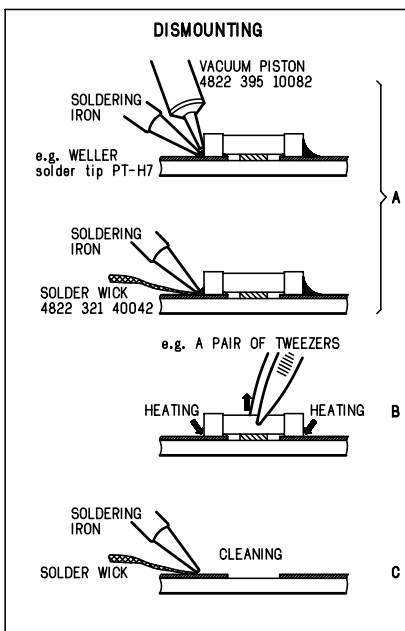
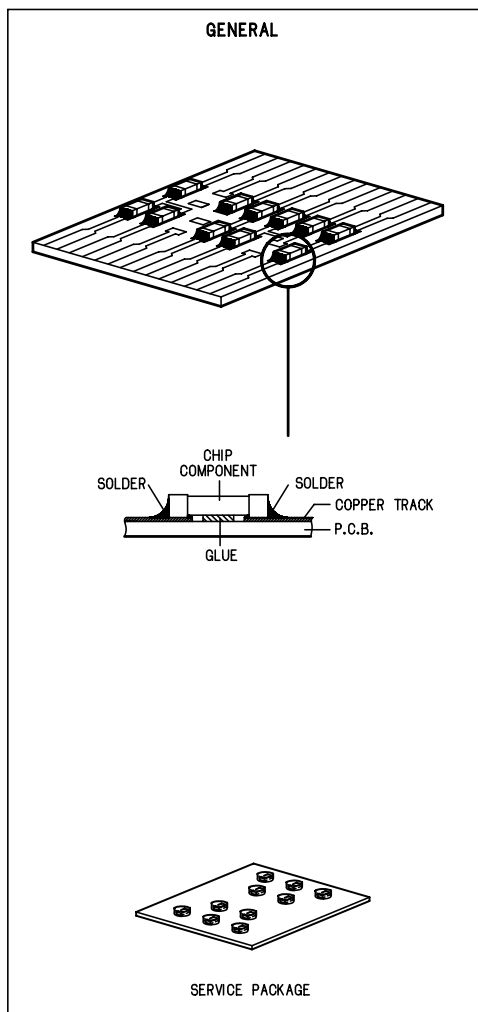
### Compact Disc:

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

### ESD Equipment:

Anti-static table mat - large 1200x650x1.25mm ...	4822 466 10953
Anti-static table mat - small 600x650x1.25mm .....	4822 466 10958
Anti-static wristband .....	4822 395 10223
Connector box (1MΩ) .....	4822 320 11307
Extension cable (to connect wristband to conn. box) .....	4822 320 11305
Connecting cable (to connect table mat to conn. box) .....	4822 320 11306
Earth cable (to connect product to mat or box) ....	4822 320 11308
Complete kit ESD3 (combining all above products) .....	4822 320 10671
Wristband tester .....	4822 344 13999

## HANDLING CHIP COMPONENTS



**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****NL WAARSCHUWING**

Alle IC's en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).

Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen. Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.

Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

**F ATTENTION**

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD).

Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.

Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfiler le bracelet serti d'une résistance de sécurité.

Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

**D WARNUNG**

Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD).

Unvorsichtige Behandlung im Reparaturfall kann die Lebensdauer drastisch reduzieren.

Veranlassen Sie, dass Sie im Reparaturfall über ein Pulsarmband mit Widerstand verbunden sind mit dem gleichen Potential wie die Masse des Gerätes.

Bauteile und Hilfsmittel auch auf dieses gleiche Potential halten.

**I AVVERTIMENTO**

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).

La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della più grande cauzione alla loro manipolazione.

Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un bracciale a resistenza.

Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

**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  $\triangle$ .

**NL**

Veiligheidsbepalingen vereisen, dat het apparaat bij reparatie in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde, worden toegepast.

De Veiligheidsonderdelen zijn aangeduid met het symbool  $\triangle$

**F**

Les normes de sécurité exigent que l'appareil soit remis à l'état d'origine et que soient utilisées les pièces de rechange identiques à celles spécifiées.

Les composants de sécurité sont marqués  $\triangle$

**D**

Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Originalzustand des Geräts darf nicht verändert werden; für Reparaturen sind Original-Ersatzteile zu verwenden.

Sicherheitsbauteile sind durch das Symbol  $\triangle$  markiert.

**I**

Le norme di sicurezza esigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati i pezzi di ricambio identici a quelli specificati.

Componenti di sicurezza sono marcati con  $\triangle$

**GB**

After servicing and before returning set to customer perform a leakage current measurement test from all exposed metal parts to earth ground to assure no shock hazard exist. The leakage current must not exceed 0.5mA.

**GB Warning !**

Invisible laser radiation when open.  
Avoid direct exposure to beam.

**S Varning !**

Osynlig laserstrålning när apparaten är öppnad och spärren är urkopplad. Betrakta ej strålen.

**SF Varoitus !**

Avatussa laitteessa ja suojalukituksen ohitettaessa olet alttiina näkymättömälle laserisäteilylle. Älä katso säteeseen!

**DK Advarse !**

Usynlig laserstråling ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsættelse for stråling.

**F**

"Pour votre sécurité, ces documents doivent être utilisés par des spécialistes agréés, seuls habilités à réparer votre appareil en panne".

## INFORMATION ABOUT LEAD-FREE SOLDERING

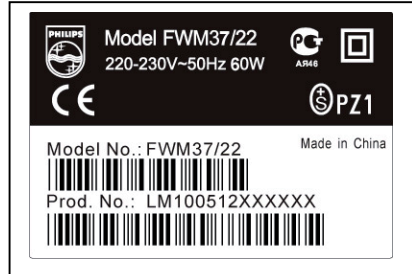
Philips CE is producing lead-free sets from 1.1.2005 onwards.

### IDENTIFICATION:

Regardless of special logo (not always indicated) one must treat all sets from 1 Jan 2005 onwards, according next rules:



### Example S/N:



Bottom line of typeplate gives a 14-digit S/N. Digit 5&6 is the year, digit 7&8 is the week number, so in this case 2005 wk12

So from 0501 onwards = from 1 Jan 2005 onwards

***Important note: In fact also products of year 2004 must be treated in this way as long as you avoid mixing solder-alloys (leaded/ lead-free). So best to always use SAC305 and the higher temperatures belong to this.***

Due to lead-free technology some rules have to be respected by the workshop during a repair:

- Use only lead-free solder alloy Philips SAC305 with order code 0622 149 00106. If lead-free solder-paste is required, please contact the manufacturer of your solder-equipment. In general use of solder-paste within workshops should be avoided because paste is not easy to store and to handle.
- Use only adequate solder tools applicable for lead-free solder alloy. The solder tool must be able
  - To reach at least a solder-temperature of 400°C,
  - To stabilize the adjusted temperature at the solder-tip
  - To exchange solder-tips for different applications.
- Adjust your solder tool so that a temperature around 360°C – 380°C is reached and stabilized at the solder joint. Heating-time of the solder-joint should not exceed ~ 4 sec. Avoid temperatures above 400°C otherwise wear-out of tips will rise drastically and flux-fluid will be destroyed. To avoid wear-out of tips switch off un-used equipment, or reduce heat.
- Mix of lead-free solder alloy / parts with leaded solder alloy / parts is possible but PHILIPS recommends strongly to avoid mixed solder alloy types (leaded and lead-free).  
If one cannot avoid or does not know whether product is lead-free, clean carefully the solder-joint from old solder alloy and re-solder with new solder alloy (SAC305).
- Use only original spare-parts listed in the Service-Manuals. Not listed standard-material (commodities) has to be purchased at external companies.
- Special information for BGA-ICs:
  - always use the 12nc-recognizable soldering temperature profile of the specific BGA (for de-soldering always use the lead-free temperature profile, in case of doubt)
  - lead free BGA-ICs will be delivered in so-called 'dry-packaging' (sealed pack including a silica gel pack) to protect the IC against moisture. After opening, dependent of MSL-level seen on indicator-label in the bag, the BGA-IC possibly still has to be baked dry. (MSL=Moisture Sensitivity Level). This will be communicated via AYS-website. Do not re-use BGAs at all.
- For sets produced before 1.1.2005 (except products of 2004), containing leaded solder-alloy and components, all needed spare-parts will be available till the end of the service-period. For repair of such sets nothing changes.
- 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

You will find this and more technical information within the "magazine", chapter "workshop news".

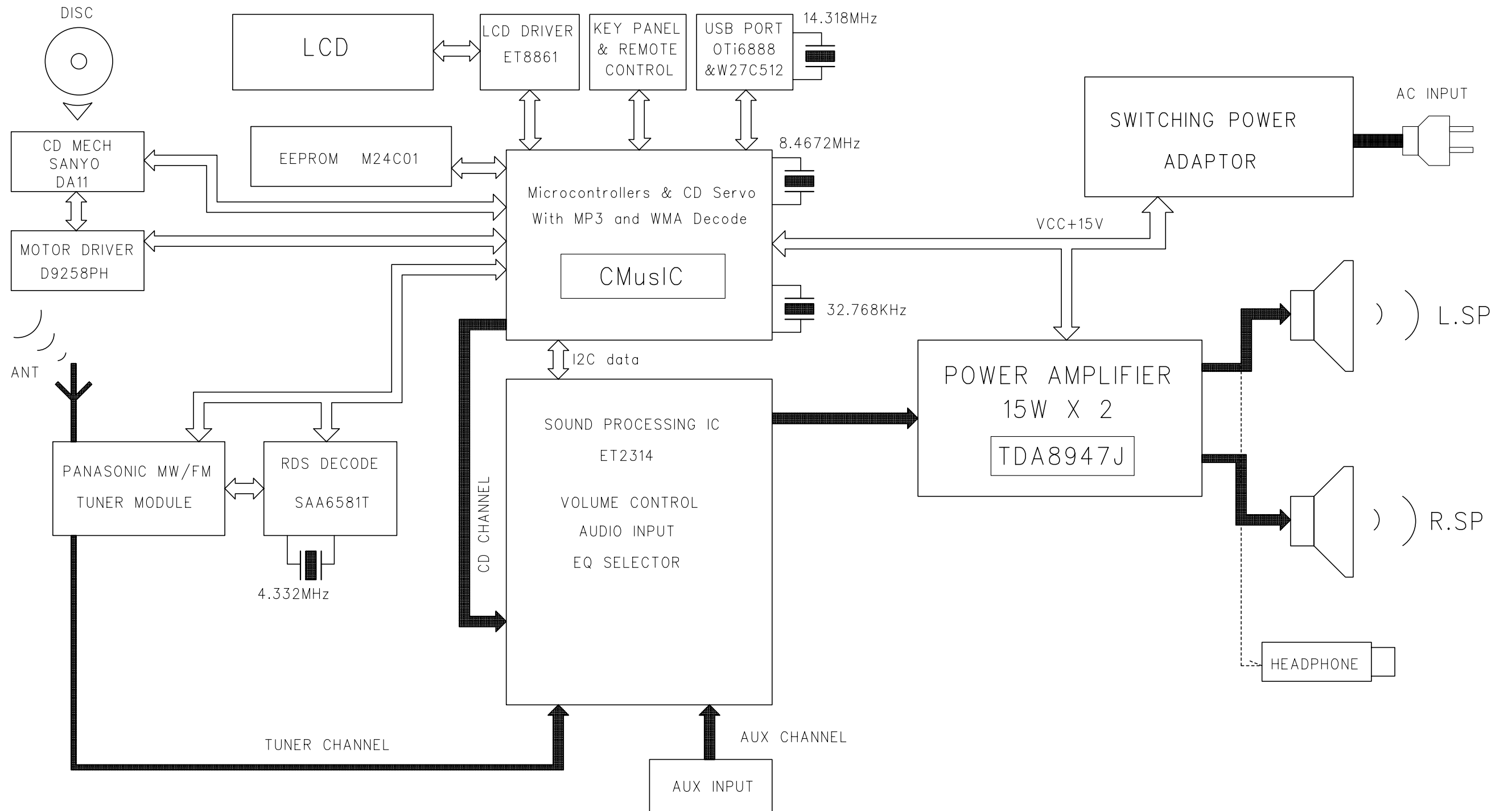
For additional questions please contact your local repair-helpdesk.

## 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:

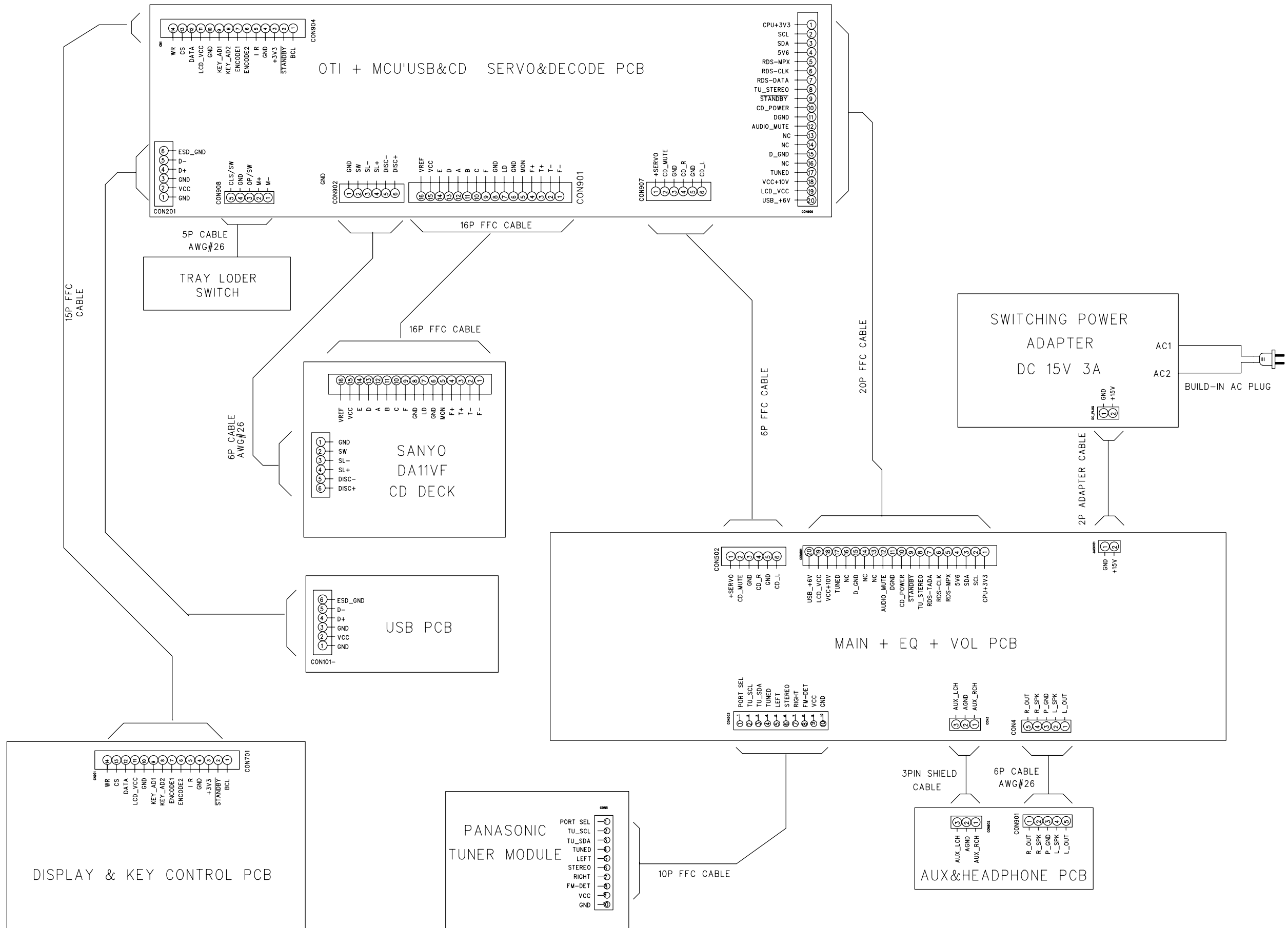
- Route the wire trees correctly and fix them with the mounted cable clamps.
- Check the insulation of the AC Power lead for external damage.
- Check the strain relief of the AC Power cord for proper function.
- Check the electrical DC resistance between the AC Power Plug and the secondary side (only 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.

### SET BLOCK DIAGRAM





# SET WIRING DIAGRAM



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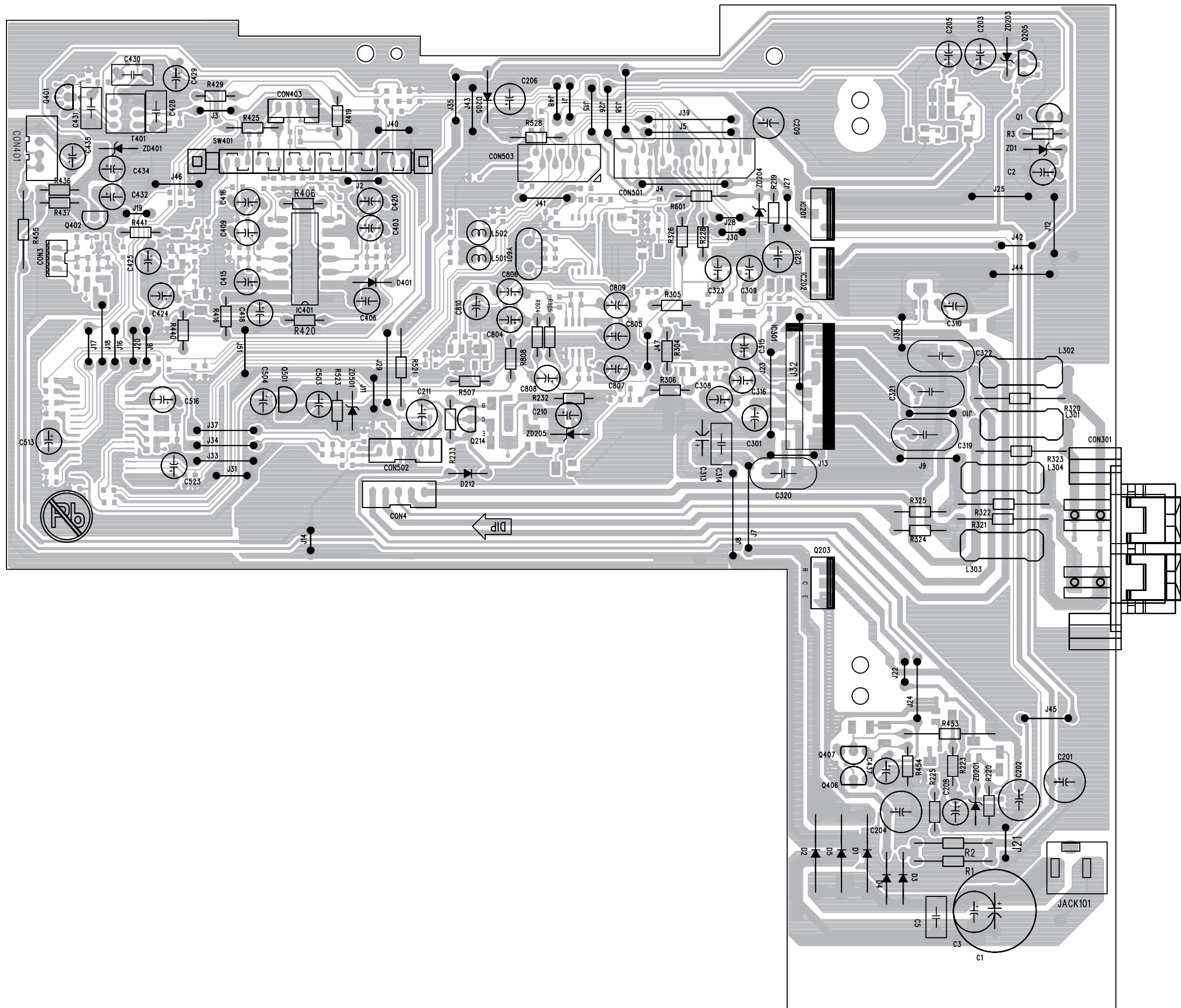
# MAIN BOARD

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# PCB LAYOUT - MAIN BOARD (TOP VIEW)



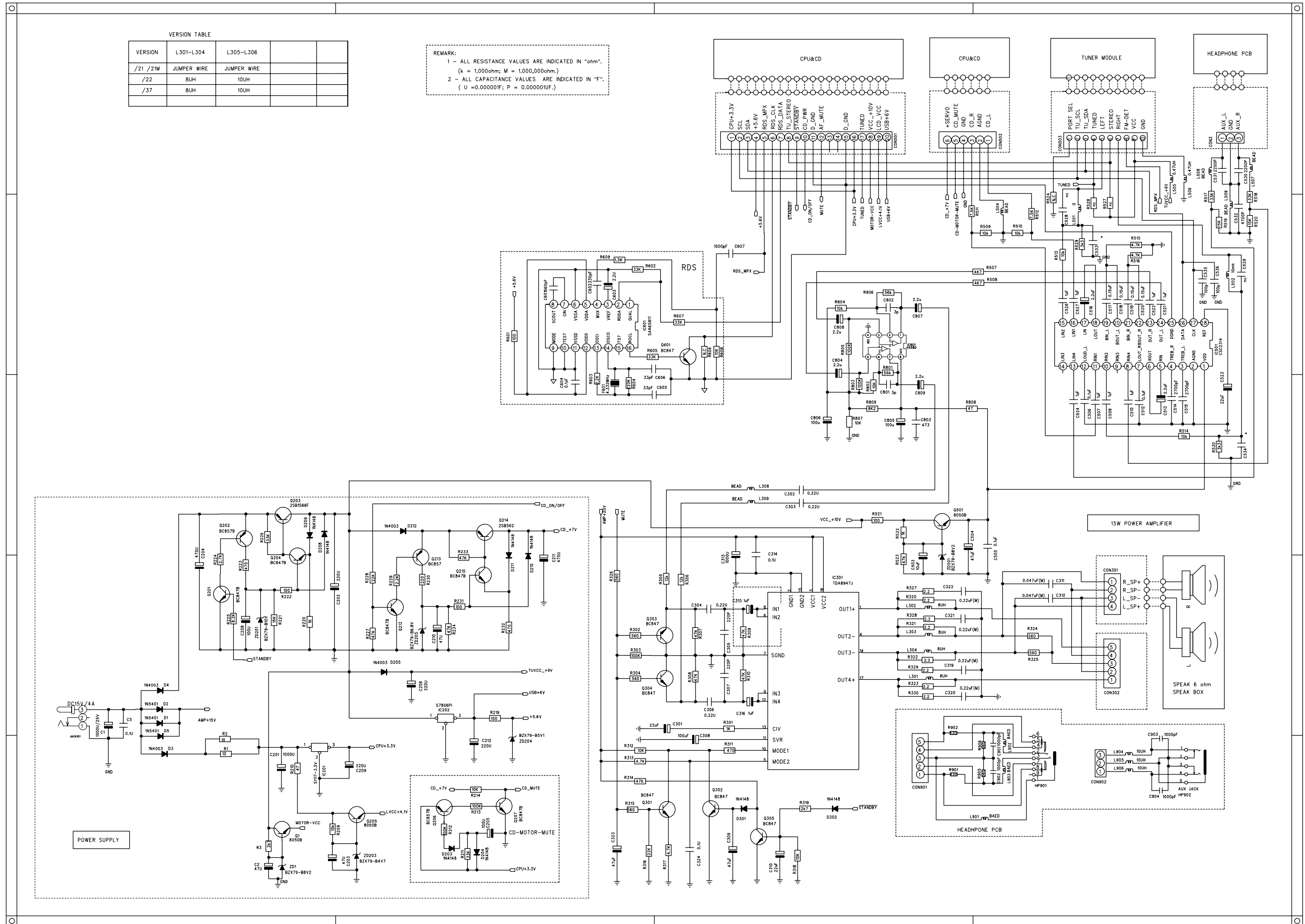


# CIRCUIT DIAGRAM - MAIN BOARD

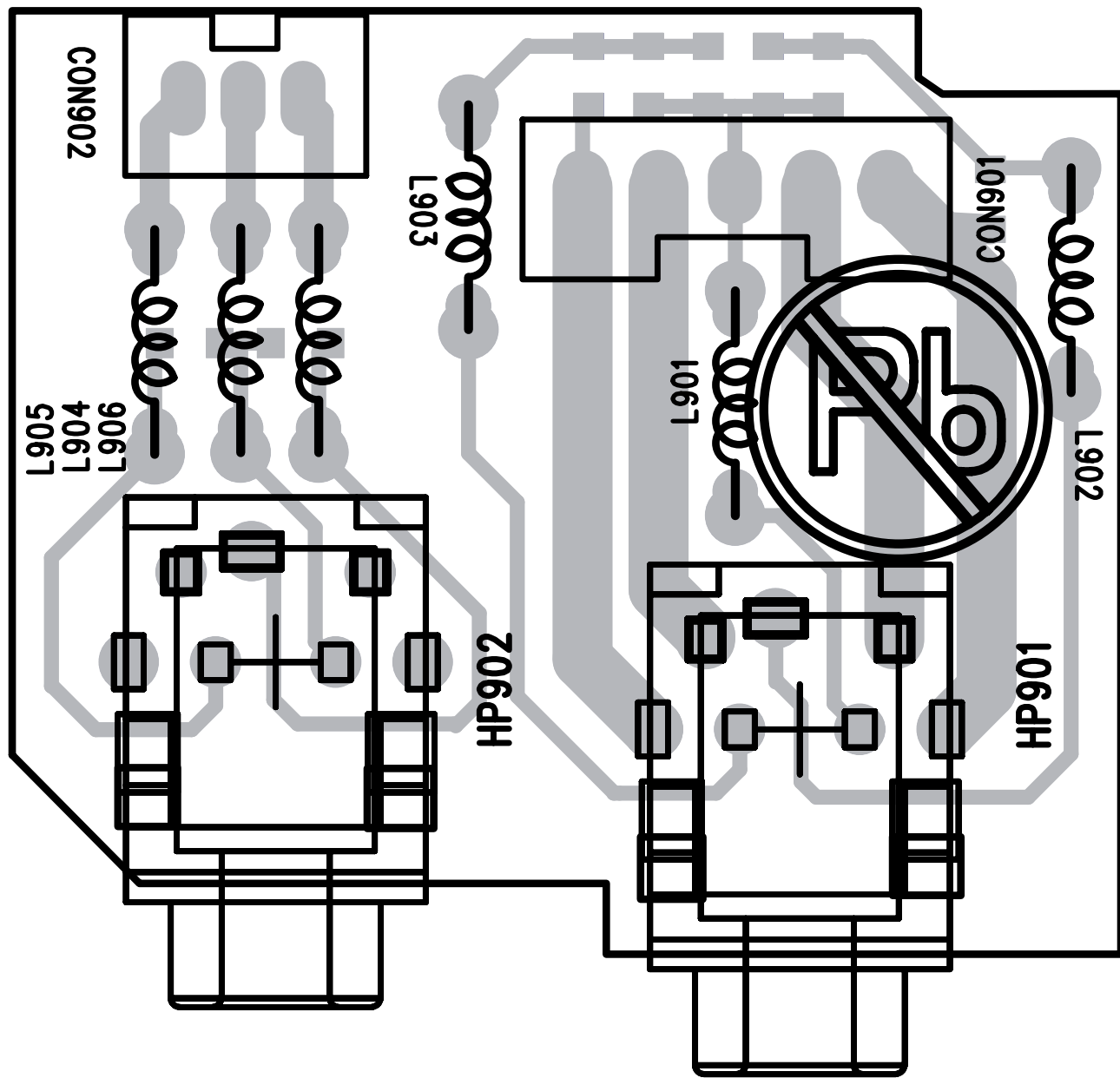
VERSION TABLE

VERSION	L301-L304	L305-L306
/21 /21M	JUMPER WIRE	JUMPER WIRE
/22	8UH	10UH
/37	8UH	10UH

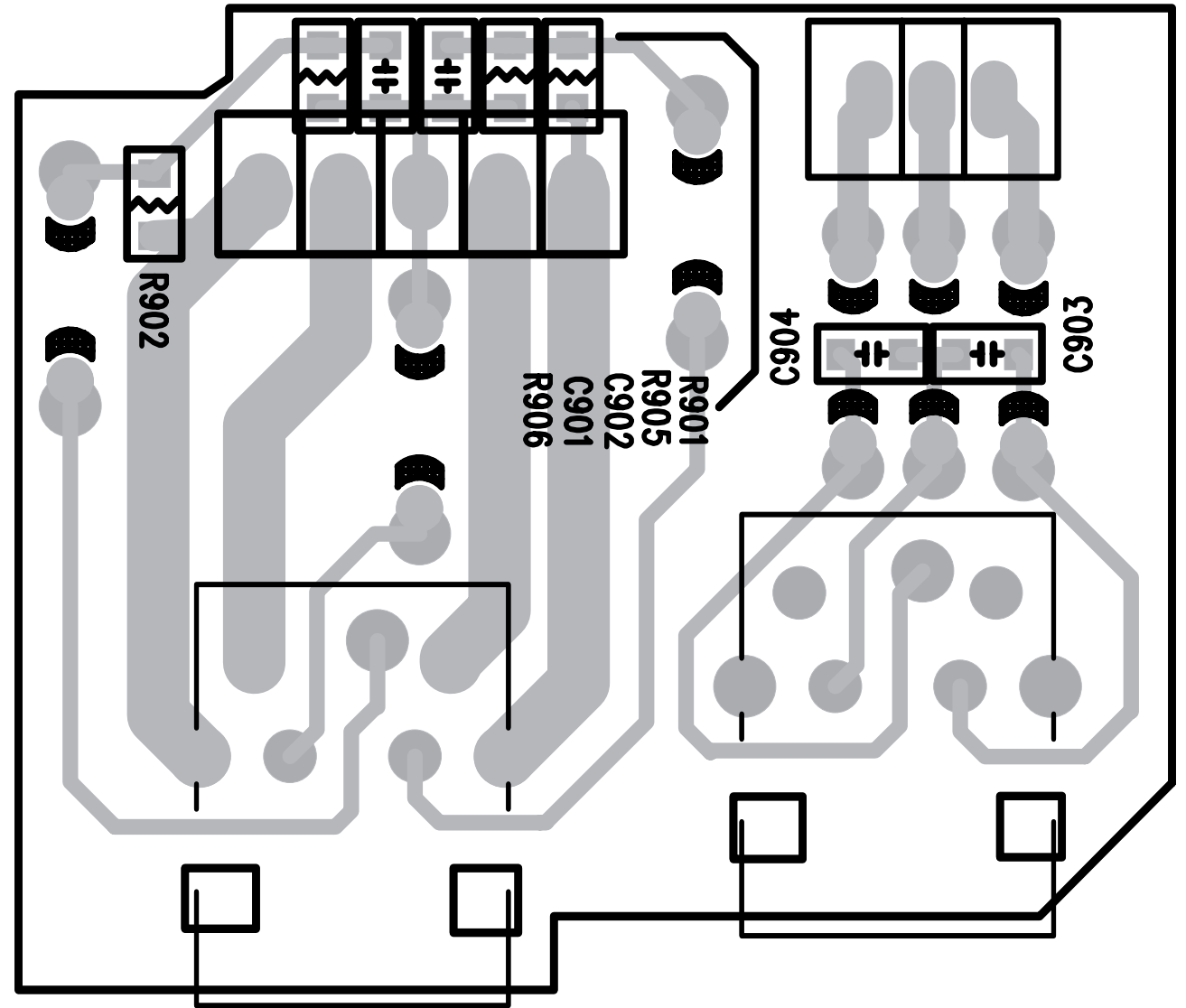
REMARK:  
 1 - ALL RESISTANCE VALUES ARE INDICATED IN "ohm".  
 (k = 1,000ohm; M = 1,000,000ohm.)  
 2 - ALL CAPACITANCE VALUES ARE INDICATED IN "F".  
 (U = 0.000001F; P = 0.000001UF.)



PCB LAYOUT - HEADPHONE BOARD (TOP VIEW)



PCB LAYOUT - HEADPHONE BOARD (BOTTOM VIEW)



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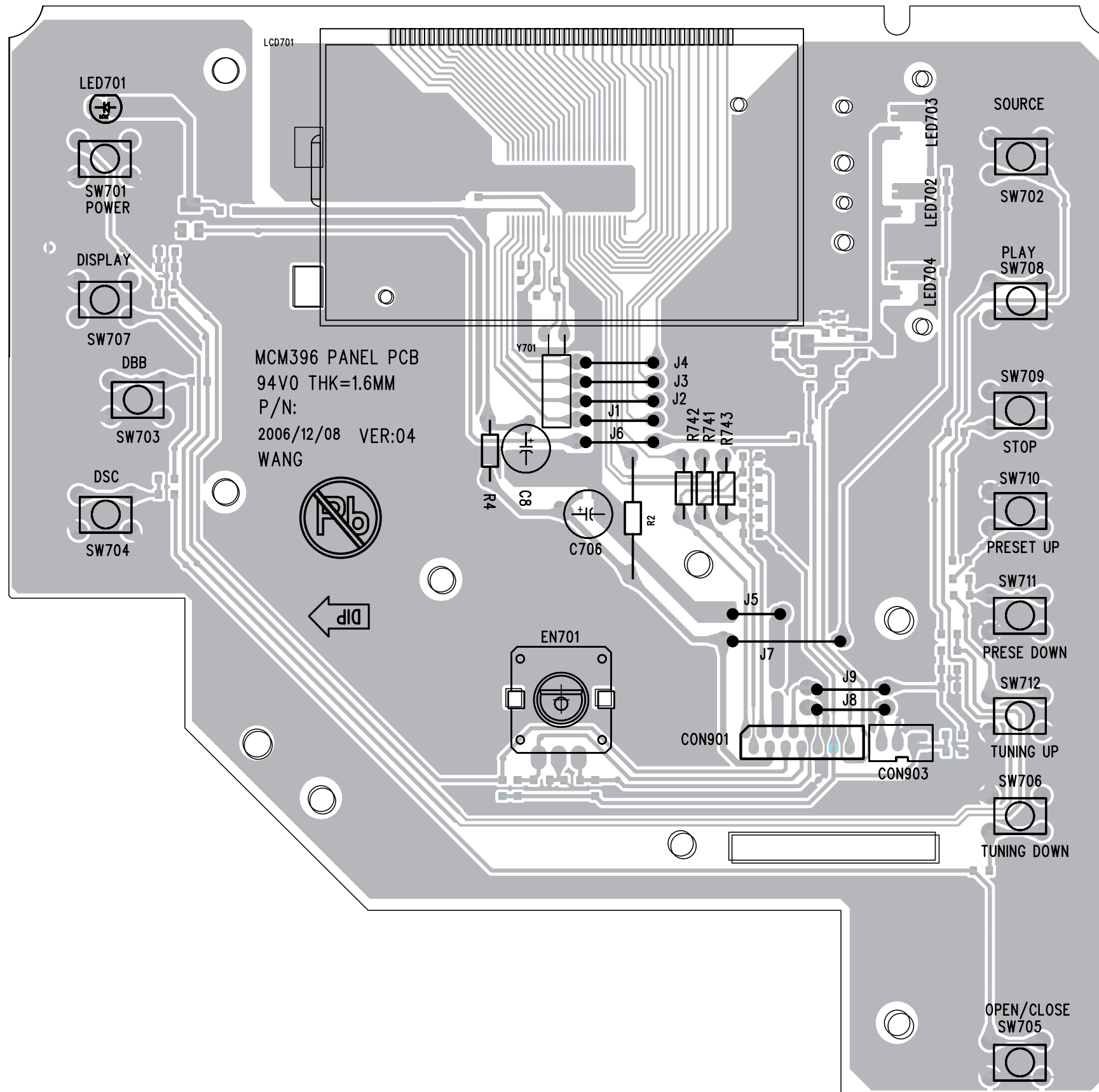
# DISPLAY BOARD

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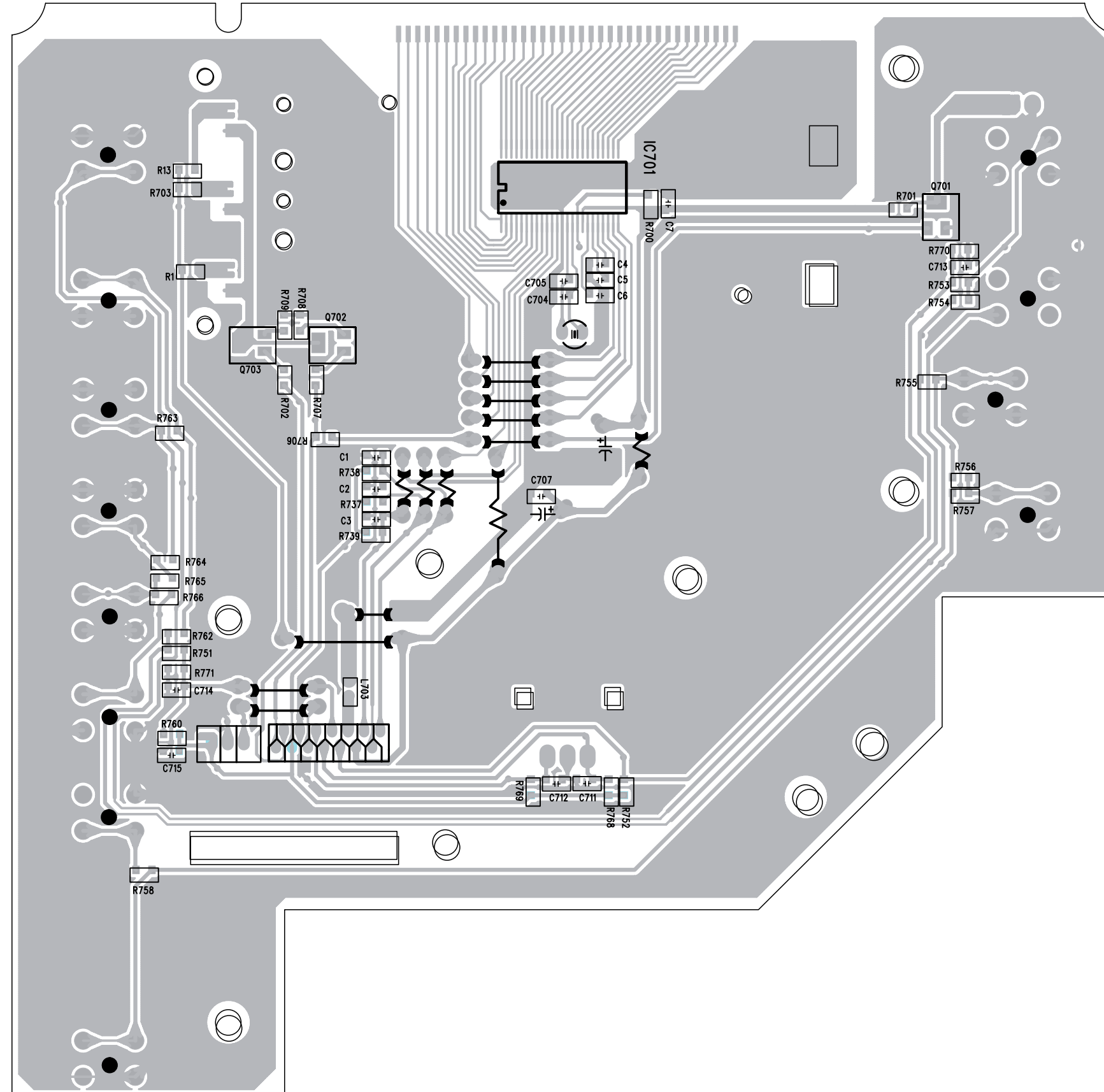
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# PCB LAYOUT - DISPLAY BOARD (TOP VIEW)

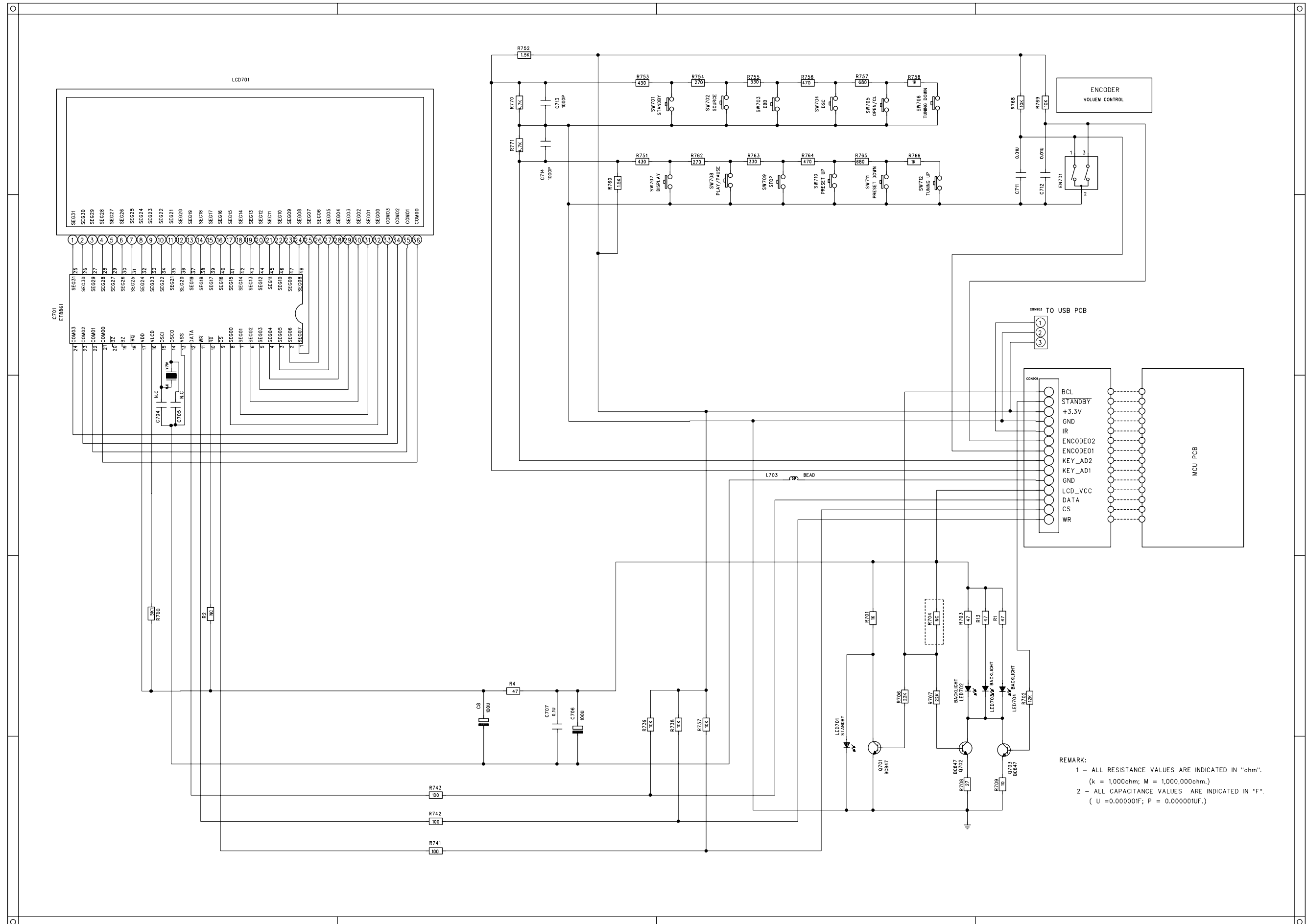




# PCB LAYOUT - DISPLAY BOARD (BOTTOM VIEW)



# CIRCUIT DIAGRAM - DISPLAY BOARD



REMARK:  
 1 - ALL RESISTANCE VALUES ARE INDICATED IN "ohm".  
 (k = 1,000ohm; M = 1,000,000ohm.)  
 2 - ALL CAPACITANCE VALUES ARE INDICATED IN "F".  
 ( U =0.000001F; P = 0.000001UF.)

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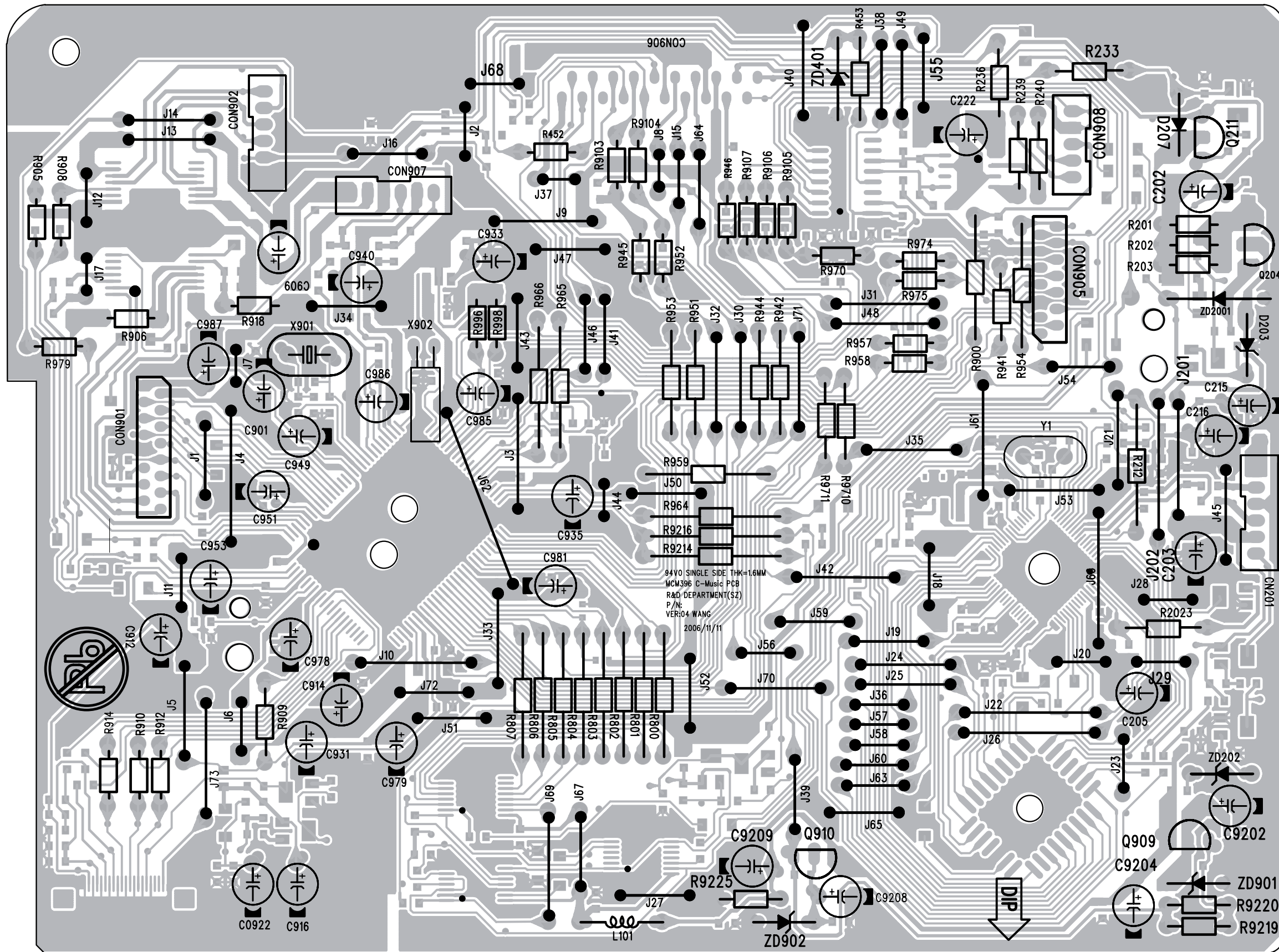
# MCU & USB JACK BOARD

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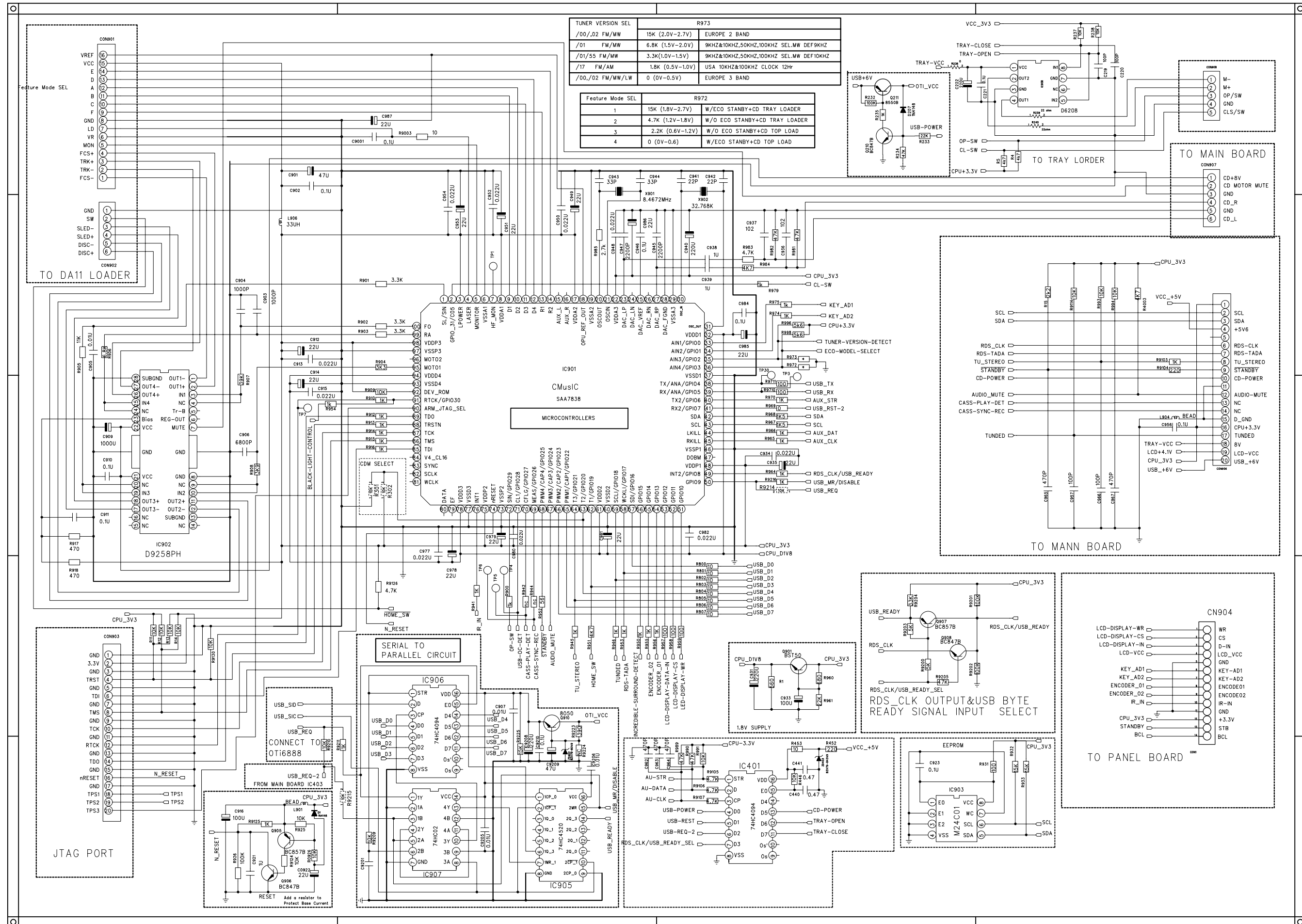
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USB JACK PCB - Circuit Diagram.....	7-5
USB JACK PCB - Layout Diagram.....	7-6

# PCB LAYOUT - MCU BOARD (TOP VIEW)

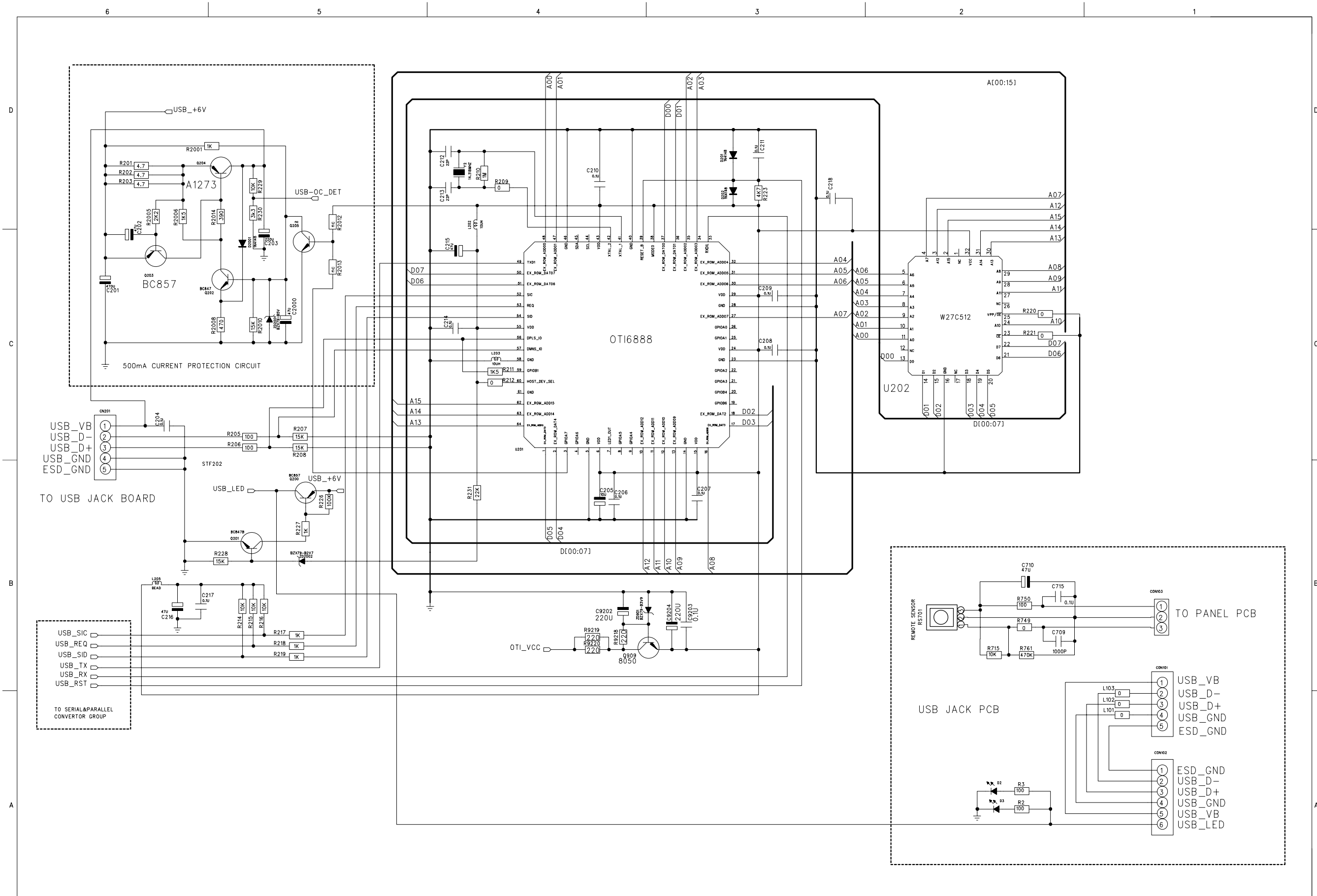




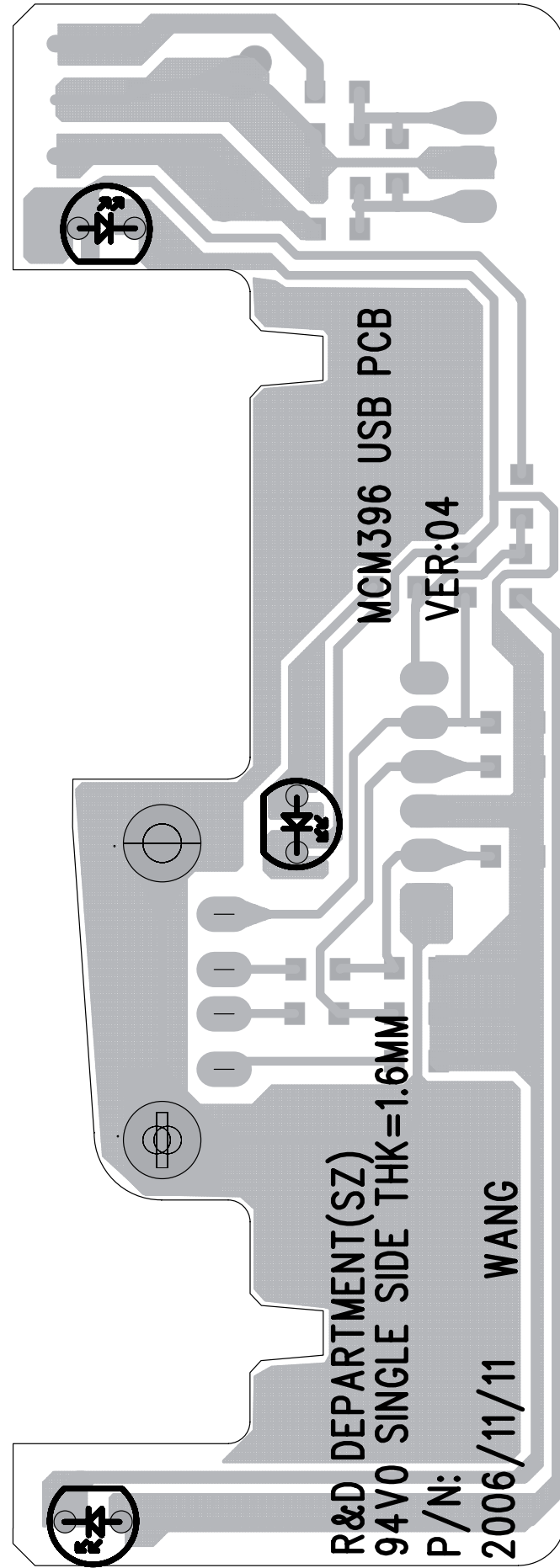
# CIRCUIT DIAGRAM - MCU BOARD



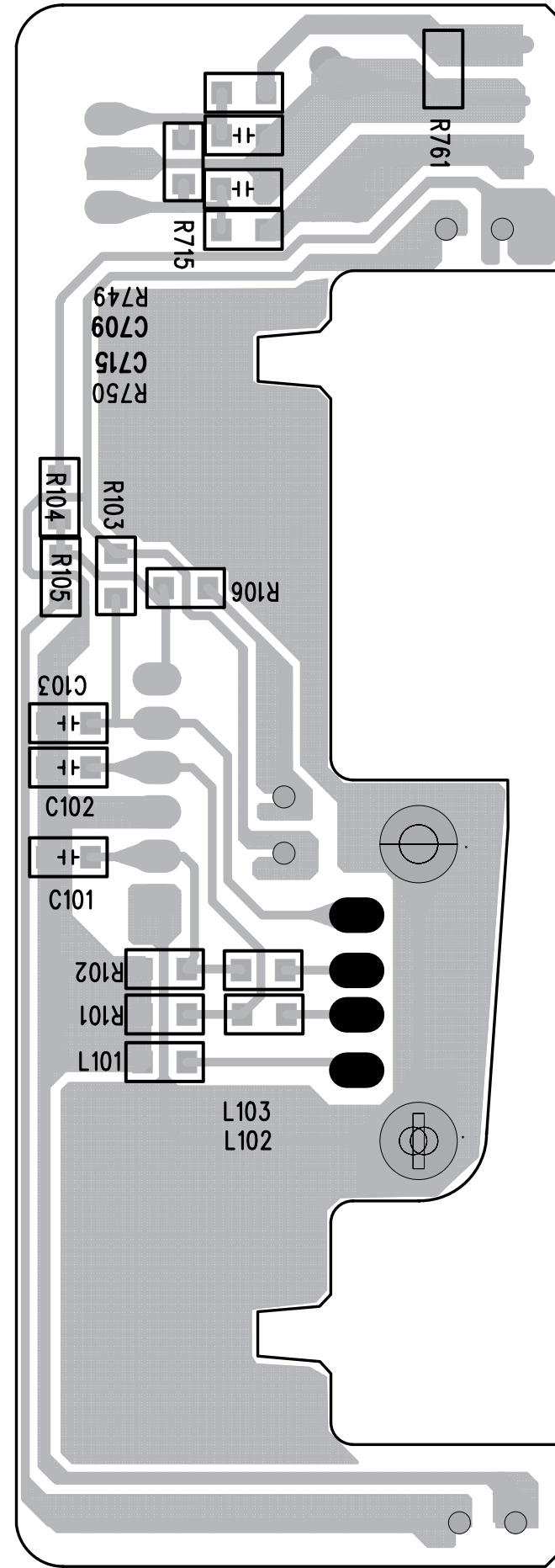
# CIRCUIT DIAGRAM - USB JACK BOARD



PCB LAYOUT - USB JACK BOARD (TOP VIEW)

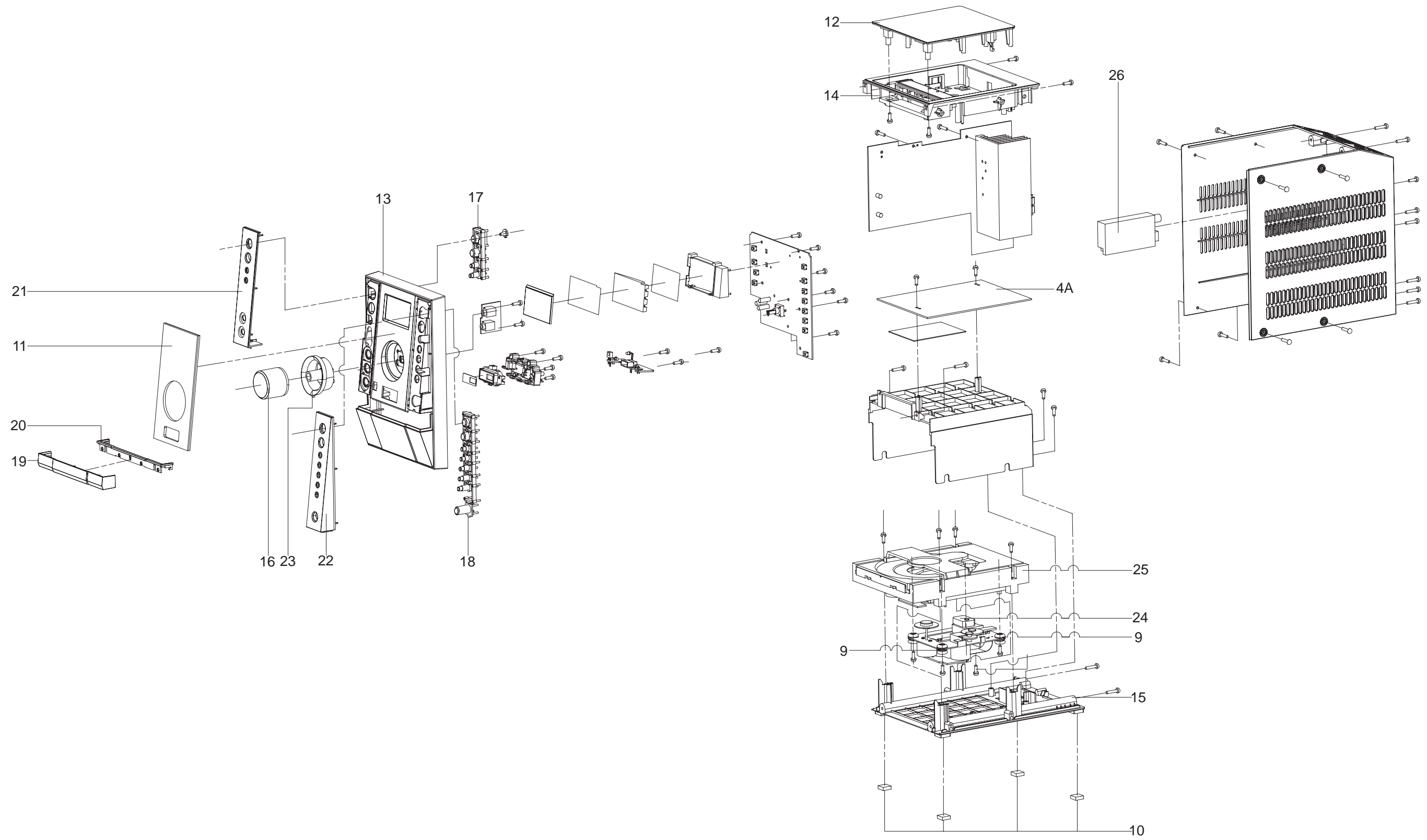


PCB LAYOUT - USB JACK BOARD (BOTTOM VIEW)





SET MECHANICAL EXPLODED VIEW



**MECHANICAL & ACCESSORIES PARTS LIST**

9	996510000868	CD DAMPER PINK 658F HARDNESS
10	996510001076	RUBBER FOOT 11.8X11.8X6MM
11	996510001077	DISPLAY LENS
12	996510001078	TOP COVER
13	996510001079	FRONT CABINET
14	996510001080	TOP CABINET
15	996510001081	BOTTOM CABINET
16	996510001082	VOLUME KNOB
17	996510001083	CONTROL KEY SET - LEFT
18	996510001084	CONTROL KEY SET - RIGHT
19	996510001085	CD LOADER COVER
20	996510001086	CHROME RING - CD LOADER COVER
21	996510001087	LEFT FRONT PANEL
22	996510001088	RIGHT FRONT PANEL
23	996510001089	VOLUME KNOB RING
24	994000005786	CD MECHANISM DA11VF(SANYO)
25	996510000871	CD TRAY LOADER
26	996510001090	TUNER MODULE ENG07821QF
27	996510001091	FFC CABLE 80MM 14P P1.0
28	996510001092	FFC R/A TYPE 16P L180MM
29	996510001093	FFC CABLE 20P P1.25MM L200MM
30	996510001094	FFC CABLE 200MM 20P P1.25
31	996510001095	FFC CABLE 10P L300MM P1.25
32	⚠ 996510001096	POWER AC ADAPTER 15V 3A
33	996510001097	WOODEN SPEAKER (L+R)ONE SET
34	996510001098	REMOTE CONTROL
35	994000003268	ANTENNA WIRE 1000MM
36	996510001099	AM LOOP FRAME ASSY
4A	996520000101	C MUSIC BOARD ASSY
02	996510019243	MAIN BOARD ASSY

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

**ELECTRICAL PARTS LIST - MAIN BOARD**

CON301	996510000380	PUSH TERMINAL JACK PST-418
D4	996510001053	RECTIFIER DIODE RL201
IC201	996510001057	IC S1117-33PIC TO-220F-3SL
IC202	996510001058	IC S7806PI TO-220F
IC301	994000003203	POWER AMPLIFIER IC TDA8947J
IC501	996510001056	IC ET2314
IC601	994000003215	RDS IC SAA6581T
IC801	996510001055	IC BA4558 SOP8
JACK101	996510001054	6.5MM DC JACK (DJ32-2)
L301	996510000388	CHOKO COIL 8UH 3A1941N
L302	996510000388	CHOKO COIL 8UH 3A1941N
L303	996510000388	CHOKO COIL 8UH 3A1941N
L304	996510000388	CHOKO COIL 8UH 3A1941N
Q1	996500039268	TRANSISTOR KTC-8050C
Q203	994000001436	TRANSISTOR 2SB1566-F
Q205	996500039268	TRANSISTOR KTC-8050C
Q214	994000005727	TRANSISTOR 2SB562C TO-92MOD
Q501	996500039268	TRANSISTOR KTC-8050C
Y601	994000003209	CRYSTAL 4.332MHZ HC-49/S

**ELECTRICAL PARTS LIST - DISPLAY BOARD**

D704	996510001062	3.1MM RED COLOR LED
EN701	996510001059	ENCODER EC121102X2B-HA1-082
IC701	996510001064	IC ET8861S (FOR LCD DRIVER)
L703	996510001060	FERR. BEAN SBK160808T-601Y-S
LCD701	996510001061	LCD DISPLAY GS-34301+HSC-A/P
LED701	996510000394	LED INDICATOR RED4.3X2.98MM
LED702	996510001062	3.1MM RED COLOR LED
LED702	996510001063	D3MM LED RED 4.1X2.97MM
LED703	996510001062	3.1MM RED COLOR LED
LED703	996510001063	D3MM LED RED 4.1X2.97MM
LED704	996510001063	D3MM LED RED 4.1X2.97MM
SW701	996500039269	TACT SWITCH
SW702	996500039269	TACT SWITCH
SW703	996500039269	TACT SWITCH
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

**ELECTRICAL PARTS LIST - C MUSIC (MCU) BOARD (only for reference)**

IC401	994000003199	IC HEF4094BT
IC901	996510001066	C MUSIC PLUS IC SAA7838H/N3
IC901	996510001067	C MUSIC PLUS IC SAA7838/M3
IC901	996510001068	C MUSIC PLUS IC SAA7838H/N3
IC902	994000005753	I.C. D9258PH
IC903	994000003272	IC M24C01-RDW6T
IC905	994000005751	I.C. 74HC4520DB SSOP16
IC906	994000005749	I.C. 74HC4094DB SSOP16
IC907	994000005748	I.C. 74HC02DB SSOP14
IC908	996510001069	IC D6208 SOP8
L205	996510001060	FERR. BEAN SBK160808T-601Y-S
L901	996510001060	FERR. BEAN SBK160808T-601Y-S
L904	996510001060	FERR. BEAN SBK160808T-601Y-S
L906	996510001060	FERR. BEAN SBK160808T-601Y-S
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
U201	994000005747	IC OTI6888-G LQFP-64
U202	996510000738	IC EPROM ICE27C512-70?PCW
U202	996510001065	IC EPROM ICE27C512-70
X901	994000005742	X'TAL 8.4672 MHZ 20PF
X902	994000003208	X'TAL 32.768KHZ 12.5PF -10P
Y1	994000005741	X'TAL 14.318 MHZ 20PF
ZD2001	994000005744	ZENER DIODE 5V1 1/2W
ZD202	994000005743	ZENER DIODE 2V7 1/2W
ZD401	996500039267	ZENER DIODE 3V9 1/2W
ZD901	996500039267	ZENER DIODE 3V9 1/2W
ZD902	996500039267	ZENER DIODE 3V9 1/2W

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

***ELECTRICAL PARTS LIST - USB JACK 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
L101	996510001060	FERRITE BEAN SBK160808T-601Y-S
RS701	996510001070	INFRARED RECEIVER SM3385B

***ELECTRICAL PARTS LIST - HEADPHONE BOARD***

HP901	994000001456	STEREO HEADPHONE JACK
HP902	996510001073	EARPHONE CKX3.5-19S (3PIN)

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

## REVISION LIST

### **1.0 Manual 3141 785 31550**

Initial Service Manual released.

### **1.1 Manual 3141 785 31551**

In this version, on Page 1-2, Version Variations added  
and Page 8-2 Mechanical & Accessories Parts List is updated.

add:

4A 996520000101 C MUSIC BOARD ASSY

### **1.2 Manual 3141 785 31552**

In this version,  
Page 8-2 Mechanical & Accessories Parts List is updated.

add:

02 996510019243 MAIN BOARD ASSY