

Service
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Service Manual

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Version 1.0



PHILIPS

SPECIFICATION

AMPLIFIER

1 KHz
 (Low channel - both channels driven)
 30 W per channel (8 Ω)
 10 KHz
 (High channel - both channels driven)
 30 W per channel (8 Ω)
 Total output power 120 W
 Signal-to-noise ratio \geq 62 dBA (IEC)
 Frequency response 63 – 16000 Hz, \pm 3 dB

CD PLAYER

Frequency range 63 – 16000 Hz
 Signal-to-noise ratio 65 dBA

TUNER

FM wave range 87.5 – 108 MHz
 MW wave range 531 – 1602 kHz

TAPE DECK

Frequency response
 Normal tape (type I) 125 – 8000 Hz (8 dB)
 Signal-to-noise ratio
 Normal tape (type I) 35 dBA
 Wow and flutter \leq 0.4% DIN

USB PLAYER

USB 12Mb/s, V1.1
 support MP3 and WMA files
 Number of albums/folders maximum 99
 Number of tracks/titles maximum 400

SPEAKERS

2-way Bass Reflex System
 Impedance 8 Ω
 Woofer 1x10 cm
 Tweeter 1x5 cm
 Dimensions (w x h x d) 21.5x34.9x16.2 (cm)

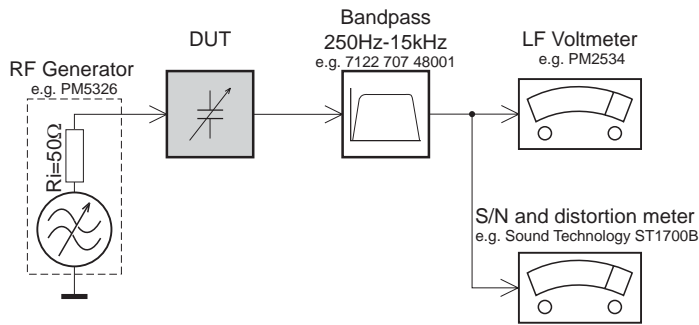
GENERAL

AC Power 220 – 230 V / 50 Hz
 Dimensions (w x h x d) 22x29.2x27.2 (cm)
 Weight (with/without speakers)
 approx. 4.9 / 2.3 kg

Specifications and external appearance are subject to change without notice.

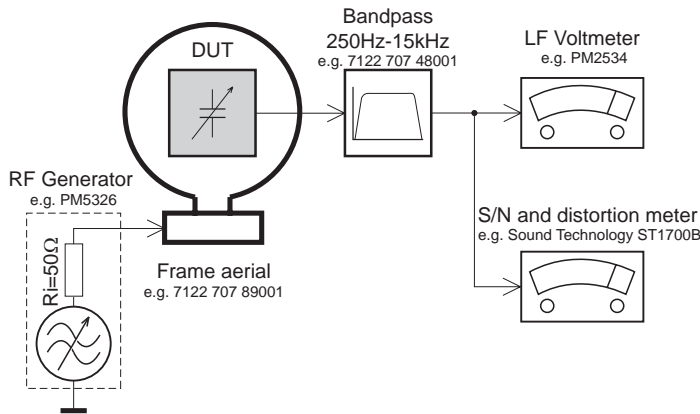
MEASUREMENT SETUP

Tuner FM



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

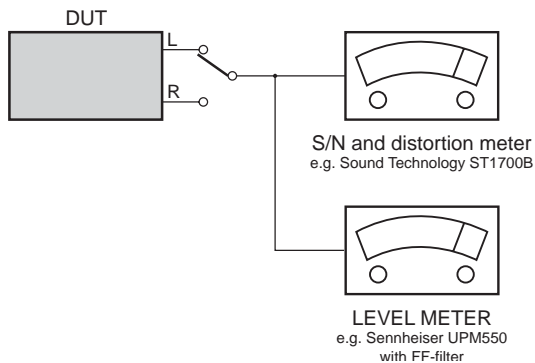
Tuner AM (MW,LW)



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).

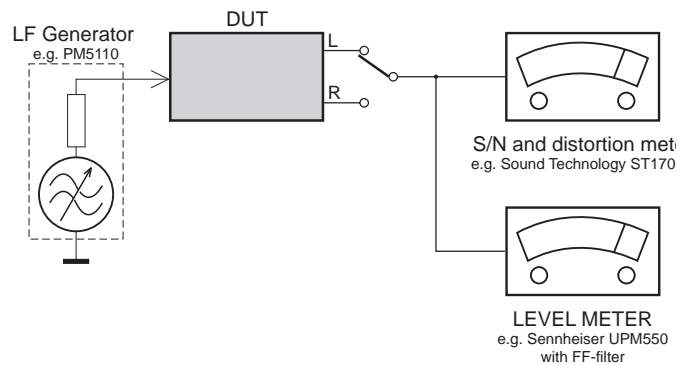
CD

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

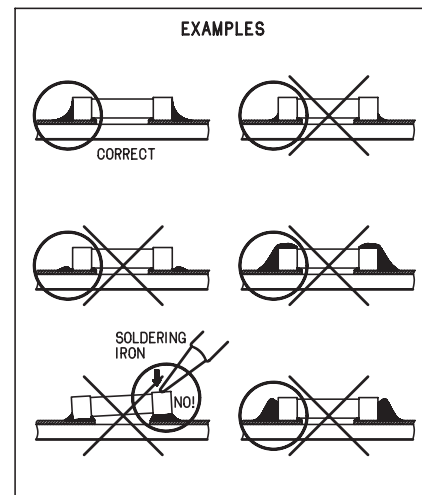
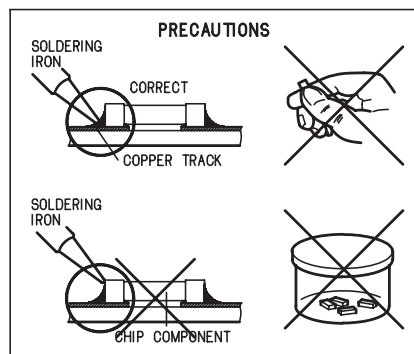
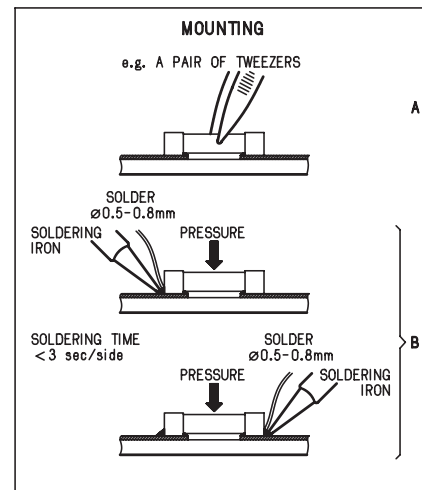
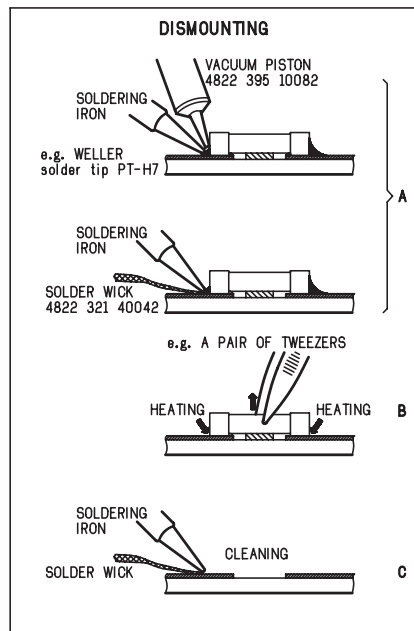
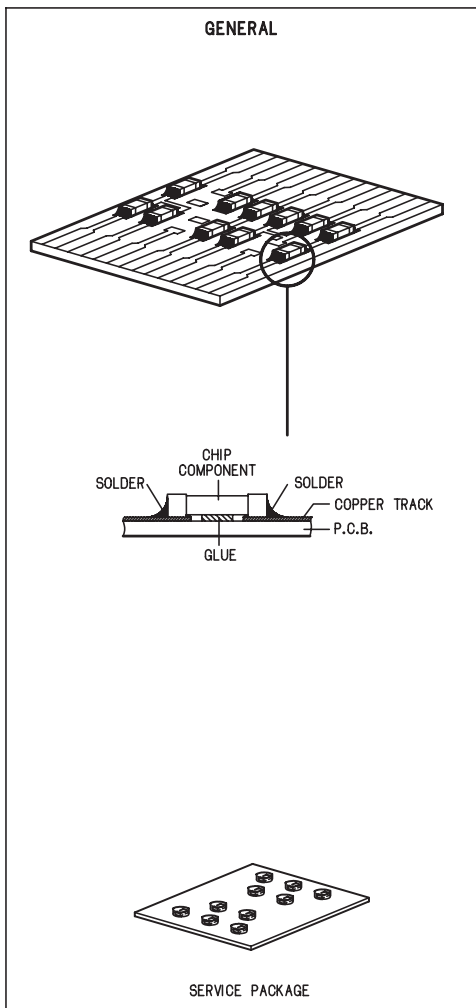
Compact Disc:

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

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
Connectorbox (1M Ω)	4822 395 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 hetzelfde 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 enfilez 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 ridotta 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 braccialetto a resistenza.

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

(GB) ESD PROTECTION EQUIPMENT:

Complete Kit ESD3 (small tablemat, wristband, connection box, extension cable and earth cable) 4822 310 10671
Wristband tester 4822 344 13999

(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 utilisés les pièces de rechange identiques à celles spécifiées.

Less 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.

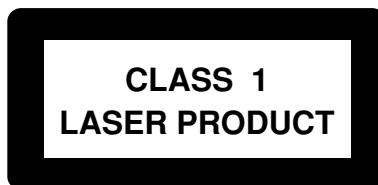
(I)

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 suoalukituksen ohitettaessa olet alltiina näkymättömälle laserisäteilylle. Älä katso säteeseen!

(DK) Advarse !

Usynlig laserstrålning ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsættelse for strålning.

(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

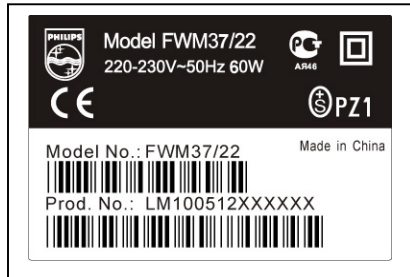
Philips CE is producing lead-free sets from 1.1.2005 onwards.

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 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".

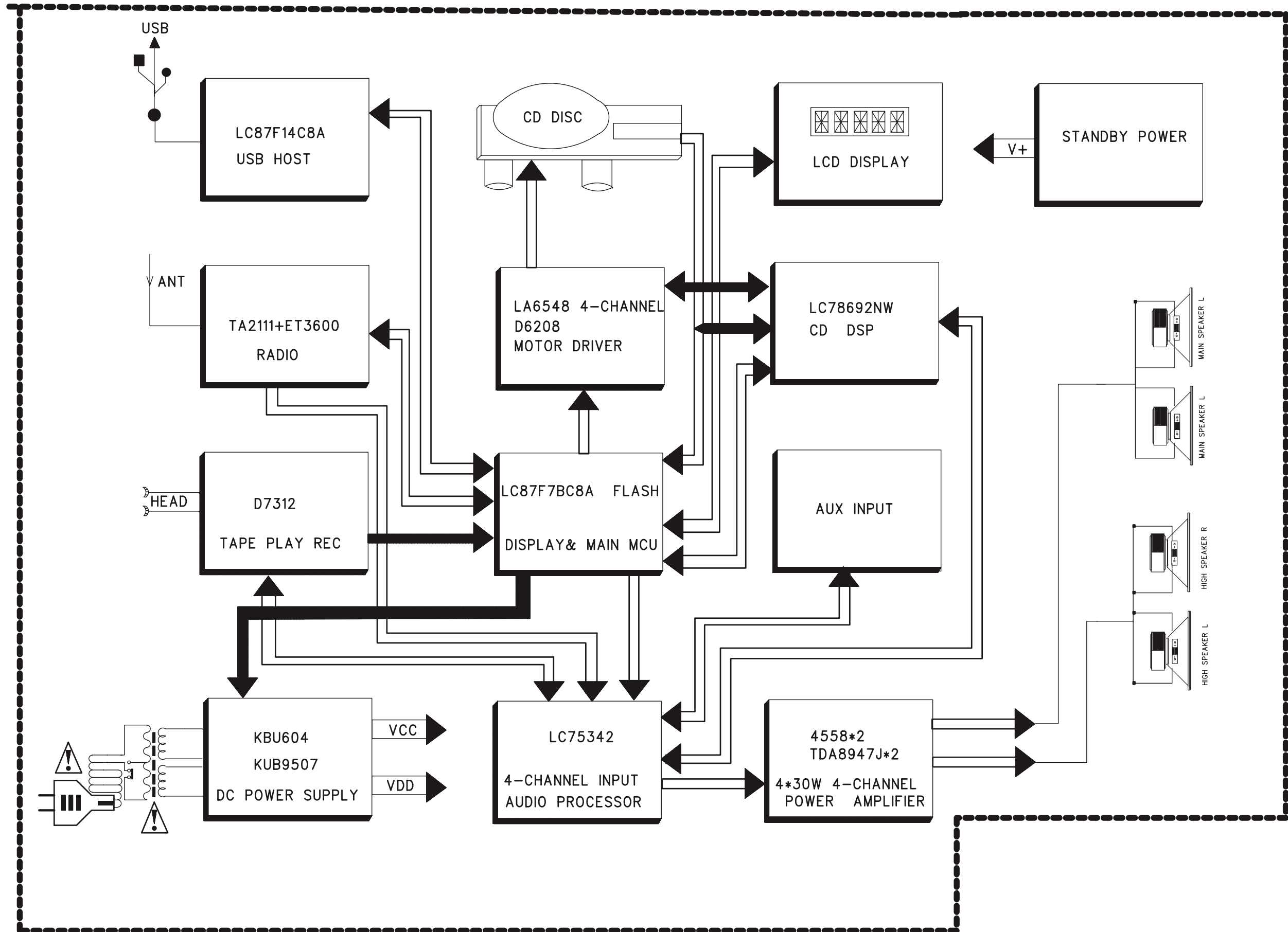
For additional questions please contact your local repair-helpdesk.

SERVICE INSTRUCTION

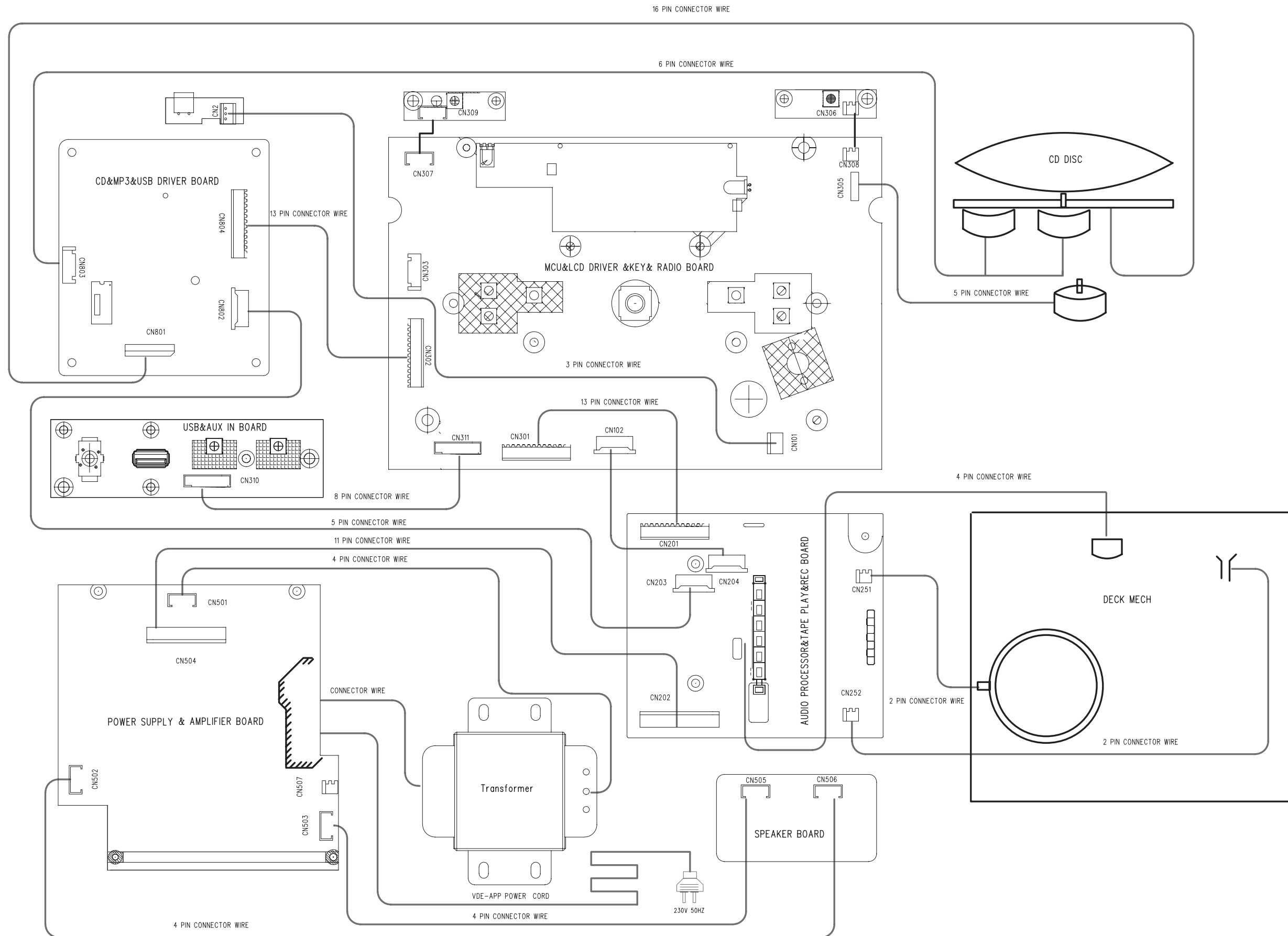
Safety regulations require that after a repair, the set must be returned in its original condition. Pay in particular attention to the following points:

- 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.

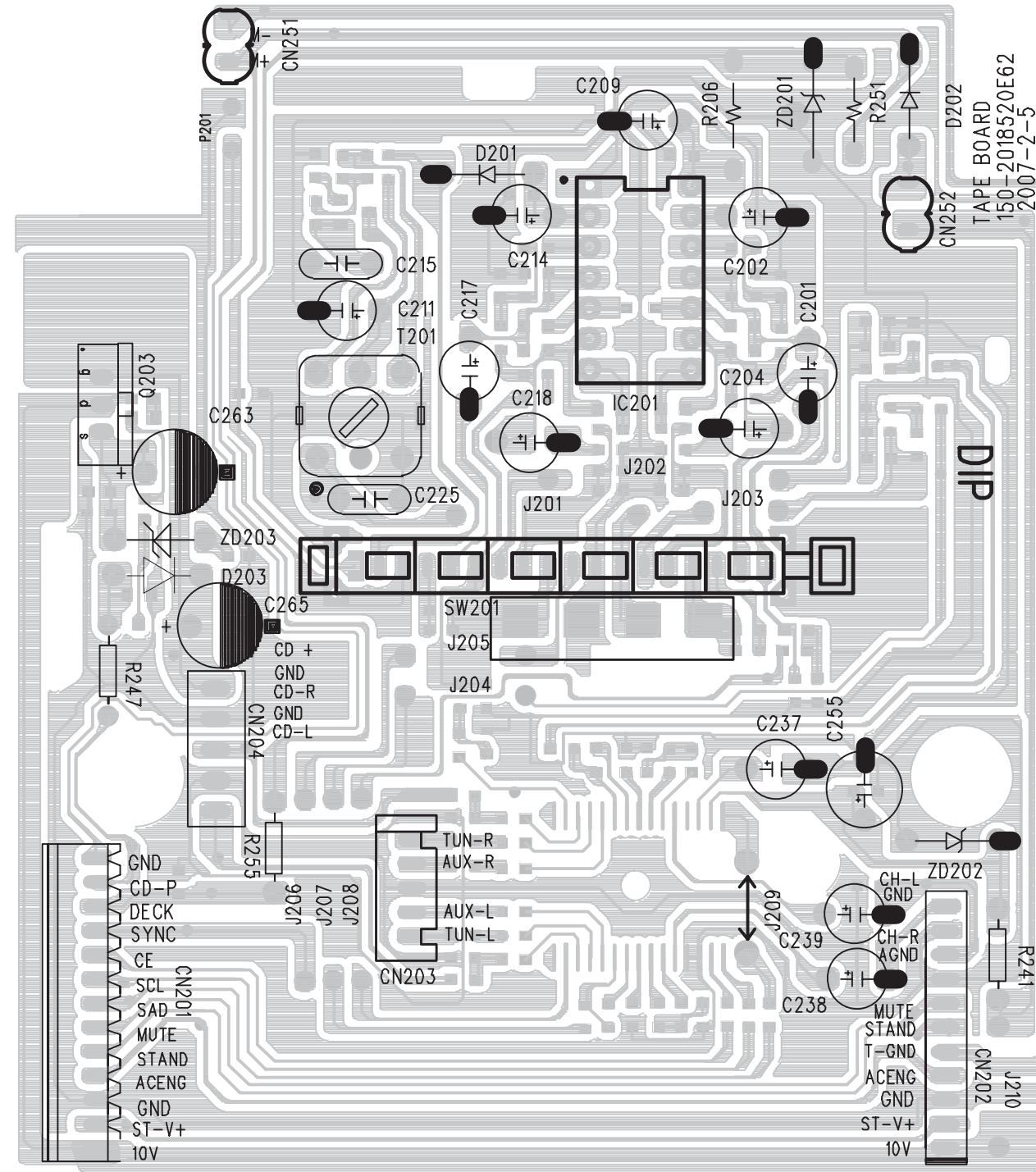
SET BLOCK DIAGRAM



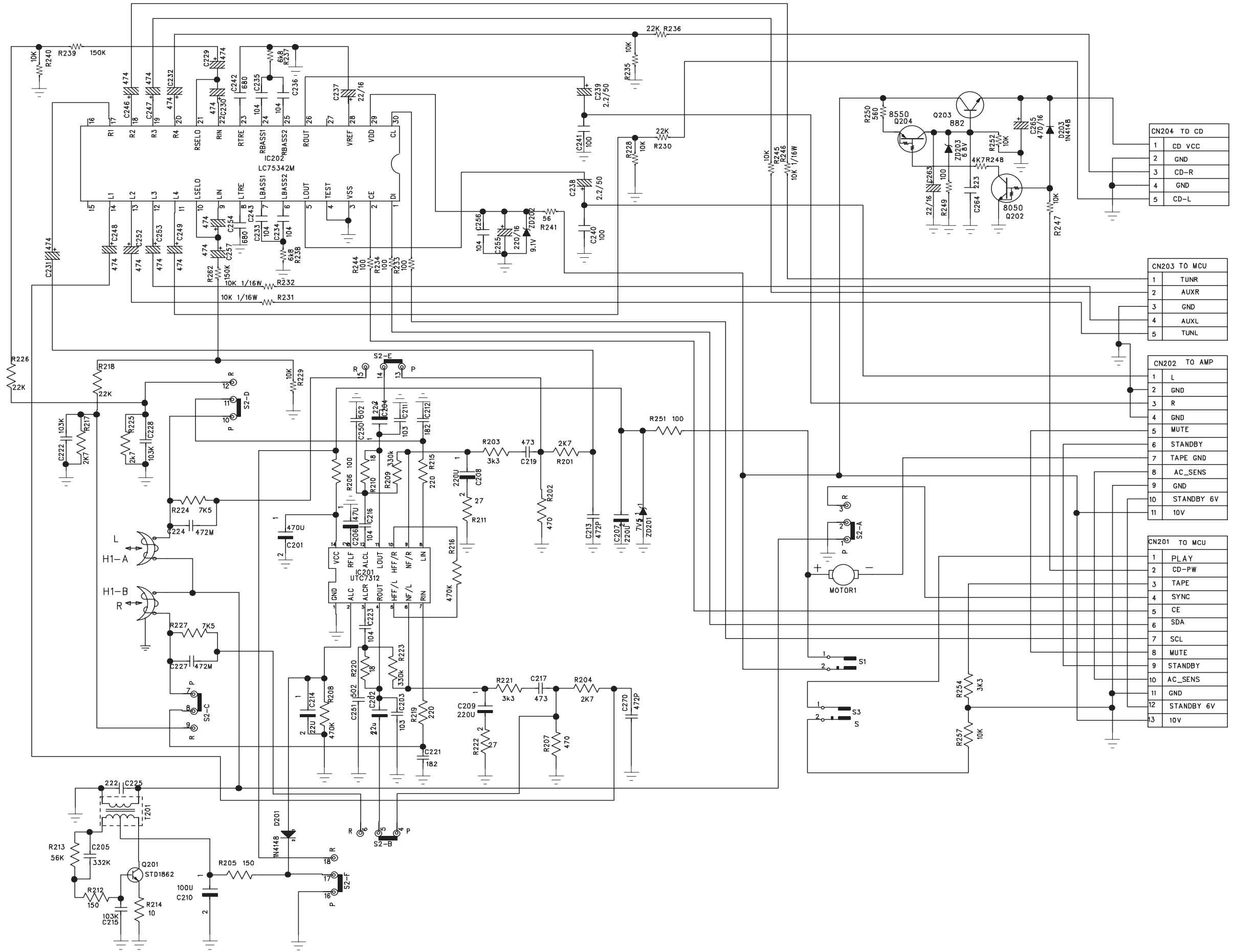
SET WIRING DIAGRAM



PCB LAYOUT - CASSETTE BOARD



CIRCUIT DIAGRAM - CASSETTE BOARD



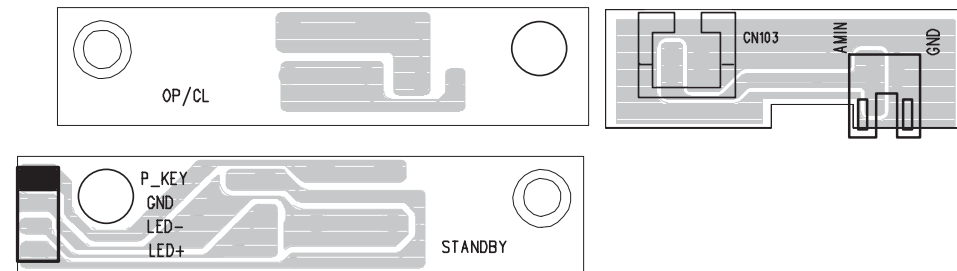
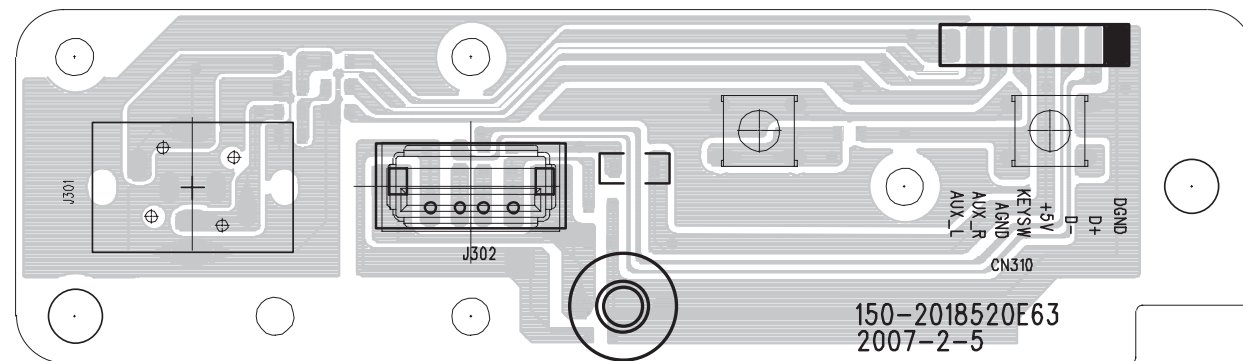
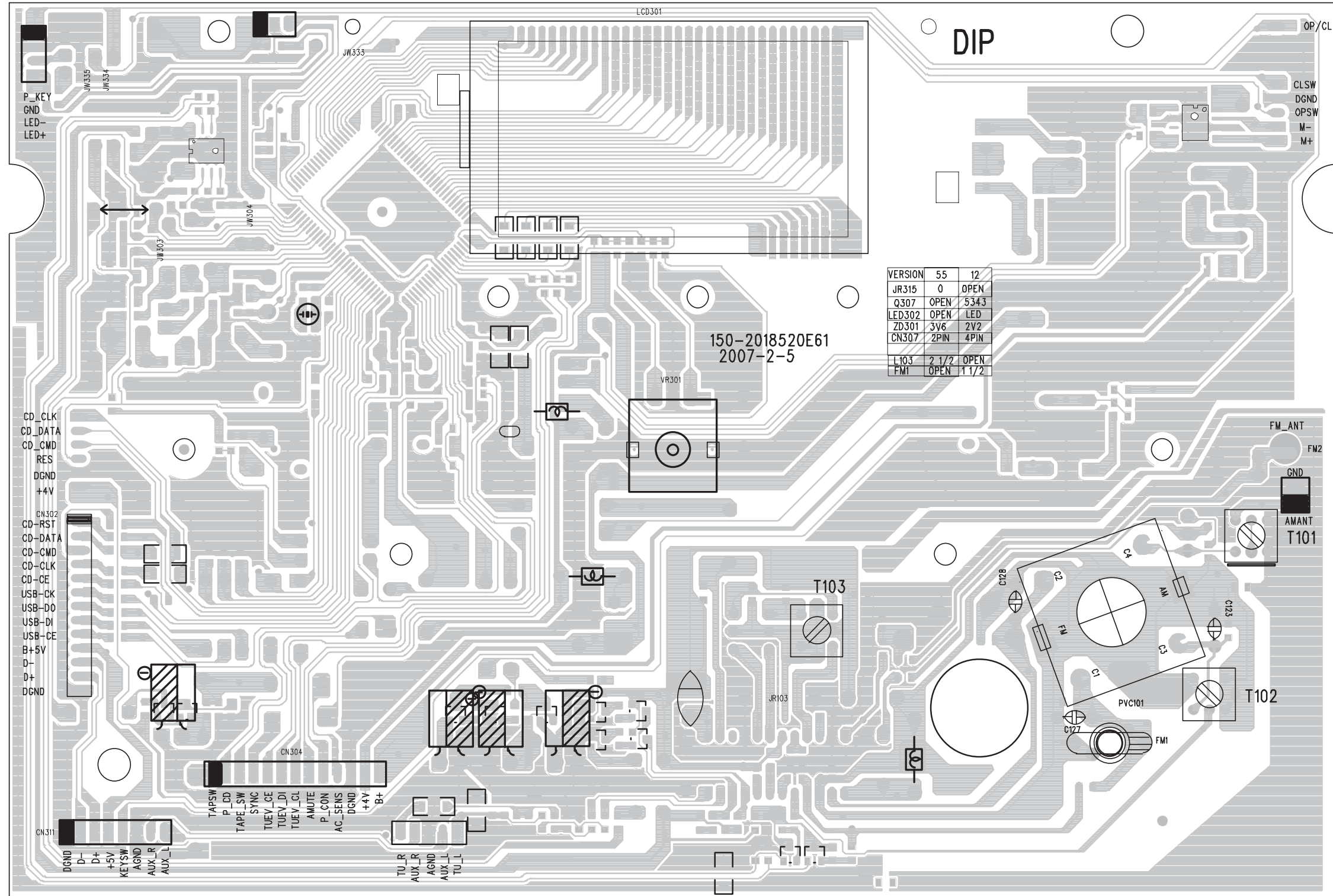
1	CD VCC
2	GND
3	CD-R
4	GND
5	CD-L

1	TUNR
2	AUXR
3	GND
4	AUXL
5	TUNL

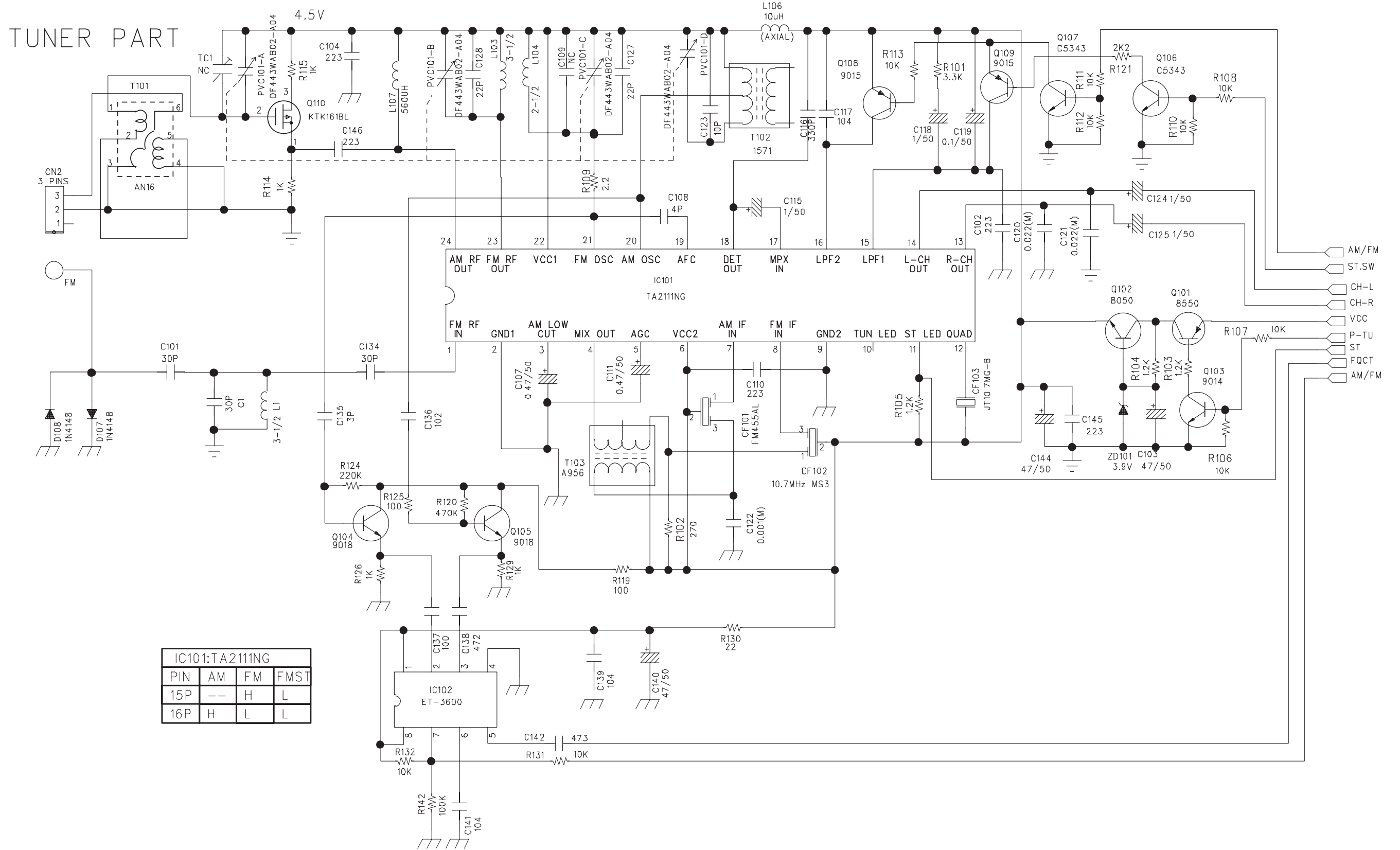
1	L
2	GND
3	R
4	GND
5	MUTE
6	STANDBY
7	TAPE GND
8	AC_SENS
9	GND
10	STANDBY 6V
11	10V

1	PLAY
2	CD-PW
3	TAPE
4	SYNC
5	CE
6	SDA
7	SCL
8	MUTE
9	STANDBY
10	AC_SENS
11	GND
12	STANDBY 6V
13	10V

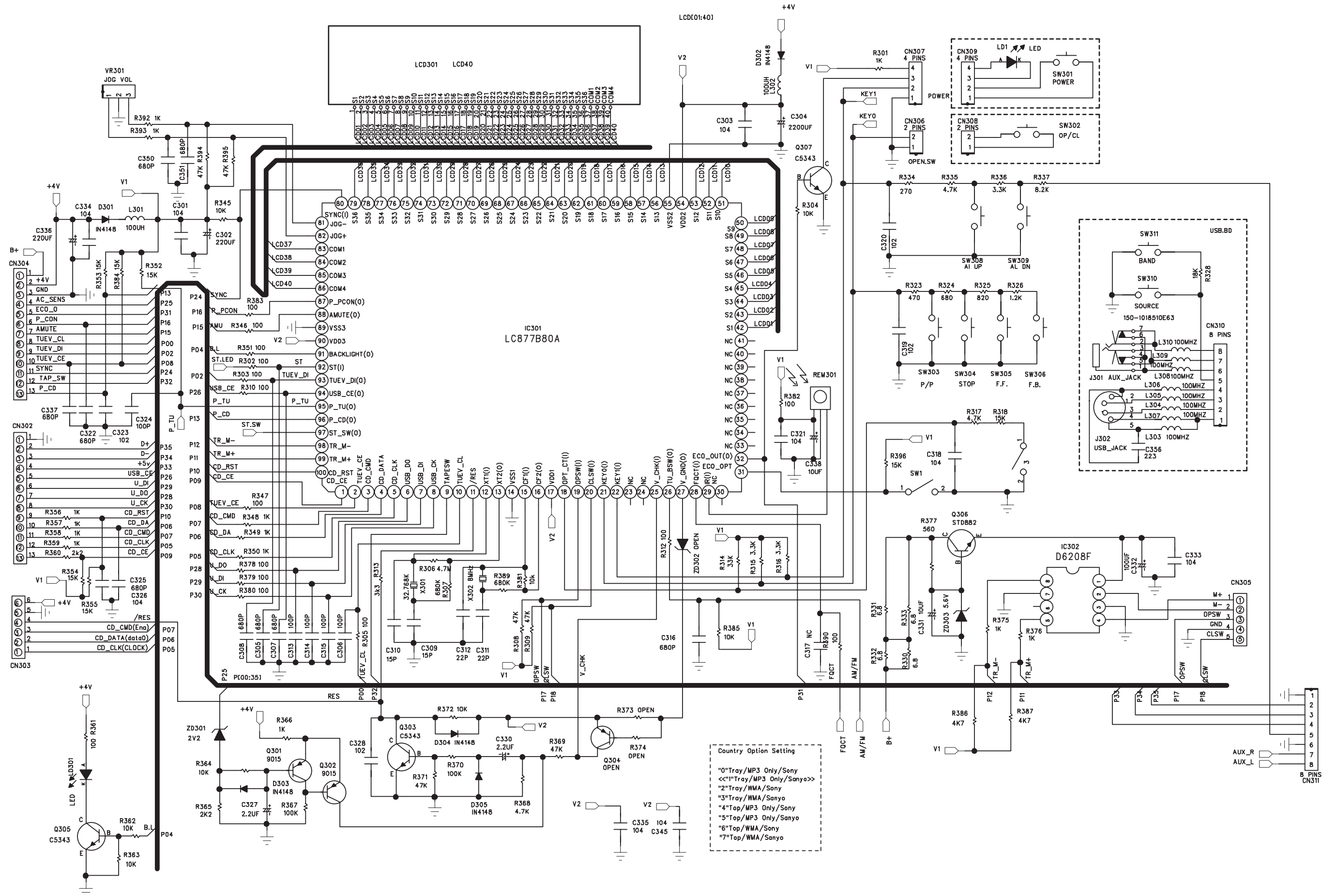
PCB LAYOUT - MAIN(MCU) & USB BOARD



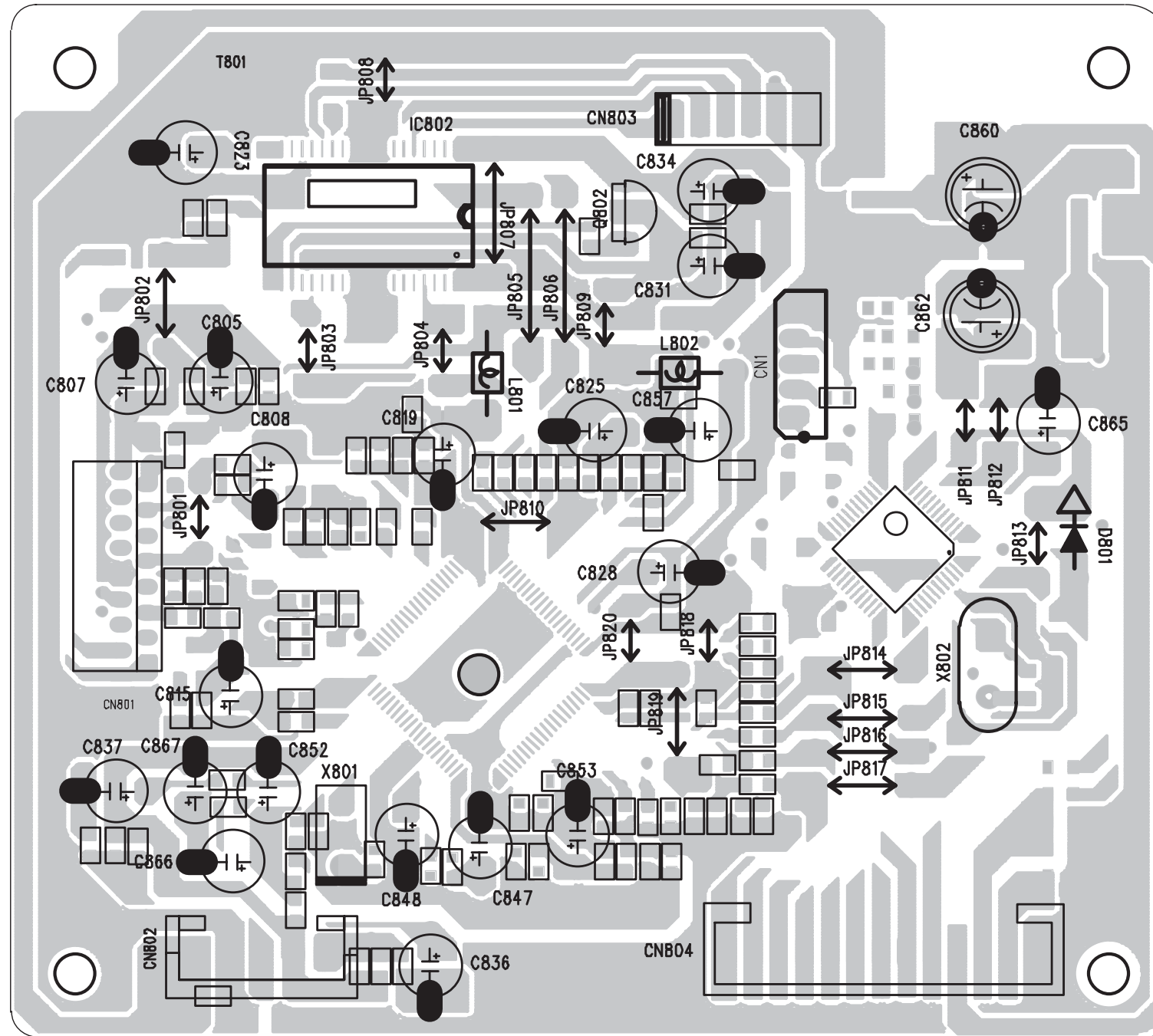
CIRCUIT DIAGRAM - MAIN(MCU) BOARD - TUNER PART



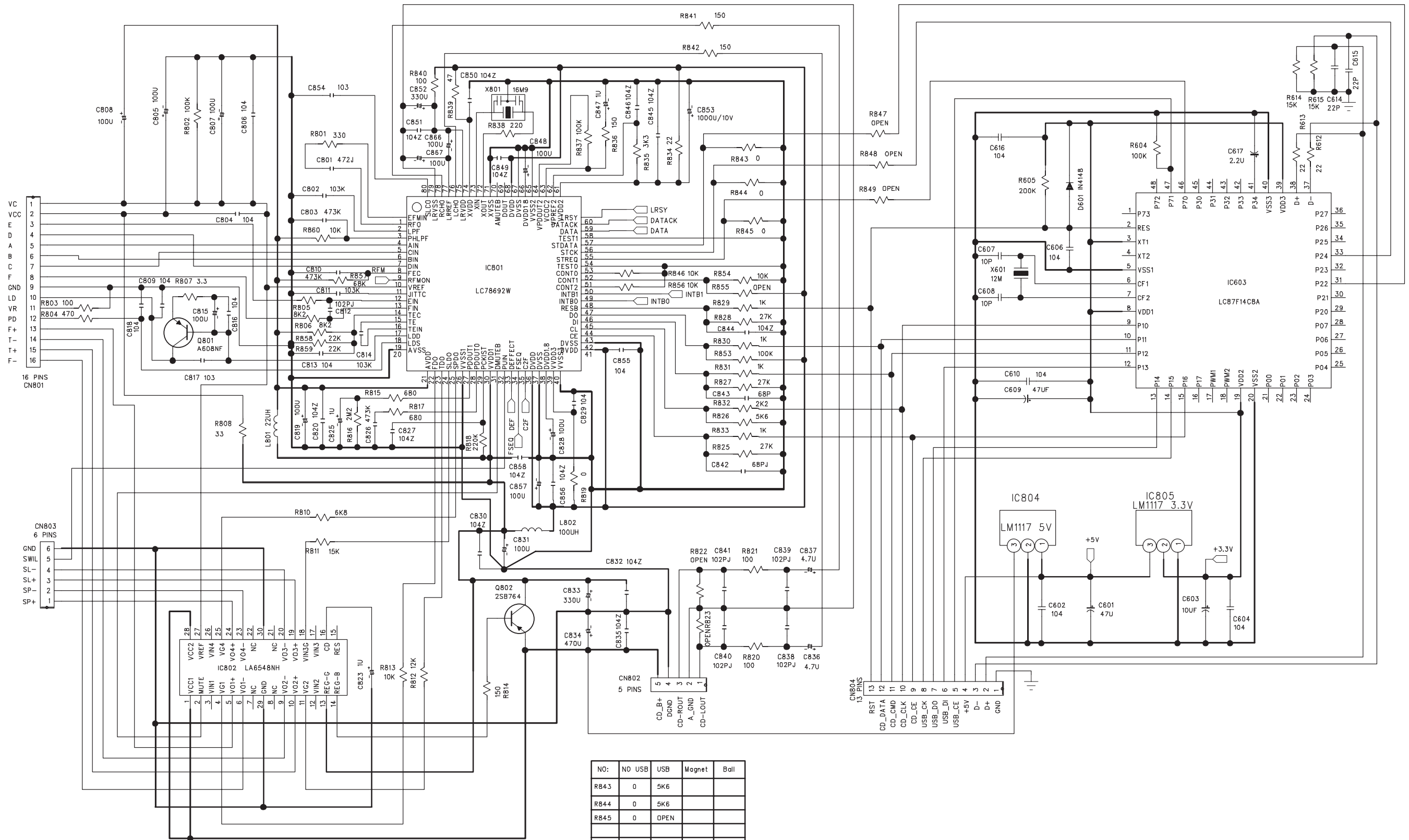
CIRCUIT DIAGRAM - MAIN(MCU) & USB BOARD



PCB LAYOUT - CD BOARD

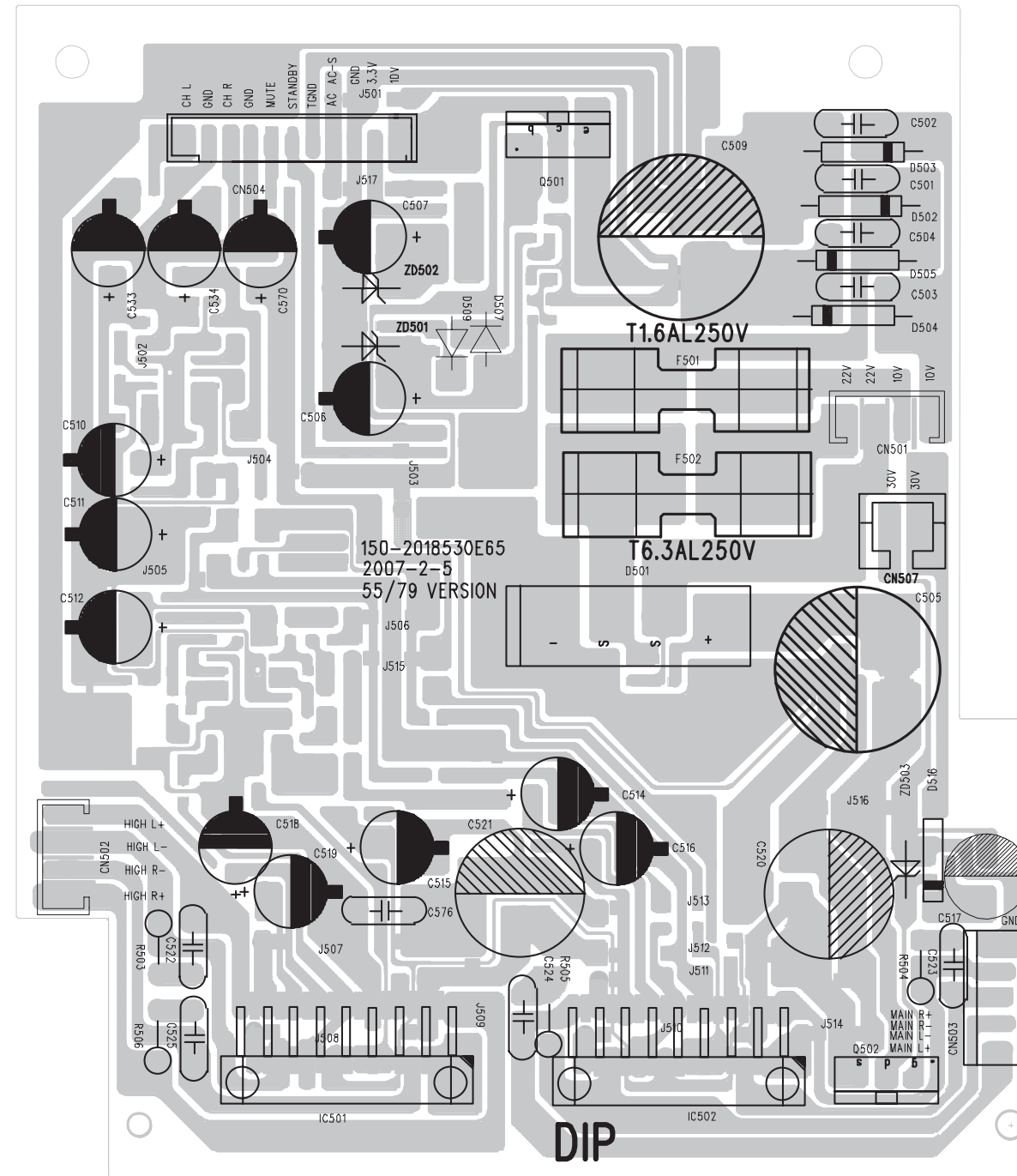


CIRCUIT DIAGRAM - CD BOARD

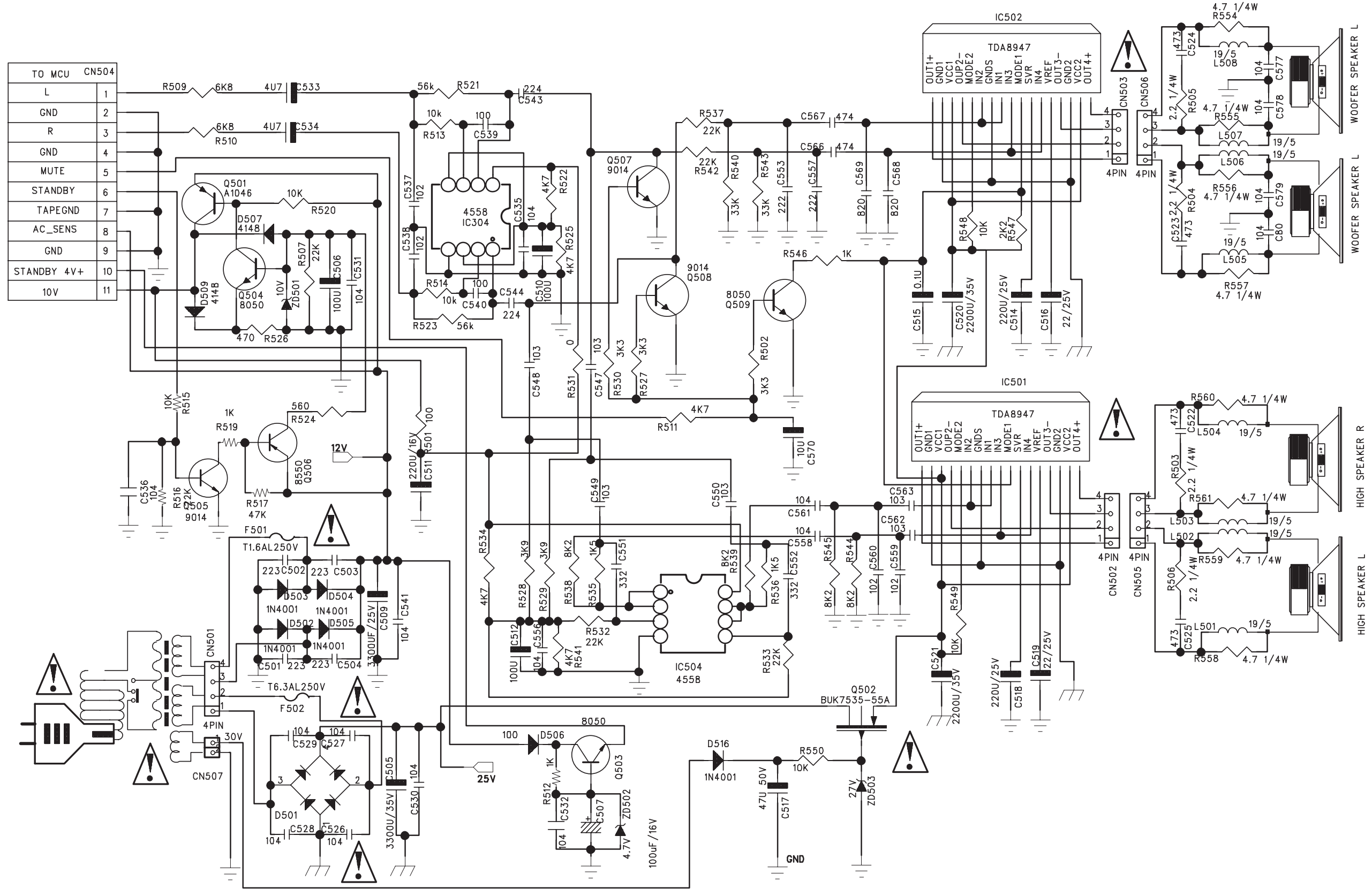


NO:	NO USB	USB	Magnet	Ball
R843	0	5K6		
R844	0	5K6		
R845	0	OPEN		
R847	OPEN	3K3		
R848	OPEN	3K3		
R849	OPEN	3K3		
R850	OPEN	OPEN		
R854			10K	OPEN
R855			OPEN	10K

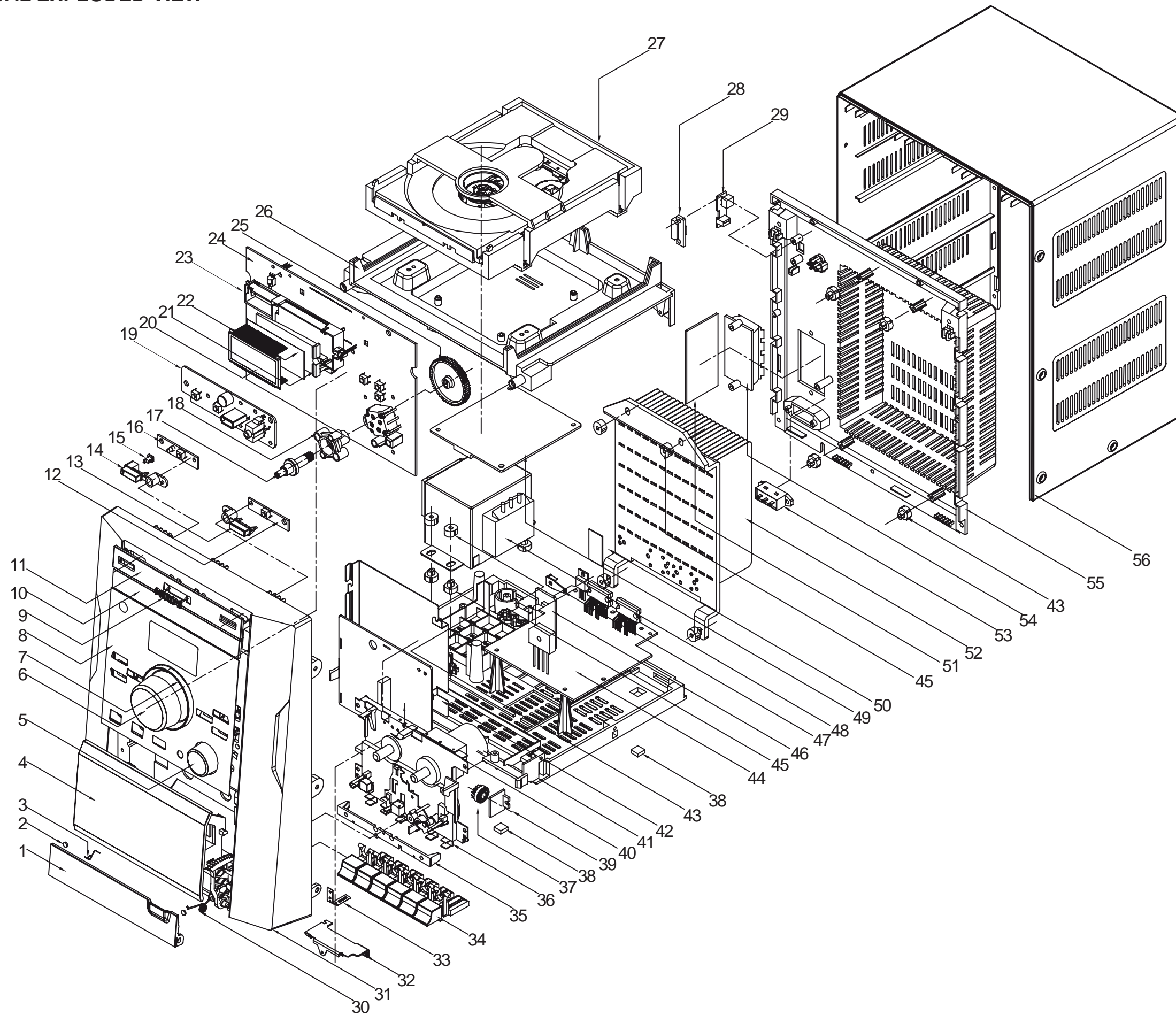
PCB LAYOUT - AMP BOARD



CIRCUIT DIAGRAM - AMP BOARD



SET MECHANICAL EXPLODED VIEW



MECHANICAL & ACCESSORIES PARTS LIST

1	996510002247	CASS KEY DOOR	996510002238	SPEAKER BOX ASS'Y(8R 30W)
2	996510002263	CASSETTE KEYS DOOR FOOT	△ 996510002304	AC CORD 1650mm /12/55
3	996510002265	CASS KEYS DOOR SPRING	△ 996510002409	BS APP AC CORD SET /05
4	996510002246	CASS DOOR	996510002306	REMOTE HANDSET
5	996510002255	TUNING KNOB		
6	996510002254	VOLUME KNOB CHROME		
7	996510002248	VOLUME RING SPRAY SIL		
8	996510002244	FRONT LENS		
10	996510002245	CD DOOR		
13	996510002258	OPEN/CLOSE KNOB		
14	996510002257	STANDBY KNOB		
15	996510002260	STANDBY LIGHT GUIDE BKT		
17	996510002261	TUNING SHAFT		
18	996510002259	TUNING SHAFT BRACKET		
25	996510002277	TUNING GEAR		
26	996510002307	LOADER BRACKET		
27	996500038820	CD LOADER WXD-8210 (COMPLETED)		
28	996510002242	LOOP ANT COVER		
30	996510002266	CASSETTE DOOR SPRING		
31	996510002239	FRONT CAB		
32	996510002267	CASS BRACKET		
34	996510002249	STOP KNOB		
34	996510002250	PLAY KNOB		
34	996510002251	REC KNOB		
34	996510002252	F.FWD KNOB		
34	996510002253	REW KNOB		
34	996510002256	PAUSE KNOB		
35	994000004719	CASS HOLDER		
36	994000004734	CASS DECK CS-21SC-820T		
37	994000004726	DAMPER GEAR (MODE:0.8)		
38	996510002262	PU RUBBER FOOT		
39	994000004727	GEAR STAND (MODE:0.8)		
40	996510002269	CASSETTE BOARD		
41	996510002305	BASE CABINET		
42	996510002268	SCREEN COVER		
48	△ 996510002303	TRANSFORM VDE-STD 230V		
55	996510002241	REAR CAB		
56	996510002240	TOP COVER		
	996500038819	CD MECHANISM SANYO DA11VF		
	996510002243	REMOTE RECEIVER LENS		

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

ELECTRICAL PARTSLIST**CASSETTE BOARD**

IC201	994000004007	IC D7312
IC202	996500038832	IC LC75342-TLM-E
Q201	994000004004	CHIP TR NPN 8050C
Q202	994000004004	CHIP TR NPN 8050C
Q203	996510002270	TR NPN UTC 2SD882 (TO-126)
Q204	994000004005	CHIP TR PNP 8550D
SW201	994000004784	REC/PLAY SW (PS-62D01-NS)
T201	994000004008	IFT BRO 10MM

USB BOARD

J301	996510002273	ST PHONES JACK 3.5mm TC38
J302	996510002272	USB A TYPE (FEMALE) S/T
L303A	996510002271	COIL 39mH CW68-393K
SW310	994000004792	TACT SW 6X6MM H4.3
SW311	994000004792	TACT SW 6X6MM H4.3

MCU BOARD

CF101	996500038852	FILTER FM450AL (DOUBLE)
CF102	994000005186	FILTER 10.7MC (L10.7A)
CF103	994000005187	DISCRIMINATOR J10.7C
F501	△ 994000004782	FUSE 50T D5X20 1.6A 250V(S.B.)
F502	△ 996510002287	FUSE T6.3A 250V 5x20
FM1	996510002282	COIL 1T5 D7.6 #0.7 CW
IC101	994000003962	IC TA2111NG
IC102	996500038835	IC ET3600 SOP8
IC301	996510002284	IC LC87F7BC8A(MCU\QIP100E\OTP)
IC302	994000004737	IC D6208 (MOTOR DRIVER)
L101	996510002281	COIL 3T5 D4.8 #0.8 CW
L102	996510002281	COIL 3T5 D4.8 #0.8 CW
LCD301	996510002276	LCD MODULE SDH-DA1455-TN-4
LE302	996510002283	LED RED DL23RTH /L2R3A4HD00
LED301	996510002275	LED WHITE D5mm (DL5NWCH)

Q101	994000004005	CHIP TR PNP 8550D
Q102	994000004004	CHIP TR NPN 8050C
Q103	994000003972	CHIP TR MMBT9014C
Q104	994000004743	CHIP TR MMBT9018H
Q105	994000004743	CHIP TR MMBT9018H
Q106	994000003972	CHIP TR MMBT9014C
Q107	994000003972	CHIP TR MMBT9014C
Q108	994000003973	CHIP TR MMBT9015C
Q109	994000003973	CHIP TR MMBT9015C
Q110	996510002286	NFET KTK161BL
Q301	994000003973	CHIP TR MMBT9015C
Q302	994000003973	CHIP TR MMBT9015C
Q303	996500038838	TR NPN 2SC5343YPF (TO-92)

MCU BOARD

Q305	996500038838	TR NPN 2SC5343YPF (TO-92)
Q306	996510002285	TR NPN STD882 (TO-92)(TP)
Q307	996500038838	TR NPN 2SC5343YPF (TO-92)
REM301	996510002274	SENSOR AT136BV3 36KHz 3.3V
SW301	994000004792	TACT SW 6X6MM H4.3
SW302	994000004792	TACT SW 6X6MM H4.3
SW303	994000004792	TACT SW 6X6MM H4.3
SW304	994000004792	TACT SW 6X6MM H4.3
SW305	994000004792	TACT SW 6X6MM H4.3
SW306	994000004792	TACT SW 6X6MM H4.3
SW308	994000004792	TACT SW 6X6MM H4.3
SW309	994000004792	TACT SW 6X6MM H4.3
T101	996510002279	AM IFT BLACK AN16 7mm
T102	996510002280	AM IFT RED 7mm (1571)
T103	994000003964	AM IFT YEL 7MM A956
VR301	996510002278	ENCODER
X301	996500038822	CRYSTAL JF32.768kHz JU2x6
X302	996500038823	CRYSTAL 8MHZ(HC-49US)

CD BOARD

IC801	996510002298	IC LC78692W (CD DSP) SQFP80
IC802	996500038842	IC LA6548NH (4 CH DRIVER)
IC803	996510002301	IC LC87F14C8AU-TQFP-E
IC804	996510002299	IC LM1117 5V (SOT-223)
IC805	996510002300	IC LM1117S-3.3V (SOT-223)
Q801	994000003973	CHIP TR MMBT9015C
Q802	996500038840	TR PNP 2SB764E-SSH-AE(TP)
X801	996510002297	C RESON'R QZTT16.93MX 3P

AMP & SPEAKER BOARD

C505	996510002291	E CAP 35V +-20% 3300uF
C509	996510002290	E CAP 25V +-20% 4700uF
D501	996500038843	BRIDGE RECTIFIER KBU604 6A
IC501	996510002288	IC TDA8947J (DBS17P)(SOT243-1)
IC502	996510002288	IC TDA8947J (DBS17P)(SOT243-1)
IC503	996510002294	IC D4558 (SOP8)
IC504	996510002294	IC D4558 (SOP8)
K501	△ 996510002293	RELAY:DC5V (ME-7,005-HL)
Q501	△ 994000004064	POWER TR PNP KTA1046/P
Q502	996510002289	NFET BUK7535-55A
Q503	994000004004	CHIP TR NPN 8050C
Q504	994000004004	CHIP TR NPN 8050C
Q505	994000003972	CHIP TR MMBT9014C

ELECTRICAL PARTSLIST**AMP & SPEAKER BOARD**

Q506	994000004005	CHIP TR PNP 8550D
Q507	994000003972	CHIP TR MMBT9014C
Q508	994000003972	CHIP TR MMBT9014C
Q509	994000004004	CHIP TR NPN 8050C
SP501	996510002296	SPEAKER TERMINAL 8POSITION
TH501	△ 996510002292	TRANSFORMER VDE-APP 230V

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