

Service  
Service  
**Service**



# Service Manual

## TABLE OF CONTENTS

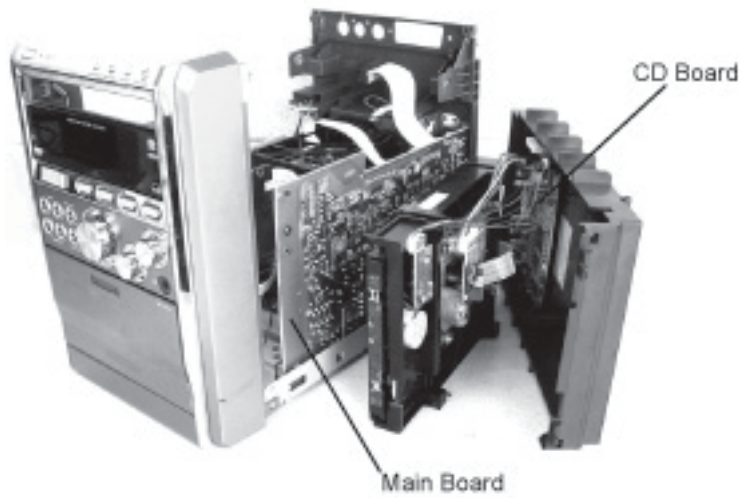
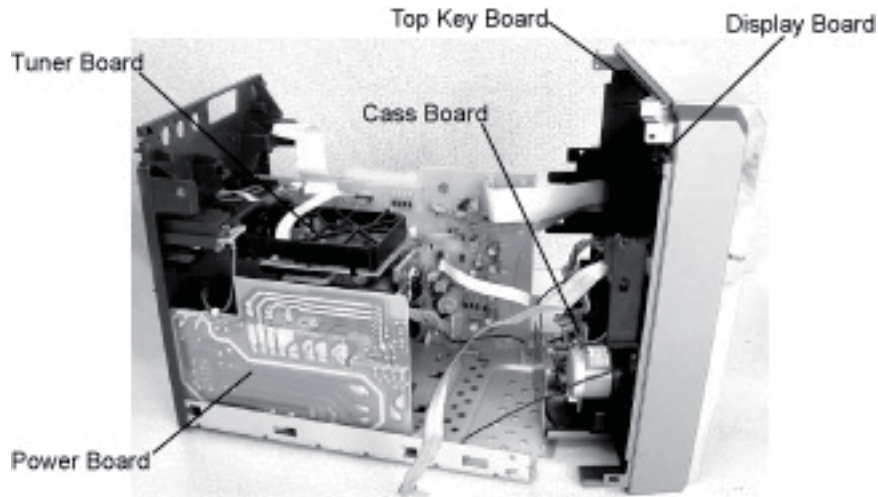
	Page
Location of PC Boards & Versions Variation .....	1-2
Specifications .....	1-3
Measurement Setup .....	1-4
Service Aids, Safety Instruction, etc .....	1-5 to 1-7
Connections & Functional Overview.....	1-8 to 1-11
Troubleshooting.....	1-12 to 1-13
Disassembly Instructions & Service positions .....	2
Service Test Program .....	3
Set Block Diagram.....	4
Set Wiring Diagram .....	5
Display Board .....	6
ECO 6 Tuner Board : Systems Non Cenelec .....	7A
Systems Cenelec.....	7B
Power Board.....	8
Tape Module.....	9
CD Board.....	10
Main and Top Key Boards .....	11
Set Mechanical Exploded View & Parts List.....	12
Revision List.....	13



© Copyright 2008 Philips Consumer Electronics B.V. Eindhoven, The Netherlands  
 All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise without the prior permission of Philips.



**LACATION OF PCBS**



**VERSION VARIATIONS:**

Type /Versions: Service policy		MCM760									
		/05	/12	/37	/61	/98					
Board in used:											
DISPLAY BOARD		C	C	C	C	C					
TOP KEY BOARD		C	C	C	C	C					
TUNER BOARD		C	C	C	C	C					
MAIN BOARD		C	C	C	C	C					
POWER BOARD		C	C	C	C	C					
CASS BOARD		M	M	M	M	M					
CD BOARD		M	M	M	M	M					

Type /Versions: Feature difference		MCM760									
		/05	/12	/37	/61	/98					
Features											
RDS		√	√								
VOLTAGE SELECTOR						√					
ECO STANDBY - DARK		√	√	√	√	√					

\* TIPS : C -- Component Lever Repair.  
M -- Module Lever Repair  
√ -- Used

## REVISION LIST

### 1.0 Manual 3141 785 31010

Initial Service Manual released.

### 1.1 Manual 3141 785 31011

In this version,  
Page 12-2 Mechanical & Accessories Parts List is updated.

### 1.2 Manual 3141 785 31012

In this version,  
Page 12-2 Mechanical & Accessories Parts List is updated.

Add:

WIRE1	9965 100 16944	5P DISCRETE WIRE
WIRE2	9965 100 16945	6P DISCRETE WIRE

## SPECIFICATIONS

### GENERAL:

Mains voltage : 110-127V/220-240V Switchable for /98  
 117V  $\pm$  10% for /37  
 220V  $\pm$  10% for /61  
 230  $\pm$  10% for /05/12

Mains frequency : 50/60Hz

Power consumption : 115W at  $1/8 P_{rated}$   
 < 15W at Standby (Demo mode off)  
 < 1W at ECO Standby

Clock accuracy : < 4 seconds per day

Dimension centre unit : : 340 x 179 x 252 mm ( L x D x H )

### TUNER:

#### FM

Tuning range : 87.5-108MHz

Grid : 50kHz  
 100kHz for /37

IF frequency : 10.7MHz  $\pm$  25kHz

Aerial input : 75 ohm coaxial  
 300 ohm click fit for /37

Sensitivity at 26dB S/N : < 22uV

Selectivity at 600kHz bandwidth : > 25dB

Image rejection : > 25dB [> 75dB]

Distortion at RF=1mV, dev. 75kHz : < 3%

-3dB Limiting point : < 23.5dBf

Crosstalk at RF=1mV, dev. 40kHz : > 18dB

#### MW

Tuning range : 531-1602kHz  
 530-1700kHz for /98/37

Grid : 9kHz  
 10kHz for /98/37

IF frequency : 450kHz  $\pm$  1kHz

Aerial input : Frame aerial

Sensitivity at 26dB S/N : < 22uV

Selectivity at 18kHz bandwidth : > 18dB

IF rejection : > 45dB

Image rejection : > 28dB

Distortion at RF=50mV, M=80% : < 5%

### AMPLIFIER:

Output power (6 ohm, 1kHz, 10% THD)  
 L & R : 2 x 75W RMS

Frequency response within -3dB : 40Hz-15kHz

Bass : 60Hz  $\pm$  3 Steps

Treble : 12kHz  $\pm$  3 Steps

Incredible Surround : On / Off

### Input sensitivity

Aux in (at 1kHz) : 500mV at 600 ohm  
 CD (Audio Disc1) : -6dB track (Trk 35)  
 USB : -6dB track

### Output sensitivity

Headphone output at 32 ohm : 15mW  $\pm$  2dB (Max. vol.)

### CASSETTE RECORDER:

Number of track : 2 tracks (stereo)

Tape speed : 4.76 cm/sec  $\pm$  2%

Wow and flutter : < 0.4% DIN

Fast-wind/Rewind time C60 : 130 sec

Bias system : 78kHz  $\pm$  10kHz

Rec/Pb frequency response within 8dB: 80Hz - 10kHz

Signal to Noise Ratio (Type I) : > 48dBA

Signal to Noise Ratio (Type II) : > 52dBA

### COMPACT DISC:

Measurement done directly at the connector on the board.

Output Resistance : < 100 ohm

Output Voltage (0dB, 1kHz) : 0.5Vrms  $\pm$  1dB (unloaded)

Channel Unbalance : <  $\pm$ 1dB

Channel Separation (1kHz) : > 60dB

Frequency Response ( $\pm$ 3dB) : 20Hz-20kHz

Signal to Noise Ratio : > 76dBA

MP3-CD Bit Rate : 8-320 kbps

WMA-CD Bit Rate : 64-192kbps

Sampling Frequencies : 8,11.025,12,16,22.05,24,  
 32,44.1,48kHz

Recording Format : ISO9660 UDF format not supported

### USB:

Measurement done at speaker terminals across 6 $\Omega$  load  
 w/ 500mW output and DSC setting in Jazz Mode.

Frequency response within  $\pm$  3dB : 100Hz - 16kHz

Signal/Noise ratio (A-weighted) : > 60dBA

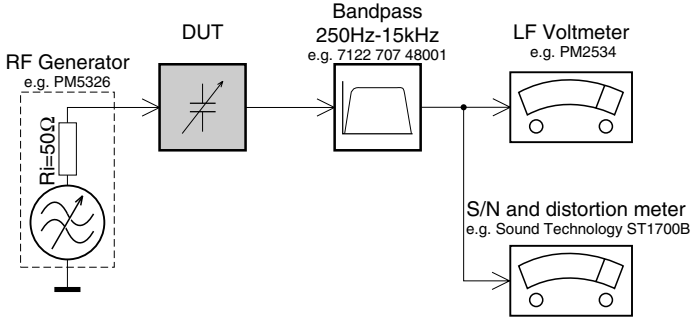
Channel crosstalk at 1kHz : > 35dB

Channel unbalance at 1kHz :  $\pm$ 3dB

[...] Values indicated are for "ECO6 Cenelec Board" only.

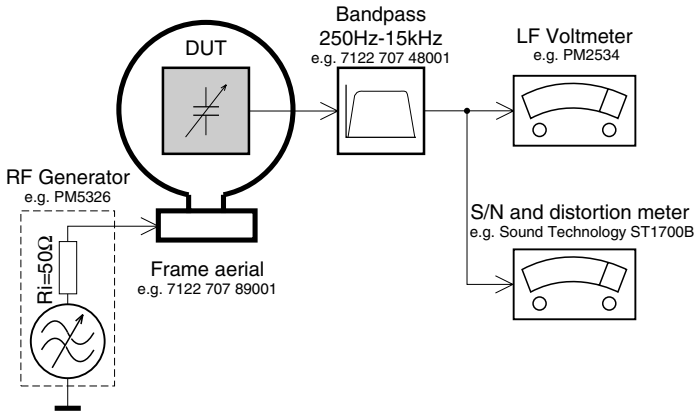
# MEASUREMENT SETUP

## Tuner FM



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

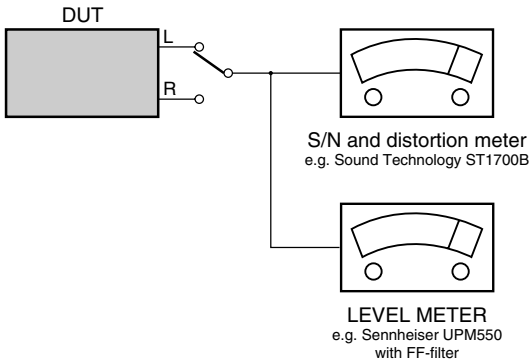
## Tuner AM (MW,LW)



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).

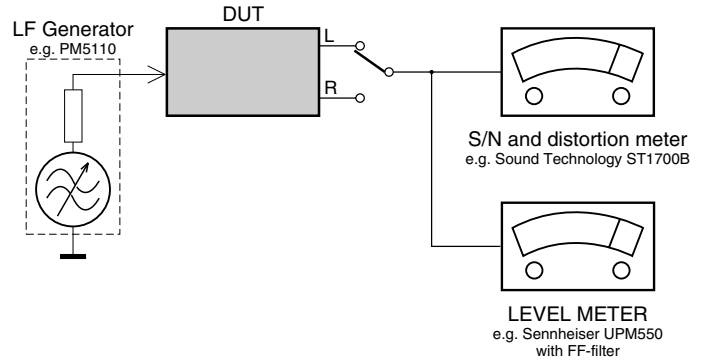
## CD

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

### Cassette:

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

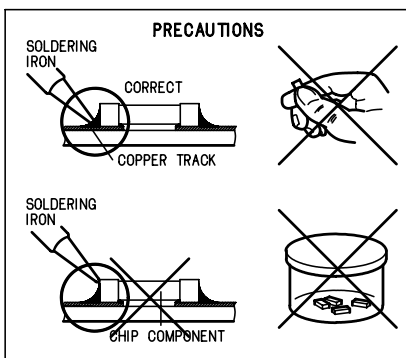
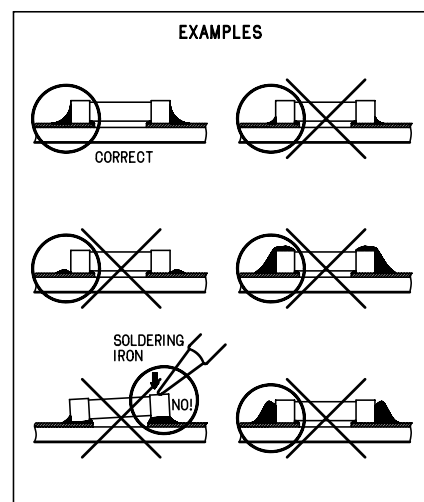
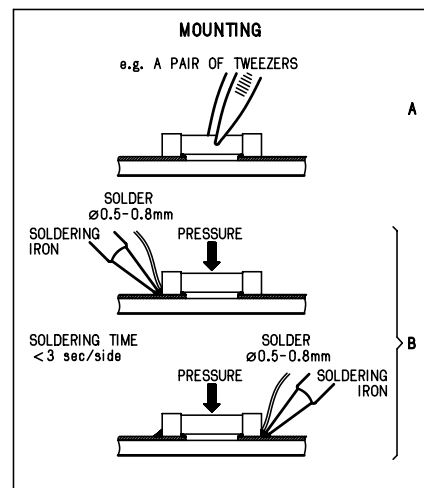
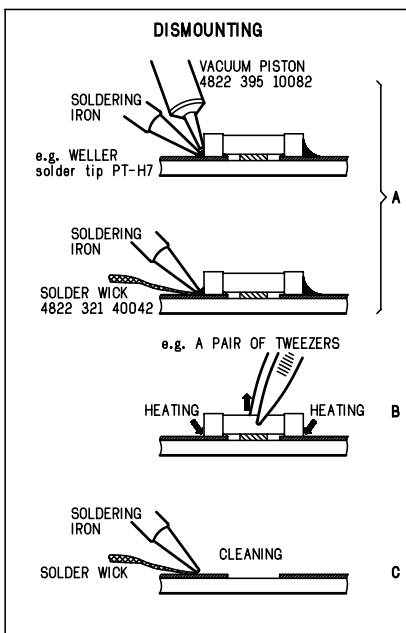
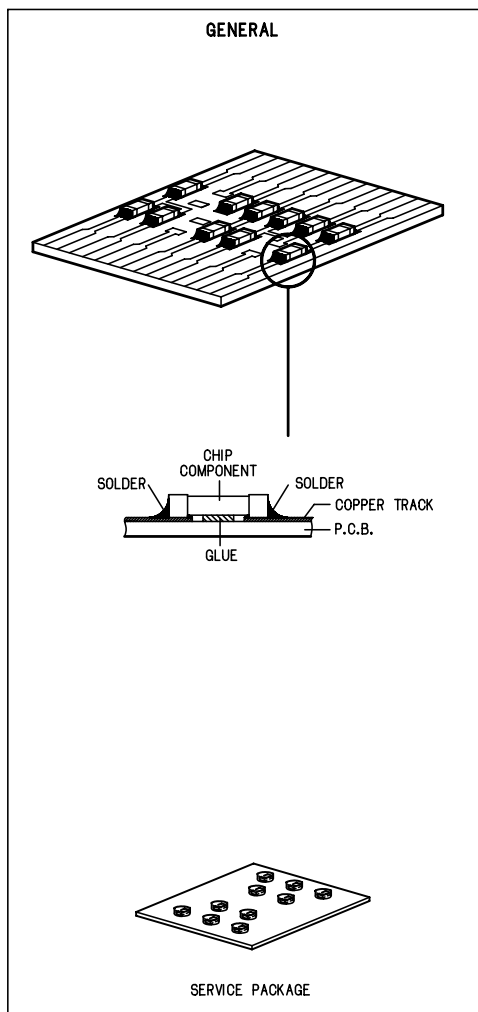
### Compact Disc:

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

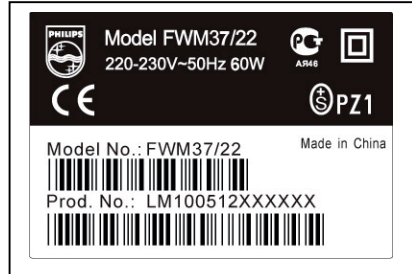
Philips CE is producing lead-free sets from 1.1.2005 onwards.

### 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

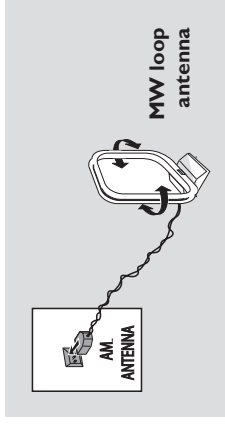
Safety regulations require that after a repair, the set must be returned in its original condition. Pay in particular attention to the following points:

- 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.



## Installation

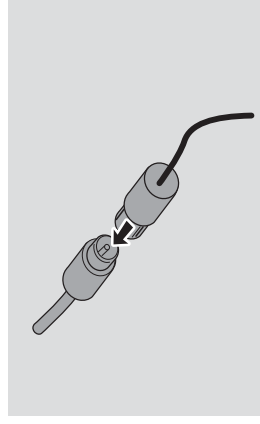
- 2 Fit the plug of the loop antenna to AM ANTENNA, as shown below
- 3 Adjust the position of the antenna for optimal reception (as far away as possible from the TV, VCR or other radiation sources)



### FM antenna

The wire antenna supplied can only be used to receive nearby stations. For better reception we recommend using a cable antenna system or an outdoor antenna.

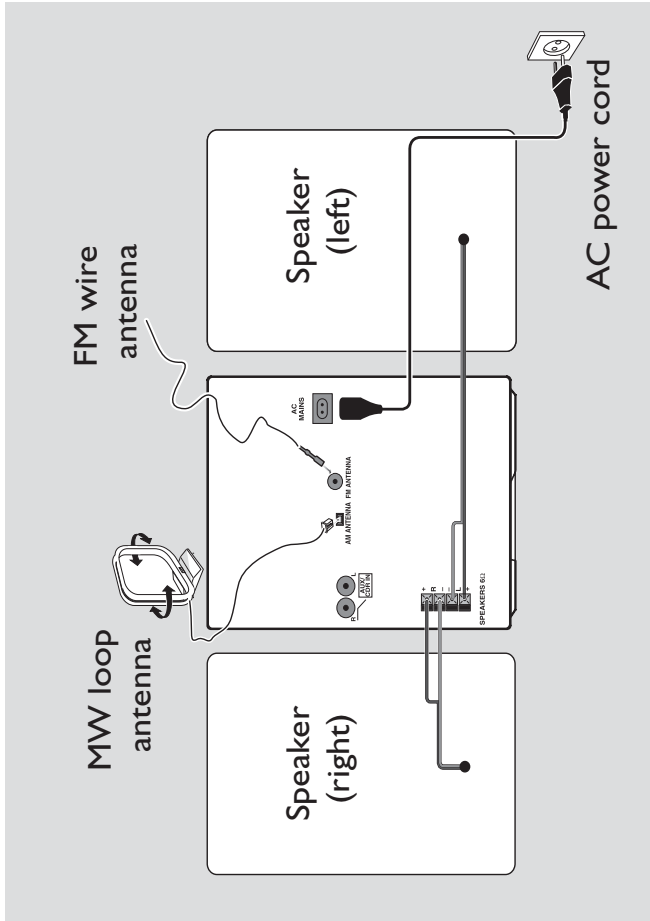
- 1 Extend the wire antenna and fit it to FM ANTENNA, as shown below



**Note:** If you are using a cable antenna system or an outdoor antenna, fit the antenna plug, instead of the wire antenna, to FM ANTENNA.

- 2 Move the antenna in different positions for optimal reception (as far away as possible from the TV/VCR or other radiation sources)
- 3 Fix the antenna's end to the wall

## Installation



### Rear connections

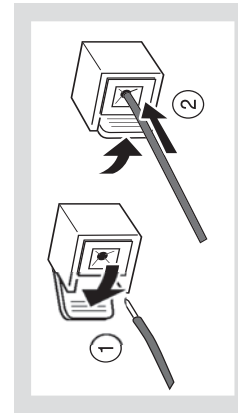
#### Warning:

- Never make or change connections with the mains supply switched on.
- Install your set near the AC outlet and where the AC power plug can be reached easily.

#### (A) Speaker connections

Use the supplied speakers only. Using other speakers can damage the set or the sound quality will be negatively affected.

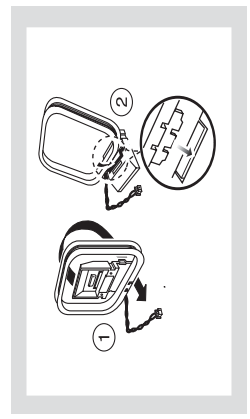
- Connect the cable of the left speaker to **L +/-** (red and black) and the cable of the right speaker to **R +/-** (red and black) as follows:
  - Press the clip of the red terminal and fully insert the stripped portion of the colored (or marked) speaker cable into the socket, then release the clip
  - Press the clip of the black terminal and fully insert the stripped portion of the black (or unmarked) speaker cable into the socket, then release the clip



#### (B) Antenna connections

##### MW antenna

- 1 Assemble the loop antenna as shown:

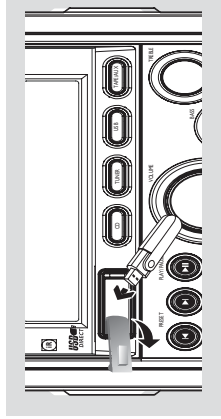


### Connecting an additional appliance

#### Connecting a USB device or memory card

On MCM760, you can playback music from a USB mass storage device and also record music to such a device.

- 1 Insert the USB device's USB plug into the socket  on MCM760




or

#### for the devices with USB cable:

- Insert one plug of the USB cable (not supplied) to the socket  on MCM760
- Insert the other plug of the USB cable to the USB output terminal of the USB device

or

#### for the memory card:

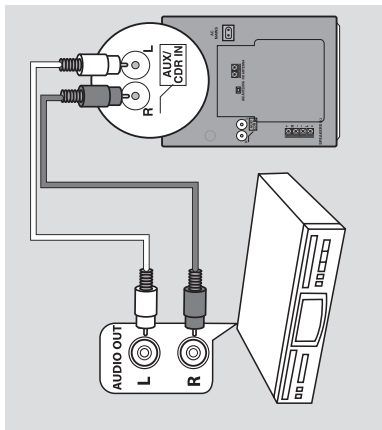
- Insert the memory card into a card reader (not supplied)
- Use a USB cable (not supplied) to connect the card reader to the socket  on MCM760

#### Connecting a non-USB device

It is possible to use an additional appliance, e.g. TV/VCR or CD recorder with the set. On MCM760, you can playback music from an external source.

- 1 Insert the red plug of the red/white audio cables (not supplied) to the red socket **AUX/CDR IN R** and the white plug to the white socket **AUX/CDR IN L**
- 2 Connect the other end of the audio cables to the **AUDIO OUT** terminals of the additional appliance

## Installation



When MCM760 is switched to standby, it is still consuming some power. **To disconnect the system from the power supply completely, remove the power plug from the wall socket.**

**The type plate is located on the rear of the set.**

### CAUTION

**Visible and invisible laser radiation. If the cover is open, do not look at the beam.**

**High voltage! Do not open. You run the risk of getting an electric shock.**

**The machine does not contain any user-serviceable parts.**

**Modification of the product could result in hazardous radiation of EMC or other unsafe operation.**

**If you disconnect the product from the mains, make sure to take the plug out of the wall socket completely.**

**Children could seriously injure themselves as the free end of the cable may still be live if only the connector is removed from the MAINS socket at the back of the unit.**

- 3 Select **AUX** mode on MCM760

#### Helpful hints:

- Always refer to the owner's manual of other equipment for complete connection.

#### Using AC power

- 1 Make sure all the connections have been made before switching on the power supply
- 2 Connect the AC power cord to the wall socket. This switches on the power supply  
 → **AUTO INSTALL** - **PRESS PLAY** appears the first time you power up MCM760  
 - Press **▶||** on the set to store all available radio stations  
 - Press **■** to exit (See **Tuner**)

#### Helpful hints:

- If the first preset is a RDS station, it will proceed to clock setting (See **Tuner: Clock setting via RDS**)  
 → "INSTALL" appears, then "TIME" and "SEARCH RDS TIME"  
 → When RDS time is read, "RDS TIME" will appear and the current time will be stored.  
 → If RDS station does not transmit RDS time within 90 seconds, "NO RDS TIME" will appear and the program will exit automatically.

## Preparation

### Using the remote control

#### IMPORTANT!

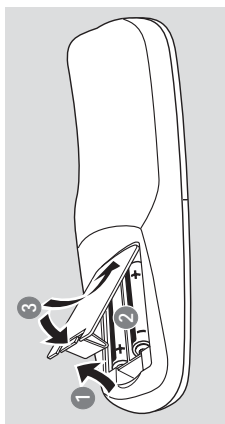
- Always point the remote control directly towards IR area.

#### Notes for remote control:

- First select the source you wish to control by pressing one of the source select keys on the remote control (for example **CD, TUNER**).
- Then select the desired function (for example **▶||**, **◀||**).

#### Inserting batteries into the remote control

- 1 Open the battery compartment
- 2 Insert 2 batteries type R06 or AA into the remote control with the correct polarity as indicated by the "+" and "-" symbols inside the battery compartment
- 3 Put back the compartment door



#### CAUTION!

- Remove batteries if they are exhausted or will not be used for a long time.
- Do not use old and new or different types of batteries in combination.
- Batteries contain chemical substances, so they should be disposed of properly.

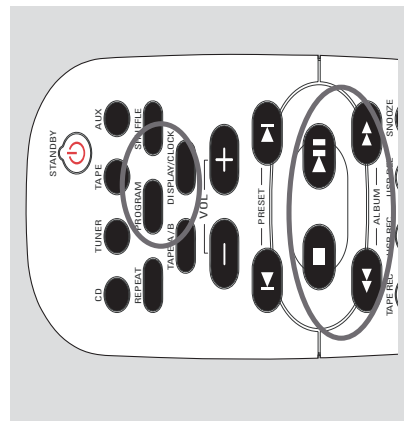
### Setting the clock

After connecting MCM760 to the power supply, set the clock first.

- 1 On the remote control, press and hold **DISPLAY/CLOCK** until the clock time starts flashing  
 ? The display shows the set time  
 ? 12:00 AM appears by default if you have not set the clock
- 2 Press **PROGRAM** repeatedly to change between 12-hour and 24-hour clock mode
- 3 Press **◀||** or **▶||** repeatedly to set the hour
- 4 Press **▶||** to change to minutes setting, then press **◀||** or **▶||** repeatedly to set the minutes
- 5 Press **DISPLAY/CLOCK** again to store the setting.  
 ? The clock will start working.

#### Helpful hints:

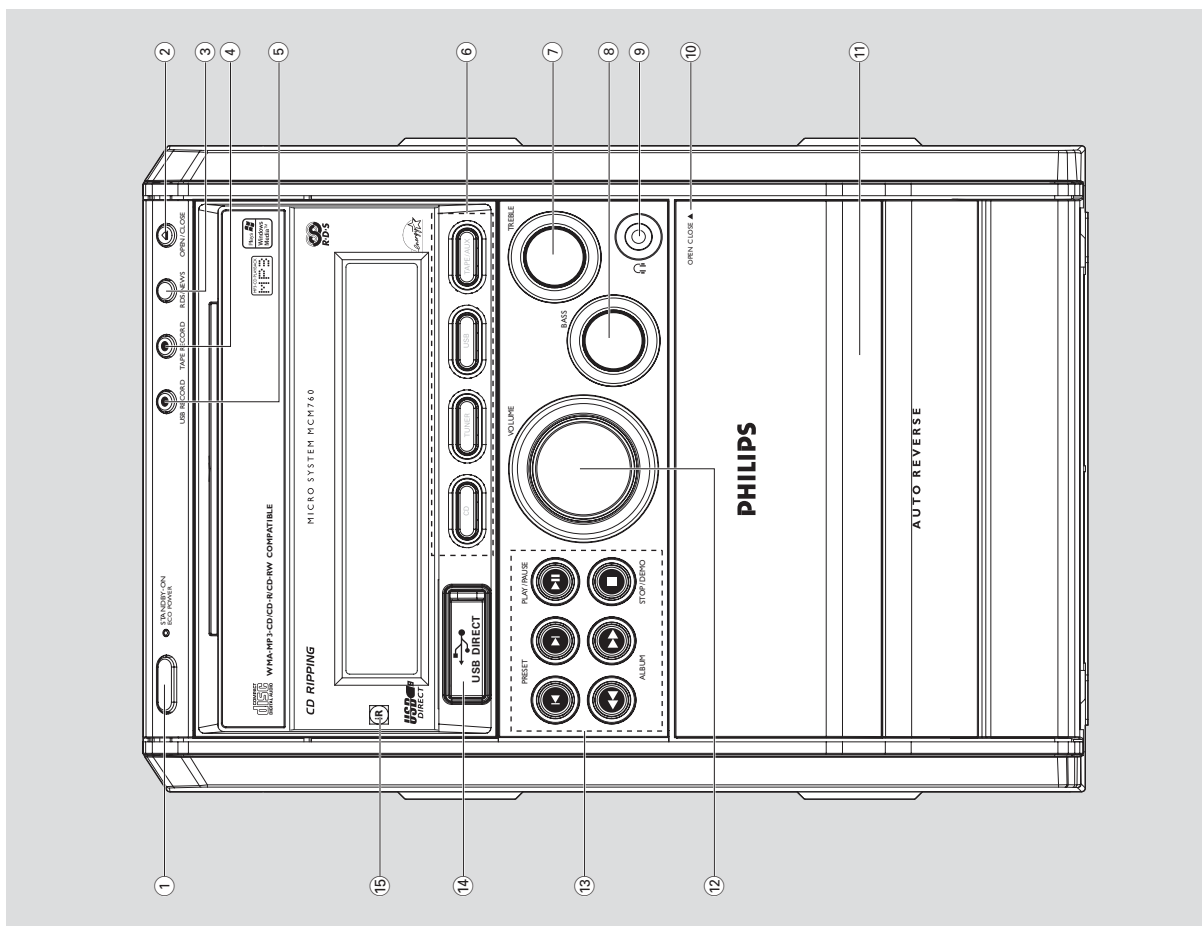
- The clock setting will be erased when the system is disconnected from the power supply.
- The set will exit from the clock setting mode if no button is pressed within 90 seconds.
- To set the clock automatically through the time information in the RDS signal, refer to **Tuner: Clock setting via RDS**.



# CONTROLS

## Controls

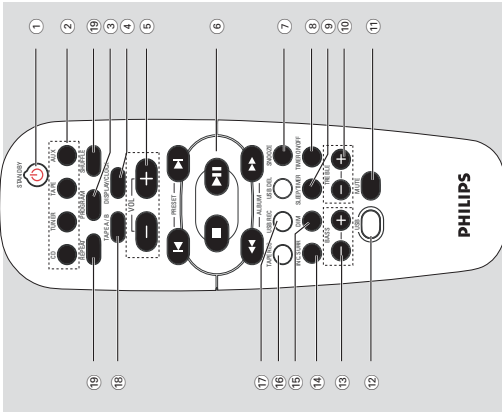
- ① **STANDBY/ON/ECO POWER**
    - press briefly to switch the set on or to ECO POWER (power-saving mode);
    - press and hold to switch the set to standby mode
  - Red indicator:** lights up red when the set is switched to ECO POWER mode
  - ② **OPEN/CLOSE ▲**
    - opens/closes the CD door
  - ③ **RDS/NEWS**
    - **Tuner:** selects RDS (Radio Data System) information
    - **CD/USB/TAPE/AUX:** activates/deactivates news
  - ④ **TAPE RECORD**
    - starts recording to a tape
  - ⑤ **USB RECORD**
    - starts recording to a USB mass storage device
  - ⑥ **Source buttons**
    - selects **CD** source
    - **In standby or Eco Power mode:** switches the set on and selects **CD** source
  - TUNER**
    - selects **TUNER** source and toggles between the wavebands: FM and MW
    - **In standby or Eco Power mode:** switches the set on and selects **TUNER** source
  - USB**
    - selects **USB** source
    - **In standby or Eco Power mode:** switches the set on and selects **USB** source
  - TAPE/AUX**
    - selects **TAPE** source or the audio input from an additional connected appliance
    - **In standby or Eco Power mode:** switches the set on and selects **TAPE** source or the audio input from an additional connected appliance
  - ⑦ **TREBLE**
    - selects a desired TREBLE (high tone) level
  - ⑧ **BASS**
    - selects a desired BASS (low tone)
  - ⑨ **Headphones**
    - 3.5 mm headphone socket
  - Helpful hints:**
    - Adjust the volume to a moderate level before you plug in the headphones.
    - Connecting headphones will switch off the speakers.
  - ⑩ **OPEN/CLOSE ▲**
    - opens/closes the tape deck door
  - ⑪ **Tape deck**
  - ⑫ **VOLUME**
    - adjusts the volume level
  - ⑬ **PRESET |◀/▶|**
    - **CD/USB:** skips CD tracks backwards/forwards
    - **TUNER:** selects a preset radio station.
    - **TAPE:** selects other side of the tape
  - ALBUM ◀◀ ▶▶**
    - **CD/USB:** selects albums (for MP3/WMA only)
    - **CD:** searches backward/forward
    - **TUNER:** tunes to radio stations
    - **TAPE:** rewind or fast forward
    - **CLOCK:** sets the hours or minutes
  - PLAY/ PAUSE ▶||**
    - **CD/USB:** starts or pauses playback
    - **TAPE:** starts playback
    - **CLOCK:** toggles between hour and minutes setting
    - **TUNER:** enters Plug & Play mode and/or starts preset radio station installation
  - STOP/DEMO ■**
    - **CD/USB:** stops playback or recording; erase a program
    - **TUNER:** press and hold to erase a preset radio station
  - TAPE:** stops playback or recording
  - **In standby or Eco Power mode:** press and hold to turn on/off the demonstration mode
  - ⑭ **IR**
    - jack for the external USB mass storage device
  - ⑮ **IR**
    - sensor for the infrared remote control
- Helpful hints: Always point the remote control towards this sensor.**



# CONNECTIONS AND FUNCTIONAL OVERVIEW

## Controls

### Remote control



### Notes for remote control:

- **1** First select the source you wish to control by pressing one of the source select keys on the remote control (for example CD, TUNER).
- **2** Then select the desired function (for example ► II, ◀, ▶).
- **1** press briefly to switch the set to ECO POWER (power-saving mode);
- press and hold to switch the set to standby mode
- **2** **Source buttons**
- **CD** selects CD source
- **In standby or Eco Power mode:** switches the set on and selects CD source
- **TUNER** selects TUNER source and toggles between the wavebands; FM and MW
- **In standby or Eco Power mode:** switches the set on and selects TUNER source
- **TAPE** selects TAPE source
- **In standby or Eco Power mode:** switches the set on and selects TAPE source

## Controls

- **AUX** selects the audio input from an additional connected appliance
- **In standby or Eco Power mode:** switches the set on and selects the audio input from an additional connected appliance
- **3** **PROGRAM** CD/USB: programs tracks
- **Tuner:** programs preset radio stations
- **4** **DISPLAY/CLOCK** **Clock:** - displays the set time - enters the clock setting mode (press and hold for more than 2 seconds)
- **TUNER/Audio CD:** switches between clock display and playback display
- **MP3/WMA files:** displays disc information during playback
- **5** **VOLUME** - adjusts the volume level
- **6** **PRESET ◀/▶** **CD/USB:** skips CD tracks backwards/forwards
- **TUNER:** selects a preset radio station.
- **TAPE:** selects other side of the tape
- **CD/USB:** stops playback or recording; erase a program
- **TUNER:** press and hold to erase a preset radio station
- **TAPE:** stops playback or recording
- **▶ II** **CD/USB:** starts or pauses playback
- **TAPE:** starts playback
- **CLOCK:** toggles between hour and minutes setting
- **ALBUM ◀◀ / ▶▶** **CD/USB:** selects albums (for MP3/WMA only)
- **CD:** searches backward/forward
- **TUNER:** tunes to radio stations
- **TAPE:** rewind or fast forward
- **CLOCK:** sets the hour's or minutes
- **7** **SNOOZE** - Temporarily deactivate the timer
- **8** **TIMER ON/OFF** - turns the timer on/off
- **9** **SLEEP/TIMER** - set the sleep timer - displays the timer setting - enters the timer setting mode (press and hold for more than 2 seconds)
- **10** **TREBLE (+ -)** - Selects a desired TREBLE (high tone) level
- **11** **MUTE** - switches the sound off temporarily
- **12** **USB** - selects USB source
- **In standby or Eco Power mode:** switches the set on and selects USB source
- **13** **BASS (+ -)** - Selects a desired BASS (low tone) level
- **14** **INC. SURR.** - Turns on/off the incredible surround sound effect
- **15** **DIM** - Selects different levels of brightness for display panel
- **16** **TAPE REC** - starts recording to a tape
- **17** **USB REC** - starts recording to a USB mass storage device
- **USB DEL** - delete files from a USB mass storage device
- **18** **TAPE A/B** - selects the desired tape playback modes : one side, both sides or auto replay
- **19** **REPEAT** - selects continuous playback
- **SHUFFLE** - selects random playback

# Troubleshooting

## WARNING

Under no circumstances should you try to repair the system yourself, as this will invalidate the warranty. Do not open the system as there is a risk of electric shock.

If a fault occurs, first check the points listed below before taking the system for repair. If you are unable to remedy a problem by following these hints, consult your dealer or Philips for help.

Problem	Solution
<b>NO DISC” is displayed.</b>	<ul style="list-style-type: none"> <li>✓ Insert a disc.</li> <li>✓ Wait until the moisture condensation at the lens has cleared.</li> <li>✓ Replace or clean the disc, see “Maintenance”.</li> <li>✓ Use a finalised CD-RW or a correct MP3/WMA -CD format disc.</li> </ul>
<b>Some files on the USB device are not displayed.</b>	<ul style="list-style-type: none"> <li>✓ Check if the number of folders exceeds 99 or the number of titles exceeds 999.</li> <li>✓ Only the completely ripped MP3/WMA file can be found and played by MCM760. Check if the file has been completely ripped.</li> </ul>
<b>POWER NOT ENOUGH ” is displayed.</b>	<ul style="list-style-type: none"> <li>✓ Check if the USB device needs extra power supply.</li> </ul>
<b>Radio reception is poor.</b>	<ul style="list-style-type: none"> <li>✓ If the signal is too weak, adjust the antenna or connect an external antenna for better reception.</li> <li>✓ Increase the distance between the Micro HiFi System and your TV or VCR.</li> </ul>
<b>Tape recording or playback cannot be made.</b>	<ul style="list-style-type: none"> <li>✓ Use only NORMAL (IEC I) tape.</li> <li>✓ Apply a piece of adhesive tape over the missing tab space.</li> </ul>
<b>The tape deck door cannot open.</b>	<ul style="list-style-type: none"> <li>✓ Remove and reconnect the AC power plug and switch on the system again.</li> </ul>
<b>The system does not react when buttons are pressed.</b>	<ul style="list-style-type: none"> <li>✓ Remove and reconnect the AC power plug and switch on the system again.</li> </ul>
<b>Sound cannot be heard or is of poor quality.</b>	<ul style="list-style-type: none"> <li>✓ Adjust the volume.</li> <li>✓ Disconnect the headphones.</li> <li>✓ Check that the speakers are connected correctly</li> <li>✓ Check if the stripped speaker wire is clamped.</li> </ul>

# TROUBLESHOOTING

## Troubleshooting

**The left and right sound outputs are reversed.**

✓ Check the speaker connections and location.

**The remote control does not function properly.**

✓ Select the source (CD or TUNER, for example) before pressing the function button (▶||◀, ▶|◀, ▶|◀).

✓ Reduce the distance between the remote control and the system.

✓ Insert the battery with its polarities (+/- signs) aligned as indicated.

✓ Replace the battery.

✓ Point the remote control directly toward IR sensor on the front of the system.

**The timer is not working.**

✓ Check the set is switched off

✓ Set the clock correctly.

✓ Press TIMER to switch on the timer.

**The Clock/Timer setting is erased.**

✓ Power has been interrupted or the power cord has been disconnected. Reset the clock/timer.



## DISMANTLING INSTRUCTIONS

### Dismantling of the Cover Cassette and Universal Loader

- 1) Remove the Cover Cassette (pos 1+pos 2) in the direction as shown in Figure 1.
- 2) Loosen 4 screws to remove the Cover Top (pos 62) by sliding it out towards the rear before lifting up.
  - 2 screws on the rear
  - 1 screw each on the left & right side
- 3) Loosen 2 screws each to remove the Panel Left (pos 61) and Panel Right (pos 60). The Panels are removed by sliding it towards the rear and outwards.
  - 1 screw on the rear
  - 1 screw on the side
  - see Service position A
- 4) Loosen 4 screws A (see Figure 2) to remove the Bracket Module Mounting (pos 54) and Universal Loader (pos 58).
  - 2 screws each on the left & right side
- 5) Shake up the Bracket Module Mounting and CD Loader as shown in Figure 3 till the Cover CD (pos7) fall off.

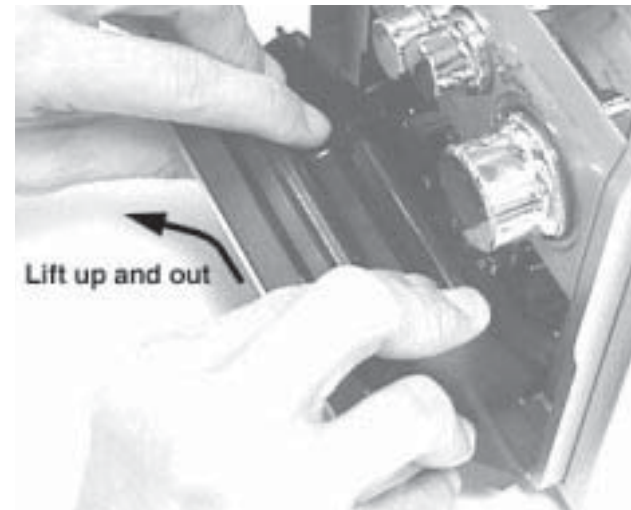


Figure 1

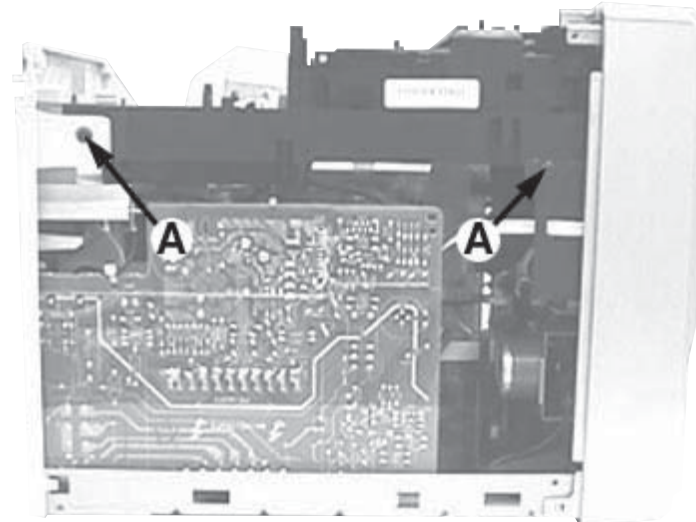


Figure 2



Figure 3

### Detaching the Universal Loader from the Bracket Module Mounting

- 1) Slide out the Loader Tray fully and remove 4 screws B (see Figure 4) to detach the Universal Loader (pos 58) from the Bracket Module Mounting (pos 54).
  - see Service position B

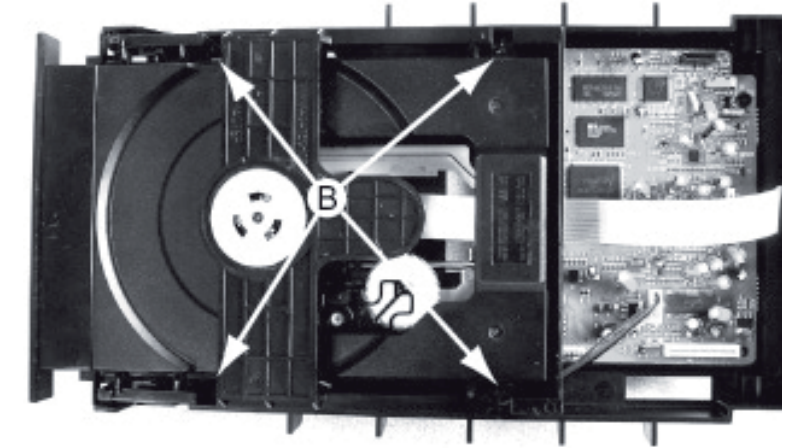


Figure 4

### Detaching the Front Panel assembly from the Bottom/Rear assembly

- 1) Remove 2 screws C (see Figure 5) from the bottom of the Cabinet Front .

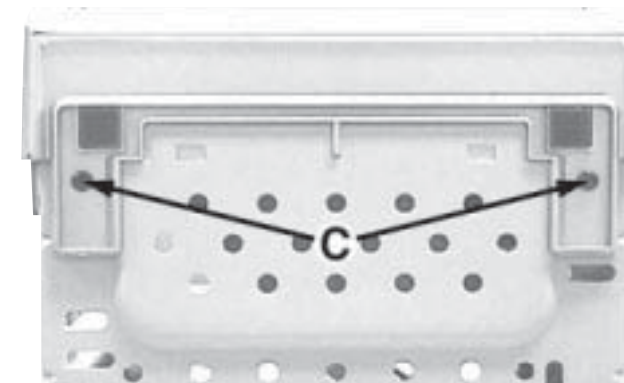


Figure 5

- 2) Release the fixation of the Main Board to Bracket Combi by removing the 1 screw and pulling the Main Board outwards (see Figure 6).
- 3) Uncatch 2 catches on the left & right sides of the Cabinet Front and slides the Front Panel assembly out towards the front.
  - see Service position C

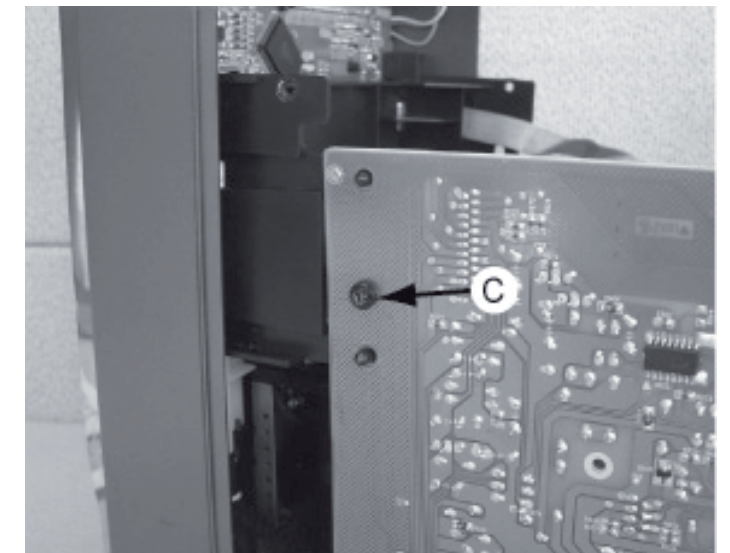


Figure 7

## DISMANTLING INSTRUCTIONS

### Dismantling of the Front Panel assembly

- 1) The Knob Volume (pos 10) can be remove by pulling it out in the direction as shown in Figure 7
- 2) The Knob Bass/Knob Treble (pos 11) can be remove by pulling it out in the direction as shown in Figure 8.
- 3) Loosen 4 screws D (see Figure 10) to remove the Shield Tape Deck and Module Tape Deck (pos 29).
- 4) Loosen 2 screws E (see Figure 9) to remove the Bracket Top Support .
- 5) Loosen 4 screws G (see Figure 9) to remove the Bracket Main.
- 6) Loosen 6 screws C4 (see Figure 11) to remove the Display Board.
- 7) Loosen 4 screws H (see Figure 11) to remove the Top Key Board.

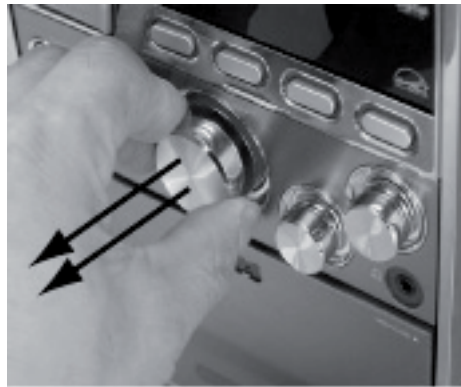


Figure 7



Figure 8

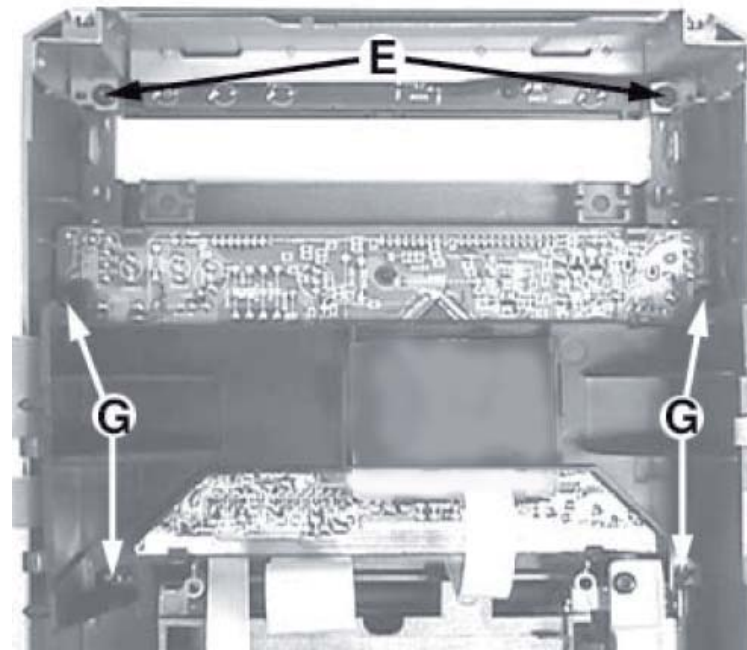


Figure 9

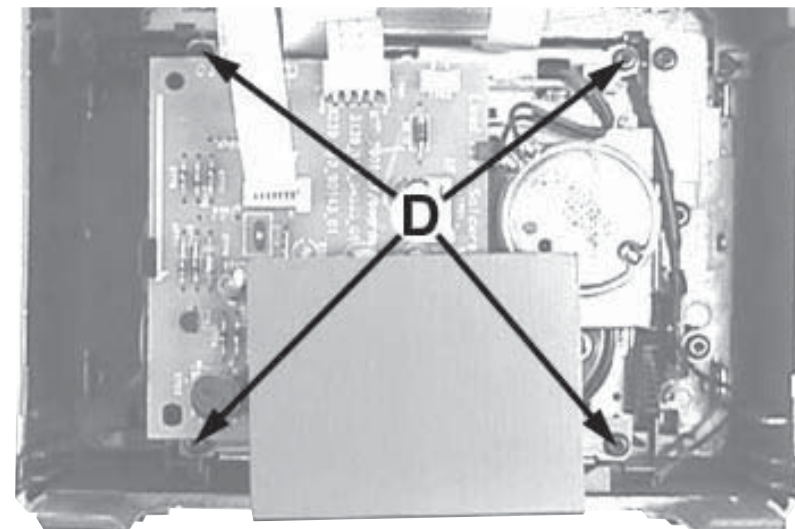


Figure 10

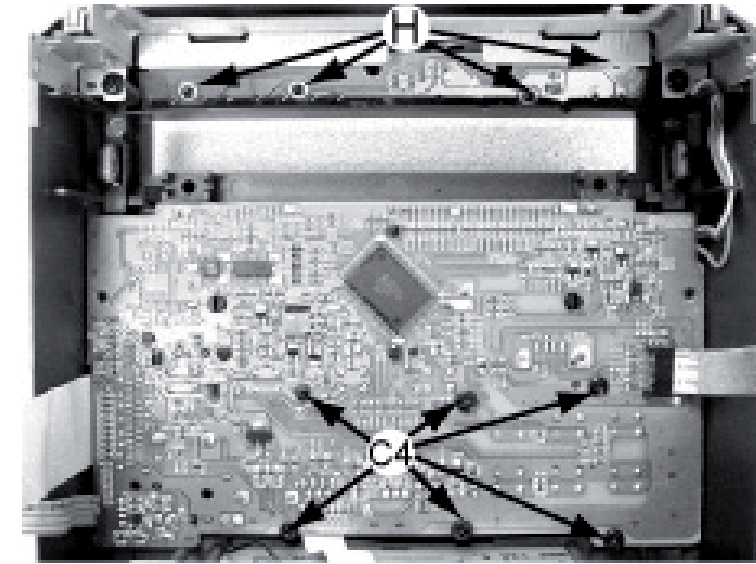


Figure 11

### Dismantling of the Front Panel assembly

### Dismantling of the Rear Panel assembly

- 1) Loosen 3 screws K and 2 catches C5 (see Figure 12) to remove the Tuner Board assembly.
- 2) Loosen 3 screws L (see Figure 12) to free the Main Board.
- 3) Loosen 1 screw M (see Figure 12) to free the Mains Socket Board.
- 4) Loosen 1 screw N and 2 catches C6 (see Figure 12) to free the Panel Rear (pos 53) by sliding it out towards the rear.  
*Note : Tuner Board assembly and Mains Socket Board can also be remove together with the Panel Rear.*

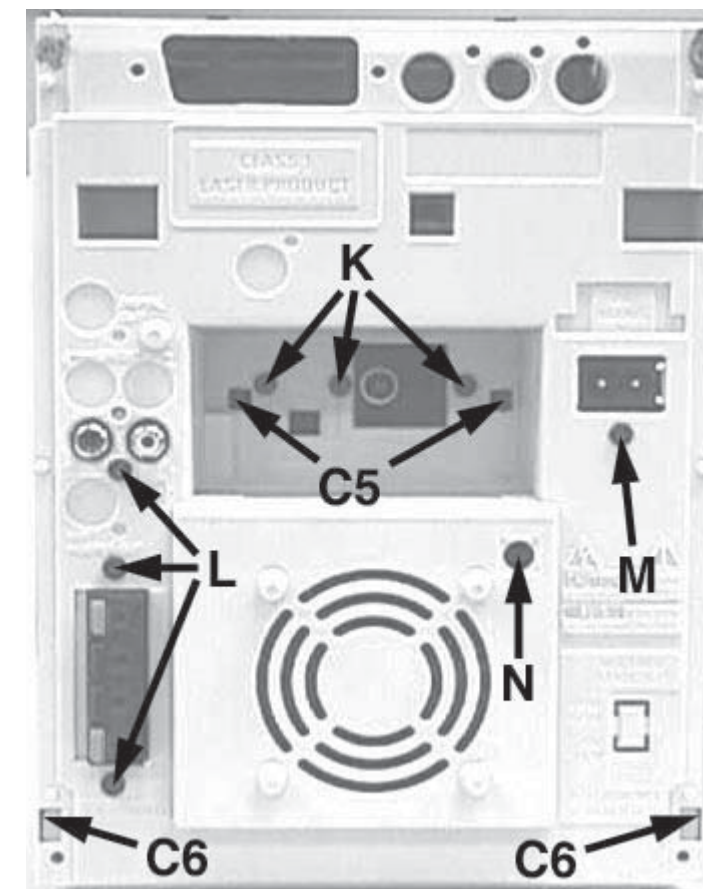


Figure 12



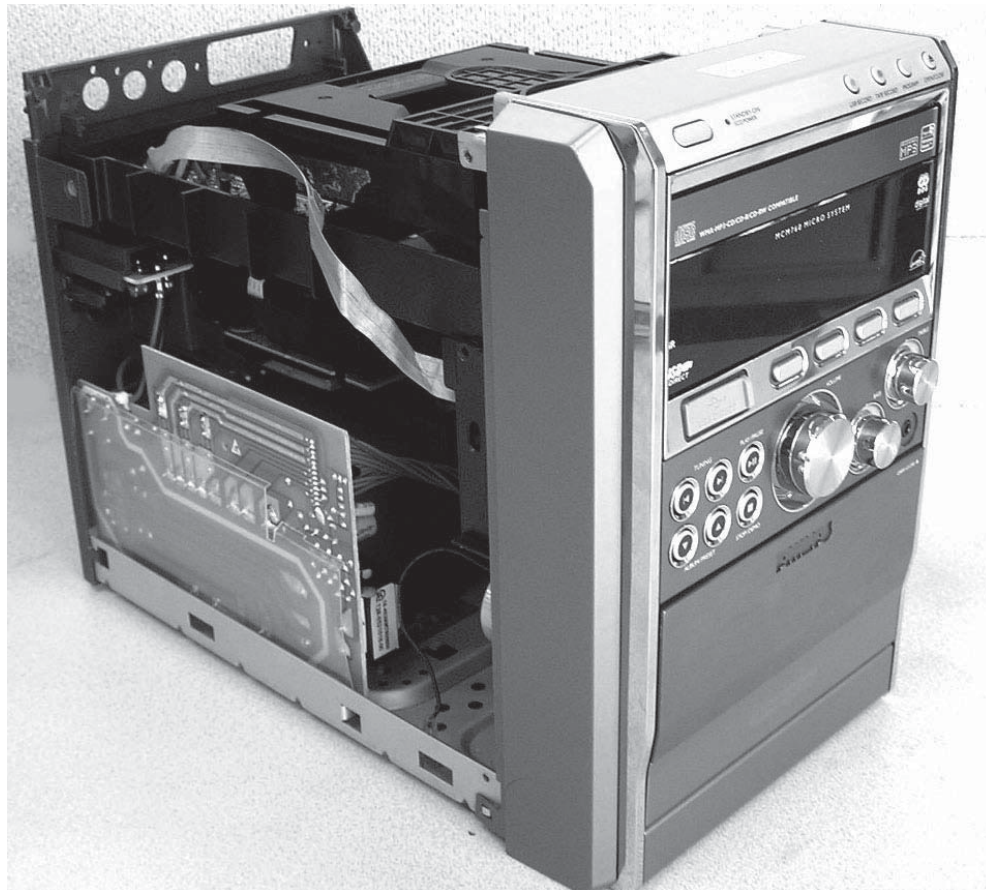
## DISMANTLING INSTRUCTIONS

### Repair Hints & Service Positions

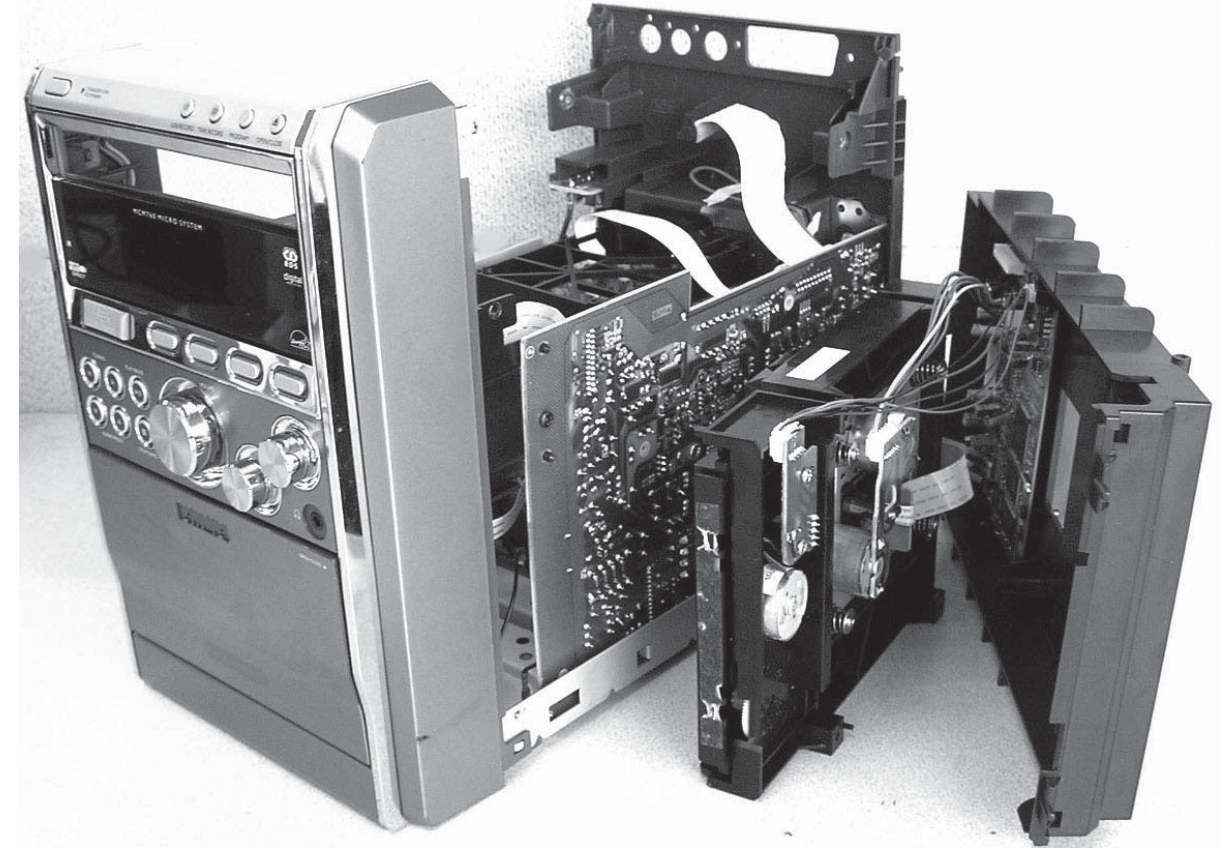
- 1) During repair it is possible to disconnect the Tuner Board and/or CD Module completely unless the fault is suspected to be in that area. This will not affect the performance of the rest of the set.

Note: The flex cables are very fragile, care should be taken not to damage them during repair. After repair, be very sure that the flex cables are inserted properly into the flex sockets before encasing, otherwise faults may occur.

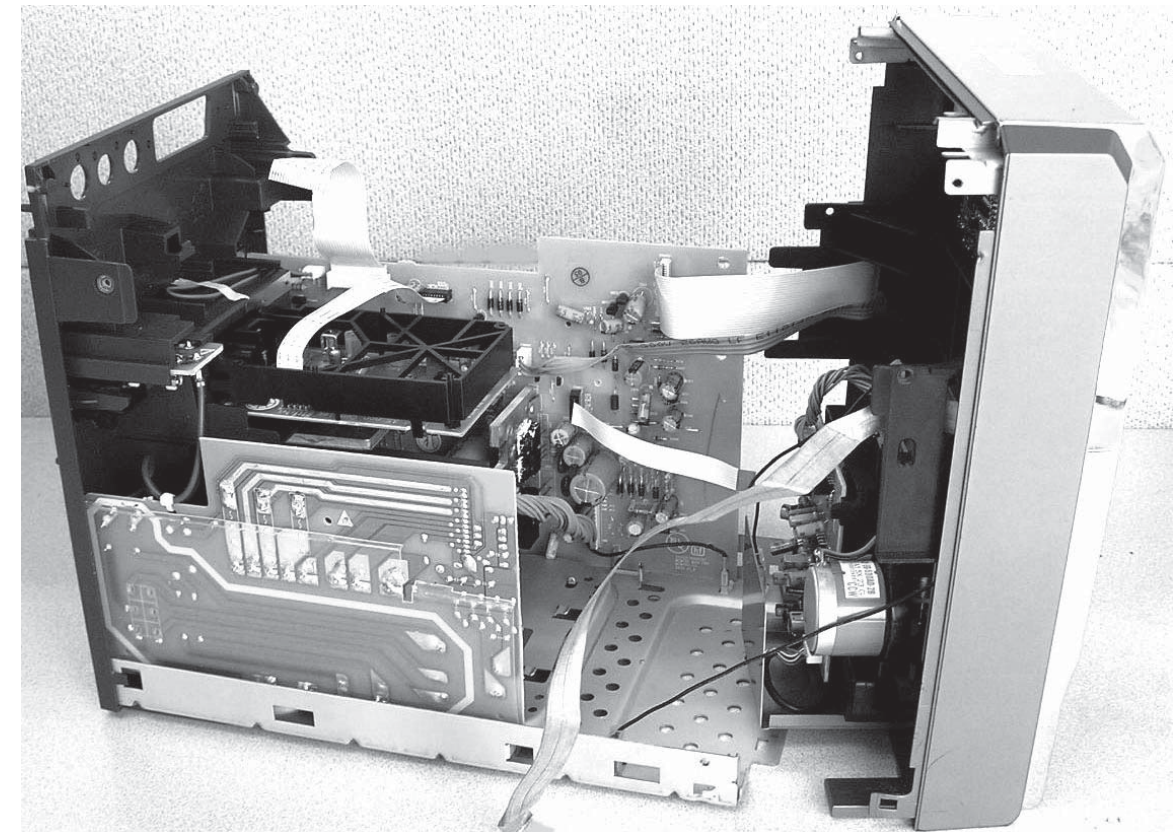
Service position A



Service position B

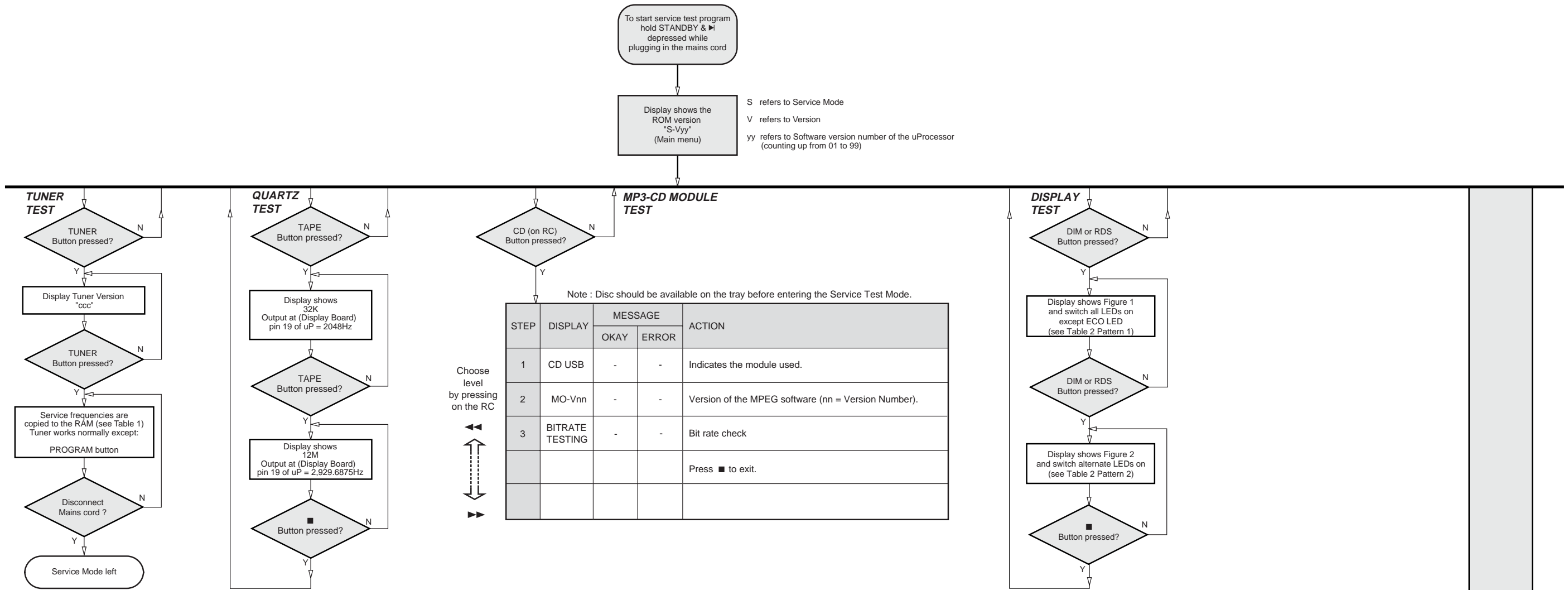


Service position C





# SERVICE TEST PROGRAM



PRESET	Europe "EUR"	East Europe "EAS"	East Eur. Extended-band "EAS"	USA "USA"	Oversea "OSE"
1	87.5MHz	87.5MHz	65.81MHz	87.5MHz	87.5MHz
2	108MHz	108MHz	108MHz	108MHz	108MHz
3	531kHz	531kHz	74MHz	530kHz	531/530kHz*
4	1602kHz	1602kHz	87.5MHz	1700kHz	1602/1700kHz*
5	558kHz	558kHz	531kHz	560kHz	558/560kHz*
6	1494kHz	1494kHz	1602kHz	1500kHz	1494/1500kHz*
7	87.5MHz	87.5MHz	558kHz	98MHz	87.5/98MHz*
8	87.5MHz	87.5MHz	1494kHz	87.5MHz	87.5MHz
9	87.5MHz	87.5MHz	98MHz	87.5MHz	87.5MHz
10	87.5MHz	87.5MHz	70.01MHz	87.5MHz	87.5MHz
11	98MHz	98MHz	65.81MHz	87.5MHz	98/87.5MHz*

Table 1

Note: \* Depending on the selected grid frequency (9 or 10kHz).  
 By holding the ECO and TUNER buttons depressed while switching on the Mains supply, one of the undermentioned features will be activated:  
 - the tuning grid frequency is toggled between 9kHz and 10kHz for the Oversea (/98) version.  
 - the extended FM1 (65.81MHz - 74MHz) is toggled on and off for East Eur. version.

LEDs	Pattern 1	Pattern 2
ECO	Off	Off
CD	On	On
TUNER	On	Off
TAPE	On	On
AUX	On	Off
Volume Rotary	On	On

Table 2



Figure 1

Remark: Full Display Pattern function is not available for no RDS version.

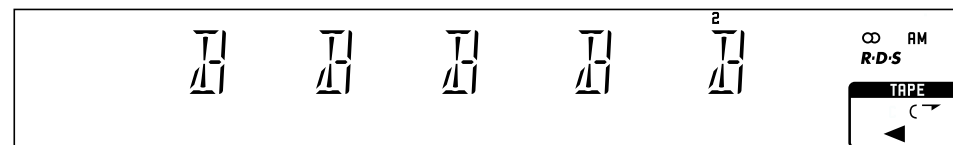
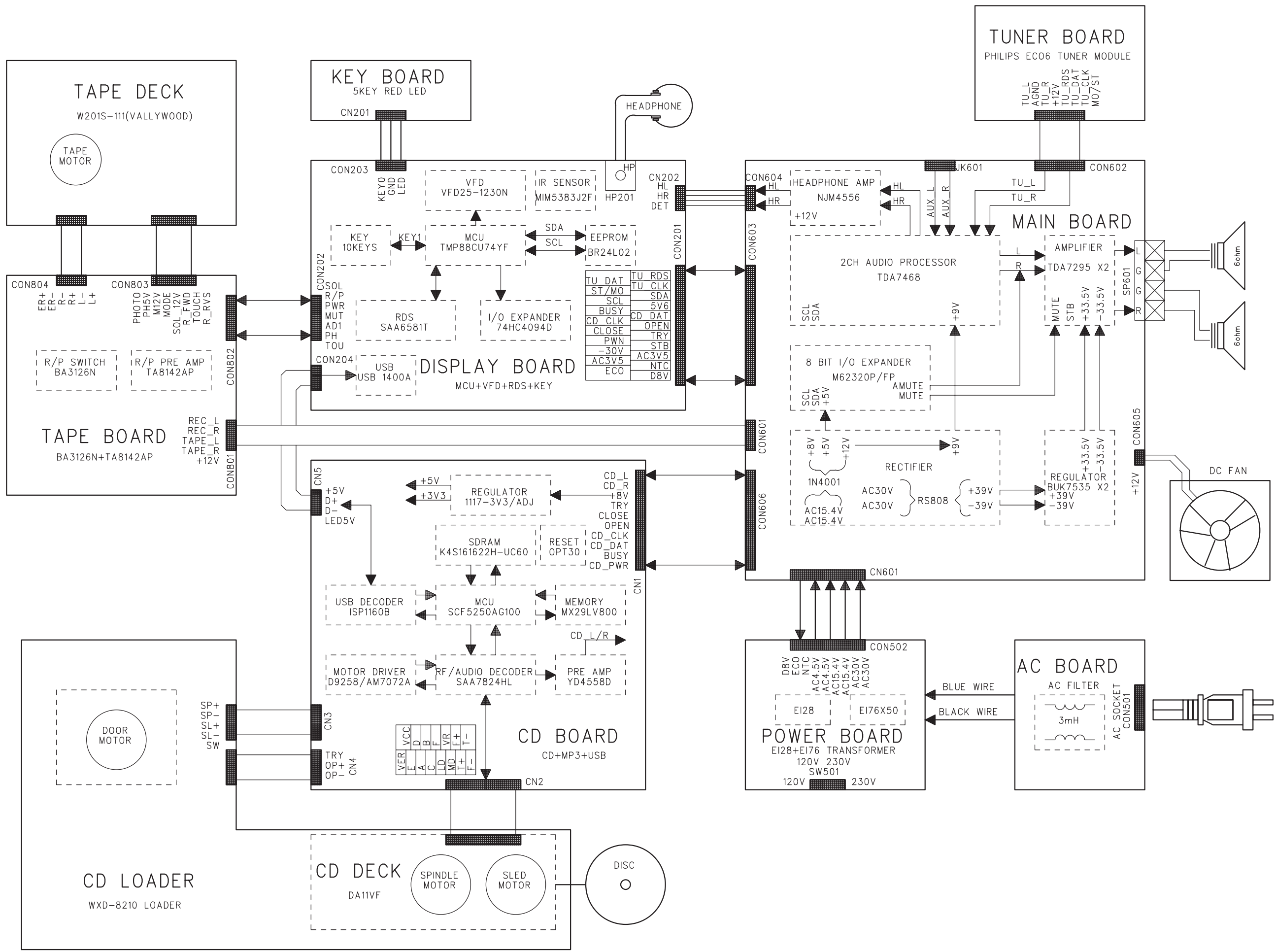


Figure 2

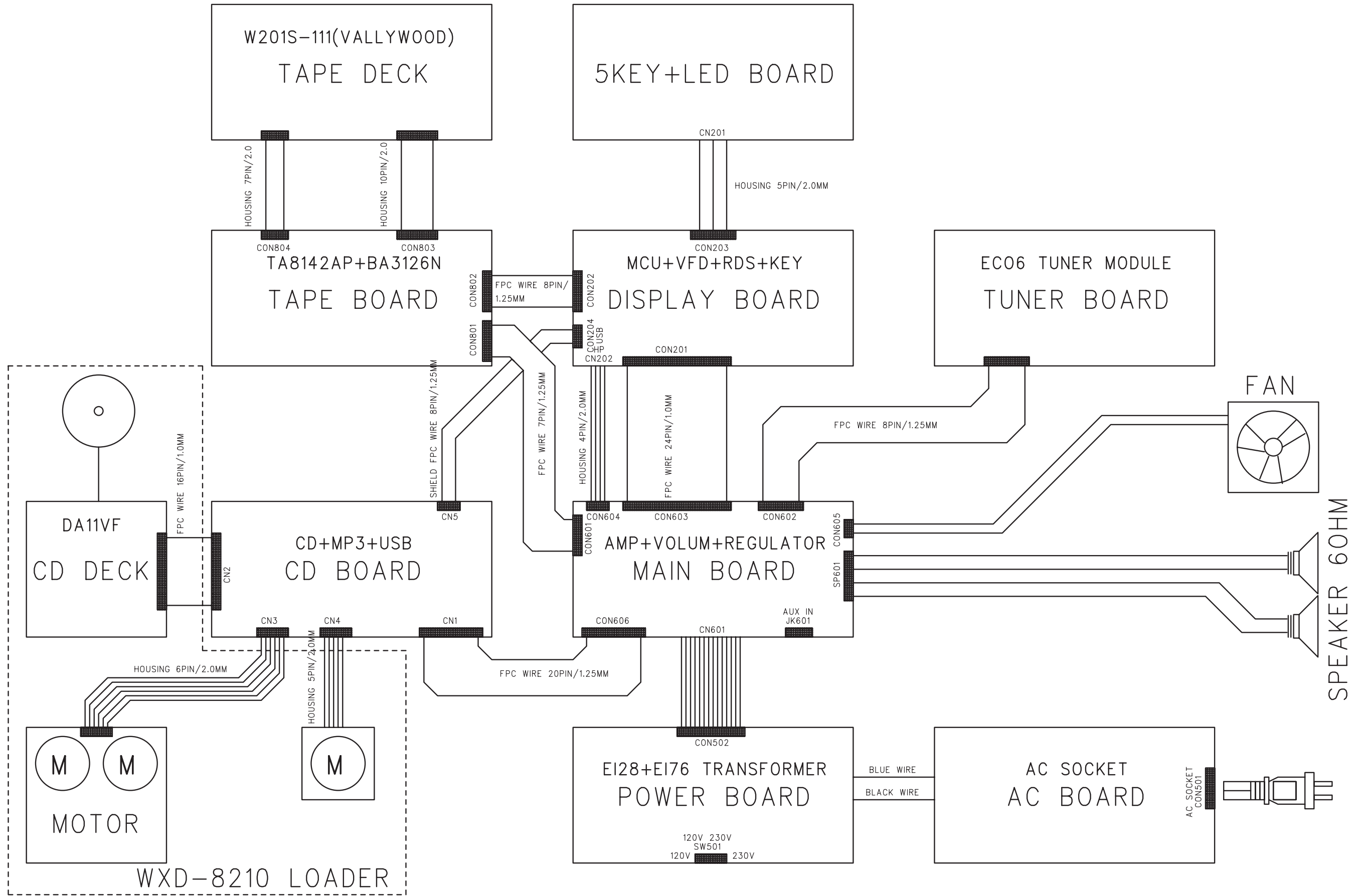
TEST	Activated with	ACTION
EEPROM TEST	[Right Arrow] [Square] to Exit	Test patterns will be sent to the EEPROM. "PASS" is displayed if the uProcessor read back the test patterns correctly, otherwise "FAIL" will be displayed.
EEPROM FORMAT TEST	[Left Arrow]	Load default data. Display shows "NEW" for 1 second. <b>Caution! All presets from the customer will be lost!!</b>
DEMO TOGGLE	[Right Arrow]	Pressing this button will toggle between DEMO ON and DEMO OFF. The DEMO status will scroll once across the Display.
ROTARY ENCODER TEST	Volume, Treble or Bass Knob	Display shows value for 2 seconds. Values increases or decreases until Volume Maximum (0dB) or Volume Minimum (VOL MUTE) is reached.
LEAVE SERVICE TEST PROGRAM	Disconnect mains cord	

Various other Tests

# SET BLOCK DIAGRAM



SET WIRING DIAGRAM



---

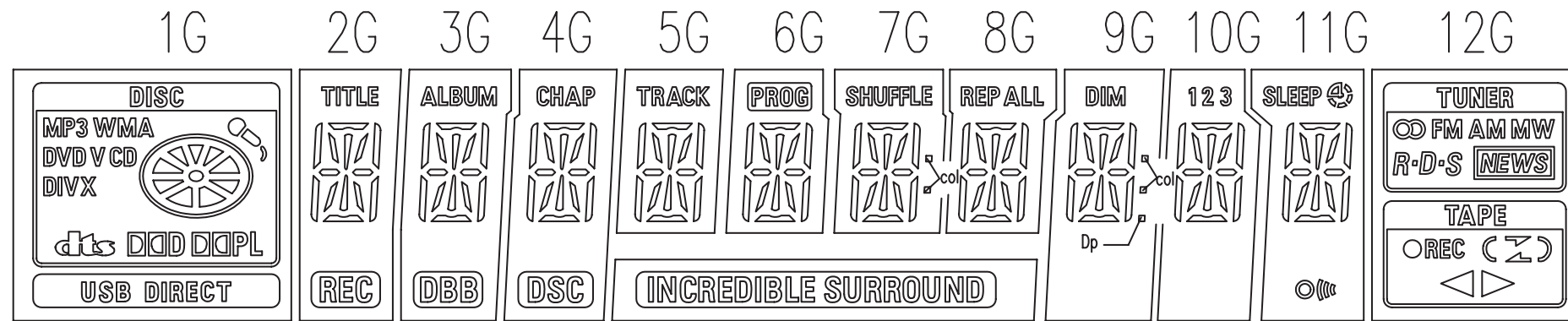
# DISPLAY BOARD

---

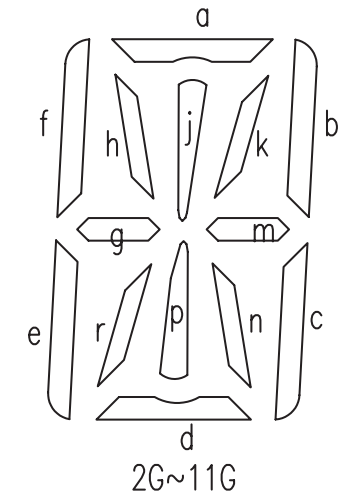
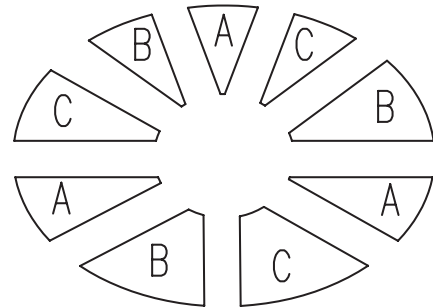
## TABLE OF CONTENTS

FTD Display Pin Connection .....	6-2
Display PCB - Layout Top View .....	6-3
Display PCB - Layout Bottom View .....	6-4
Circuit Diagram .....	6-5
Electrical Parts List .....	6-6

FTD DISPLAY PIN CONNECTION



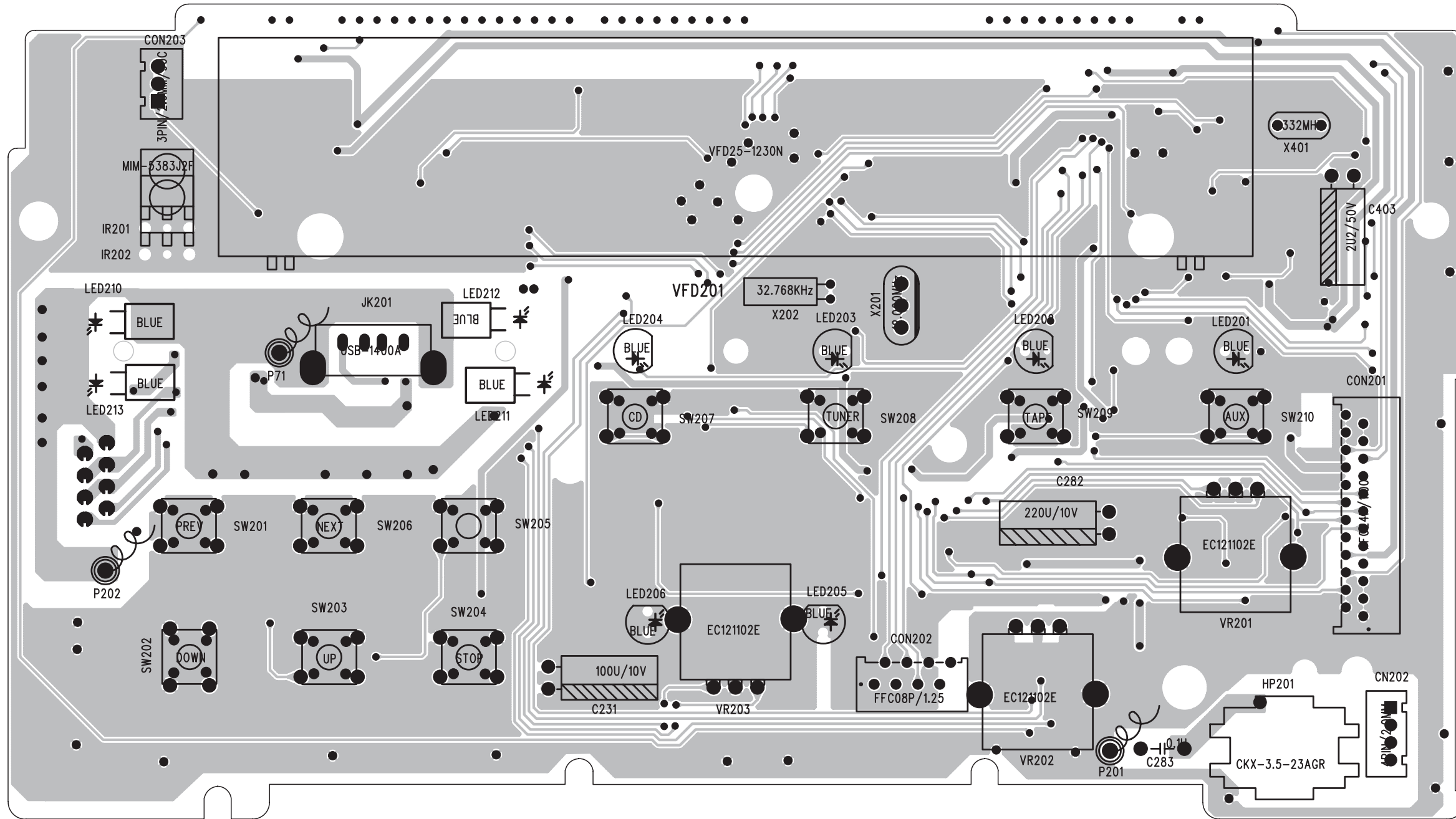
5G



P/G	1G	2G	3G	4G	5G	6G	7G	8G	9G	10G	11G	12G
P1	DISC	REC	DBB	DSC	INCREIBLE SURROUND		col		col	1	SLEEP	TUNER
P2	MP3							REP	Dp	2	Ⓞ	Ⓞ
P3	DVD	TITLE	ALBUM	CHAP	TRACK	PROG	SHUFFLE	ALL	DIM	3	Ⓞ	FM
P4	DIVX	a	a	a	a	a	a	a	a	a	a	AM
P5	CD	h	h	h	h	h	h	h	h	h	h	MW
P6	V	j,p	j,p	j,p	j,p	j,p	j,p	j,p	j,p	j,p	j,p	R-D-S
P7	WMA	k	k	k	k	k	k	k	k	k	k	NEWS
P8	USB DIRECT	b	b	b	b	b	b	b	b	b	b	TAPE
P9	dts	f	f	f	f	f	f	f	f	f	f	REC
P10	Ⓞ	m	m	m	m	m	m	m	m	m	m	Ⓞ
P11	Ⓞ	g	g	g	g	g	g	g	g	g	g	Ⓞ
P12	Ⓞ	c	c	c	c	c	c	c	c	c	c	Ⓞ
P13	Ⓞ	e	e	e	e	e	e	e	e	e	e	Ⓞ
P14	C	r	r	r	r	r	r	r	r	r	r	Ⓞ
P15	B	n	n	n	n	n	n	n	n	n	n	Ⓞ
P16	A	d	d	d	d	d	d	d	d	d	d	

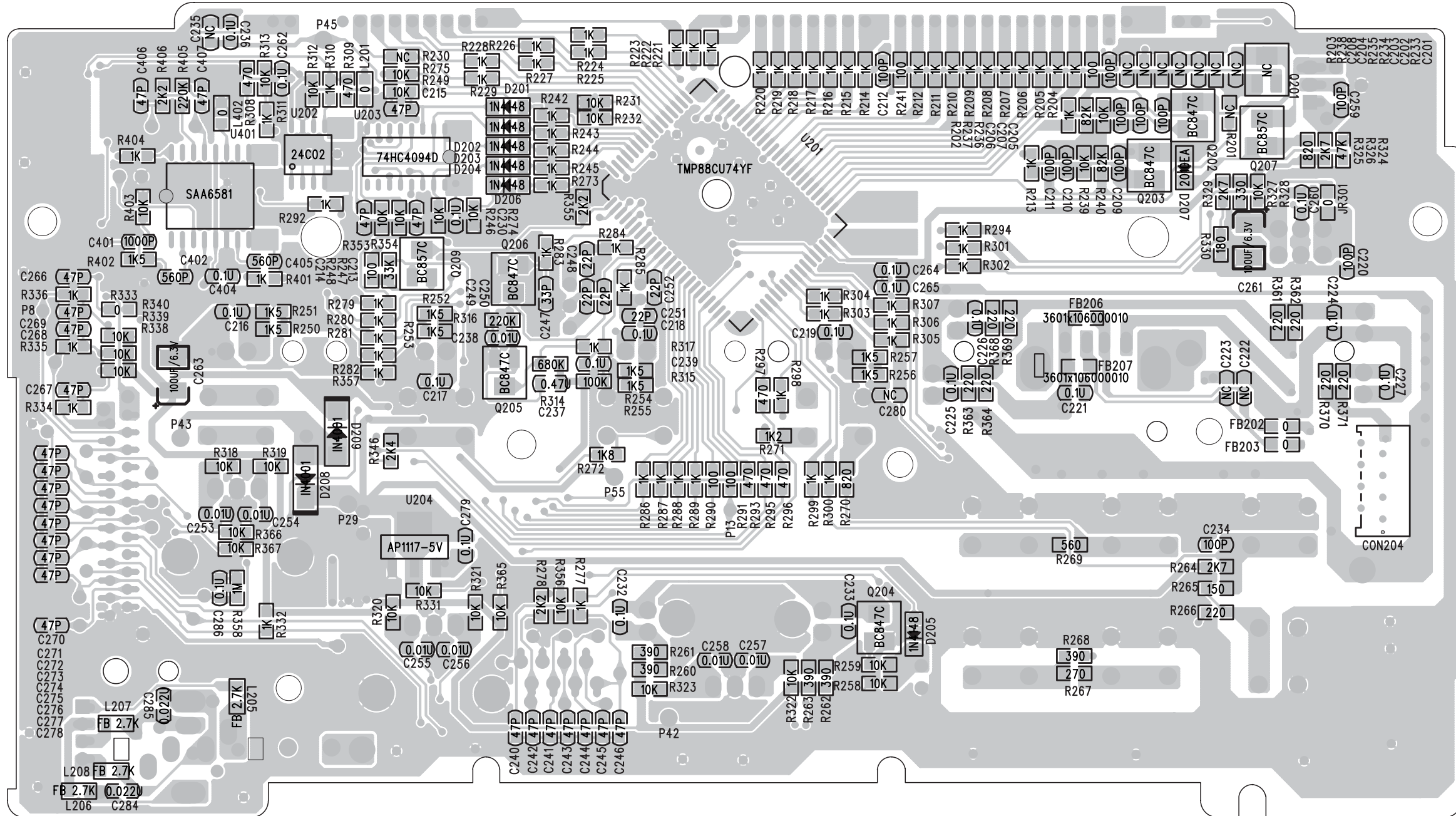
2G~11G

# PCB LAYOUT - DISPLAY BOARD (TOP VIEW)

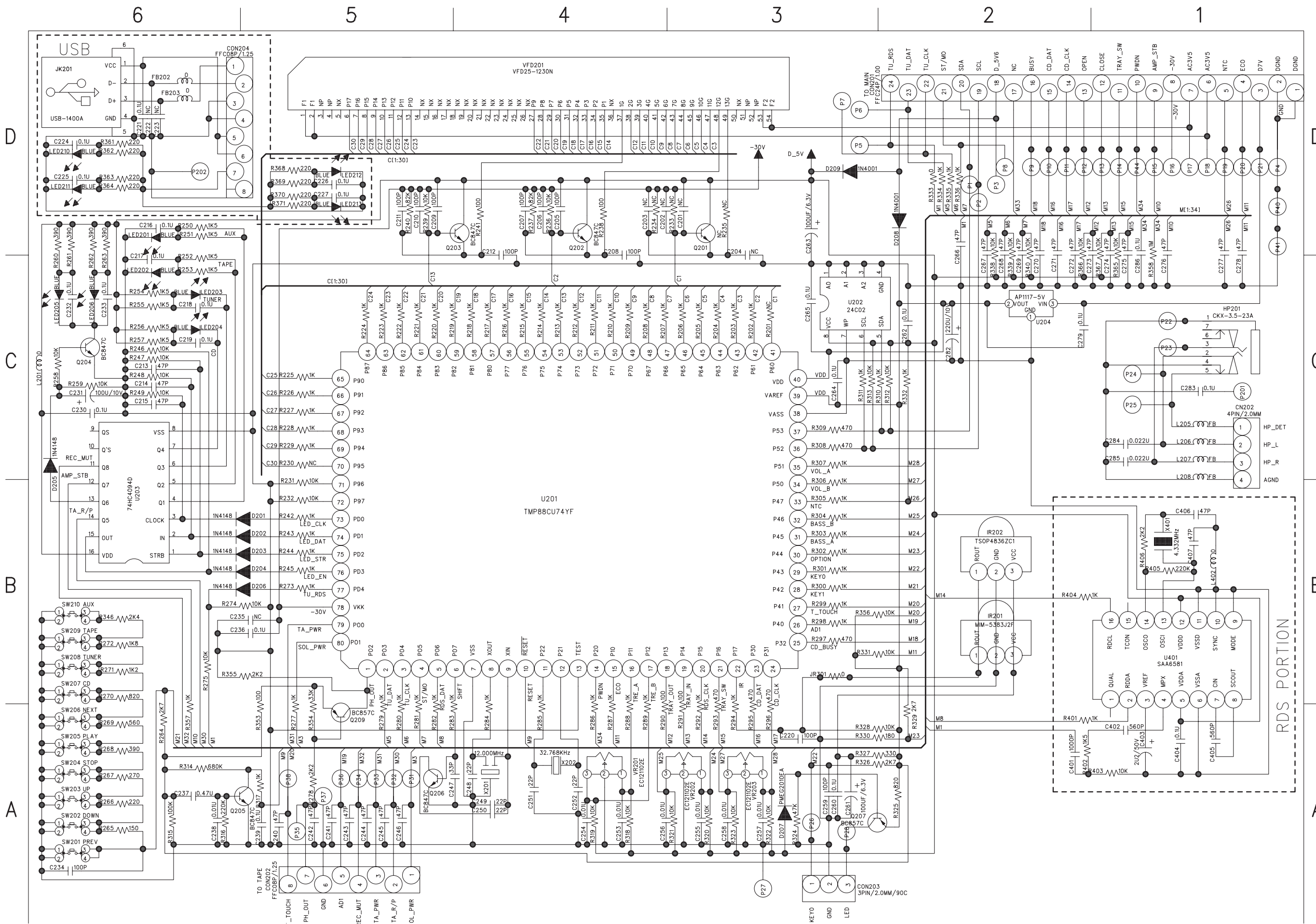




# PCB LAYOUT - DISPLAY BOARD (BOTTOM VIEW)



# CIRCUIT DIAGRAM - DISPLAY BOARD

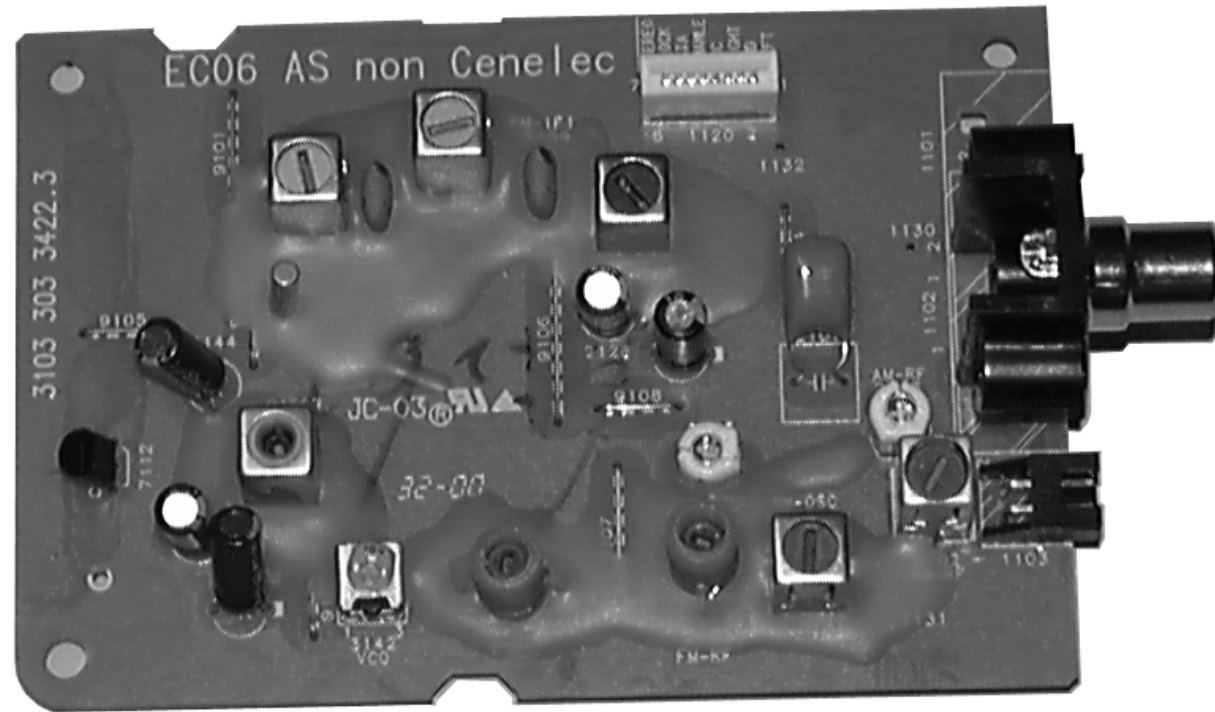




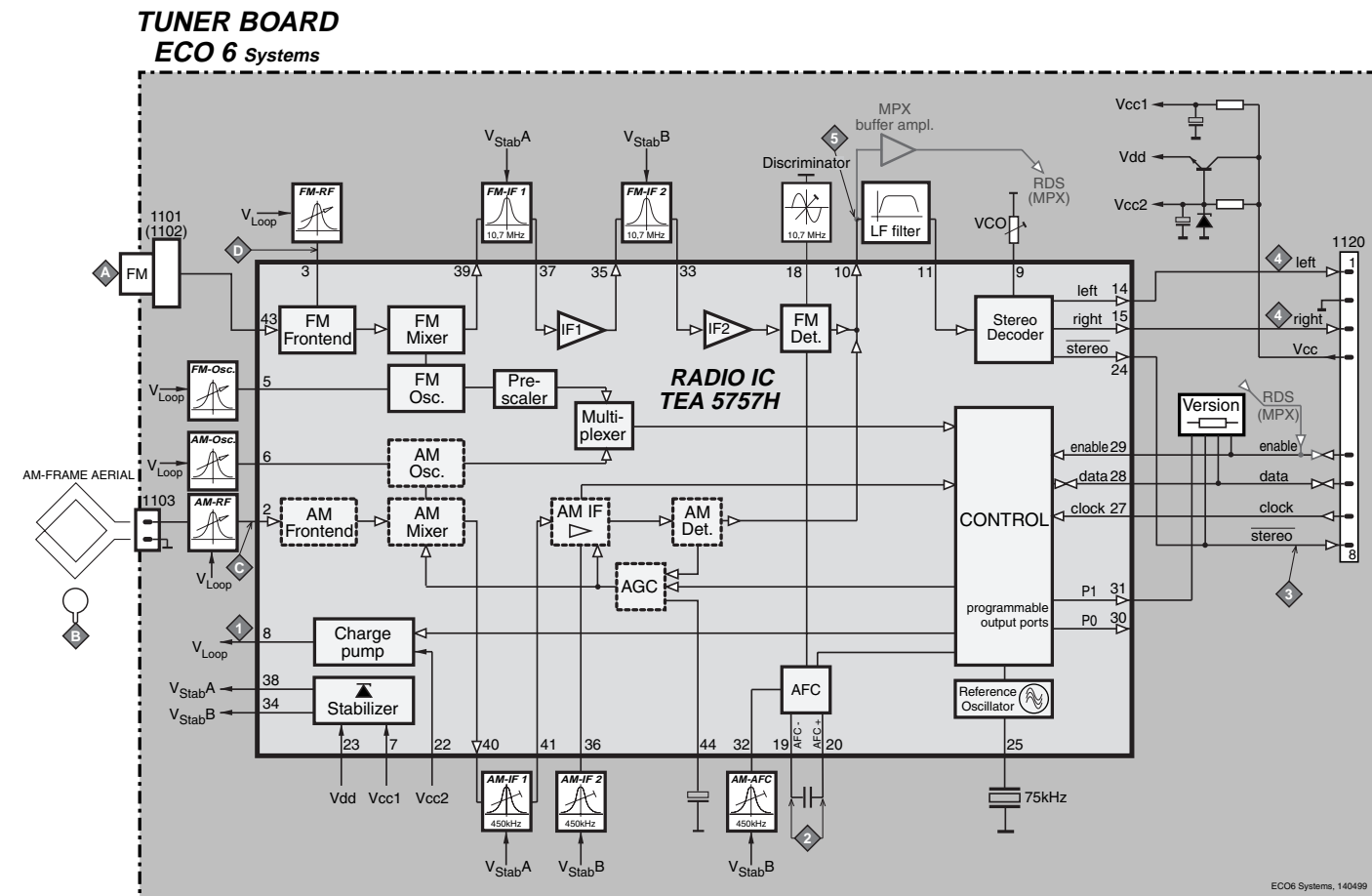
**ELECTRICAL PARTS LIST - DISPLAY BOARD**

D207	9940 000 04422	SCHOTTKY PMEG2010
D208	9940 000 05673	DIODE SM4001 DO-213AB.
D209	9940 000 05673	DIODE SM4001 DO-213AB.
FB206	9940 000 04264	MULT. VAR. 10.6-15.4V
FB207	9940 000 04264	MULT. VAR. 10.6-15.4V
HP201	9940 000 05682	PHONE STEREO JACK CKX-3.5-23A
IR201	9940 000 05679	IR RECEIVER MIM-5383J2F
JK201	9940 000 04263	USB JACK USB-1400A 4P
L205	9940 000 05661	FB 2700Ω +/-25% SZ2012K272T
L206	9940 000 05661	FB 2700Ω +/-25% SZ2012K272T
L207	9940 000 05661	FB 2700Ω +/-25% SZ2012K272T
L208	9940 000 05661	FB 2700Ω +/-25% SZ2012K272T
LED201	9940 000 05678	LED 3MM SUPER BLUE
LED202	9940 000 05678	LED 3MM SUPER BLUE
LED203	9940 000 05678	LED 3MM SUPER BLUE
LED204	9940 000 05678	LED 3MM SUPER BLUE
LED205	9940 000 05678	LED 3MM SUPER BLUE
LED206	9940 000 05678	LED 3MM SUPER BLUE
LED210	9940 000 05678	LED 3MM SUPER BLUE
LED211	9940 000 05678	LED 3MM SUPER BLUE
LED212	9940 000 05678	LED 3MM SUPER BLUE
LED213	9940 000 05678	LED 3MM SUPER BLUE
SW201	9940 000 01627	TACT SWITCH AI KFC-A06-5
SW202	9940 000 01627	TACT SWITCH AI KFC-A06-5
SW203	9940 000 01627	TACT SWITCH AI KFC-A06-5
SW204	9940 000 01627	TACT SWITCH AI KFC-A06-5
SW205	9940 000 01627	TACT SWITCH AI KFC-A06-5
SW206	9940 000 01627	TACT SWITCH AI KFC-A06-5
SW207	9940 000 01627	TACT SWITCH AI KFC-A06-5
SW208	9940 000 01627	TACT SWITCH AI KFC-A06-5
SW209	9940 000 01627	TACT SWITCH AI KFC-A06-5
SW210	9940 000 01627	TACT SWITCH AI KFC-A06-5
U201	9940 000 05677	IC TMP88PU74YFG MCU
U202	9940 000 05674	IC BR24L02F-WE2
U203	9940 000 05676	IC 74HC4094D MEMORY
U204	9940 000 05675	IC AZ1117H-5.0 REGULATOR
U401	9940 000 03346	IC SAA6581T RDS /05/12
VFD201	9940 000 05681	FTD VFD25-1230N
VR201	9940 000 01628	ROTARY ENCODER
VR202	9940 000 01628	ROTARY ENCODER
VR203	9940 000 05683	ROTARY ENCODER L23FX10(T)
X201	9940 000 05672	RESONATOR 12MHZ +/-0.5%
X202	9940 000 05671	X'TAL 32.768KHZ +/-20PPM
X401	9940 000 04238	X'TAL 4.332MHZ +/-20PPM /05/12

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



BLOCK DIAGRAM



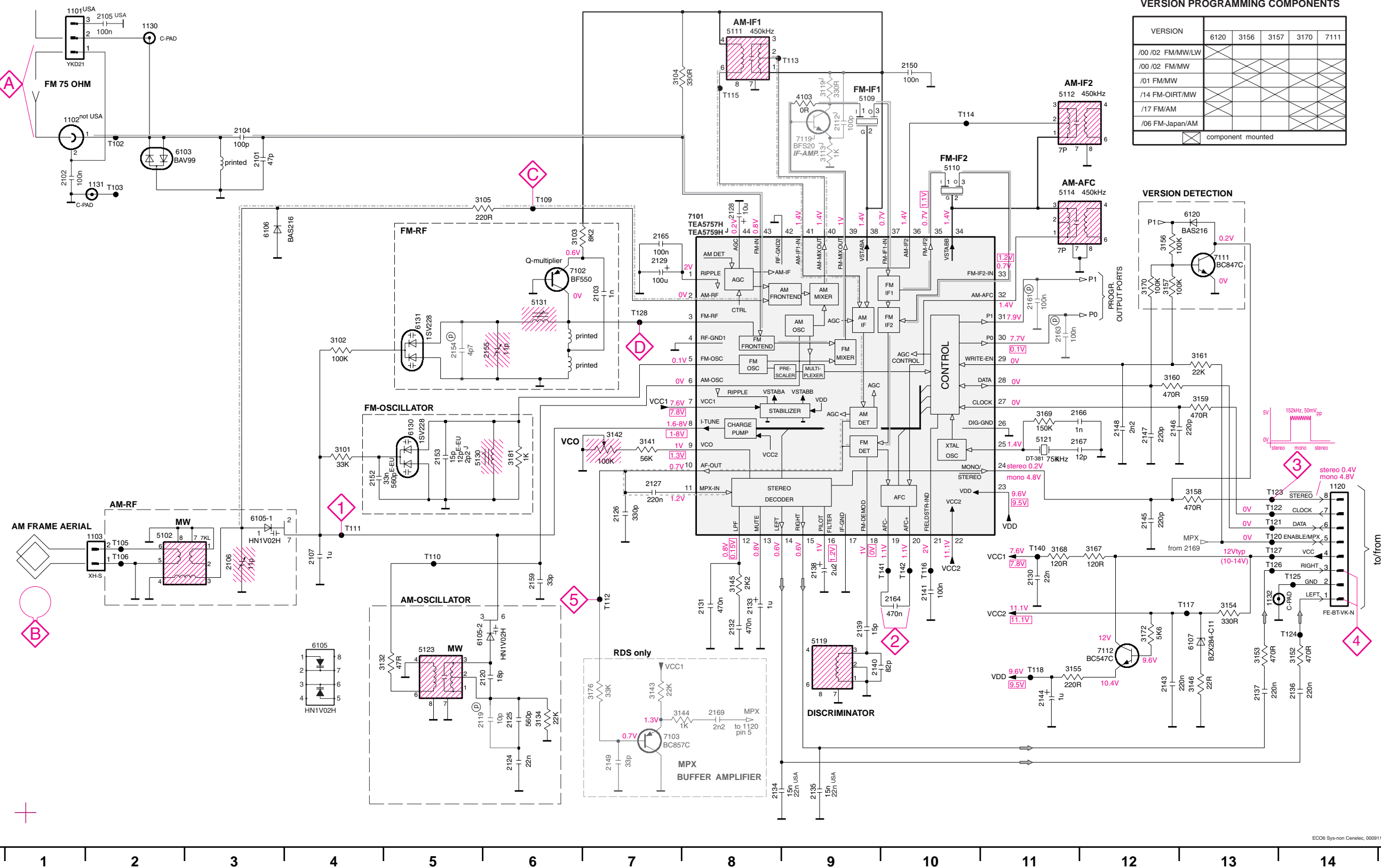
# ECO6 Tuner Board

version: **SYSTEMS non-CENELEC**

TABLE OF CONTENTS

Blockdiagram .....7A-1  
 Schematic Diagram .....7A-2  
 Component Layout.....7A-3  
 Adjustment table .....7A-3  
 Electrical Partslist.....7A-4

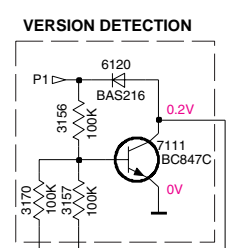
# TUNER BOARD ECO6 / SYSTEMS NON CENELEC



**VERSION PROGRAMMING COMPONENTS**

VERSION	6120	3156	3157	3170	7111
/00 /02 FM/MW/LW					
/00 /02 FM/MW					
/01 FM/MW					
/14 FM-OIRT/MW					
/17 FM/AM					
/06 FM-Japan/AM					

component mounted



- 1101 A1
- 1102 B1
- 1103 F2
- 1120 E14
- 1130 A2
- 1131 B2
- 1132 G13
- 1133 B3
- 2102 B1
- 2103 C7
- 2104 B3
- 2105 A2
- 2106 F3
- 2107 F4
- 2119 H6
- 2120 G6
- 2124 H6
- 2125 H6
- 2126 F7
- 2127 E7
- 2128 C8
- 2129 C7
- 2130 F11
- 2131 G8
- 2132 G8
- 2133 G8
- 2134 H8
- 2135 H9
- 2136 G14
- 2137 G13
- 2138 F9
- 2139 G9
- 2140 G9
- 2141 F10
- 2143 G12
- 2144 G11
- 2145 F12
- 2146 E12
- 2147 E12
- 2148 H7
- 2149 H7
- 2150 A10
- 2152 E4
- 2153 E5
- 2154 D5
- 2155 D5
- 2159 F6
- 2161 C11
- 2163 D11
- 2164 F10
- 2165 C7
- 2166 E11
- 2167 E11
- 2169 H8
- 3101 E4
- 3102 D4
- 3103 C6
- 3104 A7
- 3105 B6
- 3132 G5
- 3134 H6
- 3141 E7
- 3142 E7
- 3143 G7
- 3144 H7
- 3145 F8
- 3146 G13
- 3152 G14
- 3153 G13
- 3154 G13
- 3155 G11
- 3156 C12
- 3157 D12
- 3158 E13
- 3159 D13
- 3160 D13
- 3161 D13
- 3167 F12
- 3168 F11
- 3169 E11
- 3170 C12
- 3172 G12
- 3176 G7
- 3181 E6
- 5102 F2
- 5109 B9
- 5110 B10
- 5111 A8
- 5112 A11
- 5114 B11
- 5119 G9
- 5121 E11
- 5123 G5
- 5130 E5
- 5131 C6
- 5132 B2
- 6105-1 F3
- 6105-2 G5
- 6106 C3
- 6107 G13
- 6120 G13
- 6130 E5
- 6131 D5
- 7101 C8
- 7102 C6
- 7103 H7
- 7111 C13
- 7112 F13
- T102 B2
- T103 B2
- T105 F2
- T106 F2
- T109 B6
- T110 F5
- T111 F4
- T112 F7
- T113 A8
- T114 B10
- T115 A8
- T116 F10
- T117 G13
- T118 G11
- T120 F13
- T122 F13
- T123 F13
- T124 G14
- T125 F14
- T126 F13
- T127 F13
- T128 D7
- T140 F11
- T141 F10
- T142 F10

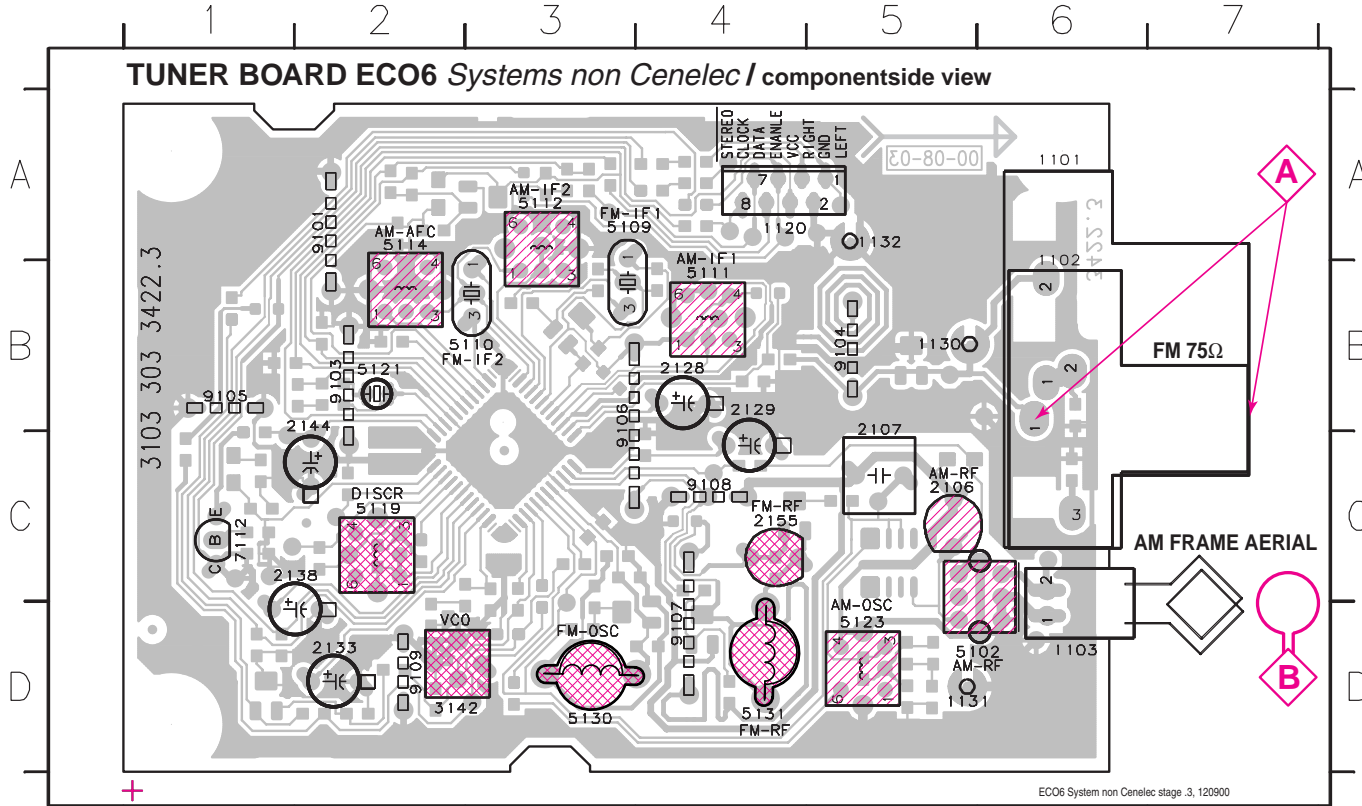
### LEGEND

- Ⓟ...for provision only
- USA ... for USA version only
- E-EU ... for East European version only
- J ... for Japanese version only

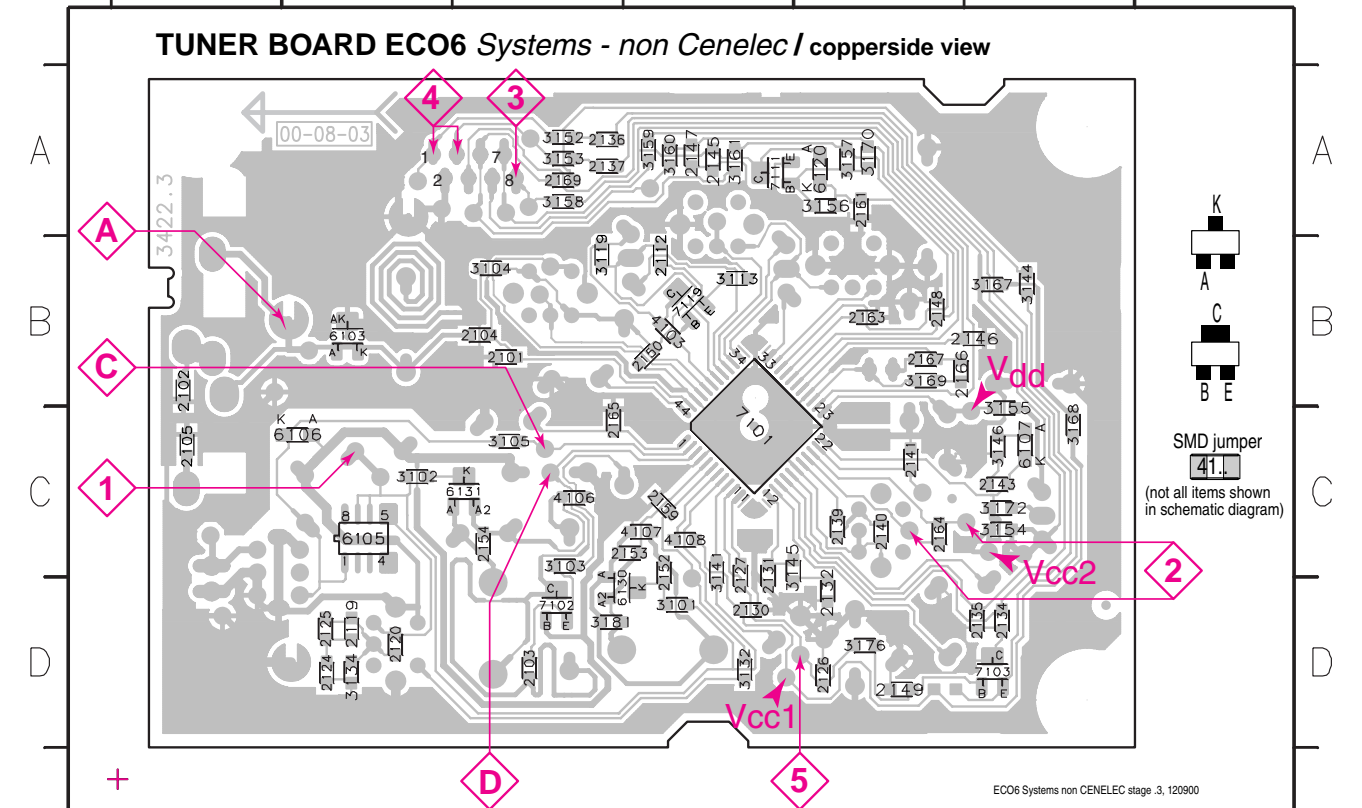
- Ⓜ...V FM mode stereo
- Ⓜ...V MW mode
- Ⓜ...V LW mode
- Ⓜ...V EVM
- voltages measured while set is tuned to a strong transmitter

- Signal path**
- FM
  - - - AM
  - · - · MPX (Audio Frequency)
  - ⇒ AF - left/right

1101 A6 1120 A4 1132 A5 2128 C4 2138 C2 3142 D2 5110 B3 5114 A2 5123 D5 7112 C1 9104 B5 9107 D4  
 1102 B6 1130 B5 2106 C5 2129 B4 2144 B2 5102 D6 5111 B4 5119 C2 5130 D3 9101 A2 9105 B1 9108 C4  
 1103 D6 1131 D5 2107 B5 2133 D2 2155 C4 5109 A3 5112 A3 5121 B2 5131 D4 9103 B2 9106 B3 9109 D2



2101 B4 2119 D3 2130 D5 2137 A4 2146 B7 2153 C5 2165 C4 3103 C4 3134 D3 3152 A4 3158 A4 3169 B6 4106 C4 6107 C7 7103 D7  
 2102 B1 2120 D3 2131 C5 2139 C6 2147 A5 2154 C4 2166 B6 3104 B4 3141 C5 3153 A4 3159 A5 3170 A6 4107 C5 6120 A6 7111 A5  
 2103 D4 2124 D3 2132 D6 2140 C6 2148 B6 2159 C5 2167 B6 3105 C4 3143 D6 3154 C7 3160 A5 3172 C7 4108 C5 6130 D4 7119 B5  
 2104 B4 2125 D3 2134 D7 2141 C6 2149 D6 2161 A6 2169 A4 3113 B5 3144 B7 3155 C7 3161 A5 3176 D6 6103 B3 6131 C4  
 2105 C1 2126 D6 2135 D7 2143 C7 2150 B5 2163 B6 3101 D5 3119 B5 3145 C5 3156 A6 3167 B7 3181 D4 6105 C3 7101 C5  
 2112 B5 2127 C5 2136 A4 2145 A5 2152 C5 3102 C3 3132 D5 3146 C7 3157 A6 3168 C7 4103 B5 6106 C3 7102 D4



These assembly drawings show a summary of all possible versions.  
 For components used in a specific version see schematic diagram respectively partlist.

TUNER ADJUSTMENT TABLE ( ECO6 FM/MW- and FM/MW/LW - versions with AM-frame aerial )

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
<b>VARICAP ALIGNMENT</b>						
<b>FM</b> 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)			108MHz	5130		8V ±0.2V
			87.5MHz (65.81MHz)	check		4.3V ±0.5V (1.2V ±0.5V)
<b>MW</b> FM/AM-version, 10kHz grid 530 - 1700kHz			1700kHz	5123		8V ±0.2V
			530kHz	check		1.1V ±0.4V
FM/MW-version, 9kHz grid 531 - 1602kHz			1602kHz	5123	1	6.9V ±0.2V
			531kHz	check		1.1V ±0.4V
<b>LW</b> 153 - 279kHz			279kHz	5122		8V ±0.2V
			153kHz	check		1.1V ±0.4V
<b>MW</b> FM/MW/LW- version, 9kHz grid 531 - 1602kHz			1602kHz	5123		8V ±0.2V
			531kHz	check		1.1V ±0.4V
<b>FM IF</b>						
<b>FM</b>	10.7MHz, 45mV continuous wave	D		5119	2	0 ± 3 mV DC
<b>FM RF</b>						
<b>FM</b> 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)	108MHz	A	108MHz	2155	4	MAX
	87.5MHz (65.81MHz)	mod=1kHz Δf=±22.5kHz	87.5MHz (65.81MHz)	5131		
<b>VCO</b>						
<b>FM</b>	98MHz, 1mV continuous wave	A	98MHz	3142	3	152kHz ±1kHz <sup>1)</sup>
<b>AM IF</b>						
<b>MW</b>	450kHz connect pin 6 of IC 7101 (AM Osc.) with 3.3kΩ to Vcc	C		5111	5	
		C	see remark 2)	5112		
<b>AM AFC</b> <b>MW</b>		C	continuous wave V <sub>RF</sub> = 2mV	5114	2	0 ± 2 mV DC
<b>AM RF<sup>3)</sup></b>						
<b>MW<sup>4)</sup></b> FM/MW/LW- and FM/MW-version (9kHz grid)	1494kHz	B	1494kHz	2106	5	
	531 - 1602kHz		558kHz	5102		
<b>LW</b>	198kHz		198kHz	5103		
<b>MW</b> FM/AM-version, 10kHz grid 530 - 1700kHz	1500kHz	B	1500kHz	2106	5	
	560kHz		560kHz	5102		

Use Service Testprogram. By selecting the TUNER TEST test frequencies will be stored as preset frequencies automatically.

- 1) If sensitivity of frequency counter is too low adjust to max. channel separation (input signal: stereo left 90% + 9%, adjust output on right channel to minimum)
- 2) RC network serves for damping the IF-filter while adjusting the other one.
- 3) For AM RF adjustments the original frame antenna has to be used!
- 4) MW has to be aligned before LW.

↑ Repeat



MISCELLANEOUS

1101	2422 015 19376	SOCKET 2P CLICKFIT	USA only
1102	4822 267 10283	SOCKET COAX, IEC 75Ω	not USA
1103	4822 265 31184	JST CONNECTOR 2 POLE	
1120	4822 265 11515	FFC SOCKET, 8P	

CAPACITORS

2101	4822 126 13692	47pF	1%	63V	
2102	4822 126 13838	100nF	10%	50V	not USA
2103	5322 122 31647	1nF	10%	63V	
2104	5322 122 32531	100pF	5%	50V	
2105	4822 126 13838	100nF	10%	50V	USA only
2106	2020 800 00191	3-11pF TRIMCAP.,N450			
2107	4822 121 51319	1μF	20%	50V	
2120	4822 126 13689	18pF	1%	63V	
2124	5322 122 32654	22nF	10%	63V	
2125	2020 552 96199	560pF	1%	50V	

2126	5322 122 31863	330pF	5%	50V	
2127	4822 126 14076	220nF	20%	25V	
2128	4822 124 40248	10μF	20%	63V	
2129	4822 124 41584	100μF	20%	10V	
2130	5322 122 32654	22nF	10%	63V	

2131	4822 126 13482	470nF	20%	16V	
2132	4822 126 13482	470nF	20%	16V	
2133	4822 124 21913	1μF	20%	63V	
2134	4822 126 13188	15nF	5%	63V	not USA
2134	5322 122 32654	22nF	10%	63V	USA only

2135	4822 126 13188	15nF	5%	63V	not USA
2135	5322 122 32654	22nF	10%	63V	USA only
2136	4822 126 14076	220nF	20%	25V	
2137	4822 126 14076	220nF	20%	25V	
2138	4822 124 22652	2,2μF	20%	50V	

2139	4822 126 14236	15pF	5%	50V	
2140	4822 126 13695	82pF	1%	63V	
2141	4822 126 13838	100nF	10%	50V	
2143	4822 126 14076	220nF	20%	25V	
2144	4822 124 21913	1μF	20%	63V	

2145	4822 122 33575	220pF	5%	50V	
2146	4822 122 33575	220pF	5%	50V	
2147	4822 122 33575	220pF	5%	50V	
2148	4822 122 33127	2,2nF	10%	63V	
2149	5322 122 32659	33pF	5%	50V	RDS only

2150	4822 126 13838	100nF	10%	50V	
2152	4822 126 12105	33nF	5%	63V	not for East Europe
2152	5322 116 80853	560pF	5%	63V	for East Europe only
2153	4822 126 13486	15pF	2%	63V	not for East Europe
2153	4822 122 33926	12pF	2%	50V	for East Europe only

2155	2020 800 00191	3-11pF TRIMCAP.,N450			
2159	5322 122 32659	33pF	5%	50V	
2164	4822 126 13482	470nF	20%	16V	
2165	4822 126 13838	100nF	10%	50V	
2166	5322 122 31647	1nF	10%	63V	

2167	4822 122 33926	12pF	5%	50V	
2169	4822 122 33127	2,2nF	10%	63V	RDS only

RESISTORS

3101	4822 051 20333	33kΩ	5%	0,1W	
3102	4822 117 10837	100kΩ	1%	0,1W	
3103	4822 051 20822	8,2kΩ	5%	0,1W	
3104	4822 117 13577	330Ω	1%	0,1W	
3105	4822 117 11503	220Ω	5%	0,1W	

3132	4822 051 20479	47Ω	5%	0,1W	
3134	4822 051 20223	22kΩ	5%	0,1W	
3141	4822 117 11148	56kΩ	1%	0,1W	
3142	4822 100 12159	TRIMPOT. 100kΩ			

RESISTORS

3143	4822 051 20223	22kΩ	5%	0,1W	RDS only
3144	4822 051 10102	1kΩ	2%	0,25W	RDS only
3145	4822 117 11449	2,2kΩ	1%	0,1W	
3146	4822 051 20229	22Ω	5%	0,1W	
3152	4822 051 20471	470Ω	5%	0,1W	

3153	4822 051 20471	470Ω	5%	0,1W	
3154	4822 117 13577	330Ω	1%	0,1W	
3155	4822 117 11503	220Ω	5%	0,1W	
3156	4822 117 10837	100kΩ	1%	0,1W	
3157	4822 117 10837	100kΩ	1%	0,1W	

3158	4822 051 20471	470Ω	5%	0,1W	
3159	4822 051 20471	470Ω	5%	0,1W	
3160	4822 051 20471	470Ω	5%	0,1W	
3161	4822 051 20223	22kΩ	5%	0,1W	
3167	4822 051 20121	120Ω	5%	0,1W	

3168	4822 051 20121	120Ω	5%	0,1W	
3169	4822 051 20154	150kΩ	5%	0,1W	
3170	4822 117 10837	100kΩ	1%	0,1W	
3172	4822 051 20562	5,6kΩ	5%	0,1W	
3176	4822 051 20333	33kΩ	5%	0,1W	RDS only

3181	4822 051 10102	1kΩ	2%	0,25W	
4103	4822 051 20008	CHIP JUMPER 0805			
4106	4822 051 20008	CHIP JUMPER 0805			
4107	4822 051 20008	CHIP JUMPER 0805			
4108	4822 051 20008	CHIP JUMPER 0805			

COILS

5102	4822 157 71634	RF-COIL MW			
5109	4822 242 70665	FM-IF FILTER 10,7MHz			
5110	4822 242 70665	FM-IF FILTER 10,7MHz			
5111	2422 549 44023	AM-IF FILTER 450kHz			
5112	4822 157 70302	AM-IF FILTER 450kHz			

5114	4822 157 70302	AM-IF FILTER 450kHz			
5119	4822 157 11443	DISCRIMINATOR COIL			
5121	4822 242 10261	QUARTZ 75kHz			
5123	2422 549 44108	RF-COIL, AM-OSCILLATOR			
5130	4822 157 11843	RF COIL 1,5 TURNS			

5131	4822 157 11843	RF COIL 1,5 TURNS			
------	----------------	-------------------	--	--	--

DIODES

6103	5322 130 34337	BAV99			
6105	4822 130 83075	HN1V02H			
6106	4822 130 83757	BAS216			
6107	9340 386 90115	BZX284-C11			
6120	4822 130 83757	BAS216			

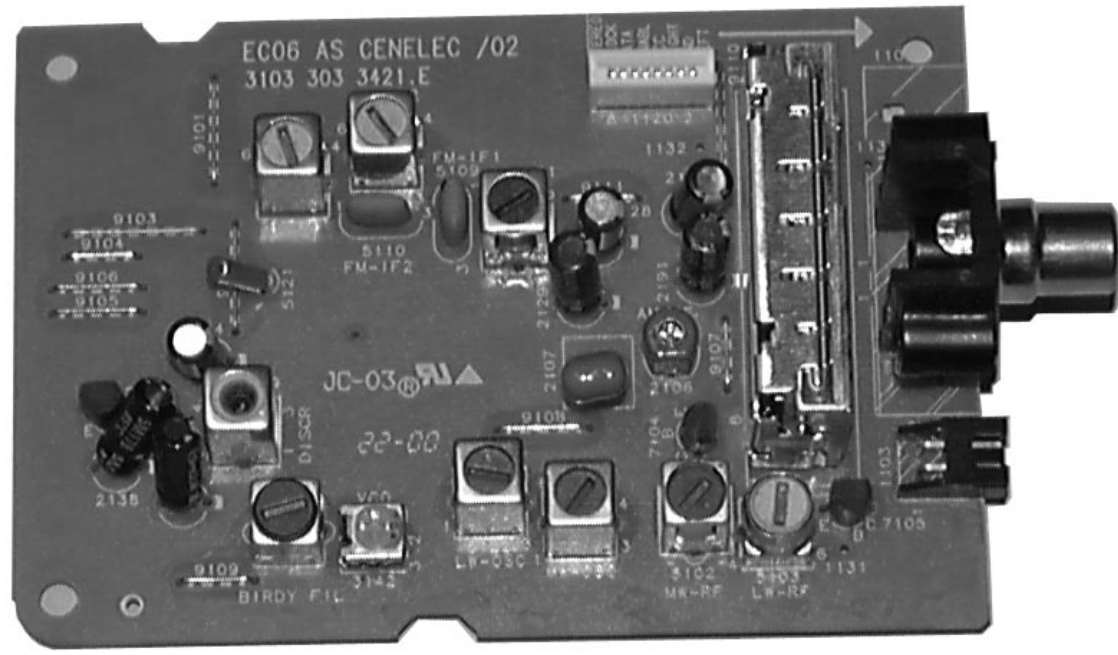
6130	4822 130 82833	1SV228			
6131	4822 130 82833	1SV228			

TRANSISTORS

7102	4822 130 42131	BF550			
7103	5322 130 42756	BC857C			RDS only
7111	5322 130 42755	BC847C			
7112	4822 130 44503	BC547C			

INTEGRATED CIRCUITS

7101	9351 740 80557	TEA5757H/V1, RADIO IC			
------	----------------	-----------------------	--	--	--



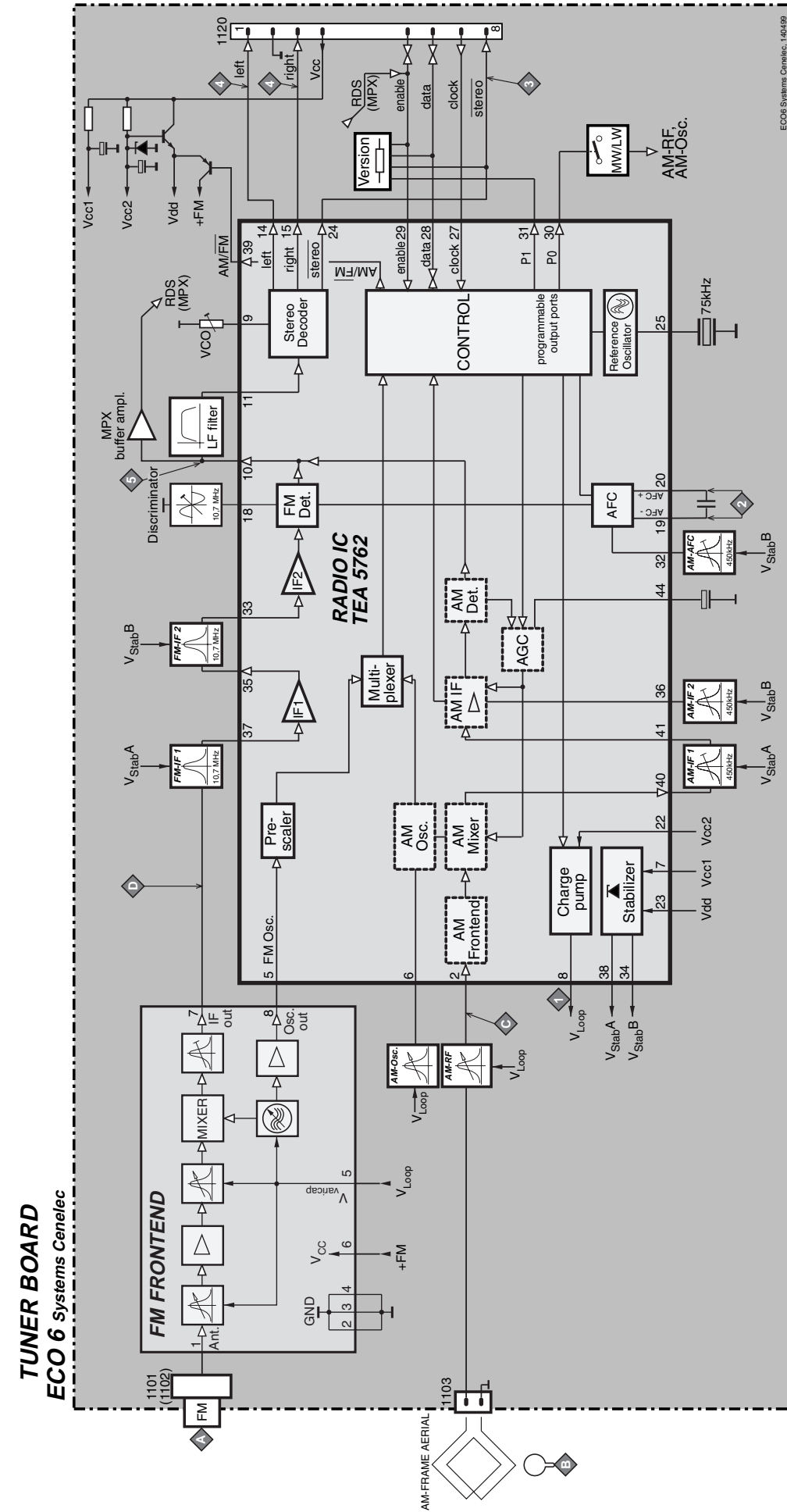
# ECO6 Tuner Board

version: **SYSTEMS CENELEC**

## TABLE OF CONTENTS

Blockdiagram.....	7B-1
Schematic Diagram.....	7B-2
Component Layout.....	7B-3
Adjustment table.....	7B-3
Electrical Partslist.....	7B-4

## BLOCK DIAGRAM



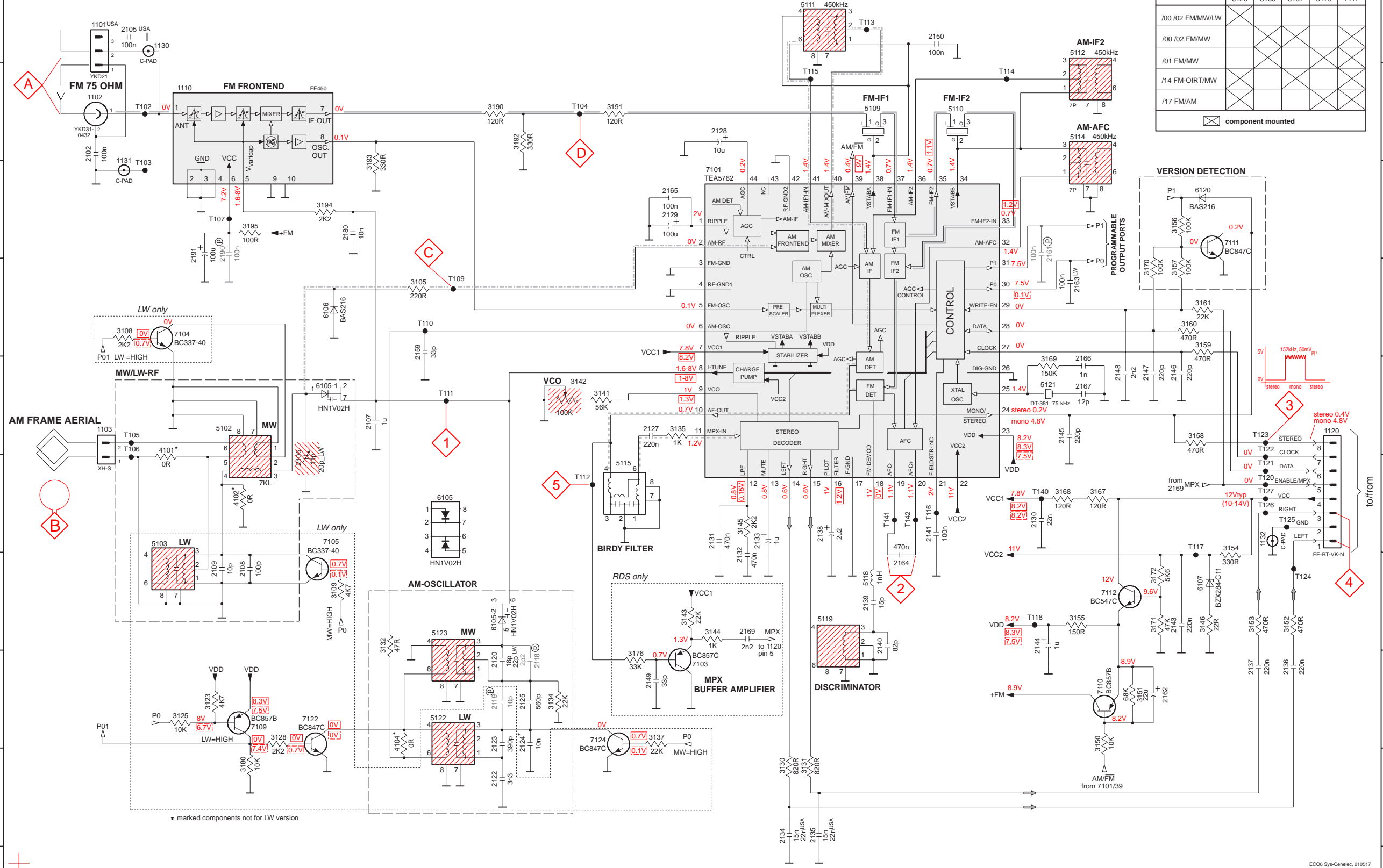
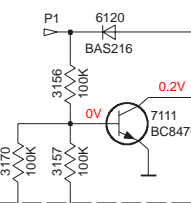
# TUNER BOARD ECO6 / SYSTEMS-CENELEC

## VERSION PROGRAMMING COMPONENTS

VERSION	6120	3156	3157	3170	7111
/00 /02 FM/MW/LW					
/00 /02 FM/MW					
/01 FM/MW					
/14 FM-OIRT/MW					
/17 FM/AM					

☒ component mounted

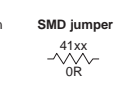
## VERSION DETECTION



- 1101 A2
- 1102 B1
- 1103 E5
- 1110 B2
- 1120 E4
- 1130 A2
- 1131 C2
- 1132 F13
- 1132 B1
- 2105 A2
- 2106 E3
- 2107 E4
- 2108 G3
- 2109 G3
- 2118 H6
- 2119 H6
- 2120 H6
- 2122 I6
- 2123 H6
- 2124 H6
- 2125 H6
- 2127 E7
- 2128 B8
- 2129 C7
- 2130 F11
- 2131 F8
- 2132 F8
- 2133 F8
- 2134 I8
- 2135 I9
- 2136 H14
- 2137 H13
- 2138 F9
- 2139 G9
- 2140 G9
- 2141 F10
- 2143 G12
- 2144 G11
- 2145 E11
- 2146 E12
- 2147 E12
- 2148 E12
- 2149 H7
- 2150 A10
- 2159 D5
- 2161 C11
- 2162 H12
- 2163 D11
- 2164 G10
- 2165 C7
- 2166 E11
- 2167 E11
- 2169 G8
- 2180 C4
- 2190 C3
- 2191 C3
- 3105 D5
- 3108 D2
- 3109 G4
- 3123 H3
- 3125 H2
- 3128 H3
- 3130 I9
- 3131 I9
- 3132 G4
- 3134 H6
- 3135 E7
- 3141 E7
- 3142 E6
- 3143 G7
- 3144 G8
- 3145 F8
- 3146 G13
- 3150 H12
- 3151 H12
- 3152 G14
- 3153 G13
- 3154 F13
- 3155 G12
- 3156 C12
- 3157 D12
- 3158 E13
- 3159 D13
- 3160 D13
- 3161 D13
- 3167 F12
- 3168 F11
- 3169 E11
- 3170 D12
- 3171 G12
- 3172 G12
- 3176 H7
- 3180 I3
- 3190 B6
- 3191 B7
- 3192 B6
- 3193 B4
- 3194 C4
- 3195 C3
- 4101 E2
- 4102 F3
- 4104 H5
- 5102 E3
- 5103 F2
- 5109 B9
- 5110 B10
- 5111 A9
- 5112 A11
- 5114 B11
- 5115 E7
- 5118 G9
- 5119 G9
- 5121 E11
- 5122 H5
- 5123 G5
- 6105-1 E4
- 6105-2 G6
- 6106 D4
- 6107 G13
- 6120 C13
- 7101 C8
- 7103 H8
- 7104 D2
- 7105 F4
- 7109 H3
- 7110 H12
- 7111 C13
- 7112 G12
- 7122 H4
- 7124 H7
- T102 B2
- T103 B2
- T104 B6
- T105 B6
- T106 B6
- T107 B6
- T109 C6
- T110 C6
- T111 C6
- T112 C6
- T113 C6
- T114 C6
- T115 C6
- T120 C6
- T121 C6
- T122 C6
- T123 C6
- T124 C6
- T125 C6
- T126 C6
- T127 C6
- T128 C6
- T129 C6
- T130 C6
- T131 C6
- T132 C6
- T133 C6
- T134 C6
- T135 C6
- T136 C6
- T137 C6
- T138 C6
- T139 C6
- T140 C6
- T141 C6
- T142 C6
- T143 C6
- T144 C6
- T145 C6
- T146 C6
- T147 C6
- T148 C6
- T149 C6
- T150 C6

### LEGEND

- \*... only assembled in FM/AM-version
- Ⓢ... for provision only
- USA ... for USA version only
- LW ... for LW version only



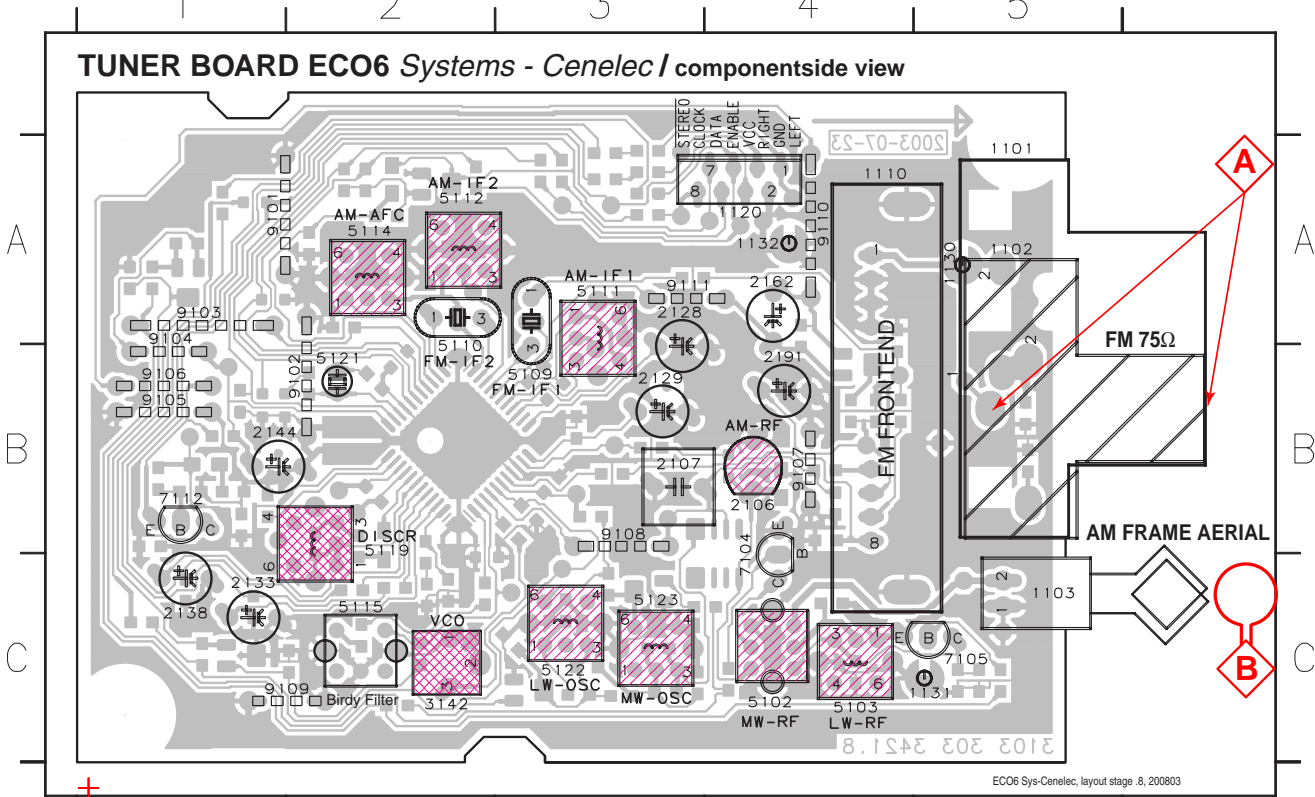
- ...V FM mode stereo
- ...V MW mode
- ...V LW mode
- voltages measured while set is tuned to a strong transmitter

### Signal path

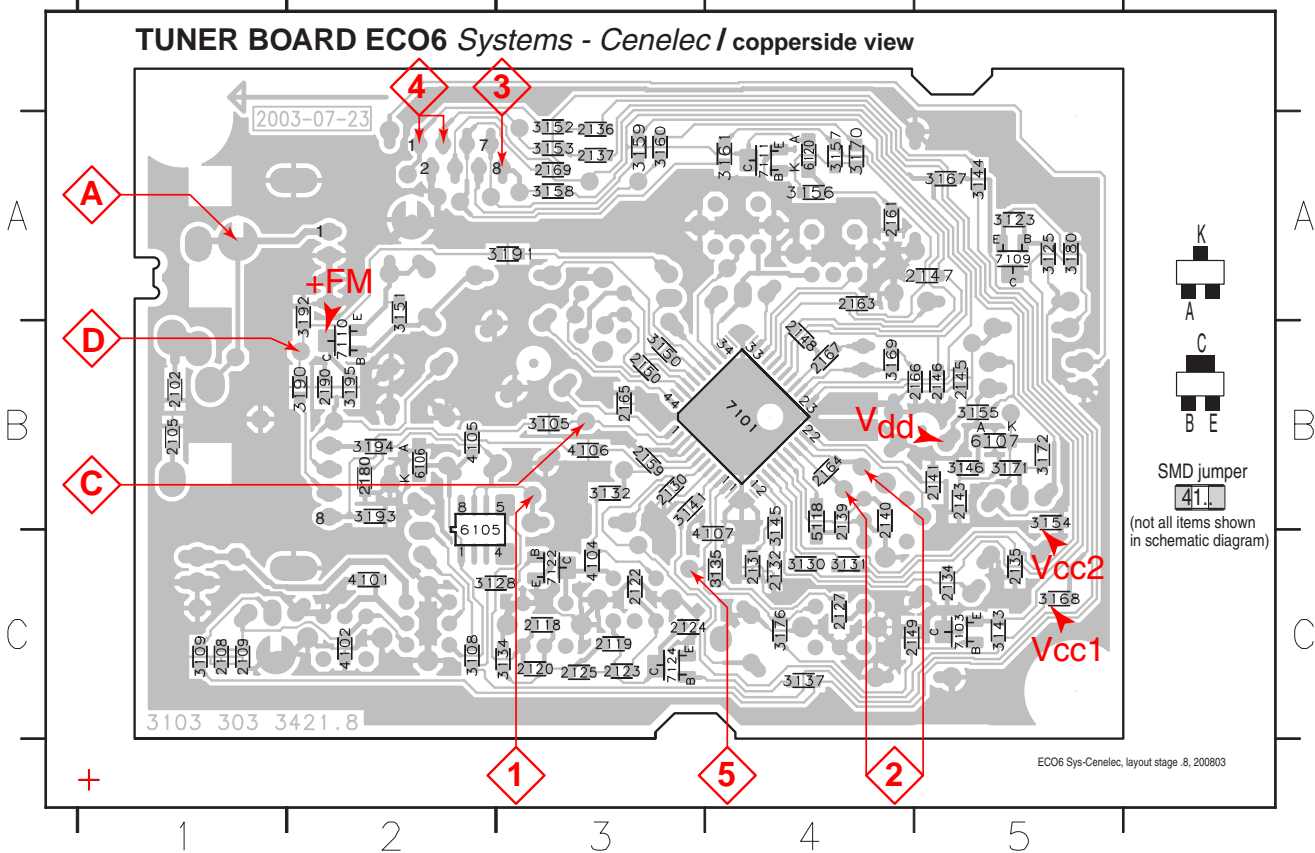
- FM
- - - AM
- - - MPX (Audio Frequency)
- ⇒ AF - left/right



1101 B5 1110 B4 1131 C5 2107 B3 2133 C1 2162 A4 5102 C4 5110 A2 5114 A2 5121 B2 7104 C4 9101 A2 9104 B1 9107 B4 9110 A4  
 1102 B5 1120 A4 1132 A4 2128 A3 2138 B1 2191 B4 5103 C4 5111 A3 5115 C2 5122 C3 7105 C5 9102 B2 9105 B1 9108 B3 9111 A3  
 1103 C5 1130 A5 2106 B4 2129 B3 2144 B1 3142 C2 5109 B3 5112 A2 5119 B2 5123 C3 7112 B1 9103 A1 9106 B1 9109 C2



2102 B1 2120 C3 2130 B3 2137 A3 2146 B5 2161 A4 2169 A3 3123 A5 3134 C3 3145 C4 3154 B5 3160 A3 3171 B5 3192 A2 4104 C3 6106 B2 7110 B2  
 2105 B1 2122 C3 2131 C4 2139 B4 2147 A5 2163 A4 2180 B2 3125 A5 3135 C4 3146 B5 3155 B5 3161 A4 3172 B5 3193 B2 4105 B2 6107 B5 7111 A4  
 2108 C1 2123 C3 2132 C4 2140 B4 2148 B4 2164 B4 2190 B2 3128 C2 3137 C4 3150 B3 3156 A4 3167 A5 3176 C4 3194 B2 4106 B3 6120 A4 7122 C3  
 2109 C1 2124 C3 2134 C5 2141 B5 2149 C4 2165 B3 3105 B3 3130 C4 3141 B3 3151 A2 3157 A4 3168 C5 3180 A5 3195 B2 4107 C4 7101 B4 7124 C3  
 2118 C3 2125 C3 2135 C5 2143 B5 2150 B3 2166 B5 3108 C2 3131 C4 3143 C5 3152 A3 3158 A3 3169 B4 3190 B2 4101 C2 5118 C4 7103 C5  
 2119 C3 2127 C4 2136 A3 2145 B5 2159 B3 2167 B4 3109 C1 3132 B3 3144 A5 3153 A3 3159 A3 3170 A4 3191 A3 4102 C2 6105 B2 7109 A5



These assembly drawings show a summary of all possible versions.  
 For components used in a specific version see schematic diagram respectively partslist.

**TUNER ADJUSTMENT TABLE ( ECO6 Cenelec FM/MW - and FM/MW/LW - versions with AM-frame aerial )**

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
<b>VARICAP ALIGNMENT</b>						
<b>FM</b> 87.5 - 108MHz (50kHz grid)			108MHz	check		8V ±1.2V
			87.5MHz	check		1.6V ±0.5V
<b>MW</b> 531 - 1602kHz (9kHz grid)			1602kHz	5123	1	8V ±0.2V 3-band 6.9V ±0.2V 2-band
			531kHz	check		1.1V ±0.4V
<b>LW</b> 153 - 279kHz (3kHz grid)			279kHz	5122		8V ±0.2V
			153kHz	check		1.1V ±0.4V
<b>FM - IF</b>						
<b>FM</b>	10.7MHz, 45mV continuous wave	D		5119	2	0mV ±3mV
<b>FM - VCO</b>						
<b>FM</b>	98MHz, 1mV continuous wave	A	98MHz	3142	3	152kHz ±1kHz <sup>1)</sup>
<b>FM RF (channel separation)</b> Note: The FM-frontend unit has already been adjusted by the factory and needs therefore no further adjustments for service purposes.						
<b>FM</b>	98MHz, 1mV 90% Left + 9% pilot mod=1kHz	A	98MHz	IF coil inside FM frontend 1110	4	right channel min.
<b>AM IF</b>						
<b>MW</b>	450kHz  connect pin 6 of IC 7101 (AM Osc.) with 3.3kΩ to Vcc	C		5111	5	
<b>AM AFC</b> <b>MW</b>	continuous wave V <sub>RF</sub> = 2mV	C		5114	2	0mV ±2mV
<b>AM RF <sup>3)</sup></b>						
<b>MW</b>	1494kHz	B	1494kHz	2106	5	
	558kHz					
<b>LW</b>	198kHz	C	198kHz	5103		

Use Service Testprogram. By selecting the TUNER TEST test frequencies will be stored as preset frequencies automatically.

- <sup>1)</sup> If sensitivity of frequency counter is too low adjust to max. channel separation (input signal: stereo left 90% + 9%, adjust output on right channel to minimum)
- <sup>2)</sup> RC network serves for damping the IF-filter while adjusting the other one.
- <sup>3)</sup> For AM RF adjustments the original frame antenna has to be used!  
 MW has to be aligned before LW.

↑ Repeat



MISCELLANEOUS

1101	2422 015 19376	SOCKET CLICKFIT 2P	USA only
1102	4822 267 10283	SOCKET COAX, IEC 75Ω	not USA
1103	4822 265 31184	JST CONNECTOR, 2 POLE	
1110	2422 542 90071	FM FRONTEND	
1120	4822 265 11515	FFC SOCKET, 8P	

CAPACITORS

2102©	4822 126 13838	100nF 10%	50V	not USA
2105©	4822 126 13838	100nF 10%	50V	USA only
2106	2020 800 00204	TRIMCAP. 4,2 - 20pF, N750		LW only
2106	2020 800 00191	TRIMCAP. 3 - 11pF, N450		FM/AM only
2107	4822 121 51319	1μF 20%	50V	
2108©	5322 122 32531	100pF 5%	50V	LW only
2109©	5322 122 32448	10pF 5%	50V	LW only
2120©	4822 126 13689	18pF 1%	63V	FM/AM only
2120©	5322 122 32658	22pF 5%	50V	LW only
2122©	4822 122 33891	3,3nF 10%	63V	LW only
2123©	2020 552 93494	390pF 1%	50V	LW only
2124©	4822 122 33177	10nF 20%	50V	FM/AM only
2125©	2020 552 96199	560pF 1%	50V	
2127©	4822 126 14076	220nF 20%	25V	
2128	4822 124 40248	10μF 20%	63V	
2129	4822 124 41584	100μF 20%	10V	
2130©	5322 122 32654	22nF 10%	63V	
2131©	4822 126 13482	470nF 20%	16V	
2132©	4822 126 13482	470nF 20%	16V	
2133	4822 124 21913	1μF 20%	63V	
2134©	3198 017 31530	15nF 10%	50V	not USA
2134©	5322 122 32654	22nF 10%	63V	USA only
2135©	3198 017 31530	15nF 10%	50V	not USA
2135©	3198 017 32230	22nF 10%	25V	USA only
2136©	4822 126 14076	220nF 20%	25V	
2137©	4822 126 14076	220nF 20%	25V	
2138	4822 124 22652	2,2μF 20%	50V	
2139©	4822 126 14236	15pF 5%	50V	
2140©	4822 126 13695	82pF 1%	63V	
2141©	4822 126 13838	100nF 10%	50V	
2143©	4822 126 14076	220nF 20%	25V	
2144	4822 124 21913	1μF 20%	63V	
2145©	4822 122 33575	220pF 5%	50V	
2146©	4822 122 33575	220pF 5%	50V	
2147©	4822 122 33575	220pF 5%	50V	
2148©	4822 122 33127	2,2nF 10%	63V	
2149©	5322 122 32659	33pF 5%	50V	RDS only
2150©	4822 126 13838	100nF 10%	50V	
2159©	5322 122 31151	22μF 20%	50V	
2163©	4822 126 13838	100nF 10%	50V	LW only
2164©	4822 126 13482	470nF 20%	16V	
2165©	4822 126 13838	100nF 10%	50V	
2166©	5322 122 31647	1nF 10%	63V	
2167©	4822 122 33926	12pF 5%	50V	
2169©	4822 122 33127	2,2nF 10%	63V	RDS only
2180©	3198 017 31030	10nF 10%	50V	
2190©	4822 126 13838	100nF 10%	50V	
2191	4822 124 40178	100μF 20%	10V	

RESISTORS

3105©	4822 117 11503	220Ω 5%	0,1W	
3108©	4822 117 11449	2,2kΩ 1%	0,1W	LW only
3109©	4822 051 20472	4,7kΩ 5%	0,1W	LW only
3123©	4822 051 20472	4,7kΩ 5%	0,1W	LW only
3125©	4822 117 10833	10kΩ 1%	0,1W	LW only

RESISTORS

3128©	4822 117 11449	2,2kΩ 1%	0,1W	LW only
3130©	3198 021 38210	820Ω 5%	0,06W	
3131©	3198 021 38210	820Ω 5%	0,06W	
3132©	4822 051 20479	47Ω 5%	0,1W	
3134©	4822 051 20223	22kΩ 5%	0,1W	
3135©	3198 021 31020	1kΩ 5%	0,06W	
3137©	4822 051 20223	22kΩ 5%	0,1W	LW only
3141©	4822 117 11148	56kΩ 1%	0,1W	
3142	4822 100 12159	TRIMPOT. 100kΩ		
3143©	4822 051 20223	22kΩ 5%	0,1W	RDS only
3144©	4822 051 10102	1kΩ 2%	0,25W	RDS only
3145©	4822 117 11449	2,2kΩ 1%	0,1W	
3146©	4822 051 20229	22Ω 5%	0,1W	
3150©	4822 117 10833	10kΩ 1%	0,1W	
3151©	4822 051 20683	68kΩ 5%	0,1W	
3152©	4822 051 20471	470Ω 5%	0,1W	
3153©	4822 051 20471	470Ω 5%	0,1W	
3154©	4822 117 13577	330Ω 1%	0,1W	
3155©	4822 117 10353	150Ω 5%	0,1W	
3156©	4822 117 10837	100kΩ 1%	0,1W	
3157©	4822 117 10837	100kΩ 1%	0,1W	
3158©	4822 051 20471	470Ω 5%	0,1W	
3159©	4822 051 20471	470Ω 5%	0,1W	
3160©	4822 051 20471	470Ω 5%	0,1W	
3161©	4822 051 20223	22kΩ 5%	0,1W	
3167©	4822 051 20121	120Ω 5%	0,1W	
3168©	4822 051 20121	120Ω 5%	0,1W	
3169©	4822 051 20154	150kΩ 5%	0,1W	
3170©	4822 117 10837	100kΩ 1%	0,1W	
3171©	4822 117 10834	47kΩ 1%	0,1W	
3172©	4822 051 20562	5,6kΩ 5%	0,1W	
3176©	4822 051 20333	33kΩ 5%	0,1W	RDS only
3180©	4822 117 10833	10kΩ 1%	0,1W	LW only
3190©	4822 051 20121	120Ω 5%	0,1W	
3191©	4822 051 20121	120Ω 5%	0,1W	
3192©	4822 117 13577	330Ω 1%	0,1W	
3193©	4822 117 13577	330Ω 1%	0,1W	
3194©	4822 117 11449	2,2kΩ 1%	0,1W	
3195©	4822 051 20101	100Ω 5%	0,1W	
4101©	4822 051 20008	CHIP JUMPER 0805		FM/AM only
4102©	4822 051 20008	CHIP JUMPER 0805		FM/AM only
4104©	4822 051 20008	CHIP JUMPER 0805		FM/AM only
4105©	4822 051 20008	CHIP JUMPER 0805		
4106©	4822 051 20008	CHIP JUMPER 0805		
4107©	4822 051 20008	CHIP JUMPER 0805		

COILS

5102	4822 157 71634	RF-COIL MW	
5103	2422 549 44107	RF-COIL LW	LW only
5109	4822 157 71639	FM-IF FILTER 10,7MHz	
5110	4822 242 70665	FM-IF FILTER 10,7MHz	
5111	2422 549 44023	AM-IF FILTER 450kHz	
5112	4822 157 70302	AM-IF FILTER 450kHz	
5114	4822 157 70302	AM-IF FILTER 450kHz	
5115	4822 157 71636	ANTI BIRDY FILTER	
5118©	2422 535 95881	100nH	
5119	4822 157 11443	DISCRIMINATOR COIL	
5121	4822 242 10261	QUARTZ 75kHz	
5122	2422 549 44108	RF-COIL, LW-OSCILLATOR	LW only
5123	2422 549 44108	RF-COIL, MW-OSCILLATOR	

DIODES

6105©	4822 130 83075	HN1V02H	
6106©	4822 130 83757	BAS216	
6107©	9340 386 90115	BZX284-C11	
6120©	4822 130 83757	BAS216	

TRANSISTORS

7103©	5322 130 42756	BC857C	RDS only
7104	9322 003 64676	TBC337-40	LW only
7105	9322 003 64676	TBC337-40	LW only
7109©	4822 130 60373	BC856B	LW only
7110©	4822 130 60373	BC856B	
7111©	5322 130 42755	BC847C	
7112	4822 130 44503	BC547C	
7122©	5322 130 42755	BC847C	LW only
7124©	5322 130 42755	BC847C	LW only

INTEGRATED CIRCUITS

7101	4822 209 90315	TEA5762H/V1, RADIO IC	
------	----------------	-----------------------	--

# POWER BOARD

## TABLE OF CONTENTS

Brief Introduction .....	8-1
AC Socket PCB - Circuit Diagram & Layout.....	8-1
Power PCB - Layout.....	8-2
Power PCB - Circuit Diagram.....	8-3
Electrical Parts List.....	8-4

## Brief introduction of the Mains Board

ECO Power

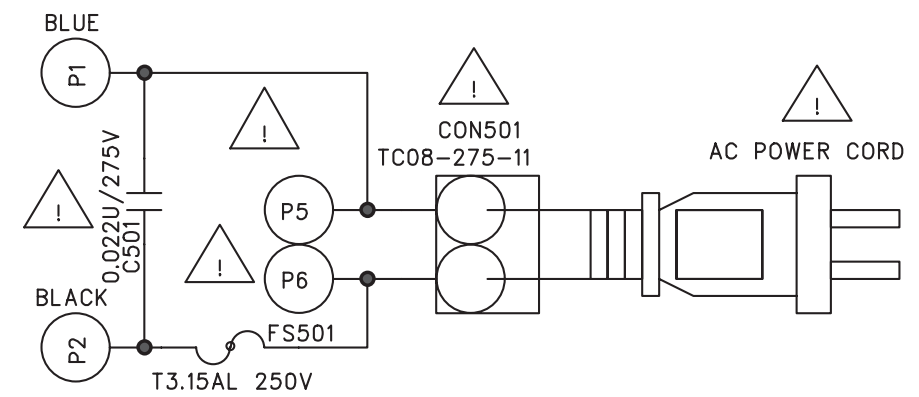
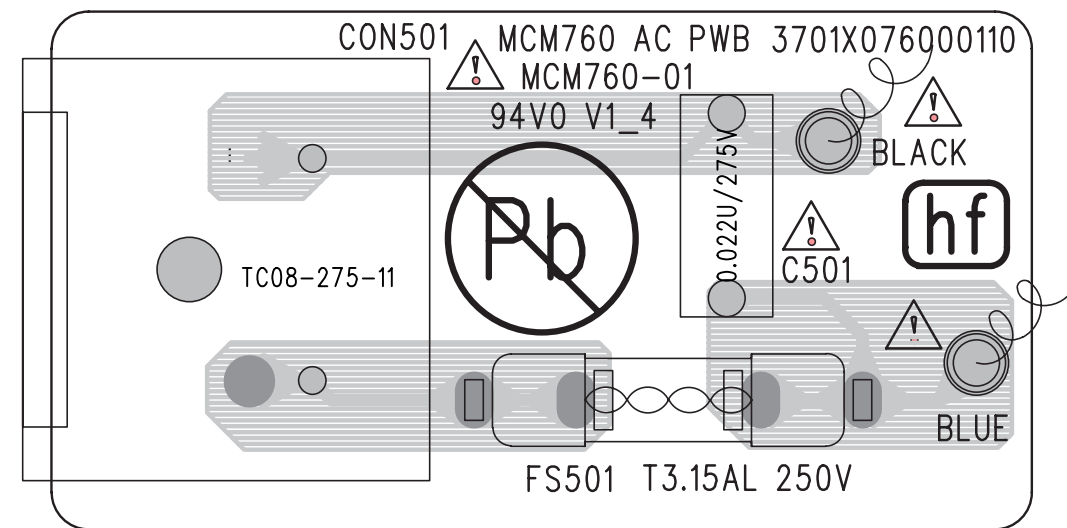
Standby Transformer 5203 provides the LPS supply to control the relay 1210, cutting of the Mains supply to the Mains transformer during the ECO Power (standby) mode.

The Mains transformer provides the following:

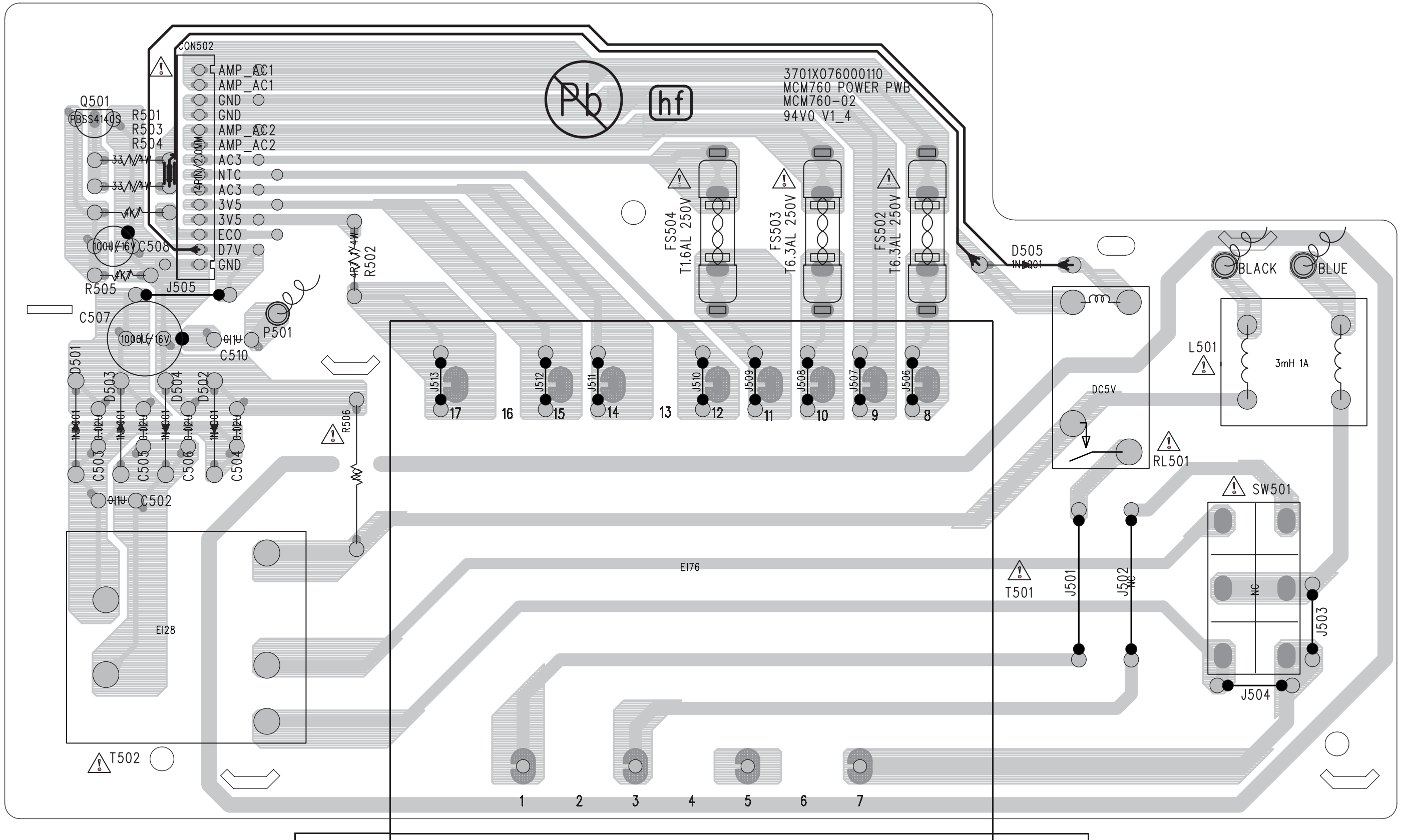
-5V6\_ECO for Low Power Supply

--+A, +A/2 and +B to the Combi board

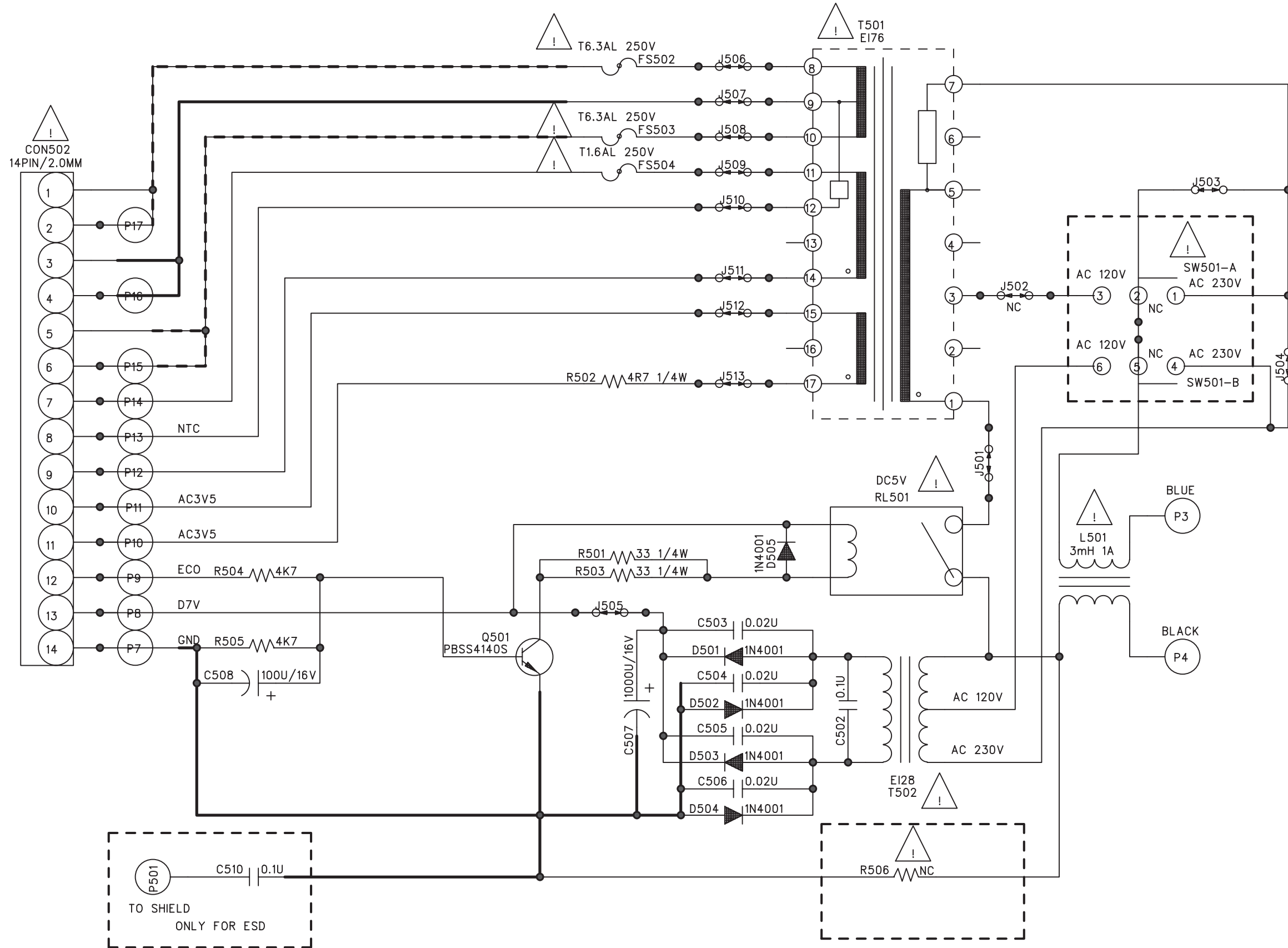
## AC SOCKET PCB- CIRCUIT DIAGRAM & LAYOUT



# PCB LAYOUT - POWER BOARD



# CIRCUIT DIAGRAM - POWER BOARD



**ELECTRICAL PARTS LIST - POWER BOARD**

CON501△ 9940 000 03327 AC POWER SOCKET 2PIN  
FS501 △ 9940 000 05593 FUSE S506 T3.15AL 250V 5X20MM  
FS502 △ 9940 000 05594 FUSE S506 T6.3AL 250V 5X20MM  
FS503 △ 9940 000 05594 FUSE S506 T6.3AL 250V 5X20MM  
FS504 △ 9940 000 04228 FUSE S506 T1.6AL 250V

L501 9940 000 02657 AC LINE FILTER 3MH 1A  
Q501 9940 000 05651 TRANSISTOR PBSS4140S NPN  
RL501 9940 000 05597 RELAY DC5V AC10A  
T501 △ 9940 000 05669 TRASFO. EI-76X50 AC230V /05/12/61  
T501 △ 9940 000 05596 TRASFO. EI-76X50 AC120V /37

T502 △ 9940 000 05668 TRASFO. EI-28 AC230V /05/12/61  
T502 △ 9940 000 05595 TRASFO. EI-28 AC120V /37

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

---

# CASSETTE BOARD

---

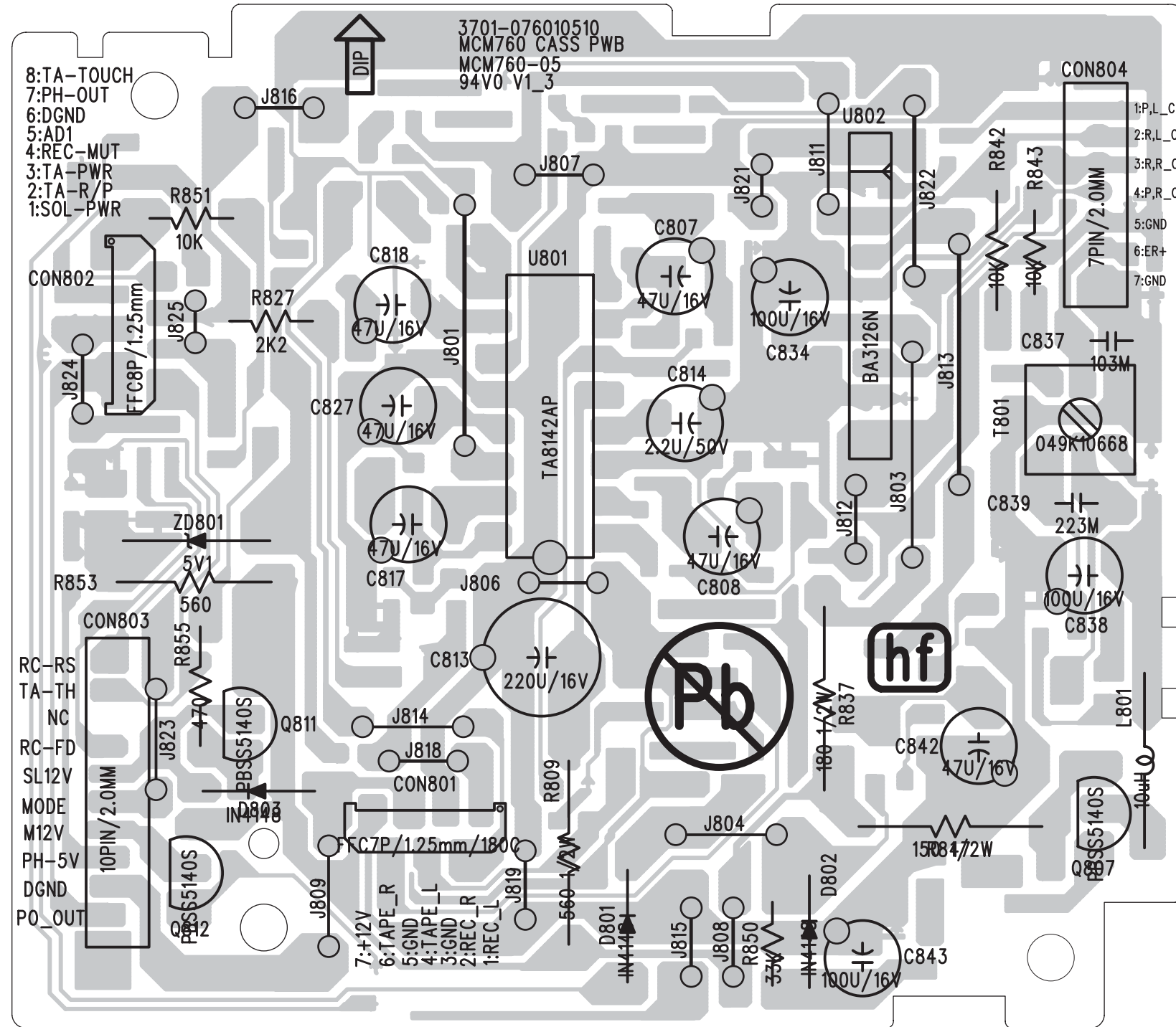
**The board is not intended to be repaired on component level.  
Circuit Diagram and Printed Circuit Board drawings  
are published for orientation only.**

**In case of defects please replace the entire board.  
The board can be ordered with codenumber "9940 000 05592" for /37.  
"9940 000 05684" for /05/12/61.**

## TABLE OF CONTENTS

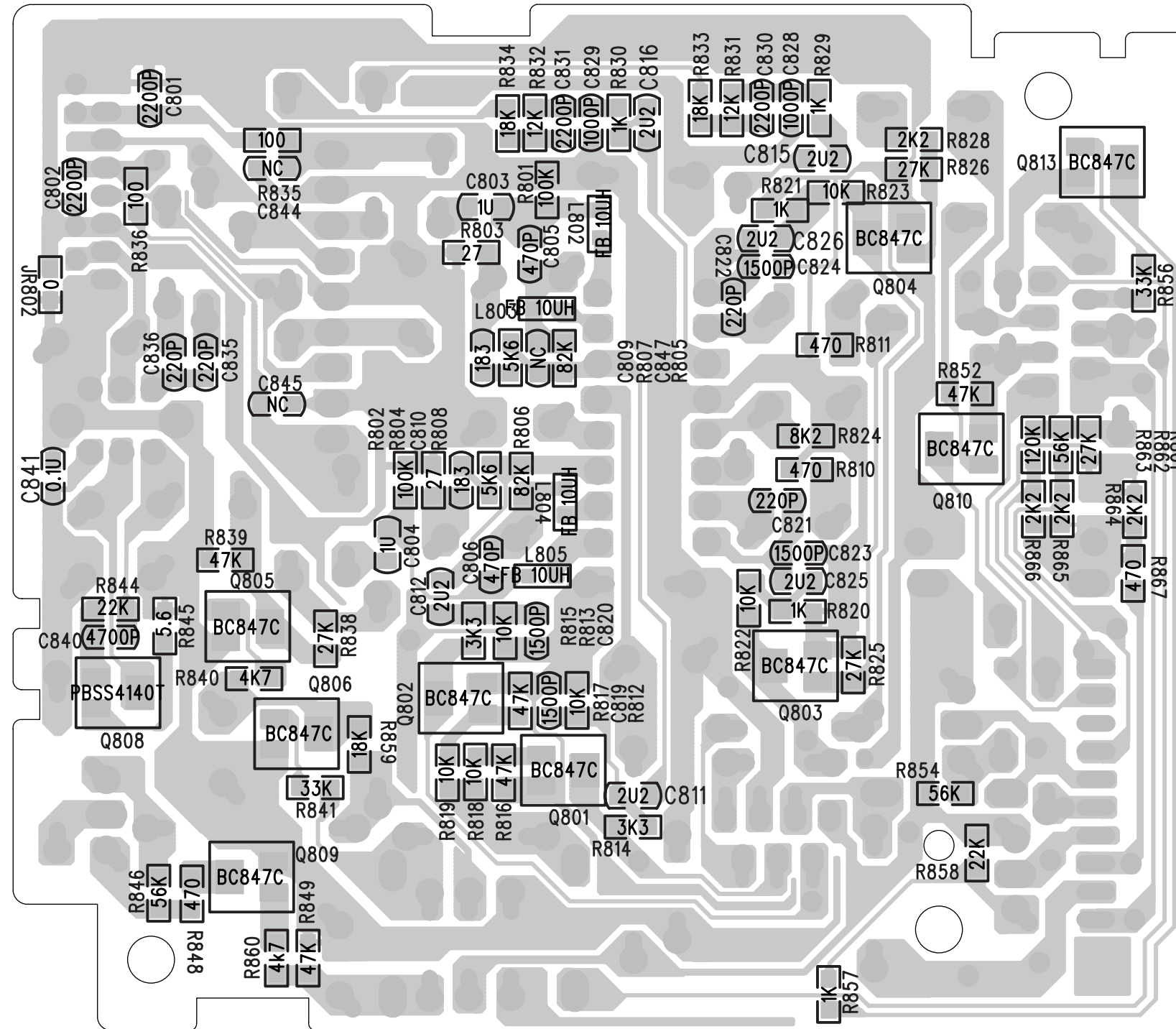
Cassette PCB - Layout Top View .....	9-2
Cassette PCB - Layout Bottom View .....	9-3
Cassette PCB - Circuit Diagram .....	9-4

# PCB LAYOUT - CASSETTE BOARD (TOP VIEW)



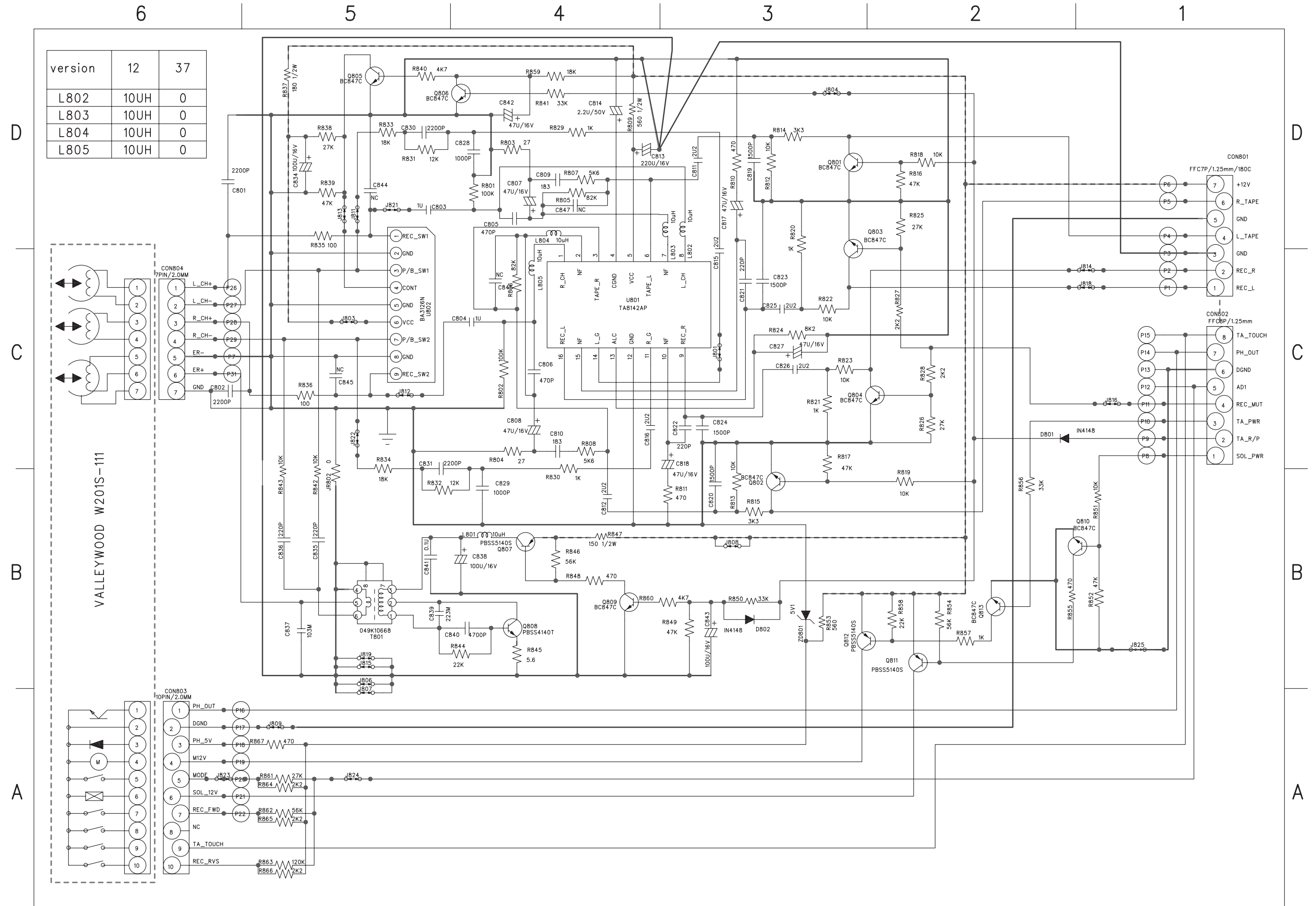


# PCB LAYOUT - CASSETTE BOARD (BOTTOM VIEW)





# CIRCUIT DIAGRAM - DISPLAY BOARD



---

# CD BOARD

---

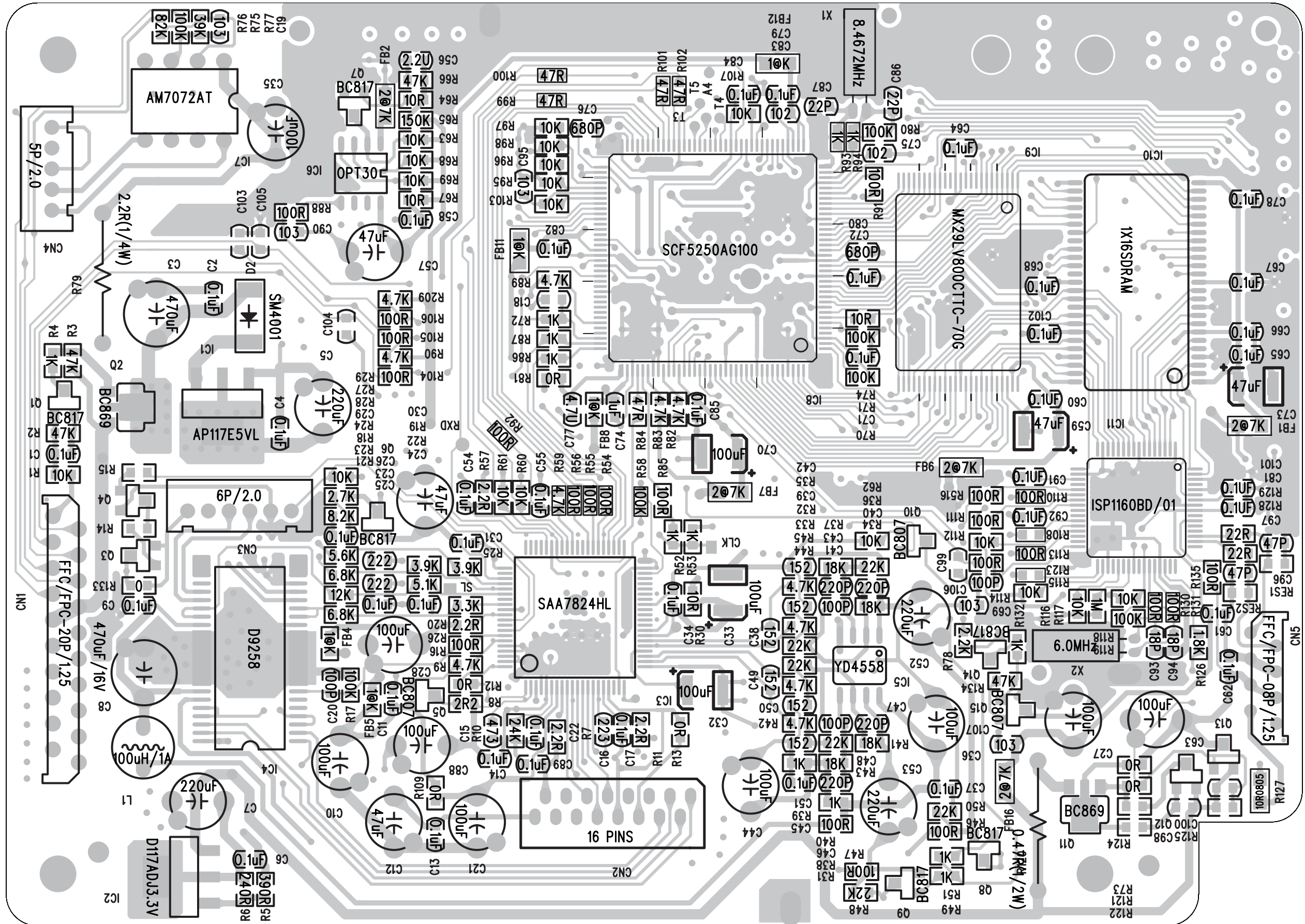
**The board is not intended to be repaired on component level.  
Circuit Diagram and Printed Circuit Board drawings  
are published for orientation only.**

**In case of defects please replace the entire board.  
The board can be ordered with codenumber "9940 000 05584" for /37.  
"9940 000 05685" for /05/12/61.**

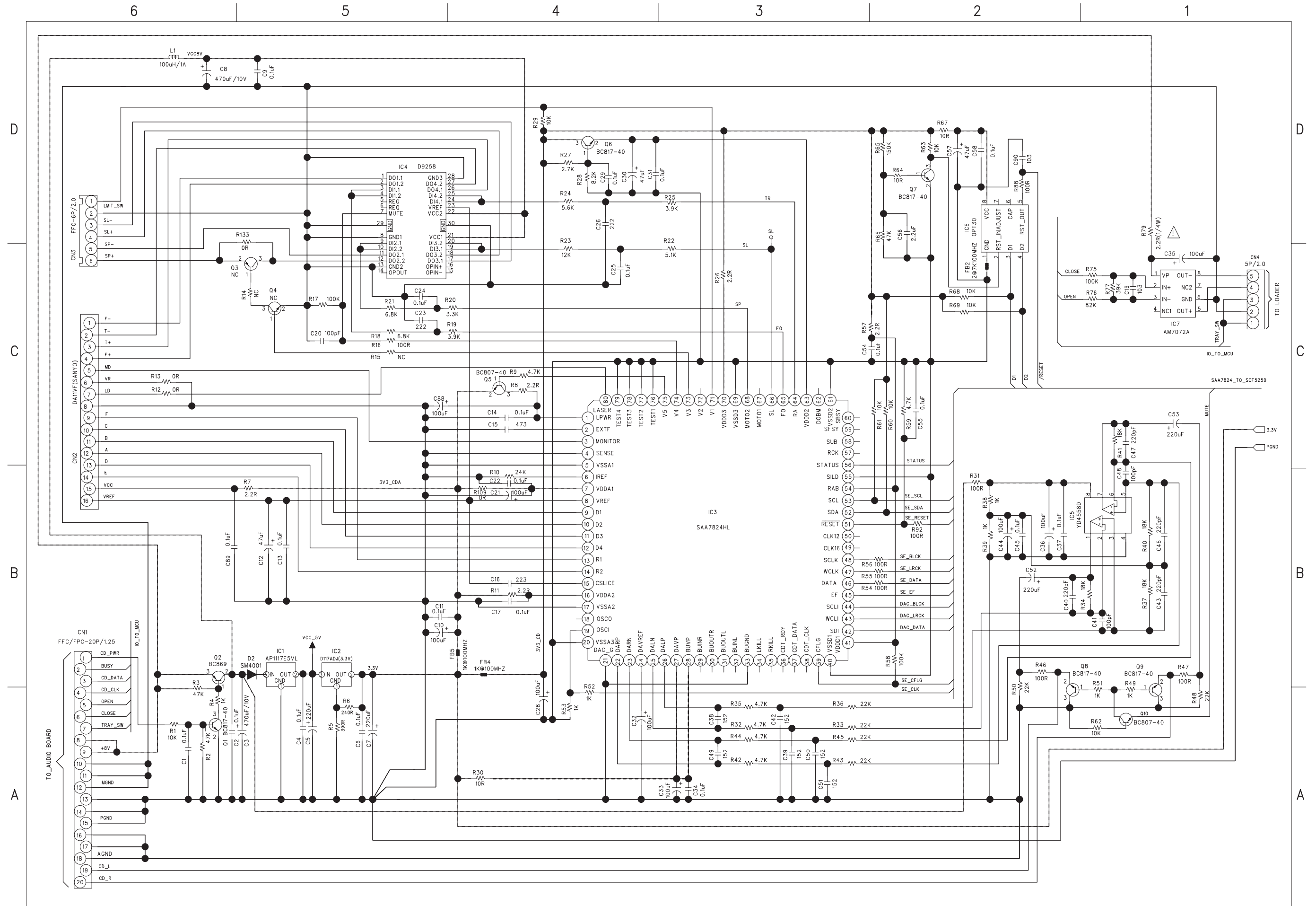
## TABLE OF CONTENTS

CD PCB - Layout Top View .....	10-2
CD PCB - Circuit Diagram Part1 .....	10-3
CD PCB - Circuit Diagram Part2 .....	10-4

PCB LAYOUT - CD BOARD (TOP VIEW)

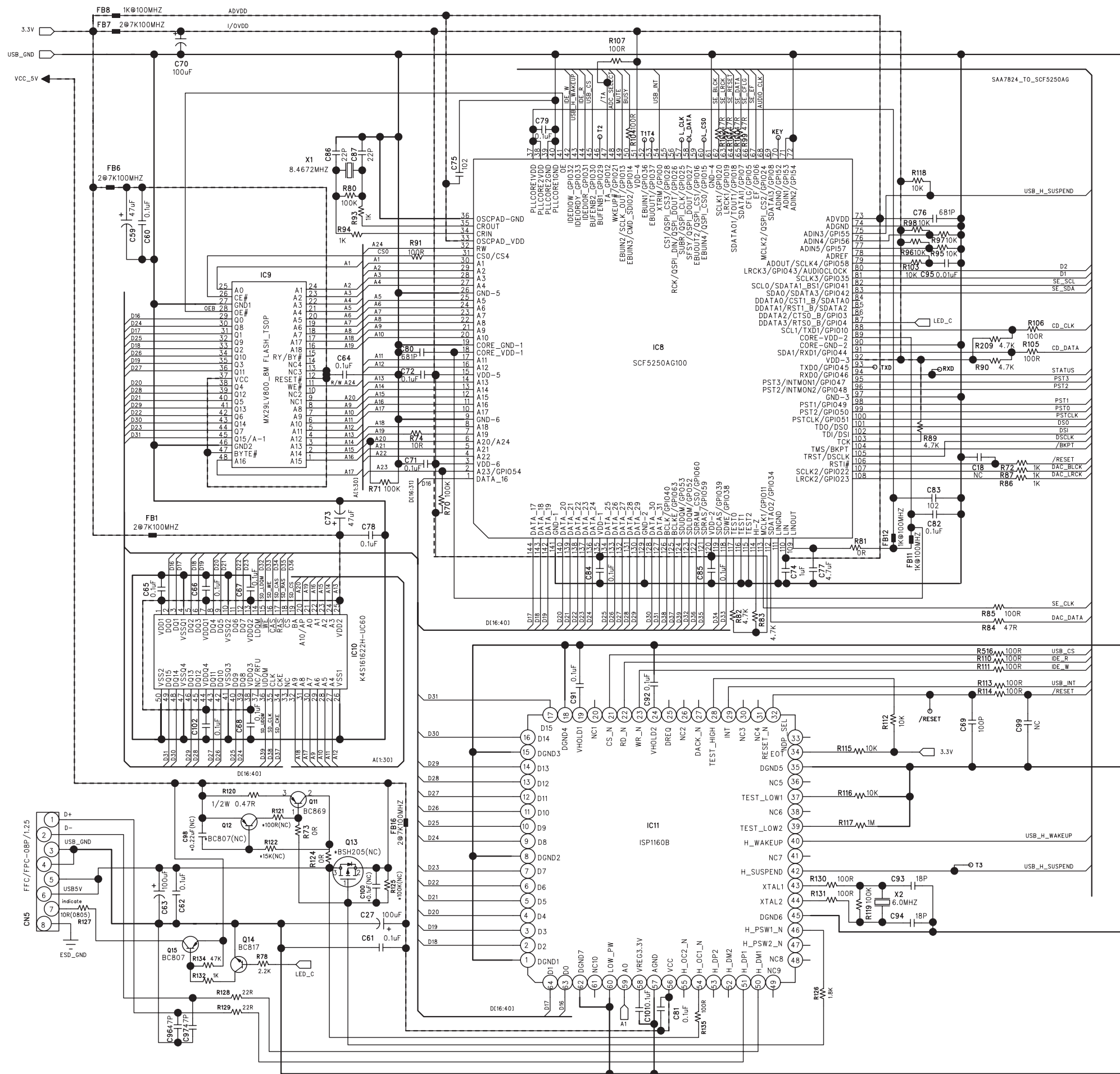


# CIRCUIT DIAGRAM - CD BOARD (PART1)



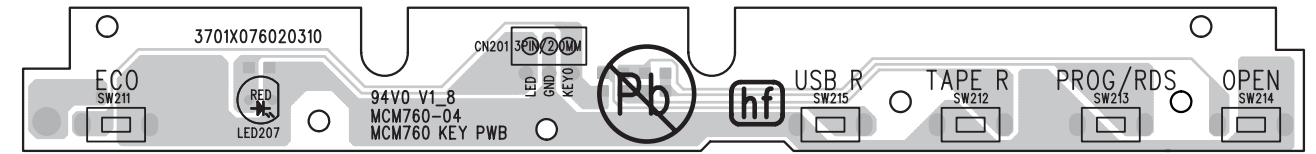


# CIRCUIT DIAGRAM - CD BOARD (PART2)





PCB LAYOUT - TOP KEY BOARD (TOP VIEW) (ONLY FOR ORIENTATION)



# MAIN & TOP KEY BOARD

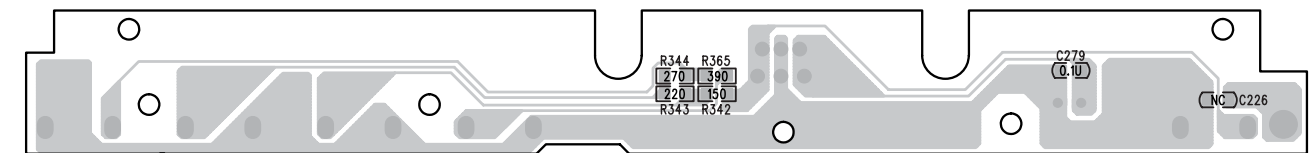
Top Key Board is not intended to be repaired on component level.  
Circuit Diagram and Printed Circuit Board drawings  
are published for orientation only.

In case of defects please replace the entire board.  
The board can be ordered with codenumber "9940 000 05579" for /37.  
"9940 000 05664" for /05/12/61.

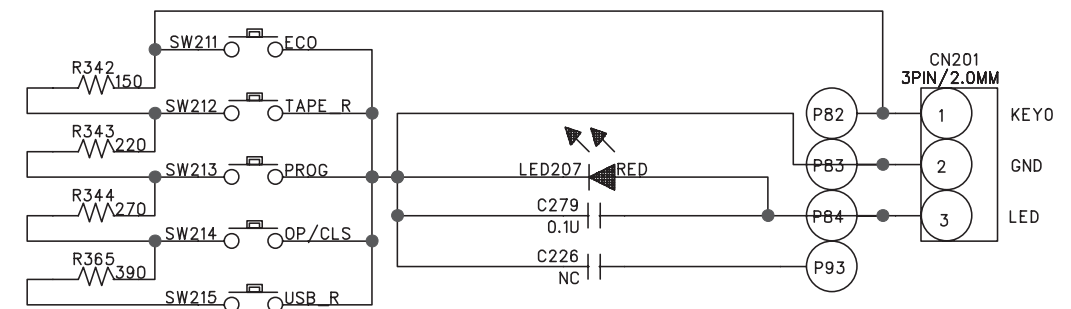
TABLE OF CONTENTS

Top Key PCB - Circuit Diagram & Layout.....	11-1
Main PCB - Layout Top View .....	11-2
Main PCB - Layout Bottom View .....	11-3
Main PCB - Circuit Diagram .....	11-4
Electrical Parts List .....	11-5

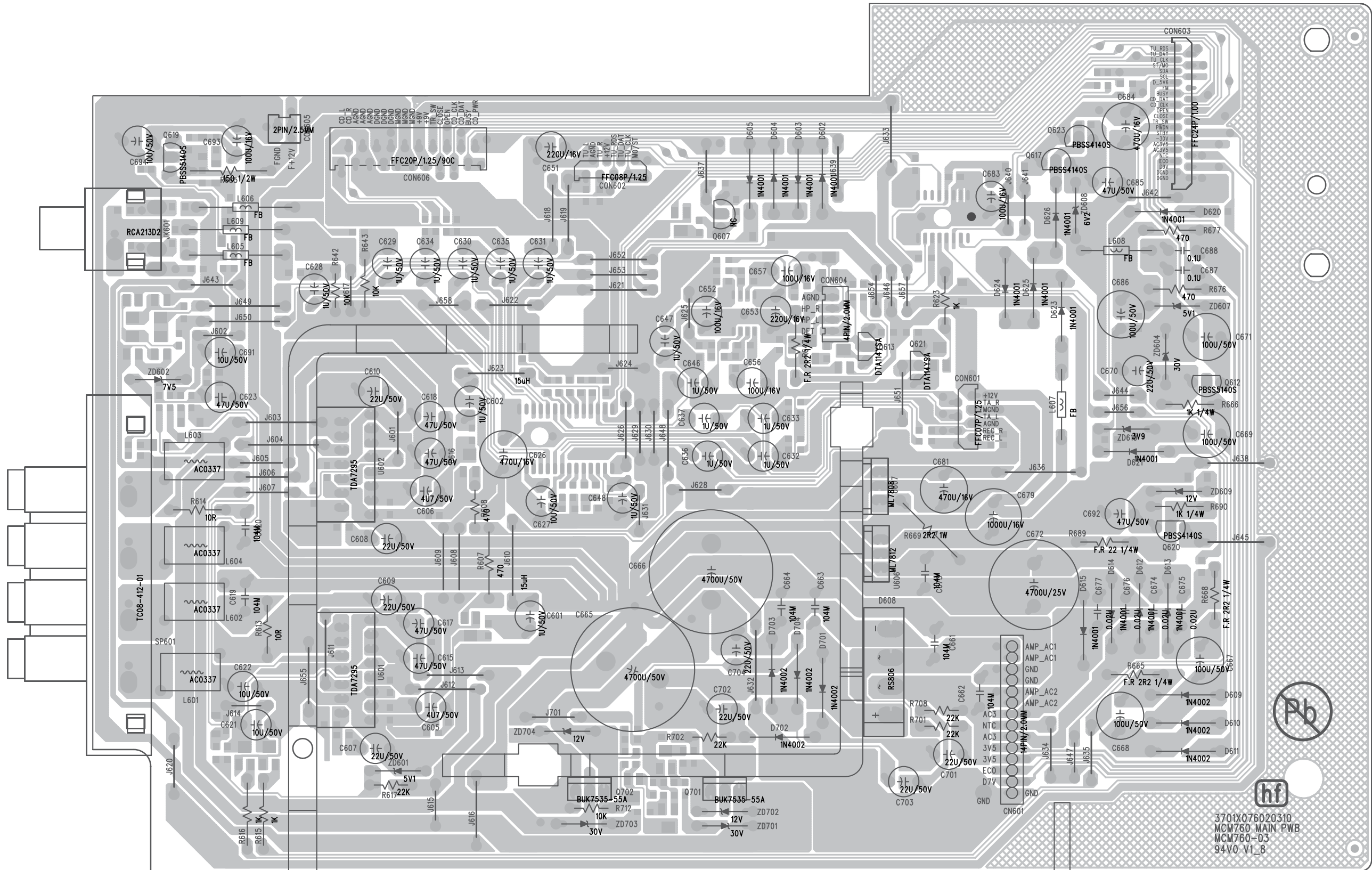
PCB LAYOUT - TOP KEY BOARD (BOTTOM VIEW) (ONLY FOR ORIENTATION)



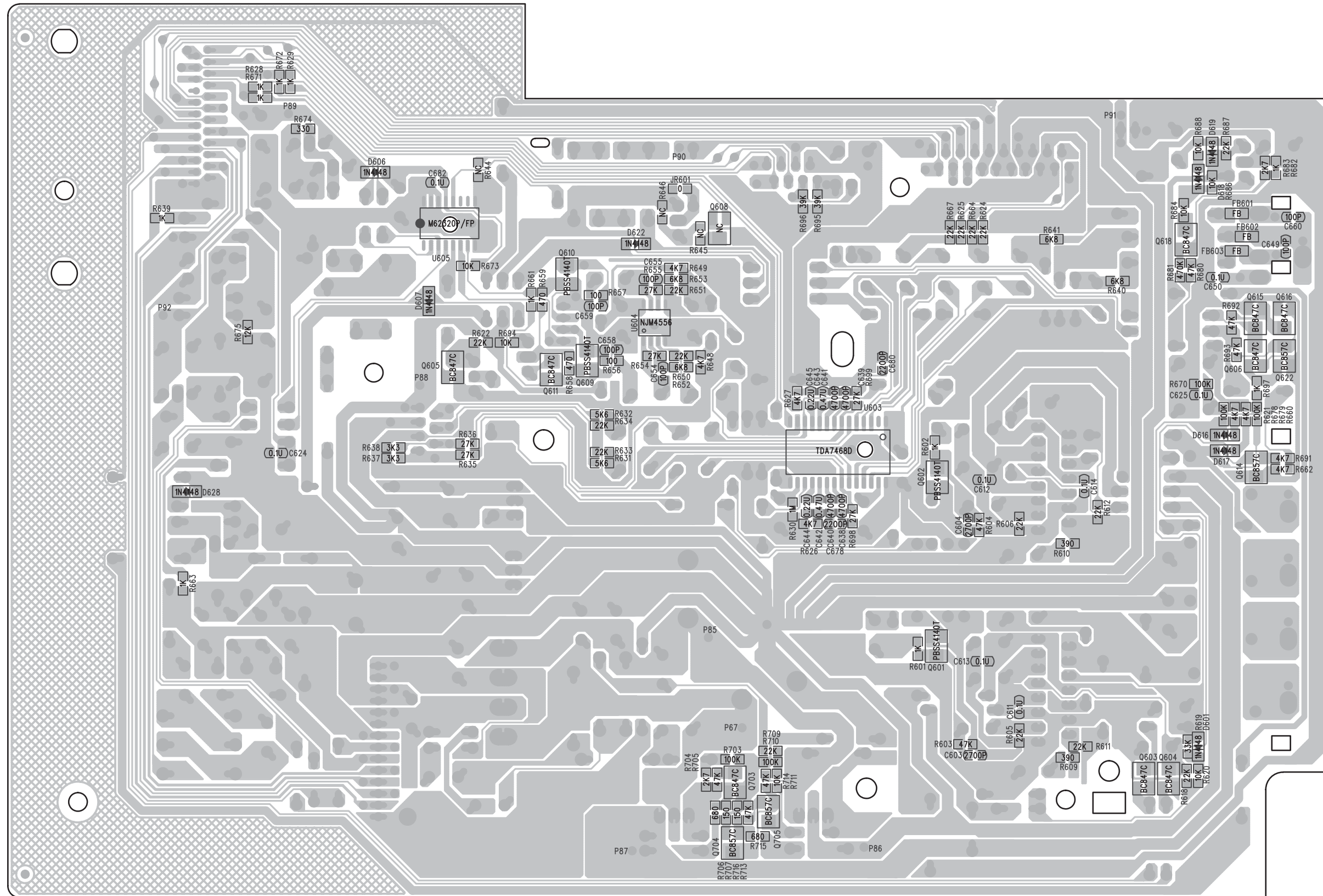
CIRCUIT DIAGRAM - TOP KEY BOARD (ONLY FOR ORIENTATION)



# PCB LAYOUT - MAIN BOARD (TOP VIEW)

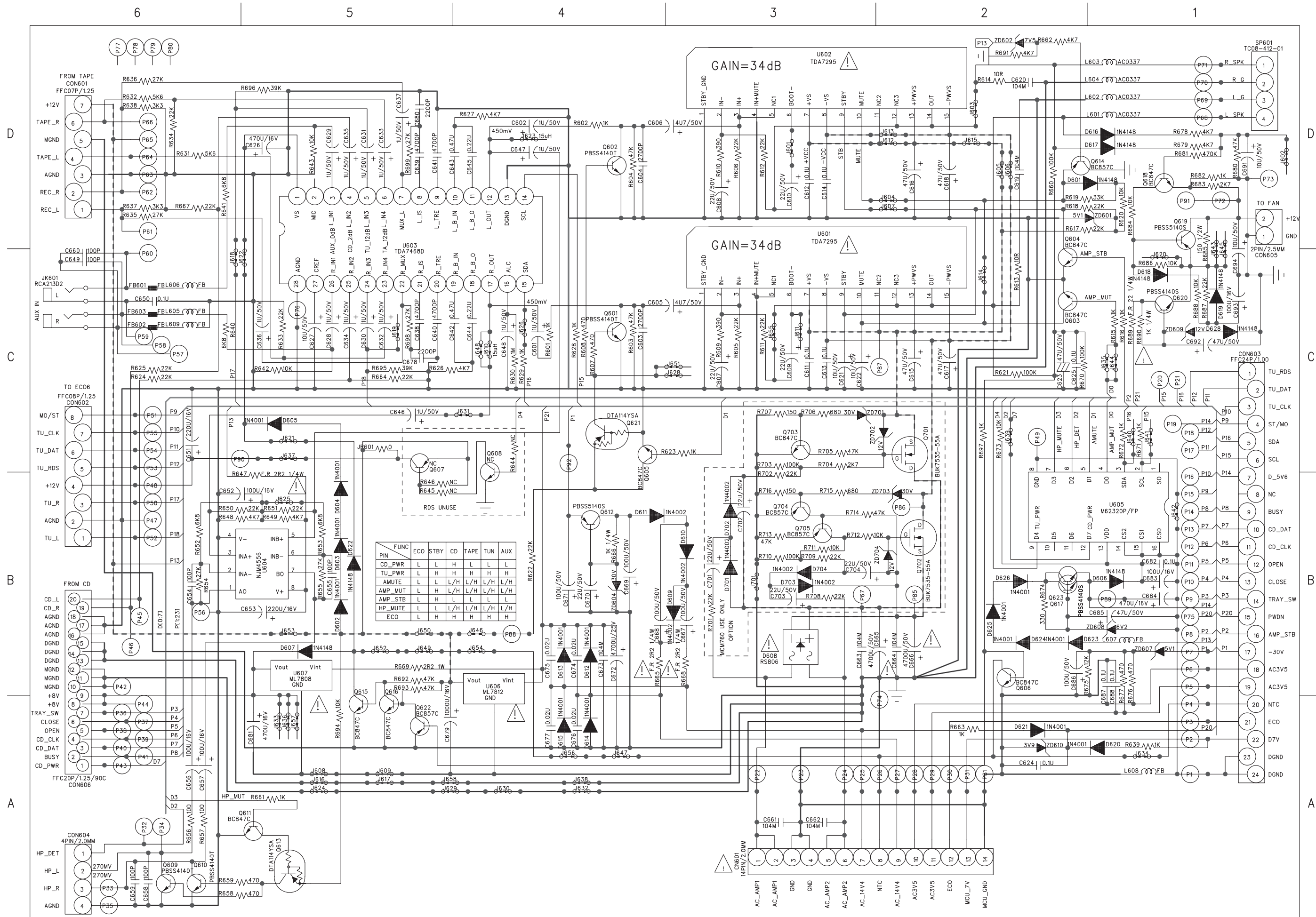


# PCB LAYOUT - DISPLAY BOARD (BOTTOM VIEW)





# CIRCUIT DIAGRAM - MAIN BOARD



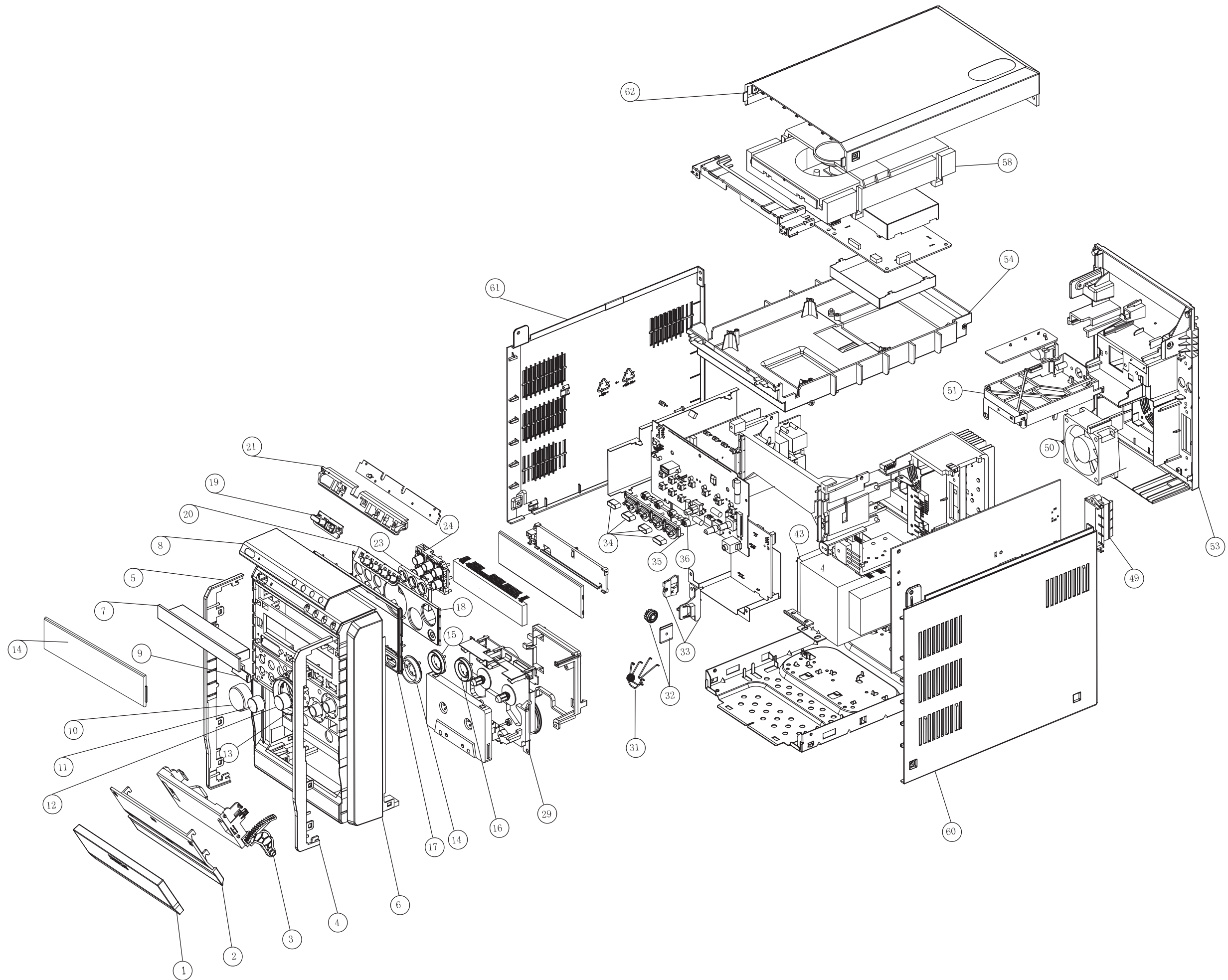
**ELECTRICAL PARTS LIST - MAIN BOARD**

C665	9940 000 05647	CAP ELECT 4700 $\mu$ F 50V /-20%
C666	9940 000 05647	CAP ELECT 4700 $\mu$ F 50V /-20%
C672	9940 000 03286	CAP ELECT 4700 $\mu$ F 25V /-20%
D608	9940 000 05313	RECTIFIER BRIDGE DIODE RS808
FB601	9940 000 05661	CH-FB 2700 $\Omega$ +/-25% SZ2012K272T
FB602	9940 000 05661	CH-FB 2700 $\Omega$ +/-25% SZ2012K272T
FB603	9940 000 05661	CH-FB 2700 $\Omega$ +/-25% SZ2012K272T
JK601	9940 000 05662	AUX JACK 4P 3.5MM TC58-292-53
L601	9940 000 05659	FM COIL AC0377 18.5TX5.6X0.5MM
L602	9940 000 05659	FM COIL AC0377 18.5TX5.6X0.5MM
L603	9940 000 05659	FM COIL AC0377 18.5TX5.6X0.5MM
L604	9940 000 05659	FM COIL AC0377 18.5TX5.6X0.5MM
Q601	9940 000 05653	TRANSISTOR PBSS4140T
Q602	9940 000 05653	TRANSISTOR PBSS4140T
Q609	9940 000 05653	TRANSISTOR PBSS4140T
Q610	9940 000 05653	TRANSISTOR PBSS4140T
Q612	9940 000 05652	TRANSISTOR PBSS5140S
Q613	9940 000 05649	TRANSISTOR DTA114YSA PNP
Q617	9940 000 05651	TRANSISTOR PBSS4140S NPN
Q619	9940 000 05652	TRANSISTOR PBSS5140S
Q620	9940 000 05651	TRANSISTOR PBSS4140S NPN
Q621	9940 000 05649	TRANSISTOR DTA114YSA PNP
Q623	9940 000 05651	TRANSISTOR PBSS4140S NPN
Q701	9965 000 38552	MOSFET BUK7535-55A
Q702	9965 000 38552	MOSFET BUK7535-55A
R647	$\Delta$ 9940 000 04221	FUSE RES 2.2 $\Omega$ 1/4W +/-5%
R665	$\Delta$ 9940 000 04221	FUSE RES 2.2 $\Omega$ 1/4W +/-5%
R668	$\Delta$ 9940 000 04221	FUSE RES 2.2 $\Omega$ 1/4W +/-5%
R689	$\Delta$ 9940 000 05648	FUSE RES 22 $\Omega$ 1/4W +/-5%
SP601	9940 000 02095	SPK TERMINAL TC08-412-0
U601	9940 000 05655	IC TDA7295 AMPLIFIER 80V-80W
U602	9940 000 05655	IC TDA7295 AMPLIFIER 80V-80W
U603	9940 000 03304	IC TDA7468D SOUND
U604	9940 000 05654	IC NJM4556AM (JRC) DMP8
U605	9940 000 05658	IC M62320FP 8-BIT I/O EXPANDER
U606	9940 000 05657	IC ML7812FA REGULATOR
U607	9940 000 05656	IC ML7808FA REGULATOR

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



**SET MECHANICAL EXPLODED VIEW**



**MECHANICAL & ACCESSORIES PARTS LIST**

1	9940 000 05631	PANEL CASS DOOR	△ 9940 000 02082	AC CORD VDE 2C L=1.5M /12
2	9940 000 05629	DOOR-CASSETTE	△ 9940 000 02178	AC CORD BSI /05
3	9940 000 05628	BRACKET-CASSETTE DOOR	△ 9940 000 01684	AC CORD UL /37
4	9940 000 05625	FRAME-FRONT CABINET (R)	△ 9940 000 02917	AC CORD L1.5M 2.5A 250V /61
5	9940 000 05624	FRAME-FRONT CABINET (L)	9940 000 02595	AM LOOP ANT
6	9940 000 05694	CABINET FRONT	9940 000 03388	FM ANT WIRE 75Ω 1M /05/12/61
7	9940 000 05638	DOOR CD	9940 000 04421	FM ANT WIRE 300Ω 2.6M /37
8	9940 000 05697	PANEL TOP ORNAMENTAL	9940 000 05589	REMOTE CONTROL
9	9940 000 05698	USB-COVER	9940 000 05591	CD DRIVER DA11VF
10	9940 000 05636	KNOB-VOLUME	9940 000 05612	STOPPER HEATSINK
11-12	9940 000 05637	KNOB-BASS/TREBLE	9940 000 05641	SPRING COMPRESSION
13	9940 000 05622	RING-VOLUME KNOB	9940 000 05699	SPEAKER BOX 6Ω 75W /12
14	9940 000 05696	LENS DISPLAY	9940 000 05701	SPEAKER BOX 6Ω 75W /05/37
17	9940 000 05627	FRAME-FRONT CABINET	9965 000 38551	SPEAKER BOX 6Ω 75W /61
18	9940 000 05626	PANEL FRONT CABINET		
19	9940 000 05614	BUTTON-POWER		
20	9940 000 05616	BUTTON-FUNCTION		
21	9940 000 05615	BRACKET-POWER/FUNC.-BUTT.		
23	9940 000 01661	RING-CD FUNCTION BUTTON		
24	9940 000 05619	BUTTON-CD FUNCTION.		
29	9940 000 05606	CASS. DECK MECHANISM		
31	9940 000 05642	SPRING-CASSETTE DOOR		
32	9940 000 01664	DAMPER GEAR ASSEMBLY		
33	9940 000 05312	CATCH ASSEMBLY		
34	9940 000 05617	BUTTON-SOURCE		
35	9940 000 05618	BRACKET-SOURCE BUTTON		
53	9940 000 05693	CABINET-REAR		
54	9940 000 05633	TRAY-CD		
58	9940 000 05588	CD LOADER WXD8210D		
60	9940 000 03357	PANEL-RIGHT		
61	9940 000 03356	PANEL-LEFT		
62	9940 000 05695	CABINET TOP		
15-16	9940 000 05621	RING-BASS/TREBLE KNOB		

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

**ELECTRICAL PARTS LIST - MISCELLANEOUS**

1110	9940 000 04237	FM FRONT END MODULE /05/12		
	9940 000 02122	FFC CABLE 16P L=170MM		
	9940 000 05598	FFC 7PIN P=1.25MM L=100MM		
	9940 000 05599	FFC 8PIN P1.25MM L110MM		
	9940 000 05601	FFC 8P P=1.25MM L=140MM		
	9940 000 05603	FFC 20P P=1.25MM L=120MM		
	9940 000 05604	FFC 24P P1.00MM L160MM		
	9940 000 05605	FFC 8P P1.25MM L320MM		
	9940 000 05607	FAN 12VDC 0.1A		
	9940 000 05664	TOP KEY BOARD ASS'Y /05/12/61		
	9940 000 05665	TUNER ASSEMBLY /05/12/61		
	9940 000 05684	CASSETTE PWB ASSEMBLY /05/12/61		
	9940 000 05685	CD BOARD ASS'Y /05/12/61		
	9940 000 05577	MAIN BOARD ASS'Y /37		
	9940 000 05579	TOP KEY BOARD ASS'Y /37		
	9940 000 05581	POWER BOARD ASS'Y /37		
	9940 000 05582	TUNER MODULE ECO6 /37		
	9940 000 05583	DISPLAY BOARD ASS'Y /37		
	9940 000 05584	CD BOARD ASS'Y /37		
	9940 000 05592	CASSETTE BOARD ASS'Y /37		
WIRE1	9965 100 16944	5P DISCRETE WIRE		
WIRE2	9965 100 16945	6P DISCRETE WIRE		

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