

Service
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Service Manual

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(Circuit and Layout diagram for reference only)



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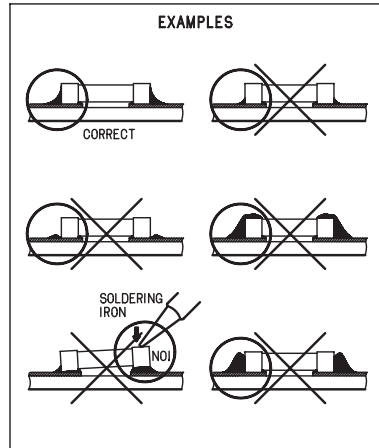
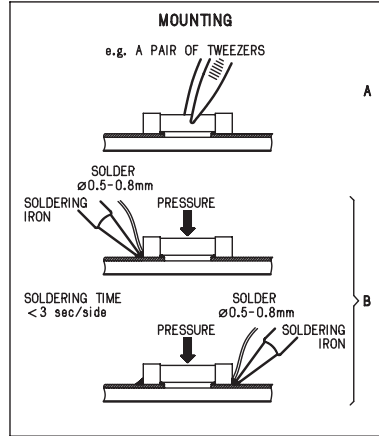
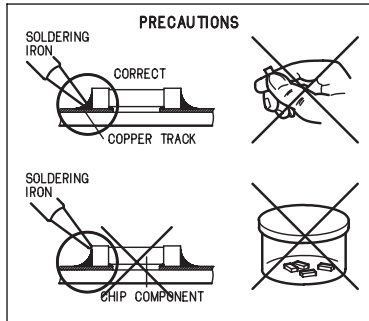
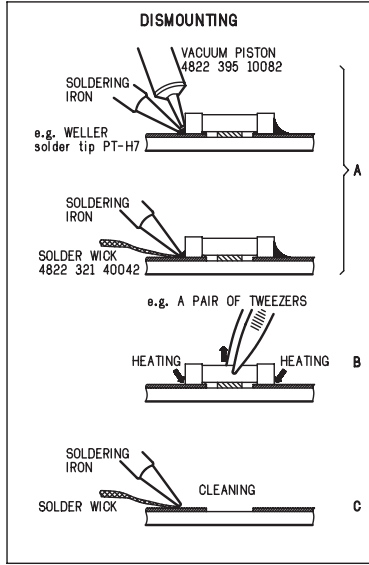
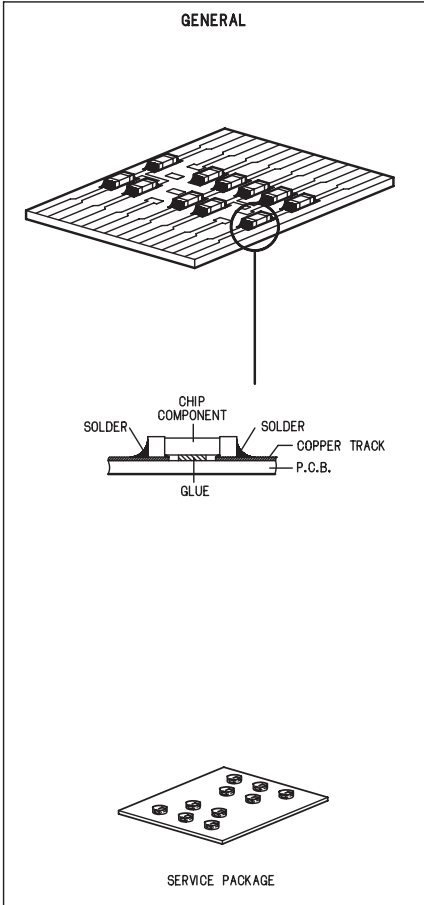
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version1.0



PHILIPS

HANDLING CHIP COMPONENTS



(GB) WARNING

All ICs and many other semiconductors 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 wristband with resistance. Keep components and tools 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 enfilez le bracelet serri 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). Unsorgfältige Behandlung im Reparaturfall kann die Lebensdauer drastisch reduzieren. Sorgen Sie dafür, daß Sie im Reparaturfall über ein Pulsarmband mit Widerstand mit dem Massepotential des Gerätes verbunden sind. Halten Sie Bauteile und Hilfsmittel ebenfalls auf diesem Potential.

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

(GB) SAFETY

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

SAFETY



(F) SECURITE

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

(D) SICHERHEIT

Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Originalzustand des Gerätes darf nicht verändert werden. Für Reparaturen sind Originalersatzteile zu verwenden. Sicherheitsbauteile sind durch das Symbol markiert.

(NL) VEILIGHEID

Veiligheidsbepalingen vereisen, dat het apparaat in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde, worden toegepast. De Veiligheidsonderdelen zijn aangeduid met het symbool

(I) SICUREZZA

Le norme di sicurezza estigono 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



(GB) DANGER: Invisible laser radiation when open. AVOID DIRECT EXPOSURE TO BEAM.

(S) Varning! Osynlig laserstrålning när apparaten är öppnad och spårren är urkopplad. Betrakta ej strålen.

(DK) Advarsel! Usynlig laserstrålning ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsættelse for stråling.

(FIN) Varoitus! Avatussa laiteessa ja suojauslaituksen ohitettaessa olet alttiina näkymättömälle laserisäteilylle. Älä katso säteeseen!

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

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

TECHNICAL SPECIFICATIONS

GENERAL

Mains voltage	-/01 : 120V/230 V
	-/10 : 240 V
Mains frequency	-/01 : 60 Hz/50Hz
	-/10 : 50 Hz
Battery	mains : 12 V (R20 x 8)
Power consumption	: < 24 W
Dimension (W x H x D)	: 480 x 260 x 170 mm

AMPLIFIER & MAX PART

Output power	mains : 2 x 4 W
	battery : 2 x 4 W
Residual noise	: 60nW (volume minimum)
Channel difference	: 3dB typ. at 500mW
Hum & noise	: 500nw (Vol.max.-20dB)

TUNER - FM SECTION

Tuning range	: 87.5 - 108 MHz
IF frequency	: 10.7 MHz \pm 0.02MHz
Sensitivity	: < 25 dBf at 26dB S/N
Selectivity	: > 20 dB at S9/300kHz
IF rejection	: > 50 dB
Image rejection	: > 20 dB

TUNER - MW SECTION

Tuning range	: 9kHz 531 - 1602 kHz
	: 10kHz 530 - 1700 kHz
IF frequency	: 450 kHz \pm 1 kHz
Sensitivity	: < 5000 μ V/m at 26dB S/N
Selectivity	: > 16 dB at S9/300kHz
IF rejection ratio	: > 24 dB
Image rejection	: > 28 dB

COMPACT DISC

S/N ratio	: > 50 dB
Channel difference	: < 3 dB
Crosstalk	1 kHz : > 26 dB
Crosstalk	10 kHz : > 16 dB
Frequency response	: +10dB \pm 2dB at 100Hz
(500mW output WOOX ON)	
Frequency response	: +1dB \pm 2dB at 10kHz
(500mW output WOOX ON)	
THD (1KHz,-6dB)	: <1%
THD (10KHz,-20dB)	: <3%
Shock resistance	\pm Z axis : > 5 g
	\pm X or \pm Y axis : > 5 g
Acoustical noise	: 35dBAm _{max} .(mode:play/pause)
	: 45dBAm _{max} . (mode:jump)

SERVICE TOOLS

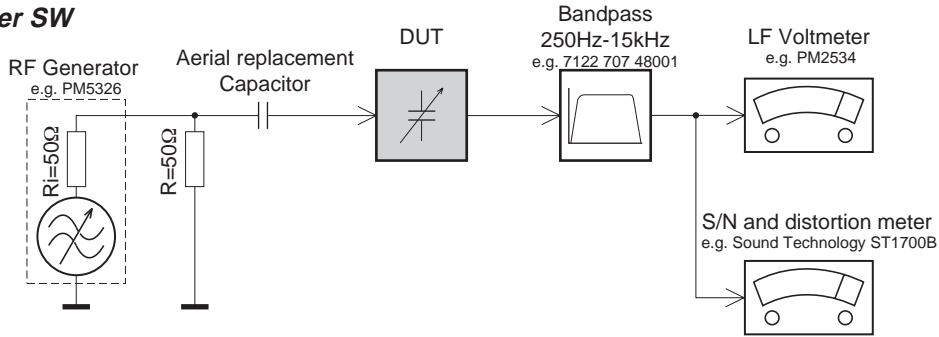
Audio signal disc SBC 429.....	4822 397 30184
Playability test disc SBC 444.....	4822 397 30245
Test disc 5 (disc without errors) +	
Test disc 5A (disc with dropout errors, black spots and fingerprints)	
SBC 426/426A.....	4822 397 30096
Burn in test disc (65 min. 1kHz signal at -30 dB level without "pause").....	4822 397 30155

AVAILABLE ESD PROTECTION EQUIPMENT

anti-static table mat	large 1200x650x1.25mm	4822 466 10953
	small 600x650x1.25m	4822 466 10958
anti-static wristband		4822 395 10223
connection box (3 press stud connections, 1M Ω)		4822 320 11307
extendible cable (2m, 2M Ω , to connect wristband to connection box)		4822 320 11305
connecting cable (3m, 2M Ω , to connect table mat to connection box)		4822 320 11306
earth cable (1M Ω , to connect any product to mat or to connection box)		4822 320 11308
KIT ESD3 (combining all 6 prior products - small table mat)		4822 310 10671
wristband tester		4822 344 13999

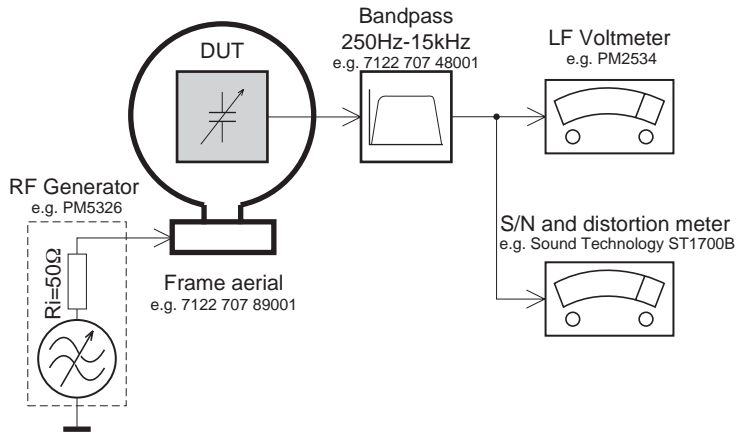
SERVICE MEASUREMENT

Tuner SW



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).

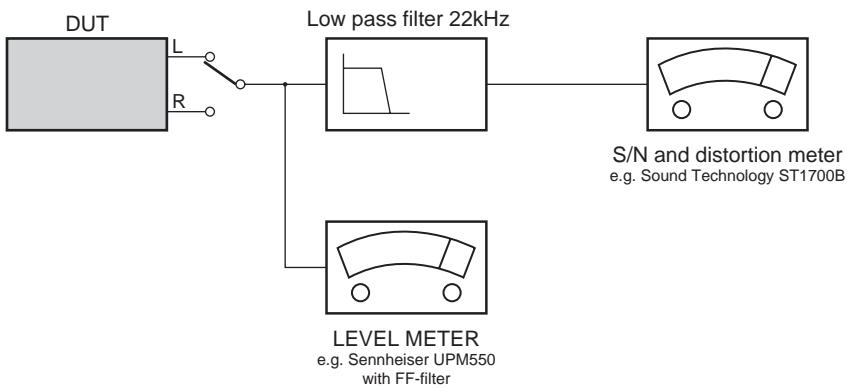
Tuner AM (MW,LW)



To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday's cage.

CD

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



CONNECTIONS AND CONTROLS

HEAVY !

Take care of your CD Soundmachine. Grip both handles when you carry or lift the set.

LOURD !

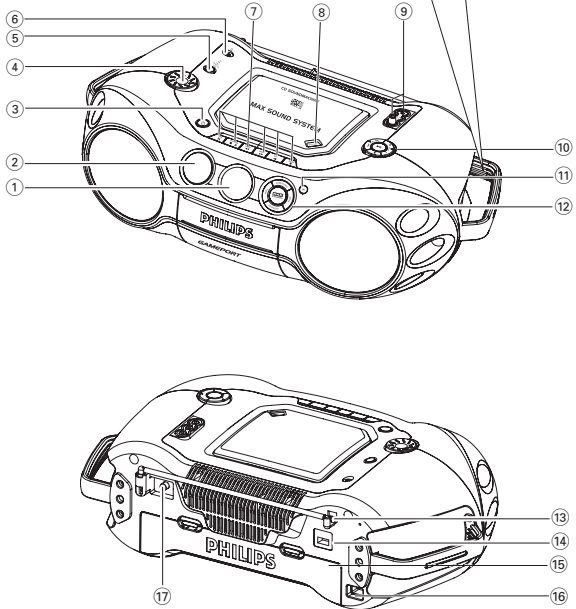
Soin de prise de votre Soundmachine CD. Saisissez les deux poignées quand vous portez ou déplacez l'appareil.

HEAVY !

Take care of your CD Soundmachine. Grip both handles when you carry or lift the set.

HEAVY !

Take care of your CD Soundmachine. Grip both handles when you carry or lift the set.



SUPPLIED ACCESSORIES

- Remote Control1 pc
- AC Power Cord1 pc
- Audio / Video Cable1 pc

TOP AND FRONT PANEL

- 1 **LCD Display** - shows the status of the set
- 2 **[dB]** - meter to indicate bass power
- 3 **STANDBY ON** \odot - switches the set on/off
- 4 **VOLUME** - adjusts volume or equalizer level
- 5 **SOURCE** - selects sound source for functions: **CD • VCD, FM, MW, TAPE**
- 6 \odot - 3.5 mm stereo headphone jack
Helpful hints: The speakers will be muted when headphones are connected to the set.
- 7 **Cassette recorder keys**
PAUSE II - pauses playback or recording
STOP • OPEN $\blacksquare \blacktriangle$
- opens the cassette compartment
- stops the tape
SEARCH \ll / \gg - fast winds/rewinds tape
PLAY \blacktriangleleft - starts playback
RECORD \bullet - starts recording
- 8 **OPEN • CLOSE** - press to open/close CD door
- 9 **MIC** - jack to connect microphones
VOL - adjust the mixing level for karaoke
- 10 **ALBUM/PRESET** $- , +$
MP3-CD: selects previous/next albums
FM/MW: selects a preset radio station
SEARCH $\ll \gg$ -
CD/MP3-CD: - searches backward or forward;
- skips to the beginning of a current track/ previous/ later track.
FM/MW: tunes to radio stations
 $\blacktriangleright \text{II}$ - starts or pauses CD playback
 \blacksquare - stop CD playback;
- erases a CD program.
- 11 **IR SENSOR** - infrared sensor for remote control

- 12 **EQUALIZER** - selects bass, mid and high frequencies
PROG -
CD/VCD/MP3-CD: programs tracks and reviews the programmed songs
FM/MW: programs preset radio stations
MODE - selects different CD/VCD/MP3-CD play modes: e.g. REPEAT or SHUFFLE order
MAX SOUND - actives or deactivates the optimal mix of various sound features

BACK PANEL

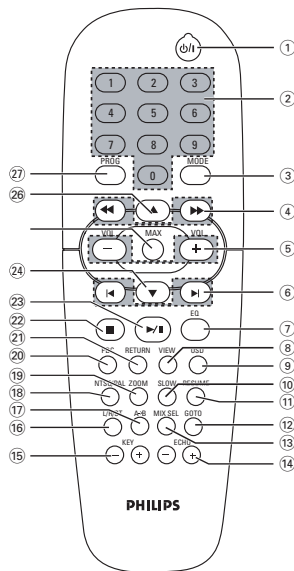
- 13 **Telescopic aerial** - improves FM reception
- 14 **Voltage selector** (some versions only) - adjusts to match the local voltage 110/220V before plugging in the set.
- 15 **Battery door** - opens the battery compartment
- 16 **AC MAINS** - Socket for power cord
- 17 **AUDIO / VIDEO SOCKET** - connects to a TV set

REMOTE CONTROL

- 1 \odot / I - switches the set to standby / on if set operating on AC power. (Switches the set off only if it is battery-powered)
- 2 **DIGITS 0 - 9**
CD/VCD/MP3-CD: selects a track number. (numbers consisting more than 2 figures must be keyed in within 2 seconds)
- 3 **MODE** - selects different CD/VCD/MP3-CD play modes: e.g. REPEAT or SHUFFLE order
- 4 $\ll \gg$ -
CD/VCD/MP3-CD: searches backward or forward
FM/MW: tunes to radio stations
- 5 **VOL +/-** - adjusts volume or equalizer level

CONTROLS

- 6 $\blacktriangleleft \blacktriangleright$ -
CD/VCD/MP3-CD: selects previous/next tracks
FM/MW: selects a preset radio station
- 7 **EQ** - selects bass, mid and high frequencies
- 8 **VIEW** - scans through a VCD with 9 pictures display on TV screen. Only when PBC mode is switched off (for VCD operation only).
- 9 **OSD** - switches on/off the on screen display on the TV screen.
- 10 **SLOW** - watches a VCD at a slower speed (for VCD operation only).
- 11 **RESUME** - resumes playback in stop mode.
- 12 **GOTO** - starts playback at any chosen time on the disc (for CD/VCD operation only and PBC mode is off).
- 13 **MIX/SEL** - selects disc format (CD/MP3-CD) in a mixed mode disc.
- 14 **ECHO + / ECHO -** - adjusts the VCD echo level for karaoke after you inserted a microphone.
- 15 **KEY+ / KEY-** - changes the VCD key tone to suit to your vocal range.
- 16 **L/R/ST** - selects channel left / channel right / stereo sound, or selects a language in a bilingual VCD.
- 17 **A -> B** - plays a certain scene or passage repeatedly (for CD/VCD operation only).
- 18 **NTSC/PAL** - selects the video output for NTSC or PAL system.
- 19 **ZOOM** (for VCD operation only)
zooms in or zooms out pictures.
- 20 **PBC (PLAYBACK CONTROL)** - switches on or off PBC mode (for VCD version 2.0 only).
- 21 **RETURN** - returns to the previous MENU level during playback (for VCD with PBC on).
- 22 \blacksquare - stops playback or clears a programme.
- 23 $\blacktriangleright \text{II}$ - starts or interrupts playback.
- 24 \blacktriangledown (album down) - selects previous albums (for MP3-CD only)
- 25 **MAX** - selects special bass enhancement on/off
- 26 \blacktriangle (album up) - selects next albums (for MP3-CD only)
- 27 **PROG** -
CD/VCD/MP3-CD: programme tracks and reviews programmed songs.
FM/MW: programs preset radio stations



POWER SUPPLY

IMPORTANT!

For best CD/MP3-CD/VCD playback, please plug in your set to an AC power supply where convenient.

If operated in DC mode, see below approximate playtime. (Playtime is also varied from different brand batteries):

Battery type	Playtime
Alkaline	approximate 9 hrs
Zinc Carbonate	approximate 2hrs

The CD part of this system also serves as a Video CD player if you connect it to your TV set.

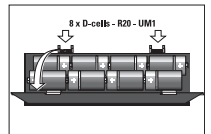
Before viewing the Video CD, ensure that the set is switched to corresponding PAL or NTSC system of your TV set (exception Multi-system TV).

BATTERIES (NOT SUPPLIED)

Whenever convenient, use the mains supply if you want to conserve battery life. The battery supply will be switched off when the set is connected to the mains. Make sure you remove the plug from the set and wall outlet before inserting batteries.

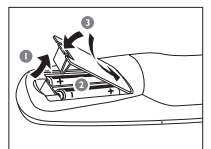
Batteries

1. Open the battery compartment and insert six batteries, type **R20, UM1** or **D-cells**, (preferably alkaline) with the correct polarity as indicated by the "+" and "-" symbols inside the compartment.



Remote control

- Open the battery compartment and insert two batteries, type **AA, R6** or **UM3** (preferably alkaline).



2. Replace the compartment door, making sure the batteries are firmly and correctly in place.

3. Remove the batteries if they are exhausted or if they will not be used for a long period.
 - The incorrect use of batteries can cause electrolyte leakage and will corrode the compartment or cause the batteries to burst. Therefore:
 - Do not mix battery types, e.g. alkaline with zinc carbonate.
 - When inserting new batteries, replace all at the same time.
 - Remove the batteries if the set is not to be used for a long time.

Helpful hints:

- The battery supply is switched off when the set is connected to the mains.

TV screen is disabled during CD / MP3-CD playing if your A22536 is battery powered.

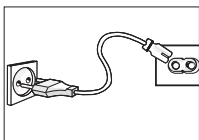
Batteries contain chemical substances, so they should be disposed of properly

CONNECTIONS AND CONTROLS

GENERAL OPERATION

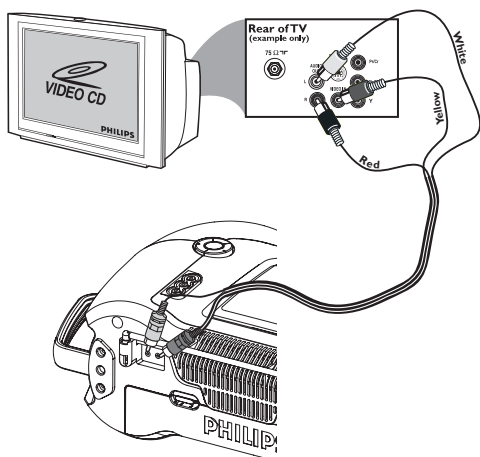
MAINS

1. Check if the mains voltage as shown on the type plate (on the bottom of the set) corresponds to your local mains voltage. Select 110 or 220V by the selector (for some version only).
2. If your set is equipped with a voltage selector, adjust the selector so that it matches with the local mains.
3. Connect the mains lead to the **AC MAINS** ~ socket and the wall socket.
 - The set is now ready for use.
4. To switch off the mains supply completely, pull the mains plug out of the wall socket.
 - Disconnect the mains lead when you change over to battery supply, or to protect the set during heavy thunderstorms.



The type plate is located on the bottom of the set.

CONNECTING TO YOUR TV SYSTEM



DIGITAL TUNER

RADIO RECEPTION

Tuning to stations

1. Press **STANDBY ON** ⏻ to on, then press **SOURCE** once or more to select **FM/MW**.
 - Display: shows waveband, frequency, and preset station number if already stored.
2. **Tuning to stations:** you can tune to your stations manually or by automatic search tuning:
 - Press down on **◀** or **▶** (◀ or ▶) on the remote control) and release button when the frequency in the display starts running.
 - The radio automatically tunes to a station of sufficient reception. Display shows **SEARCH** during automatic tuning.
3. Repeat step 2 if necessary until you find the desired station.
 - To tune to a weak station, press **◀** or **▶** (◀ or ▶) on the remote control) briefly and repeatedly until you have found optimal reception.



Changing tuning grid (some versions only)

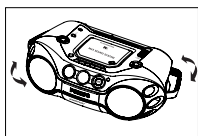
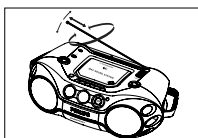
In North and South America the frequency step between adjacent channels in the AM and FM band are 10 KHz and 100 KHz respectively. In the rest of the world this step is 9 KHz and 50 KHz. Usually the frequency step has been preset in the factory for your area if not :

1. Select **TUNER** source.
2. Press **MODE** on the set for at least 6 seconds.
 - The display shows either 67 9 or 67 0.

Helpful hints: All preset stations will be lost and need to be reprogrammed.

To improve radio reception:

- For **FM**, extend, incline and turn the telescopic antenna. Reduce its length if the signal is too strong.
- For **MW**, the set uses a built-in antenna. Direct this antenna by turning the whole set.



GENERAL OPERATION

SWITCHING ON AND OFF

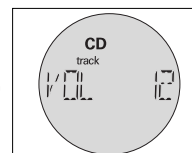
1. Press **STANDBY ON** ⏻ on the set to switch on.
2. Press **SOURCE** once or more to select your desired function: **CD • VCD, FM, MW, TAPE**
3. Press **STANDBY ON** ⏻ to switch the set to standby.

Helpful hints :

- To change from **TAPE** to **CD • VCD, FM** or **MW** source, or when you are switching off the set: first, make sure you press the tape **STOP** ■ key to end playback and all the cassette keys are released.
- The tone, sound settings, tuner presets and the volume level (up to a maximum volume level of VOL 20) will be retained in the set's memory.

ADJUSTING VOLUME AND SOUND

1. Adjust the volume with the **VOLUME** control.
 - Display shows the volume level VOL and a number from 0-32.
2. **MAX SOUND**
 - To enhance the bass response: press **MAX SOUND** once or more to switch on / off.
 - **MAX SOUND**-key backlight lights up when **MAX SOUND** is turned on.

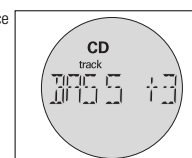


Helpful hints :

- **MAX SOUND** can be used when you play **CD, VCD, FM, MW** and **TAPE** source.
- Some discs might be recorded in high modulation, which causes a distortion at high volume. If this occurs, deactivate **MAX SOUND** or reduce the volume.

3. EQUALIZER

- To adjust the bass, mid and high frequencies, press **EQUALIZER** once or more (or press **EQ** on the remote control), then rotate **VOLUME** within 3 seconds to adjust each level.
- Display briefly shows **BASS**, **MID** or **HIGH** level (-5 to +5) or VOL.



Helpful hints:

- **EQUALIZER** can be used during **CD, VCD, FM, MW** and **TAPE** source.
- To prevent sound interference the bass control options operate exclusively. You cannot combine the bass from **EQUALIZER** with **MAX SOUND**

DIGITAL TUNER

Programming tuner stations:

You can store up to a total of 30 radio stations in the memory (20 FM and 10 MW), manually or automatically (Autostore).

Autostore

Automatic programming will start from preset 1 or a chosen preset number. The set will only program stations which are not in the memory already.

1. Press **ALBUM/PRESET** -+ (◀ or ▶) on the remote control) once or more to select the preset number where programming should start.

Helpful hints:

– If no tuner preset number is selected, default is preset 1 and all your presets will be erased.

2. Press **PROG** for 4 seconds or more to activate auto store programming.
 - Display: **ALTO** is shown and available stations are programmed in order of waveband **FM**, followed by **MW**, the first preset station will then be played after all stations are stored automatically.

Manual programming

1. Tune to your desired station (see **Tuning to stations**).
2. Press **PROG** to activate programming.
 - Display: **PROG** flashes.
3. Press **ALBUM/PRESET** -+ (◀ or ▶) on the remote control) once or more to allocate a number from 1 to 20 for FM or 1 to 10 for MW.
4. Press **PROG** again to confirm.
 - Display: shows the preset number, waveband and the frequency of the preset station.
5. Repeat the above four steps to store other stations.

Helpful hints:

– You can erase a preset station by storing another frequency in its place.

To listen to a preset station

Press **ALBUM/PRESET** -+ (◀ or ▶) on the remote control) once or more until the desired preset station is displayed.

CAUTION

Use of controls or adjustments or performance of procedures other than herein may result in hazardous radiation exposure or other unsafe operation.

Environmental information

All unnecessary packaging material has been omitted. We have done our utmost to make the packaging easily separable into three mono materials: cardboard, polystyrene and plastic.

Your set consists of materials which can be recycled if disassembled by a specialized company. Please observe the local regulations regarding the disposal of packaging materials, exhausted batteries and old equipment.

INSTRUCTION FOR USE

CD/VCD/MP3-CD

DISCS FOR PLAYBACK

This set can play all digital audio CD, video CD, finalised digital audio CD-Recordable (CD-R) discs and finalised digital audio CD-Rewritable (CD-RW) discs.



Support following MP3-CD formats:

- ISO 9660 or ISO 9660 + Joliet format - Max. 30 characters
- Max. Track number is 400
- Max. nested directory is 8 levels
- The max. album number is 99
- The max. MP3 programme track number is 20
- The max. length of each track is 99 minutes 59 seconds
- The player can play mixed mode disc of CD / MP3-CD
- Supported VBR bit-rate
- Supported sampling frequencies for MP3 disc : 8 kHz to 48 kHz (44.1kHz preferably)
- Supported bit-rates of MP3 disc are: 32 - 320 kbps (128 kbps preferably)

Following formats are not supported

- The files like *.WMA, *.AAC, *.DLF, *.M3U, *.PLS, MP3 PRO
- The non-session closed discs

PLAYING A DISC

1. Press **STANDBY ON** \odot once or more to on, then select **CD • VCD SOURCE**.
2. Press **OPEN•CLOSE** to open the CD door.
 - **OPEN** is displayed when the CD door is open.
3. Insert a CD with the printed side facing up and press down on **OPEN•CLOSE** to close the CD door.
 - Display show **READY**, then 001 (track number) and elapsed time.
 - **NO DISC** will be displayed if no disc is inserted or error in CD operation.
4. Playback starts from the beginning of the 1st track automatically.

For MP3-CD only

- The current track number "x:xx" and current album number "R:xx" will be displayed interchangeably.
- On TV screen, the album list appears on the left and track list on the right (max. 10 lines per page). The current selected music is highlighted, with the elapsed time shown at the upper right corner.



Helpful hints:

- To ensure good system performance, wait until the disc completely reads before proceeding.
- For MP3-CD, the disc reading time may exceed 1 minute due to the large number of songs compiled into one disc.

CD/VCD/MP3-CD

PROGRAMMING TRACKS

Programming tracks of disc is possible when playback is stopped. Up to 20 tracks can be stored in the memory in any order.

1. In stop mode, press **PROG** to enter program setting.
 - **PROG** will start flashing and "P0 1" will be displayed.
 - On TV screen, "PROG" program list (5 lines per page) will be displayed.
2. Press \leftarrow/\rightarrow (or use **digits 0 - 9** or press \leftarrow/\rightarrow on the remote control) to select the desired track.
 - **MP3-CD mode only:**
First press **ALBUM/PRESET -**, + once or more (or press **digits 0 - 9** or $\blacktriangle/\blacktriangledown$ on the remote control) to find your album, press **PROG** to store the selected album, and then press \leftarrow/\rightarrow (or use **digits 0 - 9** or press \leftarrow/\rightarrow on the remote control) to select the desired track.
3. Press **PROG** to confirm the track number to be stored.
 - Display shows "P02", indicating the next program location available.
4. Repeat steps 1-3 to select and store all desired tracks.
 - Display: **FULL** if you try to program more than 20 tracks.
5. Press **▶▶** to play the programmed tracks.
 - If you select **REPEAT/REPEAT ALL** during program playback, the current track or all programmed tracks will be played repeatedly.
 - **REPEAT/REPEAT ALL** icon and **PROG** will appear on the display.

Reviewing the program

- In the stop position, press **PROG** repeatedly to see your stored track numbers.
- The display first shows the number of program location and then, the number of the track stored here.
 - For MP3-CD only: The display first shows the number of program location and then, the album number for the track stored here. To see the track number, press **PROG** again.

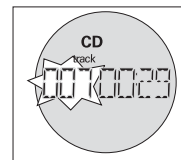
Erasing a program

You can erase the contents of the memory by:

- opening the CD door;
- selecting **FM**, **MW** or **TAPE** sound sources;
- pressing \blacksquare twice during playback or once in the stop position.
 - **PROG** disappears.

CD/VCD/MP3-CD

- Press **▶▶** to start playback if in the stop position.
 - The current track number and elapsed time appear on the display.
- To interrupt playback, press **▶▶**.
 - The current track number will start flashing.
- To resume playback, press **▶▶** again.
- To stop playback, press \blacksquare .



SELECTING A DESIRED TRACK/PASSAGE

To select a desired track

- Press \leftarrow or \rightarrow on the set repeatedly (or use digits 0 - 9 buttons or press \leftarrow/\rightarrow on the remote control) until the desired track appears on the display.
- If playback is stopped, press **▶▶** to start playback.

To search for a particular passage during playback

- Either press and hold \leftarrow or \rightarrow on the set for 1 second, and then release \leftarrow or \rightarrow to select the passage or press \leftarrow or \rightarrow on the remote control and then press **▶▶** to select the passage.
 - During searching, the volume will be muted.

For MP3-CD only

To select a desired album

- Press **ALBUM/PRESET -**, + on the set repeatedly (or press \blacktriangle or \blacktriangledown on the remote control) until the desired album number appear on the display.
 - "R:xx" will be displayed.
 - On TV screen, the arrow will move forward/backward in the ALBUM menu.

To select a desired track

- Press \leftarrow or \rightarrow on the set repeatedly (or on the remote control, press \leftarrow/\rightarrow) to select a desired track from the current album.
 - "x:xx" will be displayed.
 - On TV screen, the arrow will move forward/backward in the TRACK menu.
- Use the digital keys on the remote control to select the track under current album directly.

For VCD only

- Either press \leftarrow or \rightarrow on the remote control repeatedly to select fast search speed (x1, x2, x3 or x4) or press & hold \leftarrow or \rightarrow on the set for 1 second and then release \leftarrow or \rightarrow to select fast search speed (x1). Repeat this step to select other speed (x2, x3 or x4).

CD/VCD/MP3-CD

SHUFFLE

You can play all the tracks in random order.

1. During playback, press **MODE** once or more.
 - **SHUFFLE** will appear on the display.
2. To select normal playback, press **MODE** repeatedly until the various modes are no longer displayed.
 - You can also press the \blacksquare to cancel your play mode in playing.

REPEAT

You can play the current track, the program or the whole disc repeatedly.

1. During playback, press **MODE** once or more.
 - REPEAT** - plays the current track continuously
 - REPEAT ALL** - repeats the entire CD/ program
2. To select normal playback, press **MODE** repeatedly until the various modes are no longer displayed.
 - You can also press the \blacksquare to cancel your play mode in playing.

VIDEO CD

Adjusting the TV System

Before viewing the Video CD, ensure that the set is switched to corresponding PAL or NTSC system of your TV set (except for Multi - system TV).

1. On the remote control, press **NTSC/PAL** to switch between NTSC and PAL TV system.

OSD - On Screen Display

If you insert VCD/CD, your TV screen will serve as an additional display for messages (e.g. PLAY, STOP), and information stored on the VCD/CD.

- Press OSD on the remote control to select viewing various information.
 - The elapsed time, remaining time in the track/disc (SINGLE REMAIN / TOTAL REMAIN) and EQUALIZER bars appear on the display.

Helpful hints:

- For a MP3-CD, TOTAL REMAIN is not available.
- For a VCD, SINGLE REMAIN is not available.

INSTRUCTION FOR USE

CD/VCD/MP3-CD

VIDEO CD

Playing a Video CD with PBC

VCD with PBC (Playback Control) will be indicated of the set and on your TV screen as soon as they are inserted. PBC is a predefined play sequence stored on the VCD.

1. Switch on the TV, insert a VCD with PBC.
2. Menu appears on the TV screen.

If the menu consists of a list of titles, you can select a sequence directly

1. Press **digits 0 - 9** on the remote control to select your choice.
→ The VCD starts playing of the selected sequence automatically.
2. Press **RETURN** on the remote control to go back to the previous menu.

Helpful hints:

- If a menu consists of more than one page, press **◀** or **▶** to go through the pages.

Switching off PBC

- In stop mode, press **PBC**.
→ On TV screen, "PBC OFF" will be displayed shortly.

Helpful hints:

- Programme mode is not available whenever PBC mode is switched on.
- The menu structure depends on the programme stored on the VCD. Please refer to the information supplied with the disc.

Pause

1. During playback, press **⏸** to have a still picture on the TV screen.
→ The sound will be muted.
→ On TV screen, "PAUSE" will be displayed.
2. Press **⏸** again to continue playback.

Goto

1. Press **GOTO** on the remote control.
→ On TV screen, "GOTO ---:" will be displayed.
2. Press **digits 0 - 9** on the remote control to key in the disc time which you want the disc to begin playback.

Helpful hints:

- The disc time entered should not be greater than the total disc time.
- Goto mode is not available whenever PBC mode is switched on.

Slow

1. Press **SLOW** on the remote control to watch a VCD at a slower speed. There are 4 types of slow modes to select.
→ The sound will be muted.
→ On TV screen, "SLOW 1/2", "SLOW 1/4", "SLOW 1/8" or "SLOW 1/16" will be displayed.
2. To resume playback at normal speed, press **SLOW** repeatedly until "PLAY" appears on the TV screen or press **⏸**.

CD/VCD/MP3-CD

L/R/ST

You can use it to select the different audio modes.

- Press **L/R/ST** on the remote control repeatedly to select the following modes:
Ⓛ → **Ⓡ** → **Ⓛ** **Ⓡ** on the LCD represents channel left/channel right / dual channel on a bilingual VCD or mono left / mono right / stereo on single language VCD.

PLAYING A MIXED MODE DISC

This set can play a mixed mode disc.

- mixture of audio CD and MP3-CD
- mixture of other combination may not be operated normally.

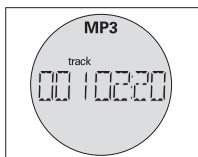
1. As default, audio CD tracks will be read first.
→ **Ⓛ** **Ⓡ** will be displayed.
→ TV screen, "MIX, CD-DA" will be displayed.

2. Press **MIX/SEL** (on the remote control) repeatedly to select other disc modes.

• MP3-CD:

- **MP3** is displayed.
- TV screen, MP3 menu is displayed.

Helpful hints: - For protected CDs, "MIX CD-DA" is displayed on your TV screen even if the disc does not have other format. The **MIX/SEL** normal functions are not available for protected CDs.



CD/VCD/MP3-CD

A->B repeat

This feature is also applicable to audio CD (except for MP3-CD). To Play a certain scene or passage of the disc repeatedly,

1. Press **A->B** on the remote control during playback to mark the start point of the chosen scene or passage.
→ "REPEAT A" will appear on the screen.
2. Press **A->B** again to mark the end of the chosen scene or passage.
→ "REPEAT AB" will appear on the screen.
→ The selected scene or passage will start playing repeatedly.
3. Press **A->B** once more to return to normal playback.
→ "REPEAT AB" will disappear from the display.

Helpful hints:

- You can also cancel A->B repeat by pressing **◀** or **▶**.
- The A->B repeat marking can only be set within the same track.

Resume

- In stop mode, press **RESUME** on the remote control to start playback again from where you have stopped.

Helpful hints:

- Resume will not be available if you have changed the disc, opened the disc tray or disconnected the system from the power supply.

View

This feature allows you to scan through a VCD for a quick review. PBC mode must be switched off.

1. In stop mode, press **VIEW** on the remote control to go to disc view function.
→ On TV screen, up to 9 pictures will be displayed. If a menu consists of more than one page, press **◀** or **▶** to view the previous/next page.
→ The first several seconds of each track will be played.
To exit review mode, press **digits 0 - 9** to play the desired track or **⏸** to play the current selected track.
2. In playback mode, press **VIEW** on the remote control to go to track view function.
→ press **◀** or **▶** to select the track.
→ On TV screen, up to 9 pictures within the track will be displayed.
→ The first several seconds of each picture will be played.
To exit review mode, press **digits 0 - 9** to play the desired position within the track or **⏸** to play the current selected position.

Helpful hints:

- If the disc is AVCD disc and there're no video tracks on the same viewed page, cannot use the direct digital key to play the track.

Return

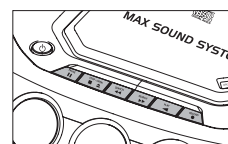
- Press **RETURN** on the remote control to return to the previous VCD disc MENU level. It is functional only for Video CD when PBC is switched on.

CASSETTE RECORDER

CASSETTE PLAYBACK

Cassette playback

- 1 Select **TAPE** source.
→ Display: shows **TAPE** throughout tape operation.
 - 2 Press **STOP • OPEN** **▲** to open the cassette door.
 - 3 Insert a recorded cassette and close the cassette door.
 - 4 Press **PLAY** **▶** to start playback.
 - 5 To interrupt playback press **PAUSE** **⏸**. To resume, press this key again.
 - 6 By pressing **SEARCH** **◀** or **▶** on the set fast winding of the tape is possible in both directions.
 - 7 To stop the tape, press **STOP • OPEN** **▲**.
- The keys are automatically released at the end of a tape, except if **PAUSE** **⏸** has been activated.



CASSETTE RECORDING

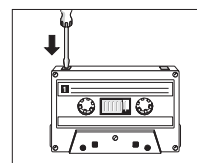
General information on cassette recording

- Recording is permissible insofar as copyright or other rights of third parties are not infringed.
- This deck is not suitable for recording on CHROME (IEC II) or METAL (IEC IV) type cassettes. For recording you should use NORMAL type cassettes (IEC I) on which the tabs have not been broken.
- Check and tighten slack tape before use with a pencil, to avoid jamming the deck mechanism.
- The recording level is set automatically. Altering the VOLUME MAX SOUND or BASS, MID & HIGH controls will not affect the recording in progress.

Helpful hints:

-No recording will take place during the 7 seconds in the beginning of the tape.

- To prevent the accidental erasure of a recording, keep the cassette side to be safeguarded in front of you and break out the left tab. Recording on this side is no longer possible.



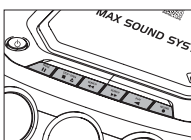
INSTRUCTION FOR USE

MAINTENANCE & SAFETY

CASSETTE RECORDER

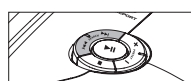
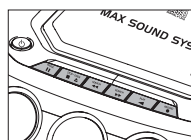
RECORDING FROM THE RADIO

1. Tune to the desired radio station (see **Tuning to radio stations**).
2. Press **STOP•OPEN** ■▲ to open the cassette holder.
3. Insert a blank tape.
4. Press **RECORD** ● to start recording.
5. For brief interruptions, press **PAUSE II**. To resume recording, press **PAUSE II** again.
6. To stop recording, press **STOP•OPEN** ■▲



CD SYNCHRO START RECORDING

1. Select **CD•VCD**.
2. Insert a CD and if desired, programme track numbers.
3. Press **STOP•OPEN** ■▲ to open the cassette holder.
4. Insert a blank cassette.
5. Press **RECORD** ● to start recording.
 - Playing of the whole disc or programme starts automatically from the beginning. It is not necessary to start the CD player separately.
6. For brief interruptions, press **PAUSE II**. To resume recording, press **PAUSE II** again.
7. To stop recording press **STOP•OPEN** ■▲



To select and record a particular passage within a track

1. Press and hold **SEARCH** ◀▶ on the set to select a passage.
2. Put the CD player in **PAUSE II** position at the selected passage.
 - Recording will start from this exact point when you press **RECORD** ●.

KARAOKE

Microphone mixing

Connect microphones (not supplied) to the system to sing along with the music source.

1. Connect microphones to **MIC**.

- Before connecting the microphone, set the microphone level with **VOL** to the lower level to prevent howling sound.
2. Select **VCD** and press **▶II** to start playback.
 3. Adjust the volume level of the source with **VOLUME** control.
 4. Press **ECHO +/-** to adjust the ECHO level to the desired mixing level.
 5. Start singing or talking through the microphone.
 6. Press **KEY +/-** to select key tone if necessary.

Helpful hints:

- Keep the microphones away from the speakers to prevent howling.
- Microphone mixing only available in VCD mode.

TROUBLESHOOTING

If a fault occurs, first check the points listed below before taking the set for repair.

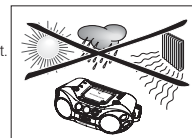
If you are unable to remedy a problem by following these hints, consult your dealer or service centre.

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

Problem	Solution
CD/VCD OPERATION	
"NO DISC" is displayed	<ul style="list-style-type: none"> – Insert a disc. – Check if the disc is inserted upside down. – Wait until the moisture condensation at the lens has cleared. – Replace or clean the disc, see "Maintenance" – Use a readable disc or correct recorded format MP3-CD.
No picture on TV screen No colour on TV	<ul style="list-style-type: none"> – Connect the cable between the system and TV. – Change the system to the respective PAL or NTSC setting.
RADIO RECEPTION	
Radio reception is poor	<ul style="list-style-type: none"> – If the signal is too weak, adjust the antenna for better reception. – Increase the distance between the Receiver and your TV or VCR.
TAPE OPERATION/RECORDING	
Recording or playback cannot be made	<ul style="list-style-type: none"> – Clean deck parts, see "Maintenance". – Use only NORMAL (IEC I) tape. – Apply a piece of adhesive tape over the missing tab space.
GENERAL	
The system does not react when buttons pressed/set does not work/no display on LCD.	<ul style="list-style-type: none"> – Switch off the set. Remove and reconnect the AC power plug for 30 seconds and switch on the system again.
Sound cannot be heard or is of poor quality	<ul style="list-style-type: none"> – Adjust the volume. – Make sure the MP3-CD was recorded within 32-320 kbps (128kbps preferably) with sampling frequencies at 8 - 48 kHz (44.1kHz preferably). – Reduce the distance between the remote control and the system. – Insert the batteries with their polarities (+/- signs) aligned as indicated. – Replace the batteries. – Point the remote control in the direction of the system's IR sensor.
The remote control does not function properly	<ul style="list-style-type: none"> – Insert the batteries with their polarities (+/- signs) aligned as indicated. – Replace the batteries. – Point the remote control in the direction of the system's IR sensor.

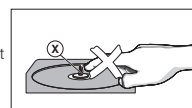
SAFETY INFORMATION

- Place the set on a hard, flat surface so that the system does not tilt.
- Do not expose the set, CDs, batteries or cassettes to humidity, rain, sand or excessive heat caused by heating equipment or direct sunlight.
- Always shut the CD door to keep the CD compartment dust-free. To clean, dust the compartment with a soft dry cloth.
- Do not cover the set. Adequate ventilation with a minimum gap of 15 cms between the ventilation holes and surrounding surfaces is necessary to prevent heat build-up.
- The mechanical parts of the set contain self-lubricating bearings and must not be oiled or lubricated.
- To clean the set, use a soft, slightly dampened chamois leather. Do not use any cleaning agents containing alcohol, ammonia, benzene or abrasives as these may harm the housing.



CD PLAYER AND CD HANDLING

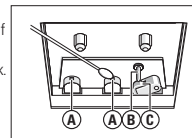
- The lens of the CD player should *never be touched*.
- Sudden changes in the surrounding temperature can cause condensation to form and the lens of your CD player to cloud over. Playing a CD is then not possible. Do not attempt to clean the lens but leave the set in a warm environment until the moisture evaporates.
- Use only Digital Audio Discs.
- To take a CD out of its box, press the centre spindle while lifting the CD.
 - Always pick up the CD by the edge and replace the CD back in its box after use to avoid scratching and dust.
- To clean the CD, wipe in a straight line from the centre towards the edge using a soft, lint-free cloth. Do not use cleaning agents as they may damage the disc.
- *Never write* on a CD or attach stickers to it.



TAPE DECK MAINTENANCE

To ensure a good recording and playback of the tape deck, clean parts (A), (B) and (C) show in the diagram below, after approx. 50 hours of operation, or on average once a month. Use a cotton bud slightly moistened with alcohol or a special head cleaning fluid to clean the deck.

- Open the cassette holder by pressing **STOP•OPEN** ■▲
- Press **PLAY** ◀ and clean the rubber pressure rollers (C).
- Press **PAUSE II** and clean the magnetic heads (A) and also the capstans (B).
- After cleaning, press **STOP•OPEN** ■▲

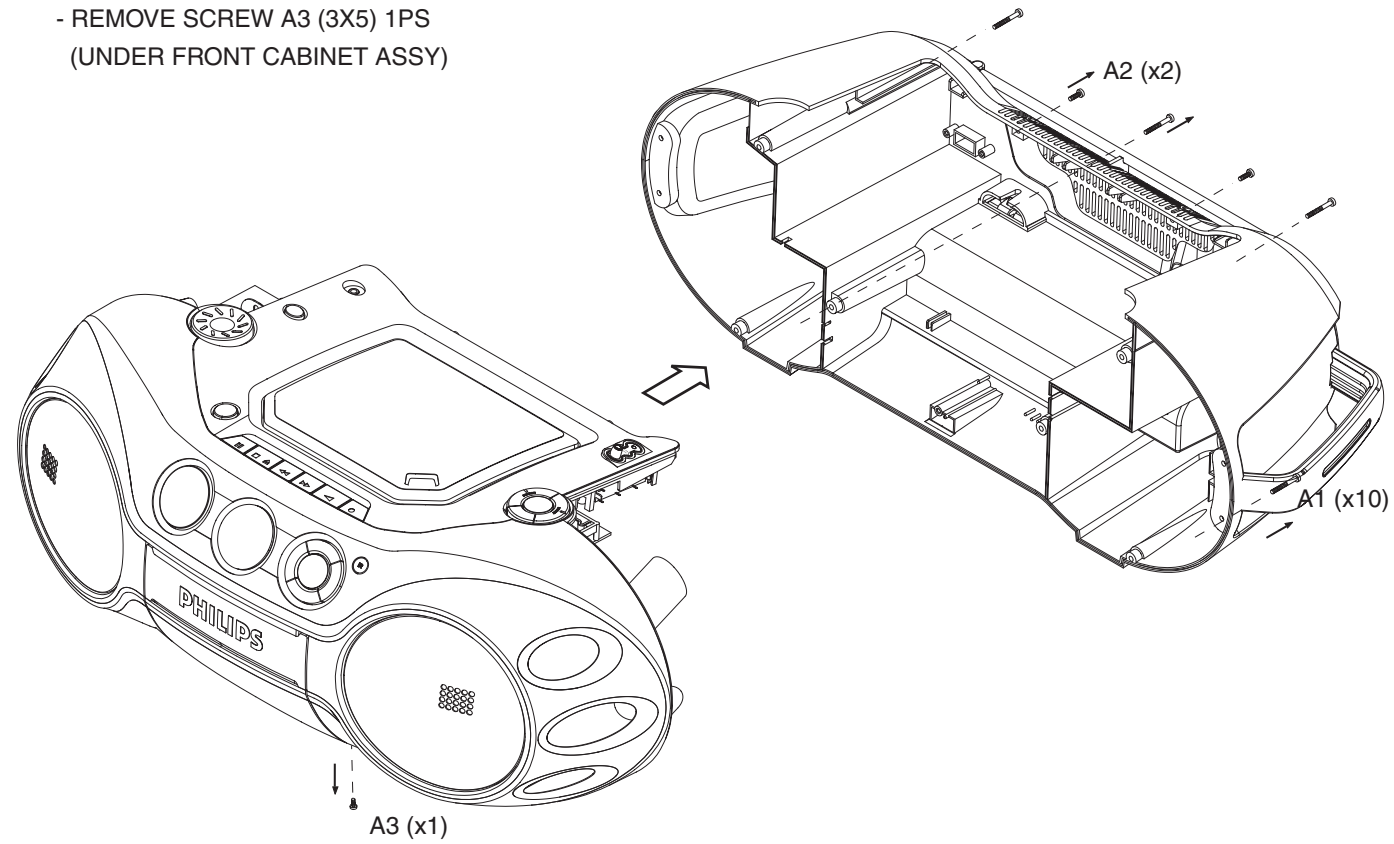


Cleaning of the heads can also be done by playing a cleaning cassette through once.

DISASSEMBLY DIAGRAM

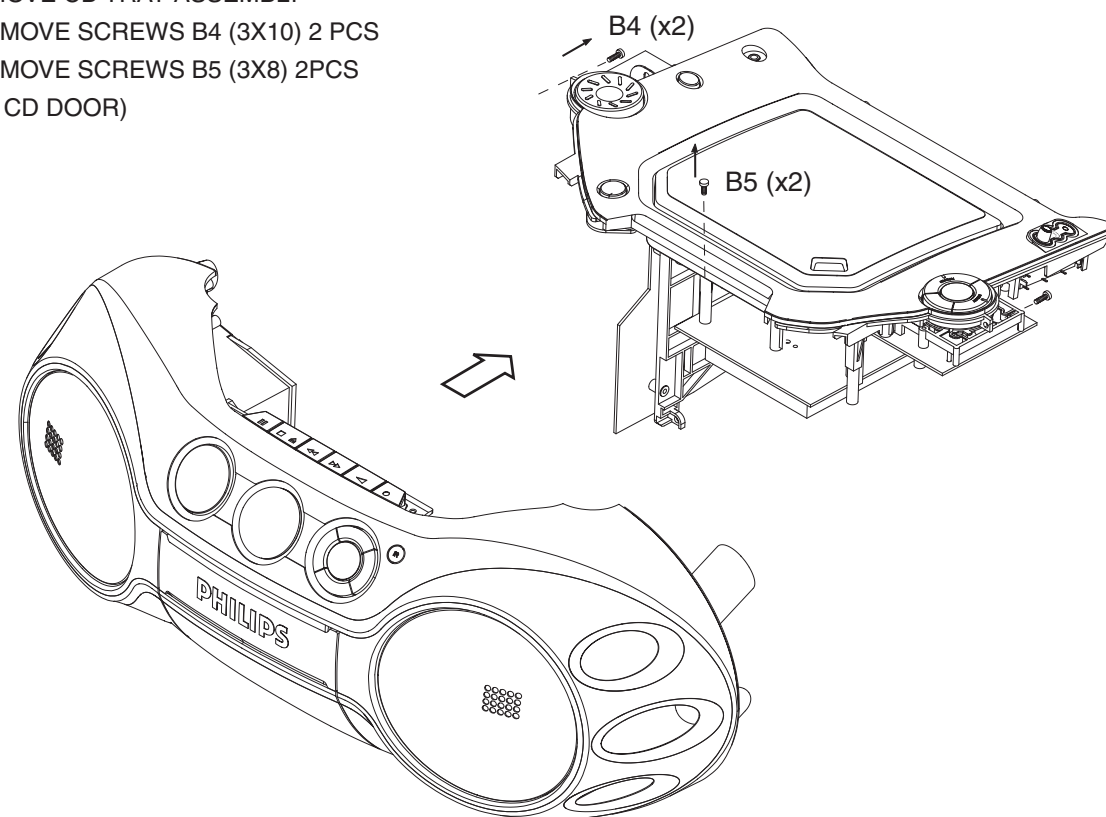
A. REMOVE REAR CABINET ASSEMBLY

- REMOVE SCREWS A1 (3X20) 10 PCS
- REMOVE SCREWS A2 (3X12) 2PCS
- REMOVE SCREW A3 (3X5) 1PS
(UNDER FRONT CABINET ASSY)



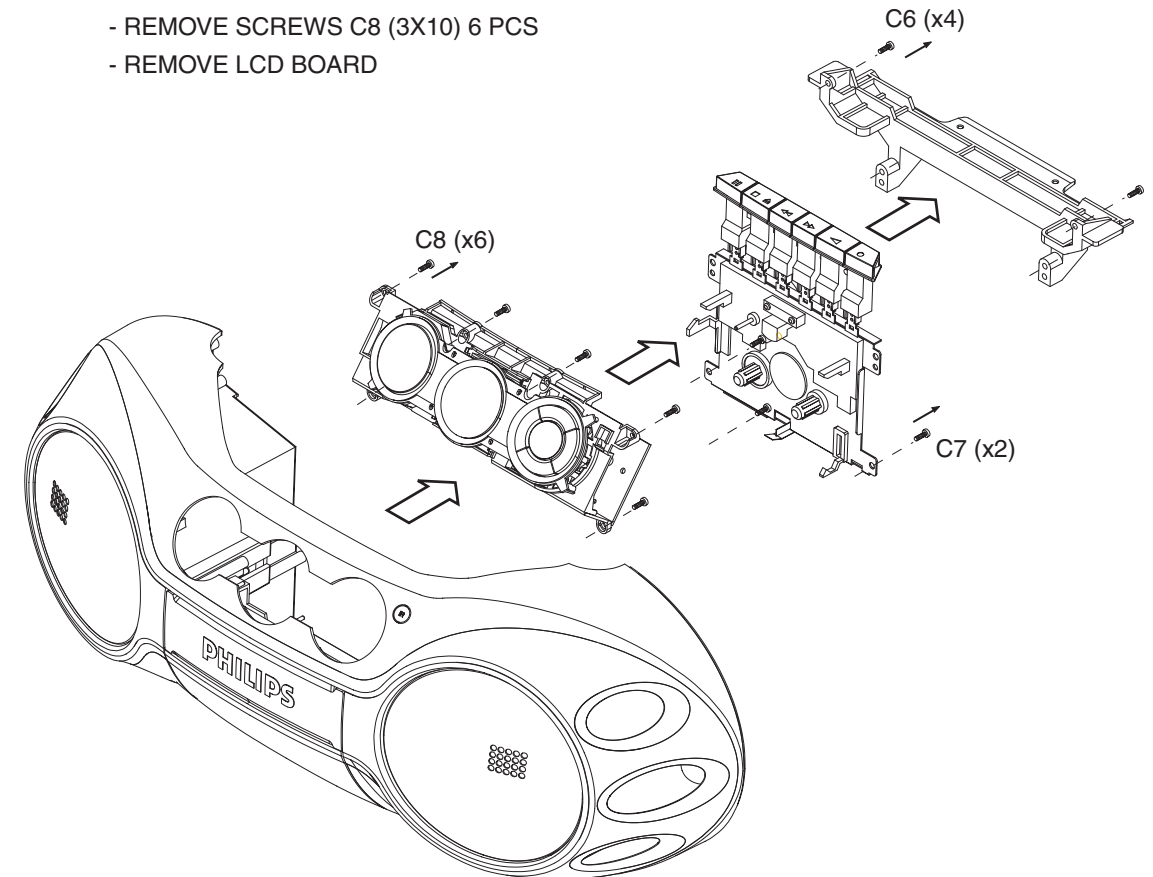
B. REMOVE CD TRAY ASSEMBLY

- REMOVE SCREWS B4 (3X10) 2 PCS
- REMOVE SCREWS B5 (3X8) 2PCS
(IN CD DOOR)

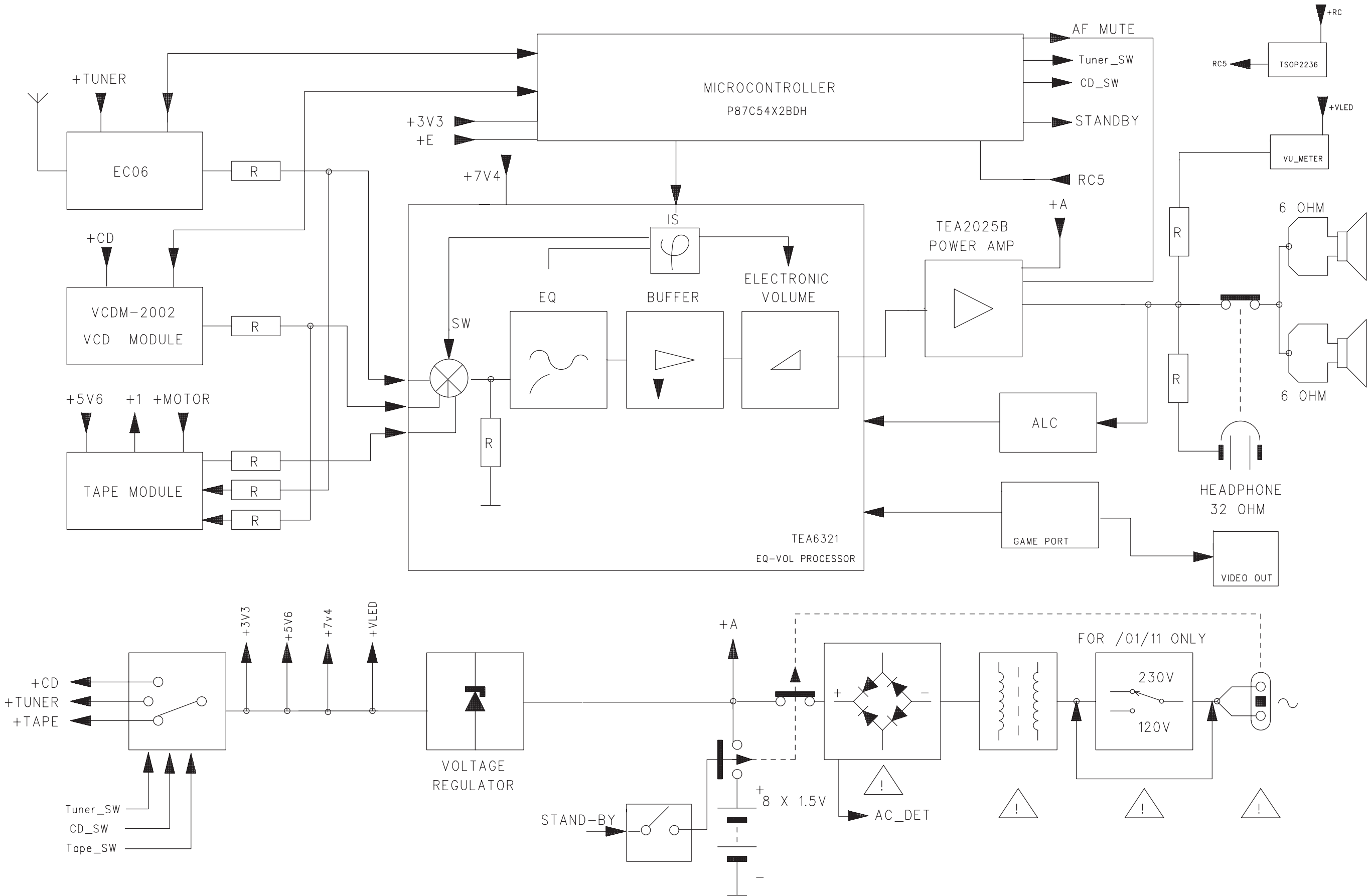


C. REMOVE LCD BOARD

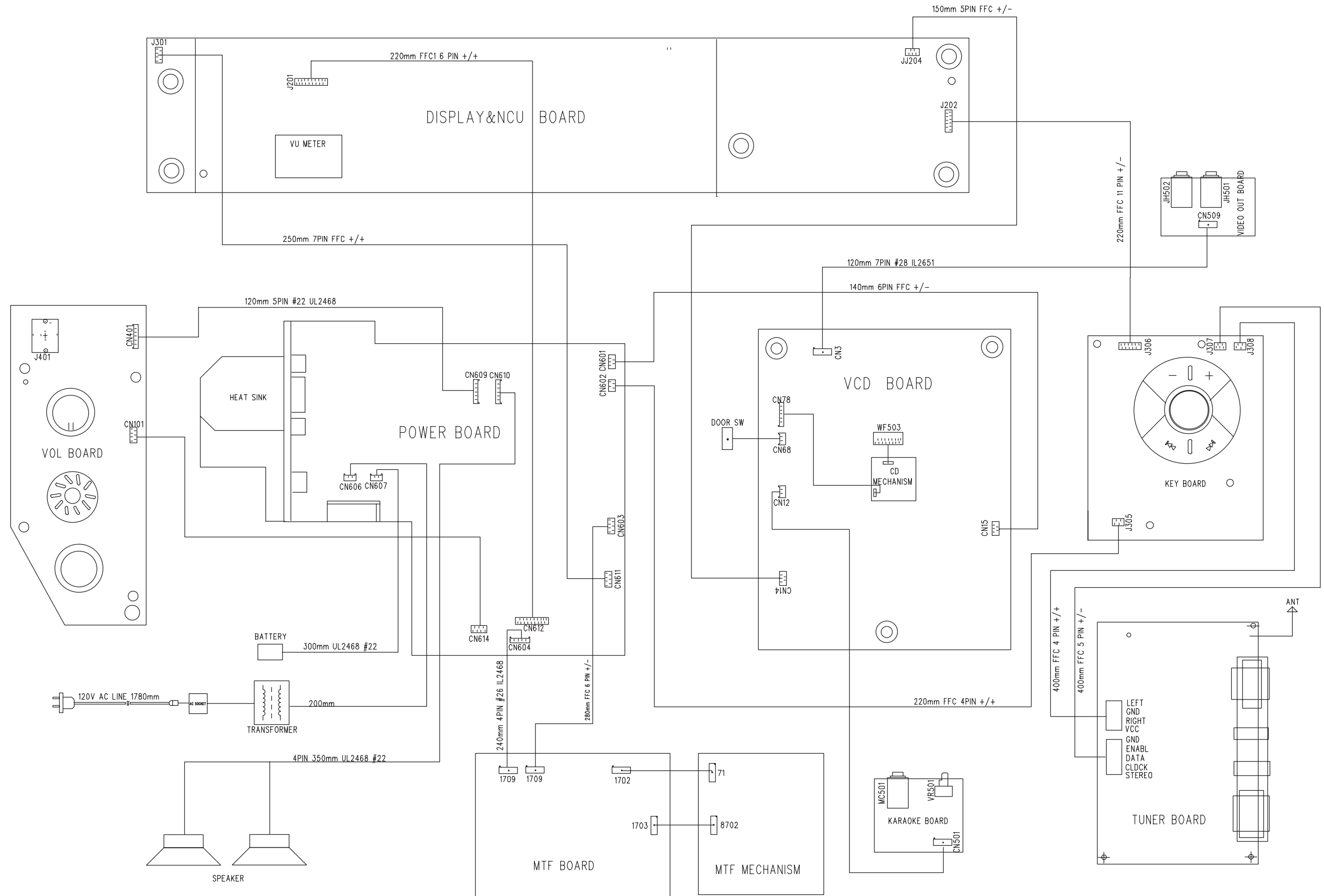
- REMOVE SCREWS C6 (3X10) 4 PCS
- REMOVE CASSETTE BRACKET
- REMOVE SCREWS C7 (3X10) 2 PCS
- REMOVE CASSETTE SET
- REMOVE SCREWS C8 (3X10) 6 PCS
- REMOVE LCD BOARD



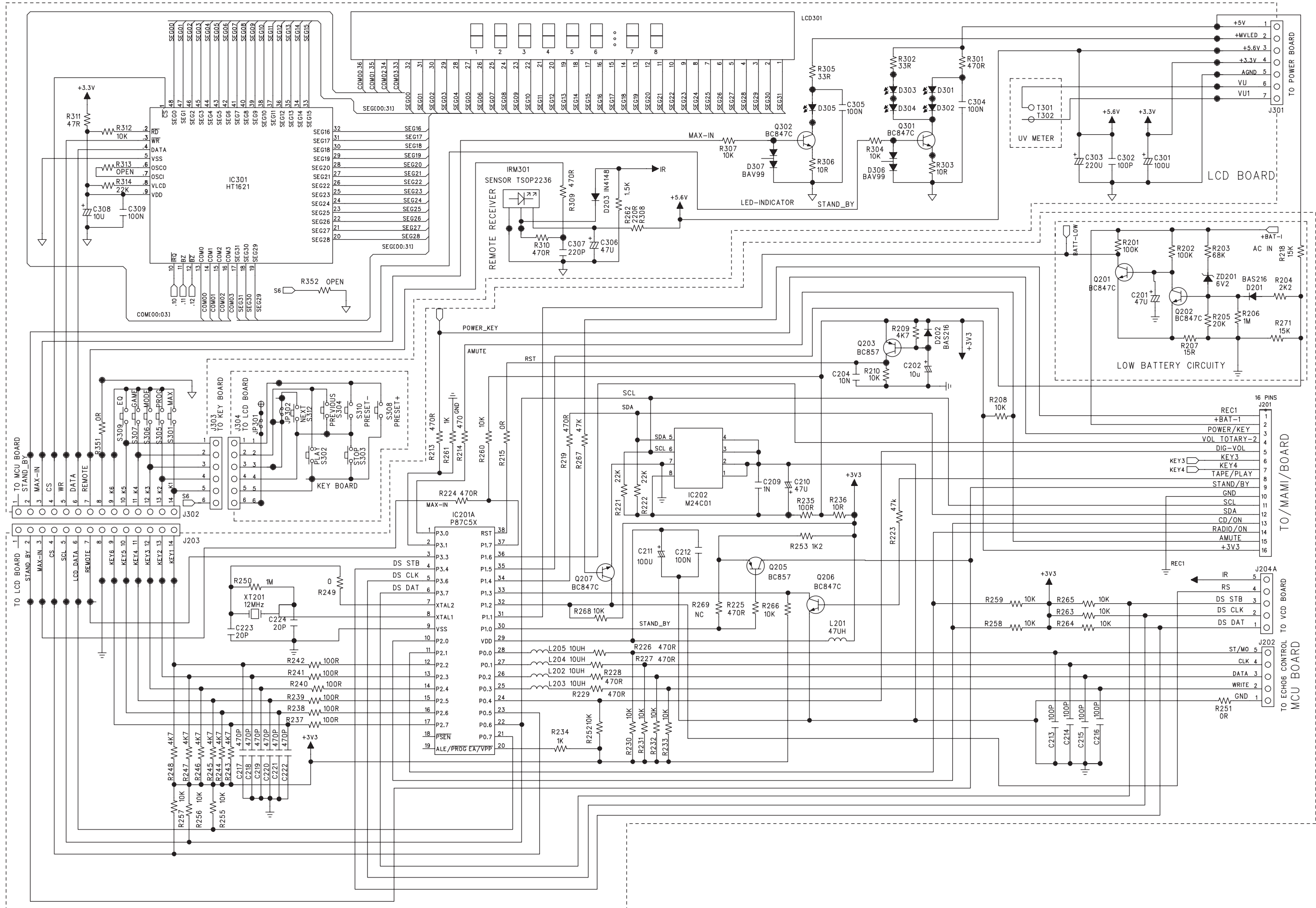
BLOCK DIAGRAM



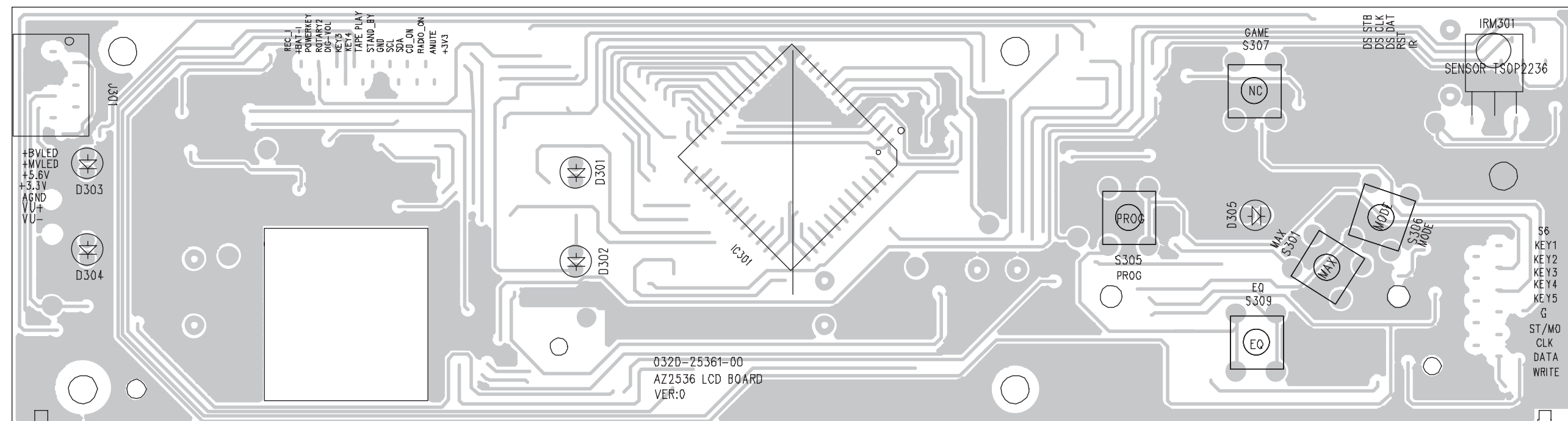
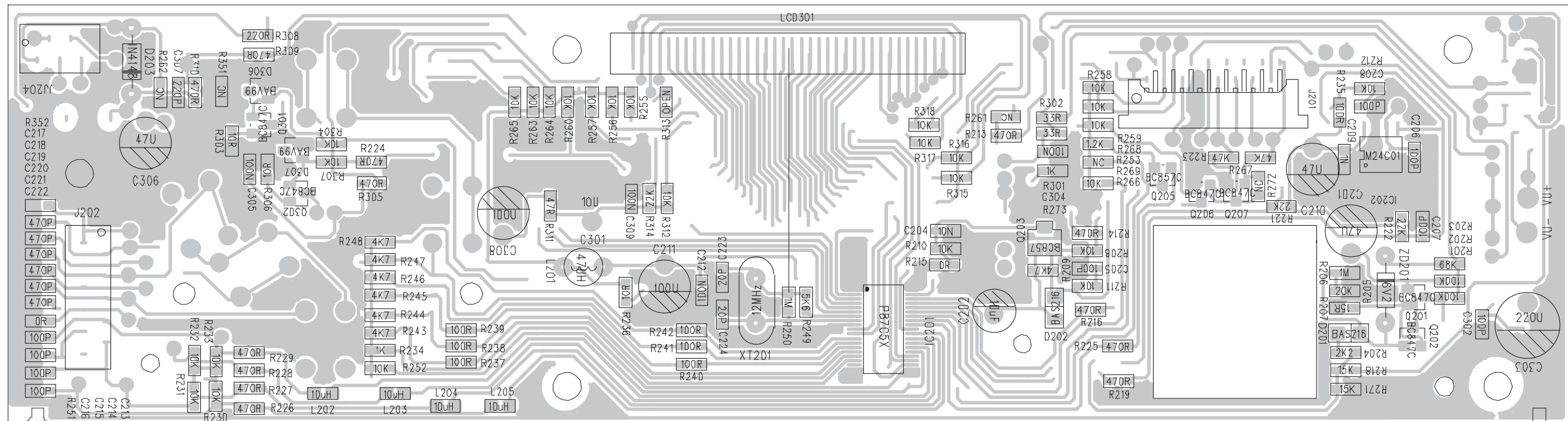
WIRING DIAGRAM



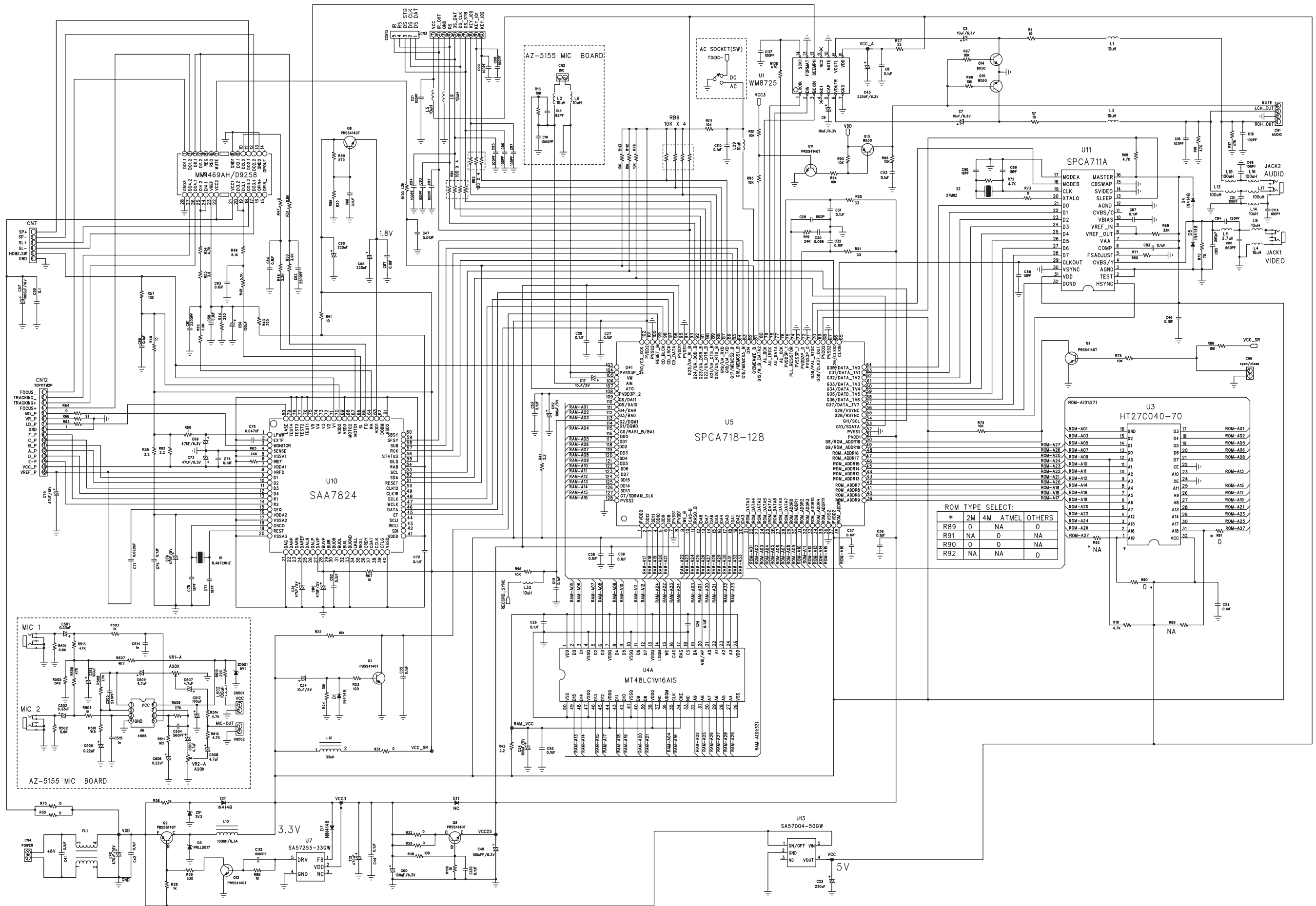
LCD & MCU BOARD - CIRCUIT DIAGRAM



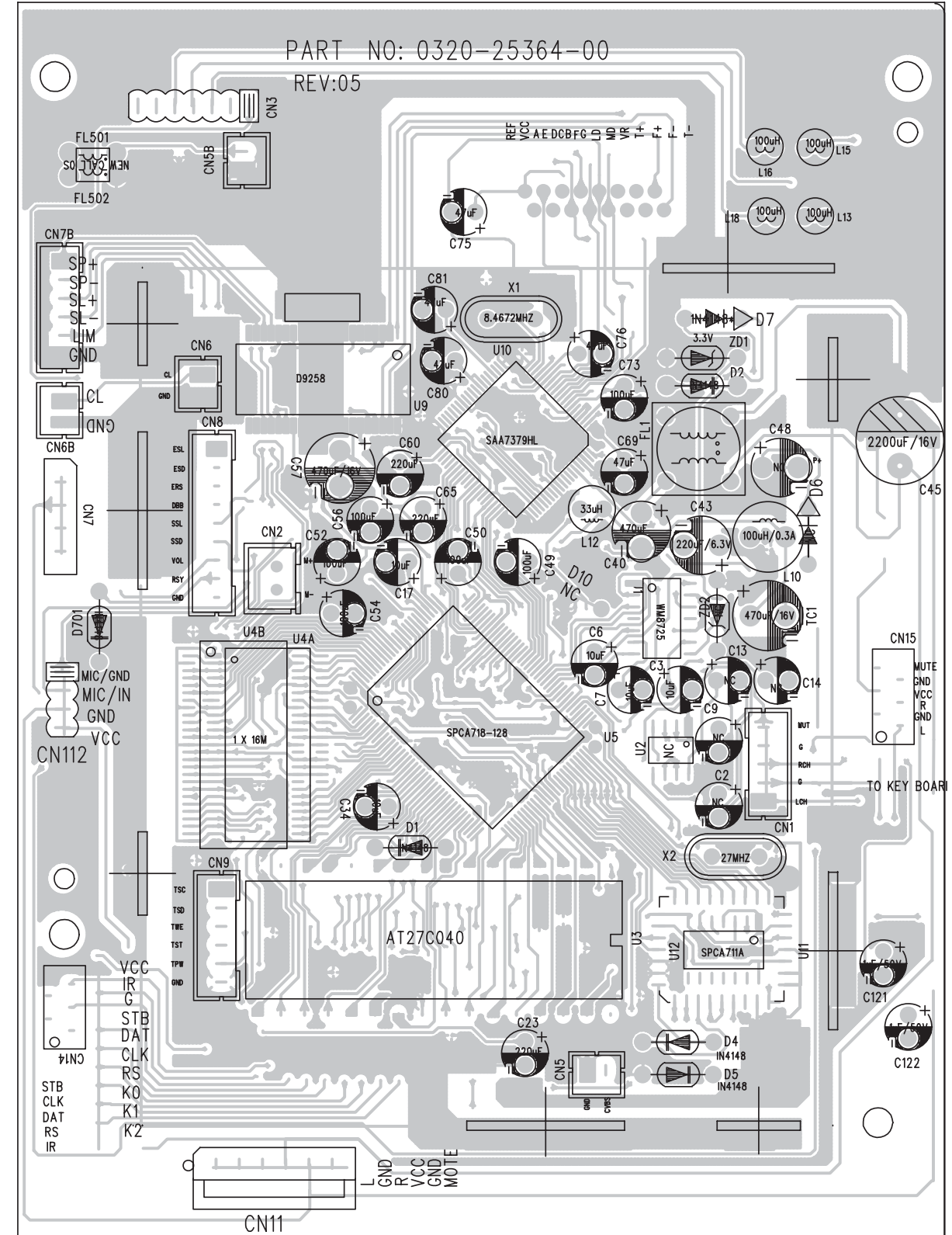
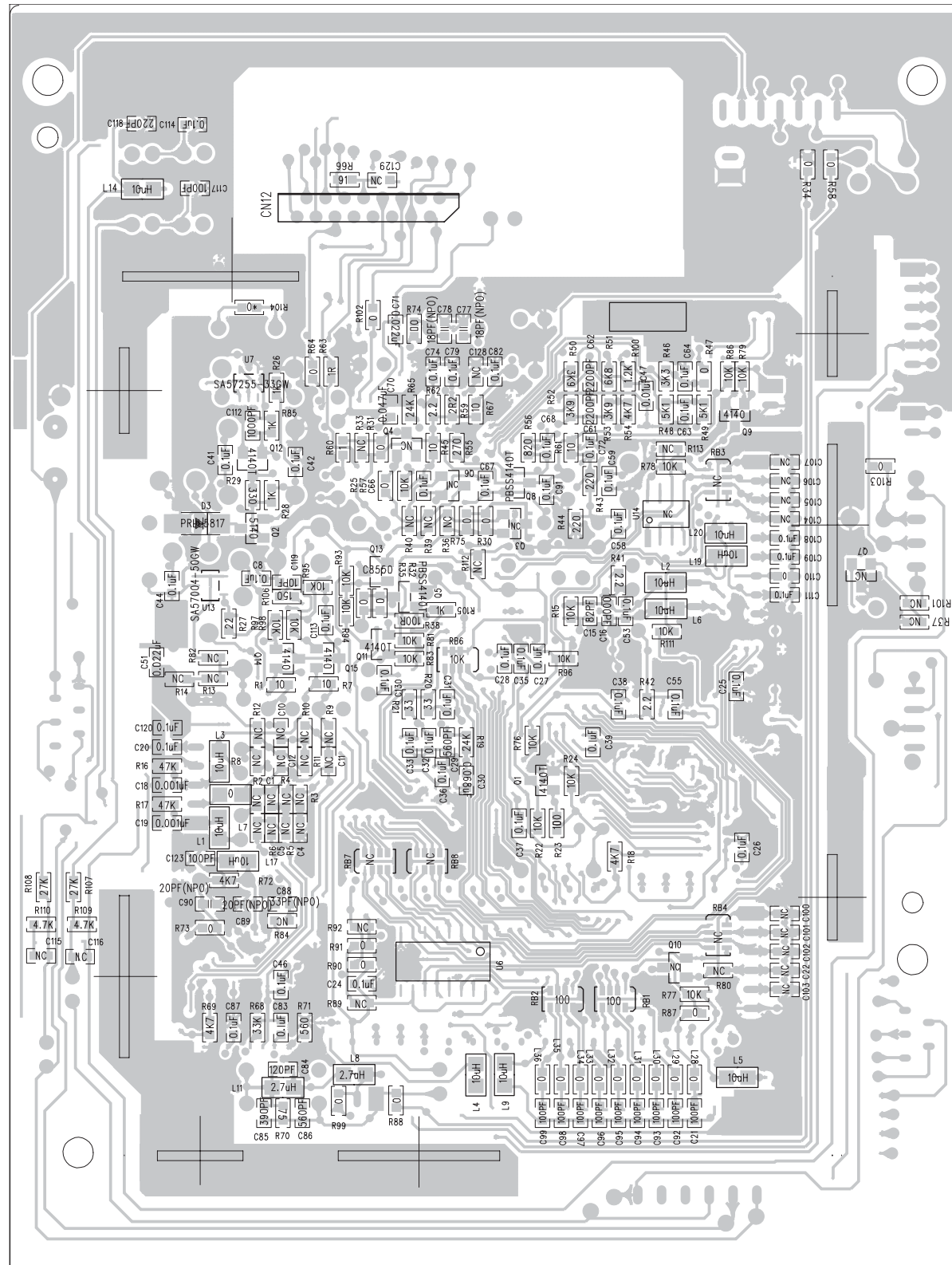
LCD& MCU BOARD - LAYOUT DIAGRAM



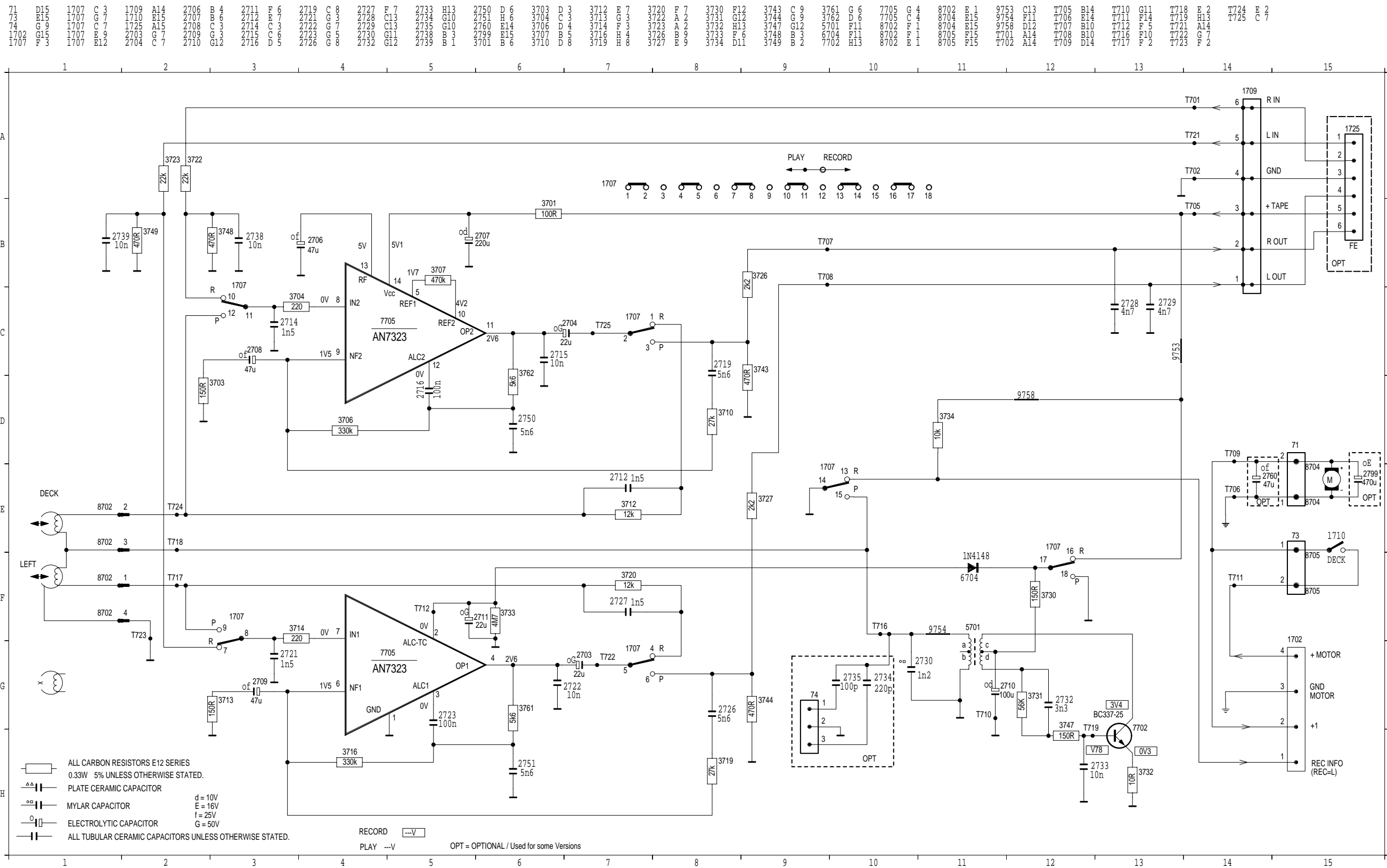
VCD BOARD - CIRCUIT DIAGRAM



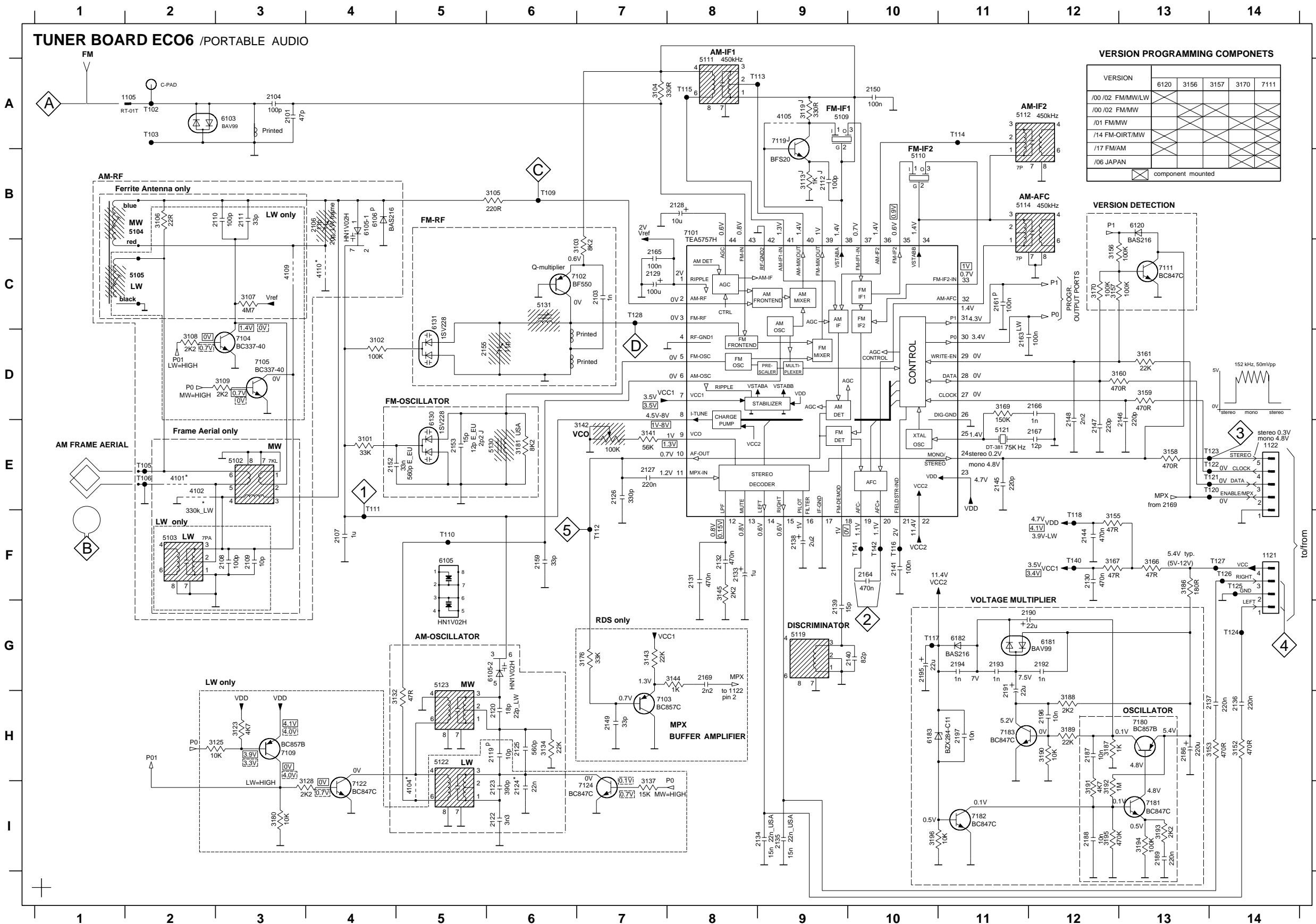
VCD BOARD - LAYOUT DIAGRAM



MTF BOARD - CIRCUIT DIAGRAM



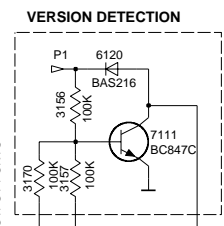
TUNER BOARD - CIRCUIT DIAGRAM



VERSION PROGRAMMING COMPONENTS

VERSION	6120	3156	3157	3170	7111
/00 /02 FMMW/LW					
/00 /02 FMMW					
/01 FMMW					
/14 FM-ORT/MW					
/17 FM/AM					
/06 JAPAN					

component mounted



- 1105 A1
- 1121 F14
- 1122 E14
- 2101 A3
- 2103 C7
- 2104 A3
- 2106 B4
- 2107 F4
- 2108 F3
- 2109 F3
- 2110 B3
- 2111 B3
- 2112 B9
- 2119 H6
- 2120 H6
- 2122 B6
- 2123 B6
- 2124 I6
- 2125 H6
- 2126 E7
- 2127 E7
- 2128 B8
- 2129 C7
- 2130 F12
- 2131 F8
- 2132 F8
- 2133 F8
- 2134 I9
- 2135 I9
- 2136 H14
- 2137 H14
- 2138 F9
- 2139 G9
- 2140 G10
- 2141 F10
- 2144 F12
- 2145 H11
- 2146 D12
- 2147 E12
- 2148 D12
- 2149 H7
- 2150 A10
- 2152 E4
- 2153 E5
- 2155 D5
- 2159 F6
- 2161 C11
- 2163 D11
- 2164 F10
- 2165 C7
- 2166 D12
- 2167 E12
- 2169 G8
- 2186 H13
- 2187 H12
- 2188 H12
- 2189 H13
- 2190 G12
- 2191 H11
- 2192 G11
- 2193 G11
- 2194 G11
- 2195 G10
- 2196 H12
- 2197 H11
- 3101 E4
- 3102 D4
- 3103 C7
- 3104 A7
- 3105 B6
- 3106 B2
- 3107 C3
- 3108 D3
- 3109 D3
- 3113 B9
- 3119 A9
- 3123 H3
- 3125 H3
- 3128 I4
- 3132 H5
- 3134 H6
- 3137 I7
- 3141 E7
- 3142 E7
- 3143 G7
- 3144 G8
- 3145 F8
- 3152 H14
- 3153 H14
- 3155 F12
- 3156 C12
- 3157 C12
- 3158 E13
- 3159 D13
- 3160 D13
- 3161 D3
- 3166 F12
- 3167 F12
- 3169 D11
- 3170 C12
- 3176 G7
- 3180 I3
- 3181 E6
- 3186 F13
- 3187 H12
- 3188 H12
- 3189 H12
- 3190 H12
- 3191 H12
- 3192 H12
- 3193 H13
- 3194 H13
- 3195 H12
- 3196 H10
- 4101 E2
- 4102 E2

LEGEND

- * ... only assembled in FM/AM-version
- p ... for provision only
- USA ... for USA version only
- LW ... for LW version only
- LW frame ... for LW version with frame aerial only
- E_EU ... for East European version only
- J ... for JAPAN version only

...V FM mode stereo

...V MW mode

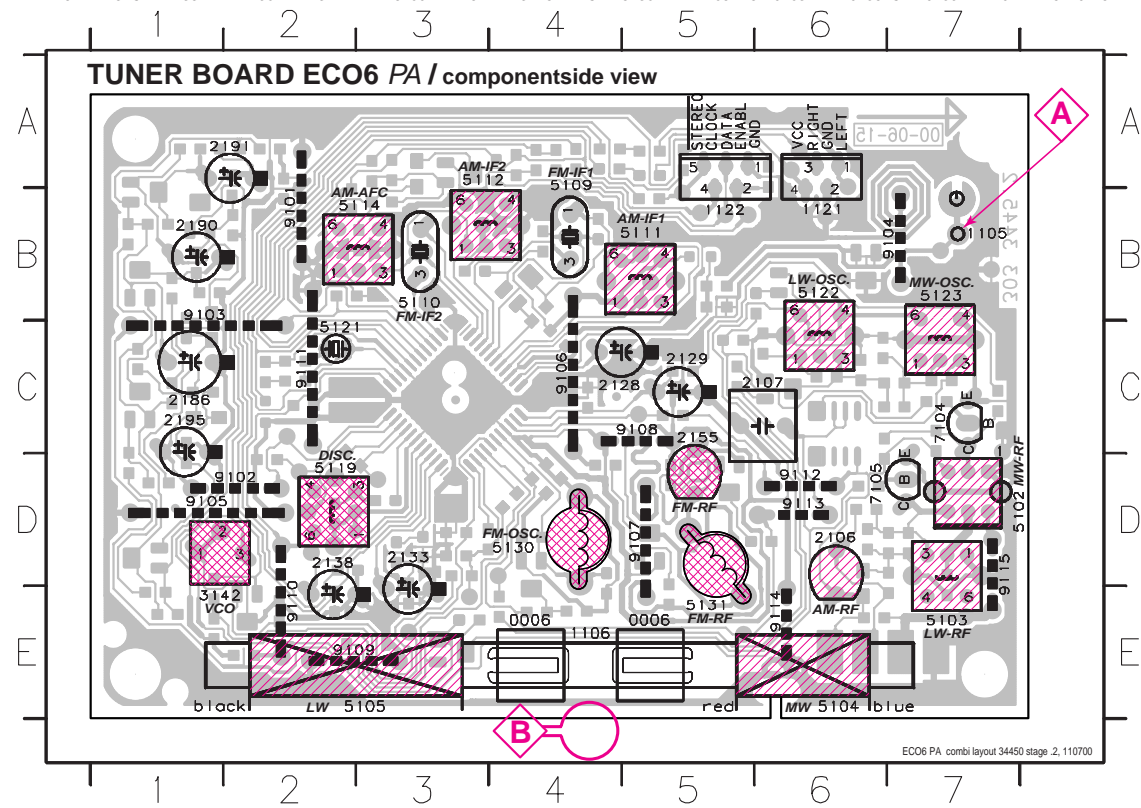
...V LW mode

voltages measured while set is tuned to a strong transmitter

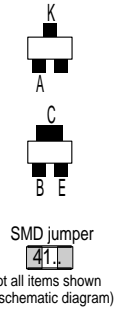
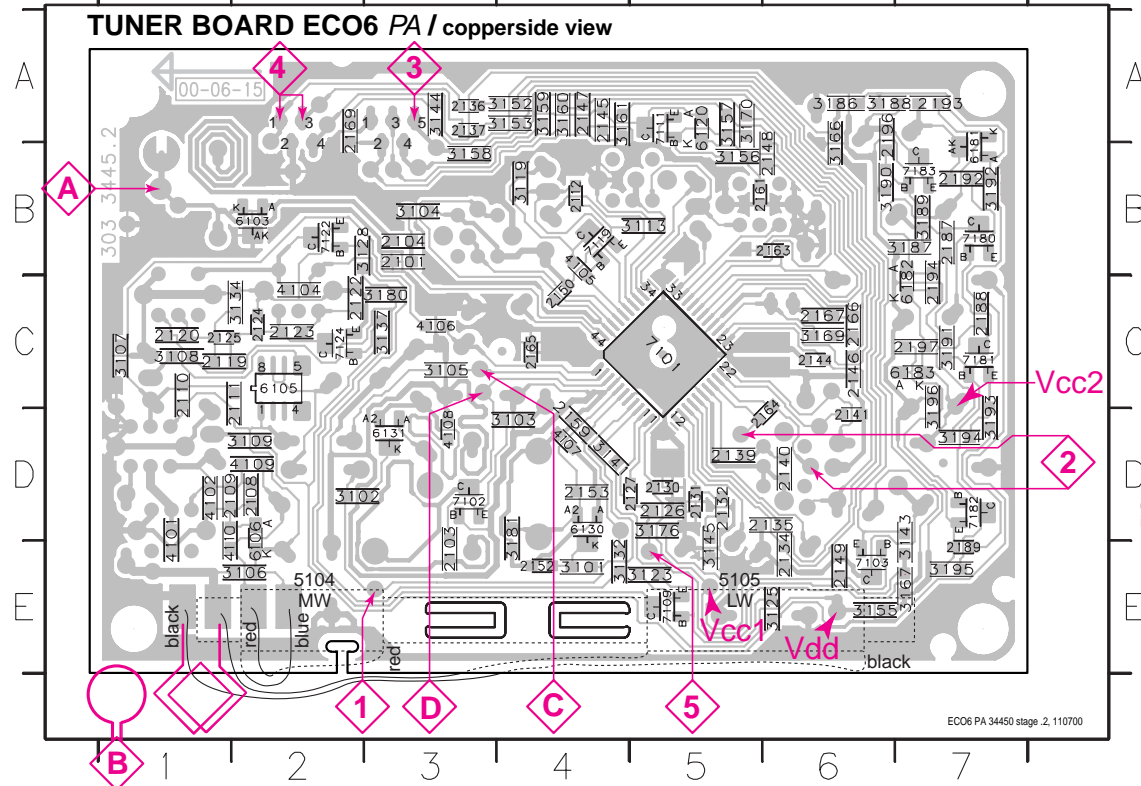
EVM

TUNER BOARD ECO6 - LAYOUT DIAGRAM

1105 B7 2106 D6 2129 C5 2155 C5 2191 A2 5102 D7 5110 B3 5114 B3 5122 B6 5131 E5 9101 B2 9104 B7 9107 D5 9110 E2 9113 D6
 1121 B6 2107 C6 2133 D3 2186 C1 2195 C1 5103 E7 5111 B4 5119 D2 5123 B7 7104 C7 9102 D2 9105 D1 9108 C5 9111 C2 9114 E6
 1122 B5 2128 C4 2138 D2 2190 B1 3142 E1 5109 B4 5112 B3 5121 C2 5130 D4 7105 D6 9103 B1 9106 C4 9109 E2 9112 D6 9115 D7



2101 B3 2119 C1 2130 D5 2140 D6 2150 C4 2166 C6 2194 C7 3106 E2 3128 B2 3152 A4 3161 A4 3186 A6 3194 D7 4107 D4 6130 D4 7109 E5 7183 B7
 2103 E3 2120 C1 2131 D5 2141 D6 2152 E4 2167 C6 2196 A6 3107 C1 3132 E4 3153 A4 3166 B6 3187 B7 3195 E7 4108 D3 6131 D3 7111 A5
 2104 B3 2122 C2 2132 D5 2144 C6 2153 D4 2169 A2 2197 C7 3108 C1 3134 C2 3155 E6 3167 E7 3188 A6 3196 C7 4109 D2 6181 B7 7119 B5
 2108 D2 2123 C2 2134 E6 2145 A4 2159 D4 2187 B7 3101 E4 3109 D2 3137 C3 3156 B5 3169 C6 3189 B7 4101 D1 4110 D1 6182 C7 7122 B2
 2109 D1 2124 C2 2135 D6 2146 C6 2161 B5 2188 C7 3102 D2 3113 B5 3141 D4 3157 A5 3170 A5 3190 B6 4102 D1 6103 B2 6183 C7 7124 C2
 2110 C1 2125 C1 2136 A3 2147 A4 2163 B6 2189 E7 3103 D4 3119 B5 3143 D7 3158 B3 3176 D5 3191 C7 4104 C2 6105 C2 7101 C5 7180 B7
 2111 C2 2126 D5 2137 A3 2148 B6 2164 D6 2192 A7 3104 B3 3123 E5 3144 A3 3159 A4 3180 C3 3192 B7 4105 B4 6106 D2 7102 D3 7181 C7
 2112 B4 2127 D5 2139 D5 2149 E6 2165 C4 2193 A7 3105 C3 3125 E6 3145 E5 3160 A4 3181 D4 3193 D7 4106 C3 6120 A5 7103 E6 7182 D7



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

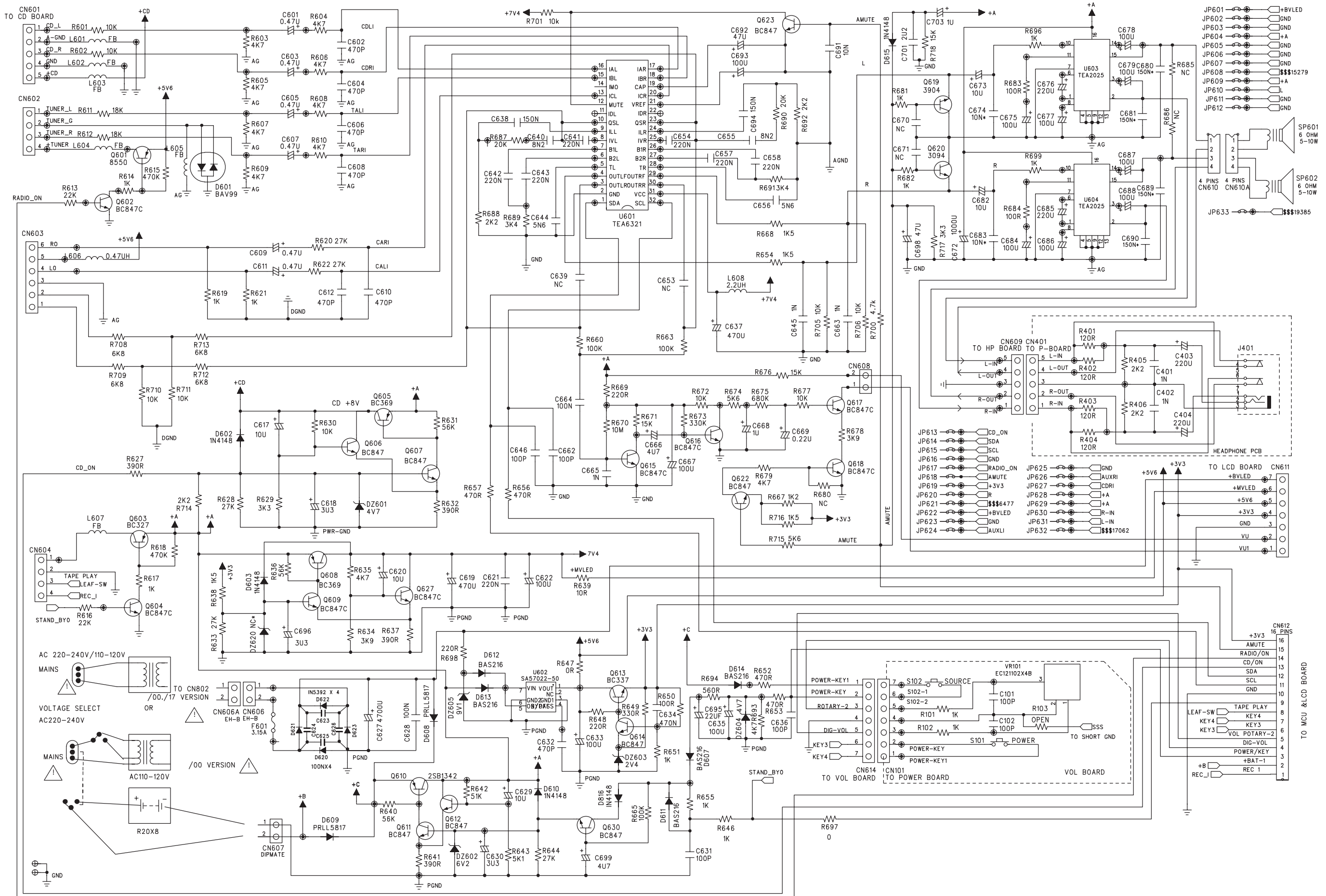
TUNER ADJUSTMENT TABLE (ECO6 FM/MW- and FM/MW/LW - versions with ferrite antenna)

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM 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)
MW 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
LW 153 - 279kHz			279kHz	5122		8V -0.2V
			153kHz	check		1.1V -0.4V
MW FM/MW/LW- version, 9kHz grid 531 - 1602kHz			1602kHz	5123		8V -0.2V
			531kHz	check		1.1V -0.4V
FM IF						
FM	10.7MHz, 45mV continuous wave	D		5119	2	0 - 3 mV DC
FM RF						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)	108MHz	A mod=1kHz Δf=-22.5kHz	108MHz	2155	4	MAX
	87.5MHz (65.81MHz)		87.5MHz (65.81MHz)	5131		
VCO						
FM	98MHz, 1mV continuous wave	A	98MHz	3142	3	152kHz -1kHz ¹⁾
AM IF						
MW	450kHz connect pin 6 of IC 7101 (AM Osc.) with 2.2kΩ to Vcc	C Δf=-10kHz V _{RF} = 0.5mV (as low as possible) see remark 2)		5111	5	
				5112		
AM AFC		C		5114	2	0 - 2 mV DC
AM RF³⁾						
LW	198kHz	B	198kHz	5105 LW ferrite coil	5	
MW FMMW/LW- and FM/MW-version (9kHz grid) 531 - 1602kHz	1494kHz		2106			
	558kHz	5104 MW ferrite coil				
MW FM/AM-version, 10kHz grid 530 - 1700kHz	1500kHz	Δf = -30kHz V _{RF} as low as possible	1500kHz	2106		
	560kHz		560kHz	5104 MW ferrite coil		

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) LW has to be aligned before MW.
 ↑ Repeat

ECO6, general with ferrite antenna, 070799

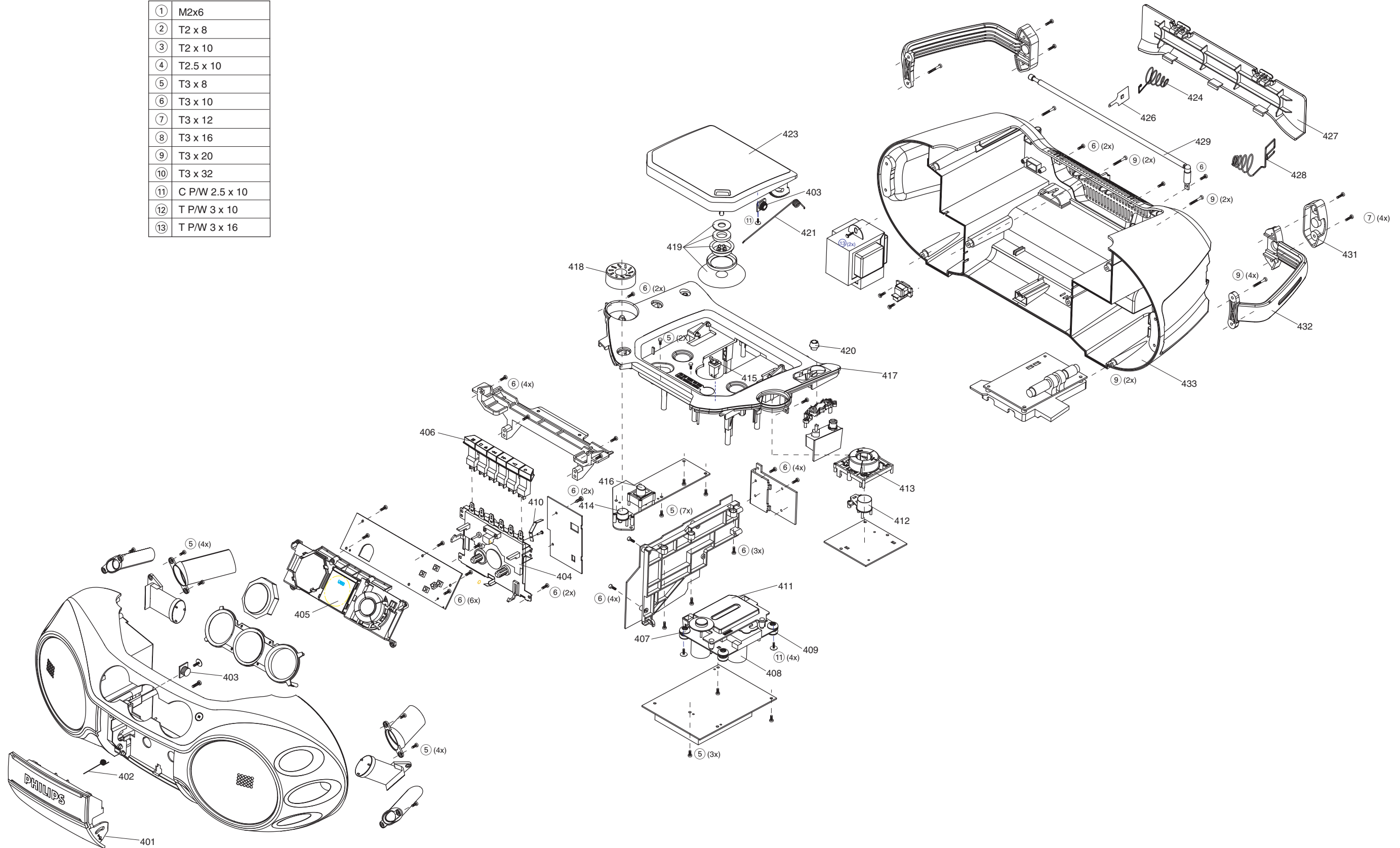
POWER BOARD - CIRCUIT DIAGRAM



EXPLODED VIEW DIAGRAM

SCREW LIST :

①	M2x6
②	T2 x 8
③	T2 x 10
④	T2.5 x 10
⑤	T3 x 8
⑥	T3 x 10
⑦	T3 x 12
⑧	T3 x 16
⑨	T3 x 20
⑩	T3 x 32
⑪	C P/W 2.5 x 10
⑫	T P/W 3 x 10
⑬	T P/W 3 x 16



MECHANICAL PARTSLIST

401	994000000361	CASS ASSY
402	994000000077	CASS SPRING
403	994000000073	DAMPER ASSY
404	994000000075	CASS DECK TK20FX-V689-001
405	994000000353	LCD DISPLAY
406	994000000074	CASSETTE KEY 1
406	994000000133	CASSETTE KEY 2
406	994000000134	CASSETTE KEY 3
406	994000000135	CASSETTE KEY 4
406	994000000136	CASSETTE KEY 5
406	994000000137	CASSETTE KEY 6
407	994000000098	DAMPER RUBBER 40
408	310330905311	DA11T3CN-PH CDM
409	994000000097	DAMPER RUBBER 30
410	996500008506	REC SPRING
411	994000000095	DUST COVER
412	994000000091	KET SET-PLAY
413	994000000092	KEY SET-PRESET
414	994000000089	KEY SET-POW-ON-OFF
415	994000000101	DOOR LATCH SWITCH
416	994000000094	SOURCE KNOB
417	994000000087	CD TRAY
418	994000000093	VOLUME KNOB
419	994000000102	CHUCKING PLATE ASSY
420	994000000362	MIC VOLUME KNOB
421	994000000096	CD SPRING
423	994000000088	DOOR-CD
424	994000000084	SPRING-COMPRESS(-)
426	994000000083	CONTACT PLATE
427	994000000081	DOOR-BATTERY
428	994000000086	BATTERY SPRING(+)
429	994000000085	ROD ANT
431	994000000082	HANDLE COVER
432	994000000079	HANDLE
433	994000000058	REAR CAB ASSY
	994000000364	REMOTE CONTROL

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

ELECTRICAL PARTSLIST**- MISCELLANEOUS -**

	994000000105	RECORD BOARD ASSY
	994000000106	TUNER BAORD ASSY
	994000000346	LCD BOARD ASSY
	994000000347	VCD BOARD ASSY
JH501	996500020544	EARPHONE JACK
JH502	996500020543	STEREO EARPHONE JACK
	242203000333	AC SOCKET
	314011051881	VU-METER
F601	994000000118	GLASS FUSE 3.15A 250V
S101	996500013424	TC-0113X TACT SW.
S102	996500013424	TC-0113X TACT SW.
	994000000352	36P 55mm HEAT SEAL CONNECTOR
U601	935079510118	TEA6321(SMD)
U603	994000000348	IC KA2206B
U604	994000000348	IC KA2206B
U602	994000000349	SA57022-50D
	482227730971	SLIDE SWITCH
	994000000131	TRANSFORMER VDE(-/01)
	994000000119	TRANSFORMER VDE(-/10)
	242207098151	VDE POWER CORD(-/01)
	996500012162	SAA POWER CORD(-/10)
	994000000354	SPEAKER 8W MAX

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