Micro System

MCD510

All Version

Service
Service
Service

Service Manual

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CLASS 1
LASER PRODUCT

Published by SL 0540 Service Audio Printed in The Netherlands Subject to modification

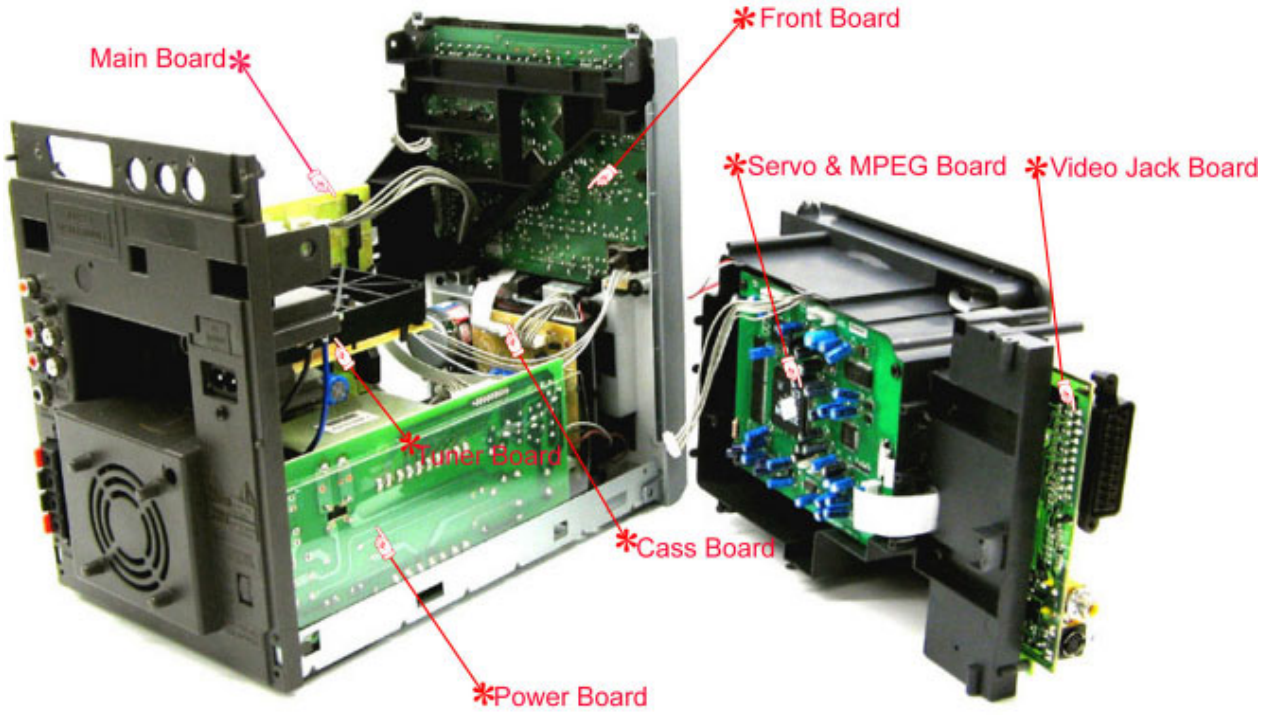
GB

3141 785 30611

Version 1.1

PHILIPS

LOCATION OF PCBS



VERSION VARIATIONS:

Type /Versions: / Features & Board in used:	MCD510									
	/22	/21M	/14	/21						
Aux in / CDR in	x	x	x	x						
Line Out	x	x	x	x						
Video Out										
Surround Out										
Subwoofer Out	x	x	x	x						
Power Booster Out										
Digital Out	x	x	x	x						
Digital in										
Matrix Surround										
RDS	x									
News	x									
Dolby Pro Logic (DPL)										
Incredible Surround	x	x	x	x						
Karaoke Features										
Voltage Selector		x		x						
ECO Power Standby (LCD Display Off)	x	x	x	x						
ECO6 Tuner Board - Systems Non-Cenelec		x		x						
ECO6 Tuner Board - Systems Cenelec	x		x							

SPECIFICATIONS

GENERAL:

Mains voltage : 230V ± 10% for /22/14
110-127V/220-240V Switchable for /21M/21
Mains frequency : 50/60Hz
Clock accuracy : < 4 seconds per day
Dimension centre unit : 180(W) x 265(H) x 325(D) (mm)

Power consumption
Active : 60W
Standby : < 15W (DEMO mode off)
ECO Power Standby : < 1W

TUNER:

FM

Tuning range : 87.5-108MHz
Grid : 50kHz
100kHz for /21
IF frequency : 10.7MHz ± 20kHz
Aerial input : 75 Ω coaxial
Sensitivity at 26dB S/N : < 22dBf
Selectivity at 300kHz bandwidth : > 33dB
Image rejection : > 20dB
Distortion at RF=1mV, dev. 75kHz : < 3%
-3dB Limiting point : < 23.5dB
Crosstalk at RF=1mV, dev. 40kHz : > 26dB

AM

Tuning range : 531-1602kHz
530-1700kHz for /21/21M
Grid : 9kHz
10kHz for /21/21M
IF frequency : 450kHz ± 1kHz
Aerial input : Frame aerial 18.1μH
Sensitivity at 26dB S/N : > 1.3mV/M
Selectivity at 300kHz bandwidth : > 20dB
IF rejection : > 24dB
Image rejection : > 28dB
Distortion at RF=50mV, M=80% : < 5%

AMPLIFIER:

Output power
L & R : 2 x 25W (6Ω, 1kHz, 10% THD)
Frequency response within +0.5/-1.0dB
: 20Hz-20kHz
Digital Sound Control (DSC) : Jazz / Rock / Pop / Optimal
Dynamic Bass Boost (DBB) : On / Off
Incredible Surround : On / Off

Input sensitivity
Aux in (at 1kHz) : 500mV at 600 Ω
Microphone in (at 1kHz) : 1mV rms at 600 Ω /21 /21M

Output sensitivity
Headphone output at 32 kΩ : 12mW ± 1dB (Max. vol.)
Line output at 10 kΩ : 2Vrms
Subwoofer output at 10 kΩ : 3Vrms (100Hz,Dist: 1%)
Digital output (Coaxial SPDIF) : 0.5Vpp at 75Ω

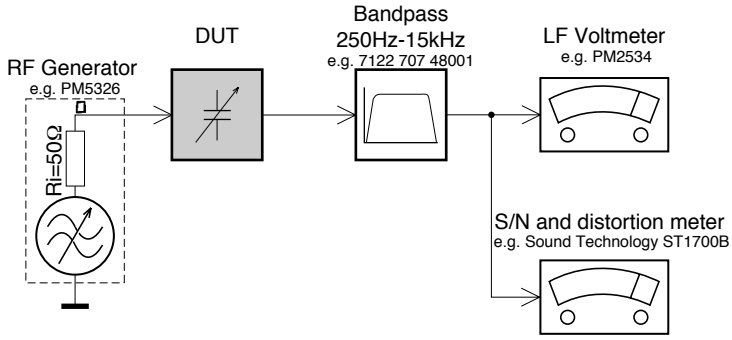
COMPACT DISC:

Frequency response within ± 3dB : 20Hz - 20kHz
Output level (in Vrms) : 500mV, Z_{out} = 100Ω
Signal/Noise ratio (A-weighted) : > 65dBA
Distortion at 1kHz : < 0.02%
Channel unbalance at 1kHz : < ±2dB
Channel separation at 1kHz : > 30dB
Emphasis : 15/50 μS (switched automatically by CD10)
THD Noise(1kHz) : < 0.5%
Outband Attenuation : 35dB
MP3-CD Bit Rate : 32-320 kbps
Sampling Rate : 32, 44.1, 48 kHz
Forma : ISO9660, Joliet
VIDEO PART
Video Bandwidth : 6MHz(-5dB)
S/N luminance : > 48dB
S/N chroma : AM: >58dB/PM: >51dB
Chrome/Luminance delay : < 80ns
Burst/Chroma ratio : ± 5%

CASSETTE RECORDER:
Number of track : 2 stereo
Tape speed : 4.76 cm/sec ± 2%
Wow and flutter : < 0.4% DIN
Fast-wind/Rewind time C60 : 130 sec
Bias system : 75kHz ± 10kHz
Rec/Pb frequency response within 8dB : 100Hz - 10kHz
Signal to Noise Ratio (Type I) : > 38dB

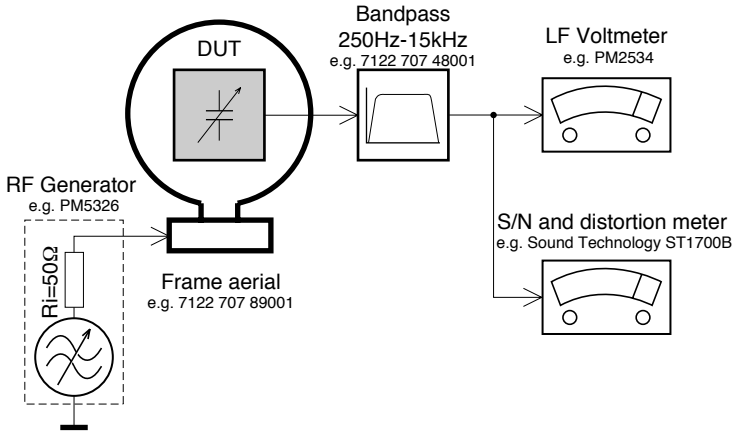
MEASUREMENT SETUP

Tuner FM



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

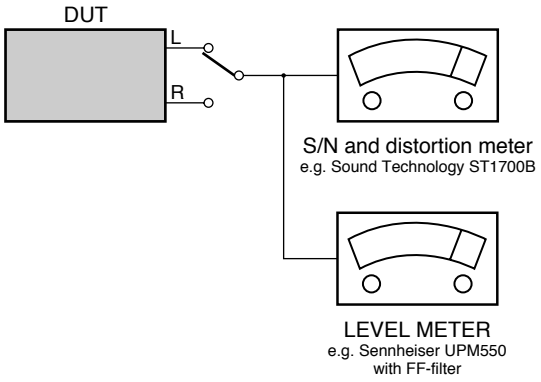
Tuner AM (MW,LW)



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).

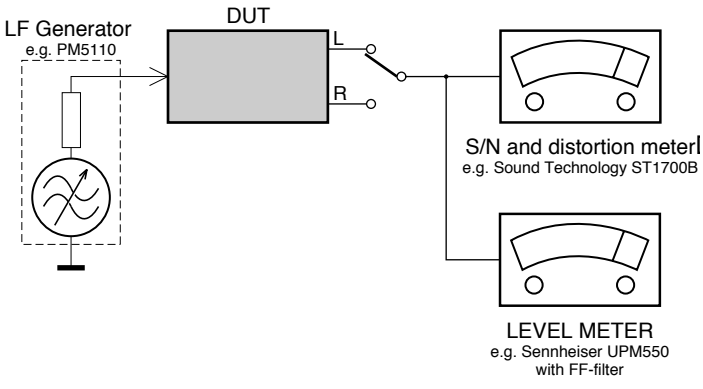
CD

Use Audio Signal Disc SBC429 4822 397 30184
(replaces test disc 3)



RECORDER

Use Universal Test Cassette **CrO_2** SBC419 4822 397 30069
or Universal Test Cassette **Fe** SBC420 4822 397 30071



SERVICE AIDS

Service Tools:

Universal Torx driver holder 4822 395 91019
Torx bit T10 150mm 4822 395 50456
Torx driver set T6-T20 .....4822 395 50145
Torx driver T10 extended 4822 395 50423

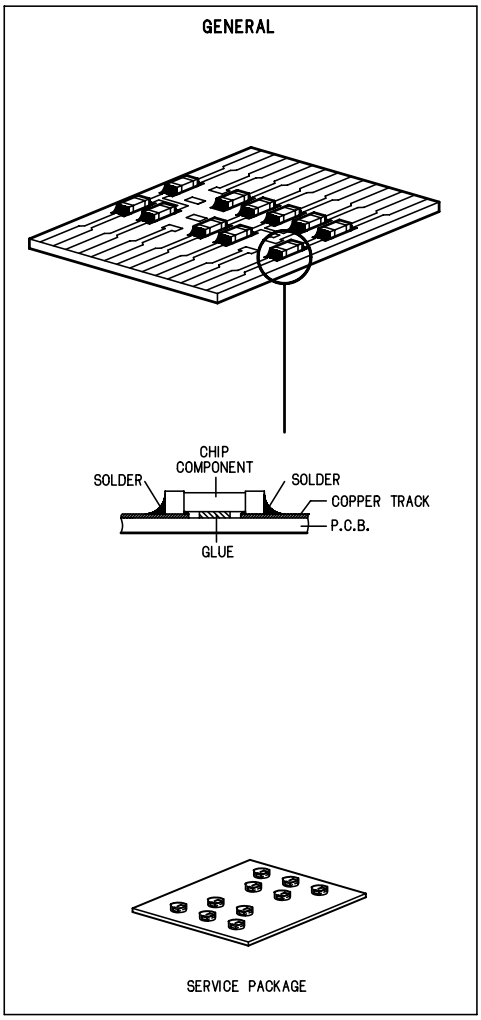
Compact Disc:

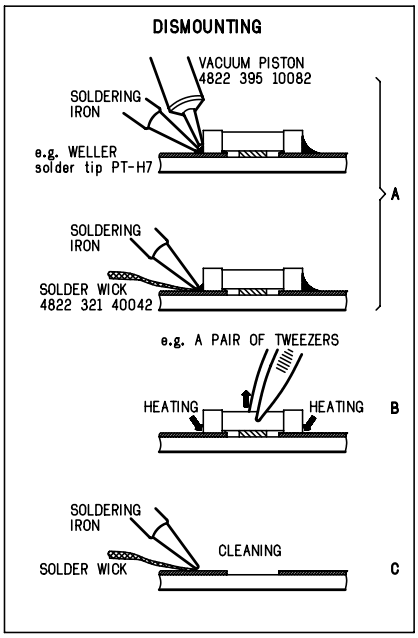
SBC426/426A Test disc 5 + 5A 4822 397 30096
SBC442 Audio Burn-in test disc 1kHz 4822 397 30155
SBC429 Audio Signals disc 4822 397 30184
Dolby Pro-logic Test Disc 4822 395 10216

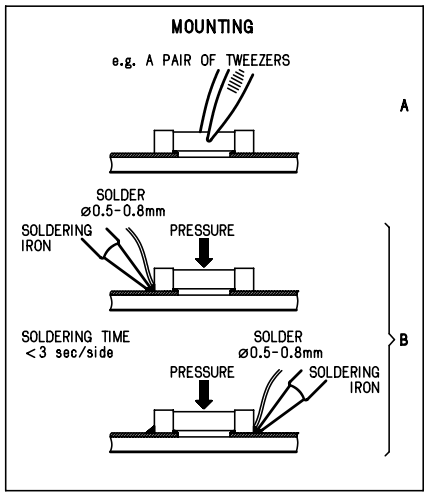
ESD Equipment:

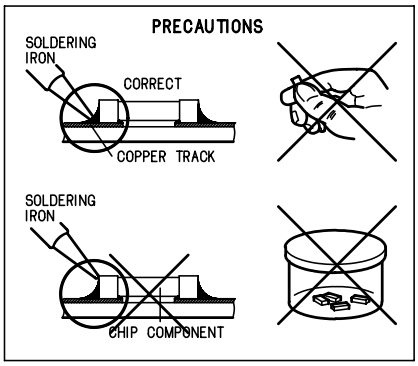
Anti-static table mat - large 1200x650x1.25mm ...4822 466 10953
anti-static table mat - small 600x650x1.25mm 4822 466 10958
Anti-static wristband 4822 395 10223
Connectorbox (1MΩ) 4822 395 11307
Extension cable
(to connect wristband to conn.box) 4822 320 11305
Connecting cable
(to connect table mat to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

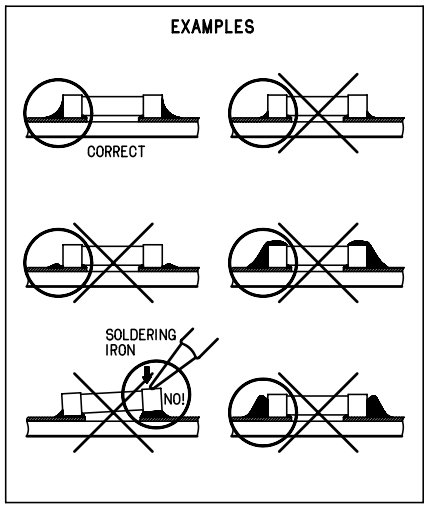
HANDLING CHIP COMPONENTS











ESD

(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.

(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).
Unsorgfältige Behandlung im Reparaturfall kan 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.

(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.

(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 braccialetto 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.

(NL)

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

(F)

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

(D)

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

(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.

"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."

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

(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 udsaettelse for stråling.

INFORMATION ABOUT LEAD-FREE SOLDERING

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

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

Example S/N:

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

So from 0501 onwards = from 1 Jan 2005 onwards

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

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

- Use only lead-free solder alloy Philips SAC305 with order code 0622 149 00106. If lead-free solder-paste is required, please contact the manufacturer of your solder-equipment. In general use of solder-paste within workshops should be avoided because paste is not easy to store and to handle.

- Use only adequate solder tools applicable for lead-free solder alloy. The solder tool must be able
  - To reach at least a solder-temperature of 400°C,
  - To stabilize the adjusted temperature at the solder-tip
  - To exchange solder-tips for different applications.
- Adjust your solder tool so that a temperature around 360°C – 380°C is reached and stabilized at the solder joint. Heating-time of the solder-joint should not exceed ~ 4 sec. Avoid temperatures above 400°C otherwise wear-out of tips will rise drastically and flux-fluid will be destroyed. To avoid wear-out of tips switch off un-used equipment, or reduce heat.
- Mix of lead-free solder alloy / parts with leaded solder alloy / parts is possible but PHILIPS recommends strongly to avoid mixed solder alloy types (leaded and lead-free).
  If one cannot avoid or does not know whether product is lead-free, clean carefully the solder-joint from old solder alloy and re-solder with new solder alloy (SAC305).
- Use only original spare-parts listed in the Service-Manuals. Not listed standard-material (commodities) has to be purchased at external companies.
- Special information for BGA-ICs:
  - always use the 12nc-recognizable soldering temperature profile of the specific BGA (for de-soldering always use the lead-free temperature profile, in case of doubt)
  - lead free BGA-ICs will be delivered in so-called 'dry-packaging' (sealed pack including a silica gel pack) to protect the IC against moisture. After opening, dependent of MSL-level seen on indicator-label in the bag, the BGA-IC possibly still has to be baked dry. (MSL=Moisture Sensitivity Level). This will be communicated via AYS-website.
  Do not re-use BGAs at all.

- For sets produced before 1.1.2005 (except products of 2004), containing leaded solder-alloy and components, all needed spare-parts will be available till the end of the service-period. For repair of such sets nothing changes.

- On our website **www.atyourservice.ce.Philips.com** you find more information to:

  - BGA-de-/soldering (+ baking instructions)
  - Heating-profiles of BGAs and other ICs used in Philips-sets

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

For additional questions please contact your local repair-helpdesk.

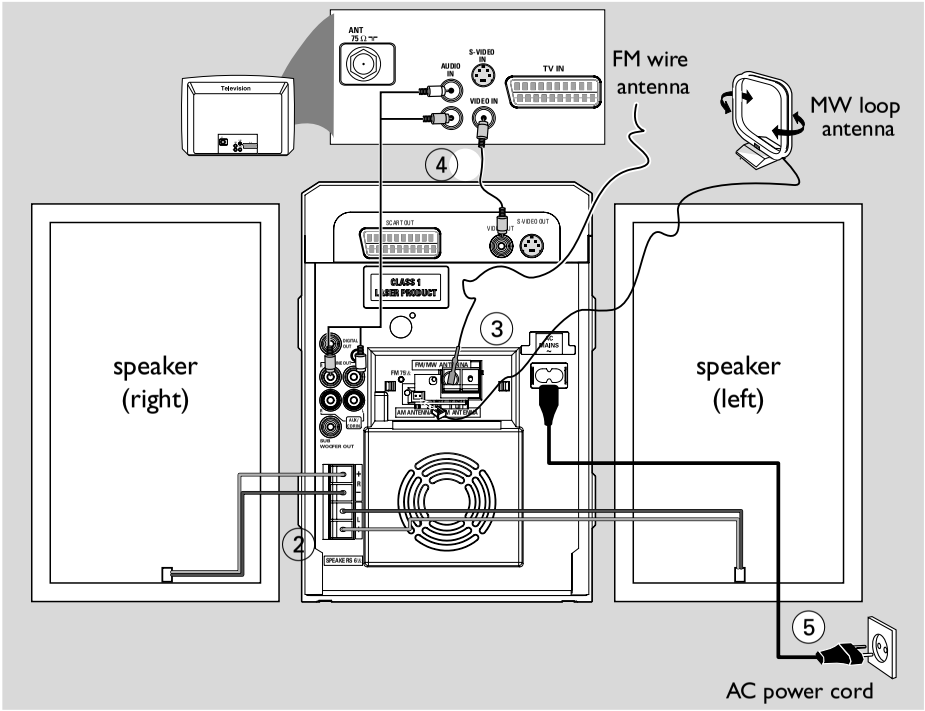
SERVICE INSTRUCTION

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

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

1. Unplug the AC Power cord and connect a wire between the two pins of the AC Power plug.
2. Set the AC Power switch to the "on" position (keep the AC Power cord unplugged!).
3. Measure the resistance value between the pins of the AC Power plug and the metal shielding of the tuner or the aerial connection on the set. The reading should be larger than 4.5 Mohm (For U.S. it should be between 4.2 Mohm and 12 Mohm).
4. Switch "off" the set, and remove the wire between the two pins of the AC Power plug.

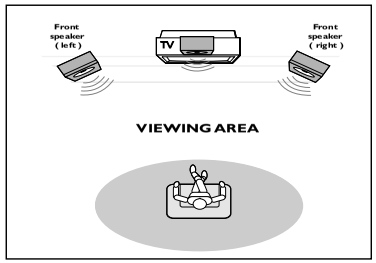
- Check the cabinet for defects, to avoid touching of any inner parts by the customer.



IMPORTANT!
-The type plate is located at the rear of the system.
-Before connecting the AC power cord to the wall outlet, ensure that all other connections have been made.
-Never make or change any connections with the power switched on.

To avoid overheating of the system, a safety circuit has been built in. Therefore, your system may switch to Standby mode automatically under extreme conditions. If this happens, let the system cool down before reusing it (not available for all versions).

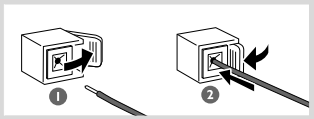
Step 1: Placing speakers



Place the front left and right speakers at equal distances from the TV set and at an angle of approximately 45 degrees from the listening position.

Notes:
-To avoid magnetic interference, do not position the front speakers too close to your TV set.
-Allow adequate ventilation around the DVD System.

Step 2: Connecting speakers



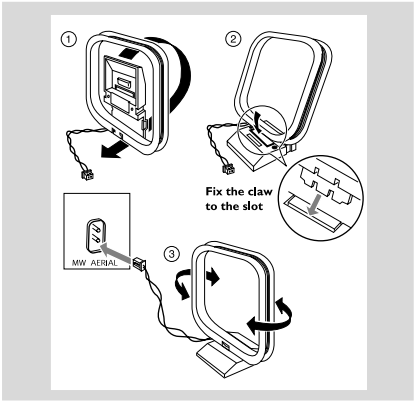
Connect the speaker wires to the **SPEAKERS** terminals, right speaker to "R" and left speaker to "L", coloured (marked) wire to "+" and black (unmarked) wire to "-". Fully insert the stripped portion of the speaker wire into the terminal as shown.

Notes:
- Ensure that the speaker cables are correctly connected. Improper connections may damage the system due to short-circuit.
- For optimal sound performance, use the supplied speakers.
- Do not connect more than one speaker to any one pair of +/- speaker terminals.
-Do not connect speakers with an impedance lower than the speakers supplied. Please refer to the SPECIFICATIONS section of this manual.

Step 3: Antennas Connection

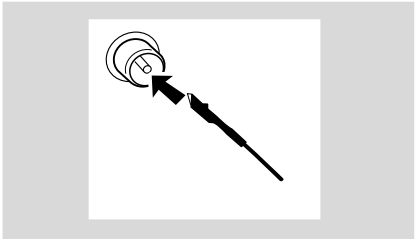
Connect the supplied MW loop antenna and FM antenna to the respective terminals. Adjust the position of the antenna for optimal reception.

MW Antenna



Position the antenna as far as possible from a TV, VCR or other radiation source.

FM Antenna



For better FM stereo reception, connect an outdoor FM antenna to the FM AERIAL (FM ANTENNA) terminal.

Connections

Step 4: Connecting TV

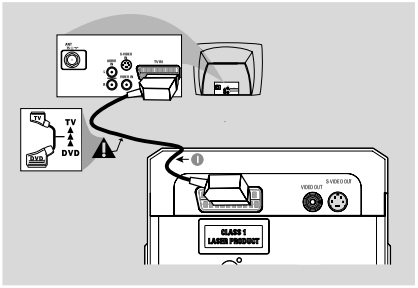
IMPORTANT!

– You only need to make one video connection from the following options, depending on the capabilities of your TV system.

– Connect the DVD system directly to the TV.

– A SCART connection will let you use features both Audio and Video on the DVD Player.

Using SCART jack

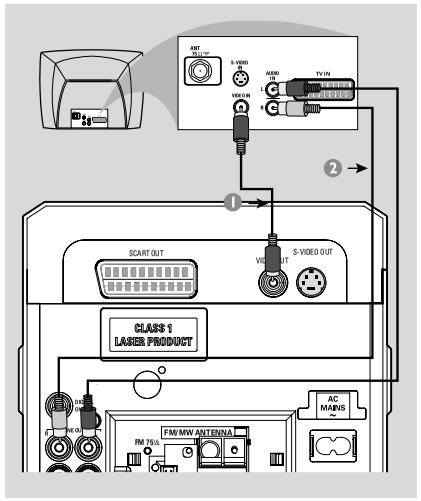


Use the SCART cable (black) to connect the DVD Player's SCART jack (**SCART OUT**) to the corresponding Scart input jacks on the TV *(cable not supplied)*.

Note:

– Ensure that the "TV" indication on SCART cable is connected to the TV set and "DVD" indication on SCART cable is connected to the DVD Player.

Using Composite Video jacks (CVBS)



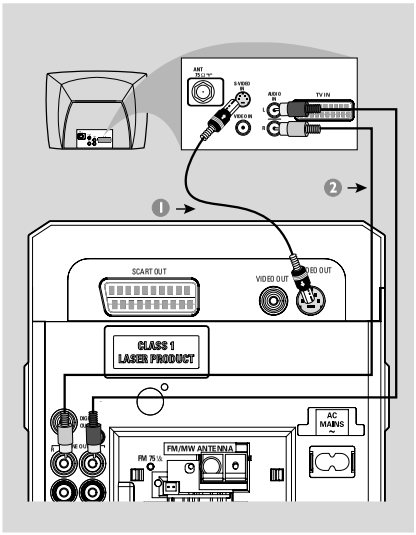
1 Use the composite video cable (yellow) to connect the DVD Player's CVBS (VIDEO OUT) jack to the video input jack (or labeled as A/V In, Video In, Composite or Baseband) on the TV.

2 To hear the sound of this DVD Player through your TV, use the audio cables (white/red) to connect LINE OUT (L/R) jacks of the DVD Player to the corresponding AUDIO IN jacks on the TV.

Using S-Video In jack

IMPORTANT!

– If the picture is distorted, check the Video Output setting. Make sure it is set to 'S-Video'. (See Setting video preference).



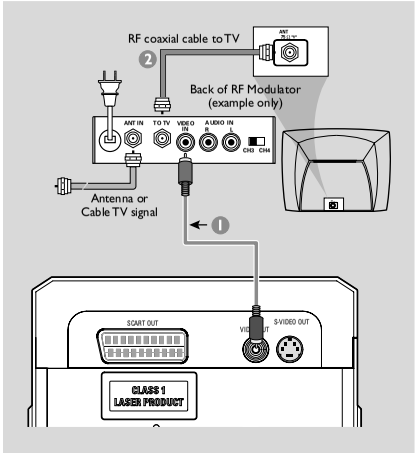
1 Use the S-Video cable (not supplied) to connect the system's **S-VIDEO OUT** jack to the S-Video input jack (or labeled as Y/C or S-VHS) on the TV set.

2 To hear the sound of this DVD Player through your TV, use the audio cables (white/red) to connect LINE OUT (L/R) jacks of the DVD Player to the corresponding AUDIO IN jacks on the TV.

Using an accessory RF modulator

IMPORTANT!

– If your TV set only has a single Antenna In jack (or labeled as 75 ohm or RF In), you will need a RF modulator in order to view the DVD playback via TV. See your electronics retailer or contact Philips for details on RF modulator availability and operations.



Use the composite cable (yellow) to connect the system's **CVBS** jack to the video input jack on the RF modulator.

Use the RF coaxial cable (not supplied) to connect the RF modulator to your TV's RF jack.

Step 5: Connecting the power cord

IMPORTANT!

– Never make or change any connection with the power switched on.

"AUTO INSTALL – PRESS PLAY TO START" may appear on the display panel when the AC power cord is plugged into the power outlet for the first time.

Press ▶II on the main unit to store all available radio stations or press ■ to exit (refer to "Tuner Reception").

After everything is connected properly, plug in the AC power cord to the power outlet.

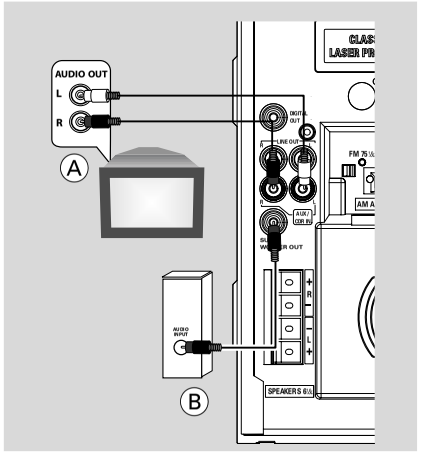
Optional: Connecting additional equipment

IMPORTANT!

– Some discs are copy-protected. You cannot record the disc through a VCR or digital recording device.

– When making connections, make sure the colour of cables matches the colour of jacks.

– Always refer to the owner's manual of the other equipment for complete connection and usage details.



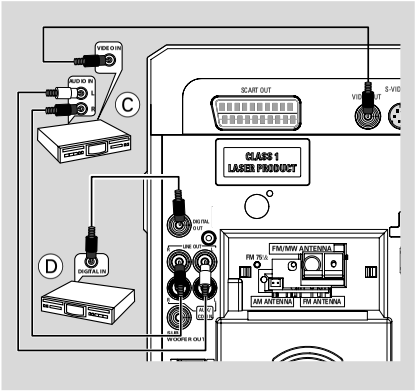
Viewing and listening to the playback of other equipment Ⓐ

Connect the system's **AUX/CDR IN** (R/L) jacks to the AUDIO OUT jacks on the other audio/visual device (such as a TV, VCR, Laser Disc player or cassette deck).

Before starting operation, press **SOURCE** on the front panel to select AUX or press **AUX** on the remote in order to activate the input source.

Connecting an active subwoofer Ⓑ

Connect the DVD micro system's **SUBWOOFER OUT** jack to the AUDIO INPUT jack on an active subwoofer (not supplied).



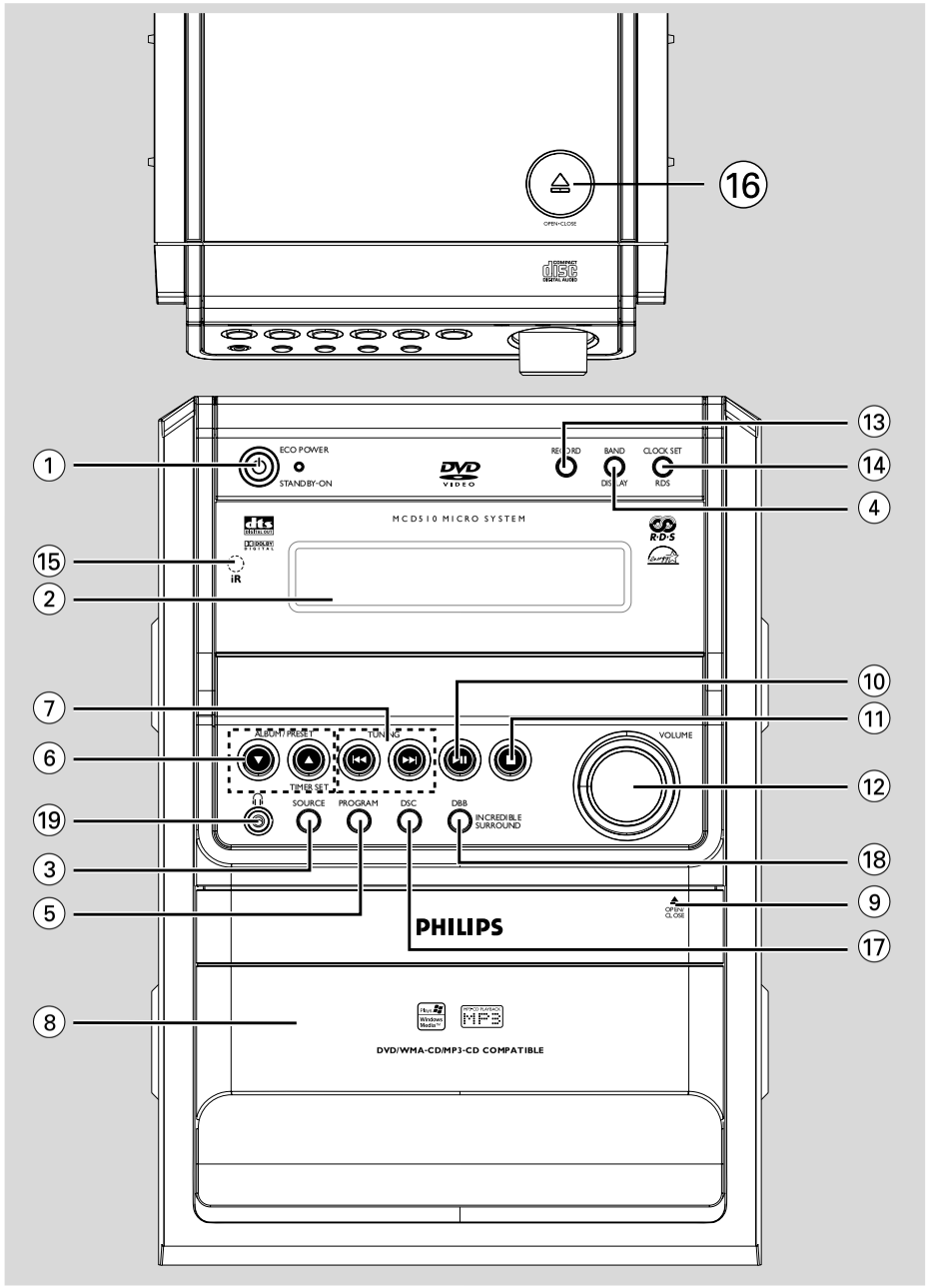
Using the VCR for recording DVDs Ⓒ

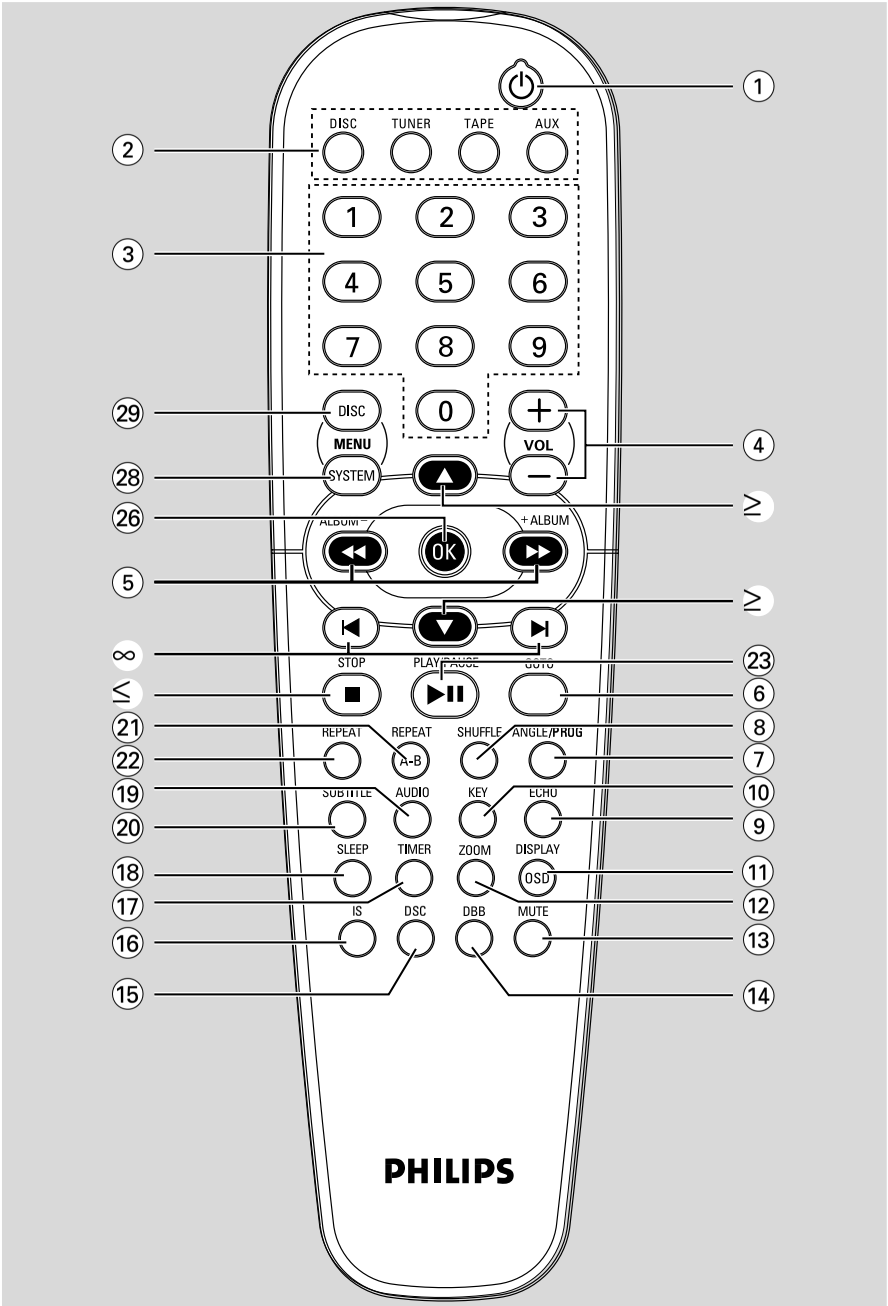
Connect one of the system's **VIDEO OUT** jacks to the corresponding VIDEO IN jack and **LINE OUT (R/L)** jacks to the AUDIO IN jacks on the VCR. This will allow you to make analogue stereo (two channel, right and left) recordings.

Recording (digital) Ⓓ

Connect the system's **DIGITAL OUT** jack to the DIGITAL IN jack on a digital recording device (such as DTS-Digital Theatre compatible, with Dolby Digital decoder).

Before starting operation, set the DIGITAL OUT according to the audio connection. (See page 28)





Controls on the system

① **ECO POWER/STANDBY-ON** ⏻
– to switch the system on or to Eco power/normal standby mode.

② **Display screen**
– to view the current status of the system.

③ **SOURCE**
– to select the respective sound source : DISC TUNER, TAPE or AUX.

④ **BAND / DISPLAY**
for Tuner ..... to select waveband : FM or MW.
for DVD/VCD/CD/MP3-CD displays disc information on the TV screen and system display panel during playback.

⑤ **PROGRAM**
for VCD/CD/MP3-CD…to program disc tracks.
for Tuner ..... to program preset radio stations.

⑥ **▲▼ ALBUM/PRESET/TIMER SET**
for MP3-CD ..... to select previous/next album.
for Tuner ..... to select a preset radio station.
*for Timer (▲)..to set the timer function

⑦ **TUNING ⏮◀◀ ▶▶⏭**
*for DVD/VCD/CD..... to fast reverse/ forward the disc. (It is impossible to fast reverse / forward for MP3-CD)
for DVD/VCD/CD/MP3 CD… to select a desired track.
for Tuner ..... to tune to a lower or higher radio frequency.
for Tape ..... to rewind or fast forward.
for clock/timer setting
..... to adjust the hours and minutes for the clock/timer functions.

⑧ **Tape deck**

⑨ **OPEN/CLOSE ⏏**
– to open the tape compartment.

⑩ **▶II**
– to start or interrupt playback.

⑪ **■**
for DVD/VCD/CD/MP3-CD…to stop playback or to clear a program.
for Tape ..... to stop playback or recording.

⑫ **VOLUME**
– to increase or decrease the volume.

⑬ **RECORD**
– to start recording.

⑭ **CLOCK SET/RDS**
*for Clock..... *(on the system only)* to set the clock function.
for tuner ..... displays RDS information.

⑮ **iR sensor**
– infrared sensor for remote control.

⑯ **OPEN•CLOSE ⏏**
– to open or close the disc tray.

⑰ **DSC**
– selects different types of preset sound equalizer settings (JAZZ, ROCK, POP or OPTIMAL).

⑱ **DBB/INCREDIBLE SURROUND**
– to create a super-enhanced stereo effect.
– to enhance the bass.

⑲ 🎧
– to connect headphones.

Controls on the remote control

① ⏻
– to switch the system on or to Eco power/normal standby mode.

② **SOURCE**
– to select the respective sound source : DISC TUNER, TAPE or AUX.

③ **Numeric Keypad (0-9)**
– to enter a track/title number of the disc.

④ **VOL +/—**
– to increase or decrease the volume.

⑤ **ALBUM-/+ ◀◀/▶▶**
– to select a fast playback speed forward and backward.
– in the tuner mode, to tune to a higher or lower radio frequency.
– to select a movement direction in the disc menu or system menu bar.
– for MP3, to select an album up or down.
– for VCD/DVD, to move an enlarged picture left or right.

**** = Press and hold the button for more than two seconds.***

Controls

⑥ **GOTO**
– to start playback at any chosen time on the disc (for VCD operation with PBC off).

⑦ **ANGLE/PROG**
for VCD/CD/MP3-CD…to program disc tracks.
for Tuner ..... to program preset radio stations.
for DVD ..... to view the same scene from different angles if the DVD is recorded with multi-angles.

⑧ **SHUFFLE**
– to play tracks in a random order

⑨ **ECHO (not for this version)**

⑩ **KEY (not for this version)**

⑪ **DISPLAY (OSD)**
– displays disc information on the TV screen and system display panel during playback.to show the status of the system.

⑫ **ZOOM**
– to zoom in picture.

⑬ **MUTE**
– to interrupt or resume sound reproduction.

⑭ **DBB (Dynamic Bass Boost)**
– Enhances the bass

⑮ **DSC**
– to select various sound effect: JAZZ, ROCK, POP or OPTIMAL.

⑯ **IS**
– to switch incredible surround on or off.

⑰ **TIMER**
*– to set the timer.
– to select TIMER ON or TIMER OFF.

⑱ **SLEEP**
– to set the sleep (auto-off) timer function.

⑲ **AUDIO**
For VCD…sets Stereo, Mono-Left or Mono-Right sound mode.
For DVD...selects an audio language.

⑳ **SUBTITLE**
– to select the preferred language for subtitle.

㉑ **REPEAT A-B**
for CD: to repeat a specific section within the same track.
for DVD/VCD: to repeat a specific section in a disc.

㉒ **REPEAT**
– to repeat a track/disc.

㉓ **PLAY/PAUSE ▶II**
– to start or interrupt disc playback.

≤ **STOP ■** - for CD/DVD/VCD (with PBC off)
– press it once to stop playback and press ▶II to resume.
– press it twice to stop playback completely.

∞ **I◀, ▶I**
– In disc mode, to select the previous or next chapter or track.

㉖ **OK**
– to exit or confirm the selection.

≥ **▲, ▼**
– to select a movement direction in the disc menu or system menu bar.
– *(for DVD/VCD only)* to select a desired slow playback speed forward or backward.

㉘ **SYSTEM MENU (disc mode only)**
– to enter or exit the system menu bar.

㉙ **DISC MENU (disc mode only)**
– to enter or exit the disc contents menu.

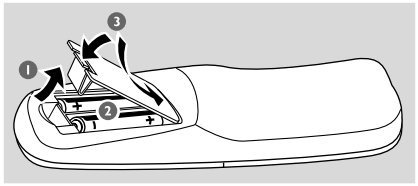
Notes for remote control:
– First, select the source you wish to control by pressing one of the source select keys on the remote control (DISC or TUNER, for example).
– Then select the desired function (▶II, ▶I, I◀ for example).

**** = Press and hold the button for more than two seconds.***

Preparations

IMPORTANT!
– Make sure to complete the preparation procedures before operating the system.

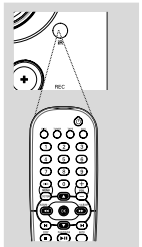
Step 1: Inserting batteries into the remote control



1 Open the battery compartment.
2 Place two batteries (Type R06 or AA) in the compartment with the correct polarity as indicated by "+" and "–" symbols.
3 Close the cover.

Using the remote control to operate the system

1 Point the remote control directly at the remote sensor (iR) on the front panel.
2 Select the source you wish to control by pressing one of the source select buttons on the remote control (for example TAPE, TUNER).
3 Then select the desired function (for example ▶II, I◀, ▶I).



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.

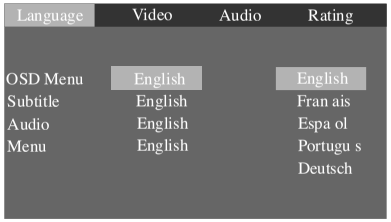
Step 2: Setting the clock

1 In standby mode, press and hold **CLOCK SET/RDS** on the system.
"SET CLOCK" appears. Then, the clock digits for the hours flash.
2 Press **TUNING** I◀◀ ▶▶I on the system to set the hours.
3 Press **CLOCK SET/RDS** again.
The clock digits for the minutes flash.
4 Press **TUNING** I◀◀ ▶▶I on the system to set the minutes.
5 Press **CLOCK SET/RDS** to confirm your setting. The system will store the setting automatically.
The time setting becomes effective.

Note:
– The clock will be cancelled when the power cord is disconnected or if a power failure occurs.
– During setting, if no button is pressed within 30 seconds, the system will exit clock setting mode automatically.

Step 3: Setting language preference

You can select your preferred language settings so that this DVD Micro System will automatically switch to the language for you whenever you load a disc. If the language selected is not available on the disc, the language set by default will be used instead. But the menu language of the DVD Micro System cannot be changed once selected.



1 In stop mode, press **SYSTEM MENU**.

2 Press ◄◄/►►/▲/▼ on the remote control to select your preferred option.

Move to **Language** and press **OK** or ▼.
Move to one of the following and press **OK** or ►►.

OSD Menu (On-Screen Display)
Switches the display language on the TV screen. Select the language from the displayed list.

Subtitle (DVD only)
Switches the display language of the subtitle. Select the language from the displayed list.

Audio (DVD only)
Switches the display language of the sound track. Select the language from the displayed list.

Menu (DVD only)
Select the language for the DVD menu.

When the selected language is not recorded in the DVD, one of the recorded languages will be selected automatically (except for OSD).
You can reset all the DVD settings except for Rating.
If the language selected is not available on the disc, the original language designated by each disc will be selected.

3 Press ▲/▼ to select a language and press **OK**.

4 Repeat **steps 2~3** for other settings.

To remove the menu

Press **SYSTEM MENU**.

IMPORTANT!
– Make sure you have completed all the necessary connections. (See Connections – Connecting TV.)

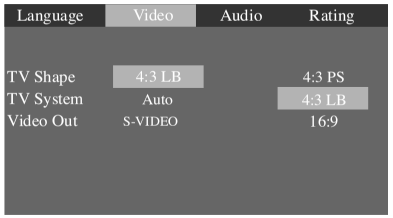
Step 4: Setting video preference

Turn on the TV set and set it to the correct Video-In channel.

You may go to channel 1 on your TV set, then press the channel button repeatedly until you see the Video In channel.

Or, you can use the TV remote control to select different video modes.

Or, set TV to channel 3 or 4 if you are using an RF modulator.



1 In the disc mode, stop playback and press **SYSTEM MENU**.

2 Press ◄◄/►►/▲/▼ on the remote control to toggle through the functions and select your preferential option.

Move to **Video** and press **OK** or ▼.
Move to one of the following and press **OK** or ►►.

Preparations

– TV Shape

Selects the aspect ratio of the TV to be connected.

4:3 PS (Pan and Scan mode)
– If you have a conventional TV set and your DVD is not formatted for widescreen viewing, use this setting. A wide picture is displayed on the whole TV screen with a portion automatically cut off.

4:3 LB (Letterbox mode)
– If you have a conventional TV set and your DVD is formatted for widescreen viewing, use this setting. A wide picture with bands displayed on the upper and lower portions of the TV screen.

16:9 (Wide screen mode)
– If you have a widescreen TV set, use this setting (you must also set your widescreen TV to "full size") available on a disc, then the disc's own preference will be used.

Note:
The format you select must be available on the disc. If it is not, the setting for TV Shape will not affect the picture during playback.

– TV System

Allows you to select the color system matching the connected TV set.

NTSC
– If the connected TV is NTSC system, select this mode. It will change the video signal of a PAL disc and output in NTSC format.

PAL
– If the connected TV is PAL system, select this mode. It will change the video signal of an NTSC disc and output in PAL format.

AUTO
– If the connected TV is multi system, select this mode.The output format will be in accordance with the video signal of the disc.

– Video Out

– Video out selection enables you to choose the type of video output suitable for your DVD system.

S-VIDEO
– Select **S-VIDEO** if you have connected the S-VIDEO output to your TV using S-VIDEO jack.

SCART
– Select **SCART** if you have connected the video output to your TV using SCART OUT jack.

To remove the menu

Press **SYSTEM MENU**.

To resume playback
Press ►II (**PLAY/PAUSE** ►II on the remote).

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
No power.	Check if the AC power cord is properly connected.
"NO DISC" is displayed.	Check if the disc is inserted upside down. Wait until the moisture condensed at the lens has cleared. Replace or clean the disc, see "Maintenance". Use a readable disc or correctly recorded format MP3-CD.
No picture.	Select the appropriate video input mode on the TV set. Check if the TV set is switched on. Check the video connection. Check if the system is securely connected.
Distorted or poor picture.	Sometimes a slight picture distortion may appear. This is not a malfunction. Clean the disc. Connect the system to the S-video input of your TV set.
The aspect ratio of the screen cannot be changed even though you have set the TV shape.	The aspect ratio is fixed on the DVD disc. The aspect ratio may not be changed for some TV systems.
The DVD player does not start playback.	Insert a readable disc. Check the disc type, color system and region code. Clean the disc. Place the disc with the playback side down. Press SYSTEM MENU to turn off the setup menu. Cancel the parental control rating function or change the rating level. Moisture has condensed inside the system. Remove the disc and leave the system turned on for about an hour.
The DVD player does not respond when buttons are pressed.	Disconnect the power plug from the jack, and insert again.

Troubleshooting

Problem	Solution
The language for the sound or subtitle cannot be changed when playing a DVD.	Multi-language sound or subtitle is not recorded on the DVD. Changing the language for the sound or subtitle is prohibited on the DVD.
No image is output when a function is selected.	Make sure the component is connected correctly. Press the correct function button for the input source.
Sound cannot be heard or is of poor quality	Adjust the volume. Disconnect the headphones. Check that the speakers are connected correctly. Check if the stripped speaker wire is clamped. If the system is in pause, slow motion or fast forward/reverse mode, press ▶II to resume the normal play mode. Make sure the MP3-CD was recorded within 32-256 kbps bit rate with sampling frequencies at 48 kHz, 44.1 kHz or 32 kHz.
Poor radio reception.	If the signal is too weak, adjust the antenna or connect an external antenna for better reception. Increase the distance between the System and your TV set or VCR.
Recording or playback cannot be made	Clean deck parts, see "Maintenance". Use only NORMAL tape. Apply a piece of adhesive tape over the missing tab space.
The tape deck door cannot open	Remove and reconnect the AC power plug and switch on the system again.
Left and right sound outputs are reversed.	Check the speaker connections and location.
The remote control does not function.	Point the remote control at the remote control sensor of the unit. Reduce the distance to the player. Remove any possible obstacles. Replace the batteries with new ones. Check that the batteries are loaded correctly.
The timer is not working	Set the clock correctly. If recording is in progress, stop it
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) Push 1 catch each on the left & right side then remove the Cover Cassette in the direction as shown in Figure 1 and Figure 1A.

2) Loosen 8 screws to remove the Cover Top by sliding it out towards the rear before lifting up.
   - 6 screws on the rear
   - 1 screw each on the left & right side

3) Loosen 2 screws each to remove the Panel Left and Panel Right. 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

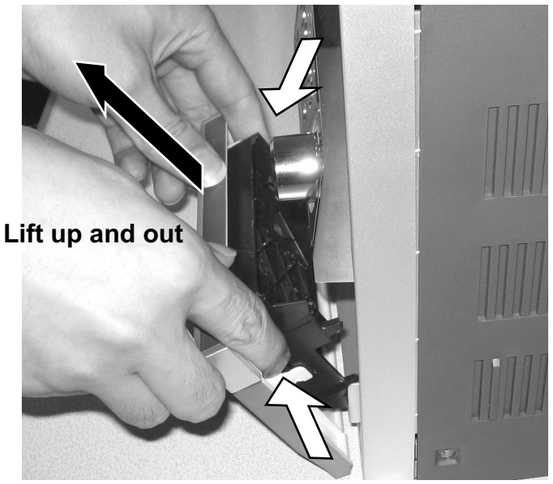


Figure 1

6) Loosen 2 screws A (see Figure 2) to remove the Bracket Module Mounting and CD Module.
   - 1 screw each on the left & right side

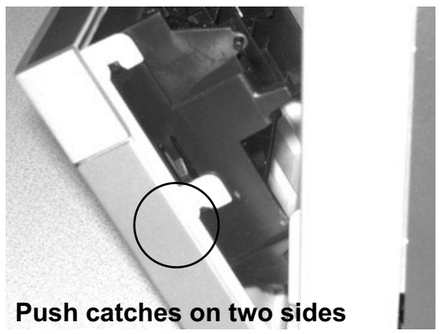


Figure 1A

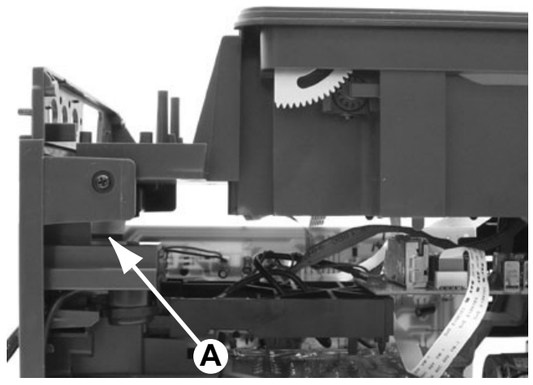


Figure 2

Detaching the Front Panel assembly from the Bottom/Rear assembly

1) Remove 2 screws B (see Figure 3) from the bottom of the Cabinet Front.

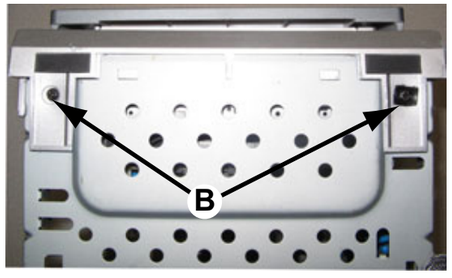


Figure 3

2) Release the fixation of the Combi Board (pos1102-1003) to Bracket Combi (pos 155) by releasing the 2 catches C1 (see Figure 7) and pulling the Combi Board outwards as shown in Figure 7A.
3) Uncatch 2 catches C2 (see Figure 7) on the left & right sides of the Cabinet Front (pos 101) and slides the Front Panel assembly out towards the front.
   - see Service position C

2-1

Detaching the Front Panel assembly from the Bottom/Rear assembly

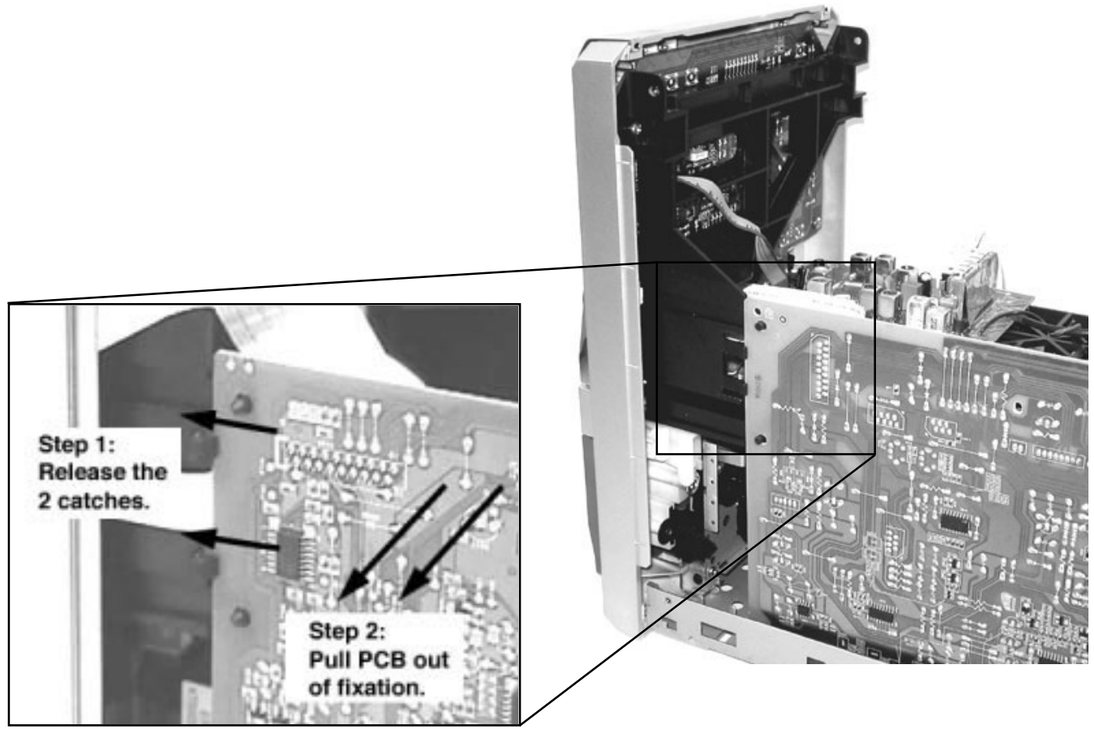


Figure 4A

Figure 4

Dismantling of the Front Panel assembly

1) The Knob Volume can be remove by pulling it out in the direction as shown in Figure 5.
2) Loosen 3 screws C (see Figure 6) to remove the Bracket Front Cabinet Display.
3) Loosen 3 screws D (see Figure 6) to remove Front Display Board.
4) Loosen 2 screws E (see Figure 6) to remove the Headphone Board.
5) Loosen 4 screws F (see Figure 7) to remove the Module Tape Deck.

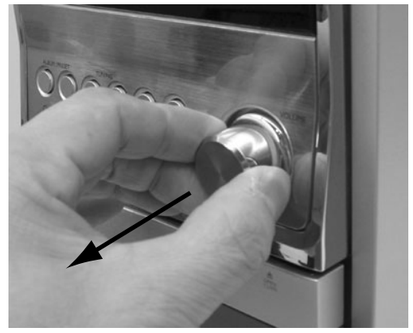


Figure 5

2-2

DISMANTLING INSTRUCTIONS

Dismantling of the Front Panel assembly

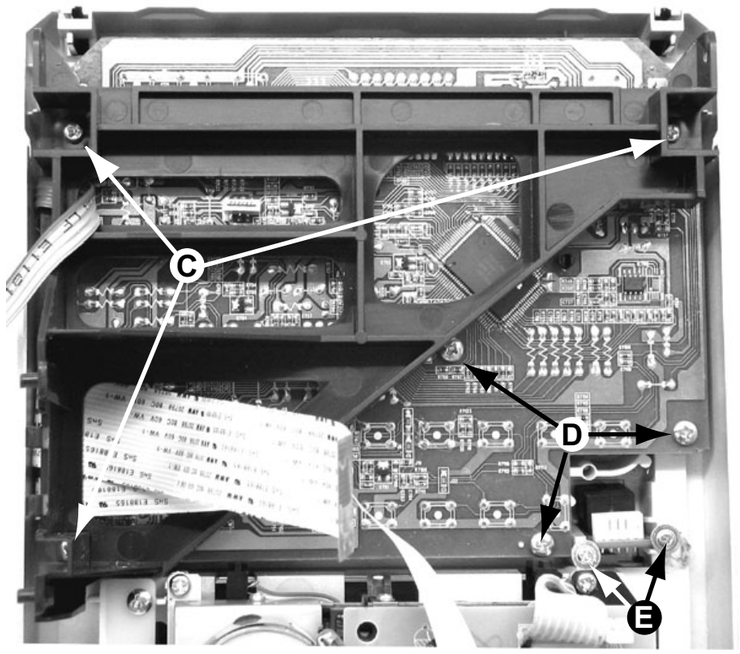


Figure 6

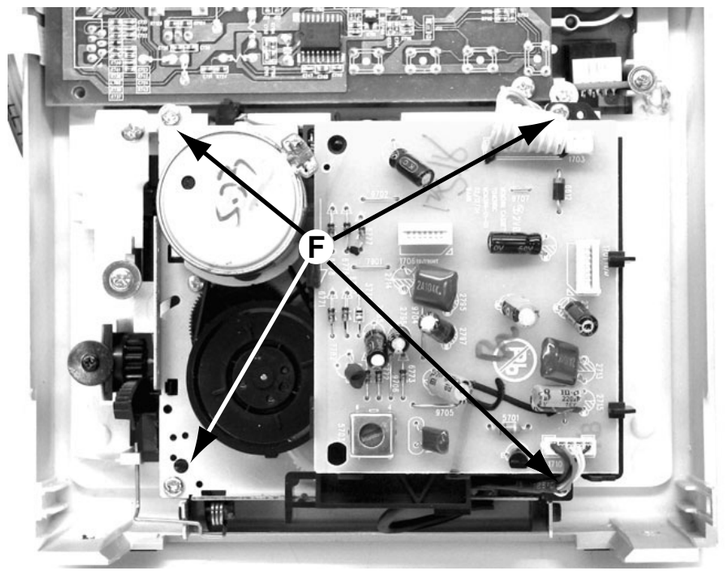


Figure 7

Dismantling of the Rear Panel assembly

1) Loosen 3 screws K and 2 catches C5 (see Figure 8) to remove the Tuner Board assembly.
2) Loosen 5 screws L (see Figure 8) to free the Main Board.
3) Loosen 1 screw M (see Figure 8) to free the Mains Socket Bracket.
4) Loosen 1 scew N and 2 catches C6 (see Figure 8) to free the Panel Rear by sliding it out towards the rear.

Note : Tuner Board assembly and Mains Socket Bracket can also be removed together with the Panel Rear.

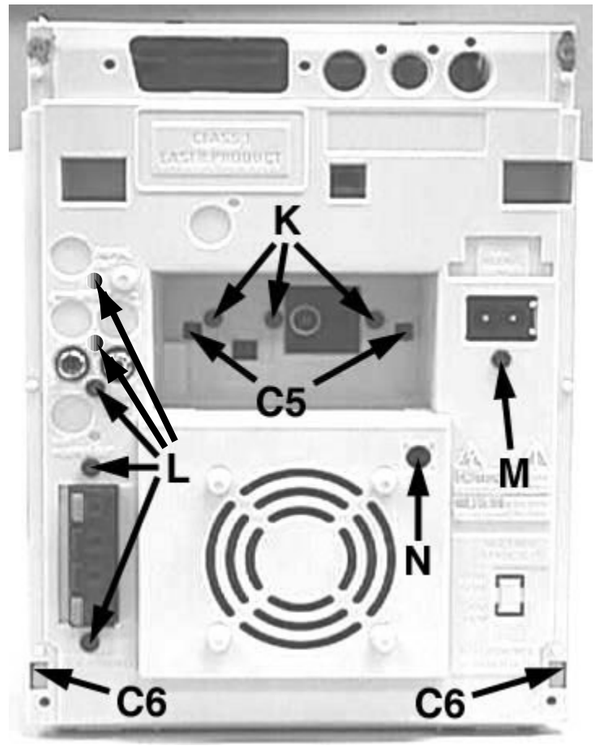


Figure 8

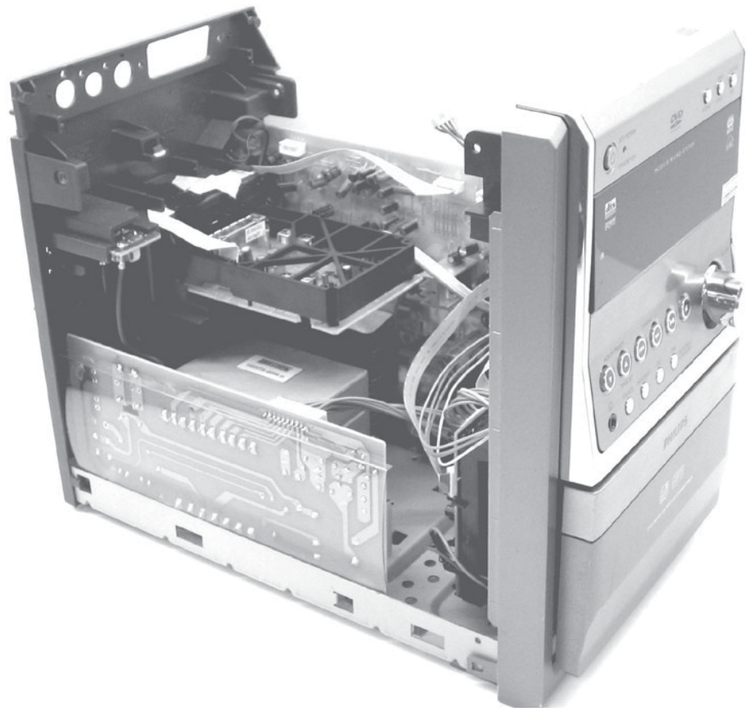
DISMANTLING INSTRUCTIONS

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.

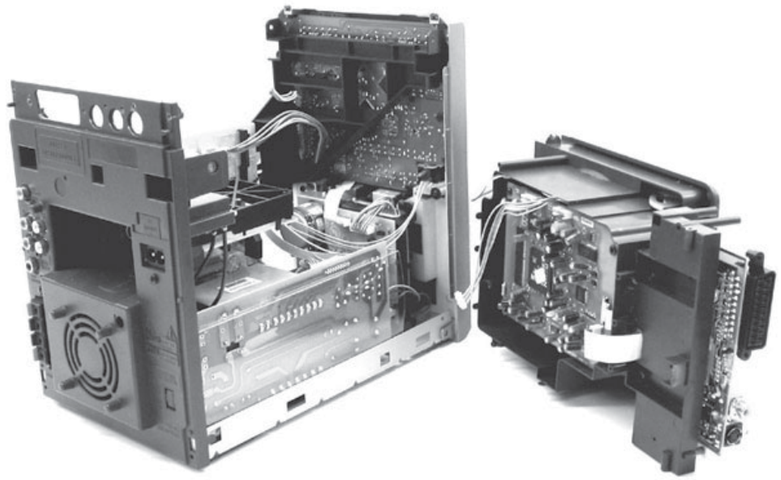
Note: The flex cables are very fragile, care should be taken not to damage them during repair. After repair, be very sure that the flex cables are inserted properly into the flex sockets before encasing, otherwise faults may occurs.

Service position A

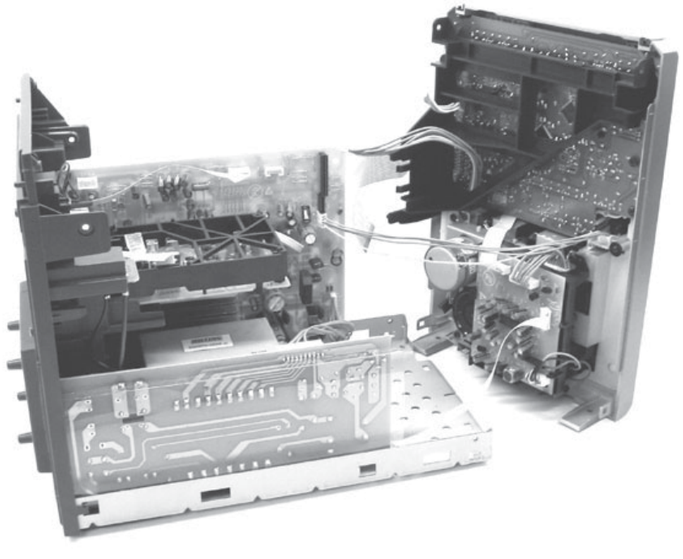


2-3

Service position B

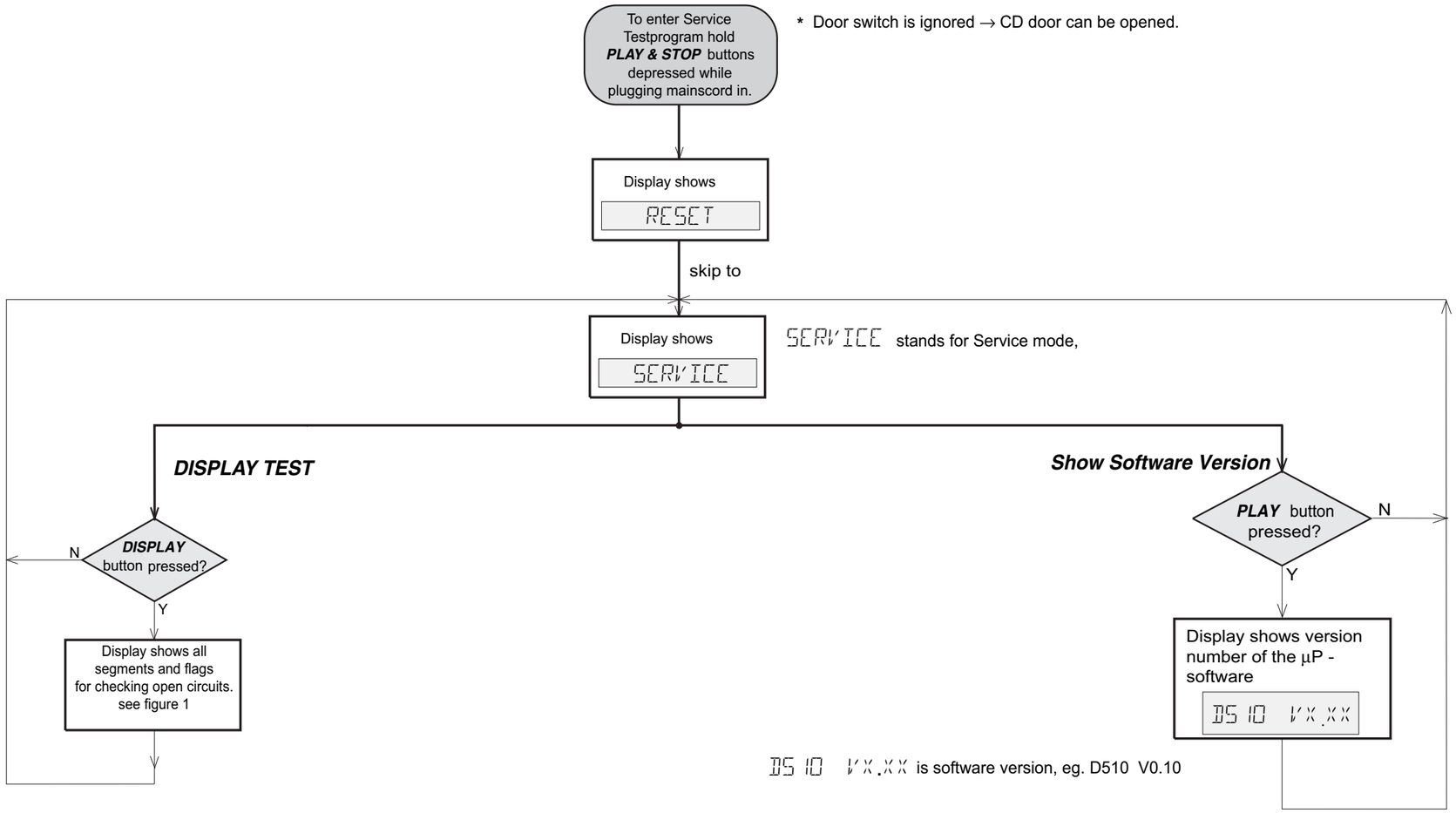


Service position C



3-1

SERVICE TEST PROGRAM



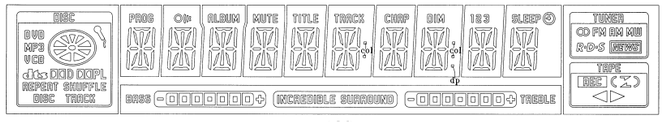
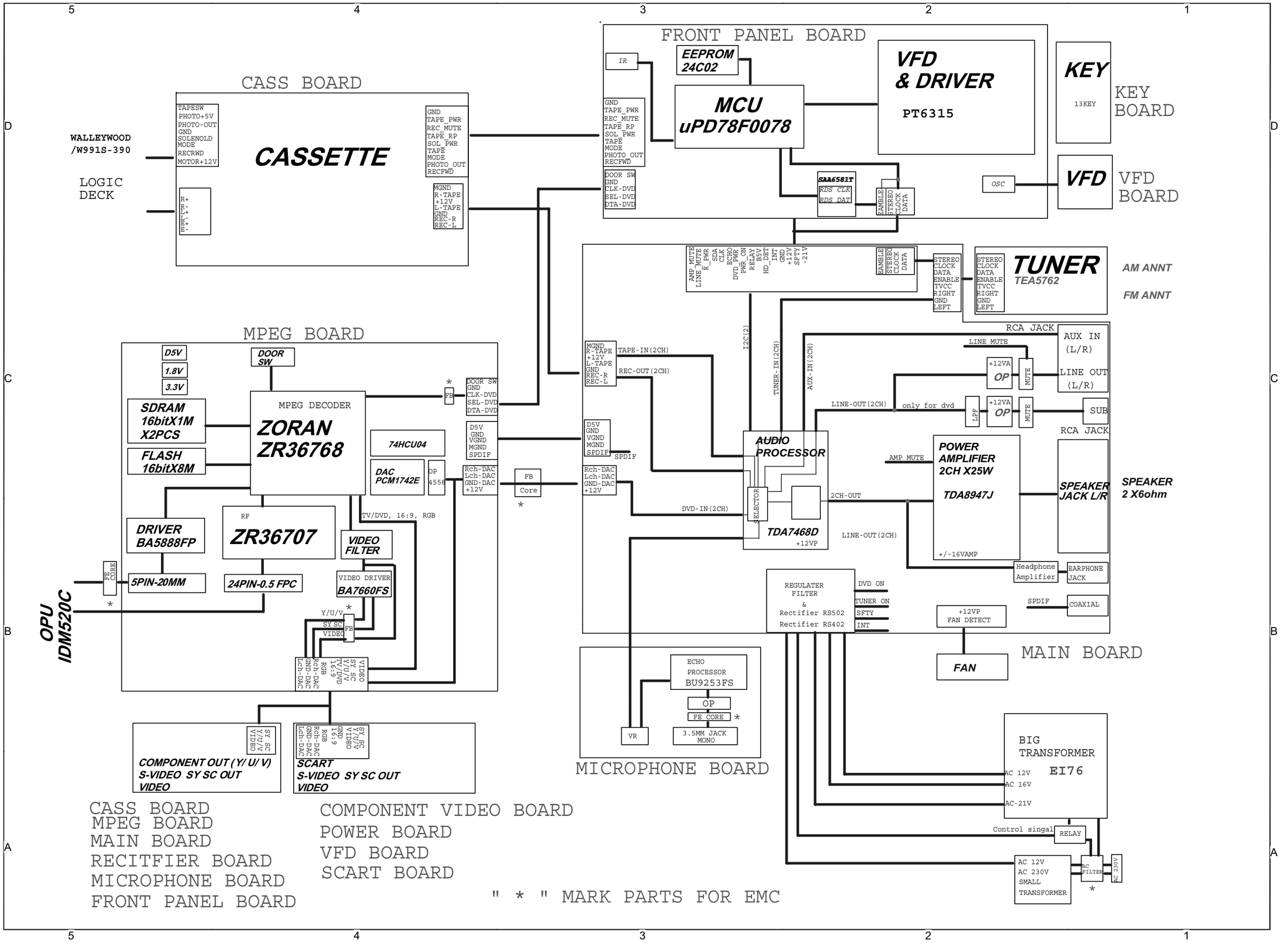


Figure 1

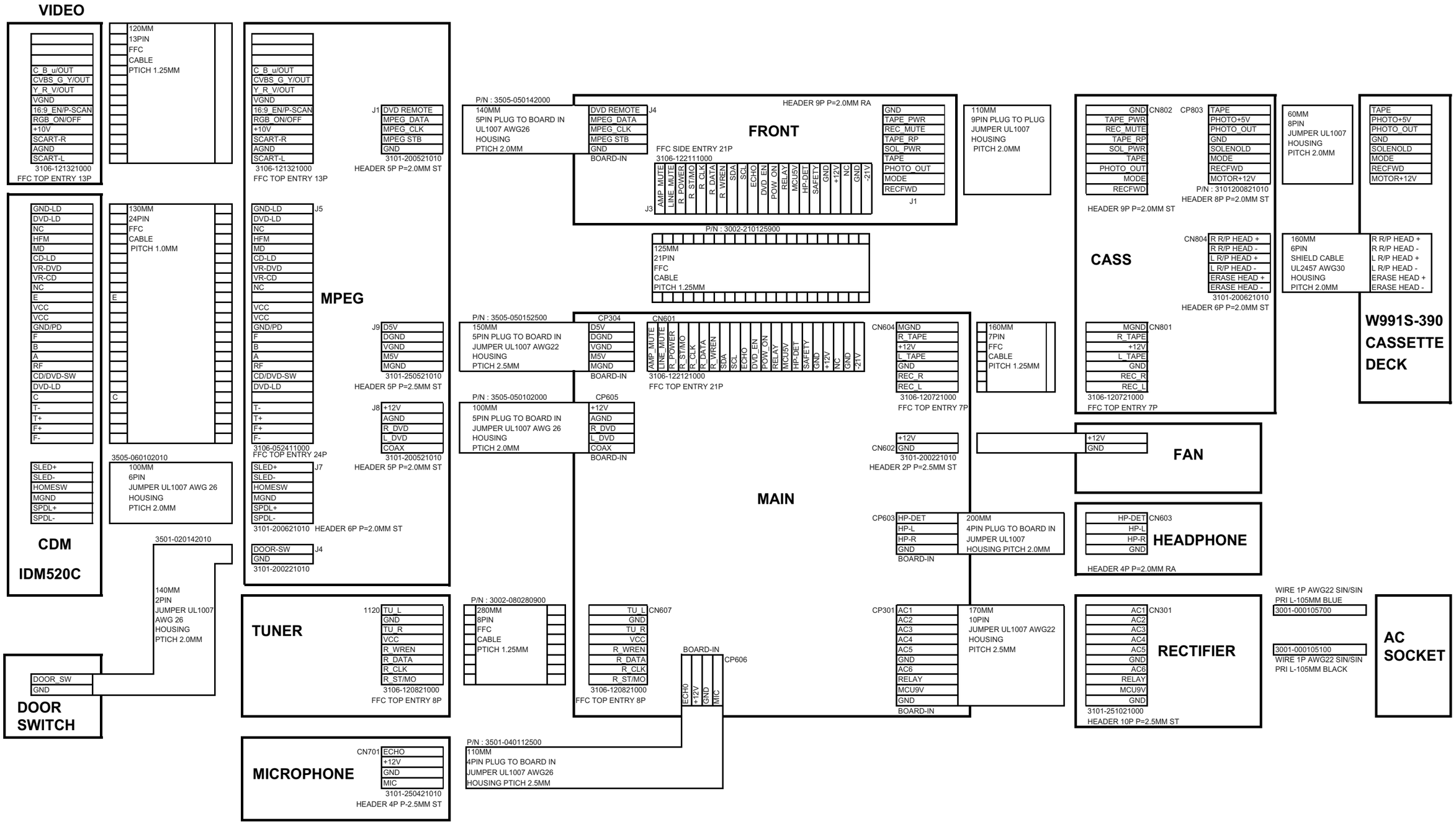
4-1

SET BLOCK DIAGRAM



5-1

SET WIRING DIAGRAM

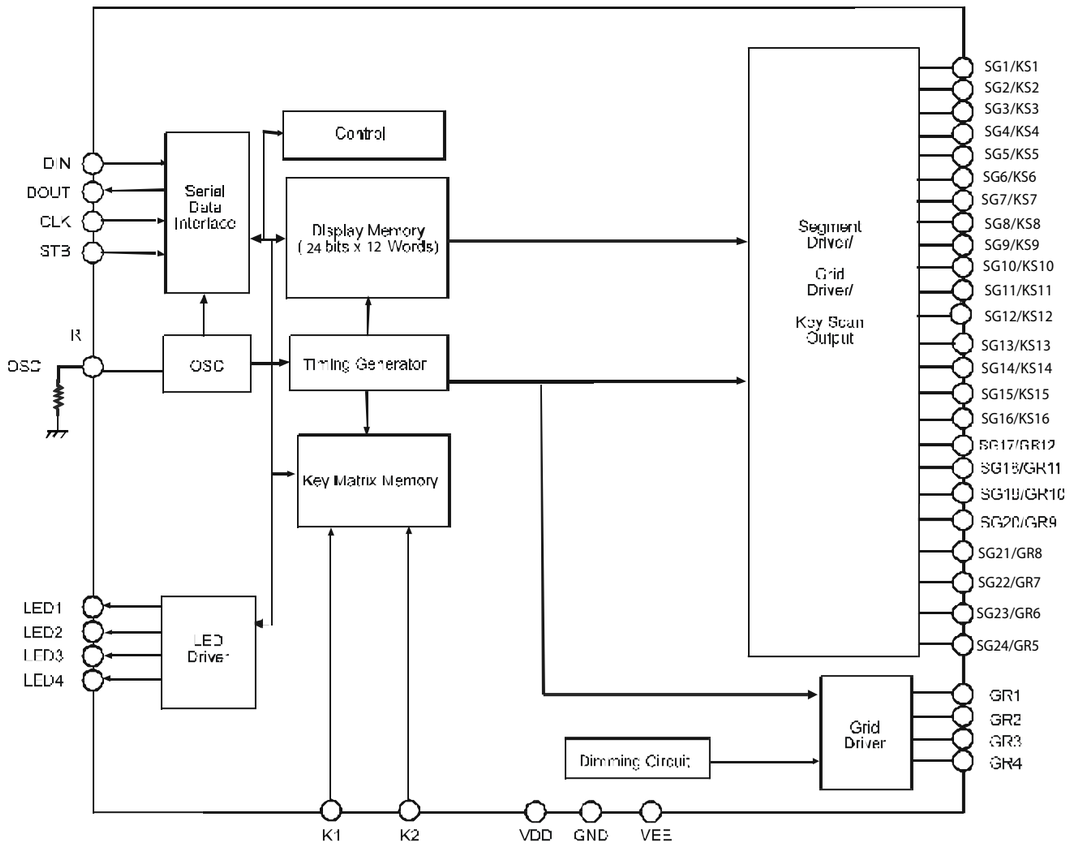


DISPLAY BOARD

TABLE OF CONTENTS

IC BLOCK DIAGRAM - VFD DRIVER
PT6315

BLOCK DIAGRAM

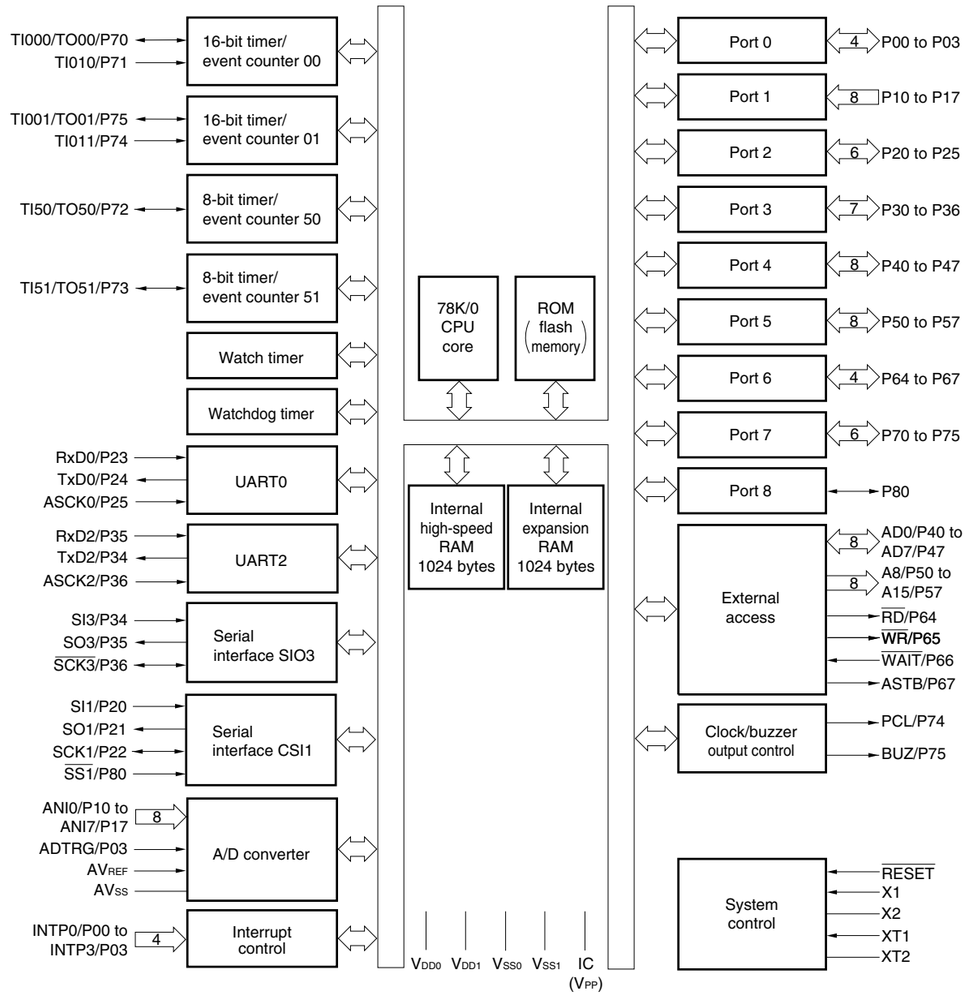


IC PIN DESCRIPTION - VFD DRIVER
PT6315

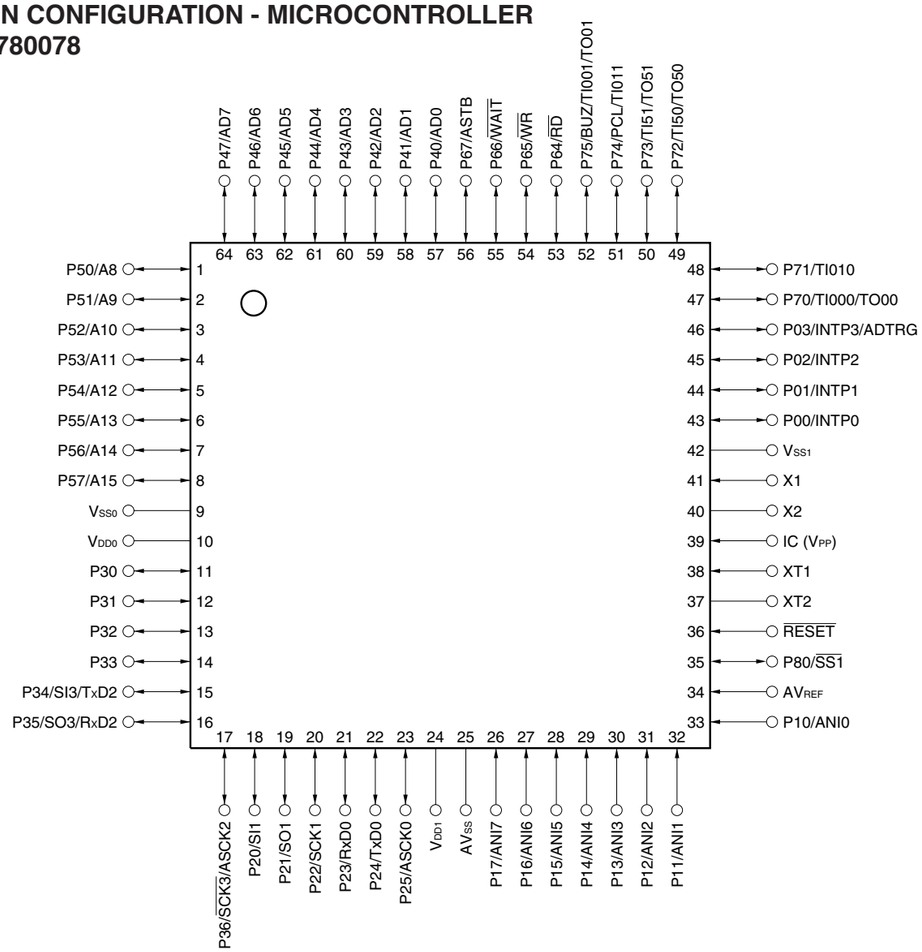
PIN DESCRIPTION

Pin Name	I/O	Description	Pin No.
LED1 to LED4	O	LED Output Pin	1 to 4
OSC	I	Oscillator Input Pin A resistor is connected to this pin to determine the oscillation frequency	5
DOUT	O	Data Output Pin (N-Channel, Open-Drain) This pin outputs serial data at the falling edge of the shift clock (starting from the lower bit).	6
DIN (Schmitt Trigger)	I	Data Input Pin This pin inputs serial data at the rising edge of the shift clock (starting from the lower bit)	7
CLK (Schmitt Trigger)	I	Clock Input Pin This pin reads serial data at the rising edge and outputs data at the falling edge.	8
STB (Schmitt Trigger)	I	Serial Interface Strobe Pin The data input after the STB has fallen is processed as a command. When this pin is "HIGH", CLK is ignored.	9
K1 to K2	I	Key Data Input Pins The data inputted to these pins are latched at the end of the display cycle.	10 ,11
VSS	-	Logic Ground Pin	12,44
VDD	-	Logic Power Supply	13,43
SG1/KS1 to SG16/KS16	O	High-Voltage Segment Output Pins Also acts as the Key Source	14 to 29
VEE	-	Pull-Down Level	30
SG17/GR12 to SG24/GR5	O	High Voltage Segment/Grid Output Pins	31 to 38
GR4 to GR1	O	High-Voltage Grid Output Pins	39 to 42

IC BLOCK DIAGRAM - MICROCONTROLLER
uPD780078

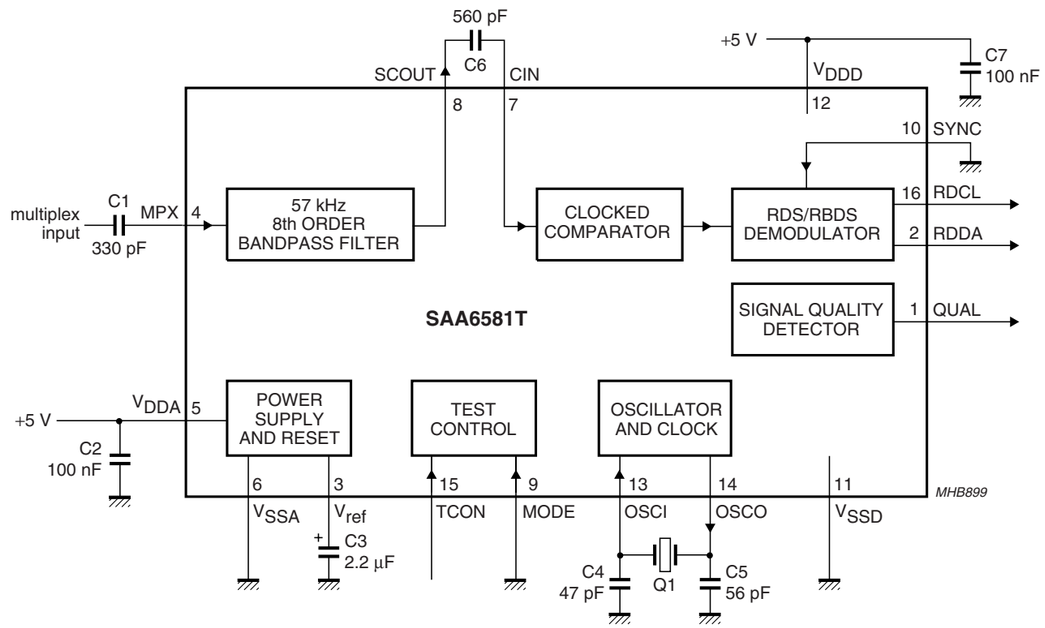


IC PIN CONFIGURATION - MICROCONTROLLER uPD780078



A8 to A15:	Address bus	PCL:	Programmable clock
AD0 to AD7:	Address/data bus	$\overline{RD}$:	Read strobe
ADTRG:	AD trigger input	$\overline{RESET}$:	Reset
ANI0 to ANI7:	Analog input	RxD0, RxD2:	Receive data
ASCK0, ASCK2:	Asynchronous serial clock	SCK1, $\overline{SCK3}$:	Serial clock
ASTB:	Address strobe	SI1, SI3:	Serial input
AV_{REF}:	Analog reference voltage	SO1, SO3:	Serial output
AV_{SS}:	Analog ground	$\overline{SS1}$:	Serial interface chip select input
BUZ:	Buzzer clock	TI000, TI010, TI001,	
IC:	Internally connected	TI011, TI50, TI51:	Timer input
INTP0 to INTP3:	External interrupt input	TO00, TO01, TO50,	
P00 to P03:	Port 0	TO51:	Timer output
P10 to P17:	Port 1	TxD0, TxD2:	Transmit data
P20 to P25:	Port 2	V_{DD0}, V_{DD1}:	Power supply
P30 to P36:	Port 3	V_{PP}:	Programming power supply
P40 to P47:	Port 4	V_{SS0}, V_{SS1}:	Ground
P50 to P57:	Port 5	$\overline{WAIT}$:	Wait
P64 to P67:	Port 6	$\overline{WR}$:	Write strobe
P70 to P75:	Port 7	X1, X2:	Crystal (main system clock)
P80:	Port 8	XT1, XT2:	Crystal (subsystem clock)

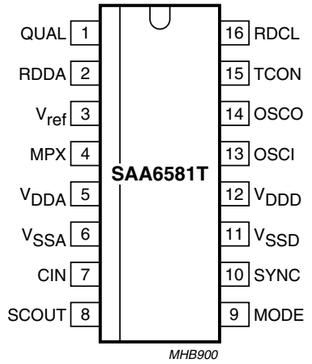
IC BLOCK DIAGRAM - RDS/RBDS DEMODULATOR SAA6581T



IC PIN DESCRIPTION - RDS/RBDS DEMODULATOR SAA6581T

PINNING

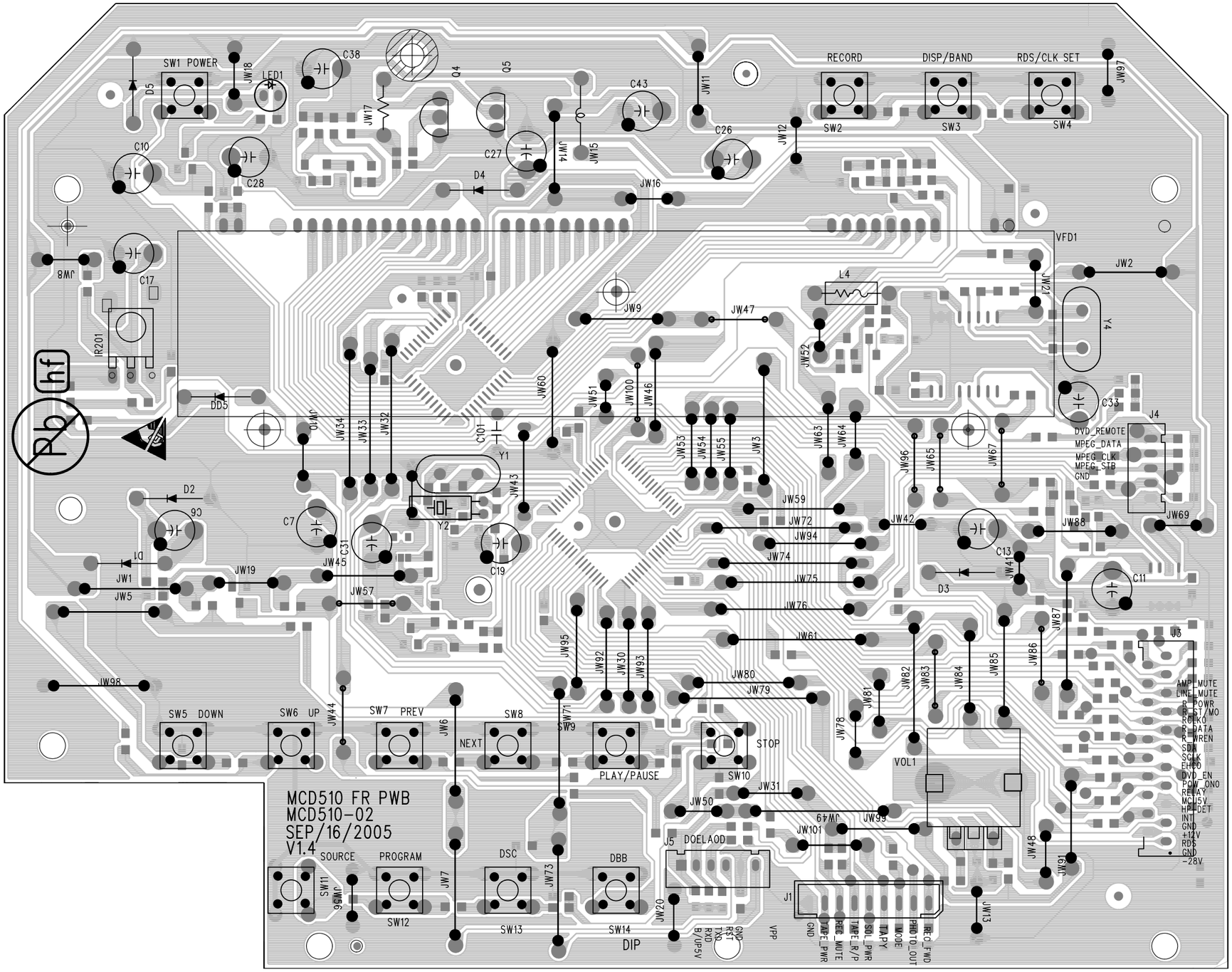
SYMBOL	PIN	DESCRIPTION
QUAL	1	signal quality indication output
RDDA	2	RDS data output
V_{ref}	3	reference voltage output ($^1/_2V_{DDA}$)
MPX	4	multiplex signal input
V_{DDA}	5	analog supply voltage (5 V)
V_{SSA}	6	analog ground (0 V)
CIN	7	comparator input
SCOUT	8	switched capacitor filter output
MODE	9	oscillator frequency select input
SYNC	10	ARI clamping control input
V_{SSD}	11	digital ground (0 V)
V_{DDD}	12	digital supply voltage (5 V)
OSCI	13	oscillator input
OSCO	14	oscillator output
TCON	15	test control input
RDCL	16	RDS clock output



Pin configuration.

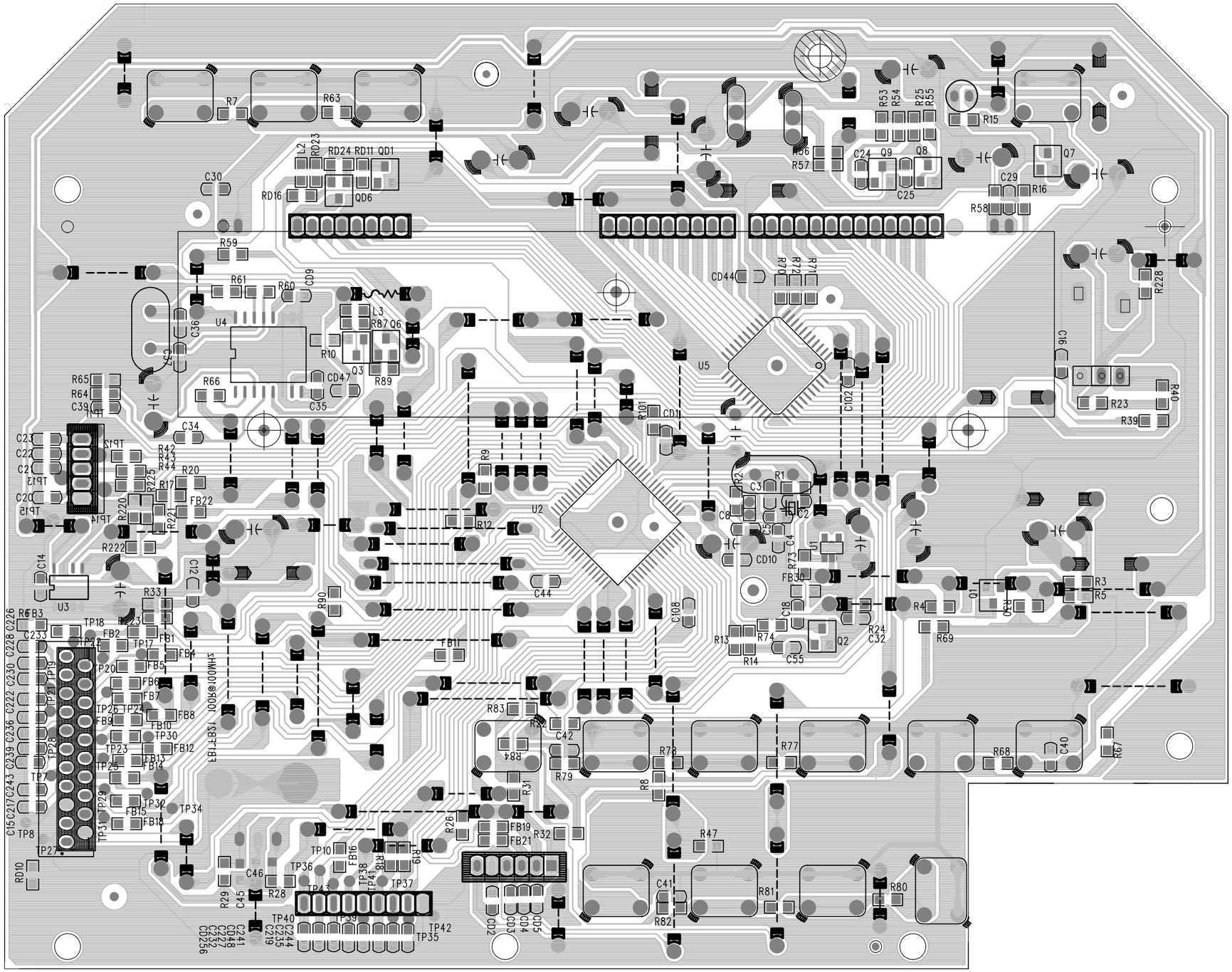
6-4

LAYOUT DIAGRAM - DISPLAY BOARD
TOP SIDE



6-5

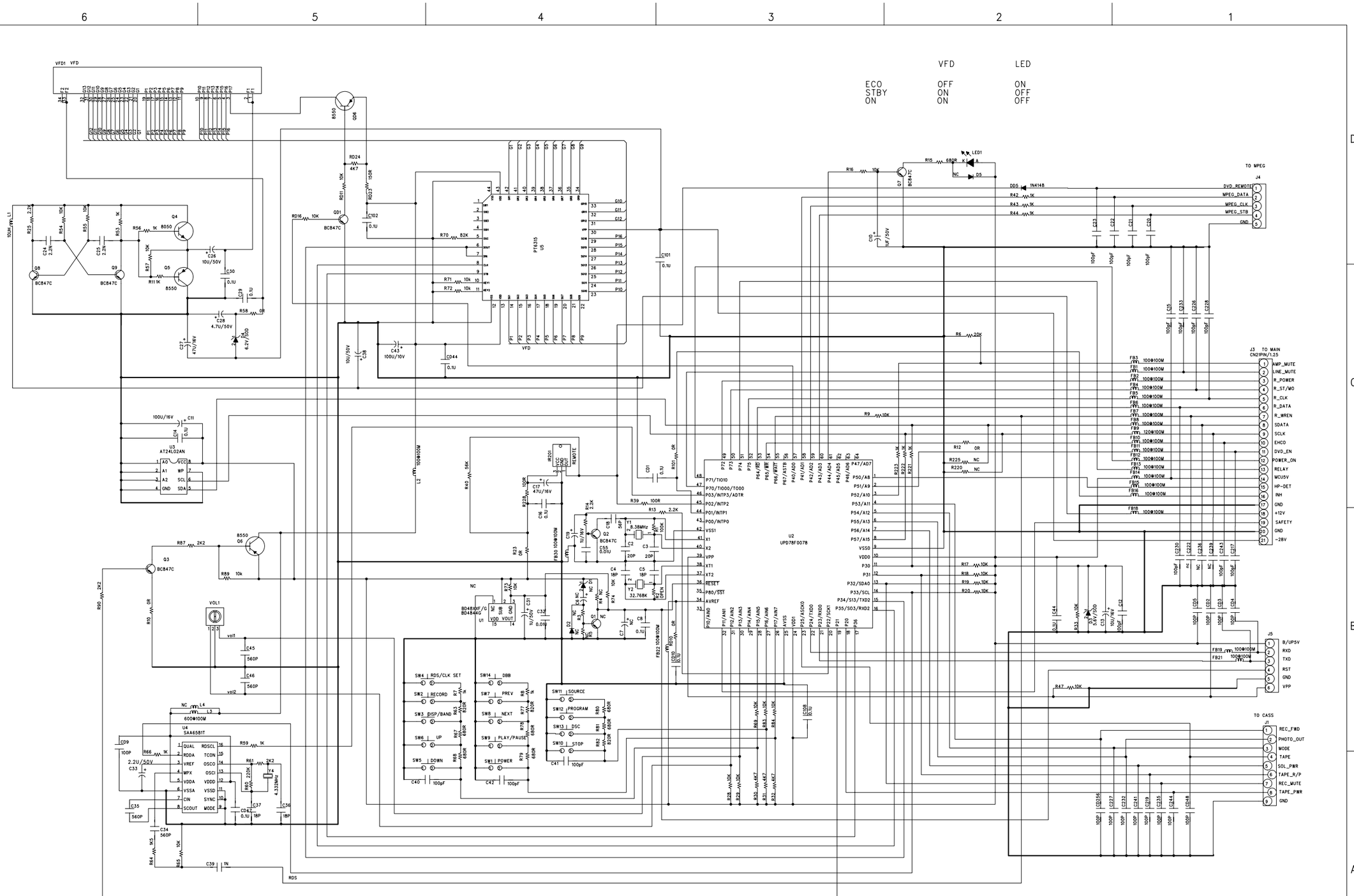
LAYOUT DIAGRAM - DISPLAY BOARD
BOTTOM SIDE



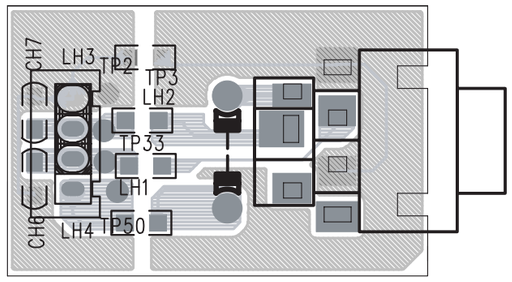
6-6

CIRCUIT DIAGRAM - DISPLAY BOARD

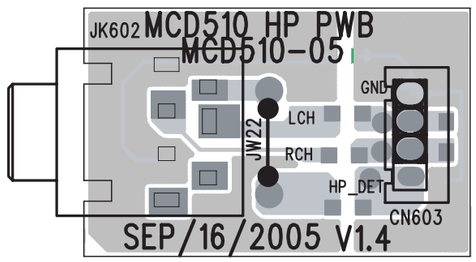
	VFD	LED
ECO	OFF	ON
STBY	ON	OFF
ON	ON	OFF



LAYOUT DIAGRAM - HEADPHONE BOARD TOP SIDE



LAYOUT DIAGRAM - HEADPHONE BOARD BOTTOM SIDE

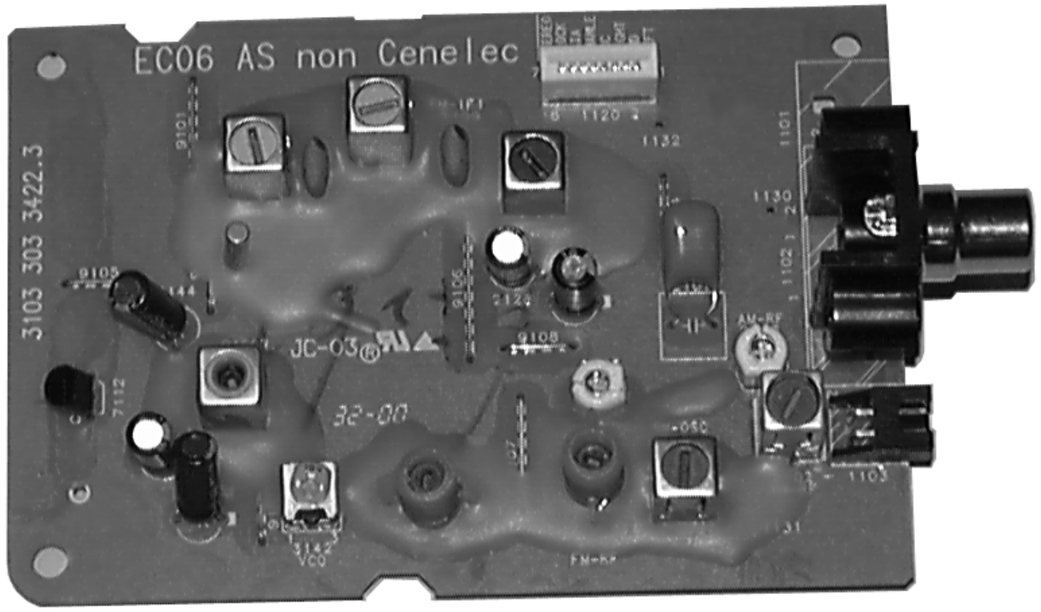


6-7

ELECTRICAL PARTSLIST - DISPLAY BOARD

D3	9940 000 03291	ZENER DIODE 5.6V 1/2W
IR201	9940 000 03347	IR SENSOR 5V 38.0KHZ
JW15	9940 000 03603	RADIAL INDUCTOR 10µH /21/21M
LED1	9940 000 02115	LED 3MM 3R4HD-7(RED)
Q4	9940 000 02646	TRANSISTOR SS8050
Q5	9940 000 02642	TRANSISTOR 3CA8550
Q6	9940 000 03299	TRANSISTOR 8550
QD6	9940 000 03299	TRANSISTOR 8550
SW1	9940 000 03349	SWITCH TACT TSA-064301-250
SW10	9940 000 03349	SWITCH TACT TSA-064301-250
SW11	9940 000 03349	SWITCH TACT TSA-064301-250
SW12	9940 000 03349	SWITCH TACT TSA-064301-250
SW13	9940 000 03349	SWITCH TACT TSA-064301-250
SW14	9940 000 03349	SWITCH TACT TSA-064301-250
SW2	9940 000 03349	SWITCH TACT TSA-064301-250
SW3	9940 000 03349	SWITCH TACT TSA-064301-250
SW4	9940 000 03349	SWITCH TACT TSA-064301-250
SW5	9940 000 03349	SWITCH TACT TSA-064301-250
SW6	9940 000 03349	SWITCH TACT TSA-064301-250
SW7	9940 000 03349	SWITCH TACT TSA-064301-250
SW8	9940 000 03349	SWITCH TACT TSA-064301-250
SW9	9940 000 03349	SWITCH TACT TSA-064301-250
U1	9940 000 03607	IC RESET BD4844G /21/21M
U2	9940 000 03351	IC UPD780078
U3	9940 000 02671	IC BR24L02F-WE2
U4	9940 000 03346	IC SAA6581T RDS /14/22
U5	9940 000 03353	IC VFD DRIVER PT6315
VFD1	9940 000 03348	FTD HNA-13SM42T
VOL1	9940 000 03354	ENCODER F-12EN5H24B
Y1	9940 000 03343	CRYSTAL 8.38MHZ +/-20PPM
Y2	9940 000 03344	CRYSTAL 32.768KHZ +/-20PPM
Y4	9940 000 03345	CRYSTAL 4.332MHZ +/-20PPM

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



ECO6 Tuner Board

version: ***SYSTEMS non-CENELEC***

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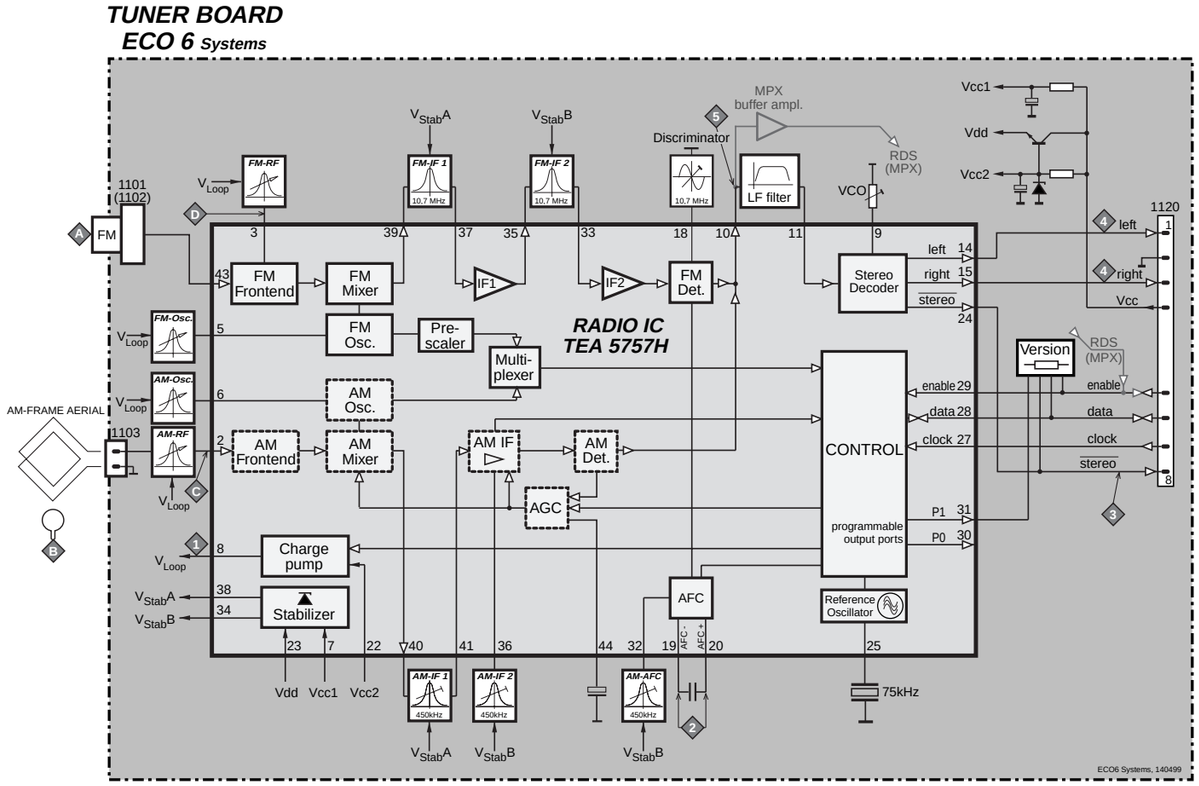
BLOCK DIAGRAM



7A-2

TUNER BOARD ECO6 / SYSTEMS NON CENELEC

VERSION PROGRAMMING COMPONENTS

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

X component mounted

VERSION DETECTION

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
EVM voltages measured while set is tuned to a strong transmitter

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

ECO6 Sys-non Cenelec, 000911

7A-3

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 AM-frame aerial)

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)			108MHz	5130	◇1	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		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	IC 7101 21 shortcircuit to block AFC 2141	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 3.3kΩ to Vcc	◇C Δf=±10kHz V_{RF} = 0.5mV (as low as possible)	IC 7101 36 220R 100nF	5111	◇5	max. f_o symmetric
			IC 7101 40 220R 100nF see remark [2]	5112		
AM AFC **MW**		◇C continuous wave V_{RF} = 2mV		5114	◇2	0 ± 2 mV DC
AM RF [3]						
MW [4] FM/MW/LW- and FM/MW-version (9kHz grid) 531 - 1602kHz	1494kHz	◇B Δf = ±30kHz V_{RF} as low as possible	1494kHz	2106	◇5	max. f_o symmetric
	558kHz		558kHz	5102		
LW	198kHz		198kHz	5103		
MW FM/AM-version, 10kHz grid 530 - 1700kHz	1500kHz		1500kHz	2106		
	560kHz		560kHz	5102		

ECO6, Sys + PA with frame aerial, 070799

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

Electrical Partslist *ECO6* *SYSTEMS NON-CENELEC*

7A-4

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

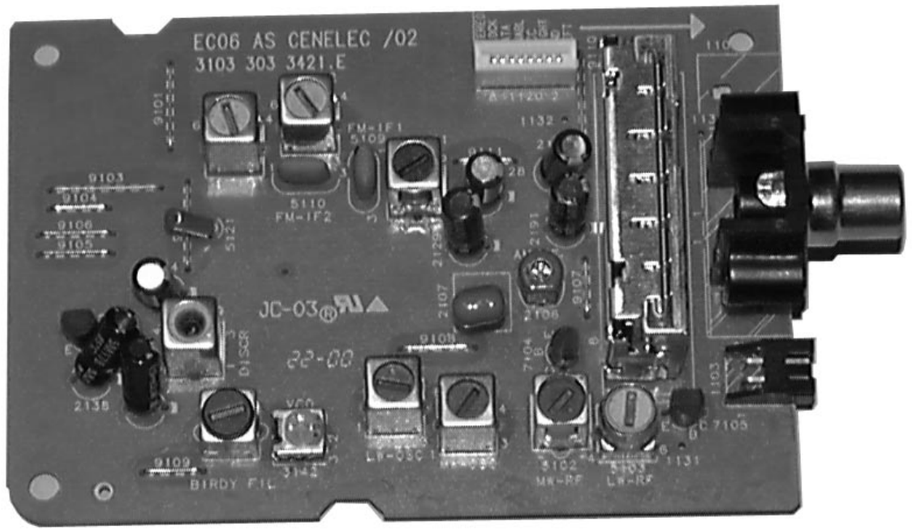
6103 ©	5322 130 34337	BAV99	
6105 ©	4822 130 83075	HN1V02H	
6106 ©	4822 130 83757	BAS216	
6107 ©	9340 386 90115	BZX284-C11	
6120 ©	4822 130 83757	BAS216	
6130 ©	4822 130 82833	1SV228	
6131 ©	4822 130 82833	1SV228	

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***

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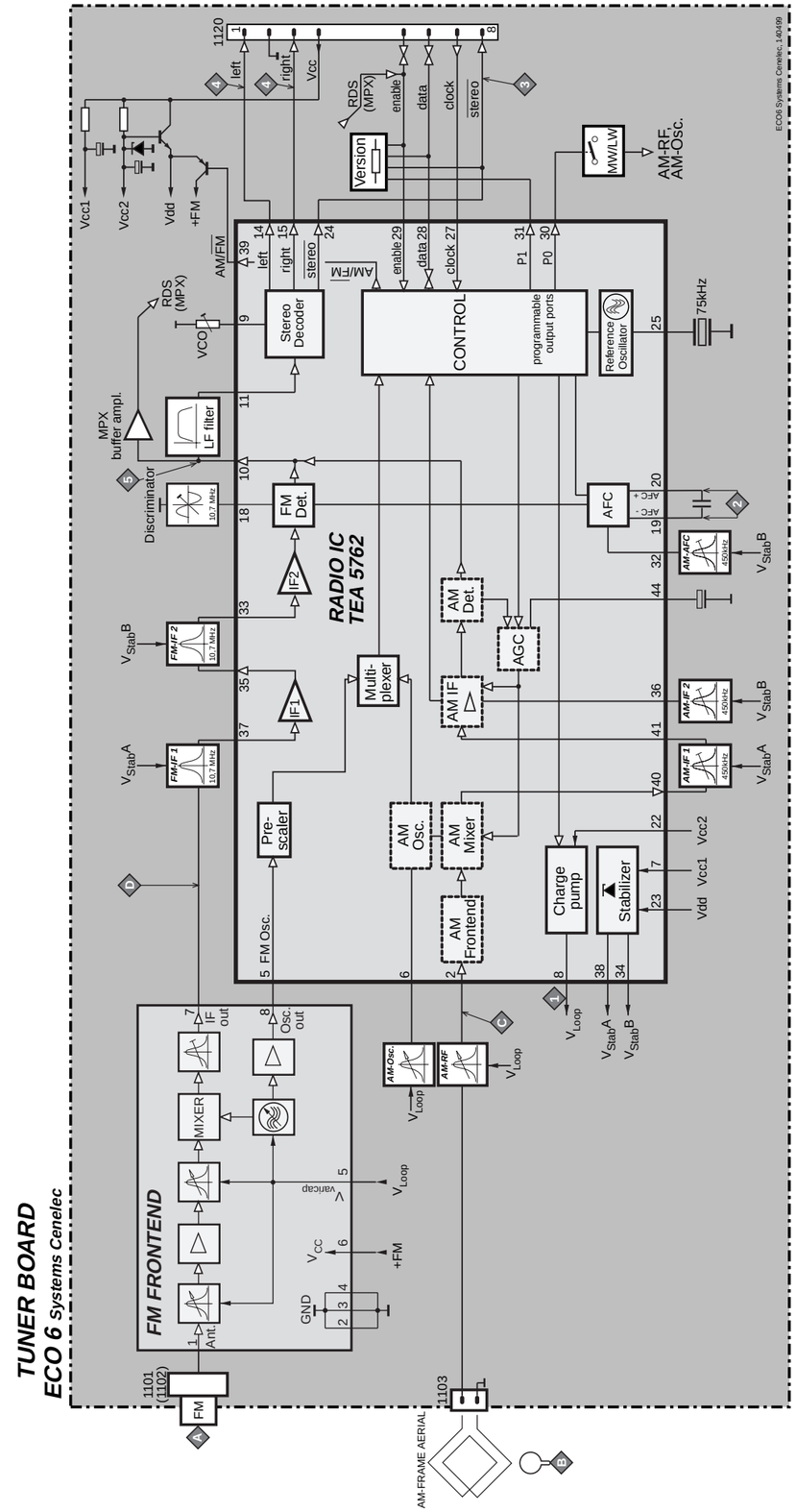
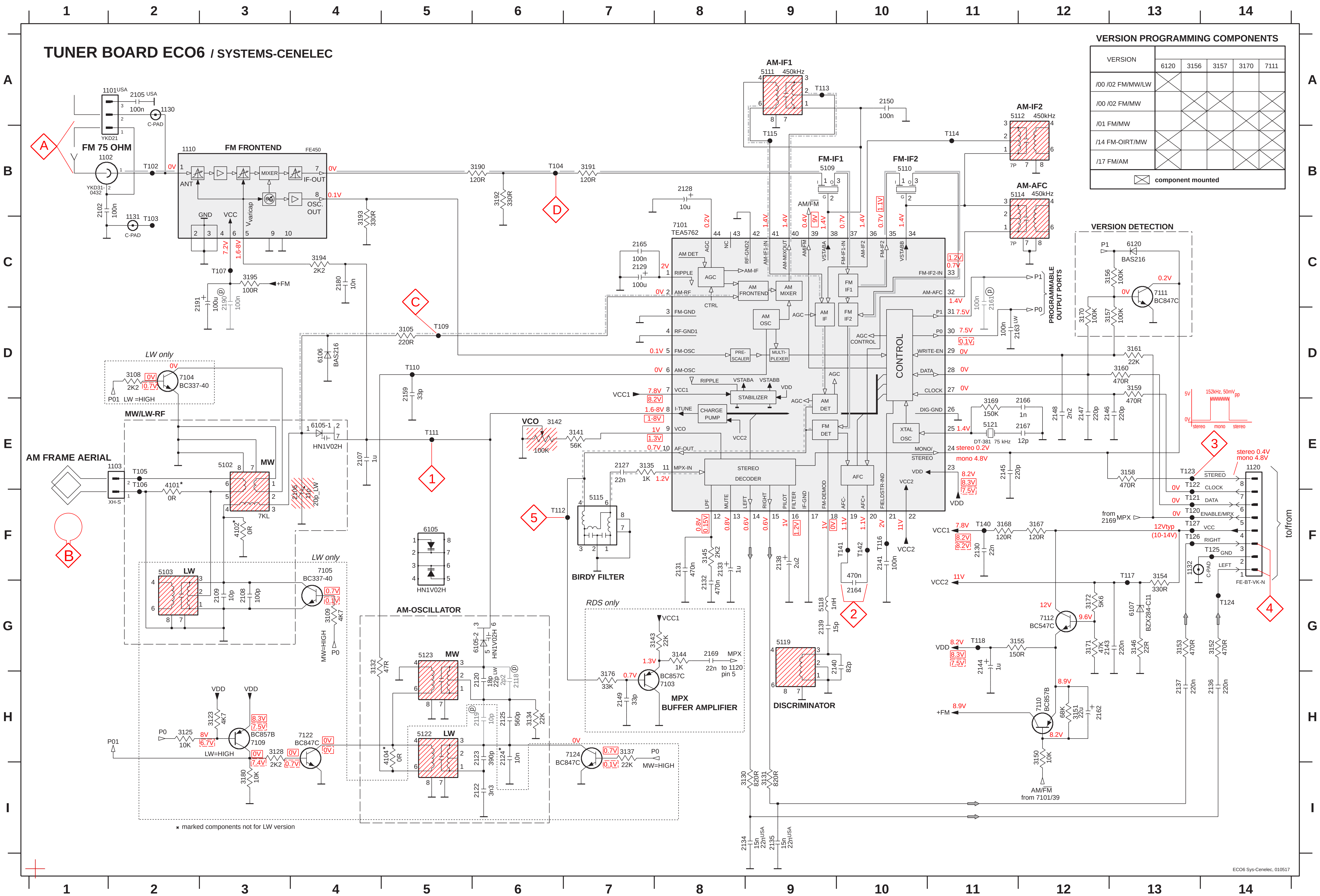


7B-2

TUNER BOARD ECO6 / SYSTEMS-CENELEC



VERSION PROGRAMMING COMPONENTS

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

X component mounted

1101 A2	5121 E11		
1102 B1	5122 H5		
1103 E2	5123 G5		
1110 B2	6105-1 E4		
1120 E14	6105-2 G6		
1130 A2	6106 D4		
1131 C2	6107 G13		
1132 F13	6120 C13		
2102 B1	7101 C8		
2105 A2	7103 H8		
2106 E3	7104 D2		
2107 E4	7105 F4		
2108 G3	7109 H3		
2109 G3	7110 H12		
2118 H6	7111 C13		
2119 H6	7112 G12		
2120 H6	7122 H4		
2122 I6	7124 H7		
2123 H6	T102 B2		
2124 H6	T103 B2		
2125 H6	T104 B6		
2127 E7	T105 E2		
2128 B8	T106 E2		
2129 C7	T107 C3		
2130 F11	T109 D5		
2131 F8	T110 D5		
2132 F8	T111 E5		
2133 F8	T112 F7		
2134 I8	T113 A9		
2135 I9	T114 B11		
2136 H14	T116 F10		
2137 H13	T117 F13		
2138 F9	T118 G11		
2139 G9	T120 F13		
2140 G9	T121 F13		
2141 F10	T122 E13		
2143 G12	T123 E13		
2144 G11	T124 G14		
2145 E11	T125 F14		
2146 E12	T126 F13		
2147 E12	T127 F13		
2148 E12	T140 F11		
2149 H7	T141 F10		
2150 A10	T142 F10		
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			
3137 H7			
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			

LEGEND

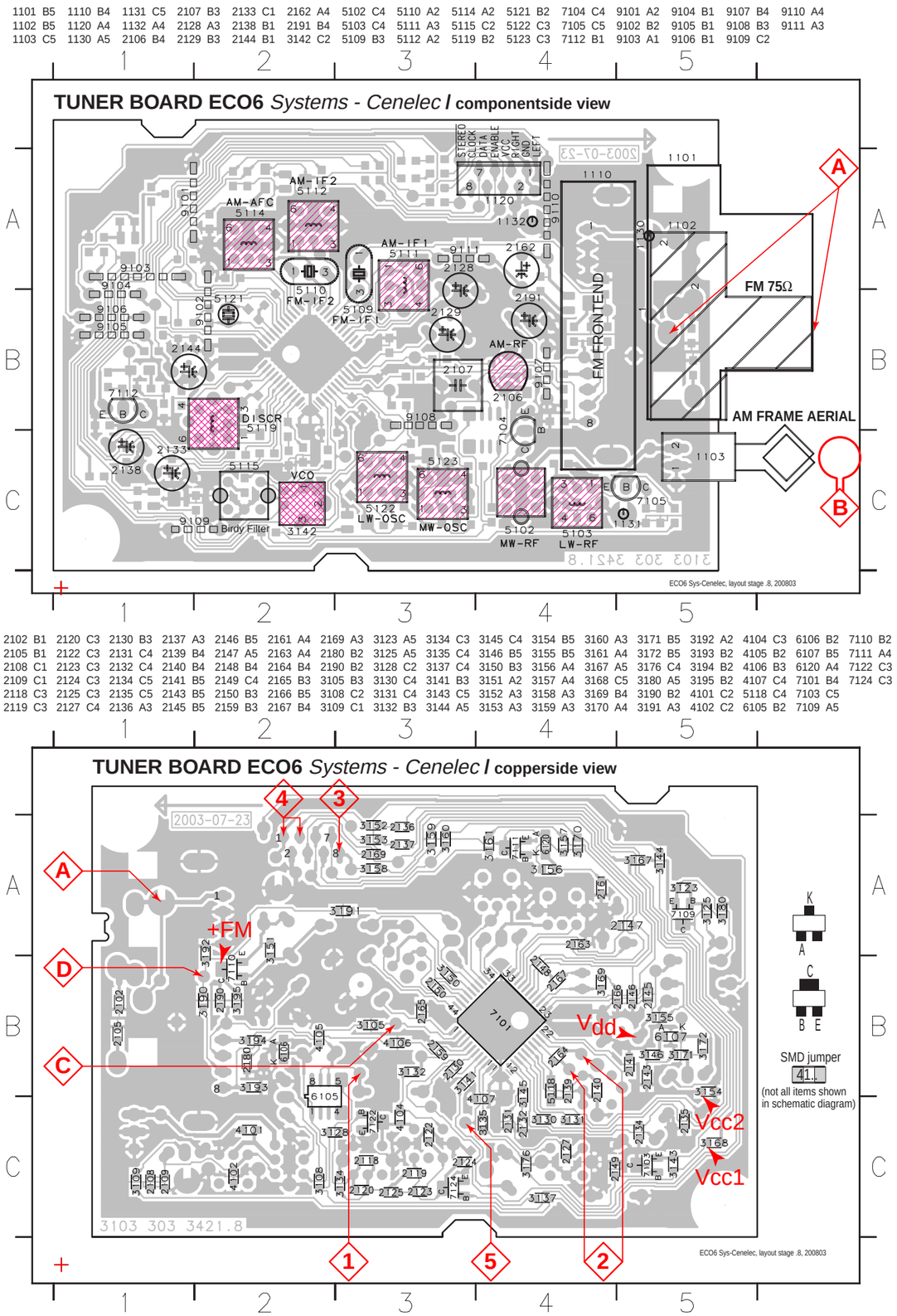
⁎ ... only assembled in FM/AM-version
(p)...for provision only
USA ... for USA version only
LW ... for LW version only

SMD jumper 41xx 0R

EVM

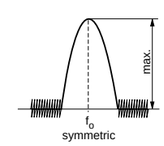
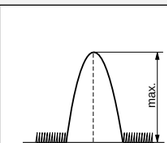
...V FM mode stereo
...V MW mode
...V LW mode
voltages measured while set is tuned to a strong transmitter

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



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
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (50kHz grid)			108MHz	check	◇1	8V ±1.2V
			87.5MHz	check		1.6V ±0.5V
MW 531 - 1602kHz (9kHz grid)			1602kHz	5123		8V ±0.2V 3-band 6.9V ±0.2V 2-band
			531kHz	check		1.1V ±0.4V
LW 153 - 279kHz (3kHz grid)			279kHz	5122		8V ±0.2V
			153kHz	check		1.1V ±0.4V
FM - IF						
FM	10.7MHz, 45mV continuous wave	◇D	IC 7101 pin 21 shortcircuit to block AFC → 2141	5119	◇2	0mV ±3mV
FM - VCO						
FM	98MHz, 1mV continuous wave	◇A	98MHz	3142	◇3	152kHz ±1kHz 1)
FM RF (channel separation)	Note: The FM-frontend unit has already been adjusted by the factory and needs therefore no further adjustments for service purposes.					
FM	98MHz, 1mV 90% Left + 9% pilot mod=1kHz	◇A	98MHz	IF coil inside FM frontend 1110	◇4	right channel min.
AM IF						
MW	450kHz connect pin 6 of IC 7101 (AM Osc.) with 3.3kΩ to Vcc	◇C Δf = ±10kHz V_{RF} = 0.5mV (as low as possible)	IC 7101 pin 36 → 100nF / 220R	5111	◇5	
			IC 7101 pin 40 → 100nF / 220R (see remark 2)	5112		
AM AFC **MW**		◇C continuous wave V_{RF} = 2mV		5114	◇2	0mV ±2mV
AM RF 3)						
MW	1494kHz	◇B Δf = ±30kHz V_{RF} as low as possible	1494kHz	2106	◇5	
	558kHz		558kHz	5102		
LW	198kHz		198kHz	5103		

ECO6 Sys Cenelec, 190599

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! MW has to be aligned before LW.

↕ Repeat

Electrical Partslist *ECO6* SYSTEMS-CENELEC

7B-4

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
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

MAIN BOARD

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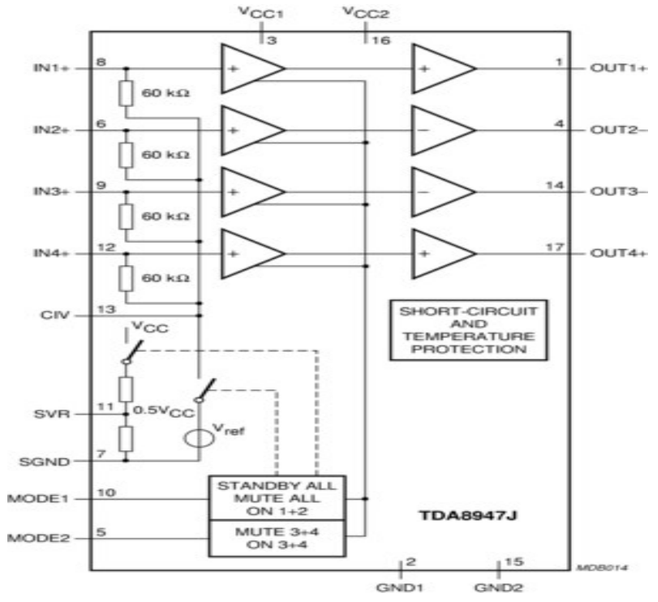
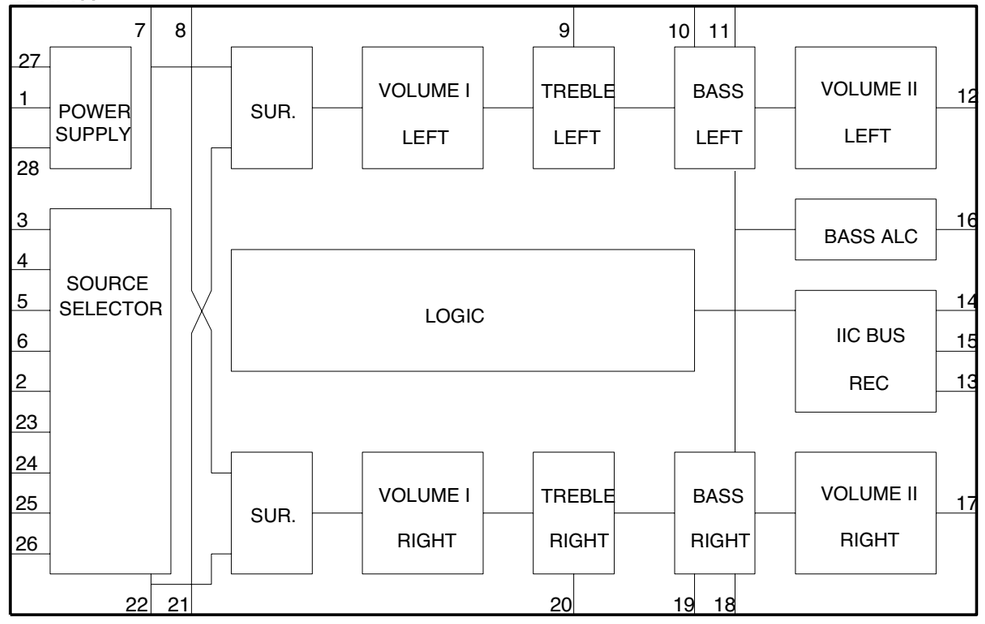
BLOCK DIAGRAM - 4-CHANNEL AUDIO AMPLIFIER TDA8947J



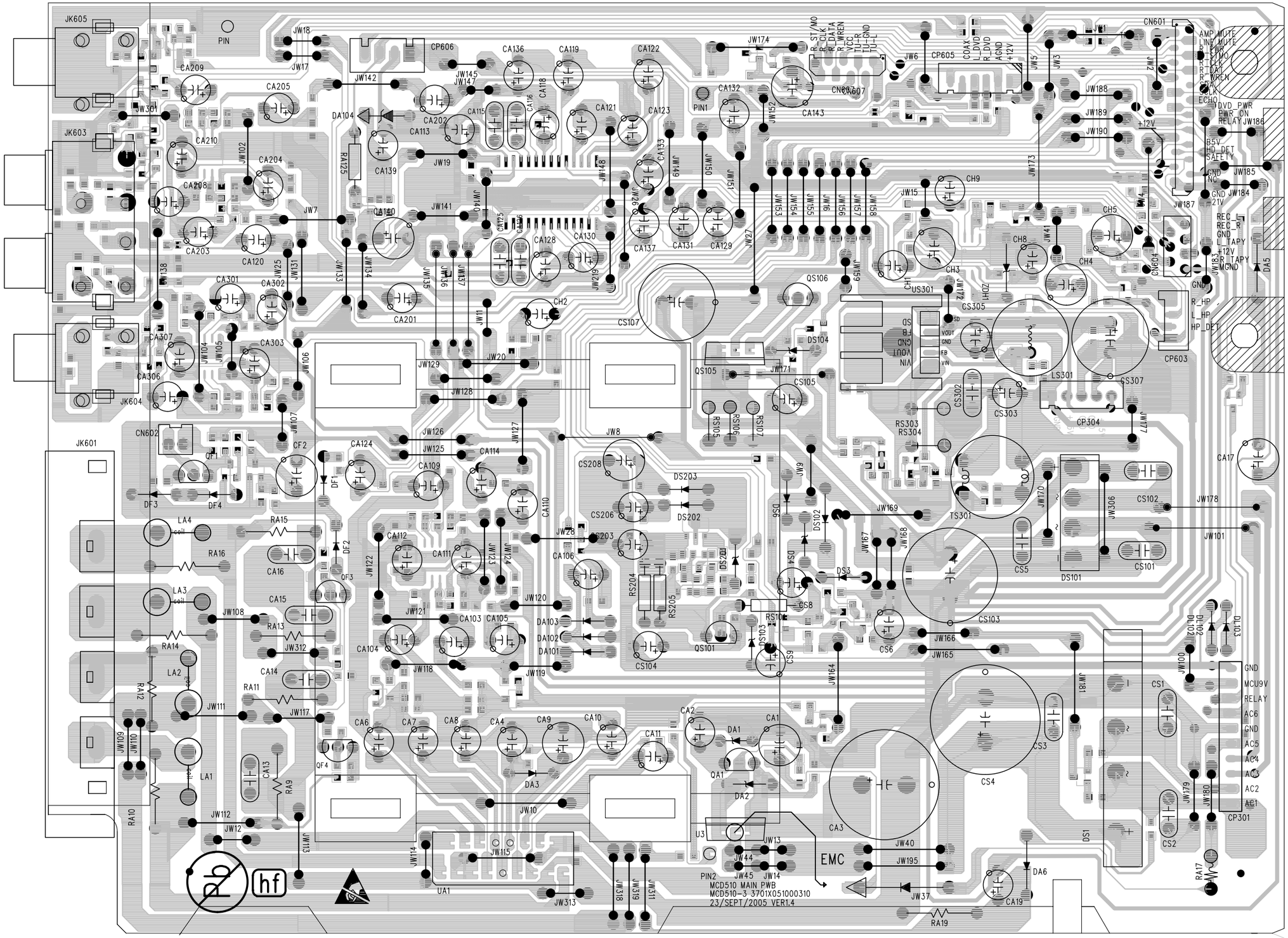
TDA7468 INTERNAL BLOCK DIAGRAM

TDA7468



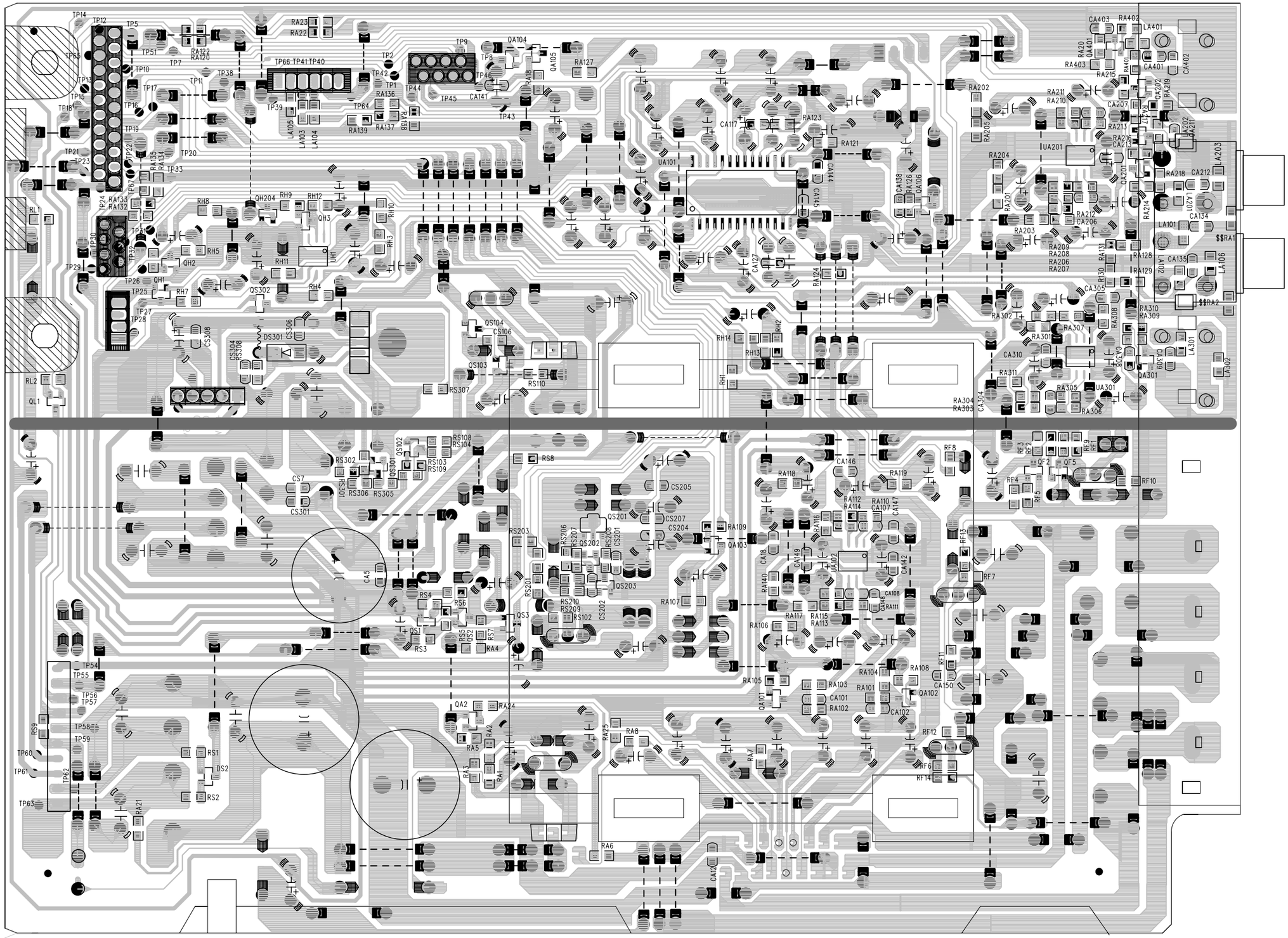
8-2

LAYOUT DIAGRAM - MAIN BOARD
TOP SIDE



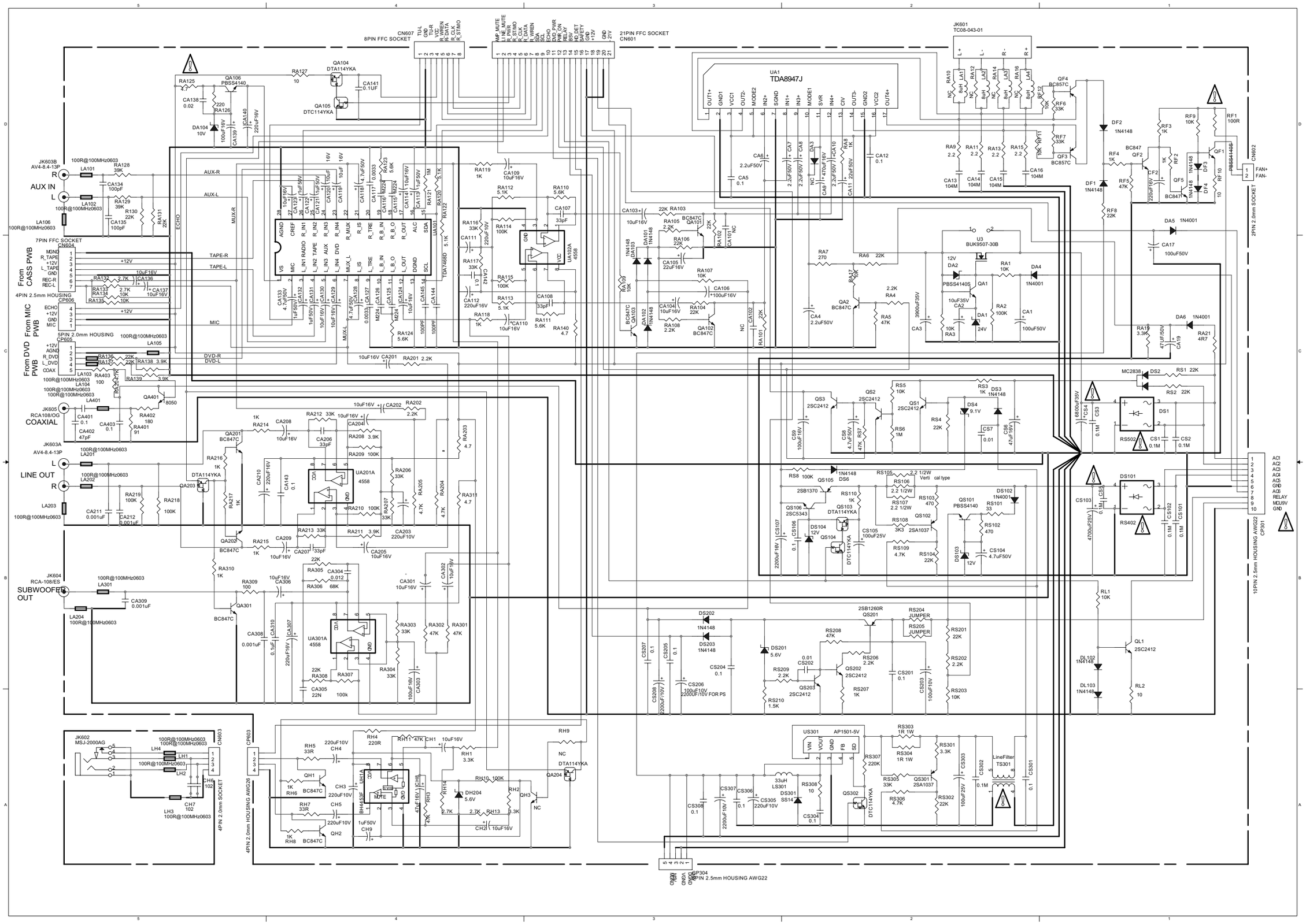
8-3

LAYOUT DIAGRAM - MAIN BOARD
BOTTOM SIDE



8-4

CIRCUIT DIAGRAM - MAIN BOARD



8-5

ELECTRICAL PARTSLIST - MAIN BOARD

CA3	9940 000 03285	CAP ELE 3900µF 35V +/-20%	QS301	9940 000 03301	TRANSISTOR 2SA1037AK
CS103	9940 000 03286	CAP ELE 4700µF 25V +/-20% /14/22	QS302	9940 000 03297	TRANSISTOR DTC114YKA
CS103	9940 000 02644	CAP ELE 6800µF 35V +/-20% /21/21M	RS101 ⚠	9940 000 03287	FUSE RES 33Ω 1/4W +/-5%
CS4	9940 000 02644	CAP ELE 6800µF 35V +/-20%	TS301	9940 000 03311	28µH CORE 6TURNS 715Ω 1.2A
DA1	9940 000 03586	ZENER DIODE 24V /21/21M	U3	9940 000 03587	MOSFET BUK9507-30B /21/21M
DA2	9940 000 03294	ZENER DIODE 12V /21/21M	UA1	9940 000 02639	IC TDA8947J AMPLIFIER
DA104	9940 000 03293	ZENER DIODE 10V	UA101	9940 000 03304	IC TDA7468D SOUND
DS1	9940 000 03289	RECTIFIER BRIDGE RS502	UA102	9940 000 00374	IC BA4558F OPERATIONAL
DS101	9940 000 00679	RECTIFIER BRIDGE RS402	UA201	9940 000 00374	IC BA4558F OPERATIONAL
DS103	9940 000 03294	ZENER DIODE 12V	UA301	9940 000 00374	IC BA4558F OPERATIONAL
DS104	9940 000 03294	ZENER DIODE 12V	UH1	9940 000 03307	IC BH4453F
DS2	9940 000 03295	DIODE MC2838	US301	9940 000 03306	IC AP1501-50T5L 5V 3A 150KHZ
DS201	9940 000 03291	ZENER DIODE 5.6V 1/2W	ZDH1	9940 000 03291	ZENER DIODE 5.6V 1/2W
DS301	9940 000 02645	DIODE SCHOTTKY SS14			
DS4	9940 000 03292	ZENER DIODE 9.1V			
JK601	9940 000 02174	SPK TERMINAL TC08-043-01			
JK603	9940 000 03315	JACK RCA-405A-04 W/R			
JK604	9940 000 03313	JACK RCA 1P D8.4MM(BLACK)			
JK605	9940 000 03314	JACK RCA 1P D8.4MM(ORANGE)			
LA1	9940 000 03589	IND. 3A1868N 8µH +/-20% 0.06Ω			
LA2	9940 000 03589	IND. 3A1868N 8µH +/-20% 0.06Ω			
LA3	9940 000 03589	IND. 3A1868N 8µH +/-20% 0.06Ω			
LA4	9940 000 03589	IND. 3A1868N 8µH +/-20% 0.06Ω			
LS301	9940 000 03308	POWER INDUCTOR 33µH			
QA104	9940 000 03296	TRANSISTOR DTA114YKA			
QA105	9940 000 03297	TRANSISTOR DTC114YKA			
QA106	9940 000 03302	TRANSISTOR PBSS4140T			
QA203	9940 000 03296	TRANSISTOR DTA114YKA			
QA401	9940 000 03588	TRANSISTOR MPS8050S /21/21M			
QF1	9940 000 02636	TRANSISTOR PBSS4140S			
QF3	9940 000 03299	TRANSISTOR 8550			
QF4	9940 000 03299	TRANSISTOR 8550			
QH204	9940 000 03296	TRANSISTOR DTA114YKA			
QL1	9940 000 03303	TRANSISTOR 2SC2412			
QS1	9940 000 03303	TRANSISTOR 2SC2412			
QS101	9940 000 02636	TRANSISTOR PBSS4140S			
QS102	9940 000 03301	TRANSISTOR 2SA1037AK			
QS103	9940 000 03296	TRANSISTOR DTA114YKA			
QS104	9940 000 03297	TRANSISTOR DTC114YKA			
QS105	9940 000 02647	TRANSISTOR 2SB1370			
QS106	9940 000 02649	TRANSISTOR 2SC5343			
QS2	9940 000 03303	TRANSISTOR 2SC2412			
QS201	9940 000 03298	TRANSISTOR 2SB1260R			
QS202	9940 000 03303	TRANSISTOR 2SC2412 SMT3			
QS203	9940 000 03303	TRANSISTOR 2SC2412 SMT3			
QS3	9940 000 03303	TRANSISTOR 2SC2412 SMT3			

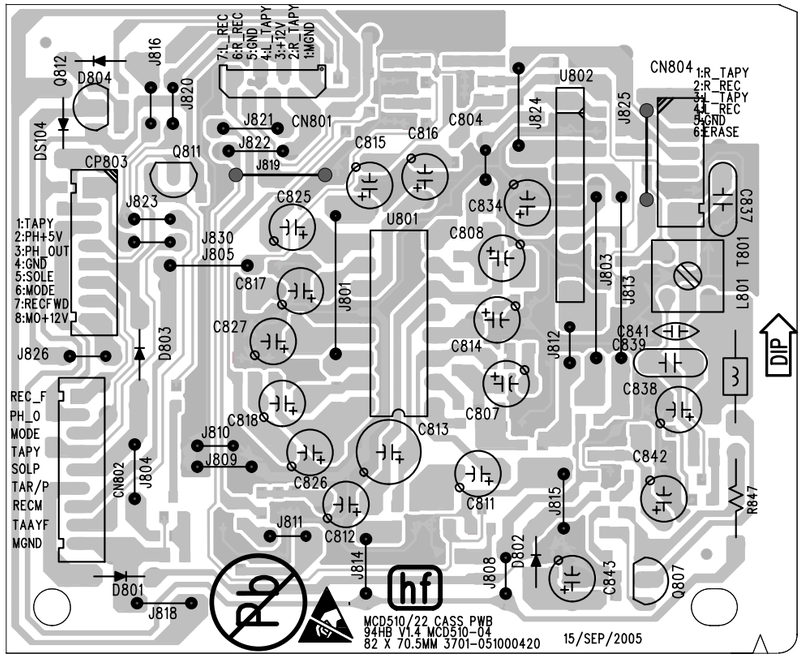
Note: Only these parts mentioned in the list are normal service parts.

9-1

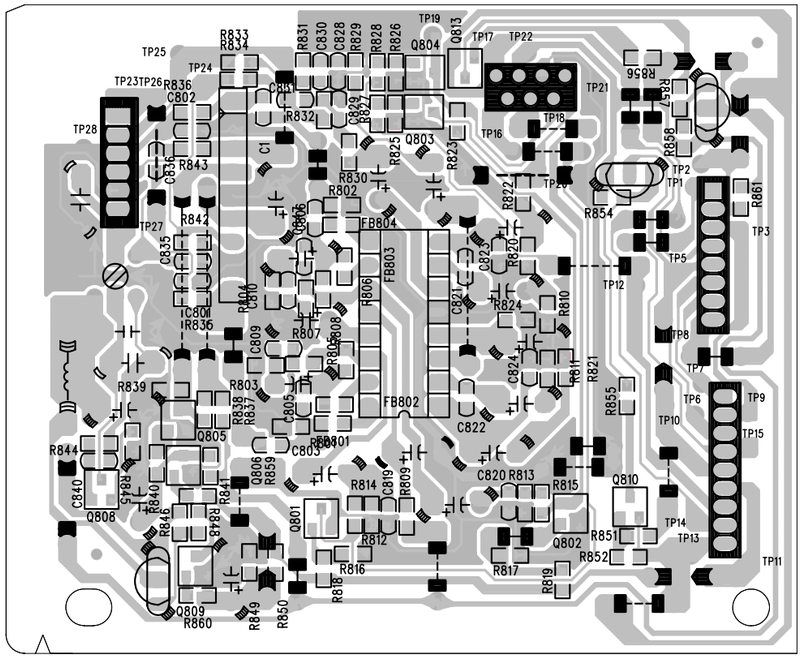
CASSETTE BOARD

This module is not intend to be repaired on componen level.
Circuit Diagram and Printed Circuit Board drawings
are published for orientation only.
In case of defects please replace the entire board and mechanic.
The Cassette Board can be ordered with codenumber "9940 000 03339".
The Cassette Deck can be ordered with codenumber "9940 000 03317".

LAYOUT DIAGRAM - CASS BOARD
TOP SIDE

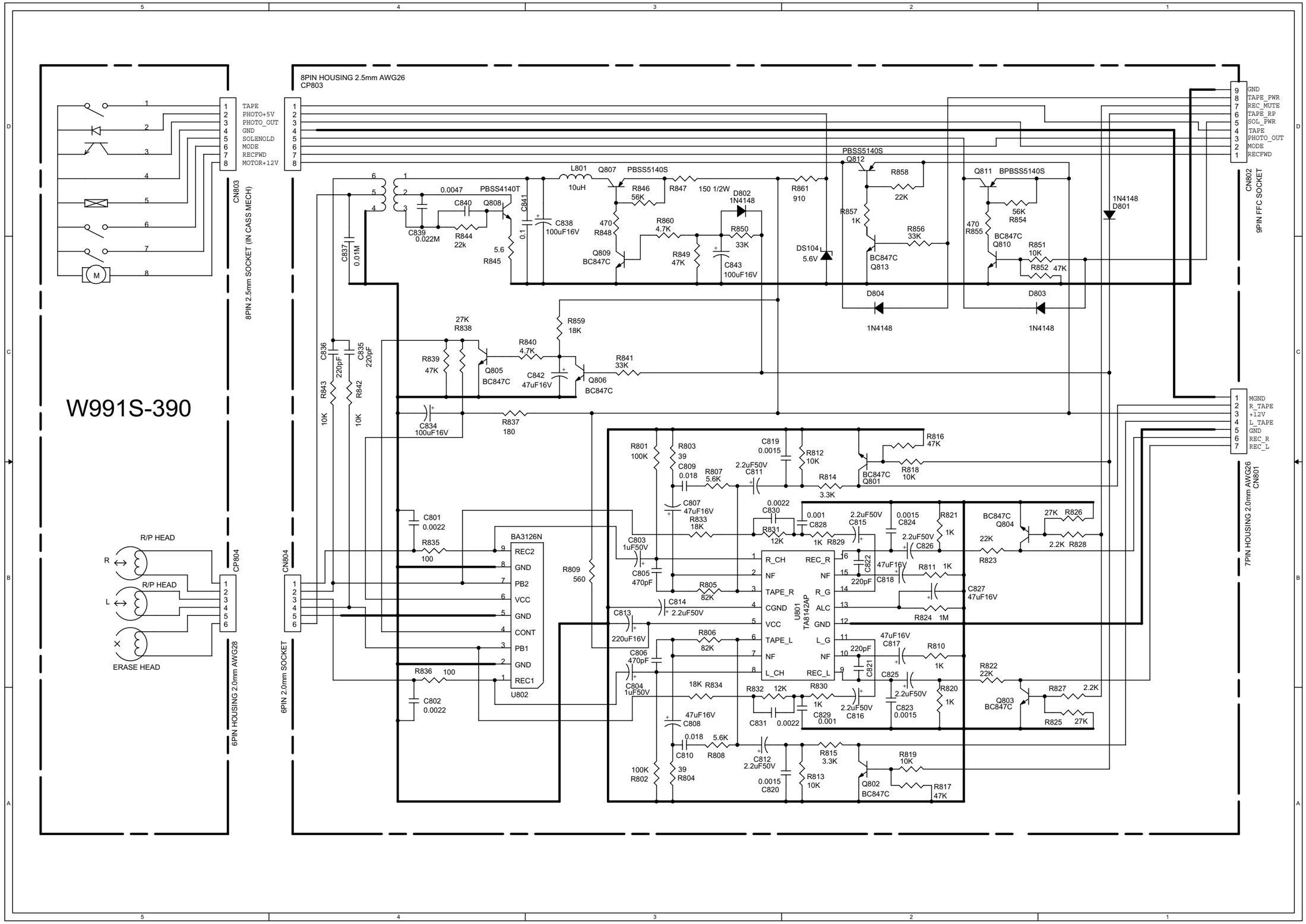


LAYOUT DIAGRAM - CASS BOARD
BOTTOM SIDE



9-3

CIRCUIT DIAGRAM - CASS BOARD



OUTPUT & MICROPHONE BOARD

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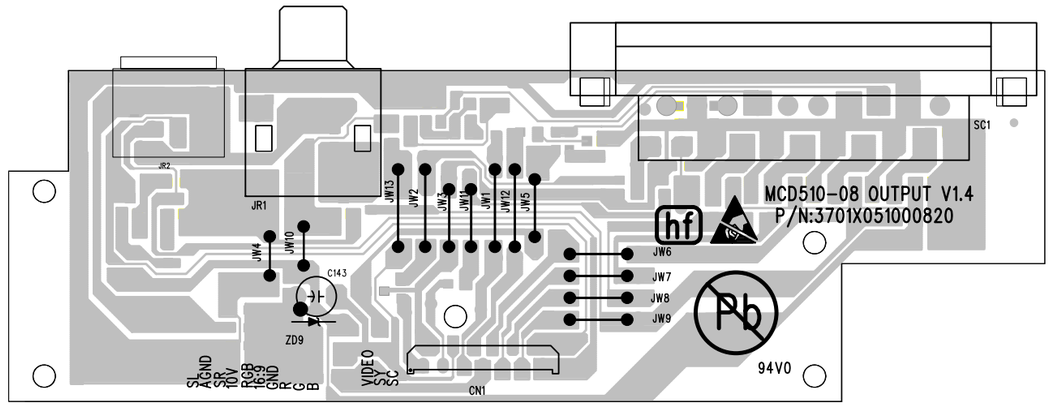
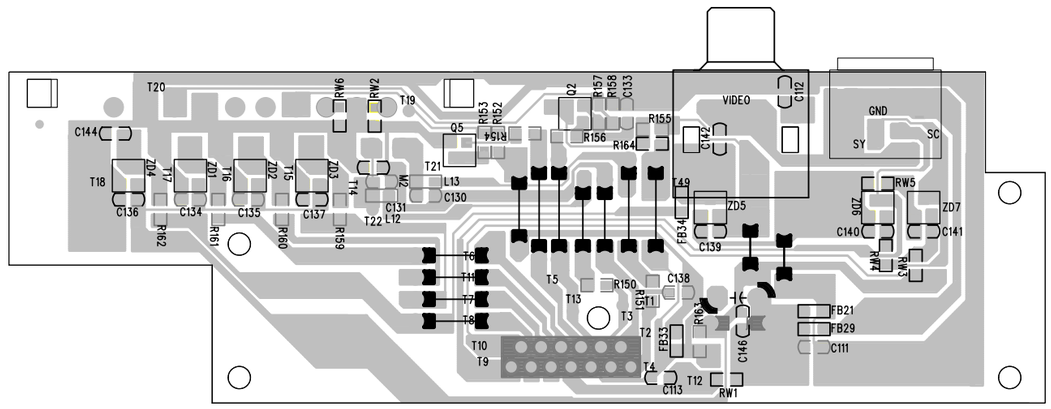
LAYOUT DIAGRAM - OUTPUT BOARD TOP SIDE

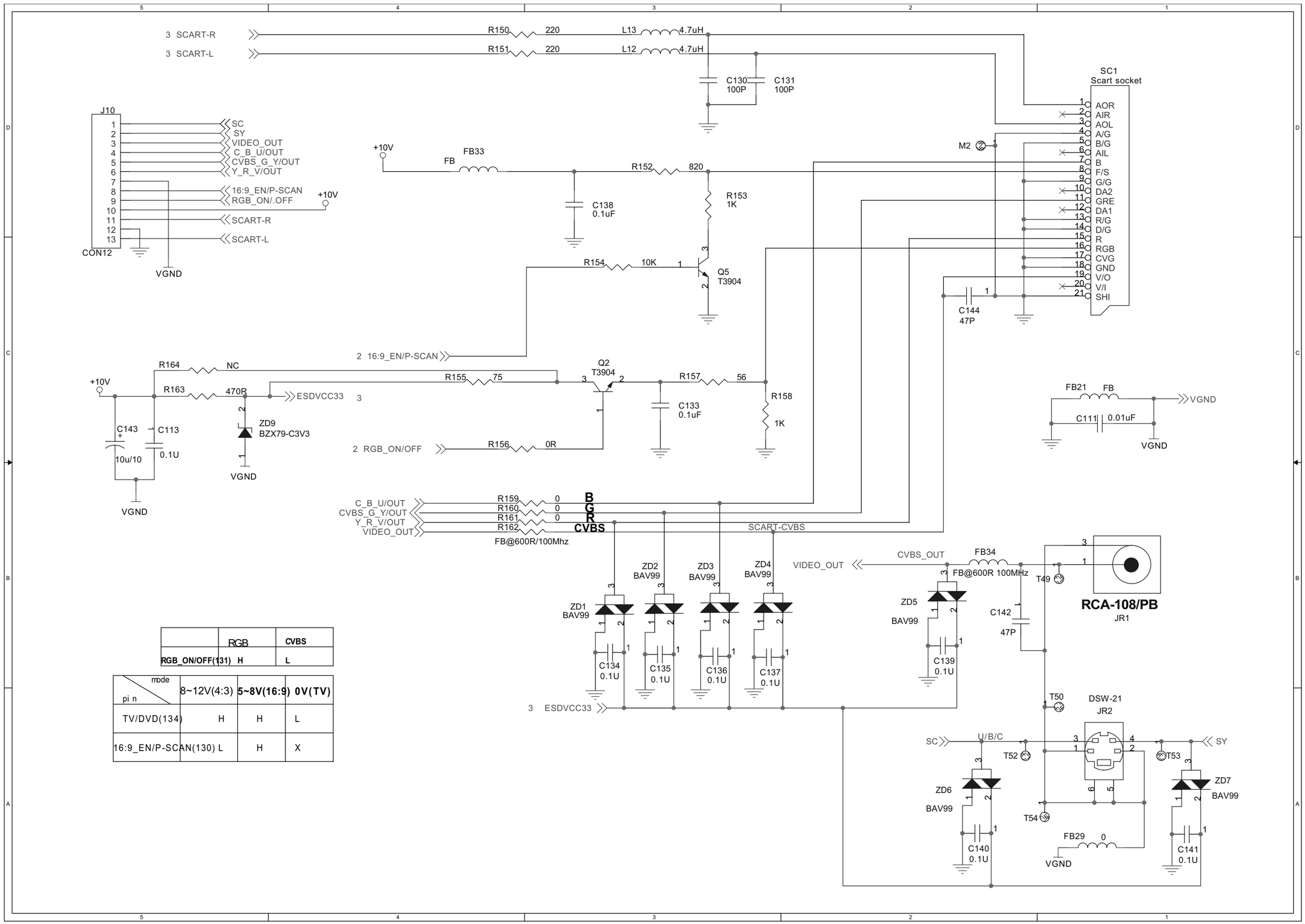


LAYOUT DIAGRAM - OUTPUT BOARD BOTTOM SIDE



10-2

CIRCUIT DIAGRAM - OUTPUT BOARD

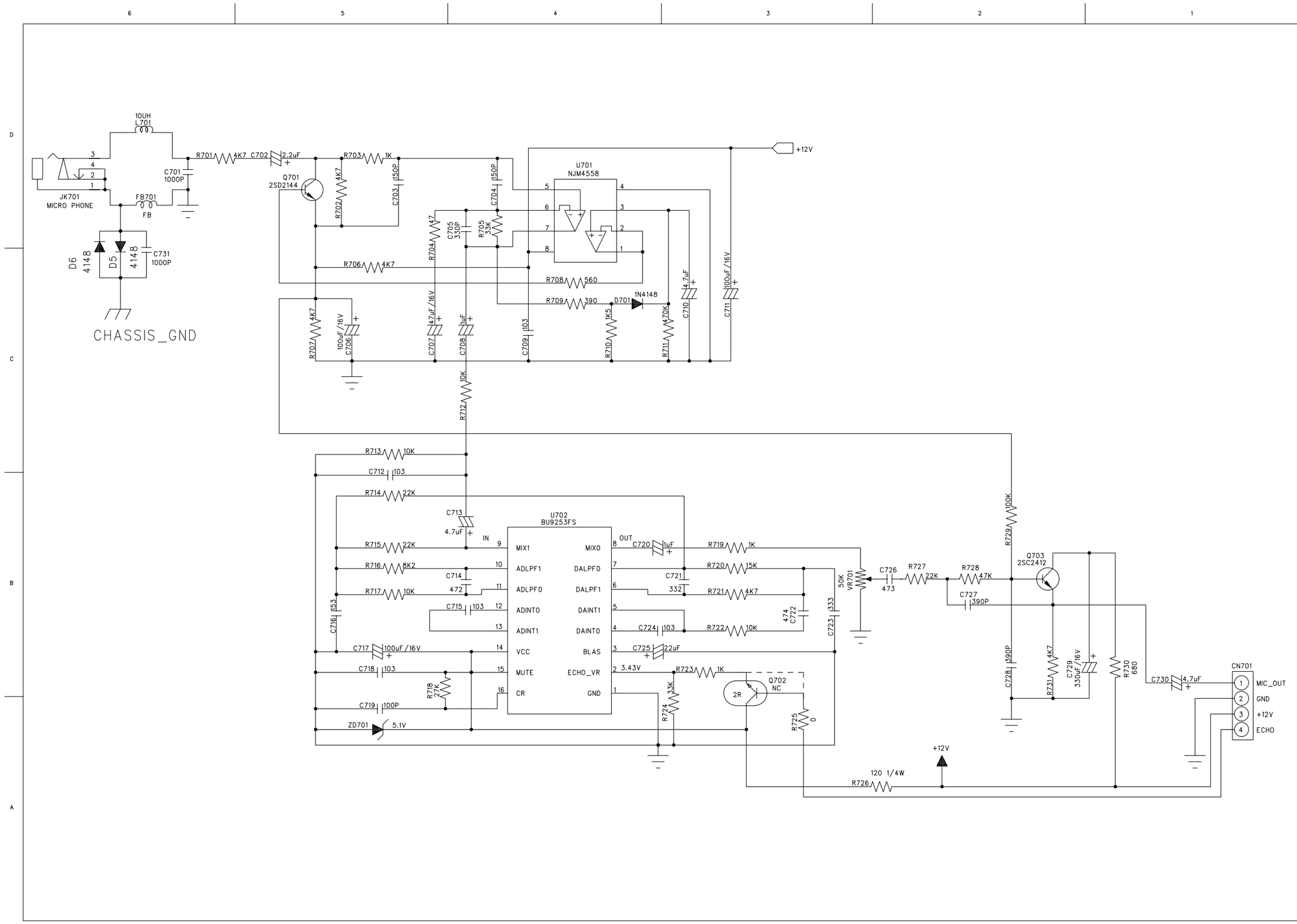


	RGB	CVBS
RGB_ON/OFF(131)	H	L

mode / pin	8~12V(4:3)	5~8V(16:9)	0V(TV)
TV/DVD(134)	H	H	L
16:9_EN/P-SCAN(130)	L	H	X

10-3

CIRCUIT DIAGRAM - MICROPHONE BOARD (ONLY FOR /21M)



ELECTRICAL PARTSLIST - OUTPUT BOARD

JR1	9940 000 03336	JACK RCA 1P D8.4MM
JR2	9940 000 03337	JACK DSW-12 S-VIDEO 6PIN
JR3	994000003595	JACK RCA D8.4MM(R) /21/21M
JR4	994000003596	JACK RCA D8.4MM(B) /21/21M
JR5	994000003597	JACK RCA D8.4MM(G) /21/21M
Q2	9940 000 03333	TRANSISTOR BT3904 /14/22
Q5	9940 000 03333	TRANSISTOR BT3904 /14/22
SC1	9940 000 03338	JACK SCART CS-109 /14/22
ZD1	9940 000 03334	SW DIODE BAV99
ZD2	9940 000 03334	SW DIODE BAV99
ZD3	9940 000 03334	SW DIODE BAV99
ZD4	9940 000 03334	SW DIODE BAV99
ZD5	9940 000 03334	SW DIODE BAV99
ZD6	9940 000 03334	SW DIODE BAV99 /14/22
ZD7	9940 000 03334	SW DIODE BAV99 /14/22
ZD9	9940 000 03335	ZENER DIODE BZX79-C3V3

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

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ELECTRICAL PARTSLIST - MICROPHONE BOARD (ONLY FOR /21/21M)

D701	9940 000 03599	DIODE RLS4148 LL-34
FB701	9940 000 03604	FILTER BEAD RH3.5X6X0.8
JK701	9940 000 03605	MICRO PHONE JACK
L701	9940 000 03603	RADIAL AXIAL INDUCTOR 10μH
Q701	9940 000 03602	TRANSISTOR 2SD2144
Q703	9940 000 03303	TRANSISTOR 2SC2412
U701	9940 000 00374	IC BA4558F OPERATIONAL AMP.CD
U702	9940 000 03606	KARAOKE ECHO IC BU9253FS
VR701	9940 000 03598	SEMI FIX RESISTOR 50K +/-20%
ZD701	9940 000 03601	ZENER DIODE BZX79-C5V1

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

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POWER BOARD

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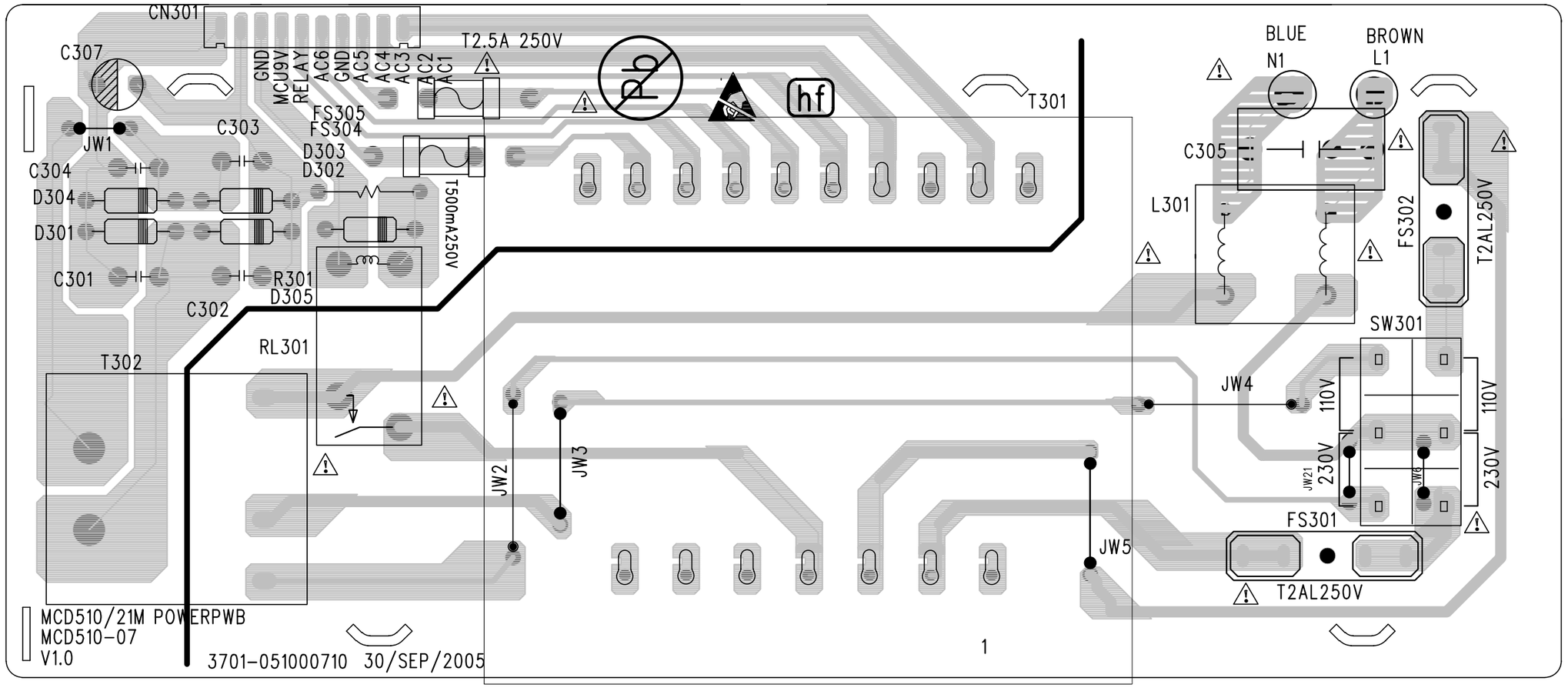
LAYOUT DIAGRAM - POWER BOARD



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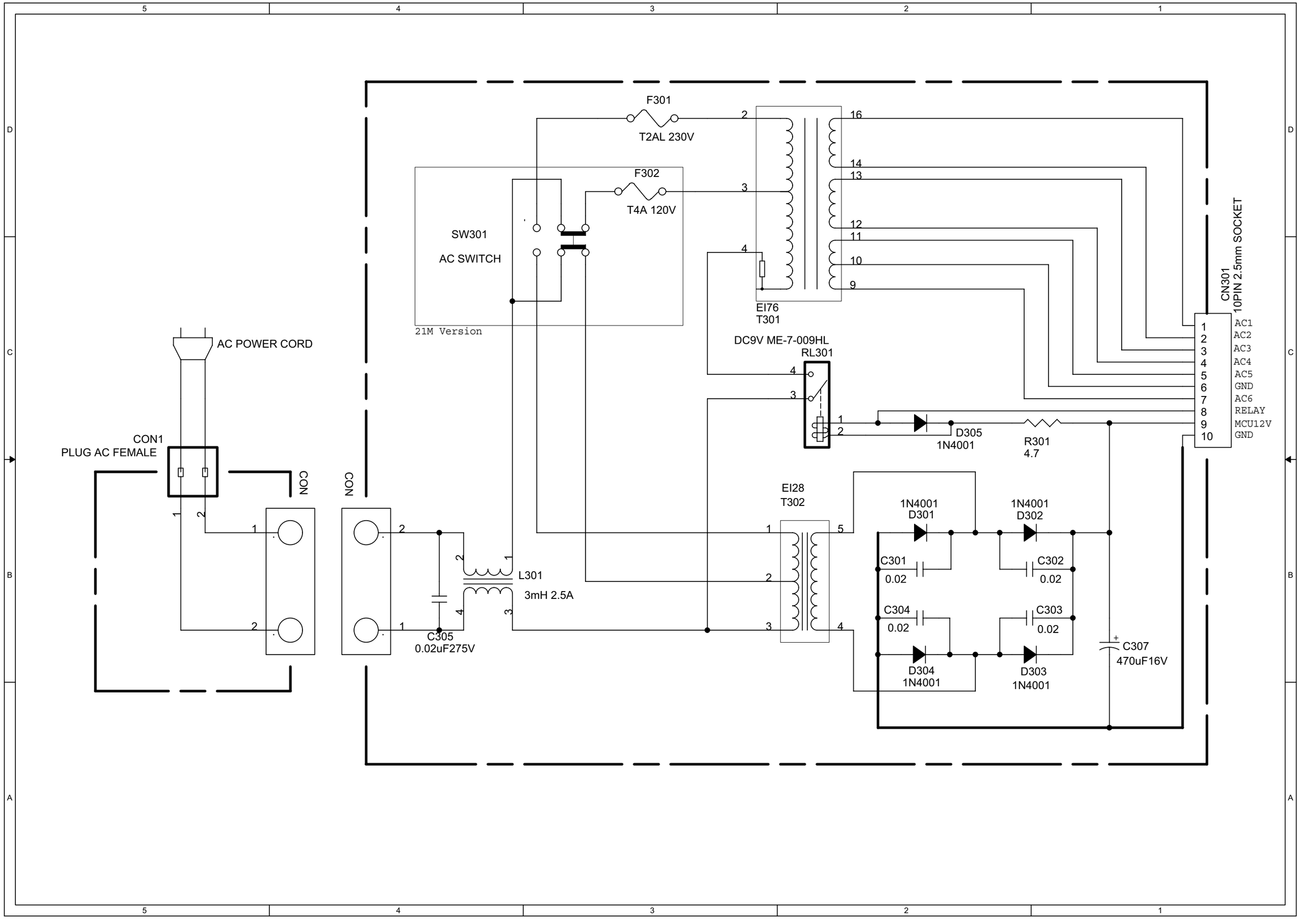
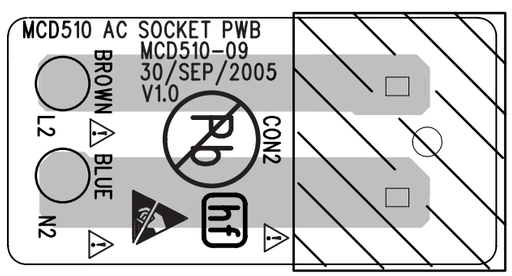
CIRCUIT DIAGRAM - POWER BOARD



LAYOUT DIAGRAM - AC SOCKET BOARD



ELECTRICAL PARTSLIST - POWER BOARD

FS301	⚠	9940 000 03324	FUSE 2A 250V VDE
FS302	⚠	9940 000 03324	FUSE 2A 250V VDE /21/21M
FS304	⚠	9940 000 03591	FUSE 0.5A 250V /21/21M
FS305	⚠	9940 000 03326	FUSE 2.5A 250V /22/14
FS305	⚠	9940 000 03592	FUSE 2.5A 250V /21/21M
L301		9940 000 03319	LINE FILTER 330UH 32MR 3A
RL301	⚠	9940 000 03321	RELAY ME-7-009 9V 10A
T301	⚠	9940 000 03323	TRASFO EI76X50 230V /22/14
T301	⚠	9940 000 03594	TRASFO EI-76x40 AC120/230V /21/21M
T302	⚠	9940 000 03322	TRANSFORMER EI28 230V /22/14
T302	⚠	9940 000 03593	TRASFO EI28 AC120/230V /21/21M
	⚠	9940 000 03327	AC POWER SOCKET 2P 2.5A/250V

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

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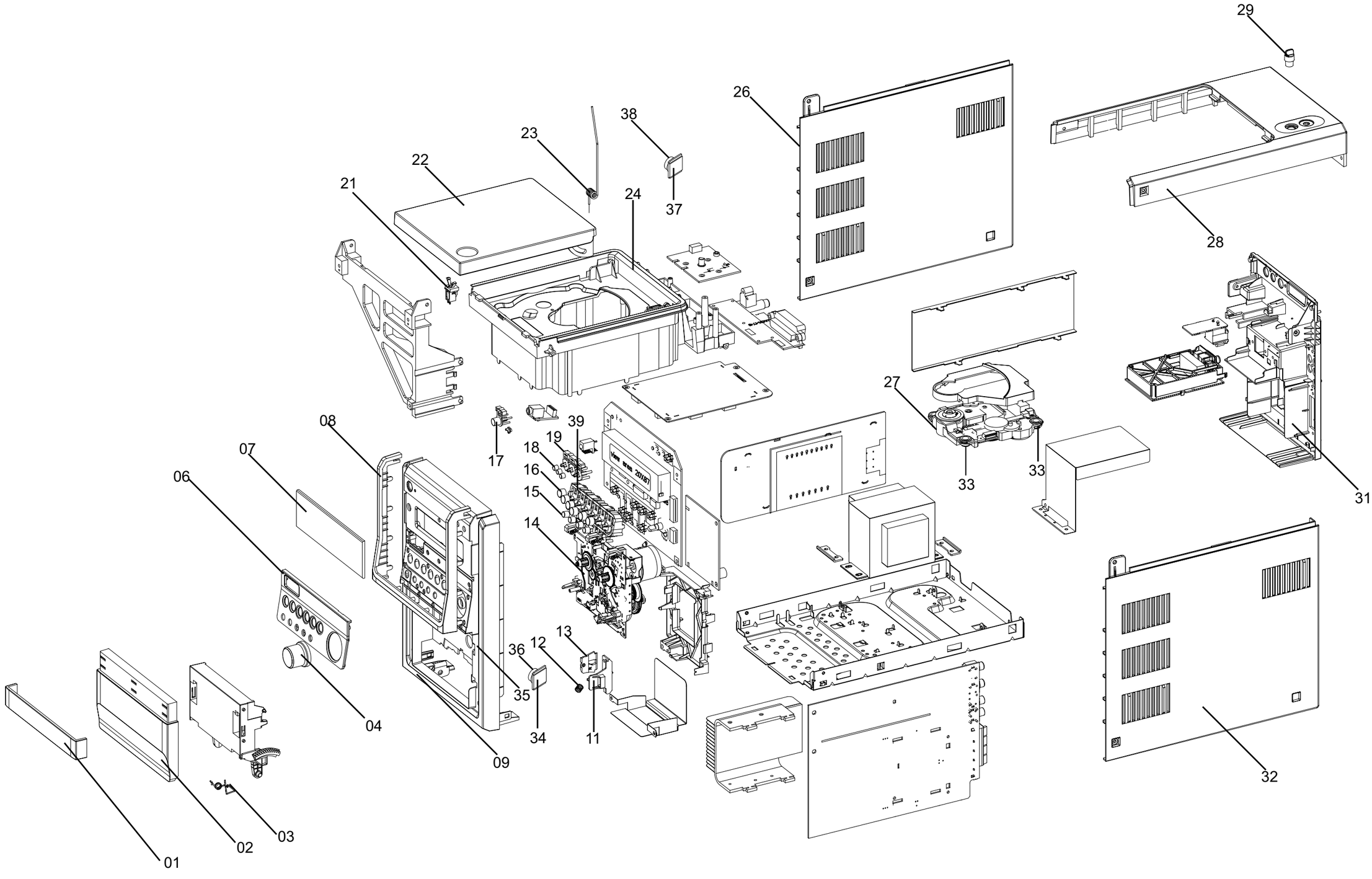
SET MECHANICAL EXPLODED VIEW



MECHANICAL & ACCESSORIES PARTSLIST

01	9940 000 03367	COVER-CASS-DOOR
02	9940 000 03368	DOOR-CASSETTE
03	9940 000 03383	SPRING-CASS DOOR EJECT
04	9940 000 03372	KNOB-VOLUME
06	9940 000 03364	PANEL-CONTROL
07	9940 000 03366	LENS-DISPLAY /22/14
07	9940 000 03613	LENS-DISPLAY /21M/21
08	9940 000 03365	FRONT COSMETIC RING
09	9940 000 03363	CABINET-FRONT /22/14
09	9940 000 03612	CABINET-FRONT /21M/21
11	3140 114 60321	BRACKET-PUSH LOCK
12	4822 492 11344	SPRING COMPRESSION
13	9940 000 01412	PUSH LOCK FOR CASS DOOR
14	9940 000 03317	CASS DECK W991S-390BCR
15	9940 000 03374	COVER SOURCE SELEC BUTT
16	9940 000 03373	COVER-VCD CONTROL BUTT
17	9940 000 03377	POWER KNOB
18	9940 000 03376	TOP BUTTON COVER
19	9940 000 03614	BRACKET TOP BUTTON
21	9940 000 01422	CD DOOR SWITCH
22	9940 000 03358	DOOR-CD
23	9940 000 03615	SPRING CD DOOR EJECT
24	9940 000 03359	TRAY-CD
26	9940 000 03356	PANEL-LEFT
27	9940 000 03331	DVD MECHANISM KHM-310AHC
28	9940 000 03361	PANEL-TOP /22/14
28	9940 000 03608	PANEL-TOP /21M/21
29	9940 000 03611	MIC KNOB /21M/21
31	9940 000 03362	CABINET-REAR /22/14
31	9940 000 03609	CABINET-REAR /21M/21
32	9940 000 03357	PANEL-RIGHT
33	9940 000 00168	CD DAMPER 38DEG
34	9940 000 03378	HOLDER-DAMPER GEAR
35	9940 000 03371	HOOK-CASSETTE DOOR
36	9940 000 03369	DAMPER GEAR
37	9940 000 03381	HOLDER DAMPER GEAR(A)
38	9940 000 03379	DAMPER GEAR(A)
39	9940 000 03375	BRACKET-VCD CNTR BUTT
	9940 000 02595	AM LOOP ANT
	9940 000 02597	RCA CABLE VIDEO (Y)
	9940 000 02598	RCA CABLE AUDIO (R/W)
	9940 000 03385	REMOTE CONTROL
⚠	9940 000 03386	POWER CORD 230V /22/14
⚠	9940 000 03616	AC CORD 120/230V /21M/21
	9940 000 03387	SPEAKER BOX ASSY /22/14
	9940 000 03617	SPEAKER BOX ASSY /21M/21
	9940 000 03388	FM ANT WIRE 75OHM 1.0M
	9940 000 03618	MAINS PLUG ADAPTOR /21M/21

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

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ELECTRICAL PARTSLIST - MISCELLANEOUS

JK602	9940 000 03318	HP JACK D3.6MM
	9940 000 03316	FAN 12VDC 0.07A
	9940 000 03312	FFC 7P P1.25MM L160MM
	9940 000 03328	FFC 13P P1.25MM L120MM
	9940 000 03329	FFC 24P P0.5MM L130MM
	9940 000 03332	CD DOOR SW DLS-02-W-1
	9940 000 03339	CASSETTE BOARD ASSY
	9940 000 03341	SERVO & MPEG BOARD ASSY
	9940 000 03342	TUNER BOARD ASSY
	9940 000 03355	FFC 21P L125MM

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

REVISION LIST

1.0 Manual 3141 785 30610

Initial Service Manual released.

1.1 Manual 3141 785 30611

Add new version MCD510/14 and MCD510/21.

The following have been updated.

1) P1-2 Version Variations,
2) P1-3 Specifications,
3) P6-7 Electrical Partslist, P8-5 Electrical Partslist, P10-4 Electrical Partslist, P11-4 Electrical Partslist, P12-2 Mechanical & Accessories Partslist.