Micro System

MCM595/21

Service
Service
Service

Service Manual

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MP3-CD PLAYBACK MP3

COMPACT disc DIGITAL AUDIO

COMPACT disc DIGITAL AUDIO ReWritable

COMPACT disc DIGITAL AUDIO Recordable

CLASS 1
LASER PRODUCT

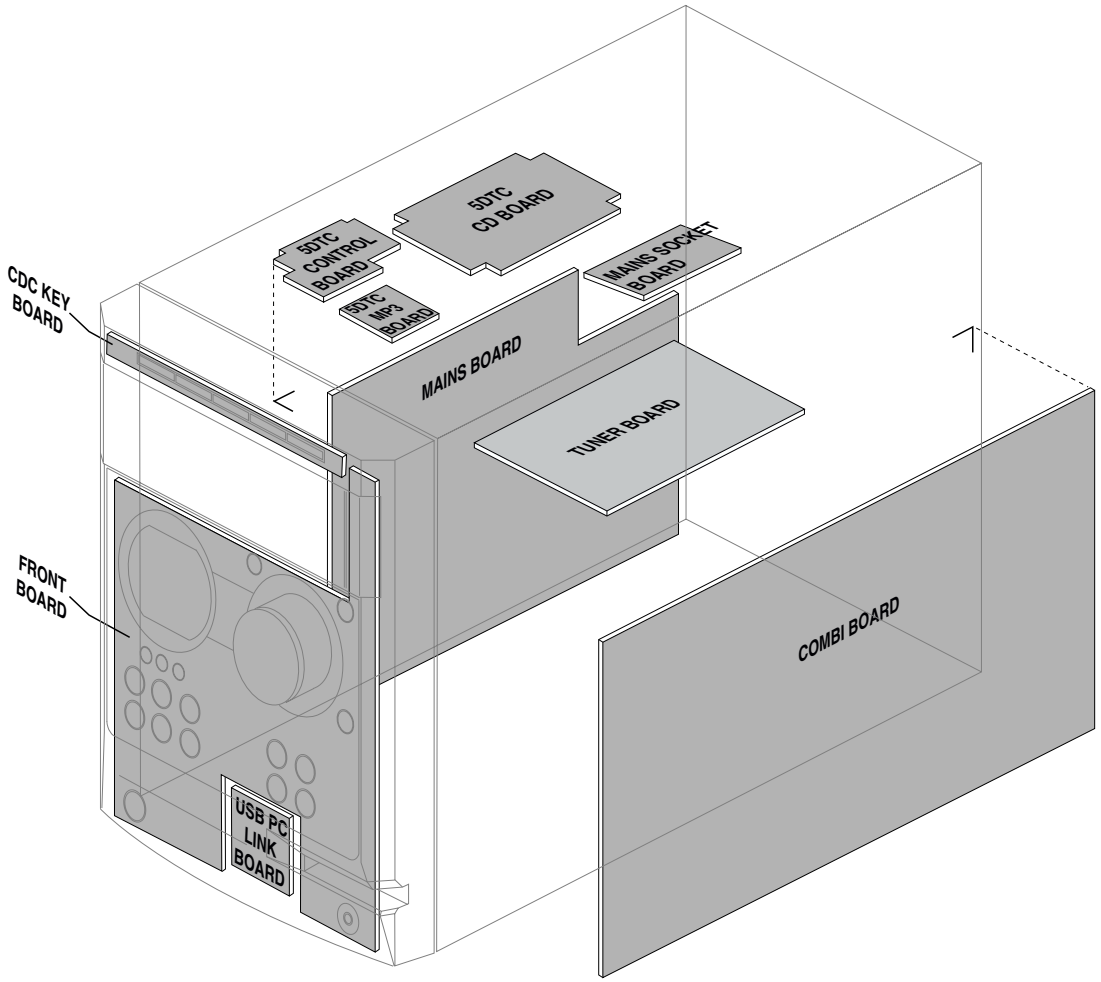
Published by SL 0525 Service Audio Printed in The Netherlands Subject to modification

GB 3141 785 30400

Version 1.0

PHILIPS

LOCATION OF PRINTED CIRCUIT BOARDS



VERSION VARIATIONS:

Type /Versions: / Features & Board in used:	MCM595									
	/21									
Aux in / CDR in	x									
Line Out										
Video Out										
Surround Out										
Subwoofer Out										
Power Booster Out										
Digital Out										
Digital in										
Matrix Surround										
RDS										
News										
Dolby Pro Logic (DPL)										
Incredible Surround										
Karaoke Features										
Voltage Selector	x									
ECO Power Standby (Clock Display Off)	x									
ECO6 Tuner Board - Systems Non-Cenelec	x									
ECO6 Tuner Board - Systems Cenelec										
USB PC LINK	x									

SPECIFICATIONS

GENERAL:

Mains voltage : 110-127V/220-240V Switchable for /21
Mains frequency : 50/60Hz
Clock accuracy : < 4 seconds per day
Dimension centre unit : 175 x 268 x 316mm

Power consumption
Active : 120W
Standby : < 15W (DEMO mode off)
ECO Power Standby : < 1W

TUNER:

FM

Tuning range : 87.5-108MHz
Grid : 50kHz
IF frequency : 10.7MHz ± 25kHz
Aerial input : 75 ohm coaxial
Sensitivity at 26dB S/N : < 7uV
Selectivity at 600kHz bandwidth : > 25dB
Image rejection : > 25dB [> 75dB]
Distortion at RF=1mV, dev. 75kHz : < 3%
-3dB Limiting point : < 8uV
Crosstalk at RF=1mV, dev. 40kHz : > 18dB

MW

Tuning range : 530-1700kHz
Grid : 10kHz
IF frequency : 450kHz ± 1kHz
Aerial input : Frame aerial
Sensitivity at 26dB S/N : < 4.4mV/M
Selectivity at 18kHz bandwidth : > 18dB
IF rejection : > 45dB
Image rejection : > 28dB
Distortion at RF=50mV, M=80% : < 5%

AMPLIFIER:

Output power (4 ohm, 1kHz, 10% THD)
L & R : 2 x 150W RMS

Frequency response within -3dB : 60Hz-16kHz
MAX Sound : On / Off
Digital Sound Control (DSC) : Jazz / Rock / Pop / Optimal
Virtual Environment Control (VEC) : Cyber Hall / Concert / Cinema / Off

Input sensitivity
Aux in (at 1kHz) : 500mV at 600 ohm
CDR in (at 1kHz) : 1000mV at 600 ohm
USB (at 1kHz) : 830mV at 600 ohm

Output sensitivity
Headphone output at 32 ohm : 700mV ± 2dB (Max. vol.)

5DTC:

Measurement done directly at the connector on the board.
Output Resistance : < 100 ohm
Output Voltage (0dB, 1kHz) : 0.5Vrms ± 1dB (unloaded)
Channel Unbalance : < ±1dB
Channel Separation (1kHz) : > 60dB
Frequency Response (±3dB) : 20Hz-20kHz
Signal to Noise Ratio : > 76dBA
MP3-CD Bit Rate : 32-256 kbps
Sampling Frequencies : 32, 44.1, 48 kHz

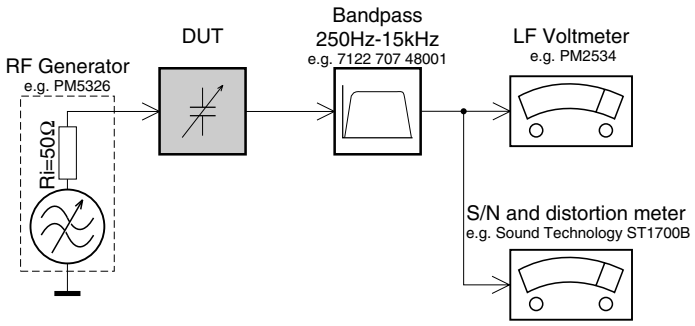
USB:

Measurement done directly at the connector on the board.
Output Resistance : < 1.5 kohm
Output Voltage (0dB, 1kHz) : 830mVrms ± 1.5dB (R_L = 33 kohm)
Channel Unbalance : < ±1dB
THD + Noise (0dB, 1kHz) : < 0.35%
Channel Separation (0dB, 1kHz) : > 40dB
Frequency Response (±3dB) : 50Hz-16kHz
Signal to Noise Ratio : > 75dBA

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

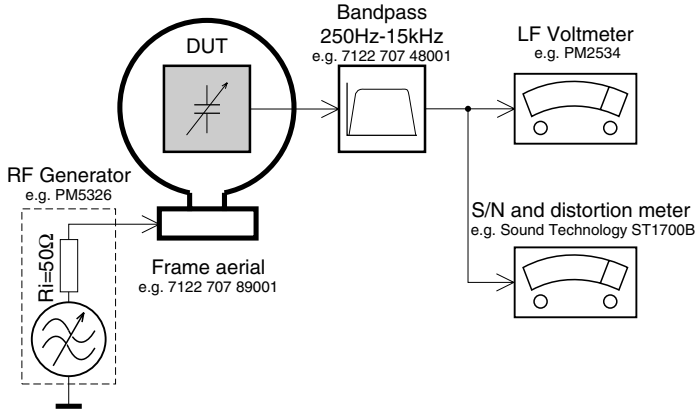
MEASUREMENT SETUP

Tuner FM



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

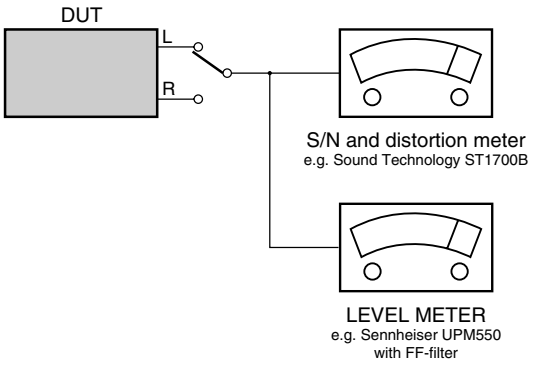
Tuner AM (MW,LW)



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).

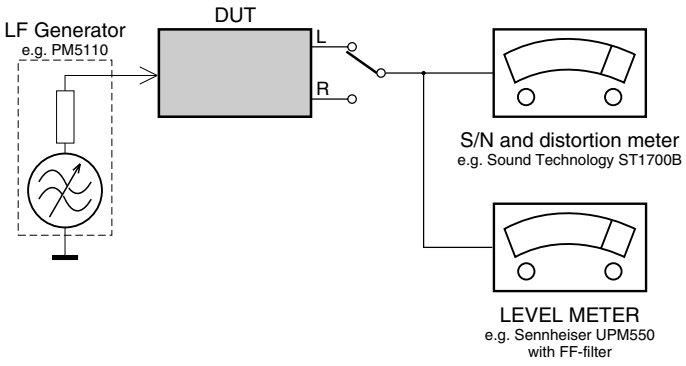
CD

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



Recorder

Use Universal Test Cassette **CrO2** SBC419 4822 397 30069
or Universal Test Cassette **Fe** SBC420 4822 397 30071



SERVICE AIDS

Service Tools:

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

Cassette:

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

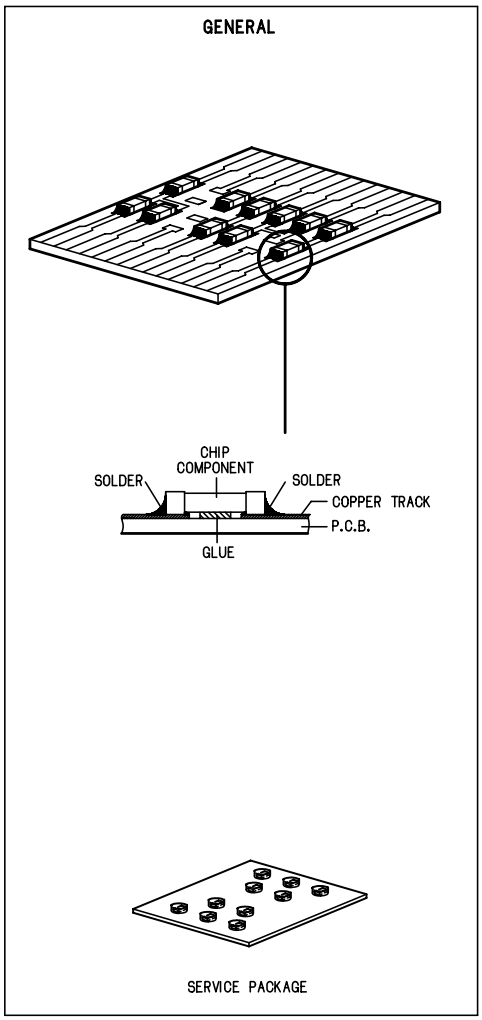
Compact Disc:

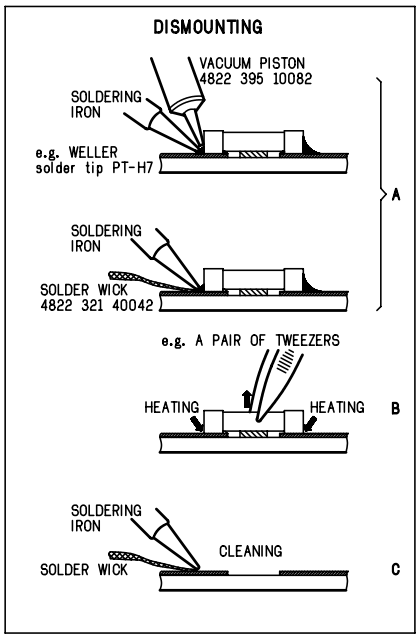
SBC426/426A Test disc 5 + 5A 4822 397 30096
SBC442 Audio Burn-in Test disc 1kHz 4822 397 30155
SBC429 Audio Signals disc 4822 397 30184
Dolby Pro-logic Test Disc 4822 395 10216

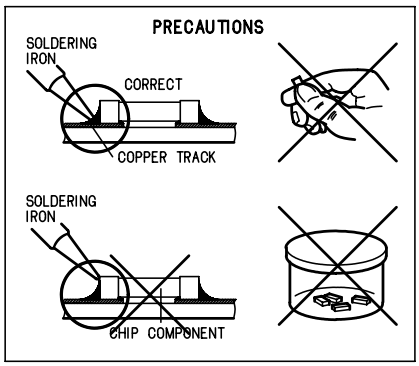
ESD Equipment:

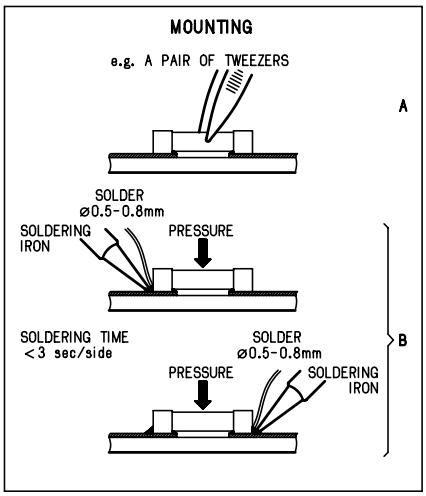
Anti-static table mat - large 1200x650x1.25mm ... 4822 466 10953
Anti-static table mat - small 600x650x1.25mm 4822 466 10958
Anti-static wristband 4822 395 10223
Connector box (1MΩ) 4822 320 11307
Extension cable
(to connect wristband to conn. box) 4822 320 11305
Connecting cable
(to connect table mat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

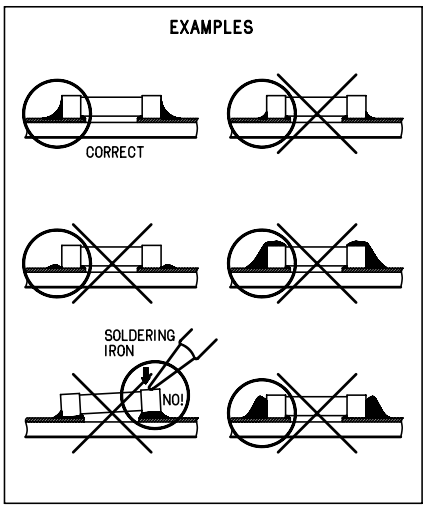
HANDLING CHIP COMPONENTS











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) ESD PROTECTION EQUIPMENT:

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

(GB)

Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified, be used

Safety components are marked by the symbol ⚠.

(NL)

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

De Veiligheidsonderdelen zijn aangeduid met het symbool ⚠

(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.

Less composants de sécurité sont marqués ⚠

(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.

Sicherheitsbauteile sind durch das Symbol ⚠ markiert.

(I)

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

Componenty di sicurezza sono marcati con ⚠

(GB)

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

CLASS 1
LASER PRODUCT

(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.

(F)

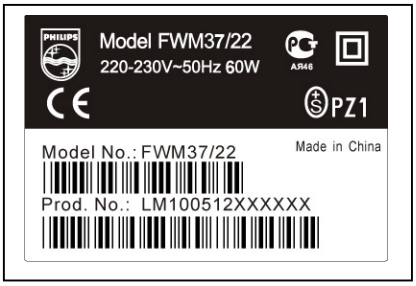
"Pour votre sécurité, ces documents doivent être utilisés par des spécialistes agréés, seuls habilités à réparer votre appareil en panne".

INFORMATION ABOUT LEAD-FREE SOLDERING

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

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

Example S/N:



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

So from 0501 onwards = from 1 Jan 2005 onwards

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

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

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

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

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

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

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

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

For additional questions please contact your local repair-helpdesk.

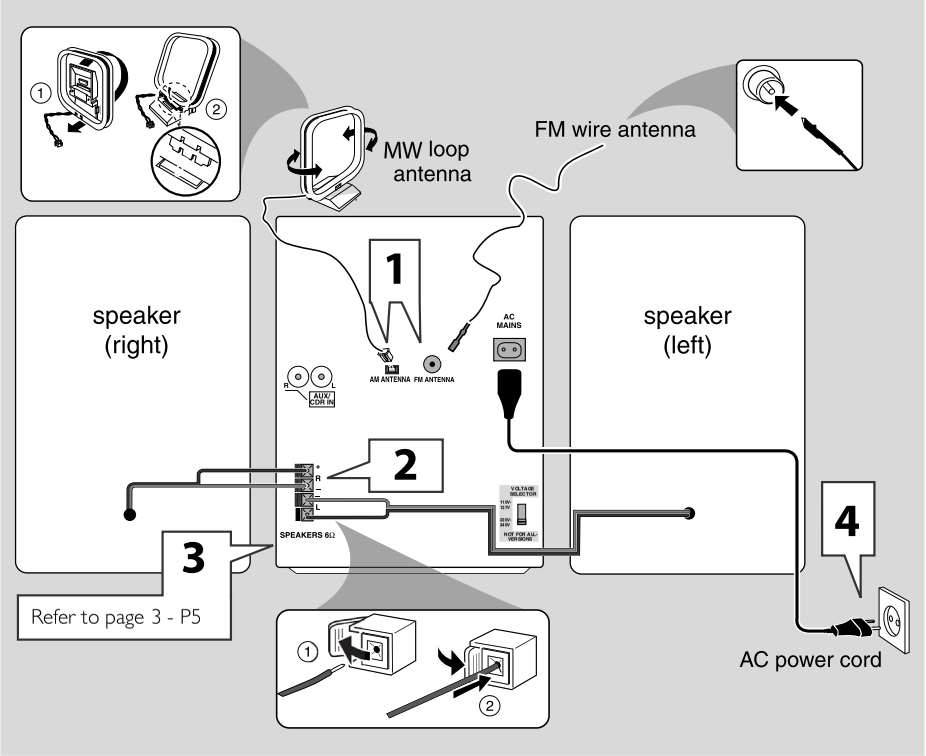
SERVICE INSTRUCTION

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

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

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

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



Warning!

– Please note that the voltage selector located at the rear of this system is preset at 220V from the factory. For countries that operate at 110V-127V, please adjust to 110V-127V before you switch on the system.

– Use only the supplied speakers. The combination of the main unit and speakers provides the best sound. Using other speakers can damage the unit and sound quality will be negatively affected.

– Never make or change connections with the power switched on.

– Connect the AC power cord to the power outlet only after you have finished hooking up everything.

– 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: Connecting FM/MW antennas

– Place the MW loop antenna on a shelf or attach it to a stand or wall.

– Extend the FM antenna and fix its ends to the wall.

– Adjust the position of the antennas for optimal reception.

– Position the antennas as far as possible from a TV, VCR or other radiation source to prevent unwanted noise.

– For better FM stereo reception, connect external FM antenna.

Step 2: Connecting the 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.

– Do not connect more than one speaker to any one pair of +/– speaker terminals.

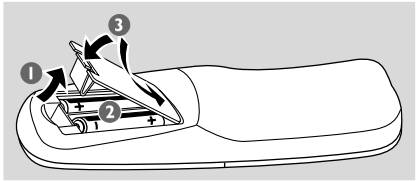
Step 3: Connecting to PC

Use the supplied USB cable to connect the system to your personal computer's USB port. After installing the USB PC LINK application software onto your PC, you are able to playback your music collection via the system (refer to "USB PC Link").

Step 4: Connecting the AC power cord

"AUTO INSTALL – PRESS PLAY" 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 Operations").

Step 5: Inserting batteries into the remote control



1 Open the battery compartment cover.

2 Insert two batteries type R06 or AA, following the indications (+ –) inside the compartment.

3 Close the cover.

Using the remote control to operate the system

1 Aim the remote control directly at the remote sensor (iR) on the main unit.

2 Select the source you wish to control by pressing one of the source select keys on the remote control (for example CD, TUNER).

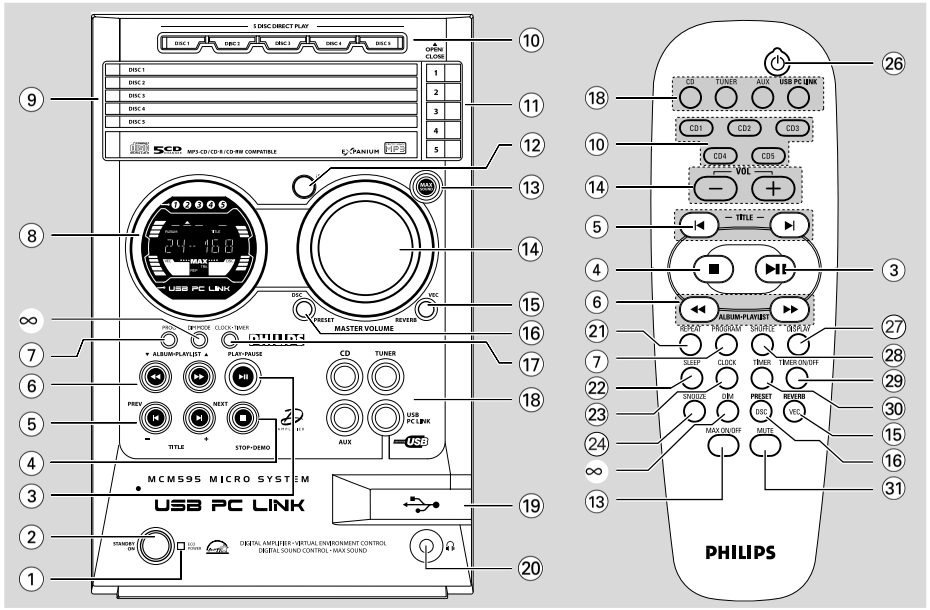
3 Then select the desired function (for example ►II , I◄◄, ►►I).

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.



Main unit and remote control

① **ECO POWER indicator**
– Lights up when the system is in Eco Power standby mode.

② **STANDBY ON ⏻**
– Switches to Eco Power standby mode or turns on the system.
– *Switches to standby mode.

③ **PLAY•PAUSE ►II**
– **CD:** starts/pauses playback.
– **USB PC LINK:** starts/pauses playback. *(only on the main unit)*
– **TUNER:** *enters Plug & Play tuner installation mode and/or starts preset radio station installation.

④ **STOP•DEMO ■**
– Exits an operation.
– **CD:** stops playback or clears a programme.
– **TUNER:** *erases a preset radio station.
– **USB PC LINK:** stops playback. *(only on the main unit)*
– *Turns on/off the demonstration mode.

⑤ **PREV |◄ / NEXT ►| (– TITLE +)**
– **CD:** selects a track.
– **MP3-CD:** select a title
– **TUNER:** selects a preset radio station.
– **CLOCK:** sets the minutes.
– **USB PC LINK:** selects a track from the playlist.

⑥ **◄◄ ALBUM•PLAYLSIT ►►**
– **CD:** *searches backward/forward.
– **MP3-CD:** select an album
– **TUNER:** tunes the radio frequency up/down.
– **CLOCK:** sets the hours.
– **USB PC LINK:** selects a playlist.

⑦ **PROG (PROGRAM)**
– **CD:** starts or confirms track programming.
– **TUNER:** starts *automatic/manual preset programming.
– **CLOCK:** selects 12- or 24-hour clock display.

⑧ **Display screen**

⑨ **Disc trays (1~5)**

⑩ **5 DISC DIRECT PLAY 1~5 (CD 1~5)**
– Selects a disc tray to playback.

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

⑪ **OPEN/CLOSE ⏏ 1~5**
– Opens/closes the individual disc tray.

⑫ **iR**
– Point the remote control towards this sensor.

⑬ **MAX SOUND (MAX ON/OFF)**
– Turns on/off the optimal mix of various sound features.

⑭ **MASTER VOLUME (VOL + –)**
– Adjusts the volume level.

⑮ **VEC/ REVERB**
– Selects different type of ambience-based equaliser settings (HALL, CINEMA, CONCERT, CYBER).

⑯ **DSC/ PRESET**
– Selects different types of preset sound equaliser settings (OPTIMAL, JAZZ, ROCK or POP).
• PRESET and REVERB environment sound modes are only available when the optional software, Philips Sound Agent 2 is activated during USB PC Link application.

⑰ **CLOCK•TIMER**
– *Enters clock or timer setting mode.
– Switches to clock display mode.

⑱ **CD /TUNER / AUX / USB PC LINK**
– Selects the relevant active mode.
– **CD:** toggles between DISC 1~5.
– **TUNER:** toggles between FM and MW band.
– **AUX:** toggles between AUX and CDR mode.
– **USB PC Link:** Selects USB PC Link source.

⑲ Connect the USB cable between the system and PC's USB port.

⑳ 🎧
– Plug in the headphones jack. The speakers output will be cancelled.

Control buttons available on the remote control only

㉑ **REPEAT**
– Repeats a track/disc/all programmed tracks.

㉒ **SLEEP**
– Sets the sleep timer function.

㉓ **CLOCK**
– *Enters clock setting mode.
– Switches to clock display mode.

㉔ **SNOOZE**
– Temporarily deactivate the wake up timer.

∞ **DIM**
– Selects different levels of brightness for display panel.

㉖ ⏻
– Switches to Eco Power standby mode.
– *Switches to standby mode.

㉗ **DISPLAY**
– Displays the album and title name for MP3 disc.

㉘ **SHUFFLE**
– Turns on/off the random play mode.

㉙ **TIMER ON/OFF**
– Turns on/off timer function.

㉚ **TIMER**
– *Enters the timer setting mode.
– Displays the timer setting.

㉛ **MUTE**
– Mutes or restores the volume.

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

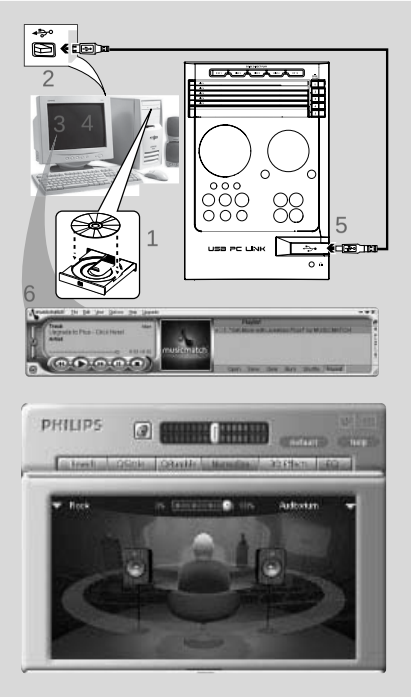
IMPORTANT!
– Make sure the mute setting on your PC control panel is deactivated to ensure you get the sound from your audio system!

Quick setup guide

PC system requirement

- Windows 98SE/ME/2000/XP
- Intel Pentium MMX200 or higher
- CD-ROM drive
- USB port
- Free hard disk space: 80 MB for the software

Software installation



1 Turn on your PC and insert the installer disc into your PC's CD-ROM drive.

2 The installation guide will appear automatically. If it does not, go to the CD-ROM drive in Windows Explorer and double click the **Setup.exe**.

3 Select your desired language from the list.

4 Select **Install Software**.

5 Connect the USB cable to the PC and Audio System and press the USB PC Link button on the Audio set or the remote control.

6 Follow the instructions as prompted on the screen to correctly install the USB PC Link Driver, **Philips Sound Agent 2** and **MusicMatch** Jukebox software.

Notes:
– Minimum OS requirement for Philips Sound Agent 2:Windows 2000 or XP.
– During installation, your previous MusicMatch Jukebox software on your PC will be replaced.

Declarations
Windows and **Pentium** are trademarks of Microsoft Corporation and Intel Corporation. All other trademarks belong to their respective owners.
USB PC Link sample track, music by Chemistry (www.chemistryteam.com)

USB PC Link

Using MusicMatch software

To create a music library

Add music files to **My Music Library**
Add files to **My Library** by dragging and dropping audio tracks from anywhere in Windows, into the **My Library** window.
You can also click **Add Files** in the **Music Center** to add tracks.

1 Click the **Add Files** button on the **Music Library** window.

2 Browse your computer to the folder where audio files are stored. Check the box **Also Add Tracks** from Subfolders to add all tracks in the current folder, and all subfolders.

3 Click the **Select All** button to select all the files in the current, and all subfolders.

4 Click **Add**.
Files will be added to **My Library**.

To create a "Playlist"

1 Drag and drop files, or folders with music files, from anywhere on your computer or **My Library** into the **Playlist** window. Your files will begin to play. Or, you may click the **Open** button on the **Playlist** window to browse for and add music to the **Playlist**.

2 Click the **Save** button on the **Playlist**, or go to the menu **Options**>**Playlist**>**Save Playlist**.

3 You will be prompted to name the **Playlist**. In the Name field type the name you'd like to give this **Playlist**.

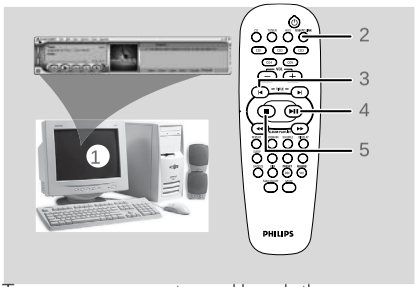
4 Click the **Save** button. Now you can play all the saved playlists with the audio system by pressing ⏮ or ⏭ buttons. Details operation, please refer to Connecting to **USB PC Link**.

Note:
– It is not possible to create a playlist from the system's 5 CD changer. If you encounter any problem using USB PC Link, please refer to the FAQ (Frequently Asked Questions) stored in your USB PC Link installer disc or visit "www.audio.philips.com" for the latest update on FAQ.

Connecting to USB PC Link

USB PC Link allows you to playback your music collection from the PC via the powerful amplifier and speakers of this system.

IMPORTANT!
Make sure the MUSICMATCH software has been installed. Refer to the CD-ROM sleeve for USB PC Link installation.



1 Turn on your computer and launch the "MUSICMATCH JUKEBOX".
The volume level of PC should not be put into mute.

2 Press **USB PC LINK**.
If the audio streaming is detected, "CONNECTING" is displayed and the USB indicator will be flashing.
If "NO CONNECTION" is displayed, check the connection between your PC and micro system.

USB PC Link

Notes:

– When the USB PC Link feature is activated, Philips Sound Agent 2 will automatically be launched (if it has been successfully installed under OS Windows 2000/XP).

– The default setting for PRESET/REVERB is MP3/ Study Room respectively. You may select from the list of different sound modes to suit your music and environment preference. Alternatively, you may select PRESET (Neutral mode) and REVERB (No Environment mode) for the minimum sound effect.

3 Press ◀◀ or ▶▶ to select your favorite playlist, and then press ⏮ or ⏭ until the desired track in the playlist is highlighted.

4 Press ▶ ❚❚ to start playback.

The track information will appear on the display. The display only supports English characters.

During playback,

– Press **SHUFFLE** to play all available tracks in the playlist in random order.

– Press **REPEAT** to repeat playback of all the tracks in the playlist.

5 To exit, select another active mode or press ■.

Philips Sound Agent 2

Philips Sound Agent 2 is a BONUS software provided with Philips Audio system to enhance the quality of MP3 Music playback via USB PC Link.

1 **Philips Sound Agent 2** will be automatically launched if USB PC Link is selected.

2 Press **DSC/PRESET** or **VEC/REVERB** to select different Preset or Reverb sound effect.

3 For more details about using **Philips Sound Agent 2** features on your PC, please refer to the User Manual in the supplied CD-ROM or the Help menu.

Notes:

– Philips Sound Agent 2 minimum OS requirement: Windows 2000 or XP.

– Please refer to the CD-ROM sleeve for detailed installation procedures, OR 'Software installation' in this manual.

Enabling digital CD audio output

Before playing the CD through your PC's CD-ROM drive, it is necessary to configure your PC's hardware as follows:

For Windows ME/2000/XP

1 Enter the system control panel menu and select:
"System → Hardware → Device Manager → CD-ROM drives → Action-Properties → Properties ".

OR

For Windows 98SE

Enter the system control panel menu and select: "MULTIMEDIA" and "CD MUSIC".

2 Check the 'Enable digital CD audio for this CD-ROM device' setting option is selected (enabled).

Notes:

– You may need to refer to your PC's manual for correct configuration.

– For the optimal playback effect of the CD/MP3-CD, please use your Philips audio system.

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
Auto Installation of the Installer CD-ROM did not install the Philips Sound Agent 2 onto my PC.	Check that your PC's Operating System is running on Windows 2000/XP.
When in USB PC LINK mode, "NO CONNECTION" is displayed.	Check the connection between your PC and the system and the inital setup required, see "Connections" and "USB PC Link". Make sure the connected PC is turned on.
I want the minimum effect from the Philips Sound Agent 2 sound mode when listening to MP3 music streaming via USB PC Link.	Select the PRESET - Neutral mode. Select the REVERB - No environment mode.
Radio reception is poor.	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 or VCR.
"NO DISC" is displayed or the disc cannot be played.	Insert a disc. Load in the disc with label facing right. Replace or clean the disc, see "Care and safety information". Use a finalised CD-R(W) or a correct format disc.
The system does not react when buttons are pressed.	Remove and reconnect the AC power cord and switch on the system again.
Sound cannot be heard or is of poor quality.	Adjust the volume. Disconnect the headphones. Check that the speakers are connected correctly. Check that the AC power cord is connected properly. When in USB PC LINK mode, check that the PC's volume is not put into mute. When playing CD from PC's CD drive, refer to "USB PC Link – Enable digital CD audio output".
The remote control does not function properly.	Select the source (CD or TUNER, for example) before pressing the function button (▶II, I◀◀ , ▶▶I). Reduce the distance between the remote control and the system. Replace the battery. Point the remote control directly toward the IR sensor.
The timer is not working.	Set the clock correctly. Press TIMER ON / OFF to switch on the timer.
The system displays features automatically and buttons start flashing.	Press and hold DEMO STOP on the main unit to switch off the demonstration mode.

Troubleshooting

Problem	Solution
The timer is not working.	Set the clock correctly. Press TIMER ON / OFF to switch on the timer.
The system displays features automatically and buttons start flashing.	Press and hold STOP DEMO on the main unit to switch off the demonstration mode.

Refer to the FAQ (Frequently Asked Questions) on the supplied CD-ROM or visit our website "www.audio.philips.com" for latest update on FAQ.

DISMANTLING INSTRUCTIONS

Dismantling of the 5DTC Module

1) Loosen 4 screws and remove the Cover Top (pos 255) by sliding it out towards the rear before lifting up.
   - 2 screws on the rear
   - 1 screw each on the left & right side
2) Loosen 3 screws each to remove the Panel Left (pos 253) and Panel Right (pos 254). The Panels are remove by sliding it towards the rear and outwards.
   - 1 screw on the side
   - 2 screws on the rear
3) Take a paper clip or any stiff wire diameter of 1mm-1.5mm. Place the set in position and insert the paper clip or stiff wire as shown in Figure 1.
4) To remove the Cover CD Orn (pos 111), you have to feel and give a push in the correct direction (see Figure 1) and correct position (see Figure 2) to release the catch of the Cover CD Orn before removing it out.
5) Loosen 4 screws A (see Figure 3 and Figure 9) to remove the 5DTC Module (pos 1103).
   - 2 screws on the front
   - 2 screws on the rear

   Note : For information on the 'Emergency opening of the trays' of the 5DTC Module, refer to Chapter 10 (Page 10-7).

Figure 1

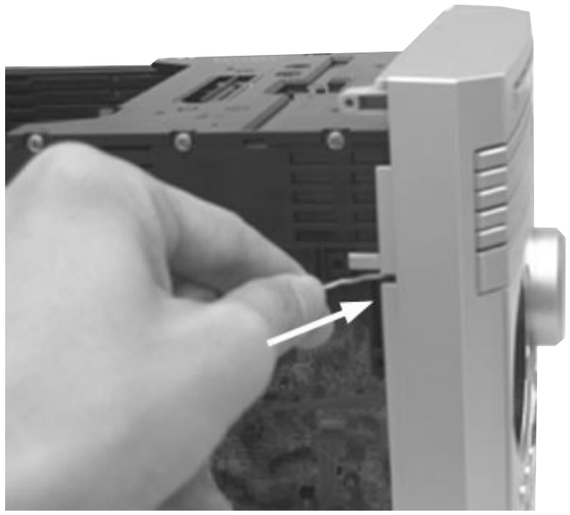
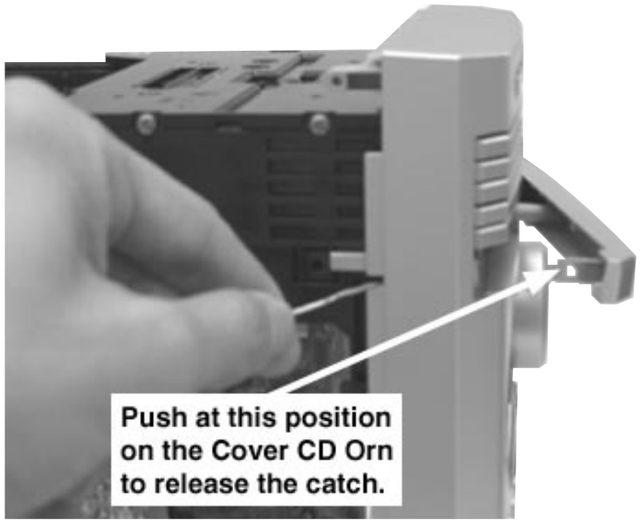
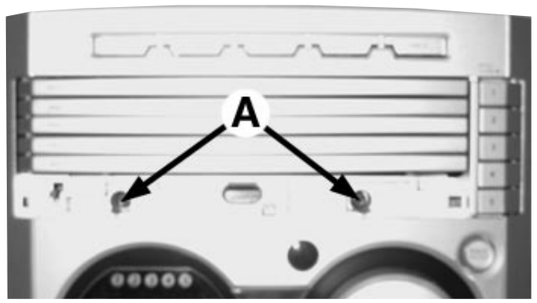


Figure 2



2-1

Figure 3



Detaching the Front Panel assembly from the Bottom/Rear assembly

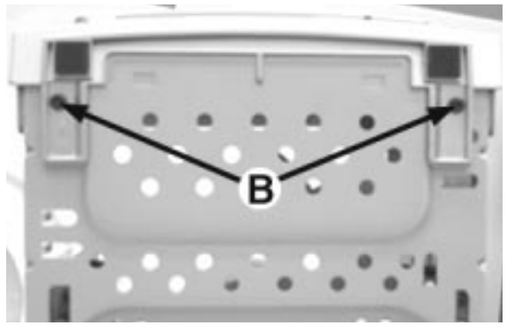


Figure 4

1) Remove 2 screws B (pos 282) as shown in Figure 4 from the bottom of the Cabinet Front (pos 101).
2) Release the fixation of the Combi Board (pos 1102-1001) to Bracket Combi (pos 252) by releasing the 2 catches C1 (see Figure 5) and pulling the Combi Board outwards as shown in Figure 6.
3) Uncatch 2 catches C2 (see Figure 5) on the left & right sides of the Cabinet Front (pos 101) and slides the Front Panel assembly out towards the front.

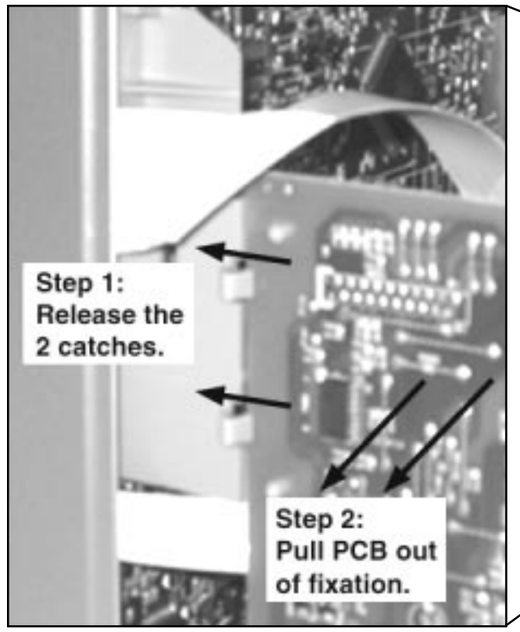


Figure 6

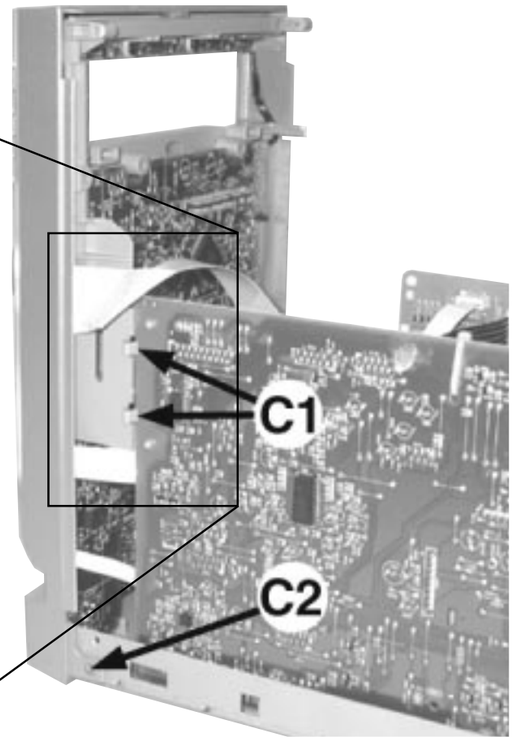


Figure 5

DISMANTLING INSTRUCTIONS

Dismantling of the Front Panel assembly

1) The Knob Volume (pos 136) can be remove by pulling it out in the direction as shown in Figure 7.
2) Loosen 4 screws D (see Figure 8) to remove the Bracket Top (pos 251) and CDC Key Board (pos 1105B).
3) Loosen 2 screws E (see Figure 8) to remove the Bracket Combi (pos 252).
4) Loosen 9 screws F (see Figure 8) to remove the Front Board (pos 1105A).
5) Loosen 3 screws G (see Figure 8) to remove the USB PC LINK Board (pos 1106).

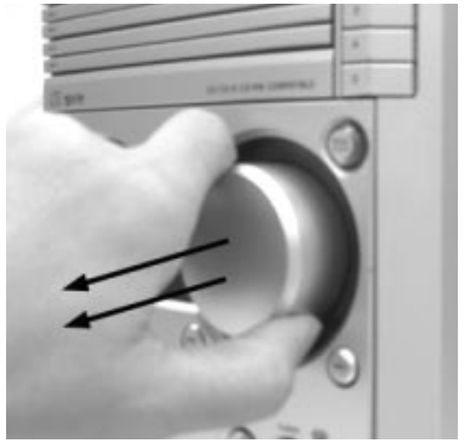
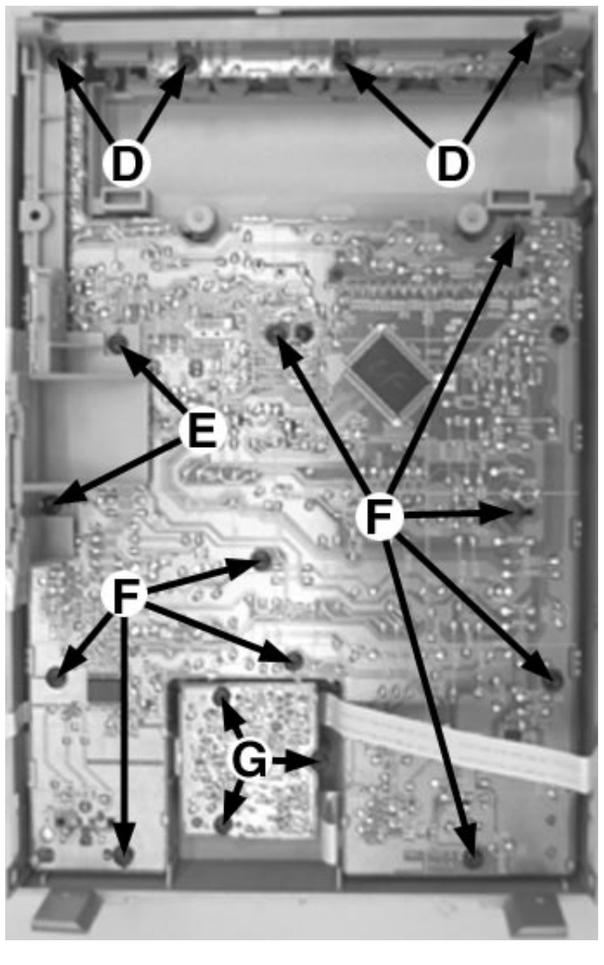


Figure 7

Figure 8



2-2

Dismantling of the Rear Panel assembly

1) Loosen 3 screws H and 2 catches C3 (see Figure 9) to remove the Tuner Board assembly.
2) Loosen 1 screw K (see Figure 9) to free the Mains Socket Board (pos 1102-1002B).
3) Loosen 4 screws J and 2 catches C4 (see Figure 9) to remove the Cabinet Rear (pos 256) by sliding it out towards the rear (see Figuer 10).
   Note : Tuner Board assembly and Mains Socket Board can also be remove together with the Cabinet Rear.
4) Loosen 4 screws L (see Figure 9) to remove the Fan (pos 1104) from the Cabinet Rear.

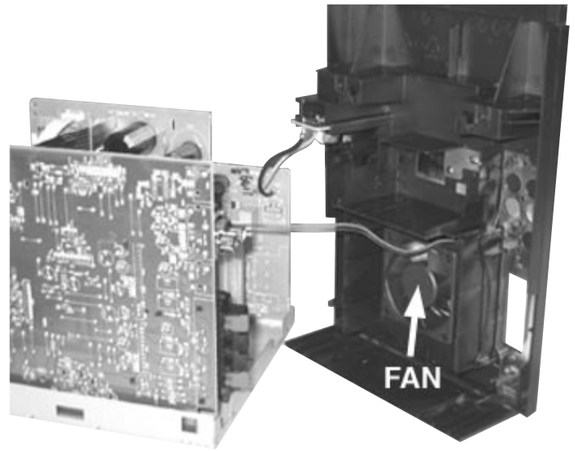
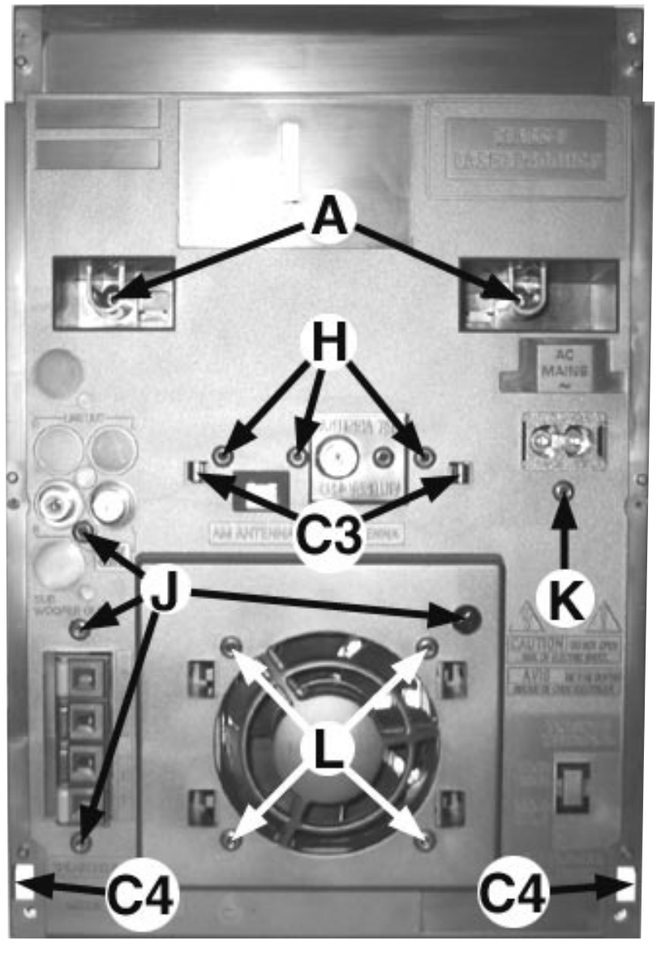


Figure 10

Figure 9



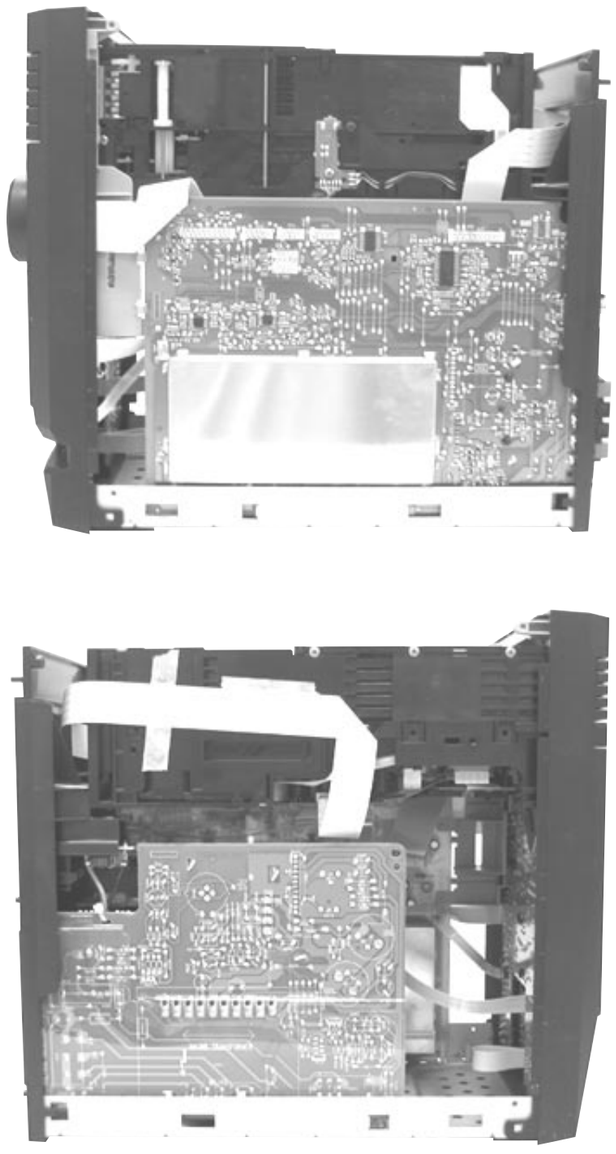
DISMANTLING INSTRUCTIONS

Repair Hints & Service Positions

1) During repair it is possible to disconnect the ECO6 Tuner board and/or 5DTC Module completely unless the fault is suspected to be in that area. This will not affect the performance of the rest of the set.

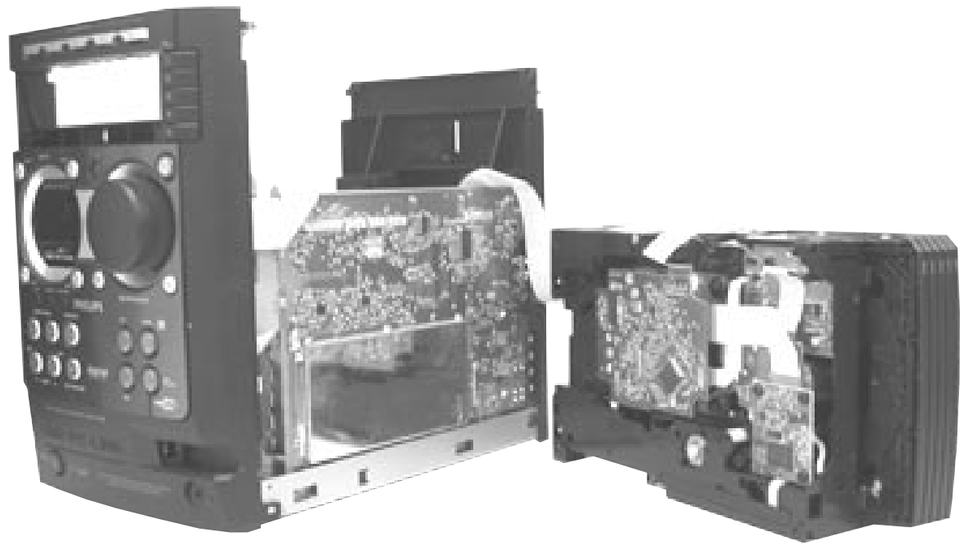
Note: The flex cables are very fragile, care should be taken not to damage them during repair. After repair, be very sure that the flex cables are inserted properly into the flex sockets before encasing, otherwise faults may occurs.

Service position A

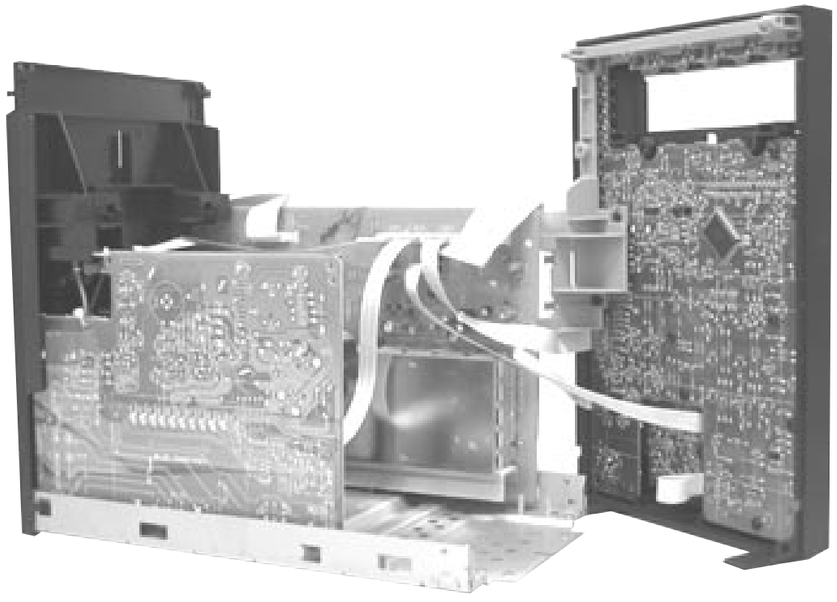


2-3

Service position B



Service position C



3-1

SERVICE TEST PROGRAM

To start service test program hold ▶| & PROG depressed while plugging in the mains cord

Display shows the ROM version "S-Vyy" (Main menu)

S refers to Service Mode

V refers to Version

yy refers to Software version number of the uProcessor (counting up from 01 to 99)

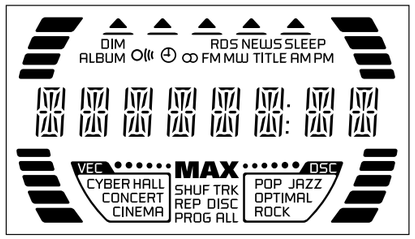


Figure 1

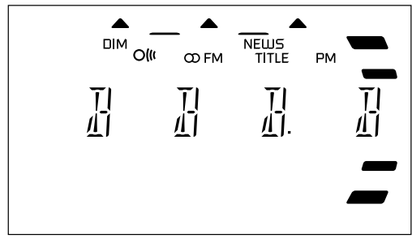


Figure 2

TUNER TEST

TUNER Button pressed? N

Y

Display Tuner Version "ccc"

TUNER Button pressed? N

Y

Service frequencies are copied to the RAM (see Table 1) Tuner works normally except:

PROGRAM button

Disconnect Mains cord ? N

Y

Service Mode left

QUARTZ TEST

|◄ Button pressed? N

Y

Display shows 32K Output at (Front Board) pin 19 of uP = 2048Hz

|◄ Button pressed? N

Y

Display shows 12M Output at (Front Board) pin 19 of uP = 2,929.6875Hz

■ Button pressed? N

Y

CD Button pressed? N

Y

5DTC CONTROL & MP3 CD MODULE TEST (For MCM595only)

Note : Disc should be available on the tray before entering the Service Test Mode.

** Choose level by pressing ◄◄ / ►►

STEP	DISPLAY	MESSAGE OKAY	MESSAGE ERROR	ACTION
1	5DTC-Vnn	-	5DTC-ER	Version of the 5DTC control software (nn = Version Number).
2	MP3CD'02	-	-	Indicates the module used.
**3	TI-Vnn	-	-	Version of the MPEG software (nn = Version Number).
**4	TI BUS	BUS OK	BUS ER	Communication test between the Main uP and CD Module
**5	TI SLD I	-	-	CD SLEDGE MOTOR is moved in.
**6	TI SLD O	-	-	CD SLEDGE MOTOR is moved out.
**7	TI FOC	FOC OK	FOC ER	FOCUS SERVO Test.
				Press ■ to exit

SERVICE PLAY MODE (For MC-500 only)

ECO Button pressed? N

Y

Set is in Service PLAY Mode

CD Button pressed? N

Y

Display shows "5DTC-Vnn" - Version of 5DTC control software (nn = Version Number).
DTC works as in normal operation. In case of failures, error codes according to Table 2 will be displayed.

The Service Play Mode is intended to detect and identify the failures in the CD Mode.

In this mode the DTC works as in normal operation. The electronics will still function even when an error is detected so that repair activities can be carried out.

ADC TEST

PLAY Button pressed? N

Y

Display shows "ADC1 Value" for ADC 1 (Input Line - SA)

PLAY Button pressed? N

Y

Display shows "ADC2 Value" for ADC 2 (Input Line - Option)

PLAY Button pressed? N

Y

Display shows "ADC3 Value" for ADC 3 (Input Line - AmNtc)

■ Button pressed? N

Y

ADC Test is used for checking the ADC inputs to the microprocessor.

The display shows an ADC value between 0 and 255 for an input signal between 0 and 5V.

DISPLAY TEST

VEC Button pressed? N

Y

Display shows Figure 1 and switch all LEDs on (except ECO POWER LED)

VEC Button pressed? N

Y

Display shows Figure 2 and switch alternate LEDs on (see Table 3)

■ Button pressed? N

Y

LEDs	MC-M570	MC-500
CD	OFF	-
TUNER	ON	-
AUX	OFF	-
USB PC LINK	ON	-
MAX SOUND	OFF	OFF
USB Indicator	ON	ON

Table 3

Various other Tests

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

Table 1

Note: * Depending on the selected grid frequency (9 or 10kHz).
By holding the PROG and ►► buttons depressed while switching on the Mains supply, one of the undermentioned features will be activated:
- the tuning grid frequency is toggled between 9kHz and 10kHz for the Oversea (/21) version.
- the extended FM1 (65.81MHz - 74MHz) is toggled on and off for East Eur. (/34) version.

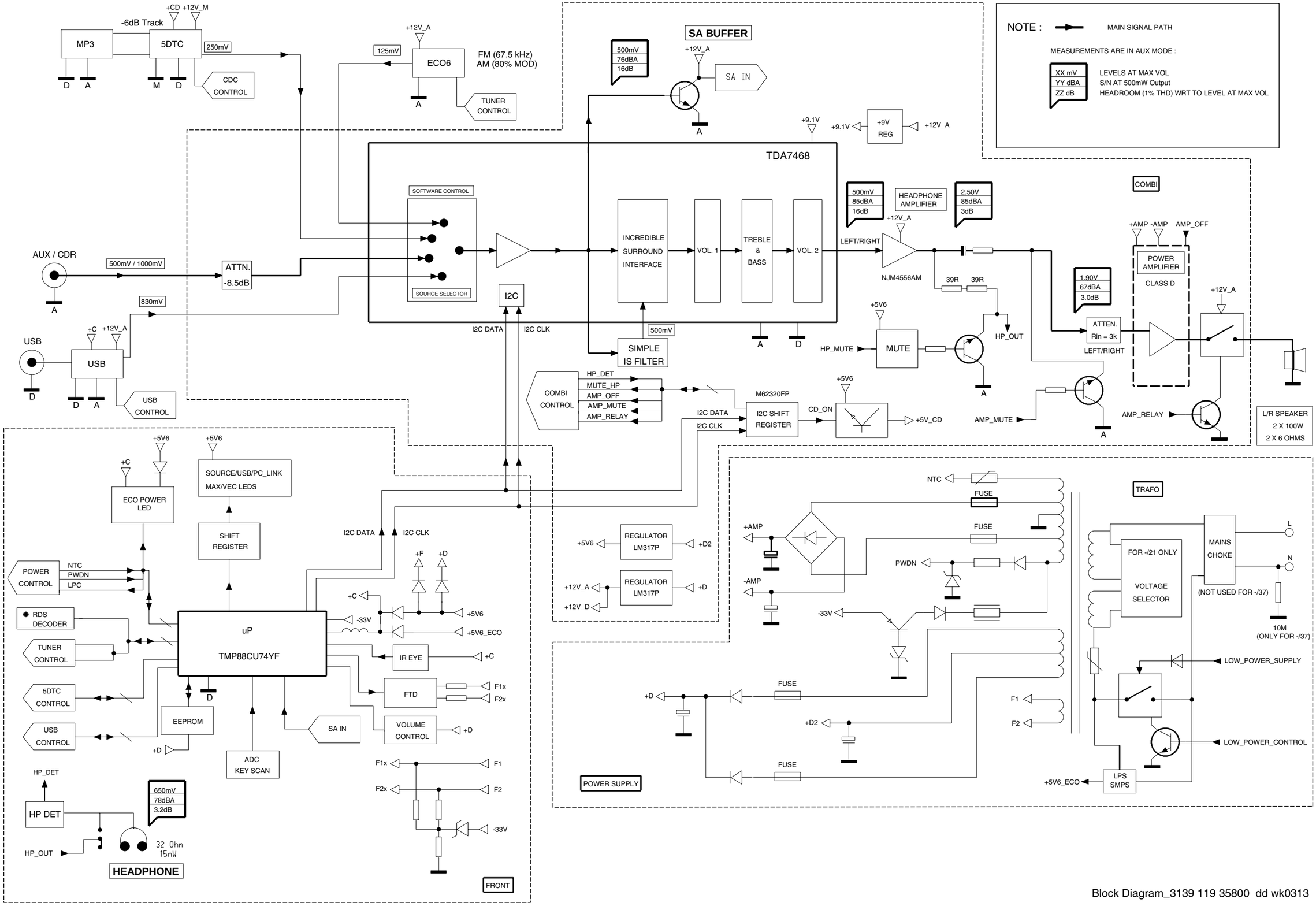
Error code	Error Description
E1000	Focus Error Triggered when the focus cannot be found within a certain time when starting up the CD, or if the focus is lost for more than a certain time during playing of CD.
E1001	Radial Error Triggered when the radial servo is off-track for a certain time during playing of CD.
E1002	Sledge In Error The sledge did not reach its inner position (inner-switch is still close) before approximately 6 seconds have passed by. Inner-switch or sledge motor problem.
E1003	Sledge Out Error The sledge did not come out of its inner position (inner-switch is still open) before approximately 250ms have passed by. Inner-switch or sledge motor problem.
E1005	Jump Error Triggered in normal play when the jump destination could not be found within a certain time.
E1006	Subcode Error Triggered when a new subcode was missing for a certain time during playing of CD.
E1007	PLL Error The Phase Lock Loop could not lock within a certain time.
E1008	Turntable Motor Error Generated when the CD could not reached 75% of speed during start-up within a certain time. Disc motor problem.
E1020	Focus Search Error The focus point has not been found within a certain time.
E1061	The tray could not enter the inside position and is opening again. This can happen if the tray is blocked such that it cannot go fully inside, or if the 5DTC control module is defective and never closes.
E1079	The tray could not reach the outside position and is stopped at its blocked position. This can happen if the tray is blocked such that it cannot go fully outside, or if the 5DTC control module is defective and never opens.

Table 2

TEST	*Activated with*	*ACTION*
EEPROM TEST	►► ■ to Exit	A test pattern will be sent to the EEPROM. "PASS" is displayed if the uProcessor read back the test pattern correctly, otherwise "FAIL" will be displayed.
EEPROM FORMAT TEST	◄◄	Load default data. Display shows "NEW" for 1 second. ***Caution! All presets from the customer will be lost!!***
DEMO TOGGLE	MAX SOUND	Pressing this button will toggle between DEMO ON and DEMO OFF. The DEMO status will scroll once across the Display.
ROTARY ENCODER TEST	Rotary Volume Knob	Display shows value for 2 seconds. Values increases or decreases until Volume Maximum (0dB) or Volume Minimum (VOL MUTE) is reached.
MICRONAS FIRMWARE VERSION	USB PC LINK ■ to Exit	To read out the Firmware Version of IC UAC3553 on the USB PC LINK Board. Display shows "Vxxxx" (xxxx = Firmware Version number).
LEAVE SERVICE TEST PROGRAM	Disconnect mains cord	

4-1

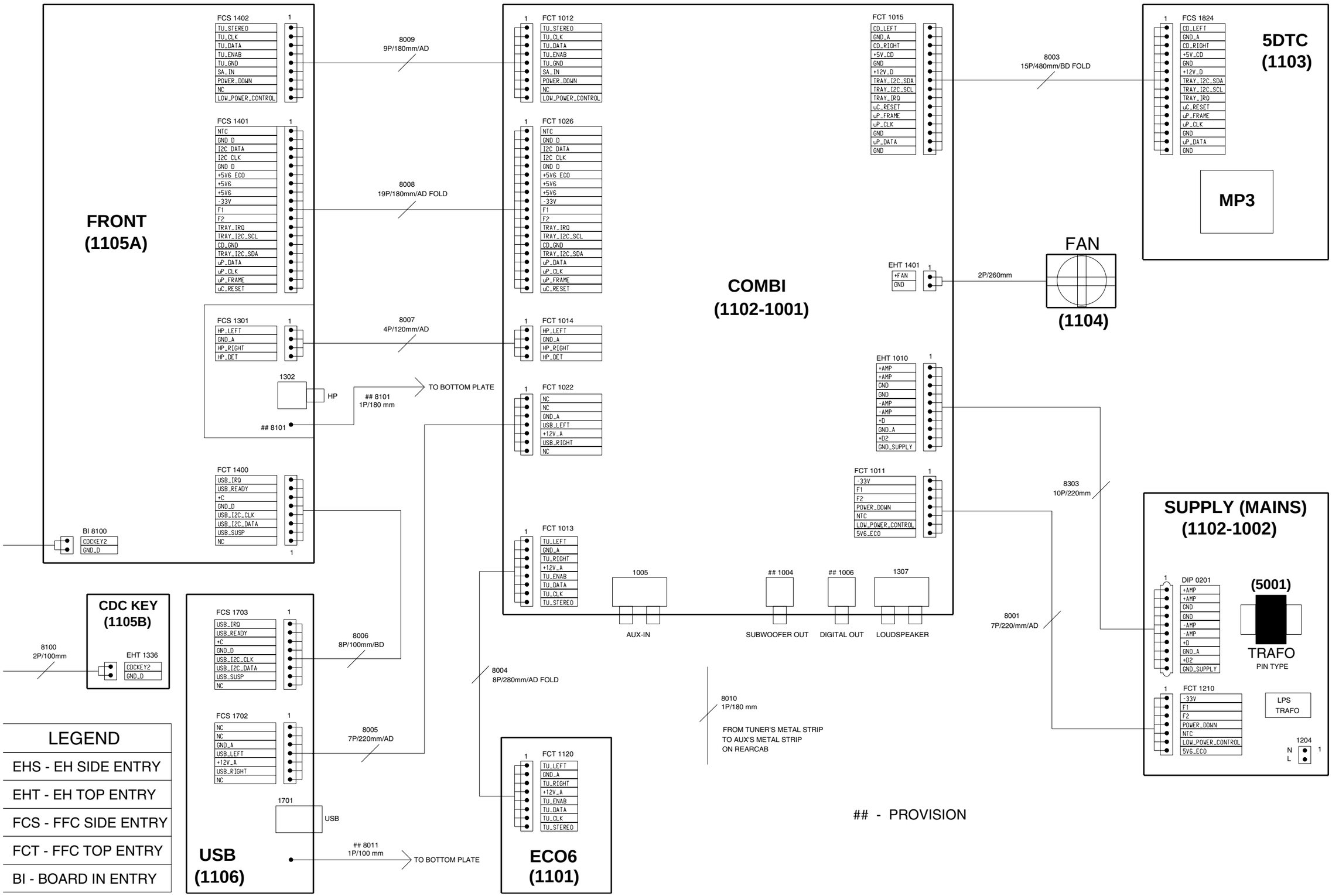
SET BLOCK DIAGRAM



Block Diagram_3139 119 35800 dd wk0313

5-1

SET WIRING DIAGRAM



FRONT BOARD

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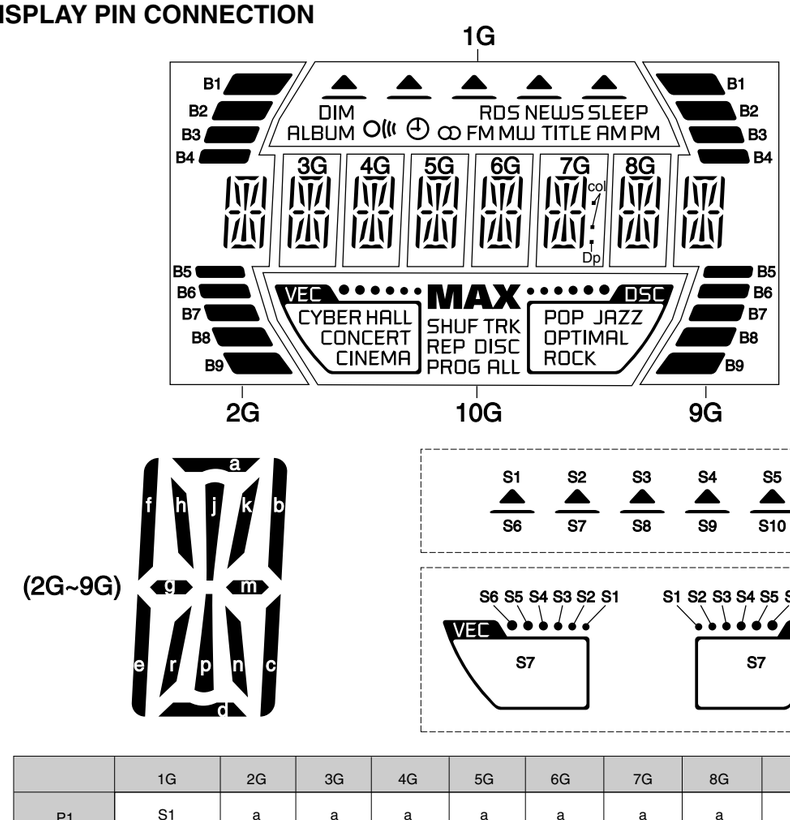
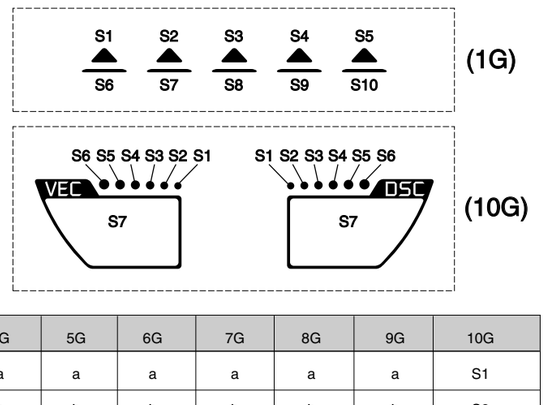
FTD DISPLAY PIN CONNECTION



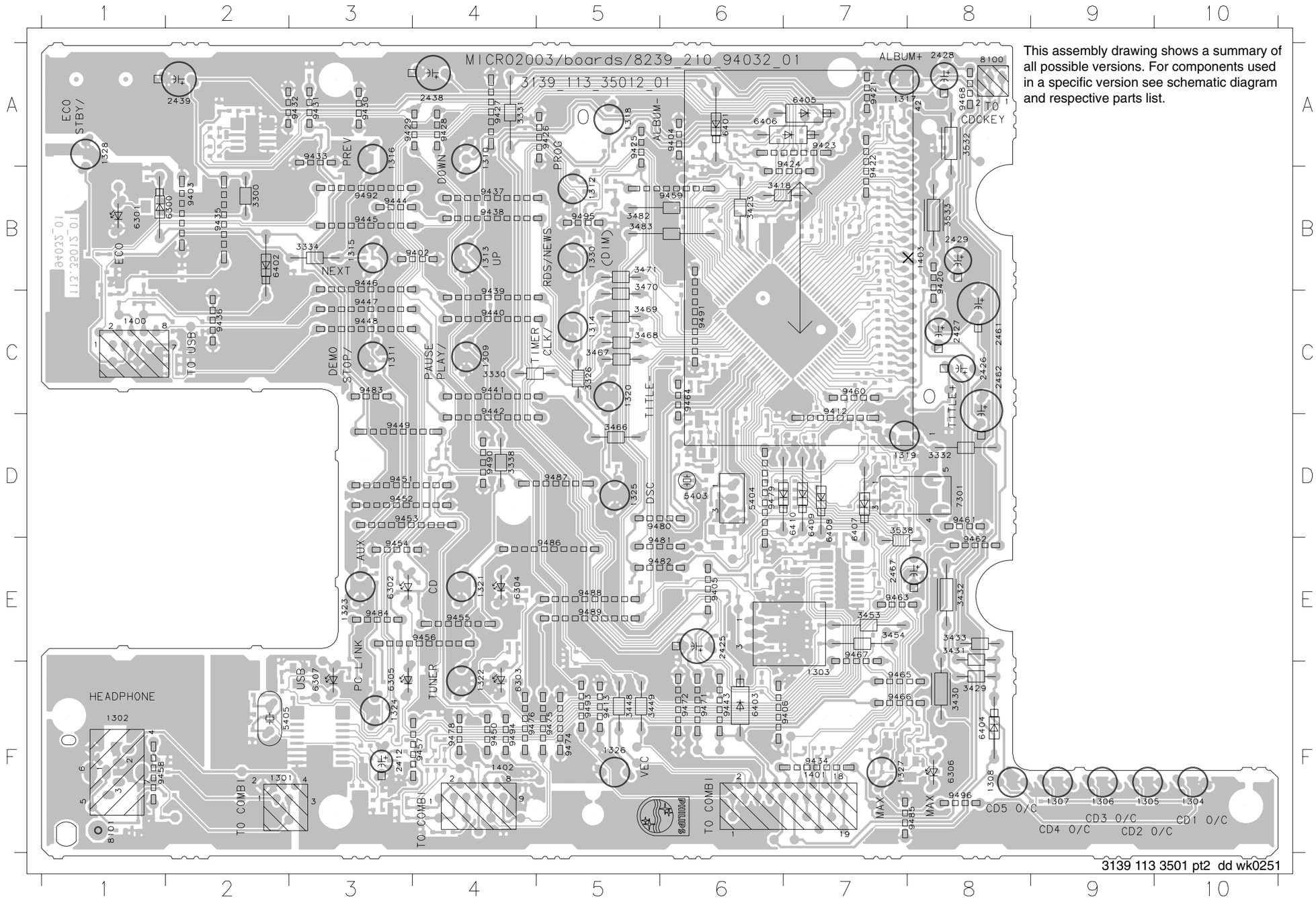


	1G	2G	3G	4G	5G	6G	7G	8G	9G	10G
P1	S1	a	a	a	a	a	a	a	a	S1
P2	S2	h	h	h	h	h	h	h	h	S2
P3	S3	j , p	j , p	j , p	j , p	j , p	j , p	j , p	j , p	S3
P4	S4	k	k	k	k	k	k	k	k	S4
P5	S5	b	b	b	b	b	b	b	b	S5
P6	S6	f	f	f	f	f	f	f	f	S6
P7	S7	m	m	m	m	m	m	m	m	S7
P8	S8	g	g	g	g	g	g	g	g	MAX
P9	S9	c	c	c	c	c	c	c	c	SHUF
P10	S10	e	e	e	e	e	e	e	e	TRK
P11	DIM	r	r	r	r	r	r	r	r	REP
P12	ALBUM	n	n	n	n	n	n	n	n	DISC
P13	O((	d	d	d	d	d	d	d	d	PROG
P14	🕘	B1	-	-	-	-	col	-	B1	ALL
P15	∞	B2	-	-	-	-	Dp	-	B2	CYBER
P16	RDS	B3	-	-	-	-	-	-	B3	HALL
P17	NEWS	B4	-	-	-	-	-	-	B4	CONCERT
P18	SLEEP	B5	-	-	-	-	-	-	B5	CINEMA
P19	FM	B6	-	-	-	-	-	-	B6	POP
P20	MW	B7	-	-	-	-	-	-	B7	JAZZ
P21	TITLE	B8	-	-	-	-	-	-	B8	OPTIMAL
P22	AM	B9	-	-	-	-	-	-	B9	ROCK
P23	PM	-	-	-	-	-	-	-	-	-

6-2

FRONT BOARD - COMPONENT LAYOUT

1301	F2	1310	A4	1319	D7	1328	A1	2427	C8	3326	C5	3430	F8	3467	C5	3538	D7	6305	F3	6407	D7	9404	A6	9424	A7	9433	A3	9442	C4	9451	D3	9460	C7	9471	F6	9482	E5	9491	C6
1302	F1	1311	C3	1320	C5	1330	B5	2428	A8	3330	C4	3431	E8	3468	C5	5403	D6	6306	F8	6408	D7	9405	E6	9425	A5	9434	F7	9443	F6	9452	D3	9461	D8	9472	F6	9483	C3	9492	B3
1303	F7	1312	B5	1321	E4	1400	C1	2429	B8	3331	A4	3432	E8	3469	C5	5404	D6	6307	F3	6409	D7	9406	F7	9426	A5	9435	B2	9444	B3	9453	D3	9462	E8	9474	F5	9484	E3	9493	F5
1304	F10	1313	B4	1322	F4	1401	F7	2438	A4	3332	D8	3433	E8	3470	B5	5405	F2	6401	A6	6410	D7	9412	C7	9427	A4	9436	C2	9445	B3	9454	E3	9463	E7	9475	F5	9485	F8	9494	F4
1305	F9	1314	C5	1323	E3	1402	F4	2439	A2	3334	B3	3448	F5	3471	B5	6300	B2	6402	B2	7301	D8	9413	F5	9428	A4	9437	B4	9446	B3	9455	E4	9464	C6	9476	F4	9486	E5	9495	B5
1306	F9	1315	B3	1324	F3	1403	B8	2461	C8	3338	D4	3449	F5	3482	B5	6301	B1	6403	F6	8100	A8	9420	B8	9429	A3	9438	B4	9447	C3	9456	E4	9465	F7	9478	F4	9487	D5	9496	F8
1307	F9	1316	A3	1325	D5	2412	F3	2462	C8	3418	B6	3453	E7	3483	B5	6302	E3	6404	F8	8101	F1	9421	A7	9430	A3	9439	C4	9448	C3	9457	F4	9466	F7	9479	D6	9488	E5		
1308	F8	1317	A7	1326	F5	2425	E6	2467	E7	3423	B6	3454	E7	3532	A8	6303	F4	6405	A7	9402	B4	9422	A7	9431	A3	9440	C4	9449	D3	9458	F1	9467	E7	9480	D5	9489	E5		
1309	C4	1318	A5	1327	F7	2426	C8	3300	B2	3429	F8	3466	D5	3533	B8	6304	E4	6406	A6	9403	B2	9423	A7	9432	A3	9441	C4	9450	F4	9459	B6	9468	A8	9481	E5	9490	D4		



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

3139 113 3501 pt2 dd wk0251

FRONT BOARD - CHIP LAYOUT

2302	E5	2408	F9	2433	F8	2451	E4	2469	F9	3301	B10	3318	A5	3341	E8	3409	F9	3438	C5	3458	D5	3479	A5	3497	B4	3512	C4	3527	C4	3546	D3	4412	B3	4434	D4	4449	D4	5301	F9	7406	B10
2303	E5	2409	F9	2434	F8	2452	D4	2470	F3	3304	E8	3319	F2	3342	C8	3410	F9	3439	C5	3459	D5	3480	A5	3498	B4	3513	C4	3528	E5	3547	E6	4420	A6	4435	D4	4450	D4	5302	F10	7407	E4
2304	F10	2410	F8	2435	F7	2453	E4	2471	F7	3305	E7	3320	F2	3343	C8	3413	D5	3440	F7	3460	D5	3481	A5	3499	B4	3514	C4	3529	D4	3548	F7	4421	B6	4436	D4	4451	F7	5401	E5	7408	F3
2305	F10	2411	F8	2436	F7	2454	F5	2472	F5	3306	E7	3321	F2	3344	B8	3416	F8	3441	F8	3461	C5	3484	B5	3500	B4	3515	C4	3530	E4	4400	C5	4422	B6	4437	E4	4452	F7	5402	B5	7409	F8
2306	F10	2413	C9	2437	B4	2455	A9	2473	B8	3307	E7	3322	F1	3345	F2	3417	F8	3442	F7	3462	D5	3485	A4	3501	B4	3516	C4	3531	E4	4401	C10	4423	B5	4438	D4	4453	F7	5406	F8		
2307	B6	2415	F8	2440	B10	2456	D5	2474	C3	3308	E7	3323	B6	3346	F3	3419	C6	3443	F7	3463	E5	3486	A4	3502	B4	3517	C4	3534	D7	4402	C9	4424	D4	4439	F7	4454	D4	5407	A9		
2308	A7	2416	F8	2441	C9	2457	E4	2475	D3	3309	E7	3324	B6	3347	F9	3420	A5	3444	F7	3464	C5	3487	A4	3503	B4	3518	C4	3536	C10	4403	F3	4425	D4	4440	B10	4455	D3	5408	C10		
2309	A4	2418	D5	2443	B10	2458	E5	2476	A3	3310	E8	3325	B6	3401	B4	3421	D5	3445	F7	3465	C5	3489	B4	3504	B4	3519	C4	3537	C10	4404	F8	4426	D4	4441	F7	4456	E5	5409	B4		
2310	F4	2419	D5	2444	C9	2459	E4	2477	A3	3311	E8	3328	F4	3402	B4	3422	D5	3447	D7	3472	C6	3490	B4	3505	B4	3520	C4	3539	D3	4405	F7	4427	D5	4442	B10	4457	E3	5410	E5		
2400	B4	2420	D5	2445	C9	2460	E4	2478	F8	3312	F3	3329	D6	3403	D7	3424	D5	3450	E4	3473	C5	3491	B4	3506	B4	3521	C4	3540	D4	4406	E4	4428	D5	4443	F7	4458	F3	5411	C10		
2401	B4	2421	D5	2446	F6	2463	A9	2479	D5	3313	F3	3335	A5	3404	A8	3425	A9	3451	E4	3474	B5	3492	A4	3507	B4	3522	C4	3541	A4	4407	E4	4429	D5	4444	E4	4459	B6	7400	C5		
2402	A4	2422	D5	2447	E6	2464	F4	2480	E5	3314	F8	3336	B7	3405	A5	3426	A9	3452	F4	3475	B5	3493	A4	3508	B4	3523	C4	3542	A4	4408	F4	4430	D7	4445	D4	4460	B6	7401	A9		
2403	A4	2423	D5	2448	D4	2465	C9	2481	A6	3315	F8	3337	C7	3406	A8	3427	A9	3455	F4	3476	B5	3494	B4	3509	B4	3524	C4	3543	F7	4409	F5	4431	D4	4446	F8	4461	D4	7403	F8		
2406	B8	2424	D5	2449	D4	2466	D4	2482	D5	3316	E5	3339	E7	3407	F8	3428	A9	3456	F4	3477	B5	3495	B4	3510	B4	3525	C4	3544	D4	4410	C9	4432	D4	4447	F8	4462	F4	7404	D5		
2407	A5	2432	F7	2450	F4	2468	B5	2483	B9	3317	E5	3340	F8	3408	F8	3437	C5	3457	D5	3478	B6	3496	B4	3511	C4	3526	C4	3545	D4	4411	B10	4433	D4	4448	F7	5300	F10	7405	D5		

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

3139 113 3501 pt2 dd wk0251

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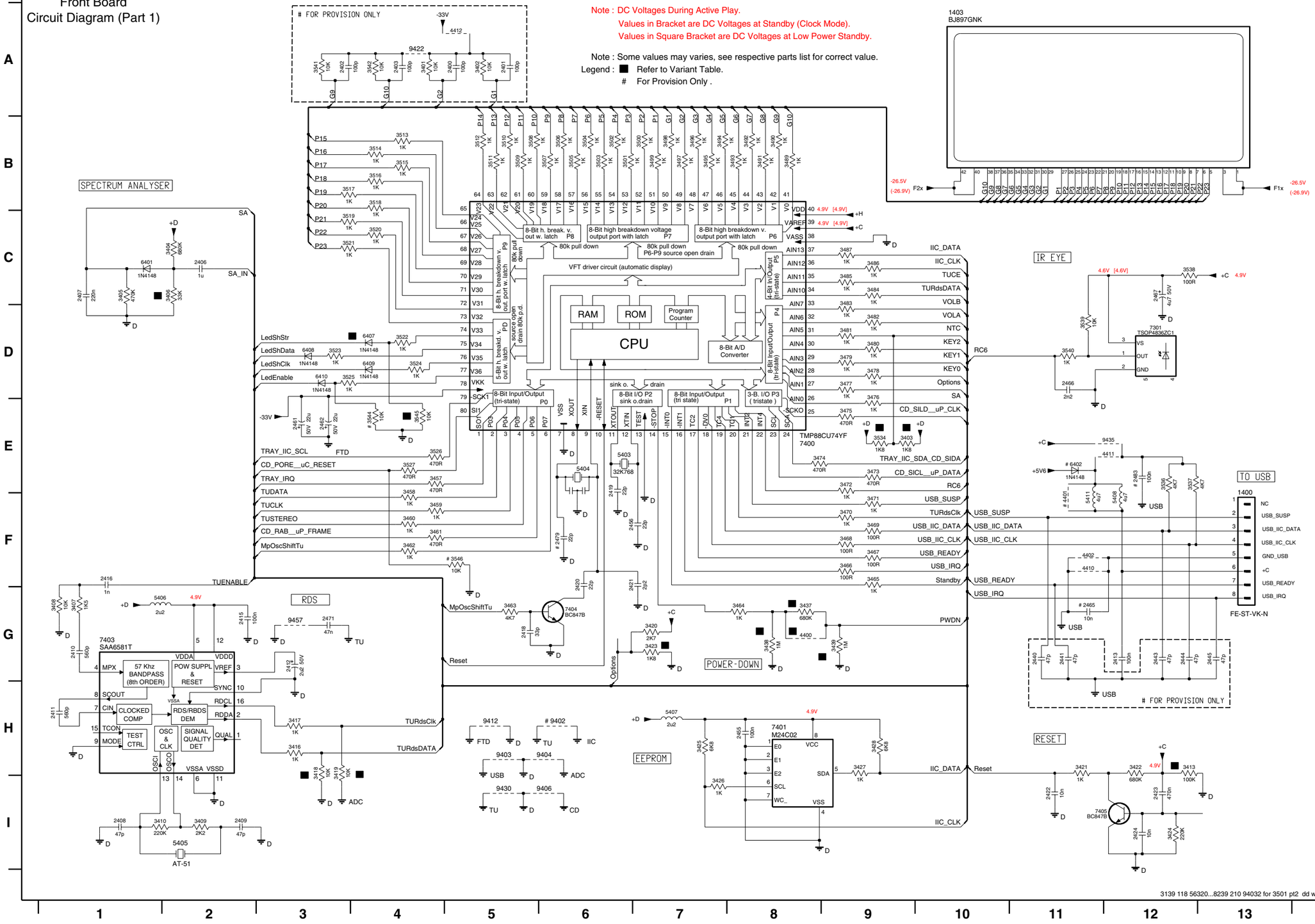
FRONT BOARD - CIRCUIT DIAGRAM (Part 1)

Front Board
Circuit Diagram (Part 1)

Note : DC Voltages During Active Play.
Values in Bracket are DC Voltages at Standby (Clock Mode).
Values in Square Bracket are DC Voltages at Low Power Standby.

Note : Some values may varies, see respective parts list for correct value.
Legend : ■ Refer to Variant Table.
For Provision Only .



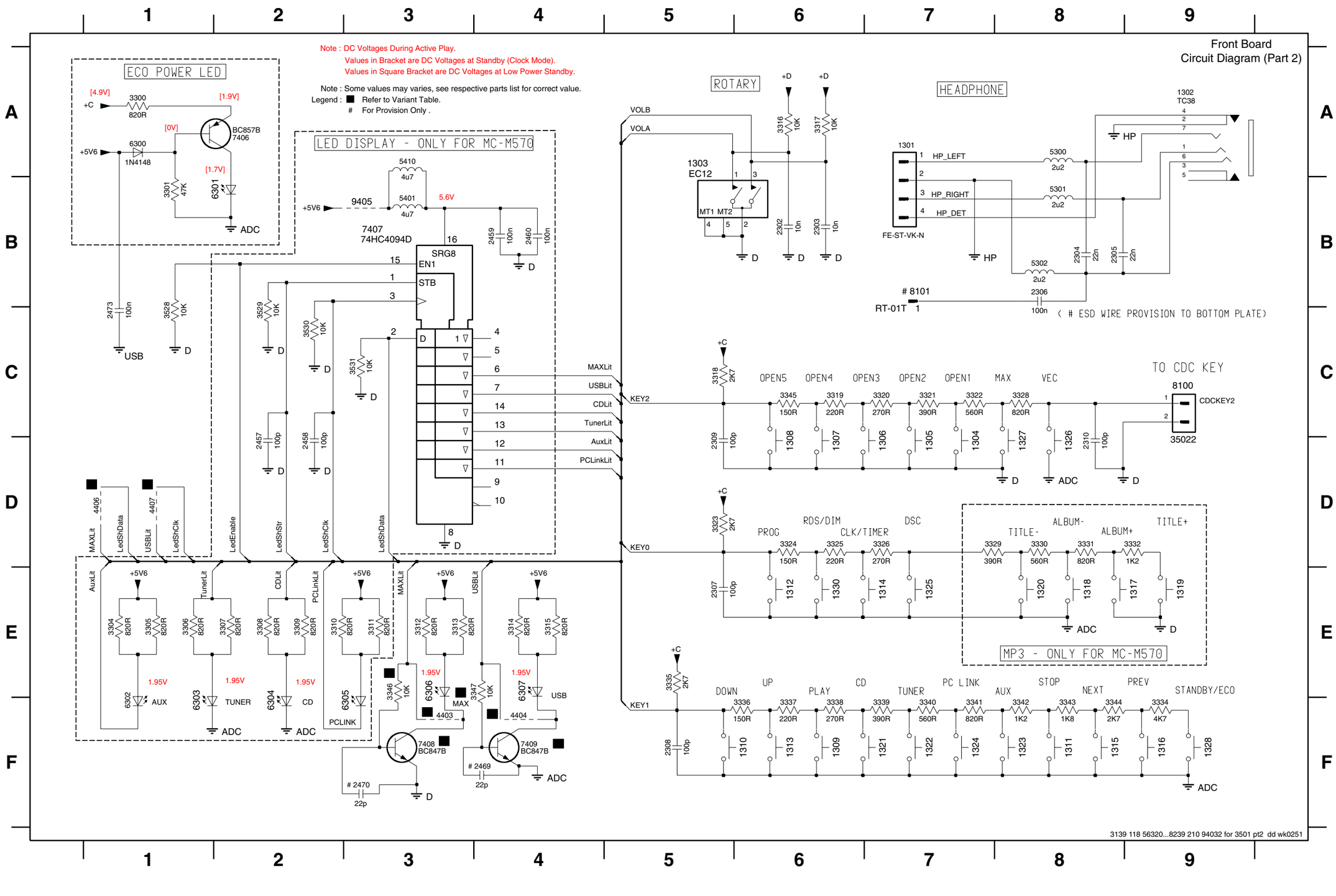
3139 118 56320...8239 210 94032 for 3501 pt2 dd wk0251

1400 F13	3508 B5
1403 A10	3509 B5
2400 A5	3510 B5
2401 A5	3511 B5
2402 A3	3512 B5
2403 A4	3513 B4
2406 C2	3514 B4
2407 C1	3515 B4
2408 I1	3516 B4
2409 I2	3517 B3
2410 G1	3518 B4
2411 H1	3519 C3
2412 G3	3520 C4
2413 G12	3521 C3
2415 G2	3522 D4
2416 F1	3523 D3
2418 G5	3524 D4
2419 E6	3525 D3
2420 F6	3526 E4
2421 F7	3527 E4
2422 I11	3534 E9
2423 I12	3536 E12
2424 I12	3537 E12
2440 G11	3538 C12
2441 G11	3539 D11
2443 G12	3540 D11
2444 G12	3541 A3
2445 G13	3542 A4
2455 H8	3544 E4
2456 F7	3545 E4
2461 E3	3546 F5
2462 E3	4400 G8
2465 G11	4401 F11
2466 D11	4402 F11
2467 C12	4410 F11
2471 G3	4411 E12
2479 F6	4412 A5
2483 E12	5403 E6
3401 A4	5404 E6
3402 A5	5405 I2
3403 E9	5406 G1
3404 C2	5407 H7
3405 C1	5408 F12
3406 C2	5411 F11
3407 G1	6401 C1
3408 G1	6402 E11
3409 I2	6407 D4
3410 I1	6408 D3
3413 H12	6409 D4
3416 H3	6410 D3
3417 H3	7301 D12
3418 H3	7400 E8
3419 H3	7401 H8
3420 G7	7403 G1
3421 H11	7404 G6
3422 H12	7405 I12
3423 G7	9402 H6
3424 I12	9403 H5
3425 H7	9404 H6
3426 I7	9406 I6
3427 H9	9412 H5
3428 H9	9422 A4
3437 G8	9430 I5
3438 G8	9435 E12
3439 G9	9457 G3
3457 E4	
3458 F4	
3459 F4	
3460 F4	
3461 F4	
3462 F4	
3463 G5	
3464 G8	
3465 F9	
3466 F9	
3467 F9	
3468 F9	
3469 F9	
3470 F9	
3471 F9	
3472 E9	
3473 E9	
3474 E8	
3475 E9	
3476 E9	
3477 D9	
3478 D9	
3479 D9	
3480 D9	
3481 D9	
3482 D9	
3483 D9	
3484 C9	
3485 C9	
3486 C9	
3487 C9	
3489 B8	
3490 B8	
3491 B8	
3492 B8	
3493 B8	
3494 B7	
3495 B7	
3496 B7	
3497 B7	
3498 B7	
3499 B7	
3500 B7	
3501 B6	
3502 B6	
3503 B6	
3504 B6	
3505 B6	
3506 B6	
3507 B6	

6-5

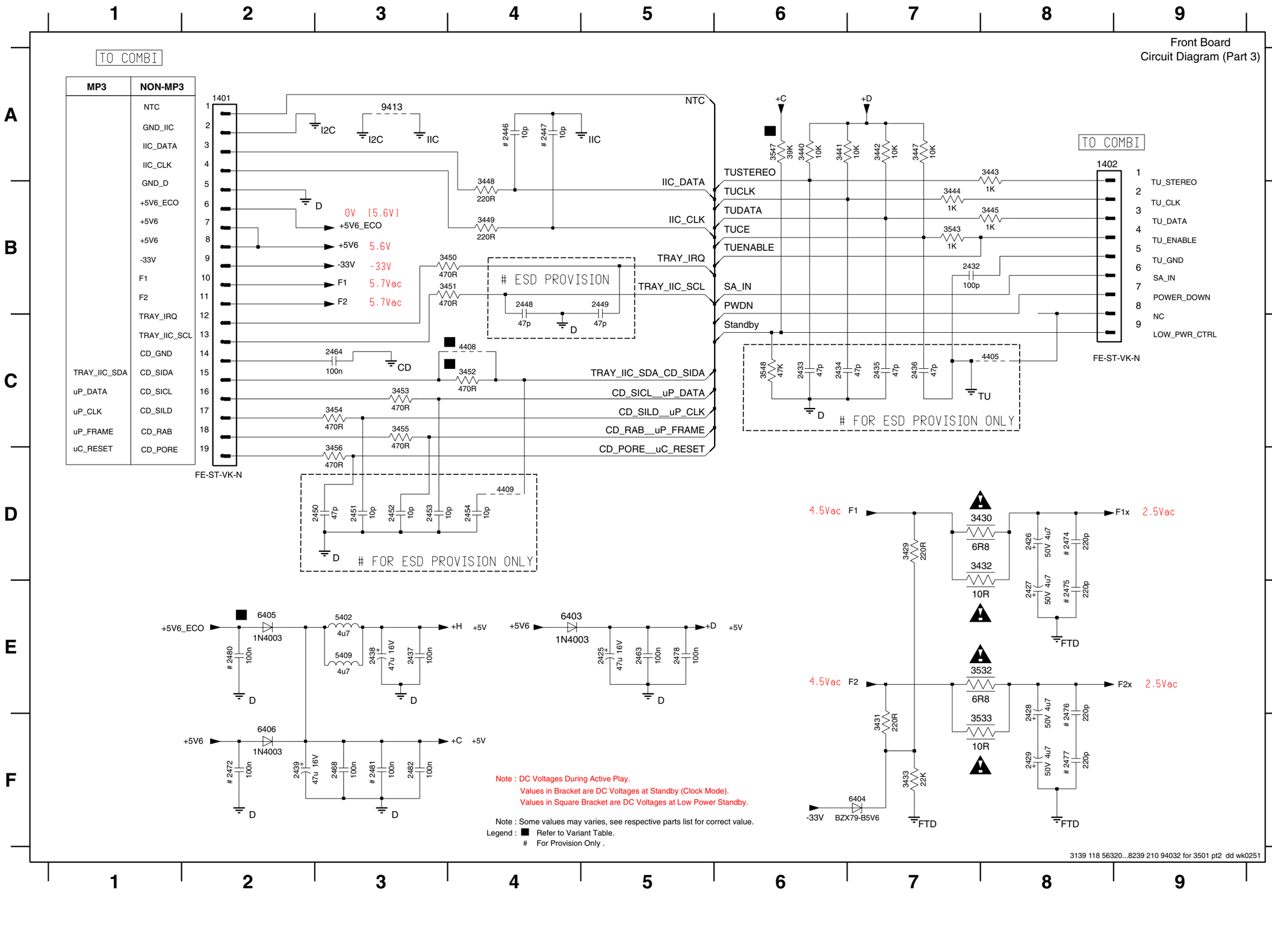
FRONT BOARD - CIRCUIT DIAGRAM (Part 2)

1301 A7	1306 D7	1311 F8	1316 F9	1321 F7	1326 D8	2303 B6	2308 F5	2459 B4	3300 A1	3307 E2	3312 E3	3317 A6	3322 C7	3328 C8	3334 F9	3339 F7	3344 F8	3529 C2	4406 D1	5401 B3	6303 F1	7406 A2	8101 B7
1302 A9	1307 D6	1312 E6	1317 E9	1322 F7	1327 D8	2304 B8	2309 D5	2460 B4	3301 B1	3308 E2	3313 E3	3318 C5	3323 D5	3329 D7	3335 E5	3340 F7	3345 C6	3530 C2	4407 D1	5410 A3	6304 F2	7407 B3	9405 B3
1303 A5	1308 D6	1313 F6	1318 E8	1323 F8	1328 F9	2305 B8	2310 D8	2469 F4	3304 E1	3309 E2	3314 E4	3319 C6	3324 D6	3330 D8	3336 F6	3341 F7	3346 E3	3531 C3	5300 A8	6300 A1	6305 F3	7408 F3	
1304 D7	1309 F6	1314 E7	1319 E9	1324 F7	1330 E6	2306 B8	2457 D2	2470 F3	3305 E1	3310 E2	3315 E4	3320 C7	3325 D6	3331 D8	3337 F6	3342 F8	3347 E4	4403 F3	5301 B8	6301 B2	6306 E3	7409 F4	
1305 D7	1310 F6	1315 F8	1320 E8	1325 E7	2302 B6	2307 E5	2458 D2	2473 C1	3306 E1	3311 E3	3316 A6	3321 C7	3326 D7	3332 D9	3338 F6	3343 F8	3528 C1	4404 F4	5302 B8	6302 F1	6307 E4	8100 C9	



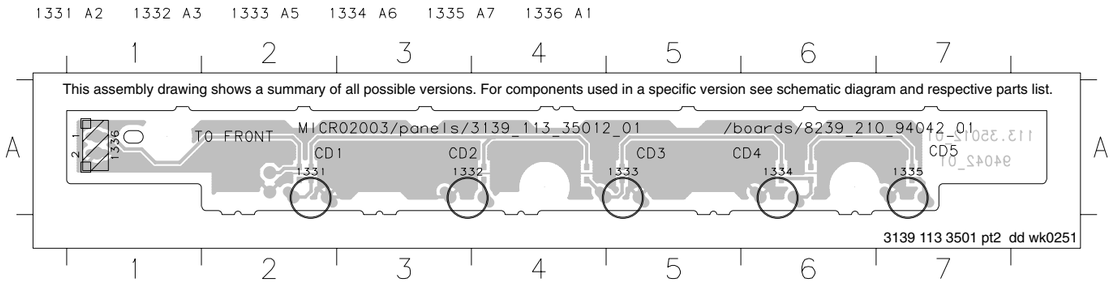
6-6

FRONT BOARD - CIRCUIT DIAGRAM (Part 3)

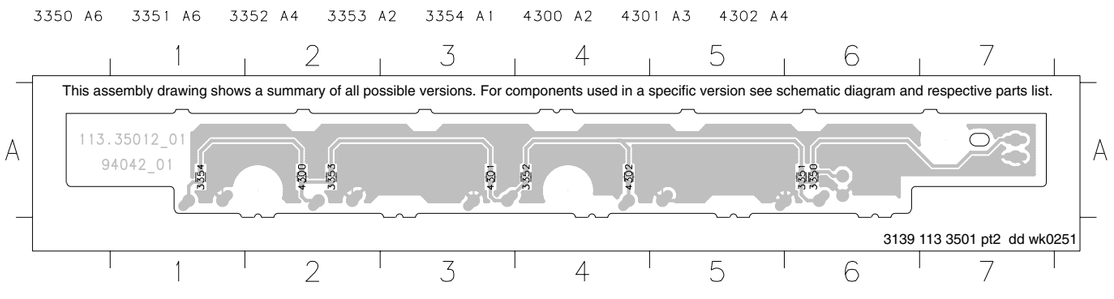


1401 A2
1402 A8
2425 E5
2426 D8
2427 E8
2428 E8
2429 F8
2432 B7
2433 C6
2434 C6
2435 C7
2436 C7
2437 E3
2438 E3
2439 F2
2446 A4
2447 A4
2448 B4
2449 B5
2450 D3
2451 D3
2452 D3
2453 D3
2454 D4
2463 E5
2464 C3
2468 F3
2472 F2
2474 D8
2475 E8
2476 E8
2477 F8
2478 E5
2480 E2
2481 F3
2482 F3
3429 D7
3430 D8
3431 F7
3432 D8
3433 F7
3440 A6
3441 A6
3442 A7
3443 A8
3444 B7
3445 B8
3447 A7
3448 B4
3449 B4
3450 B4
3451 B4
3452 C4
3453 C3
3454 C3
3455 C3
3456 D3
3532 E8
3533 F8
3543 B7
3547 A6
3548 C6
4405 C8
4408 C4
4409 D4
5402 E3
5409 E3
6403 E4
6404 F7
6405 E2
6406 F2
9413 A3

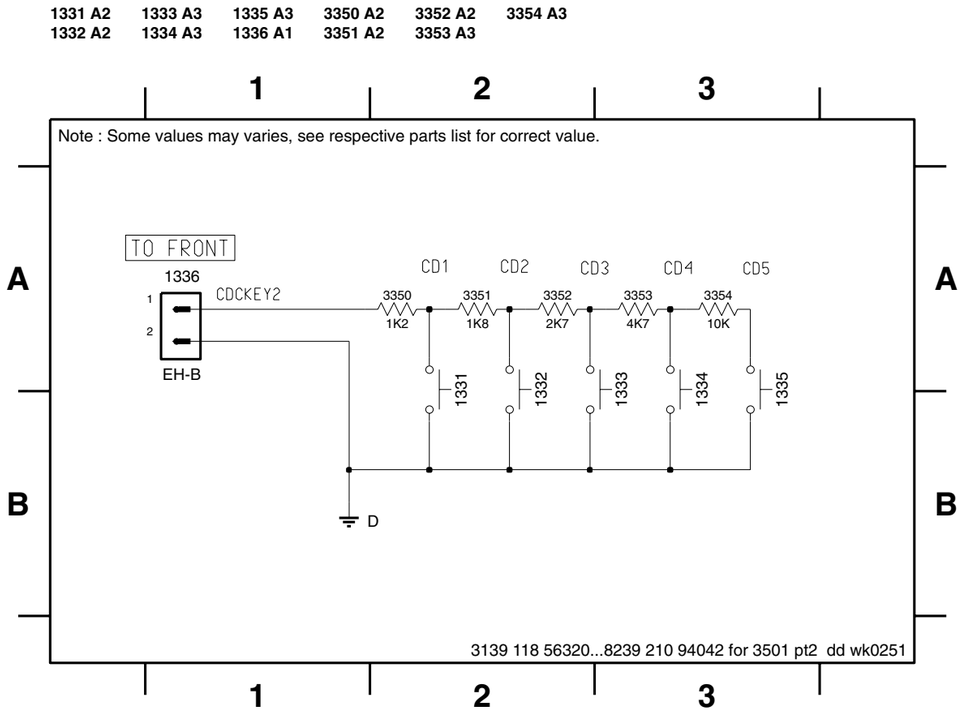
CDC KEY BOARD - COMPONENT LAYOUT



CDC KEY BOARD - CHIP LAYOUT



CDC KEY BOARD - CIRCUIT DIAGRAM



VARIANT TABLE

Item No. \ Model / Version	MC-500/22 MC-500/25	MC-500/30 MC-500/33 MC-500/37	MCM530/22	MCM595/21 MCM595/30 MCM595/37
3346	10K	10K	—	—
3347	10K	10K	—	—
3413	100K	—	100K	100K
3403 / 3534	1K8	1K8	—	—
3406	33K	33K	15K	15K
3418	—	10K	—	10K
3419	—	10K	—	10K
3423	1K8	—	1K8	1K8
3437	680K	680K	—	—
3438	1M	1M	2M2	2M2
3439	1M	1M	—	—
3452	—	—	470R	470R
3545	10K	10K	—	—
3547	39K	—	—	—
4400	—	—	X	X
4403	—	—	X	X
4404	—	—	X	X
4406	X	X	—	—
4407	X	X	—	—
4408	X	X	—	—
6405	X	—	X	X
6407	—	—	X	X
7408	X	X	—	—
7409	X	X	—	—

X - Item in use.

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ELECTRICAL PARTS LIST - FRONT BOARD

ELECTRICAL PARTS LIST - FRONT BOARD

MISCELLANEOUS

1301	4822 265 11183	Flex Connector 4P
1302	9940 000 01244	Headphone Socket
1303	9940 000 01241	Rotary Encoder 24P
1304	9940 000 01243	Tact Switch
1305	9940 000 01243	Tact Switch
1306	9940 000 01243	Tact Switch
1307	9940 000 01243	Tact Switch
1308	9940 000 01243	Tact Switch
1309	9940 000 01243	Tact Switch
1310	9940 000 01243	Tact Switch
1311	9940 000 01243	Tact Switch
1312	9940 000 01243	Tact Switch
1313	9940 000 01243	Tact Switch
1314	9940 000 01243	Tact Switch
1315	9940 000 01243	Tact Switch
1316	9940 000 01243	Tact Switch
1317	9940 000 01243	Tact Switch
1318	9940 000 01243	Tact Switch
1319	9940 000 01243	Tact Switch
1320	9940 000 01243	Tact Switch
1321	9940 000 01243	Tact Switch
1322	9940 000 01243	Tact Switch
1323	9940 000 01243	Tact Switch
1324	9940 000 01243	Tact Switch
1325	9940 000 01243	Tact Switch
1326	9940 000 01243	Tact Switch
1327	9940 000 01243	Tact Switch
1328	9940 000 01243	Tact Switch
1330	9940 000 01243	Tact Switch
1331	9940 000 01243	Tact Switch
1332	9940 000 01243	Tact Switch
1333	9940 000 01243	Tact Switch
1334	9940 000 01243	Tact Switch
1335	9940 000 01243	Tact Switch
1400	4822 265 11535	Flex Connector 8P
1401	4822 265 11545	Flex Connector 19P
1402	4822 265 11531	Flex Connector 9P
1403	9940 000 01966	FTD (HNA-10LS02T)

CAPACITORS

2302	5322 126 11583	10nF 10% 50V	
2303	5322 126 11583	10nF 10% 50V	
2304	4822 126 14494	22nF 10% 25V	
2305	4822 126 14494	22nF 10% 25V	
2306	2238 586 59812	100nF 50V	
2307	2020 552 94427	100pF 5% 50V	
2308	2020 552 94427	100pF 5% 50V	
2309	2020 552 94427	100pF 5% 50V	
2310	2020 552 94427	100pF 5% 50V	
2406	3198 017 41050	1µF 10V	
2407	4822 126 13879	220nF +80/-20% 16V	
2408	4822 126 11785	47pF 5% 50V	/22
2409	4822 126 11785	47pF 5% 50V	/22
2410	4822 126 14249	560pF 10% 50V	/22
2411	4822 126 14249	560pF 10% 50V	/22
2412	4822 124 22652	2,2µF 20% 50V	/22
2413	2238 586 59812	100nF 50V	
2415	2238 586 59812	100nF 50V	/22
2416	5322 126 11578	1nF 10% 50V	/22
2418	2222 867 15339	33pF 5% 50V	
2419	4822 122 33761	22pF 5% 50V	
2420	4822 122 33761	22pF 5% 50V	
2421	4822 126 14223	2,2pF 50V	
2422	5322 126 11583	10nF 10% 50V	
2423	3198 017 44740	470nF 10V	
2424	5322 126 11583	10nF 10% 50V	
2425	4822 124 81286	47µF 20% 16V	
2426	4822 124 12032	4,7µF 20% 50V	
2427	4822 124 12032	4,7µF 20% 50V	
2428	4822 124 12032	4,7µF 20% 50V	
2429	4822 124 12032	4,7µF 20% 50V	
2432	2020 552 94427	100pF 5% 50V	
2437	2238 586 59812	100nF 50V	
2438	4822 124 81286	47µF 20% 16V	
2439	4822 124 81286	47µF 20% 16V	
2455	2238 586 59812	100nF 50V	
2456	4822 122 33761	22pF 5% 50V	
2457	2020 552 94427	100pF 5% 50V	
2458	2020 552 94427	100pF 5% 50V	
2459	2238 586 59812	100nF 50V	
2460	2238 586 59812	100nF 50V	
2461	3198 028 52290	22µF 20% 50V	
2462	3198 028 52290	22µF 20% 50V	
2463	2238 586 59812	100nF 50V	
2464	2238 586 59812	100nF 50V	
2466	4822 126 14238	2,2nF 50V	
2467	4822 124 12032	4,7µF 20% 50V	
2468	2238 586 59812	100nF 50V	
2471	3198 017 34730	47nF 16V	/22
2473	2238 586 59812	100nF 50V	
2478	2238 586 59812	100nF 50V	
2482	2238 586 59812	100nF 50V	

RESISTORS

3300	4822 116 52231	820Ω 5% 0,5W	
3301	4822 117 12925	47k 1% 0,063W	
3304	4822 117 12968	820Ω 5% 0,62W	
3305	4822 117 12968	820Ω 5% 0,62W	
3306	4822 117 12968	820Ω 5% 0,62W	
3307	4822 117 12968	820Ω 5% 0,62W	
3308	4822 117 12968	820Ω 5% 0,62W	
3309	4822 117 12968	820Ω 5% 0,62W	
3310	4822 117 12968	820Ω 5% 0,62W	
3311	4822 117 12968	820Ω 5% 0,62W	
3312	4822 117 12968	820Ω 5% 0,62W	
3313	4822 117 12968	820Ω 5% 0,62W	
3314	4822 117 12968	820Ω 5% 0,62W	
3315	4822 117 12968	820Ω 5% 0,62W	
3316	4822 051 30103	10k 5% 0,062W	
3317	4822 051 30103	10k 5% 0,062W	
3318	4822 051 30272	2k7 5% 0,062W	
3319	4822 051 30221	220Ω 5% 0,062W	
3320	4822 051 30271	270Ω 5% 0,062W	
3321	4822 051 30391	390Ω 5% 0,062W	
3322	4822 051 30561	560Ω 5% 0,062W	
3323	4822 051 30272	2k7 5% 0,062W	
3324	4822 051 30151	150Ω 5% 0,062W	
3325	4822 051 30221	220Ω 5% 0,062W	
3326	4822 116 83876	270Ω 5% 0,5W	
3328	4822 117 12968	820Ω 5% 0,62W	
3329	4822 051 30391	390Ω 5% 0,062W	
3330	4822 116 52226	560Ω 5% 0,5W	
3331	4822 116 52231	820Ω 5% 0,5W	
3332	4822 116 52207	1k2 5% 0,5W	
3334	4822 116 52283	4k7 5% 0,5W	
3335	4822 051 30272	2k7 5% 0,062W	
3336	4822 051 30151	150Ω 5% 0,062W	
3337	4822 051 30221	220Ω 5% 0,062W	
3338	4822 116 83876	270Ω 5% 0,5W	
3339	4822 051 30391	390Ω 5% 0,062W	
3340	4822 051 30561	560Ω 5% 0,062W	
3341	4822 117 12968	820Ω 5% 0,62W	
3342	4822 117 11817	1k2 1% 1/16W	
3343	4822 117 12903	1k8 1% 0,063W	
3344	4822 051 30272	2k7 5% 0,062W	
3345	4822 051 30151	150Ω 5% 0,062W	
3350	4822 117 11817	1k2 1% 1/16W	
3351	4822 117 12903	1k8 1% 0,063W	
3352	4822 051 30272	2k7 5% 0,062W	
3353	4822 051 30472	4k7 5% 0,062W	
3354	4822 051 30103	10k 5% 0,062W	
3404	4822 051 30684	680k 5% 0,062W	
3405	4822 051 30474	470k 5% 0,062W	
3406	4822 051 30153	15k 5% 0,062W	
3407	4822 051 30152	1k5 5% 0,062W	/22
3408	4822 051 30103	10k 5% 0,062W	/22
3409	4822 051 30222	2k2 5% 0,062W	/22
3410	4822 117 12891	220k 1%	/22
3413	4822 117 13632	100k 1% 0,62W	
3416	4822 051 30102	1k 5% 0,062W	/22
3417	4822 051 30102	1k 5% 0,062W	/22
3418	4822 050 21003	10k 1% 0,6W	/21/21M/37
3419	4822 051 30103	10k 5% 0,062W	/21/21M/37
3420	4822 051 30272	2k7 5% 0,062W	
3421	4822 051 30102	1k 5% 0,062W	
3422	4822 051 30684	680k 5% 0,062W	
3423	4822 116 52249	1k8 5% 0,5W	
3424	4822 117 12891	220k 1%	
3425	4822 051 30682	6k8 5% 0,062W	
3426	4822 051 30102	1k 5% 0,062W	
3427	4822 051 30102	1k 5% 0,062W	
3428	4822 051 30682	6k8 5% 0,062W	
3429	4822 116 83872	220Ω 5% 0,5W	
3430	4822 052 10688 ⚠	6Ω8 5% 0,33W	
3431	4822 116 83872	220Ω 5% 0,5W	
3432	4822 052 10109 ⚠	10Ω 5% 0,33W	
3433	4822 116 52257	22k 5% 0,5W	
3438	3198 021 32250	2M2 5%	
3440	4822 051 30103	10k 5% 0,062W	
3441	4822 051 30103	10k 5% 0,062W	
3442	4822 051 30103	10k 5% 0,062W	
3443	4822 051 30102	1k 5% 0,062W	
3444	4822 051 30102	1k 5% 0,062W	
3445	4822 051 30102	1k 5% 0,062W	
3447	4822 051 30103	10k 5% 0,062W	
3448	4822 116 83872	220Ω 5% 0,5W	
3449	4822 116 83872	220Ω 5% 0,5W	
3450	4822 051 30471	470Ω 5% 0,062W	
3451	4822 051 30471	470Ω 5% 0,062W	
3452	4822 051 30471	470Ω 5% 0,062W	
3453	4822 116 83883	470Ω 5% 0,5W	
3454	4822 116 83883	470Ω 5% 0,5W	
3455	4822 051 30471	470Ω 5% 0,062W	
3456	4822 051 30471	470Ω 5% 0,062W	
3457	4822 051 30471	470Ω 5% 0,062W	
3458	4822 051 30102	1k 5% 0,062W	
3459	4822 051 30102	1k 5% 0,062W	
3460	4822 051 30102	1k 5% 0,062W	
3461	4822 051 30471	470Ω 5% 0,062W	
3462	4822 051 30102	1k 5% 0,062W	
3463	4822 051 30472	4k7 5% 0,062W	
3464	4822 051 30102	1k 5% 0,062W	
3465	4822 051 30102	1k 5% 0,062W	
3466	4822 116 52175	100Ω 5% 0,5W	
3467	4822 116 52175	100Ω 5% 0,5W	
3468	4822 116 52175	100Ω 5% 0,5W	
3469	4822 116 52175	100Ω 5% 0,5W	
3470	4822 050 11002	1k 1% 0,4W	
3471	4822 050 11002	1k 1% 0,4W	
3472	4822 051 30102	1k 5% 0,062W	
3473	4822 051 30471	470Ω 5% 0,062W	
3474	4822 051 30471	470Ω 5% 0,062W	
3475	4822 051 30471	470Ω 5% 0,062W	
3476	4822 051 30102	1k 5% 0,062W	
3477	4822 051 30102	1k 5% 0,062W	
3478	4822 051 30102	1k 5% 0,062W	
3479	4822 051 30102	1k 5% 0,062W	
3480	4822 051 30102	1k 5% 0,062W	

ELECTRICAL PARTS LIST - FRONT BOARD

RESISTORS

3481	4822 051 30102	1k 5% 0,062W
3482	4822 050 11002	1k 1% 0,4W
3483	4822 050 11002	1k 1% 0,4W
3484	4822 051 30102	1k 5% 0,062W
3485	4822 051 30102	1k 5% 0,062W
3486	4822 051 30102	1k 5% 0,062W
3487	4822 051 30102	1k 5% 0,062W
3489	4822 051 30102	1k 5% 0,062W
3490	4822 051 30102	1k 5% 0,062W
3491	4822 051 30102	1k 5% 0,062W
3492	4822 051 30102	1k 5% 0,062W
3493	4822 051 30102	1k 5% 0,062W
3494	4822 051 30102	1k 5% 0,062W
3495	4822 051 30102	1k 5% 0,062W
3496	4822 051 30102	1k 5% 0,062W
3497	4822 051 30102	1k 5% 0,062W
3498	4822 051 30102	1k 5% 0,062W
3499	4822 051 30102	1k 5% 0,062W
3500	4822 051 30102	1k 5% 0,062W
3501	4822 051 30102	1k 5% 0,062W
3502	4822 051 30102	1k 5% 0,062W
3503	4822 051 30102	1k 5% 0,062W
3504	4822 051 30102	1k 5% 0,062W
3505	4822 051 30102	1k 5% 0,062W
3506	4822 051 30102	1k 5% 0,062W
3507	4822 051 30102	1k 5% 0,062W
3508	4822 051 30102	1k 5% 0,062W
3509	4822 051 30102	1k 5% 0,062W
3510	4822 051 30102	1k 5% 0,062W
3511	4822 051 30102	1k 5% 0,062W
3512	4822 051 30102	1k 5% 0,062W
3513	4822 051 30102	1k 5% 0,062W
3514	4822 051 30102	1k 5% 0,062W
3515	4822 051 30102	1k 5% 0,062W
3516	4822 051 30102	1k 5% 0,062W
3517	4822 051 30102	1k 5% 0,062W
3518	4822 051 30102	1k 5% 0,062W
3519	4822 051 30102	1k 5% 0,062W
3520	4822 051 30102	1k 5% 0,062W
3521	4822 051 30102	1k 5% 0,062W
3522	4822 051 30102	1k 5% 0,062W
3523	4822 051 30102	1k 5% 0,062W
3524	4822 051 30102	1k 5% 0,062W
3525	4822 051 30102	1k 5% 0,062W
3526	4822 051 30471	470Ω 5% 0,062W
3527	4822 051 30471	470Ω 5% 0,062W
3528	4822 051 30103	10k 5% 0,062W
3529	4822 051 30103	10k 5% 0,062W
3530	4822 051 30103	10k 5% 0,062W
3531	4822 051 30103	10k 5% 0,062W
3532	4822 052 10688 ⚠	6Ω8 5% 0,33W
3533	4822 052 10109 ⚠	10Ω 5% 0,33W
3536	4822 051 30472	4k7 5% 0,062W
3537	4822 051 30472	4k7 5% 0,062W
3538	4822 116 52175	100Ω 5% 0,5W
3539	4822 051 30103	10k 5% 0,062W
3540	4822 051 30102	1k 5% 0,062W
3543	4822 051 30102	1k 5% 0,062W
4300	4822 051 30008	0Ω Jumper 0603
4301	4822 051 30008	0Ω Jumper 0603
4302	4822 051 30008	0Ω Jumper 0603
4400	4822 051 30008	0Ω Jumper 0603
4402	4822 051 30008	0Ω Jumper 0603
4403	4822 051 30008	0Ω Jumper 0603
4404	4822 051 30008	0Ω Jumper 0603
4410	4822 051 30008	0Ω Jumper 0603
4411	4822 051 30008	0Ω Jumper 0603
4420	4822 051 30008	0Ω Jumper 0603
4421	4822 051 30008	0Ω Jumper 0603
4422	4822 051 30008	0Ω Jumper 0603
4423	4822 051 30008	0Ω Jumper 0603
4424	4822 051 30008	0Ω Jumper 0603
4425	4822 051 30008	0Ω Jumper 0603
4426	4822 051 30008	0Ω Jumper 0603
4427	4822 051 30008	0Ω Jumper 0603
4428	4822 051 30008	0Ω Jumper 0603
4429	4822 051 30008	0Ω Jumper 0603
4430	4822 051 30008	0Ω Jumper 0603
4431	4822 051 30008	0Ω Jumper 0603
4432	4822 051 30008	0Ω Jumper 0603
4433	4822 051 30008	0Ω Jumper 0603
4434	4822 051 30008	0Ω Jumper 0603
4435	4822 051 30008	0Ω Jumper 0603
4436	4822 051 30008	0Ω Jumper 0603
4437	4822 051 30008	0Ω Jumper 0603
4438	4822 051 30008	0Ω Jumper 0603
4439	4822 051 30008	0Ω Jumper 0603
4440	4822 051 30008	0Ω Jumper 0603
4441	4822 051 30008	0Ω Jumper 0603
4442	4822 051 30008	0Ω Jumper 0603
4443	4822 051 30008	0Ω Jumper 0603
4444	4822 051 30008	0Ω Jumper 0603
4445	4822 051 30008	0Ω Jumper 0603
4446	4822 051 30008	0Ω Jumper 0603
4447	4822 051 30008	0Ω Jumper 0603
4448	4822 051 30008	0Ω Jumper 0603
4449	4822 051 30008	0Ω Jumper 0603
4450	4822 051 30008	0Ω Jumper 0603
4451	4822 051 30008	0Ω Jumper 0603
4452	4822 051 30008	0Ω Jumper 0603
4453	4822 051 30008	0Ω Jumper 0603
4454	4822 051 30008	0Ω Jumper 0603

ELECTRICAL PARTS LIST - FRONT BOARD

RESISTORS

4455	4822 051 30008	0Ω Jumper 0603
4456	4822 051 30008	0Ω Jumper 0603
4457	4822 051 30008	0Ω Jumper 0603
4458	4822 051 30008	0Ω Jumper 0603
4459	4822 051 30008	0Ω Jumper 0603
4460	4822 051 30008	0Ω Jumper 0603
4461	4822 051 30008	0Ω Jumper 0603
4462	4822 051 30008	0Ω Jumper 0603

COILS & FILTERS

5300	3198 018 52280	Coil 2,2µH 10%
5301	3198 018 52280	Coil 2,2µH 10%
5302	3198 018 52280	Coil 2,2µH 10%
5401	3198 018 54780	Coil 4,7µH 10%
5402	3198 018 54780	Coil 4,7µH 10%
5403	2422 543 01069	RES XTL 32,768kHz
5404	9940 000 01973	RES CER 12MHz
5405	4822 242 11033	RES XTL 4,332MHz /22
5406	3198 018 52280	Coil 2,2µH 10% /22
5407	3198 018 52280	Coil 2,2µH 10%
5408	3198 018 54780	Coil 4,7µH 10%
5409	3198 018 54780	Coil 4,7µH 10%
5410	3198 018 54780	Coil 4,7µH 10%
5411	3198 018 54780	Coil 4,7µH 10%

DIODES

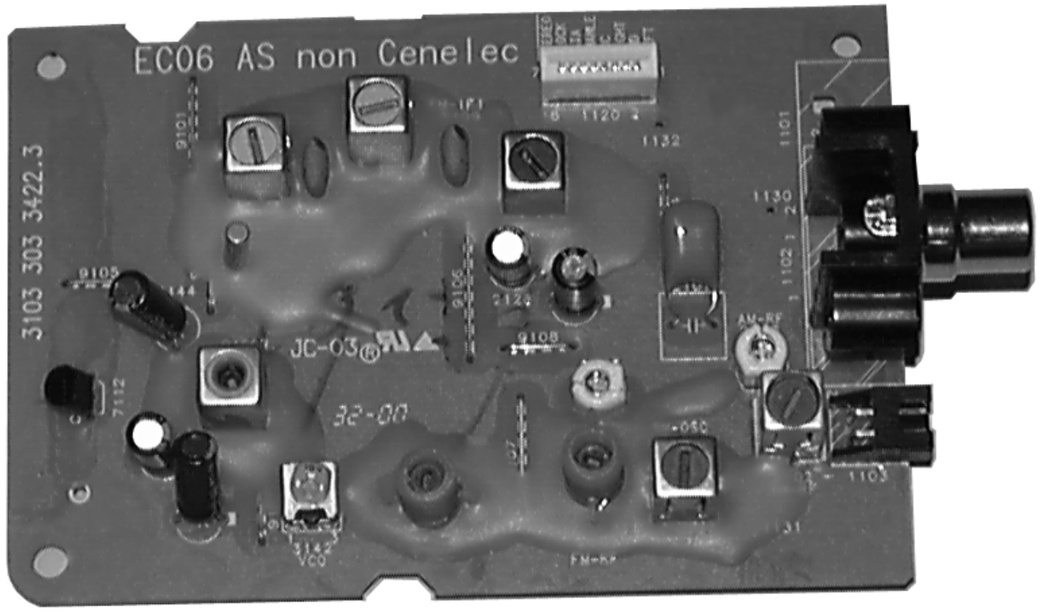
6300	4822 130 30621	1N4148
6301	9940 000 01233	LED VS LTL-816EELC
6302	9940 000 00266	LED VS LTL-8166FTNN
6303	9940 000 00266	LED VS LTL-8166FTNN
6304	9940 000 00266	LED VS LTL-8166FTNN
6305	9940 000 00266	LED VS LTL-8166FTNN
6306	9940 000 01965	LED VS LTL-8166FTNN
6307	9940 000 00266	LED VS LTL-8166FTNN
6401	4822 130 30621	1N4148
6403	4822 130 31878	1N4003G
6404	4822 130 34278	BZX79-B6V8
6405	4822 130 31878	1N4003G
6406	4822 130 31878	1N4003G
6407	4822 130 30621	1N4148
6408	4822 130 30621	1N4148
6409	4822 130 30621	1N4148
6410	4822 130 30621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

7301	9940 000 01971	IR Receiver TSOP4836ZC1
7400	9940 000 01969	MCU TMP88CU74YF
7401	9940 000 01968	M24C02-WMN6
7403	9352 686 05118	SAA6581T /22
7404	5322 130 60159	BC847B
7405	5322 130 60159	BC847B
7406	4822 130 60373	BC857B
7407	9940 000 01967	74HC4094D

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

Note:
Components printed in grey colour are considered as standard spareparts and thus not available on service stock.
Code numbers are published for orientation only.



ECO6 Tuner Board

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

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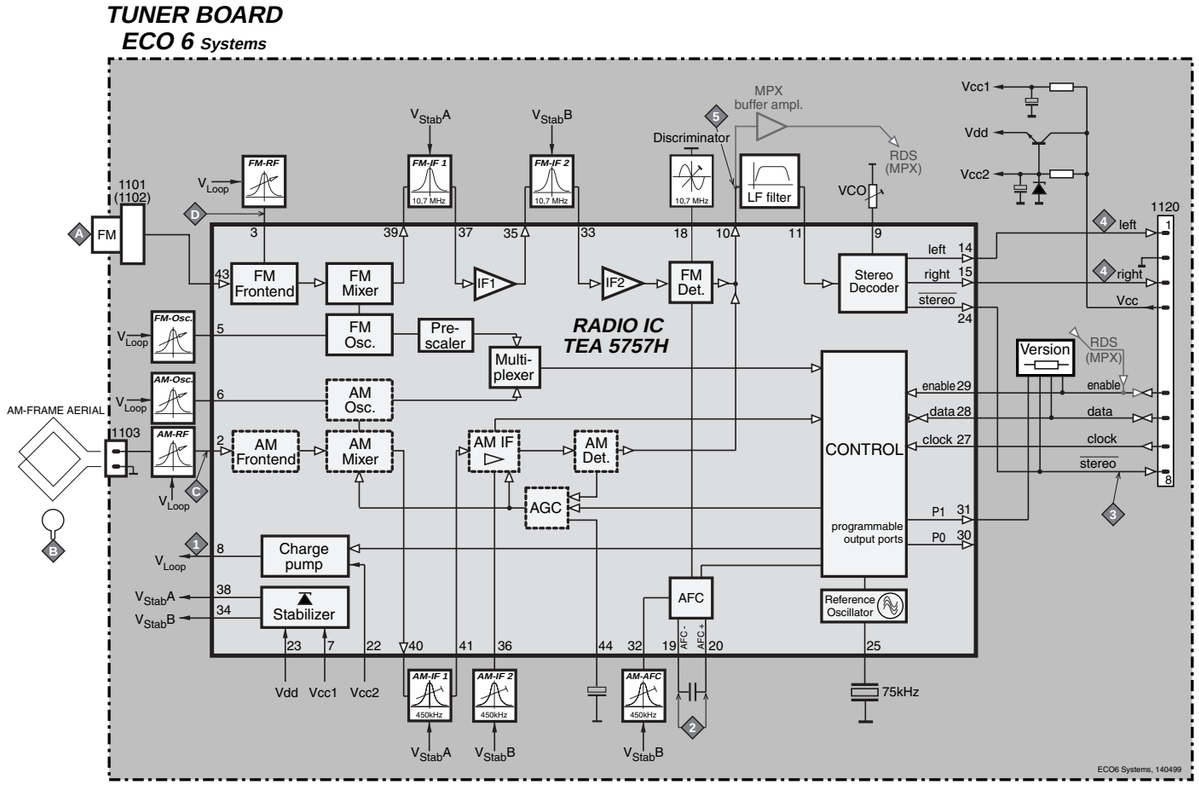
BLOCK DIAGRAM



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TUNER BOARD ECO6 / SYSTEMS NON CENELEC

VERSION PROGRAMMING COMPONENTS

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

☒ component mounted

VERSION DETECTION

LEGEND

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

Ⓥ 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

ECO6 Sys-non Cenelec, 000911

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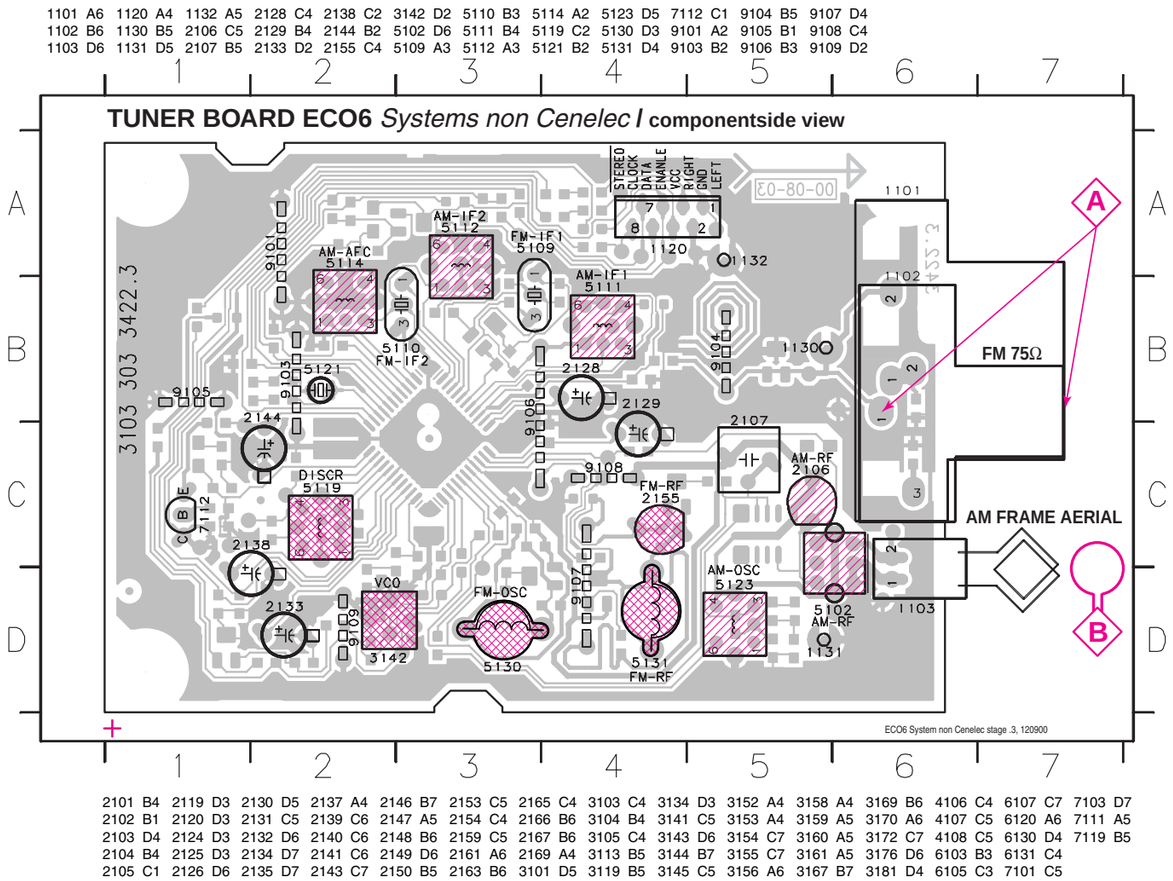
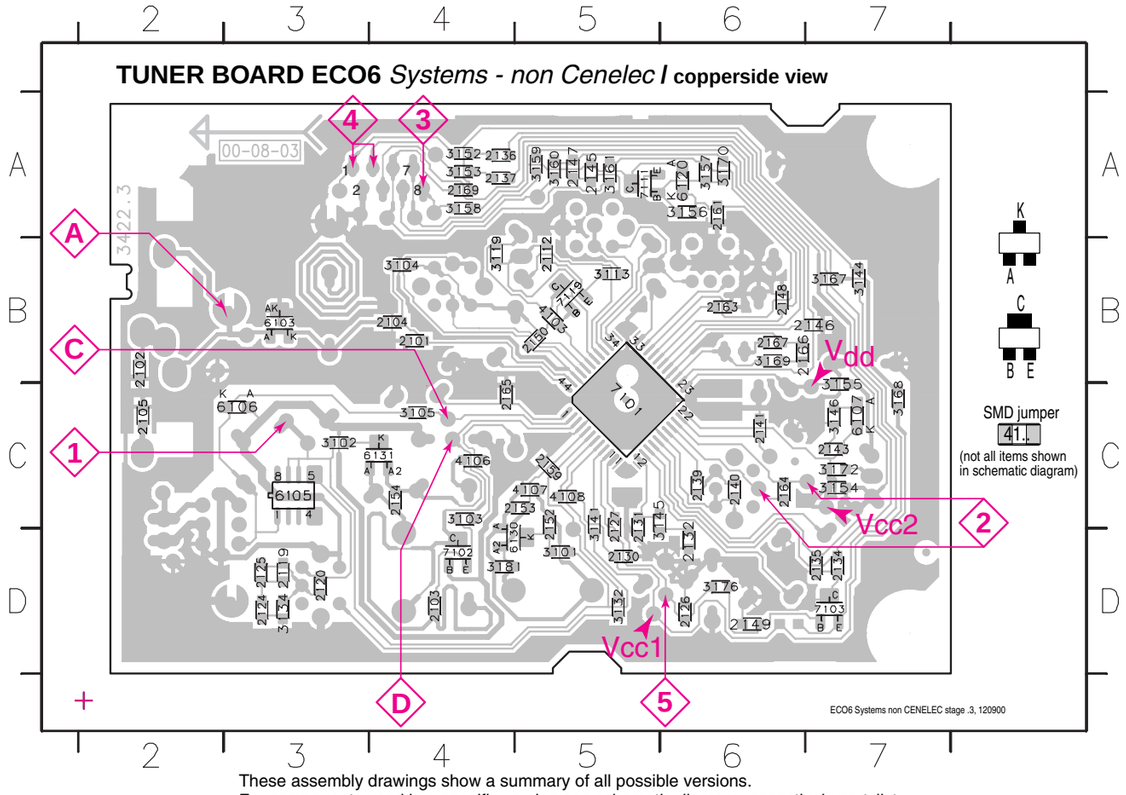




These assembly drawings show a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

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 — 100nF — 220R	5111	◇5	max. / f_o symmetric
			see remark [2] IC 7101 40 — 100nF — 220R	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

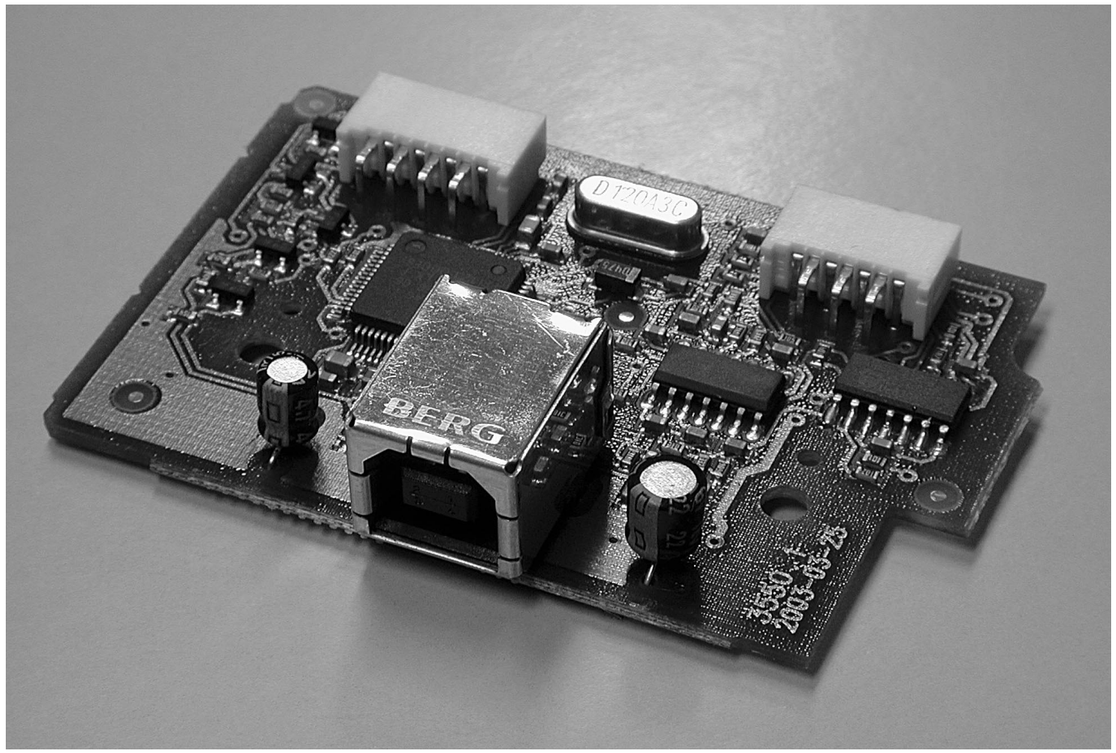
6103 ©	5322 130 34337	BAV99	
6105 ©	4822 130 83075	HN1V02H	
6106 ©	4822 130 83757	BAS216	
6107 ©	9340 386 90115	BZX284-C11	
6120 ©	4822 130 83757	BAS216	
6130 ©	4822 130 82833	1SV228	
6131 ©	4822 130 82833	1SV228	

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



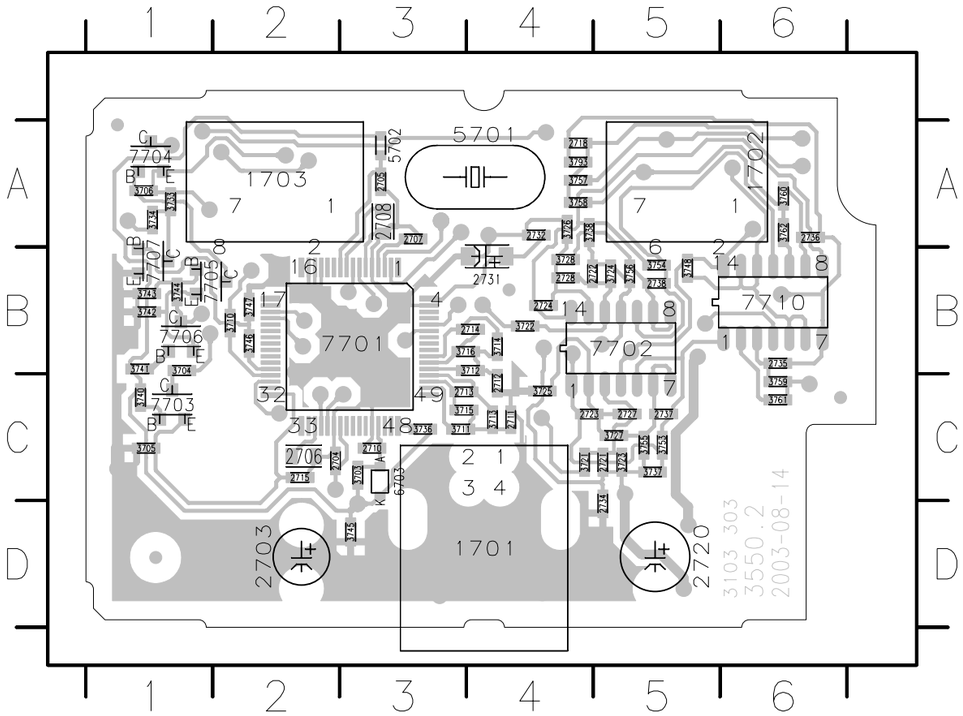
USB Sound Agent

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

In case of defects please replace the entire board.

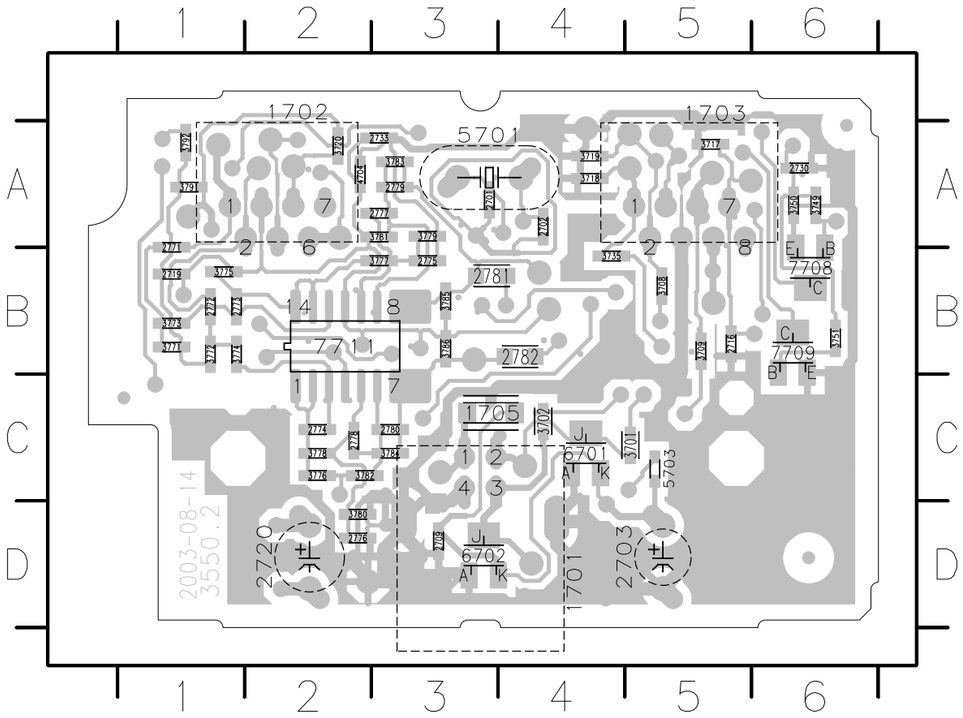
The board can be ordered with codenumber “3103 308 67740”.

Printed Circuit Board – Side A



1701	D4	3725	C4
1702	A6	3726	A4
1703	A2	3727	C5
2703	D2	3728	B4
2704	C2	3733	A1
2705	A3	3734	A1
2706	C2	3736	C3
2707	A3	3737	C5
2708	A3	3738	A4
2710	C3	3740	C1
2711	C4	3741	B1
2712	C4	3742	B1
2713	C3	3743	B1
2714	B4	3744	B1
2715	C2	3745	D3
2718	A4	3746	B2
2720	D5	3747	B2
2721	C5	3748	B5
2722	B4	3753	C5
2723	C4	3754	B5
2724	B4	3755	C5
2727	C5	3756	B5
2728	B4	3757	A4
2731	B4	3758	A4
2732	A4	3759	C6
2734	D5	3760	A6
2735	B6	3761	C6
2736	A6	3762	A6
2737	C5	3793	A4
2738	B5	5701	A4
3703	C3	5702	A3
3704	B1	6703	C3
3705	C1	7701	B3
3706	A1	7702	B5
3710	B2	7703	C1
3711	C3	7704	A1
3712	B4	7705	B1
3713	C4	7706	B1
3714	B4	7707	B1
3715	C3	7710	B6
3716	B3		
3721	C4		
3722	B4		
3723	C5		
3724	B5		

Printed Circuit Board – Side B



1701	D3	3779	A3
1702	A2	3780	D2
1703	A5	3781	A3
1705	C3	3782	C2
2701	A3	3783	A3
2702	A4	3784	C3
2703	D5	3785	B3
2709	D3	3786	B3
2716	B5	3791	A1
2719	B1	3792	A1
2720	D2	4704	A2
2730	A6	5701	A3
2733	A3	5703	C4
2771	A1	6701	C4
2772	B1	6702	D3
2773	B1	7708	B6
2774	C2	7709	B6
2775	B3	7711	B2
2776	D2		
2777	A3		
2778	C2		
2779	A3		
2780	C3		
2781	B3		
2782	B4		
3701	C5		
3702	C4		
3708	B5		
3709	B5		
3717	A5		
3718	A4		
3719	A4		
3720	A2		
3735	B4		
3749	A6		
3750	A6		
3751	B6		
3771	B1		
3772	B1		
3773	B1		
3774	B1		
3775	B1		
3776	C2		
3777	B3		
3778	C2		

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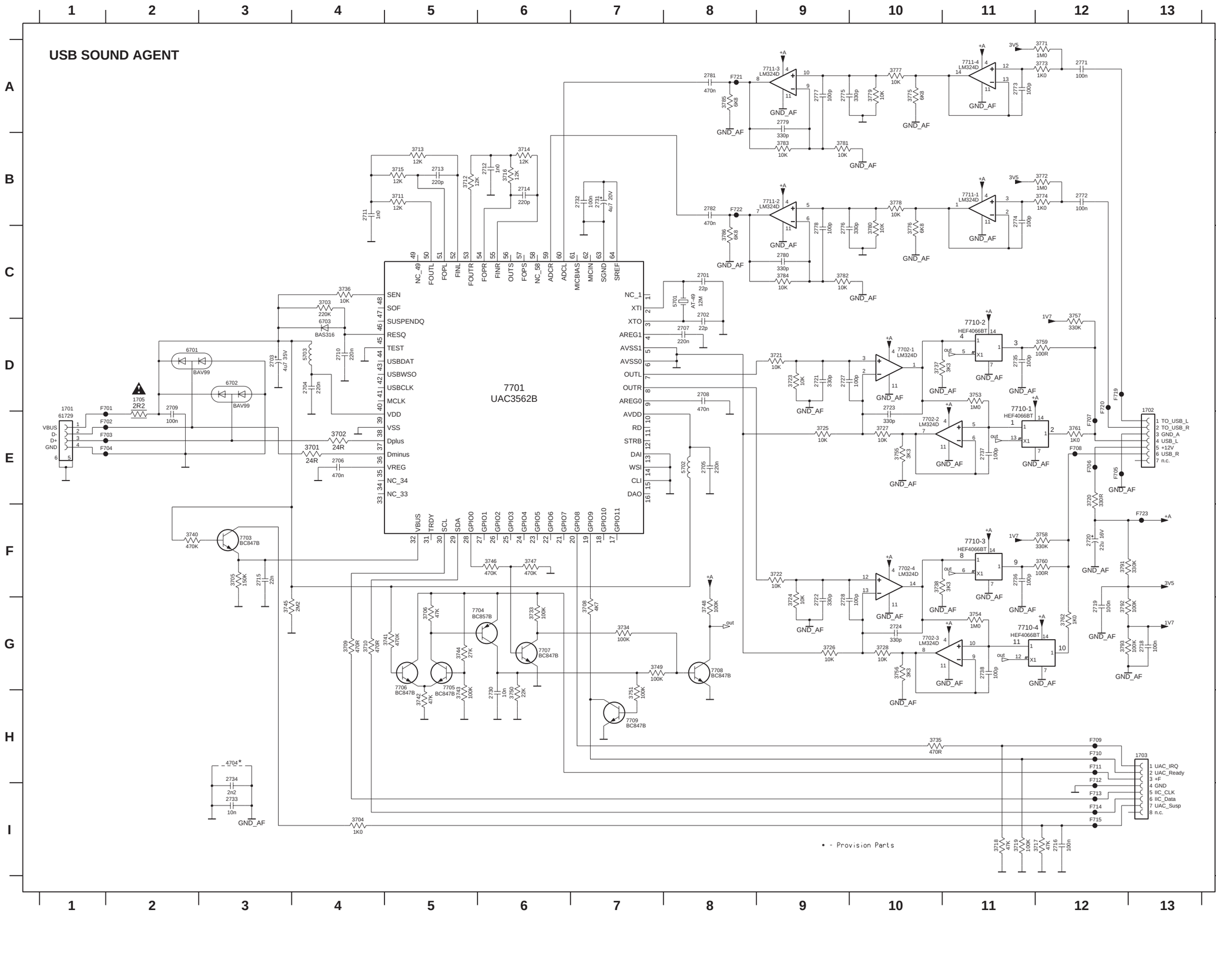
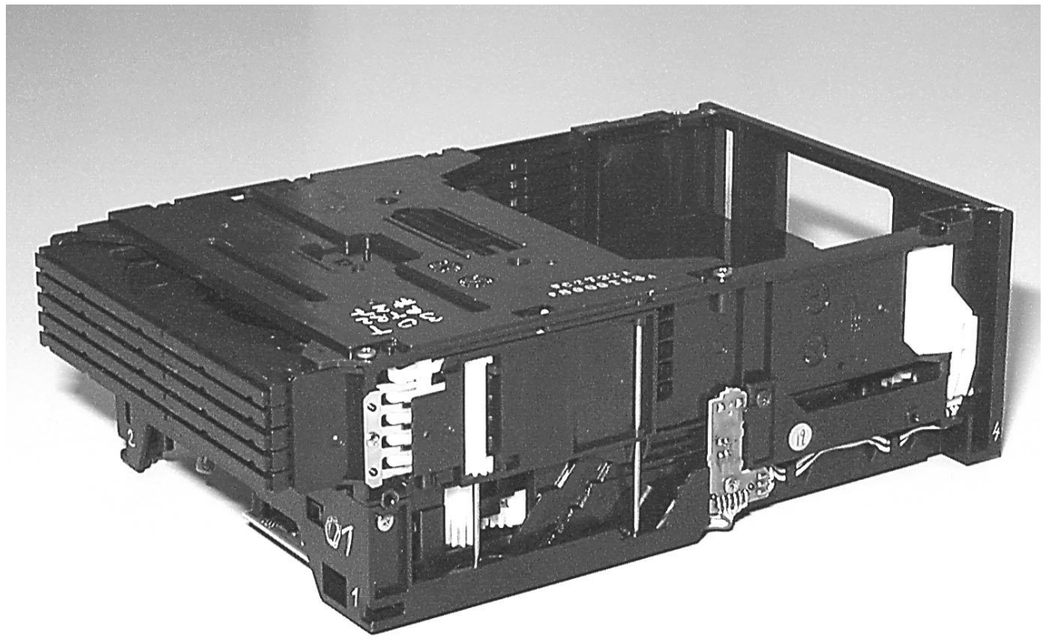
USB SOUND AGENT



1701 D1	3777 A10
1702 E13	3778 B10
1703 H13	3779 A10
1705 D2	3780 C10
2701 C8	3781 B9
2702 C8	3782 C9
2703 D3	3783 B9
2704 D4	3784 C9
2705 E8	3785 A8
2706 E4	3786 C8
2707 D8	3791 F12
2708 D8	3792 G12
2709 D2	3793 G12
2710 D4	4704 H3
2711 B4	5701 C8
2712 B6	5702 E8
2713 B5	5703 D4
2714 B6	6701 D2
2715 F3	6702 D3
2716 I12	6703 D4
2718 G13	7701 D6
2719 G12	7702-1 D10
2720 F12	7702-2 E10
2721 D9	7702-3 G10
2722 G9	7702-4 F10
2723 D10	7703 F3
2724 G10	7704 G5
2727 D9	7705 G5
2728 G9	7706 G5
2730 H6	7707 G6
2731 B7	7708 G8
2732 B7	7709 H7
2733 I3	7710-1 D11
2734 H3	7710-2 D11
2735 D11	7710-3 F11
2736 F11	7710-4 G12
2737 E11	7711-1 B11
2738 G11	7711-2 B9
2771 A12	7711-3 A9
2772 B12	7711-4 A11
2773 A11	F701 D2
2774 B11	F702 E2
2775 A9	F703 E2
2776 C9	F704 E2
2777 A9	F705 E12
2778 C9	F706 E12
2779 A9	F707 E12
2780 C9	F708 E12
2781 A8	F709 H12
2782 B8	F710 H12
3701 E4	F711 H12
3702 E4	F712 H12
3703 C4	F713 I12
3704 I4	F714 I12
3705 F3	F715 I12
3706 G5	F719 D12
3708 G7	F720 D12
3709 G4	F721 A8
3710 G4	F722 B8
3711 B5	F723 F13
3712 B5	
3713 B5	
3714 B6	
3715 B5	
3716 B6	
3717 I12	
3718 I11	
3719 I11	
3720 E12	
3721 D9	
3722 F9	
3723 D9	
3724 G9	
3725 E9	
3726 G9	
3727 E10	
3728 G10	
3733 G6	
3734 G7	
3735 H10	
3736 C4	
3737 D10	
3738 F10	
3740 F2	
3741 G5	
3742 H5	
3743 H5	
3744 G5	
3745 G3	
3746 F6	
3747 F6	
3748 G8	
3749 G7	
3750 H6	
3751 H7	
3753 D11	
3754 G11	
3755 E10	
3756 G10	
3757 C12	
3758 F12	
3759 D12	
3760 F12	
3761 E12	
3762 G12	
3771 A12	
3772 B12	
3773 A12	
3774 B12	
3775 A10	
3776 C10	



5DTC Module

(MP3 version)

Layout stage CD .5/ Control .4

TABLE OF CONTENTS

Service Hints

In case of symptom „skipping tracks“ perform following actions:

1. VERIFY THE COMPLAINT

PLAYABILITY CHECK

Use CDDA SBC 444A: 4822 397 30245
TR 14 (600µ black dot) maximum at 01:15
TR 19 (fingerprint)
TR 10 (1000µ wedge)

Use CD-RW Printed Audio Disk 7104 099 96611
TR 3 (Fingerprint)
TR 8 (600µ black dot) maximum at 01:00

- playback of all these tracks without audible disturbance
- jump forward/backward within a reasonable time

2. CLEAN THE LENS

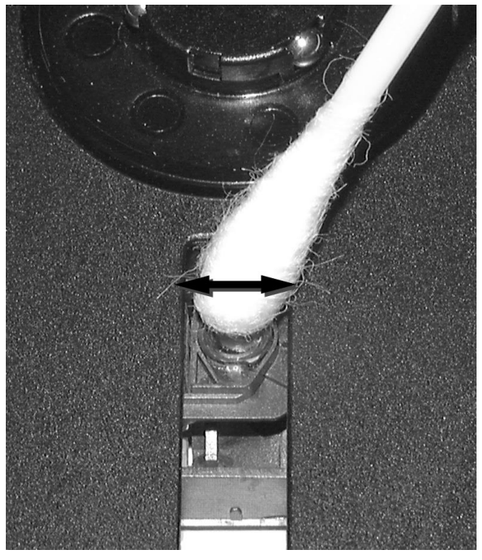
CD DRIVE – LENS CLEANING

Before touching the lens it is advised to clean the surface of the lens by blowing clean air over it in order to avoid that little particles make scratches on the lens.

Because the material of the lens is synthetic and coated with a special anti-reflectivity layer, cleaning must be done with a non-aggressive cleaning fluid. It is advised to use “KODAK LENS CLEANER CAT 176 71 36”, available in normal photo shops.

The actuator is a very precise mechanical component and may not be damaged in order to guarantee its full function. It is advised to clean the lens gently (don’t press too hard) with a soft and clean cotton bud moistened with the special lens cleaner.

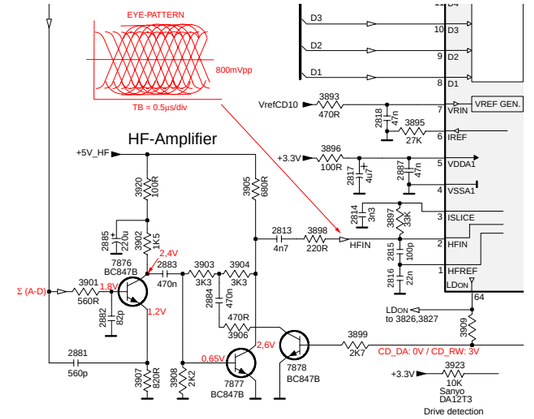
The direction of cleaning must be in the way as indicated in the picture below.



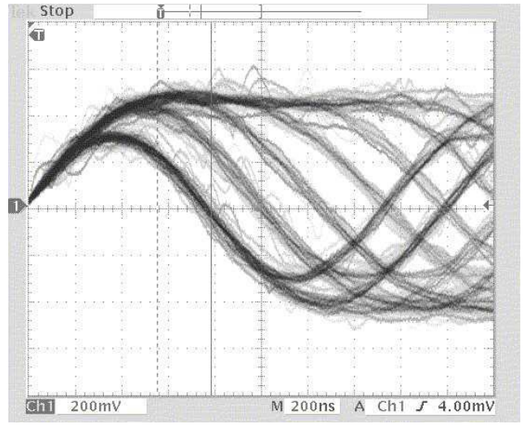
3. MEASURE THE EYE-PATTERN SIGNAL

EYE-PATTERN SIGNAL – JITTER MEASUREMENT

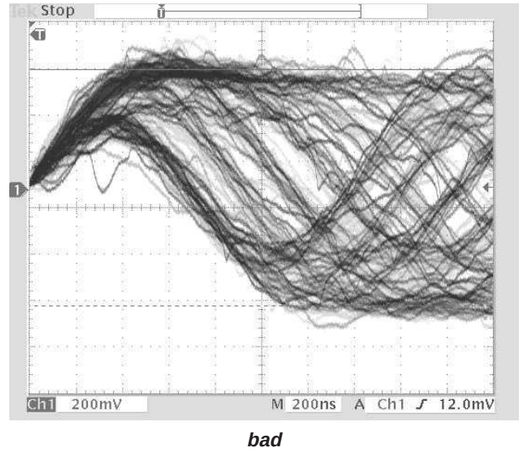
Measure the signal direct on resistor 3898 using an oscilloscope (see also chapter 10-9).



See below examples of the signal. Amplitude should read at least 700mVpp using SBC444A.



good



bad

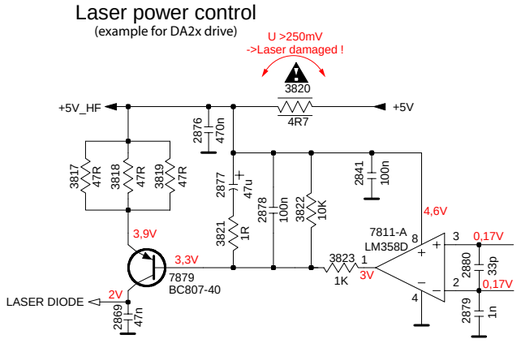
If the oscilloscope shows a signal like the ‘bad’ one, and/or the amplitude decreases within 1minute - the CD drive has to be replaced.

Service Hints

4. MEASURE THE LASER CURRENT

CD DRIVE – LASER CURRENT MEASUREMENT

The laser current can be measured as a voltage drop on resistor 3820. Typical value 170 - 190mV for CD-DA respectively 200 - 220mV for CD-RW.



5. MEASURE THE OFFSETS OF THE CD-DRIVE

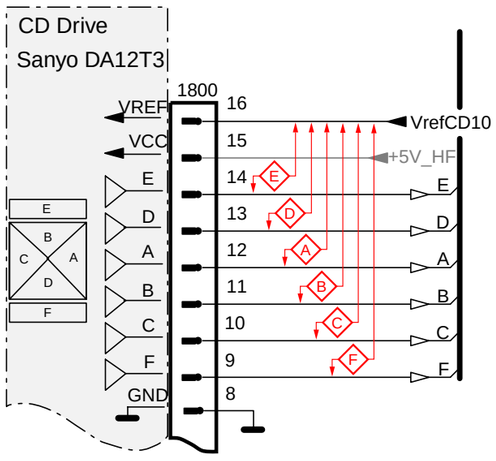
CD DRIVE – OFFSET MEASUREMENT

Each photodiode of the CD-drive may have an offset. This offset has to be compensated by the signal processor. A high offset of the CD-drive leads to poor playability of some CDs (skipping tracks).

Start the **Service Test Program** - section „Focus Test“ without a CD. Focus sensitivity = CD-RW.

Use a DC Millivoltmeter for measurement. The offsets can be measured direct on the connector. See drawing below.

The values from diode A-D should read 0±10mV. Diodes E and F are less critical.



If one of the offsets is higher than ±10mV the CD drive has to be replaced.

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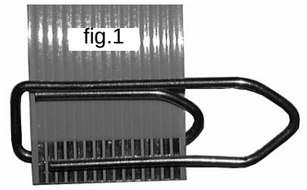
WARNING

CHARGED CAPACITORS ON THE SERVO BOARD MAY DAMAGE THE CD DRIVE ELECTRONICS WHEN CONNECTING A NEW CDM MECHANISM. THAT´S WHY, BESIDES THE SAFETY MEASURES LIKE
• SWITCH OFF POWER SUPPLY
• ESD PROTECTION
ADDITIONAL ACTIONS MUST BE TAKEN BY THE REPAIR TECHNICIAN.

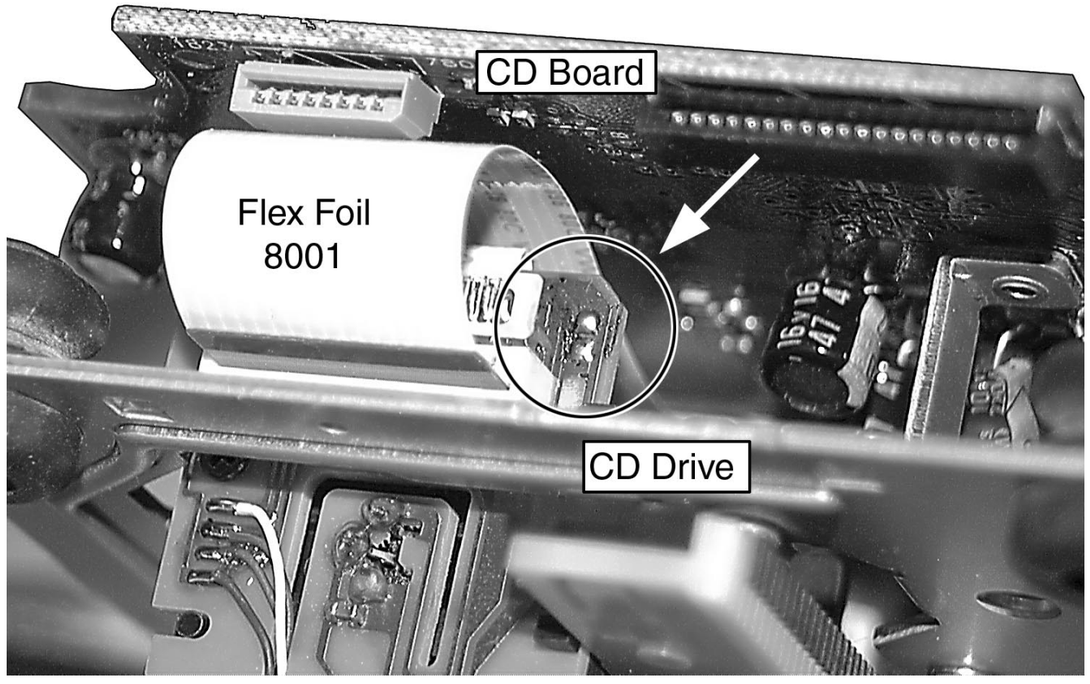
The CD drive forms a compact building block with the CD Board.



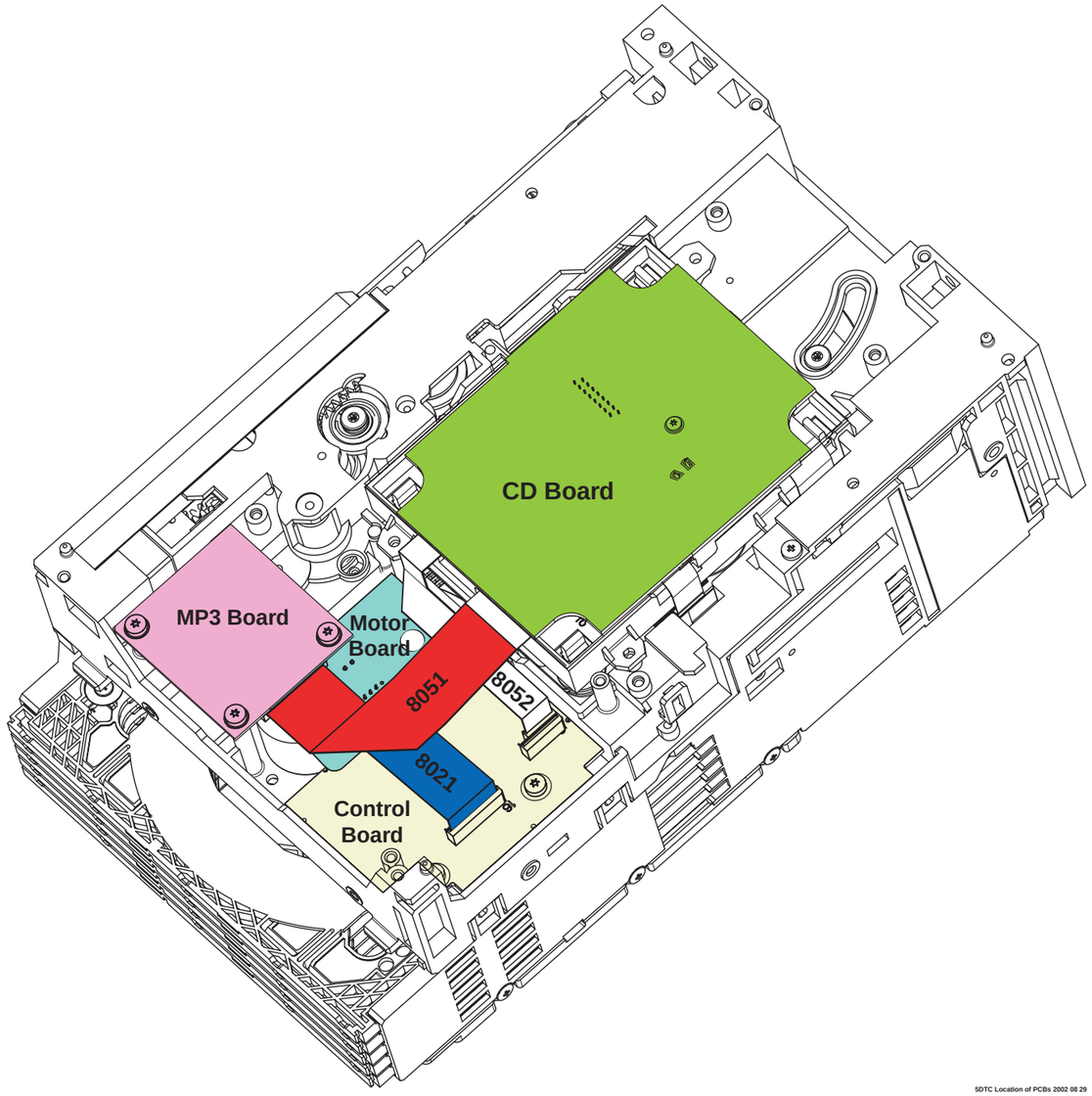
<u>The following steps have to be done when replacing the CD mechanism:</u>

1. Desolder disc and slide motor
2. Loosen 2x screw
1. Disconnect flexfoil from old CD drive
2. Put a paperclip over contacts of flexfoil to short-circuit the contacts (fig.1)
3. Remove old CD drive
4. Mount new CD drive to CD board
5. Solder disc and slide motor **after** fixing the drive to the board
5. Move slide outside
6. Remove paperclip from flexfoil
7. Connect flexfoil to new CD drive
8. Remove ESD-protection (solder joint) from laserunit (see picture below)

Attention: The laser diode of this CD drive is protected against ESD by a solder joint which shortcircuits the laserdiode to ground.
For proper functionality of the CD drive this solder joint must be removed **after** connection the drive to the set.

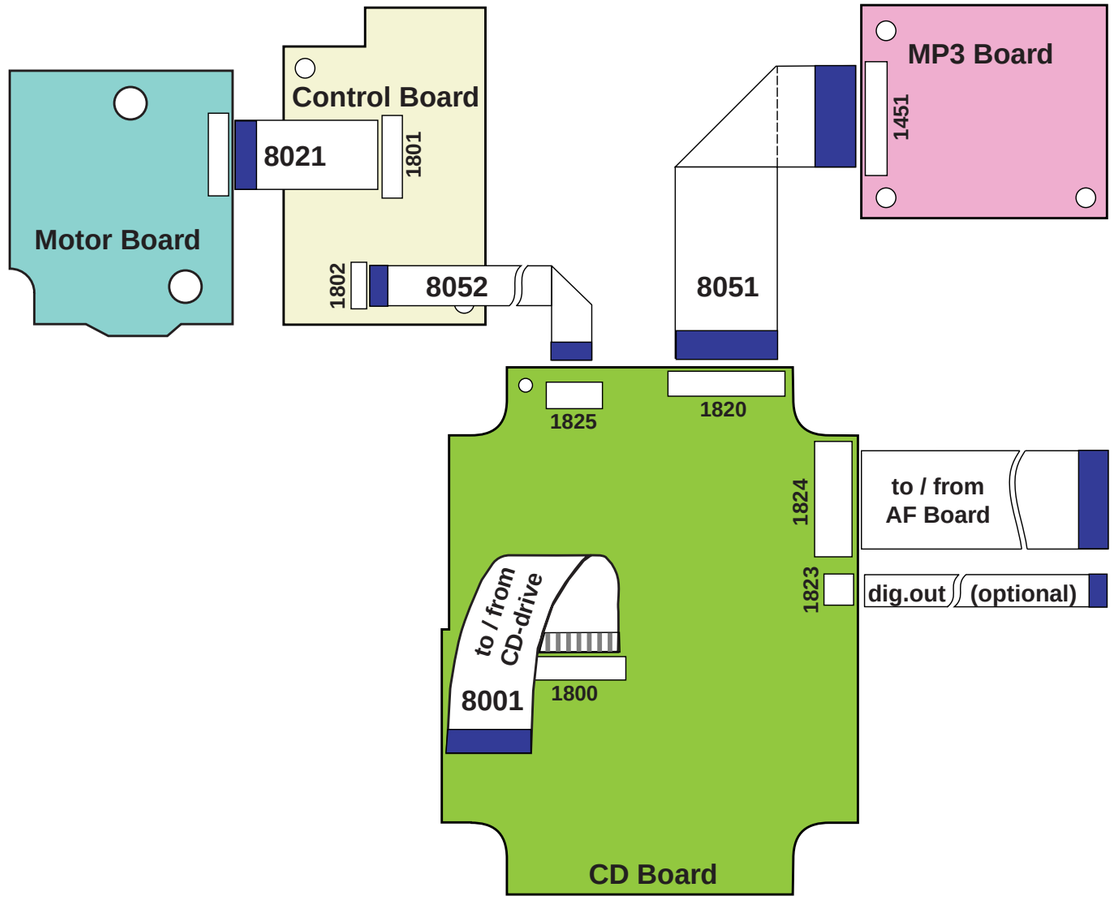


Location of Printed Circuit Boards



5DTC Location of PCBs 2002 08 29

Wiring Diagram 5DTC Module



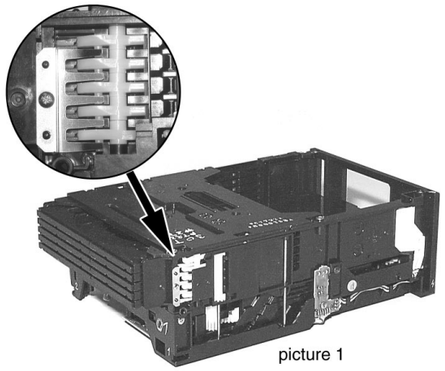
5DTC Wiring Diagram 2002 08 30

The FFC-Cables are available as sparepart.

8001	3103 308 93090	FFC CABLE 16Pin 80mm BD	Connection from CD Board to CD Drive
8051	3103 308 93100	FFC-CABLE 19Pin 90mm AD	Connection from CD Board to MP3 Board
8052	3103 308 93120	FFC CABLE 8Pin 80mm BD	Connection from CD Board to Control Board
8021	3103 308 93110	FFC-CABLE 16Pin 60mm AD	Connection from Control Board to Motor Board

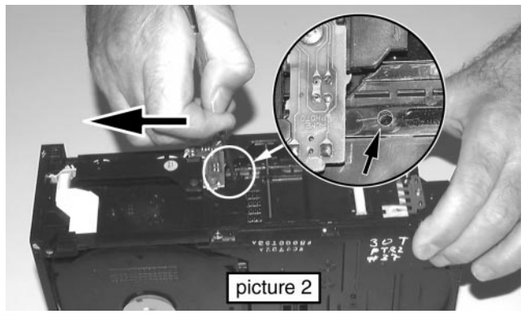
Emergency opening of the trays

The trays of the 5DTC are mechanically locked.

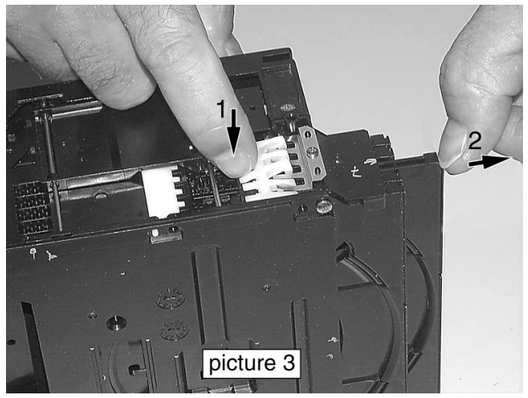


picture 1

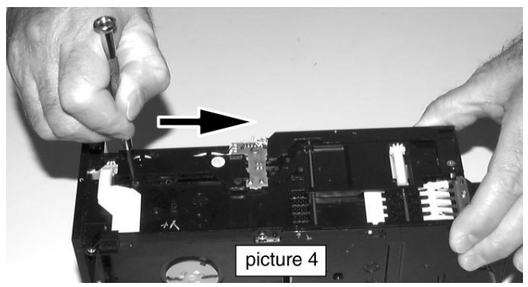
To open tray 1, 2 and 3 move lever (pos 29) backwards (e.g. with a screwdriver - see picture 2) to its endposition.



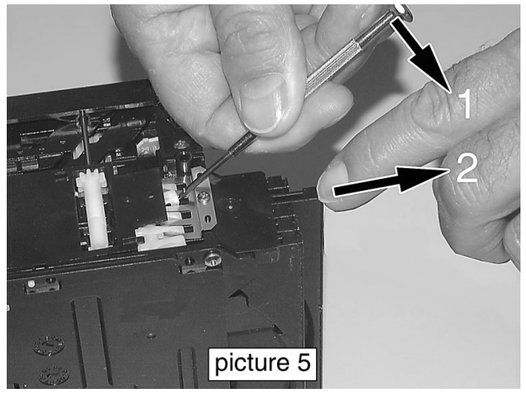
Release the locking mechanism and pull out the tray (see picture 3).



To open tray 4 and 5 move lever (pos 29) forward to its endposition (see picture 4).

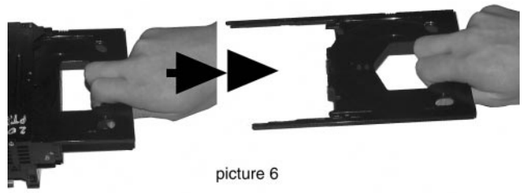


Release snap as shown in picture 5 and pull tray out.



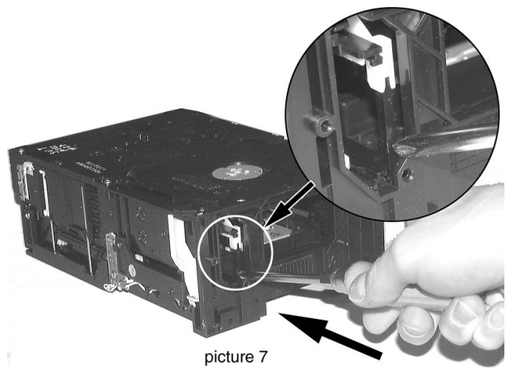
To remove a CD from Play Position perform following steps:

1. Open tray 1 as described before.
2. Tear the tray out with speed (see picture 6). The tray can be inserted aftewards without any alignment.



picture 6

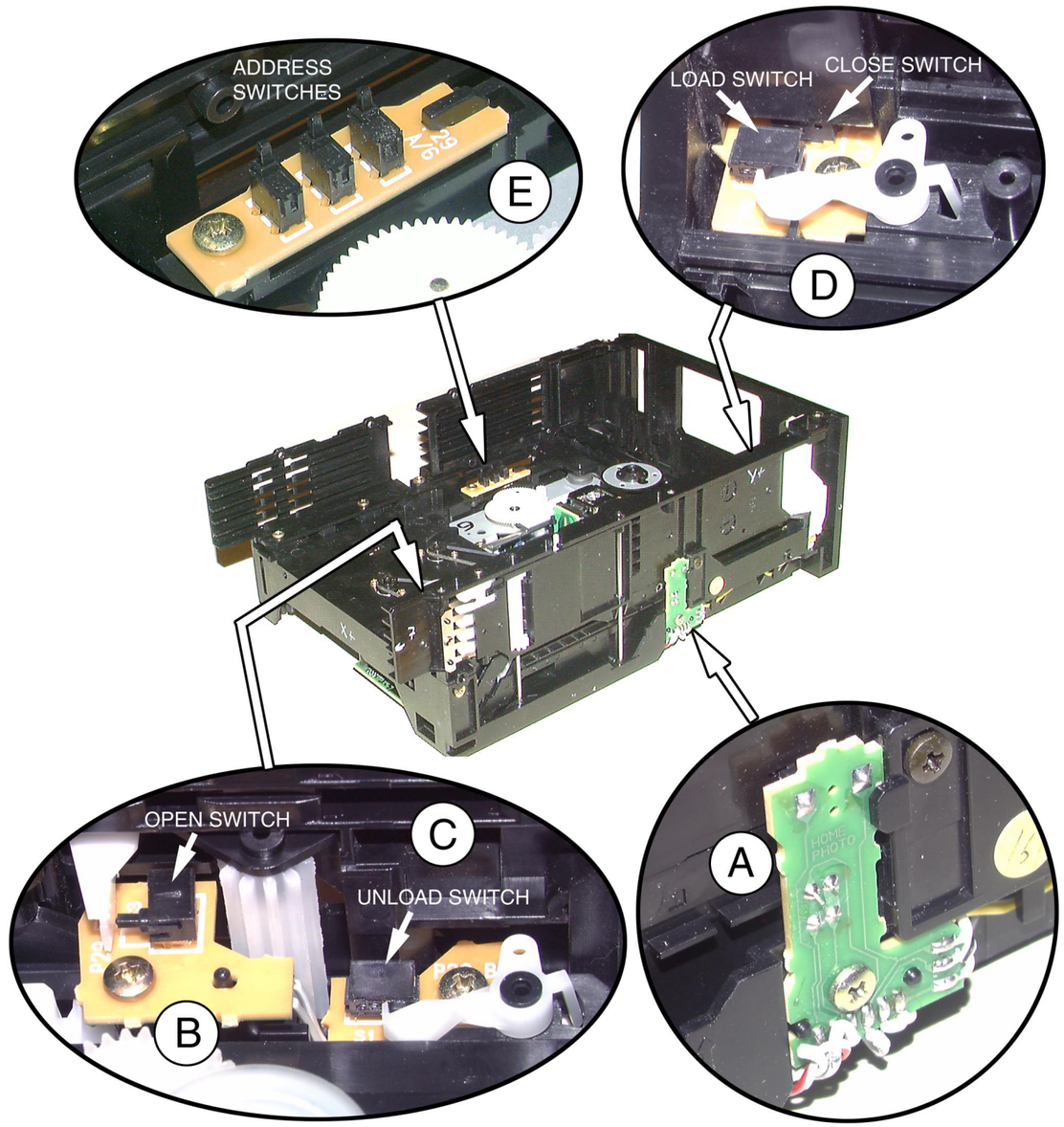
3. Move lever (pos 29) forward to its endposition (see picture 4).
4. Push lever (pos 31) forward (see picture 7).



picture 7

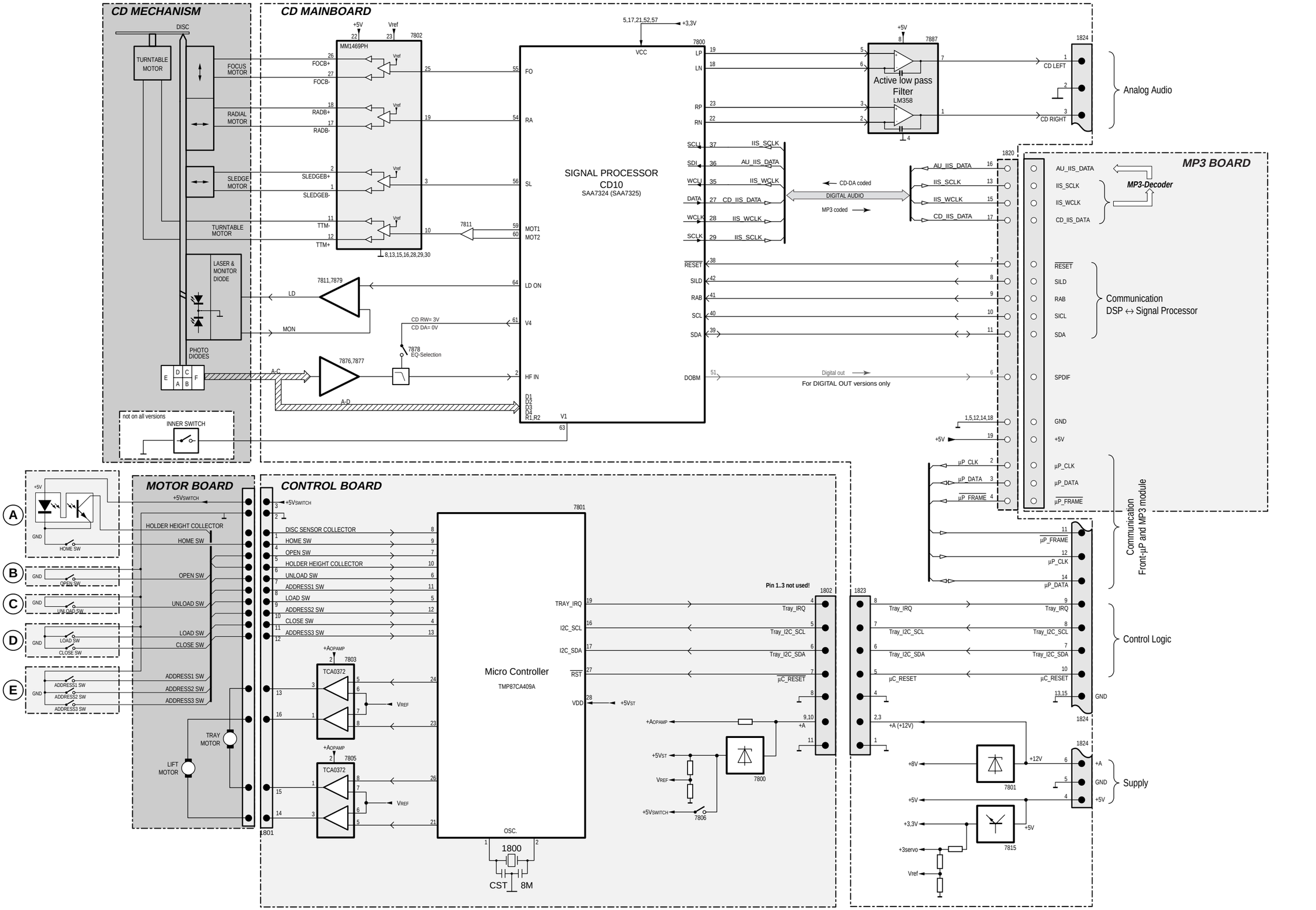
5. Remove CD.

Location of switches



10-5

BLOCK DIAGRAM 5DTC MP3 Version



10-6

5DTC CD BOARD

PHOTODIODES A..F

Laser power control

U >250mV
->Laser damaged !

HF-Amplifier

EYE-PATTERN
800mVpp
TB = 0.5µs/div

Signal Processor

Active Low Pass

Motor Driver

CD Drive
Sanyo DA12T3

ESD sensitive lines!

Focus search

...V DC voltages measured in *PLAY MODE* with following conditions:
"+A" = 12V
"+5V" = 5V

For sets with DIGITAL OUT only

Inner switch detection

Drive detection

During speed up / During brake

accelerates disc / brakes disc

CD_DA: 0V / CD_RW: 3V

LDON From 7800 pin64

LDON to 3826,3827

to / from MP3 Board

to / from 5DTC Control Board

to / from Audio / Combi Board

5DTC CD Board MP3 Version 20040616

10-7

Mapping for Circuit Diagram

1800	E1	3827	F5
1810	D9	3828	G5
1820	B15	3829	C10
1823	F15	3831	D14
1824	H15	3832	E14
2187	F9	3833	C9
2812	J10	3834	D13
2813	G8	3835	D13
2814	G9	3836	I6
2815	G9	3837	E14
2816	G9	3838	G13
2817	F9	3839	E14
2818	F9	3840	B14
2819	C9	3841	I6
2820	C9	3842	J9
2821	C9	3843	J9
2822	C10	3844	J10
2823	C10	3845	F14
2824	I12	3846	J1
2825	C11	3847	H5
2826	A15	3848	H5
2827	E13	3849	F14
2828	E13	3850	H4
2829	J9	3851	H5
2830	J10	3852	H5
2831	H11	3854	H4
2832	H5	3855	J4
2833	H4	3856	I5
2834	H5	3859	I6
2836	G3	3860	I6
2837	G3	3861	J6
2838	I4	3862	I5
2839	I5	3864	B11
2840	J4	3865	A14
2841	F4	3866	F2
2843	B12	3867	B11
2844	B12	3868	B12
2845	B13	3869	B13
2846	B14	3870	B14
2847	I11	3871	B14
2848	A12	3872	G2
2849	A11	3873	A11
2850	A13	3874	A11
2851	A14	3875	A12
2852	I5	3876	A13
2853	H4	3877	A14
2853	J11	3878	C12
2854	A12	3879	A14
2855	B11	3880	I12
2860	A6	3881	J12
2861	A6	3883	A12
2863	B6	3884	B12
2864	C6	3888	D14
2865	C6	3889	C12
2866	B6	3890	C13
2869	F2	3891	J10
2870	A7	3892	J10
2871	A7	3893	F8
2872	B7	3895	F9
2873	B7	3896	F8
2874	C7	3897	G9
2875	C7	3898	G8
2876	E3	3899	H8
2877	F3	3901	G6
2878	F3	3902	G7
2879	F5	3903	G7
2880	F5	3904	G8
2881	H6	3905	F8
2882	G6	3906	H8
2884	G7	3907	H7
2885	G6	3908	H7
2886	G11	3909	H9
2893	G7	3910	E14
3801	A6	3911	H13
3802	A6	3912	A11
3803	B6	3917	H11
3804	B6	3918	H4
3805	C6	3919	H4
3806	C6	3920	F7
3807	A7	3922	H10
3808	A7	3923	H9
3809	B7	3925	A11
3810	B7	3926	A11
3811	C7	3927	B11
3812	C7	3928	B11
3813	D6	5001	H5
3814	D6	5002	H11
3815	E6	6877	J11
3816	D14	7800	D11
3816	E6	7801	I11
3817	F2	7802	G2
3818	F2	7810-A	B13
3819	F3	7810-B	A13
3820	E4	7811-A	F4
3821	F3	7811-B	I4
3822	F4	7875	I11
3823	F4	7876	G7
3824	F5	7877	H8
3825	F5	7878	H8
3826	F5	7879	F3

5DTC CD Board Side A

This assembly drawing shows
a summary of all possible versions.
For components used in a specific version
see schematic diagram respectively partslist.

5DTC CD Board Layout stage .5 20040616

Mapping for Component Layout

1800	D3	3851	C5
1810	E5	3852	B3
1823	D7	3853	B6
1824	A5	3854	B2
2811	B6	3857	C1
2812	C3	3865	A4
2813	C4	3866	D3
2817	C3	3868	A4
2819	E5	3869	B5
2820	E5	3870	A5
2823	E6	3871	B5
2824	B1	3872	E3
2826	B5	3875	A4
2827	C6	3876	B4
2828	C6	3877	A5
2829	C2	3878	D6
2830	B5	3879	A5
2831	B5	3883	A4
2833	B2	3884	A4
2834	C5	3887	B6
2835	B3	3888	C6
2836	A2	3889	E6
2837	A2	3890	E6
2841	E2	3891	C3
2843	B4	3892	C3
2844	B4	3893	C3
2845	B4	3894	C3
2846	A5	3895	D4
2847	B1	3896	C3
2850	B4	3899	C4
2851	A5	3901	C4
2854	B4	3903	C4
2855	A4	3904	C4
2857	E2	3905	B3
2860	C3	3906	C4
2861	D4	3907	D4
2863	D3	3908	C4
2864	D3	3909	C4
2865	D4	3910	C6
2869	D4	3912	A4
2870	E5	3916	C6
2871	E5	3917	B5
2872	E4	3918	A2
2873	E4	3919	B2
2874	D4	3922	C4
2875	E4	3923	B4
2877	D3	4804	A4
2878	D2	4807	A4
2879	E2	4809	C7
2880	E2	4810	C7
2881	D4	4811	C6
2882	C4	4814	C6
2883	C4	4820	C2
2884	C4	4821	C2
2885	B5	4822	C2
2887	D4	4824	C2
2888	A1	4835	D2
3801	C3	4836	A5
3802	D4	4837	B5
3803	C4	4838	C6
3804	D3	4840	A2
3805	C3	4841	B6
3806	D4	4843	D2
3807	E4	5001	B3
3808	E4	7800	C6
3809	E4	7801	B1
3810	E4	7802	B2
3811	E4	7810	B4
3812	D4	7811	D2
3813	C4	7876	C4
3814	D3	7877	C4
3815	D3	7878	C4
3816	D4	7879	E4
3817	E3		
3818	E3		
3819	E3		
3820	E3		
3821	E3		
3822	D2		
3823	D2		
3824	E2		
3825	D2		
3826	D2		
3827	D2		
3828	D2		
3831	D6		
3832	C6		
3834	D6		
3835	D6		
3837	C6		
3838	C5		
3839	C6		
3840	A5		
3842	B3		
3843	C2		
3844	B5		
3845	C6		
3846	B1		
3848	B4		
3849	C6		
3850	B2		

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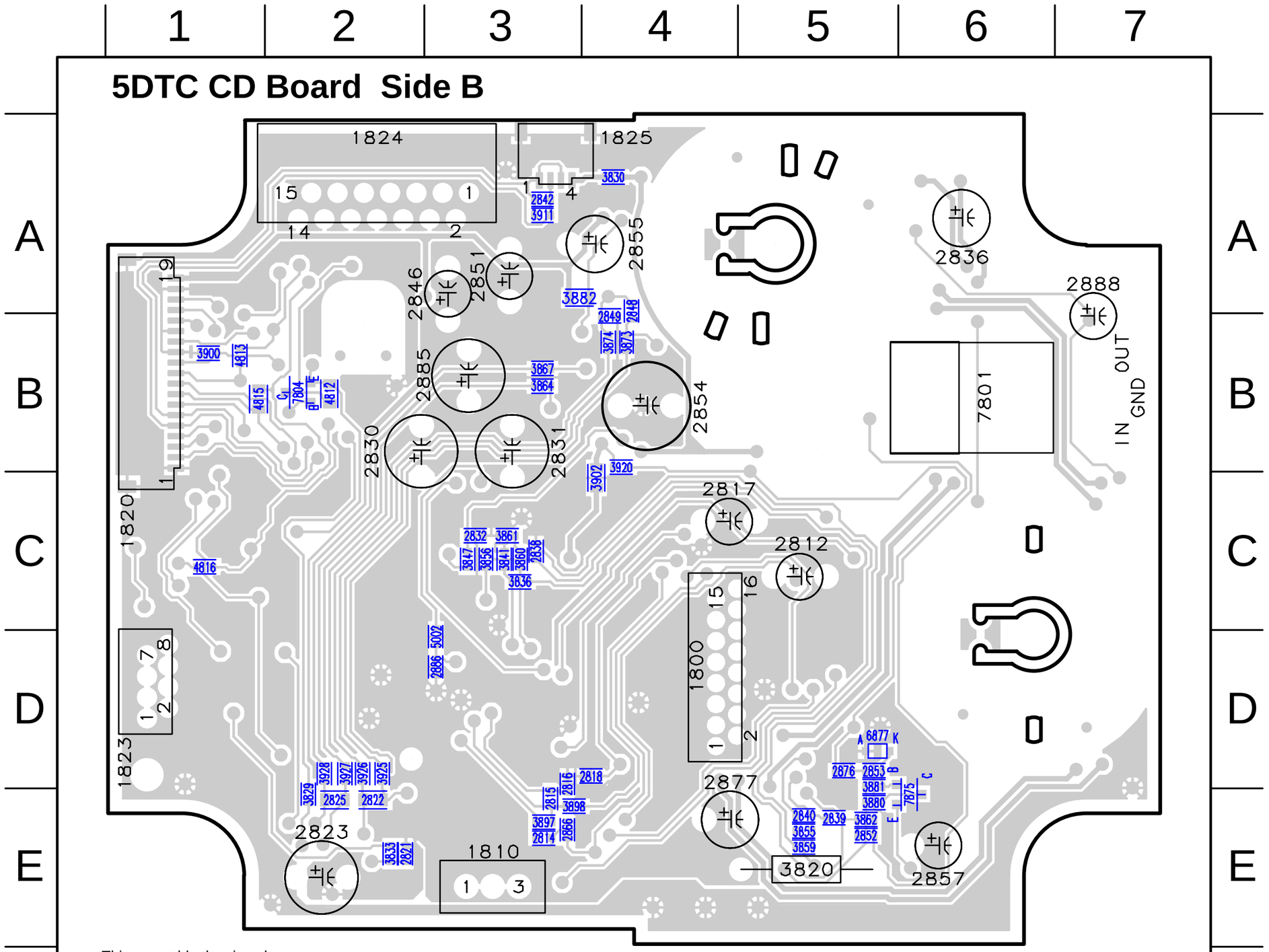
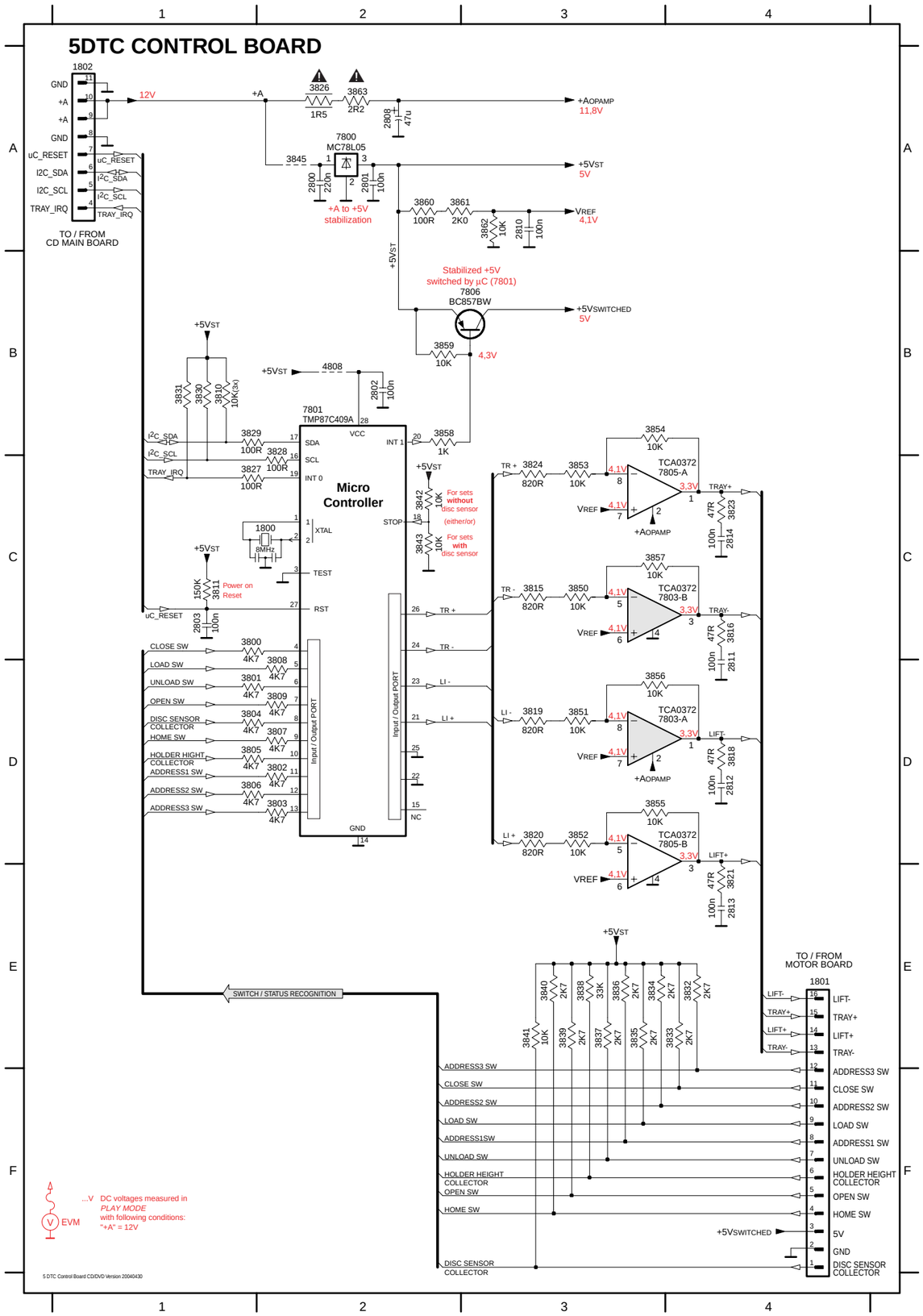
5DTC CD Board Side B



This assembly drawing shows
a summary of all possible versions.
For components used in a specific version
see schematic diagram respectively partslist.

5DTC CD Board Layout stage .4 2002-10-01

1800 D5
1810 E3
1820 C1
1823 D1
1824 A3
1825 A4
2812 C5
2814 E4
2815 E4
2816 D4
2817 C5
2818 D4
2821 E3
2822 E3
2823 E2
2825 E2
2830 B2
2831 B4
2832 C3
2836 A6
2838 C4
2839 E5
2840 E5
2842 A4
2846 A3
2848 A4
2849 B4
2851 A3
2852 E6
2853 D6
2854 B5
2855 A4
2857 E6
2866 E4
2876 D5
2877 D5
2885 B3
2886 D3
2888 A7
3820 E5
3829 E2
3830 A4
3833 E3
3836 C3
3841 C3
3847 C3
3855 E5
3856 C3
3859 E5
3860 C3
3861 C3
3862 E6
3864 B4
3867 B4
3873 B4
3874 B4
3880 E6
3881 D6
3882 A4
3897 E4
3898 E4
3900 B1
3902 C4
3911 A4
3920 B4
3925 D3
3926 D2
3927 D2
3928 D2
4812 B2
4813 B2
4815 B2
4816 C1
5002 D3
6877 D6
7801 B6
7804 B2
7875 E6

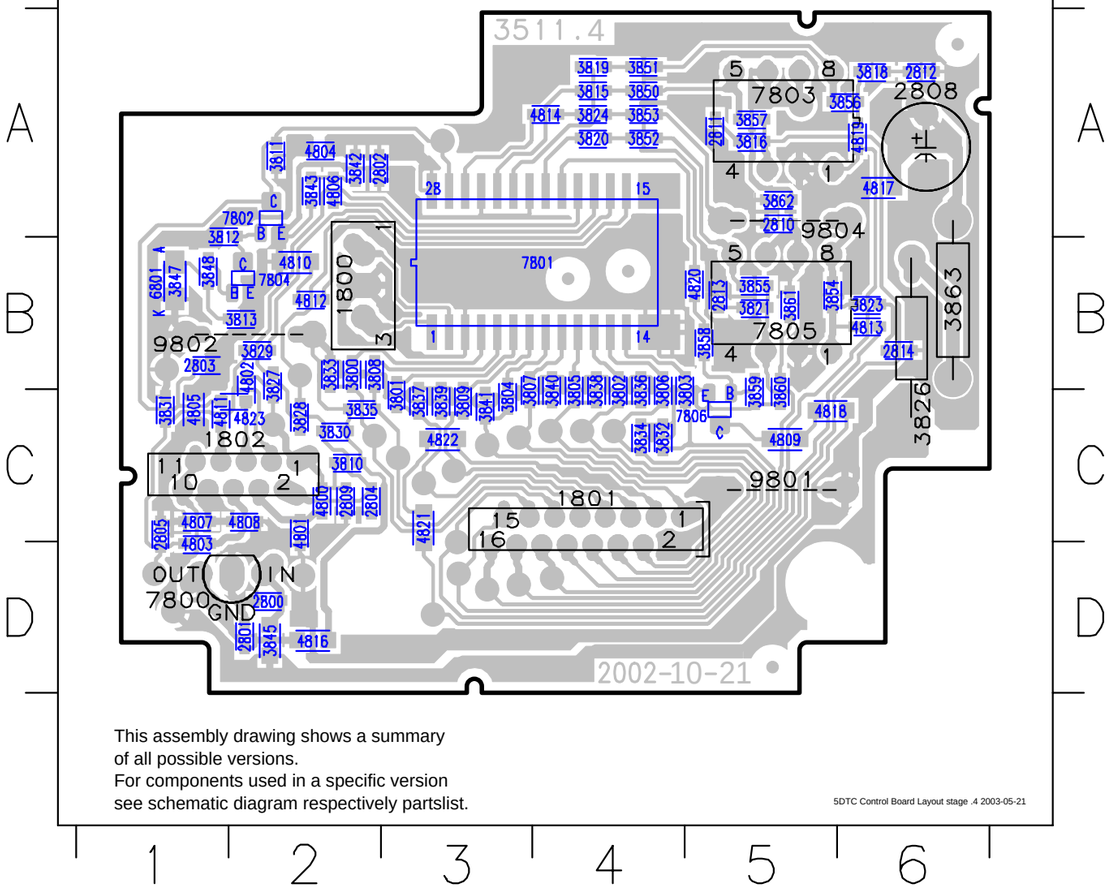


Mapping for Circuit Diagram

1800	C2	2810	A3	3804	D1	3811	C1	3824	C3	3833	E4	3841	E3	3854	B3	3862	A3	7805-B	D3
1801	E4	2811	D4	3805	D1	3815	C3	3826	A2	3834	E3	3842	C2	3855	D3	3863	A2	7806	B3
1802	A1	2812	D4	3806	D1	3816	C4	3827	C1	3835	E3	3843	C2	3856	D3	4808	B2		
2800	A2	2813	E4	3807	D2	3818	D4	3828	C2	3836	E3	3845	A2	3857	C3	7800	A2		
2801	A2	2814	C4	3808	D1	3819	D3	3829	B1	3837	E3	3850	C3	3858	B2	7801	B2		
2802	B2	3800	C1	3808	D2	3820	D3	3830	B1	3838	E3	3851	D3	3859	B3	7803-A	D3		
2803	C1	3802	D2	3809	D2	3821	E4	3831	B1	3839	E3	3852	D3	3860	A2	7803-B	C3		
2808	A2	3803	D2	3810	B1	3823	C4	3832	E4	3840	E3	3853	C3	3861	A2	7805-A	C3		

Mapping for Component Layout

1800	B2	2810	A5	3806	C4	3819	A4	3832	C4	3843	A2	3857	A5	4804	A2	4816	D2	7802	A2
1801	C4	2811	A5	3807	C3	3820	A4	3833	B2	3845	D2	3858	B5	4805	C1	4817	A6	7803	A5
1802	C2	2812	A6	3808	B2	3821	B5	3834	C4	3847	B1	3859	C5	4806	A2	4818	C5	7804	B2
2800	D2	2813	B5	3809	C3	3823	B6	3835	C2	3848	B1	3860	C5	4807	C1	4819	A6	7806	C5
2801	D2	2814	B6	3810	C2	3824	A4	3836	C4	3850	A4	3861	B5	4808	C2	4820	B5	9801	C5
2802	A2	3800	B2	3811	A2	3826	B6	3837	C3	3851	A4	3862	A5	4809	C5	4821	C3	9802	B2
2803	B1	3801	C3	3812	A1	3827	B2	3838	C4	3852	A4	3863	B6	4810	B2	4822	C3	9804	A5
2804	C2	3802	C4	3813	B2	3828	C2	3839	C3	3853	A4	4800	C2	4811	C1	4823	B1		
2805	C1	3803	C4	3815	A4	3829	B2	3840	C4	3854	B5	4801	C2	4812	B2	6801	B1		
2808	A6	3804	C3	3816	A5	3830	C2	3841	C3	3855	B5	4802	C2	4813	B6	7800	D2		
2809	C2	3805	C4	3818	A6	3831	C1	3842	A2	3856	A6	4803	D1	4814	A4	7801	B4		



10-10

MP3 BOARD - CIRCUIT DIAGRAM

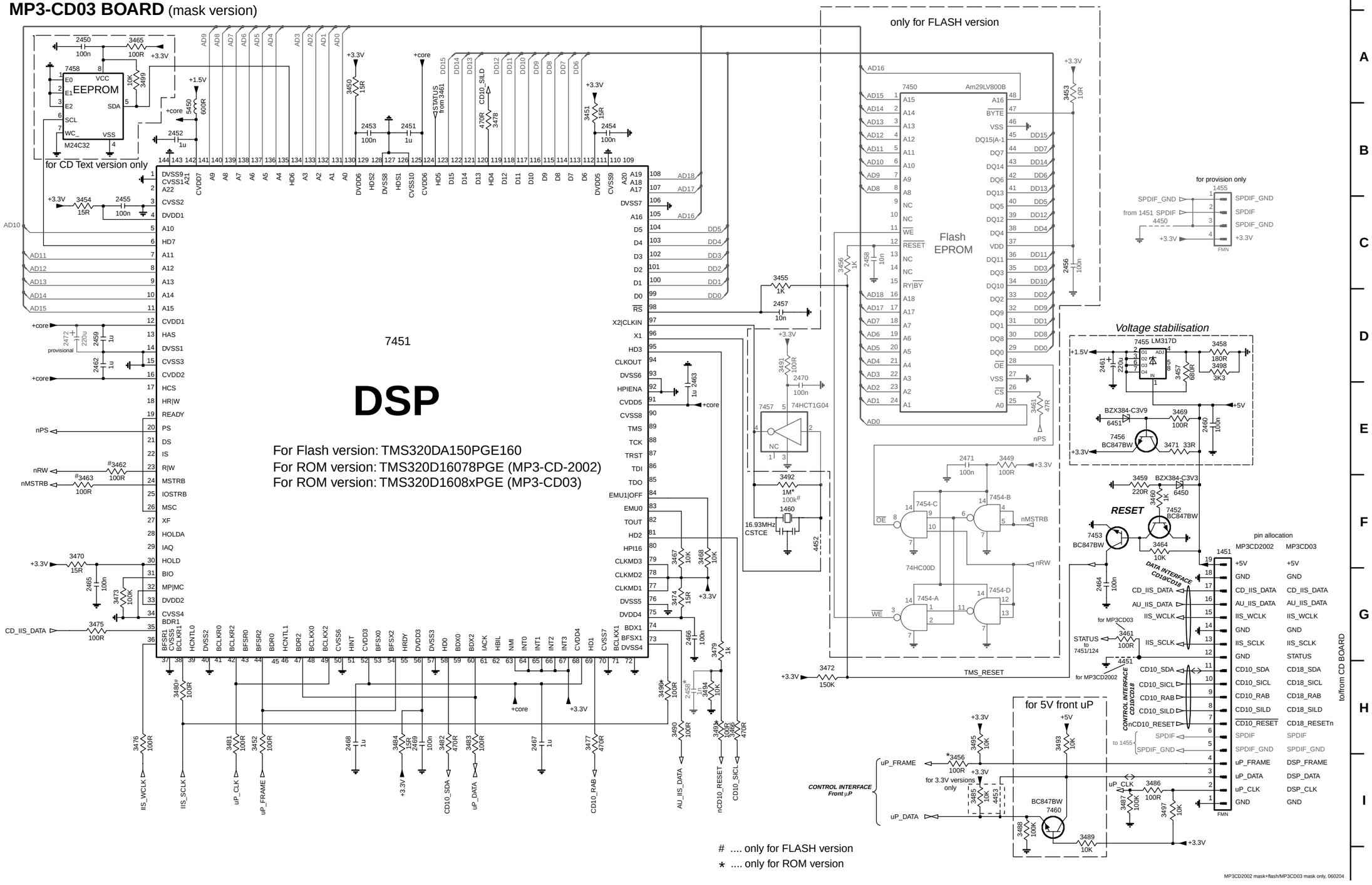
FOR ORIENTATION ONLY

MP3-CD-2002 BOARD (mask & flash version)
MP3-CD03 BOARD (mask version)

7451

DSP

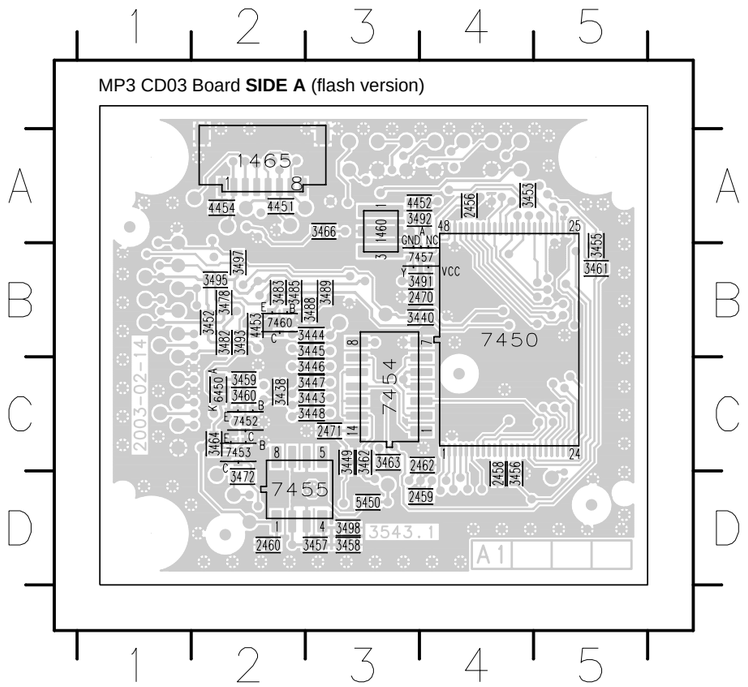
For Flash version: TMS320DA150PGE160
For ROM version: TMS320D16078PGE (MP3-CD-2002)
For ROM version: TMS320D1608xPGE (MP3-CD03)



10-11

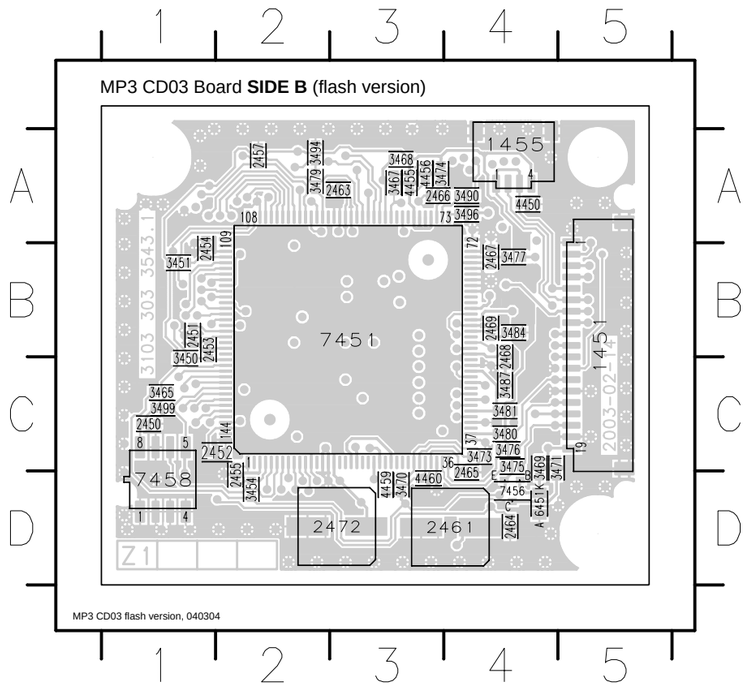
MP3 BOARD FOR ORIENTATION ONLY

MP3 CD03 Board **SIDE A** (flash version)



1460 A3 4452 A3
1465 A2 4453 B2
2456 A4 4454 A2
2458 D4 5450 D3
2459 D4 6450 C2
2460 D2 7450 B4
2462 C4 7452 C2
2470 B4 7453 C2
2471 C3 7454 C3
3438 C2 7455 D2
3440 B4 7457 B4
3443 C3 7460 B2
3444 B3
3445 B3
3446 C3
3447 C3
3448 C3
3452 B2
3453 A4
3455 B5
3456 D4
3457 D3
3458 D3
3459 C2
3460 C2
3461 B5
3462 C3
3463 C3
3464 C2
3466 A3
3472 D2
3478 B2
3482 B2
3483 B2
3485 B2
3488 B3
3489 B3
3491 B4
3492 A3
3493 B2
3495 B2
3497 B2
3498 D3
4451 A2

MP3 CD03 Board **SIDE B** (flash version)

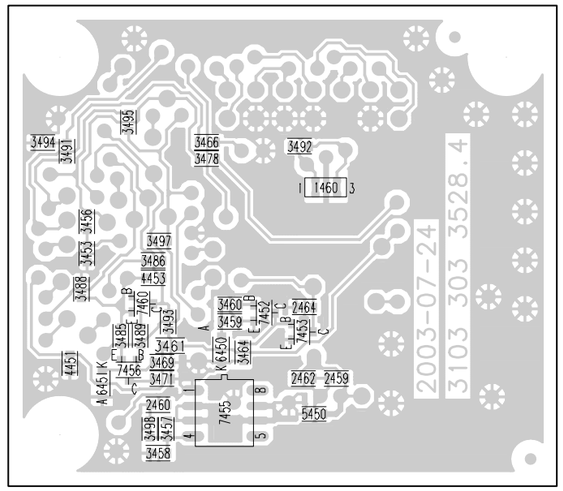


MP3 CD03 flash version, 040304

1451 B5 4459 D3
1455 A4 4460 D3
2450 C1 6451 D4
2451 B1 7451 B3
2452 C2 7456 D4
2453 B1 7458 D1
2454 B1
2455 D2
2457 A2
2461 D4
2463 A3
2464 D4
2465 D4
2466 A3
2467 B4
2468 B4
2469 B4
2472 D3
3450 C1
3451 B1
3454 D2
3465 C1
3467 A3
3468 A3
3469 C4
3470 D3
3471 C4
3473 C4
3474 A3
3475 C4
3476 C4
3477 B4
3479 A2
3480 C4
3481 C4
3484 B4
3487 C4
3490 A4
3494 A2
3496 A4
3499 C1
4450 A4
4455 A3
4456 A3

1460 B3 3456 B1 3464 C3 3486 C2 3494 A1 5450 D3 7456 C2
2459 D4 3457 D2 3466 A2 3488 C2 3495 A2 6450 C3 7460 C2
2460 D2 3458 D2 3469 C2 3489 C2 3497 B2 6451 D2
2462 D3 3459 C3 3471 D2 3491 B1 3498 D2 7452 C3
2464 C3 3460 C3 3478 B2 3492 B3 4451 C1 7453 C3
3453 B1 3461 C2 3485 C2 3493 C2 4453 C2 7455 D3

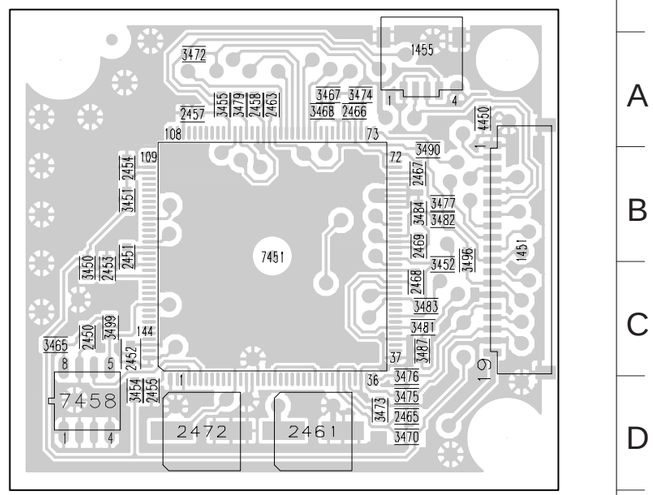
MP3 CD2002/CD03 Board **SIDE A** (mask version)



This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram
respectively partslist.

1451 B5 2454 B2 2465 D4 3450 C1 3467 A3 3475 D4 3483 C4 4450 A5
1455 A4 2455 D2 2466 A4 3451 B2 3468 A3 3476 D4 3484 B4 7451 B3
2450 C1 2457 A2 2467 B4 3452 C4 3470 D4 3477 B4 3487 C4 7458 D1
2451 B2 2458 A3 2468 C4 3454 D2 3472 A2 3479 A2 3490 B4
2452 C2 2461 D3 2469 B4 3455 A2 3473 D4 3481 C4 3496 B4
2453 C1 2463 A3 2472 D2 3465 C1 3474 A4 3482 B4 3499 C1

MP3 CD2002/CD03 Board **SIDE B** (mask version)

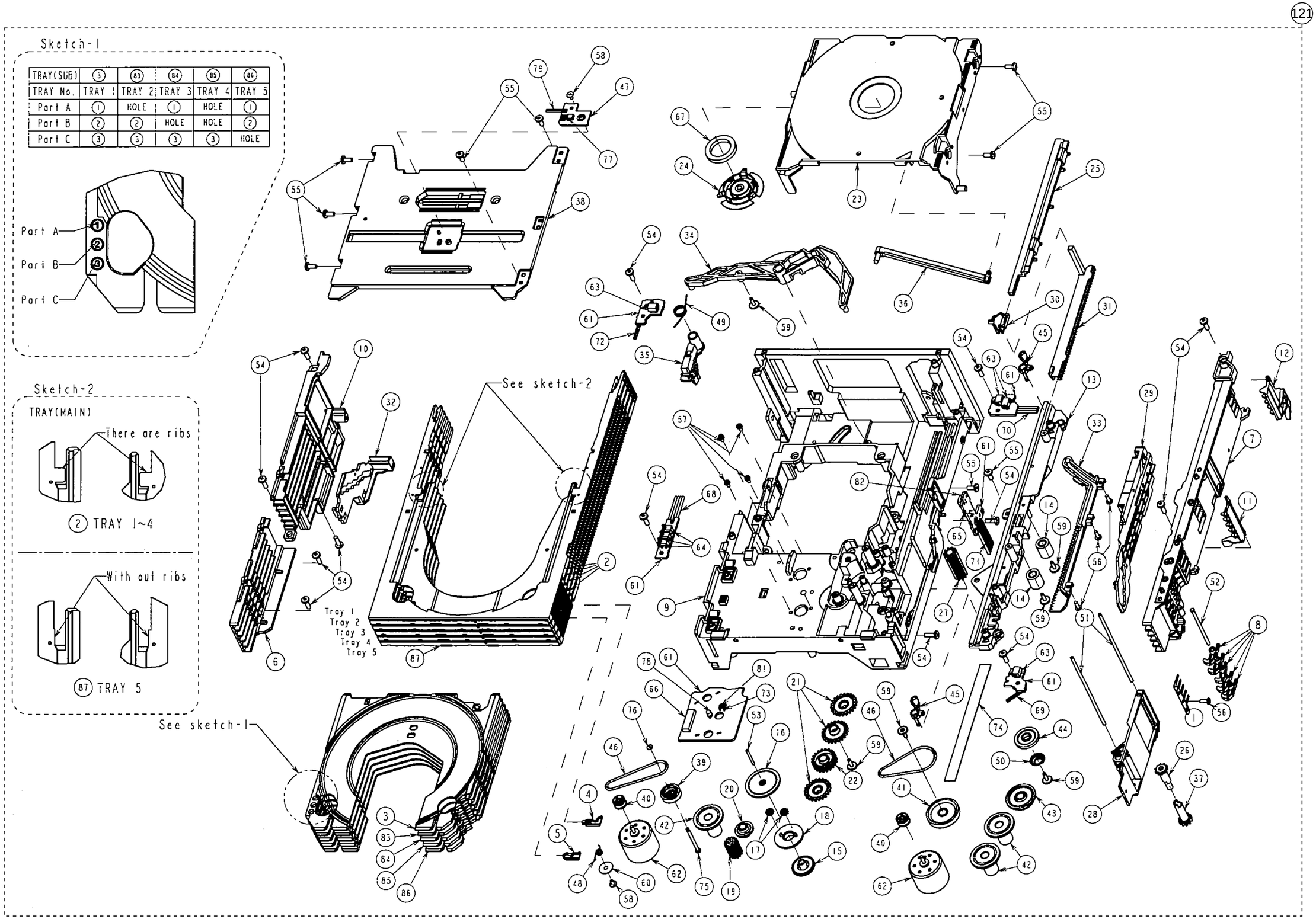


This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram
respectively partslist.

MP3 CD2002 stage .4, 050304

10-12

Exploded view 5DTC mechanic - for orientation only



PARTSLIST 5DTC MODULE MP3CD Version

MECHANICAL PARTS

121	**9940 000 01938**	**5DTC Module** (mechanic w/o electronic)
201	9940 000 01274	CD DRIVE DA12T3
252	4822 529 10387	Rubber damper CD DRIVE, FRONT
253	4822 529 10386	Rubber damper CD DRIVE, REAR

MISCELLANEOUS

1001	**9940 000 01937**	**CD BOARD (complete assy)**
1021	**9940 000 01935**	**CONTROL BOARD (complete assy)**
1051	**9940 000 01936**	**MP3 BOARD (complete assy)**
1800	4822 267 11028	FFC-CONNECTOR 16P, Side entry
1820	2422 025 17303	FFC-CONNECTOR 19P, Side entry
1823	2422 025 16371	FFC-CONNECTOR 8P, Side entry
1824	4822 265 10979	FFC-CONNECTOR, 15P, Side entry
8001	9940 000 01942	FFC CABLE 16Pin 80mm BD
8051	9940 000 01943	FFC-CABLE 19Pin 90mm AD
8052	9940 000 01941	FFC CABLE 8Pin 80mm BD

ELECTRICAL PARTSLIST CD BOARD MP3CD Version

MISCELLANEOUS

1001	**9940 000 01937**	**CD BOARD (complete assy)**

CAPACITORS

2812	4822 124 11947	10µF	20%	16V
2813©	4822 126 13193	4,7nF	10%	63V
2814©	5322 126 11579	3,3nF	10%	63V
2815©	2020 552 94427	100pF	5%	50V
2816©	3198 017 42230	22nF	10%	50V
2817	4822 124 22726	4,7µF	20%	35V
2818©	3198 024 44730	47nF	5%	50V
2821©	2238 586 59812	100nF	10%	50V
2822©	4822 126 13344	1,5nF	5%	63V
2823	4822 124 42383	220µF	20%	4V
2824©	4822 126 14043	1µF	20%	16V
2825©	4822 126 13344	1,5nF	5%	63V
2826©	3198 017 34730	47nF	10%	16V
2827©	5322 126 11578	1nF	10%	63V
2828©	4822 126 11669	27pF	10%	50V
2829©	3198 017 34730	47nF	10%	16V
2830	4822 124 81286	47µF	20%	16V
2831	4822 124 81286	47µF	20%	16V
2832©	3198 017 31530	15nF	10%	50V
2833©	5322 126 11583	10nF	10%	63V
2834©	3198 017 31530	15nF	10%	50V
2835©	5322 126 11583	10nF	10%	63V
2836	4822 124 40433	47µF	20%	25V
2837©	3198 017 34730	47nF	10%	16V
2838©	3198 017 44740	470nF	20%	10V
2839©	2238 586 59812	100nF	10%	50V
2840©	4822 126 14549	33nF	10%	16V
2841©	2238 586 59812	100nF	10%	50V
2843©	2020 552 94427	100pF	5%	50V
2844©	5322 122 33861	120pF	5%	NP0
2845©	5322 122 33861	120pF	5%	NP0
2846	4822 124 40248	10µF	20%	63V
2847©	3198 017 41050	1µF	20%	10V
2848©	2020 552 94427	100pF	5%	50V
2849©	5322 122 33861	120pF	5%	NP0
2850©	5322 122 33861	120pF	5%	NP0
2851	4822 124 40248	10µF	20%	63V
2852©	4822 126 14549	33nF	10%	16V
2853©	5322 126 11583	10nF	10%	63V
2854	4822 124 12245	220µF	20%	16V

ELECTRICAL PARTSLIST CD BOARD MP3CD Version

CAPACITORS

2855	4822 124 11912	220µF	20%	6,3V
2860©	4822 122 33753	150pF	5%	50
2861©	4822 122 33753	150pF	5%	50V
2863©	4822 126 14508	180pF	5%	50V
2864©	4822 126 14508	180pF	5%	50V
2865©	4822 126 14508	180pF	5%	50V
2866©	4822 126 14508	180pF	5%	50V
2869©	3198 017 34730	47nF	10%	16V
2870©	4822 126 13883	220pF	5%	50V
2871©	4822 126 13883	220pF	5%	50V
2872©	4822 126 13883	220pF	5%	50V
2873©	4822 126 13883	220pF	5%	50V
2874©	4822 126 13883	220pF	5%	50V
2875©	4822 126 13883	220pF	5%	50V
2876©	3198 017 44740	470nF	20%	10V
2877	4822 124 40433	47µF	20%	25V
2878©	2238 586 59812	100nF	10%	50V
2879©	5322 126 11578	1nF	10%	63V
2880©	2222 867 15339	33pF	5%	50V
2881©	4822 126 14249	560pF	10%	50V
2882©	4822 126 14226	82pF		50V
2883©	3198 017 44740	470nF	20%	10V
2884©	3198 017 44740	470nF	20%	10V
2885	4822 124 40196	220µF	20%	16V
2886©	2238 586 59812	100nF	10%	50V
2887©	3198 017 34730	47nF	10%	16V

RESISTORS

3801©	4822 051 30393	39kΩ	5%	0,06W
3802©	4822 051 30393	39kΩ	5%	0,06W
3803©	4822 117 12925	47kΩ	1%	0,06W
3804©	4822 117 12925	47kΩ	1%	0,06W
3805©	4822 117 12925	47kΩ	1%	0,06W
3806©	4822 117 12925	47kΩ	1%	0,06W
3807©	4822 051 30103	10kΩ	5%	0,06W
3808©	4822 051 30103	10kΩ	5%	0,06W
3809©	4822 051 30103	10kΩ	5%	0,06W
3810©	4822 051 30103	10kΩ	5%	0,06W
3811©	4822 051 30103	10kΩ	5%	0,06W
3812©	4822 051 30103	10kΩ	5%	0,06W
3813©	4822 051 30222	2,2kΩ	5%	0,06W
3814©	4822 051 30222	2,2kΩ	5%	0,06W
3815©	4822 051 30222	2,2kΩ	5%	0,06W
3816©	4822 051 30222	2,2kΩ	5%	0,06W
3817©	4822 051 30479	47Ω	5%	0,06W
3818©	4822 051 30479	47Ω	5%	0,06W
3819©	4822 051 30479	47Ω	5%	0,06W
3820⚠	4822 052 10478	4,7Ω	5%	NFR25
3821©	4822 117 12917	1Ω	5%	0,06W
3822©	4822 051 30103	10kΩ	5%	0,06W
3823©	4822 051 30102	1kΩ	5%	0,06W
3824©	4822 051 30474	470kΩ	5%	0,06W
3825©	5322 117 13029	47kΩ	1%	0,06W
3826©	4822 117 12891	220kΩ	1%	0,06W
3827©	5322 117 13056	8,2kΩ	1%	0,06W
3828©	5322 117 13052	2,7kΩ	1%	0,06W
3829©	4822 051 30121	120Ω	5%	0,06W
3831©	4822 051 30471	470Ω	5%	0,06W
3832©	4822 051 30471	470Ω	5%	0,06W
3833©	4822 051 30121	120Ω	5%	0,06W
3834©	4822 051 30472	4,7kΩ	5%	0,06W
3836©	4822 117 13632	100kΩ	1%	0,06W
3837©	4822 051 30471	470Ω	5%	0,06W

ELECTRICAL PARTSLIST 5DTC MODULE CD BOARD MP3CD Version

RESISTORS

3839©	4822 051 30471	470Ω	5%	0,06W
3840©	4822 051 30223	22kΩ	5%	0,06W
3841©	4822 051 30153	15kΩ	5%	0,06W
3842©	4822 051 30102	1kΩ	5%	0,06W
3843©	4822 051 30102	1kΩ	5%	0,06W
3844©	4822 051 30101	100Ω	5%	0,06W
3845©	4822 051 30471	470Ω	5%	0,06W
3846©	4822 051 30102	1kΩ	5%	0,06W
3847©	4822 117 12968	820Ω	5%	0,06W
3848©	4822 051 30221	220Ω	5%	0,06W
3849©	4822 051 30471	470Ω	5%	0,06W
3850©	4822 117 12925	47kΩ	1%	0,06W
3851©	4822 117 12968	820Ω	5%	0,06W
3852©	4822 051 30221	220Ω	5%	0,06W
3854©	4822 117 12925	47kΩ	1%	0,06W
3855©	4822 051 30393	39kΩ	5%	0,06W
3856©	4822 051 30272	2,7kΩ	5%	0,06W
3857©	4822 051 30008	CHIP JUMPER 0603		
3859©	4822 117 13632	100kΩ	1%	0,06W
3860©	4822 051 30123	12kΩ	5%	0,06W
3861©	4822 051 30153	15kΩ	5%	0,06W
3862©	4822 051 30393	39kΩ	5%	0,06W
3864©	4822 051 30333	33kΩ	5%	0,06W
3865©	4822 051 30181	180Ω	5%	0,06W
3866©	4822 117 13608	4,7Ω	5%	0,06W
3867©	4822 051 30333	33kΩ	5%	0,06W
3868©	4822 051 30183	18kΩ	5%	0,06W
3869©	4822 051 30183	18kΩ	5%	0,06W
3870©	4822 051 30681	680Ω	5%	0,06W
3871©	4822 051 30181	180Ω	5%	0,06W
3872©	4822 051 30272	2,7kΩ	5%	0,06W
3873©	4822 051 30333	33kΩ	5%	0,06W
3874©	4822 051 30333	33kΩ	5%	0,06W
3875©	4822 051 30183	18kΩ	5%	0,06W
3876©	4822 051 30183	18kΩ	5%	0,06W
3877©	4822 051 30681	680Ω	5%	0,06W
3878©	4822 051 30471	470Ω	5%	0,06W
3879©	4822 051 30223	22kΩ	5%	0,06W
3880©	4822 051 30339	33Ω	5%	0,06W
3881©	4822 051 30151	150Ω	5%	0,06W
3883©	4822 051 30472	4,7kΩ	5%	0,06W
3884©	4822 051 30472	4,7kΩ	5%	0,06W
3888©	4822 051 30103	10kΩ	5%	0,06W
3889©	4822 051 30471	470Ω	5%	0,06W
3890©	4822 051 30471	470Ω	5%	0,06W
3891©	4822 051 30102	1kΩ	5%	0,06W
3892©	4822 051 30102	1kΩ	5%	0,06W
3893©	4822 051 30471	470Ω	5%	0,06W
3895©	4822 051 30273	27kΩ	5%	0,06W
3896©	4822 051 30101	100Ω	5%	0,06W
3897©	4822 051 30333	33kΩ	5%	0,06W
3898©	4822 051 30221	220Ω	5%	0,06W
3899©	4822 051 30272	2,7kΩ	5%	0,06W
3901©	4822 051 30561	560Ω	5%	0,06W
3902©	4822 117 11139	1,5kΩ	1%	0,1W
3903©	4822 051 30332	3,3kΩ	5%	0,06W
3904©	4822 051 30332	3,3kΩ	5%	0,06W
3905©	4822 051 30681	680Ω	5%	0,06W
3906©	4822 051 30471	470Ω	5%	0,06W
3907©	4822 117 12968	820Ω	5%	0,06W
3908©	4822 051 30222	2,2kΩ	5%	0,06W
3909©	4822 117 13632	100kΩ	1%	0,06W
3910©	4822 051 30471	470Ω	5%	0,06W

RESISTORS

3912©	4822 051 30221	220Ω	5%	0,06W
3916©	4822 051 30471	470Ω	5%	0,06W
3917©	4822 117 13608	4,7Ω	5%	0,06W
3918©	4822 051 30103	10kΩ	5%	0,06W
3919©	4822 051 30153	15kΩ	5%	0,06W
3920©	4822 051 30101	100Ω	5%	0,06W
3923©	4822 051 30103	10kΩ	5%	0,06W
3925©	4822 051 30101	100Ω	5%	0,06W
3926©	4822 051 30101	100Ω	5%	0,06W
3927©	4822 051 30101	100Ω	5%	0,06W
3928©	4822 051 30101	100Ω	5%	0,06W
4807©	4822 051 30008	CHIP JUMPER 0603		
4809©	4822 051 30008	CHIP JUMPER 0603		
4820©	4822 051 30008	CHIP JUMPER 0603		
4824©	4822 051 30008	CHIP JUMPER 0603		
4835©	4822 051 20008	CHIP JUMPER 0805		
4836©	4822 051 20008	CHIP JUMPER 0805		
4837©	4822 051 20008	CHIP JUMPER 0805		
4838©	4822 051 20008	CHIP JUMPER 0805		
4840©	4822 051 20008	CHIP JUMPER 0805		
4841©	4822 051 20008	CHIP JUMPER 0805		
4843©	4822 051 20008	CHIP JUMPER 0805		

COILS

1810	2422 540 98519	RESONATOR 8,467MHz
5001©	2422 549 44607	FERRITE BEAD
5002©	2422 549 44607	FERRITE BEAD

DIODES

6877©	9322 129 34685	BZX284-C3V9

TRANSISTORS

7875©	5322 130 42755	BC847C
7876©	5322 130 42755	BC847C
7877©	5322 130 42755	BC847C
7878©	5322 130 42755	BC847C
7879©	5322 130 60123	BC807-40

INTEGRATED CIRCUITS

7800©	9352 684 20557	SAA7325H/T/M2B, Signal Processor
7801	4822 209 72554	MC7808CT 8V Regulator
7802©	9322 181 79668	MM1469PH Motor Driver
7810©	5322 209 82941	LM358D, Dual Opamp
7811©	5322 209 82941	LM358D, Dual Opamp

Note:
Components printed in grey colour are considered as standard spareparts and thus not available on service stock.
Code numbers are published for orientation only.

10-14

ELECTRICAL PARTSLIST 5DTC MODULE CONTROL BOARD

MISCELLANEOUS

1021	**9940 000 01935**	**CONTROL BOARD (complete assy)**
1801	2422 025 17065	FFC-CONNECTOR 16P, top entry
1802	2422 025 17788	FFC-CONNECTOR 8P, top entry
8021	9940 000 01939	FFC-CABLE 16Pin 60mm AD

CAPACITORS

2800©	4822 126 13879	220nF	20%	16V
2801©	2238 586 59812	100nF	10%	50V
2802©	2238 586 59812	100nF	10%	50V
2803©	2238 586 59812	100nF	10%	50V
2808	4822 124 40433	47µF	20%	25V
2810©	3198 017 34730	47nF	10%	16V
2811©	2238 586 59812	100nF	10%	50V
2812©	2238 586 59812	100nF	10%	50V
2813©	2238 586 59812	100nF	10%	50V
2814©	2238 586 59812	100nF	10%	50V

RESISTORS

3800©	4822 051 30472	4,7kΩ	5%	0,06W
3801©	4822 051 30472	4,7kΩ	5%	0,06W
3802©	4822 051 30472	4,7kΩ	5%	0,06W
3803©	4822 051 30472	4,7kΩ	5%	0,06W
3804©	4822 051 30472	4,7kΩ	5%	0,06W
3805©	4822 051 30472	4,7kΩ	5%	0,06W
3806©	4822 051 30472	4,7kΩ	5%	0,06W
3807©	4822 051 30472	4,7kΩ	5%	0,06W
3808©	4822 051 30472	4,7kΩ	5%	0,06W
3809©	4822 051 30472	4,7kΩ	5%	0,06W
3810©	4822 051 30103	10kΩ	5%	0,06W
3811©	4822 051 30154	150kΩ	5%	0,0625W
3815©	5322 117 13057	820Ω	1%	0,06W
3816©	4822 051 30479	47Ω	5%	0,06W
3818©	4822 051 30479	47Ω	5%	0,06W
3819©	5322 117 13057	820Ω	1%	0,06W
3820©	5322 117 13057	820Ω	1%	0,06W
3821©	4822 051 30479	47Ω	5%	0,06W
3823©	4822 051 30479	47Ω	5%	0,06W
3824©	5322 117 13057	820Ω	1%	0,06W
3826⚠	4822 117 12148	1,5Ω	5%	0,33W
3827©	4822 051 30101	100Ω	5%	0,06W
3828©	4822 051 30101	100Ω	5%	0,06W
3829©	4822 051 30101	100Ω	5%	0,06W
3830©	4822 051 30103	10kΩ	5%	0,06W
3831©	4822 051 30103	10kΩ	5%	0,06W
3832©	4822 051 30272	2,7kΩ	5%	0,06W
3833©	4822 051 30272	2,7kΩ	5%	0,06W
3834©	4822 051 30272	2,7kΩ	5%	0,06W
3835©	4822 051 30272	2,7kΩ	5%	0,06W
3836©	4822 051 30272	2,7kΩ	5%	0,06W
3837©	4822 051 30272	2,7kΩ	5%	0,06W
3838©	4822 051 30333	33kΩ	5%	0,06W
3839©	4822 051 30272	2,7kΩ	5%	0,06W
3840©	4822 051 30272	2,7kΩ	5%	0,06W
3841©	4822 051 30103	10kΩ	5%	0,06W
3842©	4822 051 30103	10kΩ	5%	0,06W
3845©	4822 051 20159	15Ω	5%	0,1W
3850©	4822 117 12706	10kΩ	1%	0,06W
3851©	4822 117 12706	10kΩ	1%	0,06W
3852©	4822 117 12706	10kΩ	1%	0,06W
3853©	4822 117 12706	10kΩ	1%	0,06W
3854©	4822 117 12706	10kΩ	1%	0,06W
3855©	4822 117 12706	10kΩ	1%	0,06W
3856©	4822 117 12706	10kΩ	1%	0,06W
3857©	4822 117 12706	10kΩ	1%	0,06W
3858©	4822 051 30102	1kΩ	5%	0,06W
3859©	4822 051 30103	10kΩ	5%	0,06W
3860©	5322 117 13017	100Ω	1%	0,06W
3861©	2322 704 62002	2kΩ	1%	0,06W
3862©	4822 117 12706	10kΩ	1%	0,06W
3863⚠	4822 053 10228	2,2Ω	5%	1W

RESISTORS

4800©	4822 051 30008	CHIP JUMPER 0603
4802©	4822 051 30008	CHIP JUMPER 0603
4803©	4822 051 30008	CHIP JUMPER 0603
4804©	4822 051 30008	CHIP JUMPER 0603
4805©	4822 051 20008	CHIP JUMPER 0805
4806©	4822 051 30008	CHIP JUMPER 0603
4807©	4822 051 30008	CHIP JUMPER 0603
4808©	4822 051 30008	CHIP JUMPER 0603
4809©	4822 051 20008	CHIP JUMPER 0805
4810©	4822 051 20008	CHIP JUMPER 0805
4811©	4822 051 30008	CHIP JUMPER 0603
4812©	4822 051 30008	CHIP JUMPER 0603
4813©	4822 051 30008	CHIP JUMPER 0603
4814©	4822 051 30008	CHIP JUMPER 0603
4816©	4822 051 20008	CHIP JUMPER 0805
4817©	4822 051 20008	CHIP JUMPER 0805
4818©	4822 051 20008	CHIP JUMPER 0805
4819©	4822 051 30008	CHIP JUMPER 0603
4820©	4822 051 30008	CHIP JUMPER 0603
4821©	4822 051 20008	CHIP JUMPER 0805
4822©	4822 051 20008	CHIP JUMPER 0805

COILS

1800	2422 540 98518	CERAMIC FILTER 8,0MHz

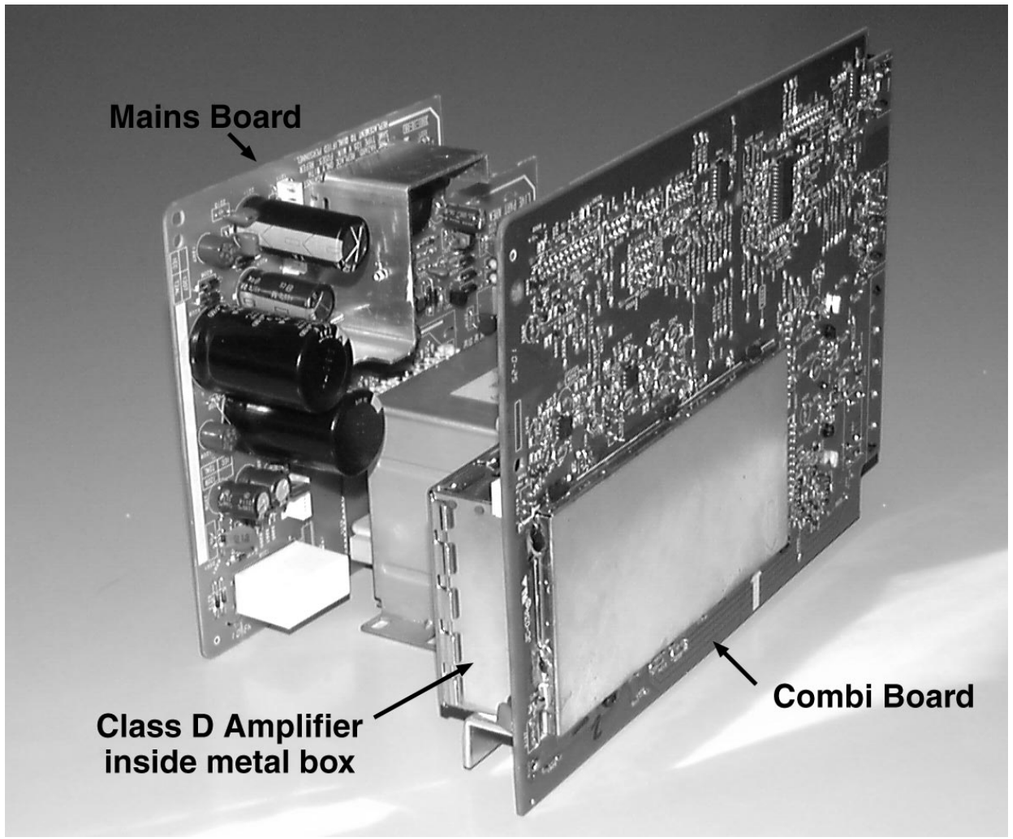
TRANSISTORS

7806©	3198 010 42320	BC857BW

INTEGRATED CIRCUITS

7800	4822 209 72042	MC78L05ACP, STABILIZER
7801©	3103 307 01761	TMP87P809M Mask2, Microcontroller
7803	4822 209 62059	TCA0372DP1, 2-FOLD OP-AMP.
7805	4822 209 62059	TCA0372DP1, 2-FOLD OP-AMP.

Note:
Components printed in grey colour are considered as standard spareparts and thus not available on service stock.
Code numbers are published for orientation only.



Power 2003 Module

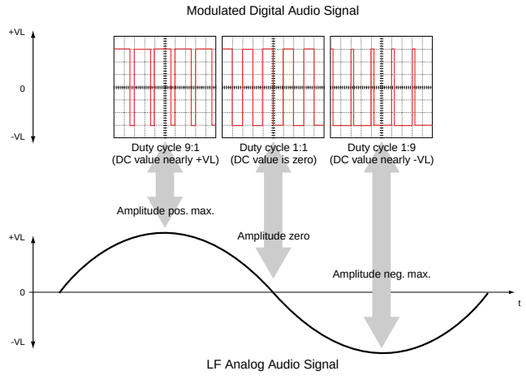
(75 - 150W Class D)

stage M.6/C.4 update 2

TABLE OF CONTENTS

Class-D Circuit Description (BASED ON POWER 2003 MODULE 75-150W CLASS D)

Basically Class-D works by transforming the LF audio input to a square wave signal with a fixed frequency and a variable duty cycle. See simplified drawing below.



The amplitude of the square wave signal is equal to the supply voltage of the amplifier. With the audio signal the square wave signal is pulse-width modulated.

Compared to a conventional power amplfier the benefits of the Class D amplifier are:
- higher effiency
- lower power dissipation
- smaller cooling fin
- smaller mains transformer

Disadvantage of this concept is:
- 500kHz square wave signal with high current requires a shielding box to suppress radiation.

Required Circuitries:

- **500kHz square wave oscillator**.
  The oscillator frequency is created by 7312-3; it is a dual-frequency oscillator with ceramic resonators 5300 and 5302, which resonate at 500kHz and 425kHz respectively. The resonators are switched by transistors 7309 and 7316, controlled by the "OZ_SW" line from the port expander 7406.
  The reason for 2 frequencies is to avoid tuner disturbances in the AM-band.
  The oscillator signal is shaped to square wave with 7312-2, afterwards buffered and fed to the amplifier modulators (ROZ to the right channel, LOZ to the left). One channel gets inverted clock to balance supply loading.

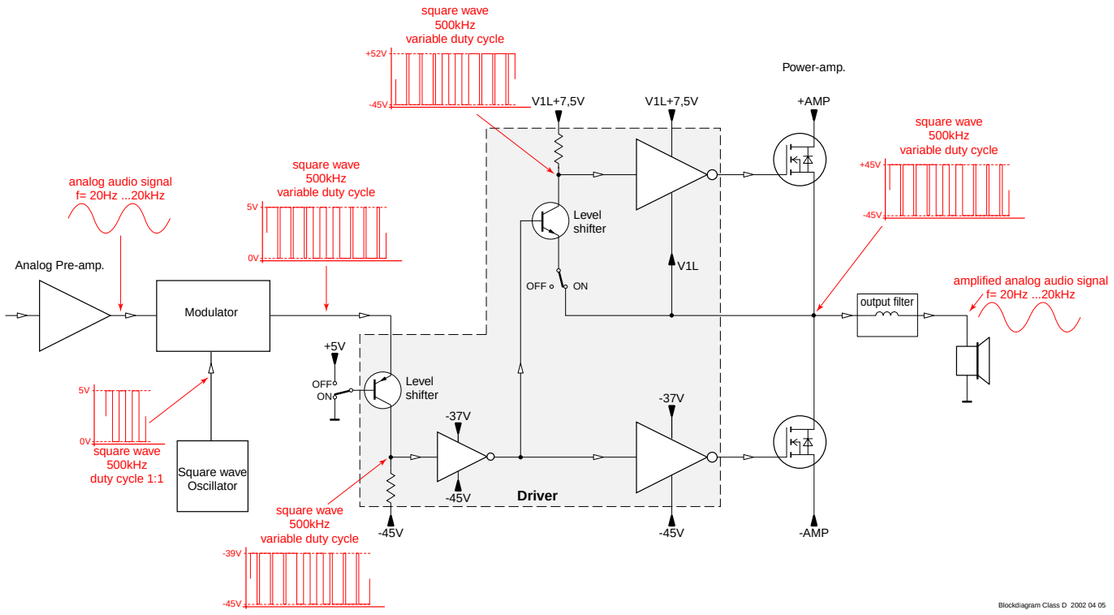
- **Modulator**
  The modulator forms the pulse width modulated signal. For each channel a seperate modulation is required.

- **Power FETs**
  The FETs require drivers which supply the gates. One for the high-side-FET and one for the low-side-FET. Because of the different supply voltages also an additional level shifter is necessary per driver.

- **Output filter**
  The output filter is necessary to block the 500kHz square wave signal from the speaker.
  Refers to the left channel in schematic diagrams.
  It consists of a series-mode coil 5101 and a capacity of approx. 550nF (2116, 2134), which forms a Chebycheff filter with 40kHz cut-off frequency at 6Ω load. For EMC reasons both, the speaker output and the return ground are fed through a common mode coil (5102). The filter is further improved by splitting the output capacity into 2116 before and 2134 after the common mode coil.

All above mentioned circuitries are located inside the metal shielding box.

Blockdiagram Class D



Class-D Circuit Description (Based on Power 2003 Module 75-150W Class D)

Functional Description:

Refers to the left channel in schematic diagrams.
The first stage of the modulator is an error integrator which compares the input to the (24 dB amplified) output signal of the power stage. The difference is leading to a current, which loads the integrator 7122-A. The second stage (7122-B) adds the 500kHz rectangular oscillator signal, creates high gain and low distortion and is again integrating. The output signal leads to a triangle wave form (see oscillogram Ⓔ). The DC value of this triangle signal is floating, dependent on the amplitude of the analog input signal. The next stage is a comparator, which compares the integrated voltage with the internal switching levels - thus creating a voltage controlled duty cycle. 7122 C and D improve the shape of the pulses. For details see oscillograms Ⓐ-Ⓕ.
At pin 8 of IC7122 there is a square wave with the same frequency and duty cycle as the desired output.

The next task is to feed this information to the output FETs. Both FETs are n-channel types, so they are modulated by feeding the gate in respect to the source connection. Inverters 74LV14 are used as drivers. The driver for the low-side FET (7121) is supplied by the negative supply -VL2 and a voltage +VL (generated by 7115 and 6113), which is 7.5V higher than -VL2. The digital signal is level-shifted by 7128 to the low side driver stage. 3142, 6111 and 2126 together form a delay circuit for rising edges by approx. 100ns for the low side FET. 3154, 6109 and 2137 delay the rising edge by 50ns for the high side FET. This to compensate the switch-off delay of the FETs and ensures that both FETs are not conducting at the same time.
The high-side FET (7109) is controlled by the inverted signal taken from pin 2 of 7118, which is level-shifted by transistor 7119. The driver for the high-side FET is supplied by a floating voltage between the amplifier output -V1L and +V1L, created by the charge pump 6110, 2114 regulated by 7114 and 6114 to a 7.5V higher level. The pump is additionally supplied (via 3151) by +45V to ensure supply at start-up (no signal). The last stage in the gate driver consists of three gates in parallel for increased output current for the capacitive load of the FET. For additional increase of the switching speed push/pull transistors 7132/7111 are added.

Protection Circuits:

The amplifier is protected against low load impedance (including short circuit). Current is sensed by shunts 3101, 3130 in both supplies. Overcurrent at the positive supply is then sensed by 7104, the negative supply overcurrent triggers 7117, which then also triggers 7104. The collector current in turn triggers the monoflop 7122-5 and -6, giving a "High" pulse at pin 10. This shuts off level-shifter 7128 and blocks transistor 7129 and 7131, which draws current into the emitter resistor 3134 of level-shifter 7119. It is now also shut off. So, both FETs are shut off within approx. 0,2 sec. The monoflop can be reset by:
- switching mains off and on again
- pressing Standby button and afterwards any source button
- plugging headphone in for a short moment

When a headphone is used the amplifier is shut off. This is done by pulling pin 13 of 7122 via signal line "AMP_OFF" and transistor 7130 to high level. The line "AMP_OFF" is controlled by the port expander 7406 which detects the headphone via signal line "HP_DET".

The loudspeakers are protected against DC voltages resulting e.g. from defective FETs. Voltages higher than ±2V are detected by 7110 respectively 7112. The transistors conduct and pull the "DC_PROT" line down, blocking transistor 7243 which in turn disables speaker relay 1201.

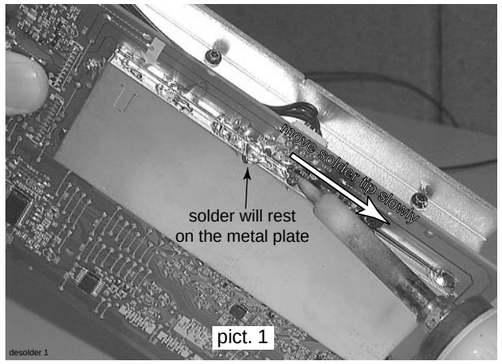
Adjustments:

The gain of the class-D amplifier is 24dB, adjusted by the feedback resistors 3155, 3136, 3149 and the input resistors 3139, 3340. The input reference voltage for 7122-A is approx. half the supply, therefore 3144, 3148 are used for offset compensation. This compensation has to be fine-tuned with trimpotentiometers 3306 and 3307 to obtain <1mV DC output.

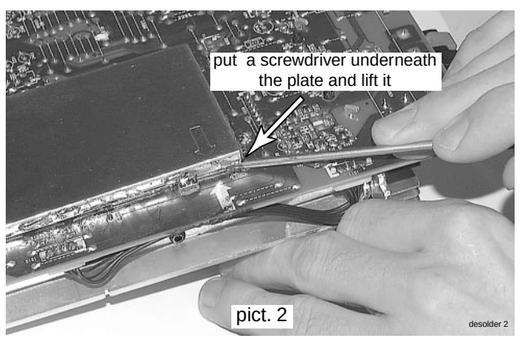
Service Hints:

The analog part of the Combi Board can be repaired without opening the metal shielding box. In case of a 'Class D' problem it is advised to disassemble the board first, desolder the metal bottom cover of the shielding box and assemble the board again. This takes a few minutes only.

<u>To de-solder the metal bottom cover proceed as follows:</u>
1)Remove top cover of shielding box to reduce heat flow
2)Do not use de-solder wick
3)Simply hold the board upright down as shown in picture 1.
Heat up solder joints and move tip of soldering iron slowly along the edge of the metal frame.
Solder will flow along the soldering tip and rest on the metal plate. A small amount will drop off.
A small gap will become visible as indication that the solder connection is released.
When all solder joints are released the cover can be removed by help of a screwdriver. Begin at the corner indicated by an arrow → see picture 2.



pict. 1



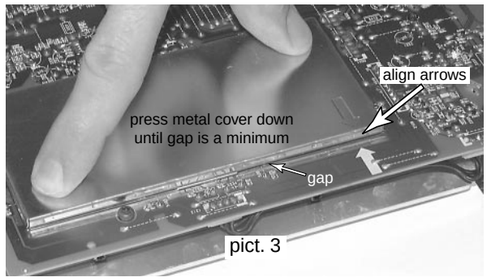
pict. 2

<u>To re-mount the metal bottom cover proceed as follows:</u>
1)The solder connections are not distributed evenly. Therefore the cover has to be mounted in that way that the arrow indicator on the cover is positioned in line with the arrow printed on the printed board → see picture 3.

Service Hints

2)Press the metal cover smoothly down until the gap between cover and printed board becomes a minimum. This is important for proper shielding.
3)Heat up the residual solder on the metal cover. The solder will flow back to the solder areas. If necessary apply additional new solder.
4)Take care that all solder joints are re-soldered again.

Attention: Poor soldering of the metal shielding box results in disturbance of the tuner.



pict. 3

In most cases the FETs 7109 and/or 7121 for the left channel, respectively 7218 and/or 7231 for the right channel will be defective. This can easily be checked with an ordinary Ohm-meter.
Left Channel:
In case **7109** is defect replace following parts:
7109, 7111, 7132, 7105, 7119, 7104, 3101, 3103 and 2106

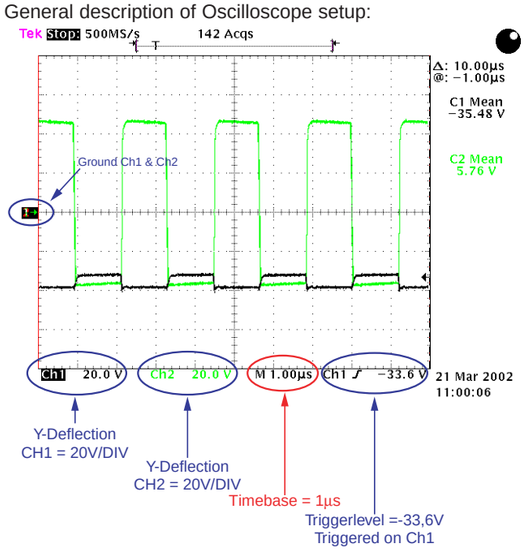
In case **7121** is defect replace following parts:
7121, 7113, 7133, 7118, 7117, 3129, 3130 and 2118

Right Channel:
In case **7218** is defect replace following parts:
7218, 7221, 7244, 7209, 7228, 7208, 3205, 3209 and 2206

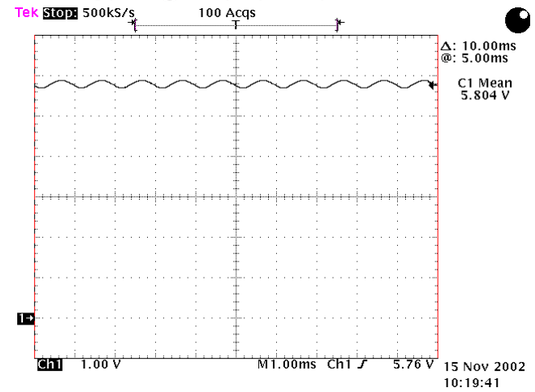
In case **7231** is defect replace following parts:
7231, 7210, 7245, 7235, 7227, 3241, 3243 and 2220

Attention: Do not forget to adjust the DC-offset after replacing the FET!
If none of the FETs is defective the fault is most probably located in the modulator. To check the operation - follow the given signals.

General description of Oscilloscope setup:

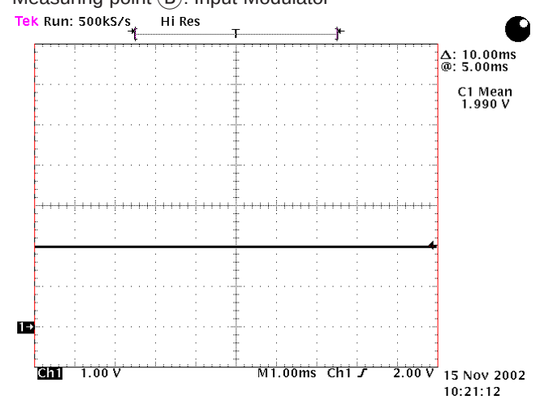


The following signals are measured on condition:
AUX in = 500mV/1kHz, Volume = -28dB
Load = 2 x 6Ω
Measuring point Ⓐ can be found on circuit diagram 3.
All other measuring points are shown on circiut diagram 4 respectively 5.
Measuring point Ⓐ: Output pre-amplifier

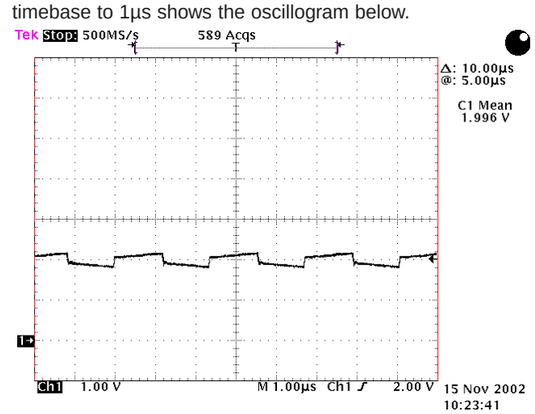


Normal analog signal measured (1kHz- Timebase 1µs). If this signal can´t be measured - the fault is outside the shielding box.

Measuring point Ⓑ: Input Modulator

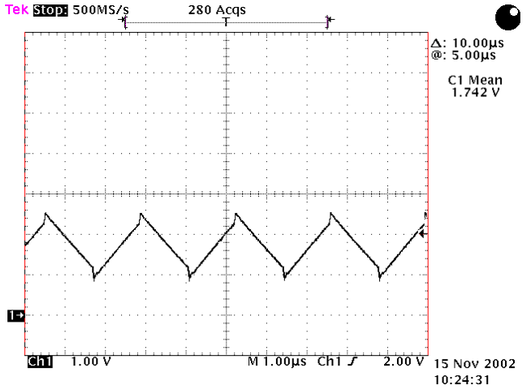


The 1kHz signal is not visible anymore. Reducing the timebase to 1µs shows the oscillogram below.



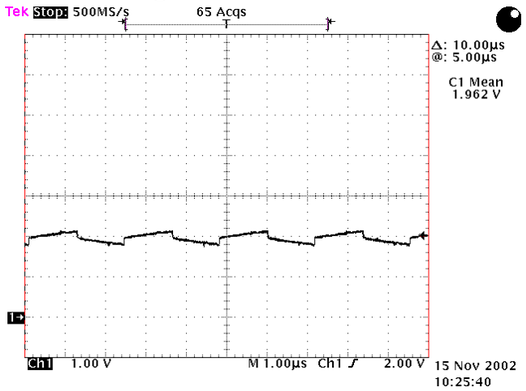
Service Hints

Measuring point Ⓒ:



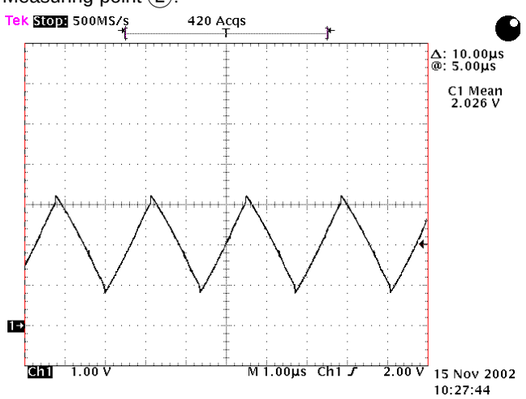
The first stage of the modulator is an integrator. An integrated rectangle results in a triangle.

Measuring point Ⓓ:



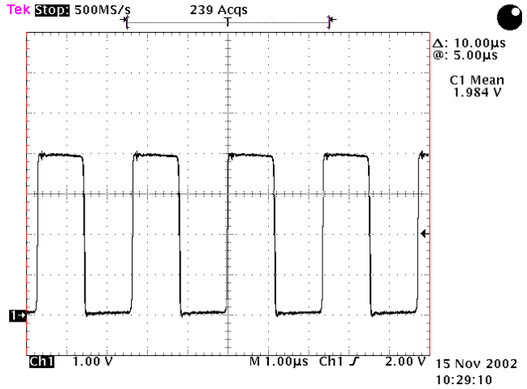
The oscillator signal (squarewave) is fed to the second integrator (7122-B).

Measuring point Ⓔ:



The integrated rectangle results in a triangle. 7122-C works as a comparator. 7122-D improves the shape of the pulses.

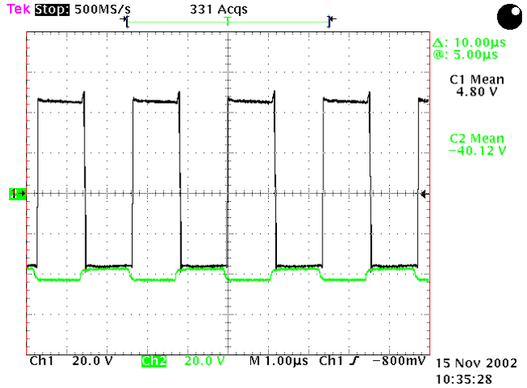
Measuring point Ⓕ: Output modulator



In this pulse width modulated square wave the analog Audio signal is included. Measurements with an analog scope will show a jitter on the falling edge.

The modulator frequency is still fixed to 500kHz. Similar to a frequency modulation - in this case the amplitude of the analog audio signal varies the pulse width, the frequency defines the speed.

Measuring point Ⓖ:

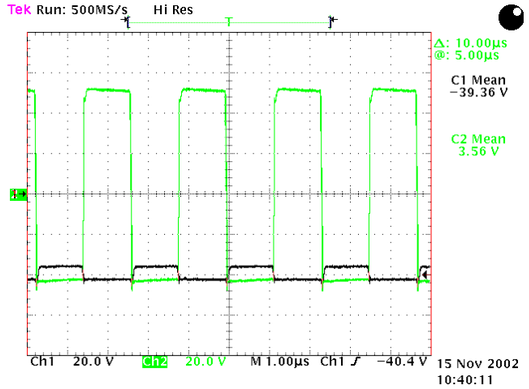


The low-side driver signal <G1> (Ch2) is the modulator output level-shifted by transistor 7128. The high-side driver signal <G2> (Ch1) is the inverted low-side driver signal level-shifted by transistor 7119.

11-3

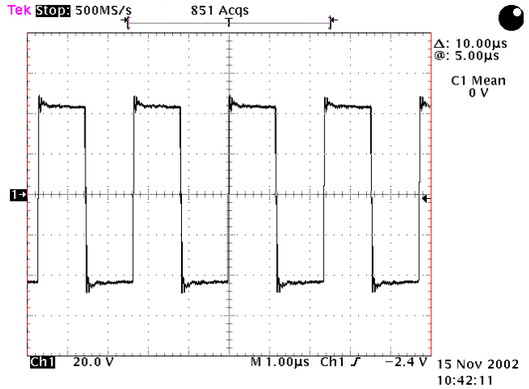
Service Hints

Measuring point Ⓗ: gate-signal of the FETs



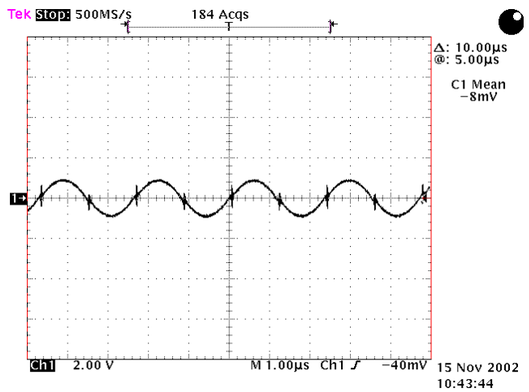
Ch1 = H1, CH2 = H2

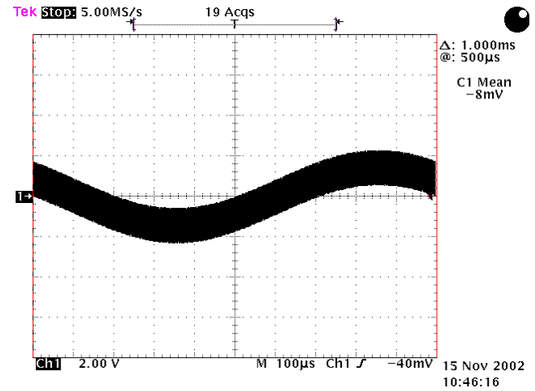
Measuring point Ⓘ:

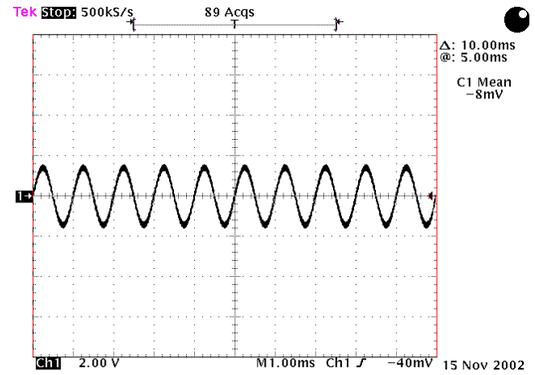


Digital output signal.

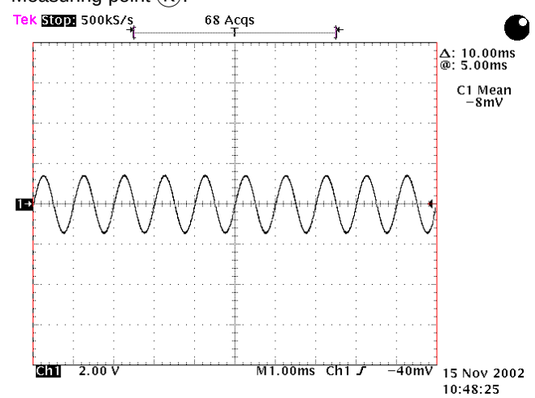
Measuring point Ⓙ:
The following three signals are measured after output filter 5101 with different timebases.







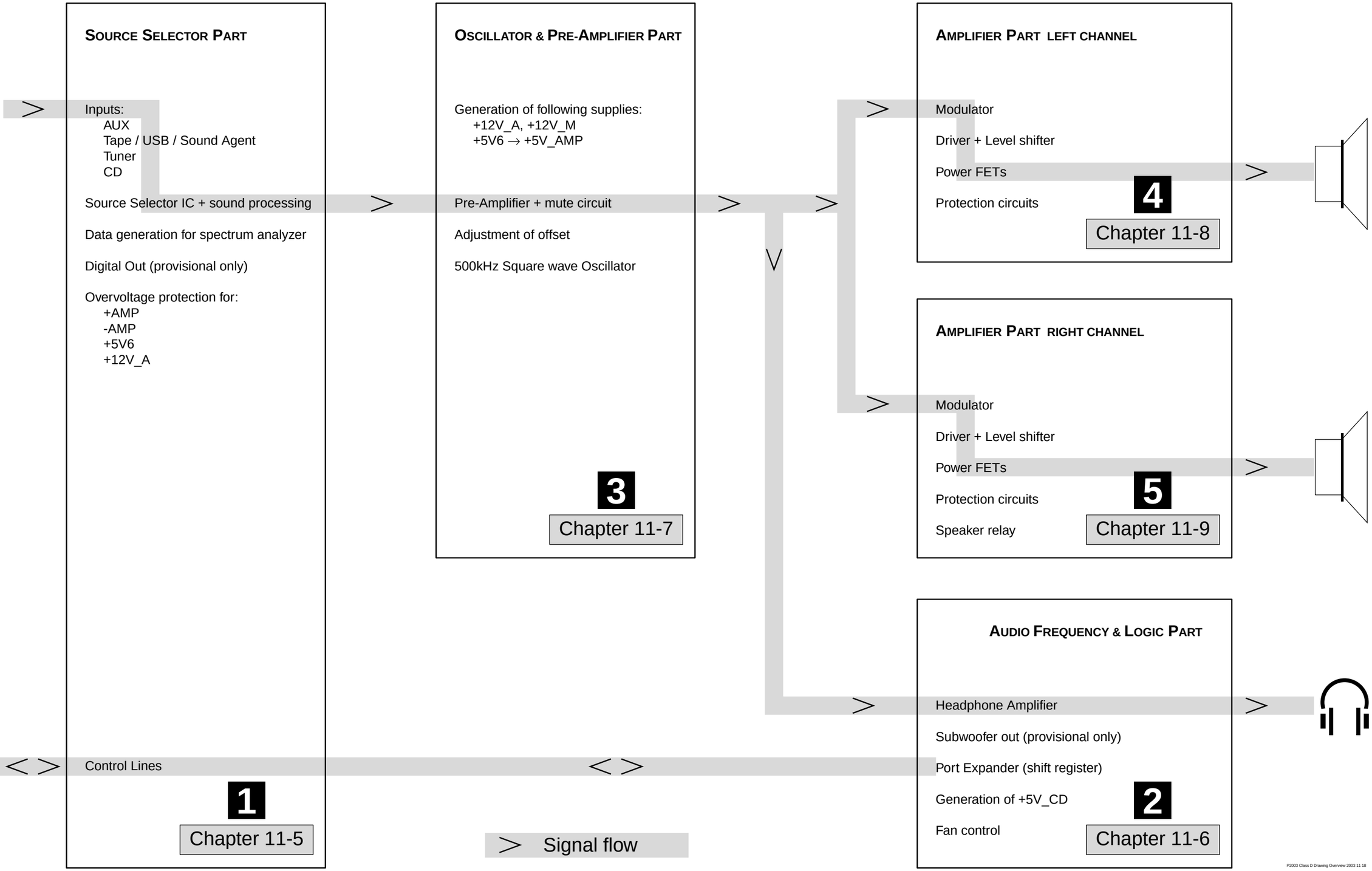
Measuring point Ⓚ:



After common mode coil 5102 - the audio signal is restored.

11-4

Power 2003 75 - 150W Class D
Combi Board Circuit Diagram Overview



1002 A15
1005-1 A1
1005-2 A1
1006 A15
1010 B15
1011 C15
1012 G15
1013 D1
1015 F1
1018 F1
1020 D1
1022 B1
1026 E15
1027 G1
1028-A B1
1028-B A8
2500 A3
2501 A8
2519 B1
2520 A2
2526 A13
2527 A14
2528 A3
2529 A12
2531 A2
2532 A13
2533 B13
2534 B3
2535 B3
2536 B10
2537 C3
2538 B12
2539 B11
2540 C3
2541 D6
2542 D7
2543 D8
2546 D8
2547 D10
2550 D8
2551 D9
2552 E9
2553 E3
2554 D10
2555 E6
2556 E3
2557 F3
2558 F11
2559 F3
2560 G4
2561 G5
2562 G5
2563 G5
2564 G5
2565 G5
2566 G6
2567 G6
2568 G13
2569 H8
2570 G10
2571 G11
2572 H9
2574 H9
2576 H8
2577 H8
2578 H7
2579 H10
2581 D13
2582 D13
2583 G8
2584 D8
2585 F6
2586 A5
2587 A7
2588 A7
2589 A6
2590 B6
2591 A7
2592 A7
2593 H9
3500 A2
3501 C3
3502 C3
3504 A2
3506 E12
3507 E12
3508 F2
3509 F2
3510 F3
3511 F3
3514 A3
3515 A13
3517 A14
3518 A2
3519 A2
3520 A3
3521 A11
3522 B2
3523 B2
3524 A10
3525 B3
3526 B10
3527 B3
3528 B11
3529 B9
3530 B13
3531 B9
3532 B10
3533 C2
3534 C5
3535 C8
3536 C8
3539 D9
3542 D7
3543 D9
3544 D10
3545 D3
3549 E6
3550 D3
3551 E10
3552 F6
3553 F6
3554 F6
3555 F13
3556 F13
3557 F6
3558 F13
3559 F14
3560 F6
3561 G12
3562 G13
3563 G6
3564 G6
3566 G11
3567 G12
3568 G6
3569 G12
3570 G13
3571 H8
3572 H10
3573 G11
3574 H6
3575 H8
3576 H7
3577 H8
3578 H9
3579 H10
3580 D8
3581 G7
3582 B7
3583 A7
3584 A6
3585 A7
3586 B6
3587 A5
3588 B5
3589 B7
3591 F12
5500 A13
6500 C3
6501 C5
6502 F14
6503 G13
6504 G13
6505 G12
6506 E13
6507 F12
6508 D13
7500-1 A12
7500-2 A12
7500-3 B12
7500-4 B12
7500-5 B11
7500-6 A11
7505 B10
7506 E12
7508 E7
7509 G14
7510 A6
7511 A6
7512 A5
F020 A1
F021 A2
F022 A1
F023 B1
F024 B2
F025 C1
F026 C2
F027 C1
F028 C2
F029 C1
F031 D2
F032 D2
F033 D2
F034 E2
F035 E2
F036 E2
F037 E2
F038 E2
F039 F2
F040 F2
F041 F2
F042 F2
F043 F2
F044 F2
F045 F2
F046 F2
F047 F2
F048 F2
F049 F2
F050 F2
F051 G2
F052 G2
F053 G2
F058 B15
F059 B14
F060 B15
F061 C15
F062 C15
F063 C15
F064 C15
F065 D15
F066 D15
F067 D15
F068 D15
F069 D15
F070 D15
F071 E15
F072 E15
F073 E15
F074 H15
F075 E15
F076 E15
F077 D1
F078 E11
F079 F10
F080 G11
F082 E6
F083 H7
F088 B10
F089 D13
F090 A14
F091 A14
F092 A14

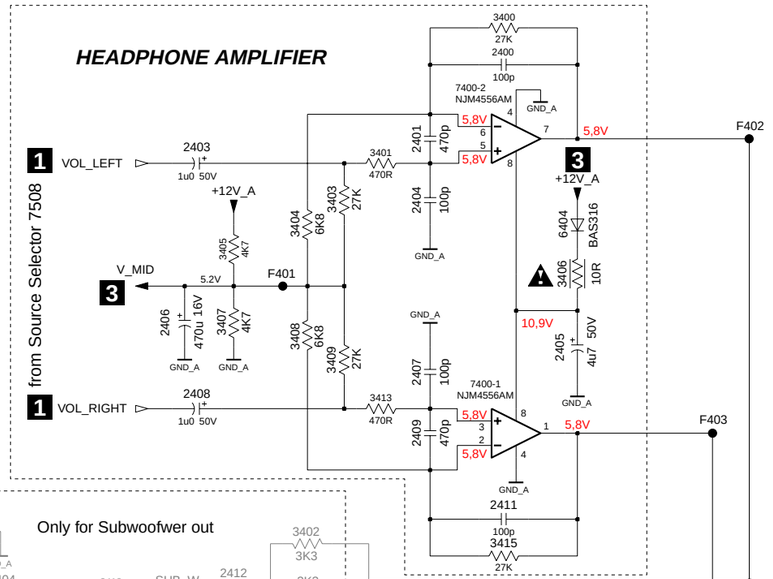
* VARIANT-TABLE			
POS.NR	67781 150W	67841 75W SA	67941 75W TAPE
3510	6k8	6k8	22k
3511	6k8	6k8	22k
3536	22k	22k	1k
3571	22k	22k	1k

SA stands for **S**ound **A**gent

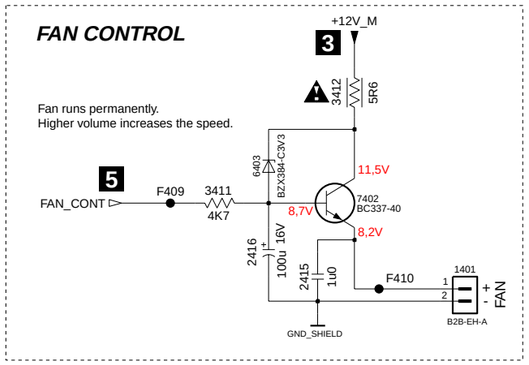
11-6

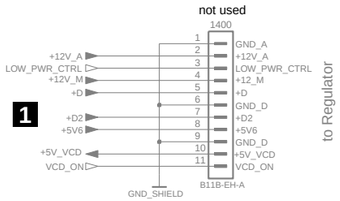
2 COMBI BOARD
AUDIO FREQUENCY & LOGIC

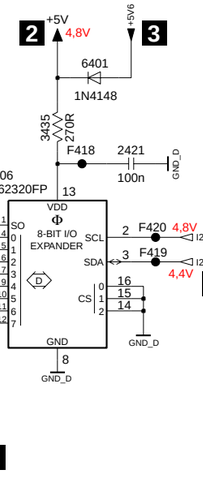
HEADPHONE AMPLIFIER



FAN CONTROL







Combi board P2003 150W class D, 03.12.03

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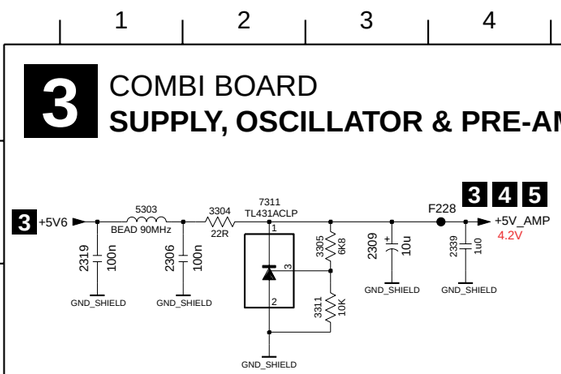
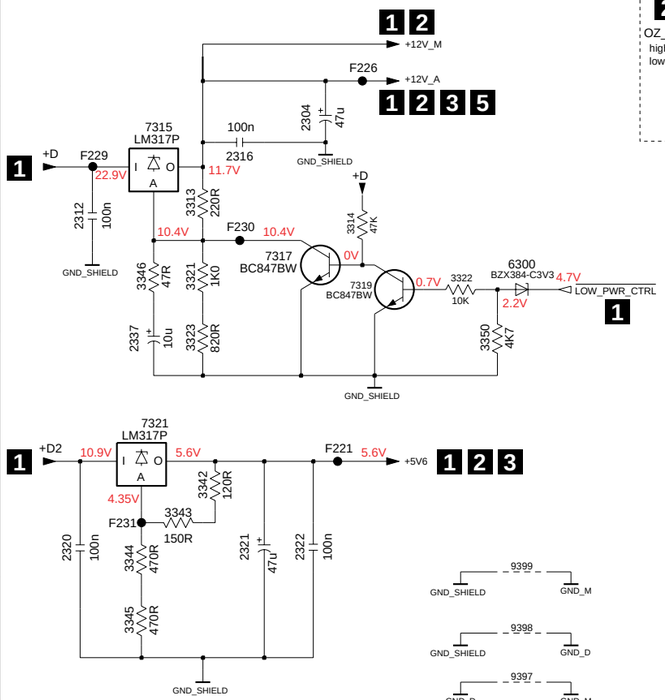
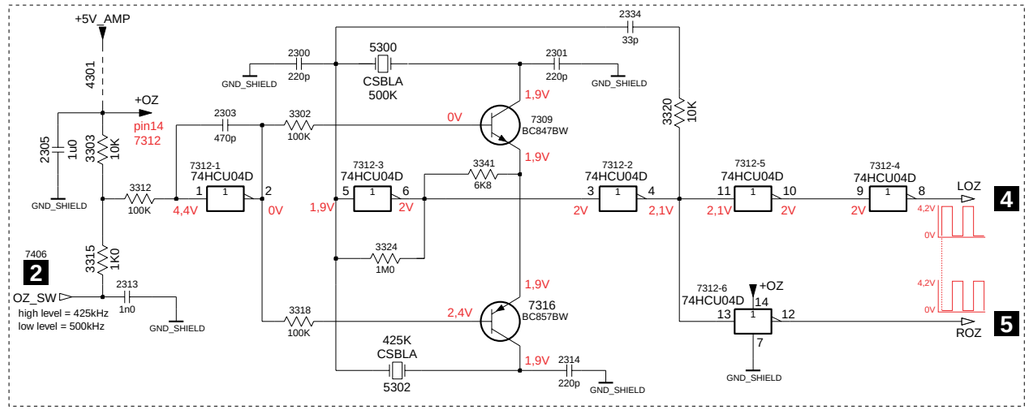
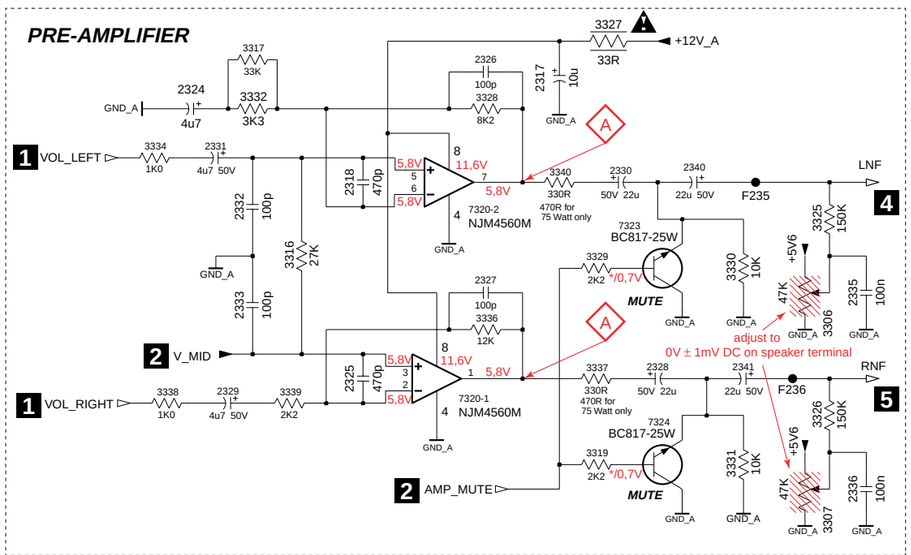
3 COMBI BOARD
SUPPLY, OSCILLATOR & PRE-AMP









Combi board P2003 150W class D, 09.04.04

...V DC voltages measured in tuner mode
EVM (V) ... / ... V off/on
* ... not defined, floating

for wave forms see chapter 11-2 Service Hints

Attention:
Adjustment to 0V ± 1mV DC has to be done with "cold" set.
After operating a few minutes the value may increase up to 30mV.

11-8

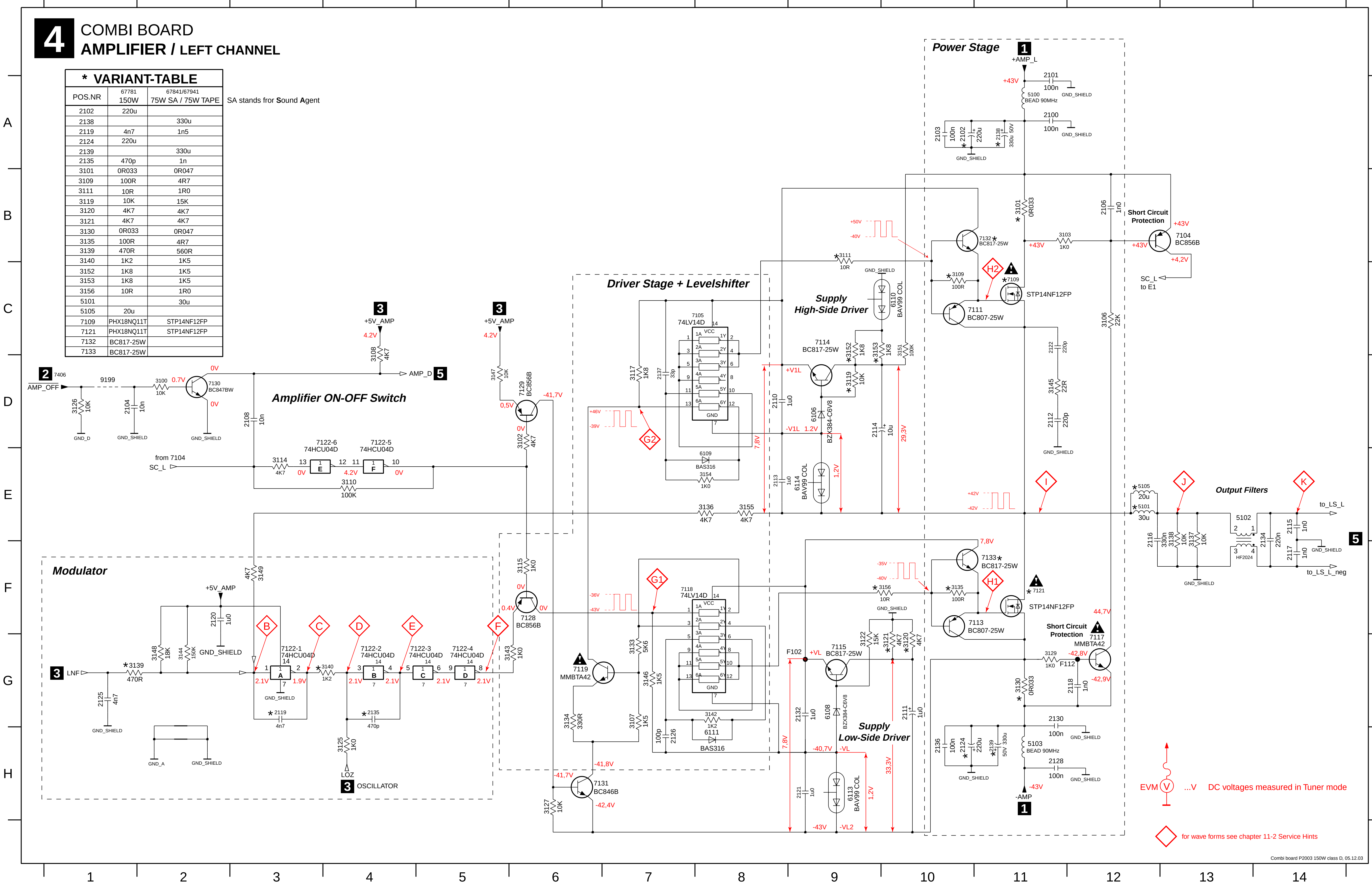
2100 A11	2106 B12	2113 E8	2118 G12	2124 H10	2132 G9	2138 A11	3103 B11	3110 E4	3119 D9	3126 D1	3134 G6	3139 G1	3145 D11	3151 C10	3156 F10	5105 E12	6111 H8	7109 C11	7117 G12	7122-2 G4	7128 F6	7133 F11
2101 A11	2108 D3	2114 D10	2119 G3	2125 G1	2134 F14	2139 H11	3106 C12	3111 C9	3120 G10	3127 H6	3135 F10	3140 G4	3146 G7	3152 C9	5100 A11	6106 D9	6113 H9	7111 C10	7118 F7	7122-3 G4	7129 D6	9199 D1
2102 A10	2110 D8	2115 E14	2120 F2	2126 H7	2135 G4	3100 D2	3107 G7	3114 E3	3121 G10	3129 G11	3136 E8	3142 G8	3147 D5	3153 C9	5101 E12	6108 G9	6114 E9	7113 F10	7119 G6	7122-4 G5	7130 D2	F102 G9
2103 A10	2111 G10	2116 F12	2121 H9	2128 H11	2136 H10	3101 B11	3108 C4	3115 F6	3122 G9	3130 G11	3137 F13	3143 G5	3148 G2	3154 E8	5102 F13	6109 E8	7104 B13	7114 D9	7121 F11	7122-5 E4	7131 H6	F112 G12
2104 D1	2112 D11	2117 F14	2122 C11	2130 G11	2137 D7	3102 E6	3109 C10	3117 D7	3125 H4	3133 G7	3138 F13	3144 G2	3149 F3	3155 E8	5103 H11	6110 C10	7105 C7	7115 G9	7122-1 G3	7122-6 E3	7132 B11	F114 D14

4 COMBI BOARD
AMPLIFIER / LEFT CHANNEL

* VARIANT-TABLE

POS.NR	67781 150W	67841/67941 75W SA / 75W TAPE
2102	220u	
2138		330u
2119	4n7	1n5
2124	220u	
2139		330u
2135	470p	1n
3101	0R033	0R047
3109	100R	4R7
3111	10R	1R0
3119	10K	15K
3120	4K7	4K7
3121	4K7	4K7
3130	0R033	0R047
3135	100R	4R7
3139	470R	560R
3140	1K2	1K5
3152	1K8	1K5
3153	1K8	1K5
3156	10R	1R0
5101		30u
5105	20u	
7109	PHX18NQ11T	STP14NF12FP
7121	PHX18NQ11T	STP14NF12FP
7132	BC817-25W	
7133	BC817-25W	

SA stands fror **S**ound **A**gent



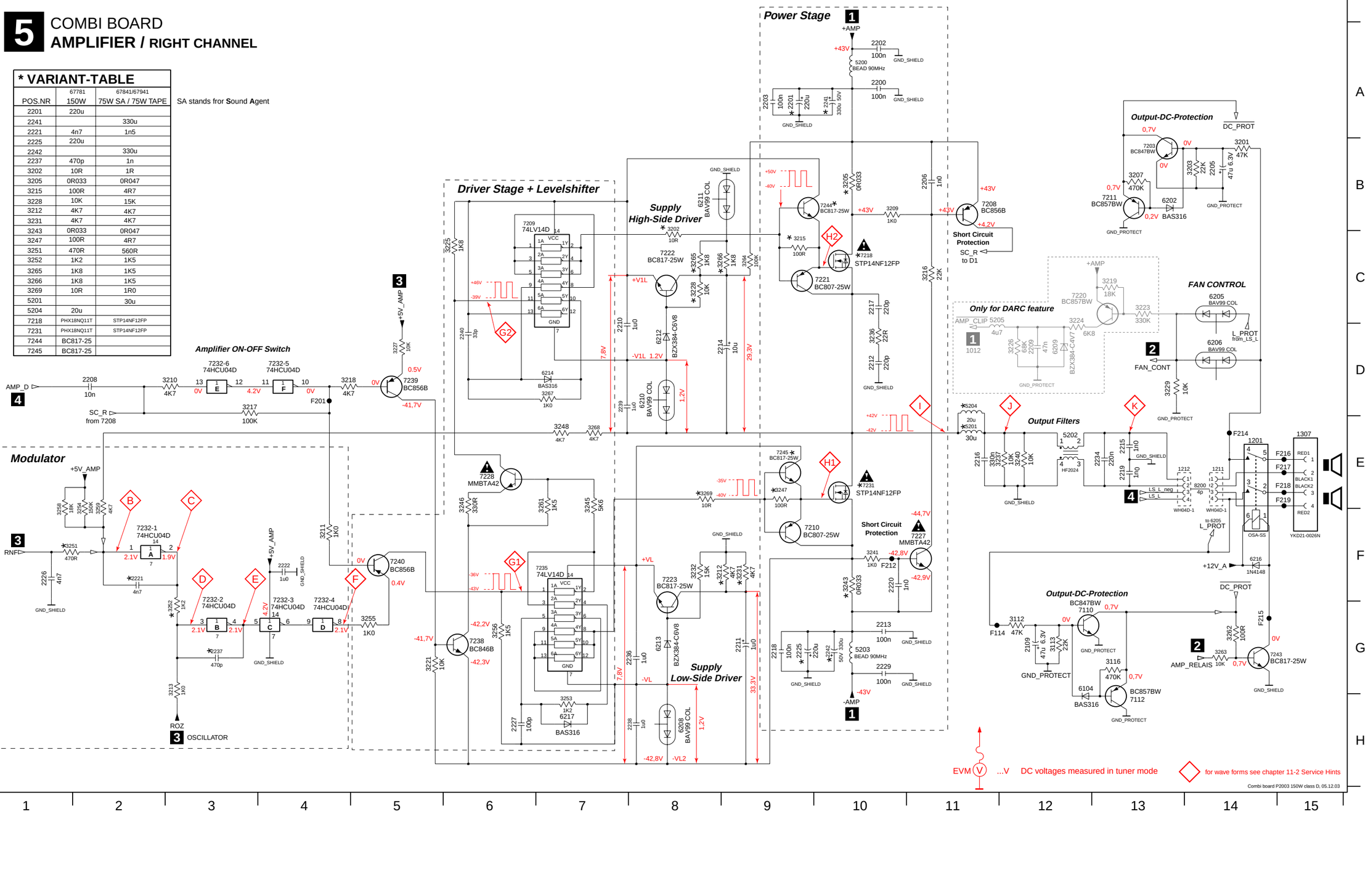
11-9

5 COMBI BOARD
AMPLIFIER / RIGHT CHANNEL

*** VARIANT-TABLE**

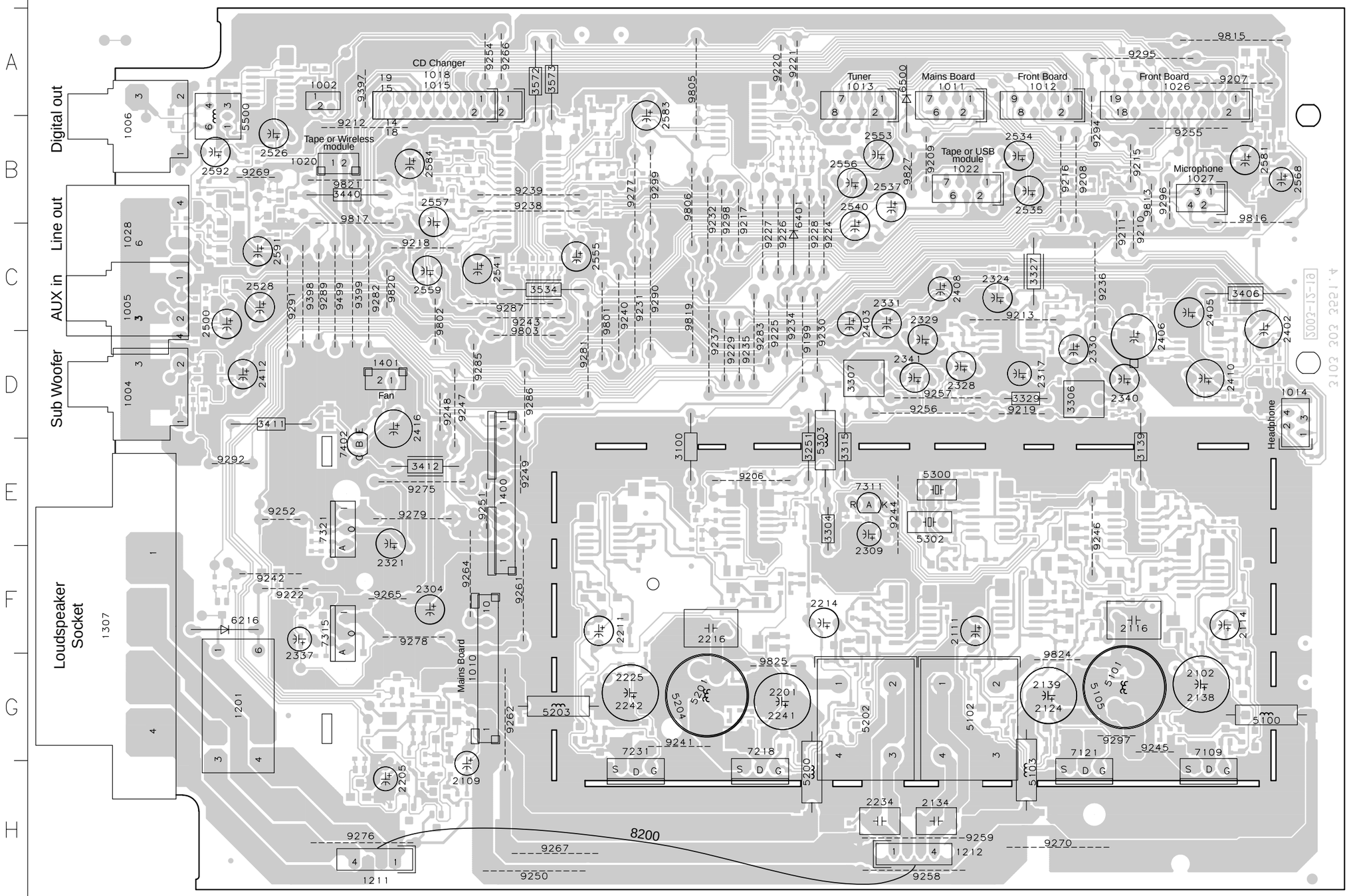
POS.NR	67781 150W	67841/67941 75W SA / 75W TAPE
2201	220u	
2241		330u
2221	4n7	1n5
2225	220u	
2242		330u
2237	470p	1n
3202	10R	1R
3205	0R033	0R047
3215	100R	4R7
3228	10K	15K
3212	4K7	4K7
3231	4K7	4K7
3243	0R033	0R047
3247	100R	4R7
3251	470R	560R
3252	1K2	1K5
3265	1K8	1K5
3266	1K8	1K5
3269	10R	1R0
5201		30u
5204	20u	
7218	PHX18NQ11T	STP14NF12FP
7231	PHX18NQ11T	STP14NF12FP
7244	BC817-25	
7245	BC817-25	

SA stands for **S**ound **A**gent



11-10

COMBI BOARD / componentside view Layout stage .4



This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

P2003 75-150W class D Combi Board .4, 030204

1002 A2
1004 D1
1005 C1
1006 B1
1010 G4
1011 A8
1012 A9
1013 A7
1014 D11
1015 A3
1018 A3
1020 B3
1022 B8
1026 A10
1027 B11
1028 C1
1201 G2
1211 H3
1212 H8
1307 F1
1400 E4
1401 D3
2102 G11
2109 H4
2111 F8
2114 F11
2116 F10
2124 G9
2134 H8
2138 G11
2139 G9
2201 G7
2205 H3
2211 F5
2214 F7
2216 F6
2225 G5
2234 H8
2241 G7
2242 G5
2304 F3
2309 F8
2317 D9
2321 F3
2324 C9
2328 D8
2329 C8
2330 D10
2331 C8
2337 G2
2340 D10
2341 D8
2402 C11
2403 C7
2405 C11
2406 D10
2408 C8
2410 D11
2412 D2
2416 D3
2500 C1
2526 B2
2528 C2
2534 B9
2535 B9
2537 B8
2540 C8
2541 C4
2553 B8
2555 C5
2556 B7
2557 B3
2559 C3
2568 B11
2581 B11
2583 A6
2584 B3
2591 C2
2592 B1
3100 E6
3139 E10
3251 E7
3304 E7
3306 D9
3307 D7
3315 E7
3327 C9
3329 D9
3406 C11
3411 D2
3412 E3
3440 B3
3534 C4
3572 A4
3573 A5
5100 G11
5101 G10
5102 G8
5103 H9
5105 G10
5200 H7
5201 G6
5202 G7
5203 G5
5204 G6
5300 E8
5302 E8
5303 E7
5500 B2
6216 F2
6401 B7
6500 A8
7109 G11
7121 G10
7218 G6
7231 G5
7307 E8
7311 F2
7315 E2
7321 E3
7402 A8
8200 H5
9199 D7
9206 E6
9207 A11
9208 B9
9209 B8
9210 C10
9211 C10
9212 B3
9213 C9
9215 B10
9216 B9
9217 B6
9218 C3
9219 D9
9220 A7
9221 A7
9222 F2
9224 C7
9225 D7
9226 C7
9227 C7
9228 C7
9229 D6
9230 D7
9231 C5
9232 B6
9234 C7
9235 D6
9236 C10
9237 D6
9238 B4
9239 B4
9240 C5
9241 G6
9242 F2
9243 C4
9244 E8
9245 G10
9246 E10
9247 D4
9248 D4
9249 E4
9250 H4
9251 E4
9252 E2
9254 A4
9255 B10
9256 D8
9257 D8
9258 H8
9259 H8
9261 F4
9262 G4
9264 F4
9265 F3
9266 A4
9267 H5
9269 B2
9270 H9
9275 E3
9276 H3
9277 B5
9278 F3
9279 E3
9281 D5
9282 C3
9283 D6
9285 D4
9286 D4
9287 C4
9289 C2
9290 C6
9291 C2
9292 E2
9294 B10
9295 A10
9296 B10
9297 G10
9298 B6
9299 B6
9397 A3
9398 C2
9399 C3
9499 C3
9801 C5
9802 C4
9803 D4
9805 A6
9806 B6
9813 B10
9815 A11
9816 B11
9817 B3
9819 C6
9820 C3
9821 B3
9824 G9
9825 G7
9827 B8

11-11

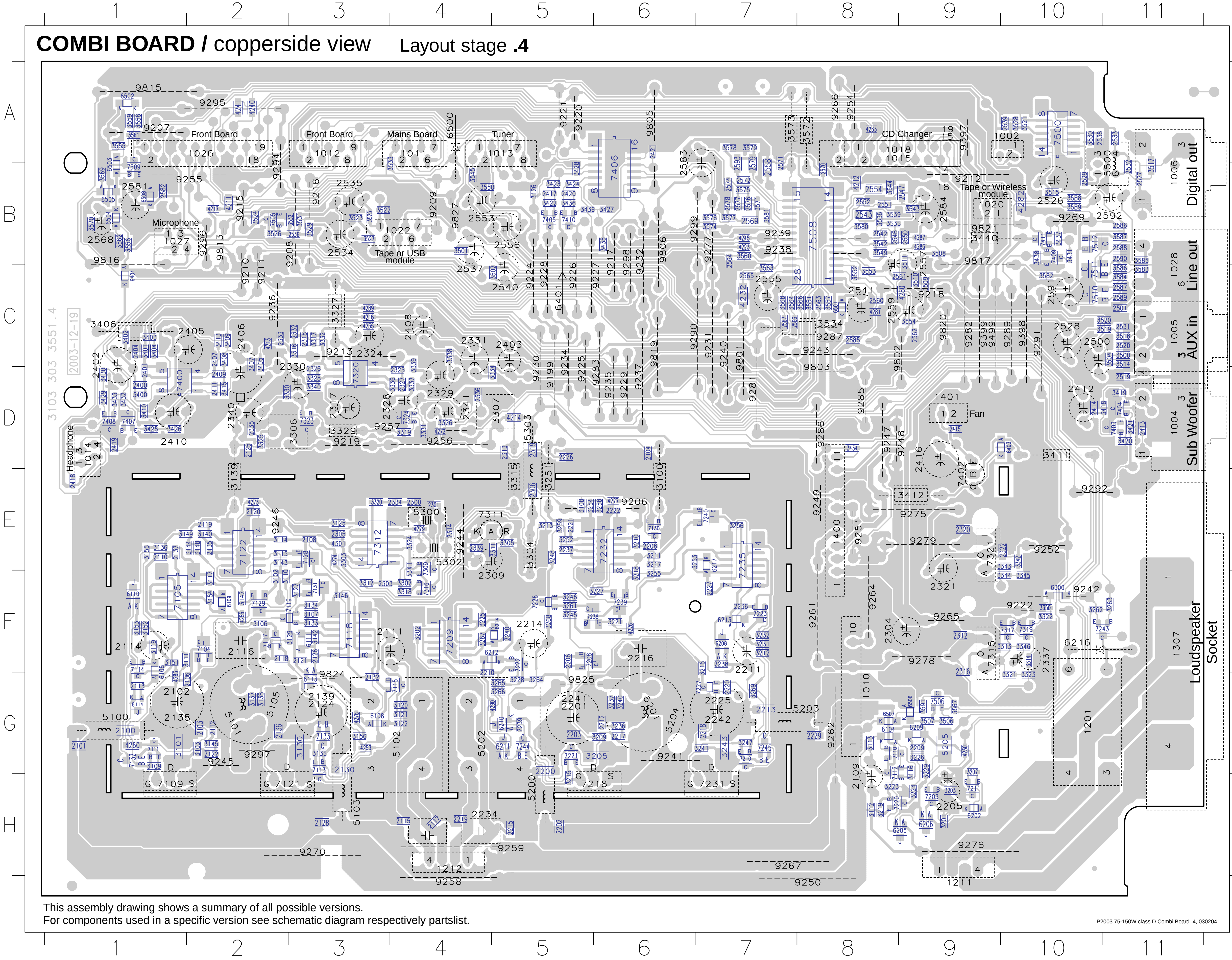
1002 A9	1013 A5	1027 B1	1401 D9	2134 H4	2216 F6	2317 D3	2337 F10
1004 D11	1014 D1	1028 C11	2102 G1	2138 G1	2225 G7	2321 F9	2340 D2
1005 C11	1015 A8	1201 G10	2109 H8	2139 G3	2234 H4	2324 C3	2341 D4
1006 B11	1018 A9	1211 H9	2111 F3	2201 G5	2241 G5	2328 D3	2402 C1
1010 G8	1020 B9	1212 H4	2114 F1	2205 H9	2242 G7	2329 D4	2403 C5
1011 A4	1022 B4	1307 F11	2116 F2	2211 F7	2304 F8	2330 D2	2405 C2
1012 A3	1026 A2	1400 E8	2124 G3	2214 F5	2309 E4	2331 C4	2406 C2

2408 C4	2534 B3	2556 B5	2591 C10	3307 D5	3440 B9	5103 H3	5300 E4
2410 D1	2535 B3	2557 B9	2592 B11	3315 E5	3534 C8	5105 G2	5302 E4
2412 D10	2537 B4	2559 C8	3100 E6	3327 C3	3572 A8	5200 H5	5303 D5
2416 D9	2540 C5	2568 B1	3139 E2	3329 D3	3573 A7	5201 G6	5500 B11
2500 C10	2541 C8	2581 B1	3251 E5	3406 C1	5100 G1	5202 G5	6216 F10
2526 B10	2553 B4	2583 A6	3304 E5	3411 D10	5101 G2	5203 G8	6401 C5
2528 C10	2555 C7	2584 B9	3306 D3	3412 E9	5102 G4	5204 G6	6500 A4

7109 H1	7402 E9	9211 C2	9219 D3	9227 C6	9235 D6	9242 F10	9249 E8
7121 H2	9199 D5	9212 B9	9220 A5	9228 C5	9236 C2	9243 C8	9250 H8
7218 H6	9206 E6	9213 C3	9221 A5	9229 D6	9237 D6	9244 E4	9251 E8
7231 H7	9207 A1	9215 B2	9222 F10	9230 D5	9238 B8	9245 G2	9252 E10
7311 E4	9208 B3	9216 B3	9224 C5	9231 C7	9239 B8	9246 E2	9254 A8
7315 F9	9209 B4	9217 B6	9225 D5	9232 B6	9240 C7	9247 D8	9255 B2
7321 E9	9210 C2	9218 C9	9226 C5	9234 C5	9241 G6	9248 D9	9256 D4

9257 D3	9266 A8	9278 F9	9287 C8	9296 B2	9499 C9	9815 A1	9825 G5
9258 H4	9267 H7	9279 E9	9289 C10	9297 G2	9801 C7	9816 B1	9827 B4
9259 H4	9269 B10	9281 D7	9290 C6	9298 B6	9802 C8	9817 B9	
9261 F8	9270 H3	9282 C9	9291 C10	9299 B6	9803 D8	9819 C6	
9262 G8	9275 E9	9283 D6	9292 E10	9397 A9	9805 A6	9820 C9	
9264 F8	9276 H9	9285 D8	9294 B2	9398 C10	9806 B6	9821 B9	
9265 F9	9277 B7	9286 D8	9295 A2	9399 C9	9813 B2	9824 F3	

COMBI BOARD / copperside view   Layout stage .4



This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

P2003 75-150W class D Combi Board .4, 030204

2100 G1	2587 C11	3337 D4	4216 C3
2101 G1	2588 B11	3338 C4	4217 B2
2103 G2	2589 C11	3339 C4	4223 B7
2104 D6	2590 B11	3340 D3	4226 F6
2106 G2	2593 B7	3341 F4	4230 G9
2108 E3	3101 G1	3342 E10	4232 C7
2110 E1	3102 F2	3343 E10	4233 A8
2112 G2	3103 G2	3344 F10	4235 C3
2113 G1	3106 F2	3345 F10	4240 A2
2115 H4	3107 F3	3346 F10	4241 A2
2117 H4	3108 E5	3350 F10	4245 B7
2118 F2	3109 G1	3400 D1	4253 G3
2119 E2	3110 F2	3401 C1	4260 G1
2120 E2	3111 F1	3402 C1	4265 F2
2121 F3	3112 H8	3403 C1	4272 D4
2122 G2	3113 G8	3404 C1	4273 E2
2125 D2	3114 E2	3405 C2	4274 E3
2126 F3	3115 E2	3407 C2	4276 G3
2128 H3	3116 G9	3408 C2	4277 E6
2130 G3	3117 F2	3409 C2	4279 E4
2132 G3	3119 F1	3410 D1	4280 C9
2135 E2	3120 G4	3413 C2	4281 C8
2136 G2	3121 G4	3415 D2	4282 B10
2137 E1	3122 G4	3418 D11	4283 G1
2200 H5	3125 E3	3419 D11	4286 B9
2202 H5	3126 B5	3420 D11	4287 B9
2203 G5	3127 F3	3421 D11	4289 C3
2206 F5	3129 F3	3422 B5	4290 G5
2208 E6	3130 G3	3423 B5	4301 E3
2209 G9	3133 F3	3424 B5	5205 G9
2210 G4	3134 F3	3425 D1	6104 G8
2212 G6	3135 G3	3426 D1	6106 F1
2213 G7	3136 E1	3427 B6	6108 G3
2215 H5	3137 G2	3428 B5	6109 F2
2217 G6	3138 G2	3429 D1	6110 F1
2218 G7	3140 E2	3430 D1	6111 F3
2219 H4	3142 F3	3431 B10	6113 G3
2220 G7	3143 E2	3432 D1	6114 G1
2221 E5	3144 E2	3433 D1	6202 H9
2222 E6	3145 G2	3434 D8	6205 H8
2226 D5	3146 F3	3435 B6	6206 H9
2227 F7	3147 F2	3436 B5	6208 F7
2229 G8	3148 E2	3437 B10	6209 G9
2236 F7	3149 E1	3438 B10	6210 G5
2237 E5	3151 F1	3439 B5	6211 G5
2238 F7	3152 F1	3500 C11	6212 F4
2239 G5	3153 F1	3501 B4	6213 F7
2240 F5	3154 F2	3502 C5	6214 F4
2300 E4	3155 E1	3504 C11	6217 E7
2301 E4	3156 G3	3506 G9	6300 F10
2303 F3	3201 H9	3507 G9	6403 D10
2305 E3	3202 F4	3508 B9	6404 C1
2306 E5	3203 H9	3509 C9	6501 C8
2312 F9	3205 G6	3510 C9	6502 A1
2313 D5	3207 G9	3511 B9	6503 A1
2314 E4	3209 G6	3514 C11	6504 B1
2316 F9	3210 E6	3515 B10	6505 B1
2318 C3	3211 E6	3517 B11	6506 G9
2319 D5	3212 F7	3518 C11	6507 G8
2320 E9	3213 E5	3519 C11	6508 B1
2322 E10	3215 H5	3520 C11	7104 F2
2325 D4	3216 F7	3521 A10	7105 F1
2326 D3	3217 E6	3522 B3	7110 G8
2327 D4	3218 F6	3523 B3	7111 G1
2332 C3	3219 H8	3524 B2	7112 G8
2333 C2	3221 F6	3525 B3	7113 G3
2334 E4	3223 H8	3526 B2	7114 F1
2335 D2	3224 H9	3527 B3	7115 G4
2336 D4	3225 F4	3528 A10	7117 F2
2339 E4	3226 G9	3529 B3	7118 F3
2400 D1	3227 F6	3530 A10	7119 F3
2401 D1	3228 G5	3531 B3	7122 E2
2404 C1	3229 G9	3532 B3	7128 E3
2407 C2	3231 F7	3533 B4	7129 F2
2409 D2	3232 F7	3535 B8	7130 E6
2411 D2	3236 G6	3536 B8	7131 F3
2413 D11	3237 G6	3539 B8	7132 G1
2414 D10	3240 G6	3542 B8	7133 G3
2415 D9	3241 G7	3543 B9	7203 H9
2417 B5	3243 G7	3544 B8	7208 F5
2418 E1	3245 F5	3545 B4	7209 F4
2419 D1	3246 F5	3549 B8	7210 G7
2420 B5	3247 G7	3550 B4	7211 H9
2421 A6	3248 E5	3551 C8	7220 H8
2501 C11	3252 E5	3552 C8	7221 G5
2519 D11	3253 E6	3553 C8	7222 F5
2520 C11	3254 E5	3554 C9	7223 F7
2527 B11	3255 F6	3555 A1	7227 G7
2529 B10	3256 E7	3556 B1	7228 F5
2531 C11	3258 E6	3557 C8	7232 E6
2532 B11	3259 E5	3558 A1	7235 E7
2533 A11	3261 F5	3559 A1	7238 F5
2536 B3	3262 F10	3560 B7	7239 F6
2538 A10	3263 F11	3561 A1	7240 E7
2539 A10	3264 G5	3562 B1	7243 F10
2542 B8	3265 G5	3563 C7	7244 G5
2543 B8	3266 G5	3564 C7	7245 G7
2546 B8	3267 F4	3566 C8	7309 E4
2547 B9	3268 F5	3567 G9	7312 E3
2550 B9	3269 G7	3568 C7	7316 F4
2551 B8	3302 F4	3569 B1	7317 F10
2552 B8	3303 E3	3570 B1	7319 F10
2554 B8	3305 E5	3571 B7	7320 D3
2558 B7	3311 E5	3574 B7	7323 D3
2560 C8	3312 F3	3575 B7	7324 D4
2561 C9	3313 F10	3576 B7	7400 D1
2562 C9	3314 F10	3577 B7	7403 D11
2563 C8	3316 C3	3578 A7	7404 D11
2564 B7	3317 C3	3579 A7	7405 B5
2565 C7	3318 F4	3580 B8	7406 B6
2566 C7	3319 D4	3581 B7	7407 D1
2567 C7	3320 E3	3582 C10	7408 D1
2569 B7	3321 G10	3583 C11	7409 B10
2570 B8	3322 F10	3584 C11	7410 B5
2571 A7	3323 G10	3585 B11	7411 B10
2572 B7	3324 E4	3586 C11	7500 A10
2574 B7	3325 D2	3587 B11	7505 B2
2576 B7	3326 D4	3588 B10	7506 G9
2577 B7	3328 D3	3589 B10	7508 B8
2578 B7	3330 D2	3591 G9	7509 B1
2579 B7	3331 D4	4211 B2	7510 C10
2582 B1	3332 C3	4212 B8	7511 C10
2585 C8	3334 D5	4213 C2	7512 B10
2586 B11	3336 D4	4214 D5	

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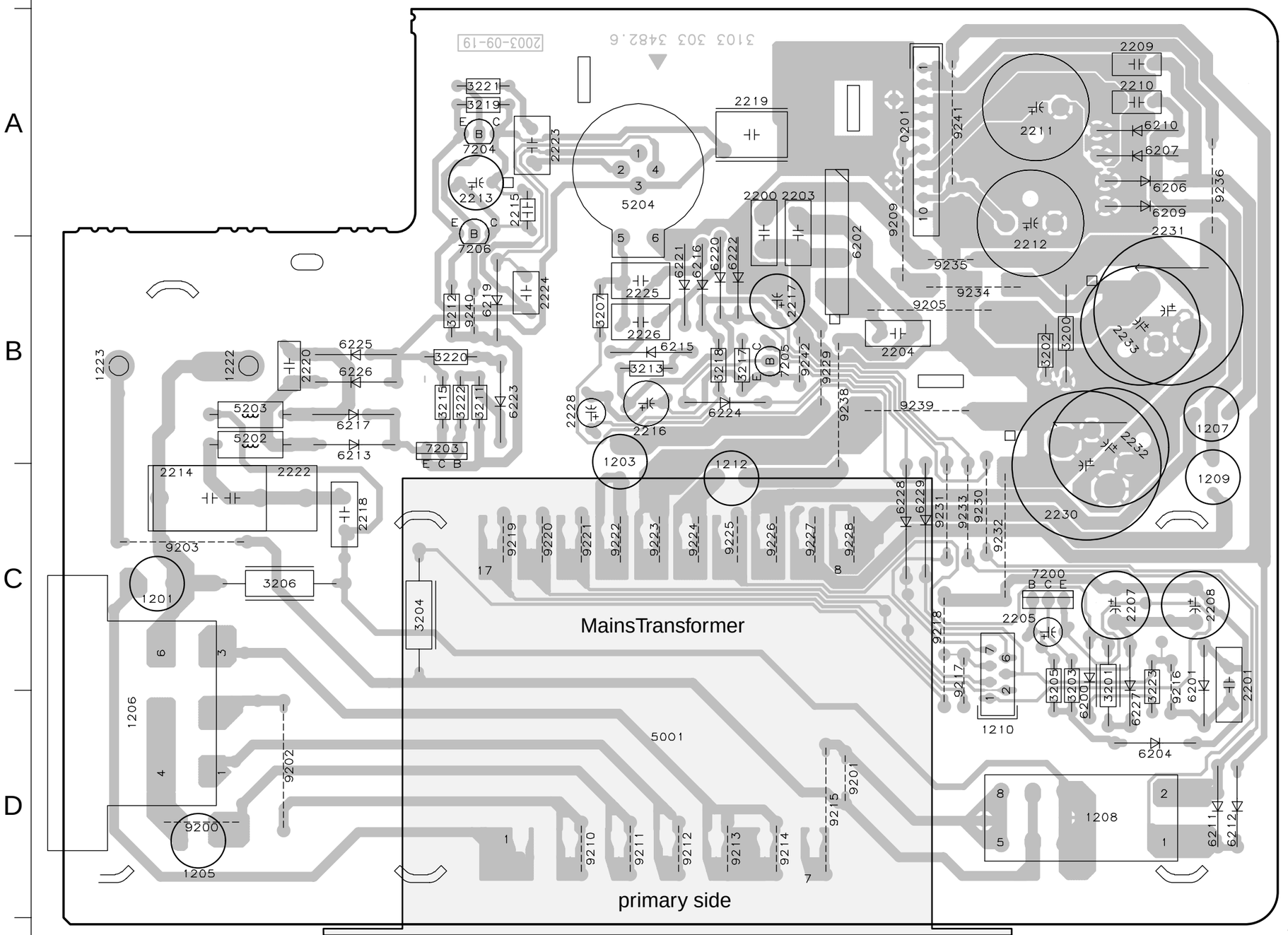
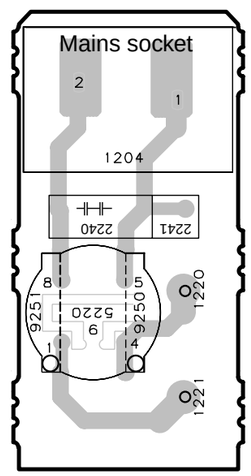
Mains Board I copperside view



This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

Power2002 70W Class D - Mains Board stage.6 2003 10 02



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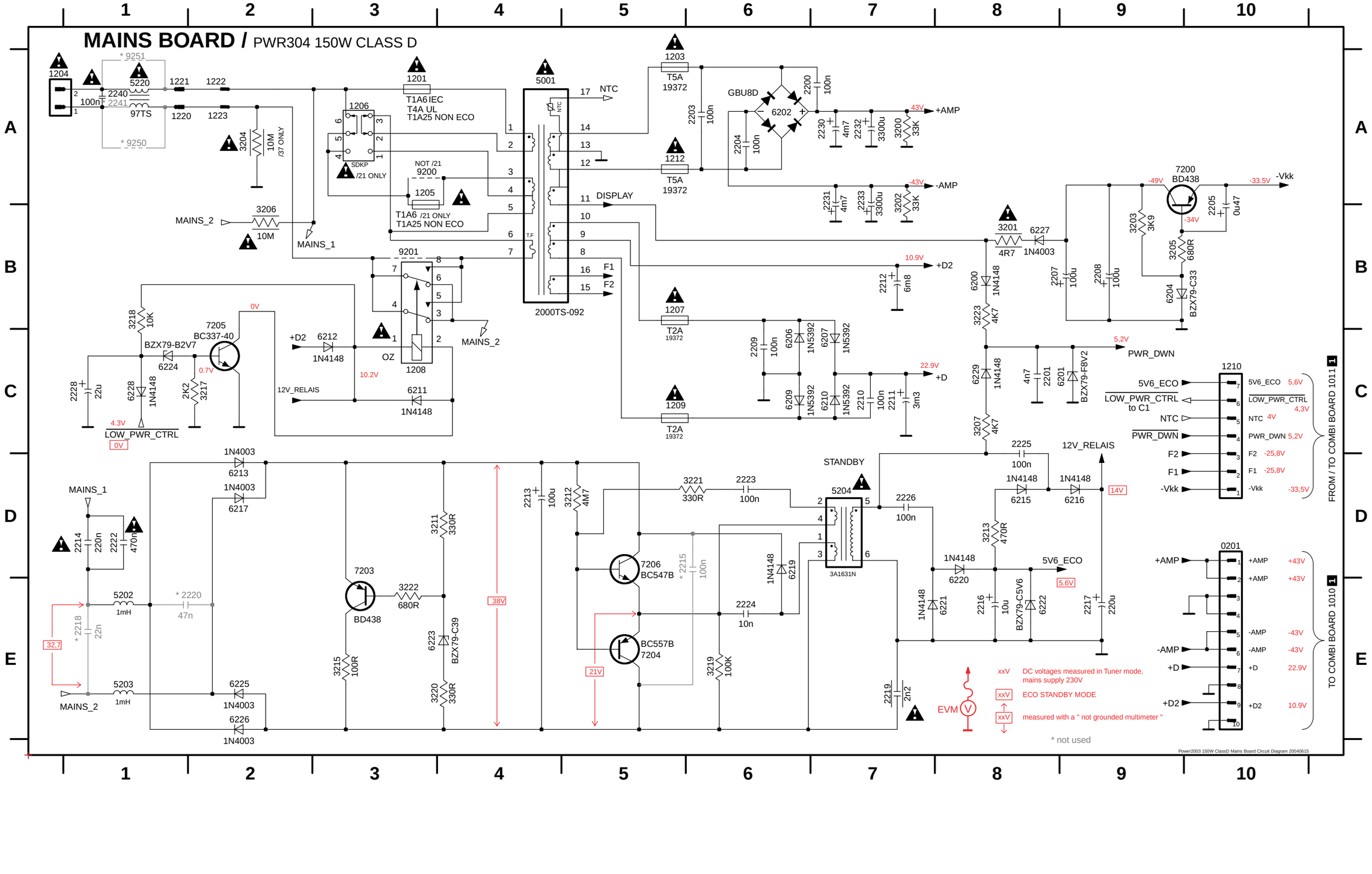
MAINS BOARD / PWR304 150W CLASS D



ELECTRICAL PARTSLIST *POWER 2003 75&150W Class-D* ***MAINS BOARD***

MISCELLANEOUS

1201 ⚠	9940 000 01959	FUSE T1,6A 250V	/21/22 only
1201 ⚠	4822 253 10126	FUSE T4A	/37 only
1203 ⚠	9940 000 01962	FUSE T5A 250V	/21/22 only
1204 ⚠	2422 030 00328	MAINS SOCKET /37	
1204 ⚠	9940 000 01347	MAINS SOCKET 2P 2.5A 250V	
1205 ⚠	9940 000 01959	FUSE T1,6A 250V	/21 only
1206 ⚠	9940 000 01323	VOLTAGE SELECTOR	/21 only
1207 ⚠	9940 000 01961	FUSE RAD T2A 250V	
1208 ⚠	9940 000 01963	RELAY 1P 12V 16A	
1209 ⚠	9940 000 01961	FUSE RAD T2A 250V	
1210	4822 267 10953	FFC-CONNECTOR, 7P, TOP ENTRY	
1212 ⚠	9940 000 01962	FUSE T5A 250V	
5001 ⚠	3103 308 30870	Mains Transformer /37	for 75W only
5001 ⚠	3103 308 30880	Mains Transformer /22	for 75W only
5001 ⚠	3103 308 30890	Mains Transformer /21, /21M	for 75W only
5001 ⚠	3103 308 31011	Mains Transformer /37	for 150W only
5001 ⚠	3103 308 31001	Mains Transformer /22	for 150W only
5001 ⚠	9940 000 01992	Mains Transformer /21, /21M	for 150W only
5204 ⚠	9940 000 01227	STANDBY TRANSFORMER	

CAPACITORS

2200	4822 121 43696	100nF	10%	100V	
2201	4822 122 31125	4,7nF	10%	63V	
2203	4822 121 43696	100nF	10%	100V	
2204	4822 121 43696	100nF	10%	100V	
2205	5322 124 41948	0,47µF	20%	50V	
2208	2020 012 93547	100µF	20%	63V	
2209	5322 121 42386	100nF	5%	63V	
2210	5322 121 42386	100nF	5%	63V	
2211	4822 124 42367	3300µF	20%	35V	
2212	4822 124 12328	6800µF	20%	16V	
2213	4822 124 40255	100µF	20%	50V	
2214 ⚠	4822 121 10512	220nF	20%	275V	/22 only
2216	4822 124 21732	10µF	20%	25V	
2217	4822 124 80144	220µF	20%	25V	
2219 ⚠	9940 000 01954	2,2nF	20%	250V	
2222 ⚠	9940 000 01956	470nF	20%	275V	/21/37 only
2223	5322 121 42386	100nF	5%	63V	
2224	4822 122 30043	10nF	80%	63V	
2225	5322 121 42386	100nF	5%	63V	
2226	5322 121 42386	100nF	5%	63V	
2228 ©	4822 124 11946	22µF	20%	16V	
2232	9940 000 01206	3300µF	20%	50V	
2233	9940 000 01206	3300µF	20%	50V	
2240 ⚠	9940 000 01955	100nF	20%	275V	

RESISTORS

3200	4822 050 23303	33kΩ	1%	0,6W	
3201 ⚠	9940 000 01953	4,7Ω	5%	0,5W	NFR
3202	4822 050 23303	33kΩ	1%	0,6W	
3203	4822 116 52276	3,9kΩ	5%	0,5W	
3204 ⚠	4822 053 21106	10MΩ	5%	0,5W	/37 only
3205	4822 116 52228	680Ω	5%	0,5W	
3206 ⚠	9940 000 01952	10MΩ	5%	0,5W	
3207	4822 116 52283	4,7kΩ	5%	0,5W	
3211	4822 116 52219	330Ω	5%	0,5W	
3212	4822 111 30893	4,7MΩ	5%	0,2W	
3213	4822 116 83883	470Ω	5%	0,16W	
3215	4822 116 52175	100Ω	5%	0,5W	
3217	4822 116 52256	2,2kΩ	5%	0,16W	
3218	4822 050 21003	10kΩ	2%	0,25W	
3219	4822 116 52234	100kΩ	5%	0,5W	
3220	4822 116 52219	330Ω	5%	0,5W	
3221	4822 116 52219	330Ω	5%	0,5W	
3222	4822 116 52228	680Ω	5%	0,5W	
3223	4822 116 52283	4,7kΩ	5%	0,5W	

COILS

5202	4822 157 53473	1000µH
5203	4822 157 53473	1000µH
5220 ⚠	9940 000 01226	400µH, Mains filter

DIODES

6200	4822 130 30621	1N4148
6201	4822 130 34382	BZX79-B8V2
6202	9940 000 01951	BRIDGE RECTIFIER GBU8K
6204	4822 130 34142	BZX79-B33
6206	4822 130 31878	1N4003G
6207	4822 130 31878	1N4003G
6209	4822 130 31878	1N4003G
6210	4822 130 31878	1N4003G
6211	4822 130 30621	1N4148
6212	4822 130 30621	1N4148
6213	4822 130 31878	1N4003G
6215	4822 130 30621	1N4148
6216	4822 130 30621	1N4148
6217	4822 130 31878	1N4003G
6219	4822 130 30621	1N4148
6220	4822 130 31983	BAT85
6221	4822 130 31983	BAT85
6223	4822 130 34145	BZX79-B39
6224	5322 130 34563	BZX79-C2V7
6225	4822 130 31878	1N4003G
6226	4822 130 31878	1N4003G
6227	4822 130 31878	1N4003G
6228	4822 130 30621	1N4148
6229	4822 130 30621	1N4148

TRANSISTORS

7200	4822 130 40995	BD438
7203	4822 130 40995	BD438
7204	4822 130 44568	BC557B
7205	4822 130 40855	BC337-40
7206	4822 130 40959	BC547B

Note:
Components printed in grey colour are considered as standard spareparts and thus not available on service stock.
Code numbers are published for orientation only.

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ELECTRICAL PARTSLIST *POWER 2003 75&150W Class-D* ***COMBI BOARD***

MISCELLANEOUS

0021	4822 492 11735	SPRING TRANSISTOR	
1005	9940 000 01221	SOCKET, CINCH, 2P	
1011	4822 267 10953	FFC-CONNECTOR, 7P, TOP ENTRY	
1012	2422 025 14518	FFC-CONNECTOR, 9P, TOP ENTRY	
1013	4822 265 11515	FFC-CONNECTOR, 8P, TOP ENTRY	
1014	4822 267 10733	FFC CONNECTOR, 4P, TOP ENTRY	
1015	4822 265 10981	FFC-CONNECTOR, 15P, TOP ENTRY	
1022	4822 267 10953	FFC-CONNECTOR, 7P, TOP ENTRY	
1026	4822 265 11553	FFC-CONNECTOR, 19P, TOP ENTRY	
1201 ⚠	9940 000 01989	RELAY 2P 12V 3A	
1307	9940 000 01219	SOCKET, CLICKFIT, 4P	

CAPACITORS

2100 ©	4822 122 33496	100nF	10%	63V	
2101 ©	2222 580 15649	100nF	10%	50V	
2102	2022 031 00196	220µF	20%	50V	for 150W only
2103 ©	2222 580 15649	100nF	10%	50V	
2104 ©	5322 126 11583	10nF	10%	63V	
2106 ©	5322 126 11578	1nF	10%	63V	
2108 ©	5322 126 11583	10nF	10%	63V	
2109	4822 124 80483	47µF	20%	6,3V	
2110 ©	3198 017 41050	1µF	20%	10V	
2111	4822 124 21913	1µF	20%	63V	
2112 ©	4822 126 13883	220pF	5%	50V	
2113 ©	3198 017 41050	1µF	20%	10V	
2114	4822 124 40248	10µF	20%	63V	
2115 ©	5322 126 11578	1nF	10%	63V	
2116	5322 121 42661	330nF	5%	63V	
2117 ©	5322 126 11578	1nF	10%	63V	
2118 ©	5322 126 11578	1nF	10%	63V	
2119 ©	4822 126 13193	4,7nF	10%	63V	for 150W only
2119 ©	4822 126 14247	1,5nF	10%	50V	for 75W only
2120 ©	3198 017 41050	1µF	20%	10V	
2121 ©	3198 017 41050	1µF	20%	10V	
2122 ©	4822 126 13883	220pF	5%	50V	
2124	2022 031 00196	220µF	20%	50V	for 150W only
2125 ©	4822 126 13193	4,7nF	10%	63V	
2126 ©	2020 552 94427	100pF	5%	50V	
2128 ©	2222 580 15649	100nF	10%	50V	
2130 ©	4822 122 33496	100nF	10%	63V	
2132 ©	3198 017 41050	1µF	20%	10V	
2134	4822 121 42408	220nF	5%	63V	
2135 ©	3198 016 31020	1nF	5%	25V	for 75W only
2135 ©	4822 126 13881	470pF	5%	50V	for 150W only
2136 ©	2222 580 15649	100nF	10%	50V	
2137 ©	2222 867 15339	33pF	5%	50V	
2138	2020 012 93762	330µF	20%	50V	for 75W only
2139	2020 012 93762	330µF	20%	50V	for 75W only
2200 ©	4822 122 33496	100nF	10%	63V	
2201	2022 031 00196	220µF	20%	50V	for 150W only
2202 ©	2222 580 15649	100nF	10%	50V	
2203 ©	2222 580 15649	100nF	10%	50V	
2205	4822 124 80483	47µF	20%	6,3V	
2206 ©	5322 126 11578	1nF	10%	63V	
2208 ©	5322 126 11583	10nF	10%	63V	
2210 ©	3198 017 41050	1µF	20%	10V	
2211	4822 124 21913	1µF	20%	63V	
2212 ©	4822 126 13883	220pF	5%	50V	
2213 ©	4822 122 33496	100nF	10%	63V	
2214	4822 124 40248	10µF	20%	63V	
2215 ©	5322 126 11578	1nF	10%	63V	
2216	5322 121 42661	330nF	5%	63V	
2217 ©	4822 126 13883	220pF	5%	50V	
2218 ©	2222 580 15649	100nF	10%	50V	
2219 ©	5322 126 11578	1nF	10%	63V	
2220 ©	5322 126 11578	1nF	10%	63V	
2221 ©	4822 126 13193	4,7nF	10%	63V	for 150W only
2221 ©	4822 126 14247	1,5nF	10%	50V	for 75W only
2222 ©	3198 017 41050	1µF	20%	10V	
2225	2022 031 00196	220µF	20%	50V	for 150W only
2226 ©	4822 126 13193	4,7nF	10%	63V	
2227 ©	2020 552 94427	100pF	5%	50V	
2229 ©	2222 580 15649	100nF	10%	50V	
2234	4822 121 42408	220nF	5%	63V	
2236 ©	3198 017 41050	1µF	20%	10V	
2237 ©	3198 016 31020	1nF	5%	25V	for 75W only
2237 ©	4822 126 13881	470pF	5%	50V	for 150W only
2238 ©	3198 017 41050	1µF	20%	10V	
2239 ©	3198 017 41050	1µF	20%	10V	
2240 ©	2222 867 15339	33pF	5%	50V	
2241	2020 012 93762	330µF	20%	50V	for 75W only
2242	2020 012 93762	330µF	20%	50V	for 75W only
2300 ©	4822 126 13883	220pF	5%	50V	
2301 ©	4822 126 13883	220pF	5%	50V	
2303 ©	4822 126 13881	470pF	5%	50V	
2304	4822 124 80231	47µF	20%	16V	
2305 ©	3198 017 41050	1µF	20%	10V	
2306 ©	4822 126 14585	100nF	10%	50V	
2309	4822 124 21732	10µF	20%	25V	
2312 ©	2222 580 15649	100nF	10%	50V	
2313 ©	5322 126 11578	1nF	10%	63V	
2314 ©	4822 126 13883	220pF	5%	50V	
2316 ©	4822 126 14585	100nF	10%	50V	
2317	4822 124 21732	10µF	20%	25V	
2318 ©	4822 126 13881	470pF	5%	50V	
2319 ©	4822 126 14585	100nF	10%	50V	
2320 ©	4822 126 14585	100nF	10%	50V	
2321	4822 124 80231	47µF	20%	16V	
2322 ©	4822 126 14585	100nF	10%	50V	
2324	4822 124 40769	4,7µF	20%	100V	
2325 ©	4822 126 13881	470pF	5%	50V	
2326 ©	2020 552 94427	100pF	5%	50V	
2327 ©	2020 552 94427	100pF	5%	50V	
2328	4822 124 81151	22µF	20%	50V	
2329	4822 124 40769	4,7µF	20%	100V	
2330	4822 124 81151	22µF	20%	50V	
2331	4822 124 40769	4,7µF	20%	100V	
2332 ©	2020 552 94427	100pF	5%	50V	
2333 ©	2020 552 94427	100pF	5%	50V	
2334 ©	2222 867 15339	33pF	5%	50V	
2335 ©	2238 586 59812	100nF	10%	50V	
2336 ©	2238 586 59812	100nF	10%	50V	
2337	4822 124 21732	10µF	20%	25V	
2339 ©	3198 017 41050	1µF	20%	10V	
2340	4822 124 81151	22µF	20%	50V	
2341	4822 124 81151	22µF	20%	50V	
2400 ©	2020 552 94427	100pF	5%	50V	
2401 ©	4822 126 13881	470pF	5%	50V	
2402	4822 124 23052	100µF	20%	16V	
2403	4822 124 22651	1µF	20%	50V	
2404 ©	2020 552 94427	100pF	5%	50V	
2405	4822 124 40769	4,7µF	20%	100V	
2406	4822 124 80791	470µF	20%	16V	
2407 ©	2020 552 94427	100pF	5%	50V	
2408	4822 124 22651	1µF	20%	50V	
2409 ©	4822 126 13881	470pF	5%	50V	
2410	4822 124 23052	100µF	20%	16V	
2411 ©	2020 552 94427	100pF	5%	50V	
2415 ©	3198 017 41050	1µF	20%	10V	

ELECTRICAL PARTSLIST *POWER 2003 75&150W Class-D* ***COMBI BOARD***

CAPACITORS

2416	4822 124 23052	100µF	20%	16V	
2417©	3198 017 41050	1µF	20%	10V	
2418©	2020 552 94427	100pF	5%	50V	
2419©	2020 552 94427	100pF	5%	50V	
2420©	3198 017 41050	1µF	20%	10V	
2421©	2238 586 59812	100nF	10%	50V	
2500	2022 020 00734	1µF	20%	50V	
2519©	2238 586 59812	100nF	10%	50V	
2520©	4822 126 13881	470pF	5%	50V	
2528	2022 020 00734	1µF	20%	50V	
2531©	4822 126 13881	470pF	5%	50V	
2534	4822 124 40769	4,7µF	20%	100V	
2535	4822 124 40769	4,7µF	20%	100V	
2536©	2238 586 59812	100nF	10%	50V	
2537	2022 020 00734	1µF	20%	50V	
2540	2022 020 00734	1µF	20%	50V	
2541	4822 124 81151	22µF	20%	50V	
2542©	5322 126 11578	1nF	10%	63V	
2543©	4822 126 14583	470nF	10%	16V	
2546©	4822 126 14549	33nF	10%	16V	
2547©	2222 780 15656	330nF	10%	16V	
2550©	5322 126 11579	3,3nF	10%	63V	
2551©	4822 126 13879	220nF	20%	16V	
2552©	4822 126 13193	4,7nF	10%	63V	
2553	4822 124 21913	1µF	20%	63V	
2554©	4822 126 14583	470nF	10%	16V	
2555	4822 124 80231	47µF	20%	16V	
2556	4822 124 21913	1µF	20%	63V	
2557	2022 020 00734	1µF	20%	50V	
2558©	4822 126 14583	470nF	10%	16V	
2559	2022 020 00734	1µF	20%	50V	
2560©	4822 126 13881	470pF	5%	50V	
2561©	4822 126 13881	470pF	5%	50V	
2562©	4822 126 13881	470pF	5%	50V	
2563©	4822 126 13881	470pF	5%	50V	
2564©	4822 126 13881	470pF	5%	50V	
2565©	4822 126 13881	470pF	5%	50V	
2566©	4822 126 13881	470pF	5%	50V	
2567©	4822 126 13881	470pF	5%	50V	
2568	4822 124 80483	47µF	20%	6,3V	
2569©	4822 126 14583	470nF	10%	16V	
2570©	2020 552 94427	100pF	5%	50V	
2571©	2020 552 94427	100pF	5%	50V	
2572©	4822 126 13879	220nF	20%	16V	
2574©	4822 126 13193	4,7nF	10%	63V	
2576©	5322 126 11578	1nF	10%	63V	
2577©	4822 126 14549	33nF	10%	16V	
2578©	5322 126 11579	3,3nF	10%	63V	
2579©	2020 552 96684	470nF	10%	25V	
2581	4822 124 21913	1µF	20%	63V	
2582©	2238 586 59812	100nF	10%	50V	
2585©	2238 586 59812	100nF	10%	50V	
2593©	2222 780 15656	330nF	10%	16V	

RESISTORS

3100	4822 050 21003	10kΩ	2%	0,25W	
3101©	2122 118 06085	0,033Ω	5%	1W	for 150W only
3101©	2122 118 06235	0,047Ω	5%	1W	for 75W only
3102©	4822 051 30472	4,7kΩ	5%	0,06W	
3103©	4822 051 30102	1kΩ	5%	0,06W	
3106©	4822 051 30223	22kΩ	5%	0,06W	
3107©	4822 051 30152	1,5kΩ	5%	0,06W	
3108©	4822 051 30472	4,7kΩ	5%	0,06W	
3109©	4822 051 30101	100Ω	5%	0,06W	for 150W only

RESISTORS

3109©	4822 117 13608	4,7Ω	5%	0,06W	for 75W only
3110©	4822 117 13632	100kΩ	1%	0,06W	
3111©	4822 051 30109	10Ω	5%	0,06W	for 150W only
3111©	4822 117 12917	1Ω	5%	0,06W	for 75W only
3112©	4822 117 12925	47kΩ	1%	0,06W	
3113©	4822 051 30223	22kΩ	5%	0,06W	
3114©	4822 051 30472	4,7kΩ	5%	0,06W	
3115©	4822 051 30102	1kΩ	5%	0,06W	
3116©	4822 051 30474	470kΩ	5%	0,06W	
3117©	4822 117 12903	1,8kΩ	1%	0,06W	
3119©	4822 051 30103	10kΩ	5%	0,06W	for 150W only
3119©	4822 051 30153	15kΩ	5%	0,06W	for 75W only
3120©	4822 051 30472	4,7kΩ	5%	0,06W	
3121©	4822 051 30472	4,7kΩ	5%	0,06W	
3122©	4822 051 30153	15kΩ	5%	0,06W	
3125©	4822 051 30102	1kΩ	5%	0,06W	
3126©	4822 051 30103	10kΩ	5%	0,06W	
3127©	4822 051 30103	10kΩ	5%	0,06W	
3129©	4822 051 30102	1kΩ	5%	0,06W	
3130©	2122 118 06085	0,033Ω	5%	1W	for 150W only
3130©	2122 118 06235	0,047Ω	5%	1W	for 75W only
3133©	4822 051 30562	5,6kΩ	5%	0,06W	
3134©	4822 051 30331	330Ω	5%	0,06W	
3135©	4822 051 30101	100Ω	5%	0,06W	for 150W only
3135©	4822 117 13608	4,7Ω	5%	0,06W	for 75W only
3136©	4822 051 30472	4,7kΩ	5%	0,06W	
3137©	4822 051 30103	10kΩ	5%	0,06W	
3138©	4822 051 30103	10kΩ	5%	0,06W	
3139	4822 116 52226	560Ω	5%	0,5W	for 75W only
3139	4822 116 83883	470Ω	5%	0,16W	for 150W only
3140©	4822 051 30152	1,5kΩ	5%	0,06W	for 75W only
3140©	4822 117 11817	1,2kΩ	1%	0,06W	for 150W only
3142©	4822 117 11817	1,2kΩ	1%	0,06W	
3143©	4822 051 30102	1kΩ	5%	0,06W	
3144©	4822 051 30154	150kΩ	5%	0,06W	
3145©	4822 117 12139	22Ω	5%	0,06W	
3146©	4822 051 30152	1,5kΩ	5%	0,06W	
3147©	4822 051 30103	10kΩ	5%	0,06W	
3148©	4822 051 30183	18kΩ	5%	0,06W	
3149©	4822 051 30472	4,7kΩ	5%	0,06W	
3151©	4822 117 13632	100kΩ	1%	0,06W	
3152©	4822 051 30152	1,5kΩ	5%	0,06W	for 75W only
3152©	4822 117 12903	1,8kΩ	1%	0,06W	for 150W only
3153©	4822 051 30152	1,5kΩ	5%	0,06W	for 75W only
3153©	4822 117 12903	1,8kΩ	1%	0,06W	for 150W only
3154©	4822 051 30102	1kΩ	5%	0,06W	
3155©	4822 051 30472	4,7kΩ	5%	0,06W	
3156©	4822 051 30109	10Ω	5%	0,06W	for 150W only
3156©	4822 117 12917	1Ω	5%	0,06W	for 75W only
3201©	4822 117 12925	47kΩ	1%	0,06W	
3202©	4822 051 30109	10Ω	5%	0,06W	for 150W only
3202©	4822 117 12917	1Ω	5%	0,06W	for 75W only
3203©	4822 051 30223	22kΩ	5%	0,06W	
3205©	2122 118 06085	0,033Ω	5%	1W	for 150W only
3205©	2122 118 06235	0,047Ω	5%	1W	for 75W only
3207©	4822 051 30474	470kΩ	5%	0,06W	
3209©	4822 051 30102	1kΩ	5%	0,06W	
3210©	4822 051 30472	4,7kΩ	5%	0,06W	
3211©	4822 051 30102	1kΩ	5%	0,06W	
3212©	4822 051 30472	4,7kΩ	5%	0,06W	
3213©	4822 051 30102	1kΩ	5%	0,06W	
3215©	4822 051 30101	100Ω	5%	0,06W	for 150W only
3215©	4822 117 13608	4,7Ω	5%	0,06W	for 75W only
3216©	4822 051 30223	22kΩ	5%	0,06W	

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ELECTRICAL PARTSLIST *POWER 2003 75&150W Class-D* ***COMBI BOARD***

RESISTORS

3217©	4822 117 13632	100kΩ	1%	0,06W	
3218©	4822 051 30472	4,7kΩ	5%	0,06W	
3221©	4822 051 30103	10kΩ	5%	0,06W	
3225©	4822 117 12903	1,8kΩ	1%	0,06W	
3227©	4822 051 30103	10kΩ	5%	0,06W	
3228©	4822 051 30103	10kΩ	5%	0,06W	for 150W only
3228©	4822 051 30153	15kΩ	5%	0,06W	for 75W only
3229©	4822 051 30103	10kΩ	5%	0,06W	
3231©	4822 051 30472	4,7kΩ	5%	0,06W	
3232©	4822 051 30153	15kΩ	5%	0,06W	
3236©	4822 117 12139	22Ω	5%	0,06W	
3237©	4822 051 30103	10kΩ	5%	0,06W	
3240©	4822 051 30103	10kΩ	5%	0,06W	
3241©	4822 051 30102	1kΩ	5%	0,06W	
3243©	2122 118 06085	0,033Ω	5%	1W	for 150W only
3243©	2122 118 06235	0,047Ω	5%	1W	for 75W only
3245©	4822 051 30562	5,6kΩ	5%	0,06W	
3246©	4822 051 30331	330Ω	5%	0,06W	
3247©	4822 051 30101	100Ω	5%	0,06W	for 150W only
3247©	4822 117 13608	4,7Ω	5%	0,06W	for 75W only
3248©	4822 051 30472	4,7kΩ	5%	0,06W	
3251	4822 116 52226	560Ω	5%	0,5W	for 75W only
3251	4822 116 83883	470Ω	5%	0,16W	for 150W only
3252©	4822 051 30152	1,5kΩ	5%	0,06W	for 75W only
3252©	4822 117 11817	1,2kΩ	1%	0,06W	for 150W only
3253©	4822 117 11817	1,2kΩ	1%	0,06W	
3254©	4822 051 30154	150kΩ	5%	0,06W	
3255©	4822 051 30102	1kΩ	5%	0,06W	
3256©	4822 051 30152	1,5kΩ	5%	0,06W	
3258©	4822 051 30183	18kΩ	5%	0,06W	
3259©	4822 051 30472	4,7kΩ	5%	0,06W	
3261©	4822 051 30152	1,5kΩ	5%	0,06W	
3262©	4822 051 30101	100Ω	5%	0,06W	
3263©	4822 051 30103	10kΩ	5%	0,06W	
3264©	4822 117 13632	100kΩ	1%	0,06W	
3265©	4822 051 30152	1,5kΩ	5%	0,06W	for 75W only
3265©	4822 117 12903	1,8kΩ	1%	0,06W	for 150W only
3266©	4822 051 30152	1,5kΩ	5%	0,06W	for 75W only
3266©	4822 117 12903	1,8kΩ	1%	0,06W	for 150W only
3267©	4822 051 30102	1kΩ	5%	0,06W	
3268©	4822 051 30472	4,7kΩ	5%	0,06W	
3269©	4822 051 30109	10Ω	5%	0,06W	for 150W only
3269©	4822 117 12917	1Ω	5%	0,06W	for 75W only
3302©	4822 117 13632	100kΩ	1%	0,06W	
3303©	4822 051 30103	10kΩ	5%	0,06W	
3304	4822 116 52186	22Ω	5%	0,5W	
3305©	4822 051 30682	6,8kΩ	5%	0,06W	
3306	2120 368 90125	47kΩ	TRIMPOT.		
3307	2120 368 90125	47kΩ	TRIMPOT.		
3311©	4822 051 30103	10kΩ	5%	0,06W	
3312©	4822 117 13632	100kΩ	1%	0,06W	
3313©	4822 051 30221	220Ω	5%	0,06W	
3314©	4822 117 12925	47kΩ	1%	0,06W	
3315	4822 050 11002	1kΩ	5%	0,2W	
3316©	4822 051 30273	27kΩ	5%	0,06W	
3317©	4822 051 30333	33kΩ	5%	0,06W	
3318©	4822 117 13632	100kΩ	1%	0,06W	
3319©	4822 051 30222	2,2kΩ	5%	0,06W	
3320©	4822 051 30103	10kΩ	5%	0,06W	
3321©	4822 051 30102	1kΩ	5%	0,06W	
3322©	4822 051 30103	10kΩ	5%	0,06W	
3323©	4822 117 12968	820Ω	5%	0,06W	
3324©	4822 051 30105	1MΩ	5%	0,06W	
3325©	4822 051 30154	150kΩ	5%	0,06W	

RESISTORS

3326©	4822 051 30154	150kΩ	5%	0,06W	
3327⚠	4822 052 10339	33Ω	5%	0,33W	NFR
3328©	5322 117 13056	8,2kΩ	1%	0,06W	
3329	4822 116 52256	2,2kΩ	5%	0,16W	
3330©	4822 051 30103	10kΩ	5%	0,06W	
3331©	4822 051 30103	10kΩ	5%	0,06W	
3332©	4822 051 30332	3,3kΩ	5%	0,06W	
3334©	4822 051 30102	1kΩ	5%	0,06W	
3336©	4822 051 30123	12kΩ	5%	0,06W	
3337©	4822 051 30331	330Ω	5%	0,06W	
3337©	4822 051 30471	470Ω	5%	0,06W	for 75W only
3338©	4822 051 30102	1kΩ	5%	0,06W	
3339©	4822 051 30222	2,2kΩ	5%	0,06W	
3340©	4822 051 30331	330Ω	5%	0,06W	
3340©	4822 051 30471	470Ω	5%	0,06W	for 75W only
3341©	4822 051 30682	6,8kΩ	5%	0,06W	
3342©	4822 051 30121	120Ω	5%	0,06W	
3343©	4822 051 30151	150Ω	5%	0,06W	
3344©	4822 051 30471	470Ω	5%	0,06W	
3345©	4822 051 30471	470Ω	5%	0,06W	
3346©	4822 051 30479	47Ω	5%	0,06W	
3350©	4822 051 30472	4,7kΩ	5%	0,06W	
3400©	4822 051 30273	27kΩ	5%	0,06W	
3401©	4822 051 30471	470Ω	5%	0,06W	
3403©	4822 051 30273	27kΩ	5%	0,06W	
3404©	4822 051 30682	6,8kΩ	5%	0,06W	
3405©	4822 051 30472	4,7kΩ	5%	0,06W	
3406⚠	4822 052 10109	10Ω	5%	0,33W	NFR
3407©	4822 051 30472	4,7kΩ	5%	0,06W	
3408©	4822 051 30682	6,8kΩ	5%	0,06W	
3409©	4822 051 30273	27kΩ	5%	0,06W	
3411	4822 116 52283	4,7kΩ	5%	0,5W	
3412⚠	4822 052 10568	5,6Ω	5%	0,33W	NFR
3413©	4822 051 30471	470Ω	5%	0,06W	
3415©	4822 051 30273	27kΩ	5%	0,06W	
3422©	4822 051 30472	4,7kΩ	5%	0,06W	
3423©	4822 051 30103	10kΩ	5%	0,06W	
3424©	4822 051 30103	10kΩ	5%	0,06W	
3425©	4822 051 30339	33Ω	5%	0,06W	
3426©	4822 051 30339	33Ω	5%	0,06W	
3427©	4822 051 30103	10kΩ	5%	0,06W	
3428©	4822 051 30103	10kΩ	5%	0,06W	
3429©	4822 051 30339	33Ω	5%	0,06W	
3430©	4822 051 30339	33Ω	5%	0,06W	
3431©	4822 051 30102	1kΩ	5%	0,06W	
3432©	4822 051 30102	1kΩ	5%	0,06W	
3433©	4822 051 30102	1kΩ	5%	0,06W	
3434©	4822 051 30222	2,2kΩ	5%	0,06W	
3435©	4822 051 30271	270Ω	5%	0,06W	
3436©	4822 051 30472	4,7kΩ	5%	0,06W	
3437©	4822 051 30562	5,6kΩ	5%	0,06W	
3438©	4822 051 30103	10kΩ	5%	0,06W	
3439©	4822 051 30103	10kΩ	5%	0,06W	
3440	4822 116 80176	1Ω	5%	0,5W	
3500©	4822 051 30152	1,5kΩ	5%	0,06W	
3501©	4822 051 30472	4,7kΩ	5%	0,06W	
3501©	4822 117 12917	1Ω	5%	0,06W	
3502©	4822 051 30472	4,7kΩ	5%	0,06W	
3502©	4822 117 12917	1Ω	5%	0,06W	
3504©	4822 051 30103	10kΩ	5%	0,06W	
3506©	4822 051 30471	470Ω	5%	0,06W	
3507©	4822 051 30562	5,6kΩ	5%	0,06W	for 75W only
3507©	5322 117 13056	8,2kΩ	1%	0,06W	
3508©	4822 051 30222	2,2kΩ	5%	0,06W	

ELECTRICAL PARTSLIST *POWER 2003 75&150W Class-D* ***COMBI BOARD***

RESISTORS

3509©	4822 051 30222	2,2kΩ	5%	0,06W	
3510©	4822 051 30682	6,8kΩ	5%	0,06W	for 150W and 75W SA
3510©	4822 051 30223	22kΩ	5%	0,06W	for 75W TAPE only
3511©	4822 051 30682	6,8kΩ	5%	0,06W	for 150W and 75W SA
3511©	4822 051 30223	22kΩ	5%	0,06W	for 75W TAPE only
3514©	4822 051 30153	15kΩ	5%	0,06W	
3518©	4822 051 30152	1,5kΩ	5%	0,06W	
3519©	4822 051 30103	10kΩ	5%	0,06W	
3520©	4822 051 30153	15kΩ	5%	0,06W	
3522©	4822 051 30152	1,5kΩ	5%	0,06W	
3523©	4822 051 30152	1,5kΩ	5%	0,06W	
3524©	4822 117 11817	1,2kΩ	1%	0,06W	
3525©	4822 051 30102	1kΩ	5%	0,06W	
3525©	4822 051 30273	27kΩ	5%	0,06W	
3526©	4822 051 30334	330kΩ	5%	0,06W	
3527©	4822 051 30102	1kΩ	5%	0,06W	
3527©	4822 051 30273	27kΩ	5%	0,06W	
3529©	482 2 051 30154	150kΩ	5%	0,06W	
3531©	4822 051 30154	150kΩ	5%	0,06W	
3532©	4822 117 12864	82kΩ	5%	0,06W	
3533©	4822 051 30562	5,6kΩ	5%	0,06W	
3534⚠	4822 052 10109	10Ω	5%	0,33W	NFR
3535©	4822 051 30562	5,6kΩ	5%	0,06W	
3536©	4822 051 30223	22kΩ	5%	0,06W	for 150W and 75W SA
3536©	4822 051 30102	1kΩ	5%	0,06W	for 75W TAPE only
3539©	4822 051 30153	15kΩ	5%	0,06W	
3542©	4822 051 30123	12kΩ	5%	0,06W	
3543©	5322 117 13056	8,2kΩ	1%	0,06W	
3544©	4822 051 30562	5,6kΩ	5%	0,06W	
3545©	4822 051 30393	39kΩ	5%	0,06W	
3549©	4822 051 30101	100Ω	5%	0,06W	
3550©	4822 051 30393	39kΩ	5%	0,06W	
3551©	4822 051 30101	100Ω	5%	0,06W	
3552©	4822 051 30101	100Ω	5%	0,06W	
3553©	4822 051 30101	100Ω	5%	0,06W	
3554©	4822 051 30101	100Ω	5%	0,06W	
3555©	4822 051 30562	5,6kΩ	5%	0,06W	
3556©	4822 051 30153	15kΩ	5%	0,06W	
3557©	4822 051 30101	100Ω	5%	0,06W	
3558©	4822 117 12903	1,8kΩ	1%	0,06W	
3559©	4822 117 12903	1,8kΩ	1%	0,06W	
3560©	4822 051 30101	100Ω	5%	0,06W	
3561©	4822 051 30102	1kΩ	5%	0,06W	
3562©	4822 051 30102	1kΩ	5%	0,06W	
3563©	4822 051 30101	100Ω	5%	0,06W	
3564©	4822 051 30101	100Ω	5%	0,06W	
3566©	4822 051 30101	100Ω	5%	0,06W	
3567©	4822 051 30101	100Ω	5%	0,06W	
3568©	4822 051 30101	100Ω	5%	0,06W	
3569©	4822 051 30102	1kΩ	5%	0,06W	
3570©	4822 117 13632	100kΩ	1%	0,06W	
3571©	4822 051 30223	22kΩ	5%	0,06W	for 150W and 75W SA
3571©	4822 051 30102	1kΩ	5%	0,06W	for 75W TAPE only
3572	4822 116 83883	470Ω	5%	0,16W	
3573	4822 116 83883	470Ω	5%	0,16W	
3574©	4822 051 30101	100Ω	5%	0,06W	
3575©	4822 051 30562	5,6kΩ	5%	0,06W	
3576©	4822 051 30123	12kΩ	5%	0,06W	
3577©	4822 051 30153	15kΩ	5%	0,06W	
3578©	5322 117 13056	8,2kΩ	1%	0,06W	
3579©	4822 051 30562	5,6kΩ	5%	0,06W	
3580©	4822 051 30101	100Ω	5%	0,06W	
3581©	4822 051 30101	100Ω	5%	0,06W	

RESISTORS

3591©	4822 051 30102	1kΩ	5%	0,06W	for 75W only
3591©	4822 051 30332	3,3kΩ	5%	0,06W	for 150W only
4211©	4822 051 20008	CHIP JUMPER 0805			
4212©	4822 051 20008	CHIP JUMPER 0805			
4213©	4822 051 30008	CHIP JUMPER 0603			
4214©	4822 051 20008	CHIP JUMPER 0805			
4216©	4822 051 30008	CHIP JUMPER 0603			
4217©	4822 051 30008	CHIP JUMPER 0603			
4223©	4822 051 30008	CHIP JUMPER 0603			
4226©	4822 051 30008	CHIP JUMPER 0603			
4230©	4822 051 30008	CHIP JUMPER 0603			
4232©	4822 051 20008	CHIP JUMPER 0805			
4233©	4822 051 30008	CHIP JUMPER 0603			
4235©	4822 051 30008	CHIP JUMPER 0603			
4240©	4822 051 20008	CHIP JUMPER 0805			
4241©	4822 051 20008	CHIP JUMPER 0805			
4245©	4822 051 30008	CHIP JUMPER 0603			
4253©	4822 051 30008	CHIP JUMPER 0603			
4260©	4822 051 20008	CHIP JUMPER 0805			
4265©	4822 051 30008	CHIP JUMPER 0603			
4272©	4822 051 30008	CHIP JUMPER 0603			
4273©	4822 051 30008	CHIP JUMPER 0603			
4274©	4822 051 30008	CHIP JUMPER 0603			
4276©	4822 051 30008	CHIP JUMPER 0603			
4277©	4822 051 30008	CHIP JUMPER 0603			
4279©	4822 051 30008	CHIP JUMPER 0603			
4280©	4822 051 20008	CHIP JUMPER 0805			
4281©	4822 051 30008	CHIP JUMPER 0603			
4282©	4822 051 20008	CHIP JUMPER 0805			
4283©	4822 051 30008	CHIP JUMPER 0603			
4286©	4822 051 30008	CHIP JUMPER 0603			
4287©	4822 051 30008	CHIP JUMPER 0603			
4289©	4822 051 30008	CHIP JUMPER 0603			
4290©	4822 051 30008	CHIP JUMPER 0603			
4301©	4822 051 30008	CHIP JUMPER 0603			

COILS

5100	4822 157 11411	FERRITE BEAD	
5101	2422 536 00612	30µH	for 75W only
5102	2422 549 44944	Mains Filter 330µH 3A	
5103	4822 157 11411	FERRITE BEAD	
5105	2422 536 00686	20µH	for 150W only
5200	4822 157 11411	FERRITE BEAD	
5201	2422 536 00612	30µH	for 75W only
5202	2422 549 44944	Mains Filter 330µH 3A	
5203	4822 157 11411	FERRITE BEAD	
5204	2422 536 00686	20µH	for 150W only
5300	9940 000 01988	Resonator 500kHz	
5302	9940 000 01987	Resonator 425kHz	
5303	4822 157 11411	FERRITE BEAD	

DIODES

6104©	4822 130 11397	BAS316	
6106©	4822 130 11416	PDZ6.8B	
6108©	4822 130 11416	PDZ6.8B	
6109©	4822 130 11397	BAS316	
6110©	4822 130 10328	BAV99W	
6111©	4822 130 11397	BAS316	
6113©	4822 130 10328	BAV99W	
6114©	4822 130 10328	BAV99W	
6202©	4822 130 11397	BAS316	
6205©	4822 130 10328	BAV99W	
6206©	4822 130 10328	BAV99W	
6208©	4822 130 10328	BAV99W	

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ELECTRICAL PARTSLIST *POWER 2003 75&150W Class-D* ***COMBI BOARD***

DIODES

6210©	4822 130 10328	BAV99W	
6211©	4822 130 10328	BAV99W	
6212©	4822 130 11416	PDZ6.8B	
6213©	4822 130 11416	PDZ6.8B	
6214©	4822 130 11397	BAS316	
6216	4822 130 30621	1N4148	
6217©	4822 130 11397	BAS316	
6300©	4822 130 10838	UDZ3.3B	
6401	4822 130 30621	1N4148	
6403©	4822 130 10838	UDZ3.3B	
6404©	4822 130 11397	BAS316	
6500	4822 130 61219	BZX79-C10	
6501©	9322 102 64685	UDZ-2,7B	
6502©	4822 130 11397	BAS316	
6503©	4822 130 11397	BAS316	
6504©	4822 130 11397	BAS316	
6505©	4822 130 11397	BAS316	
6506©	9322 150 18685	BZX384-C47	
6507©	9322 150 18685	BZX384-C47	
6508©	3198 020 55680	BZX384-C5V6	

TRANSISTORS

7104©	4822 130 60373	BC856B	
7109⚠	9322 173 29687	STP14NF12FP, FET POWER	for 75W only
7109⚠	9340 578 15127	PHX18NQ11T, FET POWER	for 150W only
7110©	3198 010 42310	BC847BW	
7111©	3198 010 44350	BC807-25W	
7112©	3198 010 42320	BC857BW	
7113©	3198 010 44350	BC807-25W	
7114©	9340 219 30115	BC817-25W	
7115©	9340 219 30115	BC817-25W	
7117©⚠	9337 760 90215	PMBTA42	
7119©⚠	9337 760 90215	PMBTA42	
7121⚠	9322 173 29687	STP14NF12FP, FET POWER	for 75W only
7121⚠	9940 000 01974	PHX18NQ11T, FET POWER	for 150W only
7128©	4822 130 60373	BC856B	
7129©	4822 130 60373	BC856B	
7130©	3198 010 42310	BC847BW	
7131©	5322 130 60159	BC846B	
7132©	9340 219 30115	BC817-25W	for 150W only
7133©	9340 219 30115	BC817-25W	for 150W only
7203©	3198 010 42310	BC847BW	
7208©	4822 130 60373	BC856B	
7210©	3198 010 44350	BC807-25W	
7211©	3198 010 42320	BC857BW	
7218⚠	9322 173 29687	STP14NF12FP, FET POWER	for 75W only
7218⚠	9940 000 01974	PHX18NQ11T, FET POWER	for 150W only
7221©	3198 010 44350	BC807-25W	
7222©	9340 219 30115	BC817-25W	
7223©	9340 219 30115	BC817-25W	
7227©⚠	9337 760 90215	PMBTA42	
7228©⚠	9337 760 90215	PMBTA42	
7231⚠	9322 173 29687	STP14NF12FP, FET POWER	for 75W only
7231⚠	9940 000 01974	PHX18NQ11T, FET POWER	for 150W only
7238©	5322 130 60159	BC846B	
7239©	4822 130 60373	BC856B	
7240©	4822 130 60373	BC856B	
7243©	9340 219 30115	BC817-25W	
7244©	9340 219 30115	BC817-25W	for 150W only
7245©	9340 219 30115	BC817-25W	for 150W only
7309©	3198 010 42310	BC847BW	
7316©	3198 010 42320	BC857BW	
7317©	3198 010 42310	BC847BW	
7319©	3198 010 42310	BC847BW	

TRANSISTORS

7323©	9340 219 30115	BC817-25W	
7324©	9340 219 30115	BC817-25W	
7402	4822 130 40855	BC337-40	
7405©	3198 010 42320	BC857BW	
7407©	9340 219 30115	BC817-25W	
7408©	9340 219 30115	BC817-25W	
7409©	9340 219 30115	BC817-25W	
7410©	3198 010 42320	BC857BW	
7411©	3198 010 44350	BC807-25W	
7505©	3198 010 42310	BC847BW	
7506©	3198 010 42320	BC857BW	
7509©	3198 010 42310	BC847BW	

INTEGRATED CIRCUITS

7105©	9940 000 01976	74LV14D
7118©	9940 000 01976	74LV14D
7122©	9940 000 01975	PC74HCU04T, HEX INVERTER IC
7209©	9940 000 01976	74LV14D
7232©	9940 000 01975	PC74HCU04T, HEX INVERTER IC
7235©	9940 000 01976	74LV14D
7311	9940 000 01983	TL431ACZ, PROGRAMMABLE VOLT.REF
7312©	9940 000 01975	PC74HCU04T, HEX INVERTER IC
7315	9940 000 01977	LM317MPTB
7320©	4822 209 83357	NJM4560M
7321	9940 000 01977	LM317MPTB
7400©	4822 209 31378	NJM4556M, 2-FOLD OP-AMP.
7406©	4822 209 17345	M62320FP, I2C SHIFT REGISTER
7508©	9322 150 74668	TDA7468D, SOURCE SEL. & SOUND

Note:
Components printed in grey colour are considered as standard spareparts and thus not available on service stock.
Code numbers are published for orientation only.

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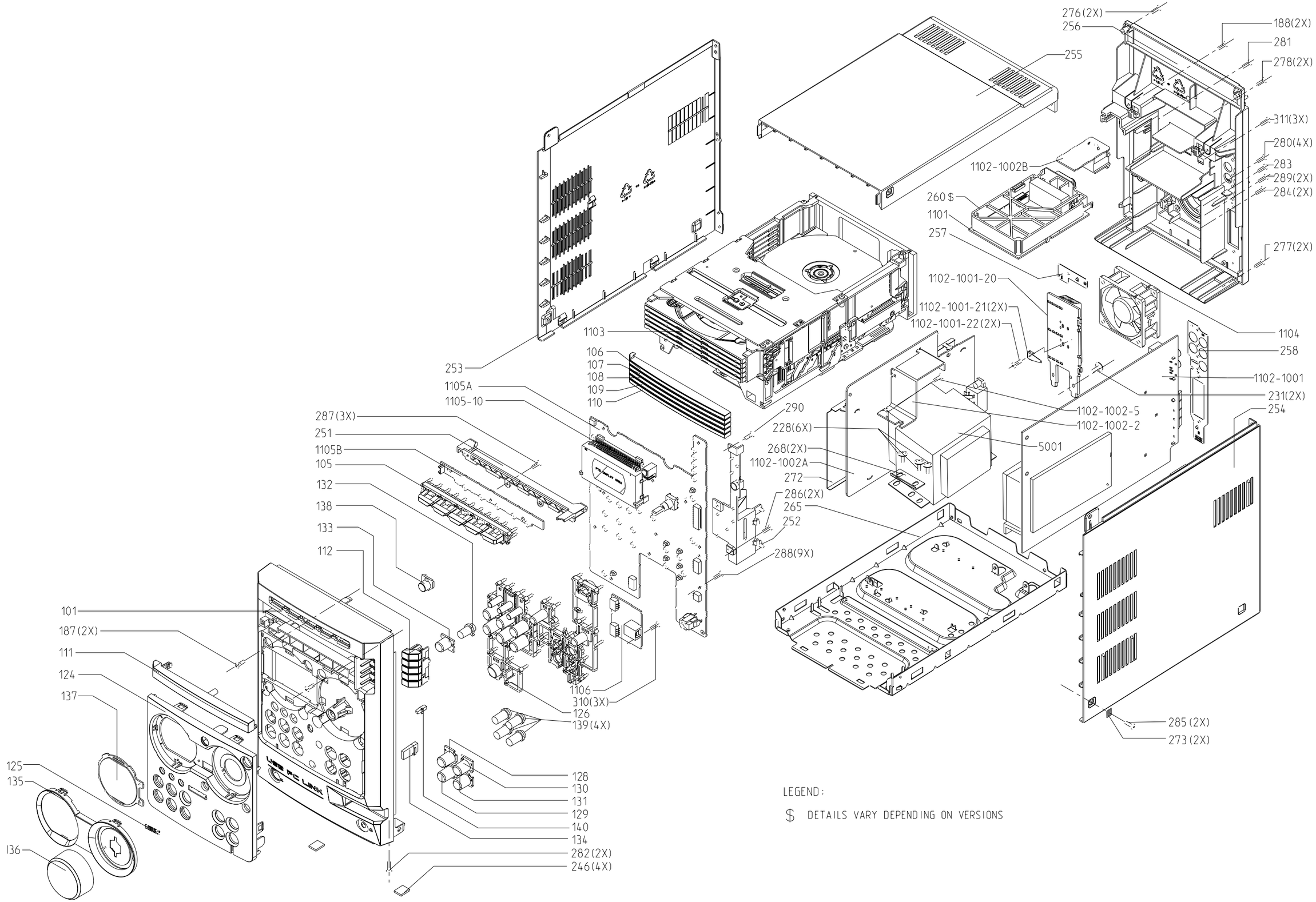
SET MECHANICAL EXPLODED VIEW



LEGEND:

$ DETAILS VARY DEPENDING ON VERSIONS

MECHANICAL & ACCESSORIES PARTS

103	9940 000 02005	CAB FRONT
105	9940 000 02017	BUTTON SET CD PLAY
111	9940 000 02016	COVER CD OPEN
112	9940 000 02018	BUT CD OPEN/CL
124	9940 000 02006	PANEL FRONT
126	9940 000 02019	BUTTON SET CONT
128	9940 000 02011	CAP BUTTON CD
129	9940 000 02012	CAP BUTTON AUX
130	9940 000 02013	CAP BUTTON TUNER
131	9940 000 02014	CAP BUTTON PC LINK
133	9940 000 02015	CAP BUTTON MAX
135	9940 000 02021	RING VOL&FTD
136	9940 000 02022	KNOB VOL
137	9940 000 02024	LENS FTD MCM530
138	9940 000 02023	LENS IR
142	9940 000 02025	COVER CD TRAY 1-5 PACKING
246	9940 000 01264	FOOT RUBBER 4MM
251	9940 000 02008	BRACKET TOP
252	9940 000 02009	BRACKET COMBI
253	9940 000 02003	PANEL LEFT
254	9940 000 02004	PANEL RIGHT
255	9940 000 02002	COVER TOP MICRO
256	9940 000 02007	REAR CABINET
369	9940 000 01949	CD-ROM PC LINK INSTALLER SW
1103	9940 000 01938	5DTC MECHANISM-KENWOOD-F8000
	9940 000 01192	AM LOOP ANTENNA LAN-031
	9940 000 01274	CD DRIVE DA12T3 (SANYO)
	9940 000 01381	FM ANT 1M
	9940 000 01946	REMOTE CONTROL
⚠	9940 000 01948	AC CORD SET 1.5M
	9940 000 02026	LEFT SPEAKER BOX
	9940 000 02027	RIGHT SPEAKER BOX

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

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ELECTRICAL PARTS - MISCELLANEOUS

1101		9940 000 01964	TUNER BOARD ASS'Y
1104		9940 000 02001	FAN 12VDV 0.8W 3100RPM
1106		9940 000 01991	USB BD ASS'Y
5001	⚠	9940 000 01992	TRANSFORMER 120/230V
		9940 000 01935	5DTC CONTROL BOARD ASS'Y
		9940 000 01936	5DTC MP3CD02 BOARD ASS'Y
		9940 000 01937	5DTC CD BOARD ASS'Y
		9940 000 01939	16P FFC 1MM L60MM
		9940 000 01941	8P FFC 1MM L80MM
		9940 000 01942	16P FFC 1MM L80MM
		9940 000 01943	19P FFC 1MM L90MM
		9940 000 01993	8P FFC 1.25MM L100MM
		9940 000 01994	4P FFC 1.25MM L120MM
		9940 000 01995	9P FFC 1.25MM L180MM
		9940 000 01996	19P FFC 1.25MM L180MM
		9940 000 01997	7P FFC 1.25MM L220MM
		9940 000 01998	8P FFC 1.25MM L280MM
		9940 000 01999	15P FFC 1.25MM L480MM

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