Service
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Service Manual

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CLASS 1
LASER PRODUCT

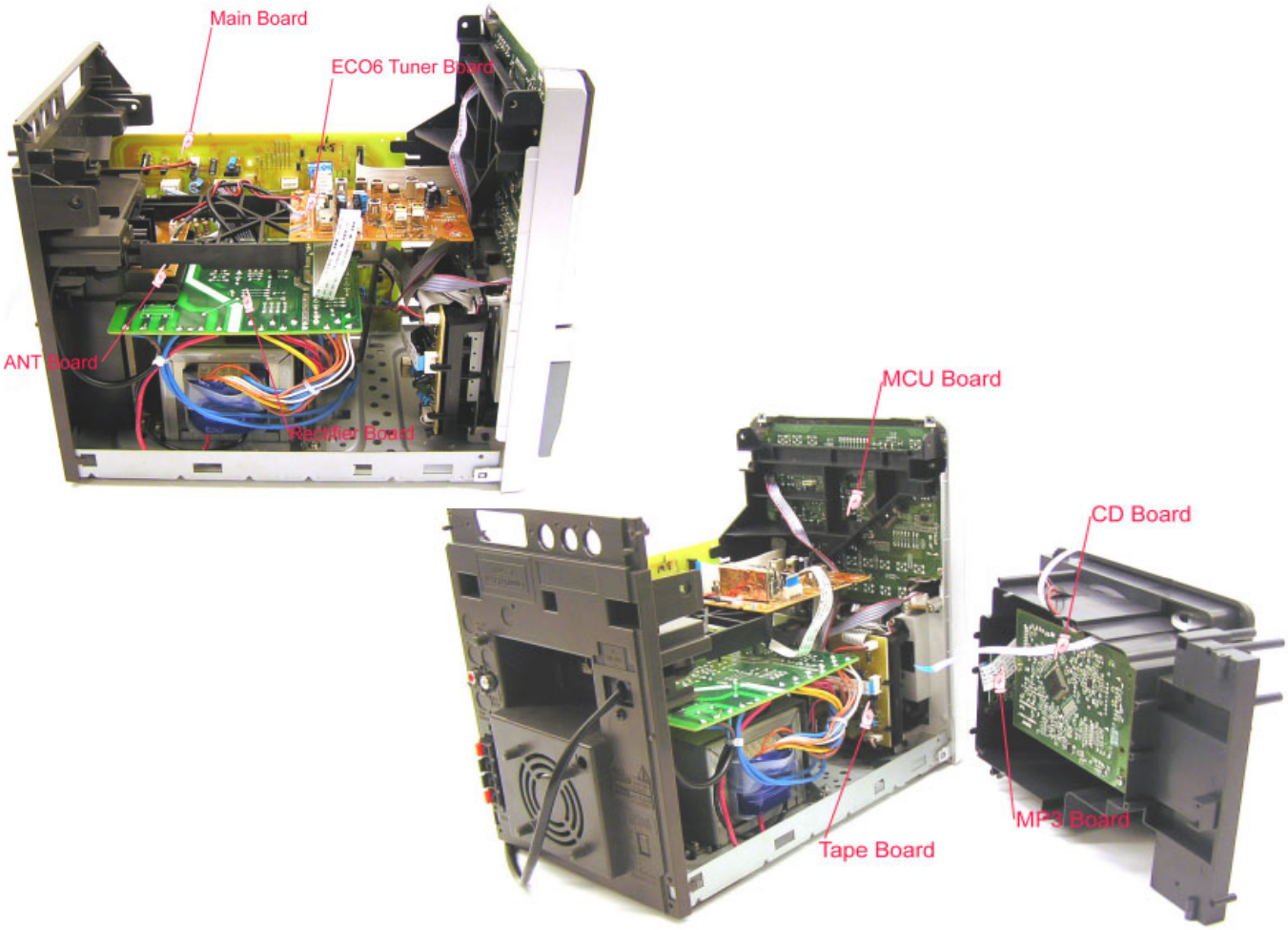
Published by SL 0535 Service Audio Printed in The Netherlands Subject to modification

GB 3141 785 30540

Version 1.0

PHILIPS

LOCATION OF PCBS



VERSION VARIATIONS:

Type /Versions: / Features & Board in used:	MCM510									
	/22	/25	/33							
Aux in / CDR in	x	x	x							
Line Out										
Video Out										
Surround Out										
Subwoofer Out										
Power Booster Out										
Digital Out										
Digital in										
Matrix Surround										
RDS	x	x								
News	x	x								
Dolby Pro Logic (DPL)										
Incredible Surround	x	x	x							
Karaoke Features										
Voltage Selector										
ECO Power Standby (LCD Display Off)	x	x	x							
ECO6 Tuner Board - Systems Non-Cenelec			x							
ECO6 Tuner Board - Systems Cenelec	x	x								

SPECIFICATIONS

GENERAL:

Mains voltage : 230V ± 10% for /22/25
220V ± 10% for /33
Mains frequency : 50/60Hz
Clock accuracy : < 4 seconds per day
Dimension centre unit : 175(W) x 254(H) x 315(D) (mm)

Power consumption
Active : 15W
Standby : < 3W (DEMO mode off)
ECO Power Standby : < 1W for /22/25

TUNER:

FM

Tuning range	: 87.5-108MHz
Grid	: 50kHz
IF frequency	: 10.7MHz ± 20kHz
Aerial input	: 75 Ω coaxial
Sensitivity at 26dB S/N	: < 22dBf
Selectivity at 300kHz bandwidth	: > 33dB
Image rejection	: > 20dB [> 25dB]
Distortion at RF=1mV, dev. 75kHz	: < 3%
-3dB Limiting point	: < 23.5dB
Crosstalk at RF=1mV, dev. 40kHz	: > 26dB

MW

Tuning range	: 531-1602kHz
Grid	: 9kHz
IF frequency	: 450kHz ± 1kHz
Aerial input	: Frame aerial 18.1μH
Sensitivity at 26dB S/N	: < 4.0mV/M [> 3.25mV/M]
Selectivity at 300kHz bandwidth	: > 20dB
IF rejection	: > 24dB
Image rejection	: > 20dB [> 28 dB]
Distortion at RF=50mV, M=80%	: < 5%

LW

Tuning range	: 153-279kHz /22
Grid	: 3kHz
IF frequency	: 450kHz ± 1kHz
Aerial input	: Frame aerial
Sensitivity at 26dB S/N	: [< 7.7mV/M]
Selectivity at 18kHz bandwidth	: [> 24dB]
IF rejection	: [> 24dB]
Image rejection	: [> 20dB]
Distortion at RF=50mV, m=80%	: [< 5%]

AMPLIFIER:

Output power
L & R : 2 x 25W (4Ω, 1kHz, 10% THD)
Frequency response within -3dB : 60Hz-14kHz
Digital Sound Control (DSC) : Jazz / Rock / Pop / Classic
Dynamic Bass Boost (DBB) : ON / OFF
Input sensitivity
Aux in (at 1kHz) : 500mV at 600 Ω
Output sensitivity
Headphone output at 32 kΩ : 15mW ± 2dB (Max. vol.)

COMPACT DISC:

Frequency response within ± 3dB	: 63Hz - 14kHz
Output level (in Vrms)	: 500mV, Z_{out} = 100Ω
Signal/Noise ratio (A-weighted)	: > 65dBA
Distortion at 1kHz	: < 0.02%
Channel unbalance at 1kHz	: < ±2dB
Channel separation at 1kHz	: > 30dB
Emphasis	: 15/50 μS (switched automatically by CD10)
THD Noise(1kHz)	: < 1.0%
Outband Attenuation	: > 35dB
MP3-CD Bit Rate	: 8-320 kbps
WMA-CD Bit Rate	: 64-192 kbps
Sampling Rate	: 8, 11.025, 12, 16, 22.05, 24, 32, 44.1, 48, 96 kHz
Format	: ISO9660, Joliet

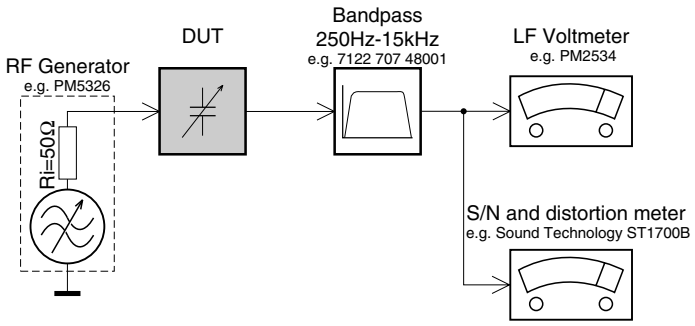
CASSETTE RECORDER:

Number of track	: 2 stereo
Tape speed	: 4.76 cm/sec ± 2%
Wow and flutter	: < 0.48% JIS
Fast-wind/Rewind time C60	: 130 sec
Bias system	: 76kHz ± 10kHz
Rec/Pb frequency response within 8dB	: 125Hz - 10kHz
Signal to Noise Ratio (Type I)	: > 48dBA

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

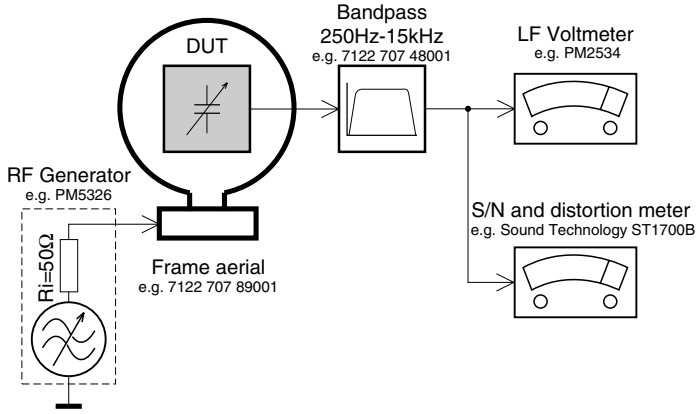
MEASUREMENT SETUP

Tuner FM



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

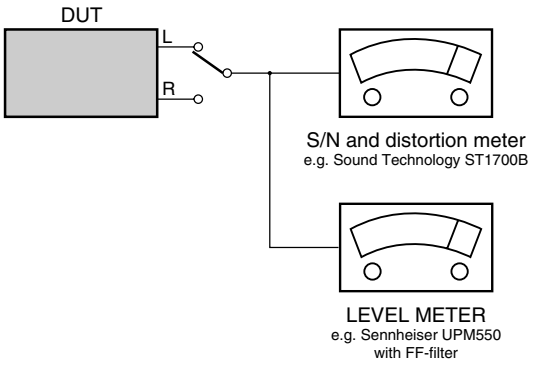
Tuner AM (MW,LW)



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).

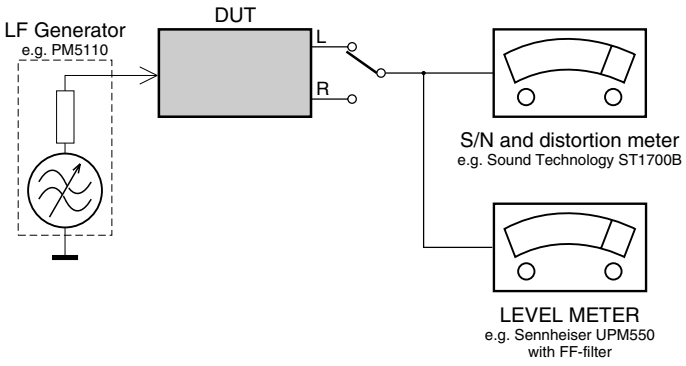
CD

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

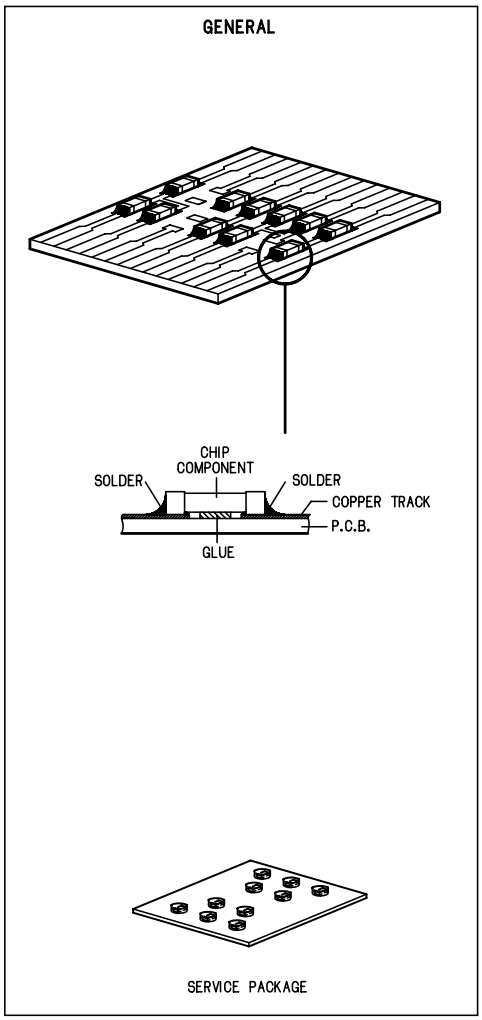
Compact Disc:

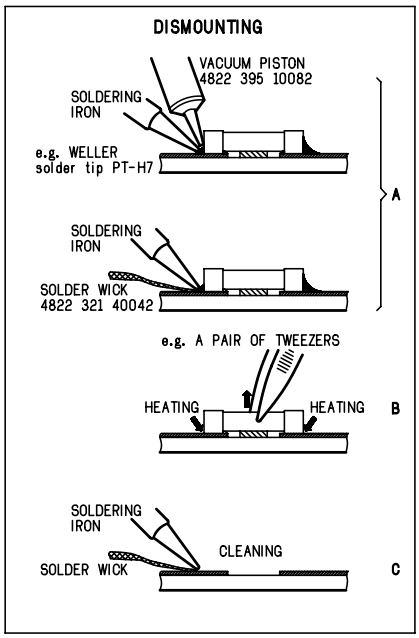
SBC426/426A Test disc 5 + 5A 4822 397 30096
SBC442 Audio Burn-in Test disc 1kHz 4822 397 30155
SBC429 Audio Signals disc 4822 397 30184
Dolby Pro-logic Test Disc 4822 395 10216

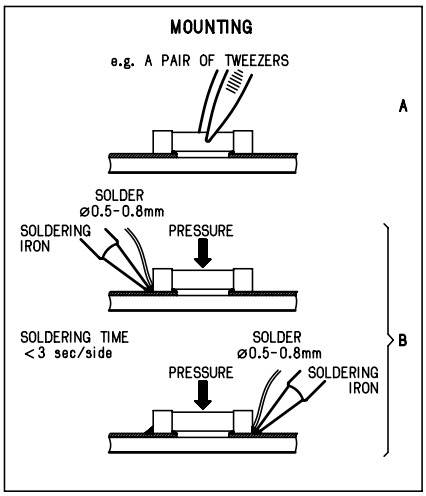
ESD Equipment:

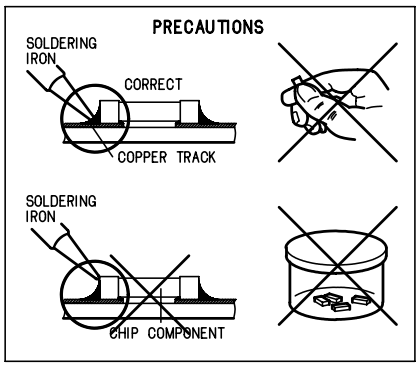
Anti-static table mat - large 1200x650x1.25mm ... 4822 466 10953
Anti-static table mat - small 600x650x1.25mm 4822 466 10958
Anti-static wristband 4822 395 10223
Connector box (1MΩ) 4822 320 11307
Extension cable
(to connect wristband to conn. box) 4822 320 11305
Connecting cable
(to connect table mat 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

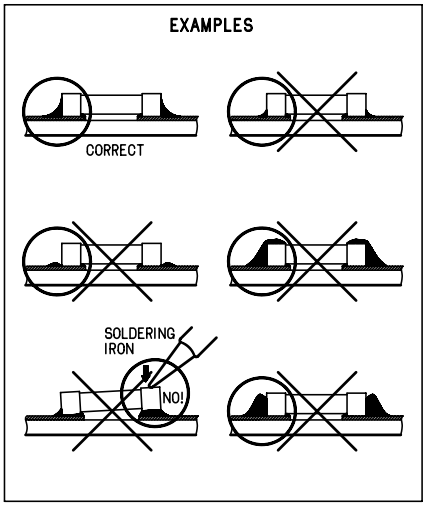
HANDLING CHIP COMPONENTS











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.

NL WAARSCHUWING

Alle IC's en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).
Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen.
Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.
Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

F ATTENTION

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD).
Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.
Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfiler le bracelet serti d'une résistance de sécurité.
Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

D WARNUNG

Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD).
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.

I AVVERTIMENTO

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della più grande cauzione alla loro manipolazione.
Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

GB

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

NL

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

F

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

D

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

I

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

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

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

GB Warning !

Invisible laser radiation when open.
Avoid direct exposure to beam.

S Varning !

Osynlig laserstrålning när apparaten är öppnad och spärren är urkopplad. Betrakta ej strålen.

SF Varoitus !

Avatussa laitteessa ja suojalukituksen ohitettaessa olet alttiina näkymättömälle laserisäteilylle. Älä katso säteeseen!

DK Advarse !

Usynlig laserstråling ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsaettelse for stråling.

INFORMATION ABOUT LEAD-FREE SOLDERING

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

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

Example S/N:

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

So from 0501 onwards = from 1 Jan 2005 onwards

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

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

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

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

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

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

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

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

For additional questions please contact your local repair-helpdesk.

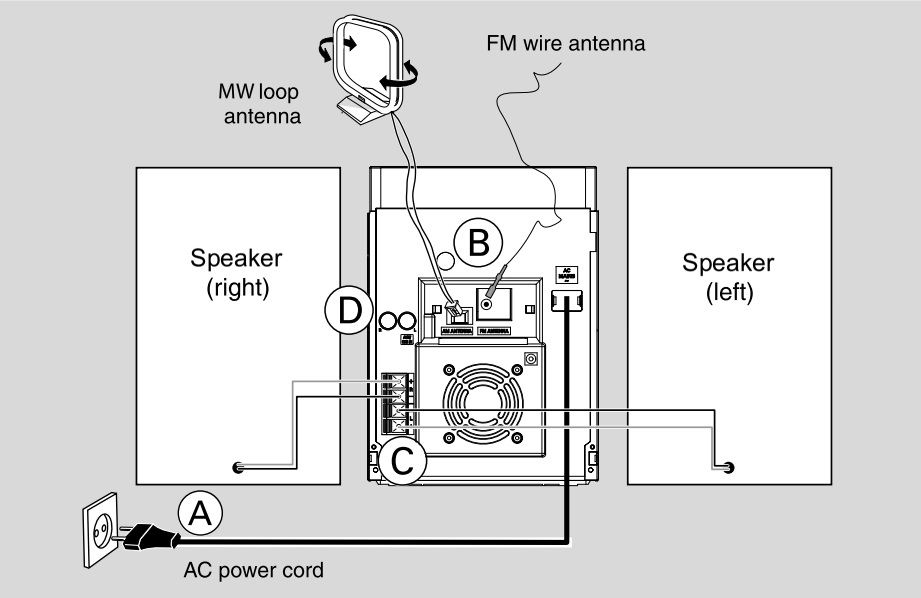
SERVICE INSTRUCTION

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

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

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

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



Rear connections

The type plate is located at the rear of the system.
For users in the U.K.: please follow the instructions on page 2.

Ⓐ Power

Before connecting the AC power cord to the wall outlet, ensure that all other connections have been made.

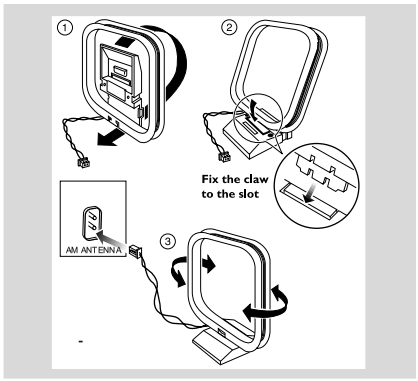
WARNING!
– For optimal performance, use only the original power cable.
– Never make or change connections with the power switched on.

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

Ⓑ Antennas Connection

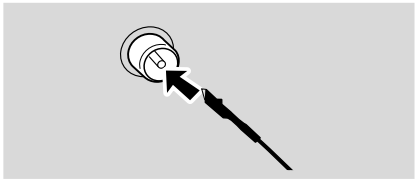
Connect the supplied MW loop antenna and FM antenna to the respective terminals. Adjust the position of the antenna for optimal reception.

MW Antenna



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

FM Antenna

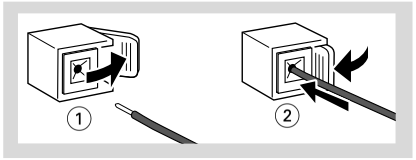


For better FM stereo reception, connect an outdoor FM antenna to the FM AERIAL (FM ANTENNA) terminal.

Ⓒ Speakers Connection

Front 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:
– For optimal sound performance, use the supplied speakers.
– Do not connect more than one speaker to any one pair of + / – speaker terminals.
– Do not connect speakers with an impedance lower than the speakers supplied. Please refer to the SPECIFICATIONS section of this manual.

Ⓓ Optional connection

The optional equipment and connecting cords are not supplied. Refer to the operating instructions of the connected equipment for details.

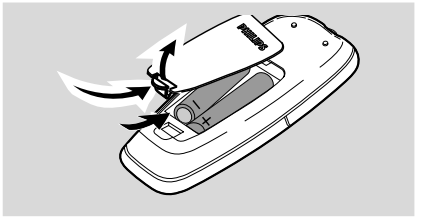
Connecting other equipment to your system

Connect the audio left and right OUT terminals of a TV, VCR, Laser Disc player, DVD player or CD Recorder to the **AUX IN** terminals.

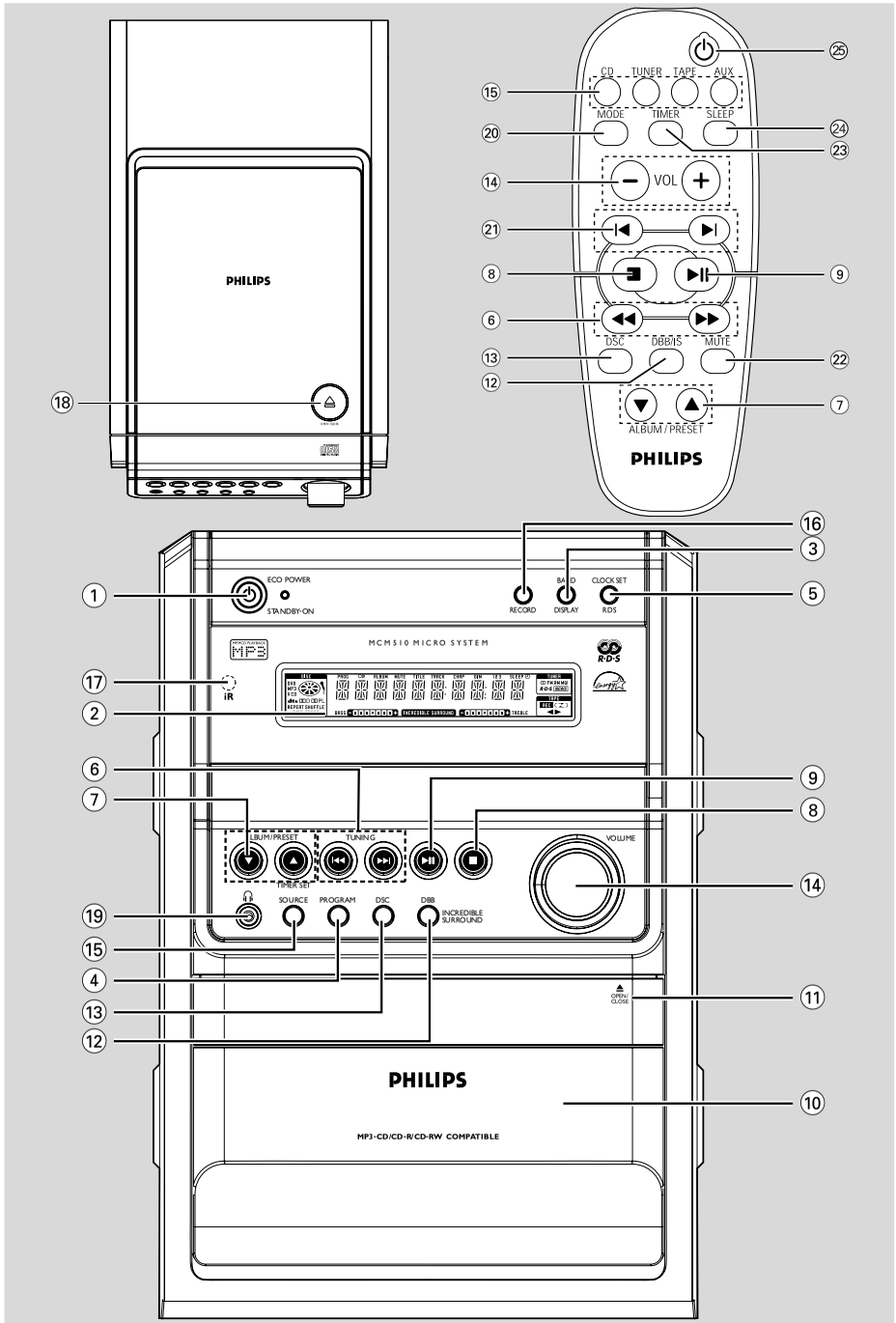
Note:
– If you are connecting equipment with a monaural output (a single audio out terminal), connect it to the AUX IN left terminal. Alternatively, you can use a "single to double" cinch cable (the output sound still remain monaural).

Inserting batteries into the remote control

Insert two batteries (type R03 or AAA) into the remote control with the correct polarity as indicated by the "+" and "–" symbols inside the battery compartment.



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.



Controls

Controls on the system and remote control

① **Eco Power/STANDBY ON** ⏻
– to switch the system on or to Eco Power standby/normal standby with clock display.

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

③ **BAND/DISPLAY**
for Tuner ..... to select waveband : FM, MW or LW.
for CD/MP3-CD…to select disc information display mode.

④ **PROGRAM**
for CD/MP3-CD…to programme disc tracks.
for Tuner ..... to programme preset radio stations.

⑤ **CLOCK SET/RDS**
for Tuner ..... to activate RDS news.
for Clock ..... *(on the system only)* to set the clock function.

⑥ **TUNING ⏮◀◀/▶▶⏭ (◀◀ /▶▶)**
for CD ..... to fast reverse/forward the disc.
for CD/MP3 CD…*(on the system only)* to select a desired track.
for Tuner ..... to tune to a lower or higher radio frequency.
for Tape ..... to rewind or fast forward.

⑦ **ALBUM/PRESET/TIMER SET ▼/▲**
for MP3-CD ..... to select previous/next album.
for Tuner ..... to select a preset radio station.
for Timer Set (▲) *(on the system only)* to set the timer function.

⑧ **STOP ■**
for CD/MP3-CD…to stop playback or to clear a programme.
for Tape ..... to stop playback or recording.

⑨ **PLAY/PAUSE ▶II**
for CD/MP3 CD…to start or interrupt playback.
for Tape ..... to start playback.

⑩ **Tape deck**

⑪ **OPEN/CLOSE ⏏**
– to open tape compartment.

⑫ **DBB/INCREDIBLE SURROUND (IS)**
– to create a super-enhanced stereo effect.
– to enhance the bass.

⑬ **DSC (Digital Sound Control)**
– to select the desired sound effect : OPTIMAL/ ROCK/POP/JAZZ.

⑭ **VOLUME (VOL + / -)**
– to increase or decrease the volume.
– *(on the system only)* to adjust the hours and minutes for the clock/timer functions.

⑮ **SOURCE**
– to select the respective sound source : CD, TUNER, TAPE or AUX.

⑯ **RECORD**
– to start recording.

⑰ **iR sensor**
– infrared sensor for remote control.

⑱ **OPEN•CLOSE ⏏**
– to open or close the disc tray.

⑲ **Headphone**
– Plugs in the headphones jack. The speakers output will be cancelled.

⑳ **MODE**
– to shuffle and repeat a track/disc.

㉑ **⏮/ ⏭**
– to select a desired track.

㉒ **MUTE**
– interrupts and resumes sound reproduction.

㉓ **TIMER**
– to activate/deactivate the timer function.

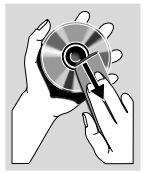
㉔ **SLEEP**
– to activate/deactivate or set the sleep timer.

∞ ⏻
– to switch the system to standby mode.

Notes for remote control:
– First select the source you wish to control by pressing one of the source select keys on the remote control (for example CD, TUNER).
– Then select the desired function (for example ▶/II , ⏮, ⏭).

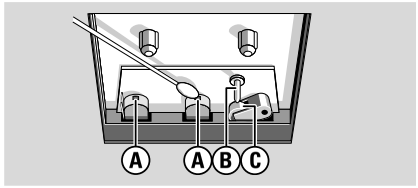
Maintenance

Cleaning the Cabinet
Use a soft cloth slightly moistened with a mild detergent solution. Do not use a solution containing alcohol, spirits, ammonia or abrasives.

Cleaning Discs

When a disc becomes dirty, clean it with a cleaning cloth. Wipe the disc from the centre out.
Do not use solvents such as benzene, thinner, commercially available cleaners, or antistatic spray intended for analogue records.

Cleaning the disc lens
After prolonged use, dirt or dust may accumulate at the disc lens. To ensure good playback quality, clean the disc lens with Philips CD Lens Cleaner or any commercially available cleaner. Follow the instructions supplied with cleaner.

Cleaning the Heads and the Tape Paths
To ensure good recording and playback quality, clean the heads (A), the capstan(s) (B), and pressure roller(s) (C) after every 50 hours of tape operation.
Caution: Do not rotate the heads during cleaning.
Use a cotton swab slightly moistened with cleaning fluid or alcohol.
You can also clean the heads by playing a cleaning tape once.



Demagnetizing the heads
Use a demagnetizing tape available at your dealer.

Troubleshooting

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

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

Problem	Solution
"NO DISC" is displayed.	Insert a disc. Check if the disc is inserted upside down. Wait until the moisture condensation at the lens has cleared. Replace or clean the disc, see "Maintenance". Use a finalised CD-RW or CD-R.
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 Micro HiFi System and your TV or VCR.

Problem	Solution
Recording or playback cannot be made.	Clean deck parts, see "Maintenance". Use only normal (IEC I) tape for recording.
"CHK TAPE" is displayed.	Apply a piece of adhesive tape over the missing tab space.
The tape deck door cannot open.	Remove and reconnect the AC power plug and switch on the system again.
The system does not react when buttons are pressed.	Remove and reconnect the AC power plug 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 if the stripped speaker wire is clamped. Make sure the MP3-CD was recorded within 32-256 kbps bit rate with sampling frequencies at 48 kHz, 44.1 kHz or 32 kHz.
The left and right sound outputs are reversed.	Check the speaker connections and location.
The remote control does not function properly.	Select the source (CD or TUNER, for example) before pressing the function button (►/II , I◄◄ , ►►I). Reduce the distance between the remote control and the system. Insert the batteries with their polarities (+/– signs) aligned as indicated. Replace the batteries. Point the remote control directly toward IR sensor on the front of the system.
The timer is not working.	Set the clock correctly. Press TIMER SET ▲ (TIMER on the remote control) to switch on the timer. If a recording is in progress, stop the recording.
The Clock/Timer setting is erased.	Power has been interrupted or the power cord has been disconnected. Reset the clock/timer.

DISMANTLING INSTRUCTIONS

Dismantling of the Cover Cassette and Universal Loader

1) Push 1 catch each on the left & right side then remove the Cover Cassette in the direction as shown in Figure 1 and Figure 1A.

2) Loosen 4 screws to remove the Cover Top by sliding it out towards the rear before lifting up.
   - 2 screws on the rear
   - 1 screw each on the left & right side

3) Loosen 2 screws each to remove the Panel Left and Panel Right. The Panels are removed by sliding it towards the rear and outwards.
   - 1 screw on the rear
   - 1 screw on the side
   - see Service position A

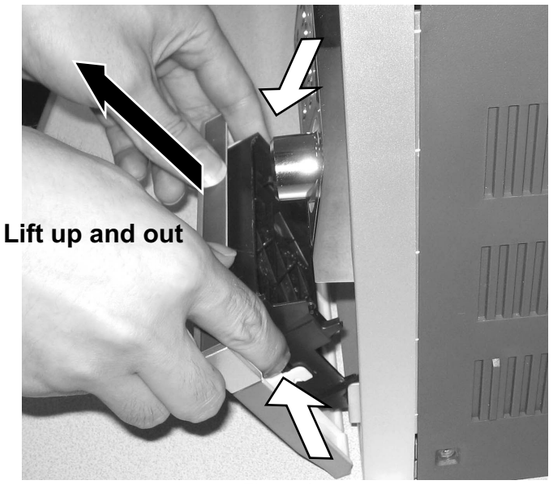


Figure 1

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

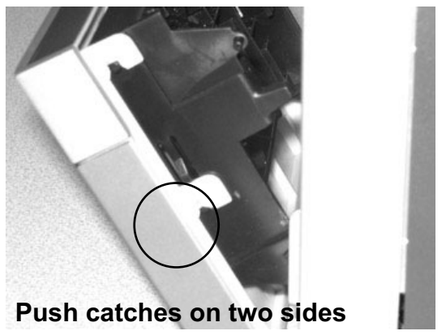


Figure 1A

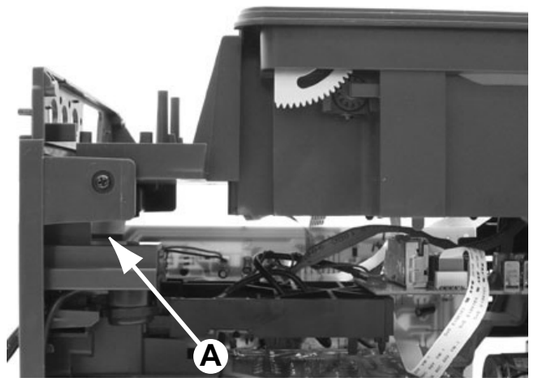


Figure 2

Detaching the Front Panel assembly from the Bottom/Rear assembly

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

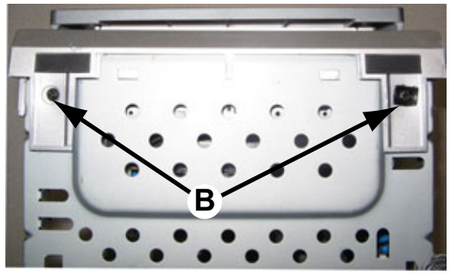


Figure 3

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

2-1

Detaching the Front Panel assembly from the Bottom/Rear assembly

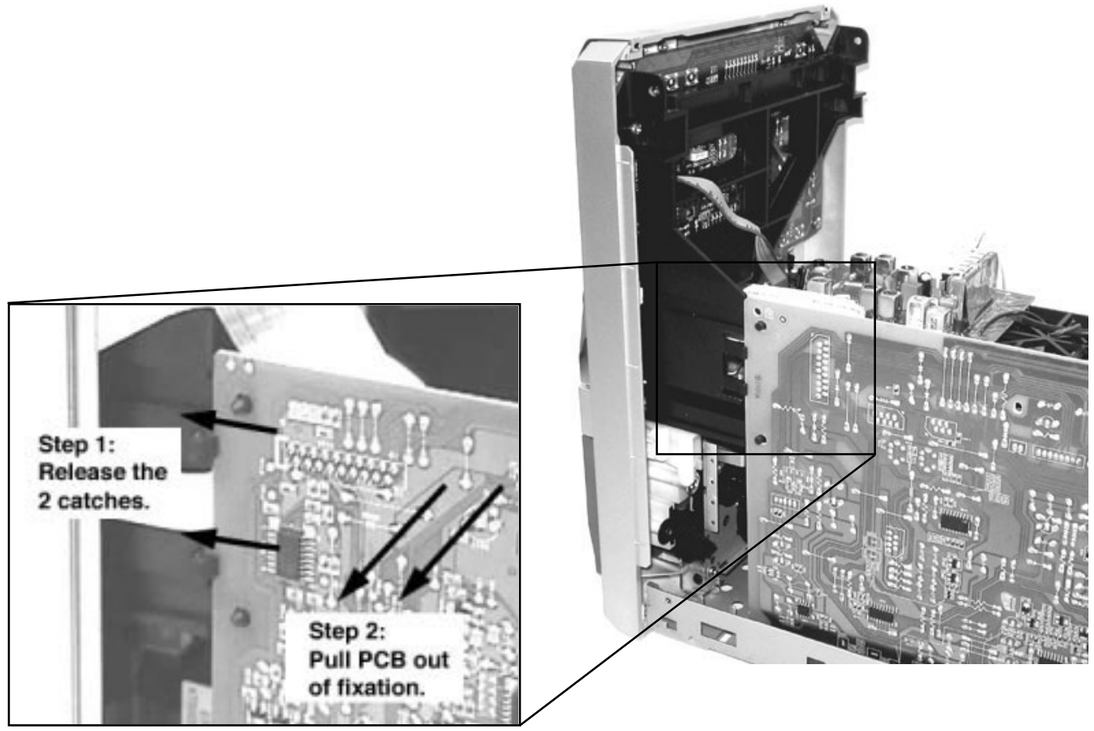


Figure 4A

Figure 4

Dismantling of the Front Panel assembly

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

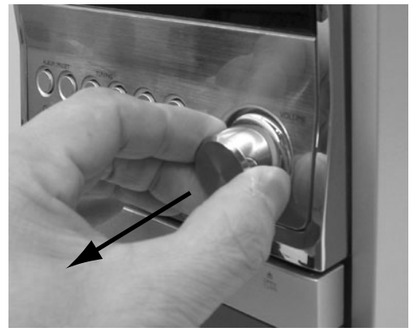


Figure 5

DISMANTLING INSTRUCTIONS

Dismantling of the Front Panel assembly

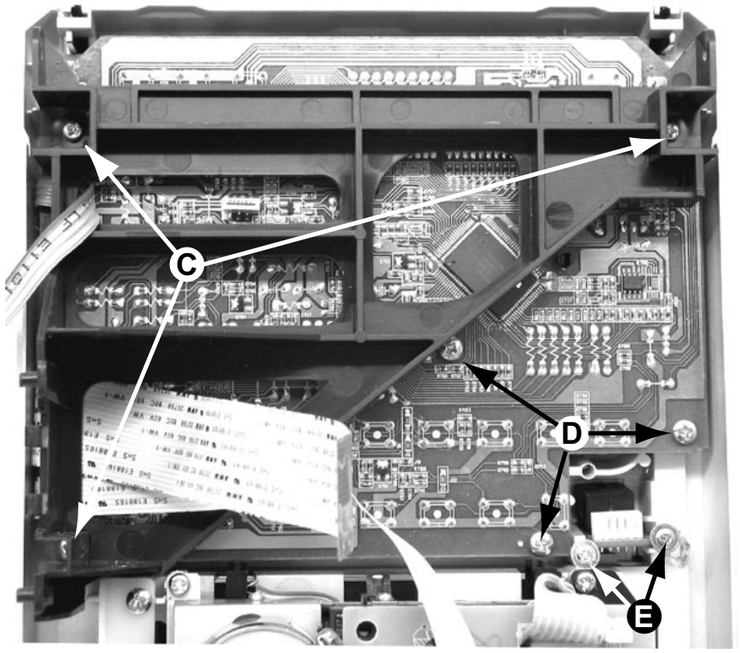


Figure 6

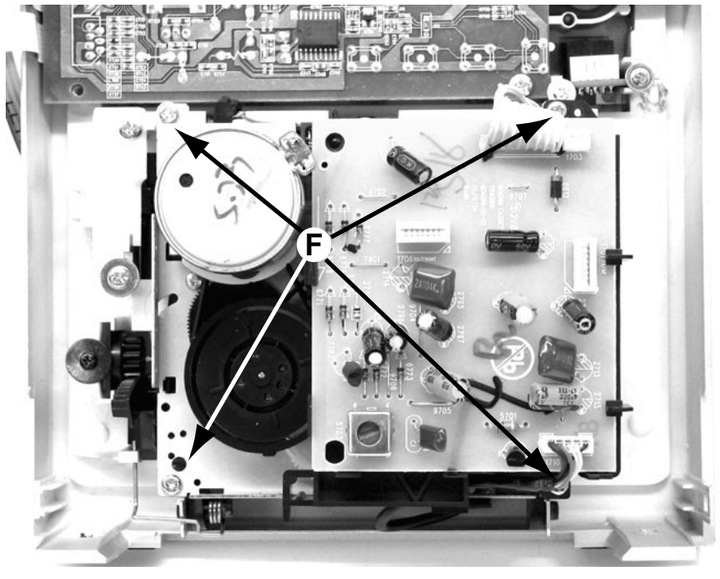


Figure 7

2-2

Dismantling of the Rear Panel assembly

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

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

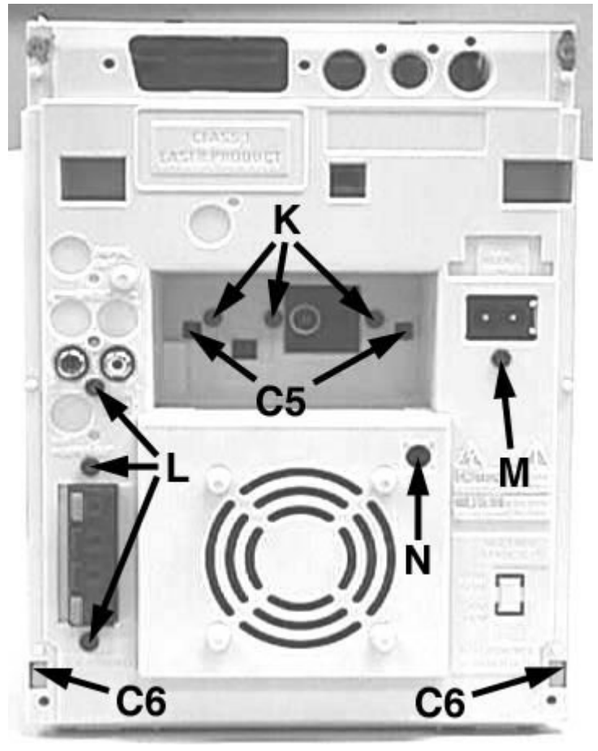


Figure 8

DISMANTLING INSTRUCTIONS

Repair Hints & Service Positions

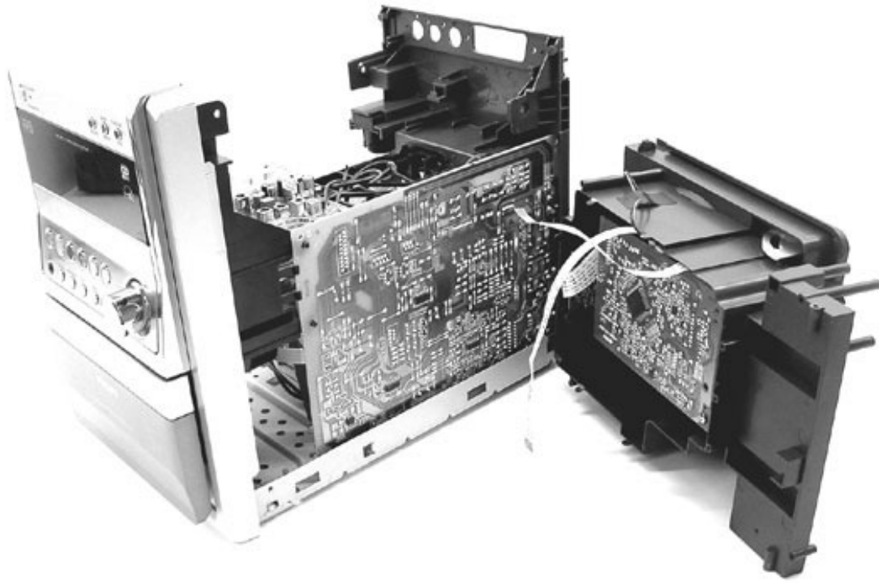
1) During repair it is possible to disconnect the Tuner Board and/or CD Module completely unless the fault is suspected to be in that area. This will not affect the performance of the rest of the set.

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

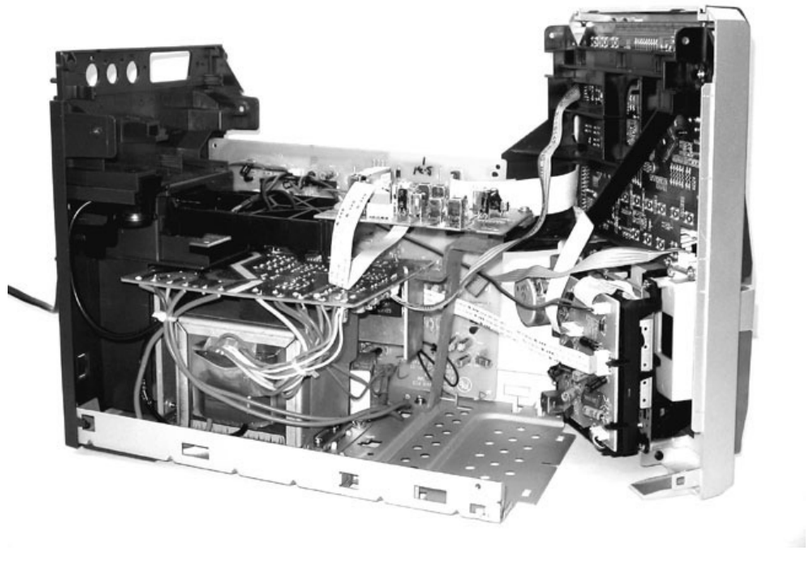
Service position A

2-3

Service position B



Service position C



3-1

SERVICE TEST PROGRAM

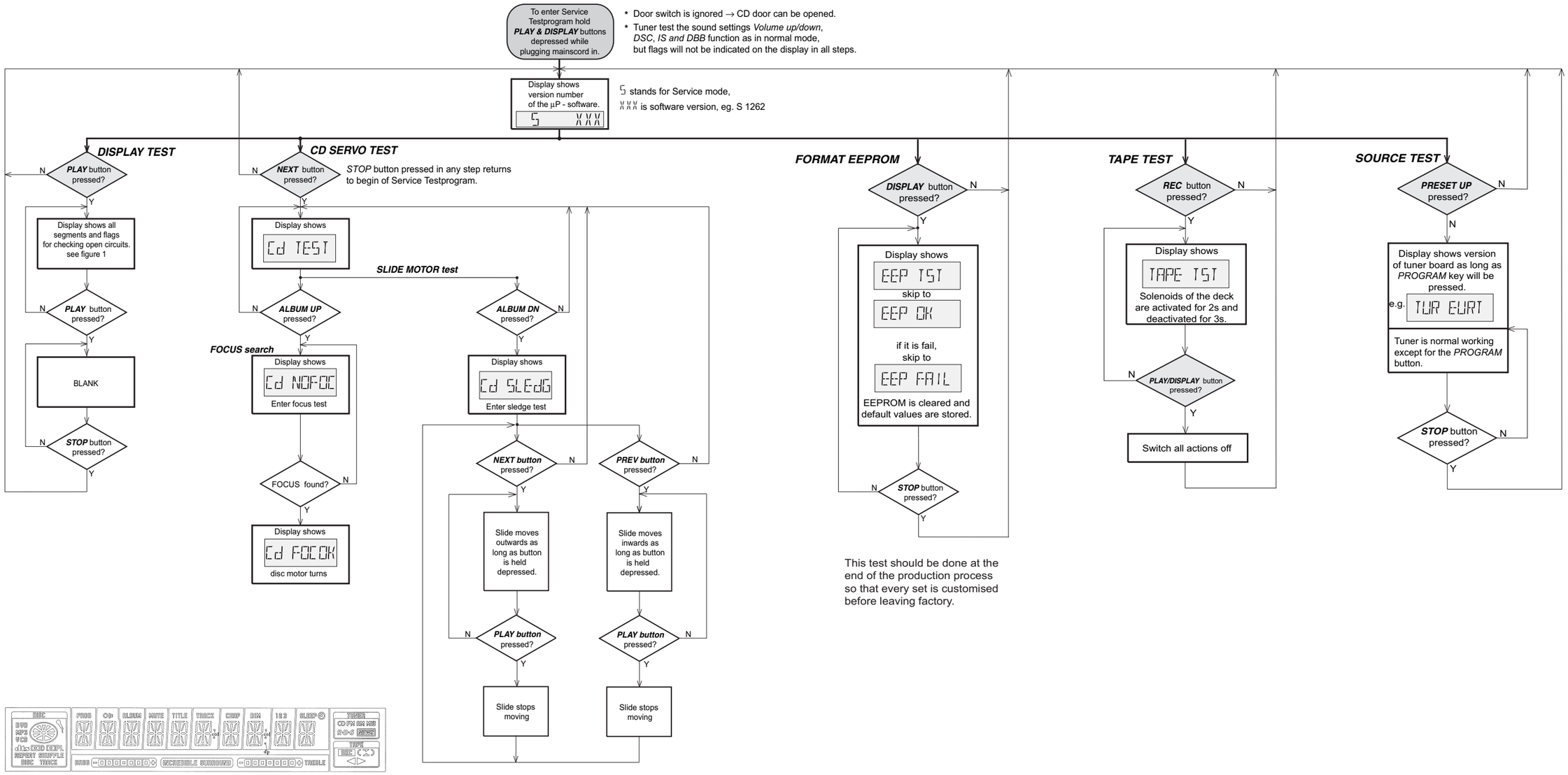


Figure 1

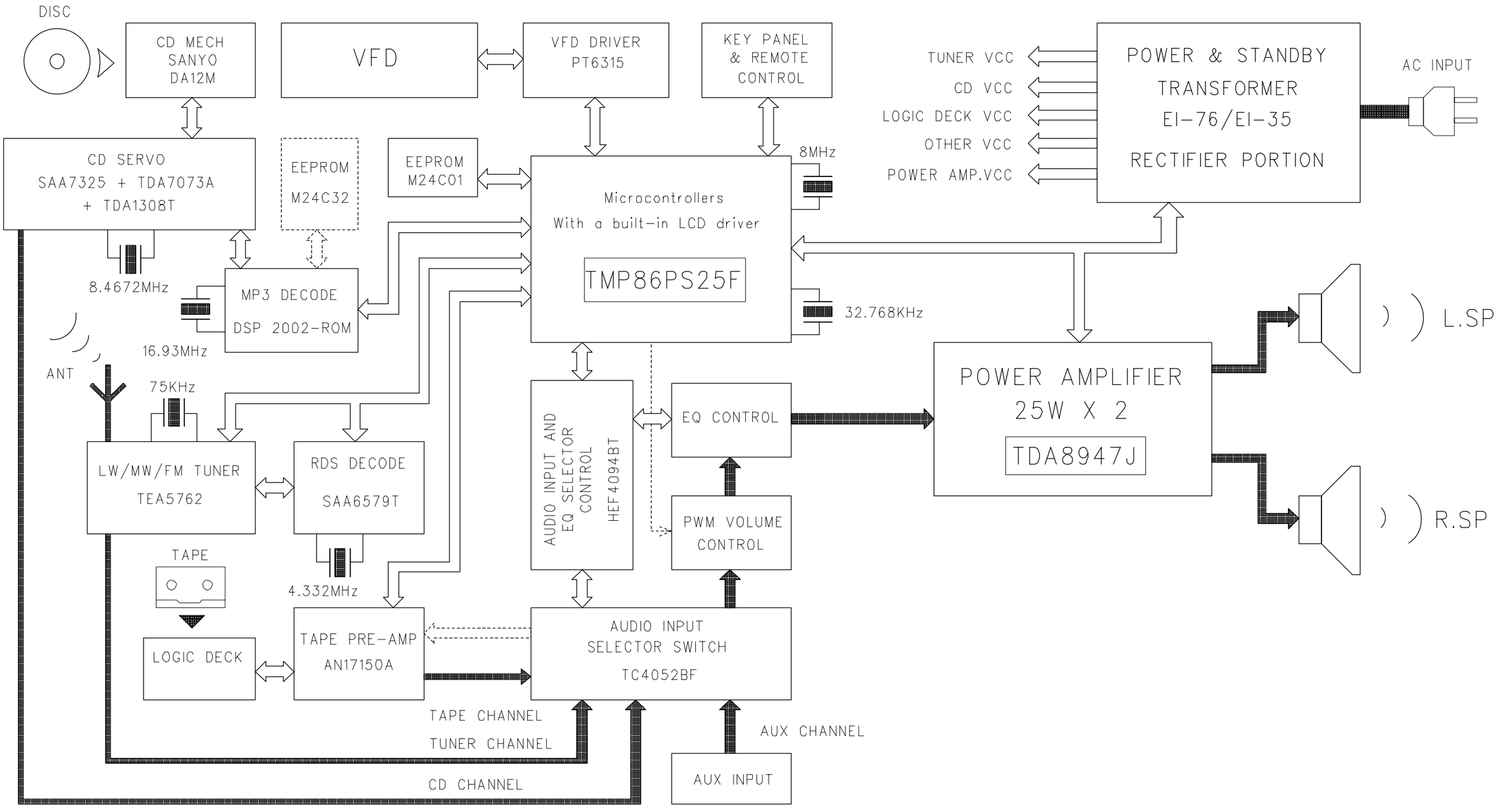
TUNER VERSIONS

	TUN EURT	TUN USA	TUN OSE
REGION & SET VERSIONS	***EUROPE*** ***FM/MW*** /22/25	***USA*** ***FM/MW*** /37	***OVERSEAS*** ***FM/MW*** 1)Grid switchable 100/10kHz - 50/9kHz / 21/21M/30

table 2

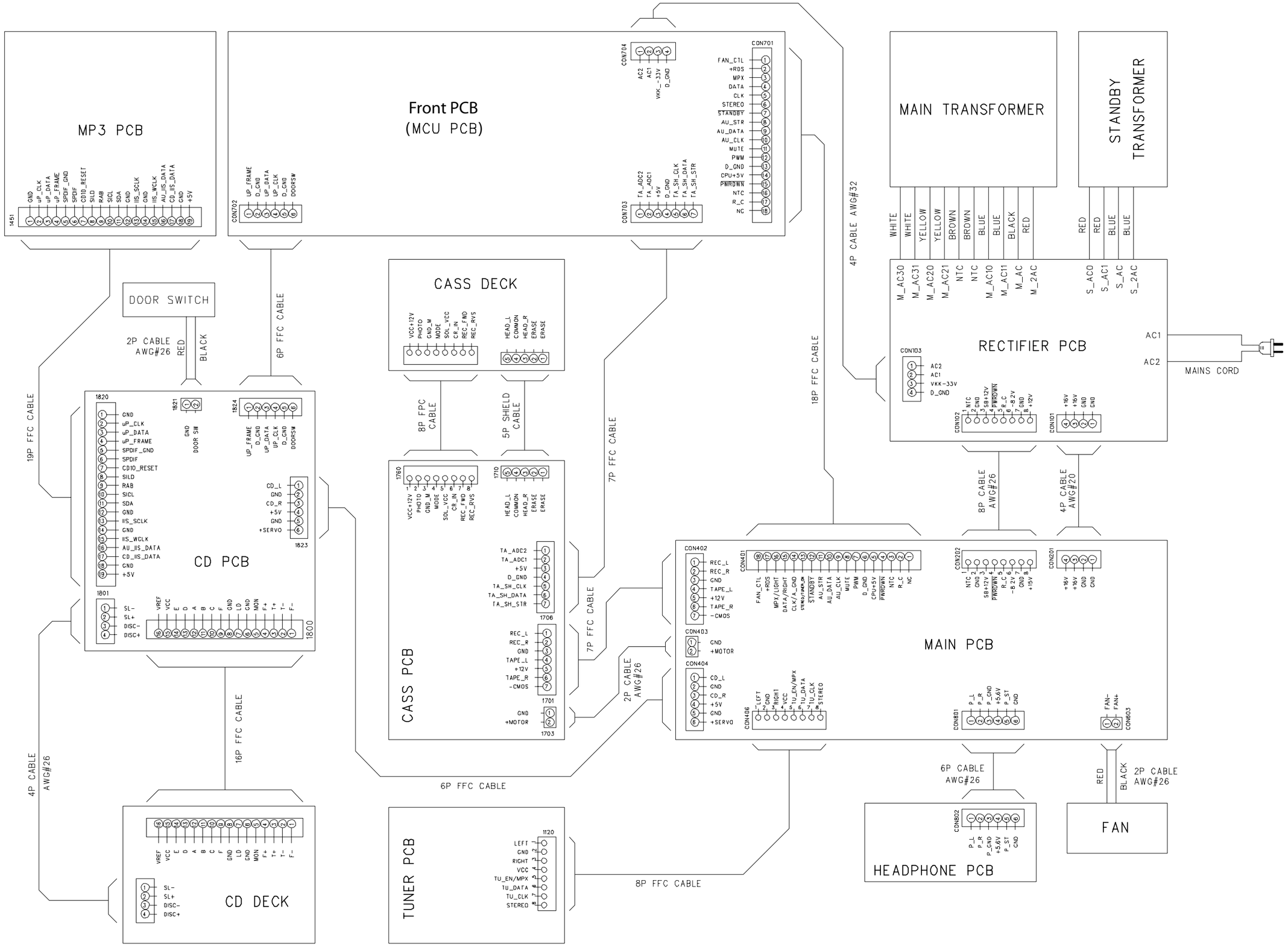
4-1

SET BLOCK DIAGRAM



5-1

SET WIRING DIAGRAM



FRONT BOARD

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Front Board Layout Top View 6-2
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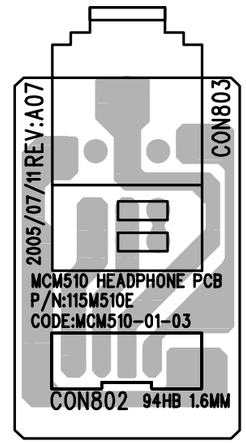
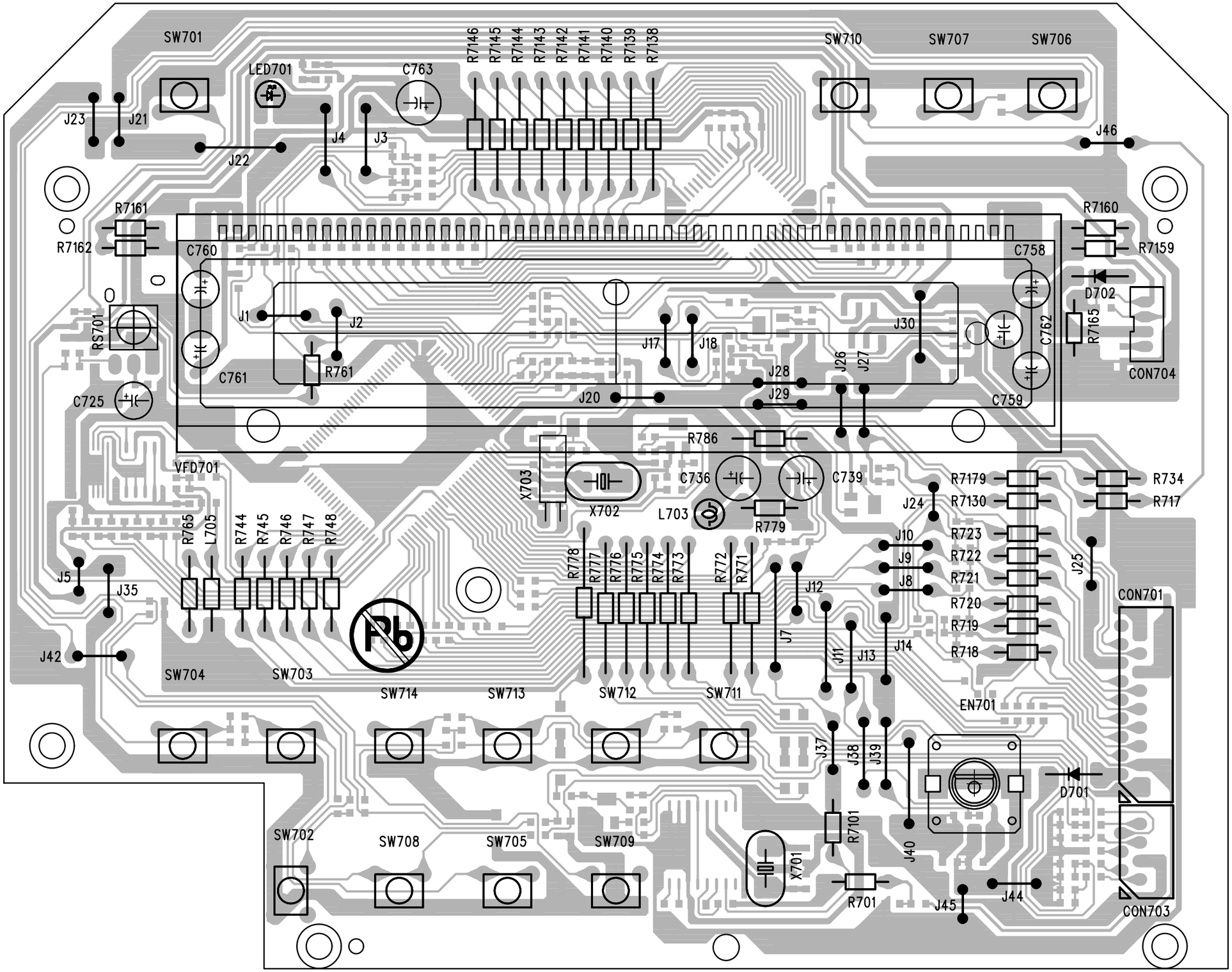
Circuit Diagram 6-4
Electrical Parts List 6-5

LAYOUT DIAGRAM - HEADPHONE BOARD



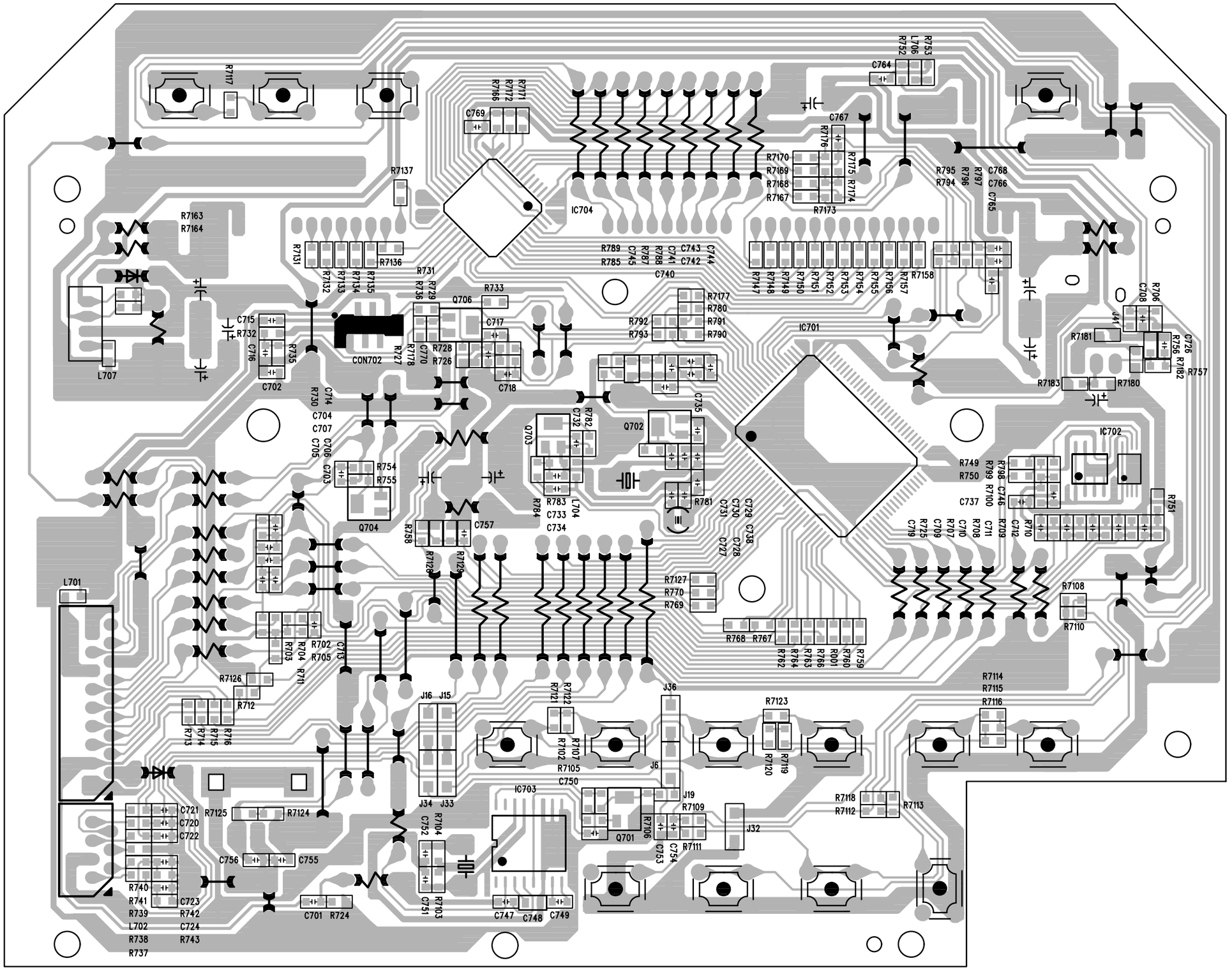
6-2

LAYOUT DIAGRAM - FRONT BOARD
TOP SIDE



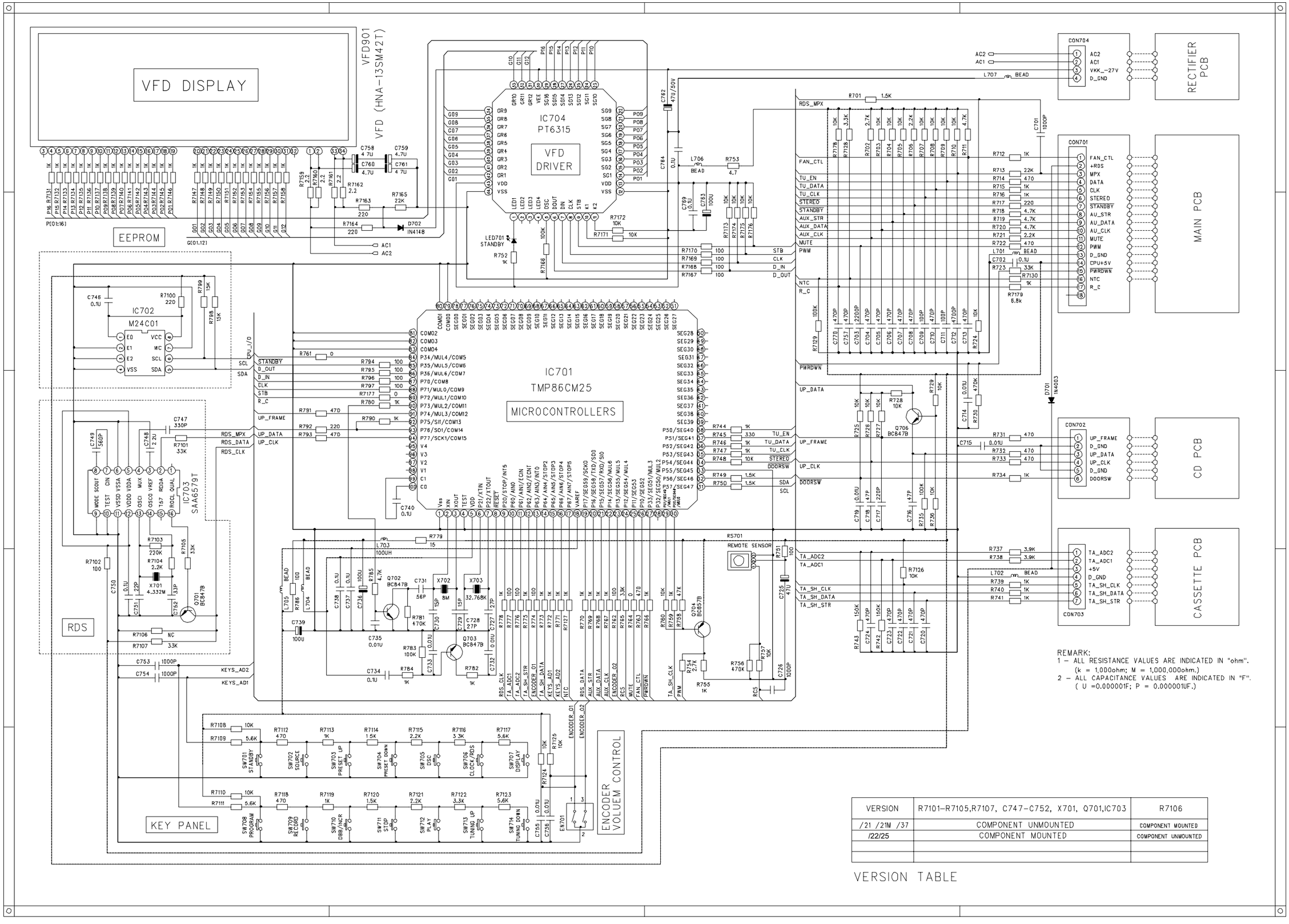
6-3

LAYOUT DIAGRAM - FRONT BOARD
BOTTOM SIDE



6-4

CIRCUIT DIAGRAM - FRONT BOARD



REMARK:
1 – ALL RESISTANCE VALUES ARE INDICATED IN "ohm".
(k = 1,000ohm; M = 1,000,000ohm.)
2 – ALL CAPACITANCE VALUES ARE INDICATED IN "F".
(U =0.000001F; P = 0.000001UF.)

VERSION	R7101–R7105,R7107, C747–C752, X701, Q701,IC703	R7106
/21 /21M /37	COMPONENT UNMOUNTED	COMPONENT MOUNTED
/22/25	COMPONENT MOUNTED	COMPONENT UNMOUNTED

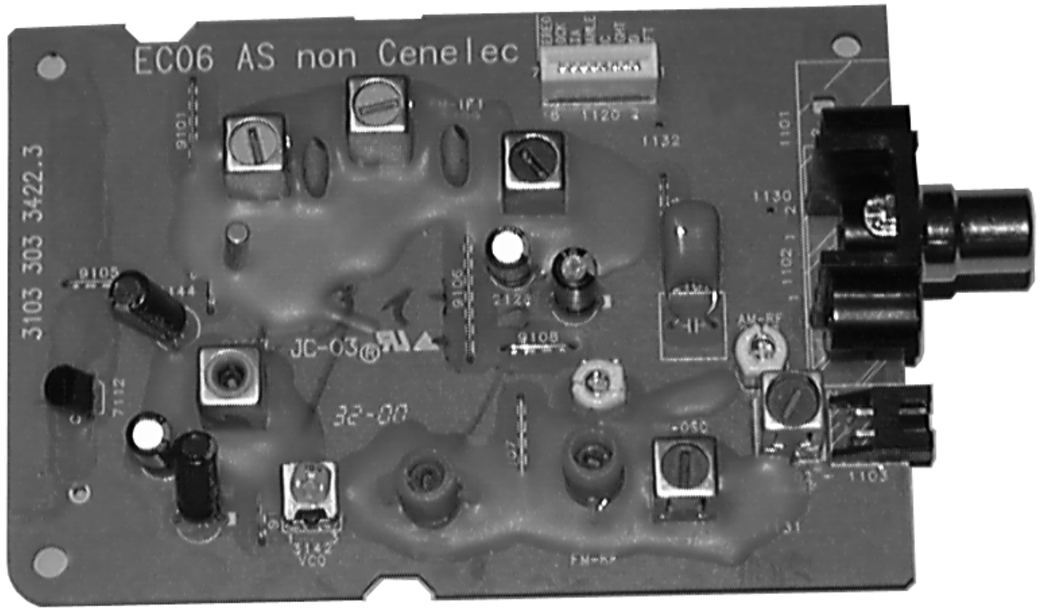
VERSION TABLE

6-5

ELECTRICAL PARTS - FRONT BOARD

EN701	9940 000 03211	ENCODER
IC701	9940 000 03213	IC OTP TMP86PS25F
IC702	9940 000 03272	IC M24C01-RDW6T
IC703	9940 000 03215	RDS IC SAA6581T
IC704	9940 000 03214	VFD DRIVER IC PT6315
L703	9940 000 03216	CHOKE COIL 100μH
L705	9965 000 17286	FIXED INDUCTOR 0.47μH-K
LED701	9940 000 01442	LED 5.25X2.9 RED 3R4SDC-8
RS701	9940 000 03271	IR RECEIVER
SW701	9965 000 13779	TACT SWITCH
SW702	9965 000 13779	TACT SWITCH
SW703	9965 000 13779	TACT SWITCH
SW704	9965 000 13779	TACT SWITCH
SW705	9965 000 13779	TACT SWITCH
SW706	9965 000 13779	TACT SWITCH
SW707	9965 000 13779	TACT SWITCH
SW708	9965 000 13779	TACT SWITCH
SW709	9965 000 13779	TACT SWITCH
SW710	9965 000 13779	TACT SWITCH
SW711	9965 000 13779	TACT SWITCH
SW712	9965 000 13779	TACT SWITCH
SW713	9965 000 13779	TACT SWITCH
SW714	9965 000 13779	TACT SWITCH
VFD701	9940 000 03212	VFD HNA-13SM42T
X701	9940 000 03209	CRYSTAL 4.332MHZ
X702	9940 000 03207	CERAMIC FILTER 8.0MHZ +-5%
X703	9940 000 03208	CRYSTAL 32.768KHZ 12.5PF

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



ECO6 Tuner Board

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

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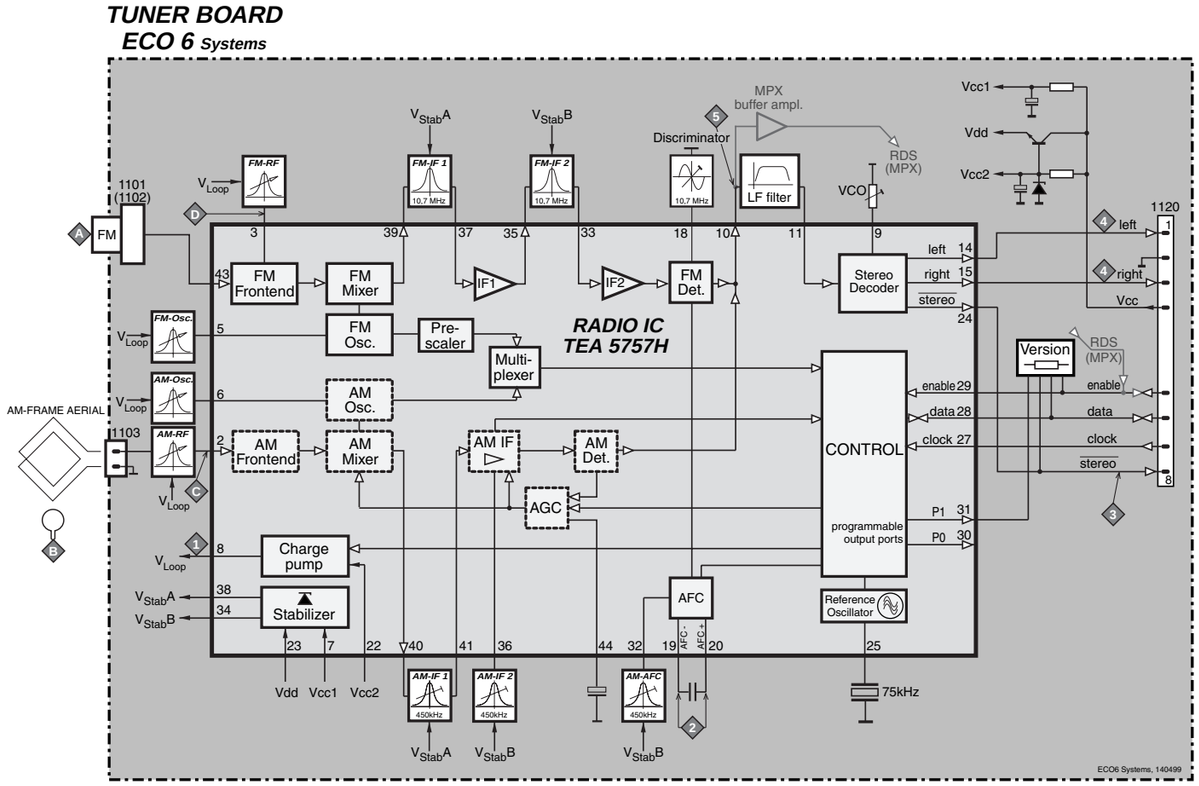
7A-1

BLOCK DIAGRAM



7A-2

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

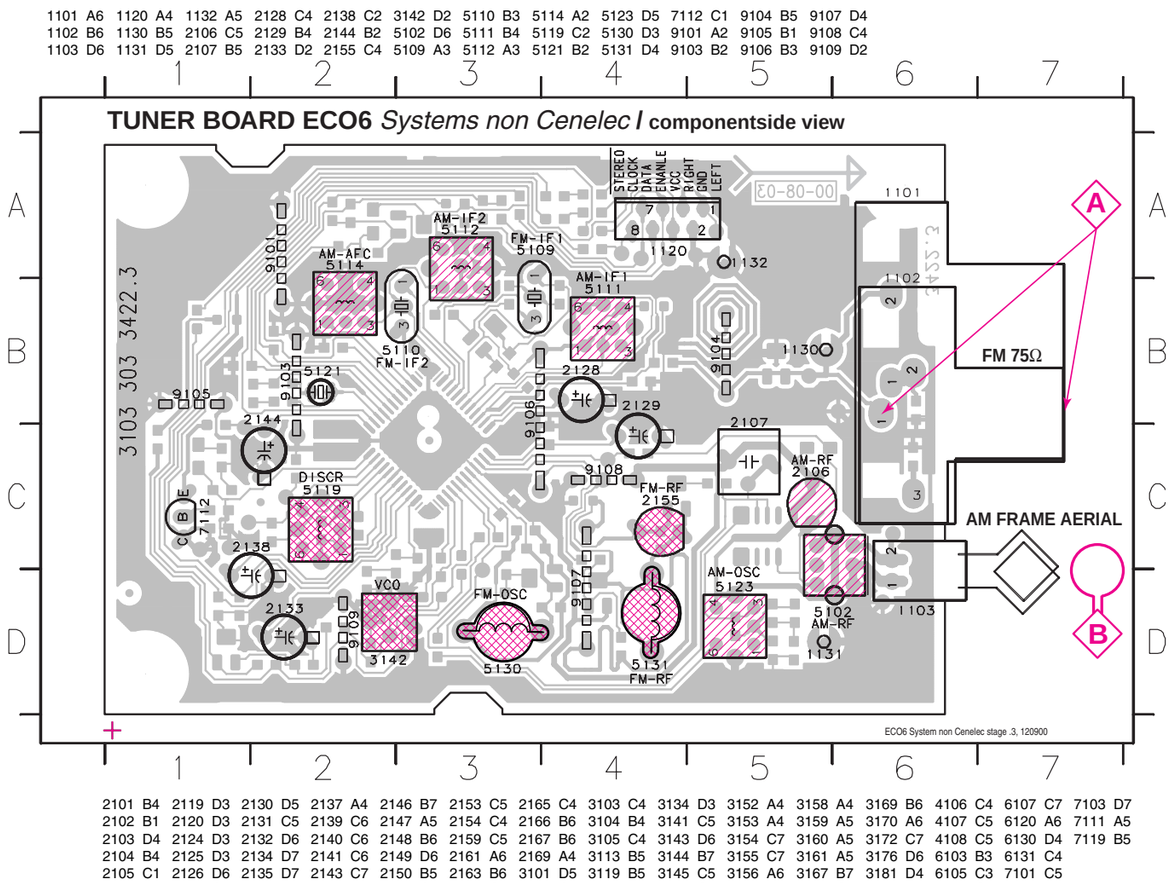
...V FM mode stereo
...V MW mode
...V LW mode
Ⓥ EVM
voltages measured while set is tuned to a strong transmitter

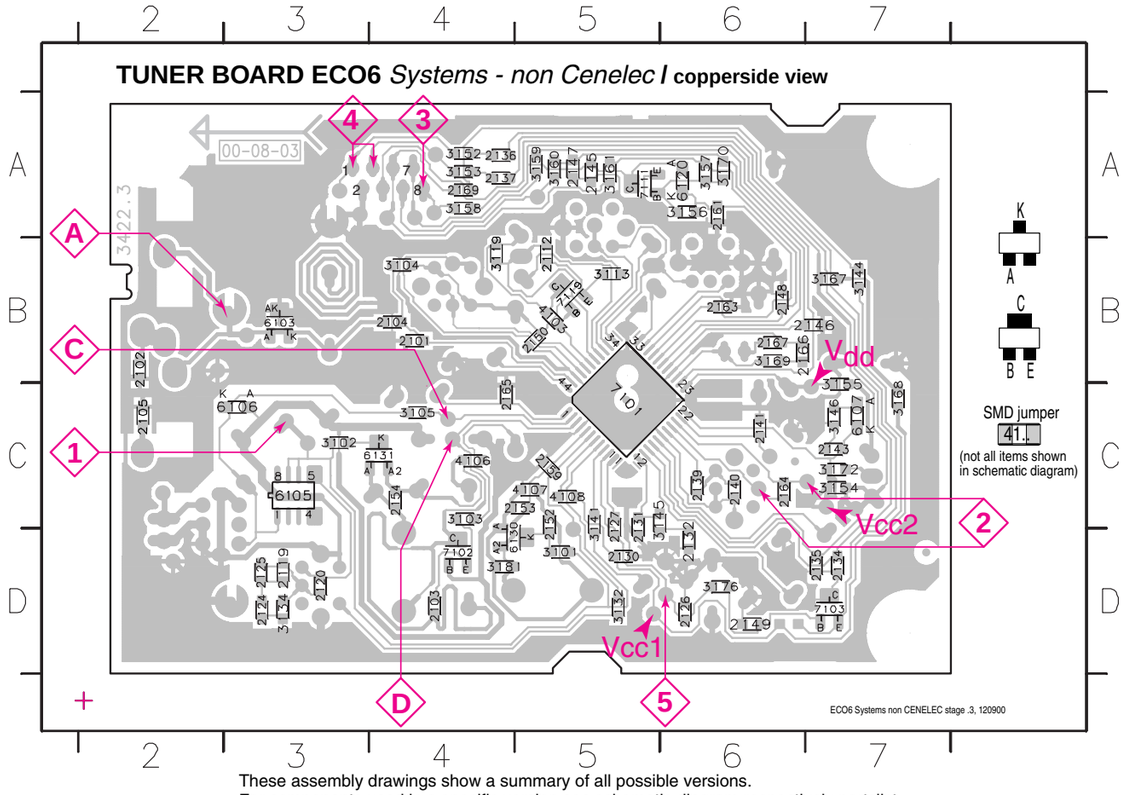
Signal path
FM
AM
MPX (Audio Frequency)
AF - left/right

ECO6 Sys-non Cenelec, 000911

1101 A1
1102 B1
1103 F2
1120 E14
1130 A2
1131 B2
1132 G13
2101 B3
2102 B1
2103 C7
2104 B3
2105 A2
2106 F3
2107 F4
2119 H6
2120 G6
2124 H6
2125 H6
2126 F7
2127 E7
2128 C8
2129 C7
2130 F11
2131 G8
2132 G8
2133 G8
2134 H8
2135 H9
2136 G14
2137 G13
2138 F9
2139 G9
2140 G9
2141 F10
2143 G12
2144 G11
2145 F12
2146 E12
2147 E12
2148 E12
2149 H7
2150 A10
2152 E4
2153 E5
2154 D5
2155 D5
2159 F6
2161 C11
2163 D11
2164 F10
2165 C7
2166 E11
2167 E11
2169 H8
3101 E4
3102 D4
3103 C6
3104 A7
3105 B6
3132 G5
3134 H6
3141 E7
3142 E7
3143 G7
3144 H7
3145 F8
3146 G13
3152 G14
3153 G13
3154 G13
3155 G11
3156 C12
3157 C12
3158 E13
3159 D13
3160 D12
3161 D13
3167 F12
3168 F11
3169 E11
3170 C12
3172 G12
3176 G7
3181 E6
5102 F2
5109 B9
5110 B10
5111 A8
5112 A11
5114 B11
5119 G9
5121 E11
5123 G5
5130 E5
5131 C6
6103 B2
6105-1 F3
6105-2 G5
6106 C3
6107 G13
6120 C13
6130 E5
6131 D5
7101 C8
7102 C6
7103 H7
7111 C13
7112 G12
T102 B2
T103 B2
T105 F2
T106 F2
T109 B6
T110 F5
T111 F4
T112 F7
T113 A8
T114 B10
T115 A8
T116 F10
T117 G13
T118 G11
T120 F13
T121 F13
T122 F13
T123 E13
T124 G14
T125 F14
T126 F13
T127 F13
T128 D7
T140 F11
T141 F10
T142 F10

7A-3





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

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

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)			108MHz	5130	◇1	8V ±0.2V
			87.5MHz (65.81MHz)	check		4.3V ±0.5V (1.2V ±0.5V)
MW FM/AM-version, 10kHz grid 530 - 1700kHz			1700kHz	5123		8V ±0.2V
			530kHz	check		1.1V ±0.4V
FM/MW-version, 9kHz grid 531 - 1602kHz			1602kHz	5123		6.9V ±0.2V
			531kHz	check		1.1V ±0.4V
LW 153 - 279kHz			279kHz	5122		8V ±0.2V
			153kHz	check		1.1V ±0.4V
MW FM/MW/LW- version, 9kHz grid 531 - 1602kHz			1602kHz	5123		8V ±0.2V
			531kHz	check		1.1V ±0.4V
FM IF						
FM	10.7MHz, 45mV continuous wave	◇D	IC 7101 21 shortcircuit to block AFC 2141	5119	◇2	0 ± 3 mV DC
FM RF						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)	108MHz	◇A	108MHz	2155	◇4	MAX
	87.5MHz (65.81MHz)	mod=1kHz Δf=±22.5kHz	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
			IC 7101 40 100nF 220R see remark 2)	5112		
AM AFC **MW**		◇C continuous wave V_{RF} = 2mV		5114	◇2	0 ± 2 mV DC
AM RF 3)						
MW 4) FM/MW/LW- and FM/MW-version (9kHz grid) 531 - 1602kHz	1494kHz	◇B	1494kHz	2106	◇5	max. f_o symmetric
	558kHz		558kHz	5102		
LW	198kHz		198kHz	5103		
MW FM/AM-version, 10kHz grid 530 - 1700kHz	1500kHz	Δf = ±30kHz V_{RF} as low as possible	1500kHz	2106		
	560kHz		560kHz	5102		

ECO6, Sys + PA with frame aerial, 070799

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

1) If sensitivity of frequency counter is too low adjust to max. channel separation (input signal: stereo left 90% + 9%, adjust output on right channel to minimum)

2) RC network serves for damping the IF-filter while adjusting the other one.

3) For AM RF adjustments the original frame antenna has to be used !

4) MW has to be aligned before LW.

↕ Repeat

Electrical Partslist *ECO6* *SYSTEMS NON-CENELEC*

7A-4

MISCELLANEOUS

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

CAPACITORS

2101 ©	4822 126 13692	47pF	1%	63V	
2102 ©	4822 126 13838	100nF	10%	50V	not USA
2103 ©	5322 122 31647	1nF	10%	63V	
2104 ©	5322 122 32531	100pF	5%	50V	
2105 ©	4822 126 13838	100nF	10%	50V	USA only
2106	2020 800 00191	3-11pF TRIMCAP.,N450			
2107	4822 121 51319	1µF	20%	50V	
2120 ©	4822 126 13689	18pF	1%	63V	
2124 ©	5322 122 32654	22nF	10%	63V	
2125 ©	2020 552 96199	560pF	1%	50V	
2126 ©	5322 122 31863	330pF	5%	50V	
2127 ©	4822 126 14076	220nF	20%	25V	
2128	4822 124 40248	10µF	20%	63V	
2129	4822 124 41584	100µF	20%	10V	
2130 ©	5322 122 32654	22nF	10%	63V	
2131 ©	4822 126 13482	470nF	20%	16V	
2132 ©	4822 126 13482	470nF	20%	16V	
2133	4822 124 21913	1µF	20%	63V	
2134 ©	4822 126 13188	15nF	5%	63V	not USA
2134 ©	5322 122 32654	22nF	10%	63V	USA only
2135 ©	4822 126 13188	15nF	5%	63V	not USA
2135 ©	5322 122 32654	22nF	10%	63V	USA only
2136 ©	4822 126 14076	220nF	20%	25V	
2137 ©	4822 126 14076	220nF	20%	25V	
2138	4822 124 22652	2,2µF	20%	50V	
2139 ©	4822 126 14236	15pF	5%	50V	
2140 ©	4822 126 13695	82pF	1%	63V	
2141 ©	4822 126 13838	100nF	10%	50V	
2143 ©	4822 126 14076	220nF	20%	25V	
2144	4822 124 21913	1µF	20%	63V	
2145 ©	4822 122 33575	220pF	5%	50V	
2146 ©	4822 122 33575	220pF	5%	50V	
2147 ©	4822 122 33575	220pF	5%	50V	
2148 ©	4822 122 33127	2,2nF	10%	63V	
2149 ©	5322 122 32659	33pF	5%	50V	RDS only
2150 ©	4822 126 13838	100nF	10%	50V	
2152 ©	4822 126 12105	33nF	5%	63V	not for East Europe
2152 ©	5322 116 80853	560pF	5%	63V	for East Europe only
2153 ©	4822 126 13486	15pF	2%	63V	not for East Europe
2153 ©	4822 122 33926	12pF	2%	50V	for East Europe only
2155	2020 800 00191	3-11pF TRIMCAP.,N450			
2159 ©	5322 122 32659	33pF	5%	50V	
2164 ©	4822 126 13482	470nF	20%	16V	
2165 ©	4822 126 13838	100nF	10%	50V	
2166 ©	5322 122 31647	1nF	10%	63V	
2167 ©	4822 122 33926	12pF	5%	50V	
2169 ©	4822 122 33127	2,2nF	10%	63V	RDS only

RESISTORS

3101 ©	4822 051 20333	33kΩ	5%	0,1W	
3102 ©	4822 117 10837	100kΩ	1%	0,1W	
3103 ©	4822 051 20822	8,2kΩ	5%	0,1W	
3104 ©	4822 117 13577	330Ω	1%	0,1W	
3105 ©	4822 117 11503	220Ω	5%	0,1W	
3132 ©	4822 051 20479	47Ω	5%	0,1W	
3134 ©	4822 051 20223	22kΩ	5%	0,1W	
3141 ©	4822 117 11148	56kΩ	1%	0,1W	
3142	4822 100 12159	TRIMPOT. 100kΩ			

RESISTORS

3143 ©	4822 051 20223	22kΩ	5%	0,1W	RDS only
3144 ©	4822 051 10102	1kΩ	2%	0,25W	RDS only
3145©	4822 117 11449	2,2kΩ	1%	0,1W	
3146 ©	4822 051 20229	22Ω	5%	0,1W	
3152 ©	4822 051 20471	470Ω	5%	0,1W	
3153 ©	4822 051 20471	470Ω	5%	0,1W	
3154 ©	4822 117 13577	330Ω	1%	0,1W	
3155 ©	4822 117 11503	220Ω	5%	0,1W	
3156 ©	4822 117 10837	100kΩ	1%	0,1W	
3157 ©	4822 117 10837	100kΩ	1%	0,1W	
3158 ©	4822 051 20471	470Ω	5%	0,1W	
3159 ©	4822 051 20471	470Ω	5%	0,1W	
3160 ©	4822 051 20471	470Ω	5%	0,1W	
3161 ©	4822 051 20223	22kΩ	5%	0,1W	
3167 ©	4822 051 20121	120Ω	5%	0,1W	
3168 ©	4822 051 20121	120Ω	5%	0,1W	
3169 ©	4822 051 20154	150kΩ	5%	0,1W	
3170 ©	4822 117 10837	100kΩ	1%	0,1W	
3172 ©	4822 051 20562	5,6kΩ	5%	0,1W	
3176 ©	4822 051 20333	33kΩ	5%	0,1W	RDS only
3181 ©	4822 051 10102	1kΩ	2%	0,25W	
4103 ©	4822 051 20008	CHIP JUMPER 0805			
4106 ©	4822 051 20008	CHIP JUMPER 0805			
4107 ©	4822 051 20008	CHIP JUMPER 0805			
4108 ©	4822 051 20008	CHIP JUMPER 0805			

COILS

5102	4822 157 71634	RF-COIL MW
5109	4822 242 70665	FM-IF FILTER 10,7MHz
5110	4822 242 70665	FM-IF FILTER 10,7MHz
5111	2422 549 44023	AM-IF FILTER 450kHz
5112	4822 157 70302	AM-IF FILTER 450kHz
5114	4822 157 70302	AM-IF FILTER 450kHz
5119	4822 157 11443	DISCRIMINATOR COIL
5121	4822 242 10261	QUARTZ 75kHz
5123	2422 549 44108	RF-COIL, AM-OSCILLATOR
5130	4822 157 11843	RF COIL 1,5 TURNS
5131	4822 157 11843	RF COIL 1,5 TURNS

DIODES

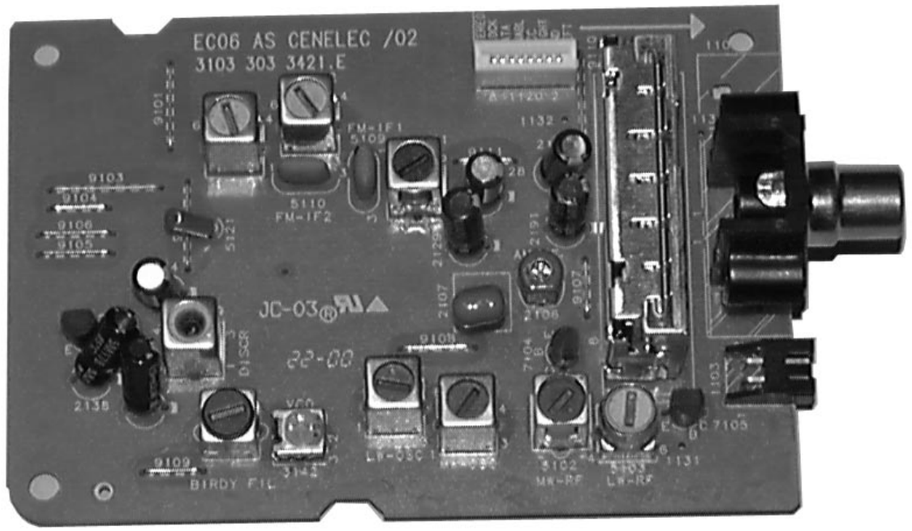
6103 ©	5322 130 34337	BAV99
6105 ©	4822 130 83075	HN1V02H
6106 ©	4822 130 83757	BAS216
6107 ©	9340 386 90115	BZX284-C11
6120 ©	4822 130 83757	BAS216
6130 ©	4822 130 82833	1SV228
6131 ©	4822 130 82833	1SV228

TRANSISTORS

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

INTEGRATED CIRCUITS

7101 ©	9351 740 80557	TEA5757H/V1, RADIO IC



ECO6 Tuner Board

version: ***SYSTEMS CENELEC***

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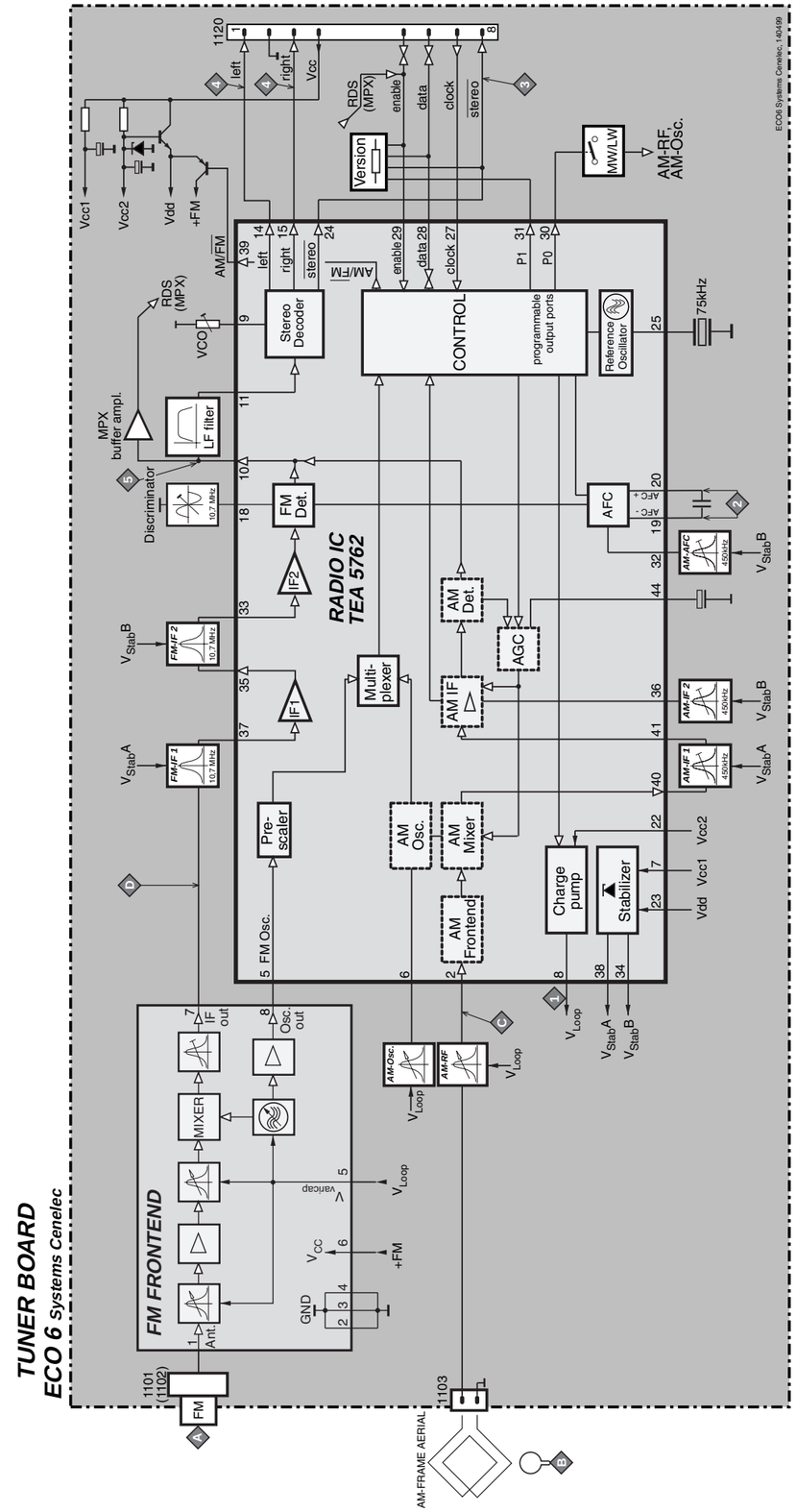
BLOCK DIAGRAM



7B-2

TUNER BOARD ECO6 / SYSTEMS-CENELEC

VERSION PROGRAMMING COMPONENTS

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

☒ component mounted

VERSION DETECTION

PROGRAMMABLE OUTPUT PORTS

AM-IF1

5111 450kHz

AM-IF2

5112 450kHz

AM-AFC

5114 450kHz

FM-IF1

5109

FM-IF2

5110

FM FRONTEND

1110 FE450

7101 TEA5762

CONTROL

STEREO DECODER

VCO

3142

AM-OSCILLATOR

BIRDY FILTER

DISCRIMINATOR

MPX BUFFER AMPLIFIER

AM FRAME AERIAL

MW/LW-RF

LW only

RDS only

× marked components not for LW version

ECO6 Sys-Cenelec, 010517

LEGEND

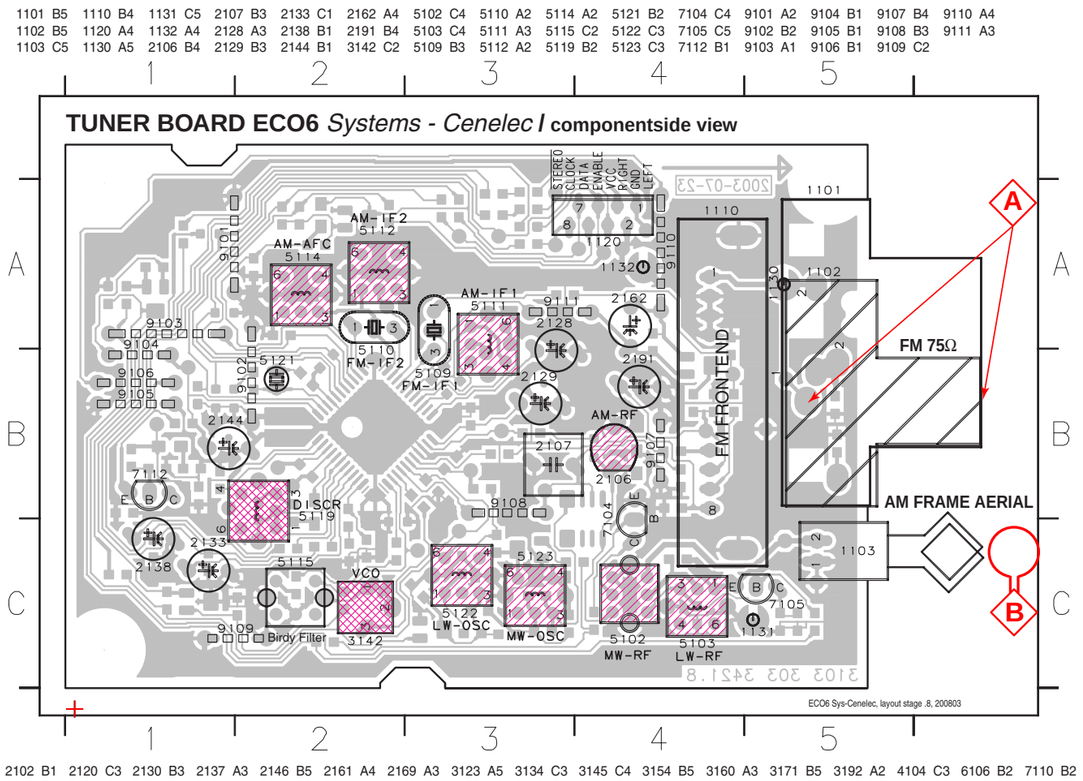
* ... only assembled in FM/AM-version
ⓟ ...for provision only
USA ... for USA version only
LW ... for LW version only

SMD jumper 41xx 0R

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

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

1101	A2	5121	E11
1102	B1	5122	H5
1103	E2	5123	G5
1110	B2	6105-1	E4
1120	E14	6105-2	G6
1130	A2	6106	D4
1131	C2	6107	G13
1132	F13	6120	C13
2102	B1	7101	C8
2105	A2	7103	H8
2106	E3	7104	D2
2107	E4	7105	F4
2108	G3	7109	H3
2109	G3	7110	H12
2118	H6	7111	C13
2119	H6	7112	G12
2120	H6	7122	H4
2122	I6	7124	H7
2123	H6	7103	B2
2124	H6	7104	B6
2125	H6	7105	E2
2127	E7	7106	E2
2128	B8	7107	C3
2129	C7	7109	D5
2130	F11	7110	D5
2131	F8	7111	E5
2132	F8	7112	F7
2133	F8	7113	A9
2134	I8	7114	B11
2135	I9	7116	F10
2136	H14	7117	F13
2137	H13	7118	G11
2138	F9	7120	F13
2139	G9	7121	F13
2140	G9	7122	E13
2141	F10	7123	E13
2143	G12	7124	G14
2144	G11	7125	F14
2145	E11	7126	F13
2146	E12	7127	F13
2147	E12	7140	F11
2148	E12	7141	F10
2149	H7	7142	F10
2150	A10		
2159	D5		
2161	C11		
2162	H12		
2163	D11		
2164	G10		
2165	C7		
2166	E11		
2167	E11		
2169	G8		
2180	C4		
2190	C3		
2191	C3		
3105	D5		
3108	D2		
3109	G4		
3123	H3		
3125	H2		
3128	H3		
3130	I9		
3131	I9		
3132	G4		
3134	H6		
3135	E7		
3137	H7		
3141	E7		
3142	E6		
3143	G7		
3144	G8		
3145	F8		
3146	G13		
3150	H12		
3151	H12		
3152	G14		
3153	G13		
3154	F13		
3155	G12		
3156	C12		
3157	D12		
3158	E13		
3159	D13		
3160	D13		
3161	D13		
3167	F12		
3168	F11		
3169	E11		
3170	D12		
3171	G12		
3172	G12		
3176	H7		
3180	I3		
3190	B6		
3191	B7		
3192	B6		
3193	B4		
3194	C4		
3195	C3		
4101	E2		
4102	F3		
4104	H5		
5102	E3		
5103	F2		
5109	B9		
5110	B10		
5111	A9		
5112	A11		
5114	B11		
5115	E7		
5118	G9		
5119	G9		



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

7B-3

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

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

ECO6 Sys Cenelec, 190599

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

1) If sensitivity of frequency counter is too low adjust to max. channel separation (input signal: stereo left 90% + 9%, adjust output on right channel to minimum)

2) RC network serves for damping the IF-filter while adjusting the other one.

3) For AM RF adjustments the original frame antenna has to be used! MW has to be aligned before LW.

↕ Repeat

Electrical Partslist *ECO6* SYSTEMS-CENELEC

7B-4

MISCELLANEOUS

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

CAPACITORS

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

RESISTORS

3105 ©	4822 117 11503	220Ω	5%	0,1W	
3108 ©	4822 117 11449	2,2kΩ	1%	0,1W	LW only
3109 ©	4822 051 20472	4,7kΩ	5%	0,1W	LW only
3123 ©	4822 051 20472	4,7kΩ	5%	0,1W	LW only
3125 ©	4822 117 10833	10kΩ	1%	0,1W	LW only
3128 ©	4822 117 11449	2,2kΩ	1%	0,1W	LW only
3130 ©	3198 021 38210	820Ω	5%	0,06W	
3131 ©	3198 021 38210	820Ω	5%	0,06W	
3132 ©	4822 051 20479	47Ω	5%	0,1W	
3134 ©	4822 051 20223	22kΩ	5%	0,1W	
3135 ©	3198 021 31020	1kΩ	5%	0,06W	
3137 ©	4822 051 20223	22kΩ	5%	0,1W	LW only
3141 ©	4822 117 11148	56kΩ	1%	0,1W	
3142	4822 100 12159	TRIMPOT. 100kΩ			
3143 ©	4822 051 20223	22kΩ	5%	0,1W	RDS only
3144 ©	4822 051 10102	1kΩ	2%	0,25W	RDS only
3145 ©	4822 117 11449	2,2kΩ	1%	0,1W	
3146 ©	4822 051 20229	22Ω	5%	0,1W	
3150 ©	4822 117 10833	10kΩ	1%	0,1W	
3151 ©	4822 051 20683	68kΩ	5%	0,1W	
3152 ©	4822 051 20471	470Ω	5%	0,1W	
3153 ©	4822 051 20471	470Ω	5%	0,1W	
3154 ©	4822 117 13577	330Ω	1%	0,1W	
3155 ©	4822 117 10353	150Ω	5%	0,1W	
3156 ©	4822 117 10837	100kΩ	1%	0,1W	
3157 ©	4822 117 10837	100kΩ	1%	0,1W	
3158 ©	4822 051 20471	470Ω	5%	0,1W	
3159 ©	4822 051 20471	470Ω	5%	0,1W	
3160 ©	4822 051 20471	470Ω	5%	0,1W	
3161 ©	4822 051 20223	22kΩ	5%	0,1W	
3167 ©	4822 051 20121	120Ω	5%	0,1W	
3168 ©	4822 051 20121	120Ω	5%	0,1W	
3169 ©	4822 051 20154	150kΩ	5%	0,1W	
3170 ©	4822 117 10837	100kΩ	1%	0,1W	
3171 ©	4822 117 10834	47kΩ	1%	0,1W	
3172 ©	4822 051 20562	5,6kΩ	5%	0,1W	
3176 ©	4822 051 20333	33kΩ	5%	0,1W	RDS only
3180 ©	4822 117 10833	10kΩ	1%	0,1W	LW only
3190 ©	4822 051 20121	120Ω	5%	0,1W	
3191 ©	4822 051 20121	120Ω	5%	0,1W	
3192 ©	4822 117 13577	330Ω	1%	0,1W	
3193 ©	4822 117 13577	330Ω	1%	0,1W	
3194 ©	4822 117 11449	2,2kΩ	1%	0,1W	
3195 ©	4822 051 20101	100Ω	5%	0,1W	
4101 ©	4822 051 20008	CHIP JUMPER 0805			FM/AM only
4102 ©	4822 051 20008	CHIP JUMPER 0805			FM/AM only
4104 ©	4822 051 20008	CHIP JUMPER 0805			FM/AM only
4105 ©	4822 051 20008	CHIP JUMPER 0805			
4106 ©	4822 051 20008	CHIP JUMPER 0805			
4107 ©	4822 051 20008	CHIP JUMPER 0805			

COILS

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

DIODES

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

TRANSISTORS

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

INTEGRATED CIRCUITS

7101	4822 209 90315	TEA5762H/V1, RADIO IC

MAIN BOARD

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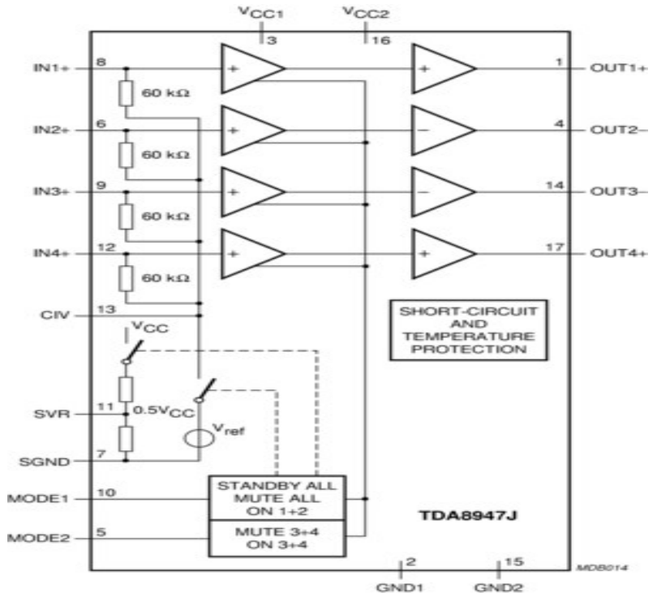
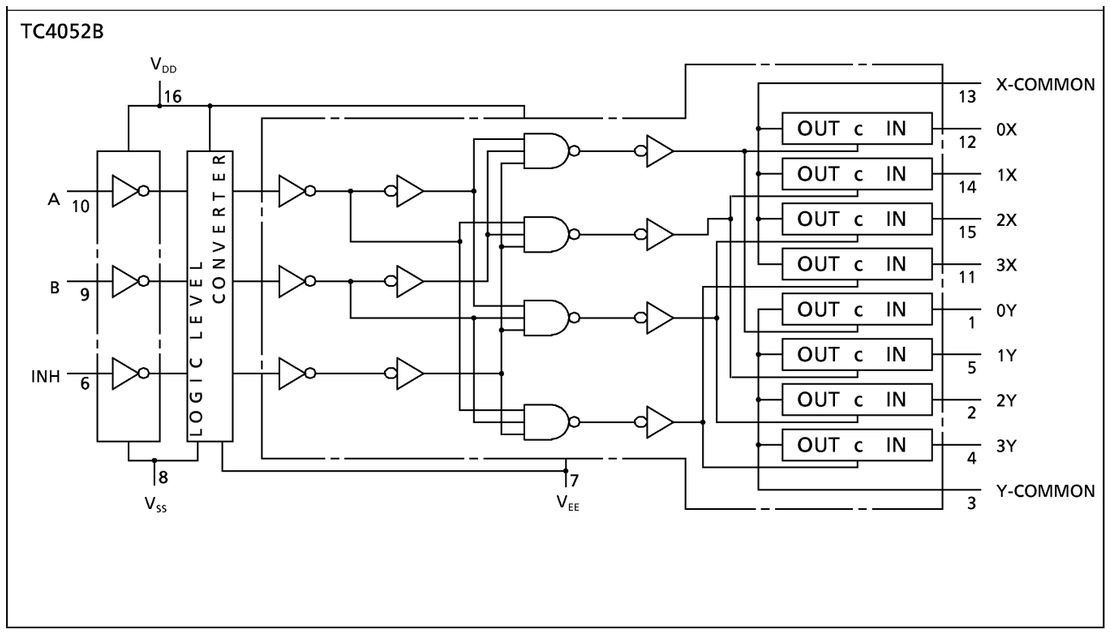
Main Board Layout Bottom View 8-3
Circuit Diagram - MCU Part 8-4
Electrical Parts List 8-5

BLOCK DIAGRAM - 4-CHANNEL AUDIO AMPLIFIER TDA8947J



BLOCK DIAGRAM - 4-CHANNEL MULTIPLEXER TC4052B

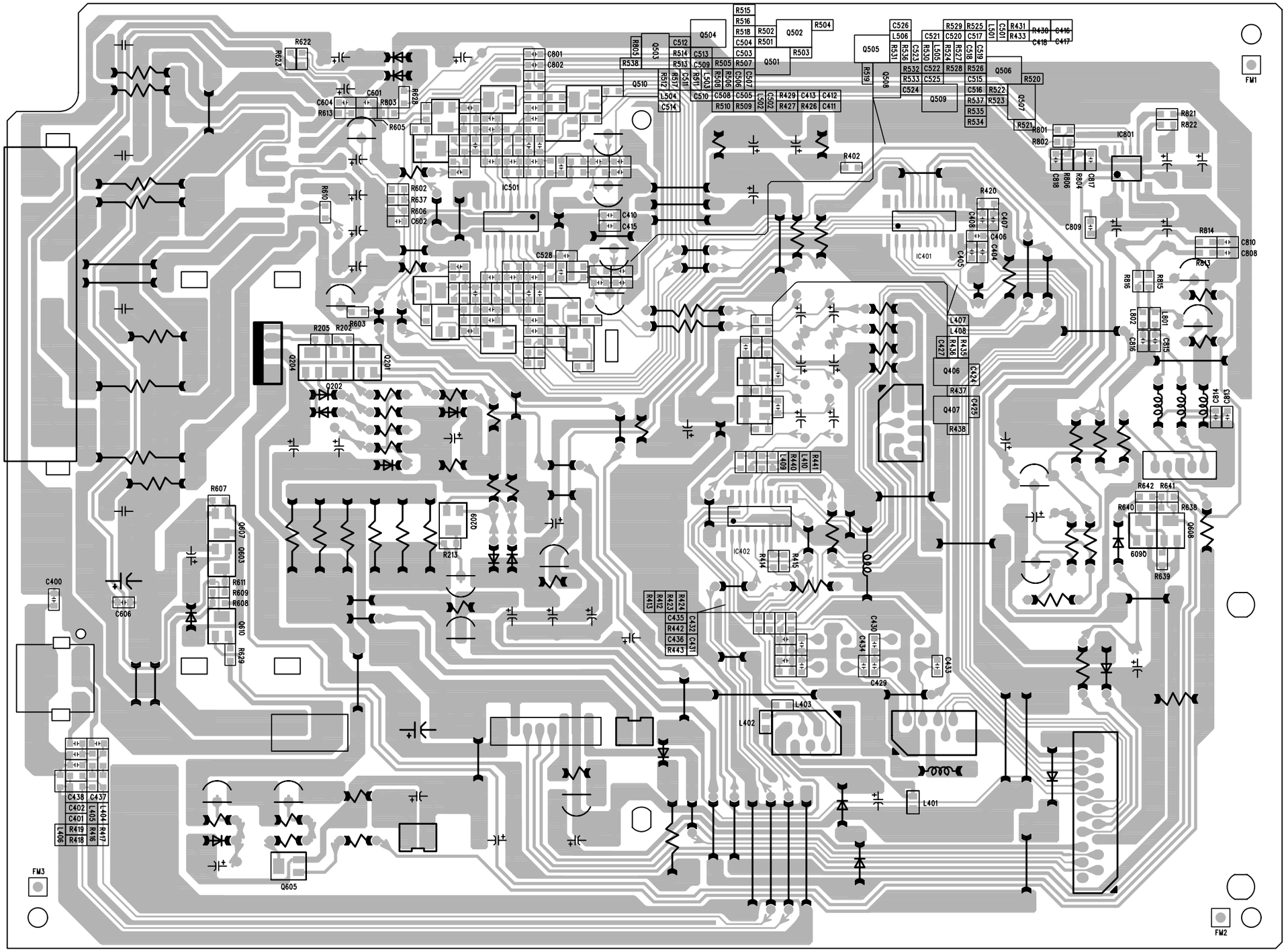


8-2

LAYOUT DIAGRAM - MAIN BOARD
TOP SIDE

8-3

LAYOUT DIAGRAM - MAIN BOARD
BOTTOM SIDE



8-4

CIRCUIT DIAGRAM - MAIN BOARD

Source Selection Logic Table		
Source	A1	A0
TAPE	0	0
AUX	1	0
TUNER	0	1
CD	1	1

DSC/DBB LOGIC CONTROL TABLE					
Sound features		Control lines			
DSC	DBB	DBB	POP	BASS	JAZZ
off (flat)	off	0	0	1	0
	on	1	0	1	0
Rock	off	1	0	1	0
	on	1	0	0	0
Jazz	off	0	0	1	1
	on	1	0	1	1
Pop	off	1	1	1	1
	on	1	1	0	1

REMARK:
1 – ALL RESISTANCE VALUES ARE INDICATED IN "ohm".
(k = 1,000ohm; M = 1,000,000ohm.)
2 – ALL CAPACITANCE VALUES ARE INDICATED IN "F".
(U =0.000001F; P = 0.000001UF.)

MC-M390 RADIO PCB

CPU&KEY PCB

CASSETTE PCB

CD PCB

AUX INPUT

HEADPHONE PCB

SOURCE SELECTOR

ELECTRONIC VOLUME CONTROL

EARPHONE POWER AMPLIFIER

uP port Extension

25W POWER AMPLIFIER

RECTIFIER PCB

POWER SUPPLY

RADIATOR FAN

SPEAK BOX

DIGITAL SOUND CONTROL (DSC)

8-5

ELECTRICAL PARTS - MAIN BOARD

CON405	9940 000 03196	8.3MM RCA JACK
CON601	9940 000 03197	PUSH TERMINAL JACK
IC201	9940 000 01435	IC S7805P
IC401	9940 000 03199	IC HEF4094BT
IC402	9940 000 03201	IC TC4052BF SWITCHING
IC501	9940 000 03198	IC HEF4069UBT
IC601	9940 000 03203	POWER AMPLIFIER IC TDA8947J
IC801	9940 000 03202	IC TDA2073
L201	9965 000 17286	FIXED INDUCTOR 0.47UH-K
L202	9965 000 17286	FIXED INDUCTOR 0.47UH-K
L411	9940 000 03204	CHOKE COIL 10MH
L412	9940 000 03204	CHOKE COIL 10MH
L601	9940 000 03205	AIR COIL 30T
L602	9940 000 03205	AIR COIL 30T
L603	9940 000 03205	AIR COIL 30T
L604	9940 000 03205	AIR COIL 30T
L803	9965 000 17770	CHOKE COIL 10UH
L804	9965 000 17770	CHOKE COIL 10UH
L805	9965 000 17770	CHOKE COIL 10UH
Q203	9940 000 01436	TRANSISTOR 2SB1566-F
Q205	9965 000 16928	TRANSISTOR : KTC-8050C
Q601	9965 000 16928	TRANSISTOR : KTC-8050C
Q602	9965 000 16928	TRANSISTOR : KTC-8050C
Q604	9965 000 16928	TRANSISTOR : KTC-8050C
Q801	9965 000 16928	TRANSISTOR : KTC-8050C
Q802	9965 000 16928	TRANSISTOR : KTC-8050C
Q804	9965 000 16928	TRANSISTOR : KTC-8050C
ZD201	4822 130 34197	BZX79-B12
ZD202	4822 130 34173	BZX79-C5V6
ZD602	4822 130 30861	BZX79-B7V5

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

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CIRCUIT DIAGRAM - CASSETTE BOARD

Variant Parts beween AR d NAR version :please refer to lable below

	AR	NAR
3723	18K	22K
3724	18K	22K
3723	1.2K	jumper (4732)
3717	1.2K	jumper (4735)
3718	15n	open
2717	15n	open
2790	1n5	open
2791	1n5	open
3769	18K	18K
3772	12K	15K

*2725/220p

SHIFT REGISTER

TO/FROM MECHANISM
FE-BT-VK-N
1760

REC/PB
FE-BT-VK-N
1710

TO/FROM FRONT BOARD
FE-BT-VK-N
1706

TO /FROM AF BOARD
FE-BT-VK-N
1701

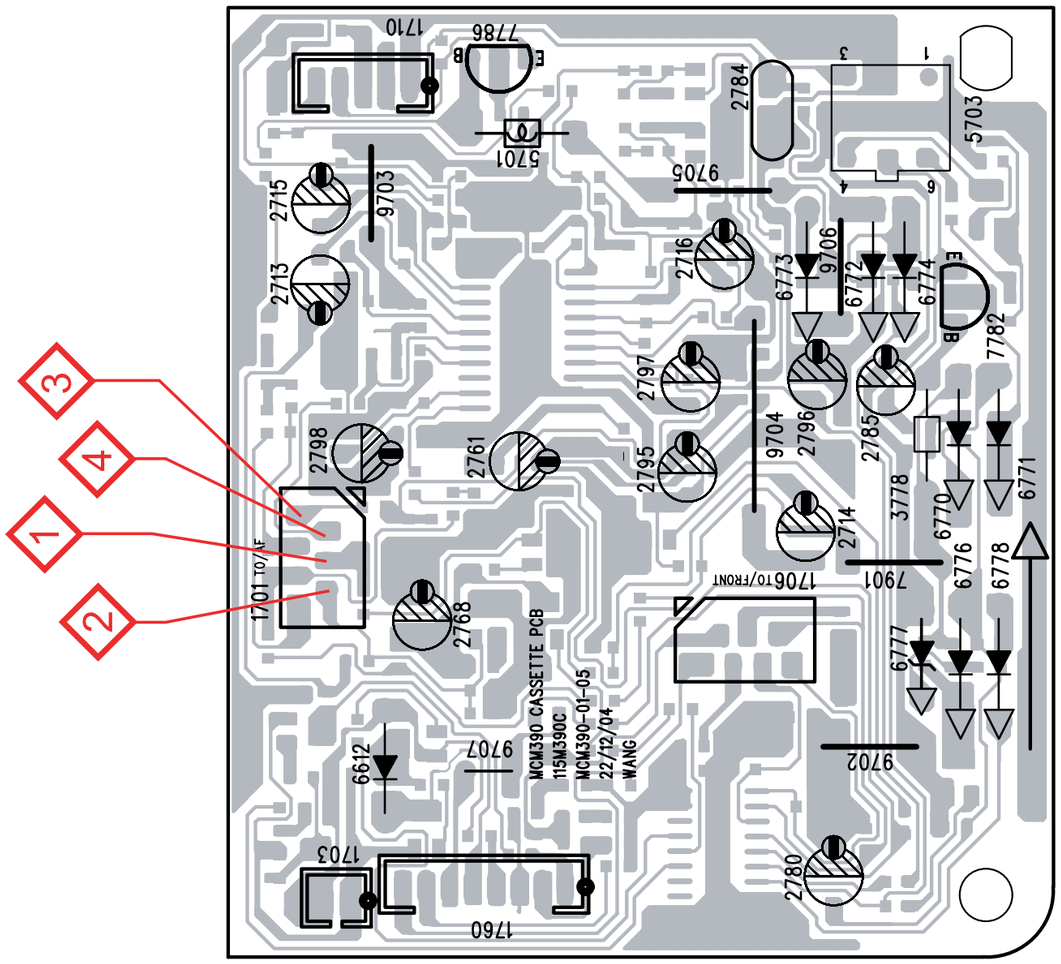
MUTE CIRCUIT

TAPE PRE-AMP

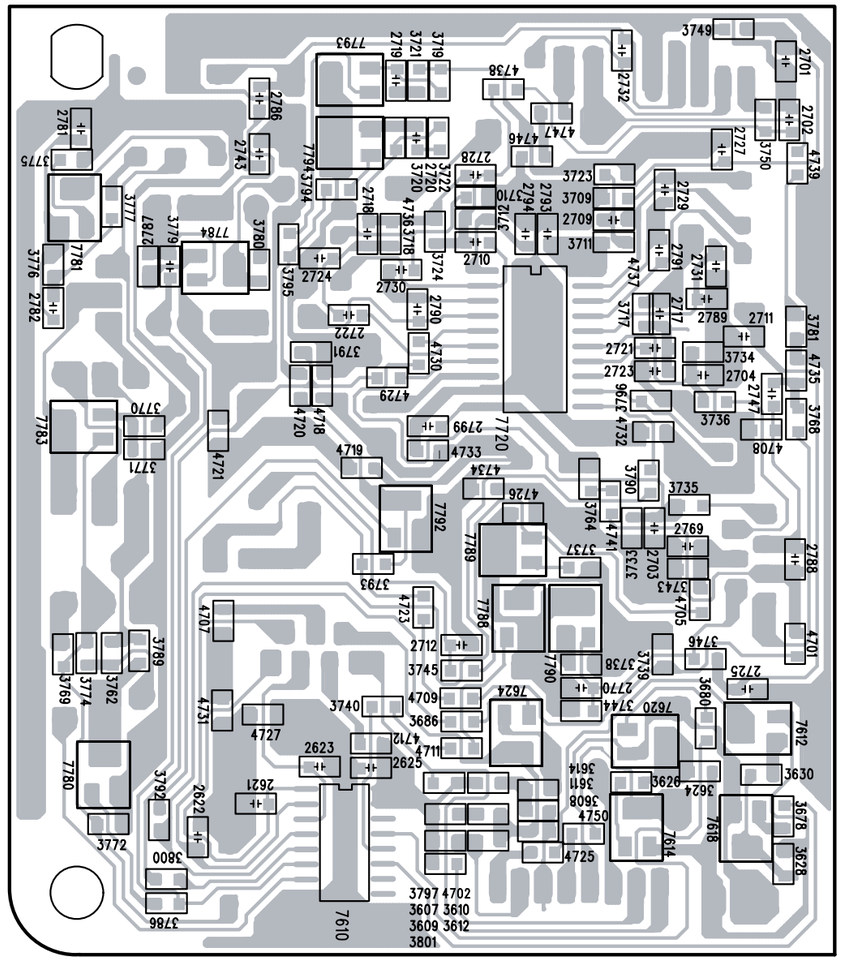
REMARK:
1 - ALL RESISTANCE VALUES ARE INDICATED IN "ohm".
(k = 1,000ohm; M = 1,000,000ohm.)
2 - ALL CAPACITANCE VALUES ARE INDICATED IN "F".
(U =0.000001F; P = 0.000001UF.)

LAYOUT DIAGRAM - CASSETTE BOARD

COMPONENT SIDE



COPPER SIDE



TAPE ADJUSTMENT & CHECK TABLE

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST with	ADJUST to
MOTOR SPEED	SBC420 3150Hz	PLAY	◇1 or ◇2 LEFT RIGHT	frequency counter	check	3150Hz +/- 2%
WOW & FLUTTER	SBC420 3150Hz	PLAY		W&F-meter	check	< 0.4 % DIN
ADJUST AZIMUTH	SBC420 10kHz	PLAY FWD		mV-meter	left hand screw	max. output level & left=right
		PLAY REV ^			right hand screw	
PLAYBACK LEVEL & FREQ. RESPONSE	SBC420 315Hz	PLAY		mV-meter	check	125mV +/- 3dB (see fig.1 for freq. response)
CHECK RECORD/PLAYBACK FREQUENCY AND DISTORTION						
Inject 3mV signals 100Hz, 250Hz, 1kHz, 10kHz, 12.5kHz via ◇3 or ◇4	SBC419A or SBC420	RECORD				
	RECORDED CASSETTE	PLAY	◇1 or ◇2 LEFT RIGHT	mV-meter	check	limits see fig. 2 *
Inject 1kHz 8.85mV via ◇3 or ◇4	SBC419A or SBC420	RECORD				
	RECORDED CASSETTE	PLAY	◇1 or ◇2 LEFT RIGHT	THD-meter	check	< 3% *

SBC419A : 4822 397 30069
SBC420 : 4822 397 30071

^ For Auto-reverse version only
* If high frequencies are not within limits, decrease bias and re-measure.
If distortion is too high, increase bias and re-meaure

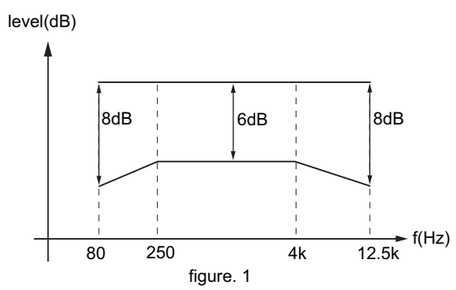


figure. 1

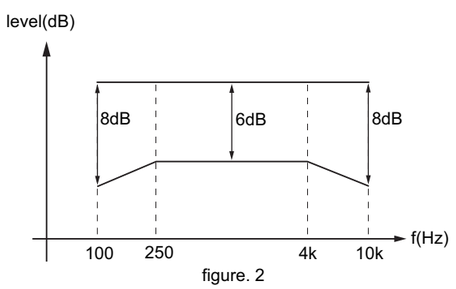


figure. 2

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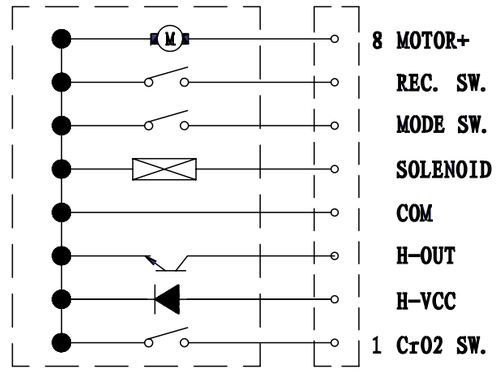
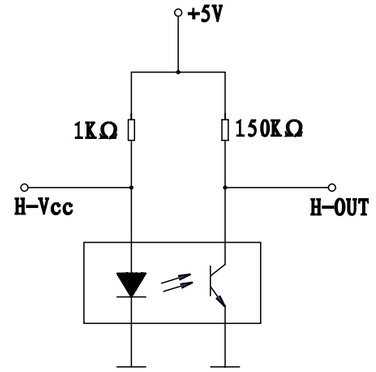
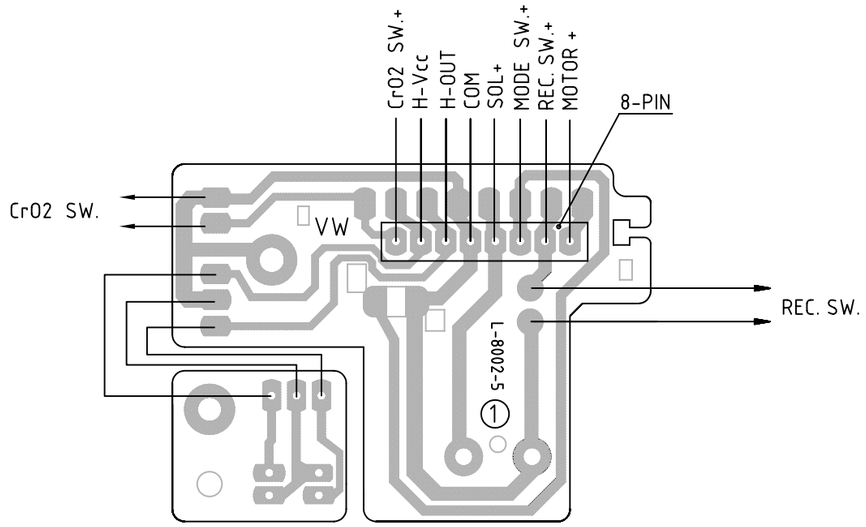
W991S-390 CIRCUIT





THE STANDARD CIRCUIT OF PHOTO INTERRUPTER



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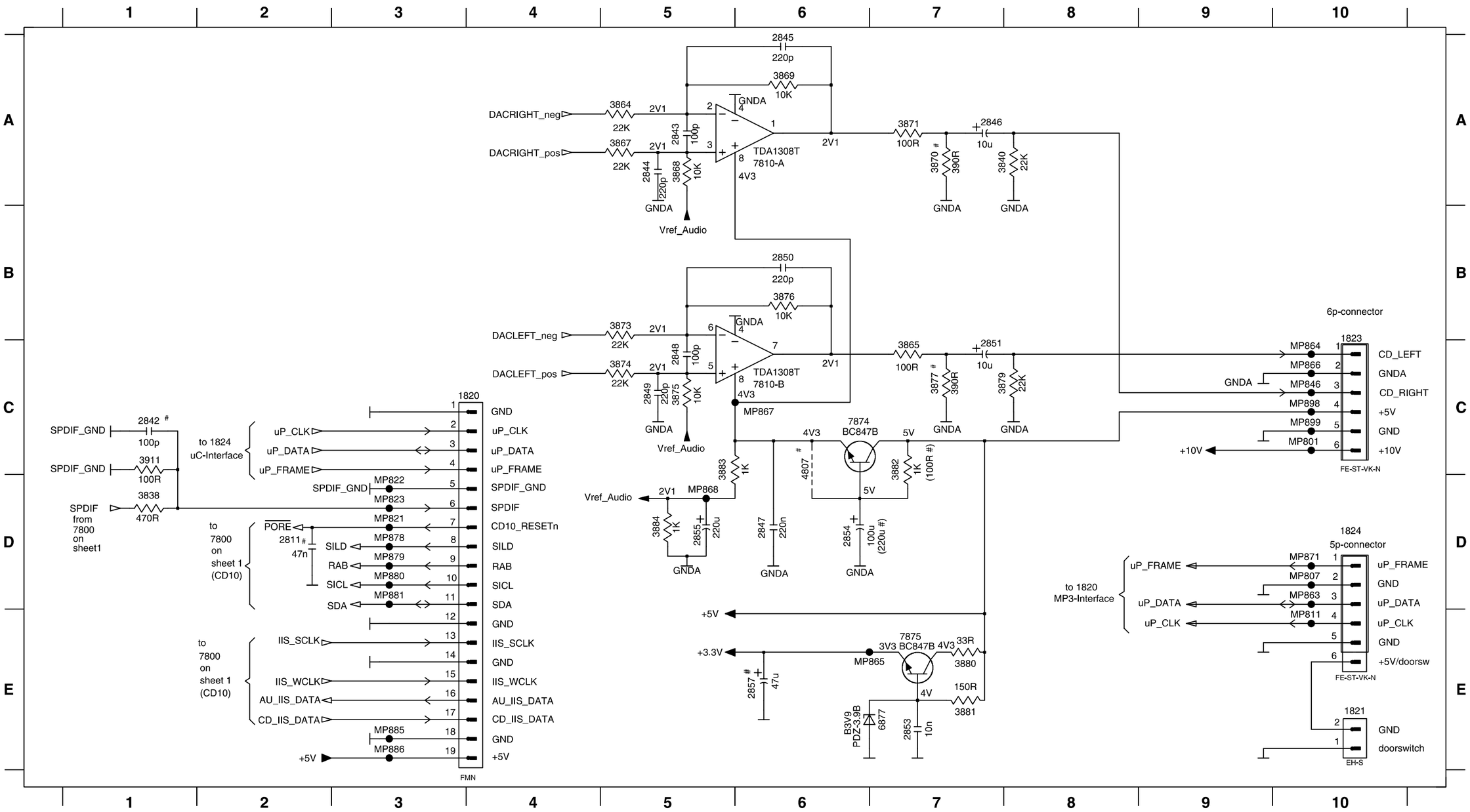
CIRCUIT DIAGRAM - CD BOARD (PART 1)

1820 C3	2811 D2	2845 A6	2849 C5	2854 D6	3840 A7	3868 A5	3873 B5	3877 C7	3882 C7	4807 C6	7874 C6	MP811 E10	MP846 C10	MP866 C10	MP878 D3	MP885 E3
1821 E10	2842 C1	2846 A7	2850 B6	2855 D5	3864 A5	3869 A6	3874 C5	3879 C7	3883 C5	6877 E7	7875 E7	MP821 D3	MP863 D10	MP867 C6	MP879 D3	MP886 E3
1823 C10	2843 A5	2847 D6	2851 C7	2857 E6	3865 C7	3870 A7	3875 C5	3880 E7	3884 D5	7810-A A6	MP801 C10	MP822 D3	MP864 C10	MP868 D5	MP880 D3	MP898 C10
1824 D10	2844 A5	2848 C5	2853 E7	3838 D1	3867 A5	3871 A7	3876 B6	3881 E7	3911 C1	7810-B C6	MP807 D10	MP823 D3	MP865 E6	MP871 D10	MP881 D3	MP899 C10



#... for provision only

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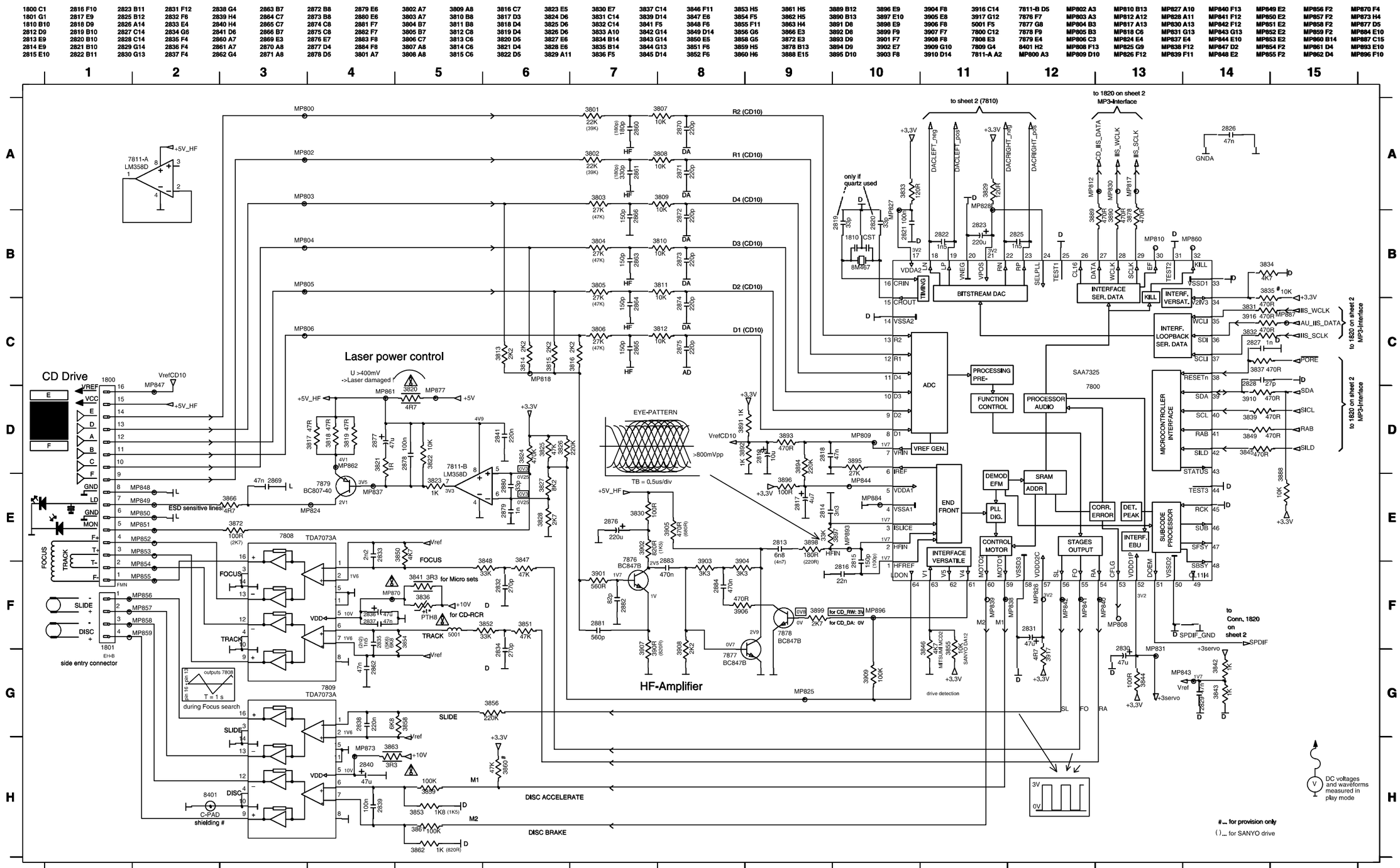
CIRCUIT DIAGRAM - CD BOARD (PART 2)



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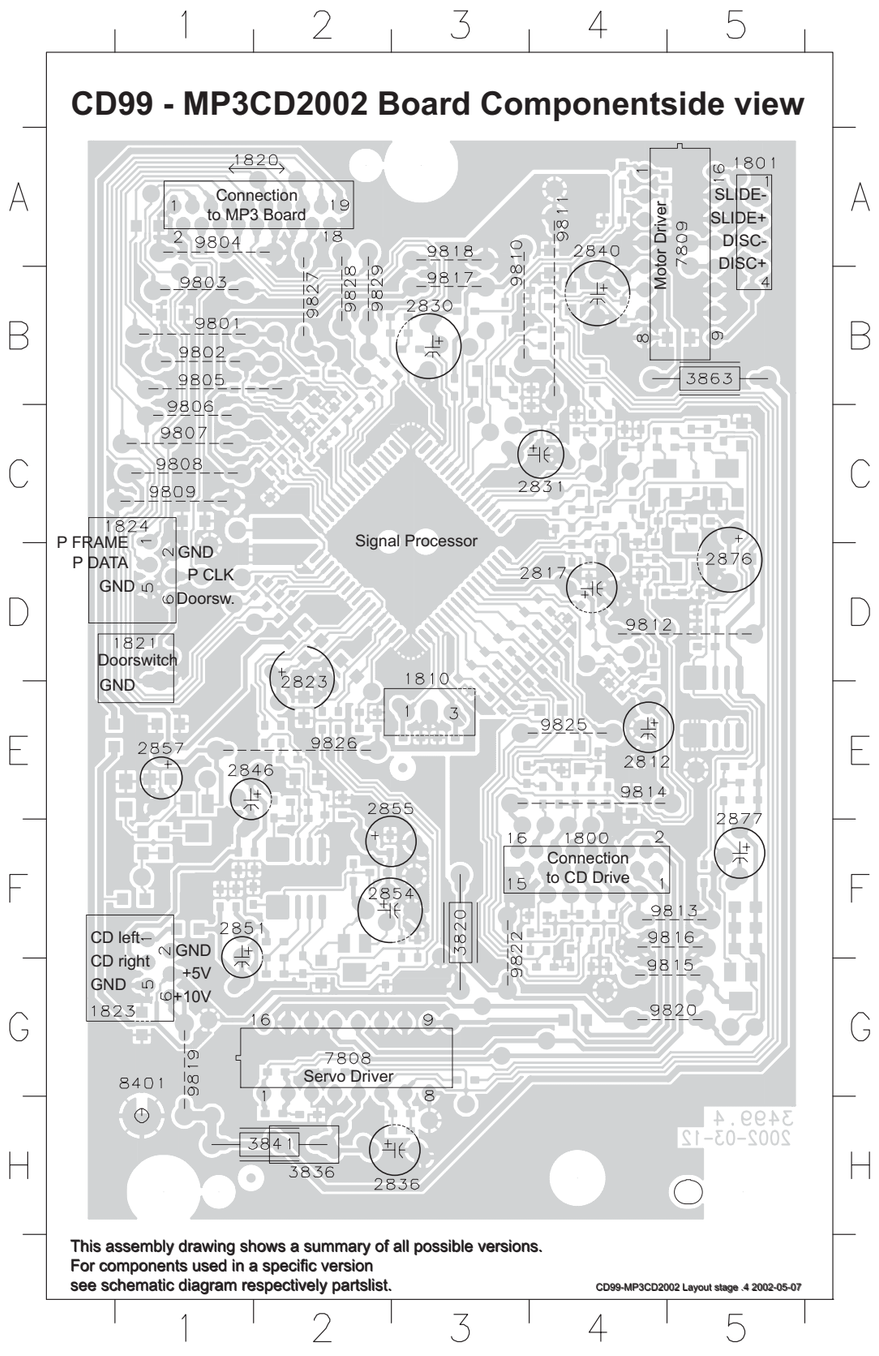
LAYOUT DIAGRAM - CD BOARD

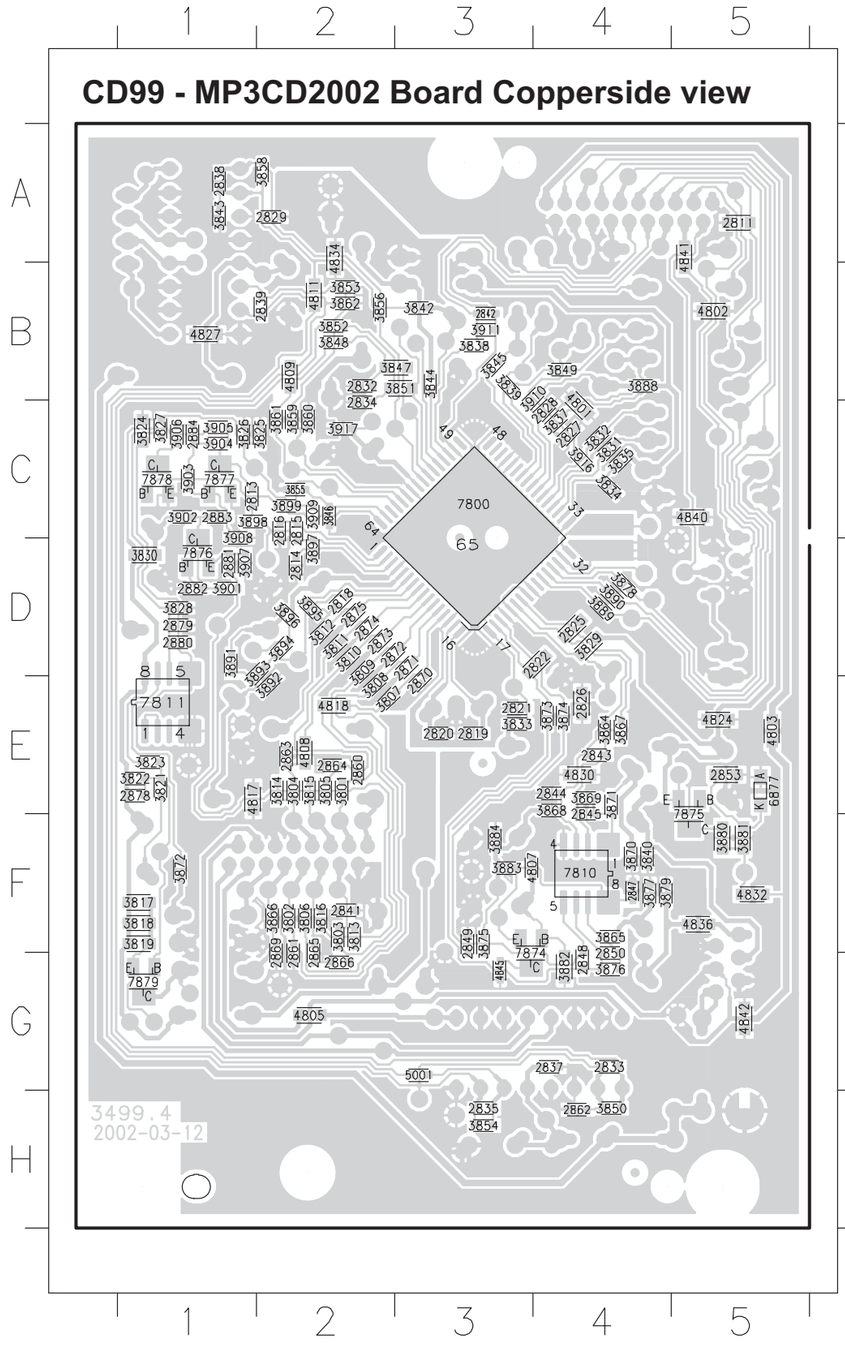
COMPONENT SIDE



Mapping Hole Mounted Components

1800 F4	1821 D1	2817 D4	2836 H3	2854 F3	2877 F5	3863 B5	9801 B1	9805 B2	9809 C1	9813 F5
1801 A5	1823 G1	2823 D2	2840 A4	2855 E3	3820 F3	7808 G4	9802 B1	9806 C1	9810 B4	9814 E4
1810 E3	1824 D1	2830 B3	2846 E2	2857 E1	3836 H2	7809 A5	9803 B1	9807 C1	9811 B4	9815 G5
1820 A2	2812 E5	2831 C4	2851 F2	2876 C5	3841 H2	8401 H1	9804 A2	9808 C1	9812 D5	9816 F5

COPPER SIDE



Mapping Chip Components

2811 A5	3845 B3	2813 C1	3846 C2	2814 D2	3847 B3	2815 C2	3848 B2	2816 C2	3849 B4	2818 D2	3850 H4
2819 E3	3851 B3	2820 E3	3852 B2	2821 E3	3853 B2	2822 D4	3854 H3	2825 D4	3855 C2	2826 E4	3856 B2
2827 C4	3858 A2	2828 C4	3859 C2	2829 A2	3860 C2	2832 B2	3861 C2	2833 G4	3862 B2	2834 C2	3864 E4
2835 H3	3865 F4	2837 G4	3866 F2	2838 A1	3867 E4	2839 B2	3868 E4	2841 F2	3869 E4	2842 B3	3870 F4
2843 E4	3871 E4	2844 E4	3872 F1	2845 E4	3873 E4	2847 F4	3874 E4	2848 G4	3875 F3	2849 F3	3876 G4
2850 G4	3877 F4	2853 E5	3878 D4	2860 E2	3879 F4	2861 G2	3880 F5	2862 H4	3881 F5	2863 E2	3882 G4
2864 E2	3883 F3	2865 G2	3884 F3	2866 G2	3888 B4	2869 G2	3889 D4	2870 E3	3890 D4	2871 D3	3891 D1
2872 D2	3892 E2	2873 D2	3893 D2	2874 D2	3894 D2	2875 D2	3895 D2	2878 E1	3896 D2	2879 D1	3897 D2
2880 D1	3898 C1	2881 D1	3899 C2	2882 D1	3901 D1	2883 C1	3902 C1	2884 C1	3903 C1	3801 E2	3904 C1
3802 F2	3905 C1	3803 F2	3906 C1	3804 E2	3907 D1	3805 E2	3908 C1	3806 F2	3909 C2	3807 E2	3910 B3
3808 E2	3911 B3	3809 D2	3916 C4	3810 D2	3917 C2	3811 D2	4801 C4	3812 D2	4802 B5	3813 F2	4803 E5
3814 E2	4805 G2	3815 E2	4807 F3	3816 F2	4808 E2	3817 F1	4809 B2	3818 F1	4811 B2	3819 F1	4817 E1
3821 E1	4818 E2	3822 E1	4824 E5	3823 E1	4827 B1	3824 C1	4830 E4	3825 C2	4832 F5	3826 C1	4834 A2
3827 C1	4836 F5	3828 D1	4840 C5	3829 D4	4841 A5	3830 D1	4842 G5	3831 C4	4845 G3	3832 C4	5001 G3
3833 E3	6877 E5	3834 C4	7800 C4	3835 C4	7810 F4	3837 C4	7811 E1	3838 B3	7874 G3	3839 B3	7875 E5
3840 F4	7876 D1	3842 B3	7877 C1	3843 A1	7878 C1	3844 B3	7879 G1				

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CIRCUIT DIAGRAM - MP3CD2002 BOARD (For reference only)

MP3-CD-2002

DSP

For Flash version: TMS320VC5416
For ROM version: TMS320VC5406

Text version only

only for FLASH version

Flash EPROM

Voltage stabilisation

for 5V front uP

JTAG Interface

.... only for FLASH version
* .... only for ROM version

2451 B5 F425 I13
2452 B2 F426 I13
2453 B4 F427 E8
2454 B7 F428 E8
2455 C2 F429 E8
2456 C12 F430 F8
2457 D9 F432 F8
2458 C10 F434 E8
2459 D2 F436 B5
2460 E13 F437 H5
2461 D12 F438 H4
2462 D2
2463 D8
2464 G12
2465 G2
2466 G8
2467 H6
2468 H4
2469 H5
2470 D9
2471 E11
2472 D1
3449 E11
3450 A4
3451 B7
3452 H3
3453 A12
3454 C1
3455 C9
3456 C10
3457 D13
3458 D14
3459 F13
3460 F13
3461 E12
3462 E2
3463 F1
3464 F13
3465 A2
3466 H8
3467 F8
3468 F8
3469 E13
3470 F1
3471 E13
3472 H9
3473 G2
3474 G8
3475 G2
3476 H2
3477 H7
3478 B6
3479 H8
3480 H2
3481 H3
3482 H5
3483 H6
3484 H5
3485 I11
3486 I13
3487 I12
3488 I12
3489 I12
3490 H8
3491 D9
3492 F9
3493 H12
3494 H8
3495 H11
3496 H8
3497 I13
3498 D14
3499 A2
4450 C13
4452 F9
4453 I11
5450 B3
6450 E13
6451 E13
7450 A10
7451 D5
7452 F13
7453 F12
7454-A G11
7454-B F11
7454-C F11
7454-D G11
7455 D13
7456 E12
7457 E9
7458 A1
7460 I12
F401 B3
F402 E13
F403 E8
F404 E8
F405 E8
F406 E8
F407 F8
F408 F8
F409 F13
F410 F8
F411 E13
F412 G1
F413 G13
F414 I2
F415 H13
F416 H13
F417 H13
F418 H13
F419 H13
F420 H8

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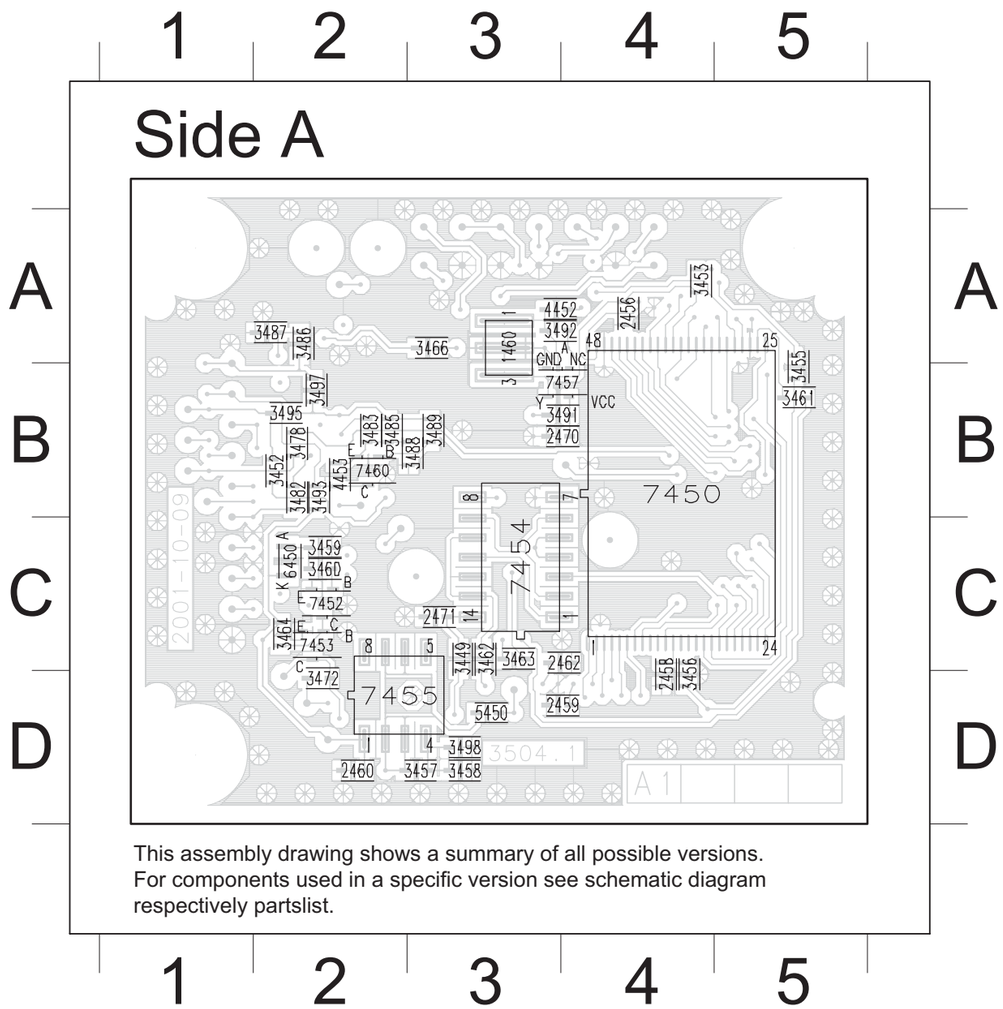
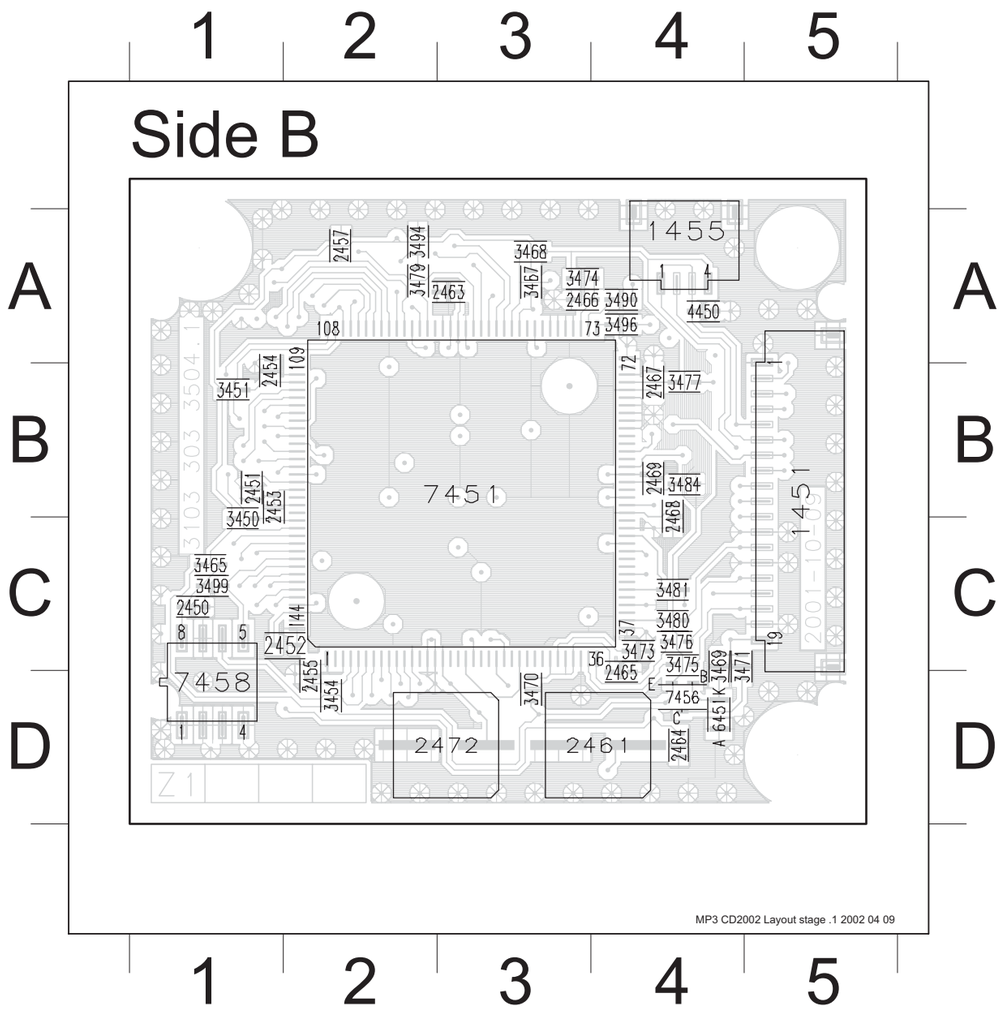
LAYOUT DIAGRAM - MP3CD2002 BOARD (For reference only)

1460 A3	3449 C3	3460 C2	3482 B2	3492 A3	6450 C2
2456 A4	3452 B2	3461 B5	3483 B2	3493 B2	7450 B4
2458 D4	3453 A4	3462 C3	3485 B2	3495 B2	7452 C2
2459 D4	3455 B5	3463 C3	3486 A2	3497 B2	7453 C2
2460 D2	3456 D4	3464 C2	3487 A2	3498 D3	7454 C3
2462 C4	3457 D3	3466 A3	3488 B3	4452 A3	7455 D2
2470 B4	3458 D3	3472 D2	3489 B3	4453 B2	7457 B4
2471 C3	3459 C2	3478 B2	3491 B4	5450 D3	7460 B2



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

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



MP3 CD2002 Layout stage .1 2002 04 09

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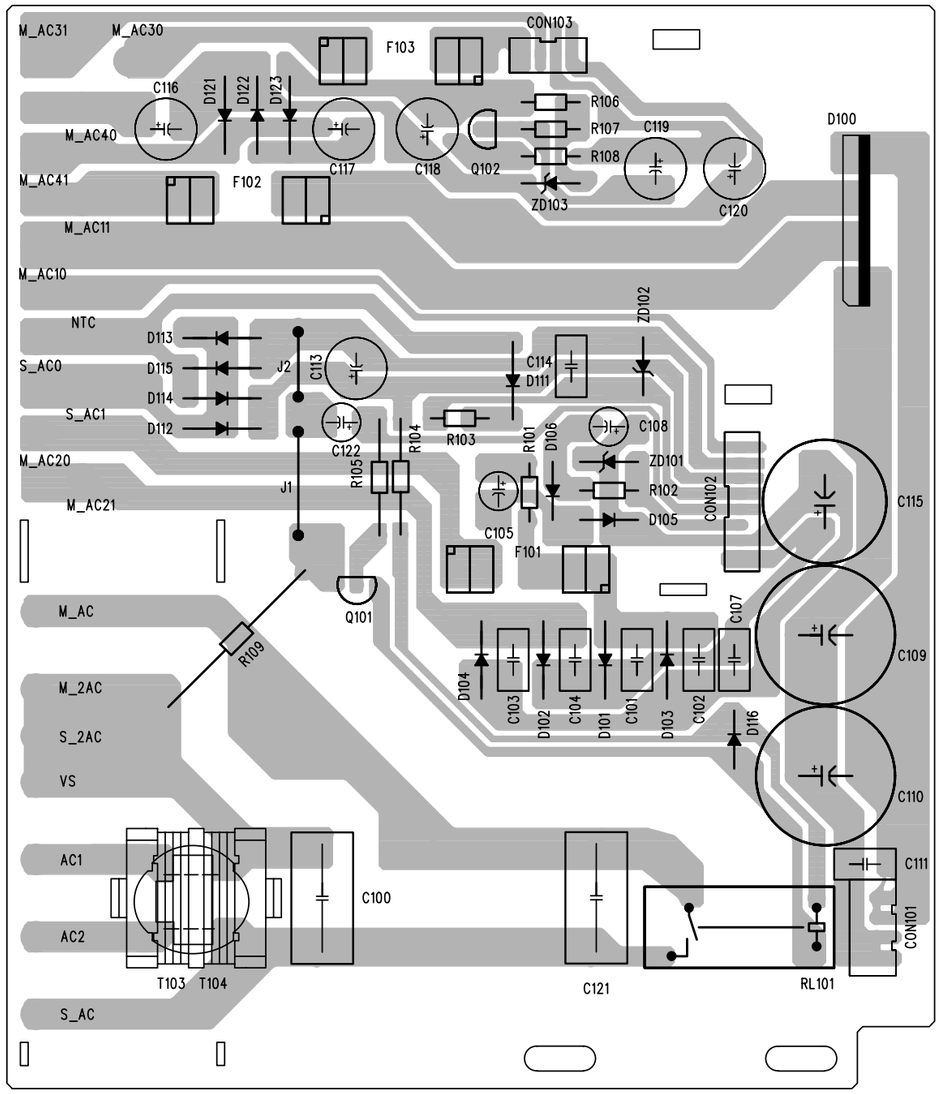
RECTIFIER BOARD

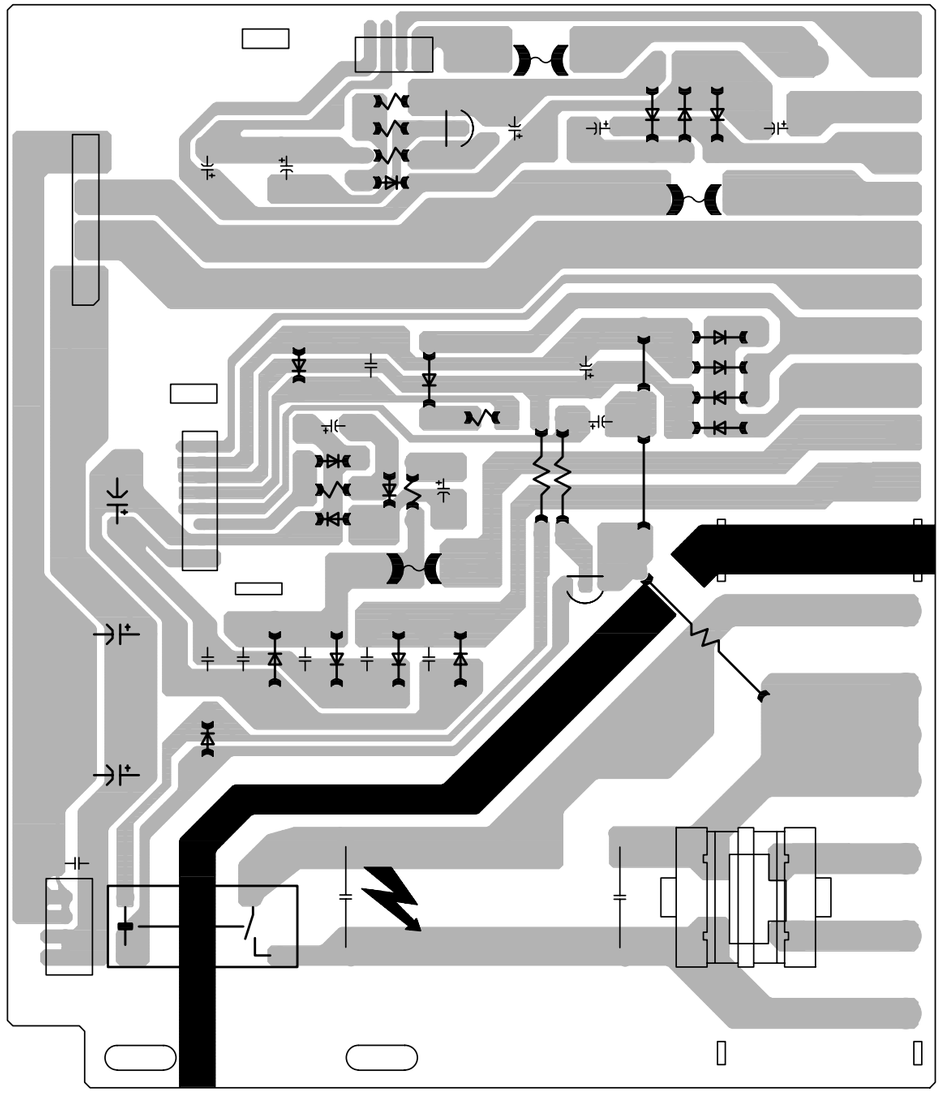
TABLE OF CONTENTS

Layout Top View 8-2
Layout Bottom View 8-2
Circuit Diagram 8-3
Electrical Parts List 8-4

LAYOUT DIAGRAM - RECTIFIER BOARD
TOP SIDE



LAYOUT DIAGRAM - RECTIFIER BOARD
BOTTOM SIDE

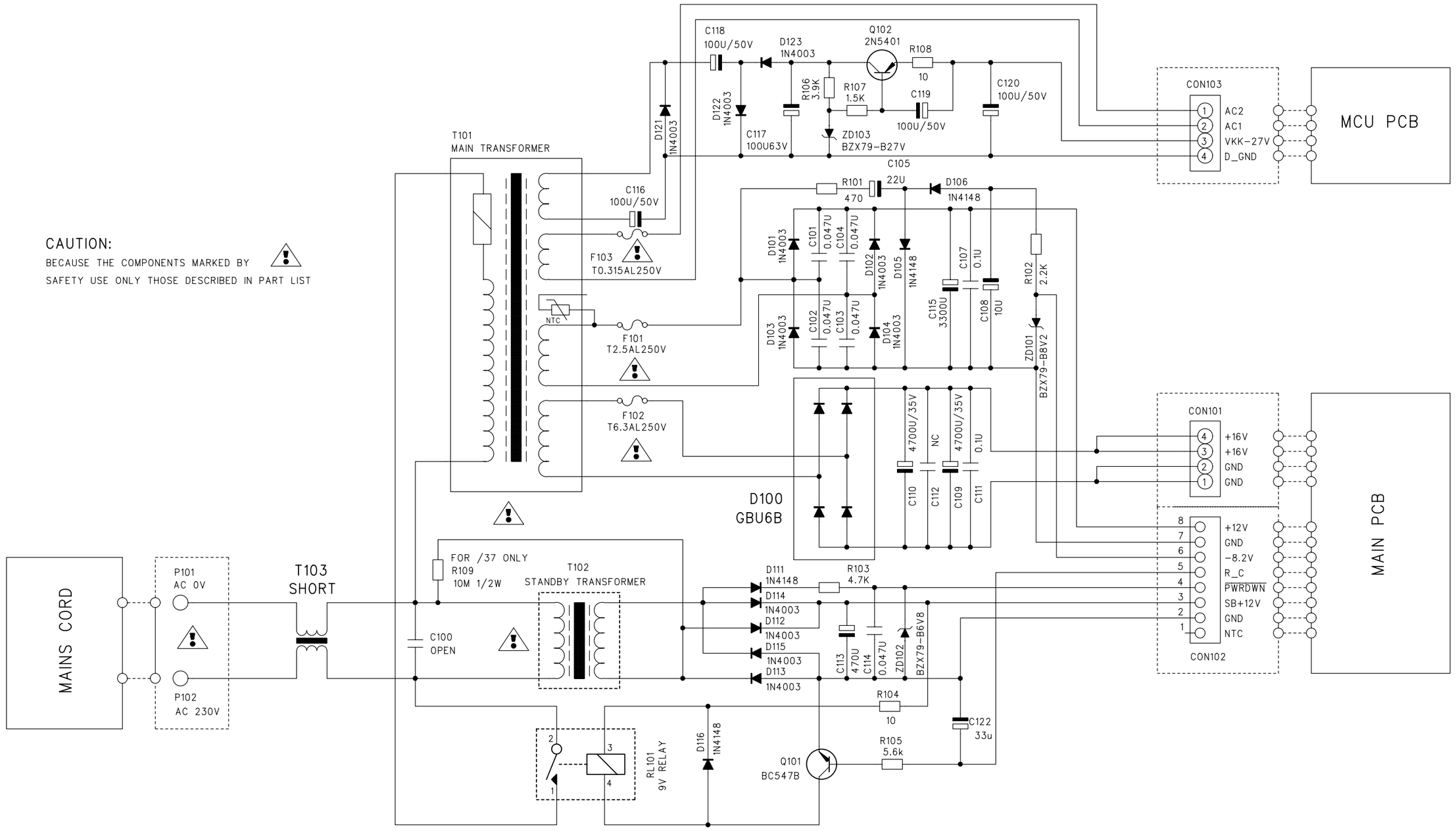


11-3

CIRCUIT DIAGRAM - RECTIFIER BOARD

CAUTION:

BECAUSE THE COMPONENTS MARKED BY ⚠ SAFETY USE ONLY THOSE DESCRIBED IN PART LIST



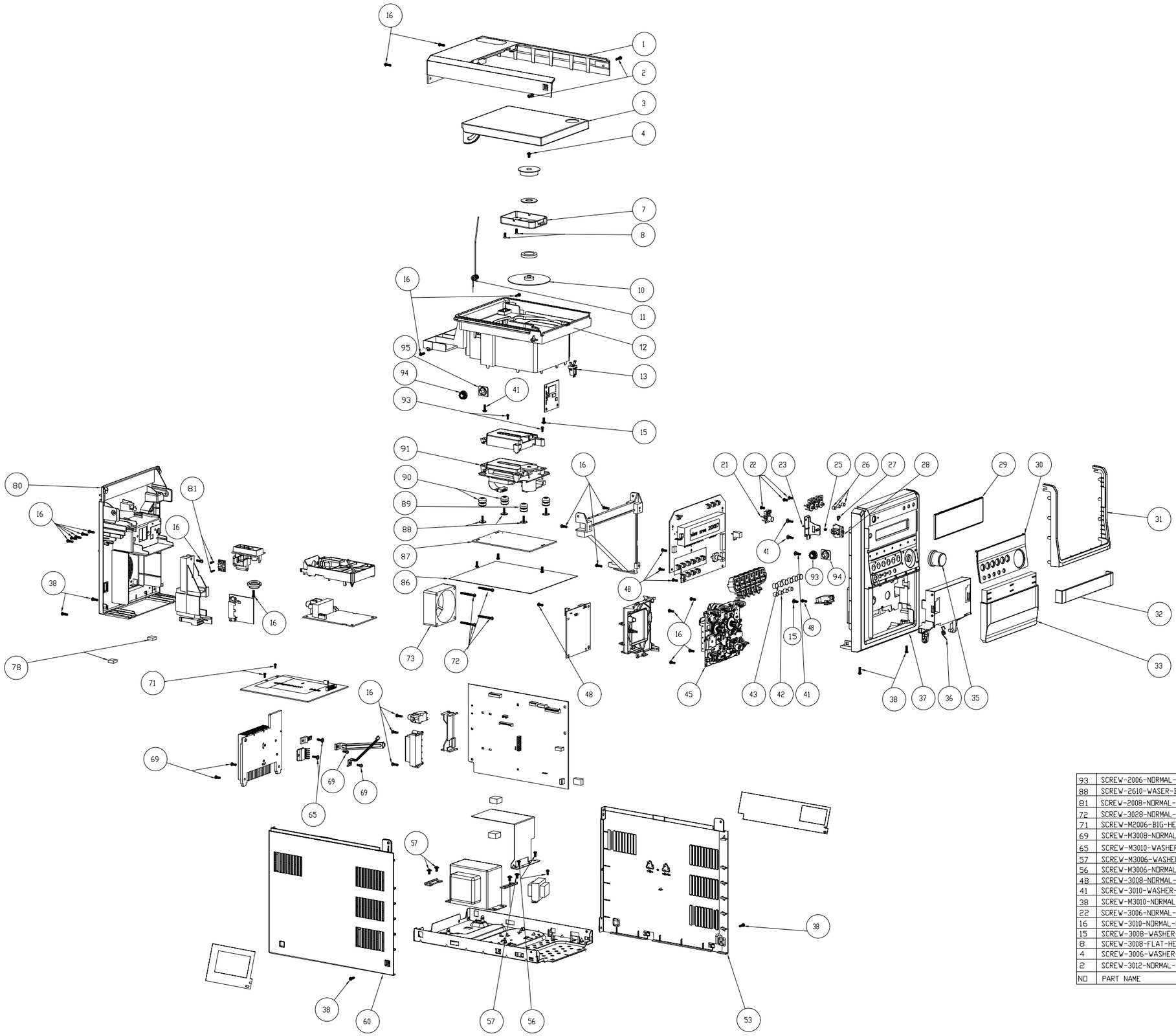
11-4

ELECTRICAL PARTS - RECTIFIER BOARD

C109		9940 000 03218	ELE. CAPACITOR 4700μF 35V
C110		9940 000 03218	ELE. CAPACITOR 4700μF 35V
C115		9940 000 03217	ELE.CAP 3300μF 25V
D100		9940 000 03223	BRIDGE RECTIFIER GBU6B
F101	⚠	9940 000 01447	FUSE 2.5A 250V D5X20MM
F102	⚠	9940 000 03224	FUSE 6.3A 250V
F103	⚠	9940 000 03225	FUSE 0.315A 250V
Q102		9940 000 03228	TRANSISTOR 2N5401
RL101	⚠	9940 000 03227	9V DC RELAY 10A
T104	⚠	9940 000 03226	AC LINE FILTER 400μH +-30%
ZD101		4822 130 34382	BZX79-B8V2
ZD102		4822 130 34278	BZX79-B6V8
ZD103		9940 000 03219	ZENER DIODE TC27V 1/2W

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

12-1



NO	PART NAME	MATERIAL	UNIT
93	SCREW-2006-NORMAL-HEAD		2
88	SCREW-2610-WASER-BIG-HEAD		4
81	SCREW-2008-NORMAL-HEAD		2
72	SCREW-3028-NORMAL-HEAD		4
71	SCREW-M2006-BIG-HEAD		2
69	SCREW-M3008-NORMAL-HEAD		4
65	SCREW-M3010-WASHER-HEAD		2
57	SCREW-M3006-WASHER-HEAD		4
56	SCREW-M3006-NORMAL-HEAD		3
48	SCREW-3008-NORMAL-HEAD		8
41	SCREW-3010-WASHER-HEAD		4
38	SCREW-M3010-NORMAL-HEAD		6
22	SCREW-3006-NORMAL-HEAD		3
16	SCREW-3010-NORMAL-HEAD		21
15	SCREW-3008-WASHER-HEAD		2
8	SCREW-3008-FLAT-HEAD		2
4	SCREW-3006-WASHER-HEAD		1
2	SCREW-3012-NORMAL-HEAD		2

MECHANICAL & ACCESSORIES PARTS

01	9940 000 03236	TOP CABINET
03	9940 000 03249	CD DOOR
07	9940 000 01406	BRACKET-MAGNET CLAMPER
10	9940 000 01407	STABILIZER
11	9940 000 03232	CD DOOR SPRING DIA1.4MM
12	9940 000 03255	CD TRAY
13	9940 000 01422	CD DOOR SWITCH 1P1T
21	9940 000 03243	POWER KEY
23	3140 114 60321	BRACKET-PUSH LOCK
25	4822 492 11344	SPRING COMPRESSION
26	9940 000 03253	TOP BUTTON COVER
27	9940 000 03247	POWER LENS
28	9940 000 01412	PUSH LOCK FOR CASS DOOR
29	9940 000 03246	DISPLAY LENS
30	9940 000 03248	CONTROL PANEL
31	9940 000 03252	DECORATION RING
32	9940 000 03254	CASSETTE DOOR TOP PANEL
33	9940 000 03251	CASSETTE DOOR
35	9940 000 03242	VOLUME KNOB
36	9940 000 03231	CASSETTE DOOR SPRING
37	9940 000 03237	FRONT CABINET
42	9940 000 03244	SOURCE BUTTON COVER A
43	9940 000 03245	SOURCE BUTTON COVER B
45	9940 000 01434	CASS MECHANISM
53	9940 000 03238	RIGHT CABINET
60	9940 000 03239	LEFT CABINET
73	9940 000 03257	DC BRUSHLESS FAN
78	9940 000 03234	RUBBER FOOT 11X11X6MM
80	9940 000 03241	REAR CABINET
89	9940 000 00168	CD DAMPER 40DEG
90	9940 000 03233	CD DAMPER
91	9940 000 03256	CD MECHANISM DA12T3
94	9940 000 01411	CD DOOR GEAR
95	9940 000 01409	CD DOOR GEAR HOLDER

	9940 000 03266	SPEAKER BOX ASSY /22/25
	9940 000 03282	SPEAKER BOX ASSY /33
⚠	9940 000 01451	POWER CORD 6FEET /22
⚠	9940 000 02922	POWER CORD 1830MM /33
⚠	9940 000 03269	POWER CORD BS /25
	9940 000 03267	REMOTE CONTROL
	9940 000 03268	ANTENNA WIRE 1000MM

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

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ELECTRICAL PARTS - MISCELLANEOUS

CON803	9940 000 03229	HEADPHONE JACK D3.5MM
JACK1	9940 000 01458	FM 75Ω ANT JACK
	9940 000 01423	16P FFC L=70MM P=1MM
	9940 000 01425	6P FFC CABLE L=200MM P1.0
	9940 000 03188	MP3 DECODER BOARD ASSY
	9940 000 03189	CD BOARD ASSY
	9940 000 03191	TUNER BOARD ASSY /22/25
	9940 000 03281	TUNER BOARD ASSY /33
	9940 000 03192	CASS BOARD ASSY
	9940 000 03257	DC FAN
	9940 000 03258	19P FFC 110MM P1.0MM
	9940 000 03259	6P FFC 120MM P1.25MM
	9940 000 03261	8P FFC 140MM P1.25MM
	9940 000 03262	18P FFC 160MM P1.25MM
	9940 000 03263	7P FFC 180MM P1.25MM
⚠	9940 000 03264	STBY TRANSFORMER
⚠	9940 000 03265	POWER TRASFO 230V 50HZ

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