

Service  
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# Service Manual



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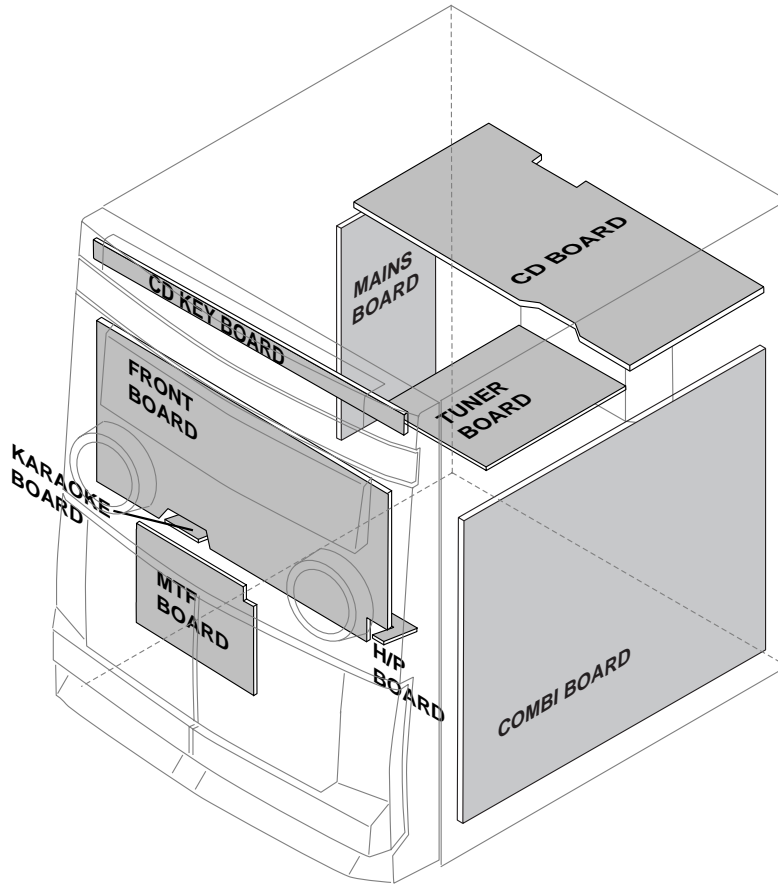
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# PHILIPS

# LOCATION OF PC BOARDS



## VERSION VARIATIONS:

Type /Versions:	FW-C100							
	/21	/21M	/22	/30	/33	/34	/37	
Features & Board in used:								
Dolby B								
Incredible Surround								
Karaoke								
News								
RDS								
Rotary Encoder (volume control)								
Jog Shuttle								
Voltage Selector	x	x						
Aux Input	x	x	x	x	x	x	x	
Digital Output								
Headphone Socket	x	x	x	x	x	x	x	
Line Output								
Subwoofer Output								
Surround Output								
Matrix Surround Loudspeakers								
Standby - Clock Display	x	x	x	x	x	x	x	
Standby - Dark								
Tuner board - ECO5 Sys	x	x		x	x	x	x	
Tuner board - Tuner 95			x					
Combi board 4W version			x	x	x	x	x	
Combi board 5W version	x	x						

## SPECIFICATIONS

### GENERAL:

Mains voltage : 110-127V/220-240V Switchable for /21/21M  
 120V for /37  
 220-230V for /22/34  
 230-240V for /30

Mains frequency : 50/60Hz

Power consumption : < 15W at Standby  
 < 30W Active

Clock accuracy : < 4 seconds per day

Dimension centre unit : 265 x 310 x 320mm

### TUNER:

#### FM

Tuning range : 87.5-108MHz  
 65.81-74MHz for /34 <sup>1)</sup>

Grid : 50kHz (& 30kHz for /34)  
 100kHz for /37

IF frequency : 10.7MHz  $\pm$  25kHz

Aerial input : 75 $\Omega$  coaxial  
 300 $\Omega$  click fit for /37

Sensitivity at 26dB S/N : < 7 $\mu$ V

Selectivity at 600kHz bandwidth : > 25dB [> 30dB]

Image rejection : > 25dB [> 60dB]

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

-3dB Limiting point : < 8 $\mu$ V

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

#### MW

Tuning range : 531-1602kHz  
 530-1700kHz for /21/21M/37

Grid : 9kHz  
 10kHz for /21/21M/37

IF frequency : 450kHz  $\pm$  1kHz

Aerial input : Frame aerial

Sensitivity at 26dB S/N : < 4.0mV/M

Selectivity at 18kHz bandwidth : > 18dB

IF rejection : > 45dB [> 40dB]

Image rejection : > 28dB

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

#### LW

Tuning range : 153-279kHz

Grid : 3kHz

IF frequency : 450kHz  $\pm$  1kHz

Aerial input : Frame aerial

Sensitivity at 26dB S/N : [< 7.0mV/M]

Selectivity at 18kHz bandwidth : [> 30dB]

IF rejection : [> 25dB]

Image rejection : [> 35dB]

Distortion at RF=50mV, m=80% : [< 5%]

### AMPLIFIER:

Output power (3 $\Omega$ , 1 kHz, 10% THD) : 2 x 5W  $\pm$  1dB

Frequency response within -3dB : 50Hz-15kHz

Dynamic Bass Boost : DBB ON, DBB Off <sup>2)</sup>

Digital Sound Control : Jazz, Techno, Optimal, Rock <sup>2)</sup>

Headphone output at 32 $\Omega$  : 25mW

Input sensitivity  
 Aux/Line-in : 700mV  $\pm$  2dB at 600 $\Omega$

### CASSETTE RECORDER:

Number of track : 2 x 2 stereo

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

Wow and flutter : < 0.4% DIN

Fast-wind/rewind time C60 : 130 sec

Bias system : 75kHz  $\pm$  5kHz

Rec/Pb frequency response within 8dB : 80Hz - 12.5kHz

Signal to noise ratio (Type I) : > 48dBA

### COMPACT DISC:

Measurement done at output conn. of the CDC module.

Frequency response within  $\pm$  1.5dB : 20Hz - 20kHz

Output level (in Vrms) : 550mV,  $Z_{out} = 100\Omega$

Signal/Noise ratio (A-weighted) : > 80dBA

Distortion at 1kHz : < 0.003%

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

Channel separation at 1kHz : > 60dB

De-emphasis : 0 or 15/50 mS (Switched by subcode on the disc)

[...] Values indicated are for "Tuner 95 Board" only

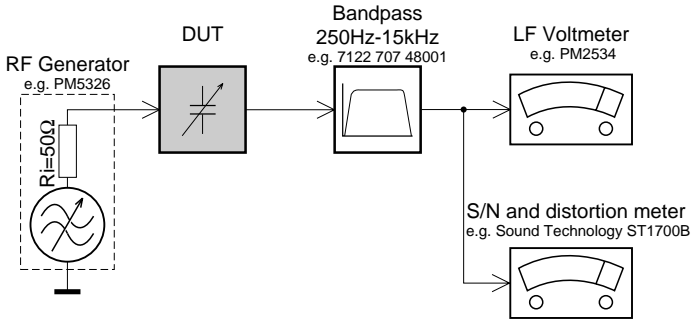
{...} Values for /21/21M only

<sup>1)</sup> Default setting is OFF, to switch on please refer page 3-4.

<sup>2)</sup> Frequency response in each setting is software controlled.

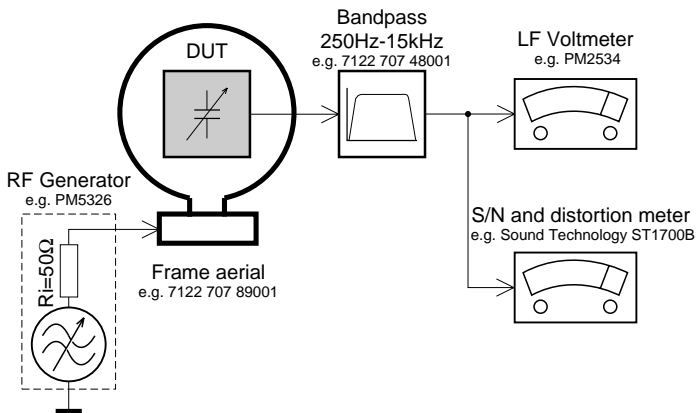
# MEASUREMENT SETUP

## Tuner FM



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

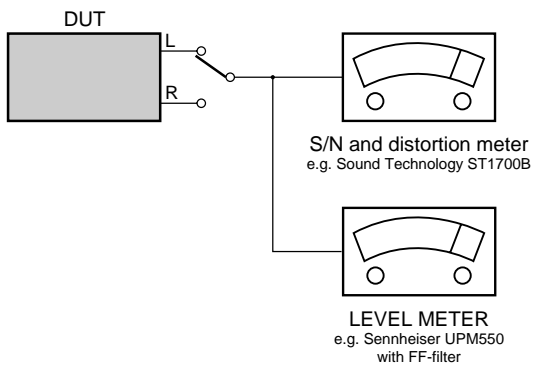
## Tuner AM (MW,LW)



To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday's cage. Use a bandpass filter (or at least a high pass filter with 250Hz) to eliminate hum (50Hz, 100Hz).

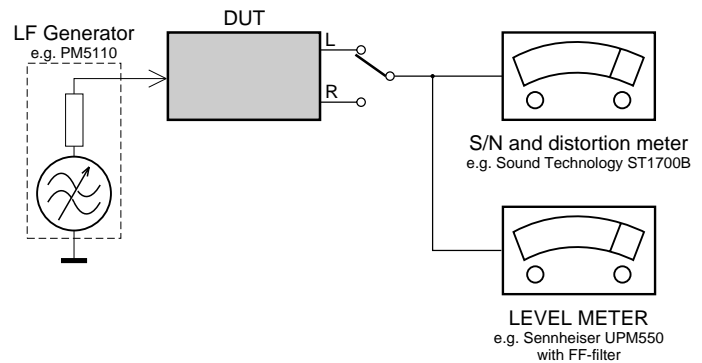
## CD

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



## Recorder

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



## SERVICE AIDS

### Service Tools:

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

### Cassette:

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

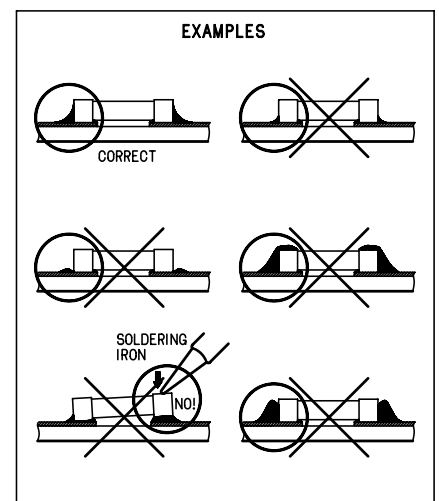
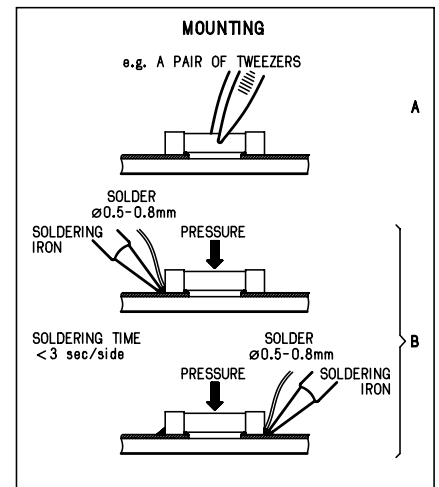
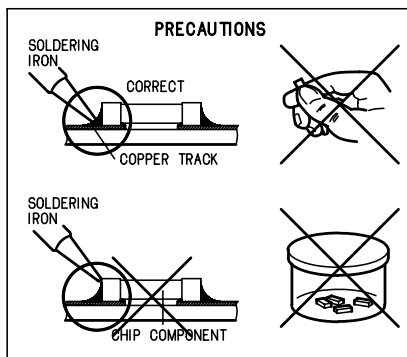
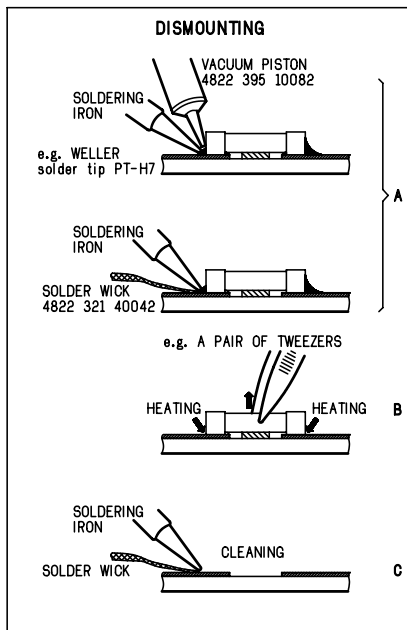
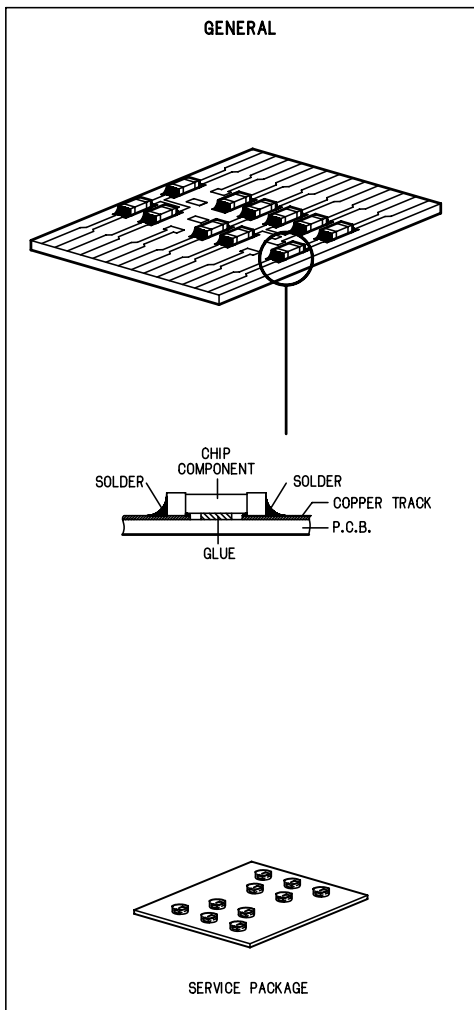
### Compact Disc:

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

### ESD Equipment:

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

## HANDLING CHIP COMPONENTS



**(GB) WARNING**

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically.

When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance.

Keep components and tools also at this potential.

**ESD****(NL) WAARSCHUWING**

Alle IC's en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).

Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen.

Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.

Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

**(F) ATTENTION**

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD).

Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.

Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfilez le bracelet serti d'une résistance de sécurité.

Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

**(D) WARNUNG**

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

Unvorsichtige Behandlung im Reparaturfall kann die Lebensdauer drastisch reduzieren.

Veranlassen Sie, dass Sie im Reparaturfall über ein Pulsarmband mit Widerstand verbunden sind mit dem gleichen Potential wie die Masse des Gerätes.

Bauteile und Hilfsmittel auch auf dieses gleiche Potential halten.

**(I) AVVERTIMENTO**

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).

La loro longevità potrebbe essere fortemente ridotta in caso di non osservazione della più grande cauzione alla loro manipolazione.

Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un 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.

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

**(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 utilisées les pièces de rechange identiques à celles spécifiées.

**(D)**

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

**(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.

**(GB) Warning !**

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

**(S) Varning !**

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

**(SF) Varoitus !**

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

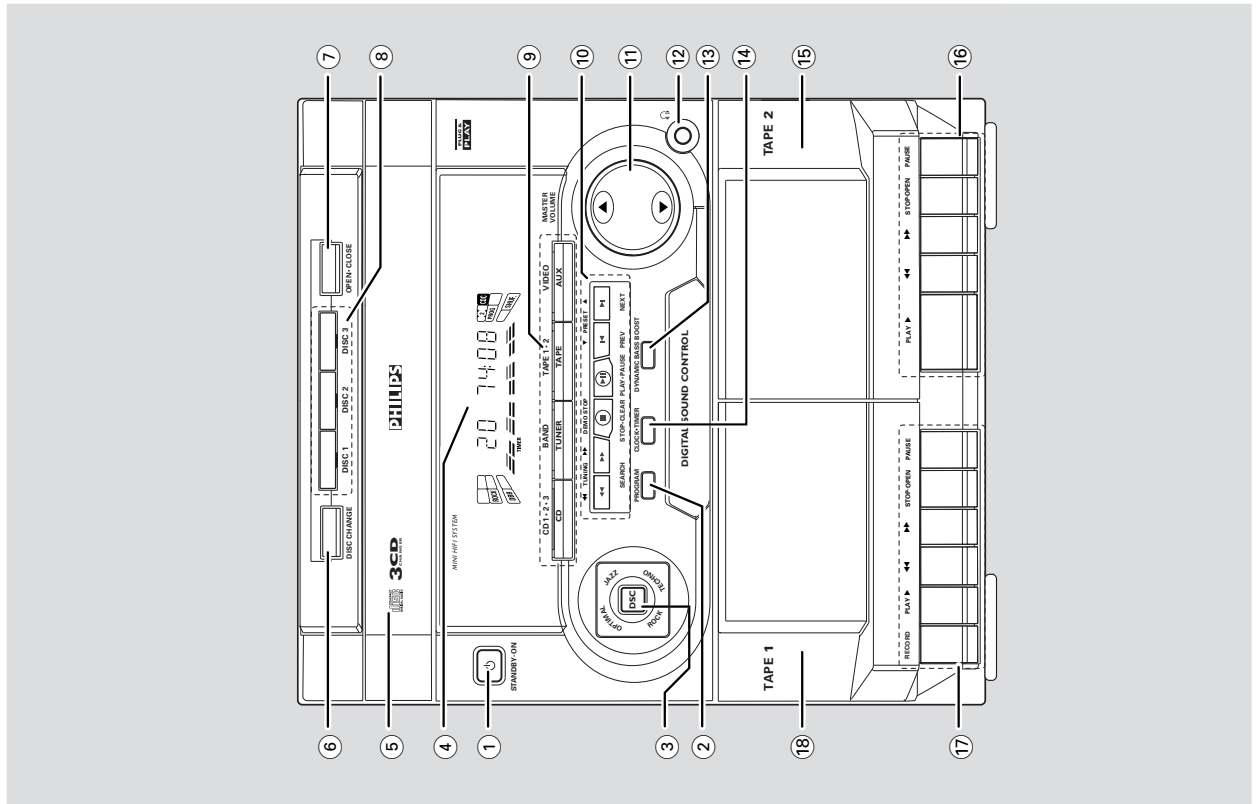
**(DK) Advarse !**

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

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## General Information

- The type plate (which contains the serial number) is located at the rear of the player.
- Recording is permissible if copyright or other rights of third parties are not infringed.
- This product complies with the radio interference requirements of the European Community.

### Environmental Information

All unnecessary packaging has been omitted. We have tried to make the packaging easy to separate into three materials: cardboard (box), polystyrene foam (buffer) and polyethylene (bags, protective foam sheet).

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

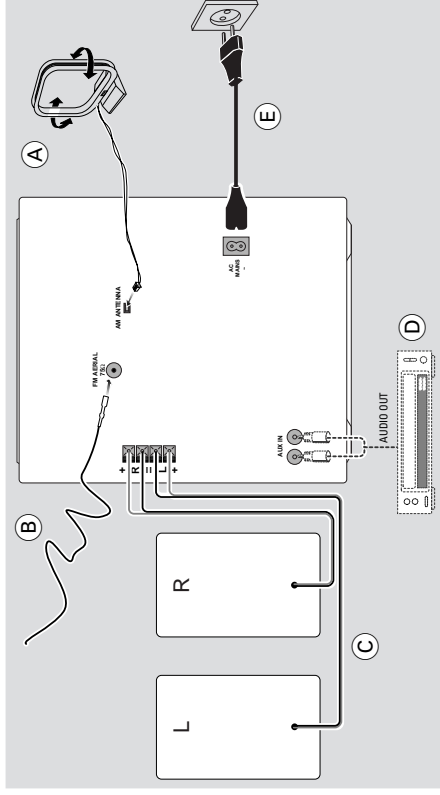
### Supplied Accessories

- Remote control
- AM loop antenna
- FM wire antenna
- AC power cord

### Safety Information

- Before operating the player, check that the operating voltage indicated on the typeplate (or the voltage indication beside the voltage selector) of your player is identical with the voltage of your local power supply. If not, please consult your dealer. The typeplate is located at the rear of your player.
- When the player is switched on, do not move it around.
- Place the player on a solid base (e.g. a cabinet).
- Place the player in a location with adequate ventilation to prevent internal heat build-up in your player. Allow at least 10 cm (4 inches) clearance from the rear and the top of the unit and 5 cm (2 inches) from the each side.
- Do not expose the player to excessive moisture, rain, sand or heat sources.
- Under no circumstances should you repair the player yourself, as this will invalidate the warranty.
- If the player is brought directly from a cold to a warm location, or is placed in a very damp room, moisture may condense on the lens of the disc unit inside the player. Should this occur, the CD player will not operate normally. Leave the power on for about one hour with no disc in the player until normal playback is possible.
- Electrostatic discharge may cause unexpected problems. See whether these problems disappear if you unplug the AC power cord and plug it in again after a few seconds.
- **To disconnect the player from the power supply completely, remove the AC power plug from the wall socket.**

## Preparations

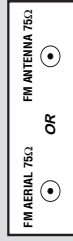


### Rear Connections

- (A) **AM Loop Antenna Connection**  
Connect the supplied loop antenna to the AM ANTENNA terminal. Place the AM loop antenna far away from the system and adjust its position for the best reception.
- (B) **FM Wire Antenna Connection**  
Connect the supplied FM wire antenna to the FM AERIAL (FM ANTENNA) 75 Ω terminal. Adjust the position of the FM antenna for the best reception.

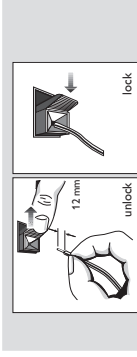
### Outdoor Antenna

For better FM stereo reception, connect an outdoor FM antenna to the FM AERIAL (FM ANTENNA) 75 Ω terminal using a 75 Ω coaxial wire.



### Speakers Connection

- Connect the right speaker to Front terminal R, with the colored wire to + and the black wire to -.
- Connect the left speaker to Front terminal L, with the colored wire to + and the black wire to -.
- Clip the stripped portion of the speaker wire as shown.



### CAUTION:

- For optimal sound performance, it is recommended to use the supplied speakers.
- Do not connect more than one speaker to any one pair of + / - speaker terminal.
- Do not connect speakers with impedance lower than the speakers supplied. Please refer to SPECIFICATION section of this manual.



## Controls

- STOP-CLEAR** ■  
for CD ..... to stop disc playback or to clear a programme.  
for TUNER ..... to stop programming (on the system only).  
for DEMO ..... to start or stop demonstration mode (on the system only).  
for CLOCK ..... to exit clock setting or cancel timer (on the system only).  
for PLUG & PLAY ..... to exit plug & play mode and return to standby mode (on the system only).
- PLAY ▶ / PAUSE II**  
for CD ..... to start or interrupt playback.  
for PLUG & PLAY ..... to initiate and start plug & play from standby/demo mode (on the system only).
- PREV ◀ / NEXT ▶ (PRESET ▼ ▲)**  
for CD ..... to skip to the beginning of the current, previous, or next track.  
for TUNER ..... to select a preset station in memory.  
for CLOCK ..... to set the minute (on the system only).

- (11) MASTERVOLUME ▼▲**  
- to increase or decrease the volume.
- (12) f**  
- to connect headphones.
- (13) DBB (DYNAMIC BASS BOOST)**  
- to switch on bass boost to enhance bass response or to switch off bass boost.
- (14) CLOCK-TIMER**  
- to view the clock, set the clock or set the timer.
- (15) TAPE DECK 2**
- (16) TAPE DECK 2 OPERATION**  
**PLAY ▶** ..... to start playback.  
**◀◀** ..... to rewind the tape.  
**▶▶** ..... to fast forward the tape.  
**STOP-OPEN** . . . to stop playback or to open the tape door.
- PAUSE** ..... to interrupt playback.
- (17) TAPE DECK 1 OPERATION**  
**RECORD** ..... to start recording.  
**PLAY ▶** ..... to start playback.  
**◀◀** ..... to rewind the tape.  
**▶▶** ..... to fast forward the tape.  
**STOP-OPEN** . . . to stop playback/recording or to open the tape door.  
**PAUSE** ..... to interrupt playback or recording.
- (18) TAPE DECK 1**
- (19) DIM**  
- to select different brightness for the display screen : DIM 1, DIM 2, DIM 3 or DIM OFF.
- (20) REPEAT**  
- to repeat a disc track, a disc, or all available discs.
- (21) MUTE**  
- to switch off the sound temporarily.
- (22) SHUFFLE**  
- to play all the available discs and their tracks in random order.
- (23) SLEEP**  
- to switch the system to standby mode at a selected time.
- ⏻**  
- to switch the system to standby mode.

### Notes for remote control:

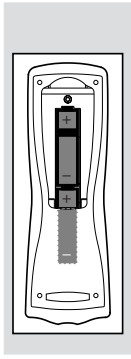
- First select the source you wish to control by pressing one of the source select keys on the remote control (e.g. CD, TUNER, etc.).
- Then select the desired function (▶, ◀, ◀◀, ▶▶, etc.).

English

## Preparation

### Inserting batteries into the Remote Control

- Insert the batteries (Type R06 or AA) into the remote control as shown in the battery compartment.



- To avoid damage from possible battery leakage, remove dead batteries or batteries that will not be used for a long time.

**Batteries contain chemical substances, so they should be disposed off properly.**

### (D) Connecting other equipment to your player

You can 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 at the rear of the system.

### (E) AC Power Supply

After all other connections have been made, connect the AC power cord to the system and to the wall outlet.

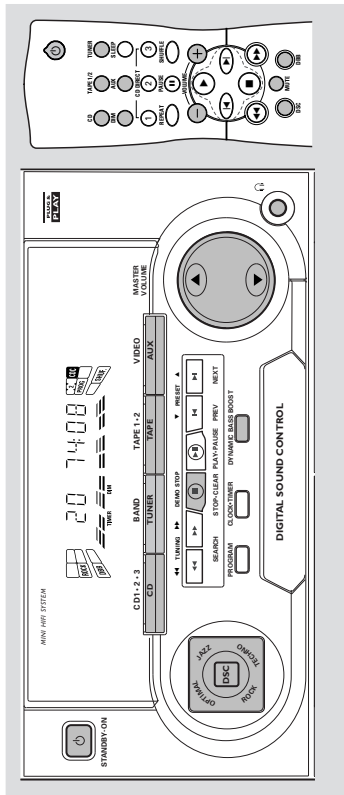
## Controls (illustrations on page 3)

- (9) SOURCE** - to select the following:  
**CD / (CD 1•2•3)**  
- to select CD mode. When disc playback is stopped, press to select disc tray 1, 2 or 3.  
**TUNER / (BAND)**  
- to select Tuner mode. When in tuner mode, press to select the waveband: FM, MW or LW.  
**TAPE / (TAPE 1• 2)**  
- to select Tape mode.  
**AUX (VIDEO)**  
- to select sound from an external source (e.g. TV, VCR, Laser Disc player, DVD player or CD Recorder).
- (10) MODE SELECTION**  
**SEARCH ◀◀ ▶▶ (TUNING ◀◀▶▶)**  
for CD ..... to search backward/forward.  
for TUNER ..... to tune to a lower or higher radio frequency.  
for CLOCK ..... to set the hour (on the system only).

### Controls on the player and remote control

- (1) STANDBY-ON 0**  
- switches the system to standby/on.
- (2) PROGRAM**  
for CD ..... to programme disc tracks.  
for TUNER ..... to programme preset radio stations.  
for CLOCK ..... to select 12 or 24 hour in clock setting mode.
- (3) DSC (DIGITAL SOUND CONTROL)**  
- to select the desired sound effect : OPTIMAL, JAZZ, ROCK or TECHNO.
- (4) DISPLAY SCREEN**  
- to view the current setting of the system.
- (5) CD CHANGER TRAY**
- (6) DISC CHANGE**  
- to change disc(s).
- (7) OPEN-CLOSE**  
- to open or close the CD changer tray.
- (8) DISC 1 / DISC 2 / DISC 3 (DISC DIRECT PLAY)**  
- to select a disc tray for playback.

English



English

**To enable the demonstration mode**

Press and hold **■** (on the system only) for **5 seconds** when the system is in standby mode. → The demonstration will begin.

**Notes:**

- If the demonstration mode has not been disabled, it will resume 5 seconds later after the system switches to standby mode.
- When the system is switched on from the main power outlet, the CD changer tray may open and close again to initialize the set.
- Even though the AC power cord is removed from and reconnected to the wall socket, the demonstration will remain off until it is switched on again.

**Switching the system ON**

- Press **CD, TUNER, TAPE** or **AUX**.
- Press **STANDBY-ON** in demo.

You can also switch on the system by pressing any one of the **CD DIRECT PLAY** buttons (on system only).

**Switching the system to standby mode**

- Press **STANDBY-ON** or **⏻** on the remote control.
- The system will switch to standby mode.

**Selecting the Source**

- Press the respective source selection button: **CD, TUNER, TAPE** or **AUX**.
- The display indicates the selected source.

**Note:**

- For an external source, make sure you have connected the audio left and right **OUT** terminals of the external equipment (TV, VCR, Laser Disc player, DVD player or CD Recorder) to the **AUX IN** terminals.

English

**Important:**  
Before you operate the system, complete the preparation procedures.

**Plug and Play**  
The system provides **PLUG and PLAY** feature that allows you to store all available radio stations automatically upon power up. **If PLUG and PLAY has been installed beforehand, it will go to standby or demonstration mode after 5 seconds.**

- 1 Press and hold **PLAY** (on the system only) for 5 seconds when the system is in standby or demonstration mode.
- If the **PLUG and PLAY** has not been installed before, you can access this feature by switching on the system from the main power outlet. → **"RADIO INSTALL - PRESET PLAYS"** will be displayed.

- 2 Press **PLAY** to start installation.
  - **"INSTALL"** will be displayed and followed by **"TUNER"** and then **"RADIO"**.
  - The **PROGRAM** starts flashing.
  - **PLUG and PLAY** will start searching for all radio stations on FM band and then followed by radio stations on MW and LW bands respectively.
  - All available radio stations with sufficient signal strength will be stored. Up to 40 presets may be stored.
  - The last preset radio station will appear on the display when **PLUG and PLAY** is completed.

**DIM mode** (only on remote control)  
You can select the desired brightness for the display.

- Press **DIM** to select **DIM 1, DIM 2, DIM 3** or **DIM OFF** display mode.
- The **DIM** display lights up.
- **"DIM 1", "DIM 2", "DIM 3"** or **"DIM OFF"** will be displayed depending on the mode selected.

**DIM OFF - normal brightness with Volume Indicator On**



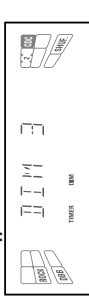
**DIM 1 - normal brightness with Volume Indicator Off**



**DIM 2 - half brightness with Volume Indicator On**



**DIM 3 - half brightness with Volume Indicator Off**



## Operating the System

### Sound Control

#### VOLUME ADJUSTMENT

Press **MASTER VOLUME** ▲ or ▼ to increase or decrease the sound level.

*For Personal Listening*

Connect the headphones plug to the  socket at the front of the system. The speakers will be muted.

#### DIGITAL SOUND CONTROL (DSC)

The DSC feature enables you to enjoy special sound effects that have preset equalizer settings, providing the best music reproduction.

- Press **DSC** to select **OPTIMAL**, **JAZZ**, **ROCK** or **TECHNO**.

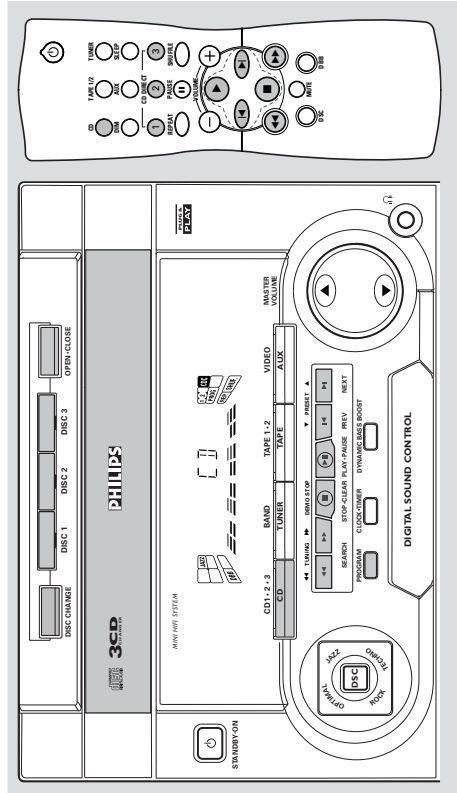
→ "OPTIMAL", "JAZZ", "ROCK" or "TECHNO", and the respective flag will be displayed.

**Note:**

- When "OPTIMAL" sound is selected **DBB** will be switched on automatically.

English

## Compact Disc



### Warning!

- 1) This system is designed for conventional discs. Do not use any accessories such as disc stabilizer rings or disc treatment sheets, etc., which may damage the disc mechanism.
  - 2) Do not load more than one disc into each tray.
  - 3) When the CD changer is loaded with discs, do not turn over or shake the system. This may jam the changer.
- You may load three discs in the CD changer for continuous playback without interruption.

### Discs for playback

This system can play all digital audio disc, finalized digital audio CD-Recordable and finalized digital audio CD-Rewritable format discs.



### Disc Direct Play

- You can play a disc directly by pressing the **DISC 1**, **DISC 2** or **DISC 3** button. The CD player will stop at the end of playback of the selected disc.
  - The corresponding CD numeric flag starts to flash.

### Loading the CD Changer

- 1 Press **CD** to select CD mode.
- 2 Press **OPEN-CLOSE**
  - The CD changer tray slides out.
- 3 Load a disc with the printed side up in the right tray.
  - You can load another disc in the left tray.
  - To load the third disc, press the **DISC CHANGE** button.
    - The CD changer tray will rotate until the empty tray is ready for loading.
- 4 Press **OPEN-CLOSE** to close the CD changer tray.
  - A lit on the respective CD numeric flag indicates that its corresponding disc(s) is loaded in the disc tray.

### Note:

- To ensure good system performance, wait until the CD changer completely reads the disc(s) before proceeding.

English

### DYNAMIC BASS BOOST (DBB)

The DBB mode enhances the bass response.

- Press **DBB** to switch on bass response.
  - "DBB ON" and the **DBB** flag will be displayed.

### To switch off DBB

- Press **DBB** again.
  - "DBB OFF", will be displayed.

**Note:**

- Some discs or tapes might be recorded in high modulation, which causes a distortion at high volume. If this occurs, switch off **DBB** or reduce the volume.

### MUTE (only on remote control)

This feature allows you to temporarily switch off the sound of the system without switching off the system when you require a moment of silence.

- Press **MUTE** on the remote control to switch off the sound.
  - "MUTE" and the **MUTE** flag will be displayed.
- Press **MUTE** again on the remote control or increase the **MASTER VOLUME** to switch on the sound.

## Compact Disc

English

English

## Compact Disc

**Playing a Disc**

- 1 Press **▶** to start playback.
  - A flashing on the CD numeric flag indicates the selected disc.
  - The track number and elapsed playing time of the current track appear on the display.
  - To interrupt playback, press **■**.
  - The playing time flashes.
  - To resume playback, press **▶** again.
- 2 To stop playback, press **■**.

**Note:**

- All the available discs will play once, then stop.

**Disc Change**

You can change the outer two discs while the third inner disc is stopped or is playing.

- 1 Press **DISC CHANGE**.
  - The CD changer tray slides out.
- 2 Replace the discs in the left and right disc trays.
  - If you wish to change the inner disc during playback, press **DISC CHANGE** again.
  - "DISC CHANGE" will be displayed.
  - The disc will stop playing.
  - The CD changer tray will close to retrieve the inner disc and then open again with the inner disc accessible.
- 3 Press **OPEN-CLOSE** to close the CD changer tray.

**Selecting a desired track**

**Selecting a desired track when playback is stopped**

- 1 Press **◀** or **▶** until the desired track appears on the display.
- 2 Press **▶** to start playback.
  - The selected track number and elapsed playing time appear on the display.

**Selecting a desired track during playback**

- Press **◀** or **▶** until the desired track appears on the display.
  - The selected track number and elapsed playing time appear on the display.
- If you press **◀** once it will skip to the beginning of the current track and play the track again.

**Note:**

- Pressing **◀** during shuffling can only skip to the beginning of the current track.

**Searching for a particular passage during playback**

- Press and hold **◀◀** or **▶▶** until the desired passage is located.
  - The volume will be reduced.
  - Play returns to normal when **◀◀** or **▶▶** is released.

**Programming Tracks**

Programming tracks of a loaded disc is possible when playback is stopped. The display will indicate the total tracks stored in the programme. Up to 40 tracks can be stored in the memory in any order. When 40 tracks are stored and you attempt to store another track, the display will show "FULL".

- 1 Load the desired discs in the disc trays.
- 2 Press **PROGRAM** to start programming.
  - The **PROGRAM** flag starts flashing.
  - A flashing on the CD numeric flag indicates the selected disc.
- 3 Press the **CD (CD 1•2•3)** or **DISC 1/2/3** button to select the disc.
- 4 Press **◀** or **▶** to select the desired track.
- 5 Press **PROGRAM** to store the track.
- Repeat steps **3** to **5** to store other discs and tracks.
- 6 Press **■** once to end programming.
  - The total number of tracks programmed and total playing time appear on the display.

**Notes:**

- If the total playing time is more than "99:59" or if one of the programmed tracks has a number greater than 30, then "....." appears on the display instead of the total playing time.
- If the system is reading the discs, programming is not possible, "READING" will be displayed and followed by "DISC n" where "n" is the current read disc number.
- During programming, if no button is pressed within 20 seconds, the system will exit programme mode automatically.
- "SELECT A DISC" will be displayed when programming an empty disc slot.

15

**Reviewing the programme**

Reviewing of the programme is possible only when playback is stopped.

Press **◀** or **▶** repeatedly to review the programmed tracks.

Press **■** to exit review mode.

**Playing the programme**

- 1 Press **▶** to start programme playback.
  - "PLAY PROGRAM" will be displayed.
  - The track number and elapsed playing time of the current track will appear on the display.
  - If you press **REPEAT** during programme playback, the current track or all programmed tracks will be played repeatedly.
  - "TRACK" or "PROGRAM" will be displayed.
  - The **REP** and **PROG** flags appear on the display.
- 2 Press **■** to stop programme playback.

**Notes:**

- If you press any of the **DISC DIRECT PLAY** buttons, the system will play the selected disc and the stored programme will be ignored temporarily. The **PROG** display also will disappear temporarily from the display. It will reappear when playback of the selected disc ends.
- **REPEAT DISC** mode will be cancelled when programme playback begins.

**Erasing the programme** (when playback is stopped)

- Press **■**
- "PROGRAM CLEAR" will be displayed.

**Note:**

- The programme will be erased when the system is disconnected from the power supply or when the CD changer tray is opened.

16

**Shuffle** (only on remote control)

In shuffle mode, the system plays all the available discs and their tracks in random order. Shuffle may be used also when tracks are programmed.

**To shuffle all the discs and tracks**

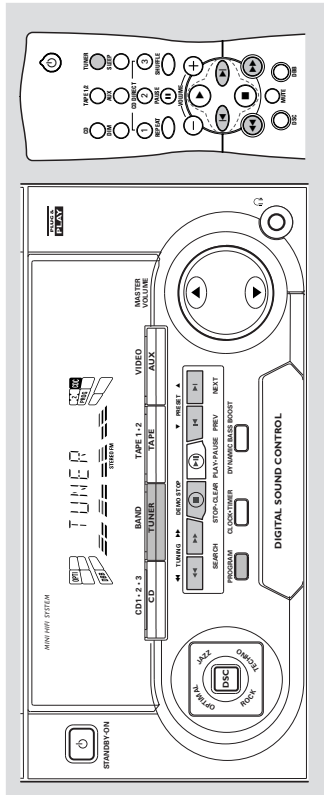
- 1 Press **SHUFFLE**.
    - "SHUFFLE" will be displayed.
    - The **SHUF** flag and the track selected at random appear on the display.
    - The discs and the tracks will be played in random order until you press **■**.
    - If you press **REPEAT** during shuffling, the current track or all available discs will be played repeatedly.
    - "TRACK" or "ALL DISC" will be displayed.
    - The **REP** and **SHUF** flags appear on the display.
  - 2 Press **SHUFFLE** again to resume normal playback.
    - The **SHUF** flag disappears from the display.
- Note:**
- **REPEAT DISC** mode will be cancelled when shuffle is selected.

**Repeat** (only on remote control)

You can play the current track, a disc or all available discs repeatedly.

- 1 Press **REPEAT** on the remote control to select the various repeat modes.
    - "TRACK", "DISC", "ALL DISC" or "OFF" will be displayed.
    - The **REP** flag appears on the display.
    - The selected track, selected disc or all available discs will now be played repeatedly until you press **■**.
    - Press **REPEAT** until the "OFF" mode is displayed to resume normal playback.
    - The **REP** flag disappears from the display.
- Notes:**
- **REPEAT DISC** mode is not available during programme play or shuffle mode.
  - You can also repeat shuffling a programme.
    - i) "TRACK" or "PROGRAM" will be displayed.
    - ii) The **REP**, **PROG**, and **SHUF** flags appear on the display.

## Tuner



English

## Tuner

English

### Notes:

- You can cancel the automatic programming by pressing PROGRAM or **■** (on the system only).
- If you want to reserve a section of preset numbers, for example preset numbers 1 to 9, select preset 10 before starting automatic programming, only the preset numbers 10 to 40 will be programmed.

### Notes:

- When 40 radio stations are stored and you attempt to store another radio station, the display will show "FULL". If you want to change an existing preset number, repeat steps 3 - 5.
- You can cancel manual programming by pressing **■** (on the system only).
- During programming, if no button is pressed within 20 seconds, the system will exit programme mode automatically.

### Manual programming

- 1 Press **TUNER** (BAND).
  - 2 Press **TUNER** (BAND) again to select the desired waveband: FM, MW or LW.
  - 3 Press **PROGRAM** for less than one second.
    - The PROG flag starts flashing.
    - The next available preset number will be displayed for selection.
  - 4 Press **◀** or **▶** to tune to the desired frequency.
    - If you wish to store the radio station to another preset number, press **▼** or **▲** to select the desired preset number.
  - 5 Press **PROGRAM** again.
    - The PROG flag disappears and the radio station will be stored.
- Repeat **steps 3 - 5** to store other preset radio stations.

### Tuning to Preset Radio Stations

- Press **▼** or **▲** to select the desired preset number.
  - The preset number, radio frequency, and waveband appear on the display.

### Storing Preset Stations

You can store up to 40 radio stations in the memory. When a preset radio station is selected, the preset number appears next to the frequency on the display.

### Tuning to radio stations

- 1 Press **TUNER** (BAND) to select TUNER mode.
  - "TUNE F" will be displayed.
- 2 A few seconds later, the current radio frequency will be displayed.
- 3 Press **TUNER** (BAND) again to select the desired waveband: FM, MW or LW.
  - Press **◀** or **▶** for more than one second, then release.
  - The display will show "SEE FREQ" until a radio station with sufficient signal strength is found.
- Repeat this procedure until the desired station is reached.
- To tune to a weak station, briefly press **◀** or **▶** repeatedly until the display shows the desired frequency and/or when the best reception has been obtained.

### Automatic programming

- 1 Press **TUNER** (BAND).
- 2 Press **PROGRAM** for more than one second.
  - The PROG flag starts flashing and "AUTO" will be displayed.
  - The system will search for every available station in the FM waveband first, MW and then search the LW waveband.
  - All available stations will be stored automatically. The frequency and preset number will be displayed briefly.
  - The system will stop searching when all the available radio stations are stored or when the memory for 40 preset radio stations is used.
  - The system will remain tuned to the last stored preset radio station.

### Note:

- For "PLUG & PLAY" feature, please refer to page 11.

# Tape

English

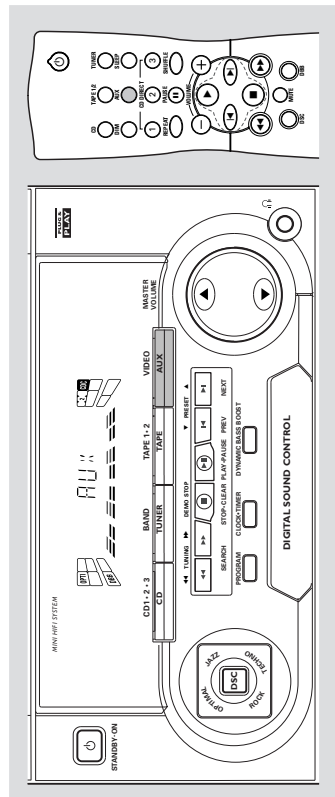
## Continuous Playback From Tape Deck 2 to Tape Deck 1

- 1 Press **TAPE** to select TAPE mode.
- 2 Load the tapes in tape deck 1 and 2.
- 3 Press **PLAY** on tape deck 2.
- 4 Press **PAUSE** on tape deck 1.
- 5 Press **PLAY** on tape deck 1.  
→ Playback will begin with tape deck 2 and will continue with tape deck 1 when playback on tape deck 2 ends.
- 6 Press **STOP-OPEN** if you want to stop playback before the end of the tape in tape deck 1 or tape deck 2.

**Notes:**

- During rewinding or fast forwarding of a tape, it is also possible to listen to another source (e.g. CD, TUNER or AUX).
- Before playing a tape, check and tighten slack tape with a pencil. Slack tape may get jammed or may burst in the mechanism.
- C-120 tape is extremely thin and is easily deformed or damaged. It is not recommended for use in this system.
- Store the tapes at room temperature, and do not put them too close to a magnetic field (for example, a transformer, TV or speaker).

# Aux



**Note:**

- All the sound control features (e.g. DSC, DBB, etc.) are available for selection.

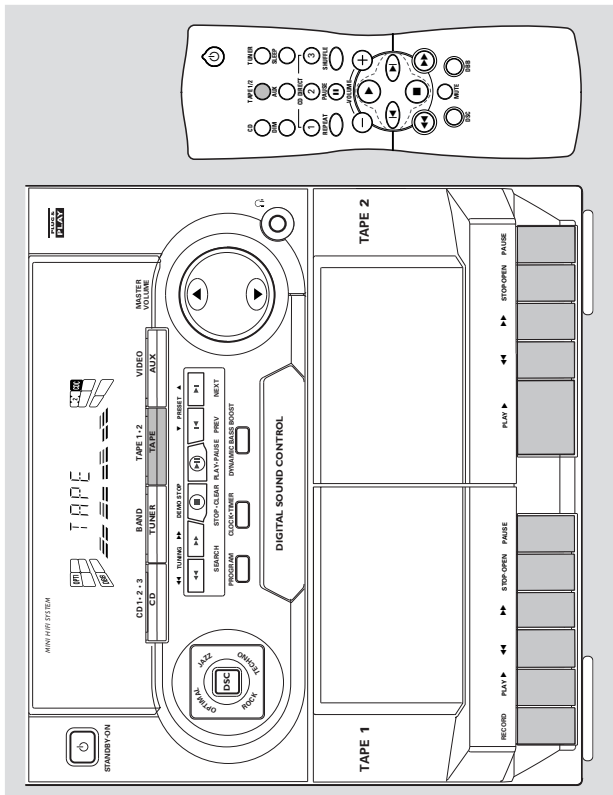
## Selecting External Equipment

If you have connected the audio out terminals of the external equipment (TV/VCR, Laser Disc player, DVD player or CD Recorder) to the AUX IN terminals, you can hear the enhanced sound from the system.

- Press **AUX** to select the external equipment.  
→ "AUX:" will be displayed.

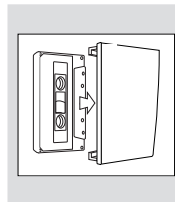
# Tape

English



## Loading a tape

- 1 Press **STOP-OPEN**.
- 2 The tape deck door opens.
- 3 Load the tape with the open side downward and the full spool to the left.



- 4 Close the tape deck door.

## Tape Playback

- 1 Press **TAPE** to select TAPE mode.  
→ "TAPE:" will be displayed.
- 2 Load the tape into the selected tape deck.
- 3 Press **PLAY** to start playback.
- To interrupt playback, press **PAUSE**.
- To resume playback, press **PAUSE** again.
- 4 Press **STOP-OPEN** to end playback.

## Rewind/Fast Forward

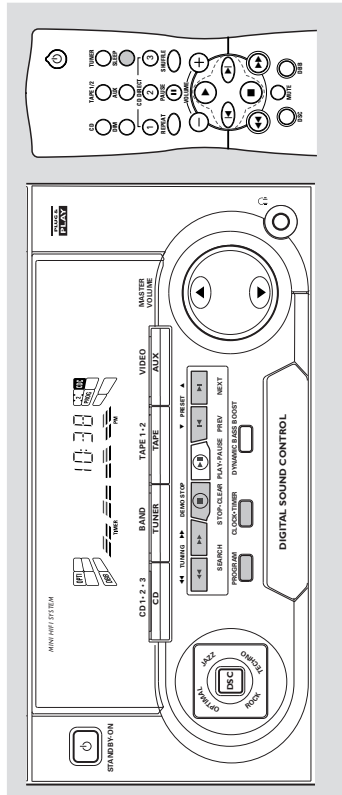
- When playback is stopped**
- 1 You can rewind or fast forward a tape by pressing **◀** or **▶**, respectively.  
→ The tape will stop automatically at the end of rewinding or fast forwarding.
  - 2 Press **STOP-OPEN** to stop rewinding or fast forwarding.



# Clock/Timer

English

English



### View Clock

You can view the clock (if it is set) if the system is in Standby mode or when any sound source is selected (CD, TUNER, etc.). The clock will be displayed for about seven seconds.

- Press **CLOCK-TIMER** briefly (on the system only).
  - "10:30 PM" or "22:38" (the current time) will be displayed depending on whether you have selected 12- or 24-hour mode.
  - "...:..:" will be displayed if the clock is not set.

### Clock Setting

The clock can be set in either 12- or 24-hour mode, e.g. "12:00 AM" or "00:00". Before setting the clock, you must be in the View Clock mode.

- 1 Press **CLOCK-TIMER** to select clock mode.
- 2 Press **PROGRAM** to select 12- and 24-hour mode.
  - If 12-hour mode is selected, "12:00" starts flashing and the **AM** lights up.
  - If 24-hour mode is selected, "00:00" starts flashing.
- 3 Set the hour with **◀** or **▶** on the system.
- 4 Set the minute with **◀** or **▶** on the system.
- 5 Press **CLOCK-TIMER** again to store the setting.
  - The clock starts.
- To exit without storing the setting, press **■** on the system.

### Notes:

- During clock setting, if no button is pressed within 90 seconds, the system will exit clock setting mode automatically.
- When a power interruption occurs, the clock setting is erased.

### Timer Setting

The system can switch on to CD or TUNER mode automatically at a preset time. It can serve as an alarm to wake you up. Before setting the timer, make sure the clock is set correctly.

The timer will always be switched on once it is set.

**The volume of the timer will increase from the minimum level to the most recently selected volume level.**

- 1 Press and hold **CLOCK-TIMER** for more than 2 seconds to select timer mode.
  - "12:..:.. AM" or "00:..:.. AM" starts flashing "XX:XX" is "12:00 AM" or "00:00" or the last timer setting, depending on whether 12- or 24-hour mode has been selected.
  - The **TIMER** starts flashing.
- 2 Press **CD** or **TUNER** to select the desired source.
  - "12:..:.. AM" or "00:..:.. AM" indicates the Timer mode is selected.
  - "00:..:.. AM" or "00:..:.. AM" indicates the CD mode is selected.
- Before selecting CD, make sure a disc is loaded in the CD changer tray.

- 3 Press **◀** or **▶** on the system to set the hour for the timer to start.
- 4 Press **◀** or **▶** on the system to set the minute for the timer to start.
- 5 Press **CLOCK-TIMER** to store the start time.
  - The timer is now set.
  - The **TIMER** remains on the display.
  - At the preset time, the timer will be activated.
  - The selected source will be played.

### Notes:

- During timer setting, if no button is pressed within 90 seconds, the system will exit timer setting mode automatically.
- If the source selected is **TUNER**, the last tuned frequency will be switched on.
- If the source selected is **CD**, playback will begin with the first track of the selected disc or programme. If the disc trays are empty, the **TUNER** will be selected instead.
- The timer will not activate if a recording is in progress.

### To switch off the TIMER

- 1 Press and hold **CLOCK-TIMER** for more than 2 seconds.
- 2 Press **■** on the system to cancel the timer.
  - The timer is now switched off.
  - The display will show "CF F" and the **TIMER** disappears.

### To start the TIMER again (for the same preset time and source)

- 1 Press and hold **CLOCK-TIMER** for more than 2 seconds.
- 2 Press **CLOCK-TIMER** again to store the start time.
  - The timer is now on.
  - The **TIMER** appears on the display.

### Sleep Timer (only on remote control)

This feature allows you to select a length of time after which the system will switch to the standby mode automatically.

- 1 Press **SLEEP** on the remote control repeatedly to select a period of time.
  - The selections are as follows (time in minutes): 15 → 30 → 45 → 60 → OFF → 15 ...
  - "SLEEP XXX" or "OFF" will be displayed. "XXX" is the time in minutes.
- 2 When you reach the desired length of time, stop pressing the **SLEEP** button.
  - The **SLEEP** display lights up.
  - The Sleep Timer is now set. Before the system switches to standby mode, a countdown of 10 seconds will be displayed.
  - "SLEEP 10" → "SLEEP 9" ... → "SLEEP 1" → "SLEEP"

### While SLEEP mode is activated

- Press **SLEEP** once to view the remaining length of time.
- Press **SLEEP** twice to change the pre-selected period of time.
  - The display will show the remaining time followed by the sequence of sleep timer options.

### To switch off the Sleep Timer

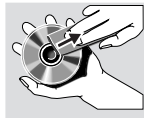
- Press **SLEEP** repeatedly until "CF F" is displayed, or press the **STANDBY-ON** button.



- **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 center out.
- Do not use solvents such as benzine, thinner, commercially available cleaners, or antistatic spray intended for analog 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, the capstan(s), and pressure roller(s) after every 50 hours of tape operation. 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.

**RADIO RECEPTION**

- Poor radio reception.
- The signal is too weak, adjust the antenna or connect an external antenna for better reception.
  - The TV or VCR is too close to the stereo system.

**TAPE DECK OPERATION**

Recording or playback cannot be made or there is a decrease in audio level.

- Dirty tape heads, capstans or pressure rollers, refer to section under Maintenance.
- Magnetic build-up in the record/playback head, use demagnetizing tape.

**GENERAL**

System does not react when any button is pressed.

- Press STANDBY-ON to switch the system off. Remove the AC power plug from the wall outlet, then reconnect the power plug and switch on the system again.

No or poor sound.

- Adjust the volume.
- Disconnect the headphones.
- Check that the speakers are connected correctly

Reversed left and right sound.

- Check if the stripped speaker wire is clamped.
- Check the speaker connections and location.

Lack of bass sound or apparently imprecise physical location of musical instruments.

- Check the speaker connection for proper phasing colored/black wires to colored/black terminals.

Remote control has no effect on the system.

- Select the source (CD, TUNER, etc.) before pressing the function button (▶, ◀, ⏪, ⏩, etc.).
- Reduce the distance to the system.
- Insert the batteries with their polarities (+/- signs) as indicated.
- Replace the batteries.

Timer is not working.

- Set the clock.
- Press CLOCK+TIMER to switch on the timer.
- If recording or dubbing is in progress, stop recording.

Clock setting is erased.

- Reset the clock.
- Press and hold ■ (on the system) for 5 seconds to switch off the demonstration.

System displays features automatically.

Troubleshooting

**WARNING**

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

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

**Symptom**

**Remedy**

**CD PLAYER OPERATION**

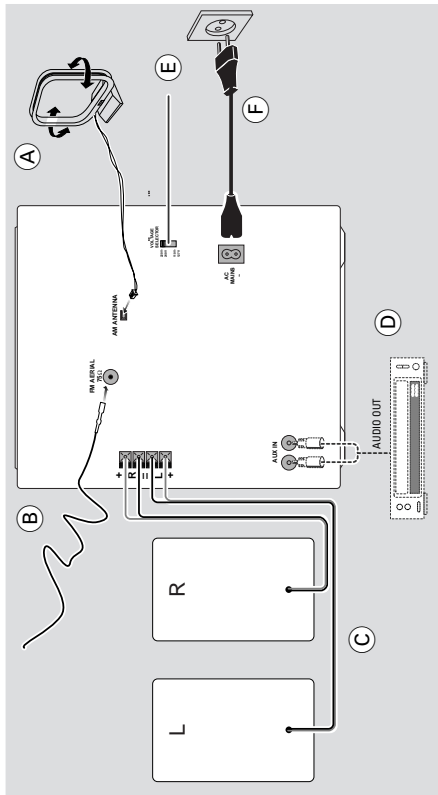
"NO DISC" is displayed.

- If the disc is inserted upside down.
- Moisture condensation at the lens.
- There is no disc in the CD tray.
- The disc is dirty, badly scratched or warped.
- The disc lens is dirty or dusty, refer to section under Maintenance.

"DISC NOT FINALIZED" is displayed.

- The CD-RW or CD-R disc is not properly recorded for use with a standard CD player.
- The disc is badly scratched or dirty.

## Additional Features for /21/21M Preparations



### Rear Connections

- A AM Loop Antenna Connection**  
Connect the supplied loop antenna to the AM ANTENNA terminal. Place the AM loop antenna far away from the system and adjust its position for the best reception.
  - B FM Wire Antenna Connection**  
Connect the supplied FM wire antenna to the FM AERIAL (FM ANTENNA) 75 Ω terminal. Adjust the position of the FM antenna for the best reception.
  - Outdoor Antenna**  
For better FM stereo reception, connect an outdoor FM antenna to the FM AERIAL (FM ANTENNA) 75 Ω terminal using a 75 Ω coaxial wire.
- FM AERIAL 75Ω      FM ANTENNA 75Ω

OR
- D Connecting other equipment to your player**  
You can 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 at the rear of the system.
  - E Adjusting the Operating Voltage (For /21/21M versions only)**  
Before connecting the AC power cord to the wall outlet, make sure that the voltage selector at the rear of the system is set to the local power line voltage. If not, reset the selector before connecting to the wall outlet.
  - F AC Power Supply**  
After all other connections have been made, connect the AC power cord to the system and to the wall outlet.

English

## Tuner

### Tuning to Preset Radio Stations

- Press **▼** or **▲** to select the desired preset number.
- The preset number, radio frequency, and waveband appear on the display.

### Changing the MW tuning grid (For /21/21M versions only)

The frequency step can be changed if necessary. In North and South America, the frequency step between adjacent channels in the MW band is 10 kHz. In other parts of the world, it is 9 kHz. The frequency step preset in the factory is 9 kHz.

**For MW Band**  
To change from 9 kHz to 10 kHz or vice versa

### Changing of tuning grid will erase all previously stored preset stations.

- 1** Disconnect the system from the AC power supply (pull out the AC power cord).
- 2** Press and hold **TUNER** and **TUNING ►►** while reconnecting the system to the AC power supply.

→ Display will show "GRID 9", "10", or "GRID 9".

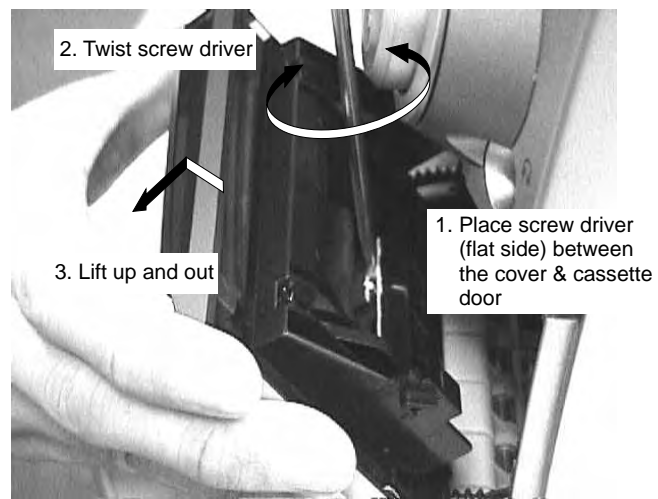
### Notes:

- **GRID 9** indicates that the tuning grid is in step of 9 kHz in MW band. **GRID 10** indicates that the tuning grid is in step of 10 kHz in MW band.
- **FM tuning grid will also be changed from 50 kHz to 100 kHz or vice versa.**

English

## DISMANTLING INSTRUCTIONS

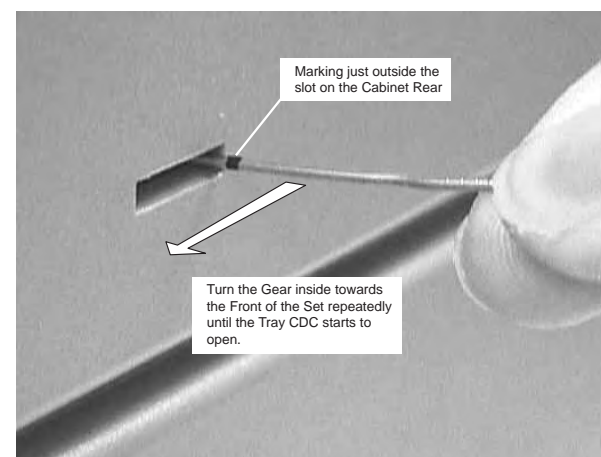
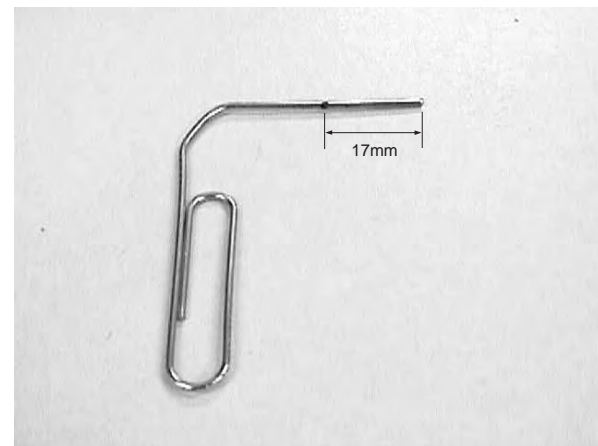
### Dismantling of the Cassette Cover



Cassette door

### Opening the CDC Tray manually

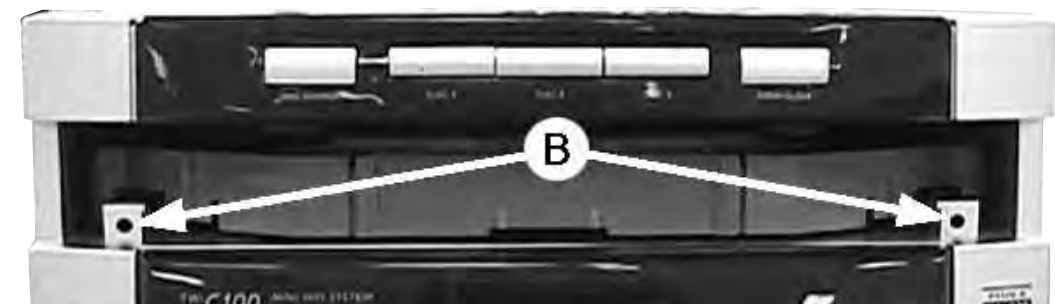
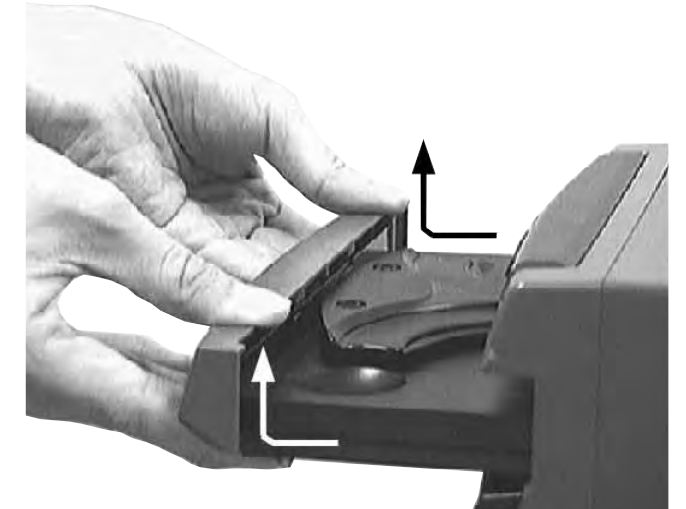
- 1) Take a paper clip or any stiff wire diameter of 1 mm -1.5mm and make a marking about 17mm from the tip.
- 2) Place the set in an upright position and insert the paper clip into the slot on the right side of the Cabinet Rear.
- 3) With the marking just outside the Cabinet Rear, you should be able to engage the gear on the side of the 3CDC-LC Module. Because of the distance between the gear and the Cabinet Rear the chance of the paper clip slipping above or below the gear is high, therefore you have to feel and adjust slightly to engage the gear correctly.
- 4) Push the gear slowly towards the front as shown until the Tray CDC starts to move out of the Front Cabinet. The Tray CDC is now disengage and can be pulled out completely



**Note:** If the Cabinet Rear has to be replaced, it has to be replaced by one that has a similar slot on the right side of the Cabinet otherwise there is no possibility to disassemble the same set in the future.

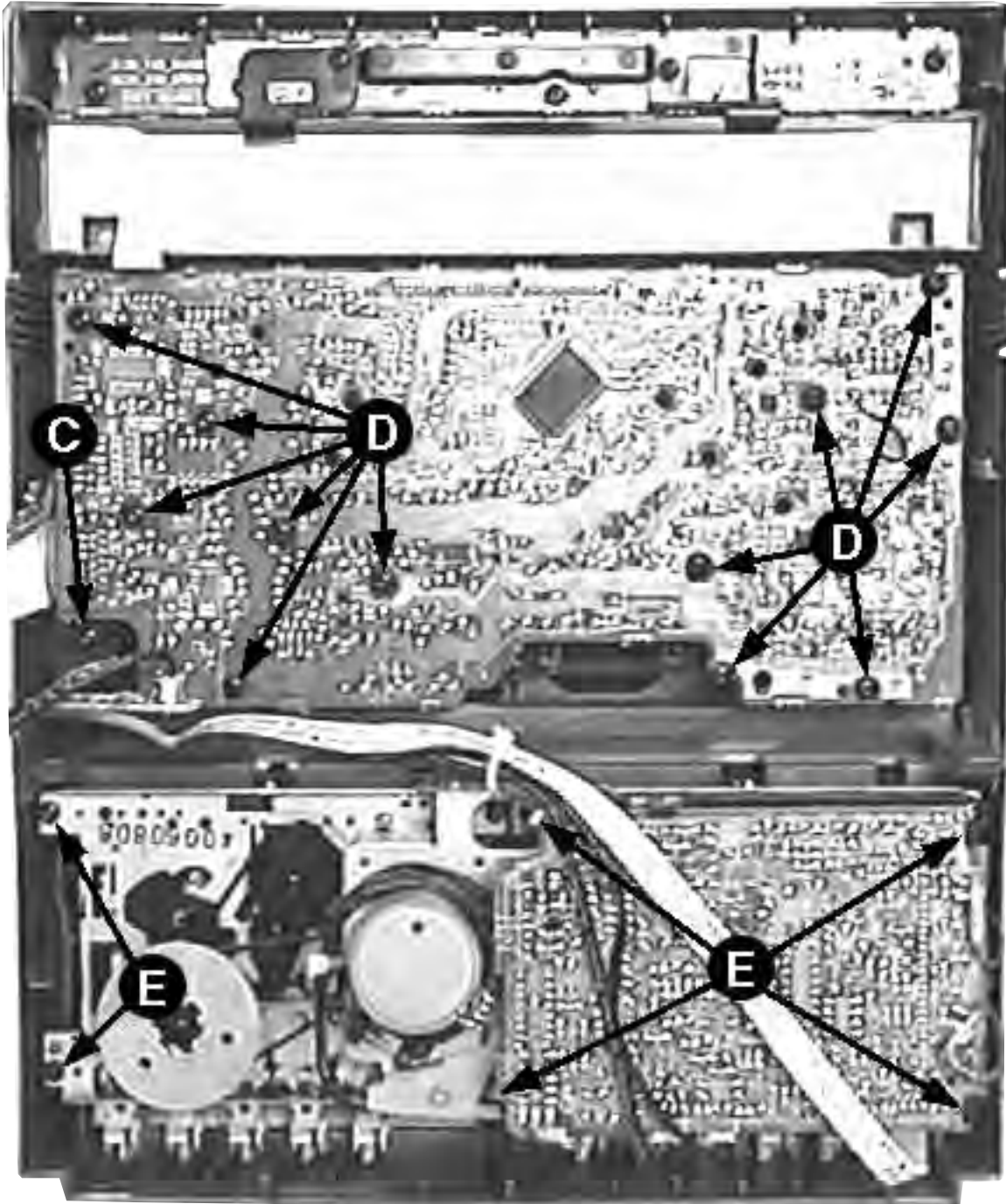
### Dismantling of the Front Panel

- 1) With the CDC tray opened remove the Cover Tray CDC (pos 107) as indicated.
- 2) Loosen the 8 screws to separate the Front Panel from the rear portion.
  - 2 screws B on the front
  - 2 screws each on the left & right side
  - 2 screws at the bottom

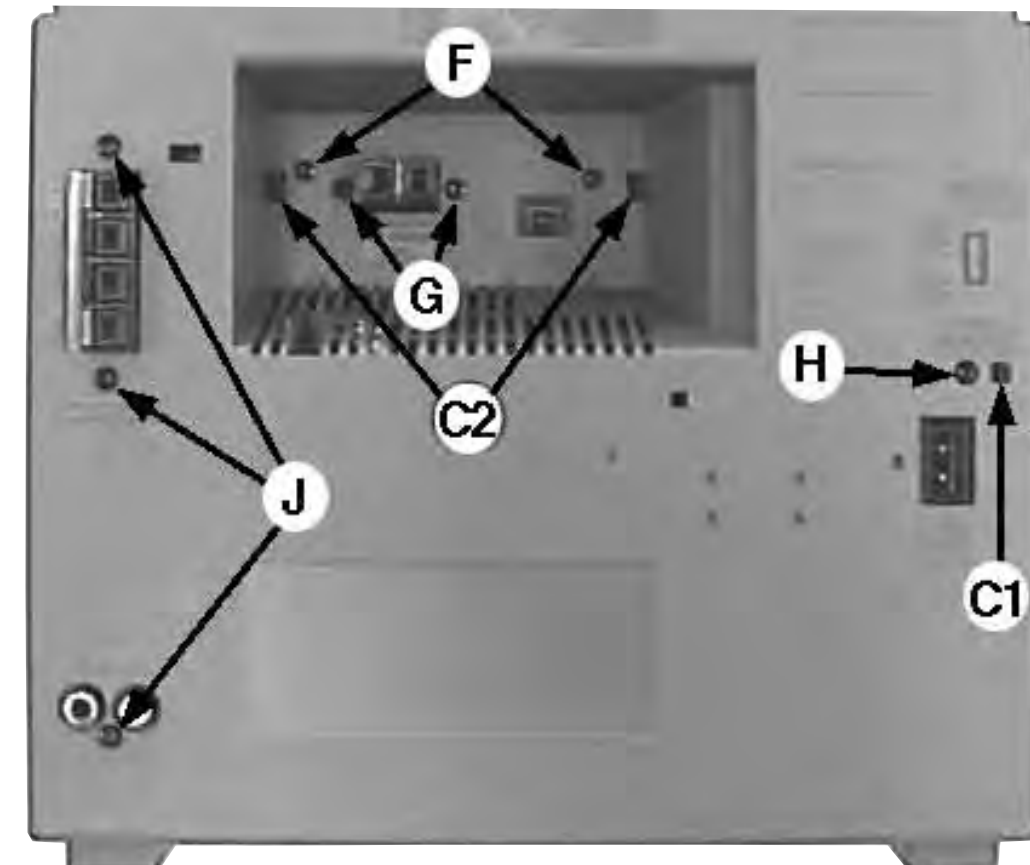
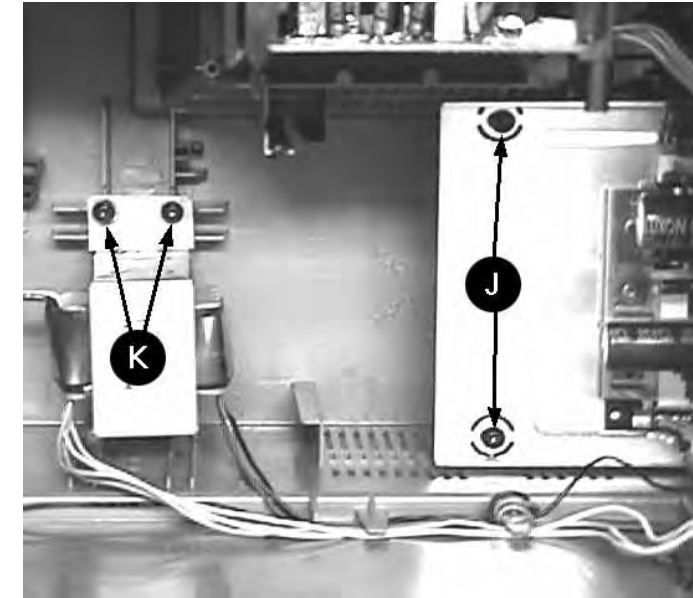


***Dismantling of Assemblies on the Front Panel***

- 1) Remove 1 screw C to loosen the Headphone board.
- 2) Remove 12 screws D as indicated to loosen the Front board.
- 3) Remove 6 screws E to loosen the ECO-MTF Module

***Dismantling of Rear Portion***

- 1) Remove 1 screw H & uncatch C1 to loosen the Mains socket board.
- 2) Remove 2 screws F, 2 screws G and uncatch C2 to loosen the Tuner board assembly.
- 3) Remove 5 screws J (3x on the rear and 2x on the heatsink) to loosen the Combi board (Main part).
- 4) Remove 2 screws K to loosen the Mains Transformer.



Service pos A



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

Service pos B



Service pos C



Service pos D



# SERVICE TEST PROGRAM

To start service test program hold **▶▶** & **AUX** 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 Processor. (Counting up from 01 to 99)

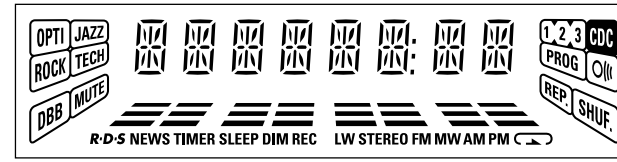
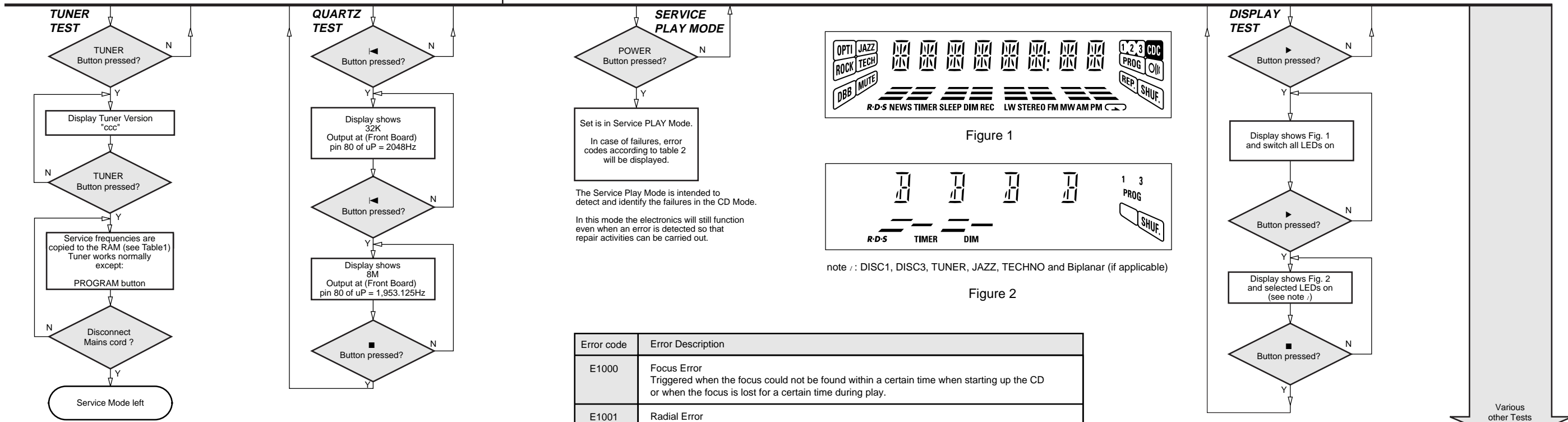


Figure 1

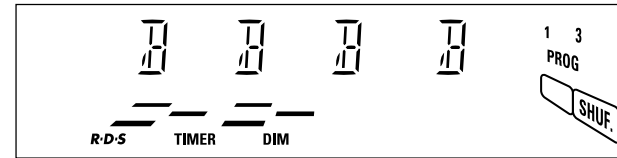


Figure 2

note : DISC1, DISC3, TUNER, JAZZ, TECHNO and Biplanar (if applicable)

Error code	Error Description
E1000	Focus Error Triggered when the focus could not be found within a certain time when starting up the CD or when the focus is lost for a certain time during play.
E1001	Radial Error Triggered when the radial servo is off-track for a certain time during play.
E1002	Sledge In Error The sledge did not reach its inner position (inner-switch is still close) before approximately 6 Sec. 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 250 mSec. have passed by. Inner-switch or sledge motor problem.
E1005	Jump-offtrack error Triggered in normal play when the jump destination could not be found within a certain time. When this error occurred, software will try to recover by initiating the jump command again. If it is recoverable, the disc will continue to play.
E1006	Subcode Error Triggered when a new subcode was missing for a certain time during play.
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 startup within a certain time. Discmotor problem.
E1020	Focus Search Error The focus point has not been found within a certain time.
E1070	The carousel switch is not open within certain time. This can happen when either the switch is defective and closed all the time, or when the carousel is blocked when located exactly at a disc position.
E1071	The carousel position switch did not close within a certain time. This can happen when the switch is defective and never closes electrically, or when the carousel is blocked in between two disc positions. The time-out is approximately 5 Sec.
E1079	The drawer could not enter the inside position and is opening again. This happen when the drawer is blocked and cannot go fully inside or when the drawer switch is defective and does not close.

Table 2

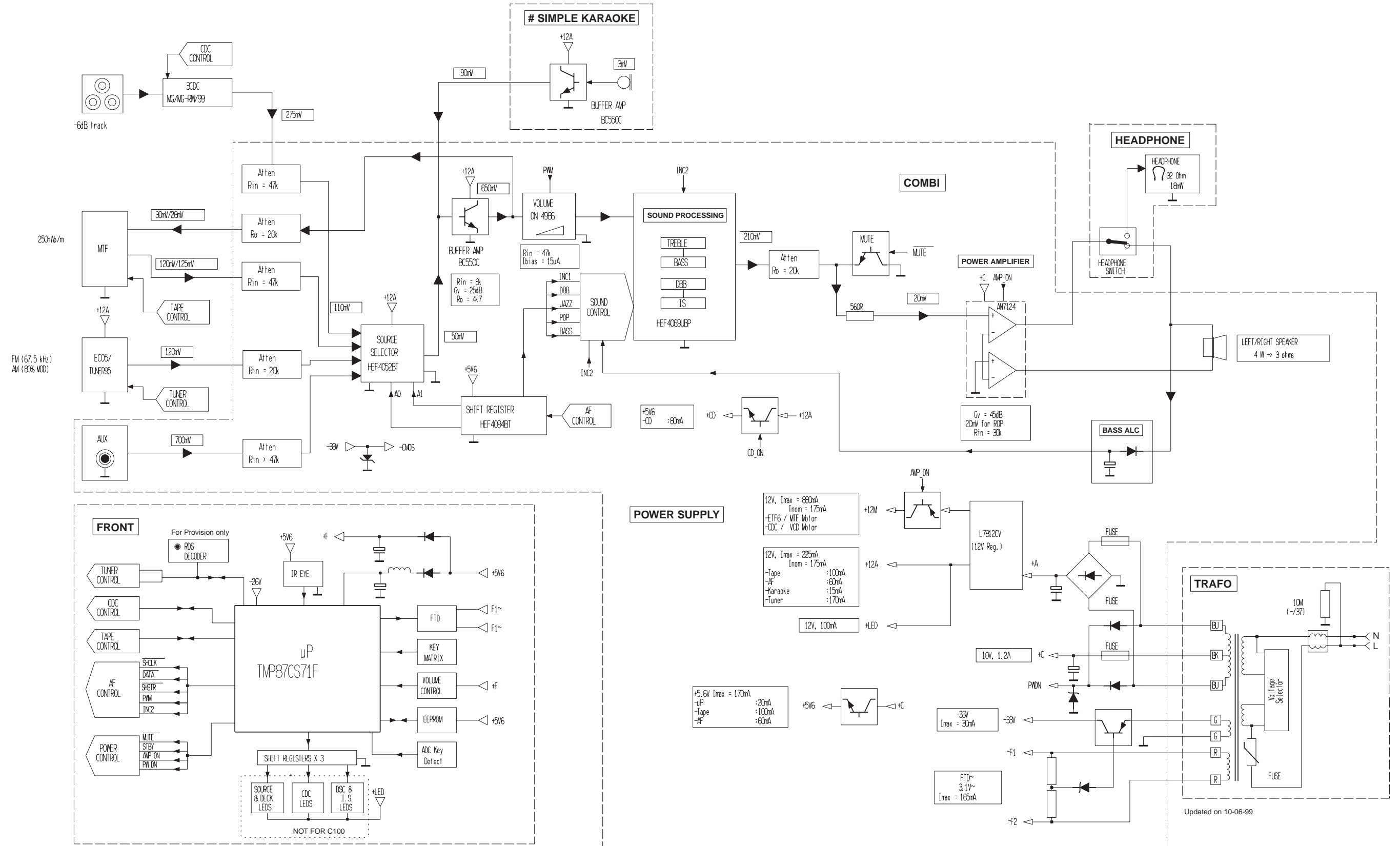
PRESET	Europe "EUR"	East Eur. "EAS"	East Eur. Extended-band "EAS"	USA "USA"	Oversea "OSE"
1	87.5MHz	87.5MHz	65.81MHz	87.5MHz	87.5MHz
2	108MHz	108MHz	108MHz	108MHz	108MHz
3	531kHz	531kHz	74MHz	530kHz	531/530kHz*
4	1602kHz	1602kHz	87.5MHz	1700kHz	1602/1700kHz*
5	558kHz	558kHz	531kHz	560kHz	558/560kHz*
6	1494kHz	1494kHz	1602kHz	1500kHz	1494/1500kHz*
7	153kHz	87.5MHz	558kHz	98MHz	87.5/98MHz*
8	279kHz	87.5MHz	1494kHz	87.5MHz	87.5MHz
9	198kHz	87.5MHz	98MHz	87.5MHz	87.5MHz
10	98MHz	87.5MHz	70.01MHz	87.5MHz	87.5MHz
11	87.5MHz	98MHz	65.81MHz	87.5MHz	98/87.5MHz*

Table 1

Note: \* Depending on the selected grid frequency (9 or 10kHz)  
By holding the TUNER 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.

TEST	Activated with	ACTION
EEPROM TEST	<b>▶▶</b>	A test pattern will be sent to the EEPROM. "PASS" is displayed if the uProcessor read back the test pattern correctly, otherwise "ERROR" will be displayed.
EEPROM FORMAT	<b>◀◀</b>	Load default data. Display shows "NEW" for 1 second. <b>Caution!</b> <b>All presets from the customer will be lost!!</b>
ENCODER TEST	Volume Knob or Jog Shuttle knob	Display shows value for 2 seconds. Values increases or decreases in steps of 1 until 0 (Min.) or 40 (Max.) is reached.
LEAVE SERVICE TESTPROGRAM	Disconnect mains cord	

# SET BLOCK DIAGRAM



**LEGEND:**

- mW AC SIGNAL LEVEL
- $\rightarrow$  SIGNAL FLOW
- $\rightarrow$  CONTROL SIGNAL

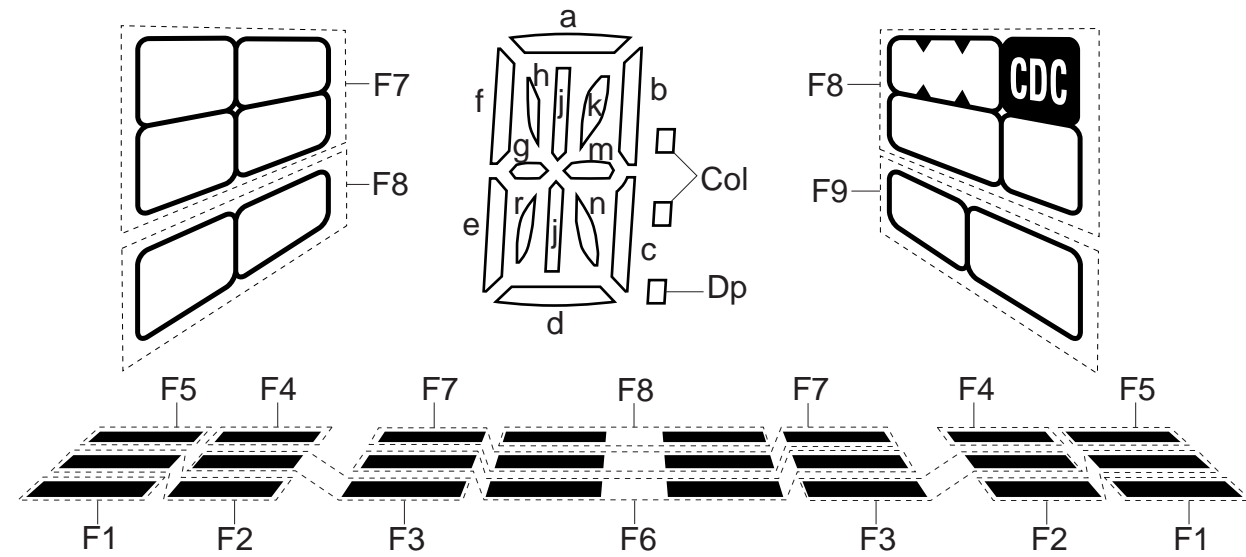
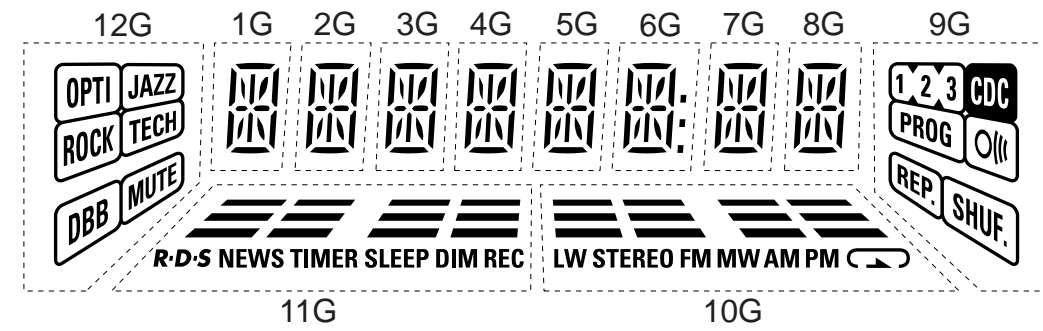
ALL OUTPUTS FROM SOURCES ARE 1kHz, 6dB UNLESS STATED OTHERWISE.

# SIMPLE KARAOKE FEATURE ONLY FOR -21 VER.





FTD DISPLAY PIN CONNECTIONS



# FRONT BOARD

TABLE OF CONTENTS

FTD Display pin connection ..... 6-1  
 Variation Table ..... 6-2  
 Circuit diagram ..... 6-3  
 Component Layout ..... 6-4  
 Chip layout ..... 6-5  
 Electrical parts list ..... 6-6

	1G - 5G	6G	7G - 8G	9G	10G	11G	12G
P1	a	a	a	1	F1	F1	OPTI
P2	h	h	h	2	F2	F2	JAZZ
P3	j	j	j	3	F3	F3	TECH
P4	k	k	k	⏸	F4	F4	MUTE
P5	b	b	b	SHUF.	F5	F5	DBB
P6	f	f	f	REP.	F6	F6	ROCK
P7	m	m	m	PROG	F7	F7	F7
P8	g	g	g	F8	F8	F8	F8
P9	c	c	c	F9	LW	R-D-S	-
P10	e	e	e	-	STEREO	NEWS	-
P11	r	r	r	-	FM	TIMER	-
P12	n	n	n	-	MW	SLEEP	-
P13	d	d	d	-	AM	DIM	-
P14	-	Col	-	-	PM	REC	-
P15	-	Dp	-	-	▶	-	-
P16	-	-	-	-	↶	-	-

Front Board application

A53920	FW-C200/12/21/21M/33
A53930	FW-C220/22/34
A53950	FW-C100/21/21M/22/30/33/34/37
A53970	FW-C250/37
A53980	FW-C250/18/19/21
A53990	FW-C280/22/34
A54000	FW-C290/18/19/21
A54340	FW-C200/30

FEATURES:	A53920	A53930	A53950	A53970	A53980	A53990	A54000	A54340		
RDS	-	x	-	-	-	x	-	-		
Rotary Encoder	x	x	-	x	x	x	x	x		
Jog Encoder	-	-	-	x	x	x	x	-		
Spectrum Analyzer	-	-	-	-	-	x	x	-		
Biplaner LED	x	x	-	x	x	x	x	x		
Small FTD	x	x	x	x	x	-	-	x		
Large FTD	-	-	-	-	-	x	x	-		
NTC	-	-	-	-	x	-	x	-		
LED Control	x	x	-	x	x	x	x	x		

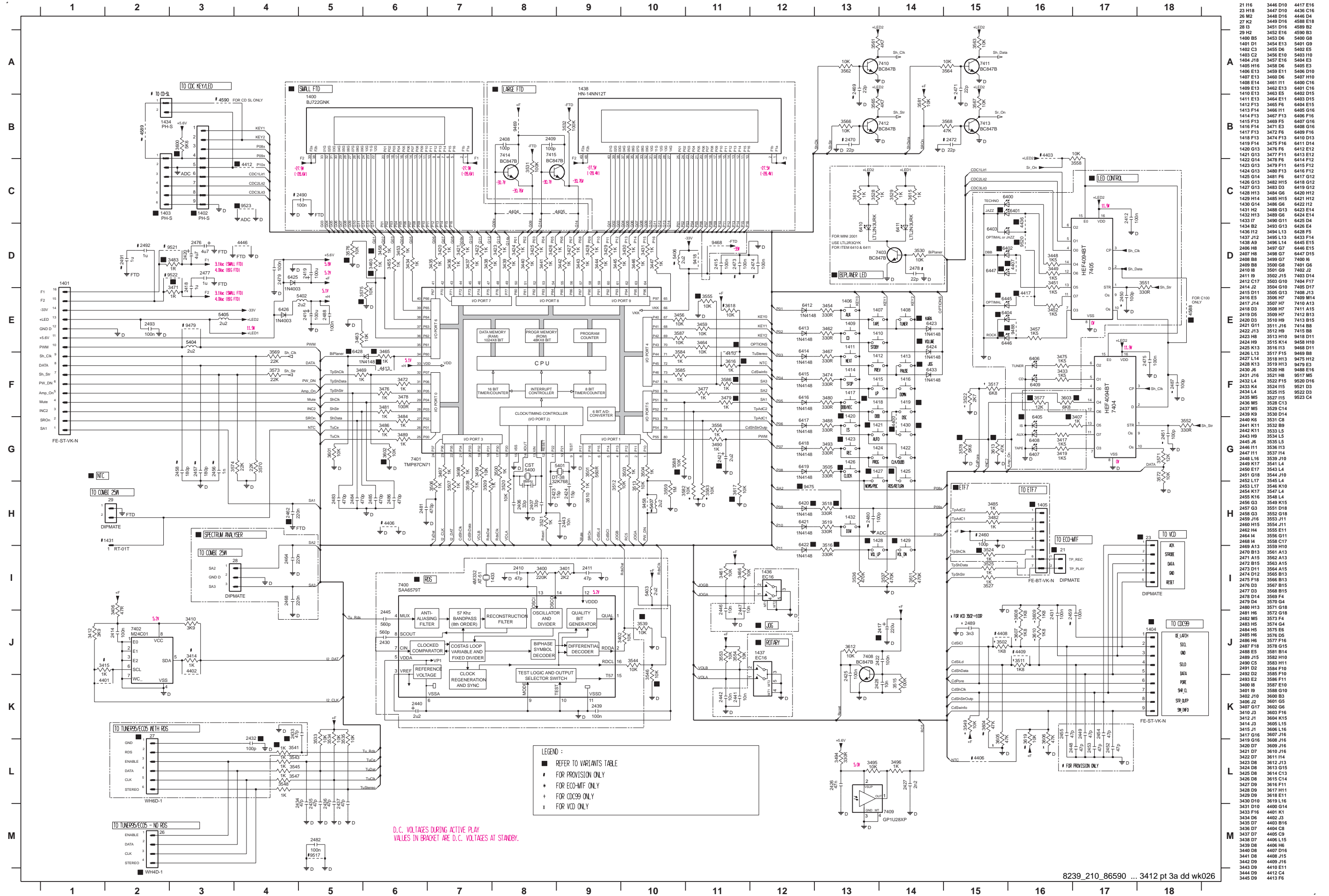
Variations table for Front Board

ITEM NO.	A53920	A53930	A53950	A53970	A53980	A53990	A54000	A54340		
DM21	-	-	x	x	x	-	-	-		
DM23	-	-	-	-	-	-	-	-		
DM26	x	-	x	x	x	-	x	x		
DM27	-	x	-	-	-	x	-	-		
DM29	-	-	-	-	x	-	x	-		
1402	-	-	-	-	-	x	x	-		
1403	x	x	x	x	x	-	-	x		
1404	x	x	x	x	x	x	x	x		
1405	x	x	-	-	-	x	x	x		
1418	-	-	-	-	-	x	x	x		
1419	-	-	-	-	-	x	x	x		
1420	-	-	-	-	-	x	x	x		
1421	x	x	-	-	-	x	x	x		
1423	x	x	-	-	-	x	x	x		
1425	-	x	-	-	-	x	-	-		
1426	x	x	-	-	-	x	x	x		
1427	-	x	-	-	-	x	-	-		
1428	-	-	x	-	-	-	-	-		
1429	-	-	x	-	-	-	-	-		
1430	x	x	x	-	-	-	-	-		
2417	220µF	220µF	-	220µF	220µF	220µF	220µF	220µF		
2421	22µF	22µF	2,2µF	22µF	22µF	22µF	22µF	22µF		
2432	-	100pF	-	-	-	100pF	-	-		
2433	-	47pF	-	-	-	47pF	-	-		
2462	220nF	220nF	-	220nF	220nF	220nF	220nF	220nF		

ITEM NO.	A53920	A53930	A53950	A53970	A53980	A53990	A54000	A54340		
3407	-	-	-	-	-	1k	1k	1k		
3458	-	-	-	-	-	1k	1k	1k		
3460	-	-	-	-	-	1k	1k	1k		
3465	1k	1k	-	1k	1k	1k	1k	1k		
3471	4R7	4R7	4R7	4R7	4R7	1R	1R	1R		
3479	1k	1k	-	1k	1k	1k	1k	1k		
3483	4R7	4R7	4R7	4R7	4R7	1R	1R	1R		
3516	-	-	330R	-	-	-	-	-		
3518	-	-	-	-	-	330R	330R	-		
3524	1k	1k	-	-	-	1k	1k	1k		
3539	10k	-	10k	10k	10k	-	10k	10k		
3541	-	1k	-	-	-	1k	-	-		
3546	10k	-	10k	10k	10k	-	10k	10k		
3555	10k	10k	10k	10k	10k	-	-	10k		
3575	10k	10k	10k	10k	10k	-	-	10k		
3576	10k	10k	10k	10k	10k	-	-	10k		
3577	-	-	-	-	-	12k	12k	-		
3578	-	-	-	-	-	5k6	5k6	-		
3586	-	-	-	-	-	1k	1k	-		
3588	-	-	10k	-	-	-	-	-		
3600	5k6	5k6	5k6	5k6	5k6	-	-	-		
3602	-	-	10k	10k	10k	-	-	-		
3603	10k	10k	6k8	10k	10k	10k	10k	10k		
3613	12k	12k	47k	12k	12k	12k	12k	12k		
3616	-	-	-	-	1k	-	1k	-		
3617	10k	10k	10k	10k	-	10k	-	10k		
4400	x	x	x	-	-	-	-	x		
4407	x	x	-	x	x	-	-	x		
4410	x	x	x	x	-	x	-	x		
4412	-	-	-	-	-	x	x	-		
4413	-	-	x	-	-	-	-	-		
4417	x	x	-	-	-	-	-	x		
4436	x	x	-	-	-	-	-	x		
4588	-	-	x	-	-	-	-	-		
6401	-	-	-	x	x	x	x	-		
6402	-	-	-	x	x	x	x	-		
6404	-	-	-	x	x	x	x	-		
6405	-	-	-	-	-	x	x	-		
6420	-	-	-	-	-	x	x	-		
6422	-	-	x	-	-	-	-	-		
6423	x	-	-	-	x	-	x	-		
6424	-	-	-	x	x	-	-	-		
6428	x	x	-	x	x	x	x	x		
6433	-	-	-	x	x	-	-	-		
6445	x	x	-	-	-	-	-	x		
6446	x	x	-	-	-	-	-	x		
6447	x	x	-	x	x	-	-	x		
9475	x	x	x	x	x	-	-	x		
9488	-	-	-	x	x	x	x	-		
9520	-	-	-	x	x	x	x	-		
9523	x	x	x	x	x	-	-	x		

x = Item in use.

CIRCUIT DIAGRAM

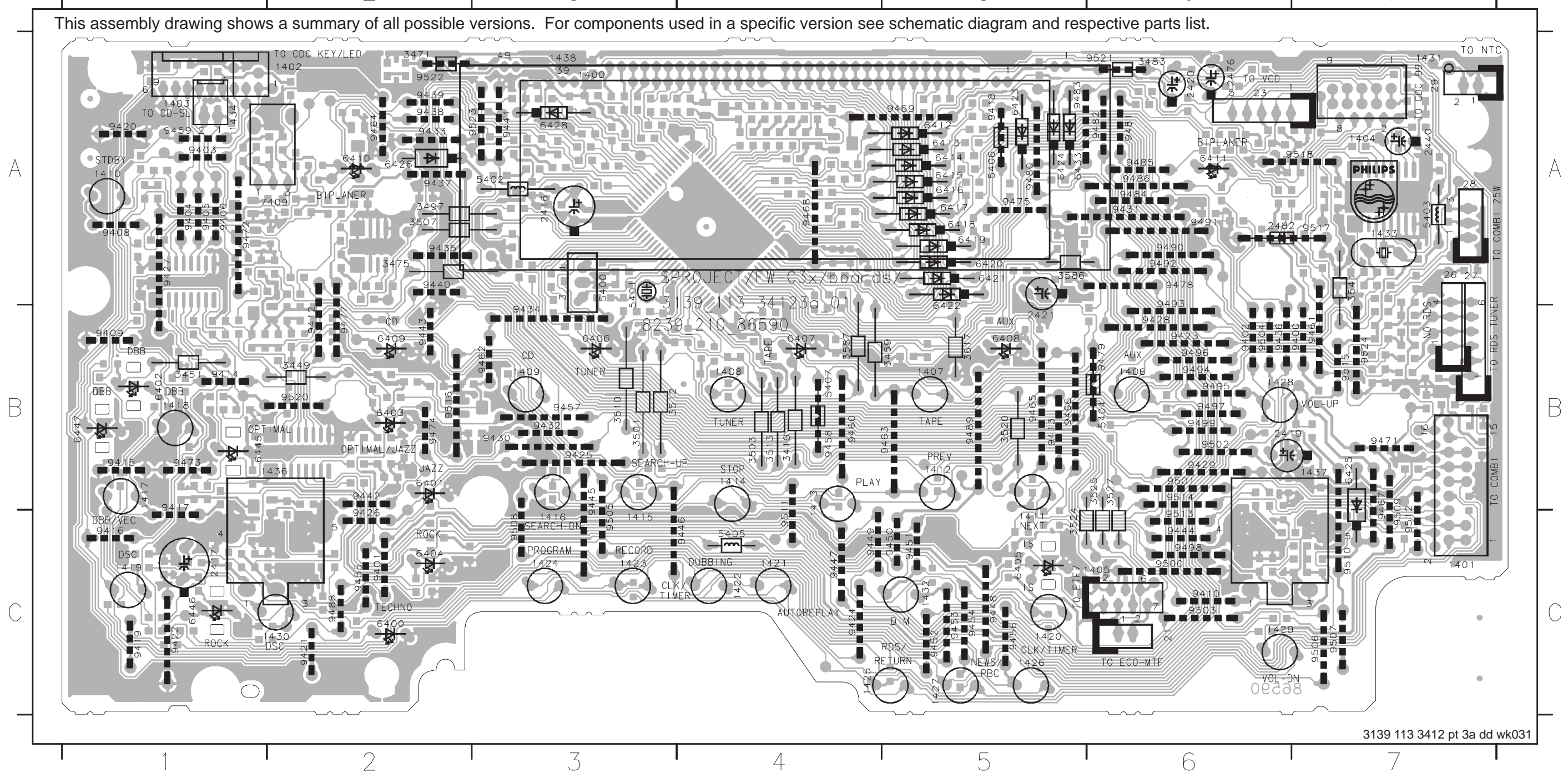


21 H6	3446 D10	4417 E16
23 H8	3447 D10	4436 C16
26 M2	3448 D16	4446 D4
27 K2	3449 D16	4588 E18
28 I3	3451 D16	4589 B2
29 H2	3452 E16	4590 B3
1400 B5	3453 D6	5400 B8
1401 D1	3454 E13	5401 G9
1402 C3	3455 D6	5402 E5
1403 C2	3456 E10	5403 H10
1404 J18	3457 E16	5404 E3
1405 H16	3458 D6	5405 E3
1406 E13	3459 E11	5406 D10
1407 E13	3460 D6	5407 H10
1408 E14	3461 H11	6400 C16
1409 E13	3462 E13	6401 C16
1410 E13	3463 E5	6402 D15
1411 E13	3464 E11	6403 D15
1412 F13	3465 F6	6404 E15
1413 F14	3466 H11	6405 G16
1414 F13	3467 F13	6406 F16
1415 F13	3469 F5	6407 G16
1416 F14	3471 E3	6408 G16
1417 F13	3472 F6	6409 F16
1418 F13	3474 F13	6410 D13
1419 F14	3475 F16	6411 D14
1420 G13	3476 F6	6412 E12
1421 G13	3477 F11	6413 E12
1422 G14	3478 F6	6414 F12
1423 G13	3479 F11	6415 F12
1424 G13	3480 F13	6416 F12
1425 G14	3481 F6	6417 G12
1426 G13	3482 H5	6418 G12
1427 G13	3483 D3	6419 G12
1428 H13	3484 G6	6420 H12
1429 H14	3485 H15	6421 H12
1430 G14	3486 G6	6422 H12
1431 H2	3488 G13	6423 E14
1432 H3	3489 G6	6424 E14
1433 I7	3490 H14	6425 G14
1434 B2	3493 G13	6426 E4
1436 I12	3494 L13	6428 F5
1437 J12	3495 L13	6433 F14
1438 A9	3496 L14	6445 E15
2406 H8	3497 G7	6446 E15
2407 H8	3498 G7	6447 D15
2408 B8	3500 G8	7401 G6
2410 H8	3501 G9	7402 J2
2411 B9	3502 J10	7403 D14
2412 C17	3503 G10	7404 F17
2414 J2	3504 H10	7405 D17
2415 D11	3505 G13	7406 D13
2416 E5	3506 H7	7409 M14
2417 J14	3507 H7	7410 A13
2418 D3	3508 H7	7411 A15
2419 D5	3509 H7	7412 B13
2420 D3	3510 H9	7413 B15
2421 G11	3511 J16	7414 B8
2422 J13	3512 H10	7415 B8
2423 H8	3513 H10	9418 D11
2424 H9	3515 K14	9458 H10
2425 K13	3516 H13	9472 H12
2426 L13	3517 F15	9469 B8
2427 L14	3518 H13	9475 H12
2428 K13	3519 H13	9479 E3
2430 J6	3520 H8	9478 E3
2431 J16	3521 H8	9517 M5
2432 L4	3522 F15	9520 D16
2433 K4	3523 H10	9521 D3
2434 L4	3525 H15	9522 D3
2435 M5	3527 H15	9523 C4
2436 M5	3528 C13	
2437 M5	3529 C14	
2439 K9	3530 D19	
2440 K6	3531 C3	
2441 K11	3532 B9	
2442 K11	3533 L5	
2443 H9	3534 L5	
2445 J6	3535 L5	
2446 H11	3536 H3	
2447 H11	3537 H4	
2448 L16	3539 J10	
2449 K17	3541 L4	
2450 E17	3543 L4	
2451 G18	3544 J10	
2452 L17	3545 L4	
2453 L17	3546 K10	
2454 K17	3547 L4	
2455 K16	3548 L4	
2456 G3	3549 K15	
2457 G3	3551 D18	
2458 G3	3552 G13	
2459 J16	3553 J11	
2460 H15	3554 J11	
2462 H4	3555 E11	
2464 I4	3556 G11	
2468 I4	3558 C17	
2469 A13	3559 H10	
2470 B13	3561 A13	
2471 A15	3562 A13	
2472 B15	3563 A15	
2473 D11	3564 A15	
2474 D12	3565 B13	
2475 F18	3566 B13	
2476 G18	3567 B15	
2477 D3	3568 B15	
2478 D4	3569 F4	
2479 D4	3570 G4	
2480 H13	3571 H18	
2481 H6	3572 G18	
2482 M5	3573 F4	
2483 H5	3574 G4	
2484 H5	3575 E6	
2485 H6	3576 D5	
2486 H6	3577 F16	
2487 F18	3578 G15	
2488 E5	3581 B14	
2489 J15	3582 H10	
2490 C5	3583 H11	
2491 D2	3584 F10	
2492 D2	3585 F10	
2493 E2	3586 F11	
3400 I8	3587 E10	
3401 I9	3588 E10	
3402 J10	3589 B3	
3406 J2	3601 G5	
3407 G17	3602 G6	
3410 L3	3603 F16	
3412 J1	3604 K15	
3414 J3	3605 L15	
3415 J1	3606 L16	
3417 G16	3607 J16	
3419 G16	3608 J16	
3420 D7	3609 J16	
3421 D7	3610 J16	
3422 D7	3611 I4	
3423 D8	3612 J13	
3424 D8	3613 G15	
3425 D8	3614 C13	
3426 D8	3615 C14	
3427 D9	3616 F11	
3428 D9	3617 H11	
3429 D9	3618 E11	
3430 D18	3619 L16	
3431 D10	4400 G14	
3433 F16	4401 K1	
3434 D6	4402 J3	
3435 D7	4403 B16	
3436 D7	4404 C8	
3437 D7	4405 C9	
3438 D7	4406 L15	
3439 D8	4406 H6	
3440 D8	4407 D16	
3441 D8	4408 J15	
3442 D9	4409 J16	
3443 D9	4410 E11	
3444 D9	4411 C4	
3445 D9	4413 F6	

# COMPONENT LAYOUT

14001	C6	14006	B5	14011	C7	14016	B1	14021	C6	14026	B5	14031	C7	14036	B1	14041	C6	14046	B5	14051	C7	14056	B1
14002	A7	14007	A6	14012	A7	14017	A6	14022	A7	14027	A6	14032	A7	14037	A6	14042	A7	14047	A6	14052	A7	14057	A6
14003	A7	14008	A6	14013	A7	14018	A6	14023	A7	14028	A6	14033	A7	14038	A6	14043	A7	14048	A6	14053	A7	14058	A6
14004	A7	14009	A6	14014	A7	14019	A6	14024	A7	14029	A6	14034	A7	14039	A6	14044	A7	14049	A6	14054	A7	14059	A6
14005	C6	14010	B5	14015	C7	14020	B1	14025	C6	14030	B5	14035	C7	14040	B1	14045	C6	14050	B5	14055	C7	14060	B1

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





## ELECTRICAL PARTS LIST - FRONT BOARD

## MISCELLANEOUS

1400	3139 110 52070	FTD Display BJ722GNK
1401	2422 025 14546	Flex Socket 16pin Hort.
1404	4822 265 11531	Flex Socket 9pin Hort.
1406	4822 276 13775	Tact Switch
1407	4822 276 13775	Tact Switch
1408	4822 276 13775	Tact Switch
1409	4822 276 13775	Tact Switch
1410	4822 276 13775	Tact Switch
1411	4822 276 13775	Tact Switch
1412	4822 276 13775	Tact Switch
1413	4822 276 13775	Tact Switch
1414	4822 276 13775	Tact Switch
1415	4822 276 13775	Tact Switch
1416	4822 276 13775	Tact Switch
1422	4822 276 13775	Tact Switch
1424	4822 276 13775	Tact Switch
1428	4822 276 13775	Tact Switch
1429	4822 276 13775	Tact Switch
1430	4822 276 13775	Tact Switch
1432	4822 276 13775	Tact Switch

## CAPACITORS

2406	5322 122 32659	33pF 5% 50V
2407	5322 122 32659	33pF 5% 50V
2414	4822 126 13838	100nF +80/-20% 50V
2415	4822 126 14585	100nF 10% 50V
2416	4822 124 23432	100µF 20% 10V
2418	4822 126 14043	1µF +80/-20% 16V
2419	4822 124 41584	100µF 20% 10V
2420	4822 124 12032	4,7µF 20% 50V
2421	4822 124 22652	2,2µF 20% 50V
2422	4822 126 14585	100nF 10% 50V
2423	4822 126 13486	15pF 2% 63V
2424	4822 126 13486	15pF 2% 63V
2425	4822 126 13838	100nF +80/-20% 50V
2426	4822 126 13751	47nF 10% 63V
2427	4822 122 33127	2,2nF 10% 63V
2428	4822 122 33177	10nF 20% 50V
2431	4822 126 14585	100nF 10% 50V
2434	4822 126 13692	47pF 1% 63V
2435	4822 126 13692	47pF 1% 63V
2436	4822 126 13692	47pF 1% 63V
2437	4822 126 13692	47pF 1% 63V
2443	4822 122 33177	10nF 20% 50V
2475	4822 126 14585	100nF 10% 50V
2476	4822 124 12032	4,7µF 20% 50V
2477	4822 126 14043	1µF +80/-20% 16V
2479	4822 126 14585	100nF 10% 50V
2481	5322 122 32268	470pF 10% 50V
2482	4822 126 12882	100nF +80/-20% 50V
2483	5322 122 32268	470pF 10% 50V
2484	5322 122 32268	470pF 10% 50V

2485	5322 122 32268	470pF 10% 50V
2486	5322 122 32268	470pF 10% 50V
2488	4822 126 14585	100nF 10% 50V
2489	4822 122 33891	3,3nF 10% 63V
2493	4822 126 14585	100nF 10% 50V

## RESISTORS

3406	4822 051 20479	47R 5% 0,1W
3410	4822 051 20392	3k9 5% 0,1W
3412	4822 051 20392	3k9 5% 0,1W
3420	4822 051 10102	1k 2% 0,25W
3421	4822 051 10102	1k 2% 0,25W
3422	4822 051 10102	1k 2% 0,25W
3423	4822 051 10102	1k 2% 0,25W
3424	4822 051 10102	1k 2% 0,25W
3425	4822 051 10102	1k 2% 0,25W
3426	4822 051 10102	1k 2% 0,25W
3427	4822 051 10102	1k 2% 0,25W
3428	4822 051 10102	1k 2% 0,25W
3429	4822 051 10102	1k 2% 0,25W
3430	4822 051 10102	1k 2% 0,25W
3431	4822 051 10102	1k 2% 0,25W
3434	4822 051 10102	1k 2% 0,25W
3435	4822 051 10102	1k 2% 0,25W
3436	4822 051 10102	1k 2% 0,25W
3437	4822 051 10102	1k 2% 0,25W
3438	4822 051 10102	1k 2% 0,25W
3439	4822 051 10102	1k 2% 0,25W
3440	4822 051 10102	1k 2% 0,25W
3441	4822 051 10102	1k 2% 0,25W
3442	4822 051 10102	1k 2% 0,25W
3443	4822 051 10102	1k 2% 0,25W
3444	4822 051 10102	1k 2% 0,25W
3445	4822 051 10102	1k 2% 0,25W
3446	4822 051 10102	1k 2% 0,25W
3447	4822 051 10102	1k 2% 0,25W
3453	4822 051 10102	1k 2% 0,25W
3454	4822 117 13577	330R 1% 0,1W
3455	4822 051 10102	1k 2% 0,25W
3456	4822 117 10833	10k 1% 0,1W
3459	4822 050 21003	10k 1% 0,6W
3461	4822 117 10833	10k 1% 0,1W
3462	4822 117 13577	330R 1% 0,1W
3463	4822 117 10833	10k 1% 0,1W
3464	4822 117 10833	10k 1% 0,1W
3466	4822 117 10833	10k 1% 0,1W
3467	4822 117 13577	330R 1% 0,1W
3469	4822 051 10102	1k 2% 0,25W
3471	4822 050 24708	4R7 1% 0,6W
3472	4822 051 10102	1k 2% 0,25W
3474	4822 117 13577	330R 1% 0,1W
3476	4822 051 10102	1k 2% 0,25W

## ELECTRICAL PARTS LIST - FRONT BOARD

3477	4822 051 10102	1k 2% 0,25W
3478	4822 051 20101	100R 5% 0,1W
3480	4822 117 13577	330R 1% 0,1W
3481	4822 051 10102	1k 2% 0,25W
3483	4822 050 24708	4R7 1% 0,6W
3484	4822 051 10102	1k 2% 0,25W
3486	4822 051 10102	1k 2% 0,25W
3488	4822 117 13577	330R 1% 0,1W
3489	4822 051 10102	1k 2% 0,25W
3490	4822 051 10102	1k 2% 0,25W
3493	4822 117 13577	330R 1% 0,1W
3494	4822 117 13577	330R 1% 0,1W
3495	4822 117 10833	10k 1% 0,1W
3496	4822 051 10102	1k 2% 0,25W
3497	4822 050 11002	1k 1% 0,4W
3498	4822 051 10102	1k 2% 0,25W
3499	4822 117 10833	10k 1% 0,1W
3500	4822 051 10102	1k 2% 0,25W
3501	4822 116 52226	560R 5% 0,5W
3502	4822 051 20182	1k8 5% 0,1W
3503	4822 050 11002	1k 1% 0,4W
3504	4822 051 10102	1k 2% 0,25W
3505	4822 117 13577	330R 1% 0,1W
3506	4822 051 10102	1k 2% 0,25W
3507	4822 050 11002	1k 1% 0,4W
3508	4822 051 10102	1k 2% 0,25W
3509	4822 051 10102	1k 2% 0,25W
3510	4822 050 11002	1k 1% 0,4W
3511	4822 051 20182	1k8 5% 0,1W
3512	4822 050 21003	10k 1% 0,6W
3513	4822 050 21003	10k 1% 0,6W
3515	4822 117 10837	100k 1% 0,1W
3516	4822 117 13577	330R 1% 0,1W
3517	4822 117 11507	6k8 1% 0,1W
3519	4822 117 13577	330R 1% 0,1W
3520	4822 050 21003	10k 1% 0,6W
3521	4822 051 10102	1k 2% 0,25W
3522	4822 117 12955	2k7 1% 0,1W
3525	4822 050 11002	1k 1% 0,4W
3527	4822 050 11002	1k 1% 0,4W
3533	4822 117 10833	10k 1% 0,1W
3534	4822 117 10833	10k 1% 0,1W
3535	4822 117 10833	10k 1% 0,1W
3536	4822 051 20474	470k 5% 0,1W
3537	4822 051 20474	470k 5% 0,1W
3539	4822 117 10833	10k 1% 0,1W
3543	4822 051 10102	1k 2% 0,25W
3545	4822 051 10102	1k 2% 0,25W
3546	4822 117 10833	10k 1% 0,1W
3547	4822 051 10102	1k 2% 0,25W
3548	4822 051 10102	1k 2% 0,25W
3549	4822 117 10833	10k 1% 0,1W

3552	4822 117 13577	330R 1% 0,1W
3553	4822 117 10833	10k 1% 0,1W
3554	4822 117 10833	10k 1% 0,1W
3555	4822 117 10833	10k 1% 0,1W
3556	4822 051 10102	1k 2% 0,25W
3558	4822 117 10833	10k 1% 0,1W
3559	4822 051 20105	1M 5% 0,1W
3561	4822 051 20472	4k7 5% 0,1W
3562	4822 117 10833	10k 1% 0,1W
3563	4822 117 10833	10k 1% 0,1W
3564	4822 117 10833	10k 1% 0,1W
3565	4822 051 20472	4k7 5% 0,1W
3566	4822 117 10833	10k 1% 0,1W
3567	4822 117 10833	10k 1% 0,1W
3568	4822 117 10834	47k 1% 0,1W
3569	4822 051 20223	22k 5% 0,1W
3570	4822 051 20223	22k 5% 0,1W
3571	4822 117 11383	12k 1% 0,1W
3572	4822 117 10833	10k 1% 0,1W
3573	4822 051 20223	22k 5% 0,1W
3574	4822 051 20223	22k 5% 0,1W
3575	4822 117 10833	10k 1% 0,1W
3576	4822 117 10833	10k 1% 0,1W
3581	4822 117 10833	10k 1% 0,1W
3582	4822 117 10833	10k 1% 0,1W
3583	4822 117 10833	10k 1% 0,1W
3584	4822 051 10102	1k 2% 0,25W
3585	4822 051 10102	1k 2% 0,25W
3587	4822 050 21003	10k 1% 0,6W
3588	4822 117 10833	10k 1% 0,1W
3600	4822 051 20562	5k6 5% 0,1W
3601	4822 117 10833	10k 1% 0,1W
3602	4822 117 10833	10k 1% 0,1W
3603	4822 117 11507	6k8 1% 0,1W
3607	4822 051 20182	1k8 5% 0,1W
3608	4822 051 20182	1k8 5% 0,1W
3609	4822 051 20182	1k8 5% 0,1W
3610	4822 051 20182	1k8 5% 0,1W
3611	4822 051 20474	470k 5% 0,1W
3612	4822 117 10833	10k 1% 0,1W
3613	4822 117 10834	47k 1% 0,1W
3617	4822 050 21003	10k 1% 0,6W
4400	4822 051 20008	OR Jumper 0805
4401	4822 051 20008	OR Jumper 0805
4402	4822 051 20008	OR Jumper 0805
4404	4822 051 20008	OR Jumper 0805
4405	4822 051 20008	OR Jumper 0805
4407	4822 051 20008	OR Jumper 0805
4410	4822 051 20008	OR Jumper 0805
4413	4822 051 20008	OR Jumper 0805
4414	4822 051 20008	OR Jumper 0805
4416	4822 051 20008	OR Jumper 0805



**ELECTRICAL PARTS LIST - FRONT BOARD****RESISTORS**

4521	4822 051 20008	OR Jumper 0805
4522	4822 051 20008	OR Jumper 0805
4523	4822 051 20008	OR Jumper 0805
4524	4822 051 20008	OR Jumper 0805
4525	4822 051 20008	OR Jumper 0805
4526	4822 051 20008	OR Jumper 0805
4527	4822 051 20008	OR Jumper 0805
4528	4822 051 20008	OR Jumper 0805
4529	4822 051 20008	OR Jumper 0805
4530	4822 051 20008	OR Jumper 0805
4531	4822 051 20008	OR Jumper 0805
4532	4822 051 20008	OR Jumper 0805
4533	4822 051 20008	OR Jumper 0805
4534	4822 051 20008	OR Jumper 0805
4535	4822 051 20008	OR Jumper 0805
4536	4822 051 20008	OR Jumper 0805
4537	4822 051 20008	OR Jumper 0805
4538	4822 051 20008	OR Jumper 0805
4539	4822 051 20008	OR Jumper 0805
4540	4822 051 20008	OR Jumper 0805
4541	4822 051 20008	OR Jumper 0805
4542	4822 051 20008	OR Jumper 0805
4543	4822 051 20008	OR Jumper 0805
4544	4822 051 20008	OR Jumper 0805
4545	4822 051 20008	OR Jumper 0805
4546	4822 051 20008	OR Jumper 0805
4547	4822 051 20008	OR Jumper 0805
4588	4822 051 20008	OR Jumper 0805
4589	4822 051 20008	OR Jumper 0805

**COILS & FILTERS**

5400	4822 242 72066	Ceram Resonator 8MHz
5401	2422 543 01069	Crystal 32,768kHz
5402	4822 157 62552	Coil 2,2 $\mu$ H 5%
5404	4822 157 62552	Coil 2,2 $\mu$ H 5%
5405	4822 157 62552	Coil 2,2 $\mu$ H 5%

**DIODES**

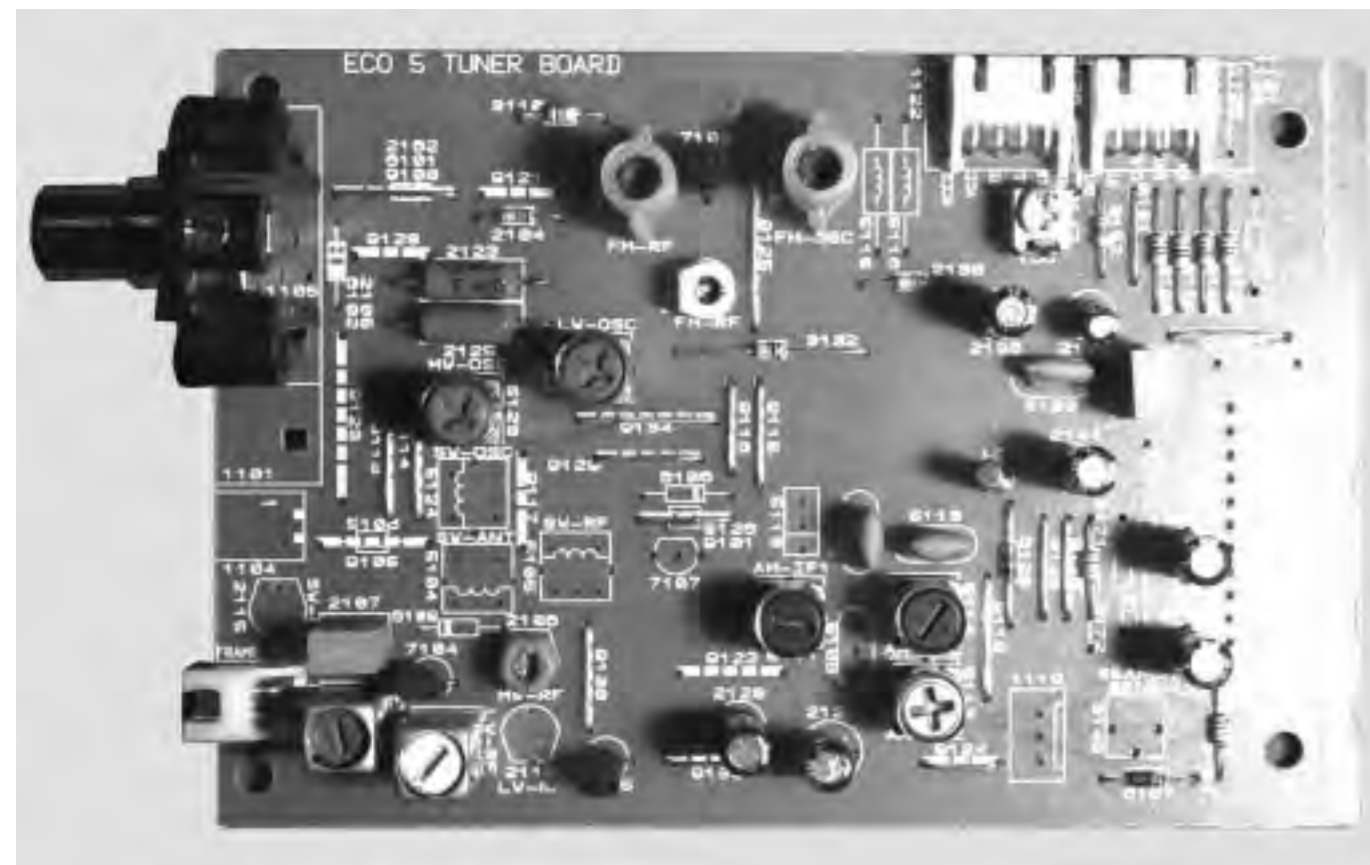
6412	4822 130 30621	1N4148
6413	4822 130 30621	1N4148
6414	4822 130 30621	1N4148
6415	4822 130 30621	1N4148
6416	4822 130 30621	1N4148
6417	4822 130 30621	1N4148
6418	4822 130 30621	1N4148
6419	4822 130 30621	1N4148
6421	4822 130 30621	1N4148
6422	4822 130 30621	1N4148
6425	4822 130 31878	1N4003G
6426	4822 130 31878	1N4003G

**TRANSISTORS & INTEGRATED CIRCUITS**

7401	3139 110 52500	TMP87CP71F "C100S52501"
7402	9965 000 04931	M24C01-WMN6
7404	5322 209 11306	HEF4094BT
7408	5322 130 60159	BC847B
7409	4822 130 10165	GP1U28XP
7410	5322 130 60159	BC847B
7411	5322 130 60159	BC847B
7412	5322 130 60159	BC847B
7413	5322 130 60159	BC847B

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





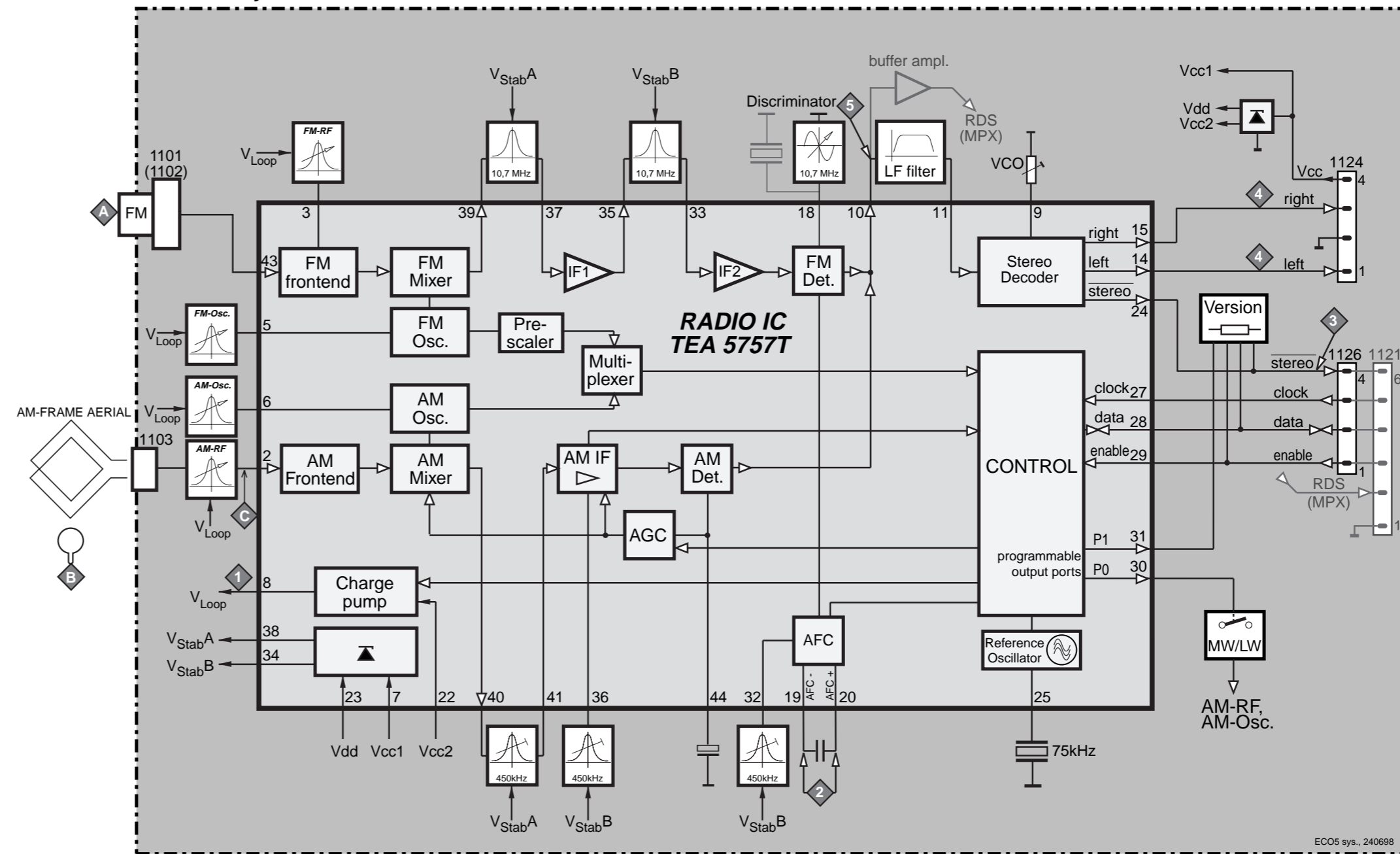
# TUNER BOARD ECO5

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**BLOCKDIAGRAM**

**TUNER BOARD  
ECO 5 systems**



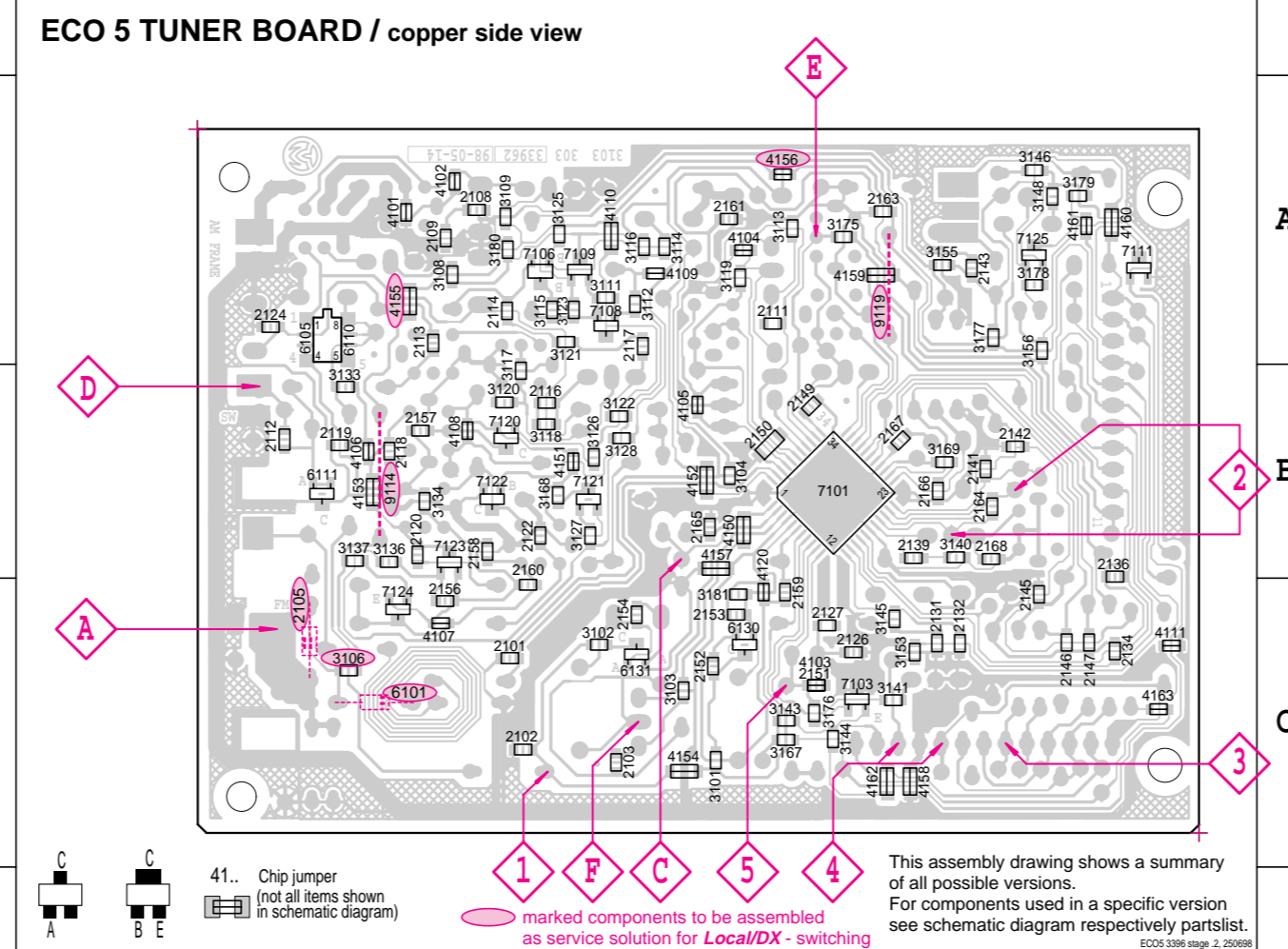
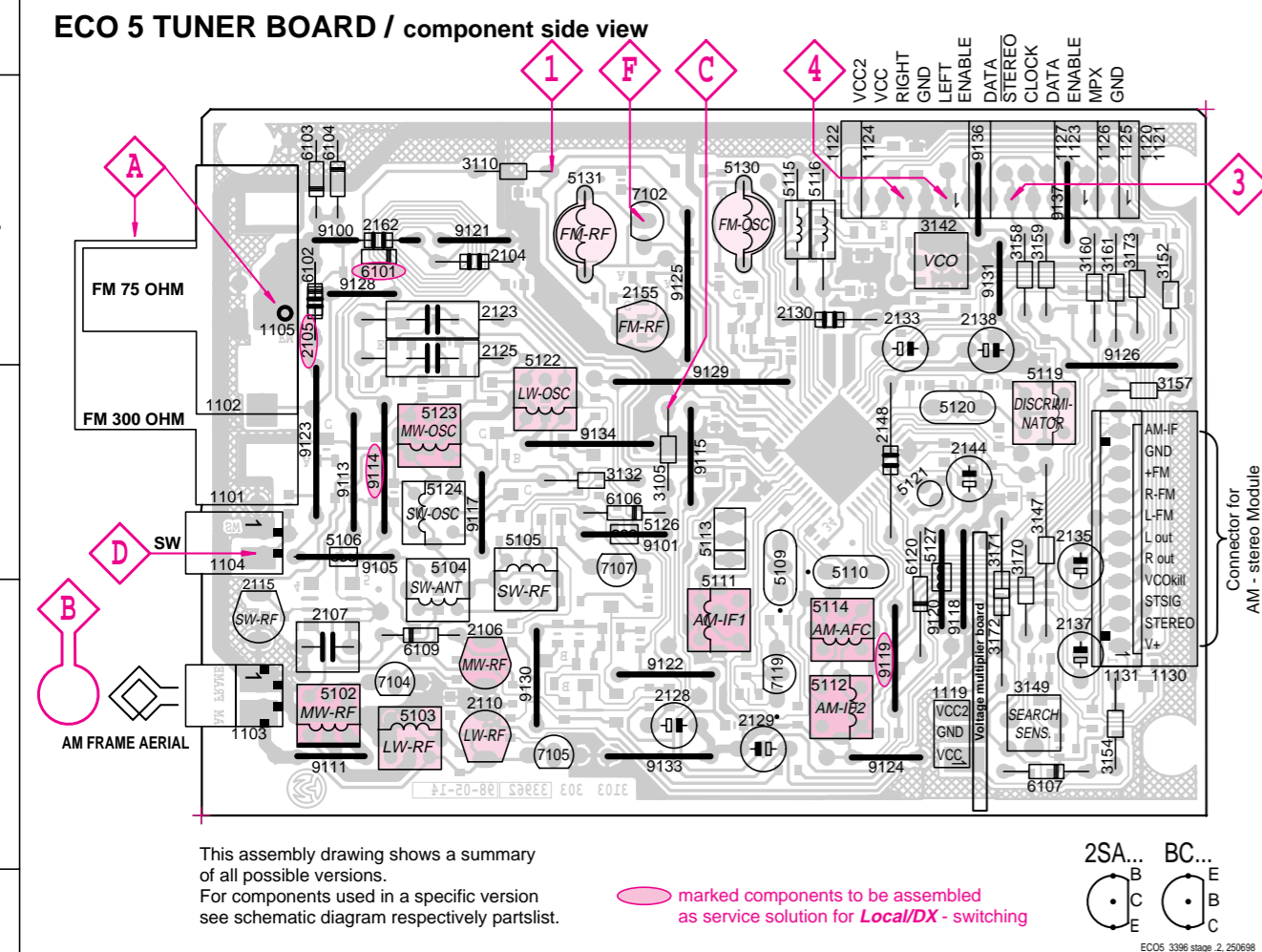
ECO5 sys., 240698

1101 A1	2106 C2	2137 C5	3149 C5	3173 A5	5114 C4	5130 A3	7104 C2	9117 B2	9129 B3
1102 A1	2107 C2	2138 A5	3152 A5	5102 C2	5115 A4	5131 A3	7105 C3	9118 B4	9130 C3
1103 C1	2110 C2	2144 B5	3154 C5	5103 C2	5116 A4	6101 A2	7107 B3	9119 C4	9131 A5
1104 B1	2115 C1	2148 B4	3157 B5	5104 C2	5119 B5	6102 A1	7119 C4	9120 B4	9133 C3
1105 A1	2123 A2	2155 A3	3158 A5	5105 B2	5120 B4	6103 A1	9100 A2	9121 A2	9134 B3
1119 C5	2125 A2	2162 A2	3159 A5	5106 B2	5121 B4	6104 A2	9101 B3	9122 C3	9136 A5
1120 A5	2128 C3	3105 B3	3160 A5	5109 B4	5122 B3	6106 B3	9105 B2	9123 B1	9137 A5
1130 B5	2129 C4	3110 A2	3161 A5	5110 B4	5123 B2	6107 C5	9111 C2	9124 C4	
1131 B5	2130 A4	3132 B3	3170 C5	5111 C3	5124 B2	6109 C2	9113 B2	9125 A3	
2104 A2	2133 A4	3142 A4	3171 C5	5112 C4	5126 B3	6120 C4	9114 B2	9126 B5	
2105 A1	2135 B5	3147 B5	3172 C5	5113 B3	5127 B4	7102 A3	9115 B3	9128 A2	

2101 C4	2118 B4	2139 B2	2153 C3	2166 B2	3112 A3	3123 A3	3143 C2	3175 A2	4105 B3	4153 B4	6105 A4	7120 B4
2102 C4	2119 B4	2141 B1	2154 C3	2167 B2	3113 A2	3125 A3	3144 C2	3176 C2	4106 B4	4154 C3	6110 A4	7121 B3
2103 C3	2120 B4	2142 B1	2156 C4	2168 B1	3114 A3	3126 B3	3145 C2	3177 A1	4107 C4	4155 A4	6111 B4	7122 B4
2108 A4	2122 B3	2143 A1	2157 B4	3101 C3	3115 A3	3127 B3	3146 A1	3178 A1	4108 B4	4156 A2	6130 C2	7123 B4
2109 A4	2124 A5	2145 C1	2158 B4	3102 C3	3116 A3	3128 B3	3148 A1	3179 A1	4109 A3	4157 B3	6131 C3	7124 C4
2111 A2	2126 C2	2146 C1	2159 C2	3103 C3	3117 B4	3133 B4	3153 C2	3180 A4	4110 A3	4158 C2	7101 B2	7125 A1
2112 B5	2127 C2	2147 C1	2160 C4	3104 B3	3118 B3	3134 B4	3155 A2	3181 C3	4111 C1	4159 A2	7103 C2	
2113 A4	2131 C2	2149 B2	2161 A3	3106 C4	3119 A3	3136 B4	3156 A1	4101 A4	4120 C2	4160 A1	7106 A3	
2114 A4	2132 C1	2150 B2	2163 A2	3108 A4	3120 B4	3137 B4	3167 C2	4102 A4	4150 B2	4161 A1	7108 A3	
2116 B3	2134 C1	2151 C2	2164 B1	3109 A4	3121 A3	3140 B2	3168 B3	4103 C2	4151 B3	4162 C1	7109 A3	
2117 A3	2136 B1	2152 C3	2165 B3	3111 A3	3122 B3	3141 C2	3169 B2	4104 A2	4152 B3	4163 C1	7111 A1	

TUNER ADJUSTMENT TABLE ( ECO5 FM/MW- and FM/MW/LW - versions with AM-frame aerial )

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
<b>VARICAP ALIGNMENT</b>						
<b>FM</b> 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)			108MHz	5130		8V ±0.2V
			87.5MHz (65.81MHz)	check		4.3V ±0.5V (1.2V ±0.5V)
<b>MW</b> FM/AM-version, 10kHz grid 530 - 1700kHz			1700kHz	5123		8V ±0.2V
			530kHz	check		1.1V ±0.4V
<b>FM/MW-version, 9kHz grid</b> 531 - 1602kHz			1602kHz	5123	1	6.9V ±0.2V
			531kHz	check		1.1V ±0.4V
<b>LW</b>	153 - 279kHz		279kHz	5122		8V ±0.2V
			153kHz	check		1.1V ±0.4V
<b>MW</b> FM/MW/LW-version, 9kHz grid 531 - 1602kHz			1602kHz	5123		8V ±0.2V
			531kHz	check		1.1V ±0.4V
<b>FM IF</b>						
<b>FM</b>	10.7MHz, 50mV continuous wave	F	IC 7101 21 shortcircuit to block AFC	5119	2	0 ± 3 mV DC
<b>FM RF</b>						
<b>FM</b> 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)	108MHz	A		2155	4	MAX
	87.5MHz (65.81MHz)	mod=1kHz Δf=±22.5kHz		5131		
<b>VCO</b>						
<b>FM</b>	98MHz, 1mV continuous wave	A		98MHz	3	152kHz ±1kHz <sup>1)</sup>
<b>AM IF</b>						
<b>MW</b>	450kHz  connect pin 6 of IC 7101 (AM Osc.) with short wire to ground (pin 4)	C	IC 7101 36 100nF	5111	4	symmetric
		C	IC 7101 40 100nF see remark 2)	5112		
<b>AM AFC</b>		C		5114	2	0 ± 2 mV DC
<b>AM RF<sup>3)</sup></b>						
<b>MW<sup>4)</sup></b> FM/MW/LW- and FM/MW-version (9kHz grid) 531 - 1602kHz	1494kHz	B		1494kHz	2106	4
	558kHz			558kHz	5102	
<b>LW</b>	198kHz			198kHz	5103	
<b>MW</b> FM/AM-version, 10kHz grid 530 - 1700kHz	1500kHz	Δf = ±30kHz V <sub>RF</sub> as low as possible		1500kHz	2106	4
	560kHz			560kHz	5102	



Use service test program. 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)

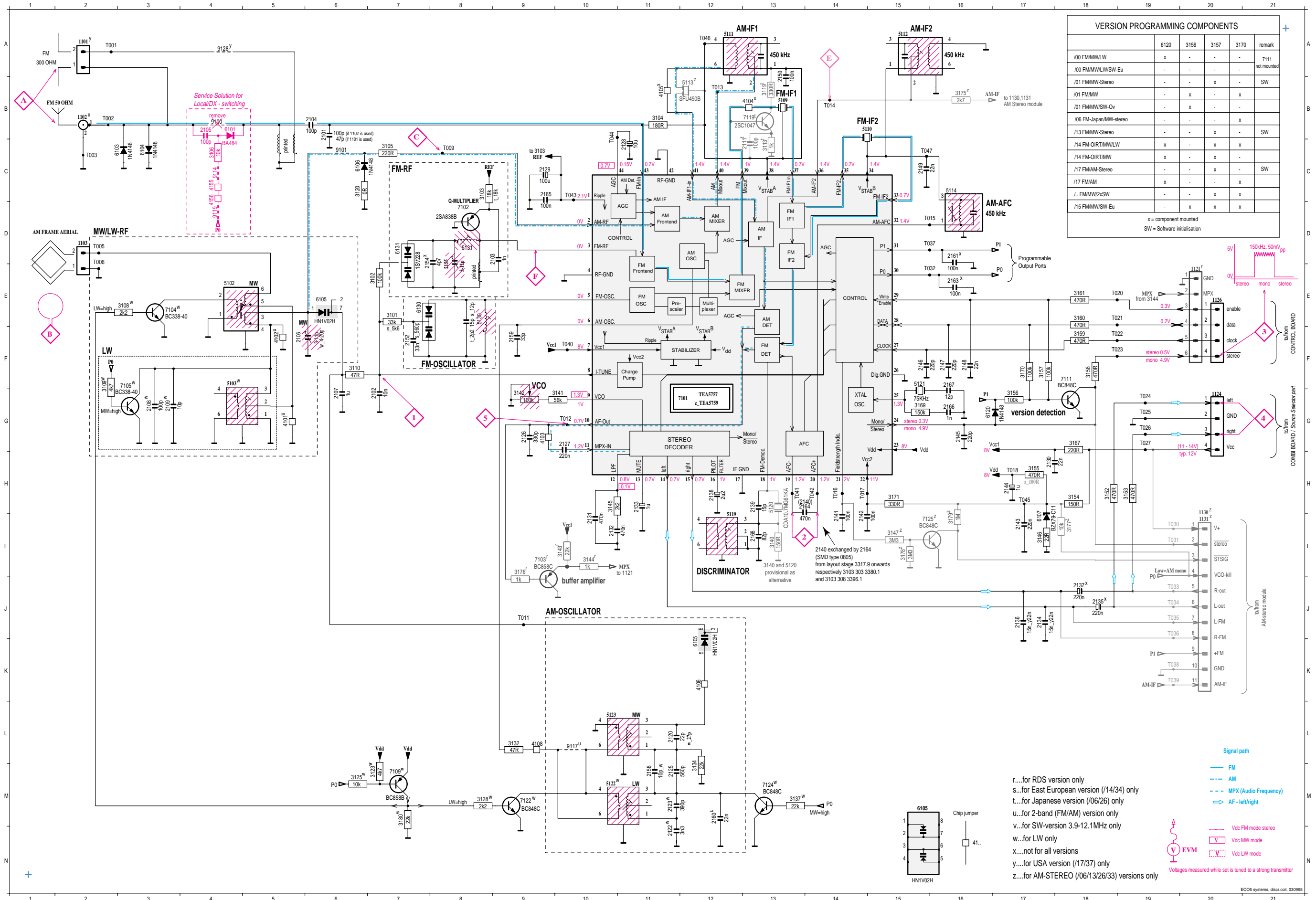
2) RC network serves for damping the IF-filter while adjusting the other one.

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

4) MW has to be aligned before LW.

Repeat

# TUNER BOARD ECO5 / Systems



## ELECTRICAL PARTS LIST - ECO5 TUNER BOARD

## MISCELLANEOUS

1101	4822 267 31505	Antenna Socket 300R
1102	4822 267 10283	Antenna Socket Coax IEC 75R

## CAPACITORS

2101	5322 122 32531	100pF 5% 50V	
2101	4822 126 13692	47pF 1% 63V	for USA
2102	4822 122 33177	10nF 20% 50V	
2103	5322 122 34123	1nF 10% 50V	
2104	4822 122 33195	100pF 10% 50V	
2106	4822 125 50355	Trimmer 4-20pF	for LW version
2106	4822 125 60101	Trimmer 3-11pF 100V	
2107	4822 121 51319	1μF 10% 63V	
2108	5322 122 32531	100pF 5% 50V	for LW version
2109	5322 122 32448	10pF 5% 50V	for LW version
2120	4822 126 13691	27pF 1% 63V	for LW version
2120	5322 122 32658	22pF 5% 50V	
2122	4822 122 33891	3,3nF 10% 63V	for LW version
2125	4822 121 51381	560pF 5% 400V	
2126	5322 122 31863	330pF 5% 50V	
2127	4822 126 13473	220nF +80/-20% 50V	
2128	4822 124 41579	10μF 20% 50V	
2129	4822 124 41584	100μF 20% 10V	
2130	4822 126 11585	22nF+80/- 20% 25V	
2131	4822 122 33325	470nF 16V	
2132	4822 122 33325	470nF 16V	
2131	4822 126 13482	470nF +80/- 20% 16V	
2132	4822 126 13482	470nF +80/- 20% 16V	
2133	4822 124 40242	1μF 20% 63V	
2134	4822 126 13188	15nF 5% 63V	
2134	5322 122 32654	22nF 10% 63V	for USA
2135	4822 124 40746	0,22μF 20% 63V	
2136	4822 126 13188	15nF 5% 63V	
2136	5322 122 32654	22nF 10% 63V	for USA
2137	4822 124 40746	0,22μF 20% 63V	
2138	4822 124 41576	2,2μF 20% 50V	
2139	4822 126 14236	50V 15pF 5%	
2140	4822 121 51252	470nF 5% 63V	
2141	4822 126 10002	100nF 20% 25V	
2142	4822 126 10002	100nF 20% 25V	
2143	4822 126 13473	220nF +80/-20% 50V	
2144	4822 124 40242	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 126 11585	22nF+80/- 20% 25V	
2149	5322 122 32654	22nF 10% 63V	
2150	4822 122 31947	100nF 20% 63V	
2152	5322 116 80853	560pF 5% 63V	for East. Europe
2152	4822 126 12105	33nF 5% 63V	
2153	4822 122 32139	12pF 2% 63V	for East. Europe
2153	4822 122 32504	15pF 2% 63V	
2155	4822 125 60101	Trimmer 3-11pF 100V	

2158	5322 122 32448	10pF 5% 50V	for LW version
2159	5322 122 32659	33pF 5% 50V	
2160	5322 122 32654	22nF 10% 63V	
2161	4822 126 10002	100nF 20% 25V	
2163	4822 126 10002	100nF 20% 25V	
2164	4822 126 13482	470nF +80/- 20% 16V	
2165	4822 126 10002	100nF 20% 25V	
2166	5322 122 34123	1nF 10% 50V	
2167	4822 122 32139	12pF 2% 63V	
2168	4822 126 13695	82pF 1% 63V	

## RESISTORS

3101	4822 051 20562	5k6 5% 0,1W	for East. Europe
3101	4822 051 20333	33k 5% 0,1W	
3102	4822 051 20104	100k 5% 0,1W	
3103	4822 117 10965	18k 1% 0,1W	
3104	4822 117 11448	180R 1% 0,1W	
3105	4822 116 83872	220R 5% 0,5W	
3108	4822 117 11449	2k2 1% 0,1W	for LW version
3109	4822 051 20472	4k7 5% 0,1W	for LW version
3110	4822 116 52195	47R 5% 0,5W	
3120	4822 051 20008	0R Jumper 0805	
3123	4822 051 20472	4k7 5% 0,1W	for LW version
3125	4822 117 10833	10k 1% 0,1W	for LW version
3128	4822 117 11449	2k2 1% 0,1W	for LW version
3132	4822 116 52195	47R 5% 0,5W	
3134	4822 051 20223	22k 5% 0,1W	
3137	4822 051 20223	22k 5% 0,1W	for LW version
3140	4822 051 20008	0R Jumper 0805	
3140	4822 117 10353	150R 1% 0,1W	
3141	4822 051 20563	56k 5% 0,1W	
3142	4822 100 11163	Trimmer 100k 30% 0,1W	
3143	4822 051 20223	22k 5% 0,1W	for RDS version
3144	4822 051 10102	1k 2% 0,25W	for RDS version
3145	4822 117 11449	2k2 1% 0,1W	
3146	4822 051 20229	22R 5% 0,1W	
3152	4822 116 83883	470R 5% 0,5W	
3153	4822 051 20471	470R 5% 0,1W	
3154	4822 116 83868	150R 5% 0,5W	
3155	4822 051 20471	470R 5% 0,1W	
3156	4822 051 20104	100k 5% 0,1W	for /21/30/33 only
3157	4822 116 52234	100k 5% 0,5W	for East. Europe
3158	4822 116 83883	470R 5% 0,5W	
3159	4822 116 83883	470R 5% 0,5W	
3160	4822 116 83883	470R 5% 0,5W	
3161	4822 116 83883	470R 5% 0,5W	
3167	4822 117 11503	220R 1% 0,1W	
3169	4822 051 20154	150k 5% 0,1W	
3170	4822 116 52234	100k 5% 0,5W	
3171	4822 116 52219	330R 5% 0,5W	

## ELECTRICAL PARTS LIST - ECO5 TUNER BOARD

3176	4822 051 10102	1k 2% 0,25W	for RDS version
3180	4822 051 20223	22k 5% 0,1W	for LW version
4101	4822 051 20008	0R Jumper 0805	for 2-Band only
4102	4822 051 20008	0R Jumper 0805	for 2-Band only
4103	4822 051 20008	0R Jumper 0805	
4104	4822 051 20008	0R Jumper 0805	
4105	4822 051 20008	0R Jumper 0805	
4106	4822 051 20008	0R Jumper 0805	
4108	4822 051 20008	0R Jumper 0805	
4111	4822 051 20008	0R Jumper 0805	
4120	4822 051 20008	0R Jumper 0805	
4150	4822 051 10008	0R Jumper 1206	
4151	4822 051 20008	0R Jumper 0805	
4152	4822 051 10008	0R Jumper 1206	
4153	4822 051 10008	0R Jumper 1206	
4154	4822 051 10008	0R Jumper 1206	
4155	4822 051 10008	0R Jumper 1206	
4156	4822 051 20008	0R Jumper 0805	
4157	4822 051 10008	0R Jumper 1206	
4158	4822 051 10008	0R Jumper 1206	
4159	4822 051 10008	0R Jumper 1206	
4162	4822 051 10008	0R Jumper 1206	

## COILS &amp; FILTERS

5102	4822 157 71634	MW RF Coil	
5103	4822 157 71635	LW RF Coil	for LW version
5109	4822 242 70665	Ceram Filter 10,7MHz	
5110	4822 242 70665	Ceram Filter 10,7MHz	
5111	4822 158 60511	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 10,7MHz	
5120	4822 242 82065	Cer. Disc. 10,7MG40K	
5120	4822 242 10251	Cer. Disc.10,7MG61KA-TF21	
5121	4822 242 10261	Quartz 75kHz	
5122	4822 157 60517	Osc. Coil LW	for LW version
5123	4822 157 60517	Osc. Coil MW	
5130	4822 156 30947	RF-Coil 1.5T	
5131	4822 156 30947	RF-Coil 1.5T	

## DIODES

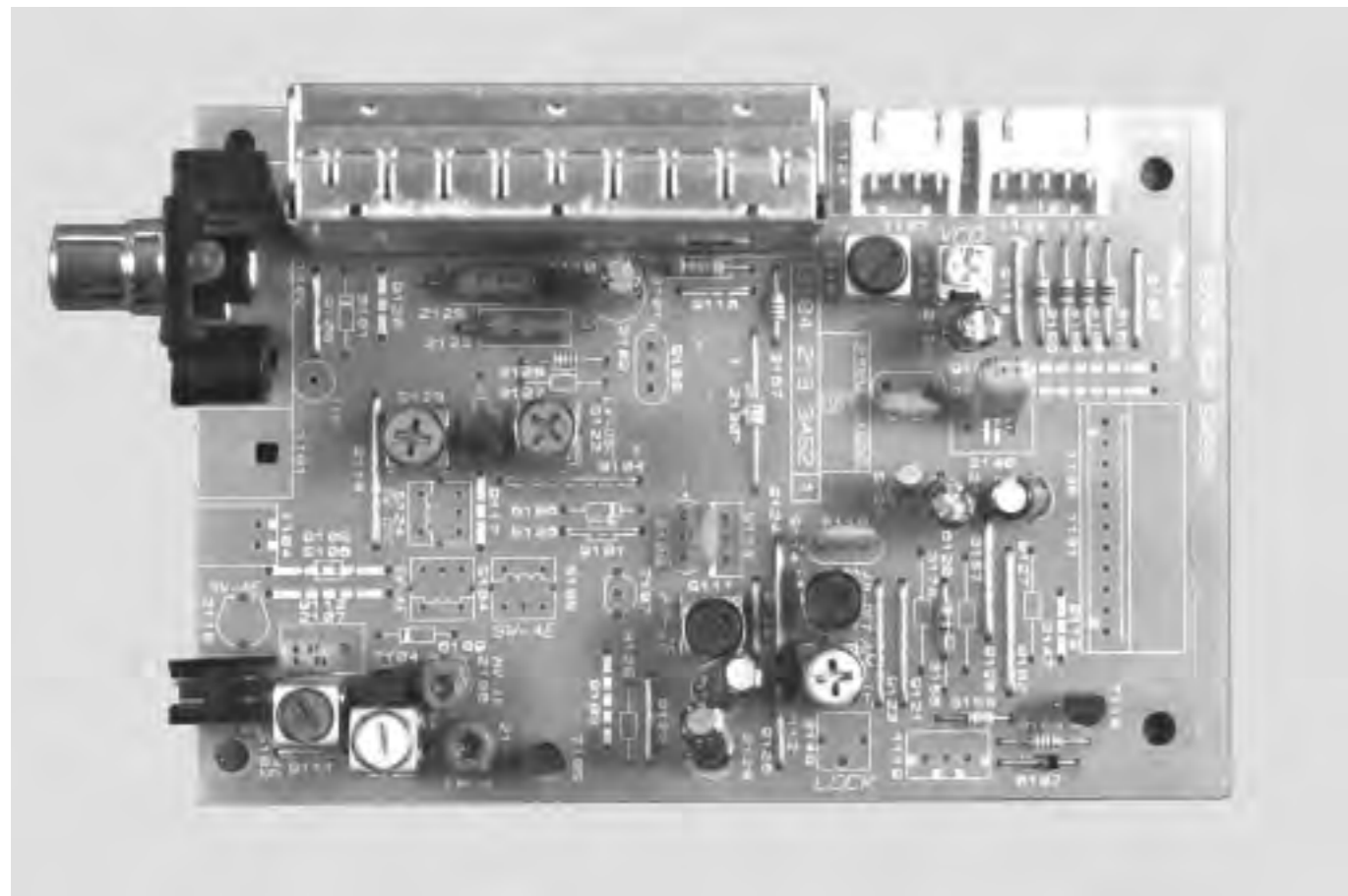
6103	4822 130 30621	1N4148	
6104	4822 130 30621	1N4148	
6105	4822 130 83075	HN1V02H-B	
6106	4822 130 30621	1N4148	
6107	4822 130 34488	BZX79-B11	
6120	4822 130 30621	1N4148	not for /21/30/33
6130	4822 130 82833	1SV228	
6131	4822 130 82833	1SV228	

## TRANSISTORS &amp; INTEGRATED CIRCUITS

7101	4822 209 90924	TEA5757H/V1	
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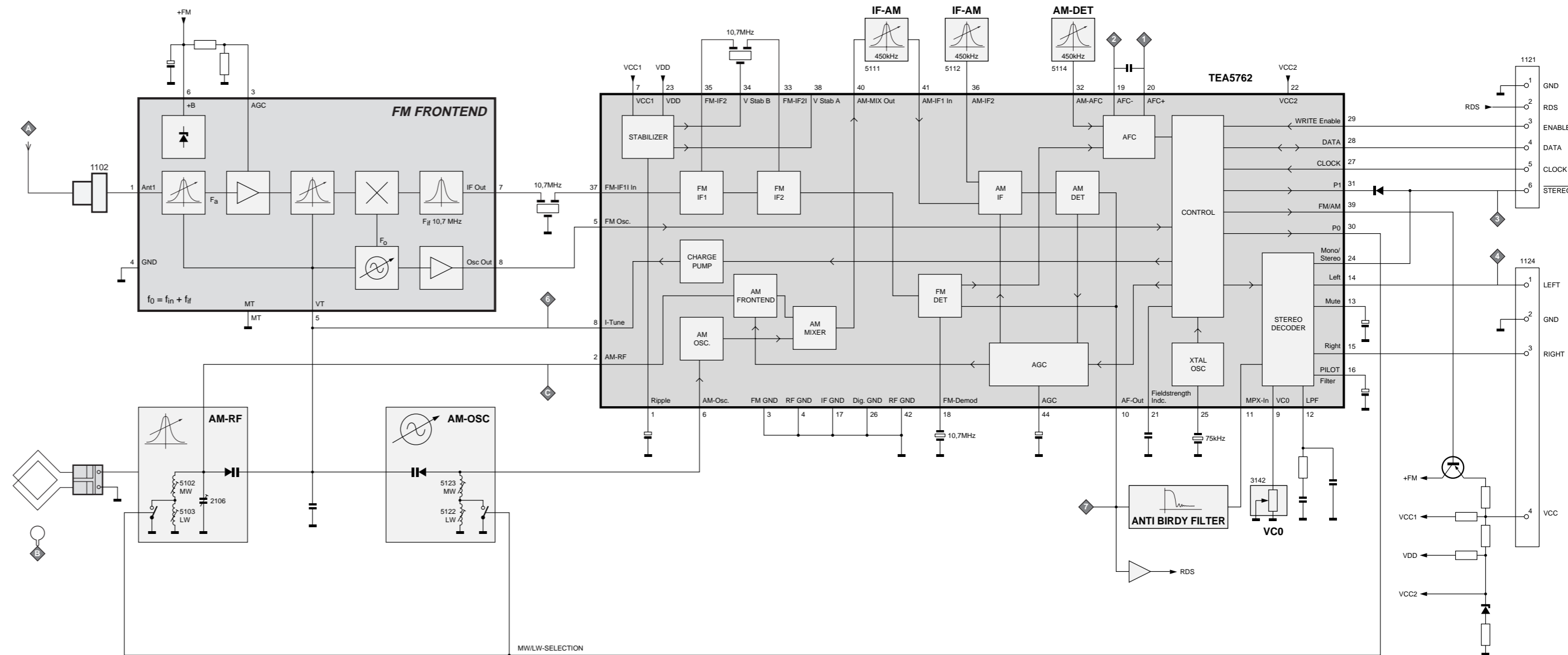
7102	4822 130 60093	2SA838B	
7103	4822 130 42513	BC858C	for RDS version
7104	5322 130 44779	BC338-40	for LW version
7105	5322 130 44779	BC338-40	for LW version
7109	5322 130 41983	BC858B	for LW version
7111	5322 130 42136	BC848C	
7122	5322 130 42136	BC848C	for LW version
7124	5322 130 42136	BC848C	for LW version

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



# TUNER 95 BOARD

## BLOCKDIAGRAM



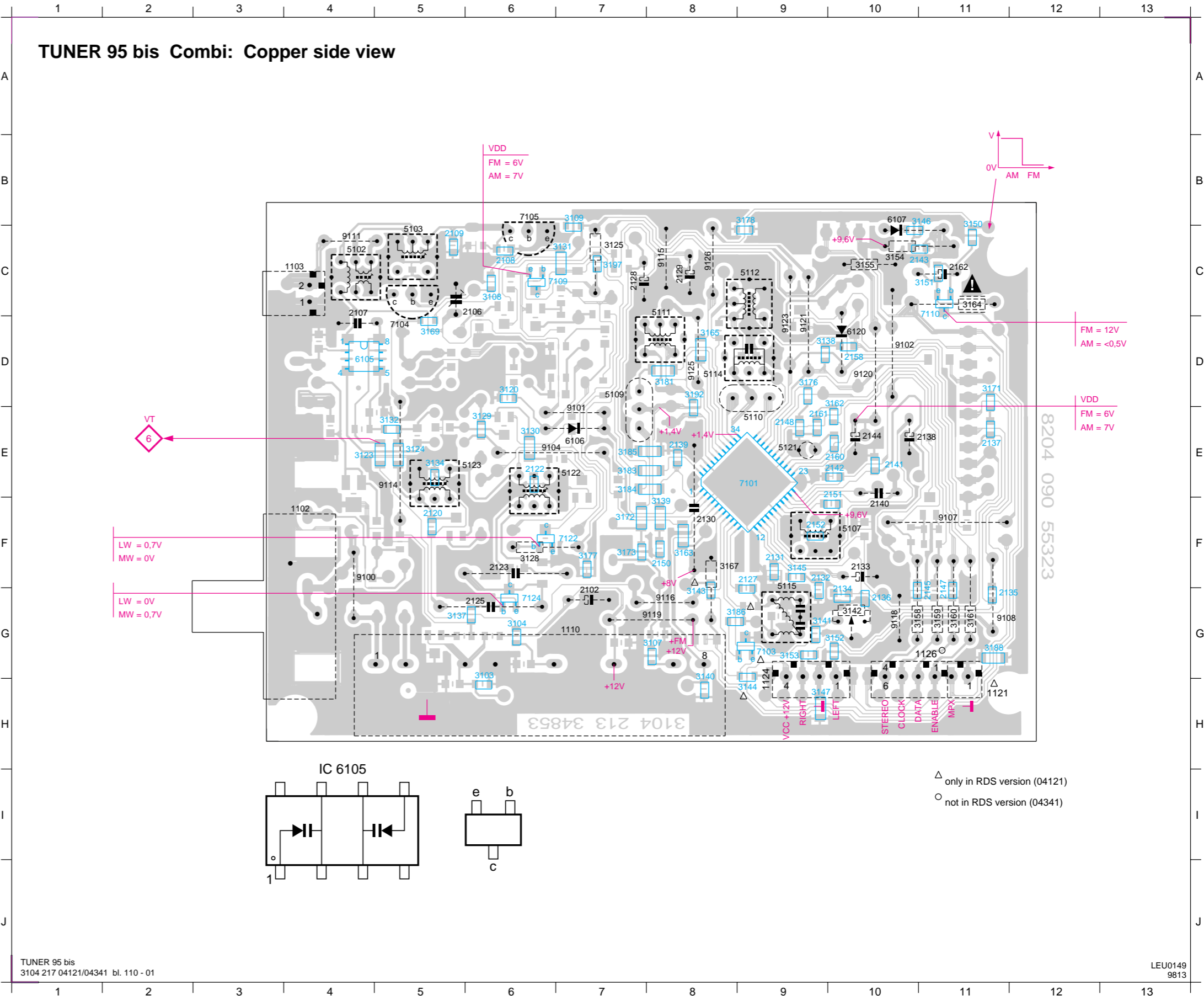
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- Blockdiagram .....7D-1
- Adjustmant table .....7D-2
- Component layout.....7D-2
- Circuit diagram.....7D-3
- Partslist .....7D-4

1102	F4	2107	C4	2128	C7	2136	G10	2144	E10	2160	E9	3120	D6	3132	E5	3143	G8	3153	G9	3163	F8	3176	D9	3188	G11	5111	C8	6106	E7	7110	D11	9108	G11	9121	D9
1103	C4	2108	C6	2129	C8	2137	E11	2145	G11	2161	E9	3123	E4	3134	E5	3144	H9	3154	C10	3164	C11	3177	F7	3192	D8	5112	C9	6107	B10	7122	F7	9111	C4	9123	D9
1110	G7	2109	C5	2130	F8	2138	E10	2147	G11	2162	C11	3124	E5	3137	G5	3145	F9	3155	C10	3165	D8	3178	B8	3197	C7	5114	D8	6120	D10	7124	G6	9114	E5	9125	D8
1121	H11	2120	F5	2131	F9	2139	E8	2148	E9	3103	H6	3125	C7	3138	D9	3146	B10	3158	G11	3167	F8	3181	D8	5102	C4	5115	G9	7101	E9	9100	F4	9115	C8	9126	C8
1124	H9	2122	E6	2132	F9	2140	F10	2150	F8	3104	G6	3128	F6	3139	F8	3147	H9	3159	G11	3169	D5	3183	E7	5103	C5	5121	E9	7103	G9	9101	E7	9116	G8		
1126	G10	2123	F6	2133	F10	2141	E10	2151	F9	3107	G7	3129	E6	3140	H8	3150	C11	3160	G11	3171	D11	3184	E7	5107	F10	5122	E7	7104	D5	9102	D10	9118	G10		
2102	G7	2125	G6	2134	G10	2142	E9	2152	F9	3108	C6	3130	E6	3141	G9	3151	C10	3161	G11	3172	F7	3185	E7	5109	D7	5123	E5	7105	B6	9104	E6	9119	G7		
2106	C5	2127	F9	2135	G11	2143	C10	2158	D10	3109	B7	3131	C6	3142	G10	3152	G9	3162	D9	3173	F7	3186	G8	5110	E9	6105	D4	7109	C6	9107	F11	9120	D10		

TUNER 95 bis Adjustment Table (FM, MW, LW with Frame antenna)

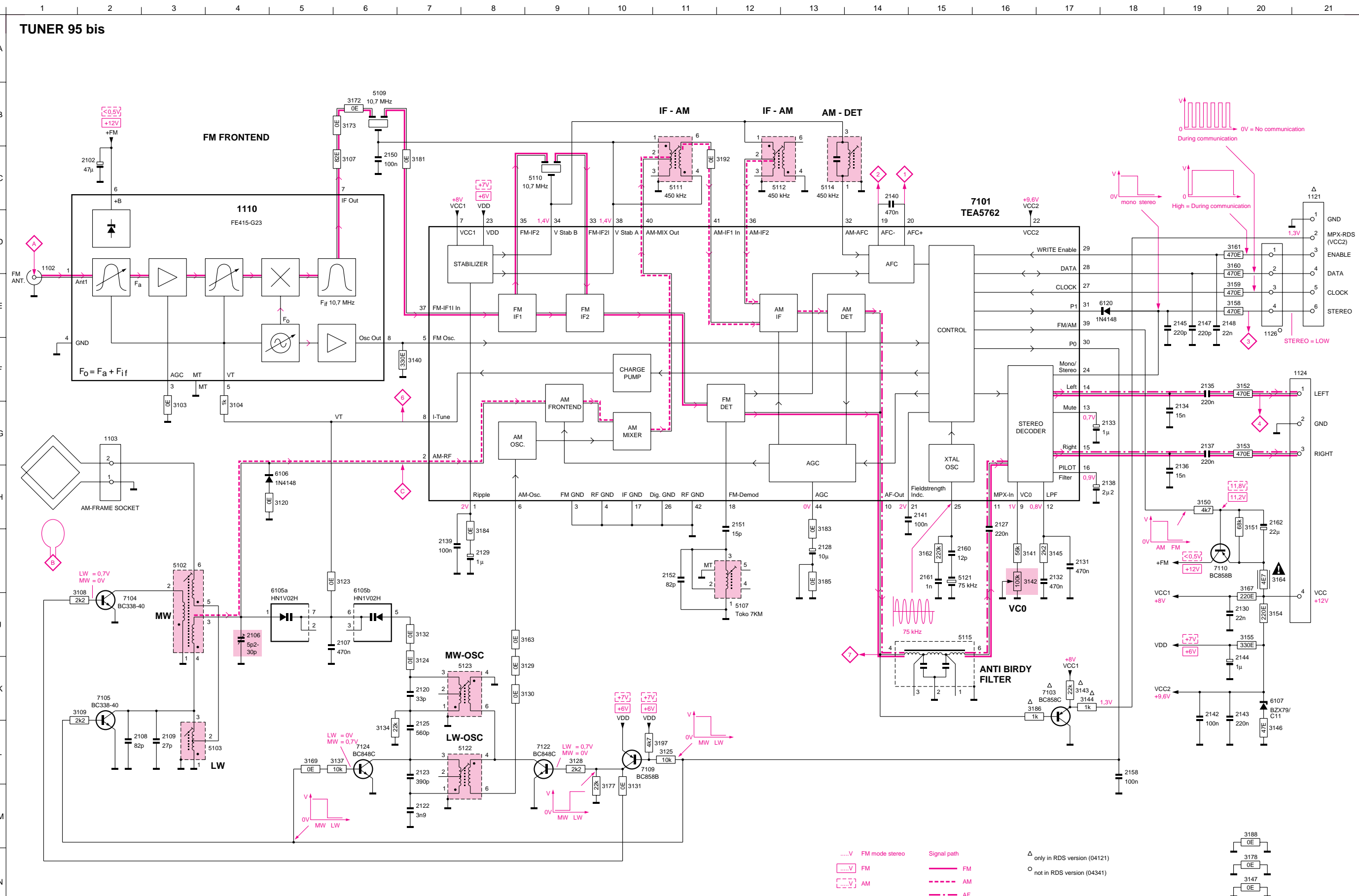
Waverange	Input frequency	Input	Set tuned to	Adjust	Output	Scope / Voltmeter
<b>VARICAP ALIGNMENT</b>						
<b>FM</b> (50)	87.5 - 108 MHz		108 MHz	check		7 ... 9V
			87.5 MHz	check		1.3 ... 2V
<b>MW</b> (9)	531 - 1602 kHz		1602 kHz	5123	◇ 6	8.3V ± 0.2V
			531 kHz	check		1V ± 0.4V
<b>LW</b> (3)	153 - 279 kHz		279 kHz	5122		8.3V ± 0.2V
			153 kHz	check		1V ± 0.4V
<b>FM - DETECTION</b>						
<b>FM</b>	98 MHz 1mV continuous wave <i>short pin 21 (IC7101) to ground</i>	◇ A	98 MHz	5107	◇ 1 ◇ 2	0mV ± 3mV
<b>FM - VCO</b>						
<b>FM</b>	98 MHz 1 mV continuous wave	◇ A	98 MHz	3142	◇ 3	152kHz ± 1 kHz
<b>DISTORTION</b>						
<b>FM</b>	98 MHz 1 mV 90 % L + 9 % pilot mod = 1kHz	◇ A	98MHz	mixcoil inside Tuner 1110	◇ 4	Distortion minimum
<b>AM - IF</b>						
<b>MW</b>	450kHz Δf = 10kHz Low as possible Swept signal	◇ C	MW	5111	◇ 7	symmetrical and max. height
	450kHz continuous wave			5112		
				5114	◇ 1 ◇ 2	0mV ± 2mV
<b>AM - RF</b>						
<b>MW</b>	558kHz Mod = 1kHz 30 % AM 1494 kHz	◇ B	558kHz	5102	◇ 7	MAX
			1494kHz	2106		
<b>LW</b>	198kHz mod = 1kHz 30 % AM	*	198kHz	5103		MAX



\* Signal send via a frame antenna  
(..) = tuning grid in kHz  
↑ repeat

adjtable for 3104 217 04121/04341

1102	D1	1124	F21	2107	J6	2122	M7	2128	I13	2132	I17	2136	H19	2140	C14	2144	K20	2150	C6	2160	I15	3104	G4	3120	H5	3128	L9	3132	J7	3141	I16	3145	I17	3151	I20	3155	J20	3161	D19	3167	I20	3177	M10	3184	I8	3192	C12	5107	J12	5112	C12	5122	L7	6106	H5	7103	K17	7110	I19
1103	G2	1126	E20	2108	L2	2123	L7	2129	I8	2133	G18	2137	G19	2141	H15	2145	E19	2151	H12	2161	I15	3107	C6	3123	I6	3129	K8	3134	L6	3142	I16	3146	L20	3152	F20	3158	E19	3162	I15	3169	L5	3178	N20	3185	I13	3197	L11	5109	B6	5114	C13	5123	K7	6107	K20	7104	J2	7122	L9
1110	D4	2102	C2	2109	L3	2125	L7	2130	J20	2134	G19	2138	H18	2142	K19	2147	E19	2152	I11	2162	H20	3108	J1	3124	K7	3130	K8	3137	L5	3143	K17	3150	H19	3154	J20	3160	D19	3164	I20	3173	B6	3183	I13	3188	M20	5103	L4	5111	C11	5121	I15	6105a	I5	6120	E17	7105	K2	7124	L6
1121	C21	2106	J4	2120	K7	2127	H16	2131	I17	2135	F19	2139	I7	2143	K20	2148	E19	2158	L18	3103	G3	3109	K1	3125	L11	3131	M10	3140	F7	3144	K17	3150	H19	3154	J20	3160	D19	3164	I20	3173	B6	3183	I13	3188	M20	5103	L4	5111	C11	5121	I15	6105b	I6	7101	C15	7109	L10		



**ELECTRICAL PARTS LIST - TUNER 95 BOARD****MISCELLANEOUS**

1102	4822 267 10283	Socket Coaxial IEC 75R
1103	4822 265 31184	JST Connector 2 pin
1110	4822 210 10739	Frontend Assembly FE415-G23

**CAPACITORS**

2102	4822 124 40433	47µF 20% 25V
2106	4822 125 60102	Trimmer 5,2-30pF 100V
2107	4822 121 51252	470nF 5% 63V
2108	4822 126 13695	82pF 1% 63V
2109	4822 126 13691	27pF 1% 63V
2120	5322 122 32659	33pF 5% 50V
2122	5322 126 10465	3,9nF 10% 50V
2123	4822 121 10766	390pF 1% 630V
2125	4822 121 10578	560pF 1% 630V
2127	4822 122 32927	220nF +80/-20% 50V
2128	4822 124 41579	10µF 20% 50V
2129	4822 124 40242	1µF 20% 63V
2130	4822 126 11585	22nF +80/-20% 25V
2131	4822 122 33325	470nF 16V
2132	4822 122 33325	470nF 16V
2133	4822 124 40242	1µF 20% 63V
2134	4822 126 13188	15nF 5% 63V
2135	4822 122 32927	220nF +80/-20% 50V
2136	4822 126 13188	15nF 5% 63V
2137	4822 122 32927	220nF +80/-20% 50V
2138	4822 124 41576	2,2µF 20% 50V
2139	4822 126 10002	100nF 20% 25V
2140	4822 121 51252	470nF 5% 63V
2141	4822 122 31947	100nF 20% 63V
2142	4822 122 31947	100nF 20% 63V
2143	4822 122 32927	220nF +80/-20% 50V
2144	4822 124 40242	1µF 20% 63V
2145	4822 122 33575	220pF 5% 50V
2147	4822 122 33575	220pF 5% 50V
2148	4822 122 33809	22nF 20% 50V
2150	4822 122 31947	100nF 20% 63V
2151	4822 126 14236	15pF 5% 50V
2152	4822 126 13695	82pF 1% 63V
2158	4822 122 31947	100nF 20% 63V
2160	4822 122 32139	12pF 2% 63V
2161	5322 122 34123	1nF 10% 50V
2162	4822 124 81151	22µF 50V

**RESISTORS**

3103	4822 051 20008	0R Jumper 0805
3104	4822 051 10102	1k 2% 0,25W
3107	4822 051 20829	82R 5% 0,1W
3108	4822 117 11449	2k2 1% 0,1W
3109	4822 117 11449	2k2 1% 0,1W
3120	4822 051 20008	0R Jumper 0805
3123	4822 051 10008	0R Jumper 1206
3124	4822 051 10008	0R Jumper 1206

3125	4822 116 83864	10k 5% 0,5W
3128	4822 116 52256	2k2 5% 0,5W
3129	4822 051 20008	0R Jumper 0805
3130	4822 051 10008	0R Jumper 1206
3131	4822 051 10008	0R Jumper 1206
3132	4822 051 20008	0R Jumper 0805
3134	4822 051 20223	22k 5% 0,1W
3137	4822 117 10833	10k 1% 0,1W
3138	4822 051 20008	0R Jumper 0805
3139	4822 051 10008	0R Jumper 1206
3140	4822 051 20331	330R 5% 0,1W
3141	4822 117 11148	56k 1% 0,1W
3142	4822 100 11163	Trimmer 100k 30% 0,1W
3143	4822 051 20223	22k 5% 0,1W
3144	4822 051 10102	1k 2% 0,25W
3145	4822 117 11449	2k2 1% 0,1W
3146	4822 051 20479	47R 5% 0,1W
3147	4822 051 10008	0R Jumper 1206
3150	4822 051 20472	4k7 5% 0,1W
3151	4822 051 20683	68k 5% 0,1W
3152	4822 051 20471	470R 5% 0,1W
3153	4822 051 20471	470R 5% 0,1W
3154	4822 116 83872	220R 5% 0,5W
3155	4822 116 52219	330R 5% 0,5W
3158	4822 116 83883	470R 5% 0,5W
3159	4822 116 83883	470R 5% 0,5W
3160	4822 116 83883	470R 5% 0,5W
3161	4822 116 83883	470R 5% 0,5W
3162	4822 117 13579	220k 1% 0,1W
3163	4822 051 10008	0R Jumper 1206
3164	4822 052 10478	△ 4R7 5% 0,33W
3165	4822 051 10008	0R Jumper 1206
3167	4822 116 83872	220R 5% 0,5W
3169	4822 051 20008	0R Jumper 0805
3171	4822 051 20008	0R Jumper 0805
3172	4822 051 10008	0R Jumper 1206
3173	4822 051 20008	0R Jumper 0805
3176	4822 051 20008	0R Jumper 0805
3177	4822 051 20223	22k 5% 0,1W
3178	4822 051 10008	0R Jumper 1206
3181	4822 051 10008	0R Jumper 1206
3183	4822 051 10008	0R Jumper 1206
3184	4822 051 10008	0R Jumper 1206
3185	4822 051 10008	0R Jumper 1206
3186	4822 051 10102	1k 2% 0,25W
3188	4822 051 10008	0R Jumper 1206
3192	4822 051 20008	0R Jumper 0805
3197	4822 051 20472	4k7 5% 0,1W

**COILS & FILTERS**

5102	4822 157 71634	MW Aerial
5103	4822 157 71635	LW Aerial

**ELECTRICAL PARTS LIST - TUNER 95 BOARD**

5107	4822 157 11443	FM Discriminator 10,7MHz
5109	4822 157 71639	Ceram Filter 10,7MHz
5110	4822 242 70665	Ceram Filter 10,7MHz
5111	4822 158 60511	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
5121	4822 242 10261	X'tal Resonator 75kHz
5122	4822 157 60517	RF Coil AM
5123	4822 157 60517	RF Coil AM

**DIODES**

6105	4822 130 83075	HN1V02H-B
6106	4822 130 30621	1N4148
6107	4822 130 34488	BZX79-C11
6120	4822 130 30621	1N4148

**TRANSISTORS & INTEGRATED CIRCUITS**

7101	4822 209 90315	TEA5762H/V1
7103	4822 130 42513	BC858C
7104	5322 130 44779	BC338-40
7105	5322 130 44779	BC338-40
7109	5322 130 41983	BC858B
7110	5322 130 41983	BC858B
7122	5322 130 42136	BC848C
7124	5322 130 42136	BC848C

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

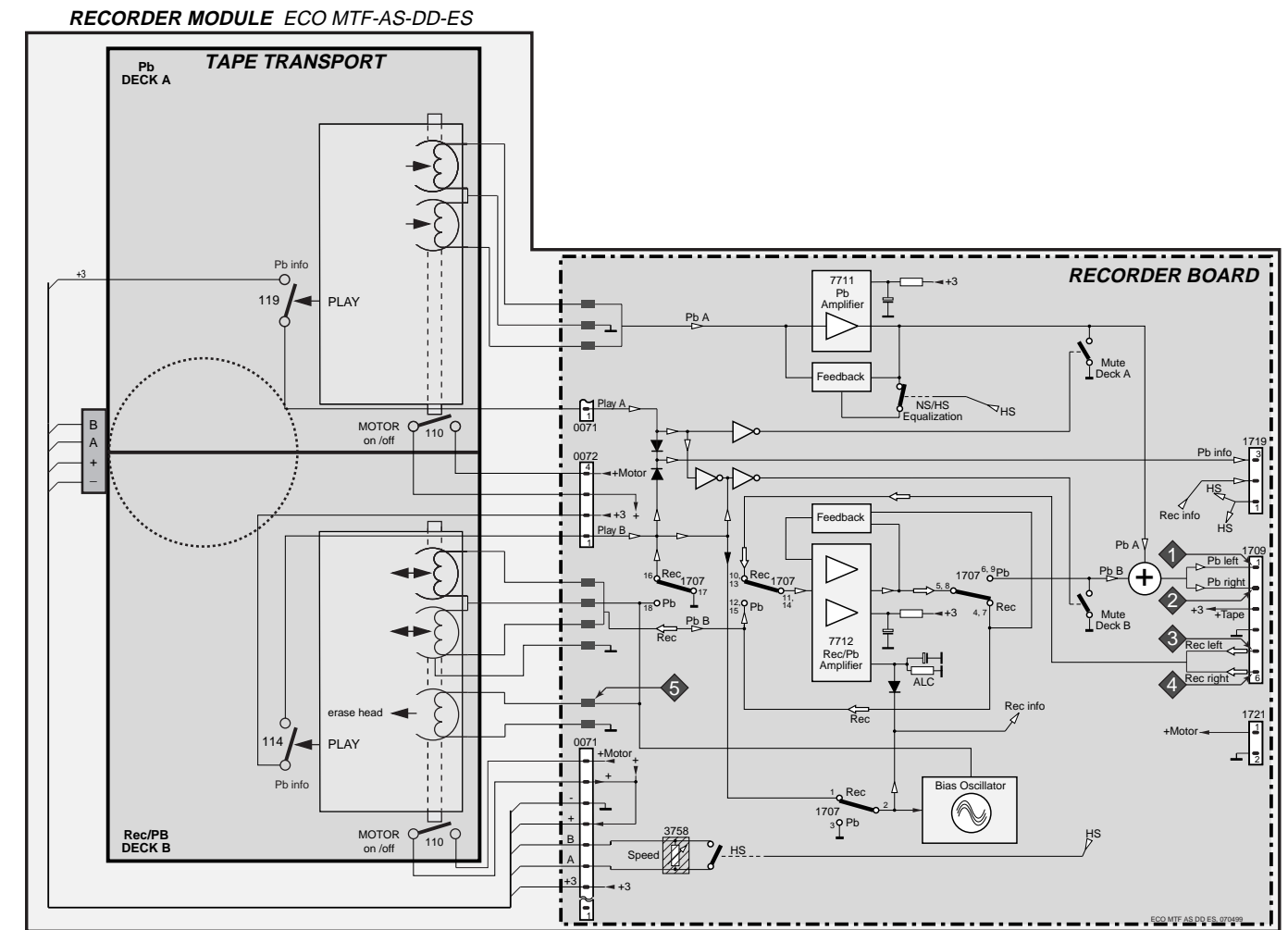


BLOCK DIAGRAM

# ECO MTF MODULE

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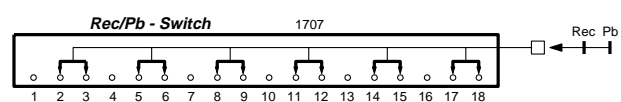
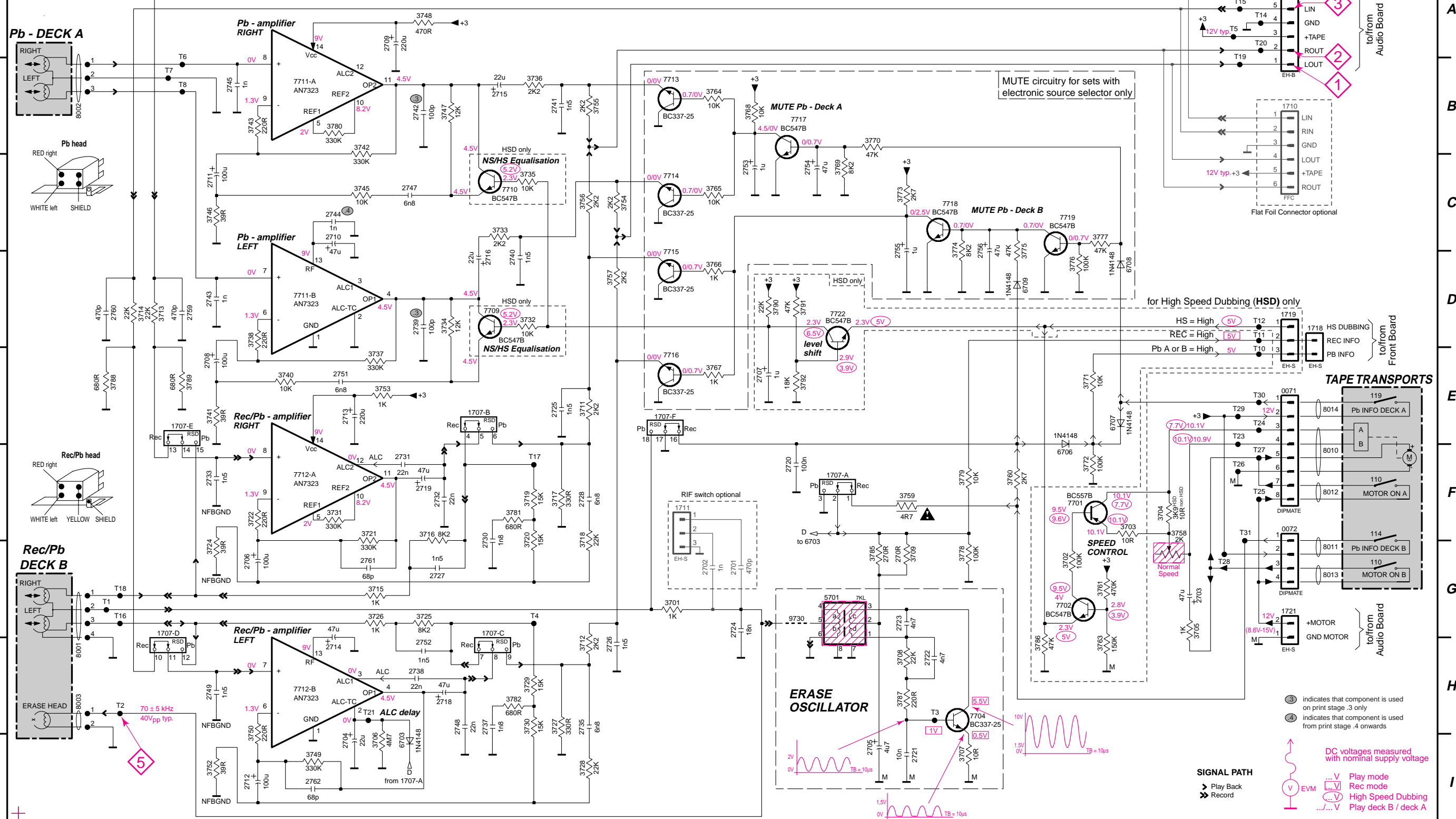
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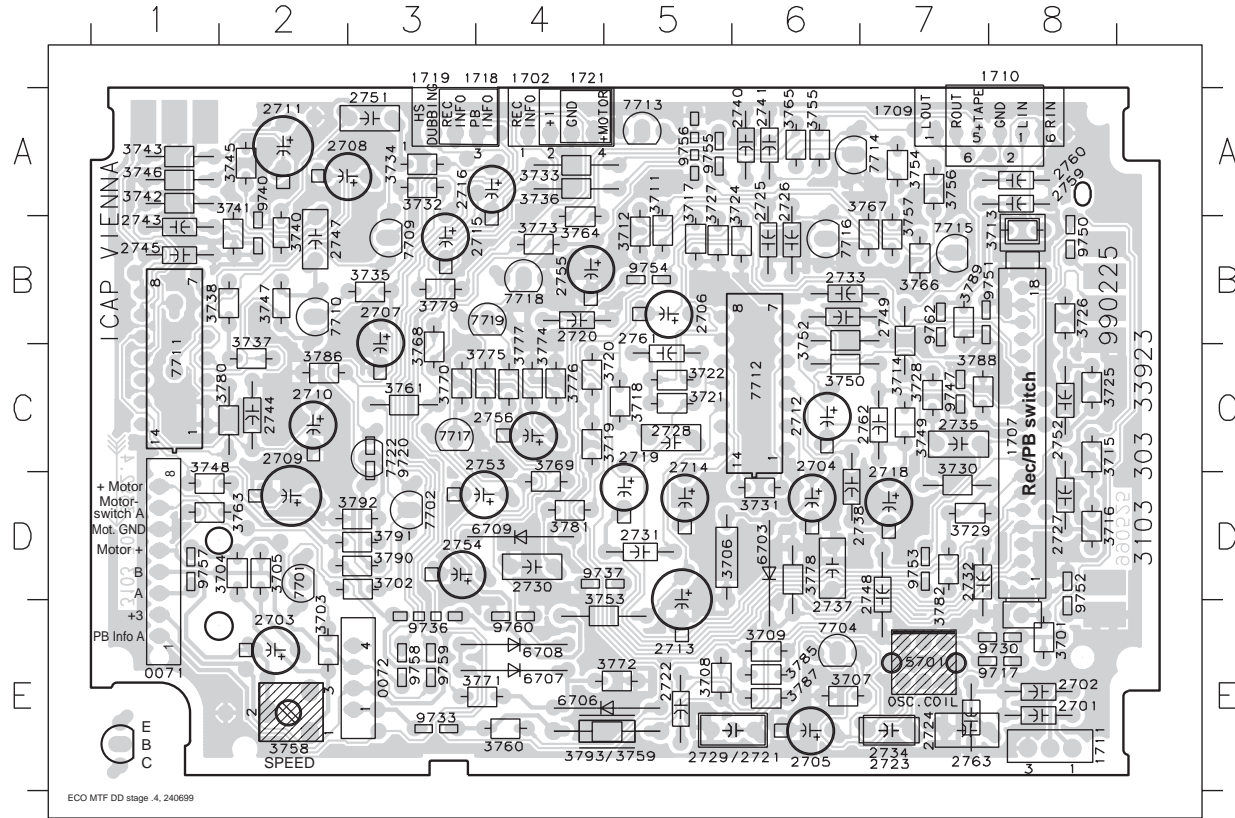
0071 E14	1707-F E7	2702 G8	2709 A5	2716 D6	2724 G8	2732 F5	2741 B6	2749 H3	2759 D2	3704 F13	3712 H7	3719 F6	3727 H6	3734 D5	3742 B4	3750 H3	3758 F13	3766 D8	3773 C10	3780 B4	3789 E2	6707 E12	7710 C6	7715 C8
0072 F14	1709 A14	2703 G13	2710 C4	2718 H5	2725 E6	2733 F3	2742 B5	2751 E4	2760 D2	3705 G13	3713 D2	3720 F6	3728 I7	3735 C6	3743 B3	3752 I3	3759 F10	3767 E8	3774 C10	3781 F6	3790 D9	6708 D12	7711-A B4	7716 E8
1707-A E9	1710 B14	2704 I4	2711 C3	2719 F5	2726 H7	2735 H7	2743 D3	2752 H5	2761 G4	3706 I4	3714 D2	3721 F4	3729 H6	3736 B6	3745 C4	3753 E5	3760 F11	3768 B8	3775 D11	3782 H6	3791 D9	6709 D11	7711-B D4	7717 B9
1707-B E5	1719 D14	2705 I10	2712 I3	2720 F9	2727 G5	2737 H6	2744 C4	2753 C8	2762 I4	3707 I11	3715 G4	3722 F3	3730 H6	3737 E4	3746 C3	3754 C7	3761 G12	3769 C9	3776 D12	3785 G10	3792 E9	7701 F12	7712-A F4	7718 C10
1707-C G6	1721 G14	2706 G3	2713 E4	2721 I10	2728 F7	2738 H5	2745 B3	2754 C9	2763 I8	3701 G8	3708 H10	3716 F5	3724 G3	3731 F4	3741 B5	3750 B7	3757 H12	3765 B10	3772 C12	3786 H11	5701 G9	7702 G12	7712-B H4	7719 C12
1707-D G2	1780 D14	2707 E8	2714 H4	2722 H10	2730 F6	2739 D5	2747 C5	2755 C10	2764 G12	3708 G10	3717 F6	3725 G5	3732 D6	3740 E4	3748 A5	3756 C7	3764 B8	3771 E12	3778 G11	3788 H10	6703 I5	7704 H11	7713 B8	7722 D9
1707-E E2	2701 G8	2708 E3	2715 B6	2723 G10	2731 F5	2740 D6	2748 H5	2756 C11	2765 F12	3711 E7	3718 F7	3726 G4	3733 C6	3741 E3	3749 I4	3757 D7	3765 C8	3772 F12	3779 F11	3788 E2	6706 F12	7709 D6	7714 C8	9730 G9

# RECORDER BOARD

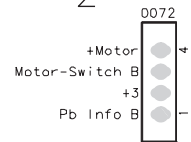
ECO MTF AS



RECORDER BOARD / componentside view

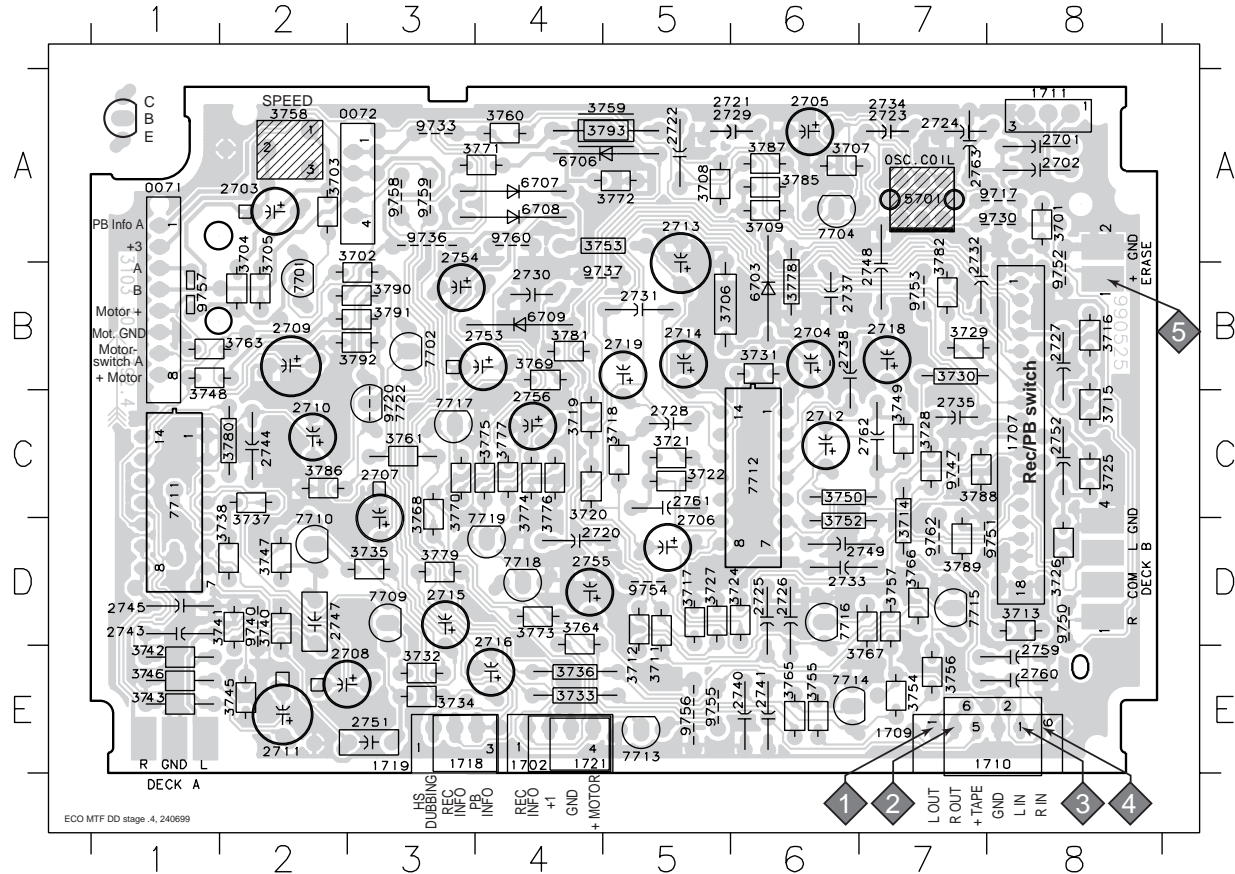


0071	E1	2744	C2	3735	B3	3789	B7
0072	E3	2745	A1	3736	A4	3790	D3
1702	A5	2747	B2	3737	B2	3791	D3
1707	B8	2748	D7	3738	B2	3792	D3
1709	A7	2749	B7	3740	B2	3793	E4
1710	A7	2751	A3	3741	A2	5701	E7
1711	E8	2752	C8	3742	B1	6703	D6
1719	A3	2753	D4	3743	B1	6706	E4
1721	A4	2754	D4	3745	A2	6707	E4
2701	E8	2755	B4	3746	A1	6708	E4
2702	E8	2756	C4	3747	D2	6709	D4
2703	E2	2758	A8	3748	C1	7701	D2
2704	C6	2760	E8	3749	C7	7702	D3
2705	E6	2761	B5	3750	C6	7704	E6
2706	B5	2762	C7	3752	B6	7709	B3
2707	B3	2763	E7	3753	D5	7710	B2
2708	A3	3701	E8	3754	A7	7711	C1
2709	D2	3702	D3	3755	A6	7712	B6
2710	C2	3703	E2	3756	A7	7713	A5
2711	A2	3704	D2	3757	B7	7714	A7
2712	C6	3705	D2	3758	E2	7715	B7
2713	E5	3706	D6	3759	E5	7716	B6
2714	D5	3707	E6	3760	E4	7717	C3
2715	B4	3708	E5	3761	C3	7718	B4
2716	A3	3709	E6	3763	D2	7719	B4
2718	D7	3711	A5	3764	B4	7722	C3
2719	D5	3712	B5	3765	A6	9717	E8
2720	B4	3713	B8	3766	B7	9720	C3
2721	E6	3714	C7	3767	A7	9730	E7
2722	E5	3715	C8	3768	C3	9733	E3
2723	E7	3716	D8	3769	C4	9736	E3
2724	E7	3717	B5	3770	C3	9737	D4
2725	A6	3718	C5	3771	E4	9740	B2
2726	A6	3719	C5	3772	E5	9747	C7
2727	D8	3720	C5	3773	B4	9750	B8
2728	C5	3721	C5	3774	C4	9751	B8
2729	E5	3722	C5	3775	C4	9752	D8
2730	D4	3724	A5	3776	C4	9753	D7
2731	D5	3725	C8	3777	C4	9754	B5
2732	D7	3726	B8	3778	D6	9755	A5
2733	B6	3727	A5	3779	B3	9756	A5
2734	E7	3728	C7	3780	C1	9757	D1
2735	C7	3729	D7	3781	D4	9758	E3
2737	E6	3730	C7	3782	E7	9759	E3
2738	D7	3731	D6	3785	E6	9760	E4
2740	A5	3732	A3	3786	C2	9762	B7
2741	A6	3733	A4	3787	E6		
2743	A1	3734	A3	3788	C7		



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

RECORDER BOARD / copperside view



0071	B1	2744	C2	3735	D3	3789	D7
0072	A3	2745	E1	3736	E4	3790	B3
1702	E4	2747	D2	3737	D2	3791	B2
1707	B8	2748	B7	3738	D2	3792	B3
1709	E8	2749	D6	3740	D2	3793	A5
1710	E8	2751	E3	3741	D1	5701	A7
1711	A8	2752	C8	3742	E1	6703	B6
1719	E3	2753	B4	3743	E1	6706	A4
1721	E4	2754	B3	3745	E2	6707	A4
2701	A8	2755	D5	3746	D1	6708	A4
2702	A8	2756	C4	3747	D2	6709	B4
2703	A2	2758	E8	3748	C1	7701	B2
2704	C6	2760	E8	3749	C7	7702	B3
2705	A6	2761	D5	3750	C6	7704	A6
2706	D5	2762	C7	3752	D6	7709	D3
2707	C3	2763	A7	3753	A4	7710	D2
2708	E3	3701	A8	3754	E7	7711	C1
2709	B2	3702	A3	3755	E6	7712	C6
2710	C2	3703	A2	3756	E7	7713	E5
2711	E2	3704	B2	3757	E7	7714	E7
2712	C6	3705	B2	3758	A2	7715	D7
2713	A5	3706	B5	3759	A5	7716	D6
2714	B5	3707	A6	3760	A4	7717	C3
2715	D4	3708	A5	3761	C3	7718	D4
2716	D4	3709	A6	3763	B2	7719	D4
2718	B7	3711	E5	3764	A4	7722	C3
2719	B5	3712	E5	3765	E6	9717	A8
2720	D4	3713	D8	3766	D7	9720	C3
2721	A6	3714	C7	3767	E7	9730	A7
2722	A5	3715	B8	3768	C3	9733	A3
2723	A7	3716	B8	3769	C4	9736	A3
2724	A7	3717	E5	3770	C3	9737	B4
2725	D6	3718	C5	3771	A4	9740	D2
2726	E6	3719	C5	3772	A5	9747	C7
2727	B8	3720	D4	3773	D4	9750	B8
2728	C5	3721	C5	3774	D4	9751	D8
2729	A6	3722	C5	3775	C4	9752	B8
2730	B4	3724	E6	3776	C4	9753	B7
2731	B5	3725	C8	3777	C4	9754	D5
2732	D6	3726	D8	3778	B6	9755	E6
2733	D6	3727	D5	3779	D3	9756	E5
2734	A7	3728	C7	3780	C2	9757	B1
2735	C7	3729	B7	3781	B4	9758	A3
2737	B6	3730	C7	3782	A7	9759	A3
2738	B7	3731	B5	3785	A6	9760	A4
2740	E6	3732	E3	3786	C2	9762	D7
2741	E6	3733	E4	3787	A6		
2743	E1	3734	E3	3788	C8		

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST	
					with	to
<b>General</b>						
<b>ADJUST MOTOR SPEED</b>	SBC420 (4822 397 30071) 3150Hz	PLAY deck A or B	1 or 2 LEFT or RIGHT or headphone socket	frequency counter	3758	3150Hz ±1%
<b>CHECK WOW &amp; FLUTTER</b>	SBC420 (4822 397 30071) 3150Hz	PLAY deck A or B	1 or 2 LEFT or RIGHT or headphone socket	W&F-meter	check only	≤0.4 % DIN or ≤0.35 % CCIR
<b>ADJUST AZIMUTH</b>	SBC420 (4822 397 30071) 10kHz	PLAY deck A PLAY deck B	1 or 2 LEFT or RIGHT or headphone socket	mV-meter or oscilloscope	left hand screw	max. output level & left=right
<b>Playback</b>						
<b>CHECK PLAYBACK FREQUENCY RESPONSE</b>	SBC420 (4822 397 30071)	PLAY deck A PLAY deck B	1 or 2 LEFT or RIGHT	mV-meter	Check	limits see fig.1
<b>Recording</b>						
<b>PRE-ADJUST BIAS</b>	FERRO	RECORD	5	mV-meter	5701	14V <sub>rms</sub> (40V <sub>pp</sub> )
<b>CHECK OVERALL FREQUENCY RESPONSE</b>	FERRO	RECORD				
Input signal: 3mV 100Hz, 250Hz, 1kHz, 10kHz via 3 or 4	RECORDED CASSETTE	PLAY	1 or 2 LEFT or RIGHT	mV-meter	check only	limits see fig.2
<b>CHECK DISTORTION</b>	FERRO	RECORD				
Input signal: 300mV 1kHz via 3 or 4	RECORDED CASSETTE	PLAY	1 or 2 LEFT or RIGHT	THD-meter	check only	≤5%
Remark: If high frequencies are not within lower limit, decrease bias and re-measure. If distortion is too high increase bias and re-measure.						

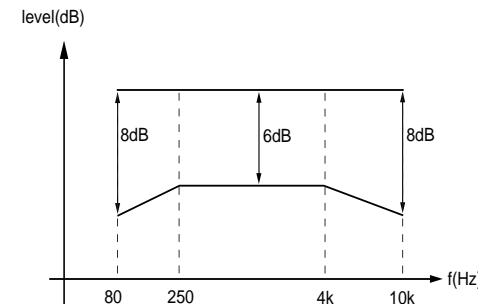


figure. 1

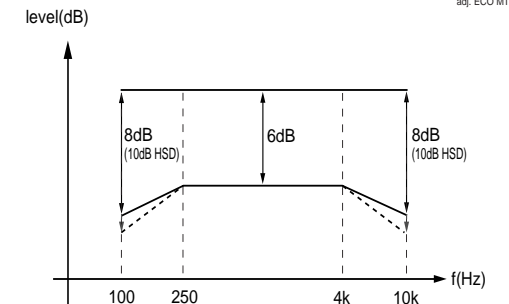
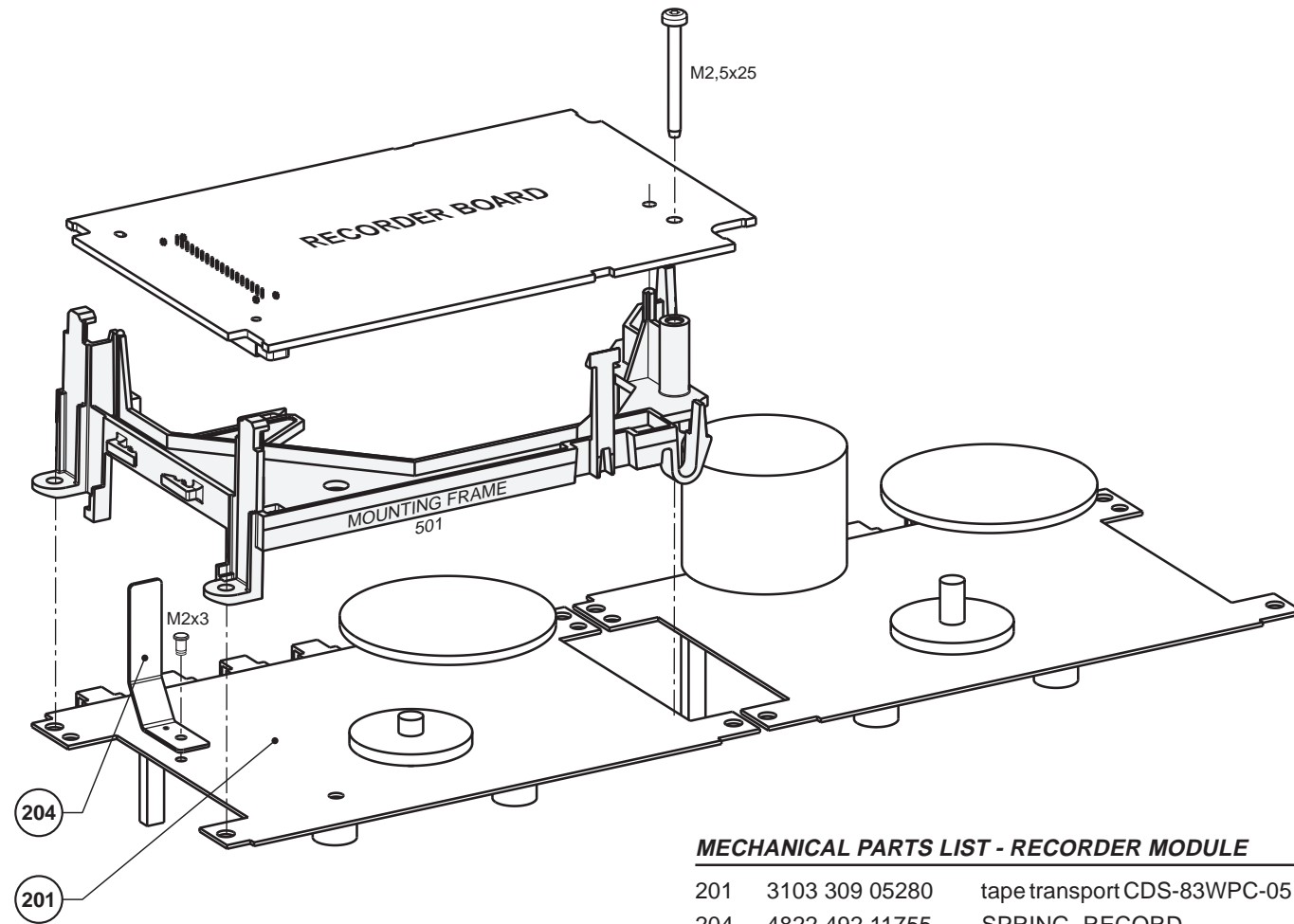


figure. 2

EXPLODED VIEW / RECORDER MODULE



**MECHANICAL PARTS LIST - RECORDER MODULE**

201	3103 309 05280	tape transport CDS-83WPC-05
204	4822 492 11755	SPRING, RECORD

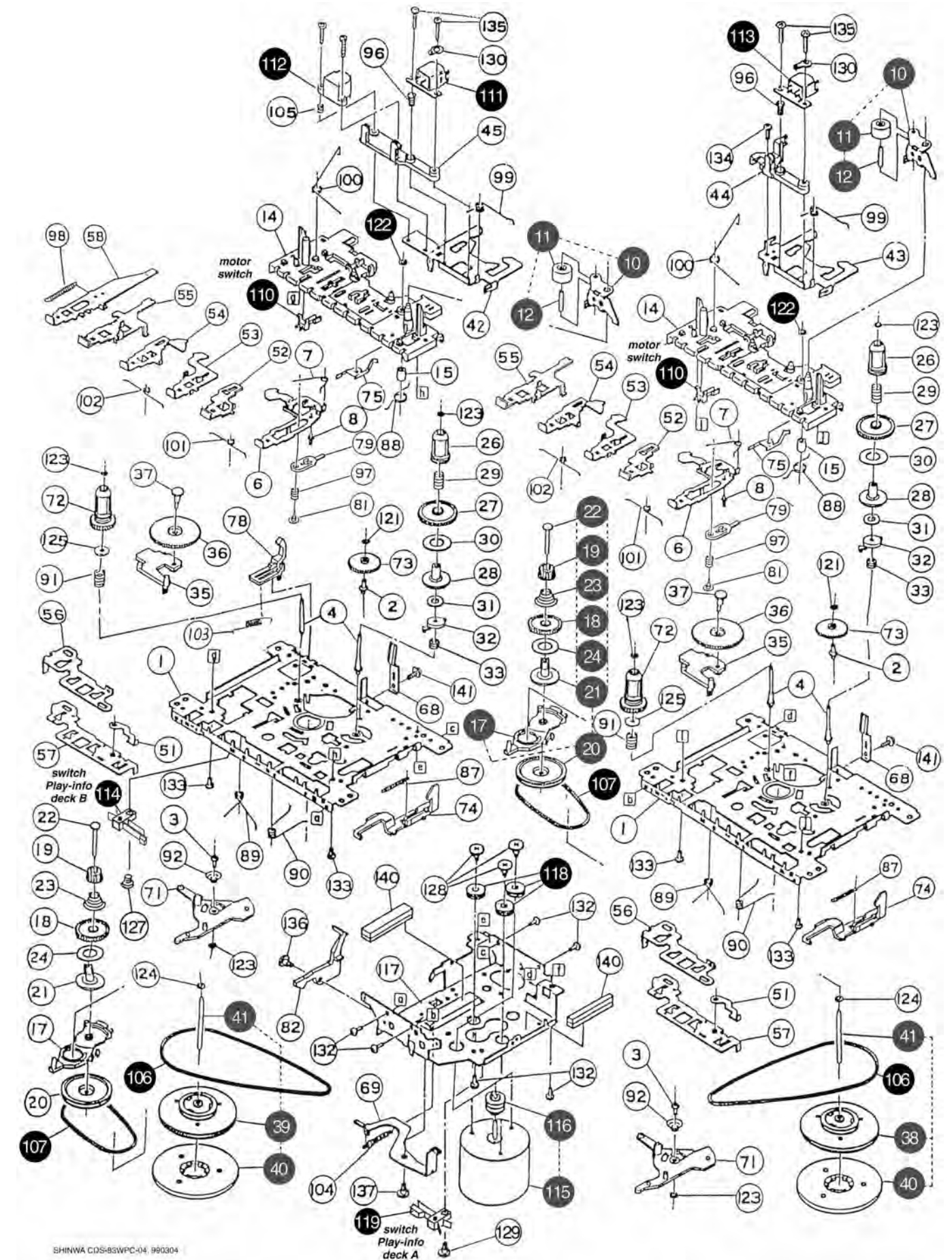
Note: Only the parts mentioned in this list are normal service spare parts.

**MECHANICAL PARTS LIST - TAPE TRANSPORT**

10-12	4822 528 11189	PINCH ROLLER ASSY	112	4822 249 10548	ERASE HEAD, LE15B-C1
17-24	4822 402 10966	CLUTCH ASSY	113	4822 249 10565	REC/PB-HEAD, TC951-B
38-41	4822 528 11242	FLYWHEEL ASSY, PB DECK	114	4822 277 11754	LEAF SWITCH, INDICAT. „PLAY“ REC/PB-DECK
39-41	4822 528 11243	FLYWHEEL ASSY, REC/PB DECK	115/116	4822 361 11053	MOTOR ASSY, EG530YD-2BH + PULLEY
106	4822 358 31225	MAIN BELT	118	4822 466 11787	MOTOR CUSHION
107	4822 358 31124	SUB BELT	119	4822 277 11753	LEAF SWITCH, INDICAT. „PLAY“ PB-DECK
110	4822 278 90663	LEAF SWITCH, MOTOR ON/OFF	122	4822 532 12937	WASHER, 1.6X3.5X0.4
111	4822 249 10565	REC/PB-HEAD, TC951-B			

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

EXPLODED VIEW TAPE TRANSPORT



**ELECTRICAL PARTS LIST - ECO MTF BOARD****MISCELLANEOUS**

1707	4822 277 11504	SWITCH SLIDE, REC/PB
1710	4822 265 11207	FFC-SOCKET 6P, SIDE ENTRY (not on all versions)

**CAPACITORS**

2703	4822 124 40433	47μF	20%	25V	
2704	4822 124 81151	22μF	20%	50V	
2705	4822 124 40769	4,7μF	20%	100V	
2706	4822 124 41584	100μF	20%	10V	
2707	4822 124 40242	1μF	20%	63V	HSD only
2708	4822 124 41584	100μF	20%	10V	
2709	4822 124 40196	220μF	20%	16V	
2710	4822 124 40433	47μF	20%	25V	
2711	4822 124 23432	100μF	20%	10V	
2712	4822 124 41584	100μF	20%	10V	
2713	4822 124 40196	220μF	20%	16V	
2714	4822 124 40433	47μF	20%	25V	
2715	4822 124 81151	22μF	20%	50V	
2716	4822 124 81151	22μF	20%	50V	
2718	4822 124 40433	47μF	20%	25V	
2719	4822 124 40433	47μF	20%	25V	
2720	4822 126 12882	100nF	20%	50V	
2721	4822 121 41857	10nF	5%	250V	
2722	4822 126 11714	4,7nF	20%	16V	
2723	4822 121 10686	4,7nF	10%	50V	
2724	4822 121 43179	18nF	5%	63V	
2725	4822 126 12878	1,5nF	10%	16V	
2726	4822 126 12878	1,5nF	10%	16V	
2727	4822 126 12878	1,5nF	10%	16V	
2728	4822 121 10746	6,8nF	10%	50V	
2730	4822 121 10685	1,8nF	10%	50V	
2731	4822 126 11585	22nF	20%	50V	
2732	4822 126 11585	22nF	20%	50V	
2733	4822 126 12878	1,5nF	10%	16V	
2735	4822 121 10746	6,8nF	10%	50V	
2737	4822 121 10685	1,8nF	10%	50V	
2738	4822 126 11585	22nF	20%	50V	
2739	4822 122 33195	100pF	10%	50V	.3 only
2740	4822 126 12878	1,5nF	10%	16V	
2741	4822 126 12878	1,5nF	10%	16V	
2742	4822 122 33195	100pF	10%	50V	.3 only
2743	4822 122 33197	1nF	10%	50V	
2744	4822 122 33197	1nF	10%	50V	.4 onwards
2745	4822 122 33197	1nF	10%	50V	
2747	4822 121 10746	6,8nF	10%	50V	
2748	4822 126 11585	22nF	20%	50V	
2749	4822 126 12878	1,5nF	10%	16V	
2751	4822 121 10746	6,8nF	10%	50V	
2752	4822 126 12878	1,5nF	10%	16V	
2753	4822 124 40242	1μF	20%	63V	
2754	4822 124 40433	47μF	20%	25V	
2755	4822 124 40242	1μF	20%	63V	

2756	4822 124 40433	47μF	20%	25V
2759	4822 122 33519	470pF	10%	50V
2760	4822 122 33519	470pF	10%	50V
2761	4822 126 10329	68pF	10%	50V
2762	4822 126 10329	68pF	10%	50V

**RESISTORS**

3701	4822 050 11002	1kΩ	5%	0,2W	
3702	4822 116 52234	100kΩ	5%	0,5W	HSD only
3703	4822 116 52176	10Ω	5%	0,5W	HSD only
3704	4822 116 52176	10Ω	5%	0,5W	Normal Speed only
3704	4822 116 52276	3,9kΩ	5%	0,5W	HSD only
3705	4822 050 11002	1kΩ	5%	0,2W	
3706	4822 050 24705	4,7MΩ	1%	0,6W	
3707	4822 116 52176	10Ω	5%	0,5W	
3708	4822 116 52257	22kΩ	5%	0,5W	
3709	4822 116 83876	270Ω	5%	0,16W	
3711	4822 116 52256	2,2kΩ	5%	0,16W	
3712	4822 116 52256	2,2kΩ	5%	0,16W	
3713	4822 116 52257	22kΩ	5%	0,5W	
3714	4822 116 52257	22kΩ	5%	0,5W	
3715	4822 050 11002	1kΩ	5%	0,2W	
3716	4822 116 52303	8,2kΩ	5%	0,5W	
3717	4822 116 52219	330Ω	5%	0,5W	
3718	4822 116 52257	22kΩ	5%	0,5W	
3719	4822 116 52244	15kΩ	5%	0,5W	
3720	4822 116 52244	15kΩ	5%	0,5W	
3721	4822 116 52272	330kΩ	5%	0,5W	
3722	4822 116 83872	220Ω	5%	0,5W	
3724	4822 116 52193	39Ω	5%	0,16W	
3725	4822 116 52303	8,2kΩ	5%	0,5W	
3726	4822 050 11002	1kΩ	5%	0,2W	
3727	4822 116 52219	330Ω	5%	0,5W	
3728	4822 116 52257	22kΩ	5%	0,5W	
3729	4822 116 52244	15kΩ	5%	0,5W	
3730	4822 116 52244	15kΩ	5%	0,5W	
3731	4822 116 52272	330kΩ	5%	0,5W	
3732	4822 116 83864	10kΩ	5%	0,5W	HSD only
3733	4822 116 52256	2,2kΩ	5%	0,16W	
3734	4822 116 52238	12kΩ	5%	0,5W	
3735	4822 116 83864	10kΩ	5%	0,5W	HSD only
3736	4822 116 52256	2,2kΩ	5%	0,16W	
3737	4822 116 52272	330kΩ	5%	0,5W	
3738	4822 116 83872	220Ω	5%	0,5W	
3740	4822 116 83864	10kΩ	5%	0,5W	
3741	4822 116 52193	39Ω	5%	0,16W	
3742	4822 116 52272	330kΩ	5%	0,5W	
3743	4822 116 83872	220Ω	5%	0,5W	
3745	4822 116 83864	10kΩ	5%	0,5W	
3746	4822 116 52193	39Ω	5%	0,16W	
3747	4822 116 52238	12kΩ	5%	0,5W	
3748	4822 116 83883	470Ω	5%	0,16W	

**ELECTRICAL PARTS LIST - ECO MTF BOARD****RESISTORS**

3749	4822 116 52272	330kΩ	5%	0,5W		7702	4822 130 40959	BC547B	HSD only
3750	4822 116 83872	220Ω	5%	0,5W		7704	4822 130 40981	BC337-25	
3752	4822 116 52193	39Ω	5%	0,16W		7709	4822 130 40959	BC547B	HSD only
3753	4822 050 11002	1kΩ	5%	0,2W		7710	4822 130 40959	BC547B	HSD only
3754	4822 116 52256	2,2kΩ	5%	0,16W		7713	4822 130 40981	BC337-25	
3755	4822 116 52256	2,2kΩ	5%	0,16W		7714	4822 130 40981	BC337-25	
3756	4822 116 52256	2,2kΩ	5%	0,16W		7715	4822 130 40981	BC337-25	
3757	4822 116 52256	2,2kΩ	5%	0,16W		7716	4822 130 40981	BC337-25	
3758	4822 100 11368	2kΩ		TRIMPOT. LIN.		7717	4822 130 40959	BC547B	
3759	△ 4822 052 10478	4,7Ω	5%	NFR		7718	4822 130 40959	BC547B	
3760	4822 116 52263	2,7kΩ	5%	0,5W		7719	4822 130 40959	BC547B	
3761	4822 116 52285	470kΩ	5%	0,5W	HSD only	7722	4822 130 40959	BC547B	HSD only
3763	4822 116 52245	150kΩ	5%	0,16W	HSD only				
3764	4822 116 83864	10kΩ	5%	0,5W					
3765	4822 116 83864	10kΩ	5%	0,5W					
3766	4822 050 11002	1kΩ	5%	0,2W					
3767	4822 050 11002	1kΩ	5%	0,2W					
3768	4822 116 83864	10kΩ	5%	0,5W					
3769	4822 116 52303	8,2kΩ	5%	0,5W					
3770	4822 116 83884	47kΩ	5%	0,16W					
3771	4822 116 83864	10kΩ	5%	0,5W					
3772	4822 116 52234	100kΩ	5%	0,5W					
3773	4822 116 52263	2,7kΩ	5%	0,5W					
3774	4822 116 52303	8,2kΩ	5%	0,5W					
3775	4822 116 83884	47kΩ	5%	0,16W					
3776	4822 116 52234	100kΩ	5%	0,5W					
3777	4822 116 83884	47kΩ	5%	0,16W					
3778	4822 116 52234	100kΩ	5%	0,5W					
3779	4822 116 83864	10kΩ	5%	0,5W					
3780	4822 116 52272	330kΩ	5%	0,5W					
3781	4822 116 52228	680Ω	5%	0,5W					
3782	4822 116 52228	680Ω	5%	0,5W					
3785	4822 116 83876	270Ω	5%	0,16W					
3786	4822 116 83884	47kΩ	5%	0,16W	HSD only				
3787	4822 116 83872	220Ω	5%	0,5W					
3788	4822 116 52228	680Ω	5%	0,5W					
3789	4822 116 52228	680Ω	5%	0,5W					
3790	4822 116 52257	22kΩ	5%	0,5W	HSD only				
3791	4822 116 83884	47kΩ	5%	0,16W	HSD only				
3792	4822 116 52251	18kΩ	5%	0,5W	HSD only				

**INTEGRATED CIRCUITS**

7711	4822 209 17498	AN7323, REC/PB-AMPLIFIER IC
7712	4822 209 17498	AN7323, REC/PB-AMPLIFIER IC

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

**COILS**

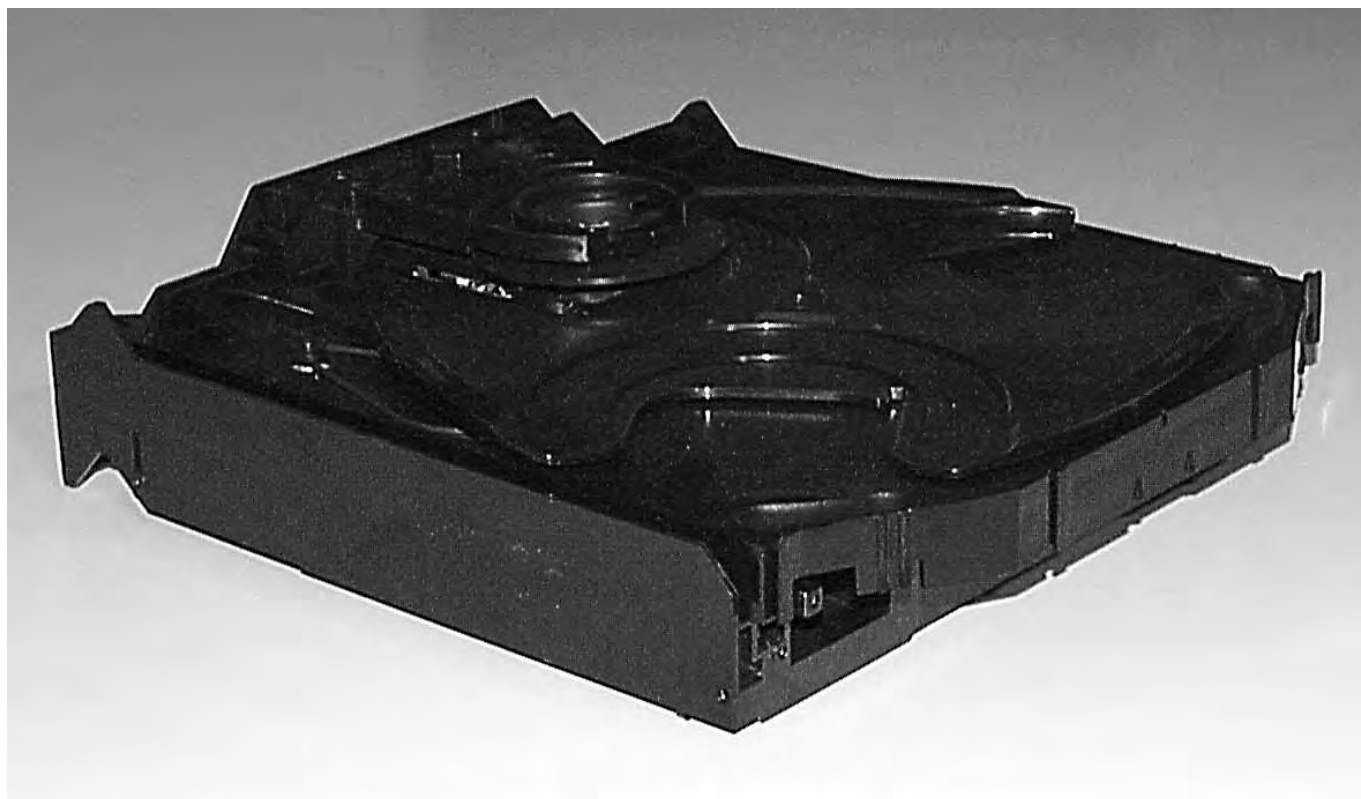
5701	4822 157 10371	OSC. COIL VAR. 100kHz
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**DIODES**

6703	4822 130 30621	1N4148
6706	4822 130 30621	1N4148
6707	4822 130 30621	1N4148
6708	4822 130 30621	1N4148
6709	4822 130 30621	1N4148

**TRANSISTORS**

7701	4822 130 44568	BC557B	HSD only
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# **3CDC-LC**

## **(3 Disc Carrousel Changer)**

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**WARNING**

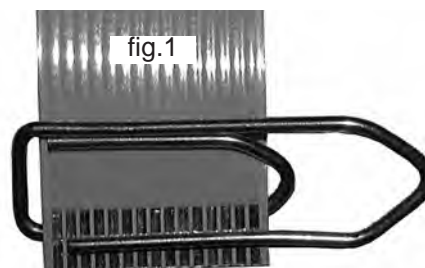
**CHARGED CAPACITORS ON THE SERVO BOARD MAY DAMAGE THE CD DRIVE ELECTRONICS WHEN CONNECTING A NEW CDM MECHANISM. THAT'S WHY, BESIDES THE SAFETY MEASURES LIKE**

- SWITCH OFF POWER SUPPLY
- ESD PROTECTION

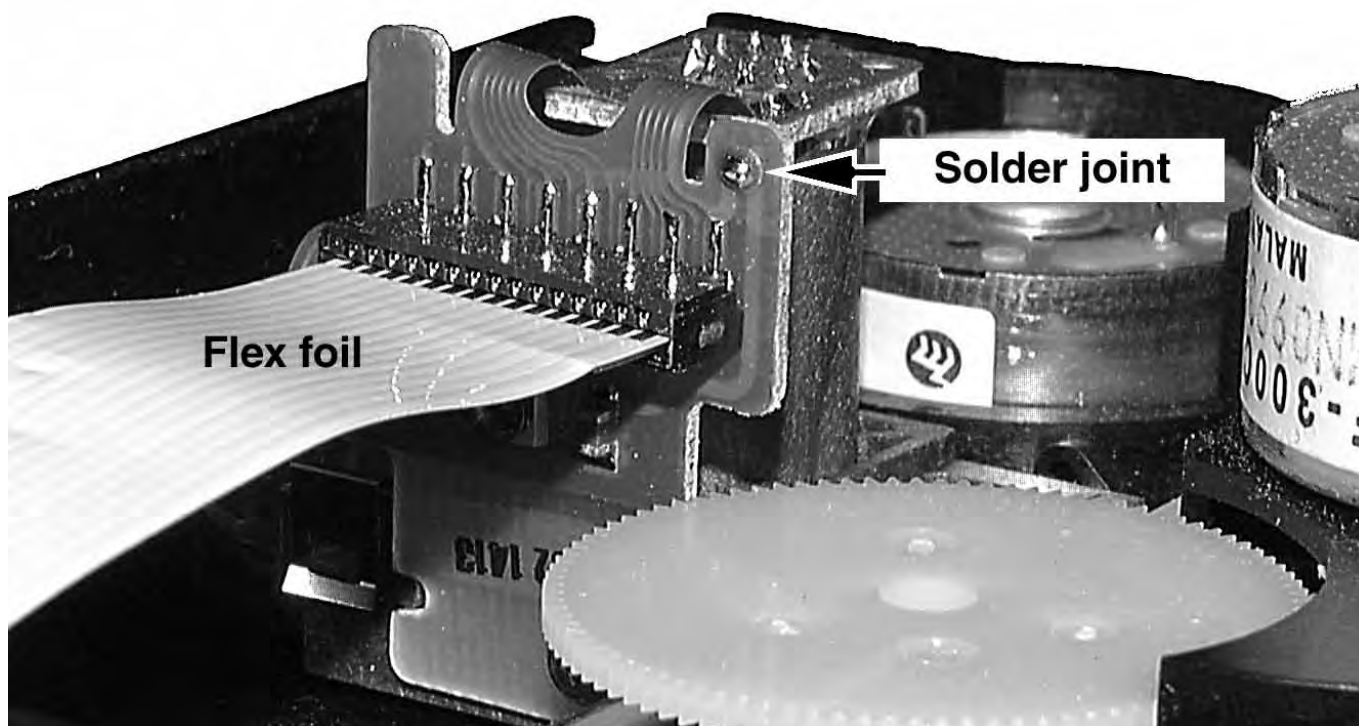
**ADDITIONAL ACTIONS MUST BE TAKEN BY THE REPAIR TECHNICIAN.**

The following steps have to be done when replacing the CD mechanism:

1. Disconnect CD drive flexfoil from old CD drive
2. Connect paperclip to CD drive flexfoil to short-circuit flexfoil (fig.1)
3. Remove old CD drive
4. Remove short-circuit from flexfoil
5. Connect flexfoil to new CD drive
6. Position new CD drive in its studs
7. Remove short-circuit from Laserunit

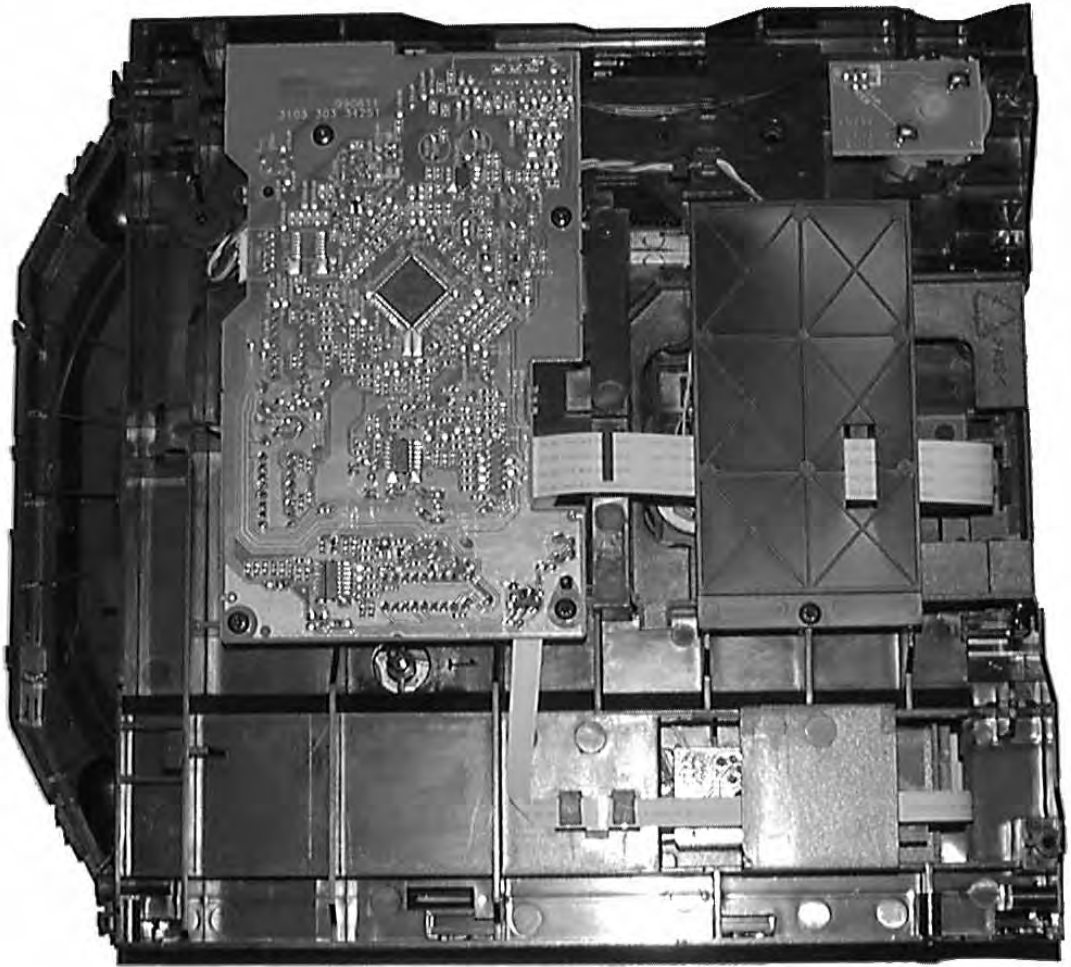


**Attention:** The laser diode of this CD drive is protected against ESD by a solder joint which shortcircuits the laserdiode to ground.  
For proper functionality of the CD drive this solder joint must be removed **after** connection the drive to the set.

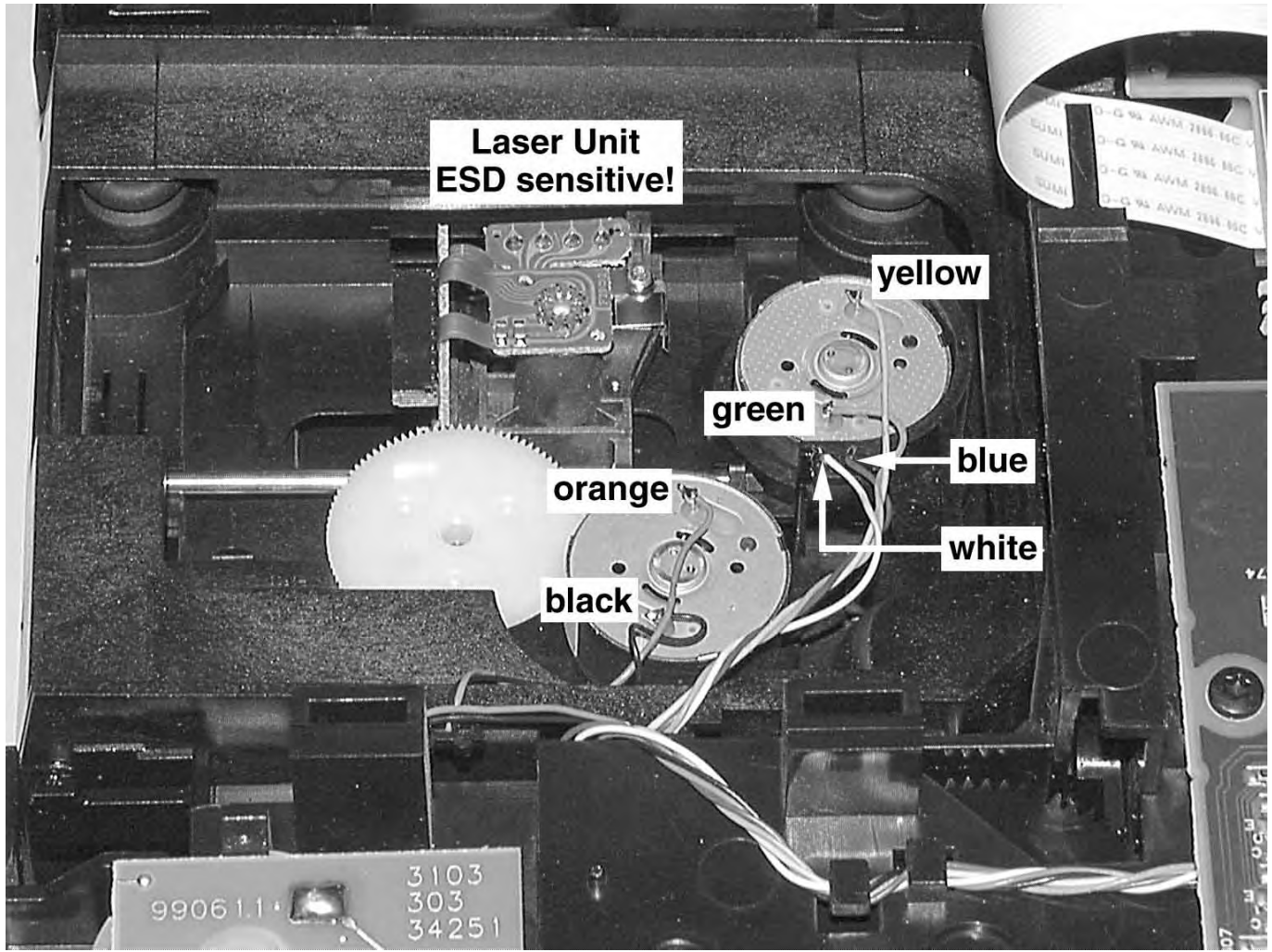


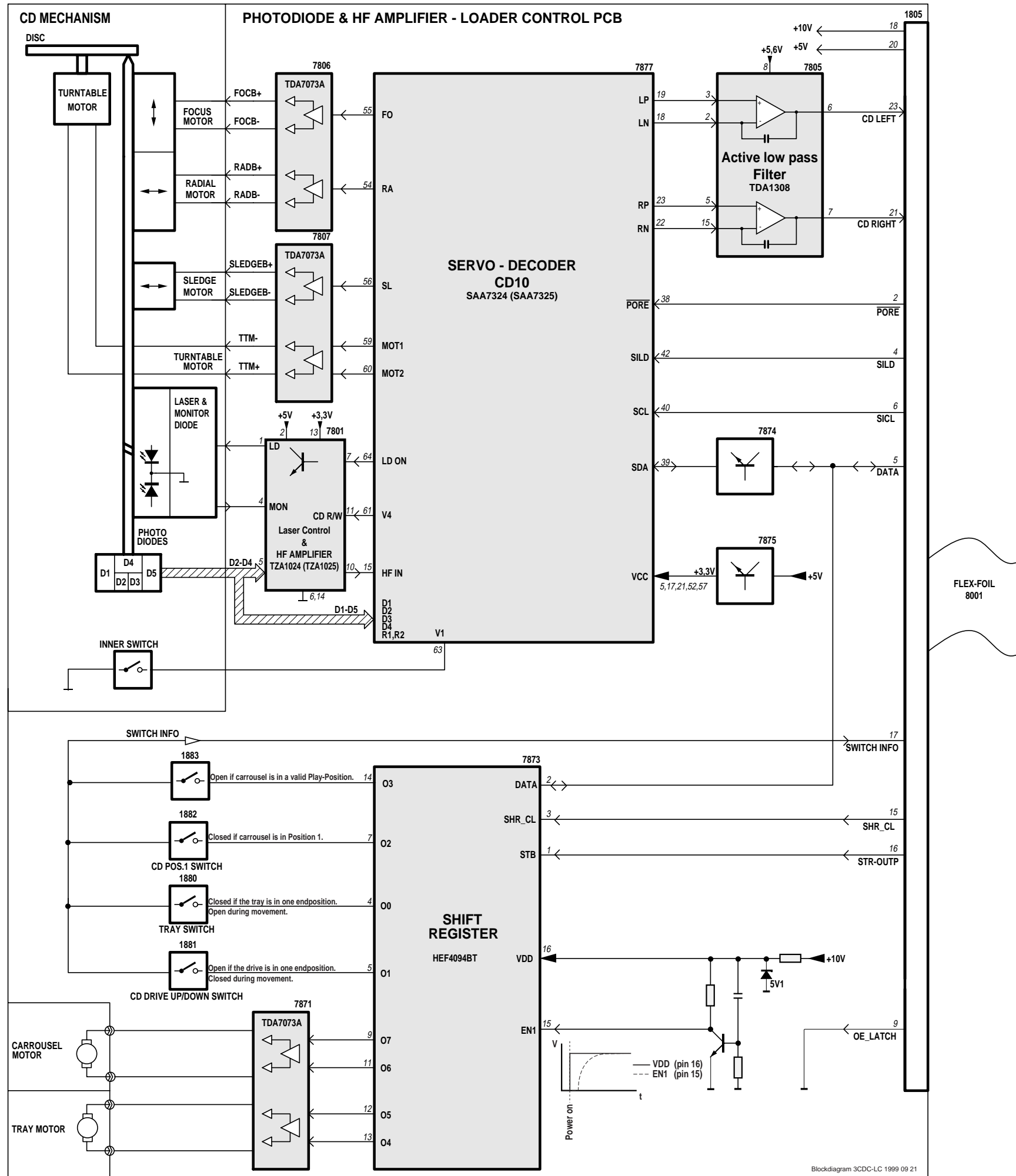


**Service Position**

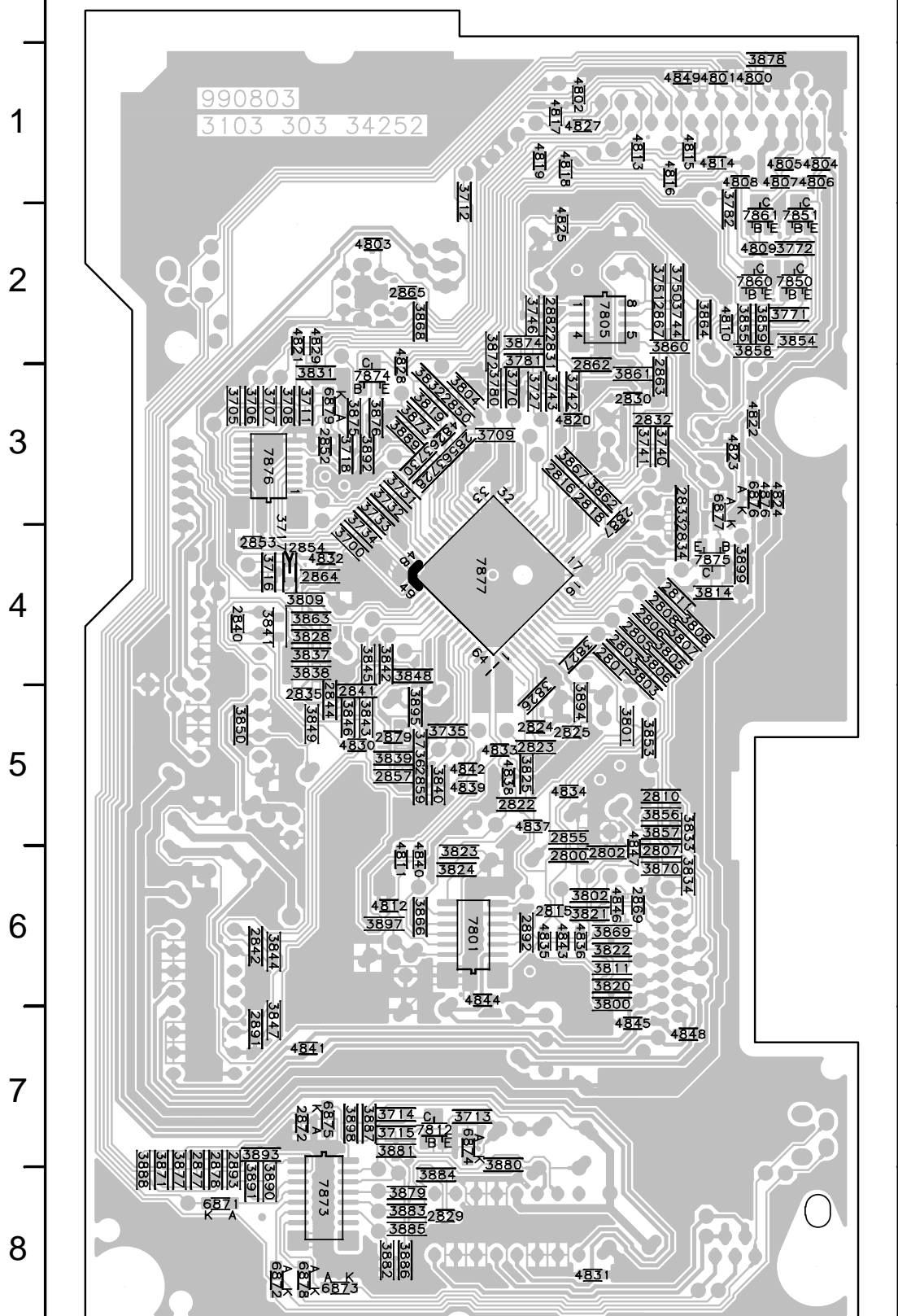


# Wiring





### 3CDC-LC Mainboard Copperside view



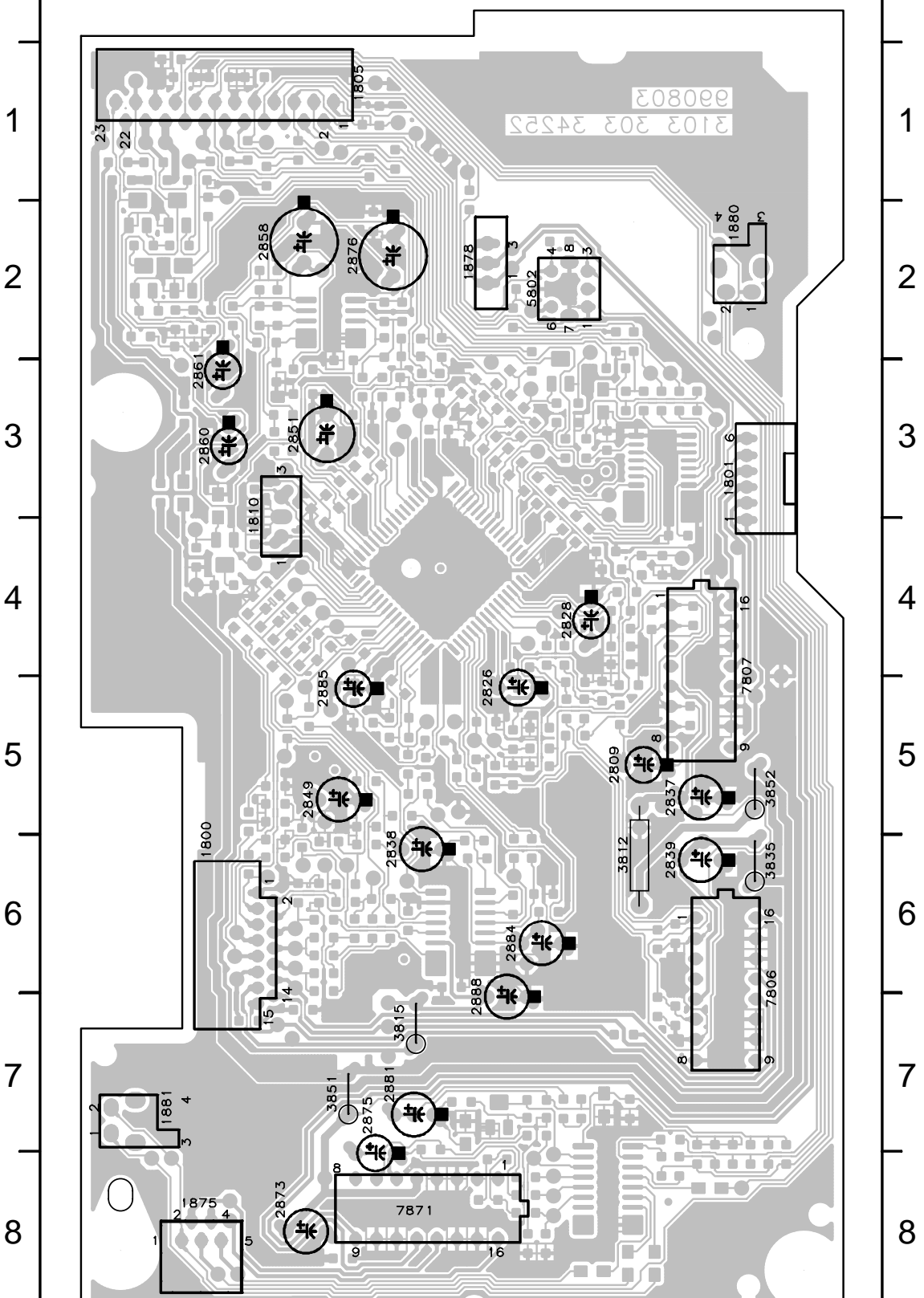
This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram respectively partslist.

3CDC-LC Mainboard Layout stage :2 990920

### Mapping

Copperside			Componentside				
2800	B6	3770	C3	3899	D3	1800	A6
2801	B4	3771	A2	3891	D8	1801	E3
2802	B6	3772	A2	3892	D3	1805	B1
2803	B4	3780	C3	3893	D7	1810	B3
2805	B4	3781	C2	3894	B5	1875	A8
2806	B4	3782	A2	3895	C5	1878	C2
2807	B6	3800	B6	3897	D6	1880	E2
2808	B4	3801	B5	3898	D7	1881	A7
2810	B5	3802	B6	3899	A4	2809	D5
2811	B4	3803	B4	4800	A1	2826	C5
2815	C6	3804	C3	4801	B1	2828	D4
2816	C3	3805	B4	4802	B1	2837	D5
2818	B3	3806	B4	4803	D2	2838	C6
2822	C5	3807	B4	4804	A1	2839	D6
2823	C5	3808	B4	4805	A1	2849	B5
2824	C5	3809	D4	4806	A1	2851	B3
2825	B5	3811	B6	4807	A1	2858	B2
2829	C8	3814	B4	4808	A1	2860	A3
2830	B3	3819	C3	4809	A2	2861	A3
2831	C2	3820	B6	4810	B2	2873	B8
2832	B3	3821	B6	4811	D6	2875	B7
2833	B3	3822	B6	4812	D6	2876	B2
2834	B4	3823	C6	4813	B1	2881	C7
2835	D5	3824	C6	4814	B1	2884	C6
2840	E4	3825	C5	4815	B1	2885	B5
2841	D5	3826	C5	4816	B1	2888	C7
2842	D6	3827	B4	4817	C1	3812	D6
2844	D5	3828	D4	4818	C1	3815	C7
2850	C3	3831	D3	4819	C1	3835	E6
2852	D3	3832	C3	4820	B3	3851	B7
2853	D4	3833	B5	4821	D2	3852	E5
2854	D4	3834	B6	4822	A3	5802	D2
2855	B5	3837	D4	4823	A3	7806	E6
2856	C3	3838	D4	4824	A3	7807	E5
2857	D5	3839	D5	4825	C2	7871	C8
2859	C5	3840	C5	4826	C3		
2862	B3	3841	D4	4827	B1		
2863	B3	3842	D4	4828	D3		
2864	D4	3843	D5	4829	D2		
2865	C2	3844	D6	4830	D5		
2867	B2	3845	D4	4831	B8		
2869	B6	3846	D5	4832	D4		
2872	D7	3847	D7	4833	C5		
2877	E8	3848	C4	4834	B5		
2878	E8	3849	D5	4835	C6		
2879	D5	3850	E5	4836	B6		
2882	C2	3853	B5	4837	C5		
2887	B3	3854	A2	4838	C5		
2891	D7	3855	A2	4839	C5		
2892	C6	3856	B5	4840	C6		
2893	E8	3857	B5	4841	D7		
3700	E4	3858	A2	4842	C5		
3705	F3	3859	A2	4843	C6		
3706	D3	3860	B2	4844	C6		
3707	D3	3861	B3	4845	B7		
3708	D3	3862	B3	4846	B6		
3709	C3	3863	D4	4847	B6		
3711	D3	3864	B2	4848	B7		
3712	C1	3866	C6	4849	B1		
3714	D7	3868	C2	6871	E8		
3715	D7	3869	B6	6872	D8		
3716	D4	3870	B6	6873	D8		
3717	D4	3871	E8	6874	C7		
3718	D3	3872	C2	6875	D7		
3728	C3	3874	C2	6877	B3		
3730	C3	3875	D3	6878	D8		
3731	D3	3876	D3	6879	D3		
3732	D3	3877	E8	7801	C6		
3733	D3	3878	A1	7805	B2		
3734	D4	3879	C8	7812	C7		
3735	C5	3880	C7	7850	A2		
3736	C5	3881	D7	7851	A2		
3740	B3	3882	D8	7860	A2		
3741	B3	3883	C8	7861	A2		
3742	B3	3884	C8	7873	D8		
3743	C3	3885	C8	7874	D3		
3744	B2	3886	D8	7875	B4		
3746	C2	3887	D7	7876	D3		
3750	B2	3888	E8	7877	C4		

### 3CDC-LC Mainboard Componentside view



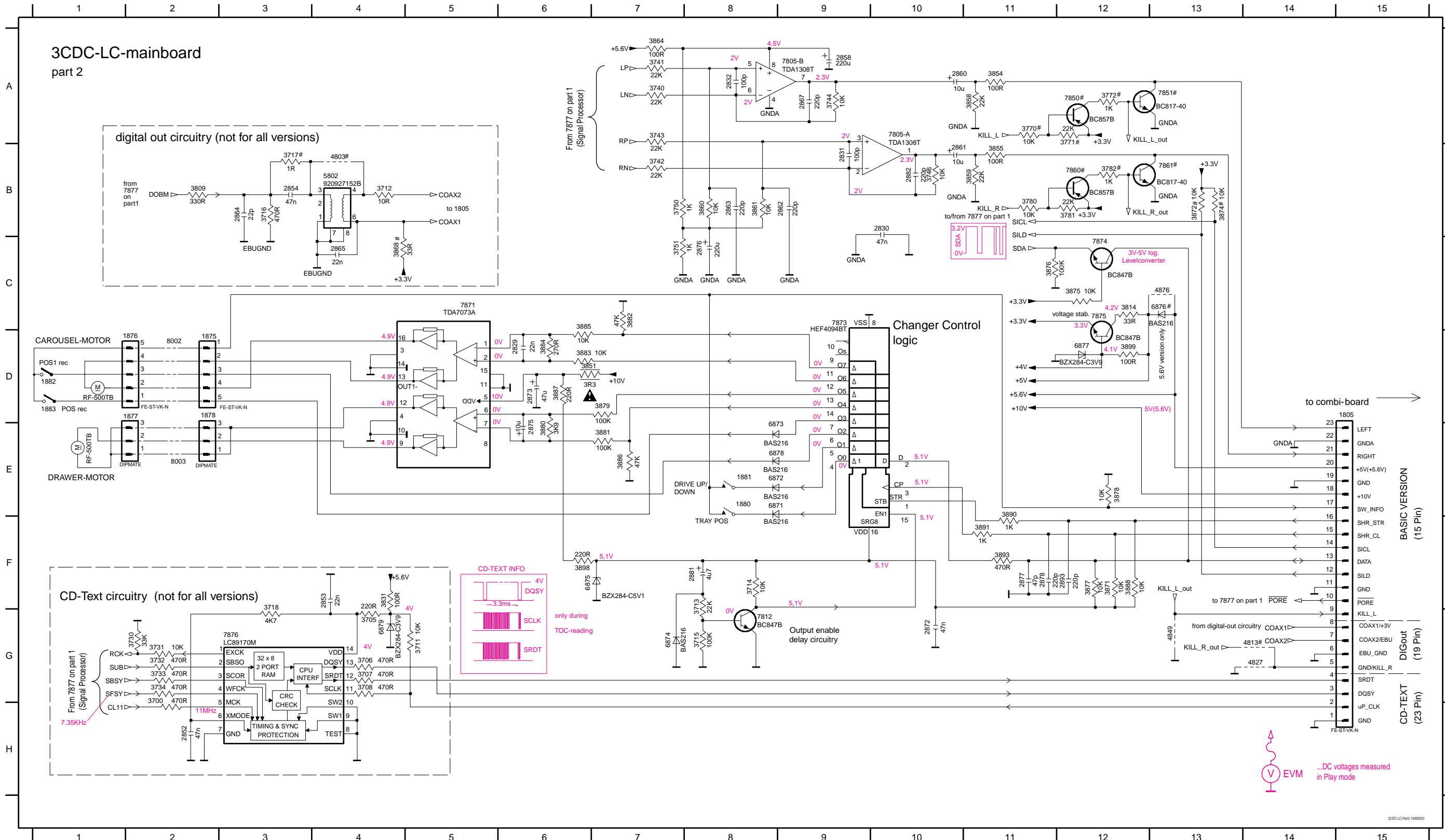
This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram respectively partslist.

3CDC-LC Mainboard Layout stage :2 990920





1805 D15	2830 B10	2858 A10	2865 C4	2877 F11	3705 G4	3713 F8	3730 G2	3741 A7	3751 C7	3782 B12	3855 B11	3868 C4	3877 F12	3883 D6	3890 F11	4813 G14	6872 E8	6878 E8	7851 A13	7875 C12	MP725 D8	MP803 F10	MP810 F13	MP830 A9	MP856 E14	MP867 E8	MP882 G2	MP891 B5
1875 D2	2831 B9	2860 A10	2867 A9	2878 F11	3706 G4	3714 F8	3731 G2	3742 B7	3770 A11	3809 B2	3858 A11	3871 F12	3878 E12	3884 D6	3891 F11	4827 G14	6873 E8	6879 G4	7860 B12	7876 G3	MP726 D8	MP804 G14	MP811 F13	MP832 G9	MP857 B13	MP868 F8	MP886 G3	MP892 B5
1878 D2	2832 A8	2861 B10	2872 G10	2881 F8	3707 G4	3715 G8	3732 G2	3743 A7	3771 A12	3814 C12	3859 B11	3872 B13	3879 D7	3885 C6	3893 F11	4849 G13	6874 F7	7805-A A10	7861 B13	MP721 C8	MP740 H14	MP805 E13	MP822 E3	MP833 F13	MP862 G13	MP869 C12	MP887 H5	MP897 D12
1880 E8	2852 H2	2862 B9	2873 D6	2882 B10	3708 G4	3716 B3	3733 G2	3744 A9	3772 A12	3814 C12	3860 B8	3874 B13	3880 E6	3886 E7	3898 F6	4876 C13	6875 F6	7805-B A9	7871 C5	MP722 E8	MP741 G14	MP806 F13	MP823 D3	MP834 G14	MP863 C11	MP871 D6	MP888 G5	MP898 D13
1881 E8	2853 F4	2863 B8	2875 E6	2893 F12	3711 G5	3717 B3	3734 G2	3746 B10	3780 B11	3851 D6	3861 B8	3875 C12	3881 E7	3887 D6	3899 D12	5802 B4	6876 C13	7812 G8	7873 C9	MP723 C8	MP742 G14	MP807 F14	MP824 D4	MP835 F14	MP865 D11	MP874 D12	MP889 G5	MP899 E14
2829 D6	2854 B3	2864 B3	2876 C8	3700 H2	3712 B4	3718 G3	3740 A7	3750 B7	3781 B12	3854 A11	3864 A7	3876 C11	3882 C7	3888 F12	4803 B4	6871 E8	6877 D12	7850 A12	7874 C12	MP724 D8	MP801 D12	MP808 E13	MP825 D4	MP854 A13	MP866 E8	MP881 G2	MP890 B3	

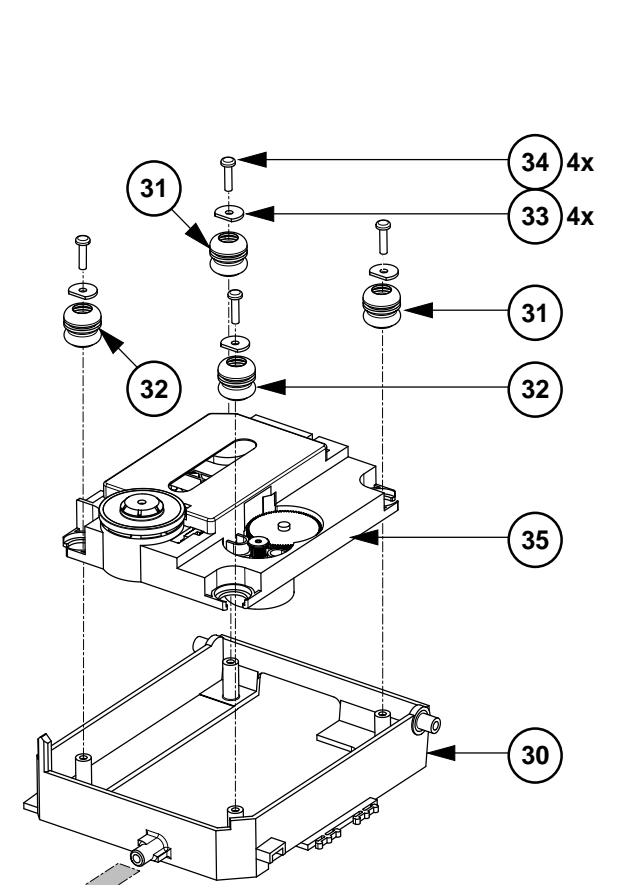
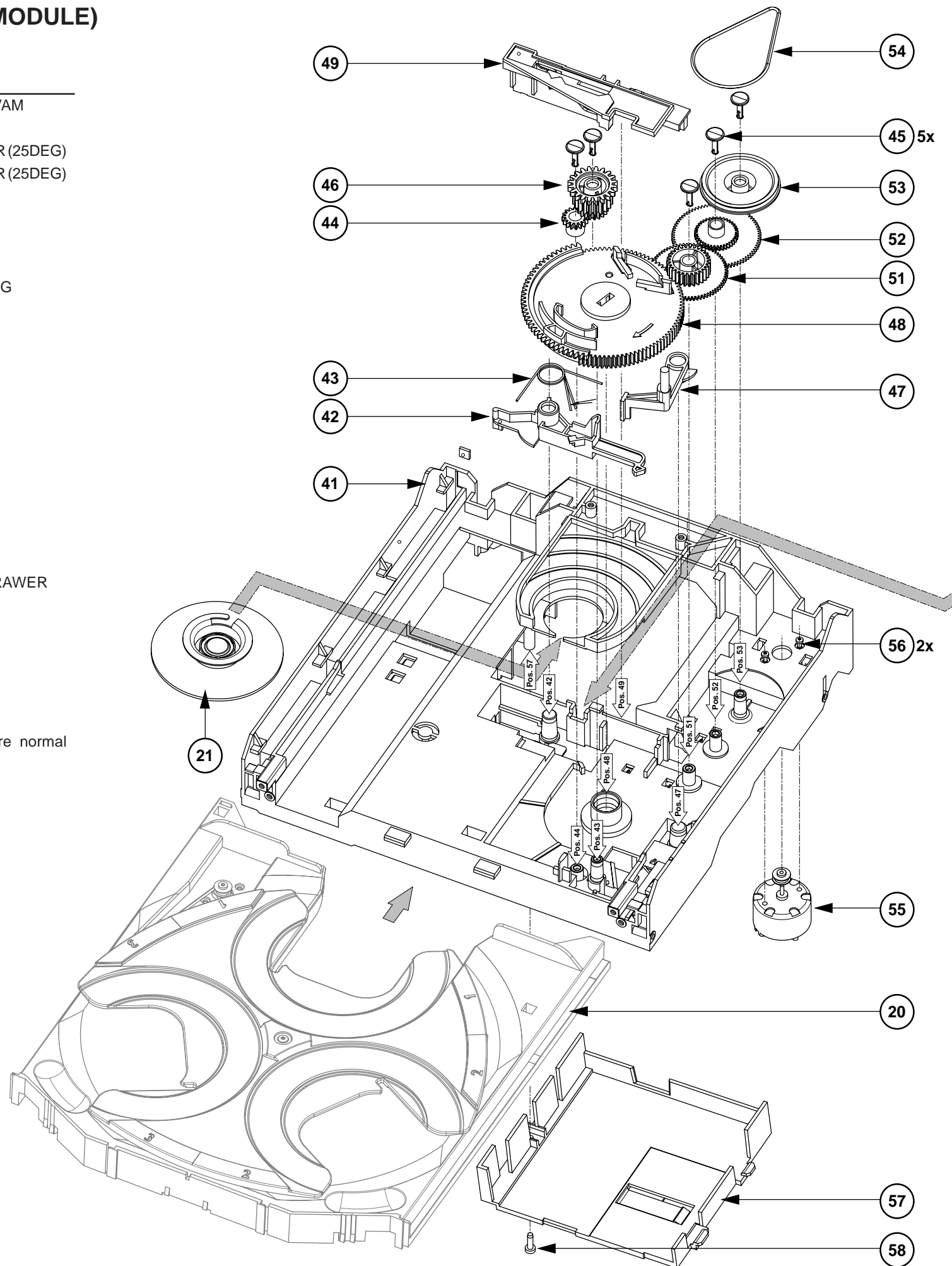


### EXPLODED VIEW (3CDC-LC MODULE)

**Mechanical Parts List - 3CDC-LC Module**

21	314011758650	CLAMPER ASSY-VAM
30	310330466560	SUPPORT
31	482252910431	DAMPER - RUBBER (25DEG)
32	482252910431	DAMPER - RUBBER (25DEG)
33	310330406970	WASHER
35	482269110772	VAM2201/01
41	310330466480	FRAME
42	310330466540	BRACKET-GUIDING
43	310330106460	SPRING-GUIDING
44	310330406890	GEAR-3
45	310330406980	NAIL
46	310330406880	GEAR-2
47	310330466530	BRACKET-LOAD
48	310330406910	CAM
49	310330466510	GUIDING
51	310330406900	GEAR-4
52	310330406870	GEAR-1
53	310330406960	PULLEY-FRAME
54	310330466910	DRIVING-BELT-DRAWER
55	482236110753	MOTOR ASSY
56	482250212548	SCREW M2,6X2,9
57	310330468890	COVER-VAM
59	482246612146	RUBBER

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



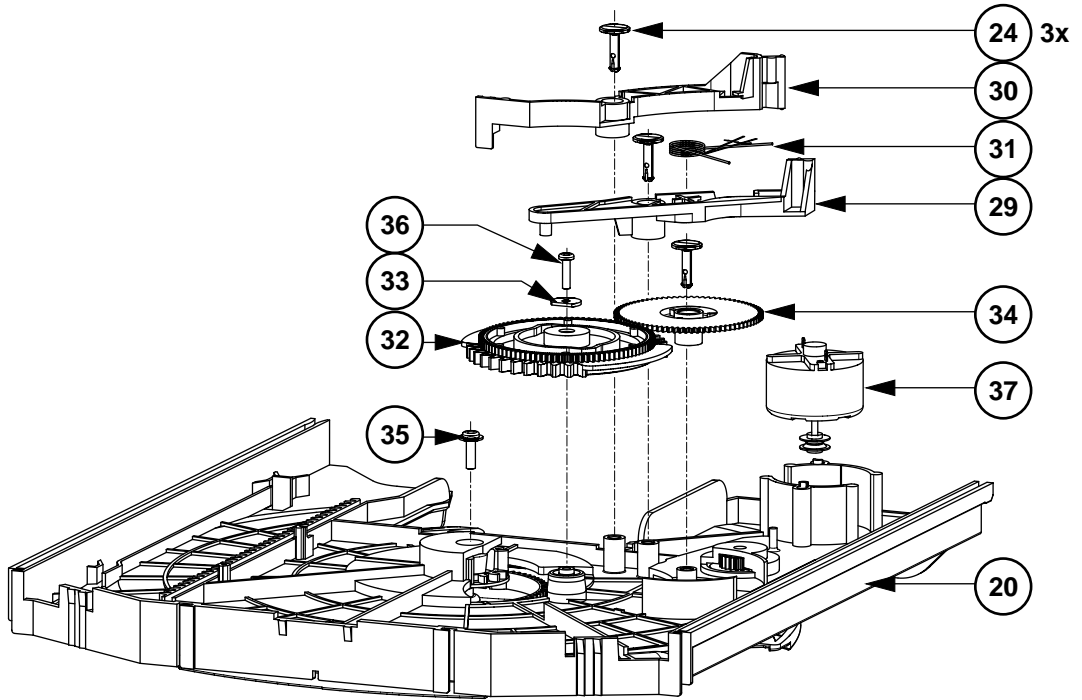
**Mechanical Parts list - Drawer Top & Bottom view**

20	3103 304 66500	DRAWER
21	3103 304 66490	CARROUSELL
22	3103 304 06860	PULLEY-DRAWER
23	3103 304 06850	ECCENTRIC
24	3103 304 06980	NAIL
25	3103 304 66850	DRIVING-BELT
27	3103 304 07100	BUSH DRAWER
29	3103 304 66550	BRACKET-DISC
30	3103 304 66520	TUMBLER
31	3103 301 06470	SPRING-DISC
32	3103 304 06920	CONTROL-DISC
33	3103 304 06970	WASHER
34	3103 304 06870	GEAR-1
37	4822 361 10753	MOTOR ASSY

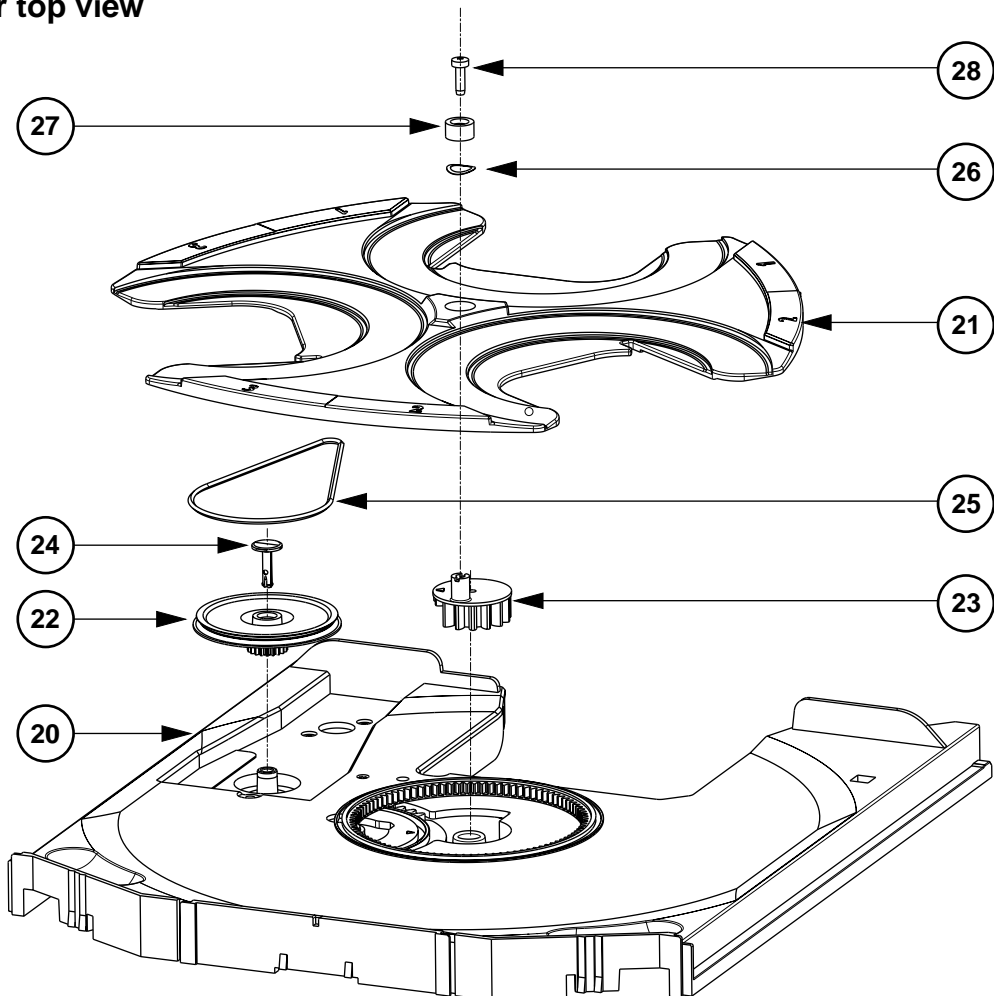
Notes: Only the parts mentioned in this list are normal service spare parts.



**Drawer bottom view**



**Drawer top view**



**ELECTRICAL PARTS LIST - 3CDC-LC MODULE****MISCELLANEOUS**

1800	482226510925	Flex Foil Connector 15P
1805	482226510979	Flex Foil Connector 15P
1805	482226511545	Flex Foil Connector 19P
1805	482226511182	Flex Foil Connector 23P
1810	482224210849	RES XTL 8MHz4672
1810	482224273557	RES CER 8MHz467
1875	482226710958	Flex Foil Connector 5P
1876	242202508332	Flex Foil Connector 5P
1880	482227613503	Switch
1881	482227613503	Switch
1882	482227613503	Switch
1883	482227613503	Switch
8002	310330891990	Flex Foil 5P 200mm
8005	310330891980	Flex Foil 15P 170mm

**CAPACITORS**

2800	482212610326	180pF 5% 63V
2801	482212233575	220pF 5% 63V
2802	482212610326	180pF 5% 63V
2803	482212233575	220pF 5% 63V
2805	482212233575	220pF 5% 63V
2806	482212233575	220pF 5% 63V
2807	532212231863	330pF 5% 63V
2808	482212233575	220pF 5% 63V
2809	532212441948	470nF 20% 50V
2810	482212610326	180pF 5% 63V
2811	482212233575	220pF 5% 63V
2815	482212614076	220nF +80/-20% 25V
2816	482212613344	1,5nF 5% 63V
2818	482212613344	1,5nF 5% 63V
2822	222286115222	2,2nF 5% 50V
2823	482212613692	47pF 1% 63V
2824	482212613751	47nF 10% 63V
2825	482212233177	10nF 20% 50V
2826	482212412362	47μF 20% 4V
2828	482212412362	47μF 20% 4V
2829	532212232654	22nF 10% 63V
2830	482212613751	47nF 10% 63V
2831	532212232531	100pF 5% 50V
2832	532212232531	100pF 5% 50V
2833	532212232659	33pF 5% 50V
2834	532212232659	33pF 5% 50V
2835	482212613751	47nF 10% 63V
2837	482212440433	47μF 20% 25V
2838	482212440248	10μF 20% 63V
2839	482212440433	47μF 20% 25V
2840	482212614585	100nF 10% 50V
2841	482212233216	270pF 5% 50V
2842	482212233127	2,2nF 10% 63V
2844	482212233216	270pF 5% 50V
2849	482212440769	4,7μF 20% 100V
2850	532212231647	1nF 10% 63V

2851	482212442383	220μF 20% 4V
2852	482212613751	47nF 10% 63V
2853	532212232654	22nF 10% 63V
2854	482212613751	47nF 10% 63V
2855	532212234099	470pF 10% 63V
2856	482212613691	27pF 1% 63V
2857	482212233177	10nF 20% 50V
2858	482212412245	220μF 20%
2859	482212233177	10nF 20% 50V
2860	482212411947	10μF 20% 16V
2861	482212411947	10μF 20% 16V
2862	482212233575	220pF 5% 63V
2863	482212233575	220pF 5% 63V
2864	532212232658	22pF 5% 50V
2865	532212232654	22nF 10% 63V
2867	482212233575	220pF 5% 63V
2869	482212613751	47nF 10% 63V
2872	482212613751	47nF 10% 63V
2873	482212480231	47μF 20% 16V
2875	482212411947	10μF 20% 16V
2876	482212412245	220μF 20%
2877	482212613692	47pF 1% 63V
2878	482212233575	220pF 5% 63V
2879	482212613751	47nF 10% 63V
2881	482212440769	4,7μF 20% 100V
2882	482212233575	220pF 5% 63V
2884	482212440769	4,7μF 20% 100V
2885	482212440769	4,7μF 20% 100V
2887	482212614585	100nF 10% 50V
2888	482212440769	4,7μF 20% 100V
2891	532212231865	1,5nF 10% 63V
2892	532212610223	4,7nF 10% 63V
2893	482212233575	220pF 5% 63V

**RESISTORS**

3700	482205120471	470R 5% 0,1W
3705	482211711503	220R 1% 0,1W
3706	482205120471	470R 5% 0,1W
3707	482205120471	470R 5% 0,1W
3708	482205120471	470R 5% 0,1W
3709	482205120108	1R 5% 0,1W
3711	482211710833	10k 1% 0,1W
3712	482205120109	10R 5% 0,1W
3713	482205120223	22k 5% 0,1W
3714	482211710833	10k 1% 0,1W
3715	482211710837	100k 1% 0,1W
3716	482205120471	470R 5% 0,1W
3718	482205120472	4k7 5% 0,1W
3727	482205120472	4k7 5% 0,1W
3728	482205120472	4k7 5% 0,1W
3730	482205120333	33k 5% 0,1W
3731	482211710833	10k 1% 0,1W

**ELECTRICAL PARTS LIST - 3CDC-LC MODULE****RESISTORS**

3732	482205120471	470R 5% 0,1W	3850	482205120392	3k9 5% 0,1W
3733	482205120471	470R 5% 0,1W	3851	482205210338	△ 3R3 5% 0,33W
3734	482205120471	470R 5% 0,1W	3852	482205210228	△ 2R2 5% 0,33W
3740	482205120223	22k 5% 0,1W	3853	482205120471	470R 5% 0,1W
3741	482205120223	22k 5% 0,1W	3854	482205120101	100R 5% 0,1W
3742	482205120223	22k 5% 0,1W	3855	482205120101	100R 5% 0,1W
3743	482205120223	22k 5% 0,1W	3856	482211712521	68R 1% 0,1W
3744	482211710833	10k 1% 0,1W	3857	482211712521	68R 1% 0,1W
3746	482211710833	10k 1% 0,1W	3858	482205120223	22k 5% 0,1W
3750	482205110102	1k 2% 0,25W	3859	482205120223	22k 5% 0,1W
3751	482205110102	1k 2% 0,25W	3860	482211710833	10k 1% 0,1W
3800	482211711148	56k 1% 0,1W	3861	482211710833	10k 1% 0,1W
3801	482211710833	10k 1% 0,1W	3862	482205120121	120R 5% 0,1W
3802	482211711148	56k 1% 0,1W	3863	482205120101	100R 5% 0,1W
3803	482211710833	10k 1% 0,1W	3863	482205120339	33R 5% 0,1W
3804	482211710833	10k 1% 0,1W	3864	482205120101	100R 5% 0,1W
3805	482211710833	10k 1% 0,1W	3866	482211710833	10k 1% 0,1W
3806	482211710833	10k 1% 0,1W	3867	482205120121	120R 5% 0,1W
3807	482211710833	10k 1% 0,1W	3869	482205120478	4R7 5% 0,1W
3808	482211710833	10k 1% 0,1W	3870	482205120101	100R 5% 0,1W
3809	482211713577	330R 1% 1,25W	3871	482211710833	10k 1% 0,1W
3811	482211710965	18k 1% 0,1W	3873	482205120471	470R 5% 0,1W
3812	482205310228	2R2 5% 1W	3875	482211710833	10k 1% 0,1W
3814	482205120339	33R 5% 0,1W	3876	482211710837	100k 1% 0,1W
3815	482205210478	△ 4R7 5% 0,33W	3877	482211710833	10k 1% 0,1W
3819	482205120471	470R 5% 0,1W	3878	482211710833	10k 1% 0,1W
3820	482205120472	4k7 5% 0,1W	3879	482211710837	100k 1% 0,1W
3821	482205120472	4k7 5% 0,1W	3880	482205120392	3k9 5% 0,1W
3822	482211712955	2k7 1% 0,1W	3881	482211710837	100k 1% 0,1W
3823	482205110102	1k 2% 0,25W	3882	482211710834	47k 1% 0,1W
3824	482205110102	1k 2% 0,25W	3883	482211710833	10k 1% 0,1W
3825	482205110102	1k 2% 0,25W	3884	482211711504	270R 1% 0,1W
3826	482205120223	22k 5% 0,1W	3885	482211710833	10k 1% 0,1W
3827	482205120333	33k 5% 0,1W	3886	482211710834	47k 1% 0,1W
3828	482205120223	22k 5% 0,1W	3887	482211711503	220R 1% 0,1W
3831	482205120101	100R 5% 0,1W	3888	482211710833	10k 1% 0,1W
3832	482211710833	10k 1% 0,1W	3889	482205120471	470R 5% 0,1W
3833	482205120223	22k 5% 0,1W	3890	482205110102	1k 2% 0,25W
3834	482205120223	22k 5% 0,1W	3891	482205110102	1k 2% 0,25W
3835	482205210338	△ 3R3 5% 0,33W	3892	482205120471	470R 5% 0,1W
3837	482205110102	1k 2% 0,25W	3893	482205120471	470R 5% 0,1W
3838	482205110102	1k 2% 0,25W	3894	482205120101	100R 5% 0,1W
3839	482211710837	100k 1% 0,1W	3895	482205120159	15R 5% 0,1W
3840	482211710837	100k 1% 0,1W	3897	482205120101	100R 5% 0,1W
3841	482205120472	4k7 5% 0,1W	3898	482211711503	220R 1% 0,1W
3842	482211710834	47k 1% 0,1W	3899	482205120101	100R 5% 0,1W
3843	482205120333	33k 5% 0,1W	4800	482205120008	0R Jumper 0805
3844	482205120472	4k7 5% 0,1W	4801	482205120008	0R Jumper 0805
3845	482211710834	47k 1% 0,1W	4802	482205120008	0R Jumper 0805
3846	482205120333	33k 5% 0,1W	4804	482205120008	0R Jumper 0805
3847	482211711507	6k8 1% 0,1W	4805	482205120008	0R Jumper 0805
3848	482211710837	100k 1% 0,1W	4806	482205120008	0R Jumper 0805
3849	482211710837	100k 1% 0,1W	4807	482205120008	0R Jumper 0805

**ELECTRICAL PARTS LIST - 3CDC-LC MODULE**

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**RESISTORS**

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4808	482205120008	0R Jumper 0805	7805	482220933165	TDA1308T/N1
4810	482205120008	0R Jumper 0805	7806	482220932852	TDA7073A/N2
4812	482205120008	0R Jumper 0805	7807	482220932852	TDA7073A/N2
4817	482205120008	0R Jumper 0805	7812	482213060511	BC847B
4818	482205120008	0R Jumper 0805	7871	482220932852	TDA7073A/N2
4819	482205120008	0R Jumper 0805	7873	532220911306	HEF4094BT
4820	482205120008	0R Jumper 0805	7874	482213060511	BC847B
4821	482205120008	0R Jumper 0805	7875	482213060511	BC847B
4822	482205120008	0R Jumper 0805	7876	482220916143	LC89170M
4823	482205120008	0R Jumper 0805	7877	482220917324	SAA7325H
4824	482205120008	0R Jumper 0805			
4825	482205120008	0R Jumper 0805			
4826	482205120008	0R Jumper 0805			
4827	482205120008	0R Jumper 0805			
4828	482205120008	0R Jumper 0805			
4830	482205120008	0R Jumper 0805			
4831	482205120008	0R Jumper 0805			
4832	482205120008	0R Jumper 0805			
4833	482205120008	0R Jumper 0805			
4834	482205120008	0R Jumper 0805			
4835	482205120008	0R Jumper 0805			
4836	482205120008	0R Jumper 0805			
4837	482205120008	0R Jumper 0805			
4838	482205120008	0R Jumper 0805			
4839	482205120008	0R Jumper 0805			
4840	482205120008	0R Jumper 0805			
4841	482205120008	0R Jumper 0805			
4842	482205120008	0R Jumper 0805			
4843	482205120008	0R Jumper 0805			
4844	482205120008	0R Jumper 0805			
4845	482205120008	0R Jumper 0805			
4846	482205120008	0R Jumper 0805			
4847	482205120008	0R Jumper 0805			
4848	482205120008	0R Jumper 0805			
4849	482205120008	0R Jumper 0805			
4876	482205120008	0R Jumper 0805			

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

**COILS & FILTERS**

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5802	482215631058	100 $\mu$ H
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**DIODES**

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6871	482213083757	BAS216
6872	482213083757	BAS216
6873	482213083757	BAS216
6874	482213083757	BAS216
6875	482213011383	BZX284-C5V1
6877	482213011366	BZX284-C3V9
6878	482213083757	BAS216
6879	482213011366	BZX284-C3V9

**TRANSISTORS & INTEGRATED CIRCUITS**

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7801	935262236118	IC SM TZA1025T/V2
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3CDC-LC-MB BLOCK DIAGRAM

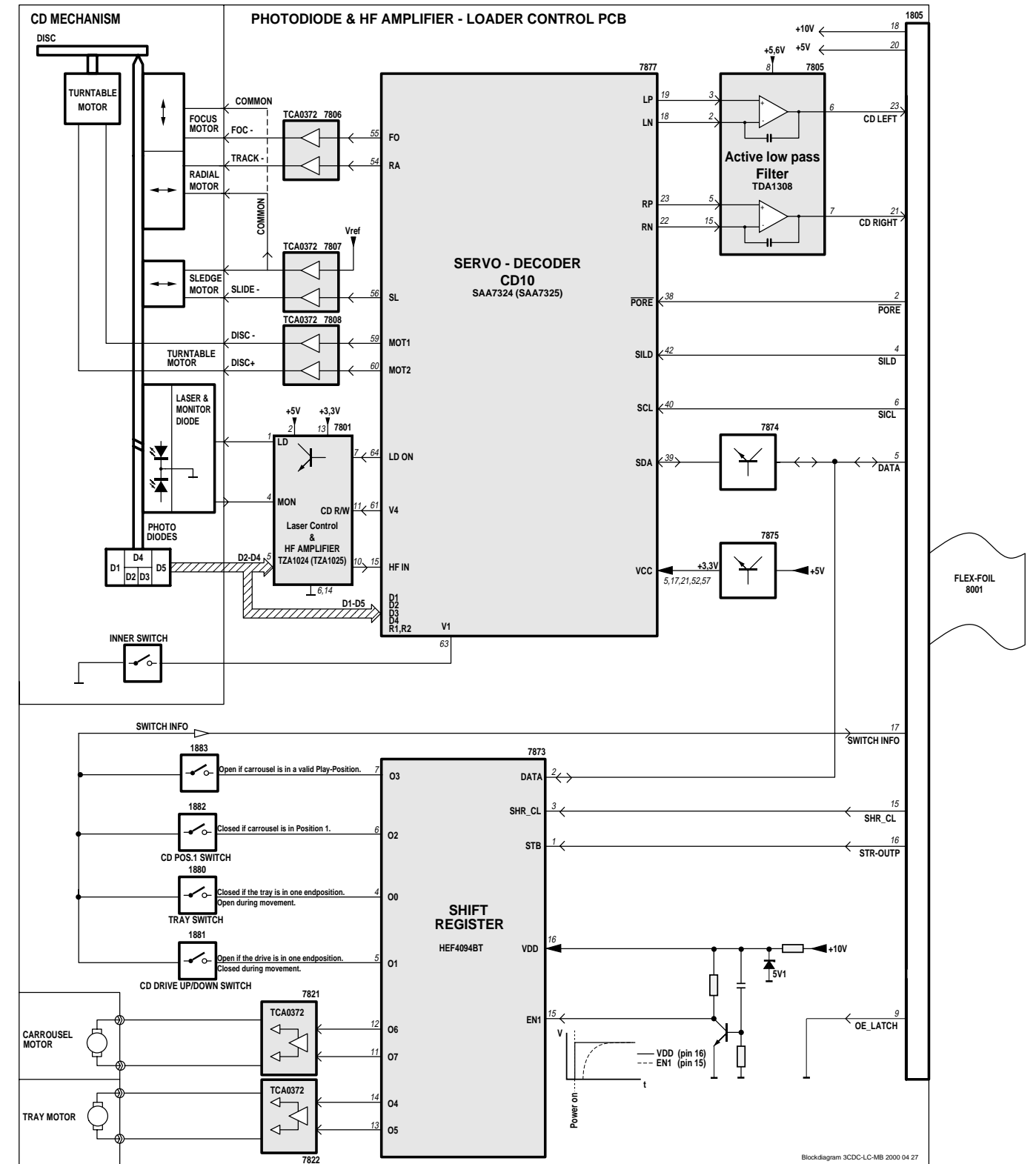
# 3CDC-LC-MB Module

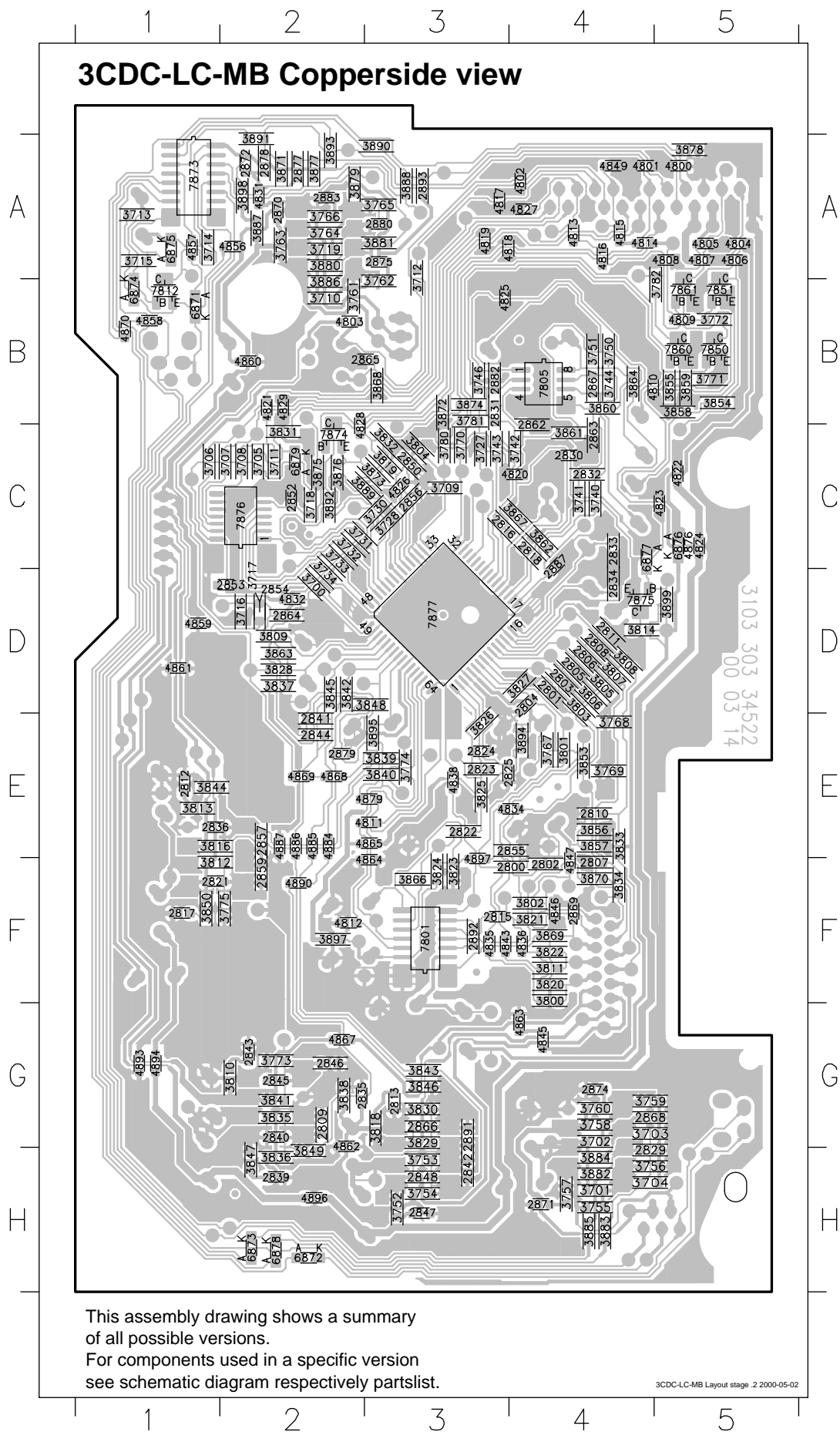
## (3 Disc Carousel Changer)

**Note:**  
 This module is mechanically the same as the 3CDC-LC Module.  
 All service information refers to Chapter 10 except the schematics, layouts & electrical parts list related to the CDC board.  
 The CDC board can be recognized by 12NC: 3103 303 34522 printed on the board.

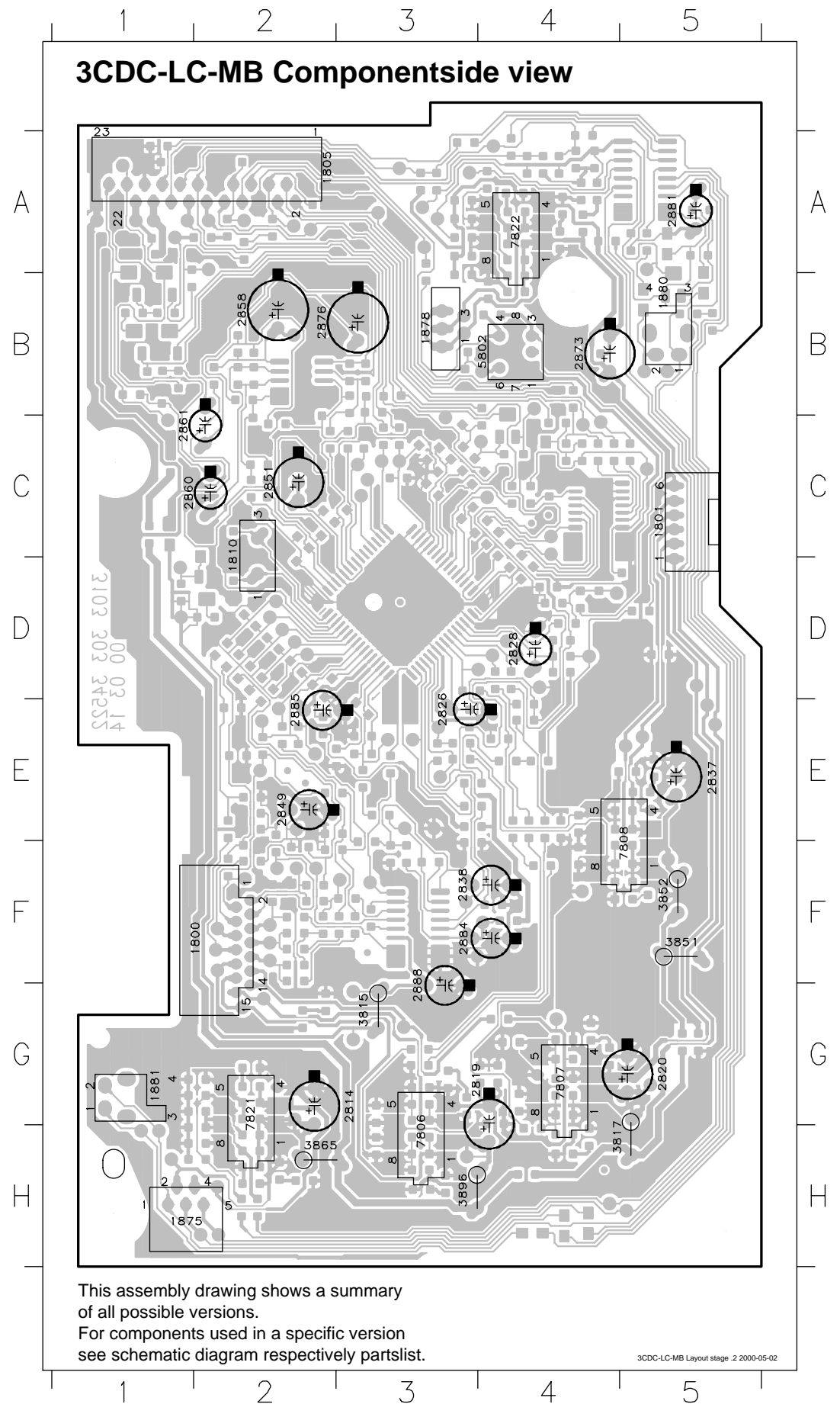
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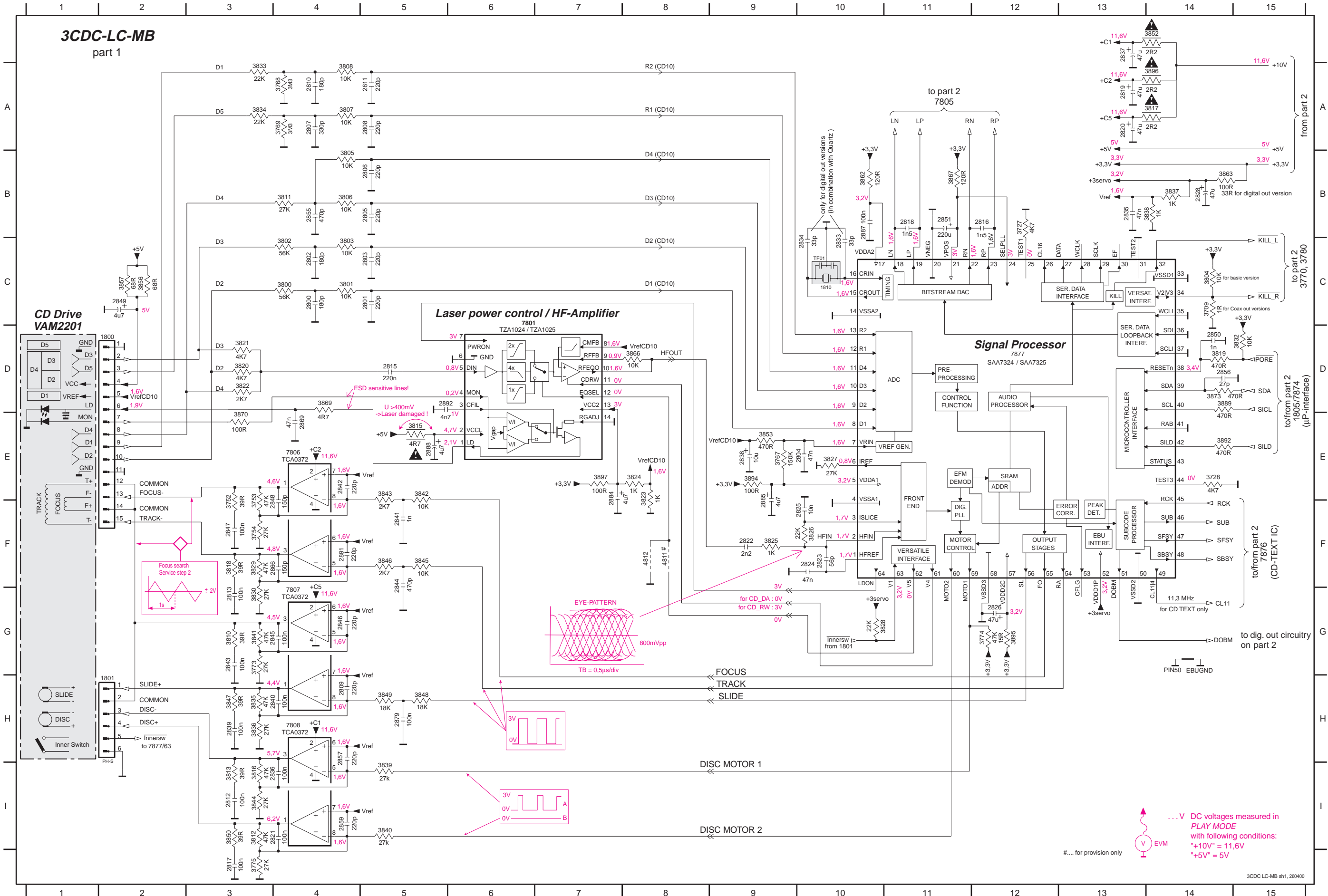




Copper side		Component side	
2800 F4	3751 B4	3883 H4	1800 F1
2801 D4	3752 H3	3884 H4	1801 C5
2802 F4	3753 H3	3885 H4	1805 A2
2803 D4	3754 H3	3886 B2	1810 C2
2804 D4	3755 H4	3887 A2	1875 H1
2805 D4	3756 H4	3888 A3	1878 B3
2806 D4	3757 H4	3889 C2	1880 B5
2807 F4	3758 G4	3890 A3	1881 G1
2808 D4	3759 G4	3891 A2	2814 G3
2809 G2	3760 G4	3892 C2	2819 G3
2810 E4	3761 B2	3893 A2	2820 G5
2811 D4	3762 B3	3894 E4	2826 E3
2812 E1	3763 A2	3895 E3	2828 D4
2813 G3	3764 A2	3897 F2	2837 E5
2815 F3	3765 A3	3898 A2	2838 F3
2816 C3	3766 A2	3899 D5	2849 E2
2817 F1	3767 E4	4800 A5	2851 C2
2818 C4	3768 E4	4801 A4	2858 B2
2821 F1	3769 E4	4802 A4	2860 C1
2822 E3	3770 C3	4803 B2	2861 C1
2823 E3	3771 B5	4804 A5	2873 B4
2824 E3	3772 B5	4805 A5	2876 B2
2825 E3	3773 G2	4806 A5	2881 A5
2829 H4	3774 E3	4807 A5	2884 F3
2830 C4	3775 F2	4808 A5	2885 E2
2831 B3	3780 C3	4809 B5	2888 G3
2832 C4	3781 B3	4810 B4	3815 G3
2833 C4	3782 B5	4811 E3	3817 H4
2834 D4	3800 F4	4812 F2	3851 F5
2835 G2	3801 E4	4813 A4	3852 F5
2836 E1	3802 F4	4814 A4	3865 H2
2839 H2	3803 D4	4815 A4	3896 H3
2840 G2	3804 C3	4816 A4	5802 B4
2841 E2	3805 D4	4817 A3	7806 H3
2842 H3	3806 D4	4818 A3	7807 G4
2843 G2	3807 D4	4819 A3	7808 E4
2844 E2	3808 D4	4820 C4	7821 G2
2845 G2	3809 D2	4821 B2	7822 A3
2846 G2	3810 G2	4822 C5	
2847 H3	3811 F4	4823 C5	
2848 H3	3812 F1	4824 C5	
2850 C3	3813 E1	4825 B3	
2852 C2	3814 D4	4826 C3	
2853 D2	3816 E1	4827 A4	
2854 D2	3818 G3	4828 C2	
2855 E4	3819 C3	4829 B2	
2856 C3	3820 F4	4831 A2	
2857 E2	3821 F4	4832 D2	
2859 F2	3822 F4	4834 E4	
2862 C4	3823 F3	4835 F3	
2863 C4	3824 F3	4836 F4	
2864 D2	3825 E3	4838 E3	
2865 B3	3826 E3	4843 F3	
2866 G3	3827 D4	4845 G4	
2867 B4	3828 D2	4846 F4	
2868 G4	3829 G3	4847 F4	
2869 F4	3830 G3	4849 A4	
2870 A2	3831 C2	4856 A2	
2871 H4	3832 C3	4857 A1	
2872 A2	3833 E4	4858 B1	
2874 G4	3834 F4	4859 D1	
2875 A3	3835 G2	4860 B2	
2877 A2	3836 H2	4861 D1	
2878 A2	3837 D2	4862 G2	
2879 E2	3838 G2	4863 G4	
2880 A3	3839 E3	4864 F3	
2882 B3	3840 E3	4865 E3	
2883 A2	3841 G2	4867 G2	
2887 C4	3842 D2	4868 E2	
2891 G3	3843 G3	4869 E2	
2892 F3	3844 E1	4870 B1	
2893 A3	3845 D2	4876 C5	
3700 D2	3846 G3	4879 E3	
3701 H4	3847 H2	4884 E2	
3702 G4	3848 D3	4885 E2	
3703 G4	3849 H2	4886 E2	
3704 H4	3850 F1	4887 E2	
3705 C2	3853 E4	4890 F2	
3706 C1	3854 B5	4893 G1	
3707 C2	3855 B5	4894 G1	
3708 C2	3856 F4	4896 H2	
3709 C3	3857 E4	4897 F3	
3710 B2	3858 B5	6871 B1	
3711 C2	3859 B5	6872 H2	
3712 A3	3860 B4	6873 H2	
3713 A1	3861 C4	6874 B1	
3714 A1	3862 C4	6875 A1	
3715 A1	3863 D2	6876 C5	
3716 D2	3864 B4	6877 C4	
3717 D2	3866 F3	6878 H2	
3718 C2	3867 C4	6879 C2	
3719 A2	3868 B3	7801 F3	
3727 C3	3869 F4	7805 B4	
3728 C3	3870 F4	7812 B1	
3730 C3	3871 A2	7850 B5	
3731 C2	3872 B3	7851 B5	
3732 C2	3873 C3	7860 B5	
3733 C2	3874 B3	7861 B5	
3734 D2	3875 C2	7873 A1	
3740 C4	3876 C2	7874 C2	
3741 C4	3877 A2	7875 D4	
3742 C4	3878 A5	7876 C2	
3743 C3	3879 A2	7877 D3	
3744 B4	3880 A2		
3746 B3	3881 A3		
3750 B4	3882 H4		



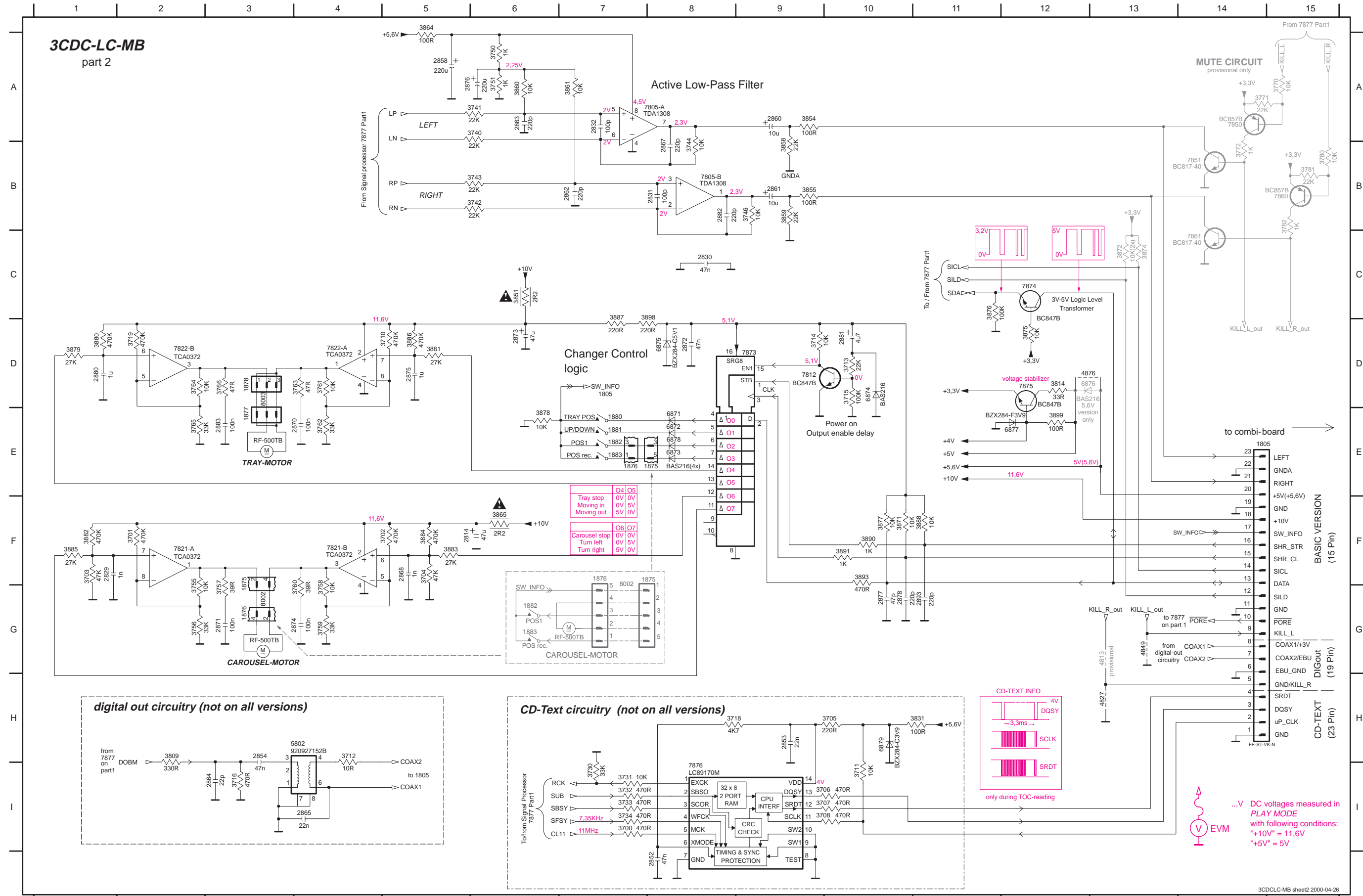
1800 D1 2801 C5 2805 B5 2809 H4 2813 G3 2818 B11 2822 F9 2826 G12 2835 B13 2839 H3 2843 G3 2847 F3 2851 B11 2859 I4 2884 E7 2891 F4 3728 E14 3767 E9 3774 G12 3802 C4 3806 B4 3811 B4 3816 I3 3820 D3 3824 E8 3828 G10 3833 A3 3837 B14 3841 G3 3845 F5 3849 H5 3856 C2 3866 D8 3873 D14 3895 G12 4812 F8 7808 H4  
 1801 G1 2802 C4 2806 B5 2810 A4 2815 D5 2819 A13 2823 F10 2828 B12 2836 I4 2840 H4 2844 F5 2848 F4 2855 B4 2866 F4 2885 F9 2892 D5 3752 F3 3768 A4 3803 C4 3807 A4 3812 I3 3817 A14 3821 D3 3825 F9 3830 G3 3835 H3 3839 I5 3843 E5 3847 H5 3855 C2 3867 B11 3877 D12  
 1810 C10 2803 C5 2807 A4 2811 A5 2816 B12 2820 A13 2824 F10 2833 C10 2837 A13 2841 F5 2845 G4 2849 C2 2856 D14 2869 E4 2887 B10 3709 C14 3753 F3 3769 A4 3800 C4 3804 C14 3808 A4 3813 I3 3818 F3 3822 D3 3826 F9 3830 G3 3835 H3 3839 I5 3843 E5 3847 H5 3855 C2 3867 B11 3877 D12  
 2800 C4 2804 E10 2808 A5 2812 I3 2817 I3 2821 I4 2825 F10 2834 C10 2838 E8 2842 E4 2846 G4 2850 D14 2857 H4 2868 E5 3727 B12 3754 F3 3773 G3 3801 C4 3805 B4 3810 G3 3815 E5 3819 D14 3823 E8 3827 F9 3832 D15 3836 H3 3840 I5 3844 I5 3848 H5 3853 E9 3863 B14 3870 E3 3875 E9 4811 F8 7807 G4







1805	E14	1880	E7	2831	B8	2861	B9	2870	E4	2877	G10	3372	C13	3705	H10	3713	D10	3730	I7	3743	B6	3757	G3	3764	D2	3781	B15	3855	B9	3871	F10	3881	D5	3888	F11	4827	H13	6874	D10	7805-B	B8	7851	B14		
1850	G3	1881	E7	2832	A7	2862	B7	2871	G3	2878	G10	3374	C13	3706	I10	3714	D9	3732	I7	3744	B8	3758	G4	3765	E2	3782	B15	3858	B9	3875	D12	3882	F1	3890	F10	4849	G13	6875	D8	7812	D9	7860	B15		
1875	E8	1882	E7	2852	I8	2863	A6	2872	D8	2880	D1	3700	I7	3707	I10	3715	D10	3733	I7	3746	B9	3759	G4	3766	D3	3809	H2	3859	B9	3876	F10	3883	F5	3891	F10	4876	D12	6876	D12	7821-A	F2	7861	C14		
1876	E7	1893	E7	2853	H9	2864	I3	2873	D6	2881	D10	3701	F2	3708	I10	3716	I5	3734	I7	3750	A6	3760	G4	3770	A14	3814	D12	3860	A6	3877	F10	3884	F5	3893	F10	5802	H4	6877	E12	7821-B	F4	7873	D9		
1877	E3	2814	F6	2854	H3	2865	I4	2874	G4	2882	B8	3702	F5	3710	D5	3718	H8	3740	A6	3751	A6	3761	D4	3771	A14	3831	H11	3861	A7	3878	E5	3885	F1	3898	D7	5802	H4	6877	E8	6878	E8	7822-A	D4	7874	C12
1878	D3	2829	F2	2858	A5	2867	B8	2875	D5	2883	E3	3703	F1	3711	I10	3719	D2	3741	A6	3755	G2	3762	E4	3772	B14	3851	C6	3864	A5	3879	D1	3886	D5	3899	E12	6872	E8	6879	H10	7822-B	D2	7875	D12		
1878	G3	2830	C8	2860	A9	2868	F5	2876	A6	2893	G11	3704	F5	3712	H4	3730	I7	3742	B6	3756	G2	3763	D4	3780	B15	3854	A9	3865	F6	3880	D1	3887	D7	4813	G13	6873	E8	7805-A	A7	7850	A14	7876	I8		



...V DC voltages measured in PLAY MODE with following conditions: "+10V" = 11.6V "+5V" = 5V



**ELECTRICAL PARTS LIST 3CDC-LC-MB MODULE**

**MISCELLANEOUS**

1800	4822 265 10925	FFC-CONNECTOR, 15P, SIDE ENTRY
1805	4822 265 10979	FLEX FOIL CONNECTOR 15PIN
1805	4822 265 11182	FLEX FOIL CONNECTOR 23PIN
1805	4822 265 11545	FLEX FOIL CONNECTOR 19PIN
1875	4822 267 10958	FFC-CONNECTOR, 5P, SIDE ENTRY
1876	2422 025 08332	FLEX FOIL CONNECTOR 5PIN
1880	4822 276 13503	SWITCH, Tray in endposition
1881	4822 276 13503	SWITCH, Drive up/down
1882	4822 276 13503	SWITCH, Position 1
1883	4822 276 13503	SWITCH, Position recogniced
8002	3103 308 91990	FLEX FOIL CABLE 5P, 200mm
8005	3103 308 91980	FLEX FOIL CABLE 15P, 170mm

**CAPACITORS**

2800	©	4822 126 10326	180pF	5%	
2801	©	4822 122 33575	220pF	5%	50V
2802	©	4822 126 10326	180pF	5%	
2803	©	4822 122 33575	220pF	5%	50V
2804	©	4822 126 13751	47nF	10%	50V
2805	©	4822 122 33575	220pF	5%	50V
2806	©	4822 122 33575	220pF	5%	50V
2807	©	5322 122 31863	330pF	5%	50V
2808	©	4822 122 33575	220pF	5%	50V
2809	©	4822 122 33575	220pF	5%	50V
2810	©	4822 126 10326	180pF	5%	
2811	©	4822 122 33575	220pF	5%	50V
2812	©	4822 126 14585	100nF	10%	50V
2813	©	4822 126 14585	100nF	10%	50V
2814	©	4822 124 40433	47µF	20%	25V
2815	©	4822 126 14076	220nF	20%	25V
2816	©	4822 126 13344	1,5nF	5%	63V
2817	©	4822 126 14585	100nF	10%	50V
2818	©	4822 126 13344	1,5nF	5%	63V
2819	©	4822 124 40433	47µF	20%	25V
2820	©	4822 124 40433	47µF	20%	25V
2821	©	4822 126 14585	100nF	10%	50V
2822	©	2222 861 15222	2,2nF	10%	50V
2823	©	4822 126 13693	56pF	1%	63V
2824	©	4822 126 13751	47nF	10%	50V
2825	©	4822 122 33177	10nF	20%	50V
2826	©	4822 124 12362	47µF	20%	4V
2828	©	4822 124 12362	47µF	20%	4V
2829	©	5322 122 31647	1nF	10%	63V
2830	©	4822 126 13751	47nF	10%	50V
2831	©	5322 122 32531	100pF	5%	50V
2832	©	5322 122 32531	100pF	5%	50V
2833	©	5322 122 32659	33pF	5%	50V
2834	©	5322 122 32659	33pF	5%	50V
2835	©	4822 126 13751	47nF	10%	50V
2836	©	4822 126 14585	100nF	10%	50V
2837	©	4822 124 40433	47µF	20%	25V
2838	©	4822 124 40248	10µF	20%	63V
2839	©	4822 126 14585	100nF	10%	50V
2840	©	4822 126 14585	100nF	10%	50V
2841	©	5322 122 31647	1nF	10%	63V
2842	©	5322 126 10794	220pF	10%	
2843	©	4822 126 14585	100nF	10%	50V
2844	©	5322 122 34099	470pF	10%	63V
2845	©	4822 126 14585	100nF	10%	50V
2846	©	4822 122 33575	220pF	5%	50V
2847	©	4822 126 14585	100nF	10%	50V
2848	©	5322 122 33538	150pF	5%	63V
2849	©	4822 124 40769	4,7µF	20%	100V
2850	©	5322 122 31647	1nF	10%	63V

**CAPACITORS**

2851	4822 124 42383	220µF	20%	4V	
2852	©	4822 126 13751	47nF	10%	50V
2853	©	5322 122 32654	22nF	10%	63V
2854	©	4822 126 13751	47nF	10%	50V
2855	©	5322 122 34099	470pF	10%	63V
2856	©	4822 126 13691	27pF	1%	63V
2857	©	4822 122 33575	220pF	5%	50V
2858	©	4822 124 12245	220µF	20%	16V
2859	©	4822 122 33575	220pF	5%	50V
2860	©	4822 124 11947	10µF	20%	16V
2861	©	4822 124 11947	10µF	20%	16V
2862	©	4822 122 33575	220pF	5%	50V
2863	©	4822 122 33575	220pF	5%	50V
2864	©	5322 122 32658	22pF	5%	50V
2865	©	5322 122 32654	22nF	10%	63V
2866	©	5322 122 33538	150pF	5%	63V
2867	©	4822 122 33575	220pF	5%	50V
2868	©	5322 122 31647	1nF	10%	63V
2869	©	4822 126 13751	47nF	10%	50V
2870	©	4822 126 14585	100nF	10%	50V
2871	©	4822 126 14585	100nF	10%	50V
2872	©	4822 126 13751	47nF	10%	50V
2873	©	4822 124 40433	47µF	20%	25V
2874	©	4822 126 14585	100nF	10%	50V
2875	©	4822 126 14043	1µF	20%	16V
2876	©	4822 124 12245	220µF	20%	16V
2877	©	4822 126 13692	47pF	1%	63V
2878	©	4822 122 33575	220pF	5%	50V
2879	©	4822 126 14585	100nF	10%	50V
2880	©	4822 126 14043	1µF	20%	16V
2881	©	4822 124 40769	4,7µF	20%	100V
2882	©	4822 122 33575	220pF	5%	50V
2883	©	4822 126 14585	100nF	10%	50V
2884	©	4822 124 40769	4,7µF	20%	100V
2885	©	4822 124 40769	4,7µF	20%	100V
2887	©	4822 126 14585	100nF	10%	50V
2888	©	4822 124 40769	4,7µF	20%	100V
2889	©	4822 122 33575	220pF	5%	50V
2892	©	5322 126 10223	4,7nF	10%	63V
2893	©	4822 122 33575	220pF	5%	50V
<b>RESISTORS</b>					
3700	©	4822 051 20471	470Ω	5%	0,1W
3701	©	4822 051 20474	470kΩ	5%	0,1W
3702	©	4822 051 20474	470kΩ	5%	0,1W
3703	©	4822 117 10834	47kΩ	1%	0,1W
3704	©	4822 117 10834	47kΩ	1%	0,1W
3705	©	4822 117 11503	220Ω	5%	0,1W
3706	©	4822 051 20471	470Ω	5%	0,1W
3707	©	4822 051 20471	470Ω	5%	0,1W
3708	©	4822 051 20471	470Ω	5%	0,1W
3709	©	4822 051 20108	1Ω	5%	0,1W
3710	©	4822 051 20474	470kΩ	5%	0,1W
3711	©	4822 117 10833	10kΩ	1%	0,1W
3712	©	4822 051 20109	10Ω	5%	0,1W
3713	©	4822 051 20223	22kΩ	5%	0,1W
3714	©	4822 117 10833	10kΩ	1%	0,1W
3715	©	4822 117 10837	100kΩ	1%	0,1W
3716	©	4822 051 20471	470Ω	5%	0,1W
3718	©	4822 051 20472	4,7kΩ	5%	0,1W
3719	©	4822 051 20474	470kΩ	5%	0,1W
3727	©	4822 051 20472	4,7kΩ	5%	0,1W
3728	©	4822 051 20472	4,7kΩ	5%	0,1W
3730	©	4822 051 20333	33kΩ	5%	0,1W
3731	©	4822 117 10833	10kΩ	1%	0,1W
3732	©	4822 051 20471	470Ω	5%	0,1W
3733	©	4822 051 20471	470Ω	5%	0,1W

**ELECTRICAL PARTS LIST 3CDC-LC-MB MODULE**

**RESISTORS**

3734	©	4822 051 20471	470Ω	5%	0,1W
3740	©	4822 051 20223	22kΩ	5%	0,1W
3741	©	4822 051 20223	22kΩ	5%	0,1W
3742	©	4822 051 20223	22kΩ	5%	0,1W
3743	©	4822 051 20223	22kΩ	5%	0,1W
3744	©	4822 117 10833	10kΩ	1%	0,1W
3746	©	4822 117 10833	10kΩ	1%	0,1W
3750	©	4822 051 10102	1kΩ	2%	0,25W
3751	©	4822 051 10102	1kΩ	2%	0,25W
3752	©	4822 051 20399	39Ω	5%	0,1W
3753	©	4822 117 10834	47kΩ	1%	0,1W
3754	©	4822 117 12024	27kΩ	1%	0,1W
3755	©	4822 117 10833	10kΩ	1%	0,1W
3756	©	2120 108 92632	33kΩ	1%	0,1W
3757	©	4822 051 20399	39Ω	5%	0,1W
3758	©	4822 117 10833	10kΩ	1%	0,1W
3759	©	2120 108 92632	33kΩ	1%	0,1W
3760	©	4822 051 20399	39Ω	5%	0,1W
3761	©	4822 117 10833	10kΩ	1%	0,1W
3762	©	2120 108 92632	33kΩ	1%	0,1W
3763	©	4822 051 20479	47Ω	5%	0,1W
3764	©	4822 117 10833	10kΩ	1%	0,1W
3765	©	2120 108 92632	33kΩ	1%	0,1W
3766	©	4822 051 20479	47Ω	5%	0,1W
3773	©	4822 117 12024	27kΩ	1%	0,1W
3775	©	4822 117 12024	27kΩ	1%	0,1W
3800	©	4822 117 11148	56kΩ	1%	0,1W
3801	©	4822 117 10833	10kΩ	1%	0,1W
3802	©	4822 117 11148	56kΩ	1%	0,1W
3803	©	4822 117 10833	10kΩ	1%	0,1W
3804	©	4822 117 10833	10kΩ	1%	0,1W
3805	©	4822 117 10833	10kΩ	1%	0,1W
3806	©	4822 117 10833	10kΩ	1%	0,1W
3807	©	4822 117 10833	10kΩ	1%	0,1W
3808	©	4822 117 10833	10kΩ	1%	0,1W
3809	©	4822 117 13577	330Ω	1%	0,1W
3810	©	4822 051 20399	39Ω	5%	0,1W
3811	©	4822 051 20273	27kΩ	5%	0,1W
3812	©	4822 117 10834	47kΩ	1%	0,1W
3813	©	4822 051 20399	39Ω	5%	0,1W
3814	©	4822 051 20339	33Ω	5%	0,1W
3815	©	4822 052 10478	4,7Ω	5%	NFR
3816	©	4822 117 10834	47kΩ	1%	0,1W
3817	©	4822 052 10228	2,2Ω	5%	0,33W
3818	©	4822 051 20399	39Ω	5%	0,1W
3819	©	4822 051 20471	470Ω	5%	0,1W
3820	©	4822 051 20472	4,7kΩ	5%	0,1W
3821	©	4822 051 20472	4,7kΩ	5%	0,1W
3822	©	4822 117 12955	2,7kΩ	1%	0,1W
3823	©	4822 051 10102	1kΩ	2%	0,25W
3824	©	4822 051 10102	1kΩ	2%	0,25W
3825	©	4822 051 10102	1kΩ	2%	0,25W
3826	©	4822 051 20223	22kΩ	5%	0,1W
3827	©	4822 051 20273	27kΩ	5%	0,1W
3828	©	4822 051 20223	22kΩ	5%	0,1W
3829	©	4822 117 10834	47kΩ	1%	0,1W
3830	©	4822 117 12024	27kΩ	1%	0,1W
3831	©	4822 051 20101	100Ω	5%	0,1W
3832	©	4822 117 10833	10kΩ	1%	0,1W
3833	©	4822 051 20223	22kΩ	5%	0,1W
3834	©	4822 051 20223	22kΩ	5%	0,1W
3835	©	4822 117 10834	47kΩ	1%	0,1W
3836	©	4822 117 12024	27kΩ	1%	0,1W
3837	©	4822 051 10102	1kΩ	2%	0,25W
3838	©	4822 051 10			

**ELECTRICAL PARTS LIST 3CDC-LC-MB MODULE****RESISTORS**

4807 ©	4822 051 20008	CHIP JUMPER 0805
4808 ©	4822 051 20008	CHIP JUMPER 0805
4809 ©	4822 051 20008	CHIP JUMPER 0805
4810 ©	4822 051 20008	CHIP JUMPER 0805
4812 ©	4822 051 20008	CHIP JUMPER 0805
4814 ©	4822 051 20008	CHIP JUMPER 0805
4815 ©	4822 051 20008	CHIP JUMPER 0805
4816 ©	4822 051 20008	CHIP JUMPER 0805
4817 ©	4822 051 20008	CHIP JUMPER 0805
4818 ©	4822 051 20008	CHIP JUMPER 0805
4819 ©	4822 051 20008	CHIP JUMPER 0805
4820 ©	4822 051 20008	CHIP JUMPER 0805
4821 ©	4822 051 20008	CHIP JUMPER 0805
4822 ©	4822 051 20008	CHIP JUMPER 0805
4823 ©	4822 051 20008	CHIP JUMPER 0805
4824 ©	4822 051 20008	CHIP JUMPER 0805
4825 ©	4822 051 20008	CHIP JUMPER 0805
4826 ©	4822 051 20008	CHIP JUMPER 0805
4827 ©	4822 051 20008	CHIP JUMPER 0805
4828 ©	4822 051 20008	CHIP JUMPER 0805
4831 ©	4822 051 20008	CHIP JUMPER 0805
4832 ©	4822 051 20008	CHIP JUMPER 0805
4834 ©	4822 051 20008	CHIP JUMPER 0805
4835 ©	4822 051 20008	CHIP JUMPER 0805
4836 ©	4822 051 20008	CHIP JUMPER 0805
4838 ©	4822 051 20008	CHIP JUMPER 0805
4843 ©	4822 051 20008	CHIP JUMPER 0805
4845 ©	4822 051 20008	CHIP JUMPER 0805
4846 ©	4822 051 20008	CHIP JUMPER 0805
4847 ©	4822 051 20008	CHIP JUMPER 0805
4849 ©	4822 051 20008	CHIP JUMPER 0805
4856 ©	4822 051 20008	CHIP JUMPER 0805
4857 ©	4822 051 20008	CHIP JUMPER 0805
4858 ©	4822 051 20008	CHIP JUMPER 0805
4859 ©	4822 051 20008	CHIP JUMPER 0805
4860 ©	4822 051 20008	CHIP JUMPER 0805
4861 ©	4822 051 20008	CHIP JUMPER 0805
4862 ©	4822 051 20008	CHIP JUMPER 0805
4863 ©	4822 051 20008	CHIP JUMPER 0805
4864 ©	4822 051 20008	CHIP JUMPER 0805
4865 ©	4822 051 20008	CHIP JUMPER 0805
4867 ©	4822 051 20008	CHIP JUMPER 0805
4868 ©	4822 051 20008	CHIP JUMPER 0805
4869 ©	4822 051 20008	CHIP JUMPER 0805
4870 ©	4822 051 20008	CHIP JUMPER 0805
4876 ©	4822 051 20008	CHIP JUMPER 0805
4879 ©	4822 051 20008	CHIP JUMPER 0805
4884 ©	4822 051 20008	CHIP JUMPER 0805
4885 ©	4822 051 20008	CHIP JUMPER 0805
4886 ©	4822 051 20008	CHIP JUMPER 0805
4887 ©	4822 051 20008	CHIP JUMPER 0805
4890 ©	4822 051 20008	CHIP JUMPER 0805
4893 ©	4822 051 20008	CHIP JUMPER 0805
4894 ©	4822 051 20008	CHIP JUMPER 0805
4896 ©	4822 051 20008	CHIP JUMPER 0805
4897 ©	4822 051 20008	CHIP JUMPER 0805

**COILS**

1810	2422 543 01068	RESONATOR 8MHZ
1810	4822 242 73557	CERAMIC RES. 8.46MHZ
5802	4822 156 31058	FILTER DIGITAL OUT

**DIODES**

6871 ©	4822 130 11397	BAS316
6872 ©	4822 130 11397	BAS316
6873 ©	4822 130 11397	BAS316
6874 ©	4822 130 11397	BAS316
6875 ©	9340 548 52115	BZX284-C5V1
6877 ©	9322 129 34685	BZX284-C3V9
6878 ©	4822 130 11397	BAS316
6879 ©	9322 129 34685	BZX284-C3V9

**TRANSISTORS**

7812 ©	5322 130 60159	BC846B
7874 ©	5322 130 60159	BC846B
7875 ©	5322 130 60159	BC846B

**INTEGRATED CIRCUITS**

7801 ©	9352 622 36118	TZA1025T/V2, HF-Amplifier
7805 ©	4822 209 33165	TDA1308T/N1, OPAMP
7806	4822 209 62059	TCA0372DP1, Motor driver
7807	4822 209 62059	TCA0372DP1, Motor driver
7808	4822 209 62059	TCA0372DP1, Motor driver
7821	4822 209 62059	TCA0372DP1, Motor driver
7822	4822 209 62059	TCA0372DP1, Motor driver
7873	5322 209 11306	HEF4094BT, Shift register
7876	4822 209 16143	LC89170M, CD TEXT IC
7877 ©	9352 642 17557	SAA7325H/M2B Signal processor CD10

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# COMBI BOARD

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## Brief introduction of the Combi Board

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### A. TRANSFORMER PRIMARY PART

Transformer Primary Circuit provide connection for AC mains supply and primary wires of transformer.

### B. POWER SUPPLY PART

Power Supply Circuit consists of rectifiers, capacitive filters and voltage regulators. Regulated voltage include +5V6, +LED, +12A, +12M, -33V, PWDN. The +C supply to the power amplifier is not regulated. F1-F2 is the ac supply voltage to the FTD Display filament.

### C. SOURCE SELECT & AMPLIFIER PART

#### a) SHIFT REGISTER (AF CONTROL)

This shift register IC 7402 (HEF4094BP) deliver commands from the  $\mu$ P to control the AF functions which include source selection (A0 & A1 control lines), DSC modes, DBB, IS and CD\_ON (via +CD). Other control lines such as MUTE, AMPON, STBY and PWM are coming directly from the  $\mu$ P on the Front board.

#### b) SOURCE SELECTION

One of the 4 sources, namely AUX, TAPE, TUNER, CD, can be selected via A0 & A1 lines which control the IC 7501 (HEF4052BP). Karaoke mic. mixing is connected to the selected source before the signal is amplified with a buffer amplifier (Tr 7503 & 7504). The source signal is then split into recording path (for recording on tape) and main signal path (to the PWM volume control).

#### c) PWM VOLUME CONTROL

The discrete volume control makes use of 4 Transistors 7505, 7506, 7507 & 7508 (ON4986 or paired BC557B) and PWM control signal from  $\mu$ P. For good performance transistors for the left and right channels should be paired for gain characteristics.

#### d) SOUND FEATURES

Sound Features include the DBB, IS and DSC modes. The sound features are realised with a hex-inverter IC 7530 (HEF4069UBD) as analog buffer/amplifier and transistors as electronic switches controlled by the shift registers (AF control).

#### e) POWER AMPLIFIER

IC 7391 (AN7124) is used as power amplifier.

#### f) CD ON CONTROL

This circuit switches on the supply +CD supply (derived from +12A) to CD servo control, HF circuit and the laser light pen on the CD Module during the CD mode only.

#### g) MATRIX SURROUND OUTPUT

The matrix surround feature is provided on board. This feature is only optional on certain type version.

### D. KARAOKE PART

#### a) SIMPLE KARAOKE

This is a 1-mic. mono amplifier using discrete components. It has a level control using a rotary potmeter. This feature is available for some version only.

### E. HEADPHONE PART

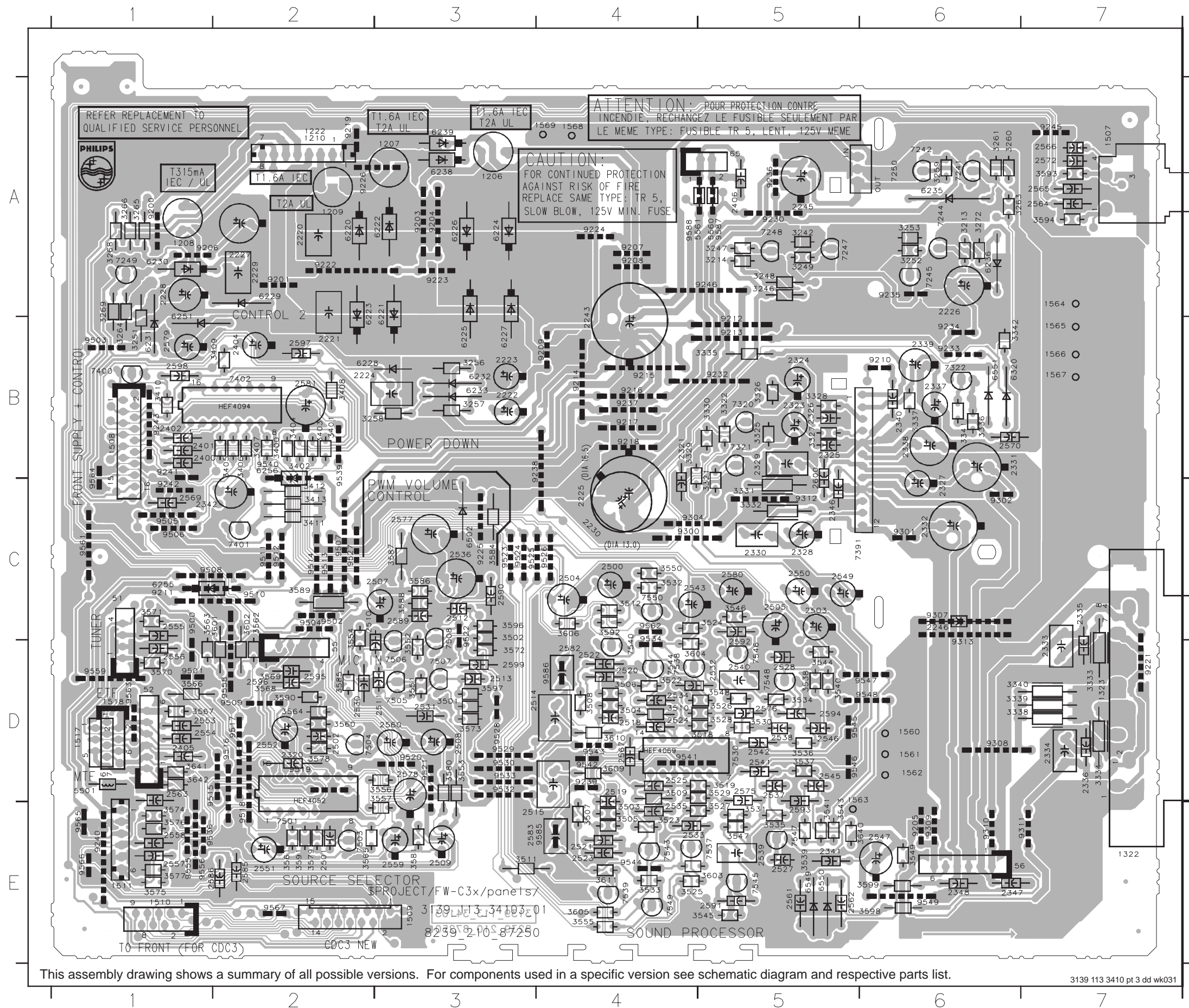
#### a) HEADPHONE OUTPUT

The headphone output is derived from the power amplifier output after the attenuation resistors which are tailored to deliver 25mW output power into a 32 ohm headphone.

### F. CDC KEY PART

The CDC key buttons and LEDs are provided on this board.

# COMPONENT LAYOUT - MAIN PART



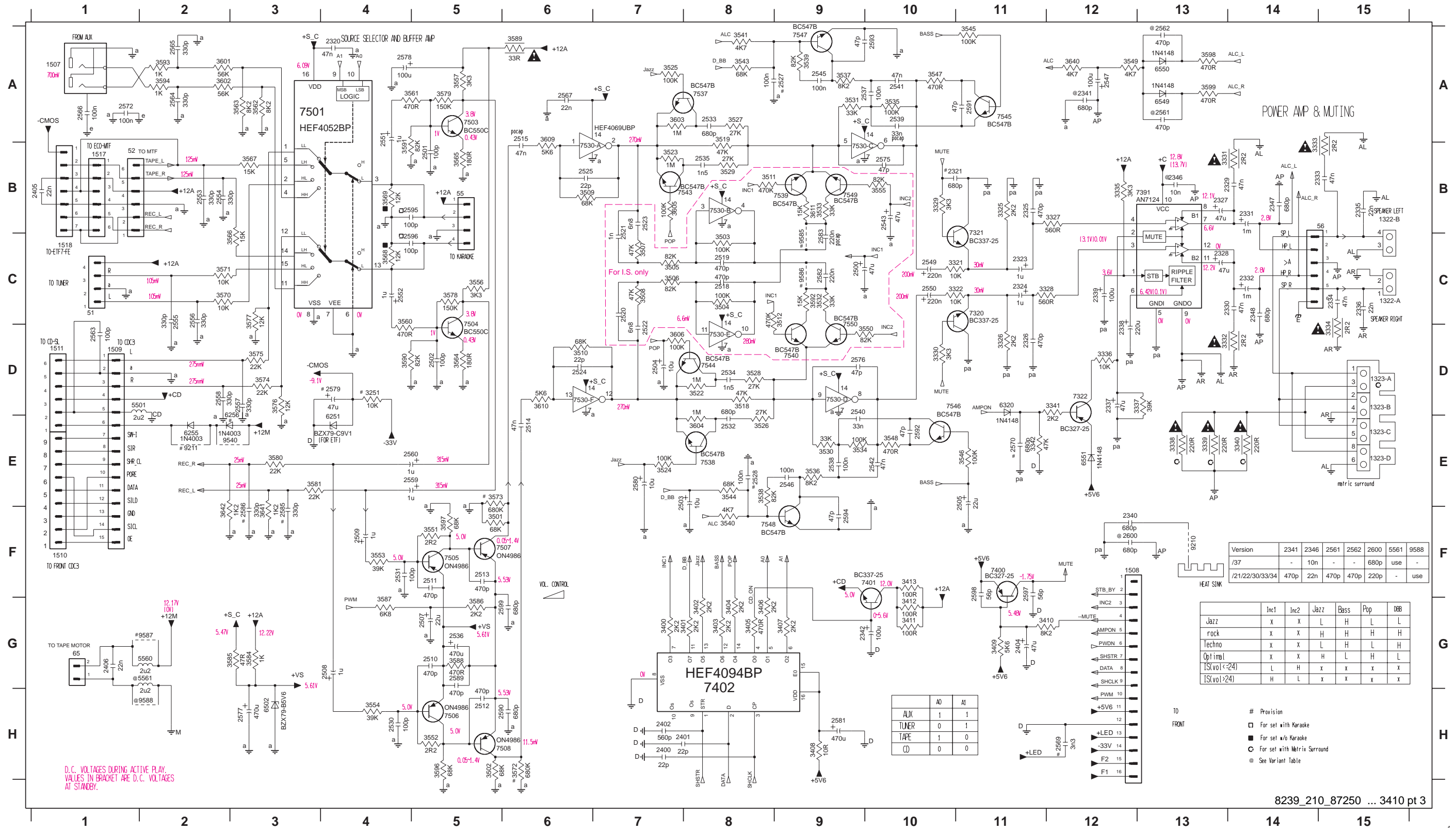
This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

3139 113 3410 pt 3 dd w031

Ref. Des.	Quantity	Part No.	Designation	Notes
9201	1	9201	IC	
9202	1	9202	IC	
9203	1	9203	IC	
9204	1	9204	IC	
9205	1	9205	IC	
9206	1	9206	IC	
9207	1	9207	IC	
9208	1	9208	IC	
9209	1	9209	IC	
9210	1	9210	IC	
9211	1	9211	IC	
9212	1	9212	IC	
9213	1	9213	IC	
9214	1	9214	IC	
9215	1	9215	IC	
9216	1	9216	IC	
9217	1	9217	IC	
9218	1	9218	IC	
9219	1	9219	IC	
9220	1	9220	IC	
9221	1	9221	IC	
9222	1	9222	IC	
9223	1	9223	IC	
9224	1	9224	IC	
9225	1	9225	IC	
9226	1	9226	IC	
9227	1	9227	IC	
9228	1	9228	IC	
9229	1	9229	IC	
9230	1	9230	IC	
9231	1	9231	IC	
9232	1	9232	IC	
9233	1	9233	IC	
9234	1	9234	IC	
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9297	1	9297	IC	
9298	1	9298	IC	
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9311	1	9311	IC	
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9314	1	9314	IC	
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9330	1	9330	IC	
9331	1	9331	IC	
9332	1	9332	IC	
9333	1	9333	IC	
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9338	1	9338	IC	
9339	1	9339	IC	
9340	1	9340	IC	
9341	1	9341	IC	
9342	1	9342	IC	
9343	1	9343	IC	
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9353	1	9353	IC	
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9355	1	9355	IC	
9356	1	9356	IC	
9357	1	9357	IC	
9358	1	9358	IC	
9359	1	9359	IC	
9360	1	9360	IC	
9361	1	9361	IC	
9362	1	9362	IC	
9363	1	9363	IC	
9364	1	9364	IC	
9365	1	9365	IC	
9366	1	9366	IC	
9367	1	9367	IC	
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9504				

CIRCUIT DIAGRAM - SOURCE SELECT & AMPLIFIER PART

51 C1	1507 A1	2325 B11	2336 C15	2401 H7	2507 G5	2520 C7	2533 A8	2545 A9	2557 D3	2569 H12	2583 C9	2597 F11	3329 B10	3340 E14	3408 H9	3506 C7	3524 E7	3535 A10	3547 A10	3560 C4	3571 C2	3584 G3	3596 H5	3610 D6	6320 D11	7402 G8	7530-D D9	7547 A9
52 B1	1508 F12	2326 D11	2337 D12	2402 H7	2508 G4	2521 B7	2534 D8	2546 E9	2558 D2	2570 E11	2585 F3	2598 F11	3330 D10	3341 D12	3409 G11	3507 C7	3525 A7	3536 E9	3548 E10	3561 A5	3572 H6	3585 G3	3597 F5	3611 B9	6502 H3	7501 A3	7530-E D8	7548 F8
55 B5	1509 D1	2327 B13	2338 D12	2404 G11	2509 F4	2522 D7	2535 B8	2547 A12	2559 E4	2572 A1	2586 F3	2599 G6	3331 B13	3342 E11	3410 G12	3508 C7	3526 E8	3537 A9	3549 A12	3562 A3	3573 E5	3586 G5	3598 A13	3640 A12	6549 A13	7503 A5	7530-F D6	7549 B9
56 B15	1510 F1	2328 C13	2339 C12	2405 B1	2510 G5	2523 B7	2536 G5	2549 C10	2560 E4	2575 B10	2589 G5	2600 F12	3332 D13	3400 G7	3411 G10	3509 B6	3527 A8	3538 E8	3550 D10	3563 A3	3574 D4	3587 G4	3599 A13	3641 F3	6550 A13	7504 D5	7537 A8	7550 D9
65 G1	1511 D1	2329 B14	2340 F12	2406 G1	2511 F5	2524 D6	2537 A10	2550 C10	2561 A13	2576 D9	2590 H6	3251 D4	3333 B14	3401 G8	3412 G10	3510 D6	3528 D8	3539 A9	3551 F5	3564 D5	3575 D3	3588 G5	3601 A2	3642 F2	6551 E12	7505 F5	7538 E8	9210 F13
1322-A C15	1517 B1	2330 C14	2341 A12	2500 C9	2512 H5	2525 B6	2538 E9	2551 A4	2562 A13	2577 H3	2591 A11	3321 C11	3334 D15	3402 G8	3413 F10	3511 B8	3529 B8	3540 F8	3552 H5	3565 B5	3576 D3	3589 A6	3602 A2	3643 D1	7320 C11	7506 H5	7539 B8	9211 E2
1322-B B15	1518 C1	2331 B14	2342 G9	2501 B5	2513 F5	2527 A9	2539 A10	2552 C4	2563 D1	2578 A4	2592 E10	3322 C11	3335 B12	3403 G8	3501 F5	3512 C9	3530 E9	3541 A8	3553 F4	3566 C3	3577 C3	3590 D4	3603 A7	3644 E1	7321 C11	7507 F5	7540 D9	9540 E3
1323-A D15	2320 A4	2332 C14	2346 B13	2502 D5	2514 E6	2528 E8	2540 D9	2553 B2	2564 A2	2579 D4	2593 A10	3325 B11	3336 D12	3404 G8	3502 H5	3518 D8	3531 A9	3543 A8	3554 H4	3567 B3	3578 C5	3591 B4	3604 E8	5561 G2	7322 D12	7508 H5	7543 B7	9585 C9
1323-B D15	2321 B10	2333 B15	2347 B14	2503 E7	2515 A6	2530 H8	2541 A10	2554 B2	2565 A2	2580 E7	2594 F9	3326 D11	3337 D13	3405 G8	3503 C8	3519 A8	3532 C9	3544 E8	3555 B10	3568 C4	3579 A5	3592 C9	3605 B7	6251 E4	7391 B12	7530-A B6	7544 D8	9586 C9
1323-C E15	2323 C11	2334 C15	2348 C14	2504 D7	2518 C8	2531 F4	2542 E10	2555 C2	2566 A1	2581 H9	2595 B4	3327 B12	3338 E13	3406 G8	3504 C8	3522 D8	3533 B9	3545 A11	3556 C5	3569 B4	3580 E3	3593 A2	3606 D7	6255 E2	7400 F11	7530-B B8	7545 A11	9587 G2
1323-D E15	2324 C11	2335 B15	2400 H7	2505 E11	2519 C8	2532 E8	2543 B10	2556 C2	2567 A6	2582 C9	2596 C4	3328 C12	3339 E13	3407 G9	3505 C7	3523 B7	3534 E9	3546 E11	3557 A5	3570 C2	3581 E3	3594 A2	3609 A6	6256 E3	7401 F10	7530-C B9	7546 D11	9588 H2



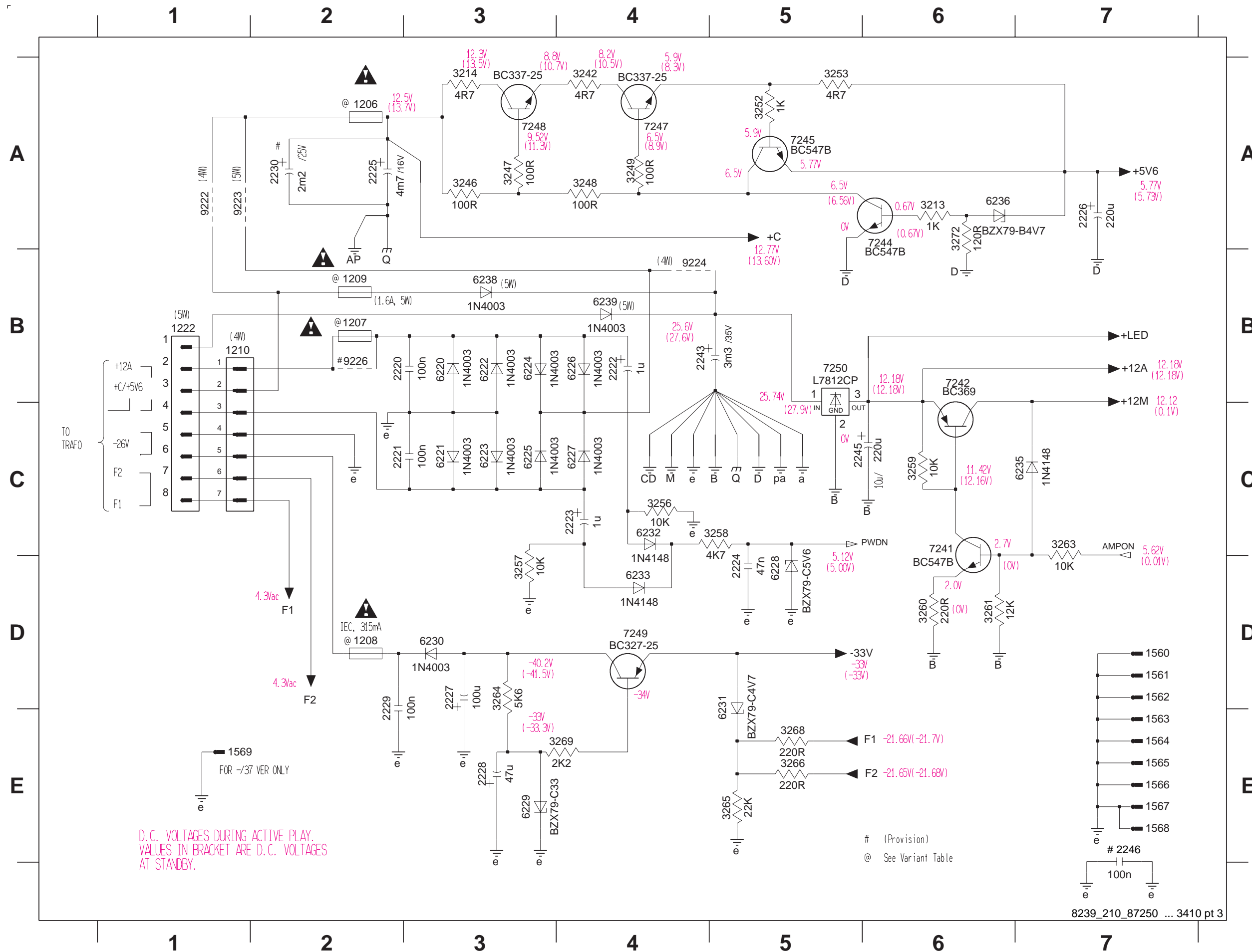
Version	2341	2346	2561	2562	2600	5561	9588
/37	-	10n	-	-	680p	use	-
/21/22/30/33/34	470p	22n	470p	470p	220p	-	use

	Inc1	Inc2	Jazz	Bass	Pop	DBB
Jazz	x	x	L	H	L	L
rock	x	x	H	L	H	H
Techno	x	x	L	H	L	H
Optimal	x	x	H	L	H	L
ISvol1<24	L	H	x	x	x	x
ISvol1>24	H	L	x	x	x	x

	A0	A1
AUX	1	1
TUNER	0	1
TAPE	1	0
CD	0	0

- # Provision
- For set with Karaoke
- For set w/o Karaoke
- For set with Matrix Surround
- ⊗ See Variant Table

CIRCUIT DIAGRAM - POWER SUPPLY PART



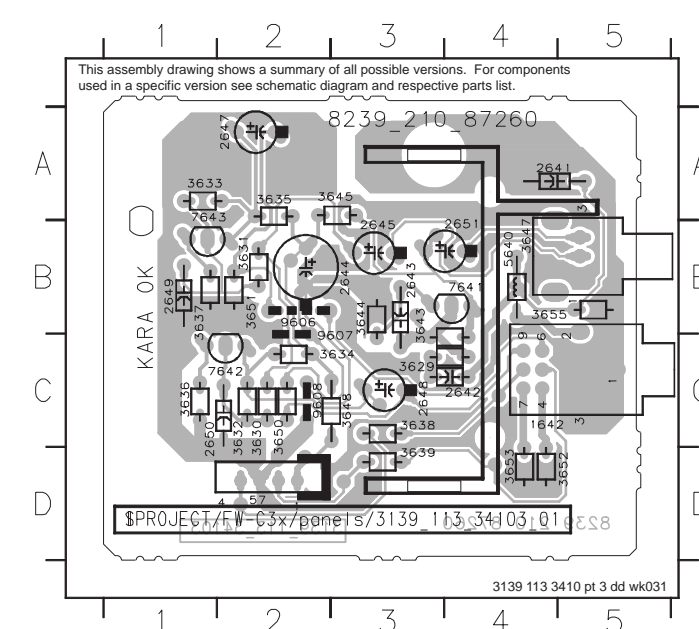
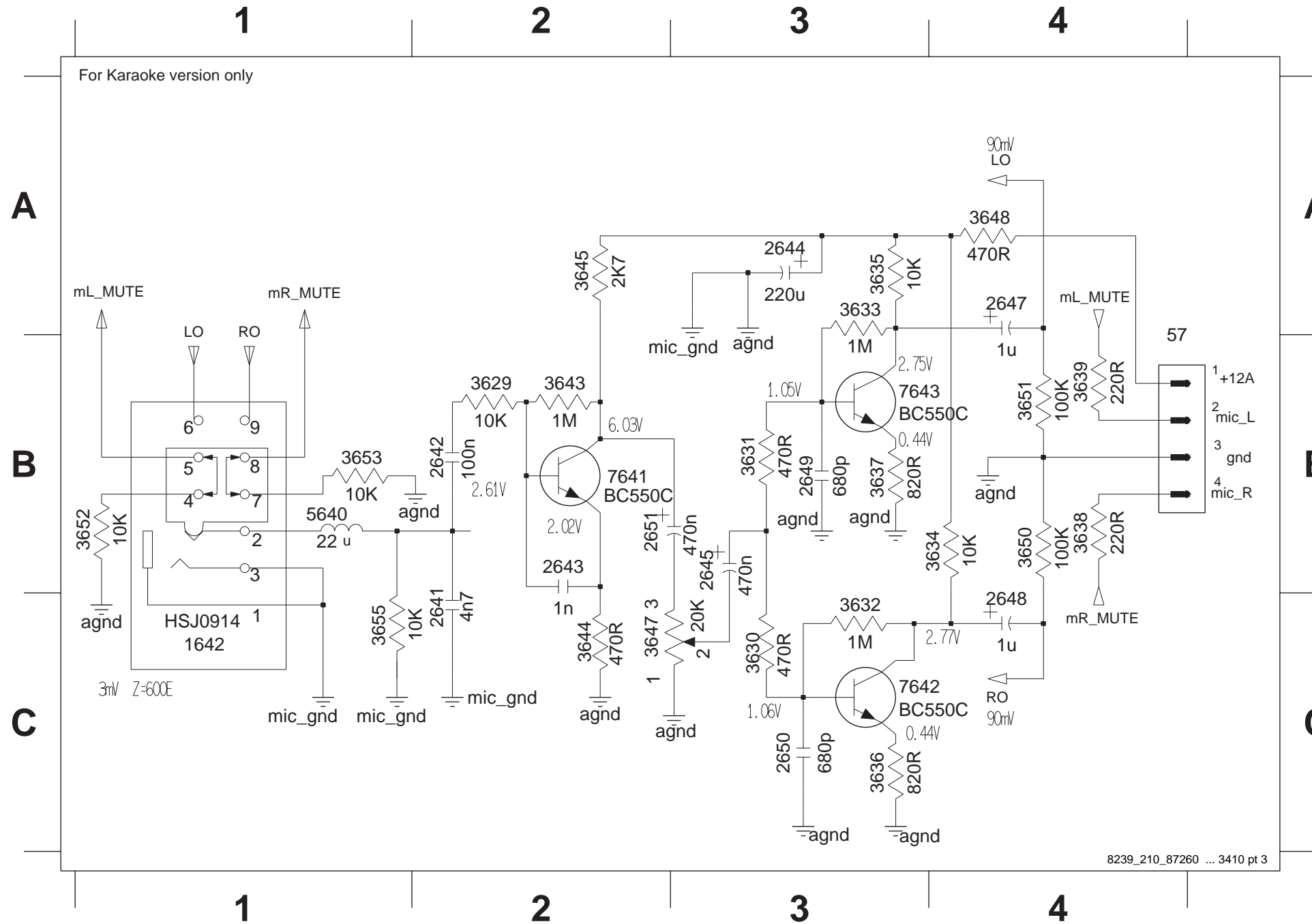
- 1206 A2
- 1207 B2
- 1208 D2
- 1209 B2
- 1210 B1
- 1222 B1
- 1560 D7
- 1561 D7
- 1562 D7
- 1563 E7
- 1564 E7
- 1565 E7
- 1566 E7
- 1567 E7
- 1568 E7
- 1569 E2
- 2220 B2
- 2221 C2
- 2222 B4
- 2223 C4
- 2224 D5
- 2225 A2
- 2226 A7
- 2227 D3
- 2228 E3
- 2229 D2
- 2230 A2
- 2243 B4
- 2245 C5
- 2246 E7
- 3213 A6
- 3214 A3
- 3242 A4
- 3246 A3
- 3247 A3
- 3248 A4
- 3249 A4
- 3252 A5
- 3253 A5
- 3256 C4
- 3257 D3
- 3258 C5
- 3259 C6
- 3260 D6
- 3261 D6
- 3263 C7
- 3264 D3
- 3265 E5
- 3266 E5
- 3268 E5
- 3272 A6
- 6220 B3
- 6221 C3
- 6222 B3
- 6223 C3
- 6224 B3
- 6225 C3
- 6226 B4
- 6227 C4
- 6228 D5
- 6229 E3
- 6230 D3
- 6231 D5
- 6232 C4
- 6233 D4
- 6235 C7
- 6236 A6
- 6238 B3
- 6239 B4
- 7241 C6
- 7242 B6
- 7244 A6
- 7245 A5
- 7247 A4
- 7248 A3
- 7249 D4
- 7250 B5
- 9222 A1
- 9223 A1
- 9224 B4
- 9226 B2





KARAOKE PART - CIRCUIT & COMPONENT LAYOUT

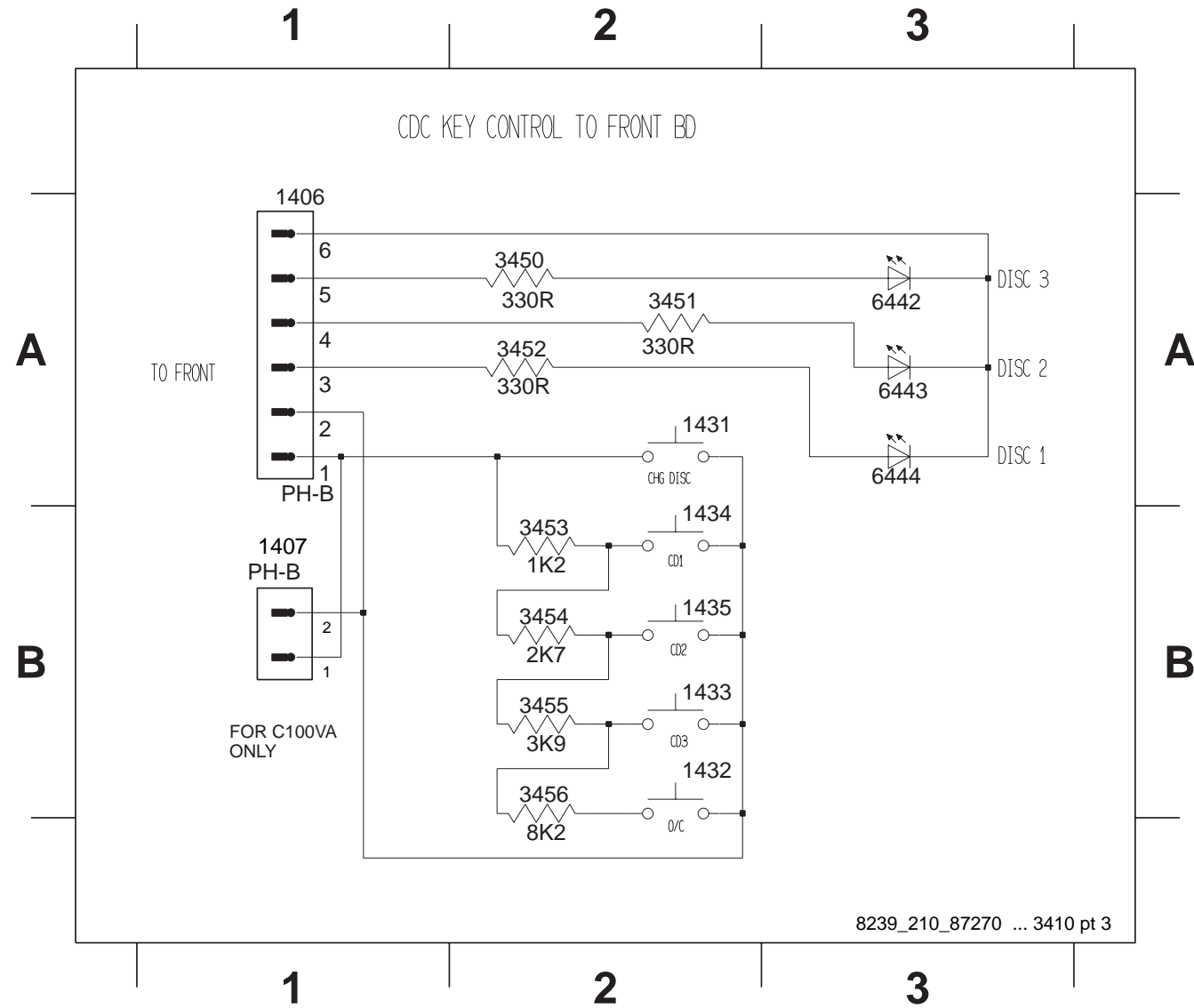
57 B4	2642 B2	2645 B3	2649 B3	3629 B2	3632 C3	3635 A3	3638 B4	3644 C2	3648 A4	3652 B1	5640 B1	7643 B3
1642 C1	2643 B2	2647 A4	2650 C3	3630 C3	3633 A3	3636 C3	3639 B4	3645 A2	3650 B4	3653 B1	7641 B2	
2641 C2	2644 A3	2648 C4	2651 B2	3631 B3	3634 B4	3637 B3	3643 B2	3647 C2	3651 B4	3655 C1	7642 C3	



1642 C1  
 2641 C2  
 2642 B2  
 2643 B2  
 2644 A3  
 2645 B3  
 2647 A4  
 2648 C4  
 2649 B3  
 2650 C3  
 2651 B2  
 3629 B2  
 3630 C3  
 3631 B3  
 3632 C3  
 3633 A3  
 3634 B4  
 3635 A3  
 3636 C3  
 3637 B3  
 3638 B4  
 3639 B4  
 3640 B4  
 3641 C2  
 3642 C3  
 3643 B2  
 3644 C2  
 3645 A2  
 3645 B3  
 3646 C2  
 3647 C2  
 3648 A4  
 3649 B3  
 3650 B4  
 3651 B4  
 3652 B1  
 3653 B1  
 3655 C1  
 5640 B1  
 7641 B2  
 7642 C3  
 7643 B3

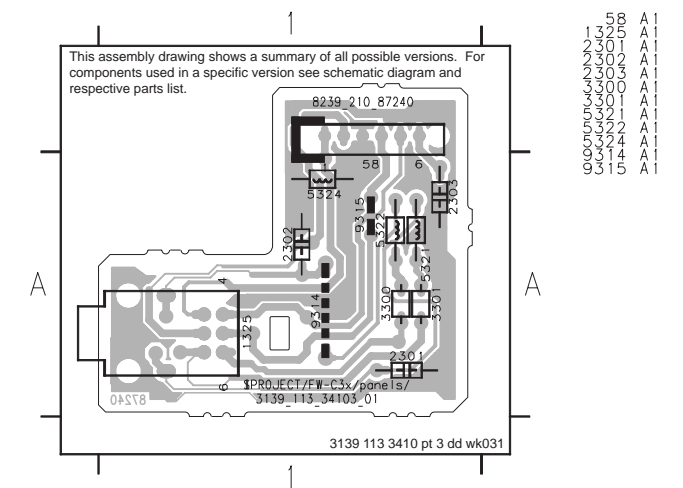
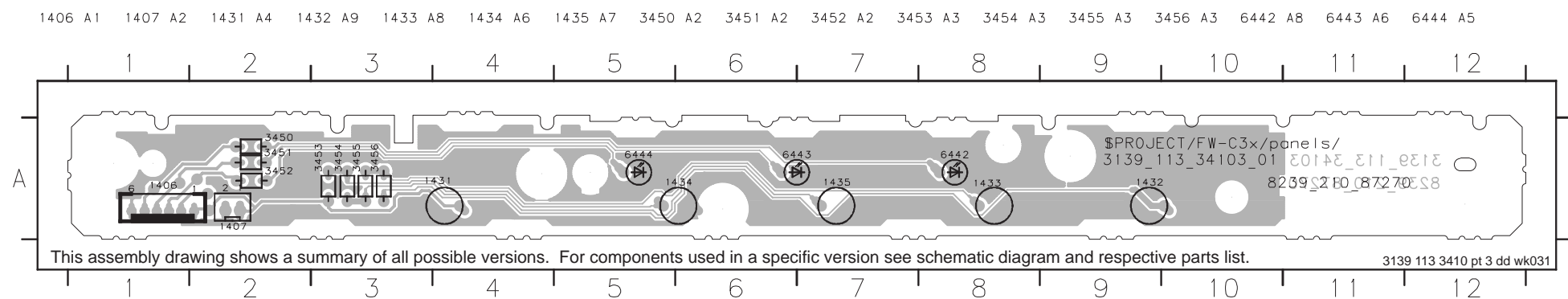
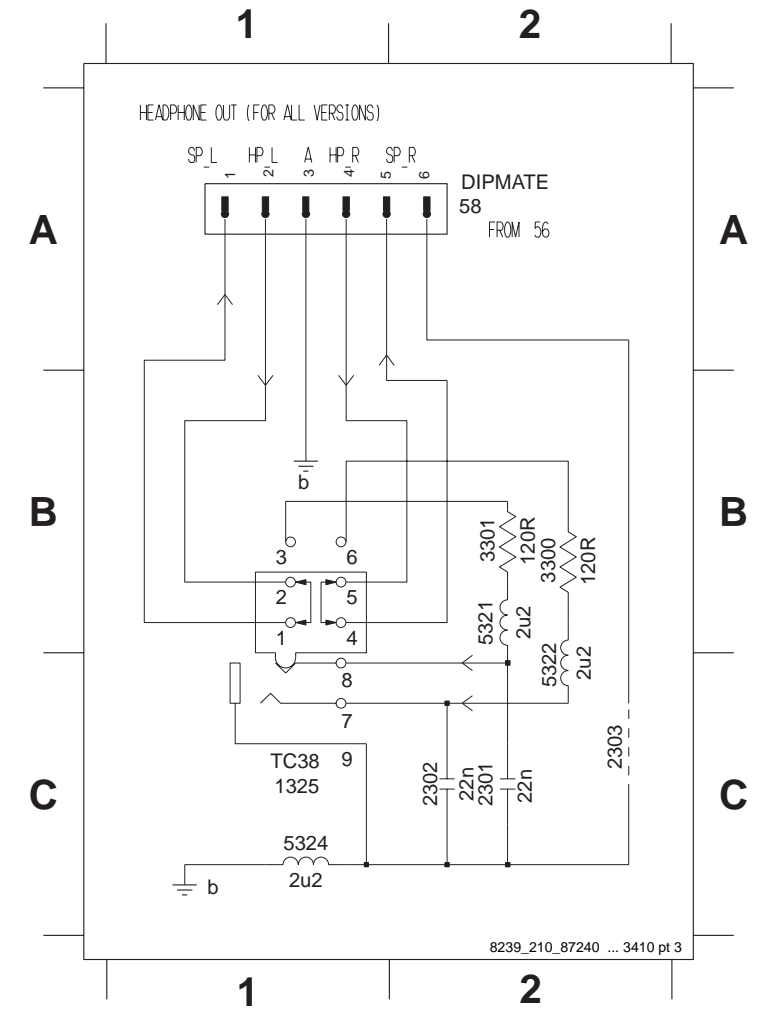
CDC KEY PART - CIRCUIT & COMPONENT LAYOUT

- |         |         |         |         |         |         |         |         |         |
|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 1406 A1 | 1431 A2 | 1433 B2 | 1435 B2 | 3451 A2 | 3453 B2 | 3455 B2 | 6442 A3 | 6444 A3 |
| 1407 B1 | 1432 B2 | 1434 B2 | 3450 A2 | 3452 A2 | 3454 B2 | 3456 B2 | 6443 A3 |         |



HEADPHONE PART - CIRCUIT & COMPONENT LAYOUT

- |         |         |         |         |         |
|---------|---------|---------|---------|---------|
| 58 A2   | 2301 C2 | 2303 C2 | 3301 B2 | 5322 C2 |
| 1325 C1 | 2302 C2 | 3300 B2 | 5321 B2 | 5324 C1 |



## ELECTRICAL PARTS LIST - COMBI BOARD

## MISCELLANEOUS

1201	4822 265 31015	△	Mains Socket
1201	4822 265 31016	△	Mains Socket /37
1202	4822 272 10269	△	Voltage Selector /21/21M
1205	4822 071 58001	△	Fuse T800mA 250V /21/21M
1206	4822 071 51602	△	Fuse T1.6A 250V
1206	4822 253 10128	△	Fuse T2A 250V /37
1207	4822 071 51602	△	Fuse T1.6A 250V
1207	4822 253 10128	△	Fuse T2A 250V /37
1208	4822 071 53151	△	Fuse T315mA 250V
1208	4822 252 51151	△	Fuse T315mA 250V /37
1209	4822 071 51602	△	Fuse T1.6A 250V /21/21M
1322	4822 267 31176		Loudspeaker Socket
1325	4822 265 11529		Headphone Socket
1431	4822 276 13775		Tact Switch
1432	4822 276 13775		Tact Switch
1433	4822 276 13775		Tact Switch
1434	4822 276 13775		Tact Switch
1435	4822 276 13775		Tact Switch
1507	4822 265 20553		Aux-in Socket
1508	2422 025 14526		Flex Socket 16pin Vert.
1509	4822 265 10981		Flex Socket 15pin Vert.
1510	2422 025 14518		Flex Socket 9pin Vert.
1517	4822 267 10731		Flex Socket 6pin Vert.

## CAPACITORS

2220	5322 121 42386		100nF 5% 63V
2221	5322 121 42386		100nF 5% 63V
2222	4822 124 21913		1µF 20% 63V
2223	4822 124 21913		1µF 20% 63V
2224	4822 121 51399		47nF 10% 50V
2225	4822 124 11878		4700µF 16V
2226	4822 124 80144		220µF 20% 25V
2227	4822 124 40255		100µF 20% 63V
2228	4822 124 41751		47µF 20% 50V
2229	5322 121 42386		100nF 5% 63V
2243	4822 124 42367		3300µF 20% 35V
2245	4822 124 80144		220µF 20% 25V
2301	4822 126 11585		22nF +80/-20% 25V
2302	4822 126 11585		22nF +80/-20% 25V
2320	4822 126 12785		47nF 50V
2323	4822 124 21913		1µF 20% 63V
2324	4822 124 21913		1µF 20% 63V
2325	4822 122 33519		470pF 10% 50V
2326	4822 122 33519		470pF 10% 50V
2327	4822 124 40433		47µF 20% 25V
2328	4822 124 40433		47µF 20% 25V
2329	4822 121 51399		47nF 10% 50V
2330	4822 121 51399		47nF 10% 50V
2331	4822 124 81144		1000µF 20% 16V
2332	4822 124 81144		1000µF 20% 16V
2333	4822 121 51399		47nF 10% 50V
2334	4822 121 51399		47nF 10% 50V

2335	4822 126 11585		22nF +80/-20% 25V
2336	4822 126 11585		22nF +80/-20% 25V
2337	4822 124 40433		47µF 20% 25V
2338	4822 124 80144		220µF 20% 25V
2339	4822 124 40207		100µF 20% 25V
2340	4822 126 14316		680pF 10% 50V
2341	4822 122 33519		470pF 10% 50V except /37
2342	4822 124 40207		100µF 20% 25V
2346	4822 126 11585		22nF +80/-20% 25V
2346	4822 121 51387		10nF 20% 16V /37
2347	4822 126 14316		680pF 10% 50V
2348	4822 126 14316		680pF 10% 50V
2400	4822 122 33191		22pF 5% 50V
2401	4822 122 33191		22pF 5% 50V
2402	4822 122 10459		560pF 10% 50V
2404	4822 124 40433		47µF 20% 25V
2405	4822 126 11585		22nF +80/-20% 25V
2406	4822 126 11585		22nF +80/-20% 25V
2501	4822 122 33195		100pF 10% 50V
2502	4822 122 33195		100pF 10% 50V
2503	4822 124 40248		10µF 20% 63V
2504	4822 124 40248		10µF 20% 63V
2505	4822 124 81151		22µF 20% 50V
2507	4822 124 81151		22µF 20% 50V
2508	4822 124 21913		1µF 20% 63V
2509	4822 124 21913		1µF 20% 63V
2510	4822 122 33519		470pF 10% 50V
2511	4822 122 33519		470pF 10% 50V
2512	4822 122 33519		470pF 10% 50V
2513	4822 122 33519		470pF 10% 50V
2514	4822 121 51399		47nF 10% 50V
2515	4822 121 51399		47nF 10% 50V
2518	4822 122 33519		470pF 10% 50V
2519	4822 122 33519		470pF 10% 50V
2524	4822 122 33191		22pF 5% 50V
2525	4822 122 33191		22pF 5% 50V
2530	4822 122 33195		100pF 10% 50V
2531	4822 122 33195		100pF 10% 50V
2532	4822 126 14316		680pF 10% 50V
2533	4822 126 14316		680pF 10% 50V
2534	4822 126 12878		1,5nF 10% 16V
2535	4822 126 12878		1,5nF 10% 16V
2536	4822 124 80791		470µF 20% 16V
2537	4822 126 12882		100nF +80/-20% 50V
2538	4822 126 12882		100nF +80/-20% 50V
2539	4822 121 42476		33nF 10% 50V
2540	4822 121 42476		33nF 10% 50V
2541	4822 126 12785		47nF +80/-20% 50V
2542	4822 126 12785		47nF +80/-20% 50V
2545	4822 126 12882		100nF +80/-20% 50V
2546	4822 126 12882		100nF +80/-20% 50V
2547	4822 124 41584		100µF 20% 10V

## ELECTRICAL PARTS LIST - COMBI BOARD

2549	4822 124 40746		0,22µF 20% 63V
2550	4822 124 40746		0,22µF 20% 63V
2551	4822 124 21913		1µF 20% 63V
2552	4822 124 21913		1µF 20% 63V
2553	4822 126 12787		330pF 10% 50V
2554	4822 126 12787		330pF 10% 50V
2555	4822 126 12787		330pF 10% 50V
2556	4822 126 12787		330pF 10% 50V
2557	4822 126 12787		330pF 10% 50V
2558	4822 126 12787		330pF 10% 50V
2559	4822 124 21913		1µF 20% 63V
2560	4822 124 21913		1µF 20% 63V
2561	4822 122 33519		470pF 10% 50V except /37
2562	4822 122 33519		470pF 10% 50V except /37
2563	4822 122 33195		100pF 10% 50V
2564	4822 126 12787		330pF 10% 50V
2565	4822 126 12787		330pF 10% 50V
2566	4822 126 12882		100nF +80/-20% 50V
2567	4822 126 11585		22nF +80/-20% 25V
2572	4822 126 12882		100nF +80/-20% 50V
2575	4822 122 33848		47pF 5% 50V
2576	4822 122 33848		47pF 5% 50V
2577	4822 124 80791		470µF 20% 16V
2578	4822 124 40207		100µF 20% 25V
2580	4822 124 40248		10µF 20% 63V
2581	4822 124 80195		470µF 20% 10V
2589	4822 122 33519		470pF 10% 50V
2590	4822 126 14316		680pF 10% 50V
2591	4822 122 33848		47pF 5% 50V
2592	4822 122 33848		47pF 5% 50V
2593	4822 122 33848		47pF 5% 50V
2594	4822 122 33848		47pF 5% 50V
2597	4822 122 10573		56pF 5% 50V
2598	4822 122 10573		56pF 5% 50V
2598	4822 122 33848		47pF 5% 50V /37
2599	4822 126 14316		680pF 10% 50V
2600	4822 122 10466		220pF 10% 50V
2600	4822 126 14316		680pF 10% 50V /37
9313	4822 126 11585		22nF +80/-20% 25V

## RESISTORS

3208	4822 053 21106		10M 5% 0,5W /37
3213	4822 050 11002		1k 1% 0,4W
3214	4822 050 24708		4R7 1% 0,6W
3242	4822 050 24708		4R7 1% 0,6W
3246	4822 116 52175		100R 5% 0,5W
3247	4822 116 52175		100R 5% 0,5W
3248	4822 116 52175		100R 5% 0,5W
3249	4822 116 52175		100R 5% 0,5W
3252	4822 050 11002		1k 1% 0,4W
3253	4822 050 24708		4R7 1% 0,6W
3256	4822 050 21003		10k 1% 0,6W

3257	4822 050 21003		10k 1% 0,6W
3258	4822 116 52283		4k7 5% 0,5W
3259	4822 050 21003		10k 1% 0,6W
3260	4822 116 83872		220R 5% 0,5W
3261	4822 116 52238		12k 5% 0,5W
3263	4822 050 21003		10k 1% 0,6W
3264	4822 116 52289		5k6 5% 0,5W
3265	4822 116 52257		22k 5% 0,5W
3266	4822 116 83872		220R 5% 0,5W
3268	4822 116 83872		220R 5% 0,5W
3269	4822 116 52256		2k2 5% 0,5W
3272	4822 116 52206		120R 5% 0,5W
3300	4822 116 52206		120R 5% 0,5W
3301	4822 116 52206		120R 5% 0,5W
3321	4822 050 21003		10k 1% 0,6W
3322	4822 050 21003		10k 1% 0,6W
3325	4822 116 52256		2k2 5% 0,5W
3326	4822 116 52256		2k2 5% 0,5W
3327	4822 116 52226		560R 5% 0,5W
3328	4822 116 52226		560R 5% 0,5W
3329	4822 116 52269		3k3 5% 0,5W
3330	4822 116 52269		3k3 5% 0,5W
3331	4822 052 10228	△	2R2 5% 0,33W
3332	4822 052 10228	△	2R2 5% 0,33W
3333	4822 052 10228	△	2R2 5% 0,33W
3334	4822 052 10228	△	2R2 5% 0,33W
3335	4822 116 52269		3k3 5% 0,5W
3336	4822 050 21003		10k 1% 0,6W
3337	4822 116 83882		39k 5% 0,5W
3341	4822 116 52256		2k2 5% 0,5W
3342	4822 116 83884		47k 5% 0,5W
3400	4822 116 52256		2k2 5% 0,5W
3401	4822 116 52256		2k2 5% 0,5W
3402	4822 116 52256		2k2 5% 0,5W
3403	4822 116 52256		2k2 5% 0,5W
3404	4822 116 52256		2k2 5% 0,5W
3405	4822 116 83883		470R 5% 0,5W
3406	4822 116 52256		2k2 5% 0,5W
3407	4822 116 52256		2k2 5% 0,5W
3408	4822 116 52176		10R 5% 0,5W
3409	4822 116 52289		5k6 5% 0,5W
3410	4822 116 52303		8k2 5% 0,5W
3411	4822 116 52175		100R 5% 0,5W
3412	4822 116 52175		100R 5% 0,5W
3413	4822 116 52175		100R 5% 0,5W
3453	4822 116 52207		1k2 5% 0,5W
3454	4822 116 52256		2k2 5% 0,5W
3455	4822 116 52276		3k9 5% 0,5W
3456	4822 116 52303		8k2 5% 0,5W
3501	4822 116 52297		68k 5% 0,5W
3502	4822 116 52297		68k 5% 0,5W
3509	4822 116 52297		68k 5% 0,5W

**ELECTRICAL PARTS LIST - COMBI BOARD****RESISTORS**

3510	4822 116 52297	68k 5% 0,5W	3574	4822 116 52257	22k 5% 0,5W
3518	4822 116 83884	47k 5% 0,5W	3575	4822 116 52257	22k 5% 0,5W
3519	4822 116 83884	47k 5% 0,5W	3576	4822 116 52244	15k 5% 0,5W /21/21M
3522	4822 116 83866	1M 5% 0,5W	3576	4822 116 52238	12k 5% 0,5W
3523	4822 116 83866	1M 5% 0,5W	3577	4822 116 52244	15k 5% 0,5W /21/21M
3524	4822 116 52234	100k 5% 0,5W	3577	4822 116 52238	12k 5% 0,5W
3525	4822 116 52234	100k 5% 0,5W	3578	4822 116 52245	150k 5% 0,5W
3526	4822 116 52264	27k 5% 0,5W	3579	4822 116 52245	150k 5% 0,5W
3527	4822 116 52264	27k 5% 0,5W	3580	4822 116 52257	22k 5% 0,5W
3528	4822 116 52264	27k 5% 0,5W	3581	4822 116 52257	22k 5% 0,5W
3529	4822 116 52264	27k 5% 0,5W	3584	4822 050 11002	1k 1% 0,4W
3530	4822 050 23303	33k 1% 0,6W	3585	4822 116 52195	47R 5% 0,5W
3531	4822 050 23303	33k 1% 0,6W	3586	4822 116 52256	2k2 5% 0,5W
3534	4822 116 52234	100k 5% 0,5W	3587	4822 116 83961	6k8 5% 0,5W
3535	4822 116 52234	100k 5% 0,5W	3588	4822 116 83883	470R 5% 0,5W
3536	4822 116 52303	8k2 5% 0,5W	3589	4822 052 10339 $\Delta$	33R 5% 0,33W
3537	4822 116 52303	8k2 5% 0,5W	3590	4822 116 52304	82k 5% 0,5W
3538	4822 116 52304	82k 5% 0,5W	3591	4822 116 52304	82k 5% 0,5W
3539	4822 116 52304	82k 5% 0,5W	3593	4822 050 11002	1k 1% 0,4W
3540	4822 116 52283	4k7 5% 0,5W	3594	4822 050 11002	1k 1% 0,4W
3541	4822 116 52283	4k7 5% 0,5W	3596	4822 116 52297	68k 5% 0,5W
3543	4822 116 52297	68k 5% 0,5W	3597	4822 116 52297	68k 5% 0,5W
3544	4822 116 52297	68k 5% 0,5W	3598	4822 116 83883	470R 5% 0,5W
3545	4822 116 52234	100k 5% 0,5W	3599	4822 116 83883	470R 5% 0,5W
3546	4822 116 52234	100k 5% 0,5W	3601	4822 116 83884	47k 5% 0,5W /21/21M
3547	4822 116 83883	470R 5% 0,5W	3601	4822 116 52291	56k 5% 0,5W
3548	4822 116 83883	470R 5% 0,5W	3602	4822 116 83884	47k 5% 0,5W /21/21M
3549	4822 116 52283	4k7 5% 0,5W	3602	4822 116 52291	56k 5% 0,5W
3551	4822 116 81154	2R2 5% 0,5W	3603	4822 116 83866	1M 5% 0,5W
3552	4822 116 81154	2R2 5% 0,5W	3604	4822 116 83866	1M 5% 0,5W
3553	4822 116 83882	39k 5% 0,5W	3605	4822 116 52234	100k 5% 0,5W
3554	4822 116 83882	39k 5% 0,5W	3606	4822 116 52234	100k 5% 0,5W
3556	4822 116 52269	3k3 5% 0,5W	3609	4822 116 52289	5k6 5% 0,5W
3557	4822 116 52269	3k3 5% 0,5W	3610	4822 116 52289	5k6 5% 0,5W
3560	4822 116 83883	470R 5% 0,5W	3640	4822 116 52283	4k7 5% 0,5W
3561	4822 116 83883	470R 5% 0,5W	3641	4822 116 52207	1k2 5% 0,5W
3562	4822 050 21003	10k 1% 0,6W /21/21M	3642	4822 116 52207	1k2 5% 0,5W
3562	4822 116 52303	8k2 1% 0,6W			
3563	4822 050 21003	10k 1% 0,6W /21/21M			
3563	4822 116 52303	8k2 1% 0,6W			
3564	4822 116 52213	180R 5% 0,5W			
3565	4822 116 52213	180R 5% 0,5W			
3566	4822 050 21003	10k 1% 0,6W /21/21M			
3566	4822 116 52244	15k 1% 0,6W			
3567	4822 050 21003	10k 1% 0,6W /21/21M			
3567	4822 116 52244	15k 1% 0,6W			
3568	4822 116 52238	12k 5% 0,5W			
3569	4822 116 52238	12k 5% 0,5W			
3570	4822 116 52289	5k6 5% 0,5W /21/21M			
3570	4822 050 21003	10k 1% 0,6W			
3571	4822 116 52289	5k6 5% 0,5W /21/21M			
3571	4822 050 21003	10k 1% 0,6W			

**COILS & FILTERS**

5202	4822 157 11832	Choke Coil 400 $\mu$ H except /37
5321	4822 157 11477	Coil 2,2 $\mu$ H 5%
5322	4822 157 11477	Coil 2,2 $\mu$ H 5%
5324	4822 157 11477	Coil 2,2 $\mu$ H 5%
5501	4822 157 11477	Coil 2,2 $\mu$ H 5%
5560	4822 157 11477	Coil 2,2 $\mu$ H 5%
5561	4822 157 11477	Coil 2,2 $\mu$ H 5% /37

**DIODES**

6220	4822 130 31878	1N4003G
6221	4822 130 31878	1N4003G
6222	4822 130 31878	1N4003G
6223	4822 130 31878	1N4003G

**ELECTRICAL PARTS LIST - COMBI BOARD**

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DIODES			
6224	4822 130 31878	1N4003G	7548 4822 130 40959 BC547B
6225	4822 130 31878	1N4003G	
6226	4822 130 31878	1N4003G	Note: Only the parts mentioned in this list are normal
6227	4822 130 31878	1N4003G	service spare parts.
6228	4822 130 34173	BZX79-B5V6	
6229	4822 130 34142	BZX79-B33	
6230	4822 130 31878	1N4003G	
6231	4822 130 34174	BZX79-B4V7	
6232	4822 130 30621	1N4148	
6233	4822 130 30621	1N4148	
6235	4822 130 30621	1N4148	
6236	4822 130 34174	BZX79-B4V7	
6238	4822 130 31878	1N4003G /21/21M	
6239	4822 130 31878	1N4003G /21/21M	
6255	4822 130 31878	1N4003G	
6320	4822 130 30621	1N4148	
6502	4822 130 34173	BZX79-B5V6	
6549	4822 130 30621	1N4148	
6550	4822 130 30621	1N4148	
6551	4822 130 30621	1N4148	

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**TRANSISTORS & INTEGRATED CIRCUITS**

7241	4822 130 40959	BC547B
7242	5322 130 44593	BC369
7244	4822 130 40959	BC547B
7245	4822 130 40959	BC547B
7247	4822 130 40981	BC337-25
7248	4822 130 40981	BC337-25
7249	4822 130 41246	BC327-25
7250	4822 209 33575	L7812CP
7320	4822 130 40981	BC337-25
7321	4822 130 40981	BC337-25
7322	4822 130 41246	BC327-25
7391	4822 209 12925	AN7124
7400	4822 130 41246	BC327-25
7401	4822 130 40981	BC337-25
7402	5322 209 10421	HEF4094BP
7501	4822 209 10263	HEF4052BP
7503	4822 130 41096	BC550C
7504	4822 130 41096	BC550C
7505	4822 130 44568	ON4986
7506	4822 130 44568	ON4986
7507	4822 130 44568	ON4986
7508	4822 130 44568	ON4986
7530	4822 209 10264	HEF4069UBD
7537	4822 130 40959	BC547B
7538	4822 130 40959	BC547B
7543	4822 130 40959	BC547B
7544	4822 130 40959	BC547B
7545	4822 130 40959	BC547B
7546	4822 130 40959	BC547B
7547	4822 130 40959	BC547B



**MECHANICAL & ACCESSORIES PARTS LIST - MAIN UNIT****SCREW LISTS - MAIN UNIT**

101	3139 118 13520	Cabinet Front Assembly	387	3139 115 20160	Instruction For Use /37	185	D3 x 25
105	3139 118 10440	Window CDC Control	1450	3139 110 34770	Flex Cable 15pin 22cm BD	198	D3 x 12
106	3139 118 13230	Button Set CDC Select	1451	4822 320 12604	Flex Cable 9pin 22cm AD	202	D3 x 12
107	3139 118 13210	Cover Tray CDC-LC	1456	3139 110 34180	Flex Cable 16pin 22cm AD	205	D3 x 12
108	4822 454 13408	Badge Philips	1556	3139 110 34320	Flex Cable 6pin 40cm BD	277	D3 x 12
124	3139 118 13290	Window Display	5001	3139 118 32360	△ Mains Transfo. /21/21M	278	D3 x 12
124	3139 118 13530	Window Display /37	5001	3139 118 32370	△ Mains Transfo. /22/30/34	280	D3 x 12
131	3139 118 13540	Button Set Prog/Clock/DBB	5001	3139 118 32350	△ Mains Transfo. /37	282	D3 x 12
132	3139 118 13550	Button Power On/Off				283	D3 x 16
133	3139 118 13240	Button Set Source Select				284	M3 x 15
<b>LOUDSPEAKER BOX BREAKDOWN</b>							
135	3139 118 13560	Button Set Controls		9965 000 06350	Speaker 4" 3R 5W Black	285	D3 x 16
144	3139 118 13570	Cover Ring Volume				286	D3 x 12
145	3139 118 13580	Button DSC				288	D3 x 12
146	3139 118 13590	Knob Volume Up/Down				289	D3 x 12
153	3139 118 13250	Cover Controls				290	D3 x 12
158	3139 118 13600	Cover Cassette Left				293	D3 x 12
159	3139 118 13610	Cover Cassette Right				294	D2 x 8
160	3139 114 71980	Lens Cassette Left				297	D3 x 12
161	3139 114 71990	Lens Cassette Right				299	D3 x 12
162-167	8240 009 27040	Rec/PB button set					
168-172	8240 009 27050	Play button set					
197	4822 529 10322	Damper Assembly					
199	4822 492 70231	Spring Leaf					
200	4822 443 10881	Door Cassette (Mech)					
201	4822 492 42709	Spring Cassette Door					
251	3139 114 69830	Cabinet Rear /21/22/30					
251	3139 114 69840	Cabinet Rear /21M/34					
251	3139 114 69850	Cabinet Rear /37					
252	4822 462 40683	Foot Rubber SQ					
255	4822 466 93148	Spacer 5mm					
260	4822 492 11734	Spring IC					
350	3139 118 78070	LS Box /37					
350	3139 118 78080	LS Box /22/34					
350	3139 118 78140	LS Box /21/21M/30					
351	4822 303 50063	FM Aerial 75R					
351	4822 320 11094	FM Antenna Wire /37					
356	3139 228 86180	Rem Cont. RC282430/01					
384	4822 303 50082	AM Frame Aerial					
385	4822 321 10249	△ Mains Cord /21/21M/22/34					
385	4822 321 10954	△ Mains Cord /30					
385	4822 321 11466	△ Mains Cord /37					
386	4822 263 21092	△ Adapter Plug /21					
387	3139 115 20360	Instr. For Use /21/21M/30					
387	3139 115 20280	Instruction For Use /22					
387	3139 115 20330	Instruction For Use /34					