



COMPACT  
disc  
DIGITAL AUDIO

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**CLASS 1  
LASER PRODUCT**

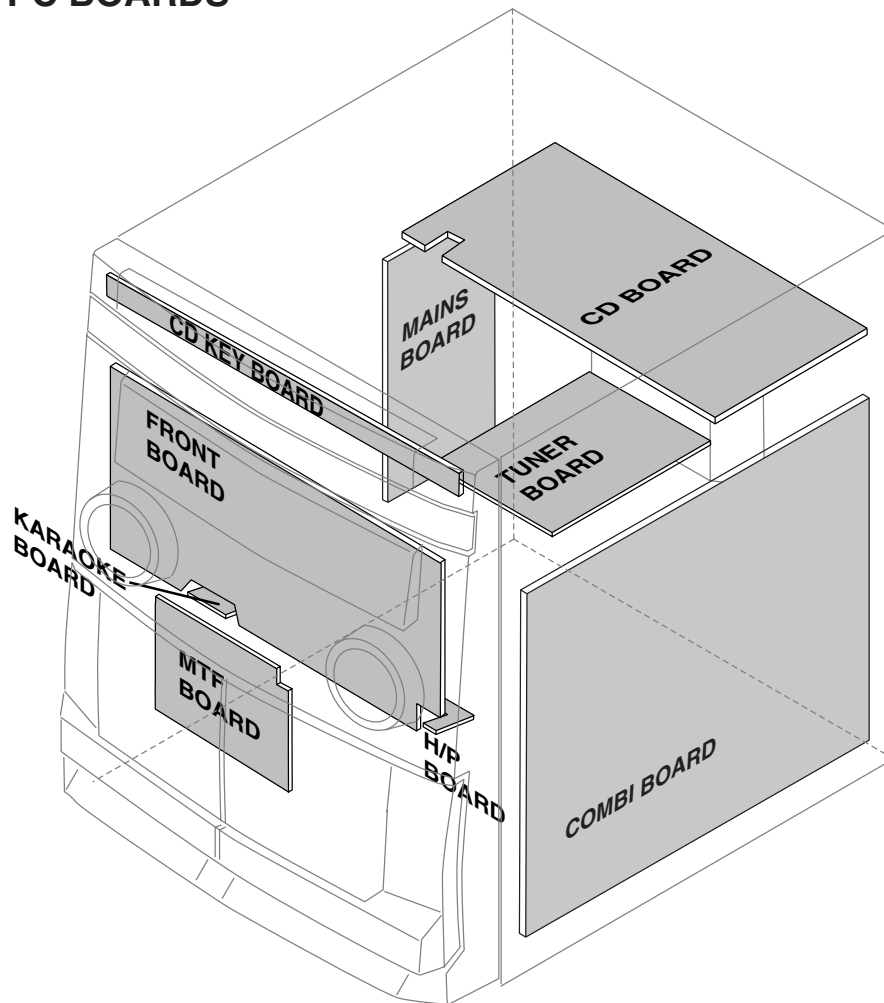
GB

PCS 103 329



# PHILIPS

## LOCATION OF PC BOARDS



### VERSION VARIATIONS:

Type /Versions:	FW-C30				FW-C3		FW-C35	
	/21	/21M	/30	/37		/37		/37
Features & Board in used:								
Dolby B								
Incredible Surround								
Karaoke	x	x						
News								
RDS								
Rotary Encoder (volume control)	x	x		x		x		x
Jog Shuttle	x	x	x	x		x		x
Voltage Selector	x	x						
Aux Input	x	x	x	x		x		x
Digital Output								
Headphone Socket	x	x	x	x		x		x
Line Output								
Subwoofer Output	x	x	x	x		x		x
Surround Output								
Matrix Surround Loudspeakers						x		x
Tuner board - ECO5 Sys	x	x	x	x		x		x
Tuner board - Tuner 95								
Standby with clock display	x	x	x	x		x		x

## SPECIFICATIONS

### GENERAL:

Mains voltage : 110-127V/220-240V Switchable for /21/21M  
 120V for /37  
 220V for /33  
 220-230V for /22/34  
 230V for /25  
 230-240V for /30  
 Mains frequency : 50/60Hz  
 Power consumption  
     Standby : < 15W  
     Active : < 70W  
 Clock accuracy : < 4 seconds per day  
 Dimension centre unit : 265 x 310 x 340mm

### 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 : 75ohm coaxial  
                   300ohm 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 /21/37  
 Grid : 9kHz  
           10kHz for /21/37  
 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  
     Left/Right : 2 x 25W FTC <sup>2)</sup> @ 6 ohm  $\pm$  1dB  
                   2 x 35W RMS <sup>3)</sup> @ 6 ohm  $\pm$  1dB  
     Surround : 2 x 2W <sup>4)</sup> @ 6 ohm  $\pm$  1dB  
 Frequency response within  $\pm$ 3dB : 50Hz-15kHz  
 Dynamic Bass Boost : DBB ON, DBB Off <sup>5)</sup>  
 Digital Sound Control : Jazz, Techno, Optimal, Rock <sup>5)</sup>  
 Input sensitivity  
     Aux-in : 700mV  $\pm$  3dB at 600ohm  
     Mic : {2.5mV  $\pm$  3dB} at 600ohm  
 Output sensitivity  
     Sub-woofer : 1.5V  $\pm$  3dB at 22kohm  
     Headphone : 18mW at 32ohm

### 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  $\pm$  2dB unloaded  
 Signal/Noise ratio (A-weighted) : > 80dBA  
 Distortion at 1kHz : < 0.003%  
 Channel difference at 1kHz : < 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 indicated are for /21/21M only

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

<sup>2)</sup> 60Hz - 12,5kHz, 10% THD

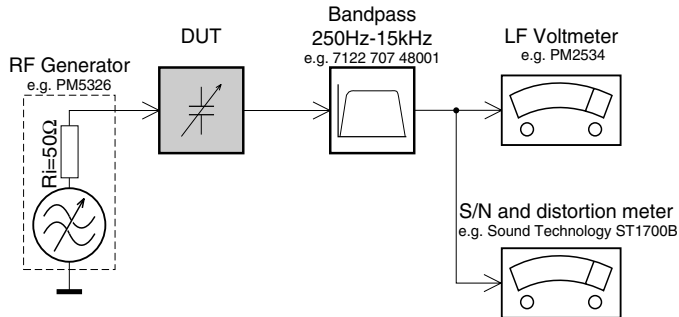
<sup>3)</sup> 1kHz, 10% THD

<sup>4)</sup> Only for FW-C3 & FW-C35

<sup>5)</sup> Frequency response in each setting is software controlled.

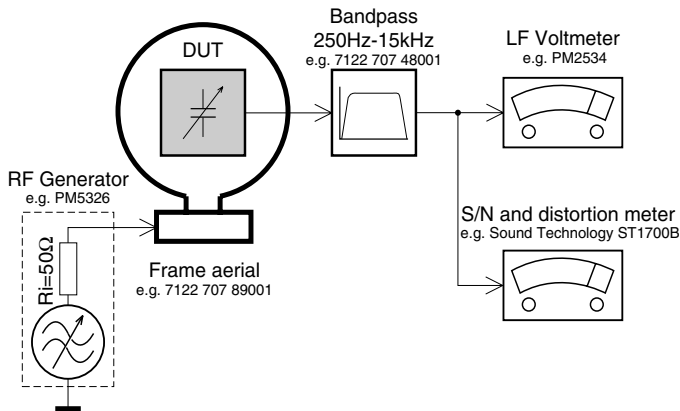
## MEASUREMENT SETUP

### Tuner FM



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

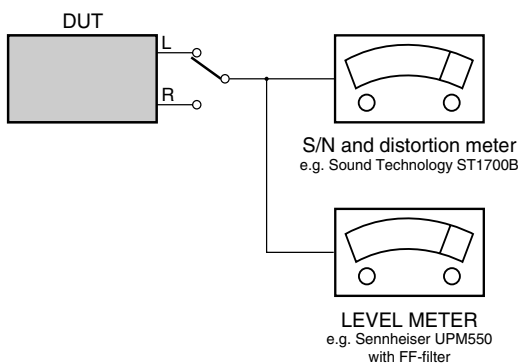
### Tuner AM (MW, LW)



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).

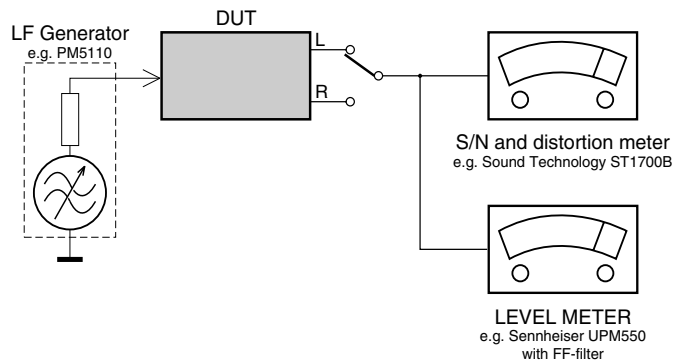
### CD

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

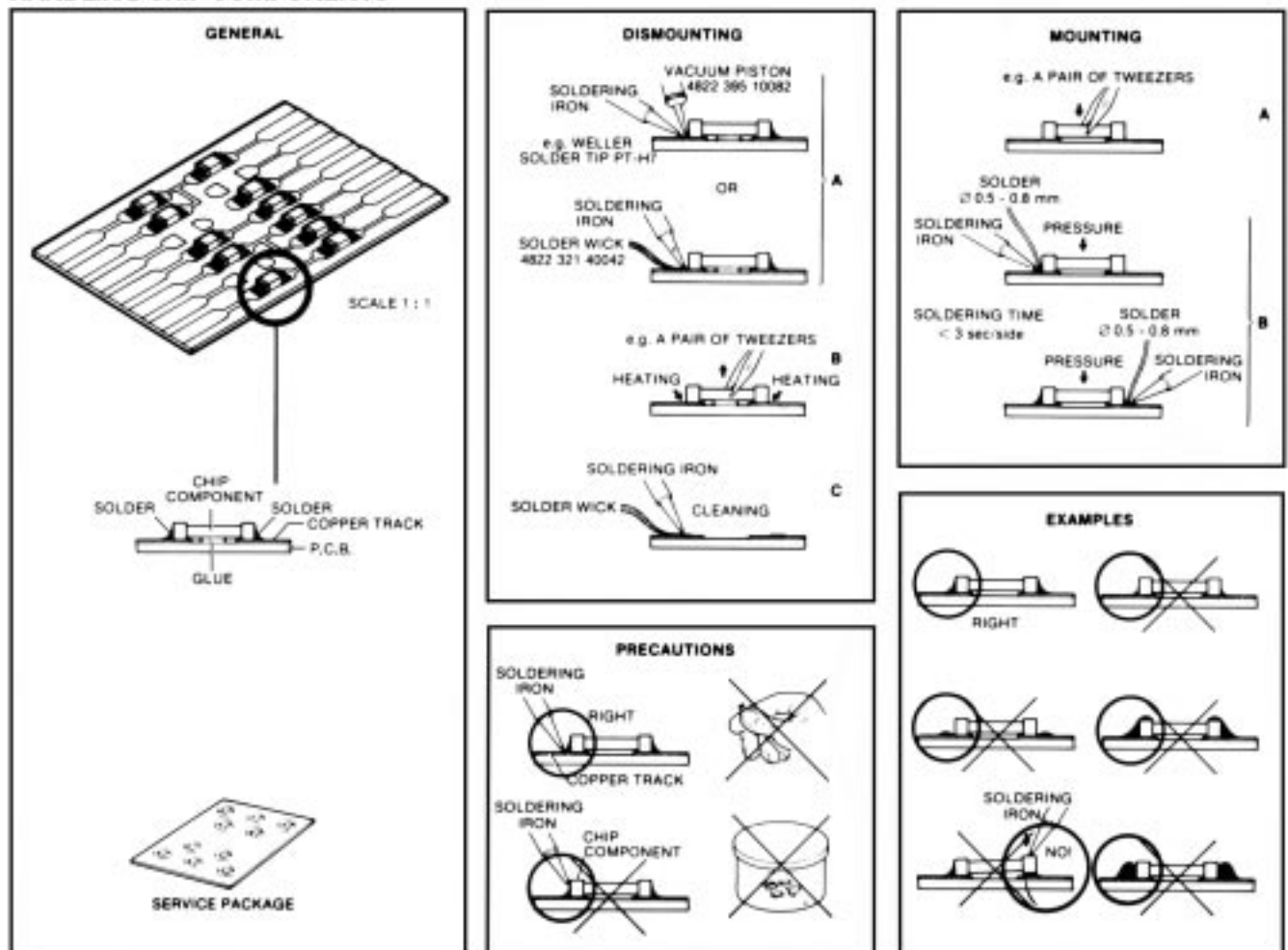
### Compact Disc:

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 hetzelfde potentiaal.

**F ATTENTION**

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

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

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

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

**D WARNUNG**

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

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.

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

**GB Warning !**

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

**S Varning !**

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

**SF Varoitus !**

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

**DK Advarse !**

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

## 7

## GENERAL INFORMATION

## General Information

- The **typeplate (which contains the serial number)** is located at the rear of the system.
- Recording is permissible if copyright or other rights of third parties are not infringed.
- This device complies with the Federal Communications Commission (FCC) rules, part 15 and with 21 CFR 1040.10. Operation is subject to the following two conditions:
  - This device may not cause harmful interference, and
  - This device must accept any interference received, including interference that may cause undesired operation.

## 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.

## Accessories (Supplied)

- Remote control
- Batteries (two AA size) for remote control
- AM loop antenna
- FM wire antenna
- AC power cord
- SS39 Surround Speakers (for model FWC3 & C35 only)

## SAFETY INFORMATION

## Safety Information

- Before operating the system, check that the operating voltage indicated on the typeplate (or the voltage indication beside the voltage selector) of your system 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 system.
- When the system is switched on, do not move it around.
- Place the system on a solid base (e.g. a cabinet).
- Place the system in a location with adequate ventilation to prevent internal heat build-up in your system. Allow at least 10cm (4 inches) clearance from the rear and the top of the unit and 5cm (2 inches) from each side.
- Do not expose the system to excessive moisture, rain, sand or heat sources.

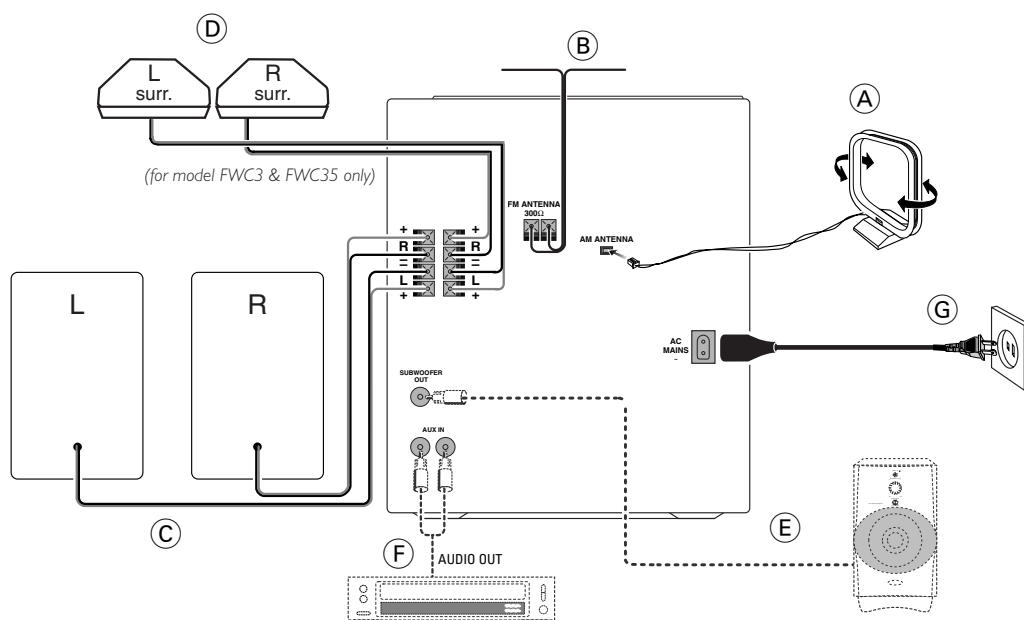
- Under no circumstances should you repair the system yourself, as this will invalidate the warranty!
- If the system is brought directly from a cold to a warm location, or is placed in a very damp room, moisture may condense on the lens of the CD unit inside the system. Should this occur, the CD player will not operate normally. Leave the power on for about one hour with no disc in the system 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 system from the power supply completely, remove the AC power plug from the wall socket.**

**CLASS 1  
LASER PRODUCT**

## 8

## PREPARATION

## Rear Connections

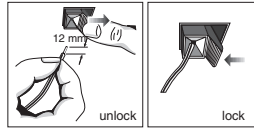


## PREPARATION

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### A AM Loop Antenna Connection

Connect the supplied FM 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.

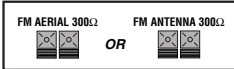


### B FM Wire Antenna Connection

Connect the supplied FM wire antenna to the FM AERIAL (FM ANTENNA) 300  $\Omega$  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) 300  $\Omega$  terminal using a 300  $\Omega$  dipole wire.



### C 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.

### D Rear Surround Speakers' Connection (for models FWC3 & FWC35 only)

Connect the black (non-marked) wires to the black REAR SURROUND terminals and the colored (marked) wires to the grey REAR SURROUND terminals.

### E Subwoofer Out Connection

Connect the optional active subwoofer to the SUBWOOFER OUT terminal. The subwoofer reproduces just the low bass sound effect (e.g. explosions, the rumble of spaceships, etc.). Be sure to follow the instructions supplied with the subwoofer.

### F Connecting other equipment to your system

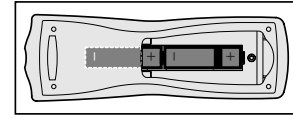
You can connect the audio left and right OUT terminals of a TV, VCR, Laser Disc player, DVD player or CD Recorder to the AUX IN terminals at the rear of the system.

### G AC Power Supply

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

### Inserting batteries into the Remote Control

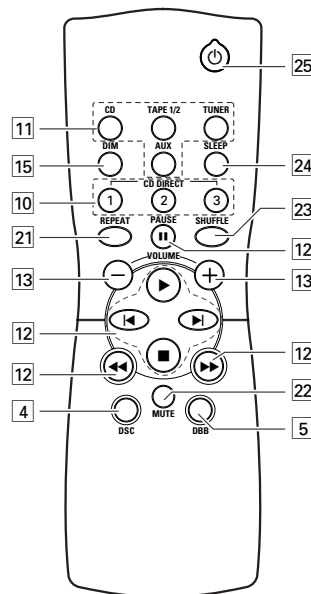
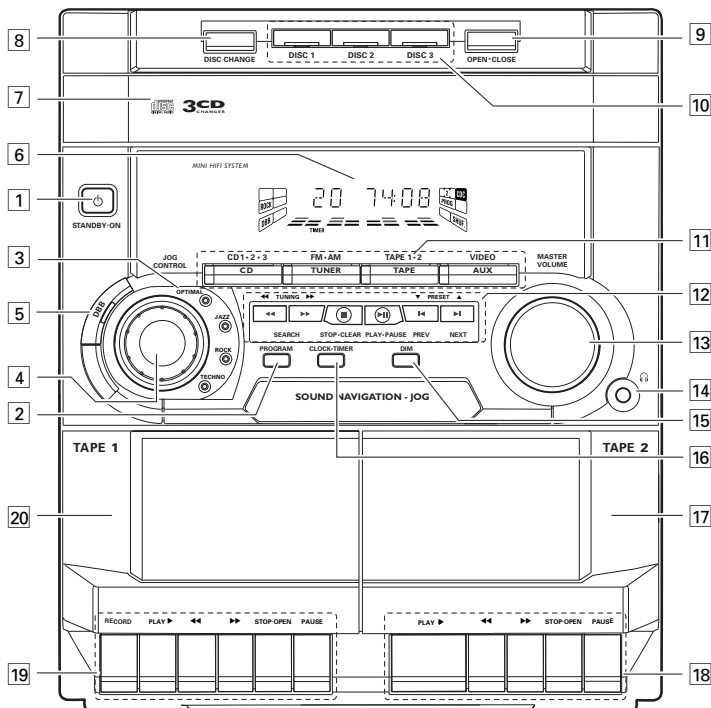
- Insert the batteries (Type R06 or AA) into the remote control as shown in the battery compartment.



- To avoid damage from possible battery leakage, remove dead batteries or batteries that will not be used for a long time. For replacement, use type R06 or AA batteries.

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## CONTROLS



## CONTROLS

## Controls on the system and remote control

1 **STANDBY ON**

- to switch the system on or to standby mode.
- to use for EASY SET.

2 **PROGRAM**

- for CD ..... to program CD tracks.
- for TUNER ... to program preset radio stations.
- for CLOCK .. to select 12- or 24-hour in clock setting mode.

3 **DIGITAL SOUND CONTROL DISPLAY PANEL**

- to view the desired DSC display.

4 **JOG CONTROL/DSC**

- to select the desired equalizer display: OPTIMAL, JAZZ, ROCK or TECHNO.

5 **DBB (DYNAMIC BASS BOOST)**

- to switch on bass boost to enhance bass response or to switch off bass boost.

6 **DISPLAY SCREEN**

- to view the current setting of the system.

7 **CD CAROUSEL TRAY**8 **DISC CHANGE**

- to change CD(s).

9 **OPEN-CLOSE**

- to open or close the CD carousel tray.

10 **DISC 1 / DISC 2 / DISC 3 (CD DIRECT PLAY)**

- to select a CD tray for playback.

11 **SOURCE** – to select the following:**CD / (CD 1•2•3)**

- to select CD mode. When CD playback is stopped, press to select disc tray 1, 2 or 3.

**TUNER / (FM•AM)**

- to select Tuner mode. When in tuner mode, press to select the waveband: FM or AM.

**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).

12 **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).

**STOP-CLEAR ■**

- for CD ..... to stop CD playback or to clear a program.
- for TUNER ... to stop programming.
- for DEMO .... (on the system only) to start or stop demonstration mode.

**PLAY ▶ / PAUSE ■**

- for CD ..... to start or interrupt playback.

**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).

13 **MASTER VOLUME**

- to increase or decrease the volume.

14 **HEADPHONE**

- to connect headphones.

15 **DIM**

- to select different brightness for the display screen : DIM 1, DIM 2, DIM 3 or DIM OFF.

16 **CLOCK-TIMER**

- to view the clock, set the clock or set the timer.

17 **TAPE DECK 2**18 **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.

19 **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.

20 **TAPE DECK 1**21 **REPEAT**

- to repeat a CD track, a disc, or all available discs.

22 **MUTE**

- to switch off the sound temporarily.

23 **SHUFFLE**

- to play all the available discs and their tracks in random order.

24 **SLEEP**

- to switch the system to standby mode at a selected time.

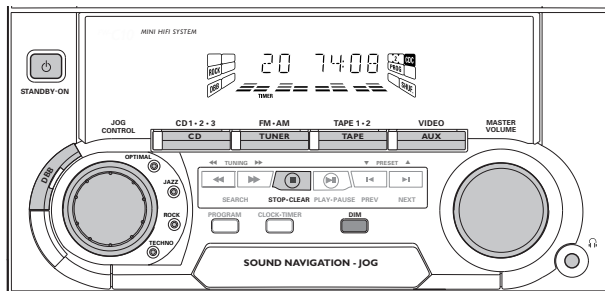
25 **⏻**

- 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.).**

## OPERATING THE SYSTEM

**Important:**

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

**Demonstration mode**

The system has a demonstration mode that shows the various features offered by the system. **When the system is switched on for the first time, the demonstration mode will start automatically.**

**Notes:**

- During the demonstration, if you press any source (or standby-on) button, the system will switch to the respective mode (or standby).
- When the system is switched to standby mode, the demonstration will resume five seconds later.

**To stop the demonstration mode**

- Press and hold ■ (on the system only) for **five seconds** when the system is in demonstration mode.
  - The demonstration will stop.
  - "DEMO OFF" is displayed.
  - The system will switch to standby mode.

**Note:**

- 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.

**To start the demonstration mode**

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

**Easy Set**

EASY SET allows you to store all available radio stations automatically.

- Press and hold **STANDBY ON** (on the system only) for **five seconds** when the system is in standby or demonstration mode.

→ "EASY SET" will be displayed, and followed by "TUNER" and then "AUTO".

→ EASY SET will start searching for all radio on FM band and then followed by radio stations on AM band.

→ All available radio stations with sufficient signal strength will be stored. Up to 40 presets may be stored.

**Notes:**

- EASY SET will start with the FM band, if there are still presets available, the system will continue to store the AM band.
- When EASY SET is used, all previously stored radio stations will be replaced.
- The last preset radio station will appear on the display when EASY SET is completed.

**Switching the system ON**

- Press **CD, TUNER, TAPE** or **AUX**.

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

**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.

## OPERATING THE SYSTEM

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### DIM mode

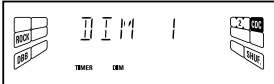
You can select the desired brightness for the display.

- 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 Spectrum Analyzer On



### DIM 1 - normal brightness with Spectrum Analyzer Off



### DIM 2 - half brightness with Spectrum Analyzer On



### DIM 3 - half brightness with Spectrum Analyzer Off and all LEDs on the system will be switched off.



### Sound Control

#### VOLUME ADJUSTMENT

Adjust **MASTER VOLUME** 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.

- Adjust **JOG CONTROL** to select OPTIMAL, JAZZ, ROCK or TECHNO.
  - The Digital Sound Control display panel will light up respectively.
  - "OPTIMAL", "JAZZ", "ROCK" or "TECHNO" and the respective flag will be displayed.

Note:

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

### DYNAMIC BASS BOOST (DBB)

The DBB mode enhances the bass response.

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

### To switch off DBB

- Press **DBB** again.
  - The DBB button light is switched off.
  - "DBB OFF" will be displayed.

Note:

- Some CDs 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.

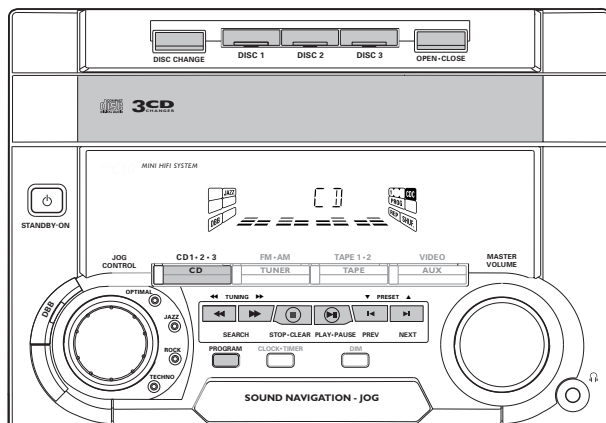
### MUTE (only on remote control)

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.

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## CD



### Warning!

- This system is designed for conventional CDs. Do not use any accessories such as disc stabilizer rings or CD treatment sheets, etc., which may damage the CD mechanism.
- Do not load more than one disc into each tray.
- When the CD changer is loaded with CDs, 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 CD, finalized digital audio CD-Recordable and finalized digital audio CD-Rewritable format discs.



### Loading the CD Changer

- Press **CD** to select CD mode.
- Press **OPEN-CLOSE**.
  - The CD carousel tray slides out.
- Load a CD 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 carousel tray will rotate until the empty tray is ready for loading.
- Press **OPEN-CLOSE** to close the CD carousel tray.
  - The total number of tracks and the playing time of the selected disc appear on the display.

Note:

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

### CD Direct Play

- You can play a CD 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.
  - A lit button indicates that a disc is loaded in the disc tray.
  - A flashing button indicates that a disc is playing.

### Playing a CD

- Press **▶** to start playback.
  - The disc tray, 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.
- 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.

- Press **DISC CHANGE**.
  - The CD carousel tray slides out.
- Replace the discs in the left and right disc trays.



- If you press **DISC CHANGE** again during playback, the CD will stop playing.
  - The CD carousel tray will rotate until the inner tray is rotated out and is ready for changing.
- Press **OPEN•CLOSE** to close the CD carousel tray.

### Selecting a desired track

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

- Press **◀** or **▶** until the desired track appears on the display.
- 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 CD is possible when playback is stopped. The display will indicate the total tracks stored in the program. 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 "PROGRAM FULL".

- Load the desired discs in the disc trays.
- Press **PROGRAM** to start programming.
  - The **PROG** flag starts flashing.
  - It will cancel any previously selected repeat mode.
- Press the **CD (CD 1•2•3)** or **DISC 1/2/3** button to select the disc.
- Press **◀** or **▶** to select the desired track.
- Press **PROGRAM** to store the track.
  - Repeat steps 3 to 5 to store other discs and tracks.

- 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 :". "X" is the current read disc number.
- During programming, if no button is pressed within 20 seconds, the system will exit program mode automatically.

### Reviewing the program

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

- Press **◀** or **▶** repeatedly to review the programmed tracks.
- Press **■** to exit review mode.

### Playing the program

- Press **▶** to start program 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 program 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.

- Press **■** to stop program playback.

Notes:

- If you press any of the CD **DIRECT PLAY** buttons, the system will play the selected disc or track and the stored program 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 program playback begins.

### Erasing the program (when playback is stopped)

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

Note:

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

### 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

- Press **SHUFFLE**.
  - "SHUFFLE" will be displayed.
  - The **SHUF** flag, the disc 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.
- 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.

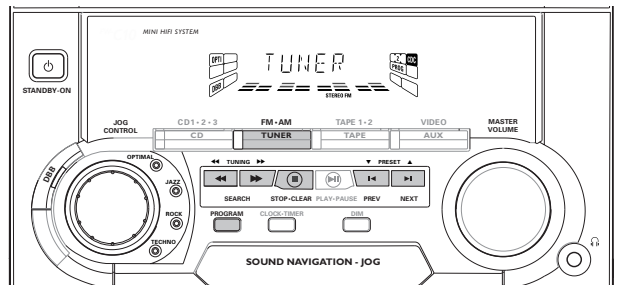
### Repeat (only on remote control)

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

- 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 program play or shuffle mode.
- You can also repeat shuffling a program.
  - "TRACK" or "PROGRAM" will be displayed.
  - The **REP**, **PROG**, and **SHUF** flags appear on the display.



Note:

- For "EASY SET" feature, please refer to page 12.

### Tuning to radio stations

- Press **TUNER (FM•AM)** to select TUNER mode.
  - "TUNER" will be displayed.
  - A few seconds later, the current radio frequency will be displayed.
- Press **TUNER (FM•AM)** again to select the desired waveband: FM or AM.
- Press **◀◀** or **▶▶** for more than one second, then release.
  - The display will show "SEARCH" 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.

## TUNER

### 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.

#### Automatic programming

- 1 Press **TUNER** (FM•AM).
- 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, then search the AM 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.

#### 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.

#### Manual programming

- 1 Press **TUNER** (FM•AM).
  - 2 Press **TUNER** (FM•AM) again to select the desired waveband : FM or AM.
  - 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.

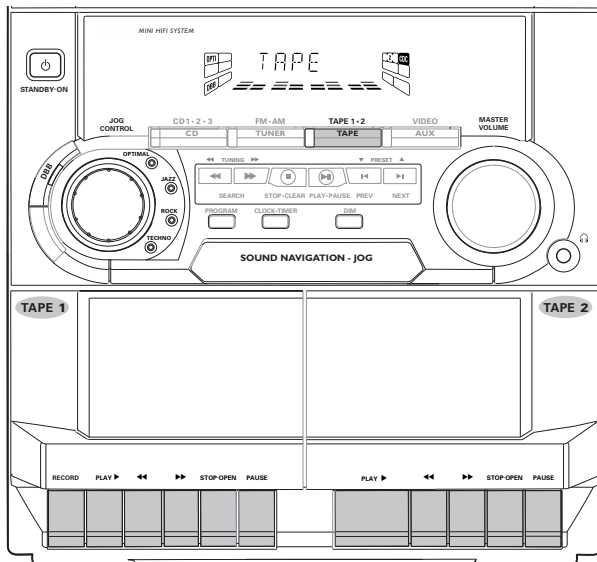
#### Notes:

- When 40 radio stations are stored and you attempt to store another radio station, the display will show "PROGRAM 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 program mode automatically.

### Tuning to Preset Radio Stations

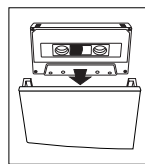
- Press **▼** or **▲** to select the desired preset number.
  - The preset number, radio frequency, and waveband appear on the display.

## TAPE



### 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.

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

- 1 Press **TAPE** to select TAPE mode.
- 2 Load the tapes in tape decks 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).

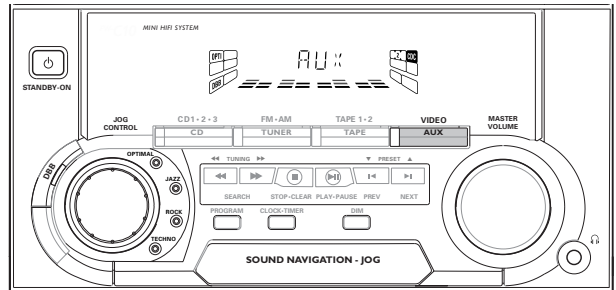


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## TAPE

- 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



### 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.

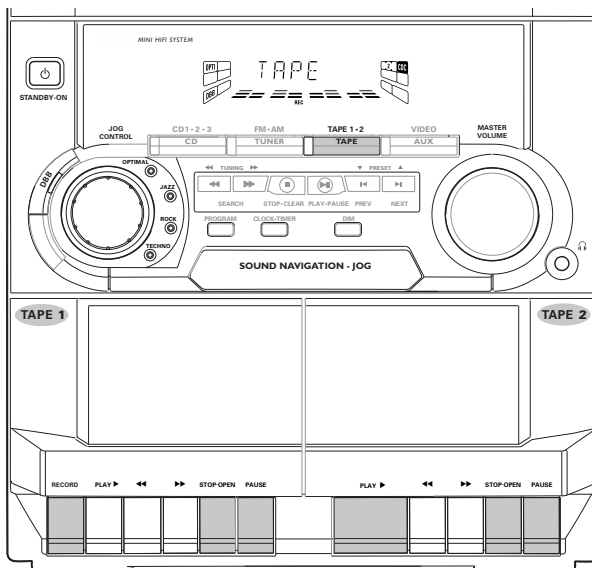
- Press **AUX** to select the external equipment.  
→ "AUX" will be displayed.

Note:

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

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## RECORDING



Notes:

- For recording, use only tape of IEC type I (normal tape).
- The tape is secured at both ends with leader tape. At the beginning and end of tape, nothing will be recorded for six to seven seconds.
- The recording level is set automatically, regardless of the position of Volume, DBB or DSC.
- To prevent accidental recording, break out the tab on the left shoulder of the tape side you want to protect.

### One Touch Recording

- For One Touch Recording, as soon as you press RECORD, the current source (CD, TUNER or AUX) will be recorded on tape deck 1.

- 1 Load a blank tape in tape deck 1.
- 2 Press **RECORD** on tape deck 1 to start recording.  
→ The **REC** starts flashing.
- 3 Press **PAUSE** to interrupt recording.
- 4 Press **STOP•OPEN** on tape deck 1 to stop recording.

### CD Synchro Start Recording

During CD synchro start recording,

- Do not fast forward/rewind your tape in tape deck 2.
- Do not listen to another source.

- 1 Load a blank tape into tape deck 1 and a disc into the disc tray.
- 2 Press **CD**.
- You can program the tracks in the order you want them to be recorded (see Programming Tracks). If you do not, the tracks are recorded according to the order on the selected disc.
- 3 Press **RECORD** on tape deck 1 to start recording.  
→ The **REC** starts flashing.
- 4 Press **STOP•OPEN** on tape deck 1 to stop recording, then press **■** to stop CD playback.

### Dubbing tapes (from tape deck 2 to tape deck 1)

- 1 Load the prerecorded tape into tape deck 2 and a blank tape into tape deck 1.
- Make sure both tapes have their full spool to the left.
- 2 Press **PAUSE** on tape deck 1.
- 3 Press **RECORD** on tape deck 1.
- 4 Press **PLAY** on tape deck 2.  
→ The **REC** starts flashing.

## RECORDING

- Recording will start automatically.
- 5 Press **STOP•OPEN** on tape deck 1 and tape deck 2 to stop dubbing.

## Notes:

- At the end of side A, flip the tapes to side B and repeat the procedure.
- Dubbing of tapes is only possible from tape deck 2 to tape deck 1.
- To ensure good dubbing, use tapes of the same length.

## Recording from other

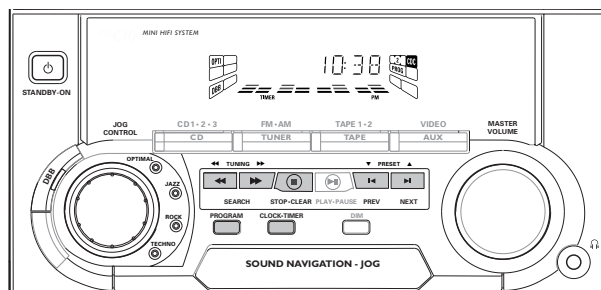
sources (only on tape deck 1)

- 1 Load a blank tape into tape deck 1.
- 2 Press **CD, TUNER** or **AUX**.
  - Start playback of the selected source.
- 3 Press **RECORD** on tape deck 1 to start recording.
  - The **REC** starts flashing.
- 4 Press **PAUSE** to interrupt recording.
- 5 Press **STOP•OPEN** on tape deck 1 to stop recording.

## Note:

- During recording, it is not possible to listen to another sound source.

## CLOCK



## 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.
  - "10:38 PM" or "22:38" (the current time in either 12- or 24-hour mode) 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- or 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.

## TIMER

- 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 until the volume level before the set is switched to standby mode.**

- 1 Press and hold **CLOCK•TIMER** for more than **two seconds** to select timer mode.

- "12:00 AM" or "00:00" or the last timer setting starts flashing depending on whether you have selected 12- or 24-hour mode.
  - The **TIMER** starts flashing.
  - The selected source is lit while other available sources are flashing.
- 2 Press **CD** or **TUNER** to select the desired source.
    - Before selecting CD, make sure a CD is loaded in the CD carousel tray.
  - 3 Press **◀** or **▶** on the system to set the hour for the timer to start on the system.
  - 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 program. If the CD 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 **two seconds**.
- 2 Press **■** on the system to cancel the timer.
  - The timer is now switched off.
  - The display will show "CANCEL" 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 **two seconds**.
- 2 Press **CLOCK•TIMER** again to store the start time.
  - The timer is now on.
  - The **TIMER** appears on the display.

## SLEEP TIMER

## 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):  
60 → 45 → 30 → 15 → OFF → 60 ...
  - "SLEEP xx" or "OFF" will be displayed. "xx" is the time in minutes.
- 2 When you reach the desired length of time, stop pressing the **SLEEP** button.
  - After this amount of time passes, the system will switch to the standby mode.

## To switch off the Sleep Timer

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

## MAINTENANCE

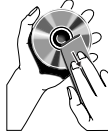
### Maintenance

#### Cleaning the Cabinet

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

#### Cleaning Discs

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



#### Cleaning the CD lens

- After prolonged use, dirt or dust may accumulate at the CD lens. To ensure good playback quality, clean the CD 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.

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

- If a fault occurs, check the points listed below before taking the system for repair.
- Should any problems persist after you have made these checks, consult your nearest dealer or service center.

### CD Player Operation

**"NO DISC" is displayed.**

- The disc is inserted upside down.
- Place CD with printed side up.
- Moisture condensation at the lens.
- Wait until lens has adjusted to normal room temperature.
- There is no disc in the CD tray.
- Insert a CD.
- The CD is dirty, badly scratched or warped.
- Clean or replace the CD.
- The CD lens is dirty or dusty.
- See section under Maintenance (page 24).

## TROUBLESHOOTING

**"DISC NOT FINALIZED" is displayed.**

- The CD-RW or CD-R disc is not properly recorded for use with a standard CD player.
- Read the instruction booklet of your CD-Rewritable or CD-Recorder on how to finalize a recording.
- The CD is badly scratched or dirty.
- Replace or clean CD.

### Radio Reception

**Poor radio reception.**

- The signal is too weak.
- Adjust the antenna.
- Connect an external antenna for better reception.
- The TV or VCR is too close to the stereo system.
- Separate the stereo system from the TV or VCR.

## TROUBLESHOOTING

### Tape Deck Operation

**"RECORDING ACTIVE" is displayed.**

- A recording is in progress.
- Stop the recording or wait until it is finished.

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

- Dirty tape heads, capstans or pressure rollers.
- See section on tape deck maintenance (page 24).
- Magnetic build-up in the record/playback head.
- Use demagnetizing tape.

### General

**System does not react when any button is pressed.**

- Electrostatic discharge.
- 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.**

- Volume is not turned up.
- Adjust **VOLUME**.
- The headphones are connected.
- Disconnect the headphones.
- Speakers are not connected or are connected wrongly.
- Check that the speakers are connected correctly.
- Make sure the stripped speaker wire is clamped.

**Reversed left and right sound.**

- Speakers are connected wrongly.
- Check the speaker connections and location.

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

- Speakers are connected wrongly.
- Check the speaker connection for proper phasing, colored/black wires to colored/black terminals.

**Remote control has no effect on the system.**

- Wrong source is selected.
- Select the source (CD, TUNER, etc.) before pressing the function button, (▶, ◀, ►, etc.).
- The distance to the system is too large.
- Reduce the distance.
- Batteries are inserted incorrectly.
- Insert the batteries with their polarities (+/- signs) as indicated.
- Batteries are exhausted.
- Replace the batteries.

**Timer is not working.**

- Clock is not set.
- Set the clock.
- Timer is not switched on.
- Press **CLOCK•TIMER** to switch on the timer.
- Recording is in progress.
- Stop recording.

**Clock setting is erased.**

- There was a power failure.
- Reset the clock.

**System displays features automatically; buttons flash continuously.**

- Demonstration mode is switched on.
- Press and hold ■ (on the system) for five seconds to switch off the demonstration.

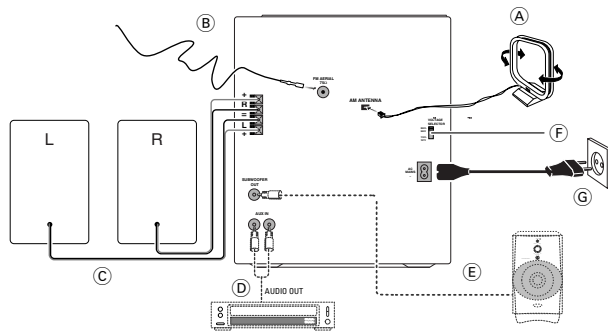
**All lighted buttons are not lit.**

- Display is switch on in DIM 3 mode.
- Press **DIM** until DIM OFF display mode is shown.

# ADDITIONAL FEATURES FOR FW-C30/21/21M

## PREPARATION

### Rear Connections

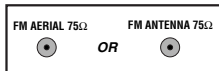


### B FM Wire Antenna Connection

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 dipole wire.

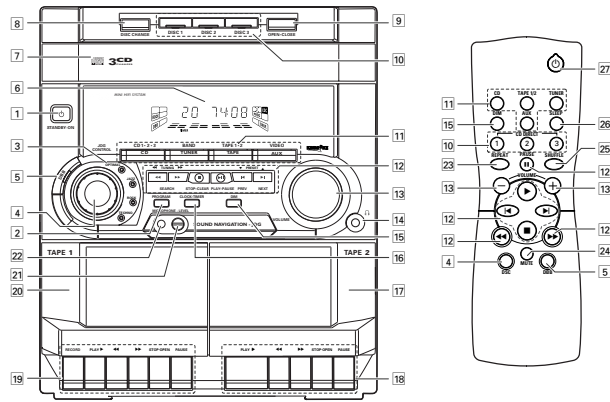


### F Adjusting the Operating Voltage

(not available for version /30)

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.

## CONTROLS



English

### 21 MIC LEVEL (not available for version /30)

— to adjust the mixing level for karaoke or microphone recording.

### 22 MIC (not available for version /30)

— to connect microphones jack.

## MW TUNING GRID

### Changing the MW tuning grid

(not available for version /30)

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

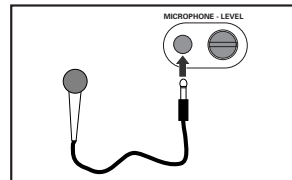
**Changing of tuning grid will erase all previously stored preset stations.**

- 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 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. All preset stations will also be erased.

## KARAOKE



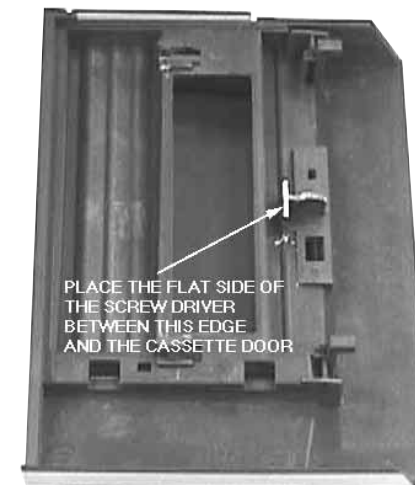
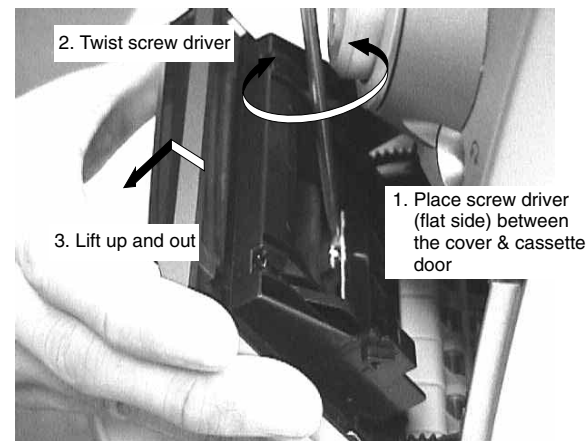
### Microphone Mixing (not available for version /30)

- 1 Set the **MIC LEVEL** control to the minimum level to prevent acoustic feedback (e.g. a loud howling sound) before you connect the microphone.
- 2 Connect a microphone to the **MIC** socket.
- 3 Press **CD**, **TUNER**, **TAPE** or **AUX**.
- 4 Play the selected source.
- 5 Adjust the volume level with **VOLUME** control.
- 6 Adjust the **MIC LEVEL** control to the mixing level that you want.
- 7 Start singing or talking through the microphone.



## DISMANTLING INSTRUCTIONS

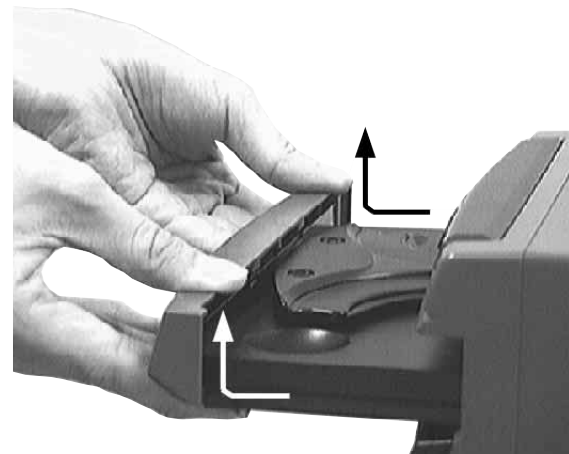
### *Dismantling of the Cassette Cover*



Cassette

### *Dismantling of the Front Panel*

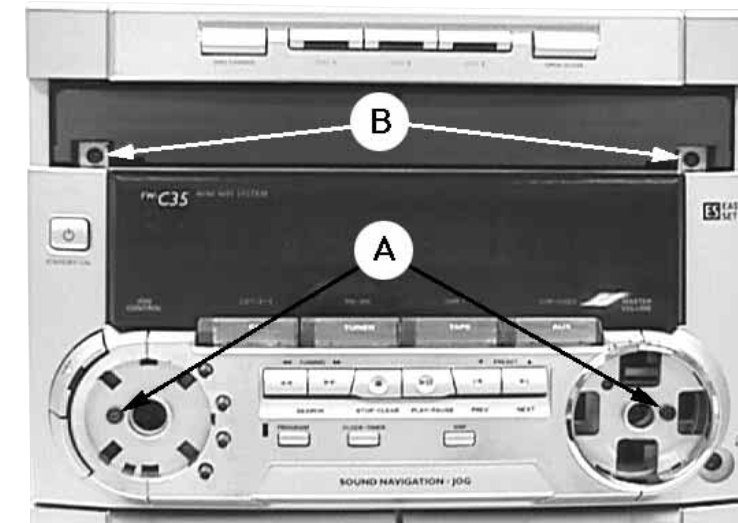
- 1) Slide out the tray and remove the Cover Tray CDC (pos 107) as indicated.
- 2) Loosen the 8 screws to separate the Front Panel from the rear portion.
  - 2 screws B on the front
  - 2 screws each on the left & right side
  - 2 screws at the bottom



### *Dismantling of the Cover Control on the Front (see Notes)*

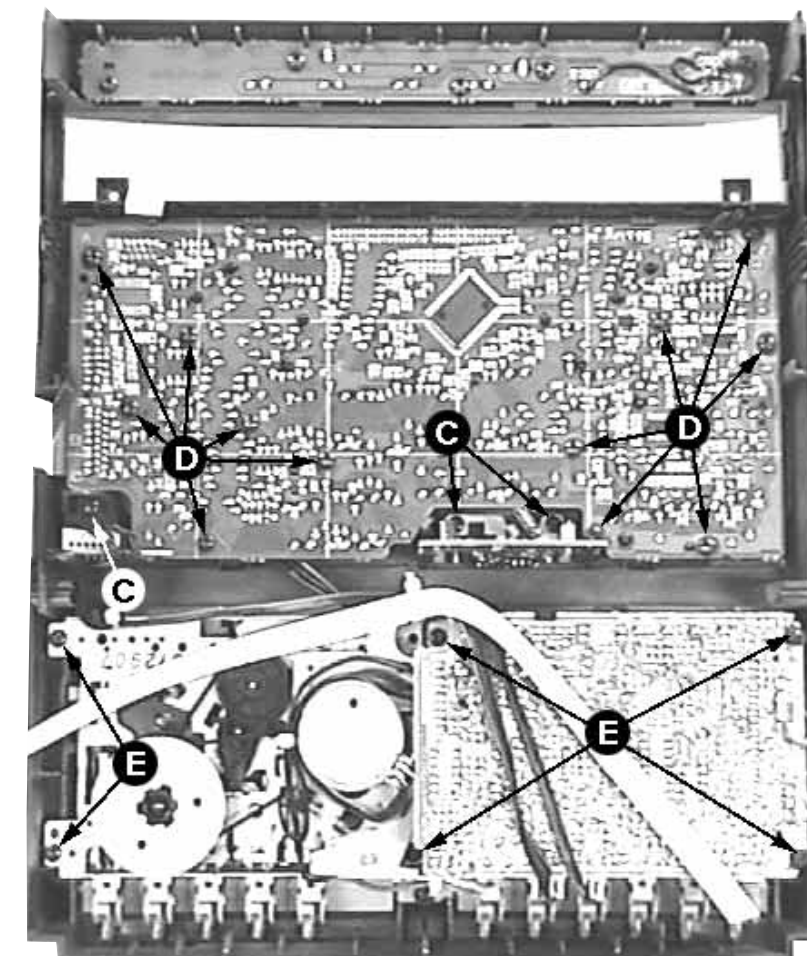
- 1) Insert a strong string into the slot between the Volume knob (pos 146) and Cover Ring Volume (pos 1440), looped it 1,5 turns securely around the Volume knob and pulled it out as shown.
- 2) Do likewise for the Jog Rotary knob (pos 145).
- 3) Remove the 2 hidden screws A to take out the Cover Control Assembly (pos 153 + 143 + 144).

**Note:** Only the Lightguide DSC (pos 127) is sandwiched between the Front Cabinet (pos 101) & Cover Control (pos 153).



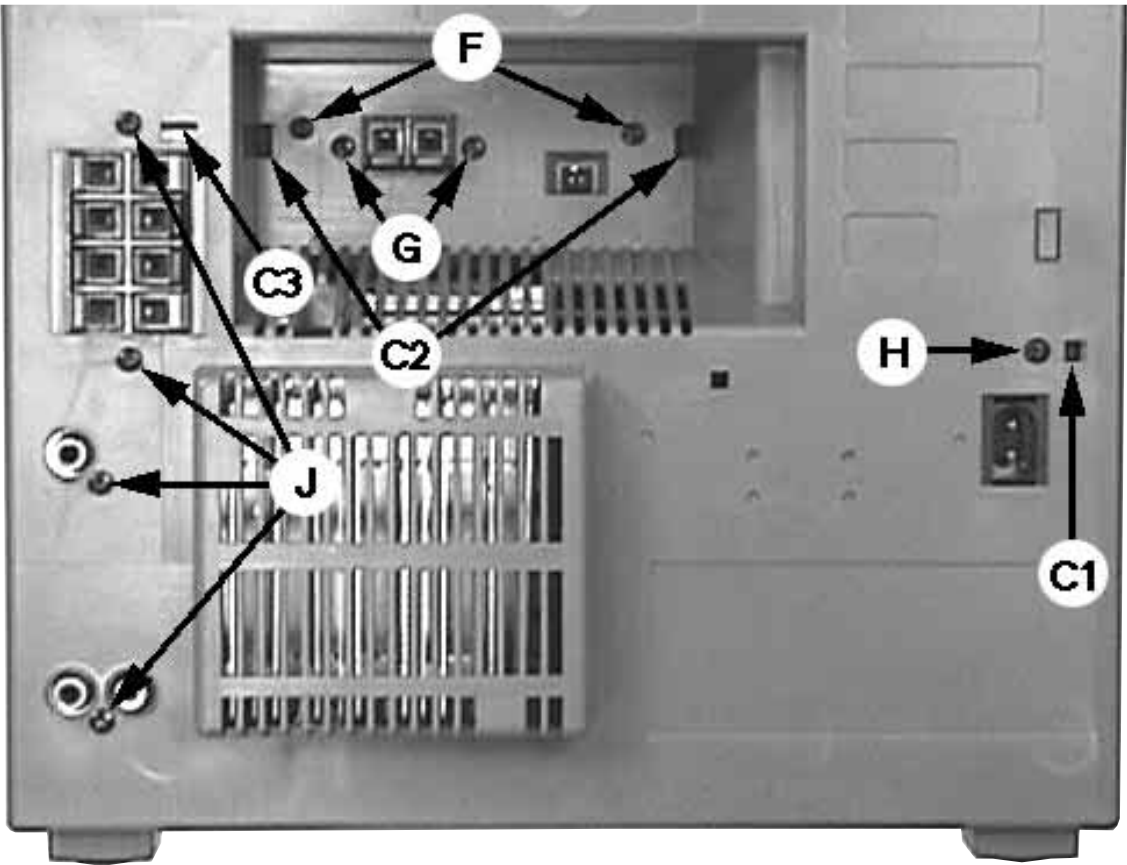
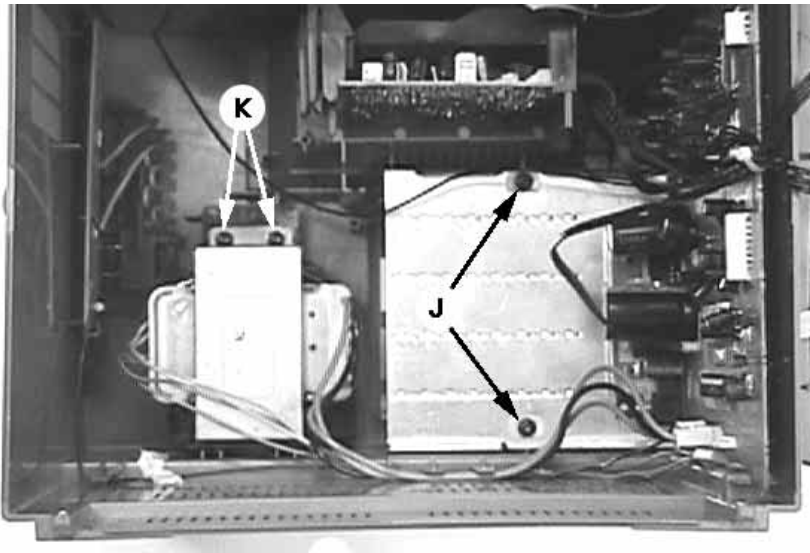
### *Dismantling of Assemblies on the Front Panel*

- 1) Remove the Volume and Jog Rotary knobs (pos 145 & 146) as per step 1 and 2 of ***Dismantling the Cover Control on the Front.***
- 2) Remove 3 screws C to loosen the Headphone board (1x) and the Karaoke board (2x).  
Note: Karaoke board is for some versions only.
- 3) Remove 12 screws D as indicated to loosen the Front board.
- 4) Remove 6 screws E to loosen the ECO-MTF Module



**Dismantling of Rear Portion**

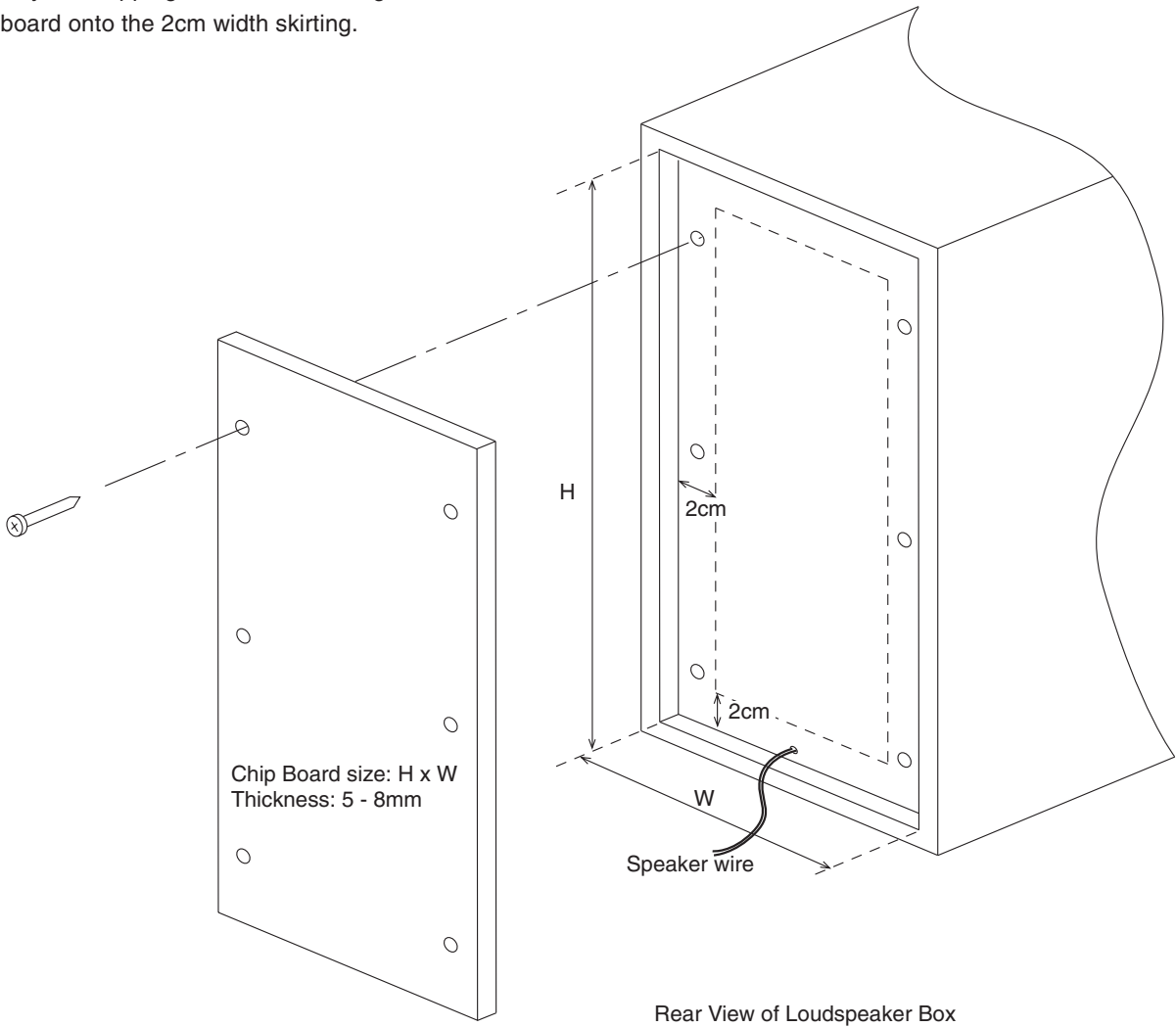
- 1) Remove 1 screw H & uncatch C1 to loosen the Mains socket board.
- 2) Remove 2 screws F, 2 screws G and uncatch C2 to loosen the Tuner board assembly.
- 3) Remove 6 screws J (4x on the rear and 2x on the heatsink) and uncatch C3 to loosen the Combi board (Main part).
- 4) Remove 2 screws K to loosen the Mains Transformer.



**Dismantling of Left/Right Loudspeaker Box (not recommended because of high risk of damage)**

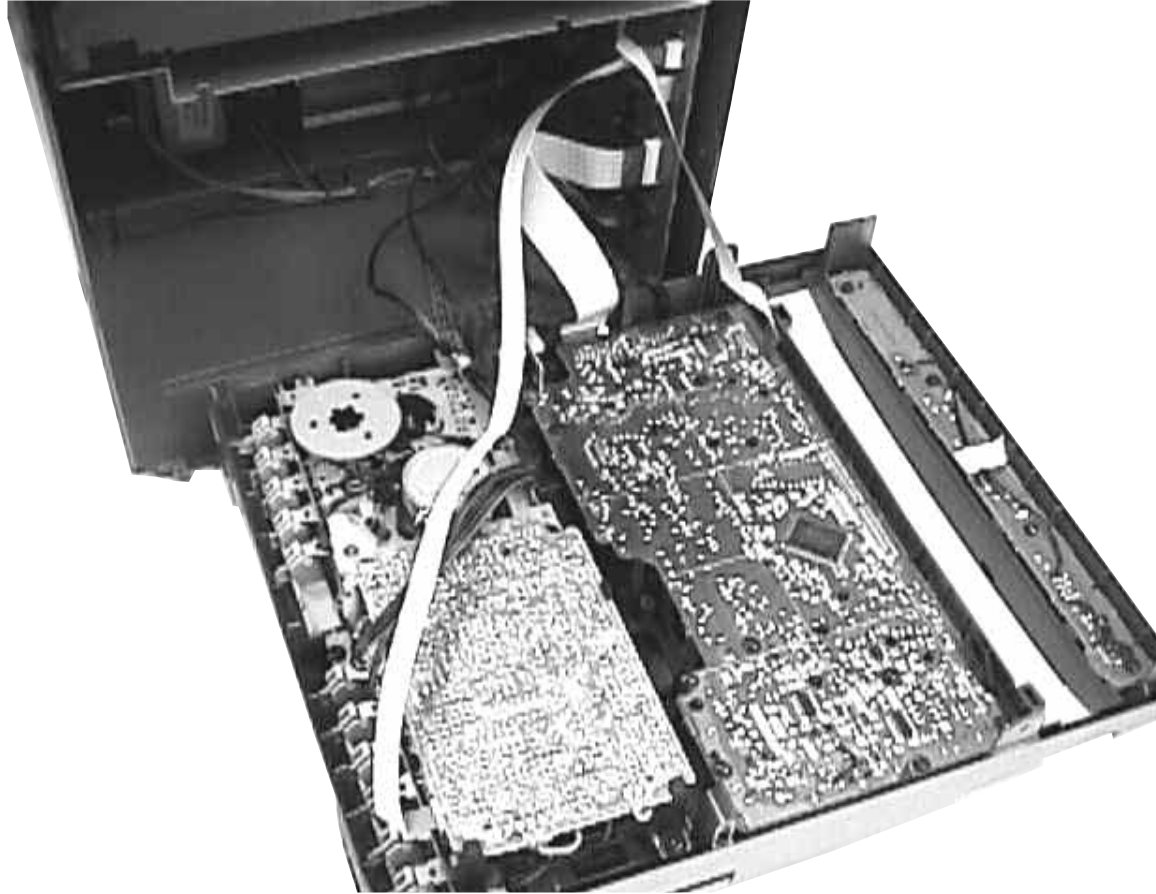
**This Loudspeaker Box is not designed to be repaired!**  
**The steps below makes it possible to replace defective parts but the service repairman must exercise extreme care not to damage the Loudspeaker box.**

- 1) Marked out a rectangular area on the Rear of the Loudspeaker box giving it a 2cm skirting all round (see picture).
- 2) Use a zigsaw (or open-end hand-held saw) cut along the earlier marked out line.  
**Caution: Be extra careful not to cut the Loudspeaker Wires near the bottom of the LS box.**
- 3) Prepare a Chipboard (thickness 5 - 8 mm) of size L x W to cover back the cut-out after replacement of defective parts.
- 4) Use any self-tapping wood screw to tighten the new Chipboard onto the 2cm width skirting.

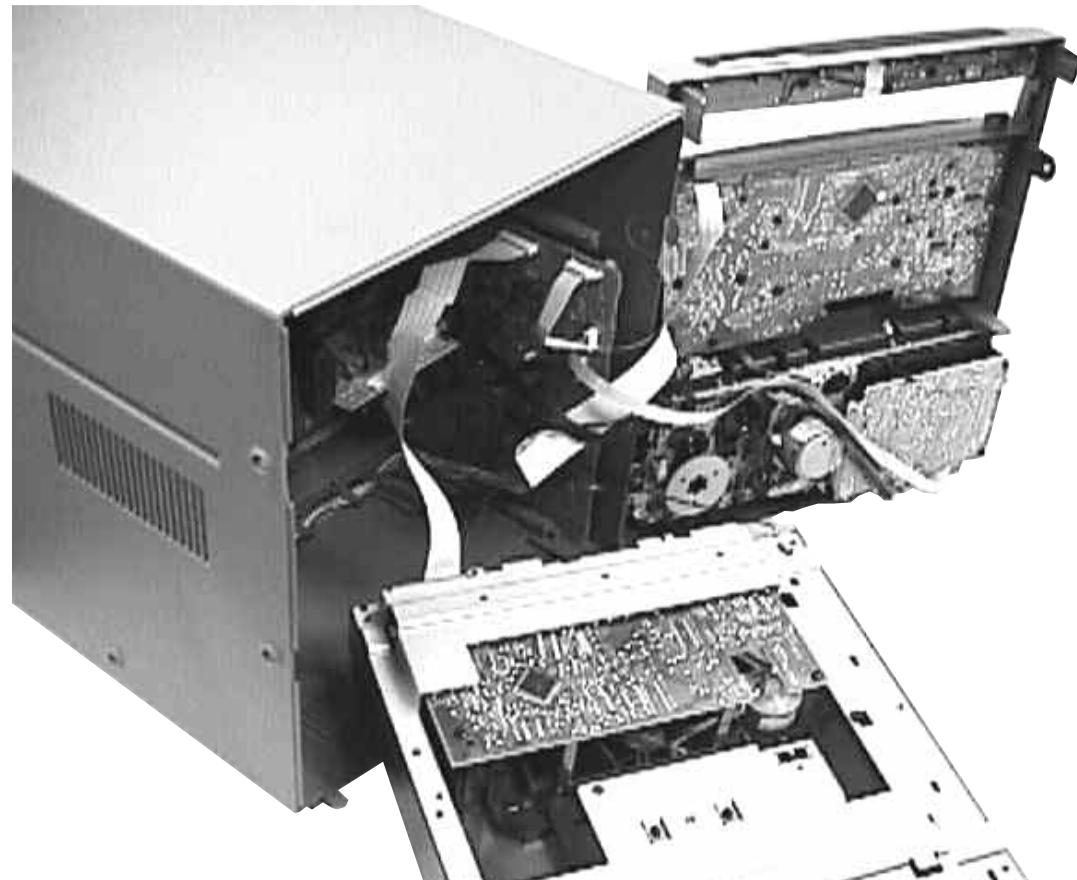




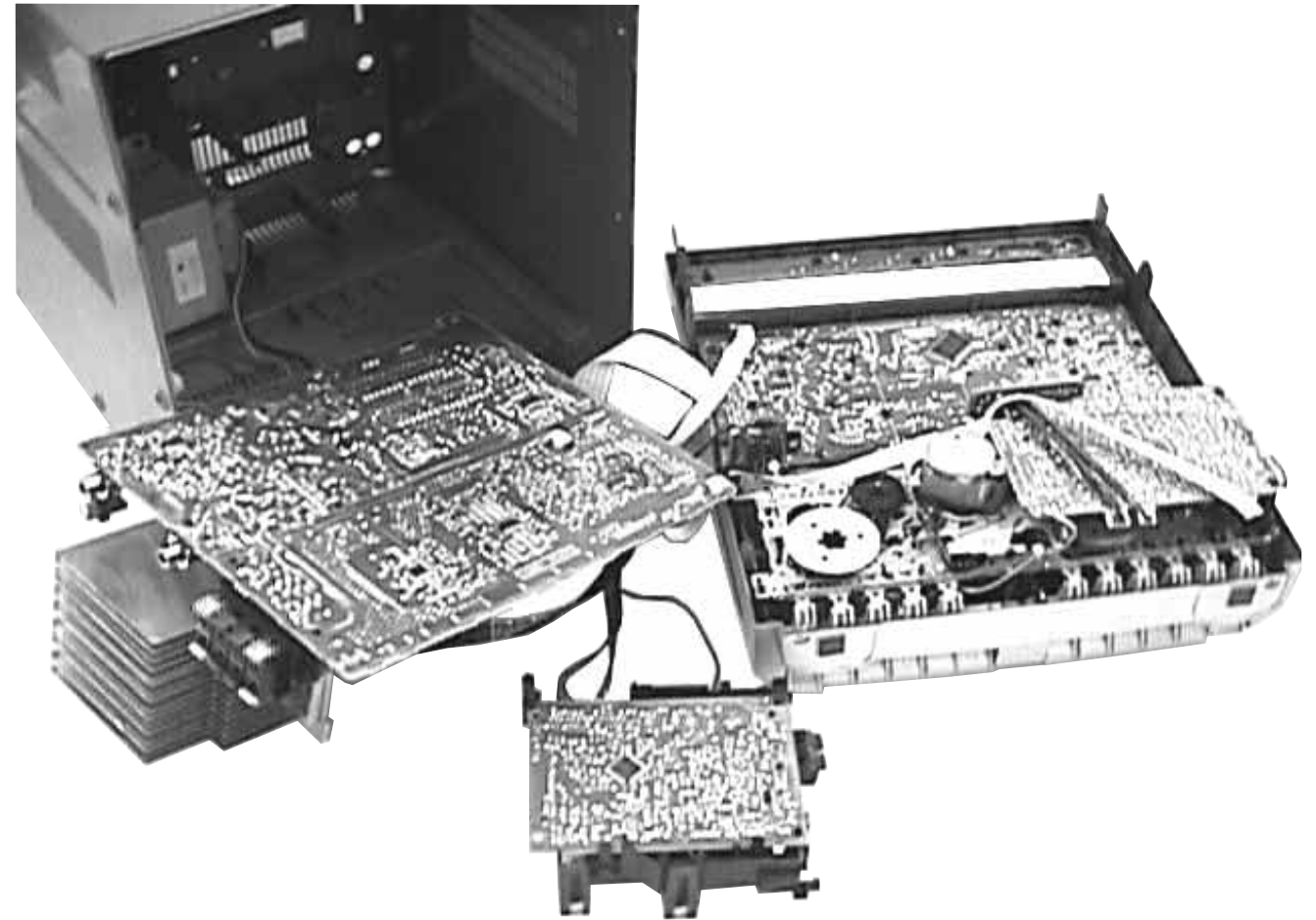
Service pos A



Service pos B

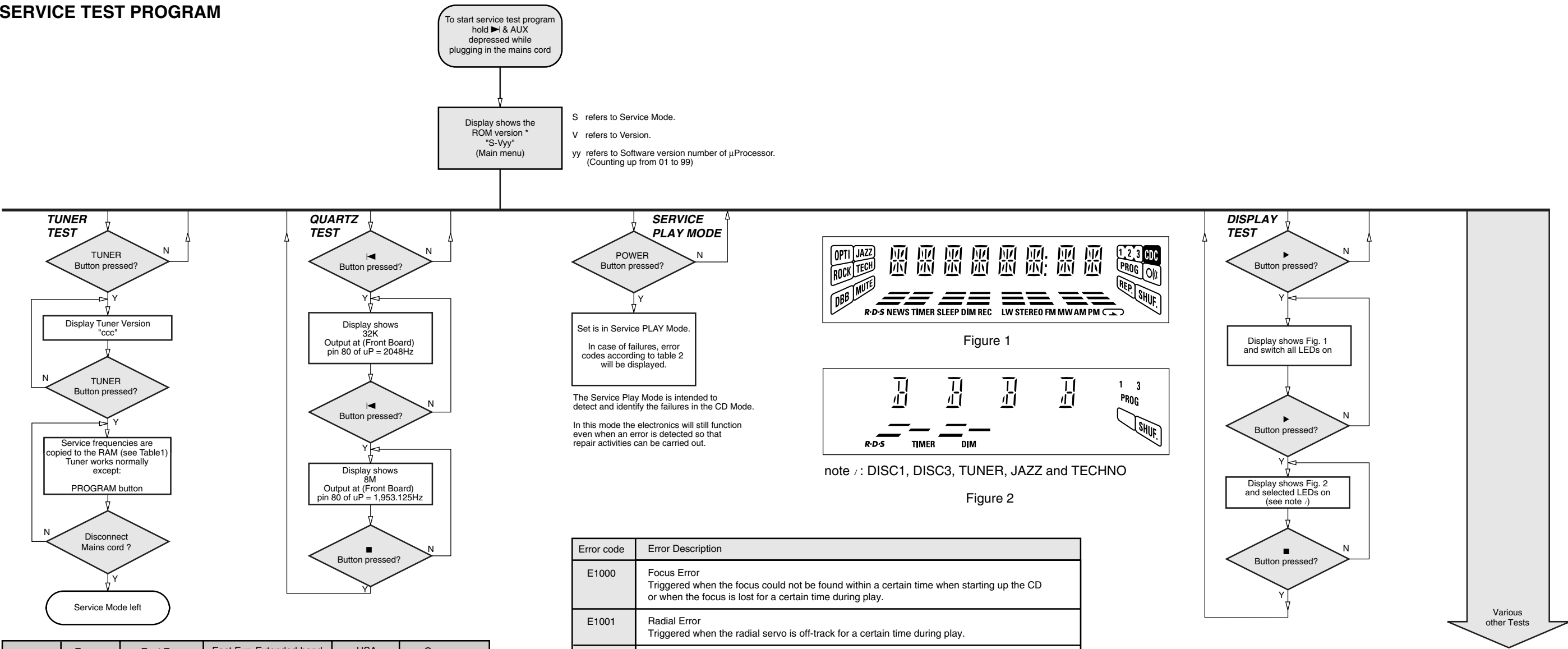


Service pos C

**Notes:**

1. During repair it is possible to disconnect the following assemblies or modules while repairing other areas:
  - Tuner Board
  - CDC Module
2. The flex cables are very fragile, care should be taken not to damage them during repair. After repair, be very sure that the flex cables are inserted properly into the flex sockets before encasing, otherwise faults may occurs.

SERVICE TEST PROGRAM



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*

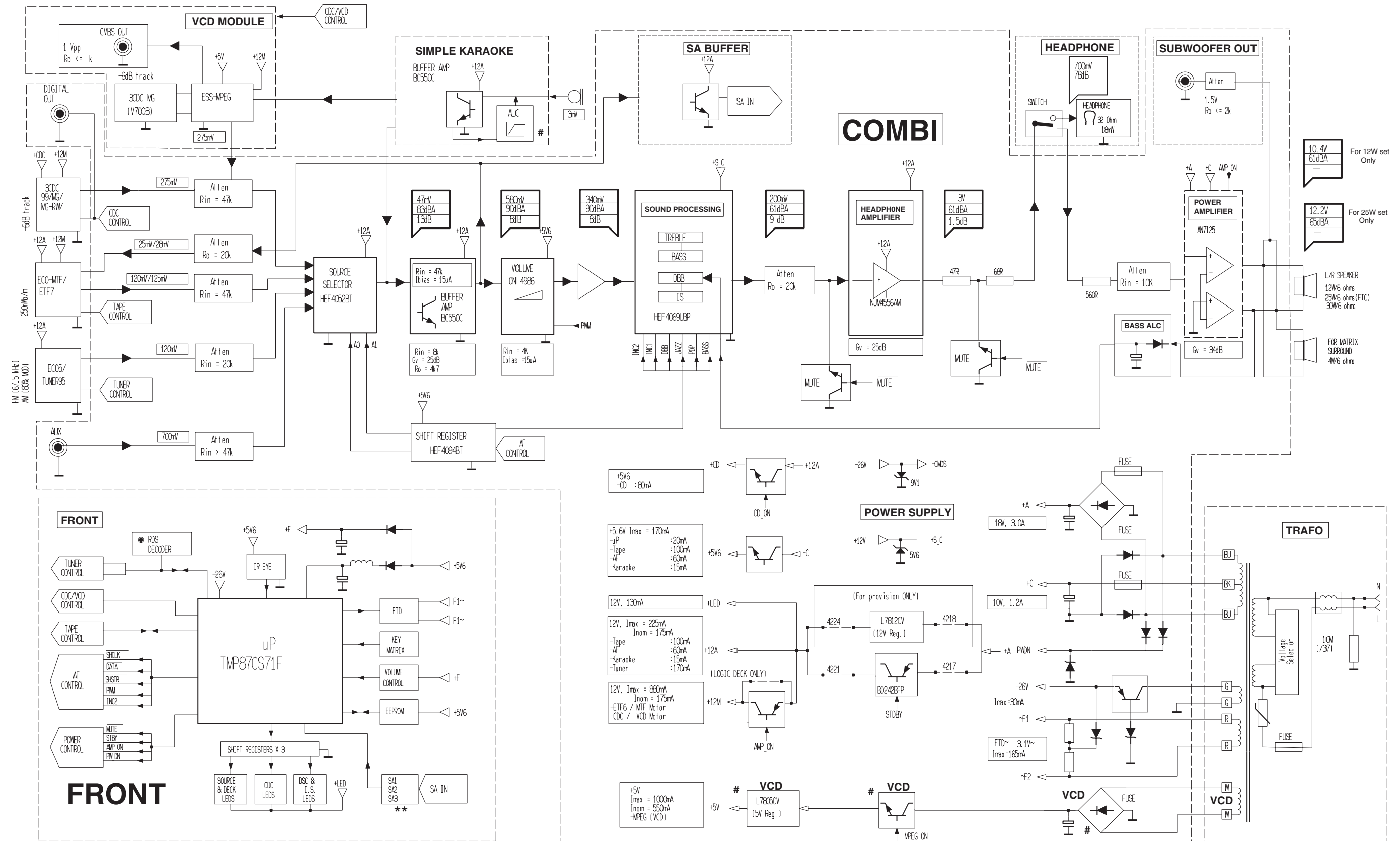
Note: \* Depending on the selected grid frequency (9 or 10kHz)  
By holding the TUNER and ►► buttons depressed while switching on the Mains supply, one of the undermentioned features will be activated:  
- the tuning grid frequency is toggled between 9kHz and 10kHz for the Oversea (/21) version.  
-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

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 is opening again. This can be caused because the drawer is blocked by something and cannot go fully inside, or the drawer switch is defective and does not close.

TEST	Activated with	ACTION
EEPROM TEST	►► ■ to Exit	A test pattern will be sent to the EEPROM. "PASS" is displayed if the uProcessor read back the test pattern correctly, otherwise "ERROR" will be displayed.
EEPROM FORMAT	◄◄	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



NOTE :

MAIN SIGNAL PATH

MEASUREMENTS ARE IN AUX MODE

XX mV LEVELS AT MAX VOL  
 YY dBA S/N AT 500mW  
 ZZ dB HEADROOM (1% 1hd) WRT TO LEVEL AT MAX VOL.

\*\* For version with small FTD,  
 only SA3 is use.

# Provision for VCD

Updated on 10-06-99

**FRONT**

**COMBI**

**MAINS**

**3CDC 99**

**3CDC SERVO FOR VCD**

**# MPEG-ESS**

**HEADPHONE**

**MIC**

**TRAF0**

**TRAF0**

**Legend:**

- Zero Insertion Force ZIF
- DIPWATE
- JST EH MALE
- JST PH MALE
- JST XH MALE
- JST FE MALE

**FW-C10/37 3139 119 32240 dd wk939**

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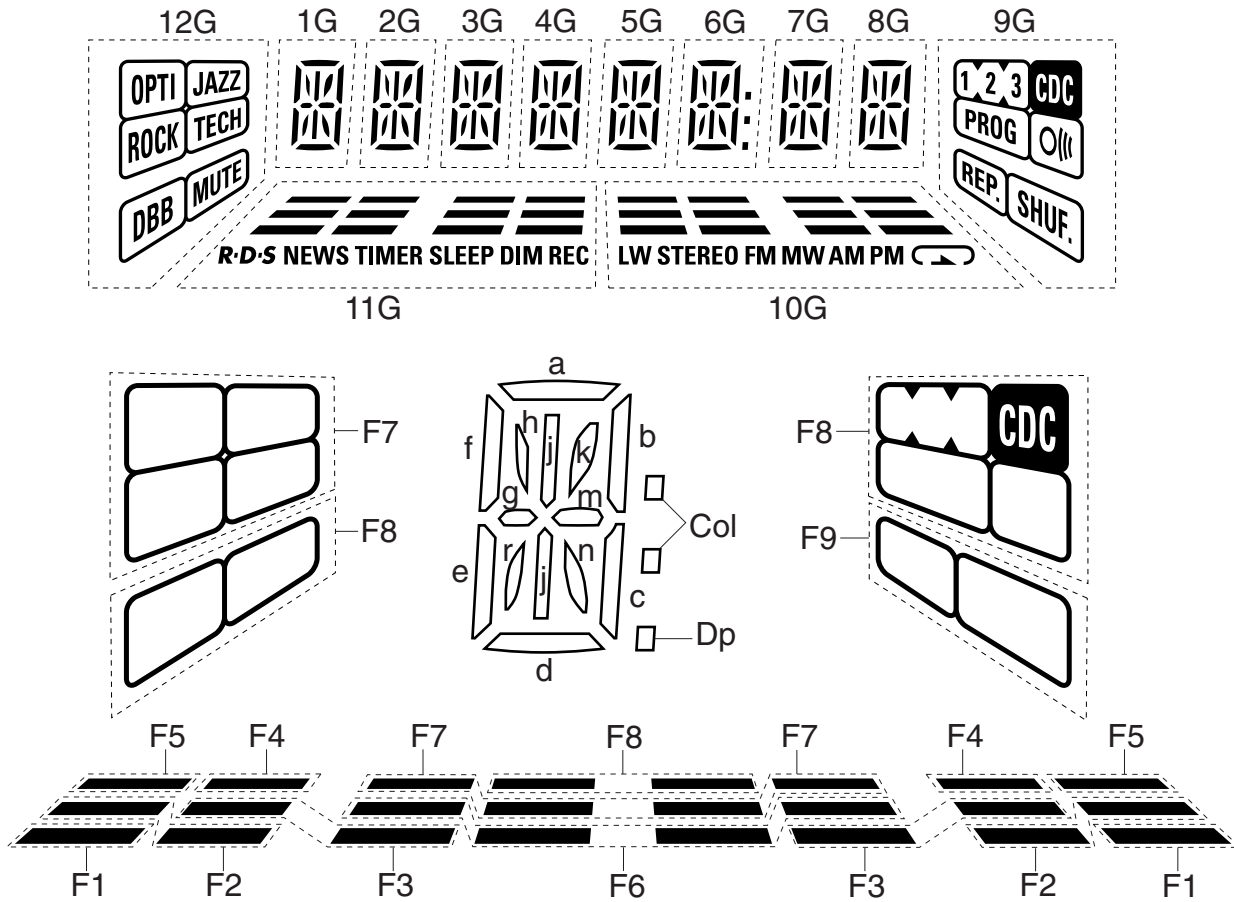
# FRONT BOARD

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# FTD DISPLAY PIN CONNECTIONS



	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	O	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

A52720	FW-C1/37, FW-C10/22/34/37
A52730	FW-C3/37, FW-C30/30/37, FW-C35/37
A52740	FW-C38/21/21M, FW-C39/21/21/33
A52750	FW-C28/33
A52760	FW-C38/22/34
A52770	FW-C28/22/34
A53070	FW-C30/21/21M
A53080	FW-C38/37, FW-C39/30
A53440	FW-V39/21

FEATURES:	A52720	A52730	A52740	A52750	A52760	A52770	A53070	A53080	A53440	
RDS	-	-	-	-	x	x	-	-	-	
Rotary Encoder	-	x	x	x	x	x	x	x	x	
Jog Encoder	-	x	x	-	x	-	x	x	x	
Spectrum Analyzer	-	-	x	-	x	-	-	x	x	
Biplaner LED	-	x	x	x	x	x	x	x	x	
Small FTD	x	x	-	x	-	x	x	-	-	
Large FTD	-	-	x	-	x	-	-	x	x	

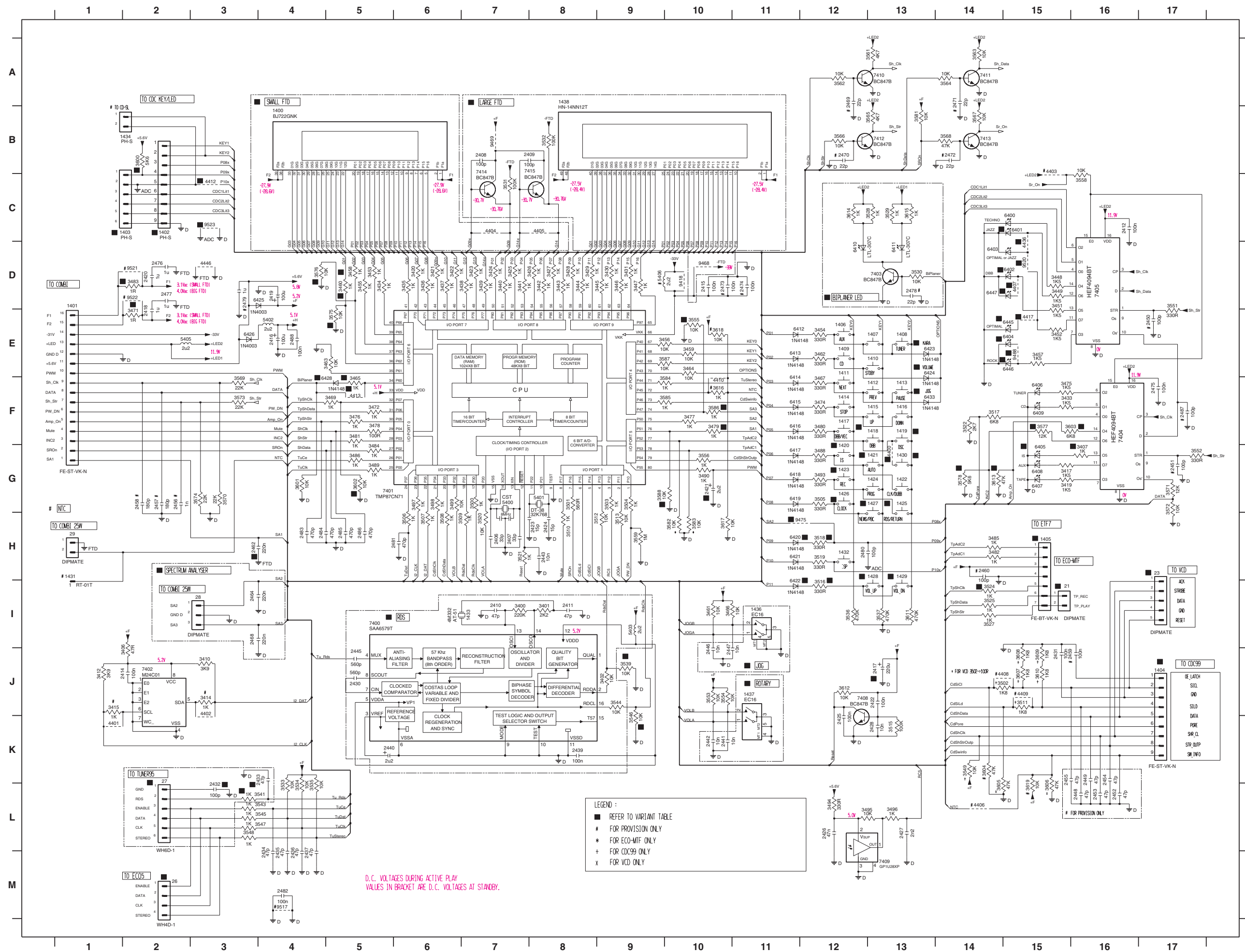
Variations table for Front Board

ITEM NO.	A52720	A52730	A52740	A52750	A52760	A52770	A53070	A53080	A53440	
DM21	x	x	-	-	-	-	x	-	-	
DM23	-	-	-	-	-	-	-	-	x	
DM26	x	x	x	x	-	-	x	x	x	
DM27	-	-	-	-	x	x	-	-	-	
1402	-	-	x	-	x	-	-	x	x	
1403	x	x	-	x	-	x	x	-	-	
1404	x	x	x	x	x	x	x	x	-	
1405	-	-	x	x	x	x	-	x	x	
1418	-	-	x	-	x	-	-	x	x	
1419	-	-	x	-	x	-	-	x	x	
1420	-	-	x	-	x	-	-	x	x	
1421	-	-	x	x	x	x	-	x	x	
1423	-	-	x	x	x	x	-	x	x	
1425	-	-	-	x	x	x	-	-	x	
1426	-	-	x	x	x	x	-	x	x	
1427	-	-	-	x	x	-	-	-	x	
1428	x	-	-	-	-	-	-	-	-	
1429	x	-	-	-	-	-	-	-	-	
1430	x	-	-	x	-	x	-	-	-	
2417	-	220μF	220μF	220μF	220μF	220μF	220μF	220μF	220μF	
2421	2,2μF	22μF	22μF	22μF	22μF	22μF	22μF	22μF	22μF	
2432	-	-	-	-	100pF	100pF	-	-	-	
2433	-	-	-	-	47pF	47pF	-	-	-	
2462	-	220nF	220nF	220nF	220nF	220nF	220nF	220nF	220nF	

ITEM NO.	A52720	A52730	A52740	A52750	A52760	A52770	A53070	A53080	A53440	
3407	-	-	1k	-	1k	-	-	1k	1k	
3458	-	-	1k	-	1k	-	-	1k	1k	
3460	-	-	1k	-	1k	-	-	1k	1k	
3465	-	1k	1k	1k	1k	1k	1k	1k	1k	
3471	4R7	4R7	1R	4R7	1R	4R7	4R7	1R	1R	
3479	-	1k	1k	1k	1k	1k	1k	1k	1k	
3483	4R7	4R7	1R	4R7	1R	4R7	4R7	1R	1R	
3516	330R	-	-	-	-	-	-	-	-	
3518	-	-	330R	-	330R	-	-	330R	330R	
3524	-	-	1k	-	1k	-	-	1k	1k	
3539	10k	10k	10k	10k	-	-	10k	10k	10k	
3541	-	-	-	-	1k	1k	-	-	-	
3546	10k	10k	10k	10k	-	-	10k	10k	10k	
3555	10k	10k	-	10k	-	10k	10k	-	-	
3575	10k	10k	-	10k	-	10k	10k	-	-	
3576	10k	10k	-	10k	-	10k	10k	-	-	
3577	-	-	12k	-	12k	-	-	12k	12k	
3578	-	-	5k6	-	5k6	-	-	5k6	5k6	
3586	-	-	1k	-	1k	-	-	1k	1k	
3588	10k	-	-	-	-	-	-	-	-	
3600	5k6	5k6	-	5k6	-	5k6	5k6	-	-	
3602	10k	10k	-	10k	-	10k	10k	-	-	
3603	6k8	10k	10k	10k	10k	10k	10k	10k	10k	
3613	47k	12k	12k	12k	12k	12k	12k	12k	12k	
4400	x	-	-	x	-	x	-	-	-	
4407	x	x	-	x	-	x	x	-	-	
4412	-	-	x	-	x	-	-	x	x	
4413	x	-	-	-	-	-	-	-	-	
4417	x	-	-	x	-	x	-	-	-	
4436	x	-	-	x	-	x	-	-	-	
6401	-	x	x	-	x	-	x	x	x	
6402	-	-	x	-	x	-	-	x	x	
6404	-	x	x	-	x	-	x	x	x	
6405	-	-	x	-	x	-	-	x	x	
6420	-	-	x	-	x	-	-	x	x	
6422	x	-	-	-	-	-	-	-	-	
6423	-	-	x	x	-	-	x	-	x	
6424	-	x	-	x	-	x	x	-	-	
6428	-	x	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	-	-	
9488	-	x	x	-	x	-	x	x	x	
9520	-	x	x	-	x	-	x	x	x	
9523	x	x	-	x	-	x	x	-	-	

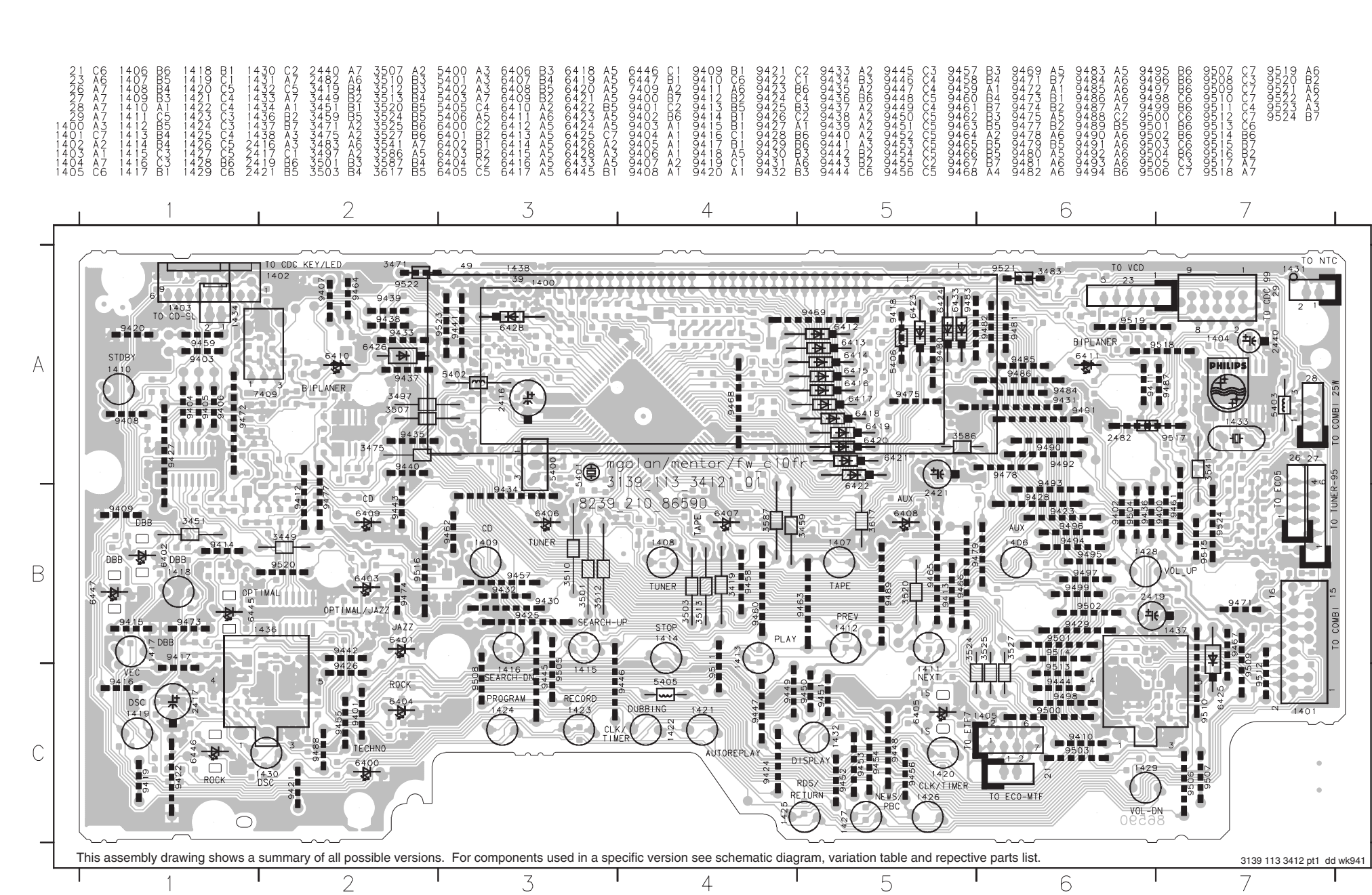
x = Item in use.

## CIRCUIT DIAGRAM

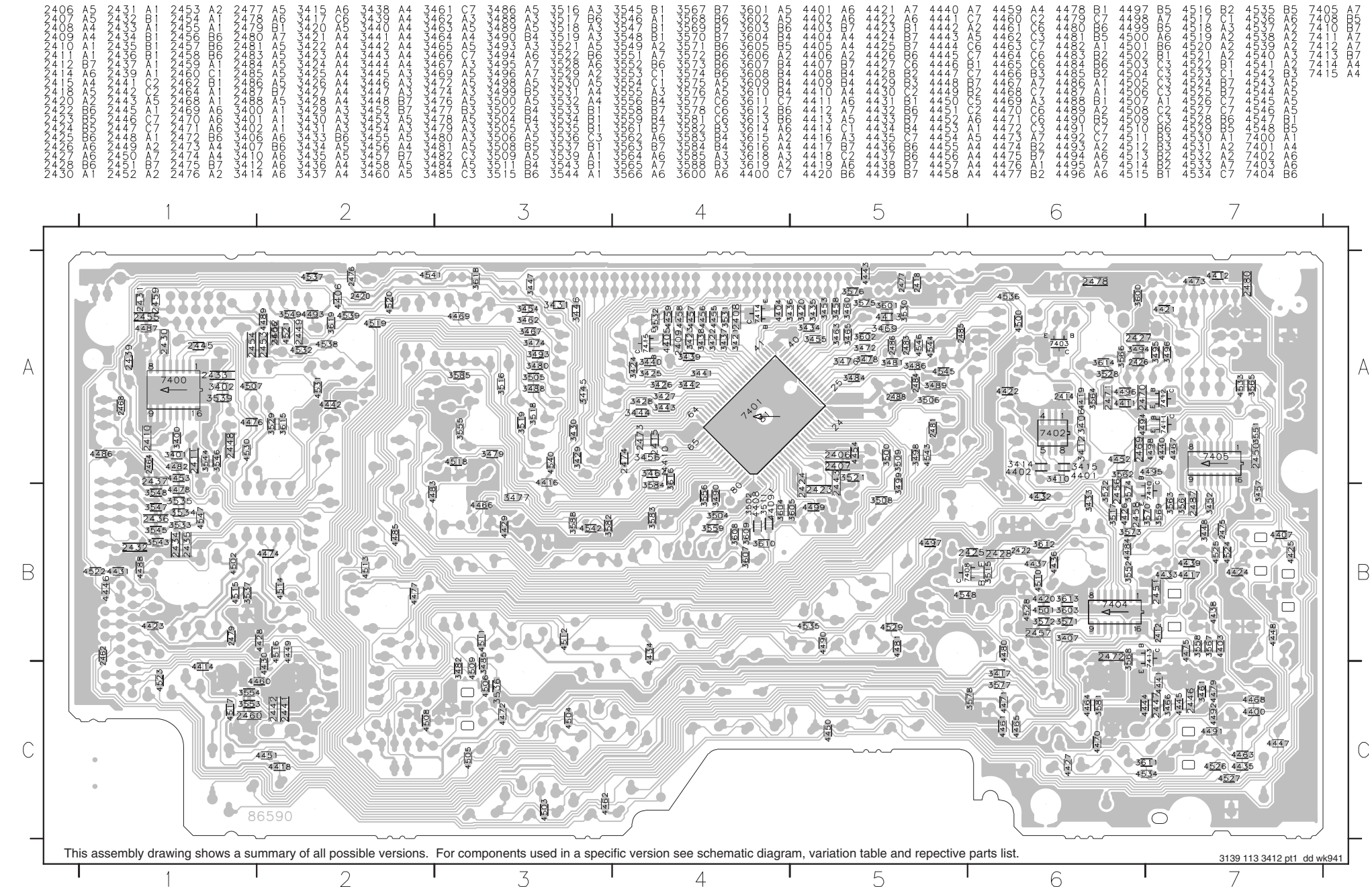




COMPONENT LAYOUT



CHIP LAYOUT





ELECTRICAL PARTS LIST - FRONT BOARD

MISCELLANEOUS

1400	313911052070	FTD Display BJ722GNK
1401	242202514546	Flex Socket 16pin Hort.
1404	482226511531	Flex Socket 9pin Hort.
1406	482227613775	Tact Switch
1407	482227613775	Tact Switch
1408	482227613775	Tact Switch
1409	482227613775	Tact Switch
1410	482227613775	Tact Switch
1411	482227613775	Tact Switch
1412	482227613775	Tact Switch
1413	482227613775	Tact Switch
1414	482227613775	Tact Switch
1415	482227613775	Tact Switch
1416	482227613775	Tact Switch
1417	482227613775	Tact Switch
1422	482227613775	Tact Switch
1424	482227613775	Tact Switch
1432	482227613775	Tact Switch
1436	482227310366	Rotary Encoder 24P
1437	482227310365	Rotary Encoder 24P

CAPACITORS

2406	532212232659	33pF 5% 50V
2407	532212232659	33pF 5% 50V
2412	482212614585	100nF 10% 50V
2414	482212613838	100nF +80/-20% 50V
2415	482212614585	100nF 10% 50V
2416	482212423432	100µF 20% 10V
2417	482212440196	220µF 20% 16V
2418	482212614043	1µF +80-20% 16V
2419	482212441584	100µF 20% 10V
2420	482212614043	1µF +80-20% 16V
2421	482212481151	22µF 20% 50V
2422	482212614585	100nF 10% 50V
2423	482212613486	15pF 2% 63V
2424	482212613486	15pF 2% 63V
2425	482212613838	100nF +80/-20% 50V
2426	482212613751	47nF 10% 63V
2427	482212233127	2,2nF 10% 63V
2428	482212233177	10nF 20% 50V
2431	482212614585	100nF 10% 50V
2434	482212613692	47pF 1% 63V
2435	482212613692	47pF 1% 63V
2436	482212613692	47pF 1% 63V
2437	482212613692	47pF 1% 63V
2441	482212233177	10nF 20% 50V
2442	482212233177	10nF 20% 50V
2443	482212233177	10nF 20% 50V
2446	482212233177	10nF 20% 50V
2447	482212233177	10nF 20% 50V
2462	482212614076	220nF +80/-20% 25V
2475	482212614585	100nF 10% 50V

2476	482212614043	1µF +80-20% 16V
2477	482212614043	1µF +80-20% 16V
2481	532212232268	470pF 5% 50V
2482	482212612882	100nF +80/-20% 50V
2483	532212232268	470pF 5% 50V
2484	532212232268	470pF 5% 50V
2485	532212232268	470pF 5% 50V
2486	532212232268	470pF 5% 50V
2488	482212614585	100nF 10% 50V

RESISTORS

3406	482205120479	47R 5% 0,1W
3410	482205120392	3k9 5% 0,1W
3412	482205120392	3k9 5% 0,1W
3417	482211711139	1k5 1% 0,1W
3419	482211652243	1k5 5% 0,5W
3420	482205110102	1k 2% 0,25W
3421	482205110102	1k 2% 0,25W
3422	482205110102	1k 2% 0,25W
3423	482205110102	1k 2% 0,25W
3424	482205110102	1k 2% 0,25W
3425	482205110102	1k 2% 0,25W
3426	482205110102	1k 2% 0,25W
3427	482205110102	1k 2% 0,25W
3428	482205110102	1k 2% 0,25W
3429	482205110102	1k 2% 0,25W
3430	482205110102	1k 2% 0,25W
3431	482205110102	1k 2% 0,25W
3433	482211711139	1k5 1% 0,1W
3434	482205110102	1k 2% 0,25W
3435	482205110102	1k 2% 0,25W
3436	482205110102	1k 2% 0,25W
3437	482205110102	1k 2% 0,25W
3438	482205110102	1k 2% 0,25W
3439	482205110102	1k 2% 0,25W
3440	482205110102	1k 2% 0,25W
3441	482205110102	1k 2% 0,25W
3442	482205110102	1k 2% 0,25W
3443	482205110102	1k 2% 0,25W
3444	482205110102	1k 2% 0,25W
3445	482205110102	1k 2% 0,25W
3446	482205110102	1k 2% 0,25W
3447	482205110102	1k 2% 0,25W
3448	482211711139	1k5 1% 0,1W
3449	482211652243	1k5 5% 0,5W
3451	482211652243	1k5 5% 0,5W
3452	482211711139	1k5 1% 0,1W
3453	482205110102	1k 2% 0,25W
3454	482211713577	330R 1% 1,25W
3455	482205110102	1k 2% 0,25W
3456	482211710833	10k 1% 0,1W
3457	482211711139	1k5 1% 0,1W

ELECTRICAL PARTS LIST - FRONT BOARD

3459	482211710833	10k 1% 0,1W
3461	482211710833	10k 1% 0,1W
3462	482211713577	330R 1% 1,25W
3463	482211710833	10k 1% 0,1W
3464	482211710833	10k 1% 0,1W
3465	482205110102	1k 2% 0,25W
3466	482211710833	10k 1% 0,1W
3467	482211713577	330R 1% 1,25W
3469	482205110102	1k 2% 0,25W
3471	482205024708	4R7 1% 0,6W
3472	482205110102	1k 2% 0,25W
3474	482211713577	330R 1% 1,25W
3475	482211652243	1k5 5% 0,5W
3476	482205110102	1k 2% 0,25W
3477	482205110102	1k 2% 0,25W
3478	482205120101	100R 5% 0,1W
3479	482205110102	1k 2% 0,25W
3480	482211713577	330R 1% 1,25W
3481	482205110102	1k 2% 0,25W
3482	482205110102	1k 2% 0,25W
3483	482205024708	4R7 1% 0,6W
3484	482205110102	1k 2% 0,25W
3485	482205110102	1k 2% 0,25W
3486	482205110102	1k 2% 0,25W
3488	482211713577	330R 1% 1,25W
3489	482205110102	1k 2% 0,25W
3490	482205110102	1k 2% 0,25W
3493	482211713577	330R 1% 1,25W
3494	482211713577	330R 1% 1,25W
3495	482211710833	10k 1% 0,1W
3496	482205110102	1k 2% 0,25W
3497	482205011002	1k 1% 0,4W
3498	482205110102	1k 2% 0,25W
3499	482211710833	10k 1% 0,1W
3500	482205110102	1k 2% 0,25W
3501	482211652226	560R 5% 0,5W
3502	482205120182	1k8 5% 0,1W
3503	482205011002	1k 1% 0,4W
3504	482205110102	1k 2% 0,25W
3505	482211713577	330R 1% 1,25W
3506	482205110102	1k 2% 0,25W
3507	482205011002	1k 1% 0,4W
3508	482205110102	1k 2% 0,25W
3509	482205110102	1k 2% 0,25W
3510	482205011002	1k 1% 0,4W
3511	482205120182	1k8 5% 0,1W
3512	482205021003	10k 1% 0,6W
3513	482205021003	10k 1% 0,6W
3515	482211710837	100k 1% 0.1W
3517	482211711507	6k8 1% 0,1W
3519	482211713577	330R 1% 1,25W
3520	482205021003	10k 1% 0,6W

3521	482205110102	1k 2% 0,25W
3522	482211712955	2k7 1% 0,1W
3525	482205011002	1k 1% 0,4W
3527	482205011002	1k 1% 0,4W
3528	482205110102	1k 2% 0,25W
3529	482205110102	1k 2% 0,25W
3530	482211710833	10k 1% 0,1W
3533	482211710833	10k 1% 0,1W
3534	482211710833	10k 1% 0,1W
3535	482211710833	10k 1% 0,1W
3536	482205120474	470k 5% 0,1W
3537	482205120474	470k 5% 0,1W
3539	482211710833	10k 1% 0,1W
3543	482205110102	1k 2% 0,25W
3545	482205110102	1k 2% 0,25W
3546	482211710833	10k 1% 0,1W
3547	482205110102	1k 2% 0,25W
3548	482205110102	1k 2% 0,25W
3549	482211710833	10k 1% 0,1W
3551	482211713577	330R 1% 1,25W
3552	482211713577	330R 1% 1,25W
3553	482211710833	10k 1% 0,1W
3554	482211710833	10k 1% 0,1W
3555	482211710833	10k 1% 0,1W
3556	482205110102	1k 2% 0,25W
3558	482211710833	10k 1% 0,1W
3559	482205120105	1M 5% 0,1W
3561	482205120472	4k7 5% 0,1W
3562	482211710833	10k 1% 0,1W
3563	482211710833	10k 1% 0,1W
3564	482211710833	10k 1% 0,1W
3565	482205120472	4k7 5% 0,1W
3566	482211710833	10k 1% 0,1W
3567	482211710833	10k 1% 0,1W
3568	482211710834	47k 1% 0,1W
3569	482205120223	22k 5% 0,1W
3570	482205120223	22k 5% 0,1W
3571	482211711383	12k 1% 0,1W
3572	482211710833	10k 1% 0,1W
3573	482205120223	22k 5% 0,1W
3574	482205120223	22k 5% 0,1W
3575	482211710833	10k 1% 0,1W
3576	482211710833	10k 1% 0,1W
3581	482211710833	10k 1% 0,1W
3582	482211710833	10k 1% 0,1W
3583	482211710833	10k 1% 0,1W
3584	482205110102	1k 2% 0,25W
3585	482205110102	1k 2% 0,25W
3587	482205021003	10k 1% 0,6W
3600	482205120562	5k6 5% 0,1W
3601	482211710833	10k 1% 0,1W
3602	482211710833	10k 1% 0,1W

ELECTRICAL PARTS LIST - FRONT BOARD

3603	482211710833	10k 1% 0,1W
3607	482205120182	1k8 5% 0,1W
3608	482205120182	1k8 5% 0,1W
3609	482205120182	1k8 5% 0,1W
3610	482205120182	1k8 5% 0,1W
3611	482205120474	470k 5% 0,1W
3612	482211710833	10k 1% 0,1W
3613	482211711383	12k 1% 0,1W
3614	482205110102	1k 2% 0,25W
3615	482205110102	1k 2% 0,25W
3617	482205021003	10k 1% 0,6W
4401	482205120008	OR Jumper 0805
4402	482205120008	OR Jumper 0805
4404	482205120008	OR Jumper 0805
4405	482205120008	OR Jumper 0805
4407	482205120008	OR Jumper 0805
4410	482205120008	OR Jumper 0805
4414	482205120008	OR Jumper 0805
4416	482205120008	OR Jumper 0805
4418	482205120008	OR Jumper 0805
4419	482205120008	OR Jumper 0805
4420	482205120008	OR Jumper 0805
4421	482205120008	OR Jumper 0805
4422	482205120008	OR Jumper 0805
4423	482205120008	OR Jumper 0805
4424	482205120008	OR Jumper 0805
4425	482205120008	OR Jumper 0805
4426	482205120008	OR Jumper 0805
4427	482205120008	OR Jumper 0805
4428	482205120008	OR Jumper 0805
4429	482205120008	OR Jumper 0805
4430	482205120008	OR Jumper 0805
4431	482205120008	OR Jumper 0805
4432	482205120008	OR Jumper 0805
4433	482205120008	OR Jumper 0805
4434	482205120008	OR Jumper 0805
4435	482205120008	OR Jumper 0805
4437	482205120008	OR Jumper 0805
4438	482205120008	OR Jumper 0805
4439	482205120008	OR Jumper 0805
4440	482205120008	OR Jumper 0805
4441	482205120008	OR Jumper 0805
4442	482205120008	OR Jumper 0805
4443	482205120008	OR Jumper 0805
4444	482205120008	OR Jumper 0805
4445	482205120008	OR Jumper 0805
4446	482205120008	OR Jumper 0805
4447	482205120008	OR Jumper 0805
4448	482205120008	OR Jumper 0805
4449	482205120008	OR Jumper 0805
4450	482205120008	OR Jumper 0805
4451	482205120008	OR Jumper 0805

4452	482205120008	OR Jumper 0805
4453	482205120008	OR Jumper 0805
4454	482205120008	OR Jumper 0805
4455	482205120008	OR Jumper 0805
4456	482205120008	OR Jumper 0



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

4504	482205120008	0R Jumper 0805
4505	482205120008	0R Jumper 0805
4506	482205120008	0R Jumper 0805
4507	482205120008	0R Jumper 0805
4508	482205120008	0R Jumper 0805
4509	482205120008	0R Jumper 0805
4510	482205120008	0R Jumper 0805
4511	482205120008	0R Jumper 0805
4512	482205120008	0R Jumper 0805
4513	482205120008	0R Jumper 0805
4514	482205120008	0R Jumper 0805
4515	482205120008	0R Jumper 0805
4516	482205120008	0R Jumper 0805
4517	482205120008	0R Jumper 0805
4518	482205120008	0R Jumper 0805
4519	482205120008	0R Jumper 0805
4520	482205120008	0R Jumper 0805
4521	482205120008	0R Jumper 0805
4522	482205120008	0R Jumper 0805
4523	482205120008	0R Jumper 0805
4524	482205120008	0R Jumper 0805
4525	482205120008	0R Jumper 0805
4526	482205120008	0R Jumper 0805
4527	482205120008	0R Jumper 0805
4528	482205120008	0R Jumper 0805
4529	482205120008	0R Jumper 0805
4530	482205120008	0R Jumper 0805
4531	482205120008	0R Jumper 0805
4532	482205120008	0R Jumper 0805
4533	482205120008	0R Jumper 0805
4534	482205120008	0R Jumper 0805
4535	482205120008	0R Jumper 0805
4536	482205120008	0R Jumper 0805
4537	482205120008	0R Jumper 0805
4538	482205120008	0R Jumper 0805
4539	482205120008	0R Jumper 0805
4540	482205120008	0R Jumper 0805
4541	482205120008	0R Jumper 0805
4542	482205120008	0R Jumper 0805
4543	482205120008	0R Jumper 0805
4544	482205120008	0R Jumper 0805
4545	482205120008	0R Jumper 0805
4546	482205120008	0R Jumper 0805
4547	482205120008	0R Jumper 0805
4548	482205120008	0R Jumper 0805

**COILS & FILTERS**

5400	482224272066	Ceram Resonator 8MHz
5401	242254301069	Crystal 32,768kHz
5402	482215762552	Coil 2,2μH 5%
5405	482215762552	Coil 2,2μH 5%

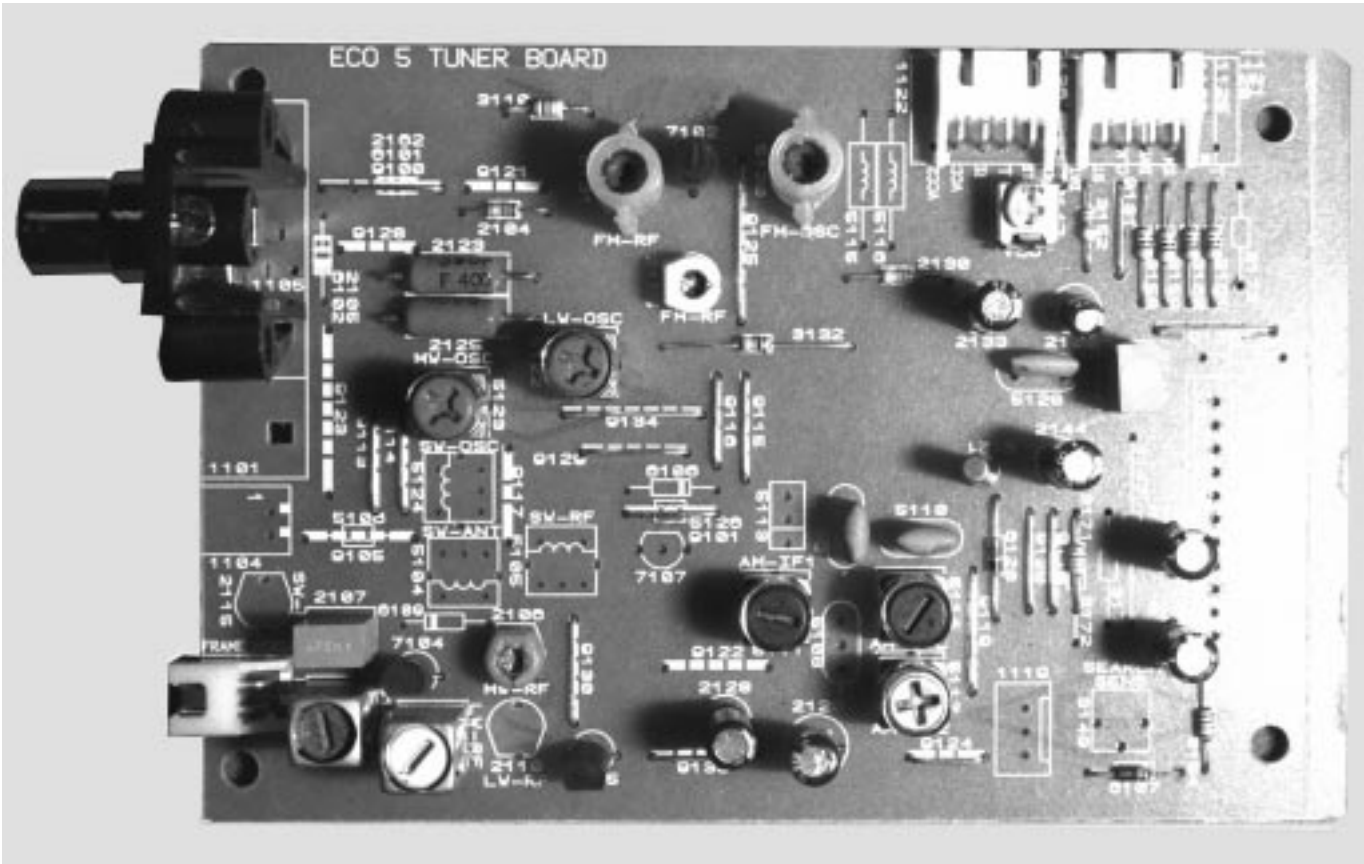
**DIODES**

6400	482213082978	LTL-1CHPE
6401	482213082978	LTL-1CHPE
6403	482213082978	LTL-1CHPE
6404	482213082978	LTL-1CHPE
6406	482213082978	LTL-1CHPE
6407	482213082978	LTL-1CHPE
6408	482213082978	LTL-1CHPE
6409	482213082978	LTL-1CHPE
6410	482213083119	LTL-307C
6411	482213083119	LTL-307C
6412	482213030621	1N4148
6413	482213030621	1N4148
6414	482213030621	1N4148
6415	482213030621	1N4148
6416	482213030621	1N4148
6417	482213030621	1N4148
6418	482213030621	1N4148
6419	482213030621	1N4148
6421	482213030621	1N4148
6423	482213030621	1N4148
6424	482213030621	1N4148
6425	482213031878	1N4003G
6426	482213031878	1N4003G
6428	482213030621	1N4148
6433	482213030621	1N4148
6447	482213082978	LTL-1CHPE

**TRANSISTORS & INTEGRATED CIRCUITS**

7401	313911052100	TMP87CP71F "C10S52101"
7402	932213104668	M24C01-WMN6
7403	482213060511	BC847B
7404	532220911306	HEF4094BT
7405	532220911306	HEF4094BT
7408	482213060511	BC847B
7409	482213010165	GP1U28XP
7410	482213060511	BC847B
7411	482213060511	BC847B
7412	482213060511	BC847B
7413	482213060511	BC847B

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

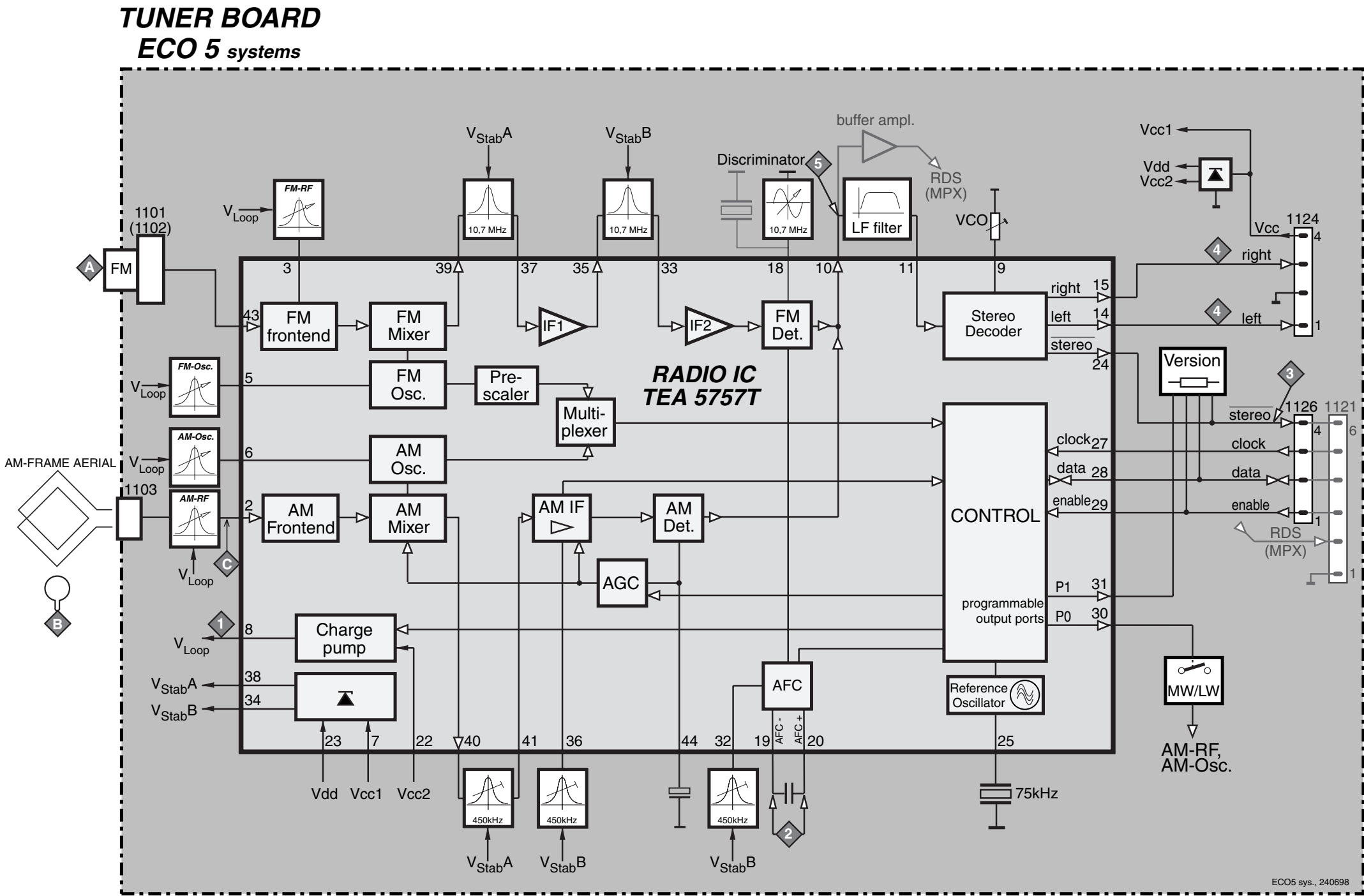


# TUNER BOARD ECO5

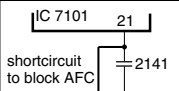
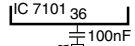
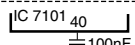
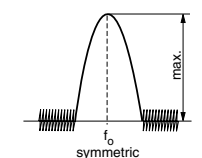
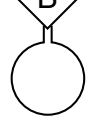
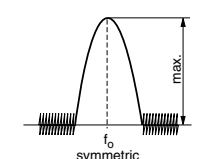
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BLOCKDIAGRAM



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
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)			108MHz	5130		8V ±0.2V
			87.5MHz (65.81MHz)	check		4.3V ±0.5V (1.2V ±0.5V)
MW FM/AM-version, 10kHz grid 530 - 1700kHz			1700kHz	5123		8V ±0.2V
			530kHz	check		1.1V ±0.4V
FM/MW-version, 9kHz grid 531 - 1602kHz			1602kHz	5123	1	6.9V ±0.2V
			531kHz	check		1.1V ±0.4V
LW 153 - 279kHz			279kHz	5122		8V ±0.2V
			153kHz	check		1.1V ±0.4V
MW FM/MW/LW- version, 9kHz grid 531 - 1602kHz			1602kHz	5123		8V ±0.2V
			531kHz	check		1.1V ±0.4V
FM IF						
FM	10.7MHz, 50mV continuous wave	F		5119	2	0 ± 3 mV DC
FM RF						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)	108MHz 87.5MHz (65.81MHz)	A mod=1kHz Δf=±22.5kHz	108MHz 87.5MHz (65.81MHz)	2155 5131	4	MAX
VCO						
FM	98MHz, 1mV continuous wave	A	98MHz	3142	3	152kHz ±1kHz <sup>1)</sup>
AM IF						
MW	450kHz  connect pin 6 of IC 7101 (AM Osc.) with short wire to ground (pin 4)	C Δf=±15kHz V <sub>RF</sub> = 3mV	 see remark 2) 	5111 5112	4	
AM AFC MW		C continuous wave V <sub>RF</sub> = 10mV		5114	2	0 ± 2 mV DC
AM RF <sup>3)</sup>						
MW <sup>4)</sup> FM/MW/LW- and FM/MW-version (9kHz grid) 531 - 1602kHz	1494kHz 558kHz	B 	1494kHz 558kHz	2106 5102	4	
LW	198kHz		198kHz	5103		
MW FM/AM-version, 10kHz grid 530 - 1700kHz	1500kHz 560kHz	Δf = ±30kHz V <sub>RF</sub> as low as possible	1500kHz 560kHz	2106 5102		

Use service test program. By selecting the TUNER TEST test frequencies will be stored as preset frequencies automatically.

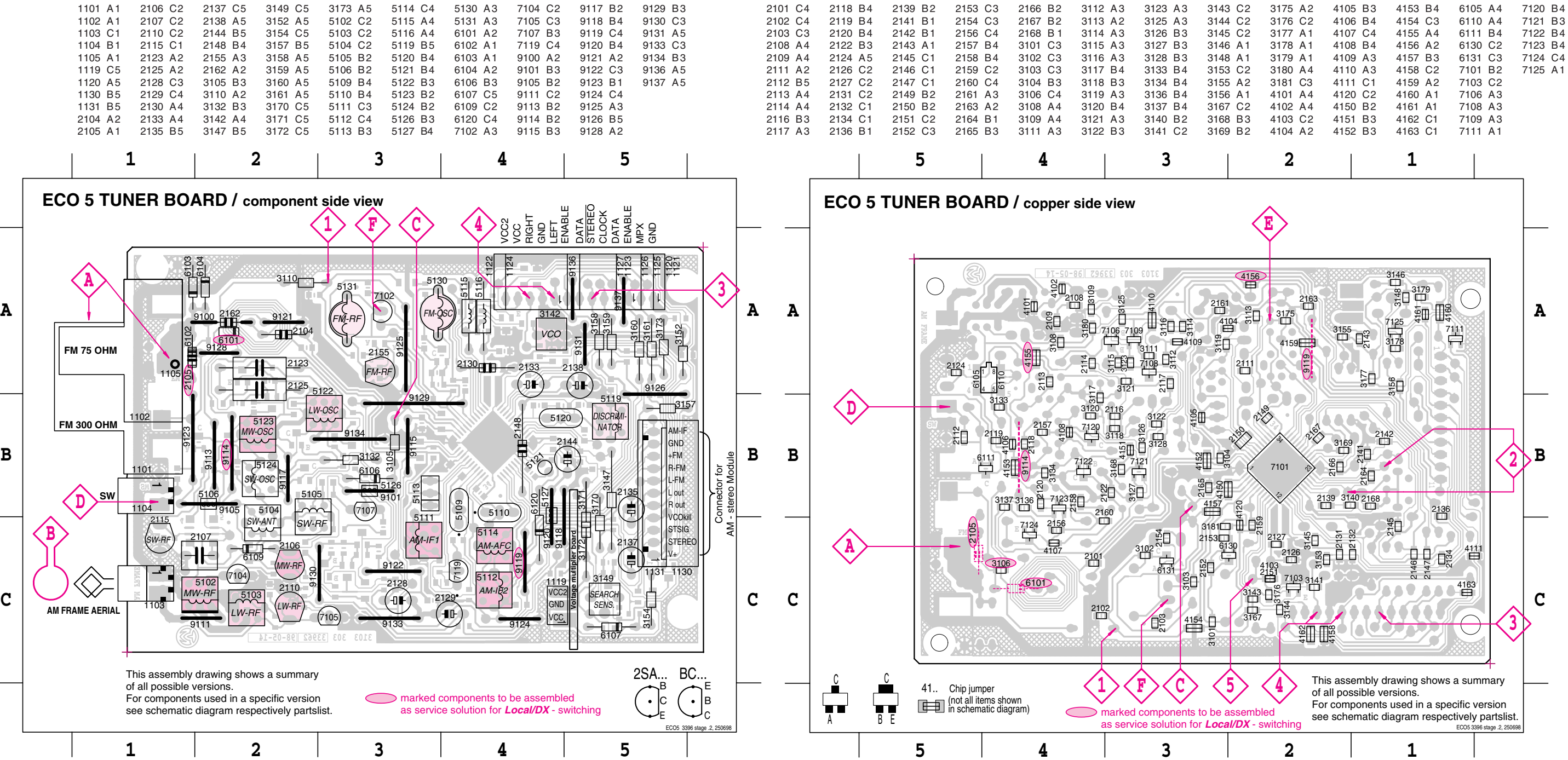
<sup>1)</sup> If sensitivity of frequency counter is too low adjust to max. channel separation (input signal: stereo left 90% + 9%, adjust output on right channel to minimum)

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

<sup>3)</sup> For AM RF adjustments the original frame antenna has to be used !

<sup>4)</sup> MW has to be aligned before LW.

Repeat





**VERSION PROGRAMMING COMPONENTS**

	6120	3156	3157	3170	remark
/00 FM/MW/LW	x	-	-	-	7111
/00 FM/MW/LW/SW-Eu	-	-	-	-	not mounted
/01 FM/MW-Stereo	-	-	x	-	SW
/01 FM/MW	-	x	-	-	
/01 FM/MW/SW-Ov	-	x	-	-	
/05 FM-Japan/MW-stereo	-	-	-	x	
/13 FM/MW-Stereo	-	-	x	-	SW
/14 FM-OIRT/MW/LW	x	-	x	x	
/14 FM-OIRT/MW	x	-	x	-	
/17 FM/AM-Stereo	-	-	x	-	SW
/17 FM/AM	x	-	-	x	
/1 FM/MW/2xSW	-	-	x	x	
/15 FM/MW/SW-Eu	-	x	x	x	

x = component mounted  
SW = Software initialisation

**Signal path**

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

**Chip jumper**

HN1V02H

**V EVM**

Vdc FM mode stereo  
Vdc MW mode  
Vdc LW mode

Voltages measured while set is tuned to a strong transmitter

ECOS systems, discor coll. 030998

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	
		5120=CDA10.7MG40K	
3140	4822 117 10353	150R 1% 0,1W	
		5120=CDA10.7MG61KA	
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 & 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

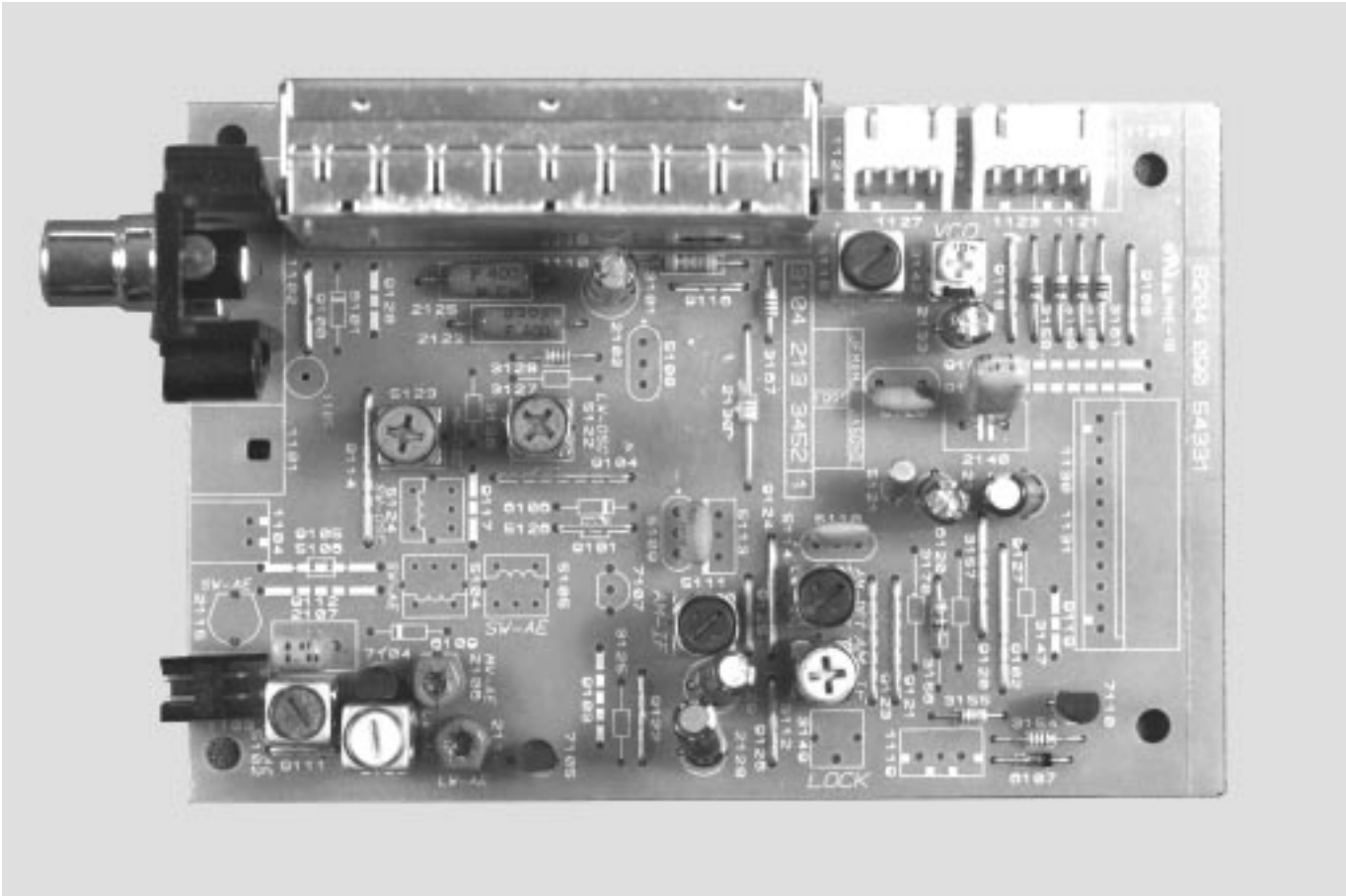
6103	4822 130 30621	1N4148	
6104	4822 130 30621	1N4148	
6105	4822 130 83075	HN1V02H-B	
6106	4822 130 30621	1N4148	
6107	4822 130 34488	BZX79-B11	
6120	4822 130 30621	1N4148	not for /21/30/33
6130	4822 130 82833	1SV228	
6131	4822 130 82833	1SV228	

TRANSISTORS & 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.

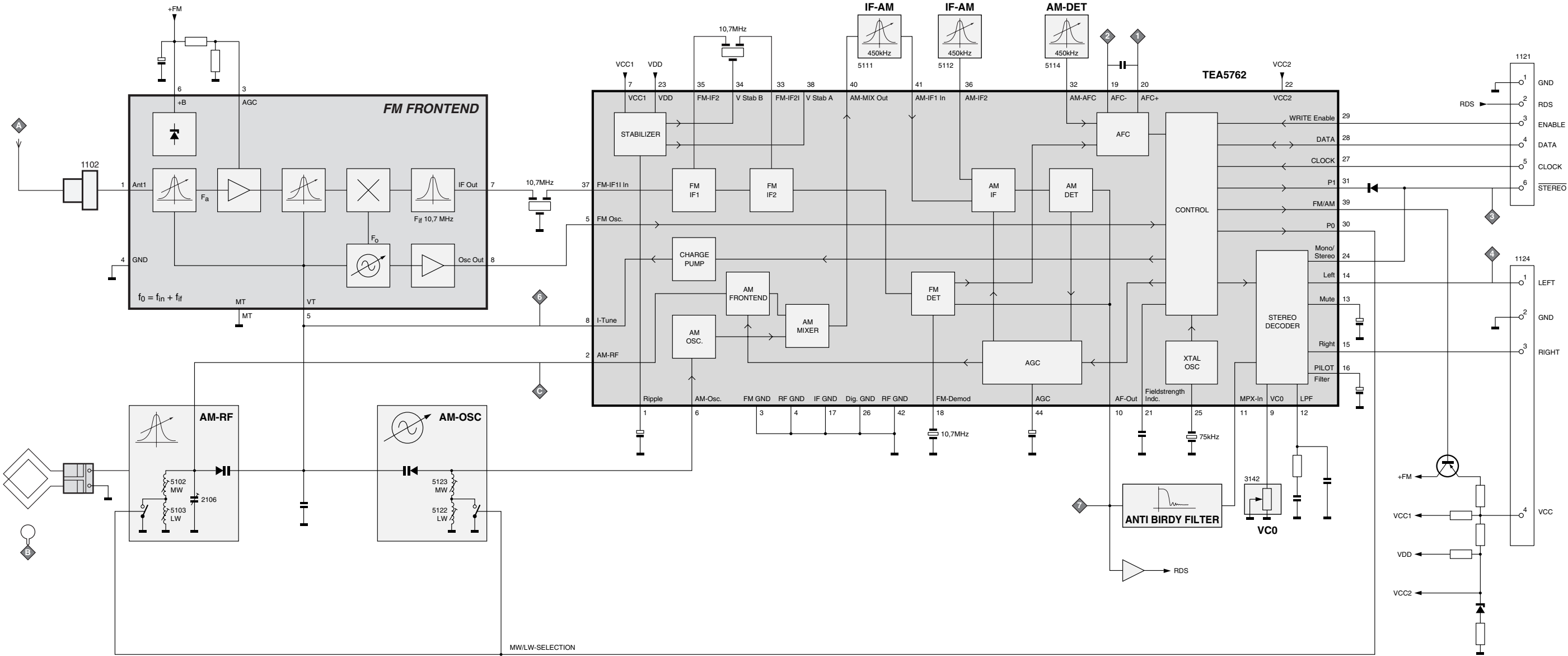


# TUNER 95 BOARD

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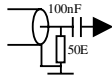
Blockdiagram .....	7D-1
Adjustmant table .....	7D-2
Component layout.....	7D-2
Circuit diagram.....	7D-3
Partslist .....	7D-4

## BLOCKDIAGRAM





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

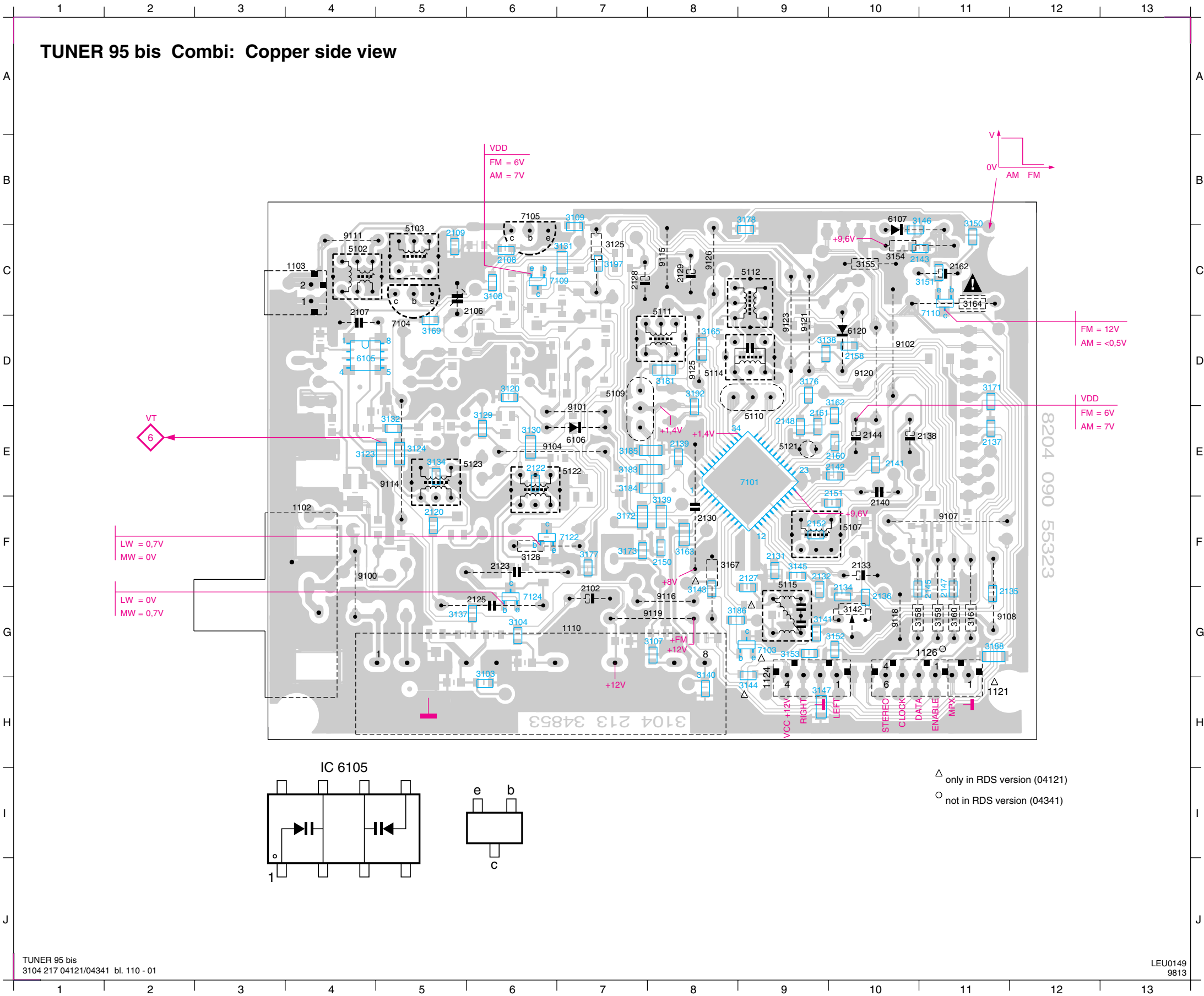
Waverange	Input frequency	Input	Set tuned to	Adjust	Output	Scope / Voltmeter
VARICAP ALIGNMENT						
FM (50) 87.5 - 108 MHz			108 MHz	check	6	7 ... 9V
			87.5 MHz	check		1.3 ... 2V
MW (9) 531 - 1602 kHz			1602 kHz	5123		8.3V ± 0.2V
			531 kHz	check		1V ± 0.4V
LW (3) 153 - 279 kHz			279 kHz	5122		8.3V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

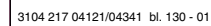
\* Signal send via a frame antenna  
(..) = tuning grid in kHz

repeat

adjtable for 3104 217 04121/04341

1102	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		







**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 Δ	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

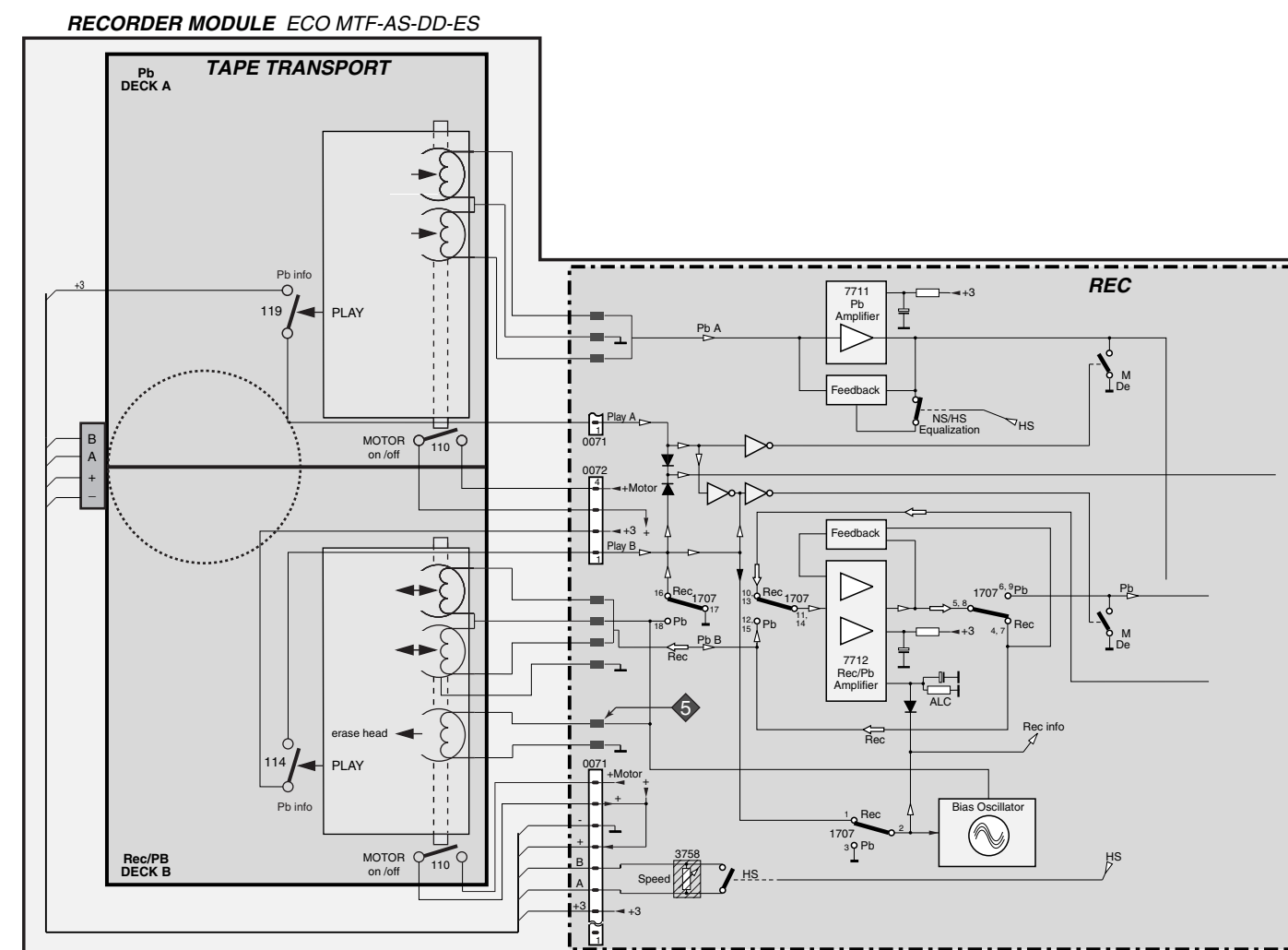
Note : Only the parts mentioned in this list are normal service spare parts.

# ECO MTF MODULE

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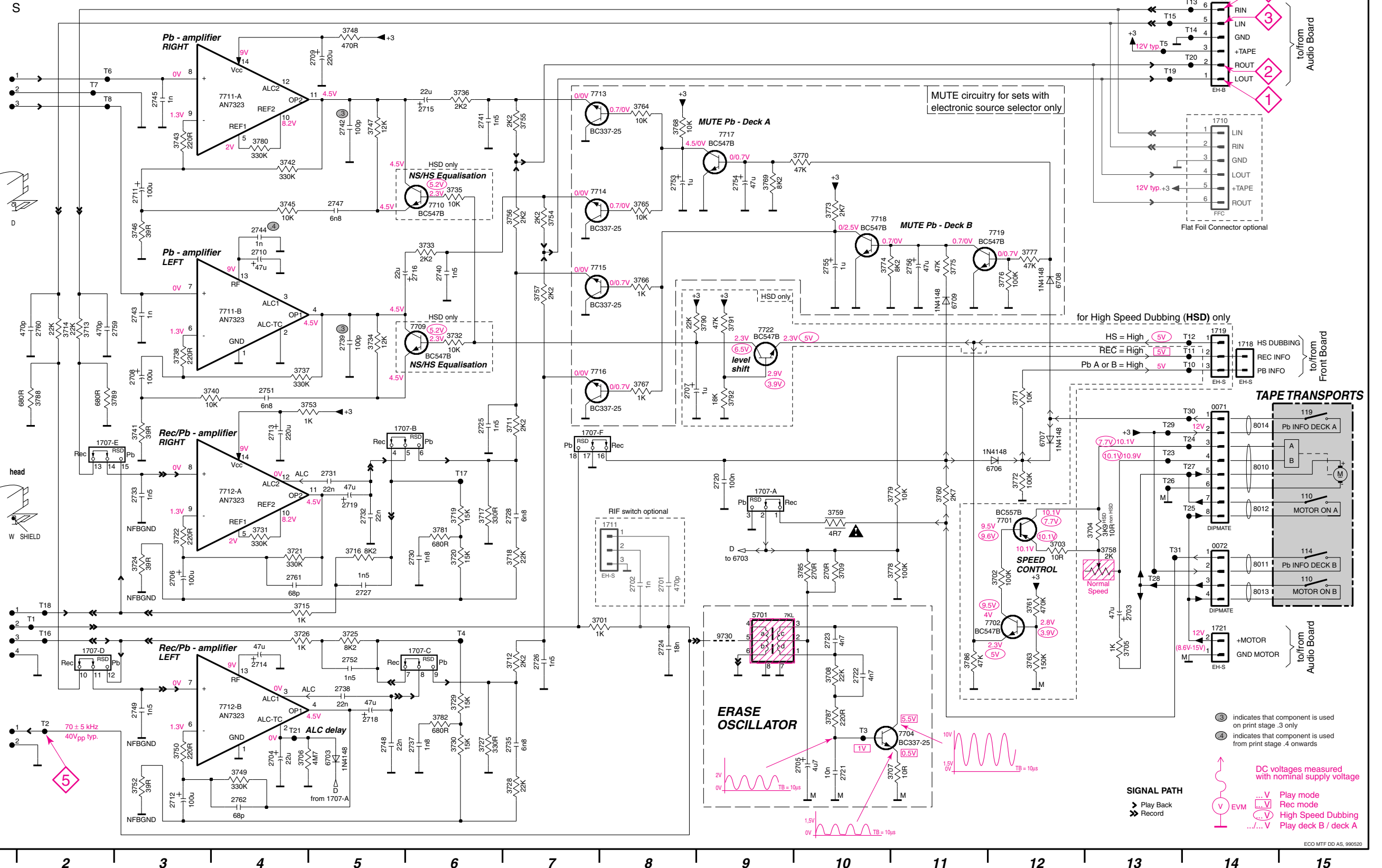
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Exploded Views & Mechanical Parts List .....	9-4
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## BLOCKDIAGRAM



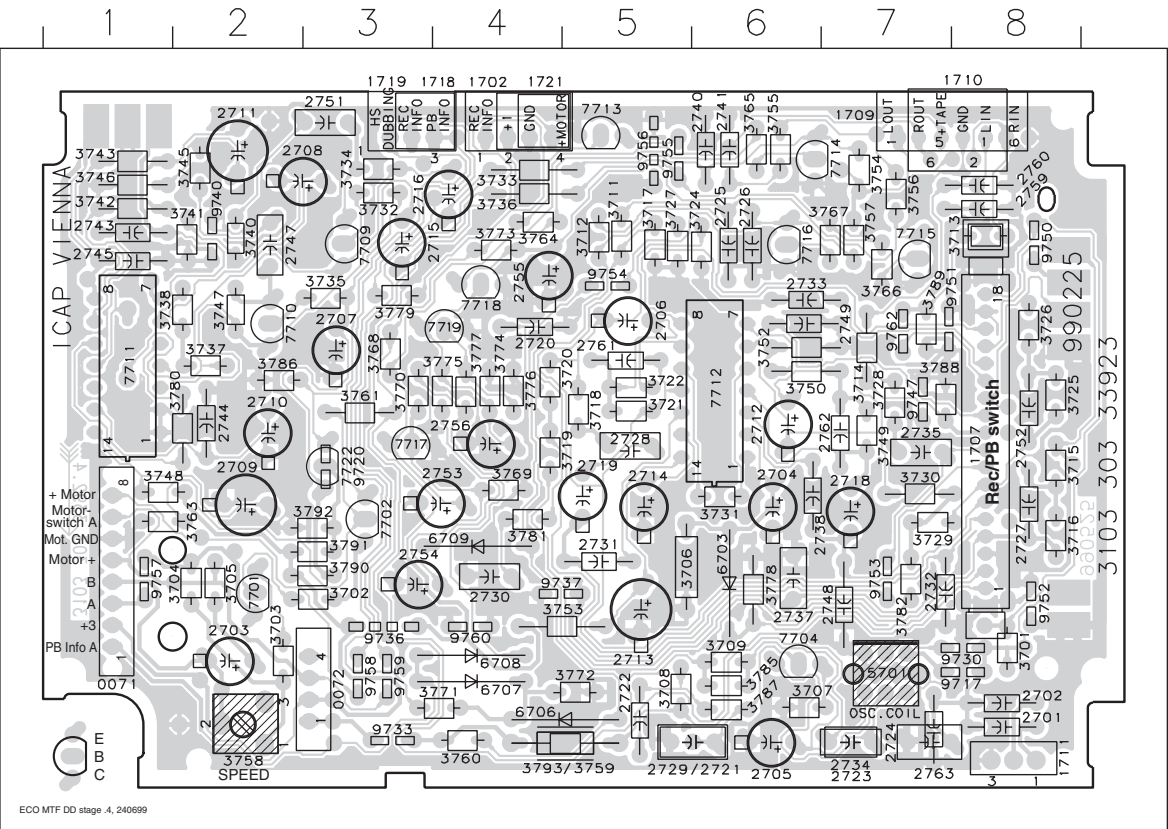
F E7	2702 G8	2709 A5	2716 D6	2724 G8	2732 F5	2741 B6	2749 H3	2759 D2	3704 F13	3712 H7	3719 F6	3727 H6	3734 D5	3742 B4	3750 H3	3758 F13	3766 D8	3773 C10	3780 B4	3789 E2	6707 E12	7710 C6	7715 C8
A14	2703 G13	2710 C4	2718 H5	2725 E6	2733 F3	2742 B5	2751 E4	2760 D2	3705 G13	3713 D2	3720 F6	3728 I7	3735 C6	3743 B3	3752 I3	3759 F10	3767 E8	3774 C10	3781 F6	3790 D9	6708 D12	7711-A B4	7716 E8
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
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	6710 F12	7712-A F4	7718 C10
G14	2706 G3	2713 E4	2721 H10	2728 F7	2738 H5	2745 B3	2754 C9	2763 G8	3708 H10	3716 F5	3724 G3	3731 F4	3738 D3	3747 B5	3755 B7	3763 H12	3770 B10	3777 C12	3786 H11	3793 G9	6711 F12	7712-B H4	7719 C12
D14	2707 E8	2714 H4	2722 H10	2730 F6	2739 D5	2747 C5	2755 C10	2764 G12	3709 G12	3717 F6	3725 G5	3732 D6	3740 E4	3748 A5	3756 C7	3764 B8	3771 E12	3778 G11	3787 H10	6703 I5	7704 H11	7713 B8	7722 D9
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

DER BOARD





RECORDER BOARD / componentside view

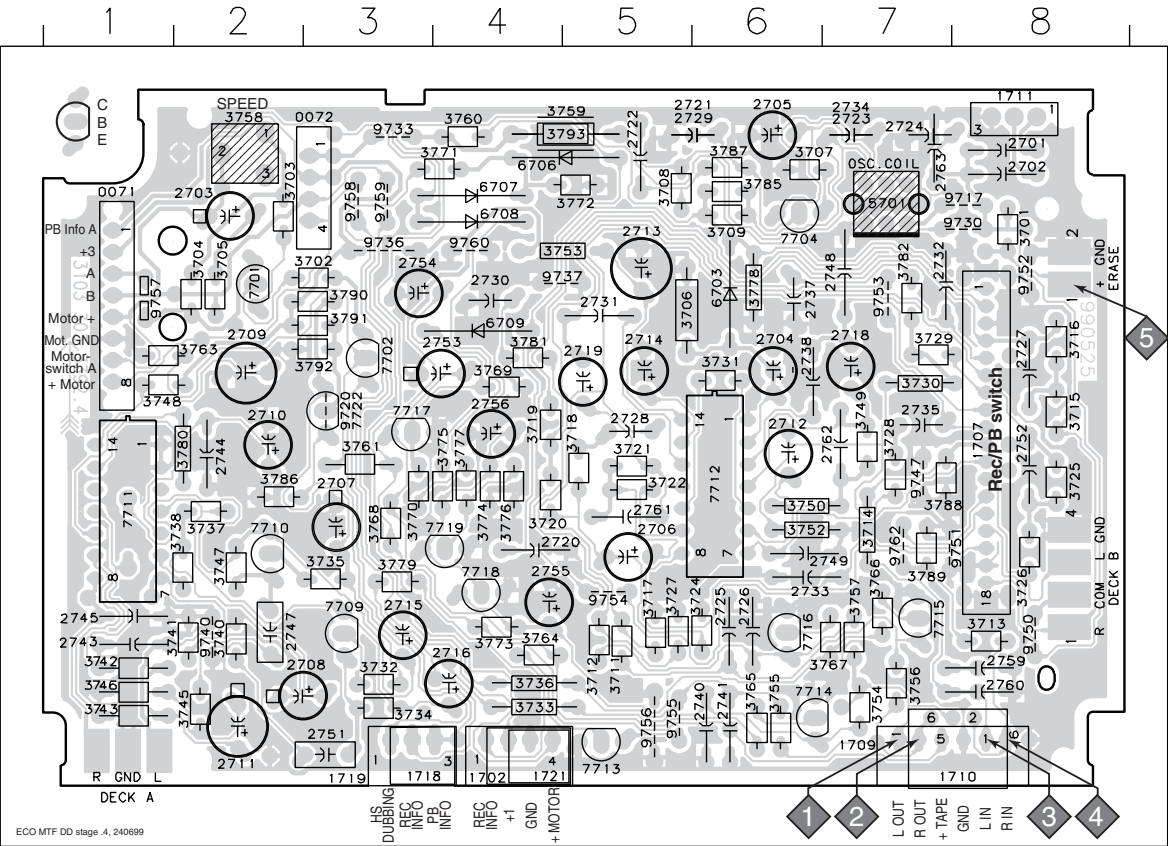


A  
B  
C  
D  
E

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 B2	6709 D4
2703 E2	2759 A8	3748 C1	7701 D2
2704 C6	2760 A8	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 B8	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



A  
B  
C  
D  
E

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	2759 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 B6	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 E4	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 E8
2728 C5	3721 C5	3774 C4	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 B7	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	

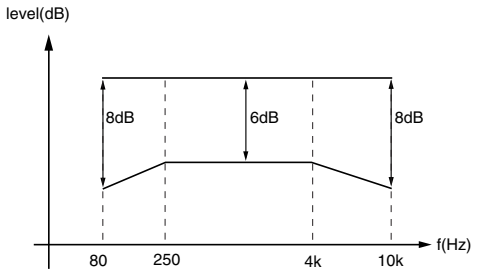


figure. 1

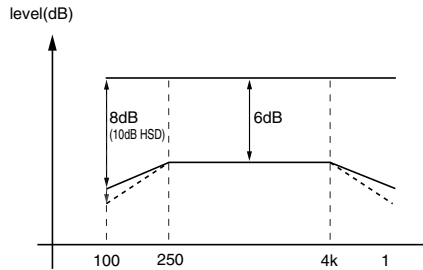


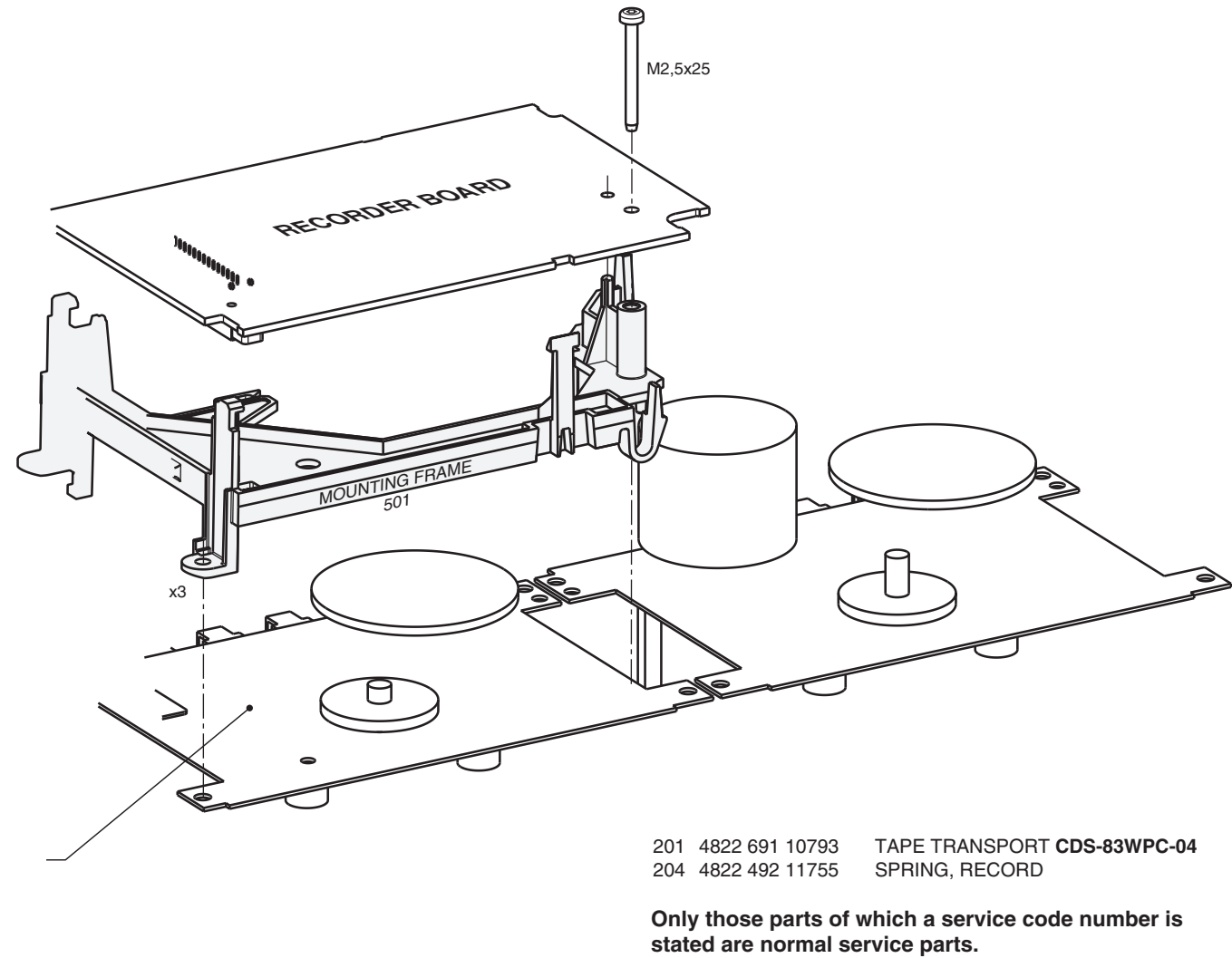
figure. 2

RECORDER ADJUSTMENT TABLE

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJ
with					
General					
ADJUST MOTOR SPEED	SBC420 (4822 397 30071) 3150Hz	PLAY deck A or B	<div>1 or 2</div> <div>LEFT or RIGHT</div> <div>or</div> <div>headphone socket</div>	frequency counter	3758
CHECK WOW & FLUTTER	SBC420 (4822 397 30071) 3150Hz	PLAY deck A or B	<div>1 or 2</div> <div>LEFT or RIGHT</div> <div>or</div> <div>headphone socket</div>	W&F-meter	check only
ADJUST AZIMUTH	SBC420 (4822 397 30071) 10kHz	PLAY deck A	<div>1 or 2</div> <div>LEFT or RIGHT</div> <div>or</div> <div>headphone socket</div>	mV-meter or oscilloscope	left hand screw
		PLAY deck B			
Playback					
CHECK PLAYBACK FREQUENCY RESPONSE	SBC420 (4822 397 30071)	PLAY deck A  PLAY deck B	<div>1 or 2</div> <div>LEFT or RIGHT</div>	mV-meter	Check
Recording					
PRE-ADJUST BIAS	FERRO	RECORD	<div>5</div>	mV-meter	5701
CHECK OVERALL FREQUENCY RESPONSE	FERRO	RECORD			
Input signal: 3mV 100Hz, 250Hz, 1kHz, 10kHz					
via <div>3 or 4</div>	RECORDED CASSETTE	PLAY	<div>1 or 2</div> <div>LEFT or RIGHT</div>	mV-meter	check only
CHECK DISTORTION	FERRO	RECORD			
Input signal: 300mV 1kHz					
via <div>3 or 4</div>	RECORDED CASSETTE	PLAY	<div>1 or 2</div> <div>LEFT or RIGHT</div>	THD-meter	check only
Remark: If high frequencies are not within lower limit, decrease bias and re-measure. If distortion is too high increase bias and re-measure.					



EXPLODED VIEW / RECORDER MODULE

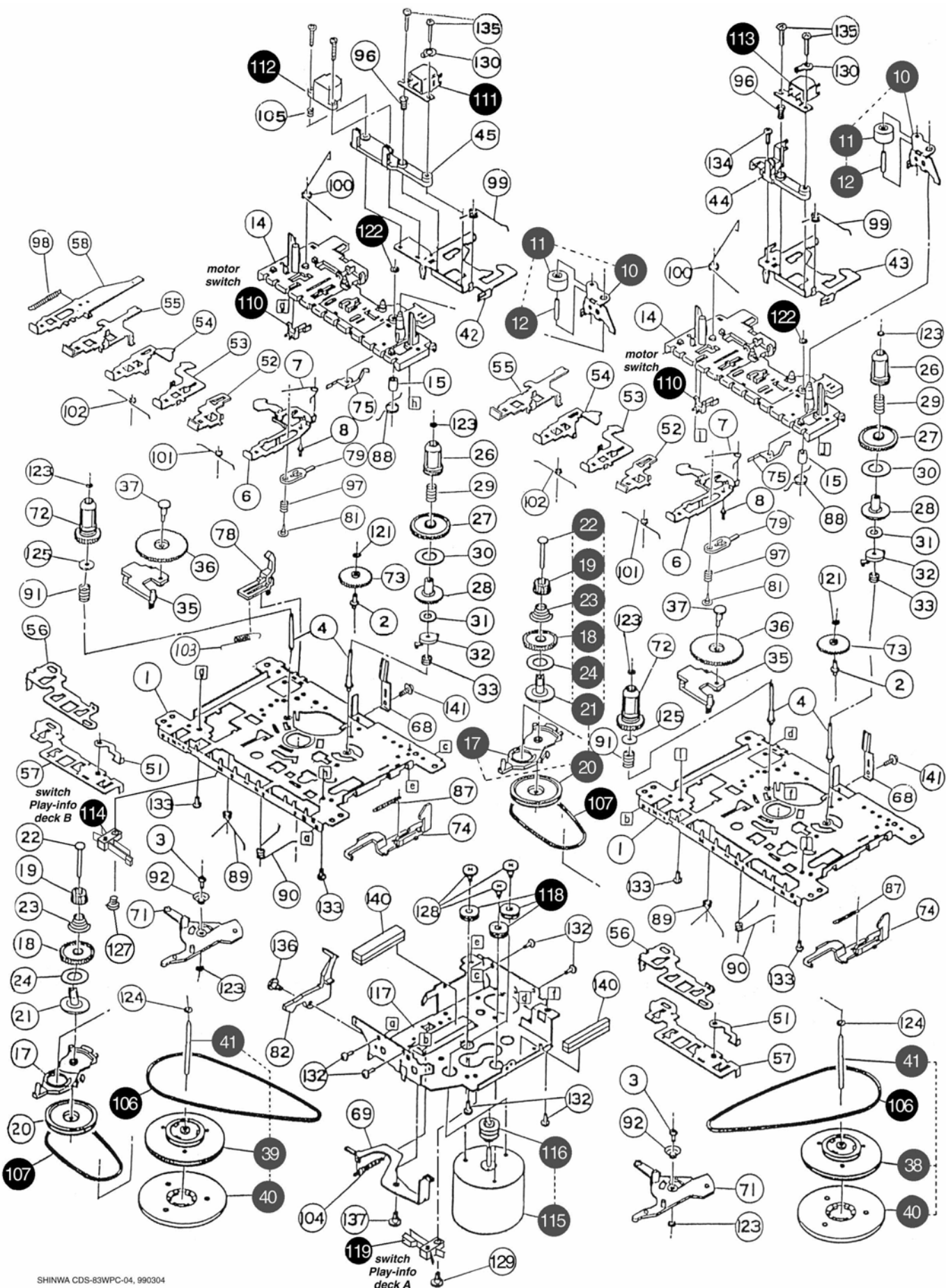


MECHANICAL PARTSLIST TAPE TRANSPORT

10-12	4822 528 11189	PINCH ROLLER ASSY
17-24	4822 402 10966	CLUTCH ASSY
38-41	4822 528 11242	FLYWHEEL ASSY, PB DECK
39-41	4822 528 11243	FLYWHEEL ASSY, REC/PB DECK
106	4822 358 31225	MAIN BELT
107	4822 358 31124	SUB BELT
110	4822 278 90663	LEAF SWITCH, MOTOR ON/OFF
111	4822 249 10565	REC/PB-HEAD, TC951-B

112	4822 249 10548	ERASE HEAD, LE15B-C1
113	4822 249 10565	REC/PB-HEAD, TC951-B
114	4822 277 11754	LEAF SWITCH, INDICAT. „PLAY“ REC/PB-DECK
115/116	4822 361 11053	MOTOR ASSY, EG530YD-2BH + PULLEY
118	4822 466 11787	MOTOR CUSHION
119	4822 277 11753	LEAF SWITCH, INDICAT. „PLAY“ PB-DECK
122	4822 532 12937	WASHER, 1.6X3.5X0.4

Only those parts of which a service code number is stated are normal service parts.





**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	
3750	4822 116 83872	220Ω	5%	0,5W	
3752	4822 116 52193	39Ω	5%	0,16W	
3753	4822 050 11002	1kΩ	5%	0,2W	
3754	4822 116 52256	2,2kΩ	5%	0,16W	
3755	4822 116 52256	2,2kΩ	5%	0,16W	
3756	4822 116 52256	2,2kΩ	5%	0,16W	
3757	4822 116 52256	2,2kΩ	5%	0,16W	
3758	4822 100 11368	2kΩ	TRIMPOT. LIN.		
3759	△ 4822 052 10478	4,7Ω	5%	NFR	
3760	4822 116 52263	2,7kΩ	5%	0,5W	
3761	4822 116 52285	470kΩ	5%	0,5W	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

**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**

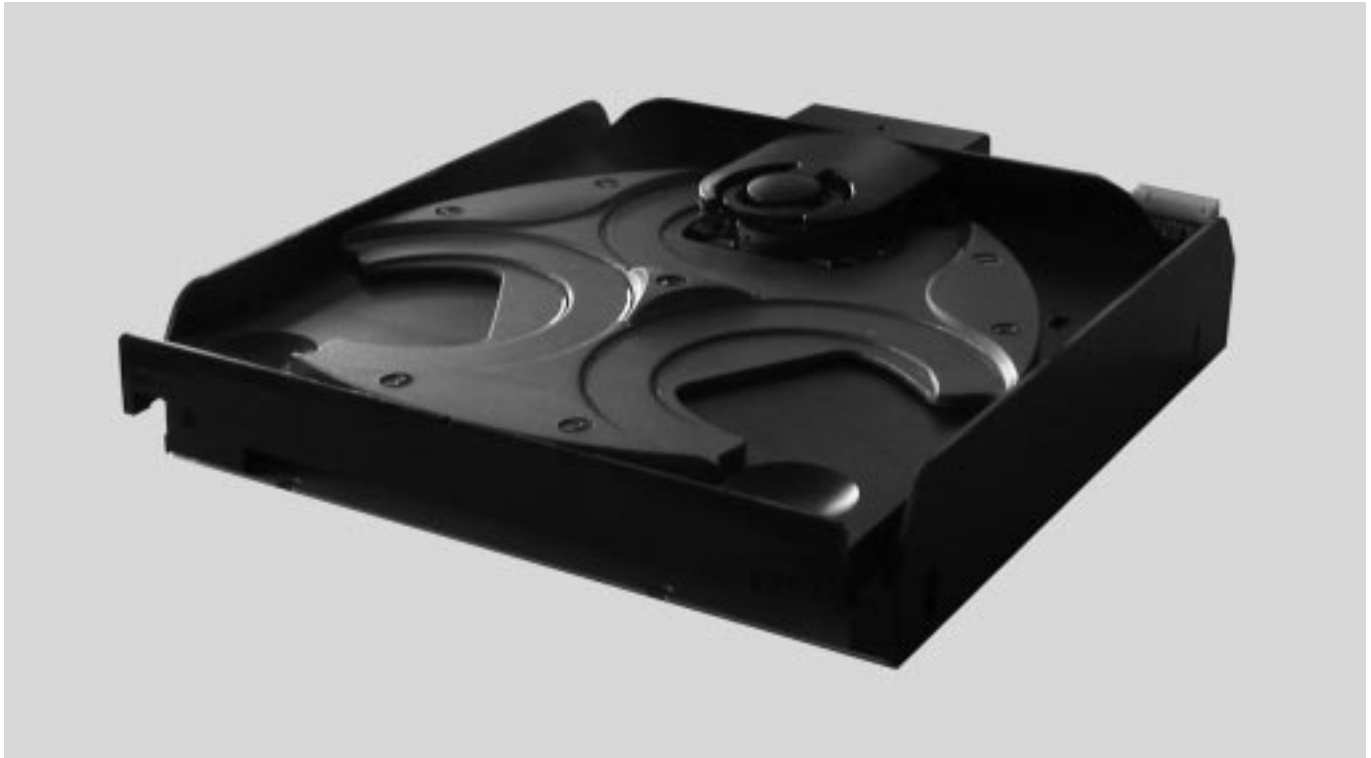
7701	4822 130 44568	BC557B	HSD only
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7702	4822 130 40959	BC547B	HSD only
7704	4822 130 40981	BC337-25	
7709	4822 130 40959	BC547B	HSD only
7710	4822 130 40959	BC547B	HSD only
7713	4822 130 40981	BC337-25	
7714	4822 130 40981	BC337-25	
7715	4822 130 40981	BC337-25	
7716	4822 130 40981	BC337-25	
7717	4822 130 40959	BC547B	
7718	4822 130 40959	BC547B	
7719	4822 130 40959	BC547B	
7722	4822 130 40959	BC547B	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.



## ***3CDC 99 Module***

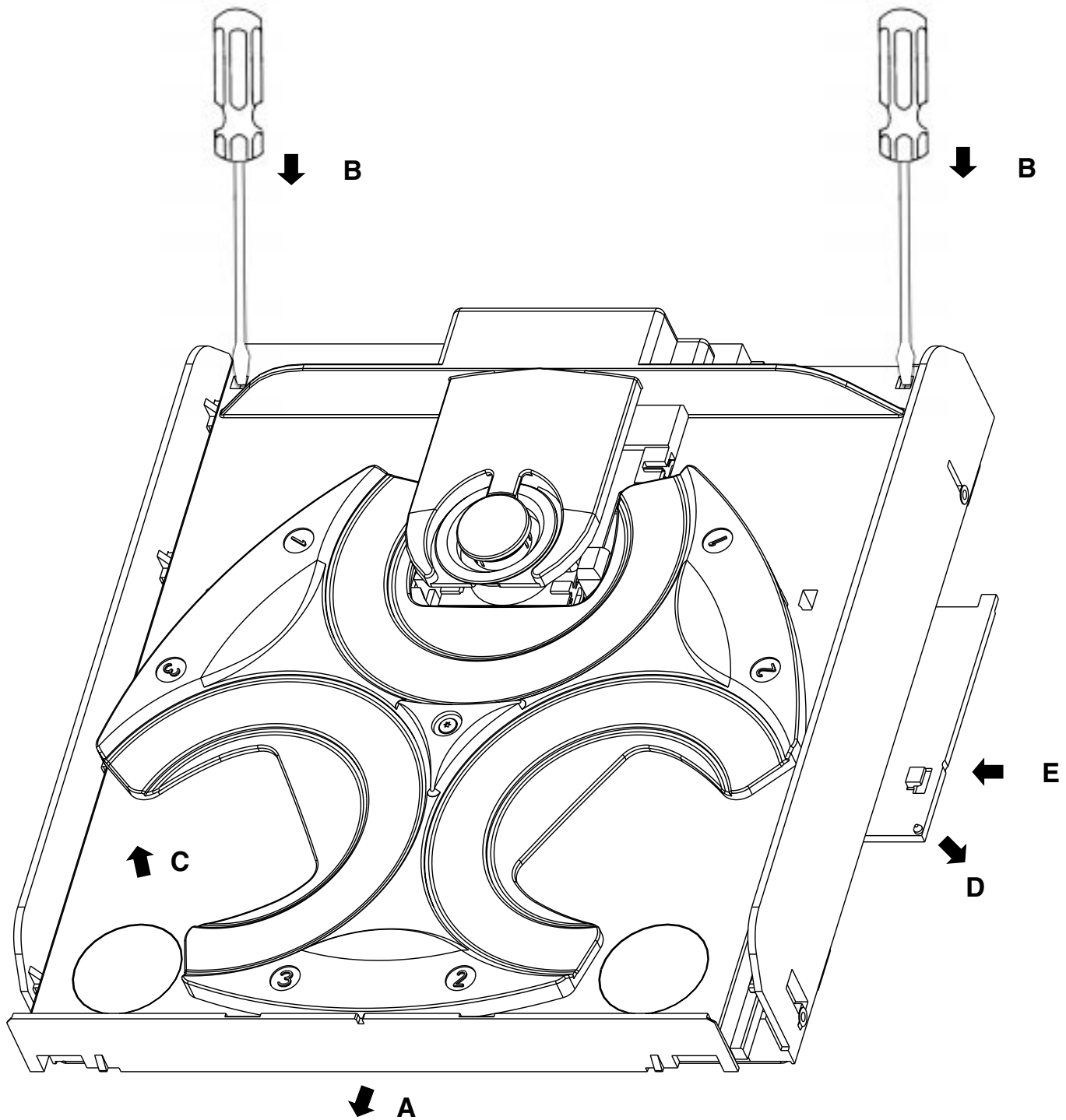
### ***(3 Disc Carousel Changer)***

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## Demounting Hints



### Demounting of Drawer

- **A** Pull drawer outwards
- **B** Unlock drawer with screwdriver
- **C** Lift drawer to demount from chassis

### Demounting of Flex Plate

- **D** Lift plate to unlock pin from bottom plate
- **E** Move plate inwards to demount from bottom plate

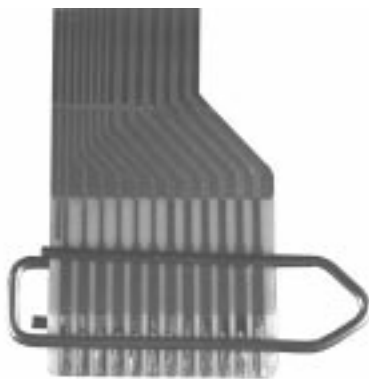


## Servicing Hints

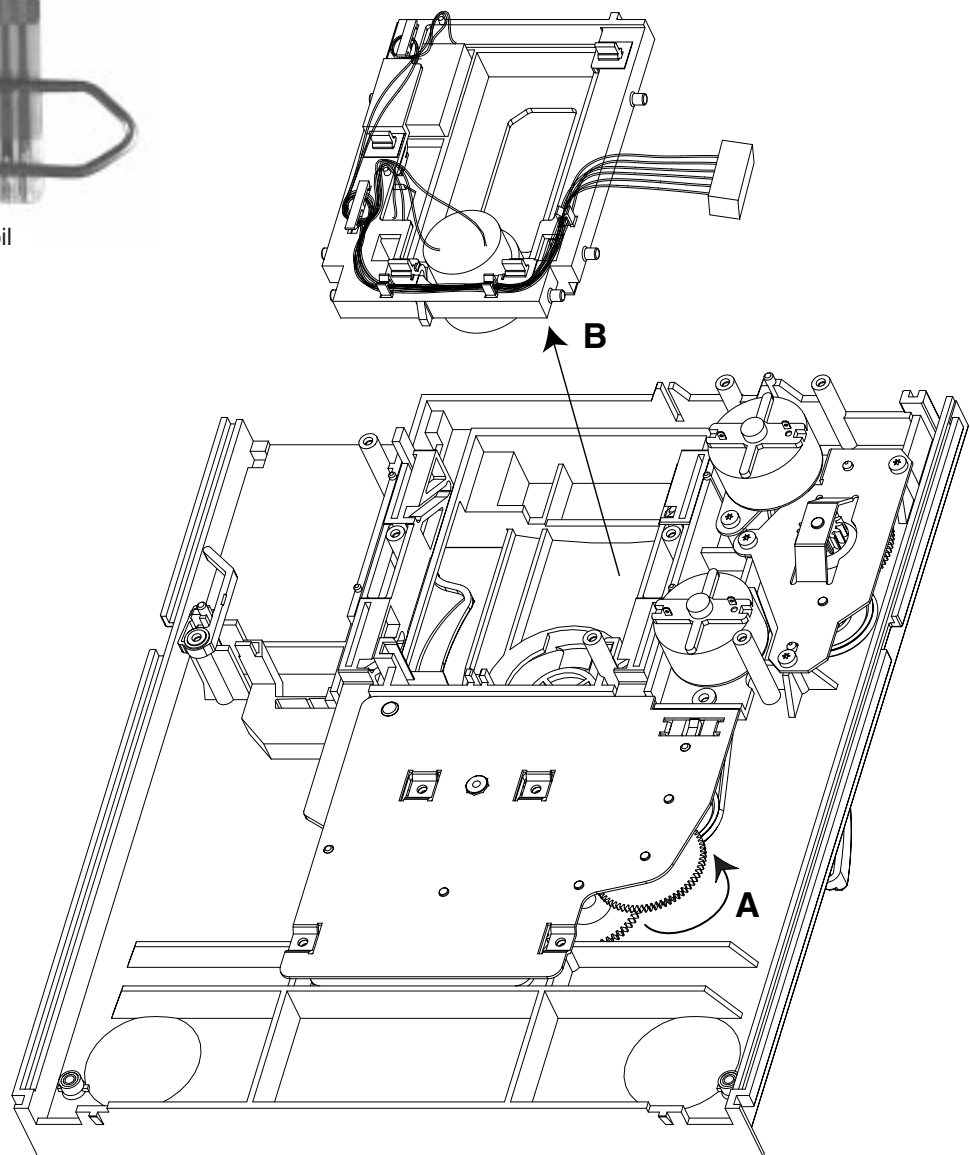
### Replacement of CD Drive

See also exploded view of changer mechanism.

1. Demount printed circuit board: remove 5 screws.
2. Disconnect flexfoil and JST connector of CD drive from Printed circuit board. Shortcircuit the flexfoil with a paperclip to protect the laser against ESD.
3. Remove 2 screws (pos 107,108) and demount CD drive lockings (pos 105,106).
4. Turn gearwheel (pos 42) of disc change mechanism by finger to move CD drive support in upper position as shown in picture below **A**.
5. Demount CD drive support (pos 95) **B**.
6. Replace CD drive (pos 100). The wire tree of JST connector has to be desoldered and resoldered on the new CD drive again.



CD drive flex foil

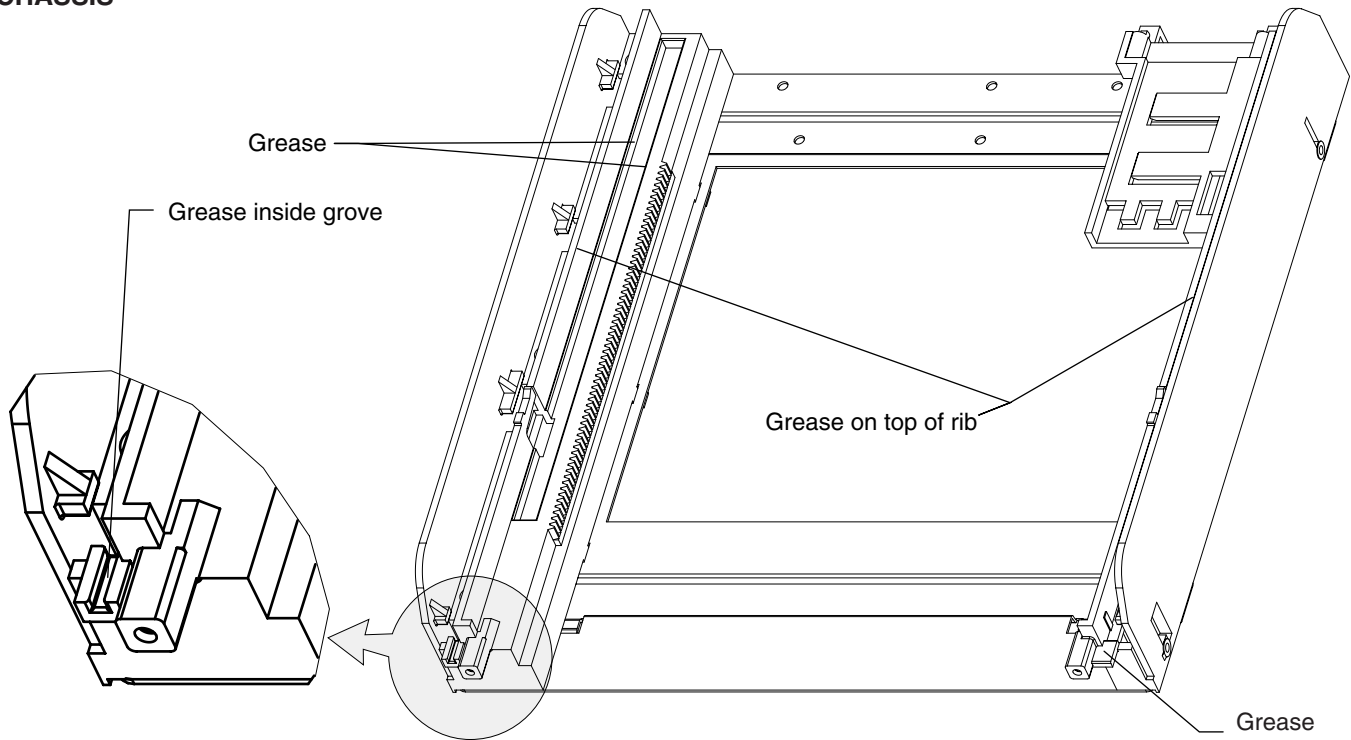


### Mounting of Carrousel

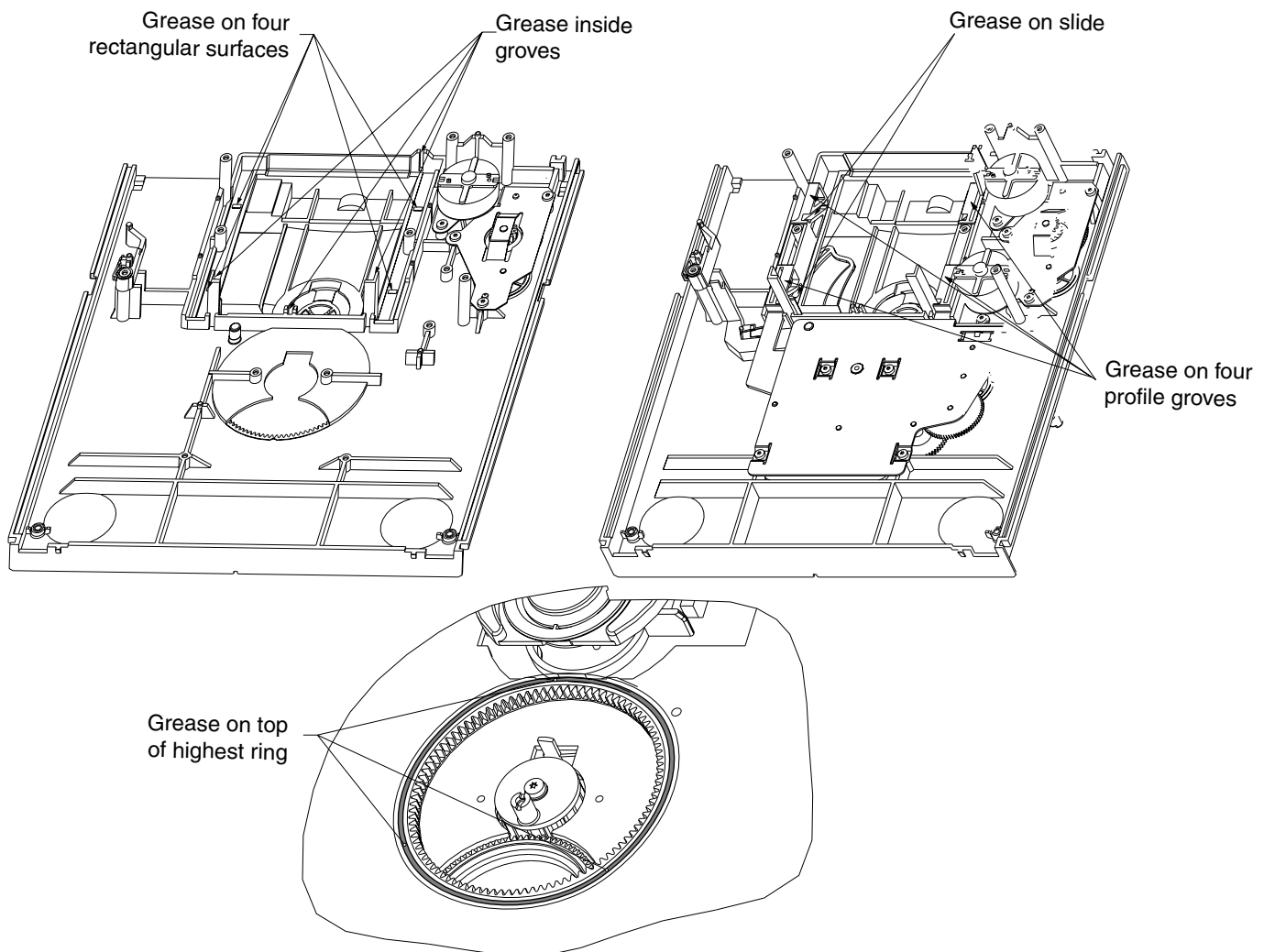
1. Turn gearwheel (pos 42) of disc change mechanism by finger until CD drive is in play position.
2. Mount carrousel (pos 115) so that disc is positioned right on turntable. Carrousel position number doesn't matter.

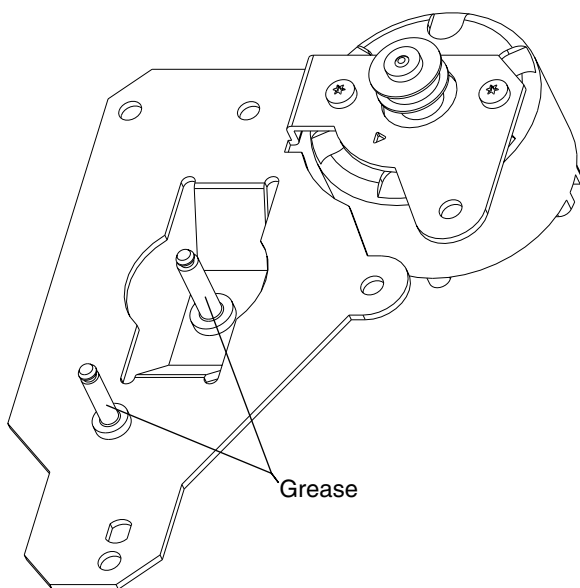
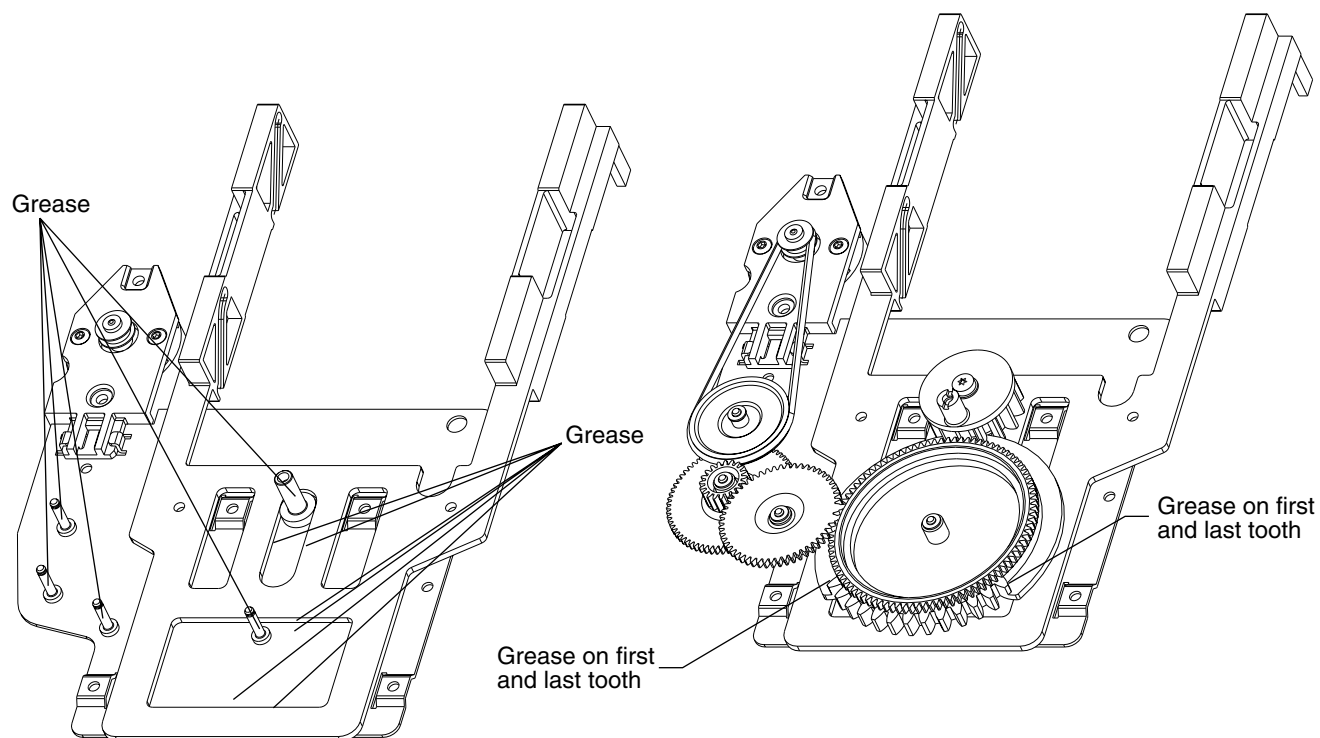
## Lubrication Instructions

### CHASSIS



### DRAWER



**DRAWER MECHANISM****DISC CHANGE MECHANISM**

Use only grease **Polylub GLY 801** service codenumber 4822 390 10136

## 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 CDM mechanism:

1. Disconnect old CD drive flexfoil from printed board
2. Connect paperclip to CD drive flexfoil to short-circuit flexfoil (fig.1)
3. Short-circuit printed board with **brass-sheet (4822 321 11197)** plugged into the flexfoil connector (fig.2)
4. Remove old CD drive mechanism
5. Position new CD mechanism in its studs
6. Remove short-circuit from printed board connector
7. Remove short-circuit from flexfoil of new CD drive
8. Connect new flexfoil to print connector (fig.3)

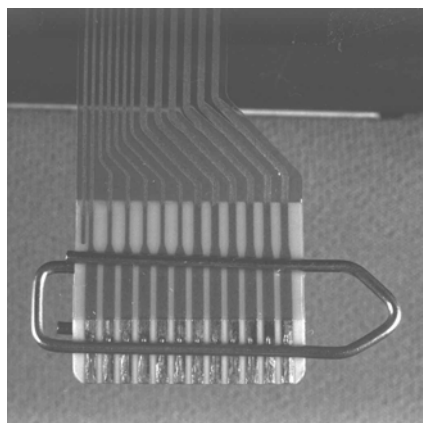


fig.1

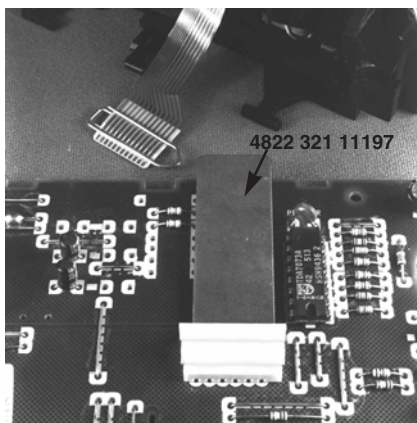


fig.2

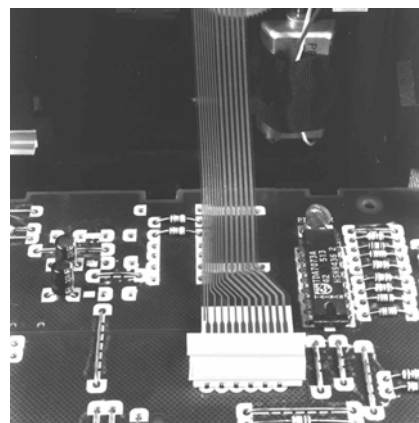
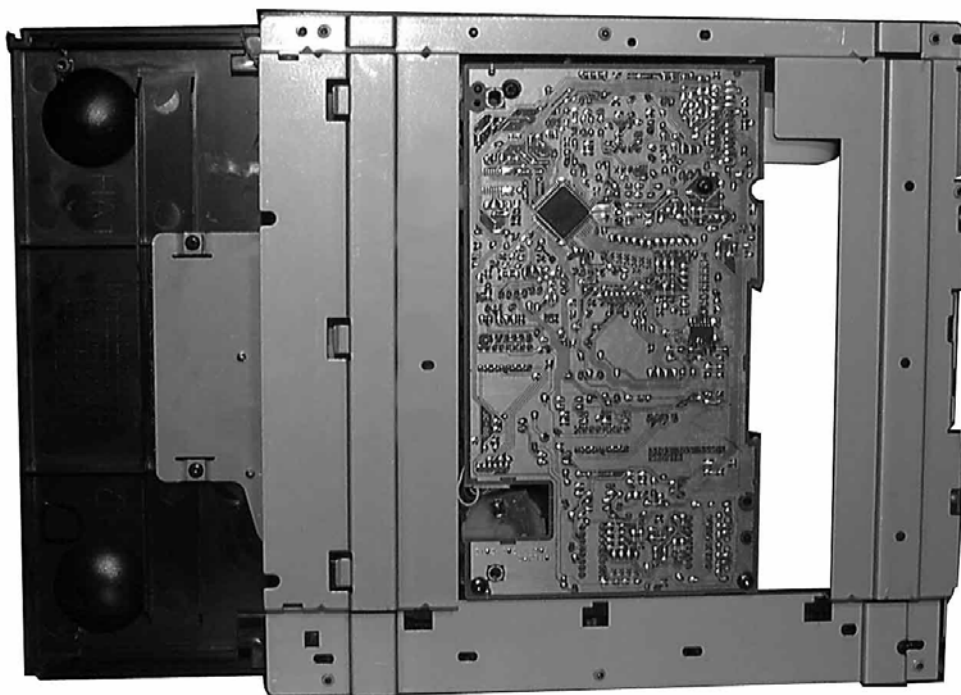


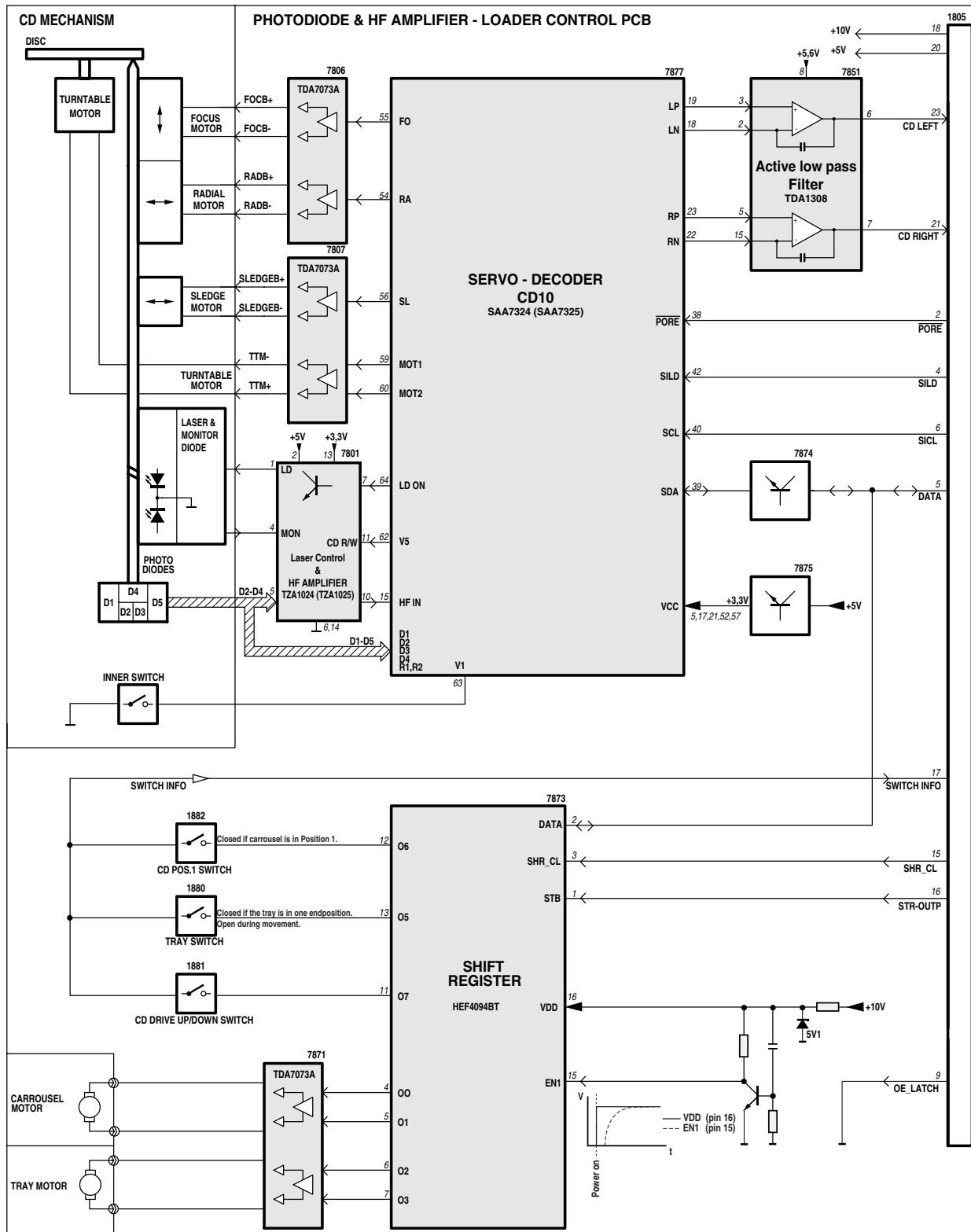
fig.3

## Service Position

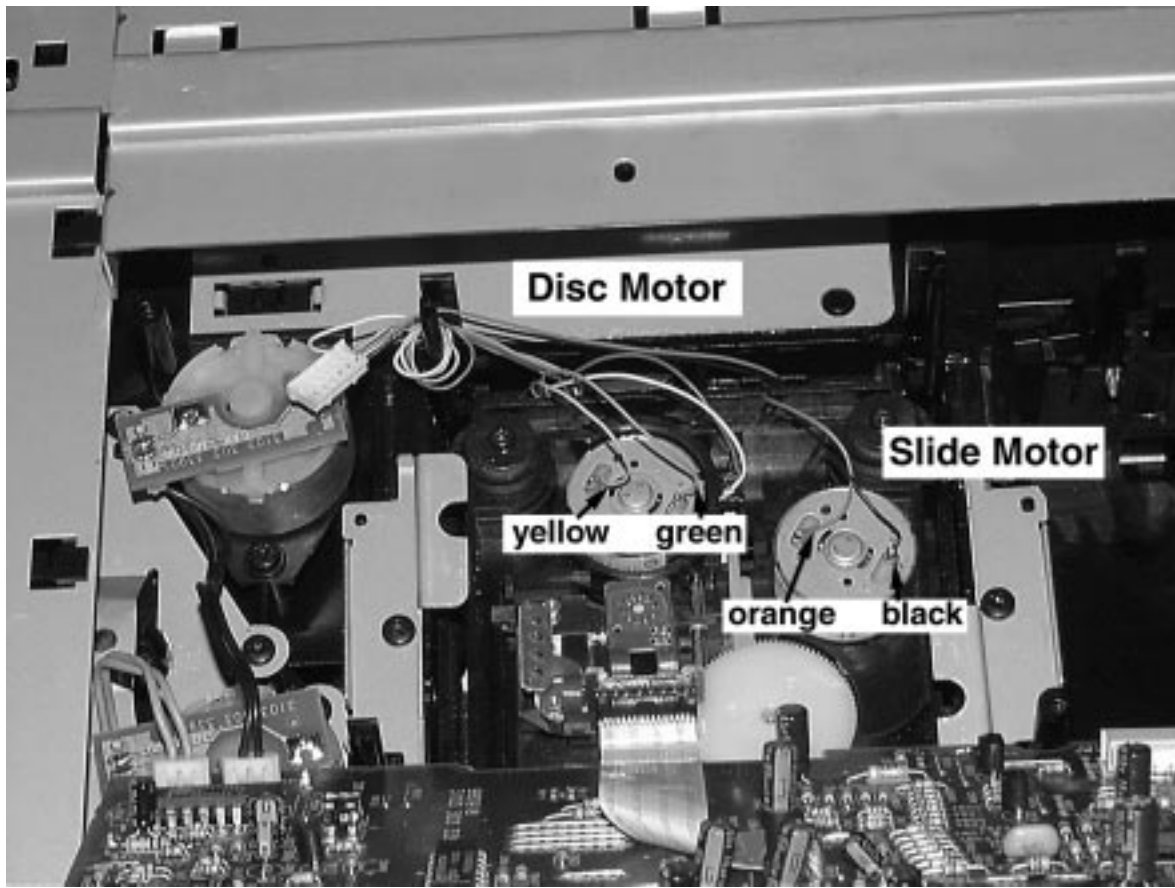




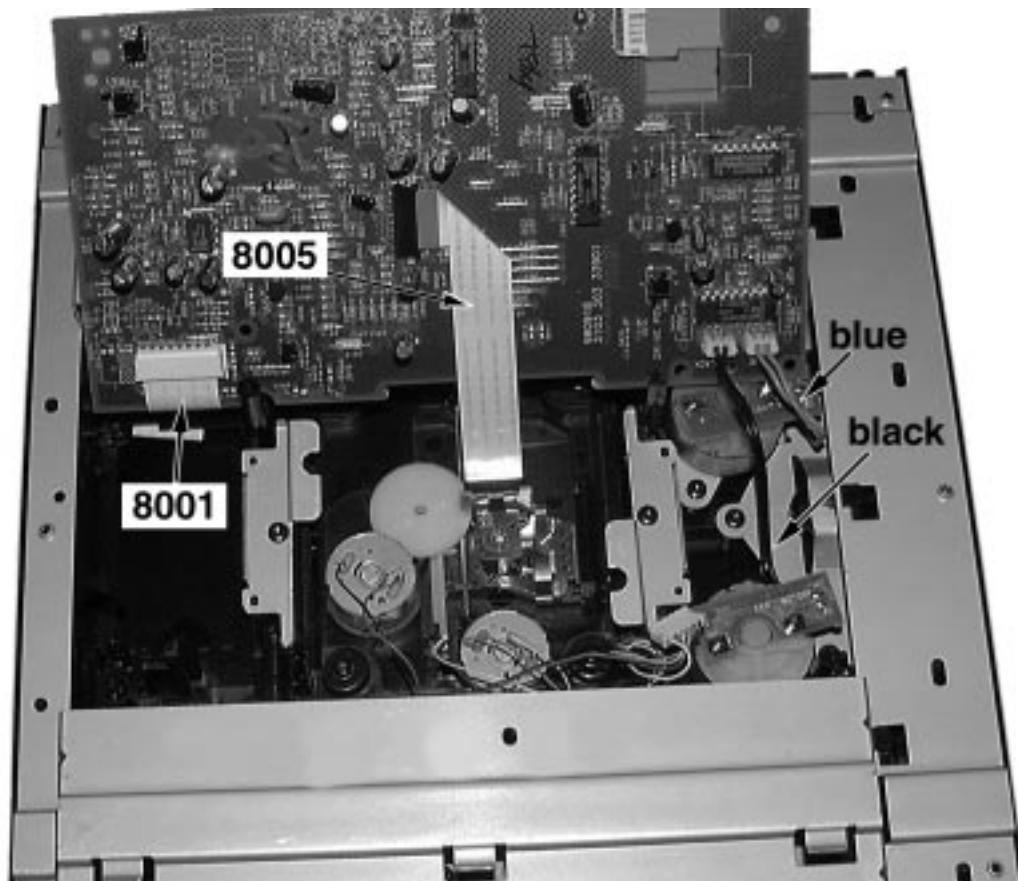
## Blockdiagram



## Wiring of CD Drive

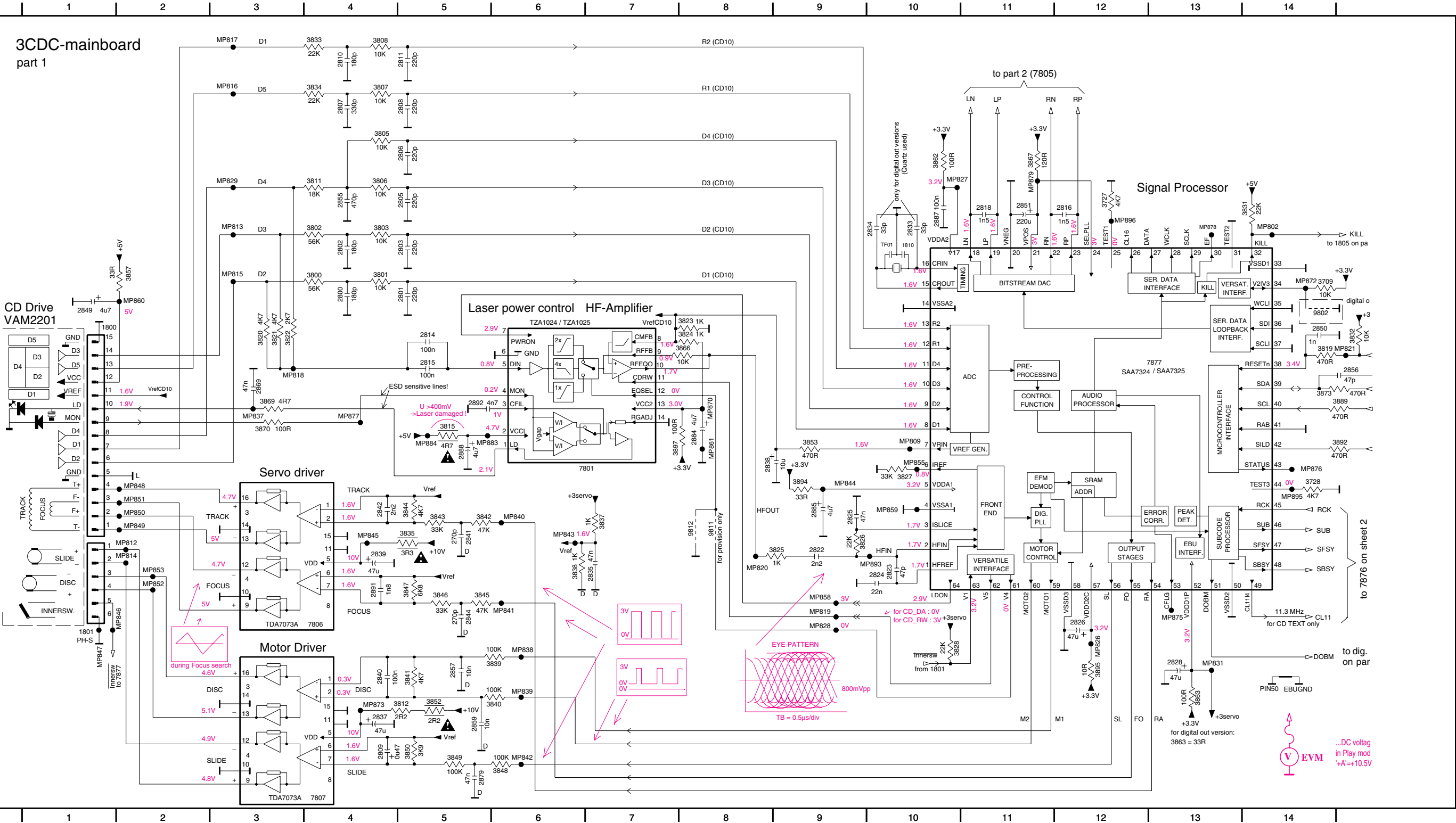


Pict. 1



Pict. 2

800 D2	2805 B5	2814 D5	2825 F9	2838 E8	2850 D14	2879 H5	2892 D5	3803 C4	3815 E5	3825 F9	3834 A4	3842 F5	3849 H5	3866 D8	3894 E9
801 G1	2806 B5	2815 D5	2826 G12	2839 F4	2851 B11	2880 D8	3709 C14	3805 B4	3819 D14	3826 F9	3835 F5	3843 F5	3850 H5	3867 B11	3895 G12
810 C10	2807 A4	2816 B12	2828 G13	2840 G4	2855 B4	2884 E8	3727 B12	3806 B4	3820 D3	3827 E10	3837 F7	3844 F5	3852 H5	3869 D3	3897 E7
800 C4	2808 A5	2818 B11	2833 C10	2841 F5	2856 D15	2885 F9	3728 E14	3807 A4	3821 D3	3828 G10	3838 F6	3845 F5	3853 E9	3870 E3	7801 E7
801 C5	2809 H4	2822 F9	2834 C10	2842 F4	2857 G5	2887 B10	3800 C4	3808 A4	3822 D3	3831 B14	3839 G6	3846 F5	3857 C2	3873 D14	7806 G4
802 C4	2810 A4	2823 F10	2835 F7	2844 G5	2859 H5	2888 E5	3801 C4	3811 B4	3823 D8	3832 D15	3840 H6	3847 F5	3859 B10	3889 D15	7807 H4
803 C5	2811 A5	2824 F10	2837 H4	2849 C1	2869 D3	2891 F4	3802 C4	3812 H5	3824 D8	3833 A4	3841 G5	3848 H6	3863 H13	3892 E15	7877 D12





### C Transistor pinning

3CDC99 Layout stage .1 981205

1800	E3	3716	A2	3889	B5
1801	H5	3717	A2	3890	I3
1805	B1	3718	C5	3891	J3
1810	C3	3727	B4	3892	B5
1876	J1	3728	B5	3893	I3
1878	I1	3730	B5	3894	D3
1880	B5	3731	C5	3895	D5
1881	H2	3740	C3	3896	H3
1882	B5	3741	C3	3897	F1
2800	D2	3742	B4	3899	C2
2801	D3	3743	B4	5802	A2
2802	E2	3744	C3	5803	J1
2803	D3	3746	B3	5804	I1
2804	D5	3750	B3	5805	A2
2805	D3	3751	B3	6871	H4
2806	D3	3800	D2	6872	I4
2807	D2	3801	D2	6873	J1
2808	D3	3802	D2	6874	H3
2809	E5	3803	D2	6875	I3
2810	D2	3805	D2	6876	C1
2811	D3	3806	D2	6877	A3
2814	E2	3807	D2	6878	H4
2815	E2	3808	D2	7801	F1
2816	B4	3809	D5	7805	B3
2818	C3	3811	D2	7806	H3
2822	F4	3812	G5	7807	F5
2823	D4	3814	C2	7812	H3
2824	D4	3815	D1	7871	J2
2825	D4	3819	B4	7873	J4
2826	E4	3820	E2	7874	C2
2828	D5	3821	E2	7875	C1
2829	J2	3822	E2	7876	C5
2830	B4	3823	F1	7877	C4
2831	B3	3824	F1	9801	I4
2832	C3	3825	G3	9802	B4
2833	D3	3826	E4	9803	B2
2834	C3	3827	D3	9805	D1
2835	E5	3828	F4	9806	F2
2837	F4	3831	C1	9807	G5
2838	F4	3832	A4	9808	F1
2839	H4	3833	F2	9811	G1
2840	E5	3834	F2	9812	G1
2841	E5	3835	H4	9813	C1
2842	G4	3837	E5	9815	A2
2844	D5	3838	E5	9816	A2
2849	E4	3839	E4	9817	A2
2850	B4	3840	E4	9818	B1
2851	C4	3841	E5	9819	B2
2852	C5	3842	E5	9820	B2
2853	C5	3843	G4	9821	B2
2854	A2	3844	G4	9822	B2
2855	E2	3845	E5	9823	D1
2856	B5	3846	G4	9824	C2
2857	E5	3847	G3	9825	H1
2858	A3	3848	E5	9827	C1
2859	E4	3849	E5	9830	D1
2860	B3	3850	E5	9831	C4
2861	B3	3851	J2	9832	E5
2862	B4	3852	G5	9833	H1
2863	B4	3853	E4	9834	D1
2864	D5	3854	C2	9835	A1
2865	A2	3855	B2	9836	D5
2867	C3	3857	G4	9837	J3
2869	F2	3858	C2	9838	A1
2870	J1	3859	B2	9839	A1
2871	I1	3860	B4	9841	E5
2872	I4	3861	B4	9842	E5
2873	I2	3862	C3	9844	F4
2875	I3	3863	D5	9845	D5
2876	A3	3864	B2	9850	C2
2877	J3	3866	F2	9851	D5
2878	J3	3867	C4	9852	E5
2879	E5	3868	B2	9853	E4
2881	I3	3869	G2	9855	E3
2882	B3	3870	G2	9856	E3
2884	E2	3871	I3	9857	G2
2885	D3	3872	A3	9858	G2
2887	C4	3873	B5	9859	G3
2888	E1	3874	A4	9861	G5
2891	G3	3875	C2	9862	F5
2892	E2	3876	A4	9864	F3
2893	J3	3877	I3	9876	C1
3700	C5	3878	D1	9884	G3
3705	D5	3879			

## Transistor pinning

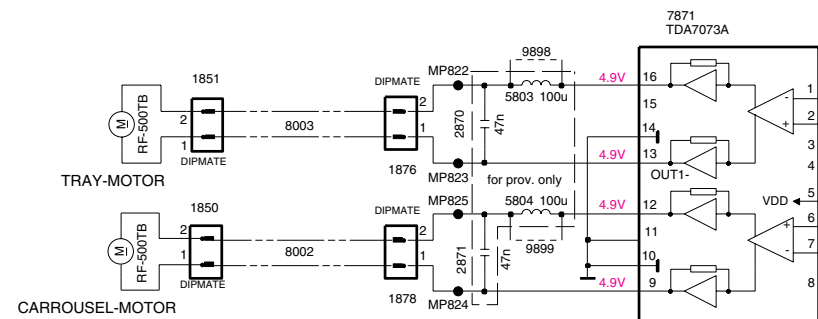
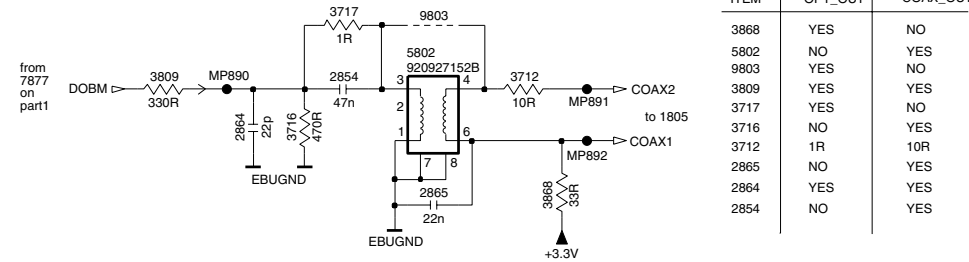
3CDC99 Layout stage .1 981205



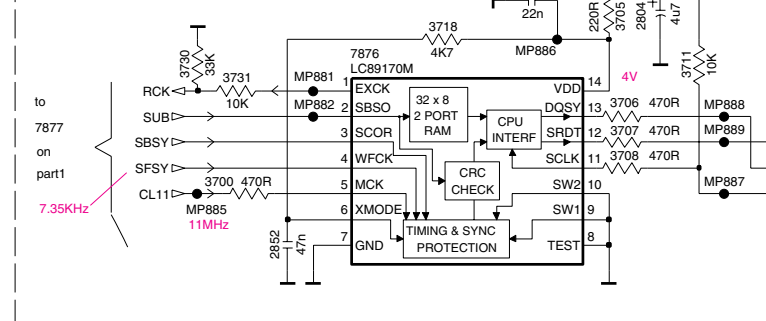
805 H14	2804 G4	2853 G4	2863 B8	2872 F10	2881 F8	3707 G4	3715 G8	3740 A7	3750 B7	3855 B11	3868 C4	3877 E11	3883 E6	3890 F11	5803 E4	6874 G7	7805-B B10	7876 G3
876 E3	2829 E6	2854 C3	2864 C2	2873 E6	2882 B10	3708 H4	3716 C3	3741 A7	3751 C7	3858 A11	3871 E11	3878 D7	3884 E6	3891 F11	5804 E4	6875 E12	7812 G8	9801 E8
878 F3	2830 C10	2858 A10	2865 C3	2875 F6	2893 F12	3711 G4	3717 B3	3742 B7	3809 C2	3859 B11	3872 B13	3879 E7	3885 D6	3893 F11	5805 C11	6876 C13	7871 D5	9803 B3
880 D8	2831 B9	2860 A11	2867 A9	2876 C8	3700 H2	3712 C4	3718 G3	3743 B7	3814 C12	3860 B8	3874 B13	3880 F6	3886 F7	3896 G10	6871 D8	6877 D12	7873 D9	9813 G14
881 D8	2832 A8	2861 B11	2870 E3	2877 F11	3705 G4	3713 F8	3730 G2	3744 A9	3851 E6	3861 B8	3875 C12	3881 F7	3887 E12	3899 D12	6872 D8	6878 E8	7874 C12	9827 G14
882 D8	2852 H2	2862 B8	2871 F4	2878 F11	3706 G4	3714 F8	3731 G2	3746 B10	3854 A11	3864 A7	3876 C12	3882 E7	3888 E12	5802 B3	6873 D8	7805-A A9	7875 D12	9834 G10

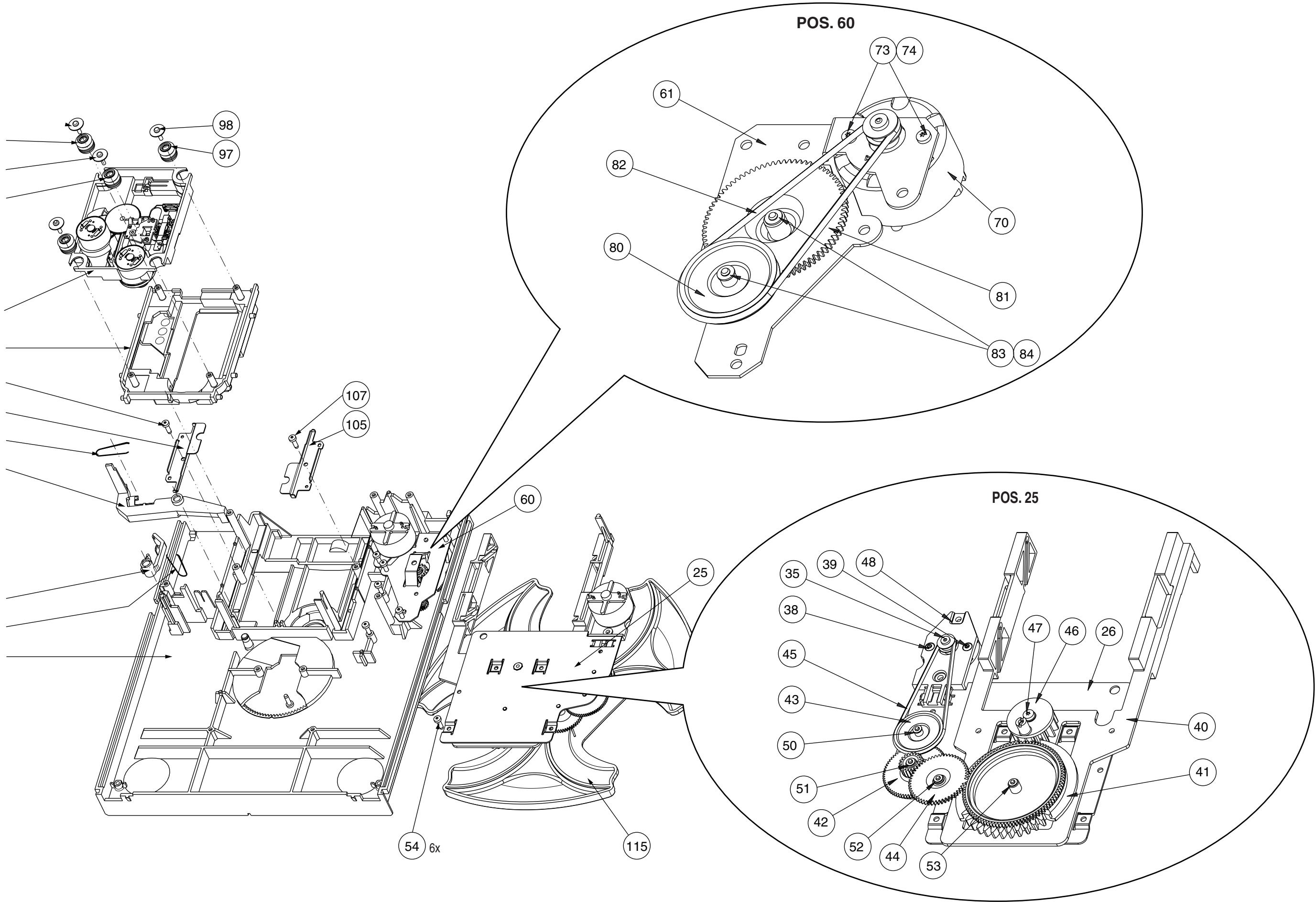
## 3CDC mainboard / part 2

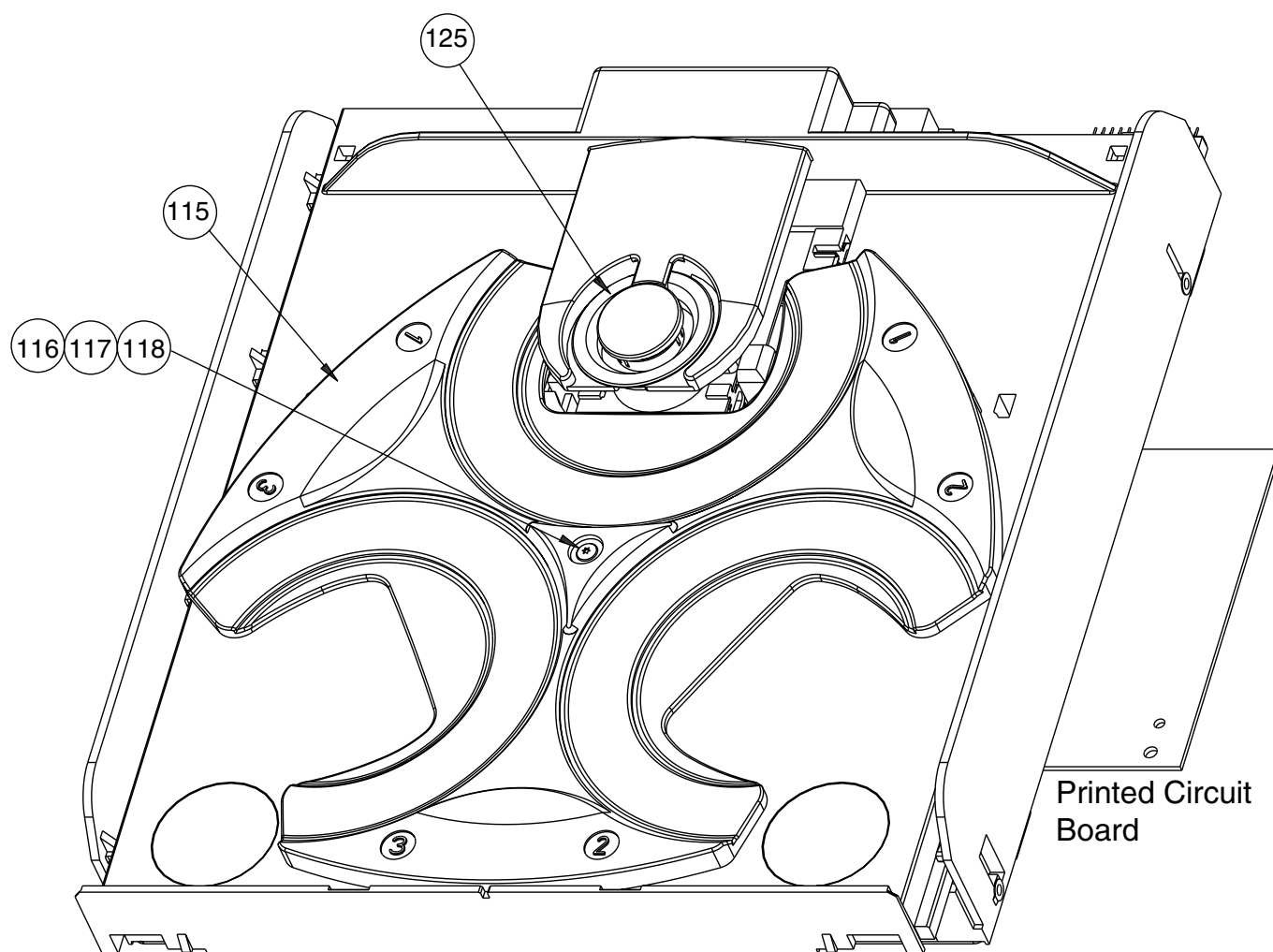
## digital out circuitry (not for all versions)



## CD-Text circuitry (not for all versions)

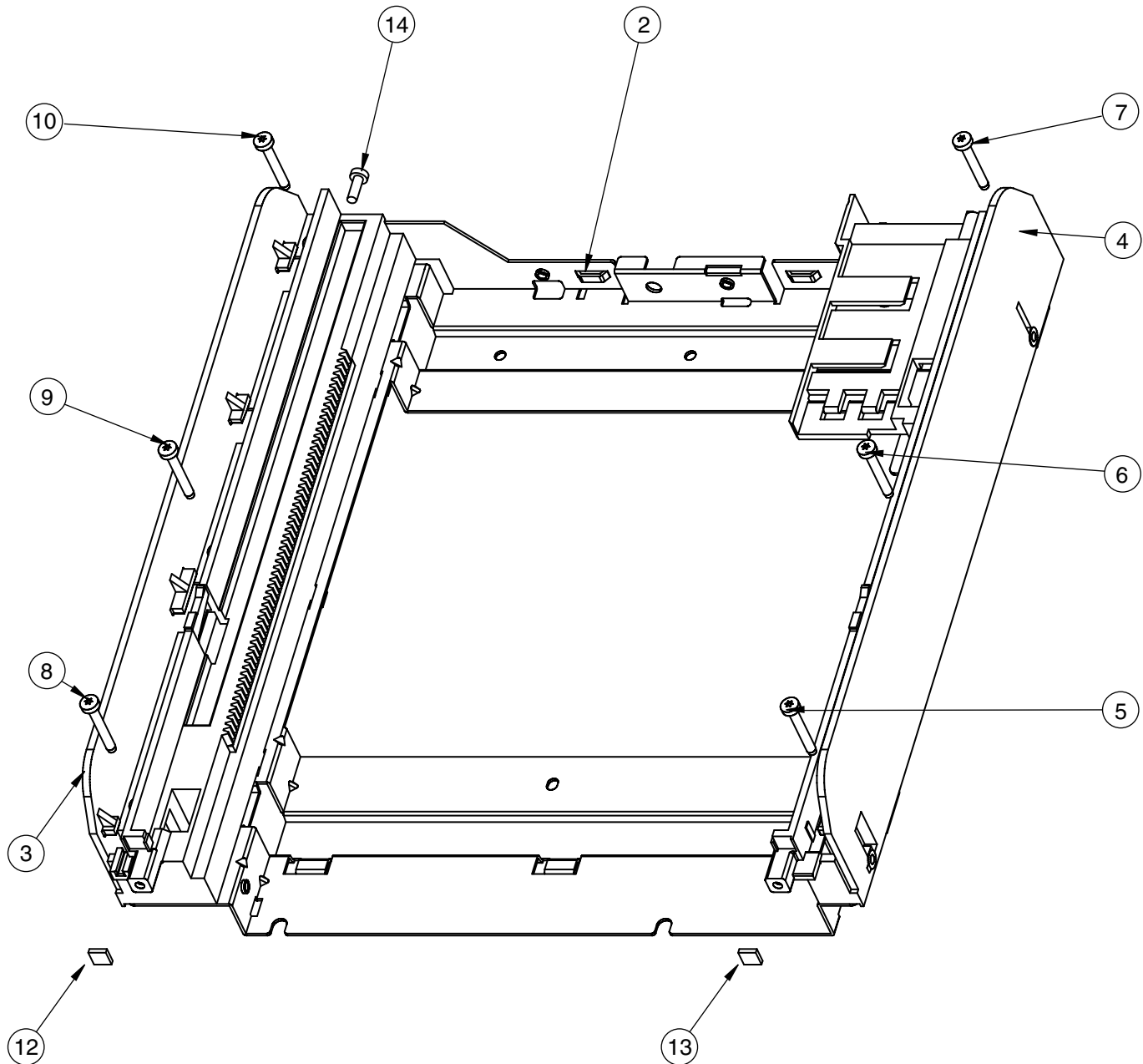





**MECHANICAL PARTSLIST 3CDC-99 MODULE**

4822 390 10136	POLYLUB GLY801 (GREASE)	43	4822 528 10937	PULLEY
3 4822 463 11008	GUIDE LEFT	44	4822 522 10493	IDLER WHEEL
4 4822 463 11009	GUIDE RIGHT	45	4822 358 10115	BELT
21 4822 441 11615	DRAWER	46	4822 466 10735	ECCENTRIC GEAR WHEEL
22 4822 402 10088	BRACKET TUMBLER	50	4822 532 12364	WASHER
38 4822 502 12548	SCREW M2,6X3,5	51	4822 532 12364	WASHER
39 4822 502 12548	SCREW M2,6X3,5	52	4822 532 12364	WASHER
40 4822 463 11011	SLIDE	53	4822 532 12364	WASHER
41 4822 522 10509	CONTROL DISC	35	4822 361 10753	CARROUSEL MOTOR
42 4822 522 10492	GEAR WHEEL	70	4822 361 10753	CARROUSEL MOTOR

continued on next page


**MECHANICAL PARTSLIST 3CDC-99 MODULE**

73	4822 502 12548	SCREW M2,6X3,5	100	4822 691 10772	CD DRIVE VAM2201
74	4822 502 12548	SCREW M2,6X3,5	115	4822 466 10736	CARROUSEL
80	4822 528 10937	PULLEY	117	4822 532 12365	BUSH DRAWER
81	4822 522 10494	GEAR DRAWER	123	4822 402 11237	SWITCH BRACKET
82	4822 358 10115	BELT	125	4822 401 11708	DISC CLAMP
83	4822 532 12364	WASHER			
84	4822 532 12364	WASHER			
95	4822 404 10895	SUPPORT			
96	4822 529 10431	SUSPENSION			
97	4822 529 10431	SUSPENSION			



**ELECTRICAL PARTSLIST 3CDC-99 MODULE****MISCELLANEOUS**

1800	4822 265 10925	FLEX FOIL CONNECTOR 15PIN
1805	4822 265 11533	FLEX FOIL CONNECTOR 23PIN
1805	2422 025 09768	FLEX FOIL CONNECTOR 19PIN
1805	4822 267 51322	FLEX FOIL CONNECTOR 15PIN
1880	4822 276 13503	SWITCH
1881	4822 276 13503	SWITCH
1882	4822 276 13503	SWITCH
8001	4822 320 12659	FLEX FOIL 23PIN 480MM *
8001	4822 320 12729	FLEX FOIL 23PIN 400MM
8001	4822 320 12658	FLEX FOIL 19PIN 480MM
8001	4822 320 12232	FLEX FOIL 15PIN 480MM
8005	3103 308 91820	FLEX FOIL 15PIN 95MM

\* will be replaced by shorter length (400mm) when stock is out.

**CAPACITORS**

2800	4822 126 10053	180pF	10%	50V
2801	4822 122 10466	220pF	10%	50V
2802	4822 126 10053	180pF	10%	50V
2803	4822 122 10466	220pF	10%	50V
2804	4822 124 40246	4,7μF	20%	63V
2805	4822 122 10466	220pF	10%	50V
2806	4822 122 10466	220pF	10%	50V
2807	4822 126 12787	330pF	10%	50V
2808	4822 122 10466	220pF	10%	50V
2809	5322 124 41948	0,47μF	20%	50V
2810	4822 126 10053	180pF	10%	50V
2811	4822 122 10466	220pF	10%	50V
2814	4822 126 12785	47nF	20%	50V
2815	4822 126 12882	100nF	20%	50V
2816	4822 126 12878	1,5nF	10%	16V
2818	4822 126 12878	1,5nF	10%	16V
2822	4822 126 12339	2,2nF	10%	16V
2823	4822 122 33848	47pF	5%	50V
2824	4822 126 11585	22nF	20%	50V
2825	4822 126 12785	47nF	20%	50V
2826	4822 124 80231	47μF	20%	16V
2828	4822 124 40433	47μF	20%	25V
2829	4822 124 21732	10μF	20%	25V
2830	4822 126 12785	47nF	20%	50V
2831	4822 122 33195	100pF	10%	50V
2832	4822 122 33195	100pF	10%	50V
2833	4822 122 33069	33pF	5%	50V
2834	4822 122 33069	33pF	5%	50V
2835	4822 126 12785	47nF	20%	50V
2837	4822 124 40433	47μF	20%	25V
2838	4822 124 41579	10μF	20%	50V
2839	4822 124 40433	47μF	20%	25V
2840	4822 126 12882	100nF	20%	50V
2841	4822 126 12702	270pF	10%	50V
2842	4822 126 12339	2,2nF	10%	16V
2844	4822 126 12702	270pF	10%	50V
2849	4822 124 40246	4,7μF	20%	63V
2850	4822 122 33197	1nF	10%	50V
2851	4822 124 40196	220μF	20%	16V
2852	4822 126 12785	47nF	20%	50V
2853	4822 126 11585	22nF	20%	50V
2854	4822 126 12785	47nF	20%	50V
2855	4822 122 33519	470pF	10%	50V
2856	4822 122 33848	47pF	5%	50V
2857	4822 121 51387	10nF	20%	16V
2858	4822 124 40196	220μF	20%	16V
2859	4822 121 51387	10nF	20%	16V
2860	4822 124 41579	10μF	20%	50V
2861	4822 124 41579	10μF	20%	50V

**CAPACITORS**

2862	4822 122 10466	220pF	10%	50V
2863	4822 122 10466	220pF	10%	50V
2864	4822 122 33191	22pF	5%	50V
2865	4822 126 11585	22nF	20%	50V
2867	4822 122 10466	220pF	10%	50V
2869	4822 126 12785	47nF	20%	50V
2872	4822 126 12785	47nF	20%	50V
2873	4822 124 12233	47μF	20%	25V
2875	4822 126 11585	22nF	20%	50V
2876	4822 124 40196	220μF	20%	16V
2877	4822 122 10319	82pF	5%	50V
2878	4822 122 10466	220pF	10%	50V
2879	4822 126 12785	47nF	20%	50V
2882	4822 122 10466	220pF	10%	50V
2884	4822 124 40246	4,7μF	20%	63V
2885	4822 124 40246	4,7μF	20%	63V
2887	4822 126 12882	100nF	20%	50V
2888	4822 124 40246	4,7μF	20%	63V
2891	4822 122 10576	1,8nF	10%	16V
2892	4822 126 11714	4,7nF	20%	16V
2893	4822 122 10466	220pF	10%	50V

**RESISTORS**

3700	4822 116 83883	470Ω	5%	0,16W
3705	4822 116 83872	220Ω	5%	0,5W
3706	4822 116 83883	470Ω	5%	0,16W
3707	4822 116 83883	470Ω	5%	0,16W
3708	4822 116 83883	470Ω	5%	0,16W
3709	4822 116 83864	10kΩ	5%	0,5W
3711	4822 116 83864	10kΩ	5%	0,5W
3712	4822 116 52176	10Ω	5%	0,5W
3713	4822 116 52257	22kΩ	5%	0,5W
3714	4822 116 83864	10kΩ	5%	0,5W
3715	4822 116 52234	100kΩ	5%	0,5W
3716	4822 116 83883	470Ω	5%	0,16W
3718	4822 116 52283	4,7kΩ	5%	0,5W
3727	4822 116 52283	4,7kΩ	5%	0,5W
3728	4822 116 52283	4,7kΩ	5%	0,5W
3730	4822 116 52271	33kΩ	5%	0,16W
3731	4822 116 83864	10kΩ	5%	0,5W
3740	4822 116 52257	22kΩ	5%	0,5W
3741	4822 116 52257	22kΩ	5%	0,5W
3742	4822 116 52257	22kΩ	5%	0,5W
3743	4822 116 52257	22kΩ	5%	0,5W
3744	4822 116 83864	10kΩ	5%	0,5W
3746	4822 116 83864	10kΩ	5%	0,5W
3750	4822 050 11002	1kΩ	5%	0,2W
3751	4822 050 11002	1kΩ	5%	0,2W
3800	4822 116 52291	56kΩ	5%	0,5W
3801	4822 116 83864	10kΩ	5%	0,5W
3802	4822 116 52291	56kΩ	5%	0,5W
3803	4822 116 83864	10kΩ	5%	0,5W
3805	4822 116 83864	10kΩ	5%	0,5W
3806	4822 116 83864	10kΩ	5%	0,5W
3807	4822 116 83864	10kΩ	5%	0,5W
3808	4822 116 83864	10kΩ	5%	0,5W
3809	4822 116 83876	270Ω	5%	0,16W
3811	4822 116 52251	18kΩ	5%	0,5W
3812	4822 053 10228	2,2Ω	5%	1W
3814	4822 116 52191	33Ω	5%	0,5W
3815	4822 052 10478	4,7Ω	5%	NFR
3819	4822 116 83883	470Ω	5%	0,16W
3820	4822 116 52283	4,7kΩ	5%	0,5W
3821	4822 116 52283	4,7kΩ	5%	0,5W

**ELECTRICAL PARTSLIST 3CDC-99 MODULE****RESISTORS**

3822	4822 116 52249	1,8kΩ	5%	0,16W
3823	4822 050 11002	1kΩ	5%	0,2W
3824	4822 050 11002	1kΩ	5%	0,2W
3825	4822 050 11002	1kΩ	5%	0,2W
3826	4822 116 52257	22kΩ	5%	0,5W

3827	4822 116 52271	33kΩ	5%	0,16W
3828	4822 116 52257	22kΩ	5%	0,5W
3831	4822 116 52257	22kΩ	5%	0,5W
3832	4822 116 83864	10kΩ	5%	0,5W
3833	4822 116 52257	22kΩ	5%	0,5W

3834	4822 116 52257	22kΩ	5%	0,5W
3835	4822 052 10338	3,3Ω		NFR25
3837	4822 050 11002	1kΩ	5%	0,2W
3838	4822 050 11002	1kΩ	5%	0,2W
3839	4822 116 52234	100kΩ	5%	0,5W

3840	4822 116 52234	100kΩ	5%	0,5W
3841	4822 116 52283	4,7kΩ	5%	0,5W
3842	4822 116 83884	47kΩ	5%	0,16W
3843	4822 116 52271	33kΩ	5%	0,16W
3844	4822 116 52283	4,7kΩ	5%	0,5W

3845	4822 116 83884	47kΩ	5%	0,16W
3846	4822 116 52271	33kΩ	5%	0,16W
3847	4822 116 83961	6,8kΩ	5%	0,16W
3848	4822 116 52234	100kΩ	5%	0,5W
3849	4822 116 52234	100kΩ	5%	0,5W

3850	4822 116 52276	3,9kΩ	5%	0,5W
3851	4822 052 10338	3,3Ω		NFR25
3852	4822 052 10228	2,2Ω	5%	0,33W
3853	4822 116 83883	470Ω	5%	0,16W
3854	4822 116 52175	100Ω	5%	0,5W

3855	4822 116 52175	100Ω	5%	0,5W
3857	4822 116 52191	33Ω	5%	0,5W
3858	4822 116 52257	22kΩ	5%	0,5W
3859	4822 116 52257	22kΩ	5%	0,5W
3860	4822 116 83864	10kΩ	5%	0,5W

3861	4822 116 83864	10kΩ	5%	0,5W
3862	4822 116 52175	100Ω	5%	0,5W
3863	4822 116 52175	100Ω	5%	0,5W
3863	4822 116 52191	33Ω	5%	0,5W
3864	4822 116 52175	100Ω	5%	0,5W

3866	4822 116 83864	10kΩ	5%	0,5W
3867	4822 116 83868	150Ω	5%	0,5W
3869	4822 050 24708	4,7Ω	1%	0,6W
3870	4822 116 52175	100Ω	5%	0,5W
3871	4822 116 83864	10kΩ	5%	0,5W

3872	4822 116 83864	10kΩ	5%	0,5W
3873	4822 116 83883	470Ω	5%	0,16W
3874	4822 116 83864	10kΩ	5%	0,5W
3875	4822 116 83864	10kΩ	5%	0,5W
3876	4822 116 83864	10kΩ	5%	0,5W

3877	4822 116 83864	10kΩ	5%	0,5W
3878	4822 116 83864	10kΩ	5%	0,5W
3879	4822 116 83864	10kΩ	5%	0,5W
3880	4822 116 52219	330Ω	5%	0,5W
3881	4822 116 83864	10kΩ	5%	0,5W

3882	4822 116 83884	47kΩ	5%	0,16W
3883	4822 116 52234	100kΩ	5%	0,5W
3884	4822 116 52276	3,9kΩ	5%	0,5W
3885	4822 116 52234	100kΩ	5%	0,5W
3886	4822 116 83884	47kΩ	5%	0,16W

3887	4822 116 83883	470Ω	5%	0,16W
3888	4822 116 83864	10kΩ	5%	0,5W
3889	4822 116 83883	470Ω	5%	0,16W
3890	4822 050 11002	1kΩ	5%	0,2W
3891	4822 050 11002	1kΩ	5%	0,2W

**RESISTORS**

3892	4822 116 83883	470Ω	5%	0,16W
3893	4822 116 83883	470Ω	5%	0,16W
3894	4822 116 52191	33Ω	5%	0,5W
3895	4822 116 52176	10Ω	5%	0,5W
3897	4822 116 52175	100Ω	5%	0,5W

3899	4822 116 52175	100Ω	5%	0,5W
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**COILS**

1810	4822 242 10849	QUARTZ 8,46MHz
1810	4822 242 73557	CERAMIC RES. 8,46MHz
5802	4822 156 31058	FILTER DIGITAL OUT

**DIODES**

6871	4822 130 30621	1N4148
6872	4822 130 30621	1N4148
6873	4822 130 30621	1N4148
6874	4822 130 30621	1N4148
6875	4822 130 34233	BZX79-B5V1

6877	4822 130 31981	BZX79-C3V9
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**TRANSISTORS**

7812	4822 130 40959	BC547B
7874	4822 130 40959	BC547B
7875	4822 130 40959	BC547B

**INTEGRATED CIRCUITS**

7801 ©	4822 209 17286	TZA1024T/N1 HF-AMPLIFIER
7805	4822 209 17284	TDA1308 OPAMP
7806	4822 209 32852	TDA7073A/N2 SERVO DRIVER
7807	4822 209 32852	TDA7073A/N2 MOTOR DRIVER
7871	4822 209 32852	TDA7073A/N2 MOTOR DRIVER

7873	5322 209 10421	HEF4094BP SHIFT REGISTER
7876 ©	4822 209 16143	LC89170M CD TEXT
7877 ©	4822 209 17285	SAA7324H/M1 SIGNAL PROCESSOR

# COMBI BOARD

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Brief introduction of the Combi Board

- 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, -26V, 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 deliver commands from the μP to control the AF functions which include source selection (A0 & A1 control lines), DSC modes , DBB, IS and CD\_STBY. Other control lines such as MUTE, AMPON, STBY and PWM are coming directly from the μP 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 (HEF4052BT). Karaoke mic. mixing is connected to th e 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 selected BC557B) and PWM control signal from μP. 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 4 DSC modes. The sound features are realised with a hex-inverter IC 7530 (HEF4069UBT) as analog buffer/amplifier and transistors as electronic switches controlled by the shift registers (AF control).

e) POWER AMPLIFIER  
IC 7391 (AN7125) is used as power amplifier.

f) CD\_STBY CONTROL  
This Transistor 7401 (BC337-25) 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.

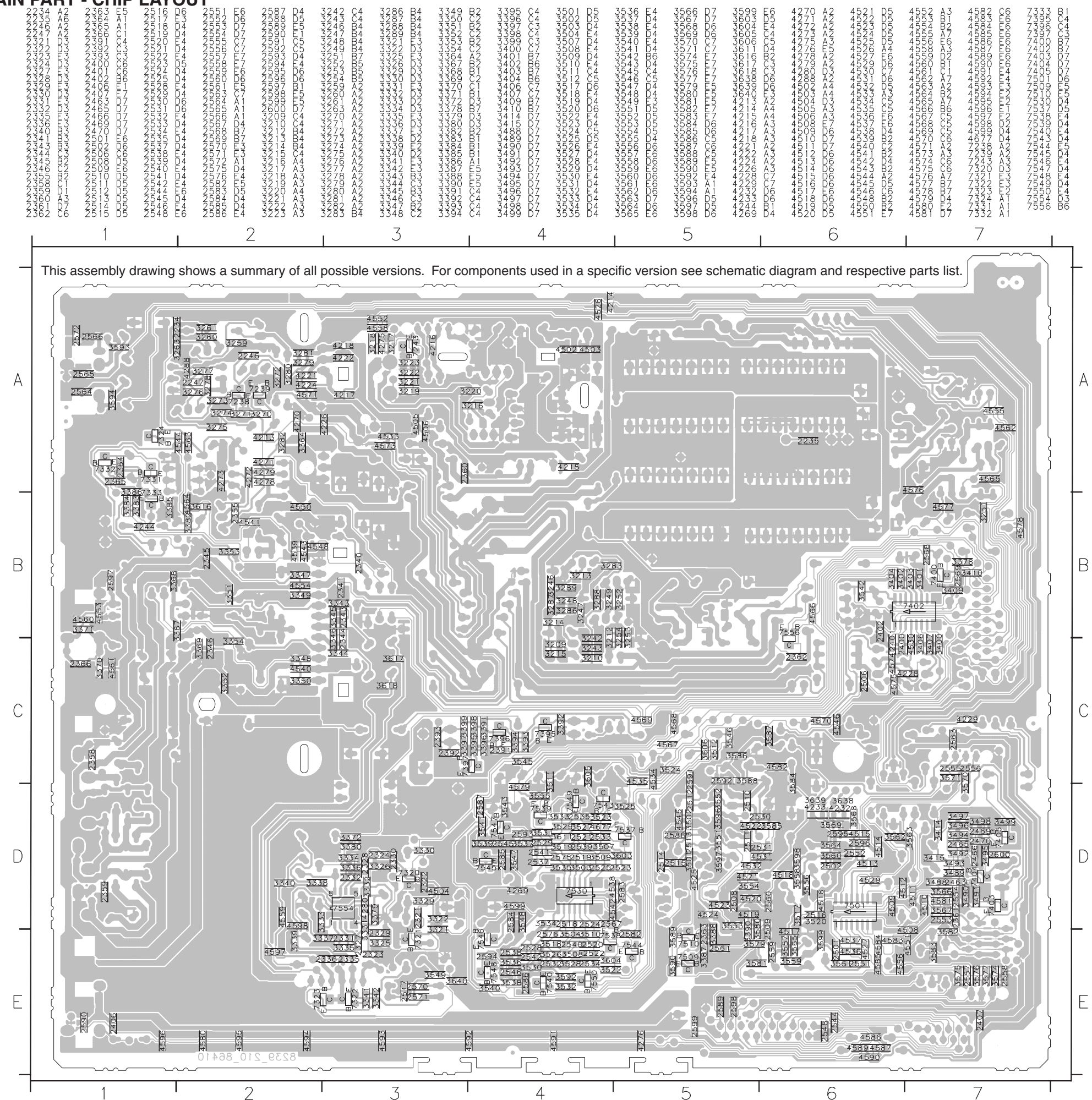
g) MATRIX SURROUND OUTPUT  
The matrix surround feature is provided on board. This feature is only optional on certain type version.
- D. KARAOKE PART  
This simple Karaoke consists of a 1-mic. mono amplifier using discrete components. It has a level control using a rotary potmeter. This feature is available for some version only.
- E. HEADPHONE PART  
The headphone output is derived from the power amplifier output after the attenuation resistors which are tailored to deliver 18mW output power into a 32 ohm headphone.
- F. CDC KEY PART  
The CDC key buttons and LEDs are provided on this board.

Combi Board application

A262	FW-C3/37, FW-C35/37
A263	FW-C30/37
A264	FW-C30/21/21M
A265	FW-C30/30
A266	FW-C38/21/21M
A267	FW-C39/30
A268	FW-C39/33
A269	FW-C28/33
A270	FW-C38/22/34
A271	FW-C28/22/34
A278	FW-C38/37
A279	FW-C39/21/21M
A343	FW-V39/21K/21M

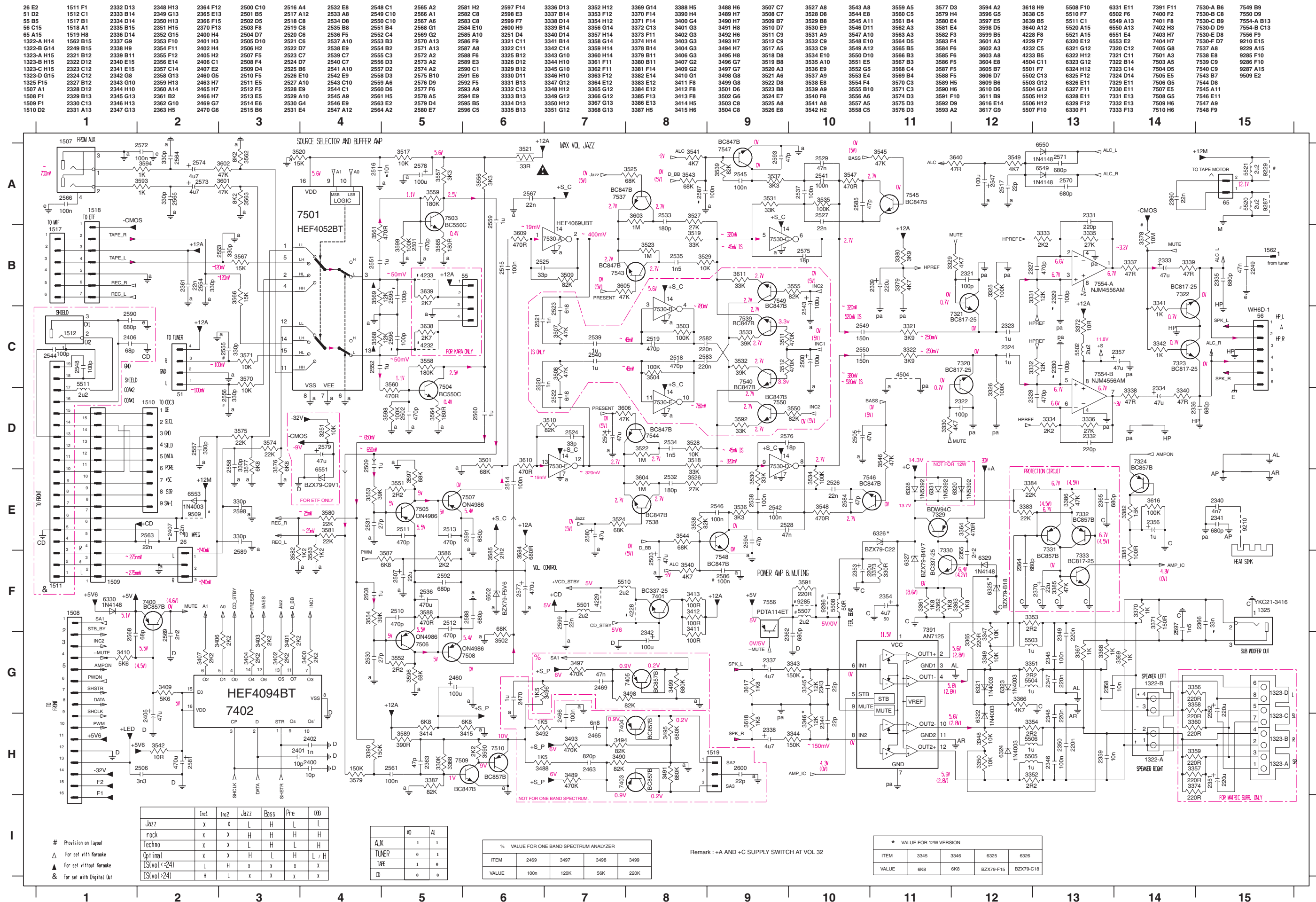
Features/Configuration:	A262	A263	A264	A265	A266	A267	A268	A269	A270	A271	A28	A279	A343
Aux In	x	x	x	x	x	x	x	x	x	x	x	x	x
Sub-woofer Out	x	x	x	x	x	x	x	-	x	-	x	x	x
Digital Out	-	-	-	-	x	x	x	-	x	-	x	x	-
I.S.	-	-	-	-	x	x	x	-	x	-	x	x	x
Voltage Selector	-	-	x	-	x	-	-	-	-	-	-	x	x
Karaoke	-	-	x	-	x	-	x	x	-	-	-	-	x
DBB	x	x	x	x	x	x	x	x	x	x	x	x	x
DSC	x	x	x	x	x	x	x	x	x	x	x	x	x
Matrix Surroud	-	x	-	-	x	x	x	-	-	-	x	x	x
1-band Spectrum Analyser	x	x	x	x	-	-	-	x	-	x	-	-	-
3-band Spectrum Analyser	-	-	-	-	x	x	x	-	x	-	x	x	x
12W	-	-	-	-	-	-	-	x	-	x	-	-	-
25W	x	x	x	x	x	x	x	-	x	-	x	x	x
VCD	-	-	-	-	-	-	-	-	-	-	-	-	x
NTC	-	-	-	-	-	-	-	-	-	-	-	-	-
ECO-MTF	x	x	x	x	-	-	-	-	-	-	-	-	-
ETF7	-	-	-	-	x	x	x	x	x	x	x	x	x







## CIRCUIT DIAGRAM - SOURCE SELECT &amp; AMPLIFIER PART

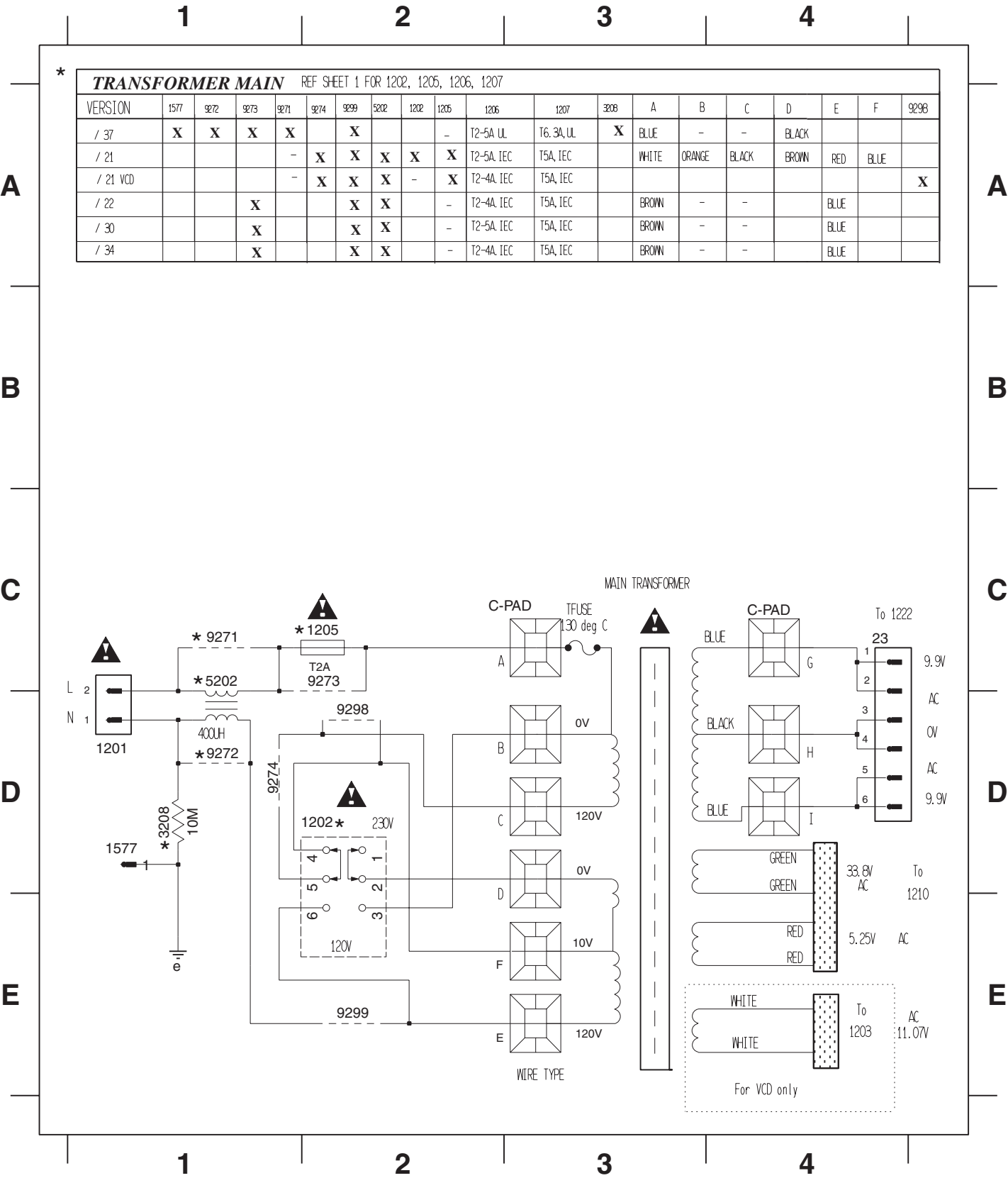


[illegible]

25 E7	3261 D9	6257 C7
1203 E1	3263 C9	6258 D7
1206 A1	3264 C3	6259 C5
1207 B1	3265 D4	6260 B5
1208 C2	3266 D4	6261 C3
1209 E1	3268 D4	6262 B3
1210 C1	3269 D3	6263 C3
1220 B1	3270 E8	6264 B3
1223 B1	3271 D8	6265 C4
1391 A9	3272 D7	6266 B4
1392 A7	3273 D7	6267 C5
1560 E9	3274 D6	6268 B5
1561 E9	3275 C6	6269 C7
1563 E9	3276 D8	6391 A9
1564 E9	3277 C8	7233 B7
1566 F9	3278 C7	7234 B8
1567 F9	3279 C7	7235 C8
1568 F9	3280 C7	7236 C7
1569 D1	3281 C6	7237 D7
1570 F9	3282 C6	7238 D8
1571 F5	3283 B6	7239 E8
2219 A2	3286 A3	7240 A5
2220 B1	3287 B3	7241 A5
2221 C1	3288 A4	7243 F3
2222 C5	3289 A4	7244 E3
2223 C5	3391 A9	7245 E4
2224 D5	3392 B9	7246 E5
2225 A1	3393 A9	7247 A5
2226 A6	3394 B8	7248 A3
2227 C3	3395 A8	7249 C3
2228 D3	3396 A8	7250 B7
2229 D2	3397 A7	7395 A9
2230 E2	3398 A7	7396 A8
2231 E2	3399 A7	7397 A8
2232 E3	4215 F7	
2233 F5	4216 F8	
2234 D9	4217 C6	
2235 E9	4218 B6	
2242 B6	4221 C7	
2243 B5	4222 C7	
2245 C8	4224 B7	
2246 D7	4226 B9	
2247 C8	4502 D1	
2248 C6	4503 D1	
2391 B8	6220 B2	
2392 B8	6221 C2	
2393 B7	6222 B3	
3209 A3	6223 C3	
3210 A4	6224 B4	
3212 A6	6225 C4	
3213 A6	6226 B4	
3214 A3	6227 C4	
3215 A3	6228 D5	
3216 E5	6229 D3	
3217 F4	6230 C2	
3218 F4	6231 C4	
3219 E3	6232 C5	
3220 E3	6233 D5	
3221 E4	6235 C9	
3222 E4	6236 A6	
3223 E3	6240 B2	
3242 A4	6241 C2	
3243 A4	6242 B3	
3246 B4	6243 C3	
3247 A3	6244 B4	
3248 B3	6245 C4	
3249 A4	6248 B2	
3252 A5	6249 C2	
3253 A6	6250 B4	
3254 A6	6251 C4	
3256 C5	6252 E2	
3257 D5	6253 E2	
3258 D5	6254 E2	
3259 C8	6255 E2	
3260 D8	6256 E5	

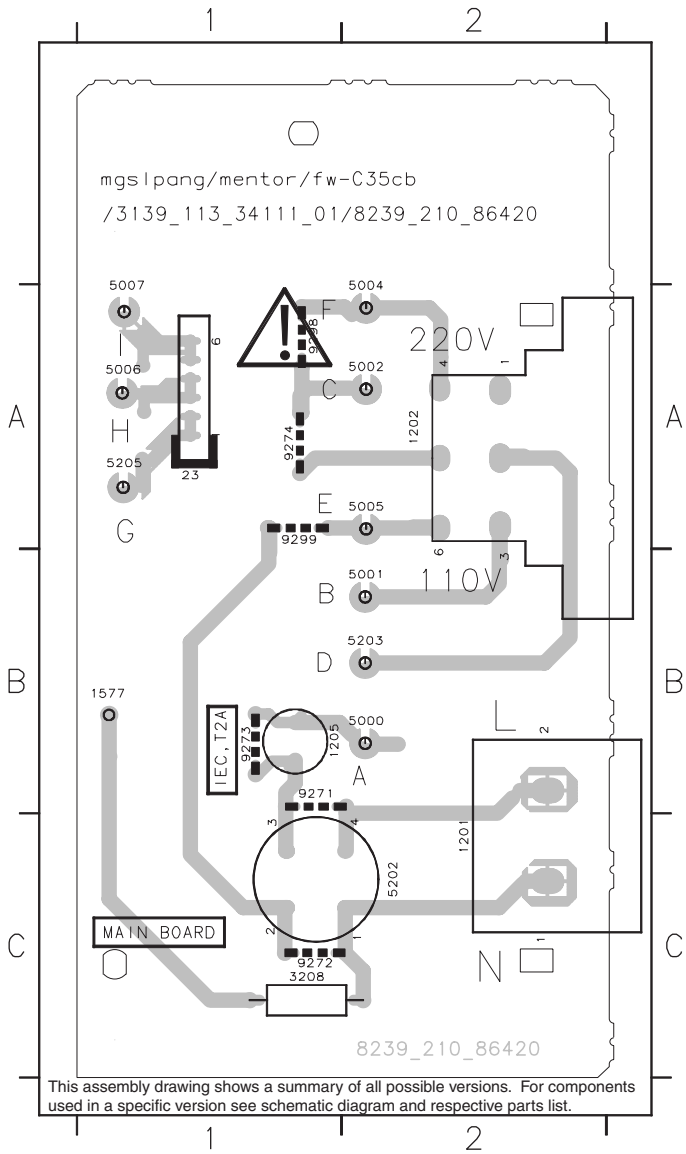
CIRCUIT DIAGRAM - TRANSFORMER PRIMARY PART

23 C4    1202 D1    1577 D1    5202 C1    9272 D1    9274 D1    9299 E2  
1201 D1    1205 C2    3208 D1    9271 C1    9273 C2    9298 D2

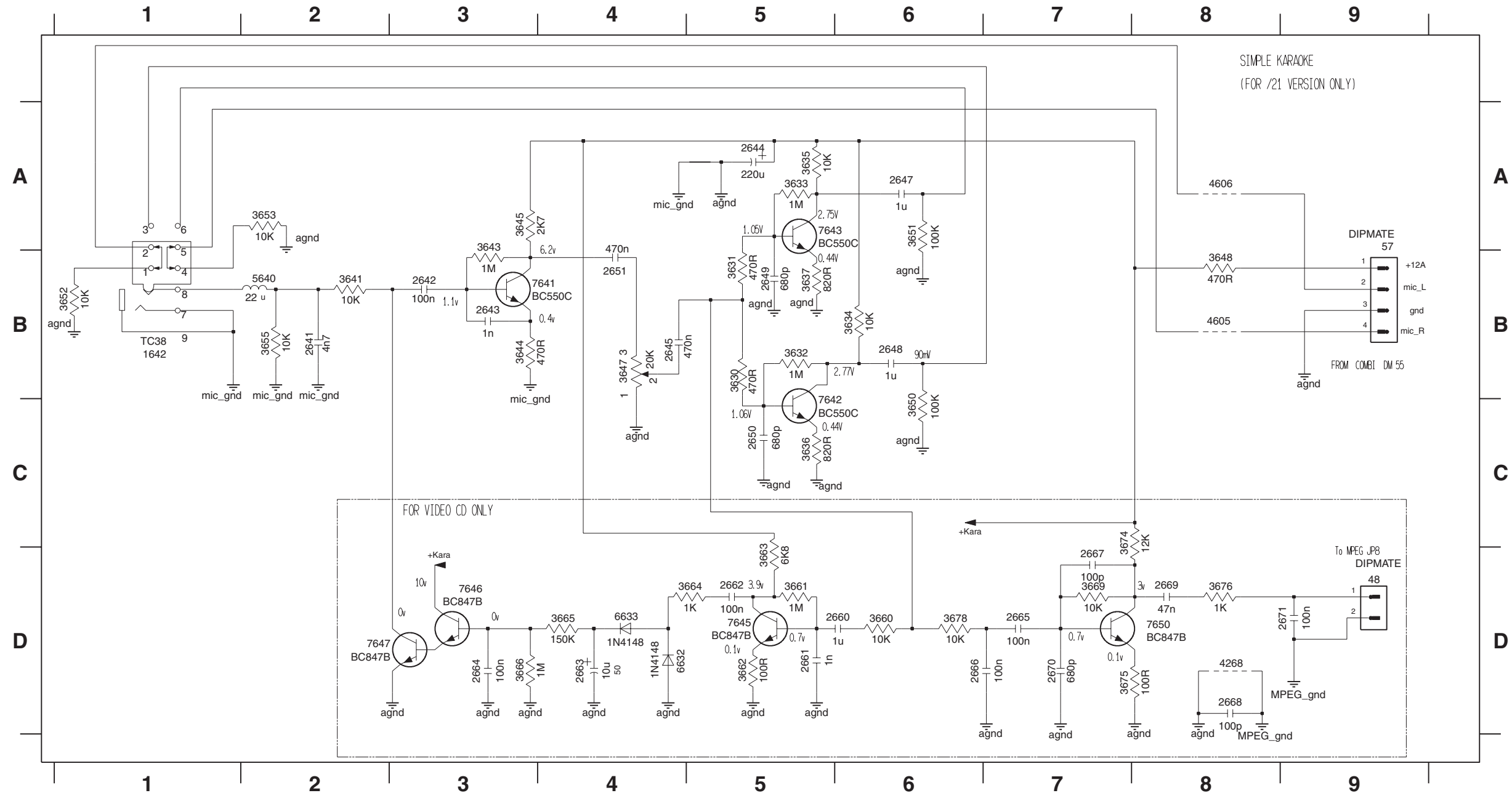


LAYOUT DIAGRAM - TRANSFORMER PRIMARY PART

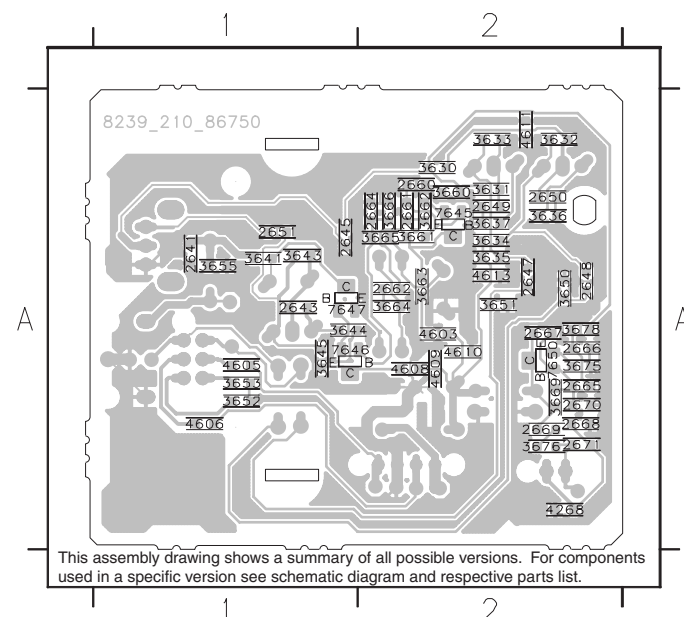
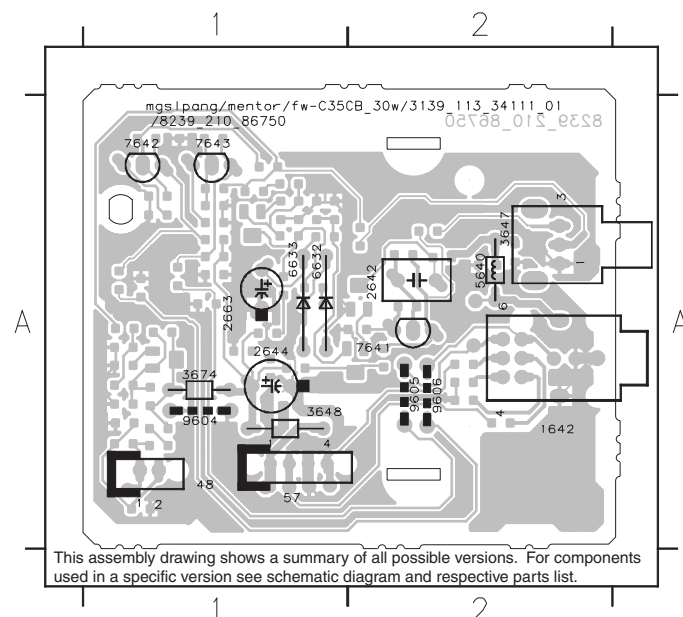
23 A1    1577 B1    5002 A2    5007 A1    9271 B1    9298 A1  
1201 C2    3208 C1    5004 A2    5202 C2    9272 C1    9299 A1  
1202 A2    5000 B2    5005 A2    5203 B2    9273 B1  
1205 B1    5001 B2    5006 A1    5205 A1    9274 A1



## CIRCUIT & LAYOUT DIAGRAMS - KARAOKE PART

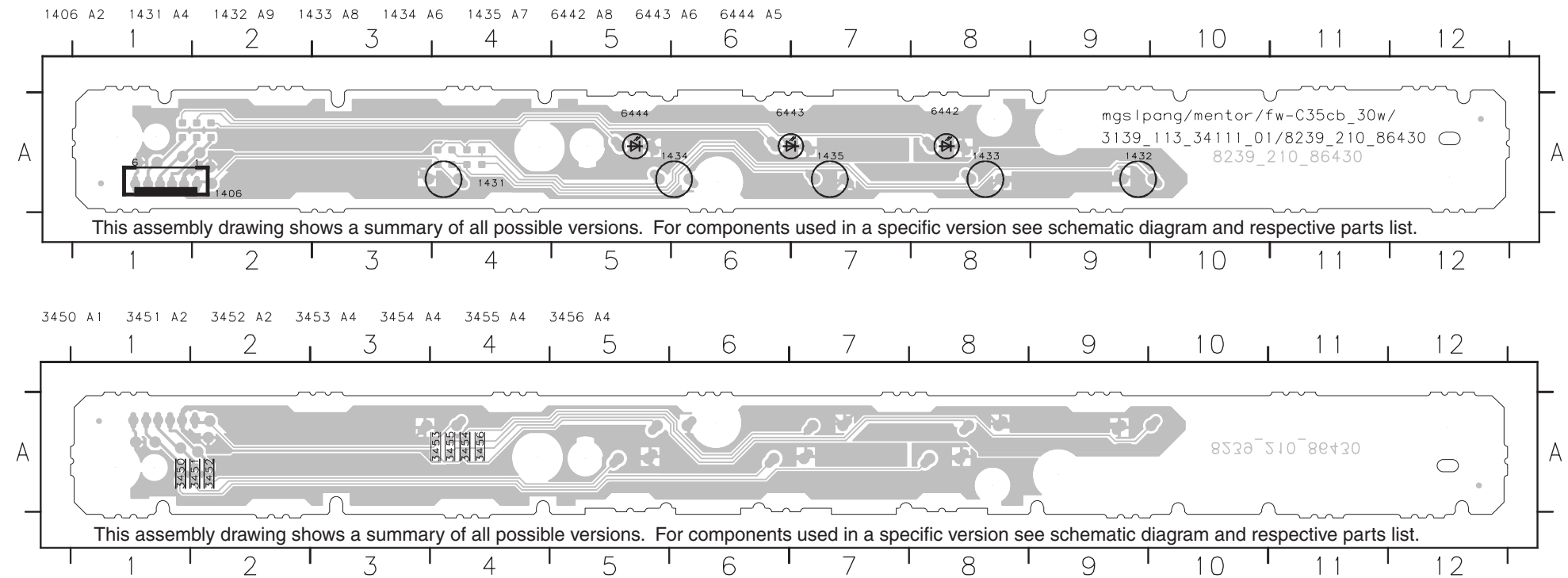
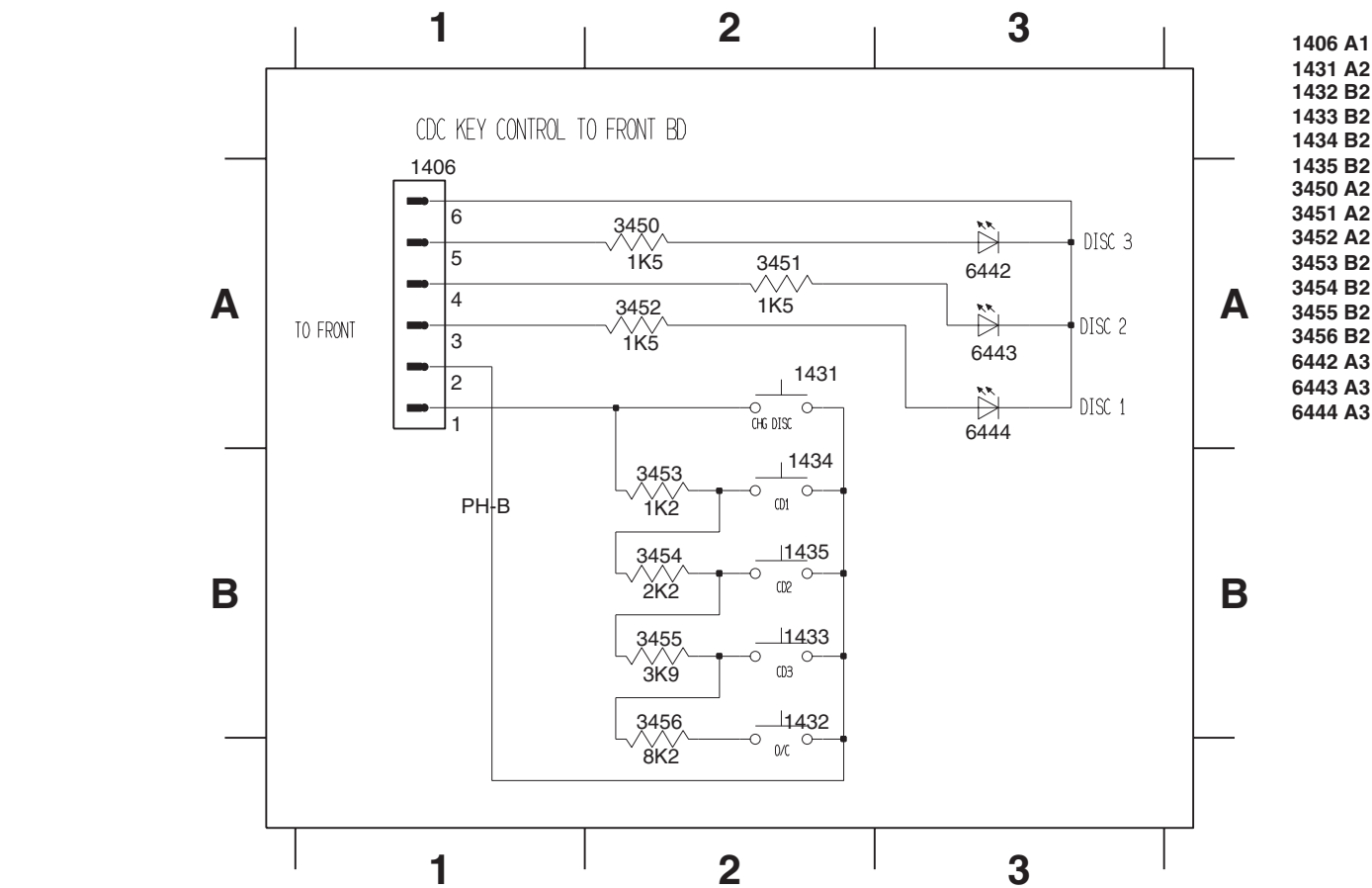


48 D9	5640 B2
57 A9	6632 D4
1642 B1	6633 D4
2641 B2	7641 B3
2642 B3	7642 C5
2643 B3	7643 A5
2644 A5	7645 D5
2645 B4	7646 D3
2647 A6	7647 D3
2648 B6	7650 D8
2649 B5	
2650 C5	
2651 B4	
2660 D6	
2661 D5	
2662 D5	
2663 D4	
2664 D3	
2665 D7	
2666 D6	
2667 D7	
2668 D8	
2669 D8	
2670 D7	
2671 D9	
3630 B5	
3631 B5	
3632 B5	
3633 A5	
3634 B6	
3635 A5	
3636 C5	
3637 B5	
3641 B2	
3643 B3	
3644 B3	
3645 A3	
3647 B4	
3648 B8	
3650 C6	
3651 A6	
3652 B1	
3653 A2	
3655 B2	
3660 D6	
3661 D5	
3662 D5	
3663 D5	
3664 D5	
3665 D4	
3666 D3	
3669 D7	
3674 C7	
3675 D7	
3676 D8	
3678 D6	
4268 D8	
4605 B8	
4606 A8	

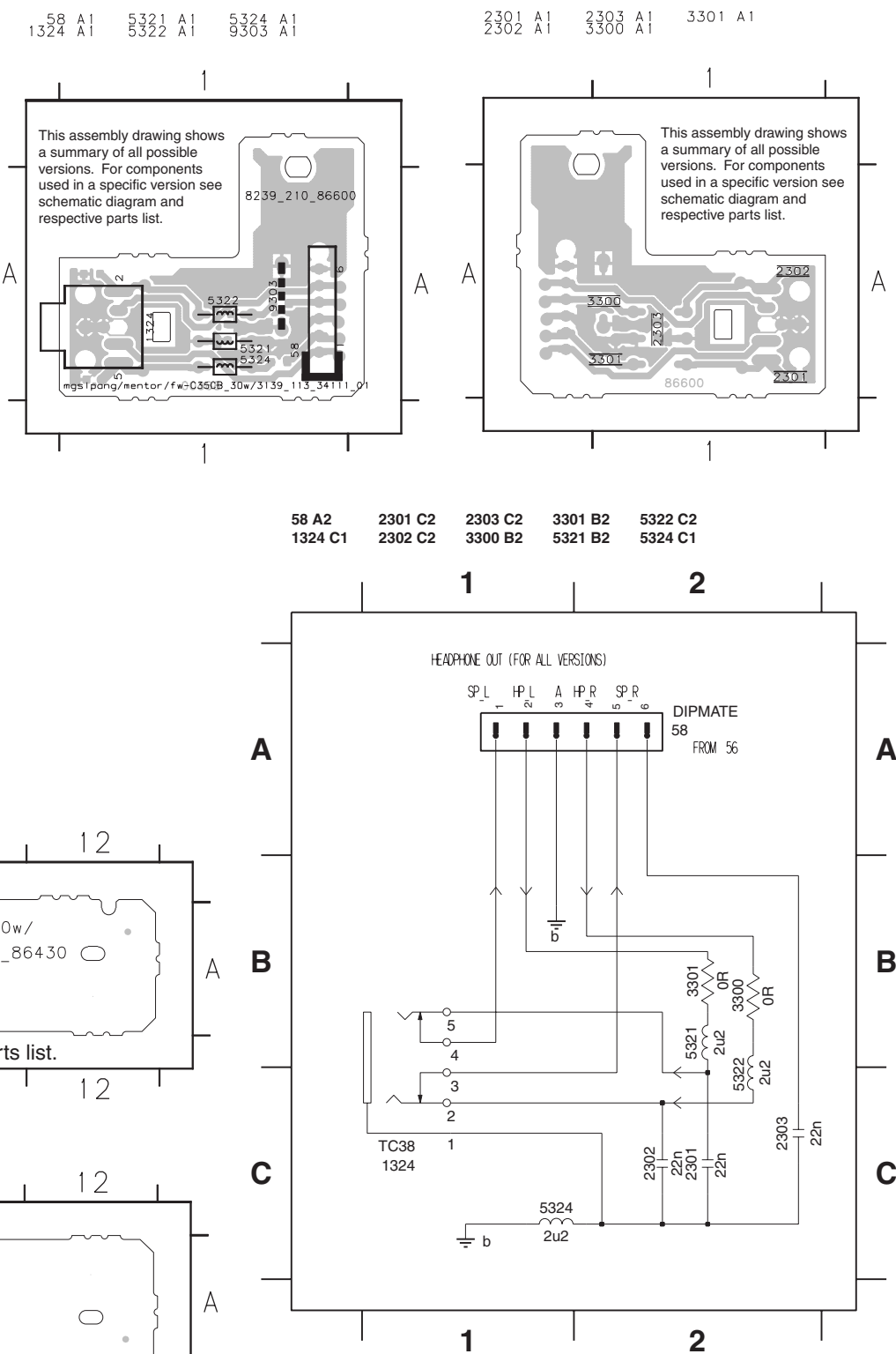




CIRCUIT & LAYOUT DIAGRAMS - CDC KEY PART



CIRCUIT & LAYOUT DIAGRAMS - HEADPHONE PART



ELECTRICAL PARTS LIST - COMBI BOARD

MISCELLANEOUS

1201	482226531015	△	Mains Socket /21/21M/30
1201	482226531016	△	Mains Socket /37
1202	482227210269	△	Voltage Selector /21/21M
1205	482207152002	△	Fuse T2A 250V /21/21M
1206	482207155002	△	Fuse T5A 250V
1207	482207155002	△	Fuse T5A 250V /21/21M/30
1207	482225251123	△	Fuse T6,3A 250V /37
1208	482207153151	△	Fuse T315mA 250V /21/21M/30
1208	482225251151	△	Fuse T315mA 250V /37
1322	482226731176		Loudspeaker Socket L/R
1323	242201518280		Loudspeaker Socket Matrix
1324	482226511547		Headphone Socket
1325	482226731729		Sub-woofer out Socket
1431	482227613775		Tact Switch
1432	482227613775		Tact Switch
1433	482227613775		Tact Switch
1434	482227613775		Tact Switch
1435	482227613775		Tact Switch
1507	482226520553		Aux-in Socket
1508	242202514526		Flex Socket 16pin Vert.
1509	482226510981		Flex Socket 15pin Vert.
1510	482226511532		Flex Socket 9pin Vert.
1517	482226710731		Flex Socket 6pin Vert.
1642	482226511529		Mic Socket /21/21M

CAPACITORS

2219	482212442367		3300µF 20% 35V
2220	532212142386		100nF 5% 63V
2221	532212142386		100nF 5% 63V
2222	482212421913		1µF 20% 63V
2223	482212421913		1µF 20% 63V
2224	482212143526		47nF 5% 250V
2226	482212480144		220µF 20% 25V
2227	482212440255		100µF 20% 63V
2228	482212441751		47µF 20% 50V
2229	532212142386		100nF 5% 63V
2234	532212234098		10nF 10% 63V
2242	482212480415		4700µF 20% 50V
2245	482212481144		1000µF 20% 16V
2246	532212231647		1nF 10% 63V
2247	532212231647		1nF 10% 63V
2248	482212440433		47µF 20% 25V
2249	482212143526		47nF 5% 250V
2301	532212232654		22nF 10% 63V
2302	532212232654		22nF 10% 63V
2303	532212232654		22nF 10% 63V
2321	532212232531		100pF 5% 50V
2322	532212232531		100pF 5% 50V
2323	482212614043		1µF +80/-20% 16V
2324	482212614043		1µF +80/-20% 16V
2327	532212234099		470pF 10% 63V
2328	532212234099		470pF 10% 63V

ELECTRICAL PARTS LIST - COMBI BOARD

2511	532212234099		470pF 10% 63V
2512	532212234099		470pF 10% 63V
2513	532212234099		470pF 10% 63V
2514	482212614585		100nF 10% 50V
2515	482212614585		100nF 10% 50V
2517	532212232658		22pF 5% 50V
2524	532212232659		33pF 5% 50V
2525	532212232659		33pF 5% 50V
2526	482212141856		22nF 5% 250V
2527	482212141856		22nF 5% 250V
2528	482212613751		47nF 10% 63V
2529	482212613751		47nF 10% 63V
2530	482212613691		27pF 1% 63V
2531	482212613691		27pF 1% 63V
2532	482212610326		180pF 5% 63V
2533	482212610326		180pF 5% 63V
2534	532212231865		1,5nF 10% 63V
2535	532212231865		1,5nF 10% 63V
2536	482212480195		470µF 20% 10V
2537	482212613838		100nF +80/-20% 50V
2538	482212613838		100nF +80/-20% 50V
2541	482212613838		100nF +80/-20% 50V
2542	482212613838		100nF +80/-20% 50V
2545	482212613838		100nF +80/-20% 50V
2546	482212613838		100nF +80/-20% 50V
2547	482212440207		100µF 20% 25V
2549	482212141854		150nF 5% 63V
2550	482212141854		150nF 5% 63V
2551	482212614043		1µF +80/-20% 16V
2552	482212614043		1µF +80/-20% 16V
2553	532212231863		330pF 5% 63V
2554	532212231863		330pF 5% 63V
2557	532212231863		330pF 5% 63V
2558	532212231863		330pF 5% 63V
2559	482212614043		1µF +80/-20% 16V
2560	482212614043		1µF +80/-20% 16V
2561	482212614585		100nF 10% 50V
2563	532212232654		22nF 10% 63V
2564	532212231863		330pF 5% 63V
2565	532212231863		330pF 5% 63V
2566	482212613838		100nF +80/-20% 50V
2567	532212232654		22nF 10% 63V
2568	482212613694		68pF 1% 63V
2569	482212233127		2,2nF 10% 63V
2570	482212232535		680pF 10% 63V
2571	482212232535		680pF 10% 63V
2572	482212613838		100nF +80/-20% 50V
2573	482212440769		4,7µF 20% 100V
2574	482212440769		4,7µF 20% 100V
2575	482212613689		18pF 1% 63V
2576	482212613689		18pF 1% 63V
2577	482212480195		470µF 20% 10V

RESISTORS

3208	482205321106		10M 5% 0,5W
3209	482205120478		4R7 5% 0,1W
3210	482205120478		4R7 5% 0,1W
3212	482205120109		10R 5% 0,1W
3213	482205120122		1k2 5% 0,1W
3214	482205120478		4R7 5% 0,1W
3215	482205120478		4R7 5% 0,1W
3242	482205120478		4R7 5% 0,1W
3243	482205120478		4R7 5% 0,1W
3246	482211713577		330R 1% 0,1W
3247	482211712521		68R 1% 0,1W
3248	482211713577		330R 1% 0,1W
3249	482211712521		68R 1% 0,1W
3252	482205110102		1k 2% 0,25W
3253	482205120109		10R 5% 0,1W
3254	482205120109		10R 5% 0,1W
3256	482205021003		10k 1% 0,6W
3257	482205021003		10k 1% 0,6W
3258	482211652283		4k7 5% 0,5W
3259	482211683933		15k 1% 0,1W
3260	482211711503		220R 1% 0,1W
3261	482211711383		12k 1% 0,1W
3263	482211711383		12k 1% 0,1W
3264	482211652289		5k6 5% 0,5W
3265	482211652257		22k 5% 0,5W
3266	482211683872		220R 5% 0,5W

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

3268	482211683872	220R 5% 0,5W
3269	482211652256	2k2 5% 0,5W
3270	482211710833	10k 1% 0,1W
3271	482211710833	10k 1% 0,1W
3272	482205120472	4k7 5% 0,1W
3273	482211711449	2k2 1% 0,1W
3274	482205120472	4k7 5% 0,1W
3275	482205120472	4k7 5% 0,1W
3276	482205120393	39k 5% 0,1W
3277	482211710834	47k 1% 0,1W
3278	482211710361	680R 1% 0,1W
3279	482211711139	1k5 1% 0,1W
3280	482211711139	1k5 1% 0,1W
3281	482211711139	1k5 1% 0,1W
3282	482211710833	10k 1% 0,1W
3283	482205120121	120R 5% 0,1W
3286	482211713577	330R 1% 0,1W
3287	482211713577	330R 1% 0,1W
3288	482211713577	330R 1% 0,1W
3289	482211713577	330R 1% 0,1W
3300	482205120008	0R Jumper 0805
3301	482205120008	0R Jumper 0805
3321	482205120392	3k9 5% 0,1W
3322	482205120392	3k9 5% 0,1W
3325	482211710837	100k 1% 0,1W
3326	482211710837	100k 1% 0,1W
3329	482205120472	4k7 5% 0,1W
3330	482205120472	4k7 5% 0,1W
3331	482211711383	12k 1% 0,1W
3332	482211711383	12k 1% 0,1W
3333	482211711449	2k2 1% 0,1W
3334	482211711449	2k2 1% 0,1W
3335	482205120273	27k 5% 0,1W
3336	482205120273	27k 5% 0,1W
3337	482205120479	47R 5% 0,1W
3338	482205120479	47R 5% 0,1W
3339	482205120479	47R 5% 0,1W
3340	482205120479	47R 5% 0,1W
3341	482205110102	1k 2% 0,25W
3342	482205110102	1k 2% 0,25W
3343	482205120154	150k 5% 0,1W
3344	482205120154	150k 5% 0,1W
3345	482211711383	12k 1% 0,1W
3346	482211711383	12k 1% 0,1W
3347	482211710833	10k 1% 0,1W
3348	482211710833	10k 1% 0,1W
3349	482211710833	10k 1% 0,1W
3350	482211710833	10k 1% 0,1W
3351	482205120228	2R2 5% 0,1W
3352	482205120228	2R2 5% 0,1W
3353	482205120228	2R2 5% 0,1W
3354	482205120228	2R2 5% 0,1W

3356	482211683872	220R 5% 0,5W
3357	482211683872	220R 5% 0,5W
3358	482211683872	220R 5% 0,5W
3359	482211683872	220R 5% 0,5W
3360	482211683872	220R 5% 0,5W
3361	482211652249	1k8 5% 0,5W
3362	482211652249	1k8 5% 0,5W
3363	482211652249	1k8 5% 0,5W
3364	482205120471	470R 5% 0,1W
3365	482211683872	220R 5% 0,5W
3366	482211652283	4k7 5% 0,5W
3367	482205110102	1k 2% 0,25W
3368	482205110102	1k 2% 0,25W
3369	482205110102	1k 2% 0,25W
3370	482205110102	1k 2% 0,25W
3371	482211710353	150R 1% 0,1W
3372	482205120109	10R 5% 0,1W
3373	482211652219	330R 5% 0,5W
3374	482211683872	220R 5% 0,5W
3379	482205120472	4k7 5% 0,1W
3380	482205120392	3k9 5% 0,1W
3381	482211652175	100R 5% 0,5W
3382	482211683933	15k 1% 0,1W
3383	482205120223	22k 5% 0,1W
3384	482205120223	22k 5% 0,1W
3385	482211710834	47k 1% 0,1W
3386	482211710834	47k 1% 0,1W
3387	482211711149	82k 1% 0,1W
3388	482205120334	330k 5% 0,1W
3390	482205120154	150k 5% 0,1W
3400	482211711449	2k2 1% 0,1W
3401	482211711449	2k2 1% 0,1W
3402	482211711449	2k2 1% 0,1W
3403	482211711449	2k2 1% 0,1W
3404	482211711449	2k2 1% 0,1W
3406	482211711449	2k2 1% 0,1W
3407	482211711449	2k2 1% 0,1W
3409	482205120562	5k6 5% 0,1W
3410	482205120562	5k6 5% 0,1W
3411	482211652175	100R 5% 0,5W
3412	482211652175	100R 5% 0,5W
3413	482211652175	100R 5% 0,5W
3414	482211711507	6k8 1% 0,1W
3415	482211711507	6k8 1% 0,1W
3450	482211711139	1k5 1% 0,1W
3451	482211711139	1k5 1% 0,1W
3452	482211711139	1k5 1% 0,1W
3453	482205120122	1k2 5% 0,1W
3454	482211711449	2k2 1% 0,1W
3455	482205120392	3k9 5% 0,1W
3456	482205120822	8k2 5% 0,1W
3496	482211711139	1k5 1% 0,1W

**ELECTRICAL PARTS LIST - COMBI BOARD**

3497	482205120124	120k 5% 0,1W
3498	482211711148	56k 1% 0,1W
3499	482211713579	220k 1% 0,1W
3501	482205120683	68k 5% 0,1W
3502	482205120683	68k 5% 0,1W
3509	482211711149	82k 1% 0,1W
3510	482211711149	82k 1% 0,1W
3517	482211710833	10k 1% 0,1W
3518	482205120333	33k 5% 0,1W
3519	482205120333	33k 5% 0,1W
3520	482211683933	15k 1% 0,1W
3521	482205210339	△ 33R 5% 0,33W
3522	482205120105	1M 5% 0,1W
3523	482205120105	1M 5% 0,1W
3524	482205120683	68k 5% 0,1W
3525	482205120683	68k 5% 0,1W
3526	482205120273	27k 5% 0,1W
3527	482205120273	27k 5% 0,1W
3528	482211710833	10k 1% 0,1W
3529	482211710833	10k 1% 0,1W
3530	482205120333	33k 5% 0,1W
3531	482205120333	33k 5% 0,1W
3534	482211710837	100k 1% 0,1W
3535	482211710837	100k 1% 0,1W
3536	482205120332	3k3 5% 0,1W
3537	482205120332	3k3 5% 0,1W
3538	482211711149	82k 1% 0,1W
3539	482211711149	82k 1% 0,1W
3540	482205120472	4k7 5% 0,1W
3541	482205120472	4k7 5% 0,1W
3542	482205120109	10R 5% 0,1W
3543	482205120683	68k 5% 0,1W
3544	482211652297	68k 5% 0,5W
3545	482211710834	47k 1% 0,1W
3546	482211710834	47k 1% 0,1W
3547	482205120471	470R 5% 0,1W
3548	482205120471	470R 5% 0,1W
3549	482205120472	4k7 5% 0,1W
3551	482205120228	2R2 5% 0,1W
3552	482205120228	2R2 5% 0,1W
3553	482205120393	39k 5% 0,1W
3554	482205120393	39k 5% 0,1W
3556	482205120332	3k3 5% 0,1W
3557	482205120332	3k3 5% 0,1W
3558	482205120184	180k 5% 0,1W
3559	482205120184	180k 5% 0,1W
3560	482205120471	470R 5% 0,1W
3561	482205120471	470R 5% 0,1W
3562	482205120822	8k2 5% 0,1W
3563	482205120822	8k2 5% 0,1W
3564	482211711448	180R 1% 0,1W
3565	482211711448	180R 1% 0,1W

3566	482211683933	15k 1% 0,1W
3567	482211683933	15k 1% 0,1W
3568	482211711383	12k 1% 0,1W
3569	482211711383	12k 1% 0,1W
3570	482211710833	10k 1% 0,1W
3571	482211710833	10k 1% 0,1W
3574	482205120223	22k 5% 0,1W
3575	482205120223	22k 5% 0,1W
3576	482211711507	6k8 1% 0,1W
3577	482211711507	6k8 1% 0,1W
3579	482205120154	150k 5% 0,1W
3580	482205120223	22k 5% 0,1W
3581	482205120223	22k 5% 0,1W
3582	482205120122	1k2 5% 0,1W
3583	482205120122	1k2 5% 0,1W
3584	482211710361	680R 1% 0,1W
3585	482205120228	2R2 5% 0,1W
3586	482211711449	2k2 1% 0,1W
3587	482211711507	6k8 1% 0,1W
3588	482205120471	470R 5% 0,1W
3589	482205120391	390R 5% 0,1W
3590	482211711449	2k2 1% 0,1W
3591	482211683883	220R 5% 0,5W
3593	482205110102	1k 2% 0,25W
3594	482205110102	1k 2% 0,25W
3596	482205120683	68k 5% 0,1W
3597	482205120683	68k 5% 0,1W
3598	482211710837	100k 1% 0,1W
3599	482211710837	100k 1% 0,1W
3601	482211683884	47k 5% 0,5W
3602	482211683884	47k 5% 0,5W
3603	482205120105	1M 5% 0,1W
3604	482205120105	1M 5% 0,1W
3605	482211710834	47k 1% 0,1W
3606	482211710834	47k 1% 0,1W
3609	482211683883	470R 5% 0,5W
3610	482211683883	470R 5% 0,5W
3616	482211710837	100k 1% 0,1W
3617	482205120182	1k8 5% 0,1W
3618	482205120182	1k8 5% 0,1W
3630	482205120471	470R 5% 0,1W
3631	482205120471	470R 5% 0,1W
3632	482205120105	1M 5% 0,1W
3633	482205120105	1M 5% 0,1W
3634	482211710833	10k 1% 0,1W
3635	482211710833	10k 1% 0,1W
3636	482211711454	820R 1% 0,1W
3637	482211711454	820R 1% 0,1W
3638	482211712955	2k7 1% 0,1
3639	482211712955	2k7 1% 0,1
3640	482205120479	47R 5% 0,1W
3641	482211710833	10k 1% 0,1W

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

3643	482205120105	1M 5% 0,1W	4525	482205120008	0R Jumper 0805
3644	482205120471	470R 5% 0,1W	4526	482205120008	0R Jumper 0805
3645	482211712955	2k7 1% 0,1W	4527	482205120008	0R Jumper 0805
3647	482210121204	Potm Rotary 20KA	4528	482205120008	0R Jumper 0805
3648	482211683883	470R 5% 0,5W	4529	482205120008	0R Jumper 0805
3650	482211710837	100k 1% 0,1W	4530	482205120008	0R Jumper 0805
3651	482211710837	100k 1% 0,1W	4531	482205120008	0R Jumper 0805
3652	482211710833	10k 1% 0,1W	4532	482205120008	0R Jumper 0805
3653	482211710833	10k 1% 0,1W	4533	482205120008	0R Jumper 0805
3655	482211710833	10k 1% 0,1W	4534	482205120008	0R Jumper 0805
3656	482205120008	0R Jumper 0805	4535	482205120008	0R Jumper 0805
3657	482205120008	0R Jumper 0805	4536	482205120008	0R Jumper 0805
4214	482205120008	0R Jumper 0805	4537	482205120008	0R Jumper 0805
4215	482205120008	0R Jumper 0805	4538	482205120008	0R Jumper 0805
4217	482205120008	0R Jumper 0805	4539	482205120008	0R Jumper 0805
4221	482205120008	0R Jumper 0805	4540	482205120008	0R Jumper 0805
4229	482205120008	0R Jumper 0805	4541	482205120008	0R Jumper 0805
4244	482205120008	0R Jumper 0805	4542	482205120008	0R Jumper 0805
4268	482205120008	0R Jumper 0805	4543	482205120008	0R Jumper 0805
4269	482205120008	0R Jumper 0805	4544	482205120008	0R Jumper 0805
4270	482205120008	0R Jumper 0805	4545	482205120008	0R Jumper 0805
4271	482205120008	0R Jumper 0805	4546	482205120008	0R Jumper 0805
4272	482205120008	0R Jumper 0805	4548	482205120008	0R Jumper 0805
4273	482205120008	0R Jumper 0805	4549	482205120008	0R Jumper 0805
4275	482205120008	0R Jumper 0805	4550	482205120008	0R Jumper 0805
4276	482205120008	0R Jumper 0805	4551	482205120008	0R Jumper 0805
4278	482205120008	0R Jumper 0805	4552	482205120008	0R Jumper 0805
4279	482205120008	0R Jumper 0805	4553	482205120008	0R Jumper 0805
4280	482205120008	0R Jumper 0805	4554	482205120008	0R Jumper 0805
4288	482205120008	0R Jumper 0805	4555	482205120008	0R Jumper 0805
4502	482205120008	0R Jumper 0805	4556	482205120008	0R Jumper 0805
4503	482205120008	0R Jumper 0805	4557	482205120008	0R Jumper 0805
4504	482205120008	0R Jumper 0805	4558	482205120008	0R Jumper 0805
4505	482205120008	0R Jumper 0805	4559	482205120008	0R Jumper 0805
4506	482205120008	0R Jumper 0805	4560	482205120008	0R Jumper 0805
4508	482205120008	0R Jumper 0805	4561	482205120008	0R Jumper 0805
4509	482205120008	0R Jumper 0805	4562	482205120008	0R Jumper 0805
4510	482205120008	0R Jumper 0805	4563	482205120008	0R Jumper 0805
4511	482205120008	0R Jumper 0805	4564	482205120008	0R Jumper 0805
4512	482205120008	0R Jumper 0805	4565	482205120008	0R Jumper 0805
4513	482205120008	0R Jumper 0805	4566	482205120008	0R Jumper 0805
4514	482205120008	0R Jumper 0805	4567	482205120008	0R Jumper 0805
4515	482205120008	0R Jumper 0805	4568	482205120008	0R Jumper 0805
4516	482205120008	0R Jumper 0805	4569	482205120008	0R Jumper 0805
4517	482205120008	0R Jumper 0805	4570	482205120008	0R Jumper 0805
4518	482205120008	0R Jumper 0805	4571	482205120008	0R Jumper 0805
4519	482205120008	0R Jumper 0805	4573	482205120008	0R Jumper 0805
4520	482205120008	0R Jumper 0805	4574	482205120008	0R Jumper 0805
4521	482205120008	0R Jumper 0805	4575	482205120008	0R Jumper 0805
4522	482205120008	0R Jumper 0805	4576	482205120008	0R Jumper 0805
4523	482205120008	0R Jumper 0805	4577	482205120008	0R Jumper 0805
4524	482205120008	0R Jumper 0805	4578	482205120008	0R Jumper 0805

**ELECTRICAL PARTS LIST - COMBI BOARD**

4579	482205120008	0R Jumper 0805	6225	482213031878	1N4003G
4580	482205120008	0R Jumper 0805	6226	482213031878	1N4003G
4581	482205120008	0R Jumper 0805	6227	482213031878	1N4003G
4582	482205120008	0R Jumper 0805	6228	482213034173	BZX79-B5V6
4583	482205120008	0R Jumper 0805	6229	482213034142	BZX79-B33
4584	482205120008	0R Jumper 0805	6230	482213031878	1N4003G
4585	482205120008	0R Jumper 0805	6231	482213034174	BZX79-B4V7
4586	482205120008	0R Jumper 0805	6232	482213030621	1N4148
4587	482205120008	0R Jumper 0805	6233	482213030621	1N4148
4589	482205120008	0R Jumper 0805	6235	482213030621	1N4148
4590	482205120008	0R Jumper 0805	6236	482213034174	BZX79-B4V7
4591	482205120008	0R Jumper 0805	6240	482213031878	1N4003G
4592	482205120008	0R Jumper 0805	6241	482213031878	1N4003G
4593	482205120008	0R Jumper 0805	6242	482213031878	1N4003G
4594	482205120008	0R Jumper 0805	6243	482213031878	1N4003G
4595	482205120008	0R Jumper 0805	6244	482213031878	1N4003G
4596	482205120008	0R Jumper 0805	6245	482213031878	1N4003G
4597	482205120008	0R Jumper 0805	6248	482213031878	1N4003G
4598	482205120008	0R Jumper 0805	6249	482213031878	1N4003G
4599	482205120008	0R Jumper 0805	6250	482213031878	1N4003G
4603	482205120008	0R Jumper 0805	6251	482213031878	1N4003G
4605	482205120008	0R Jumper 0805	6257	482213030621	1N4148
4606	482205120008	0R Jumper 0805	6258	482213034173	BZX79-C5V6
4608	482205120008	0R Jumper 0805	6259	482213031878	1N4003G
4609	482205120008	0R Jumper 0805	6260	482213031878	1N4003G
4610	482205120008	0R Jumper 0805	6261	482213031878	1N4003G
4611	482205120008	0R Jumper 0805	6262	482213031878	1N4003G
4613	482205120008	0R Jumper 0805	6263	482213031878	1N4003G
4677	482205120008	0R Jumper 0805	6264	482213031878	1N4003G

**COILS & FILTERS**

5202	482215711832	Mains Filter 400µH not for /37	6265	482213031878	1N4003G
5321	482215762552	Coil 2,2µH 5%	6266	482213031878	1N4003G
5322	482215762552	Coil 2,2µH 5%	6267	482213031878	1N4003G
5324	482215762552	Coil 2,2µH 5%	6268	482213031878	1N4003G
5501	482215762552	Coil 2,2µH 5%	6269	482213030621	1N4148
5502	482215762552	Coil 2,2µH 5%	6320	532213080686	1N5392
5503	482215762255	Coil 18,5 Turns 1µH	6321	482213031878	1N4003G
5504	482215762255	Coil 18,5 Turns 1µH	6322	482213031878	1N4003G
5505	482215762255	Coil 18,5 Turns 1µH	6323	482213031878	1N4003G
5506	482215762255	Coil 18,5 Turns 1µH	6324	482213031878	1N4003G
5508	482252610704	Fe Bead100MHZ	6325	482213031024	BZX79-B18
5510	482215762552	Coil 2,2µH 5%	6326	482213034441	BZX79-B22
5521	482215762552	Coil 2,2µH 5%	6327	482213034174	BZX79-B4V7
5640	482215711235	Coil 22µH 5%	6328	532213080686	1N5392

**DIODES**

6220	482213031878	1N4003G	6442	482213082978	LTL-16KPE-P
6221	482213031878	1N4003G	6443	482213082978	LTL-16KPE-P
6222	482213031878	1N4003G	6444	482213082978	LTL-16KPE-P
6223	482213031878	1N4003G	6502	482213034167	BZX79-F5V6
6224	482213031878	1N4003G	6549	482213030621	1N4148
			6550	482213030621	1N4148



**ELECTRICAL PARTS LIST - COMBI BOARD****DIODE**

6553	482213031878	1N4003G
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7642	482213041096	BC550C
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7643	482213041096	BC550C
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**TRANSISTORS & INTEGRATED CIRCUITS**

7233	932213922687	BD242BFP
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7234	532213044593	BC369
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7235	482213040959	BC547B
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7236	482213041246	BC327-25
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7237	482213040981	BC337-25
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7238	482213060511	BC847B
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7239	482213042804	BC817-25
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7240	482213040981	BC337-25
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7241	482213040981	BC337-25
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7247	482213040981	BC337-25
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7248	482213040981	BC337-25
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7249	482213041246	BC327-25
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7320	482213042804	BC817-25
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7321	482213042804	BC817-25
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7322	482213042804	BC817-25
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7323	482213042804	BC817-25
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7324	482213060373	BC857B
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7329	482213010847	BDW94C
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7330	482213040981	BC337-25
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7330	482213040981	BC337-25
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7331	482213060373	BC857B
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7332	482213060373	BC857B
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7333	482213042804	BC817-25
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7391	482220916224	AN7125
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7400	482213060373	BC857B
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7401	482213040981	BC337-25
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7402	532220911306	HEF4094BT
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7405	482213060373	BC857B
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7501	532220911102	HEF4052BT
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7503	482213041096	BC550C
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7504	482213041096	BC550C
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7505	482213044568	ON4986
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7506	482213044568	ON4986
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7507	482213044568	ON4986
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7508	482213044568	ON4986
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7509	482213060511	BC847B
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7510	482213060373	BC857B
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7530	532220914482	HEF4069UBT
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7537	482213060511	BC847B
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7538	482213060511	BC847B
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7543	482213060511	BC847B
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7544	482213060511	BC847B
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7545	482213060511	BC847B
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7546	482213060511	BC847B
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7547	482213060511	BC847B
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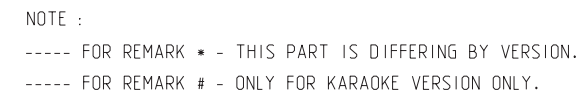
7548	482213060511	BC847B
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7554	482220931378	NJM4556MB
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7556	319801044010	PDTA114ET
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7641	482213041096	BC550C
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Note: Only the parts mentioned in this list are normal service spare parts.



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

101	313911810260	Cabinet Front Assembly	356	313922883610	Remote Control RC282425/01	185	D3 x 12
105	313911810270	Window CDC Control	384	482230350082	AM Frame Aerial	198	D3 x 12
106	313911789360	Button Set CDC Select	385	482232110249 Δ	Mains Cord IEC /21/21M	202	D3 x 12
107	313911810280	Cover Tray CDC2	385	482232110954 Δ	Mains Cord /30	205	D3 x 12
108	482245413408	Badge Philips	385	482232111466 Δ	Mains Cord UL /37	277	D3 x 12
124	313911810800	Window Disp. FW-C3/37	386	482226321092 Δ	Adaptor Plug 6A 250V /21	278	D3 x 12
124	313911810950	Window Disp. FW-C30/30/37	387	313911619350	Instruct. For Use /21/21M/30	280	D3 x 12
124	313911810520	Window Disp. FW-C30/21/21M	387	313911619370	Instruction For Use /37	282	D3 x 12
124	313911810290	Window Disp. FW-C35/37	1451	482232012604	Flex Cable 9pin 22cm	283	D3 x 16
125	313911810300	Button DBB Silver	1456	313911034180	Flex Cable 16pin 22cm	284	M3 x 15
127	313911468120	Lightguide DSC2	1556	313911034320	Flex Cable 6pin 40cm	285	D3 x 16
131	313911789400	Button Set Prog/Clock/Display	5001	313911832100 Δ	Mains Transformer /21/21M	286	D3 x 12
132	313911789410	Button Power On/Off	5001	313911832090 Δ	Mains Transformer /30	288	D3 x 12
133	313911469720	Button Set Source Sel. Blue	5001	313911832080 Δ	Mains Transformer /37	289	D3 x 12
135	313911810760	Button Set Controls				290	D3 x 12
136	313911810310	Lightcap Source Select Blue	<b>LEFT/RIGHT LOUDSPEAKER BOX BREAKDOWN</b>			291	D3 x 12
143	313911811580	Cover Ring Jog		996500002233	Woofer 5,25" 6R 30W	293	D3 x 12
144	313911810330	Cover Ring Volume		996500002232	Tweeter 2,5" 6R 30W	294	D2 x 8
145	313911810340	Knob Jog Rotary		996500002236	Cloth Frame Assembly	295	D3 x 16
146	313911810350	Knob Volume Rotary		996500002234	2,2μF/50V Wire Assembly	296	M3 x 6
152	313911468030	Knob Karaoke /21/21M	<b>SURROUND BOX BREAKDOWN</b>			297	D3 x 12
153	313911810360	Cover Control Jog		482224010374	Speaker 3" 6R 7W	298	D3 x 12
153	313911810530	Cover Control Jog/Kar/21/21M				299	D3 x 12
158	313911810370	Cover Cassette Left 2					
159	313911810380	Cover Cassette Right 2	Note:	Only the parts mentioned in this list are normal service spare parts.			
160	313911468520	Lens Cassette Left 2					
161	313911468530	Lens Cassette Right 2					
162-167	824000923460	Record Button Set Grey P422c					
168-172	824000923470	Play Button Set Grey P422c					
197	482252910322	Damper Assembly					
199	482249270231	Spring Leaf					
200	482244310881	Door Cassette (Mech)					
201	482249242709	Spring Cassette Door					
251	313911468250	Cabinet Rear /21					
251	313911468580	Cabinet Rear /21M					
251	313911468300	Cabinet Rear w/Matrix spk /37					
251	313911468240	Cabinet Rear /37					
252	482246240683	Foot Rubber SQ					
255	482246693148	Spacer 5mm					
260	482249211734	Spring IC					
266	313911468040	Spacer Heatsink					
349	313911877360	Surround Box (Matrix Spks)					
350	313911877310	Loudspeaker Box					
351	482230350063	FM Aerial 75R					
351	482232011094	FM Aerial 300R /37					