

Service Service Service



Service Manual

COMPACT
disc
DIGITAL AUDIO

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CLASS 1
LASER PRODUCT

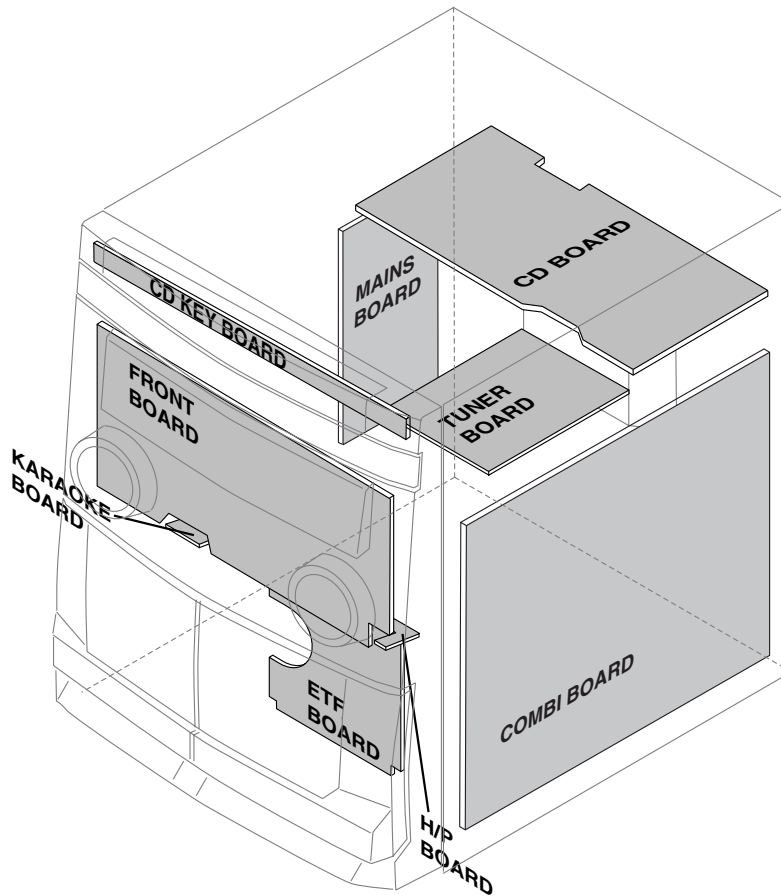


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PHILIPS

LOCATION OF PC BOARDS

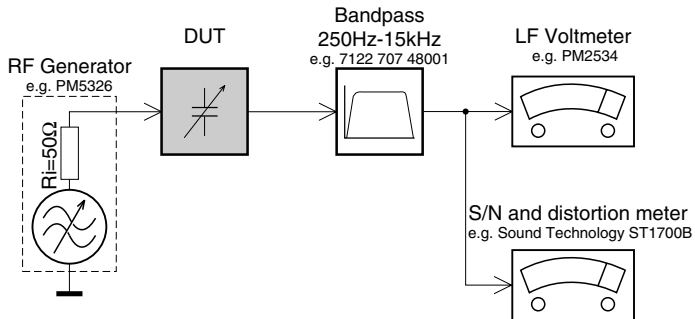


VERSION VARIATIONS:

Type /Versions:	FW-C290							
Features & Board in used:	/21							
Incredible Surround	x							
Karaoke	x							
News								
RDS								
Rotary Encoder (volume control)	x							
Jog Shuttle	x							
Voltage Selector	x							
Aux Input	x							
Digital Output								
Headphone Socket	x							
Line Output								
Subwoofer Output								
Surround Output								
Matrix Surround Loudspeakers								
Standby - Clock Display	x							
Standby - Dark								
Tuner board - ECO5 Sys	x							
Tuner board - Tuner 95								
Combi board 12W version								
Combi board 18W version								
Combi board 25W version	x							

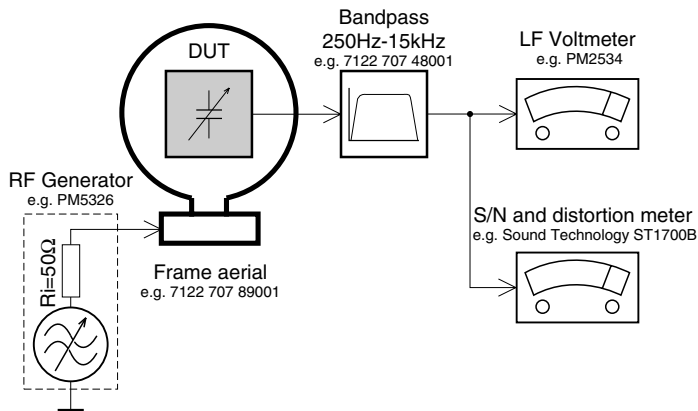
MEASUREMENT SETUP

Tuner FM



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

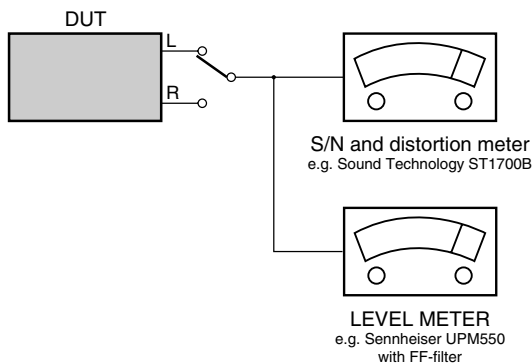
Tuner AM (MW,LW)



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).

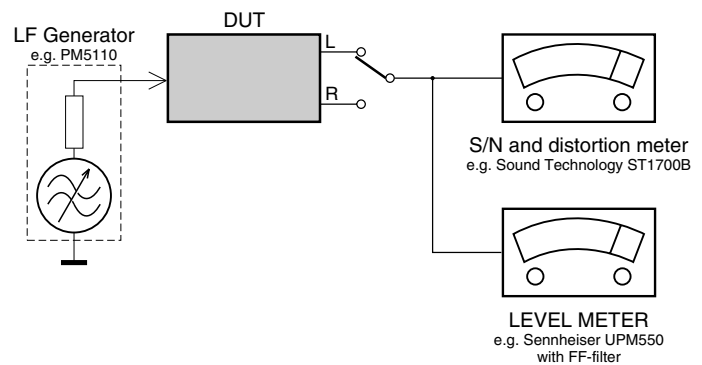
CD

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

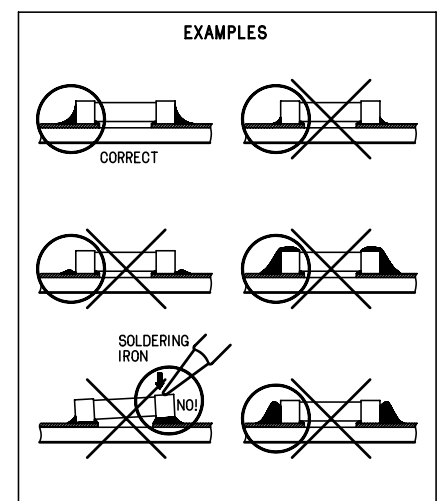
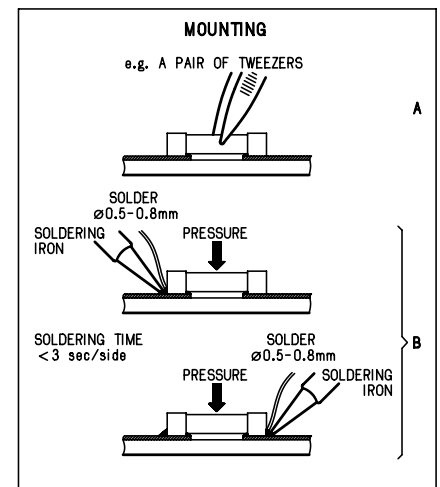
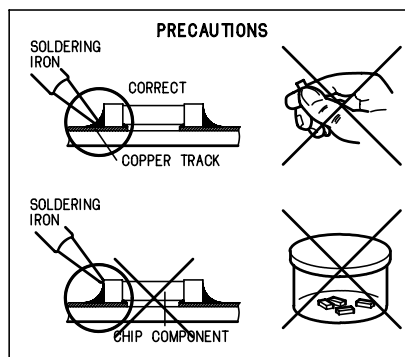
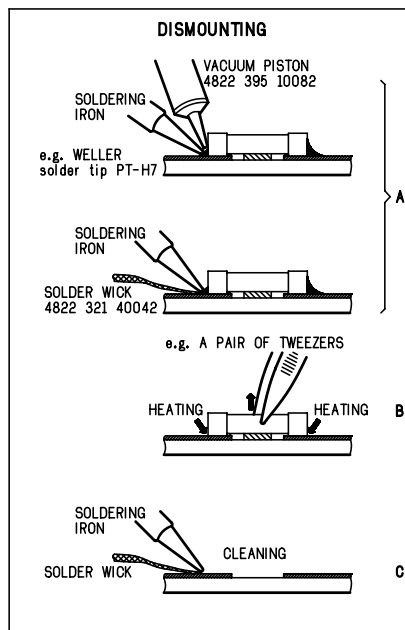
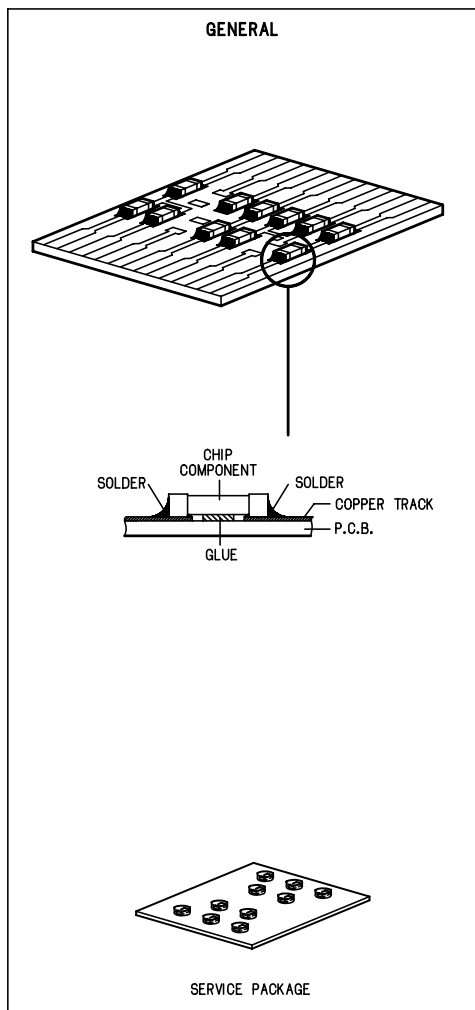
Compact Disc:

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 Ω)	4822 320 11307
Extension cable (to connect wristband to conn. box)	4822 320 11305
Connecting cable (to connect table mat to conn. box)	4822 320 11306
Earth cable (to connect product to mat or box)	4822 320 11308
Complete kit ESD3 (combining all above products)	4822 320 10671
Wristband tester	4822 344 13999

HANDLING CHIP COMPONENTS



(GB) WARNING

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

When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance. Keep components and tools also at this potential.

ESD**(NL) WAARSCHUWING**

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

Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen. Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.

Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

(F) ATTENTION

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

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

Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfilier 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 ridatta in caso di non osservazione della più grande cauzione alla loro manipolazione.

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

Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

(GB)

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

"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!

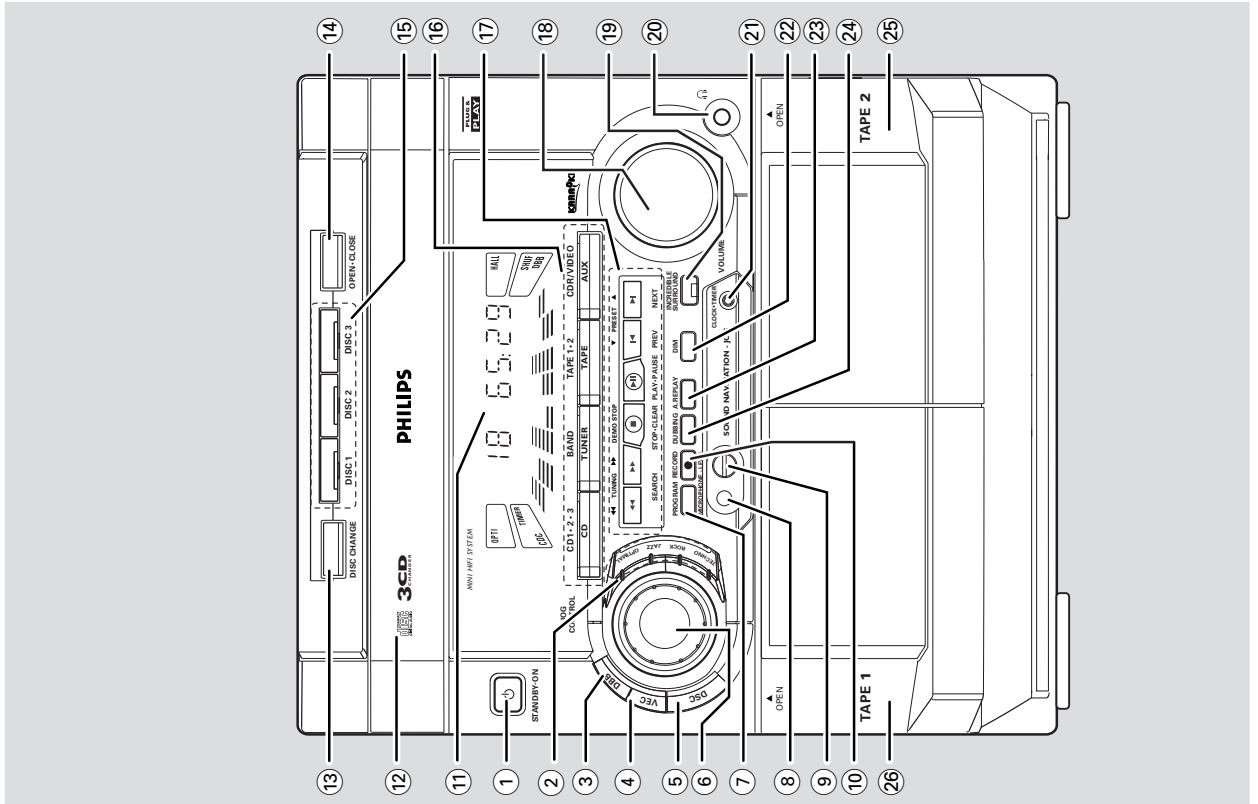
(DK) Advarse !

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

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English

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IMPORTANT:

PLEASE NOTE THAT THE VOLTAGE SELECTOR LOCATED AT THE REAR OF THIS SYSTEM IS PRESET AT 220V FROM THE FACTORY. FOR COUNTRIES THAT OPERATE AT 110-127V, PLEASE ADJUST TO 110-127V BEFORE YOU SWITCH ON THE SYSTEM.

Safety Information

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

- **The type plate (which contains the serial number) is located at the rear of the player.**
- **Recording is permissible if copyright or other rights of third parties are not infringed.**

Environmental Information

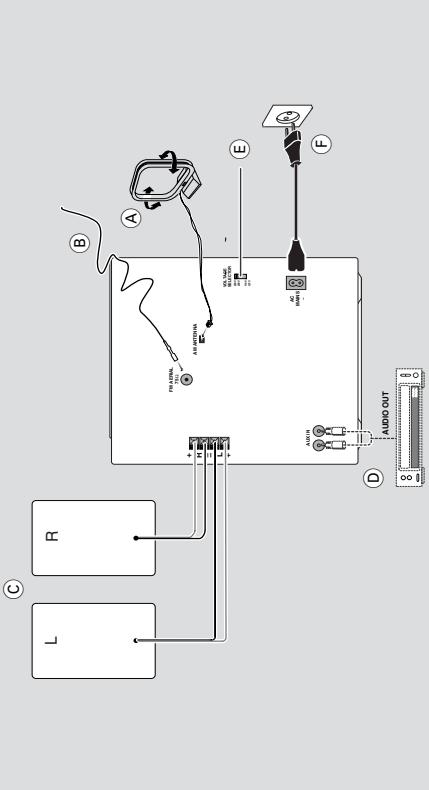
All unnecessary packaging has been omitted. We have tried to make the packaging easy to separate into three materials: cardboard (box), polystyrene foam (buffer) and polyethylene (bags, protective foam sheet).

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

Supplied Accessories

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

English

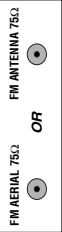


Rear Connections

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

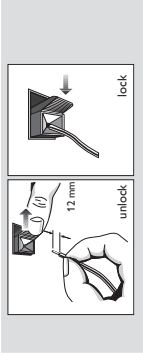
Outdoor Antenna

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



Speakers Connection

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



CAUTION:

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

English

Preparation

D Connecting other equipment to your player

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

E Adjusting the Operating Voltage (not available for version /30)

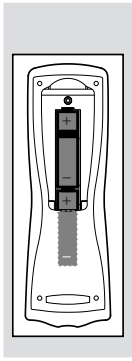
Before connecting the AC power cord to the wall outlet, make sure that the voltage selector at the rear of the system is set to the local power line voltage. If not, reset the selector before connecting to the wall outlet.

F 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 (not supplied) into the remote control as shown in the battery compartment. (Type R06 or AA).



CAUTION

- Remove batteries if they are exhausted or not to be used for a long time.
- Do not use old and new or different types of batteries in combination.
- Batteries contain chemical substances, so they should be disposed off properly.

Controls (illustrations on page 3)

Controls on the player and remote control

- 1 **STANDBY-ON** Φ
 - switches the system to standby/on.
- 2 **DIGITAL SOUND CONTROL PANEL**
 - to view the desired DSC display.
- 3 **DBB (DYNAMIC BASS BOOST)**
 - to switch on bass boost to enhance bass response or to switch off bass boost.
- 4 **VEC**
 - to select the desired Virtual Environment Control effect: HALL, CINEMA or CONCERT.
- 5 **DSC (DIGITAL SOUND CONTROL)**
 - to select the desired sound effect: OPTIMAL, JAZZ, ROCK or TECHNO.
- 6 **JOG CONTROL**
 - to select the desired DSC setting. You must select the DSC feature first.
 - to select the desired VEC setting. You must select the VEC feature first.
- 7 **PROGRAM**
 - for CD to programme disc tracks.
 - for TUNER to programme preset radio stations.
 - for CLOCK to select 12 or 24 hour in clock setting mode.

Controls

AUX (CDR/VIDEO)

- to select sound from an external source (e.g. TV, VCR, Laser Disc player, DVD player or CD Recorder).

17 MODE SELECTION

- SEARCH $\leftarrow \leftarrow \leftarrow$ (TUNING $\leftarrow \leftarrow \leftarrow$)**
 - for CD to search backward/forward.
 - for TUNER to tune to a lower or higher radio frequency.
- for TAPE to rewind or fast forward a tape.
- for CLOCK to set the hour (on the system only).

STOP-CLEAR $\blacksquare$

- for CD to stop disc playback or to clear a programme.
- for TUNER to stop programming (on the system only).
- for TAPE to stop playback or recording.
- for DEMO to start or stop demonstration mode (on the system only).
- for CLOCK to exit clock setting or cancel timer (on the system only).

for PLUG & PLAY

- to exit plug & play mode and return to standby mode (on the system only).

PLAY $\blacktriangleright$ / PAUSE $\parallel$

- for CD to start or interrupt playback.
- for TAPE to start playback.
- for PLUG & PLAY
 - to initiate and start plug & play from standby/demo mode (on the system only).

PREV $\blacktriangleleft$ / NEXT $\blacktriangleright$ (PRESET $\blacktriangledown \blacktriangle$)

- 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).

18 VOLUME

- to increase or decrease the volume.

19 INCREDIBLE SURROUND

- to switch on or off the surround sound effect.

20 H

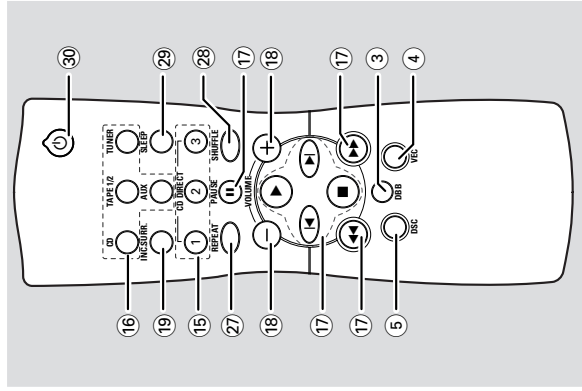
- to connect headphones.

21 CLOCK-TIMER

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

22 DIM

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



23 AUTO REPLAY

- to select playback mode either in continuous AUTO REPLAY or ONCE only.

24 DUBBING

- to dub a tape in normal speed.

25 TAPE DECK 2

26 TAPE DECK 1

27 REPEAT

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

28 SHUFFLE

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

29 SLEEP

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

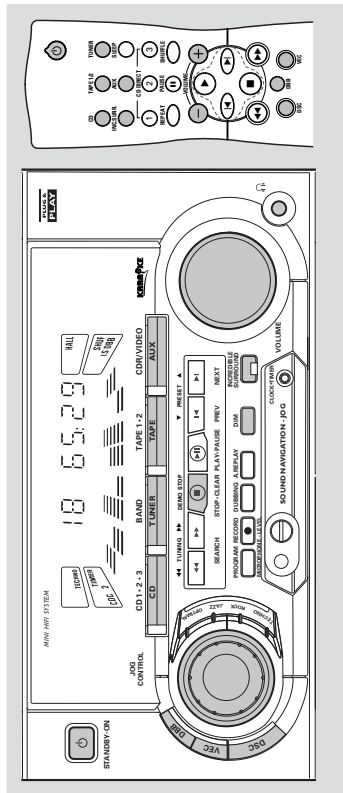
30 H

- 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 ($\blacktriangleright$, $\blacktriangleleft$, $\blacktriangledown$, etc.).

Operating the System



Important:

Before you operate the system, complete the preparation procedures.

Plug and Play

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

- 1 Press and hold **PLAY** (on the system only) for 5 seconds; when the system is in standby or demonstration mode.
 - If the **PLUG** and **PLAY** has not been installed before, you can access this feature by switching on the system from the main power outlet.
 - "**RADIO INSTALL - PRESET PLAY**" will be displayed.
- 2 Press **PLAY** to start installation.
 - "**INSTALL**" will be displayed and followed by "**TUNER**", and then "**RADIO**".
 - The **PROGRAM** starts flashing.
 - **PLUG** and **PLAY** will start searching for all radio stations on FM band and then followed by radio stations on MW band.
 - All available radio stations with sufficient signal strength will be stored. Up to 40 presets may be stored.
 - The last preset radio station will appear on the display when **PLUG** and **PLAY** is completed.

Demonstration mode

The system has a demonstration mode that shows the various features offered by the system.

To disable the demonstration mode

- Press and hold  (on the system only) for **5 seconds** when the system is in demonstration mode.
 - ➔ "DEMO OFF" is displayed.
 - ➔ The system will switch to standby mode.

Operating the System

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

Notes:

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

Switching the system ON

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

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

Switching the system to standby mode

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

Selecting the Source

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

Note:

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

English

DIM mode

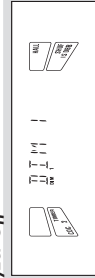
You can select the desired brightness for the display.

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

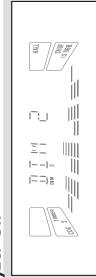
**DIM OFF - normal brightness with
Spectrum Analyzer On**



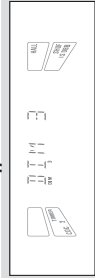
DIM 1 - normal brightness with Spectrum Analyzer Off



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.



Operating the System

Sound Control

VOLUME ADJUSTMENT

Adjust **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.

- 1 Press to select the **DSC** feature.
- 2 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.
→ The **DBB** flag disappear from the display.

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.

English

VIRTUAL ENVIRONMENT CONTROL (VEC)

The VEC feature enables you to adjust the system to select a type of environment.

- 1 Press to select the **VEC** feature.
- 2 Adjust the **JOG CONTROL** to select the desired Virtual Environment Control setting : HALL, CINEMA or CONCERT.
→ "HALL", "CINEMA" or "CONCERT" and the respective flag will be displayed.

VEC Selection	DBB	IS
HALL	On	On
CONCERT	On	On
CINEMA	Off	On

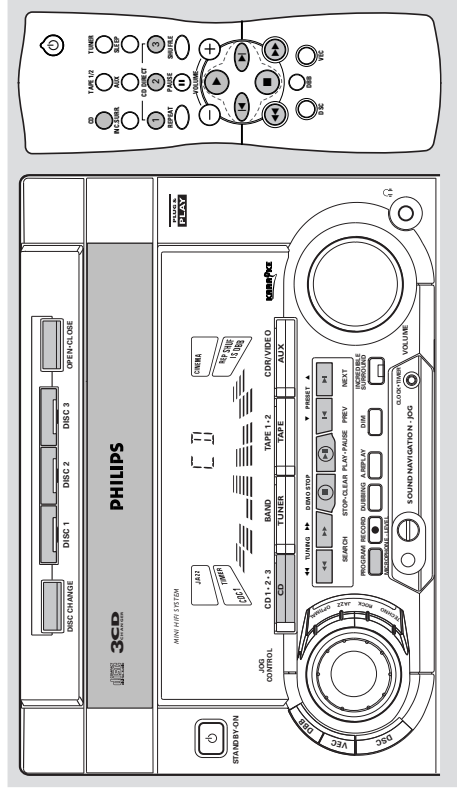
INCREDIBLE SURROUND

Normal stereo sound is determined by the distance between the front speakers. When Incredible Surround is switched on, it magnifies the virtual distance between the front speakers for an incredibly wide, enveloping, stereo effect.

- Press **INCREDIBLE SURROUND** to switch on.
→ The **INCREDIBLE SURROUND** button lights up.
→ "INCREDIBLE SURROUND" and the **IS** flag will be displayed.
To switch off Incredible Surround
Press **INCREDIBLE SURROUND** again.
→ The **INCREDIBLE SURROUND** button light is switched off.
→ "IS OFF" will be displayed.
→ The **IS** flag disappear from the display.

Compact Disc

English



Warning!

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

Discs for playback

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



Disc Direct Play

- You can play a disc directly by pressing the **DISC 1**, **DISC 2** or **DISC 3** button. The CD player will stop at the end of playback of the selected disc.
→ A lit button indicates that a disc is loaded in the disc tray.
→ A flashing button indicates that a disc is playing.

Loading the CD Changer

- 1 Press **CD** to select CD mode.
- 2 Press **OPEN-CLOSE**
→ The CD changer tray slides out.
- 3 Load a disc with the printed side up in the right tray.
 - You can load another disc in the left tray.
 - To load the third disc, press the **DISC CHANGE** button.
- 4 Press **OPEN-CLOSE** to close the CD changer empty tray is ready for loading.
→ The CD changer tray will rotate until the empty tray is ready for loading.
→ 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.

Compact Disc

English	
Playing the programme Press ► to start programme playback. → "PLAY PROGRAM" will be displayed. → The track number and elapsed playing time of the current track will appear on the display. ● If you press REPEAT during programme playback, the current track or all programmed tracks will be played repeatedly. → "TRACK" or "PROGRAM" will be displayed. → The REP and PROG flags appear on the display. Press ■ to stop programme playback. Notes: – If you press any of the DISC DIRECT PLAY buttons, the system will play the selected disc and the stored programme will be ignored temporarily. The PROG display also will disappear temporarily from the display. It will reappear when playback of the selected disc ends. – REPEAT DISC mode will be cancelled when programme playback begins.	
Erasing the programme (when playback is stopped) Press ■. → "PROGRAM CLEAR" will be displayed. Note: – The programme will be erased when the system is disconnected from the power supply or when the CD changer tray is opened.	
Shuffle (only on remote control) In shuffle mode, the system plays all the available discs and their tracks in random order. Shuffle may be used also when tracks are programmed. To shuffle all the discs and tracks 1 Press SHUFFLE . → "SHUFFLE" will be displayed. → The SHUF flag, 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. 1 Press REPEAT on the remote control to select the various repeat modes. → "TRACK", "DISC", "ALL DISC" or "OFF" will be displayed. → The REP flag appears on the display. ● The selected track, selected disc or all available discs will now be played repeatedly until you press ■. 2 Press REPEAT until the "OFF" mode is displayed to resume normal playback. → The REP flag disappears from the display. Notes: – REPEAT DISC mode is not available during programme play or shuffle mode. – You can also repeat shuffling a programme. i) "TRACK" or "PROGRAM" will be displayed. ii) The REP , PROG , and SHUF flags appear on the display.	

Compact Disc

English	
Searching for a particular passage during playback Press and hold ◀◀ or ▶▶ until the desired passage is located. ● The volume will be reduced. ● Play returns to normal when ◀◀ or ▶▶ is released.	
Programming Tracks Programming tracks of a loaded disc is possible when playback is stopped. The display will indicate the total tracks stored in the programme. Up to 40 tracks can be stored in the memory in any order. When 40 tracks are stored and you attempt to store another track, the display will show "FULL". 1 Load the desired discs in the disc trays. 2 Press PROGRAM to start programming. → The PROG flag starts flashing. 3 Press the CD (CD 1•2•3) or DISC 1/2/3 button to select the disc. 4 Press ◀ or ▶ to select the desired track. 5 Press PROGRAM to store the track. ● Repeat steps 3 to 5 to store other discs and tracks. 6 Press ■ once to end programming. → The total number of tracks programmed and total playing time appear on the display. Notes: – If the total playing time is more than "99:59" or if one of the programmed tracks has a number greater than 30, then "....." appears on the display instead of the total playing time. – If the system is reading the discs, programming is not possible, "READING" will be displayed and followed by "DISC N: N" is the current read disc number. – During programming, if no button is pressed within 20 seconds, the system will exit programme mode automatically. – "SELECT A DISC" will be displayed when programming an empty disc slot.	
Reviewing the programme Reviewing of the programme is possible only when playback is stopped. ● Press ◀ or ▶ repeatedly to review the programmed tracks. ● Press ■ to exit review mode.	
Playing a Disc 1 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 II. → The playing time flashes. ● To resume playback, press ► again. 2 To stop playback press ■. Note: – All the available discs will play once, then stop.	
Disc Change You can change the outer two discs while the third inner disc is stopped or is playing. 1 Press DISC CHANGE . → The CD changer tray slides out. 2 Replace the discs in the left and right disc trays. ● If you wish to change the inner disc during playback, press DISC CHANGE again. → "DISC CHANGE" will be displayed. → The disc will stop playing. → The CD changer tray will close to retrieve the inner disc and then open again with the inner disc accessible. 3 Press OPEN•CLOSE to close the CD changer tray.	
Selecting a desired track is stopped 1 Press ◀ or ▶ until the desired track appears on the display. 2 Press ► to start playback. → The selected track number and elapsed playing time appear on the display. Selecting a desired track during playback ● Press ◀ or ▶ until the desired track appears on the display. → The selected track number and elapsed playing time appear on the display. ● If you press ◀ once it will skip to the beginning of the current track and play the track again. Note: – Pressing ◀ during shuffling can only skip to the beginning of the current track.	

Tuner

English

Manual programming

- 1** Press **TUNER** (BAND).
- 2** Press **TUNER** (BAND) again to select the desired waveband : FM or MW.
- 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.
Press **PROGRAM** again.
→ The **PROG** flag disappears and the radio station will be stored.
- 5**

Char

Changing the MW tuning grid *(not available for version 130)*

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.

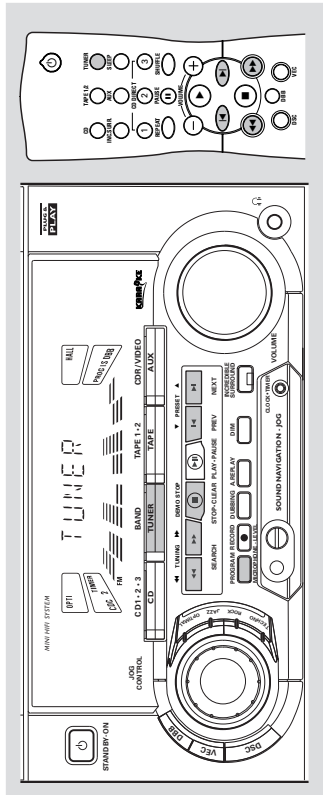
- Repeat **steps 3 – 5** to store other preset radio stations.
- Notes:**
- When **40 radio stations** are stored and you attempt to store another radio station, the display will show "FULL". If you want to change an existing preset number, repeat steps **3 – 5**.
 - You can cancel manual programming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

Tuning to Preset Radio Stations

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

Tuner

English



Note:

11. — For 'PLUG & PLAY' feature, please refer to page

Tuning to radio stations

- 1** Press **TUNER** (BAND) to select TUNER mode.
→ "TUNE P" will be displayed.
A few seconds later, the current radio frequency will be displayed.
- 2** Press **TUNER** (BAND) again to select the desired waveband: FM or MW.
- 3** Press ◀ or ▶ for more than one second, then release.
→ The display will show "5EPRC" 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.

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.

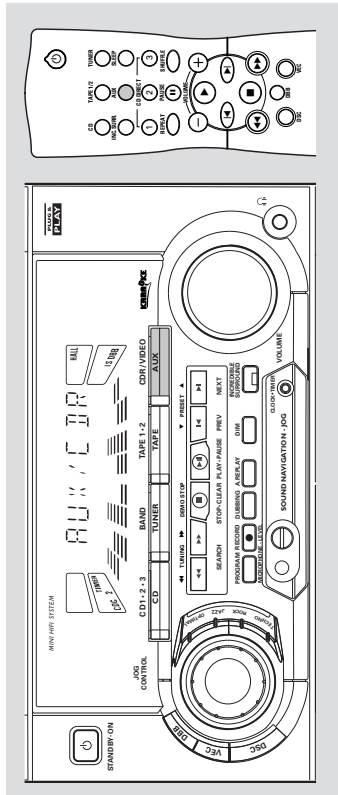
Automatic programming

- Press **TUNER (BAND)**.
- Press **PROGRAM** for more than one second.
- When the **PROG** flag starts flashing and "RUEF" will be displayed.
- The system will search for every available station in the FM waveband first, then search the MW 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.

Aux



Selecting External Equipment

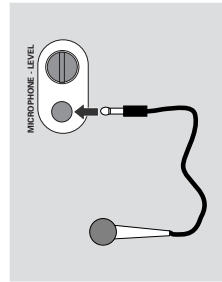
If you have connected the audio out terminals of the external equipment (TV, VCR, Laser Disc player, DVD player or CD Recorder) to the AUX IN terminals, you can hear the enhanced sound from the system.

- Press **AUX (CDR/VIDEO)** to select the external equipment.
→ "FLU:" or "CDR:" will be displayed.

Note:

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

Karaoke



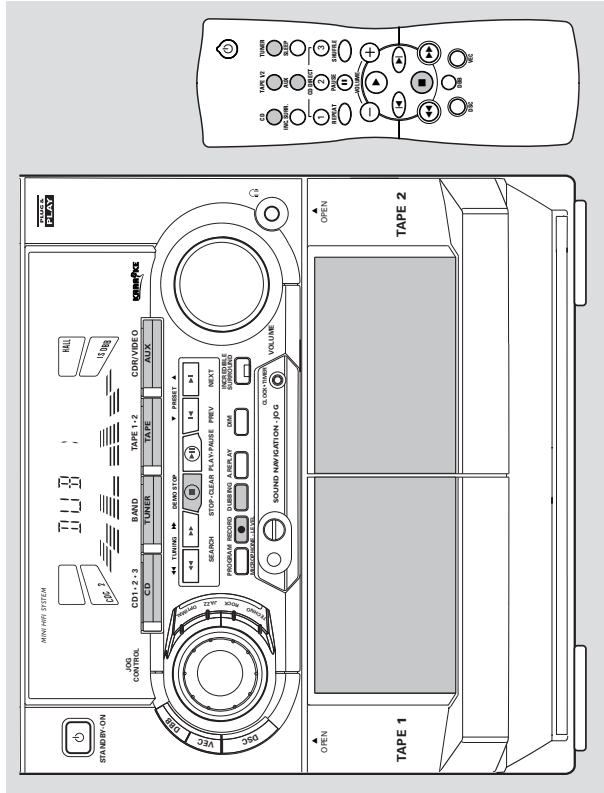
Microphone Mixing (not available for version /30)

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

Note:

- Keep the mic away from the speakers to prevent howling

Recording



Notes:

- If you do not intend to record via the microphone, unplug the microphone to avoid accidental mixing with other recording source.
- 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, Incredible Surround, DSC or VEC.
- To prevent accidental recording, break out the tab on the left shoulder of the tape side that you want to protect.
- If "CHECK TAPE" is displayed, the protection tab has been broken. Put a piece of clear adhesive tape over the opening.

Recording the mixed sound / One Touch Recording

- During microphone mixing, you can record the mixed sound on a tape in tape deck 2 except dubbing mode.
 - For One Touch Recording, as soon as you press **RECORD**, the current source (CD, TUNER or AUX) will be recorded on tape deck 2.
- Load a blank tape in tape deck 2.
 - Press **RECORD** to start recording.
→ The REC starts flashing.
 - Press **■** to stop recording.

Note:

- When you press **RECORD** while in TAPE mode, "SELECT SOURCE" will be displayed. One Touch Recording is not possible in TAPE mode.

Clock/Timer

English

English

Recording

Recording from other sources

(only on tape deck 2)

- 1 Load a blank tape into tape deck 2 with the open side downward.
- 2 Press **CD, TUNER** or **AUX**.
- 3 Start playback of the selected source.
- 3 Press **RECORD** to start recording.
- 4 Press **■** to stop recording.

Notes:

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

CD Synchro Start Recording

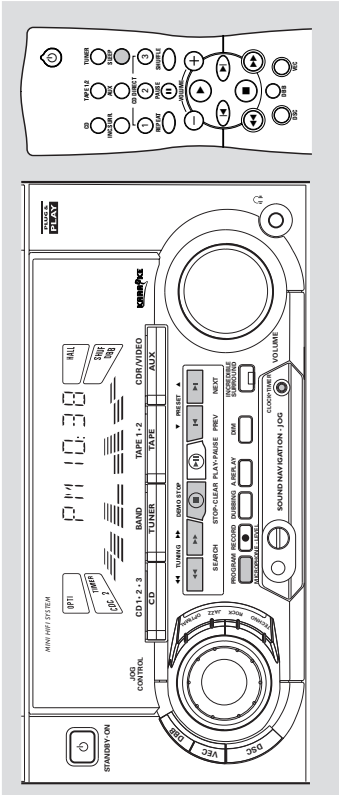
- 1 Load a blank tape into tape deck 2 and a disc into a disc tray.
- 2 Press **CD** to select CD mode.
- 3 You can programme the tracks in the order you want them to be recorded (see Programming Tracks). If not, select the disc by pressing **CD** (CD 1•2•3) and the tracks are recorded according to the order on the selected disc.
- 3 Press **RECORD** to start recording.
- 4 Press **■** to stop recording.

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

- 1 Press **TAPE** (TAPE 1•2) to select tape deck 2.
- 2 Load the prerecorded tape into tape deck 1 and a blank tape into tape deck 2, with full spool to the left.
- 3 Press **DUBBING**.
- 4 Press **■** 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 1 to tape deck 2.
- To ensure good dubbing, use tapes of the same length.
- You can switch to other source while dubbing.



View Clock

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

- Press **CLOCK • TIMER** briefly (on the system only).
 - "P.M. 10:38" (the current time) will be displayed depending on whether you have selected 12- or 24-hour mode.
 - "12:00:00" 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. "P.M. 12:00" or "00:00". Before setting the clock, you must be in the View Clock mode.

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

Notes:

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

Timer Setting

- The system can switch on to CD, TUNER or TAPE 2 mode automatically at a preset time. It can serve as an alarm to wake you up.
 - Before setting the timer, make sure the clock is set correctly.
 - The timer will always be switched on once it is set.
 - The volume of the timer will increase from the minimum level to the most recently selected volume level.
- 1 Press and hold **CLOCK • TIMER** for more than 2 seconds to select timer mode.
 - "P.M. 12:00" 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, TUNER** or **TAPE** to select the desired source.
 - Before selecting CD or TAPE, make sure a disc or tape is loaded in the CD tray or tape deck 2.

Clock/Timer

- 3 Press **◀◀** or **▶▶** on the system to set the hour for the timer to start.
 - 4 Press **◀** or **▶** on the system to set the minute for the timer to start.
 - 5 Press **CLOCK•TIMER** to store the start time.
 - The timer is now set.
 - The **TIMER** remains on the display.
 - At the preset time, the timer will be activated.
 - The selected source will be played.
- Notes:**
- During timer setting, if no button is pressed within 90 seconds, the system will exit timer setting mode automatically.
 - If the source selected is **TUNER**, the last tuned frequency will be switched on.
 - If the source selected is **CD**, playback will begin with the first track of the selected disc or programme. If the disc trays are empty, the **TUNER** will be selected instead.
 - The timer will not activate if a recording is in progress.

To switch off the TIMER

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

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

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

Sleep Timer (only on remote control)

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

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

While SLEEP mode is activated

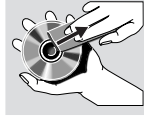
- Press **SLEEP** once to view the remaining length of time.
- Press **SLEEP** twice to change the pre-selected period of time.
 - The display will show the remaining time followed by the sequence of sleep timer options.

To switch off the Sleep Timer

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

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 benzine, thinner, commercially available cleaners, or artistic spray intended for analog records.
- **Cleaning the DISC lens**
 - After prolonged use, dirt or dust may accumulate at the disc lens. To ensure good playback quality, clean the disc lens with Philips CD Lens Cleaner or any commercially available cleaner. Follow the instructions supplied with cleaner.
- **Cleaning the Heads and the Tape Paths**
 - To ensure good recording and playback quality, clean the heads, the capstan(s), and pressure roller(s) after every 50 hours of tape operation.
 - Use a cotton swab slightly moistened with cleaning fluid or alcohol.
 - You can also clean the heads by playing a cleaning tape once.
- **Demagnetizing the heads**
 - Use a demagnetizing tape available at your dealer.



Troubleshooting

WARNING

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

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

Symptom	Remedy
"NO DISC" is displayed.	– If the disc is inserted upside down. – Moisture condensation at the lens. – There is no disc in the CD tray. – The disc is dirty, badly scratched or warped. – The disc lens is dirty or dusty, refer to section under Maintenance.
"DISC NOT FINALIZED" is displayed.	– The CD-RW or CD-R disc is not properly recorded for use with a standard CD player. – The disc is badly scratched or dirty.
Poor radio reception.	– The signal is too weak, adjust the antenna or connect an external antenna for better reception. – The TV or VCR is too close to the stereo system.

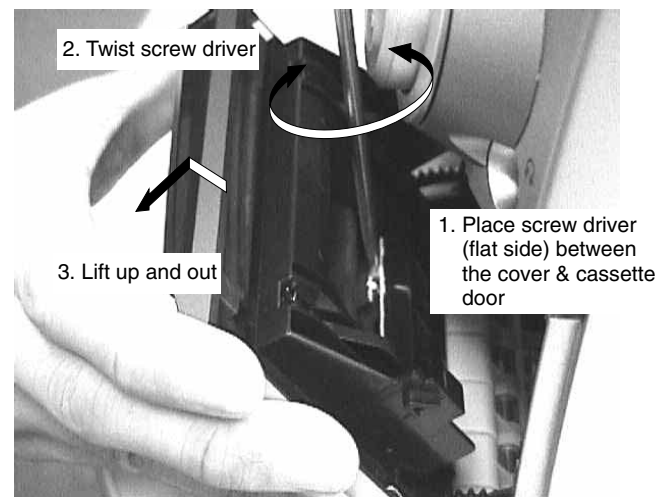
Troubleshooting

English

Cannot tune to station	– Wrong tuning grid.
Recording or playback cannot be made or there is a decrease in audio level.	– Dirty tape heads, capstans or pressure rollers; refer to section under 'Maintenance.' – Magnetic build-up in the record/playback head; use demagnetizing tape.
Tape deck door cannot open.	– Reconnect the AC power plug and switch on the system again.
System does not react when any button is pressed.	– Press STANDBY-ON to switch the system off; Remove the AC power plug from the wall outlet; then reconnect the power plug and switch on the system again.
No or poor sound.	– Adjust the volume. – Disconnect the headphones. – Check that the speakers are connected correctly. – Check if the stripped speaker wire is clamped.
Reversed left and right sound.	– Check the speaker connections and location.
Lack of bass sound or apparently imprecise physical location of musical instruments.	– Check the speaker connection for proper phasing; coloured/black wires to coloured/black terminals.
Remote control has no effect on the system.	– Select the source (CD, TUNER etc.) before pressing the function button (▶, ◀, ▲, ▼, etc.). – Reduce the distance to the system. – Insert the batteries with their polarities (+/- signs) as indicated. – Replace the batteries.
Timer is not working.	– Set the clock. – Press CLOCK • TIMER to switch on the timer. – If recording is in progress, stop recording.
Clock setting is erased.	– Reset the clock.
System displays features automatically; button flash continuously.	– Press and hold ■ (on the system) for five seconds to switch off the demonstration.
All lighted buttons are not lit.	– Press DIM until DIM OFF display mode is shown.

DISMANTLING INSTRUCTIONS

Dismantling of the Cassette Cover

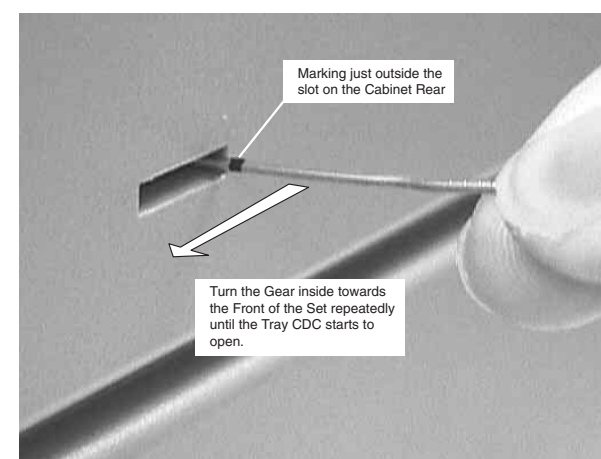
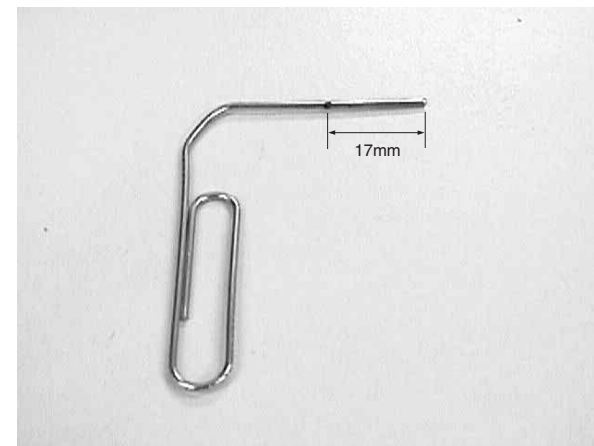


Cassette door

Opening the CDC Tray manually

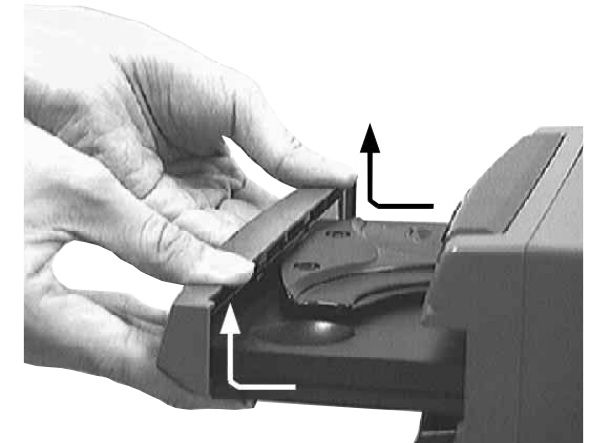
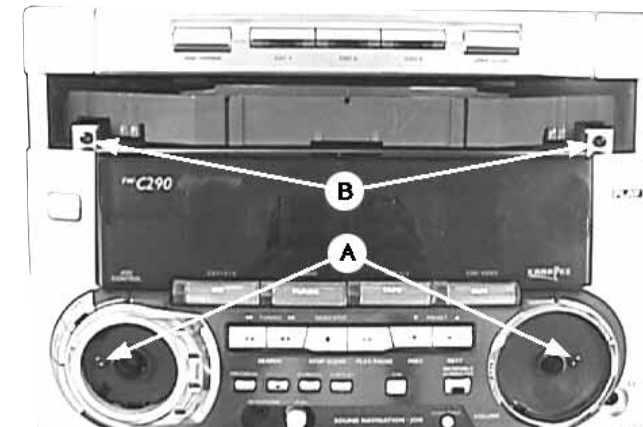
- 1) Take a paper clip or any stiff wire diameter of 1mm -1.5mm and make a marking about 17mm from the tip.
- 2) Place the set in an upright position and insert the paper clip into the slot on the right side of the Cabinet Rear.
- 3) With the marking just outside the Cabinet Rear, you should be able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

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



Dismantling of the Front Panel

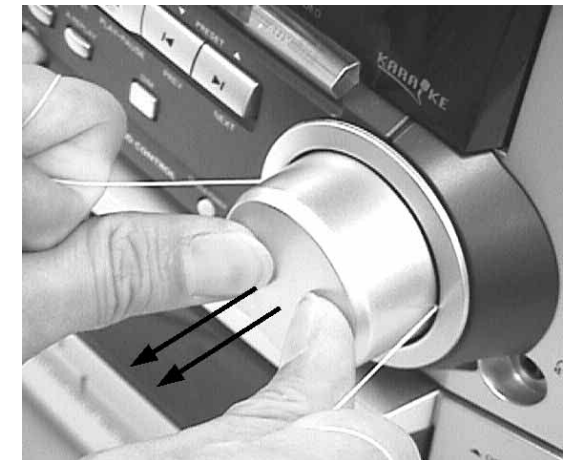
- 1) With the CDC tray opened remove the Cover Tray CDC (pos 107) as indicated.
- 2) Loosen the 8 screws to separate the Front Panel from the rear portion.
 - 2 screws B on the front
 - 2 screws each on the left & right side
 - 2 screws at the bottom



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

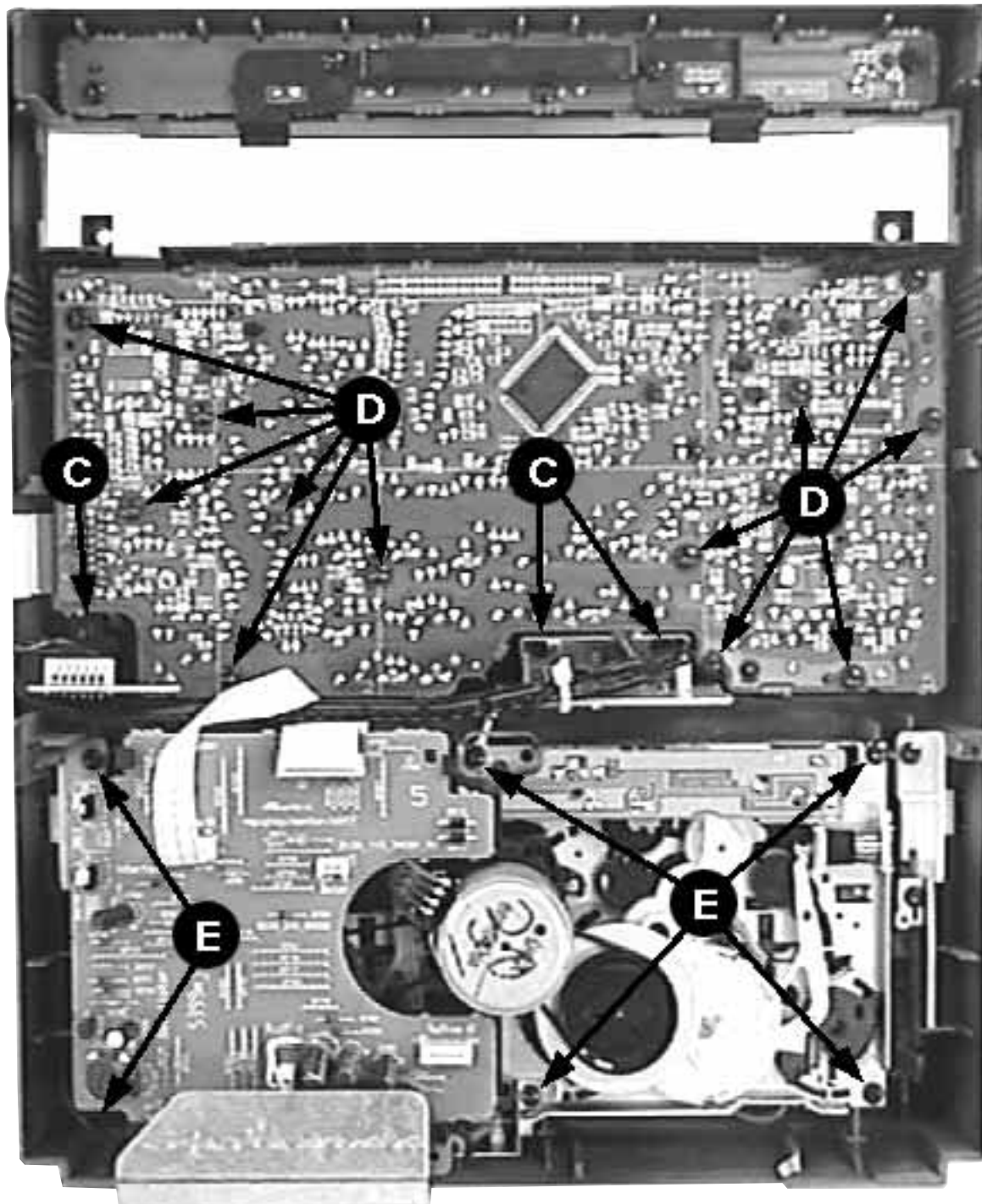
- 1) Insert a strong string into the slot between the Volume knob (pos 146) and Cover Ring Volume (pos 144), looped it 1,5 turns securely around the Volume knob and pulled it out as shown.
- 2) Do likewise for the Jog Rotary knob (pos 145).
- 3) Remove the 2 hidden screws A to take out the Cover Control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

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



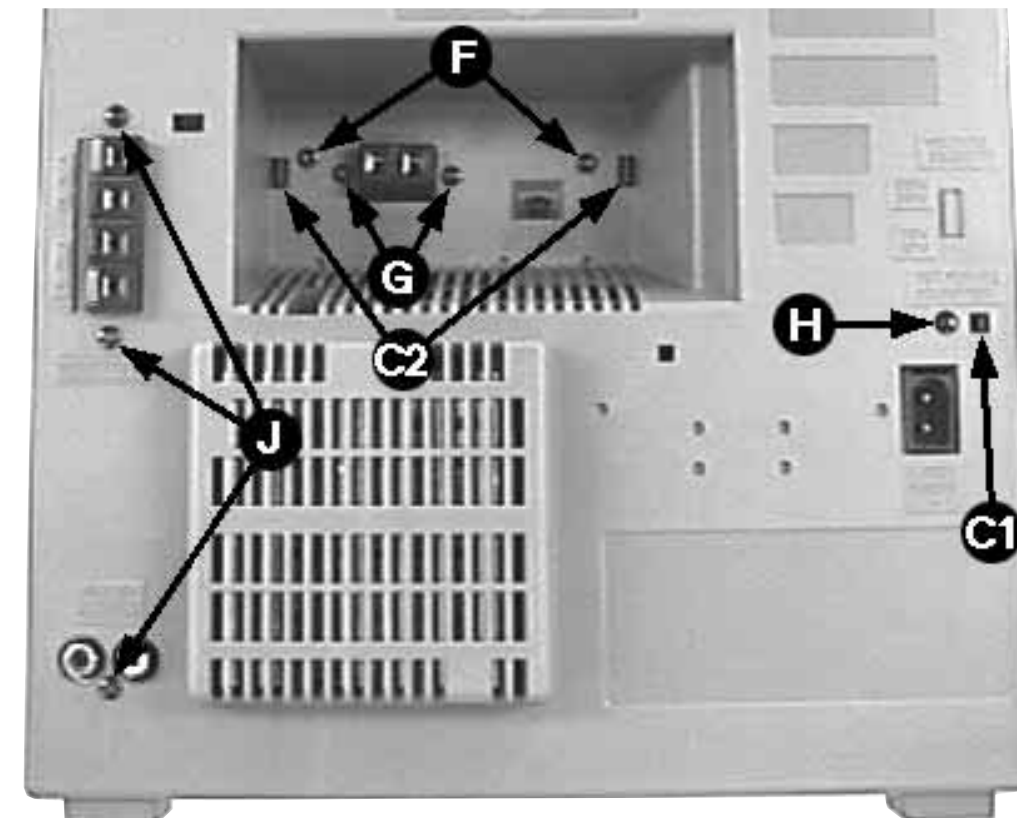
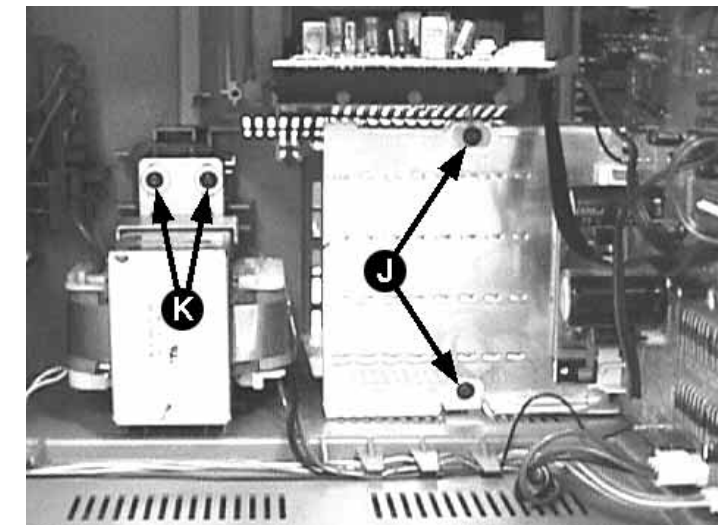
Dismantling of Assemblies on the Front Panel

- 1) Remove the Volume and Jog Rotary knobs (pos 145 & 146) as per step 1 and 2 of ***Dismantling of the Cover Control on the Front.***
- 2) Remove 3 screw C to loosen the Headphone board (1x) and the Karaoke board (2x).
Note: Karaoke board is for some version only.
- 2) Remove 12 screws D as indicated to loosen the Front board.
- 3) Remove 6 screws E to loosen the ETF7 Module.



Dismantling of Rear Portion

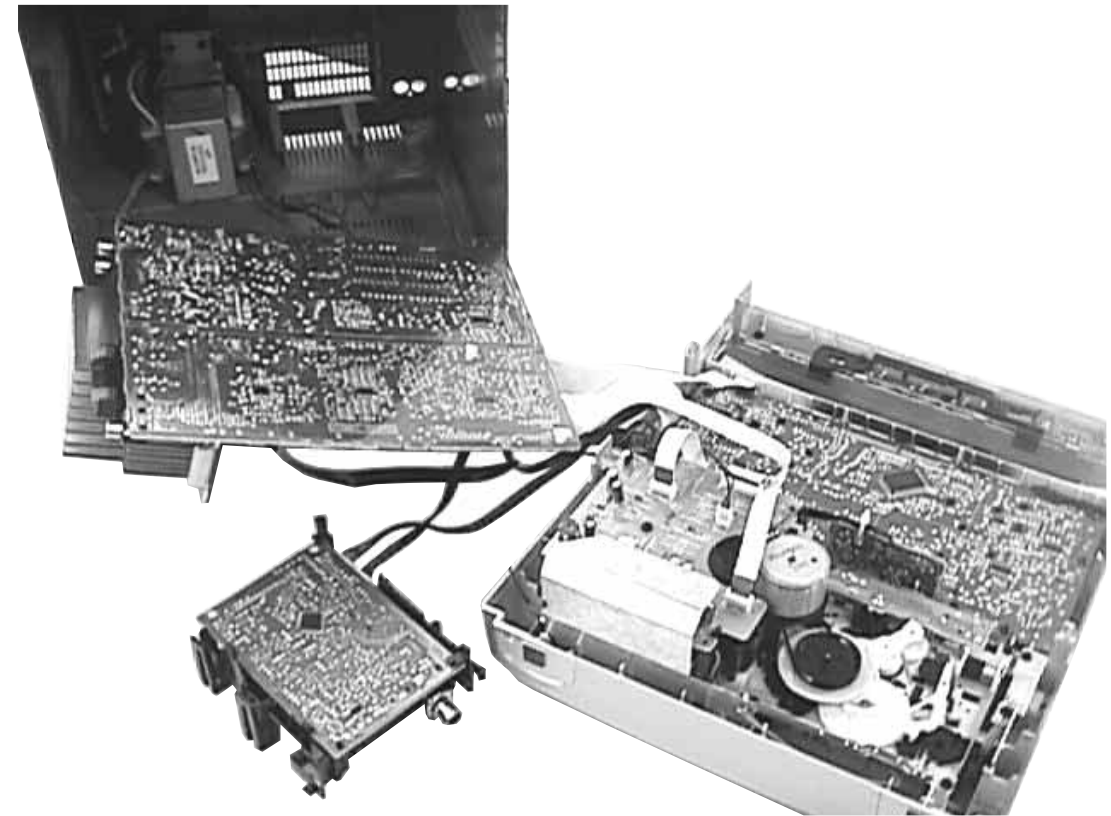
- 1) Remove 1 screw H & uncatch C1 to loosen the Mains socket board.
- 2) Remove 2 screws F, 2 screws G and uncatch C2 to loosen the Tuner board assembly.
- 3) Remove 5 screws J (3x on the rear and 2x on the heatsink) to loosen the Combi board (Main part).
- 4) Remove 2 screws K to loosen the Mains Transformer.



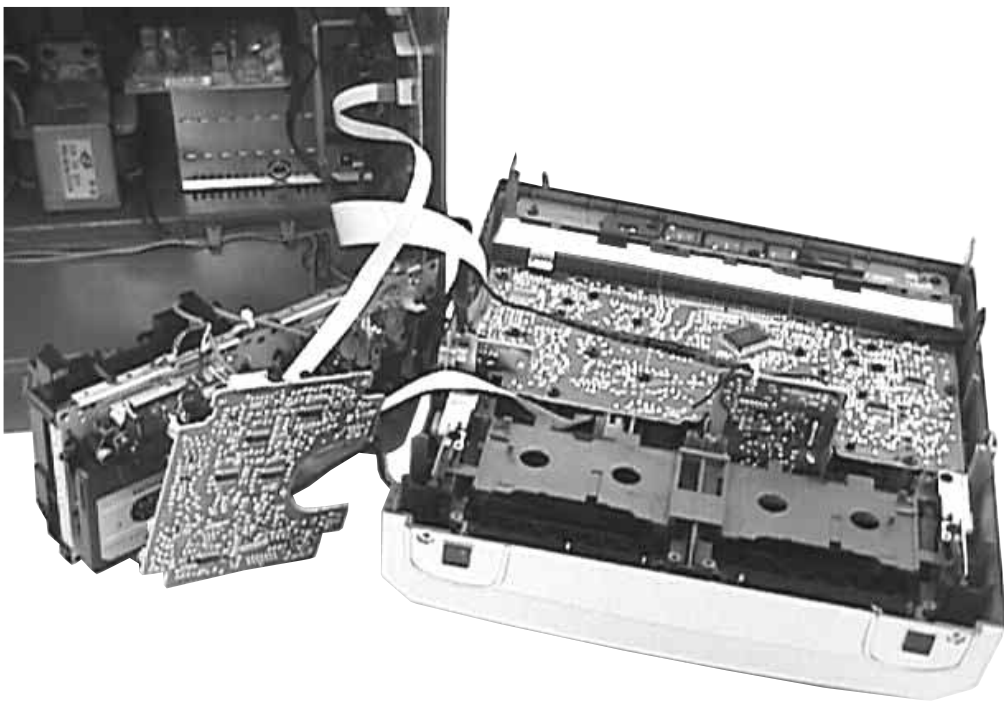
Service pos A



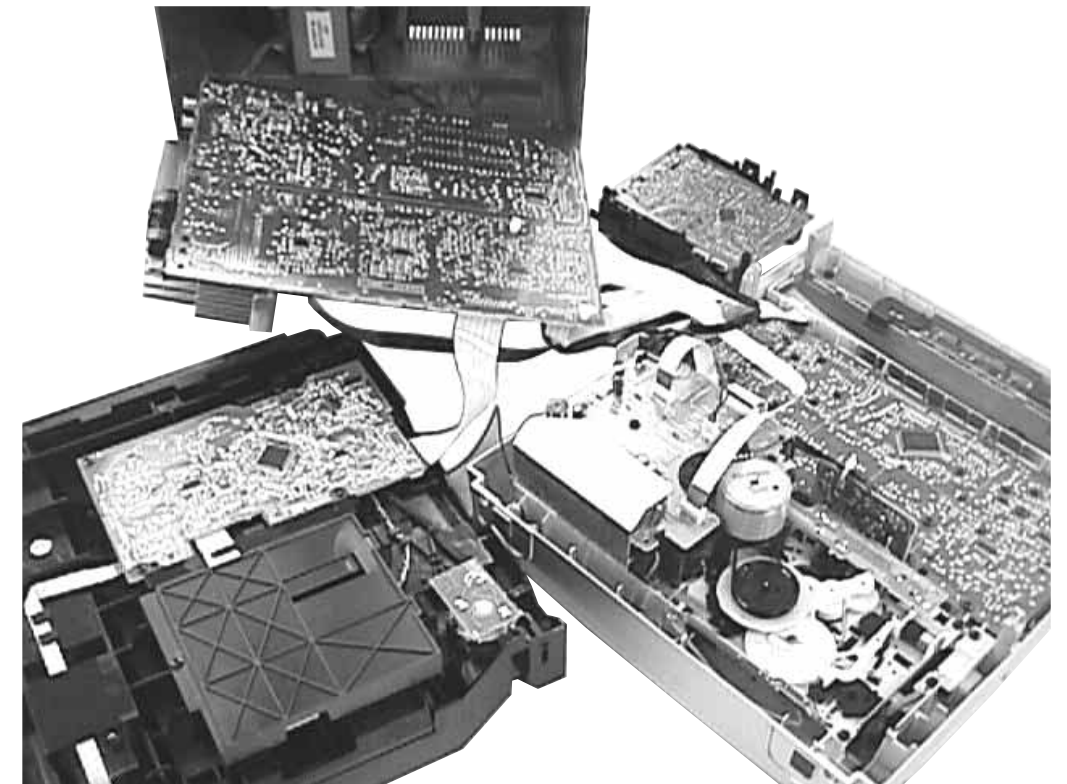
Service pos C



Service pos B

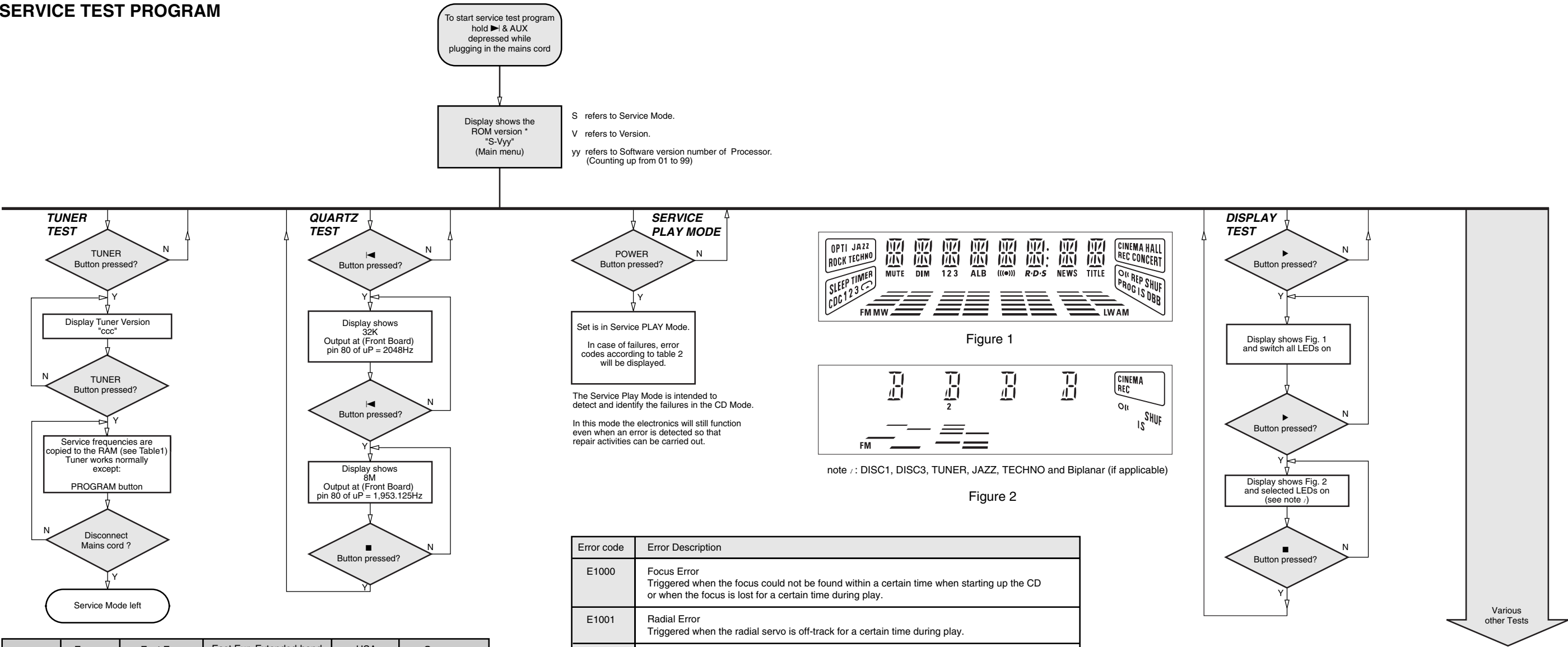


Service pos D

**Note:**

1. During repair it is possible to disconnect the following assemblies or modules while working on other areas:
 - Tuner Board
 - 3CDC Module
2. 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*

Table 1

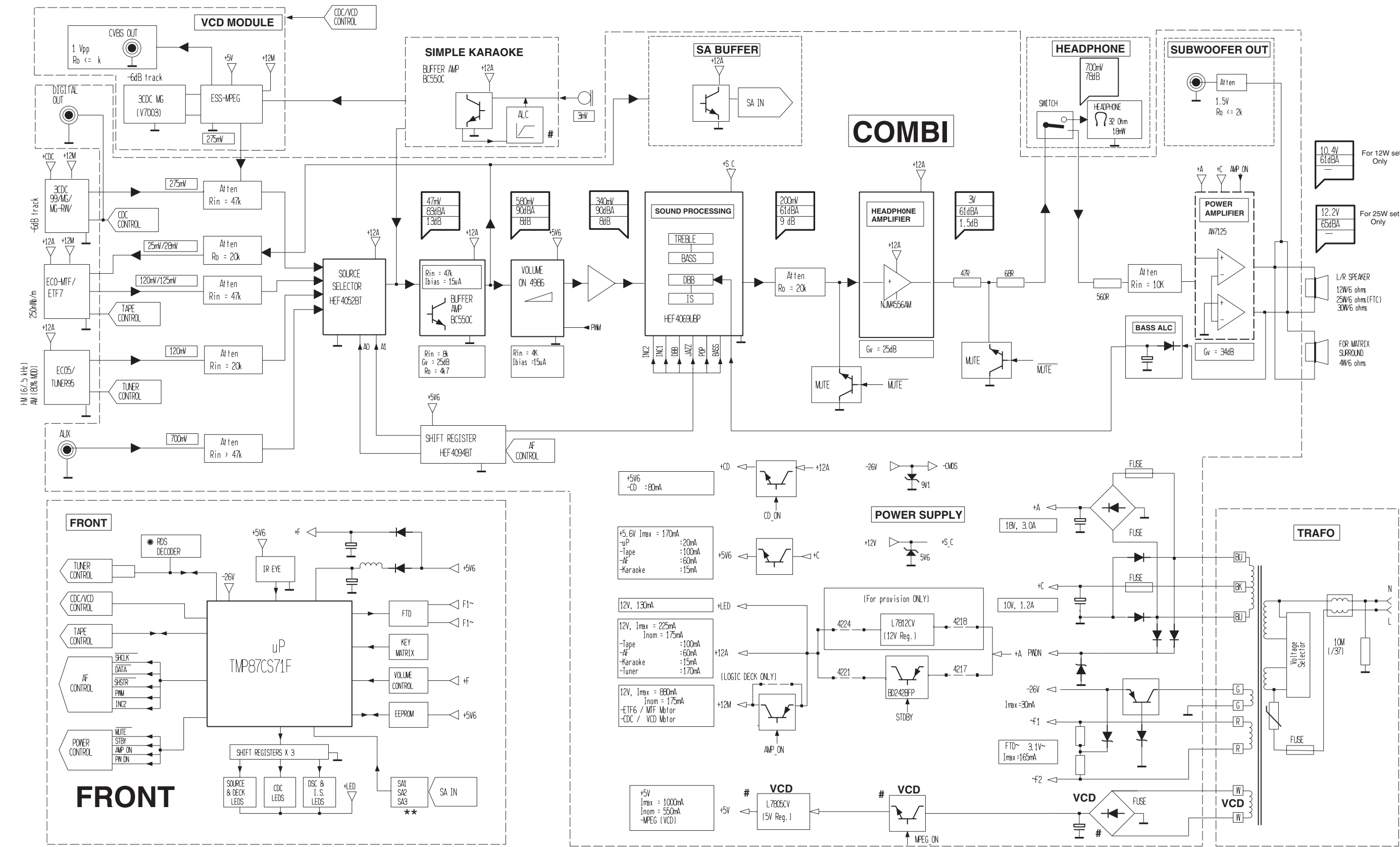
Note: * Depending on the selected grid frequency (9 or 10kHz)
By holding the TUNER and >>> buttons depressed while switching on the Mains supply, one of the undermentioned features will be activated:
- the tuning grid frequency is toggled between 9kHz and 10kHz for the Oversea (/21) version.
- the extended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

Error code	Error Description
E1000	Focus Error Triggered when the focus could not be found within a certain time when starting up the CD or when the focus is lost for a certain time during play.
E1001	Radial Error Triggered when the radial servo is off-track for a certain time during play.
E1002	Sledge In Error The sledge did not reach its inner position (inner-switch is still close) before approximately 6 Sec. have passed by. Inner-switch or sledge motor problem.
E1003	Sledge Out Error The sledge did not come out of its inner position (inner-switch is still open) before approximately 250 mSec. have passed by. Inner-switch or sledge motor problem.
E1005	Jump-offtrack error Triggered in normal play when the jump destination could not be found within a certain time. When this error occurred, software will try to recover by initiating the jump command again. If it is recoverable, the disc will continue to play.
E1006	Subcode Error Triggered when a new subcode was missing for a certain time during play.
E1007	PLL Error The Phase Lock Loop could not lock within a certain time.
E1008	Turntable Motor Error Generated when the CD could not reached 75% of speed during startup within a certain time. Discmotor problem.
E1020	Focus Search Error The focus point has not been found within a certain time.
E1070	The carousel switch is not open within certain time. This can happen when either the switch is defective and closed all the time, or when the carousel is blocked when located exactly at a disc position.
E1071	The carousel position switch did not close within a certain time. This can happen when the switch is defective and never closes electrically, or when the carousel is blocked in between two disc positions. The time-out is approximately 5 Sec.
E1079	The drawer could not enter the inside position and is opening again. This happen when the drawer is blocked and cannot go fully inside or when the drawer switch is defective and does not close.

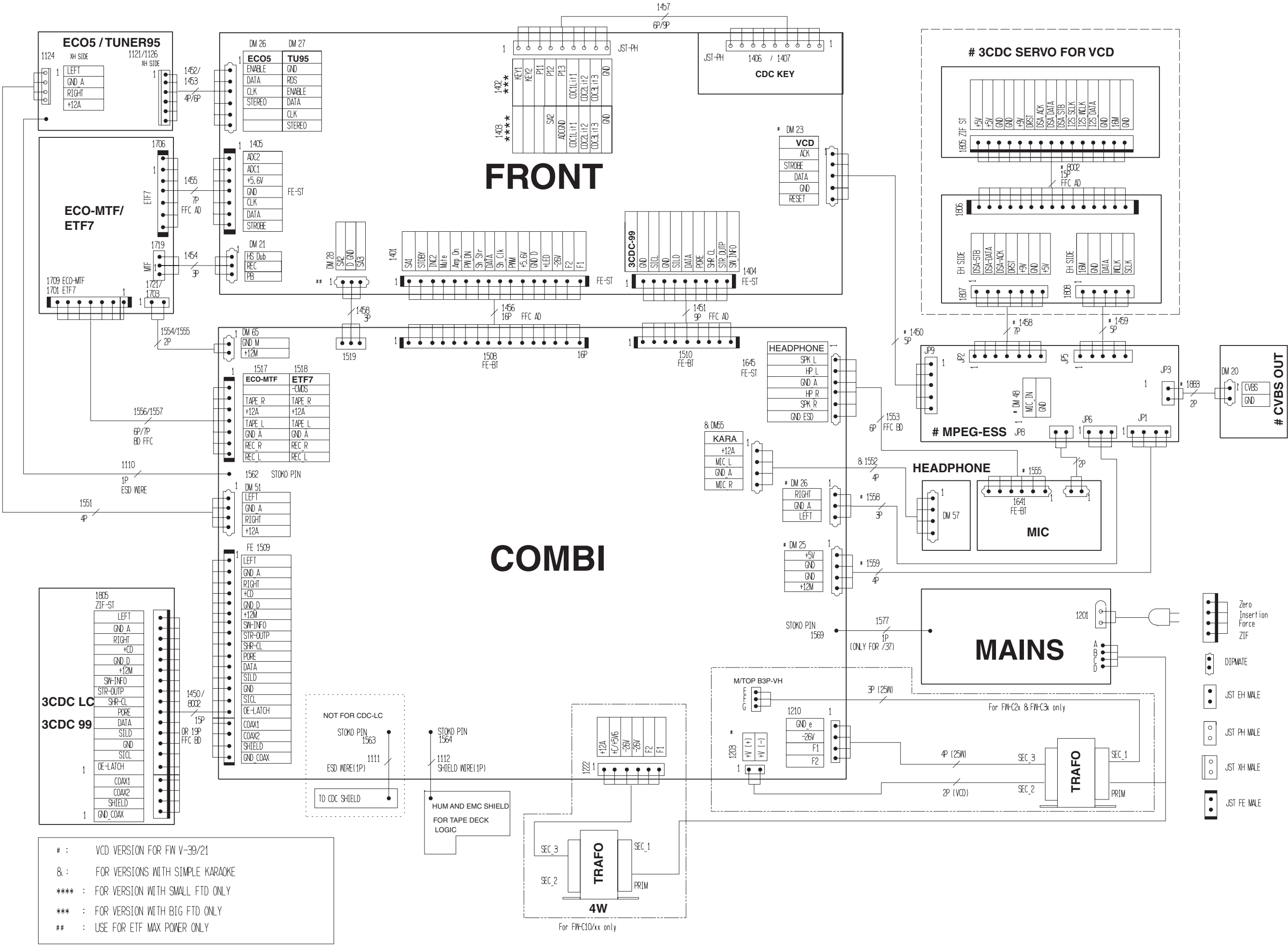
Table 2

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. Caution! All presets from the customer will be lost!!
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



SET WIRING DIAGRAM



FRONT BOARD

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Variation Table	6-2
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Component Layout	6-4
Chip layout	6-5
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FTD DISPLAY PIN CONNECTIONS

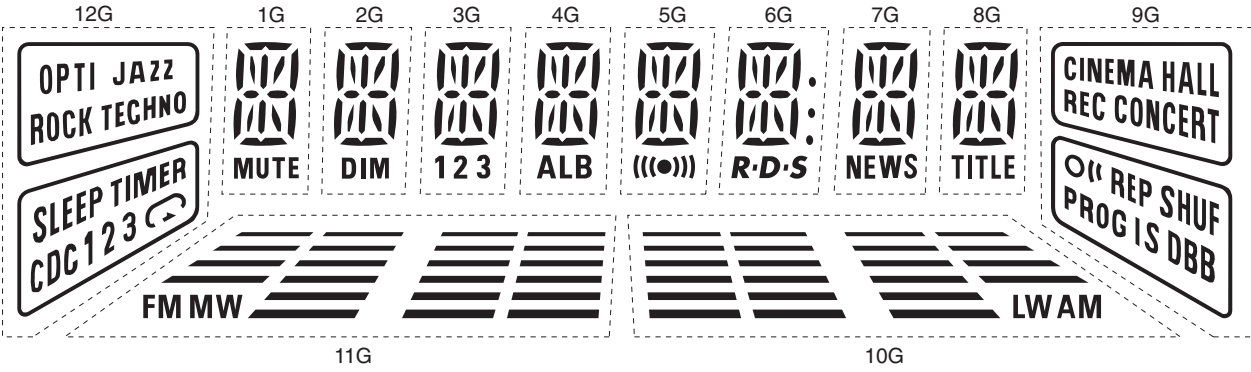


Diagram illustrating the FTD Display Pin Connections. The display is segmented into 12G (OPTI, JAZZ, ROCK, TECHNO, SLEEP, TIMER, CDC, 123), 1G (MUTE), 2G (DIM), 3G (123), 4G (ALB), 5G (((•))), 6G (R•D•S), 7G (NEWS), 8G (TITLE), and 9G (CINEMA, HALL, REC, CONCERT, Oll, REP, SHUF, PROG, IS, DBB). The display is also divided into 11G (FM, MW) and 10G (LW, AM) sections.

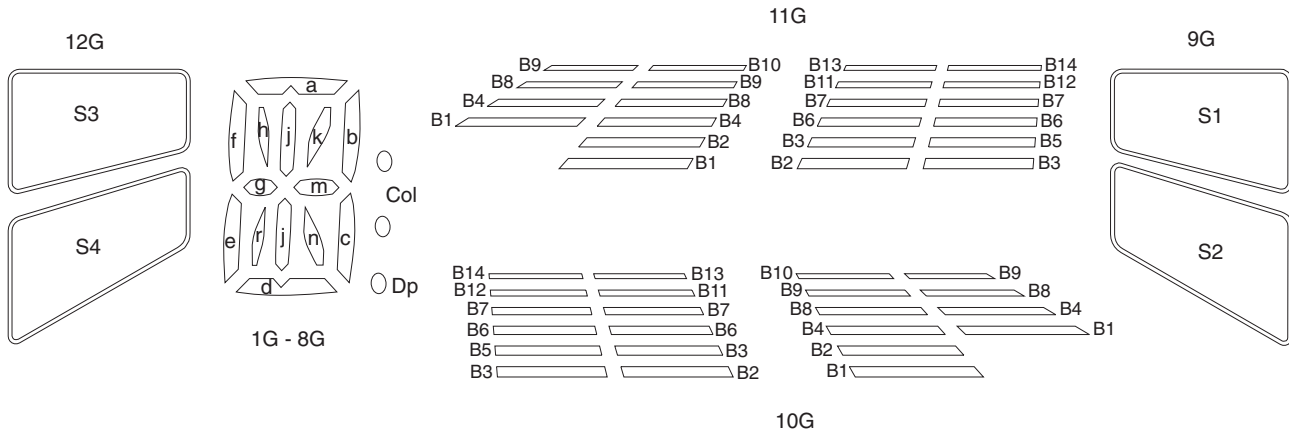


Diagram illustrating the FTD Display Pin Connections. The display is segmented into 12G (S3, S4), 1G-8G (a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, Col, Dp), 11G (B1, B2, B3, B4, B5, B6, B7, B8, B9, B10, B11, B12, B13, B14), and 9G (S1, S2).

	1G	2G	3G	4G	5G	6G	7G	8G	9G	10G	11G	12G		
P1	a	a	a	a	a	a	a	a	CINEMA	B1	B1	OPTI		
P2	h	h	h	h	h	h	h	h	HALL	B2	B2	JAZZ		
P3	j , p	j , p	j , p	j , p	j , p	j , p	j , p	j , p	REC	B3	B3	ROCK		
P4	k	k	k	k	k	k	k	k	CONCERT	B4	B4	TECHNO		
P5	b	b	b	b	b	b	b	b	Oll	B5	B5	SLEEP		
P6	f	f	f	f	f	f	f	f	REP	B6	B6	TIMER		
P7	m	m	m	m	m	m	m	m	SHUF	B7	B7	CDC		
P8	g	g	g	g	g	g	g	g	PROG	B8	B8	1		
P9	c	c	c	c	c	c	c	c	IS	B9	B9	2		
P10	e	e	e	e	e	e	e	e	DBB	B10	B10	3		
P11	r	r	r	r	r	r	r	r	S1	B11	B11	↶		
P12	n	n	n	n	n	n	n	n	S2	B12	B12	➤		
P13	d	d	d	d	d	d	d	d	-	B13	B13	S3		
P14	MUTE	DIM	1	ALB	(((•)))	R•D•S	NEWS	TITLE	-	B14	B14	S4		
P15	-	-	2	-	-	Col	-	-	-	LW	FM	-		
P16	-	-	3	-	-	Dp	-	-	-	AM	MW	-		

Front Board application

A53920	FW-C200/21/21M, FW-C220/21K
A53930	FW-C220/22/34
A53940	FW-C200/33
A53950	FW-C100/21/21M/22/30/33/34/37, FW-C105/21
A53970	FW-C250/37
A53980	FW-C250/21
A53990	FW-C280/22/34
A54000	FW-C290/21
A54340	FW-C200/30
A54450	FW-C150/37

FEATURES:	A53920	A53930	A53940	A53950	A53970	A53980	A53990	A54000	A54340	A54450
RDS	-	x	-	-	-	-	x	-	-	-
Rotary Encoder	x	x	x	-	x	x	x	x	x	-
Jog Encoder	-	-	-	-	x	x	x	x	-	-
Spectrum Analyzer	-	-	-	-	-	-	x	x	-	-
Biplaner LED	-	-	-	-	-	-	x	x	-	-
Small FTD	x	x	x	x	x	x	-	-	x	x
Large FTD	-	-	-	-	-	-	x	x	-	-
NTC	-	-	-	-	-	x	-	x	-	-
LED Control	x	x	x	-	x	x	x	x	x	-

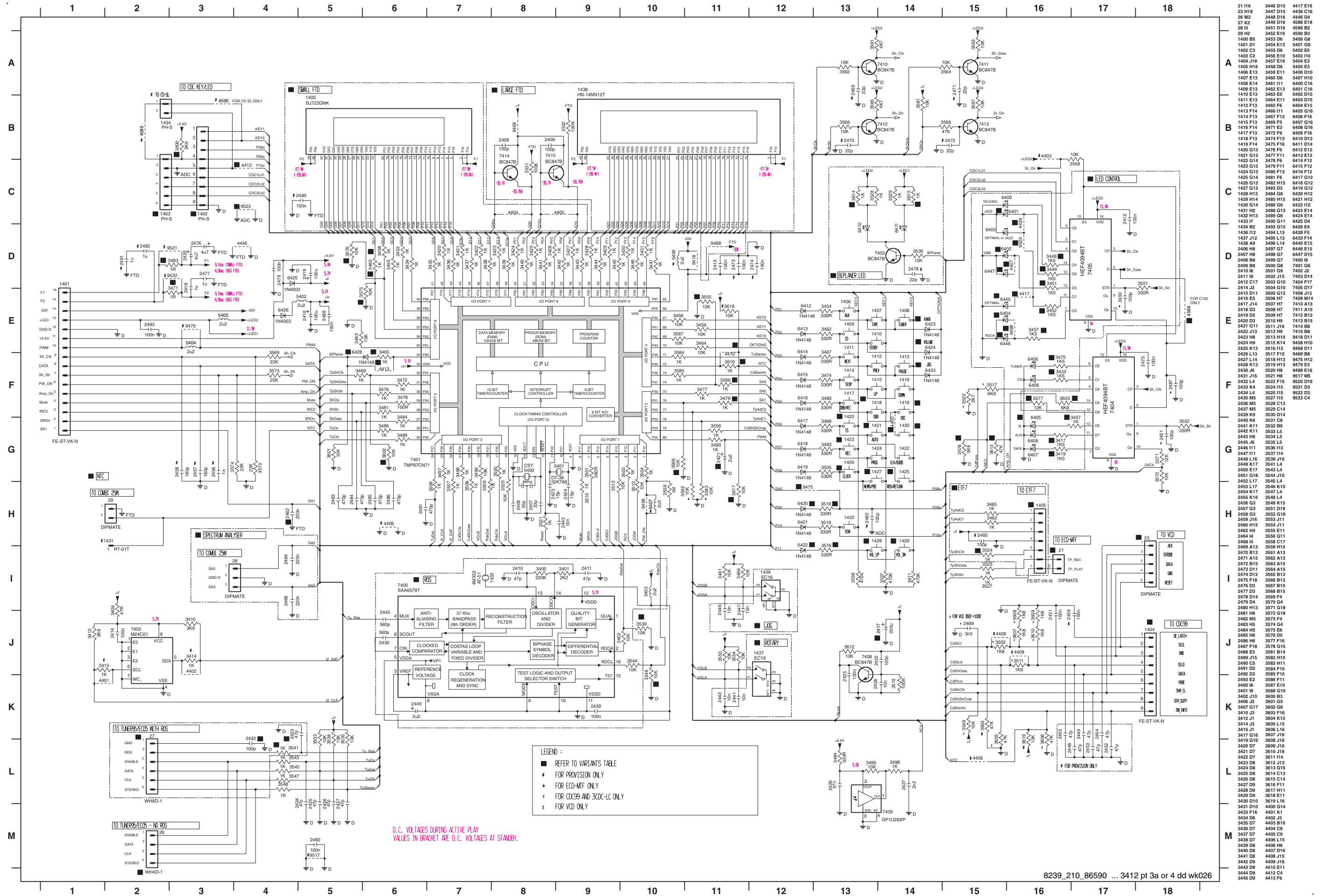
Variations table for Front Board

ITEM NO.	A53920	A53930	A53940	A53950	A53970	A53980	A53990	A54000	A54340	A54450
DM21	-	-	-	x	x	x	-	-	-	x
DM23	-	-	-	-	-	-	-	-	-	-
DM26	x	-	x	x	x	x	-	x	x	x
DM27	-	x	-	-	-	-	x	-	-	-
DM29	-	-	-	-	-	x	-	x	-	-
1402	-	-	-	-	-	-	x	x	-	-
1403	x	x	x	x	x	x	-	-	x	x
1404	x	x	x	x	x	x	x	x	x	x
1405	x	x	x	-	-	-	x	x	x	-
1418	-	-	-	-	-	-	x	x	-	-
1419	-	-	-	-	-	-	x	x	-	-
1420	-	-	-	-	-	-	x	x	-	-
1421	x	x	x	-	-	-	x	x	x	-
1423	x	x	x	-	-	-	x	x	x	-
1425	-	x	-	-	-	-	x	-	-	-
1426	x	x	x	-	-	-	x	x	x	-
1427	-	x	-	-	-	-	x	-	-	-
1428	-	-	-	x	-	-	-	-	-	x
1429	-	-	-	x	-	-	-	-	-	x
1430	x	x	x	x	-	-	-	-	x	x
2417	220μF	220μF	220μF	-	220μF	220μF	220μF	220μF	220μF	-
2421	22μF	22μF	22μF	2,2μF	22μF	22μF	22μF	22μF	22μF	2,2μF
2432	-	100pF	-	-	-	-	100pF	-	-	-
2433	-	47pF	-	-	-	-	47pF	-	-	-
2462	220nF	220nF	220nF	-	220nF	220nF	220nF	220nF	220nF	-
3407	-	-	-	-	-	-	1k	1k	-	-
3417	820R	820R	820R	-	820R	820R	820R	820R	820R	-
3419	820R	820R	820R	-	820R	820R	820R	820R	820R	-
3433	820R	820R	820R	-	820R	820R	820R	820R	820R	-

ITEM NO.	A53920	A53930	A53940	A53950	A53970	A53980	A53990	A54000	A54340	A54450
3448	820R	820R	820R	-	820R	820R	820R	820R	820R	-
3449	820R	820R	820R	-	820R	820R	820R	820R	820R	-
3451	820R	820R	820R	-	820R	820R	820R	820R	820R	-
3452	820R	820R	820R	-	820R	820R	820R	820R	820R	-
3457	820R	820R	820R	-	820R	820R	820R	820R	820R	-
3458	-	-	-	-	-	-	1k	1k	-	-
3460	-	-	-	-	-	-	1k	1k	-	-
3465	1k	1k	1k	-	1k	1k	1k	1k	1k	-
3471	4R7	4R7	4R7	4R7	4R7	4R7	1R	4R7	4R7	4R7
3475	820R	820R	820R	-	820R	820R	820R	820R	820R	-
3479	1k	1k	1k	-	1k	1k	1k	1k	1k	-
3483	4R7	4R7	4R7	4R7	4R7	4R7	1R	4R7	4R7	4R7
3516	-	-	-	330R	-	-	-	-	-	330R
3518	-	-	-	-	-	-	330R	330R	-	-
3524	1k	1k	1k	-	-	-	1k	1k	1k	-
3539	10k	-	10k	10k	10k	10k	-	10k	10k	10k
3541	-	1k	-	-	-	-	1k	-	-	-
3546	10k	-	10k	10k	10k	10k	-	10k	10k	10k
3555	10k	10k	10k	10k	10k	10k	-	-	10k	10k
3575	10k	10k	10k	10k	10k	10k	-	-	10k	10k
3576	10k	10k	10k	10k	10k	10k	-	-	10k	10k
3577	-	-	-	-	-	-	12k	12k	-	-
3578	-	-	-	-	-	-	5k6	5k6	-	-
3586	-	-	-	-	-	-	1k	1k	-	-
3588	-	-	-	10k	-	-	-	-	-	10k
3600	5k6	5k6	5k6	5k6	5k6	5k6	-	-	5k6	5k6
3602	-	-	-	10k	10k	10k	-	-	-	10k
3603	10k	10k	10k	6k8	10k	10k	10k	10k	10k	10k
3613	12k	12k	12k	47k	12k	12k	12k	12k	12k	12k
3614	-	-	-	-	-	-	820R	820R	-	-
3615	-	-	-	-	-	-	820R	820R	-	-
3616	-	-	-	-	-	-	1k	1k	-	-
3617	10k	10k	10k	10k	10k	-	10k	-	10k	10k
4400	x	x	x	x	-	-	-	-	x	x
4407	x	x	x	-	x	x	-	-	x	-
4410	x	x	x	x	x	-	x	-	x	x
4412	-	-	-	-	-	-	x	x	-	-
4413	-	-	-	x	-	-	-	-	-	x
4417	x	x	x	-	-	-	-	-	x	-
4436	x	x	x	-	-	-	-	-	x	-
4588	-	-	-	x	-	-	-	-	-	-
6401	-	-	-	-	x	x	x	x	-	-
6402	-	-	-	-	-	-	x	x	-	-
6404	-	-	-	-	x	x	x	x	-	-
6405	-	-	-	-	-	-	x	x	-	-
6420	-	-	-	-	-	-	x	x	-	-
6422	-	-	-	x	-	-	-	-	-	x
6423	x	-	x	-	-	x	-	x	-	-
6424	-	-	-	-	x	x	-	-	-	-
6428	x	x	x	-	x	x	x	x	x	-
6433	-	-	-	-	x	x	-	-	-	-
6445	x	x	x	-	-	-	-	-	x	-
6446	x	x	x	-	-	-	-	-	x	-
6447	x	x	x	-	x	x	-	-	x	-
9475	x	x	x	x	x	x	-	-	x	x
9488	-	-	-	-	x	x	x	x	-	-
9520	-	-	-	-	x	x	x	x	-	-
9523	x	x	x	x	x	x	-	-	x	x

x = Item in use.

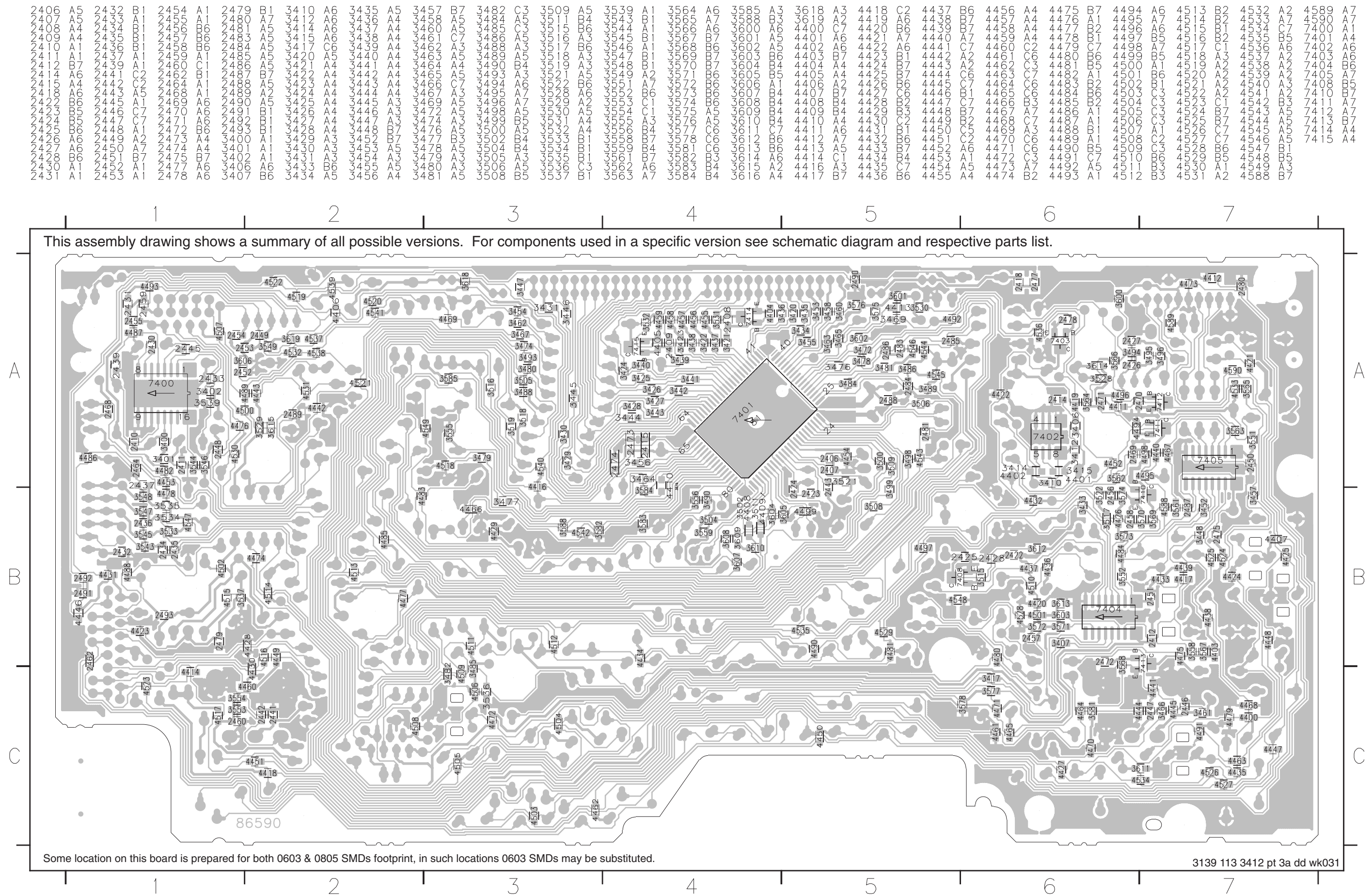
CIRCUIT DIAGRAM



6-4



CHIP LAYOUT



ELECTRICAL PARTS LIST - FRONT BOARD

MISCELLANEOUS

1401	2422 025 14546	Flex Socket 16pin Hort.
1404	4822 265 11531	Flex Socket 9pin Hort.
1405	4822 267 10953	Flex Socket 7pin Vert.
1406	4822 276 13775	Tact Switch
1407	4822 276 13775	Tact Switch
1408	4822 276 13775	Tact Switch
1409	4822 276 13775	Tact Switch
1410	4822 276 13775	Tact Switch
1411	4822 276 13775	Tact Switch
1412	4822 276 13775	Tact Switch
1413	4822 276 13775	Tact Switch
1414	4822 276 13775	Tact Switch
1415	4822 276 13775	Tact Switch
1416	4822 276 13775	Tact Switch
1417	4822 276 13775	Tact Switch
1418	4822 276 13775	Tact Switch
1419	4822 276 13775	Tact Switch
1420	4822 276 13775	Tact Switch
1421	4822 276 13775	Tact Switch
1422	4822 276 13775	Tact Switch
1423	4822 276 13775	Tact Switch
1424	4822 276 13775	Tact Switch
1426	4822 276 13775	Tact Switch
1432	4822 276 13775	Tact Switch
1436	4822 273 10366	Rotary Encoder 24P
1437	4822 273 10365	Rotary Encoder 24p
1438	3139 110 52640	FTD Display BJ796GNK

CAPACITORS

2406	5322 122 32659	33pF 5% 50V
2407	5322 122 32659	33pF 5% 50V
2408	5322 122 32531	100pF 5% 50V
2409	5322 122 32531	100pF 5% 50V
2412	4822 126 14585	100nF 10% 50V
2414	4822 126 13838	100nF +80/-20% 50V
2415	4822 126 14585	100nF 10% 50V
2416	4822 124 23432	100µF 20% 10V
2417	4822 124 12245	220µF 20% 10V
2418	4822 126 14043	1µF +80/-20% 16V
2419	4822 124 41584	100µF 20% 10V
2420	4822 124 12032	4,7µF 20% 50V
2421	4822 124 81151	22µF 20% 50V
2422	4822 126 14585	100nF 10% 50V
2423	4822 126 13486	15pF 2% 63V
2424	4822 126 13486	15pF 2% 63V
2425	4822 126 13838	100nF +80/-20% 50V
2426	4822 126 13751	47nF 10% 63V
2427	4822 122 33127	2,2nF 10% 63V
2428	4822 122 33177	10nF 20% 50V
2431	4822 126 14585	100nF 10% 50V
2434	4822 126 13692	47pF 1% 63V
2435	4822 126 13692	47pF 1% 63V

2436	4822 126 13692	47pF 1% 63V
2437	4822 126 13692	47pF 1% 63V
2441	4822 122 33177	10nF 20% 50V
2442	4822 122 33177	10nF 20% 50V
2443	4822 122 33177	10nF 20% 50V
2446	4822 122 33177	10nF 20% 50V
2447	4822 122 33177	10nF 20% 50V
2462	4822 126 14076	220nF +80/-20% 25V
2464	4822 126 14076	220nF +80/-20% 25V
2468	4822 126 14076	220nF +80/-20% 25V
2475	4822 126 14585	100nF 10% 50V
2476	4822 124 12032	4,7µF 20% 50V
2477	4822 126 14043	1µF +80/-20% 16V
2479	4822 126 14585	100nF 10% 50V
2481	5322 122 32268	470pF 10% 50V
2482	4822 126 12882	100nF +80/-20% 50V
2483	5322 122 32268	470pF 10% 50V
2484	5322 122 32268	470pF 10% 50V
2485	5322 122 32268	470pF 10% 50V
2486	5322 122 32268	470pF 10% 50V
2488	4822 126 14585	100nF 10% 50V
2489	4822 122 33891	3,3nF 10% 63V
2493	4822 126 14585	100nF 10% 50V

RESISTORS

3406	4822 051 20479	47R 5% 0,1W
3407	4822 051 10102	1k 2% 0,25W
3410	4822 051 20392	3k9 5% 0,1W
3412	4822 051 20392	3k9 5% 0,1W
3417	4822 117 11454	820R 1% 0,1W
3419	4822 116 52231	820R 5% 0,5W
3420	4822 051 10102	1k 2% 0,25W
3421	4822 051 10102	1k 2% 0,25W
3422	4822 051 10102	1k 2% 0,25W
3423	4822 051 10102	1k 2% 0,25W
3424	4822 051 10102	1k 2% 0,25W
3425	4822 051 10102	1k 2% 0,25W
3426	4822 051 10102	1k 2% 0,25W
3427	4822 051 10102	1k 2% 0,25W
3428	4822 051 10102	1k 2% 0,25W
3429	4822 051 10102	1k 2% 0,25W
3430	4822 051 10102	1k 2% 0,25W
3431	4822 051 10102	1k 2% 0,25W
3433	4822 117 11454	820R 1% 0,1W
3434	4822 051 10102	1k 2% 0,25W
3435	4822 051 10102	1k 2% 0,25W
3436	4822 051 10102	1k 2% 0,25W
3437	4822 051 10102	1k 2% 0,25W
3438	4822 051 10102	1k 2% 0,25W
3439	4822 051 10102	1k 2% 0,25W
3440	4822 051 10102	1k 2% 0,25W
3441	4822 051 10102	1k 2% 0,25W

ELECTRICAL PARTS LIST - FRONT BOARD

3442	4822 051 10102	1k 2% 0,25W
3443	4822 051 10102	1k 2% 0,25W
3444	4822 051 10102	1k 2% 0,25W
3445	4822 051 10102	1k 2% 0,25W
3446	4822 051 10102	1k 2% 0,25W
3447	4822 051 10102	1k 2% 0,25W
3448	4822 117 11454	820R 1% 0,1W
3449	4822 116 52231	820R 5% 0,5W
3451	4822 116 52231	820R 5% 0,5W
3452	4822 117 11454	820R 1% 0,1W
3453	4822 051 10102	1k 2% 0,25W
3454	4822 117 13577	330R 1% 0,1W
3455	4822 051 10102	1k 2% 0,25W
3456	4822 117 10833	10k 1% 0,1W
3457	4822 117 11454	820R 1% 0,1W
3458	4822 051 10102	1k 2% 0,25W
3459	4822 050 21003	10k 1% 0,6W
3460	4822 051 10102	1k 2% 0,25W
3461	4822 117 10833	10k 1% 0,1W
3462	4822 117 13577	330R 1% 0,1W
3463	4822 117 10833	10k 1% 0,1W
3464	4822 117 10833	10k 1% 0,1W
3465	4822 051 10102	1k 2% 0,25W
3466	4822 117 10833	10k 1% 0,1W
3467	4822 117 13577	330R 1% 0,1W
3469	4822 051 10102	1k 2% 0,25W
3471	4822 050 24708	4R7 1% 0,6W
3472	4822 051 10102	1k 2% 0,25W
3474	4822 117 13577	330R 1% 0,1W
3475	4822 116 52231	820R 5% 0,5W
3476	4822 051 10102	1k 2% 0,25W
3477	4822 051 10102	1k 2% 0,25W
3478	4822 051 20101	100R 5% 0,1W
3479	4822 051 10102	1k 2% 0,25W
3480	4822 117 13577	330R 1% 0,1W
3481	4822 051 10102	1k 2% 0,25W
3482	4822 051 10102	1k 2% 0,25W
3483	4822 050 24708	4R7 1% 0,6W
3484	4822 051 10102	1k 2% 0,25W
3485	4822 051 10102	1k 2% 0,25W
3486	4822 051 10102	1k 2% 0,25W
3488	4822 117 13577	330R 1% 0,1W
3489	4822 051 10102	1k 2% 0,25W
3490	4822 051 10102	1k 2% 0,25W
3493	4822 117 13577	330R 1% 0,1W
3494	4822 117 13577	330R 1% 0,1W
3495	4822 117 10833	10k 1% 0,1W
3496	4822 051 10102	1k 2% 0,25W
3497	4822 050 11002	1k 1% 0,4W
3498	4822 051 10102	1k 2% 0,25W
3499	4822 117 10833	10k 1% 0,1W
3500	4822 051 10102	1k 2% 0,25W

3501	4822 116 52226	560R 5% 0,5W
3502	4822 051 20182	1k8 5% 0,1W
3503	4822 050 11002	1k 1% 0,4W
3504	4822 051 10102	1k 2% 0,25W
3505	4822 117 13577	330R 1% 0,1W
3506	4822 051 10102	1k 2% 0,25W
3507	4822 050 11002	1k 1% 0,4W
3508	4822 051 10102	1k 2% 0,25W
3509	4822 051 10102	1k 2% 0,25W
3510	4822 050 11002	1k 1% 0,4W
3511	4822 051 20182	1k8 5% 0,1W
3512	4822 050 21003	10k 1% 0,6W
3513	4822 050 21003	10k 1% 0,6W
3515	4822 117 10837	100k 1% 0.1W
3517	4822 117 11507	6k8 1% 0,1W
3518	4822 117 13577	330R 1% 0,1W
3519	4822 117 13577	330R 1% 0,1W
3520	4822 050 21003	10k 1% 0,6W
3521	4822 051 10102	1k 2% 0,25W
3522	4822 117 12955	2k7 1% 0,1W
3524	4822 050 11002	1k 1% 0,4W
3525	4822 050 11002	1k 1% 0,4W
3527	4822 050 11002	1k 1% 0,4W
3528	4822 051 10102	1k 2% 0,25W
3529	4822 051 10102	1k 2% 0,25W
3530	4822 117 10833	10k 1% 0,1W
3531	4822 117 10837	100k 1% 0.1W
3532	4822 117 10837	100k 1% 0.1W
3533	4822 117 10833	10k 1% 0,1W
3534	4822 117 10833	10k 1% 0,1W
3535	4822 117 10833	10k 1% 0,1W
3536	4822 051 20474	470k 5% 0,1W
3537	4822 051 20474	470k 5% 0,1W
3539	4822 117 10833	10k 1% 0,1W
3543	4822 051 10102	1k 2% 0,25W
3545	4822 051 10102	1k 2% 0,25W
3546	4822 117 10833	10k 1% 0,1W
3547	4822 051 10102	1k 2% 0,25W
3548	4822 051 10102	1k 2% 0,25W
3549	4822 117 10833	10k 1% 0,1W
3551	4822 117 13577	330R 1% 0,1W
3552	4822 117 13577	330R 1% 0,1W
3553	4822 117 10833	10k 1% 0,1W
3554	4822 117 10833	10k 1% 0,1W
3556	4822 051 10102	1k 2% 0,25W
3558	4822 117 10833	10k 1% 0,1W
3559	4822 051 20105	1M 5% 0,1W
3561	4822 051 20472	4k7 5% 0,1W
3562	4822 117 10833	10k 1% 0,1W
3563	4822 117 10833	10k 1% 0,1W
3564	4822 117 10833	10k 1% 0,1W
3565	4822 051 20472	4k7 5% 0,1W

ELECTRICAL PARTS LIST - FRONT BOARD**RESISTORS**

3566	4822 117 10833	10k 1% 0,1W
3567	4822 117 10833	10k 1% 0,1W
3568	4822 117 10834	47k 1% 0,1W
3569	4822 051 20223	22k 5% 0,1W
3570	4822 051 20223	22k 5% 0,1W
3571	4822 117 11383	12k 1% 0,1W
3572	4822 117 10833	10k 1% 0,1W
3573	4822 051 20223	22k 5% 0,1W
3574	4822 051 20223	22k 5% 0,1W
3577	4822 117 11383	12k 1% 0,1W
3578	4822 051 20562	5k6 5% 0,1W
3581	4822 117 10833	10k 1% 0,1W
3584	4822 051 10102	1k 2% 0,25W
3585	4822 051 10102	1k 2% 0,25W
3586	4822 050 11002	1k 1% 0,4W
3587	4822 050 21003	10k 1% 0,6W
3601	4822 117 10833	10k 1% 0,1W
3603	4822 117 10833	10k 1% 0,1W
3607	4822 051 20182	1k8 5% 0,1W
3608	4822 051 20182	1k8 5% 0,1W
3609	4822 051 20182	1k8 5% 0,1W
3610	4822 051 20182	1k8 5% 0,1W
3611	4822 051 20474	470k 5% 0,1W
3612	4822 117 10833	10k 1% 0,1W
3613	4822 117 11383	12k 1% 0,1W
3614	4822 117 11454	820R 1% 0,1W
3615	4822 117 11454	820R 1% 0,1W
3616	4822 051 10102	1k 2% 0,25W
4401	4822 051 20008	0R Jumper 0805
4402	4822 051 20008	0R Jumper 0805
4411	4822 051 20008	0R Jumper 0805
4412	4822 051 20008	0R Jumper 0805
4414	4822 051 20008	0R Jumper 0805
4416	4822 051 20008	0R Jumper 0805
4418	4822 051 20008	0R Jumper 0805
4419	4822 051 20008	0R Jumper 0805
4420	4822 051 20008	0R Jumper 0805
4421	4822 051 20008	0R Jumper 0805
4422	4822 051 20008	0R Jumper 0805
4423	4822 051 20008	0R Jumper 0805
4424	4822 051 20008	0R Jumper 0805
4425	4822 051 20008	0R Jumper 0805
4426	4822 051 20008	0R Jumper 0805
4427	4822 051 20008	0R Jumper 0805
4428	4822 051 20008	0R Jumper 0805
4429	4822 051 20008	0R Jumper 0805
4430	4822 051 20008	0R Jumper 0805
4431	4822 051 20008	0R Jumper 0805
4432	4822 051 20008	0R Jumper 0805
4433	4822 051 20008	0R Jumper 0805
4434	4822 051 20008	0R Jumper 0805
4435	4822 051 20008	0R Jumper 0805

4437	4822 051 20008	0R Jumper 0805
4438	4822 051 20008	0R Jumper 0805
4439	4822 051 20008	0R Jumper 0805
4440	4822 051 20008	0R Jumper 0805
4441	4822 051 20008	0R Jumper 0805
4442	4822 051 20008	0R Jumper 0805
4443	4822 051 20008	0R Jumper 0805
4444	4822 051 20008	0R Jumper 0805
4445	4822 051 20008	0R Jumper 0805
4446	4822 051 20008	0R Jumper 0805
4447	4822 051 20008	0R Jumper 0805
4448	4822 051 20008	0R Jumper 0805
4449	4822 051 20008	0R Jumper 0805
4450	4822 051 20008	0R Jumper 0805
4451	4822 051 20008	0R Jumper 0805
4452	4822 051 20008	0R Jumper 0805
4453	4822 051 20008	0R Jumper 0805
4454	4822 051 20008	0R Jumper 0805
4455	4822 051 20008	0R Jumper 0805
4456	4822 051 20008	0R Jumper 0805
4457	4822 051 20008	0R Jumper 0805
4458	4822 051 20008	0R Jumper 0805
4459	4822 051 20008	0R Jumper 0805
4460	4822 051 20008	0R Jumper 0805
4461	4822 051 20008	0R Jumper 0805
4462	4822 051 20008	0R Jumper 0805
4463	4822 051 20008	0R Jumper 0805
4464	4822 051 20008	0R Jumper 0805
4465	4822 051 20008	0R Jumper 0805
4466	4822 051 20008	0R Jumper 0805
4467	4822 051 20008	0R Jumper 0805
4468	4822 051 20008	0R Jumper 0805
4469	4822 051 20008	0R Jumper 0805
4470	4822 051 20008	0R Jumper 0805
4471	4822 051 20008	0R Jumper 0805
4472	4822 051 20008	0R Jumper 0805
4473	4822 051 20008	0R Jumper 0805
4474	4822 051 20008	0R Jumper 0805
4475	4822 051 20008	0R Jumper 0805
4476	4822 051 20008	0R Jumper 0805
4477	4822 051 20008	0R Jumper 0805
4478	4822 051 20008	0R Jumper 0805
4479	4822 051 20008	0R Jumper 0805
4480	4822 051 20008	0R Jumper 0805
4481	4822 051 20008	0R Jumper 0805
4482	4822 051 20008	0R Jumper 0805
4483	4822 051 20008	0R Jumper 0805
4484	4822 051 20008	0R Jumper 0805
4485	4822 051 20008	0R Jumper 0805
4486	4822 051 20008	0R Jumper 0805
4487	4822 051 20008	0R Jumper 0805
4488	4822 051 20008	0R Jumper 0805

ELECTRICAL PARTS LIST - FRONT BOARD

4489	4822 051 20008	0R Jumper 0805
4490	4822 051 20008	0R Jumper 0805
4491	4822 051 20008	0R Jumper 0805
4492	4822 051 20008	0R Jumper 0805
4493	4822 051 20008	0R Jumper 0805
4494	4822 051 20008	0R Jumper 0805
4495	4822 051 20008	0R Jumper 0805
4496	4822 051 20008	0R Jumper 0805
4497	4822 051 20008	0R Jumper 0805
4498	4822 051 20008	0R Jumper 0805
4499	4822 051 20008	0R Jumper 0805
4500	4822 051 20008	0R Jumper 0805
4501	4822 051 20008	0R Jumper 0805
4502	4822 051 20008	0R Jumper 0805
4503	4822 051 20008	0R Jumper 0805
4504	4822 051 20008	0R Jumper 0805
4505	4822 051 20008	0R Jumper 0805
4506	4822 051 20008	0R Jumper 0805
4507	4822 051 20008	0R Jumper 0805
4508	4822 051 20008	0R Jumper 0805
4509	4822 051 20008	0R Jumper 0805
4510	4822 051 20008	0R Jumper 0805
4511	4822 051 20008	0R Jumper 0805
4512	4822 051 20008	0R Jumper 0805
4513	4822 051 20008	0R Jumper 0805
4514	4822 051 20008	0R Jumper 0805
4515	4822 051 20008	0R Jumper 0805
4516	4822 051 20008	0R Jumper 0805
4517	4822 051 20008	0R Jumper 0805
4518	4822 051 20008	0R Jumper 0805
4519	4822 051 20008	0R Jumper 0805
4520	4822 051 20008	0R Jumper 0805
4521	4822 051 20008	0R Jumper 0805
4522	4822 051 20008	0R Jumper 0805
4523	4822 051 20008	0R Jumper 0805
4524	4822 051 20008	0R Jumper 0805
4525	4822 051 20008	0R Jumper 0805
4526	4822 051 20008	0R Jumper 0805
4527	4822 051 20008	0R Jumper 0805
4528	4822 051 20008	0R Jumper 0805
4529	4822 051 20008	0R Jumper 0805
4530	4822 051 20008	0R Jumper 0805
4531	4822 051 20008	0R Jumper 0805
4532	4822 051 20008	0R Jumper 0805
4533	4822 051 20008	0R Jumper 0805
4534	4822 051 20008	0R Jumper 0805
4535	4822 051 20008	0R Jumper 0805
4536	4822 051 20008	0R Jumper 0805
4537	4822 051 20008	0R Jumper 0805
4538	4822 051 20008	0R Jumper 0805
4539	4822 051 20008	0R Jumper 0805
4540	4822 051 20008	0R Jumper 0805

4541	4822 051 20008	0R Jumper 0805
4542	4822 051 20008	0R Jumper 0805
4543	4822 051 20008	0R Jumper 0805
4544	4822 051 20008	0R Jumper 0805
4545	4822 051 20008	0R Jumper 0805
4546	4822 051 20008	0R Jumper 0805
4547	4822 051 20008	0R Jumper 0805

COILS & FILTERS

5400	4822 242 72066	Ceram Resonator 8MHz
5401	2422 543 01069	X'tal Resonator 32,768kHz
5402	4822 157 62552	Coil 2,2μH 5%
5404	4822 157 62552	Coil 2,2μH 5%
5405	4822 157 62552	Coil 2,2μH 5%

DIODES

6400	4822 130 11589	LTL-1CHAE
6401	4822 130 11589	LTL-1CHAE
6402	4822 130 11589	LTL-1CHAE
6403	4822 130 11589	LTL-1CHAE
6404	4822 130 11589	LTL-1CHAE
6405	4822 130 10791	LTL-1CHGE
6406	4822 130 11589	LTL-1CHAE
6407	4822 130 11589	LTL-1CHAE
6408	4822 130 11589	LTL-1CHAE
6409	4822 130 11589	LTL-1CHAE
6410	9322 161 99676	LTL-2R3VYKNT
6411	9322 161 99676	LTL-2R3VYKNT
6412	4822 130 30621	1N4148
6413	4822 130 30621	1N4148
6414	4822 130 30621	1N4148
6415	4822 130 30621	1N4148
6416	4822 130 30621	1N4148
6417	4822 130 30621	1N4148
6418	4822 130 30621	1N4148
6419	4822 130 30621	1N4148
6420	4822 130 30621	1N4148
6421	4822 130 30621	1N4148
6423	4822 130 30621	1N4148
6425	4822 130 31878	1N4003G
6426	4822 130 31878	1N4003G
6428	4822 130 30621	1N4148

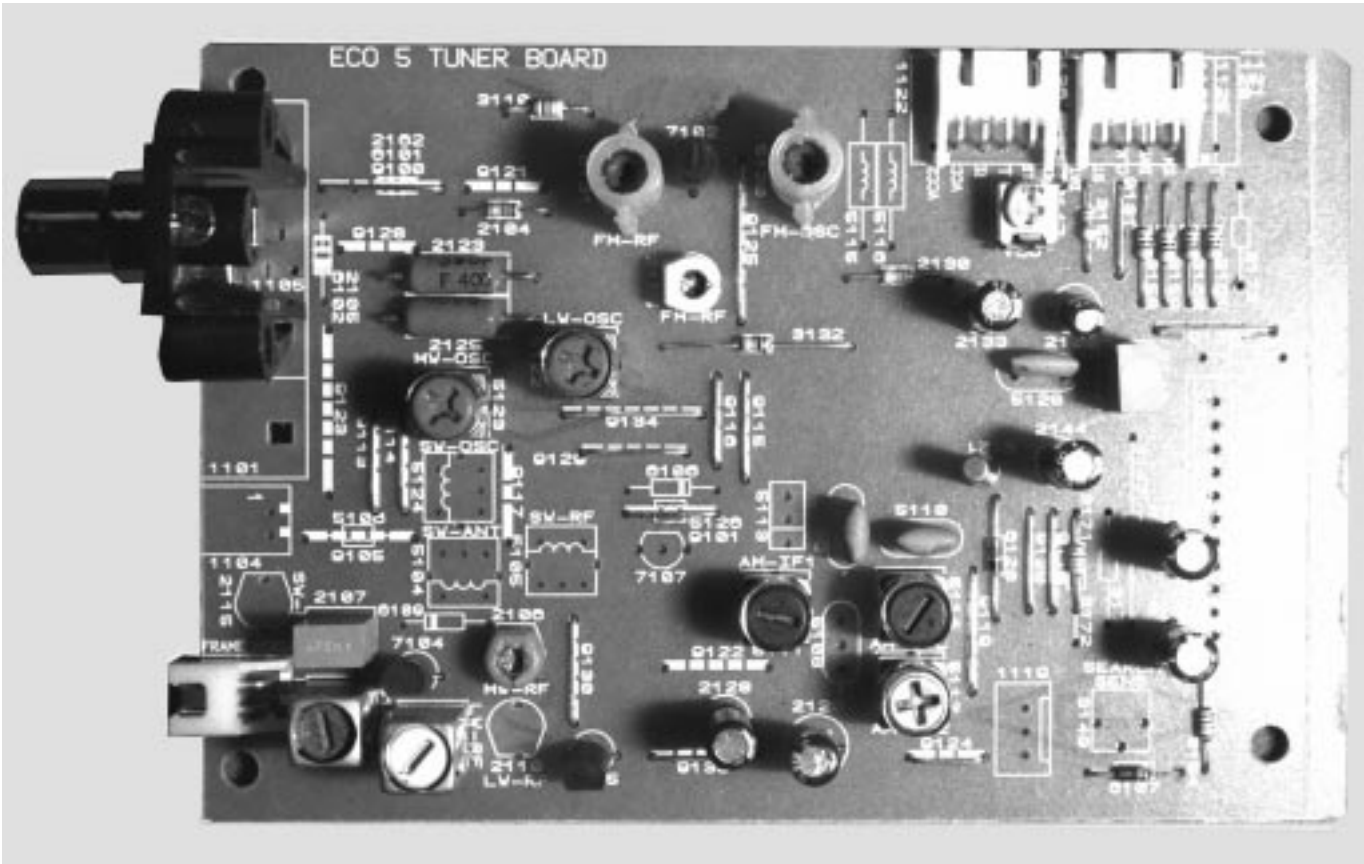
TRANSISTORS

7401	3139 110 52521	TMP87CS71F "290S52521"
7402	9965 000 04931	M24C01-WMN6
7403	5322 130 60159	BC847B
7404	5322 209 11306	HEF4094BT
7405	5322 209 11306	HEF4094BT
7408	5322 130 60159	BC847B
7409	4822 130 10165	GP1U28XP
7410	5322 130 60159	BC847B

ELECTRICAL PARTS LIST - FRONT BOARD

TRANSISTORS & INTEGRATED CIRCUITS			
7411	5322 130 60159	BC847B	
7412	5322 130 60159	BC847B	
7413	5322 130 60159	BC847B	
7414	5322 130 60159	BC847B	
7415	5322 130 60159	BC847B	

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

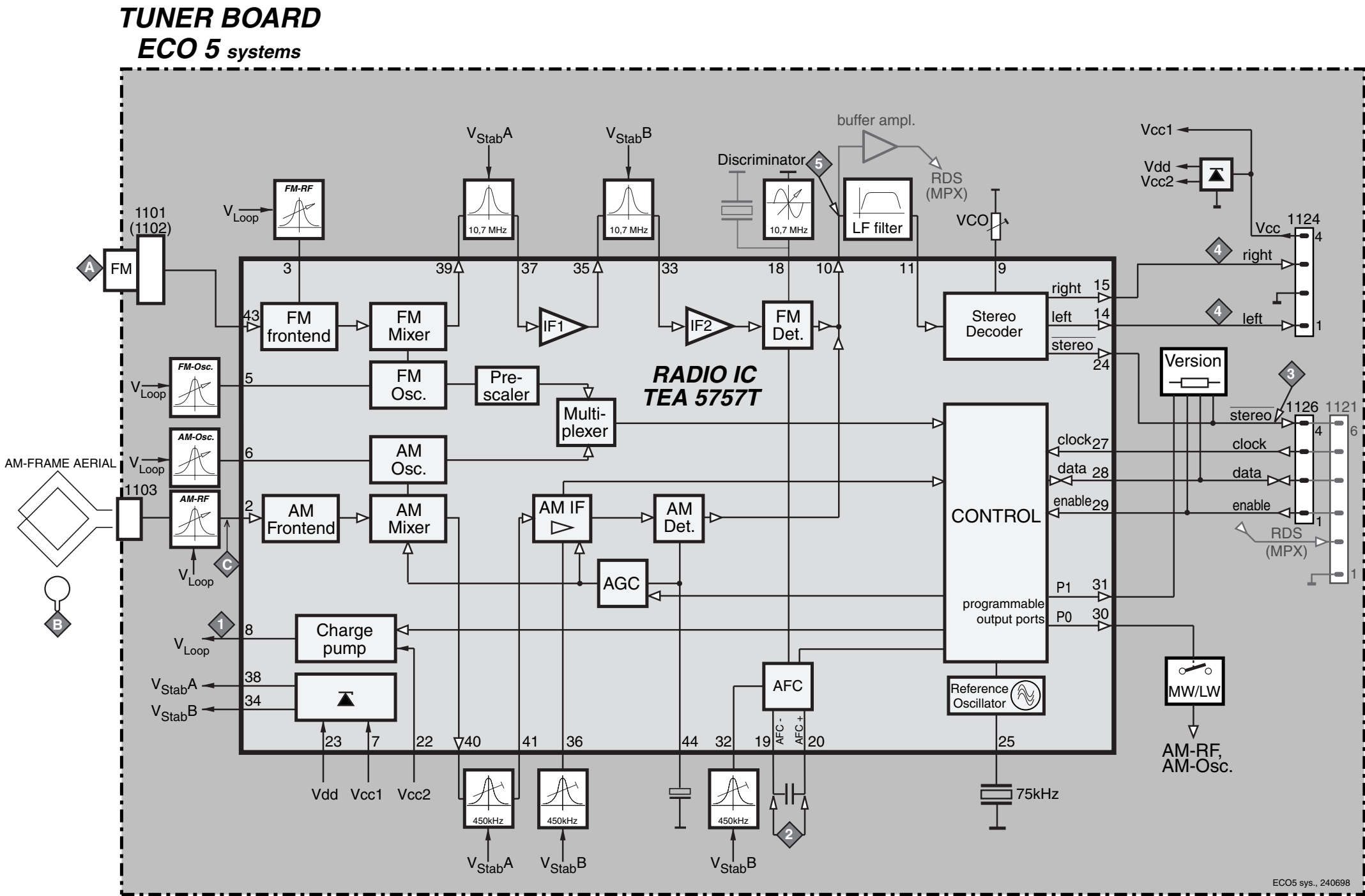


TUNER BOARD ECO5

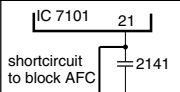
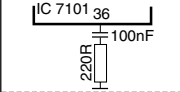
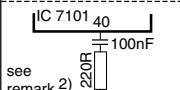
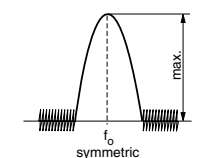
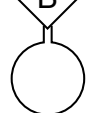
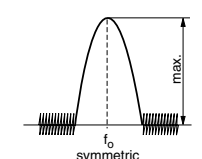
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BLOCKDIAGRAM



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

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
<i>VARICAP ALIGNMENT</i>						
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
<i>FM IF</i>						
FM	10.7MHz, 50mV continuous wave	F		5119	2	0 ± 3 mV DC
<i>FM RF</i>						
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
<i>VCO</i>						
FM	98MHz, 1mV continuous wave	A	98MHz	3142	3	152kHz ±1kHz ¹⁾
<i>AM IF</i>						
MW	450kHz connect pin 6 of IC 7101 (AM Osc.) with short wire to ground (pin 4)	C Δf=±15kHz V _{RF} = 3mV	 see remark 2) 	5111 5112	4	
AM AFC MW		C continuous wave V _{RF} = 10mV		5114	2	0 ± 2 mV DC
<i>AM RF ³⁾</i>						
MW ⁴⁾ 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	Δf = ±30kHz V _{RF} as low as possible	1500kHz	2106		
	560kHz		560kHz	5102		

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

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

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

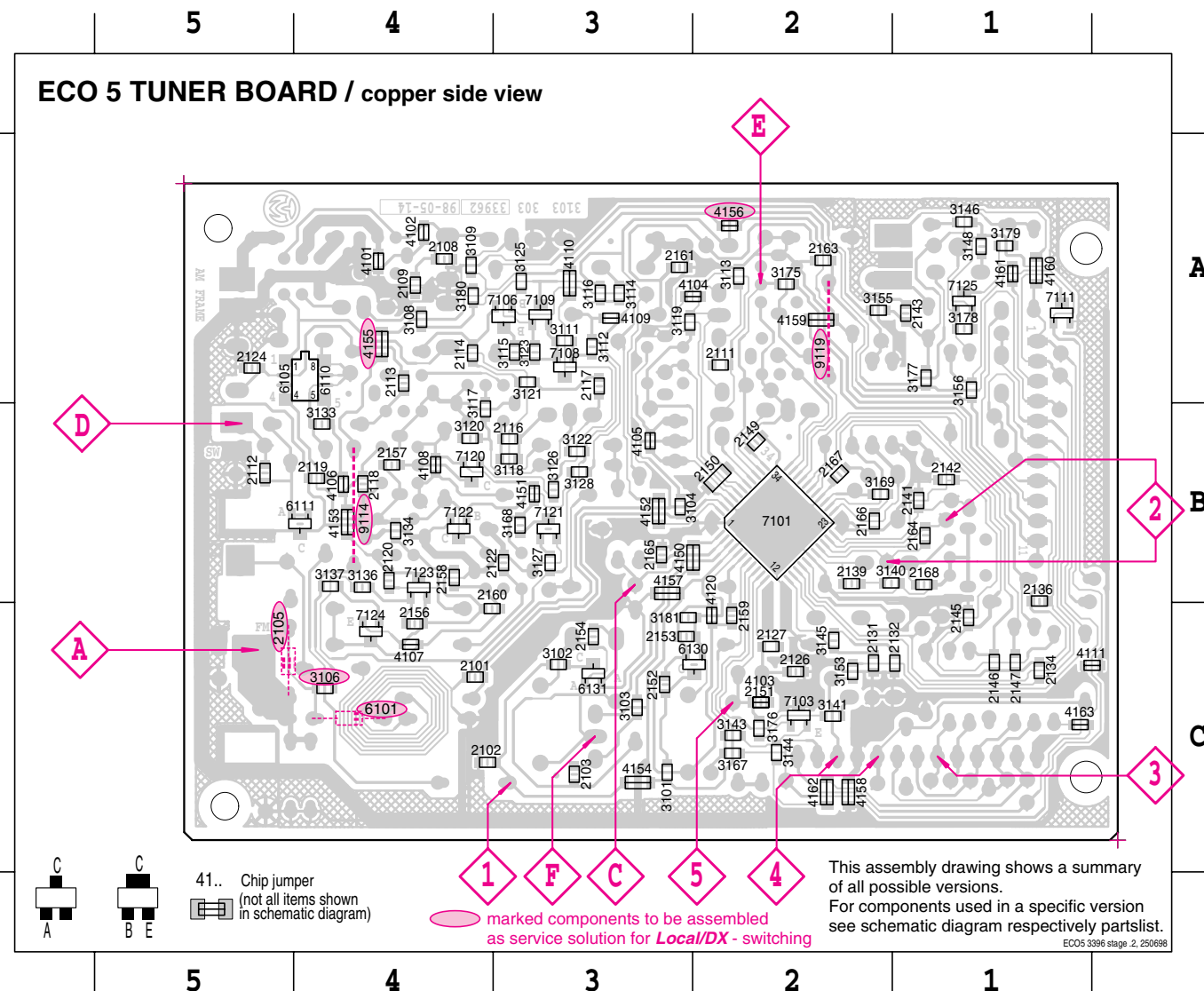
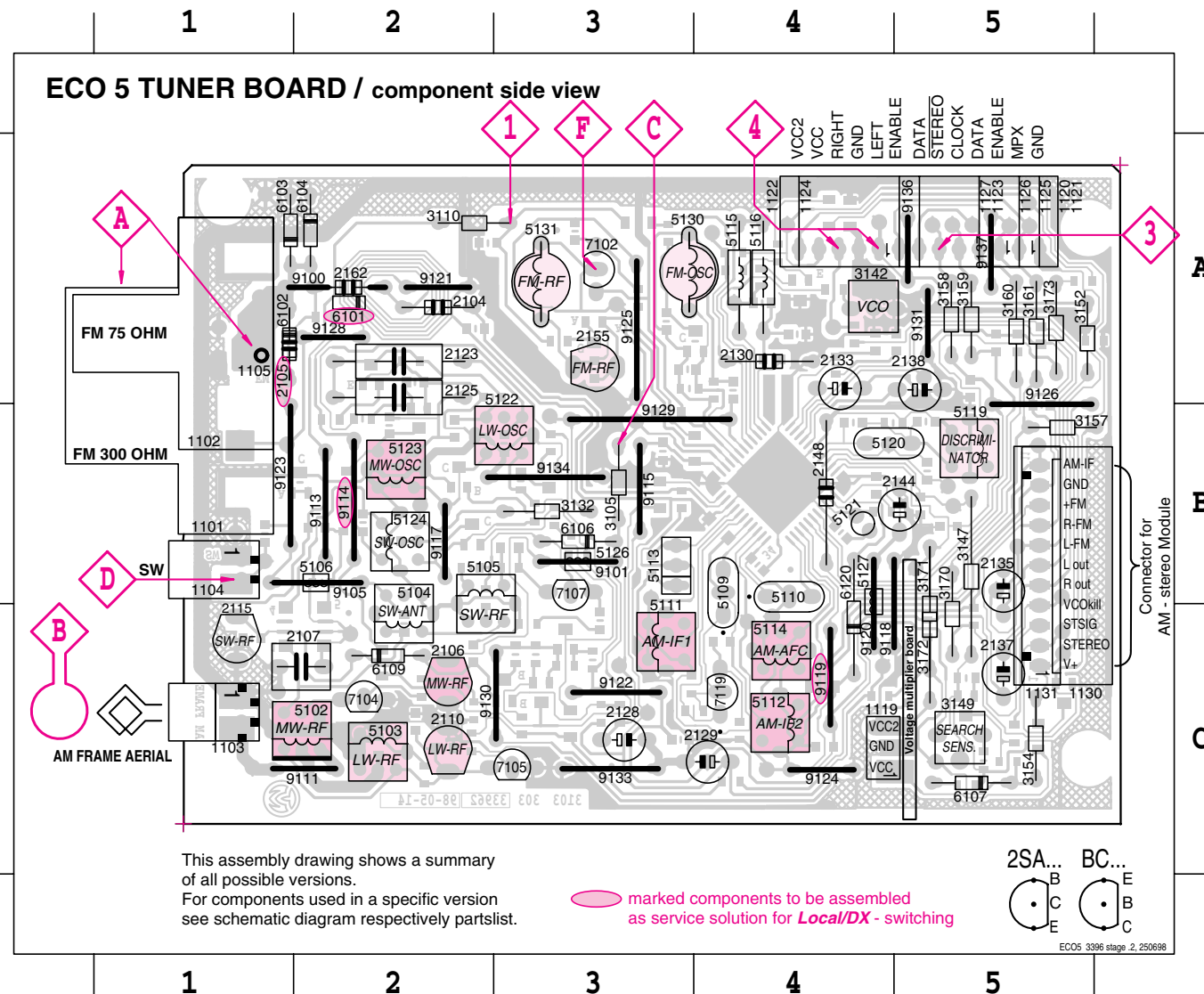
³⁾ For AM RF adjustments the original frame antenna has to be used !⁴⁾ MW has to be aligned before LW.

Repeat

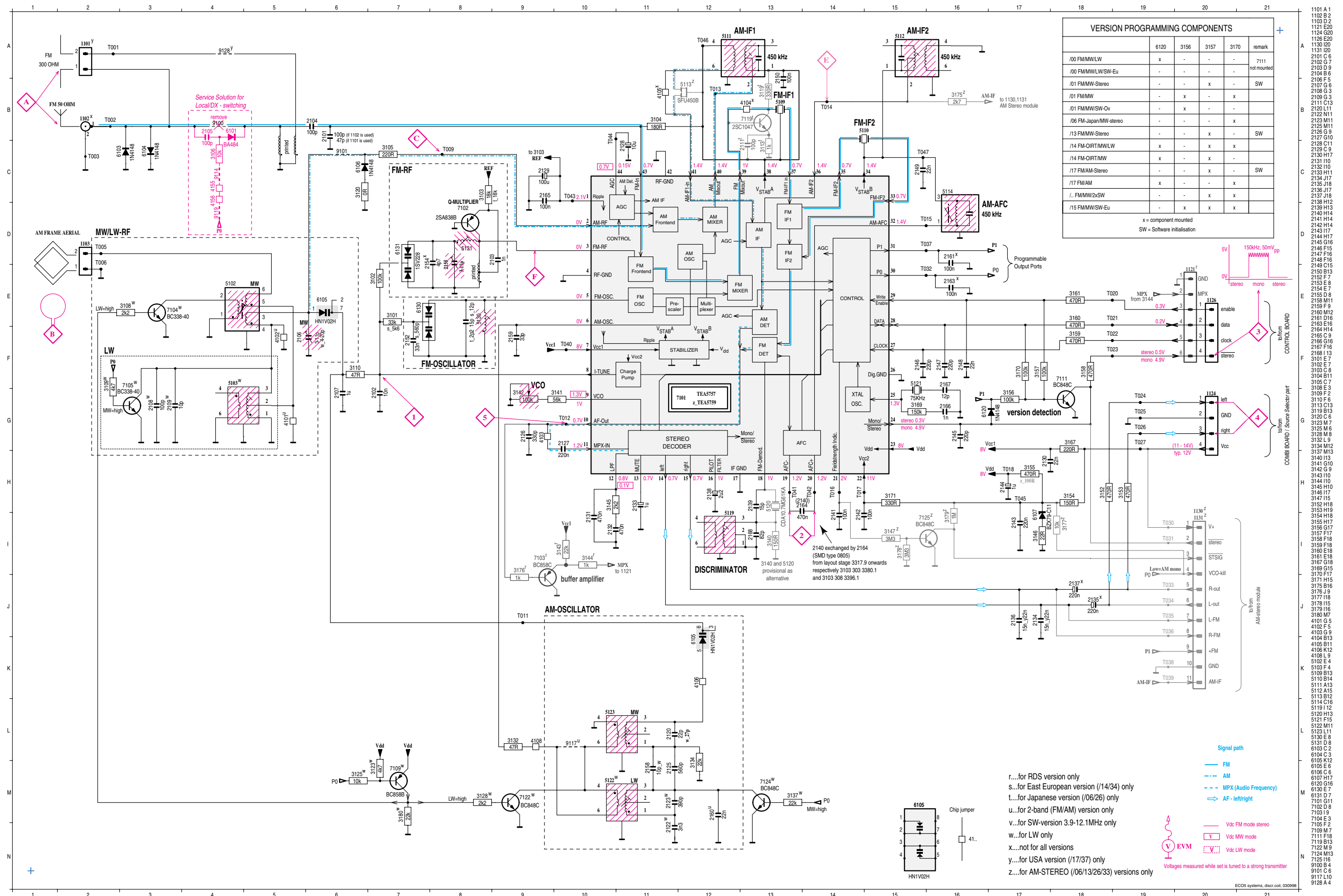
ECO5, descr. coll. 090797

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

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



TUNER BOARD ECO5 / Systems



ELECTRICAL PARTS LIST - ECO5 TUNER BOARD

MISCELLANEOUS

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

CAPACITORS

2101	5322 122 32531	100pF 5% 50V	
2101	4822 126 13692	47pF 1% 63V	for USA
2102	4822 122 33177	10nF 20% 50V	
2103	5322 122 34123	1nF 10% 50V	
2104	4822 122 33195	100pF 10% 50V	
2106	4822 125 50355	Trimmer 4-20pF	for LW version
2106	4822 125 60101	Trimmer 3-11pF 100V	
2107	4822 121 51319	1μF 10% 63V	
2108	5322 122 32531	100pF 5% 50V	for LW version
2109	5322 122 32448	10pF 5% 50V	for LW version
2120	4822 126 13691	27pF 1% 63V	for LW version
2120	5322 122 32658	22pF 5% 50V	
2122	4822 122 33891	3,3nF 10% 63V	for LW version
2125	4822 121 51381	560pF 5% 400V	
2126	5322 122 31863	330pF 5% 50V	
2127	4822 126 13473	220nF +80/-20% 50V	
2128	4822 124 41579	10μF 20% 50V	
2129	4822 124 41584	100μF 20% 10V	
2130	4822 126 11585	22nF+80/- 20% 25V	
2131	4822 122 33325	470nF 16V	
2132	4822 122 33325	470nF 16V	
2131	4822 126 13482	470nF +80/- 20% 16V	
2132	4822 126 13482	470nF +80/- 20% 16V	
2133	4822 124 40242	1μF 20% 63V	
2134	4822 126 13188	15nF 5% 63V	
2134	5322 122 32654	22nF 10% 63V	for USA
2135	4822 124 40746	0,22μF 20% 63V	
2136	4822 126 13188	15nF 5% 63V	
2136	5322 122 32654	22nF 10% 63V	for USA
2137	4822 124 40746	0,22μF 20% 63V	
2138	4822 124 41576	2,2μF 20% 50V	
2139	4822 126 14236	50V 15pF 5%	
2140	4822 121 51252	470nF 5% 63V	
2141	4822 126 10002	100nF 20% 25V	
2142	4822 126 10002	100nF 20% 25V	
2143	4822 126 13473	220nF +80/-20% 50V	
2144	4822 124 40242	1μF 20% 63V	
2145	4822 122 33575	220pF 5% 50V	
2146	4822 122 33575	220pF 5% 50V	
2147	4822 122 33575	220pF 5% 50V	
2148	4822 126 11585	22nF+80/- 20% 25V	
2149	5322 122 32654	22nF 10% 63V	
2150	4822 122 31947	100nF 20% 63V	
2152	5322 116 80853	560pF 5% 63V	for East. Europe
2152	4822 126 12105	33nF 5% 63V	
2153	4822 122 32139	12pF 2% 63V	for East. Europe
2153	4822 122 32504	15pF 2% 63V	
2155	4822 125 60101	Trimmer 3-11pF 100V	

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

RESISTORS

3101	4822 051 20562	5k6 5% 0,1W	for East. Europe
3101	4822 051 20333	33k 5% 0,1W	
3102	4822 051 20104	100k 5% 0,1W	
3103	4822 117 10965	18k 1% 0,1W	
3104	4822 117 11448	180R 1% 0,1W	
3105	4822 116 83872	220R 5% 0,5W	
3108	4822 117 11449	2k2 1% 0,1W	for LW version
3109	4822 051 20472	4k7 5% 0,1W	for LW version
3110	4822 116 52195	47R 5% 0,5W	
3120	4822 051 20008	0R Jumper 0805	
3123	4822 051 20472	4k7 5% 0,1W	for LW version
3125	4822 117 10833	10k 1% 0,1W	for LW version
3128	4822 117 11449	2k2 1% 0,1W	for LW version
3132	4822 116 52195	47R 5% 0,5W	
3134	4822 051 20223	22k 5% 0,1W	
3137	4822 051 20223	22k 5% 0,1W	for LW version
3140	4822 051 20008	0R Jumper 0805	
		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.

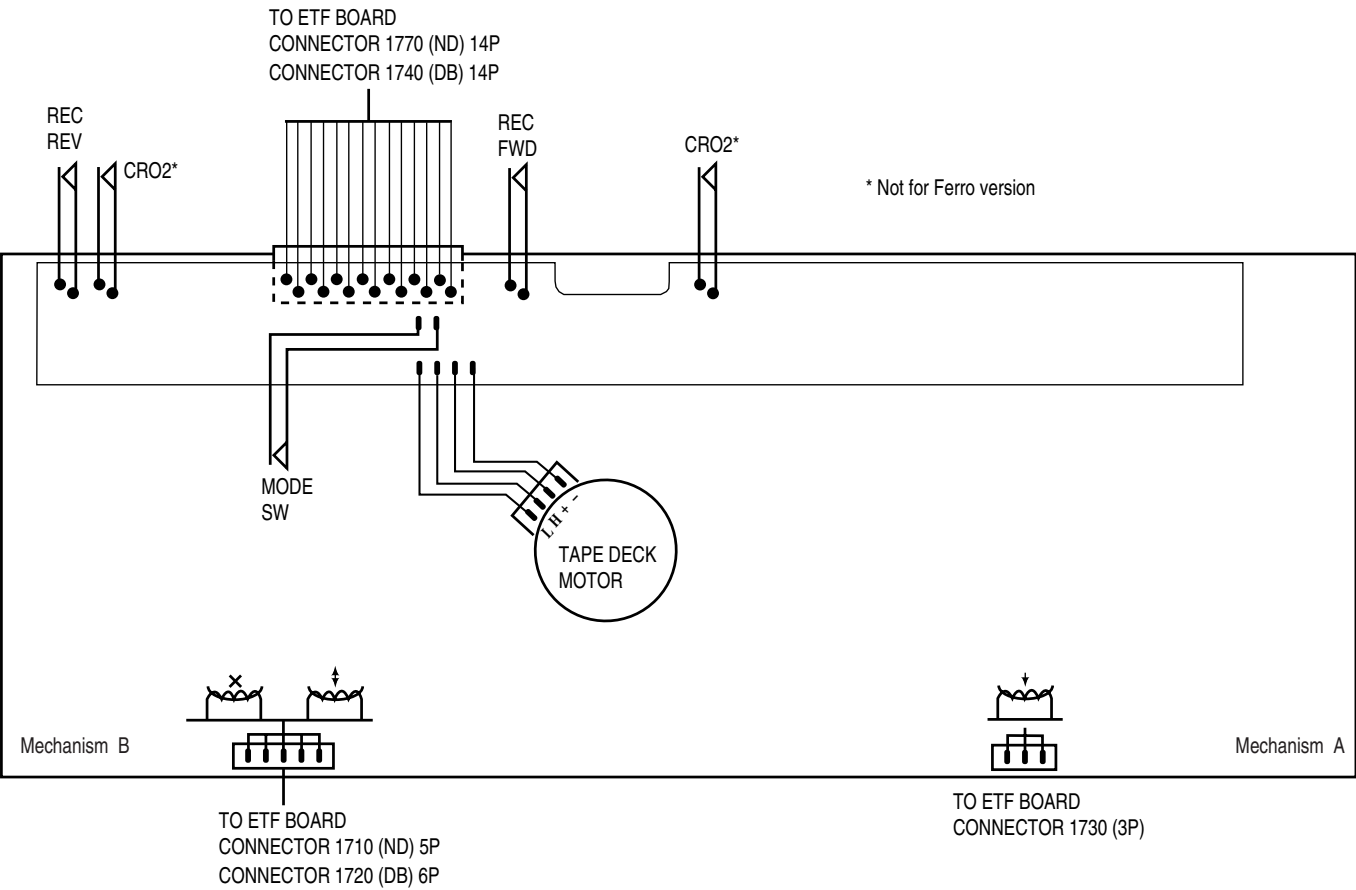
ETF7 TAPE MODULE

(Non-Dolby Version)

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Tapedeck wiring (Double deck)

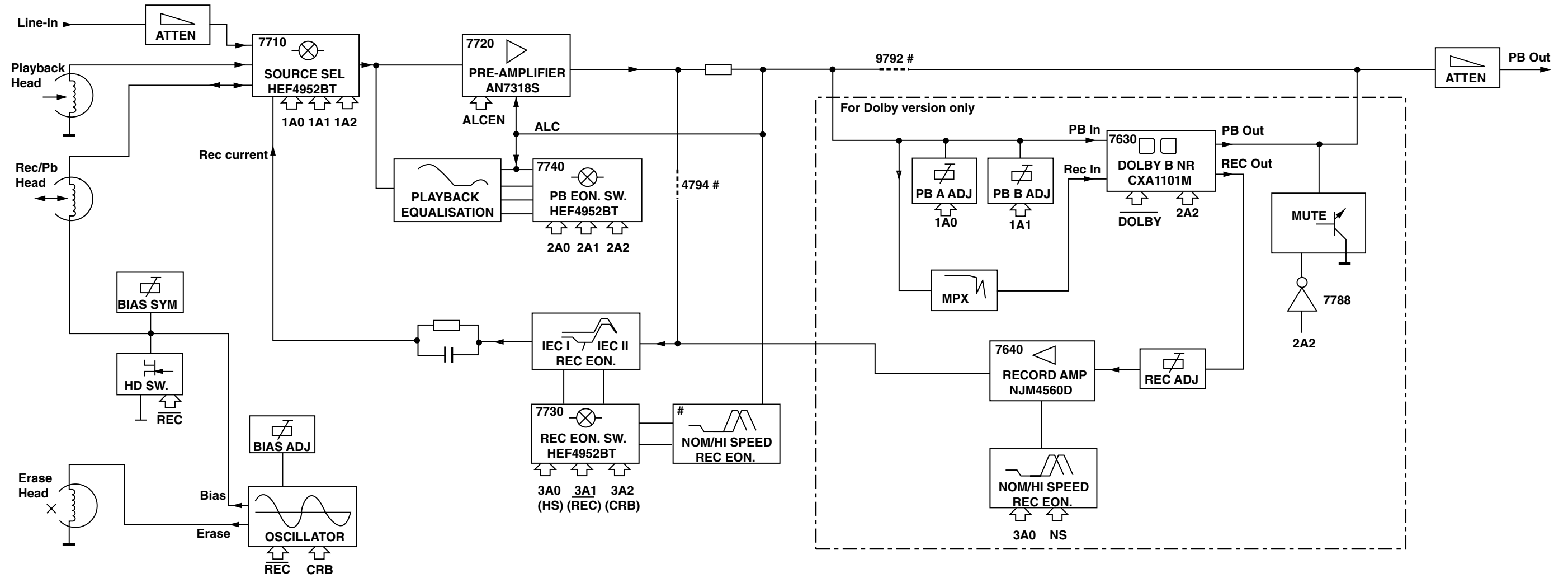


Variations table for Analog Circuit

	Autoreverse ND/DD/FR	Non-autoreverse ND/DD/FF	
	Chrome/Ferro	Chrome/Ferro	Ferro
2624	-	-	100nF
2701 , 2702	150pF	270pF	270pF
2703 , 2704	100pF	220pF	220pF
2717 , 2718	10nF	15nF	15nF
2721 , 2722	6,8nF	6,8nF	-
2727 , 2728	470pF	1nF	1nF
3616	10k	1k	1k
3618	6k8	-	-
3620	10k trimmer	-	-
3622	-	10k trimmer	10k trimmer
3672	4k7	-	-
3676	47k	-	-
3687	220R	220R	-
3688	680R	-	-
3723 , 3724	15k	18k	18k
3725 , 3726	10R	10R	-
3727 , 3728	5k6	6k8	6k8
3729 , 3730	3k3	4k7	4k7
3743 , 3744	1k5	2k2	2k2
3745 , 3746	3k3	5k6	5k6
3754 , 3755	1M	47R	47R

	Autoreverse ND/DD/FR	Non-autoreverse ND/DD/FF	
	Chrome/Ferro	Chrome/Ferro	Ferro
3769	12k	8k2	8k2
3772	6k8	5k6	5k6
4785	-	-	0R jumper
3774	15k	8k2	8k2
6614	1N4148	-	-
7616	BC857B	-	-
7622	BC847B	-	-

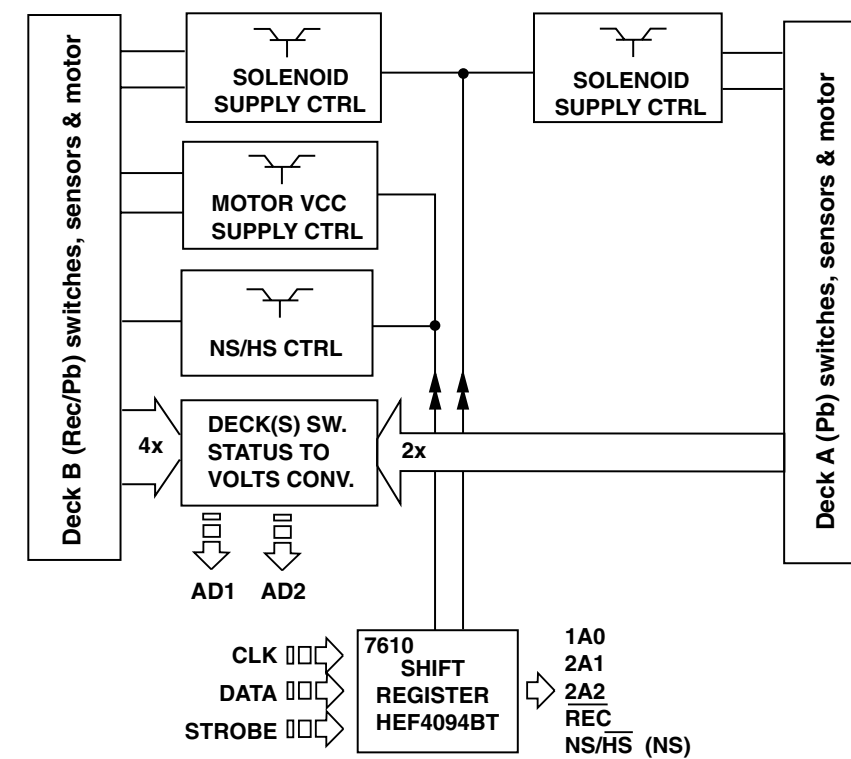
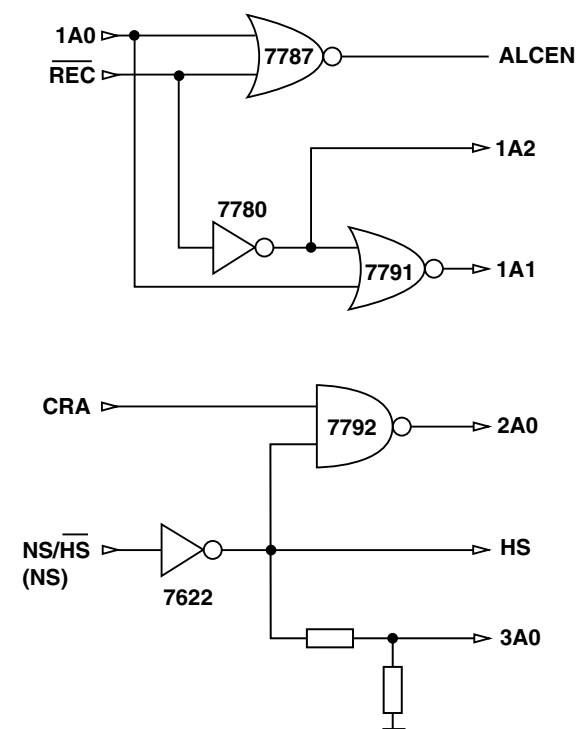
BLOCK DIAGRAM



NOTE: # For Non-dolby version only
Only 1 channel is presented.

MicroProcessor Control / Communication lines

Direct / Indirect Control lines from Shift Registers



Brief introduction

General

1. Playback Mode
Signal from the playback head Deck A or Deck B is selected and fed through by the Mode Selector IC7710 (HEF4952BT). The signal is amplified by amplifier IC7720 (AN7323S) before feeding to the IC7740 (HEF4952BT) and out to the AF Board via connector 1701.
2. Recording Mode
Recording Signal is selected and fed through by the Mode Selector IC7710 (HEF4952BT) which is then amplified by the amplifier IC7720 (AN7323S). The amplified output signal will pass through IC7730 (HEF4952BT) for record equalization and back to IC7710 (HEF4952BT) before registered into the Rec/PB Head of Deck B.
3. Dubbing Mode
In Dubbing mode, signal from the playback head Deck A is selected and fed through by the Mode Selector IC7710 (HEF4952BT) which is then equalised for playback mode by the amplifier IC7720 (AN7323S) so that a flat response is obtained after the pre-amp. The equalised signal will then follow the same path as in the Recording mode.
4. Mode Selector
The Mode Selector IC7710 (HEF4952BT) caters for 4 inputs signal, namely Playback Signal from Deck A, Playback Signal from Deck B, Recording Signal and Dubbing Signal.
5. Amplifier PB/REC
Amplifier IC7720 (AN7323S) is for the purpose of amplifying the Playback and Recording signal from the Mode Selector.
6. Automatic Level Control (ALC)
ALC circuit consists of resistors (3760, 3765, 3766, 3767), capacitors (2762 , 2763) and control by transistor 7787 (BC847B). ALC limits the amplifier output to a constant value when input signal becomes too large, thus limiting recording current to below saturation level, to prevent recording distortion.
7. Muting Circuit (For Non-Dolby version only)
Switch S4 of the IC7740 (HEF4952BT) is for the purpose of muting the output during Recording mode. During Recording mode, S4 is closed and shorted to the ground.
8. IC7740 (HEF4952BT)
The function of the IC7740 (HEF4952BT) is to change time constant between 120us Ferro (IEC I) and 70us Chrome (IEC II) during playback mode. It will automatically determined whether the tape type is 120us Ferro (IEC I) or 70us Chrome (IEC II). This IC will switch to Flat Gain during the Recording mode.
9. IC7730 (HEF4952BT)
The function of the IC7730 (HEF4952BT) is to change gain and time constant according to tape type and recording speed to boost recording current at higher frequency during recording to compensate for head loss. It will automatically determined whether the tape type is 120us Ferro (IEC I) or 70us Chrome (IEC II).
10. Bias Level
Bias Level making use of the Variable resistor (3773) for adjusting the optimal level of the bias current for Ferro or Chrome.
11. Bias Symm (For Dolby B NR version only)
Bias Symm making use of the Variable resistor (3785) to adjust the bias current for the left and the right channel to be equal.
12. PB Switch
Playback Switch which consists of the FETs 7785 (For Dolby B NR version only) & 7786 (J111) is for the purpose of providing a virtual ground for the Rec/PB Head (Deck B) during Playback mode. During the Playback mode, the FETs are turn on and shorted pin 2 and 4 of connector 1720 to the ground. During Recording mode, the FETs are turn off to allow the oscillator signal to be superposition onto the Recording signal for recording.

13. Motor Speed (For FR versions only)
During High speed dubbing, a feedback signal from the uP through pin 03 of the IC7610 (HEF4094BT) will trigger the transistors 7622 (BC847B) and 7616 (BC857B) to cause a change in the voltage level between High and Low, thus changing the speed of the motor.
14. IC7610 (HEF4094BT)
IC7610 (HEF4094BT) is a Shift Register use for issues the logic for cmos switch ICs (HEF4952BT) via 1A0, 2A1 and 2A2. It also issues logic to On/Off SOL_A, SOL_B and MOT. Recording speed is controlled via NS/HS.

Dolby Circuit (For sets with Dolby B NR version only)

15. IC7630 (CXA1551M)
IC7630 (CXA1551M) in the Dolby circuit is a Dolby Noise Reduction Type B IC for the Playback and Recording signal. Noise Reduction ON/OFF are controlled by $\overline{\text{DOLBY}}$, which is from CLK, direct from uP. After clocking in DATA, CLK is set to HIGH/LOW for NR OFF/ON.
16. 19kHz Filter
The 19kHz filters 5631 & 5632 (LXD-210) in the Dolby circuit is for the purpose of filtering the 19kHz Pilot Tone (for Tuner signal only) of the Recording signal.
17. Level Adjust
The Variable resistor 3635, 3636,3641 and 3642 in the Dolby circuit is for adjusting the playback level of the Dolby reference (400Hz , 200nWb/m). Transistor 7631, 7632 are ON to enable adjustment of 3641, 3642 during Playback Deck A. Transistor 7633, 7634 and 3635, 3636 are active for Playback Deck B.
18. Amplifier IC7640 (NJM4560M)
The Amplifiers 7640A & 7640B (NJM4560M) in the Dolby circuit is for the purpose of amplified the Recording signal.
19. Muting Circuit
The muting circuit which consists of transistors 7788, 7789 and 7790 (BC847B) is for the purpose of muting the output during Recording mode.

NOTATIONS & ABBREVIATIONS USED IN THIS DOCUMENT

CR	Chrome (IEC type II)
DB	Dolby NR type B
DD	Double Deck
DM	Double Motor
FE	Ferro (IEC type I)
FF	Non-Autoreverse
FR	Autoreverse Deck B
Gnd x	Ground x
HSD	High speed dubbing
ND	Non Dolby
NR	Noise Reduction
NSD	Normal speed dubbing
PB	Playback
REC	Record
S/A	Sub-assy
SD	Single Deck
SM	Single Motor

CONNECTORS ASSIGNMENTS:

CONNECTOR 1701		INTERCONNECTION TO AF BOARD	
○ 1	REC-L	Record input left	
○ 2	REC-R	Record input right	
○ 3	GND A	AF Ground	
○ 4	TAPE-L	Playback output left	
○ 5	+12V	D.C. supply (+12V) for AF electronics	
○ 6	TAPE-R	Playback output right	
○ 7	-CMOS	Negative d.c. supply (-9V) for CMOS ICs	

CONNECTOR 1703		INTERCONNECTION TO AF BOARD	
○ 1	GND M	Motor Ground	
○ 2	+MOTOR	D.C. supply (+12V) for tape deck motor & solenoid	

CONNECTOR 1706		INTERCONNECTION TO FRONT BOARD	
○ 1	AD2	Deck sensing switches output voltage / Deck A EOT	
○ 2	AD1	Deck sensing switches output voltage / Deck B EOT	
○ 3	+5V	DC supply +5V for ADC network	
○ 4	GND P	Control & Oscillator Ground	
○ 5	CLK	HEF4094BT shift register Clock line	
○ 6	DATA	HEF4094BT shift register Data line	
○ 7	STROBE	HEF4094BT shift register Strobe line	

CONNECTOR 1710		DECK B HEADS CONNECTON <i>(For Non-Dolby version only)</i>	
○ 1	B R/P HD L+	R/P Head left channel positive	
○ 2	GND A	R/P Head return ground	
○ 3	B R/P HD R+	R/P Head right channel positive	
○ 4	ERASE HEAD	Erase Head	
○ 5	GND A	Erase Head ground	

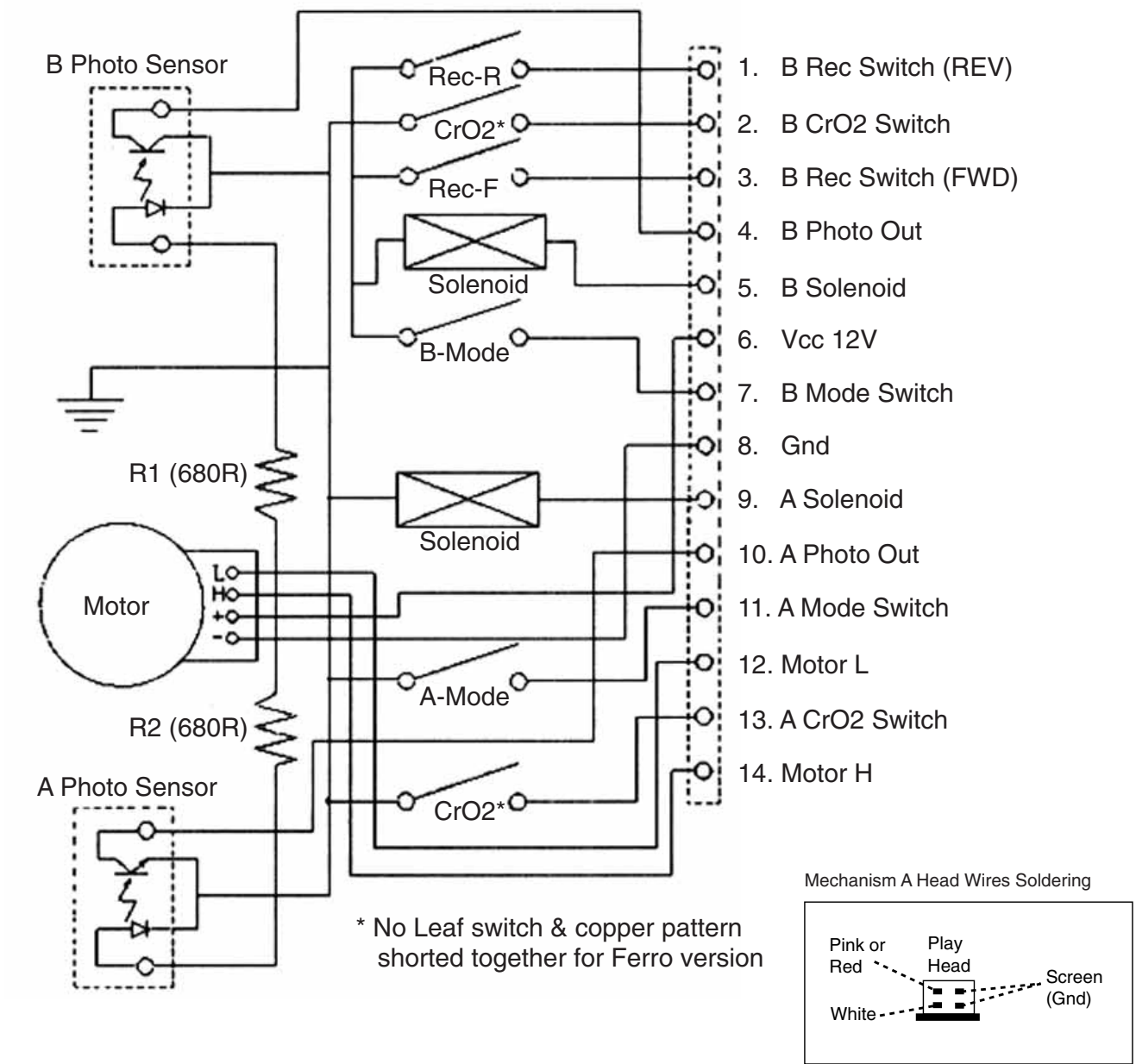
CONNECTOR 1720		DECK B HEADS CONNECTON <i>(For Dolby B NR version only)</i>	
○ 1	B R/P HD L+	R/P Head left channel positive	
○ 2	B R/P HD L-	R/P Head left channel negative	
○ 3	B R/P HD R+	R/P Head right channel positive	
○ 4	B R/P HD R-	R/P Head right channel negative	
○ 5	ERASE HEAD	Erase Head	
○ 6	GND A	Erase Head ground	

CONNECTOR 1730		DECK A HEAD CONNECTIONS <i>(For Double Deck versions only)</i>	
○ 1	A PB HD L+	Pb Head left channel positive	
○ 2	GND A	Pb Head return ground shield	
○ 3	A PB HD R+	Pb Head right channel positive	

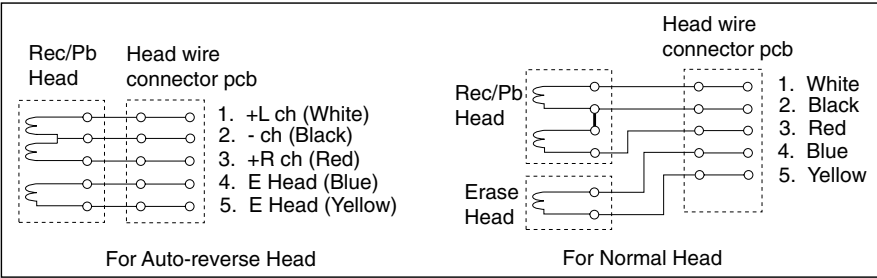
CONNECTOR 1740		DECK A & B CONTROL INTERFACE <i>(For Dolby B NR version only)</i>	
○ 1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
○ 2	CrO2 B	Chrome tape detection switch deck B	[open=Cr: close=Fe]
○ 3	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
○ 4	PHOTO B	Photo sensor output (tape movement indication)	
○ 5	SOL B	Solenoid supply for deck B	
○ 6	Vcc	Deck / Motor supply	
○ 7	MODE B	Mode switch (head engagement)	[open=off: close=engaged]
○ 8	GND M	Deck / Motor ground	
○ 9	SOL A	Solenoid supply for deck A	
○ 10	PHOTO A	Photo sensor output (tape movement indication)	
○ 11	MODE A	Mode switch (head engagement)	[open=off: close=engaged]
○ 12	L	L pin for motor	
○ 13	CrO2 A	Chrome tape detection switch deck A	[open=Cr: close=Fe]
○ 14	H	H pin for motor	

CONNECTOR 1770		DECK A & B CONTROL INTERFACE <i>(For Non-Dolby version only)</i>	
○ 1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
○ 2	CrO2 B	Chrome tape detection switch deck B	[open=Cr: close=Fe]
○ 3	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
○ 4	PHOTO B	Photo sensor output (tape movement indication)	
○ 5	SOL B	Solenoid supply for deck B	
○ 6	Vcc	Deck / Motor supply	
○ 7	MODE B	Mode switch (head engagement)	[open=off: close=engaged]
○ 8	GND M	Deck / Motor ground	
○ 9	SOL A	Solenoid supply for deck A	
○ 10	PHOTO A	Photo sensor output (tape movement indication)	
○ 11	MODE A	Mode switch (head engagement)	[open=off: close=engaged]
○ 12	L	L pin for motor	
○ 13	CrO2 A	Chrome tape detection switch deck A	[open=Cr: close=Fe]
○ 14	H	H pin for motor	

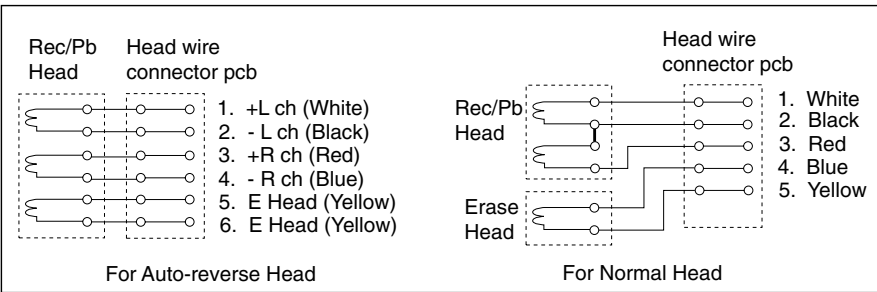
TAPE MECHANISM ELECTRONICS



Mechanism B Head Wires Soldering (Non-Dolby version)



Mechanism B Head Wires Soldering (Dolby B NR version)

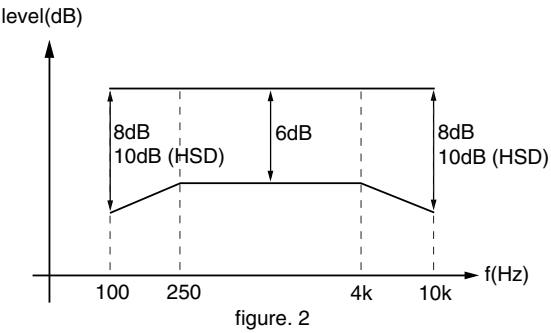
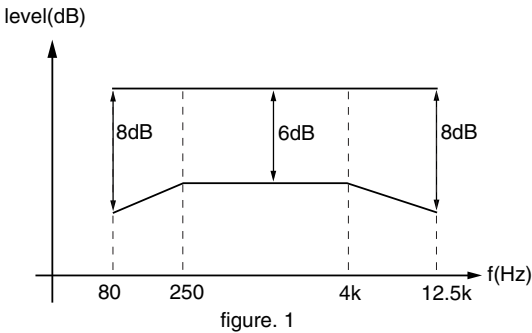


TAPE ADJUSTMENT & CHECK TABLE

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST	
					with	to
ADJUST MOTOR SPEED						
NORMAL SPEED	SBC420 3150Hz	PLAY B	1 or 2 LEFT RIGHT	frequency counter	3620	3150Hz – 0.5%
		PLAY A			check	3150Hz -0.8/+1.8%
CHECK WOW & FLUTTER						
DECK A & B	SBC420 3150Hz	PLAY	1 or 2 LEFT RIGHT	W&F-meter	check	†0.4 % DIN
ADJUST AZIMUTH						
DECK A & B	SBC420 10kHz	PLAY FWD	1 or 2 LEFT RIGHT	mV-meter	left hand screw	max. output level & left=right
		PLAY REV #			right hand screw	
CHECK PLAYBACK FREQUENCY RESPONSE						
DECK A & B	SBC420	PLAY	1 or 2 LEFT RIGHT	mV-meter	check	limits see fig.1
ADJUST BIAS CURRENT						
DECK B	SBC419A^	RECORD	5 or 6 LEFT RIGHT	mV-meter	3773	995mV
	SBC420				check	750mV – 1.5dB
CHECK OVERALL FREQUENCY RESPONSE AND DISTORTION						
Inject 3mV signals 100Hz, 250Hz, 1kHz, 10kHz, 12.5kHz via 3 or 4	SBC419A^ or SBC420	RECORD B				
	RECORDED CASSETTE	PLAY B	1 or 2 LEFT RIGHT	mV-meter	check	limits see fig. 2 *
Inject 1kHz 8.85mV via 3 or 4	SBC419A^ or SBC420	RECORD B				
	RECORDED CASSETTE	PLAY B	1 or 2 LEFT RIGHT	THD-meter	check	†3% *

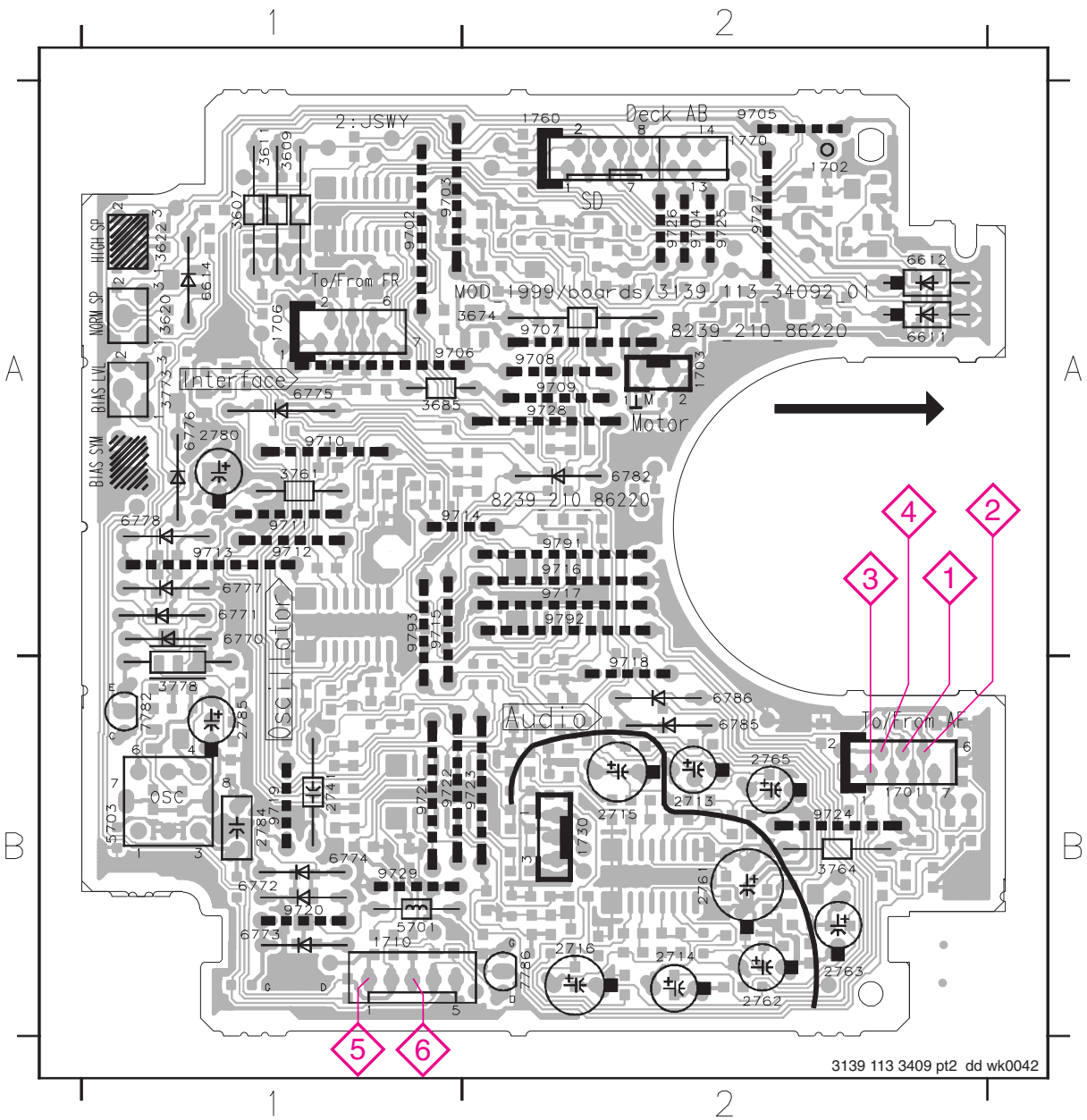
SBC419A^: 4822 397 30069
SBC420 : 4822 397 30071

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



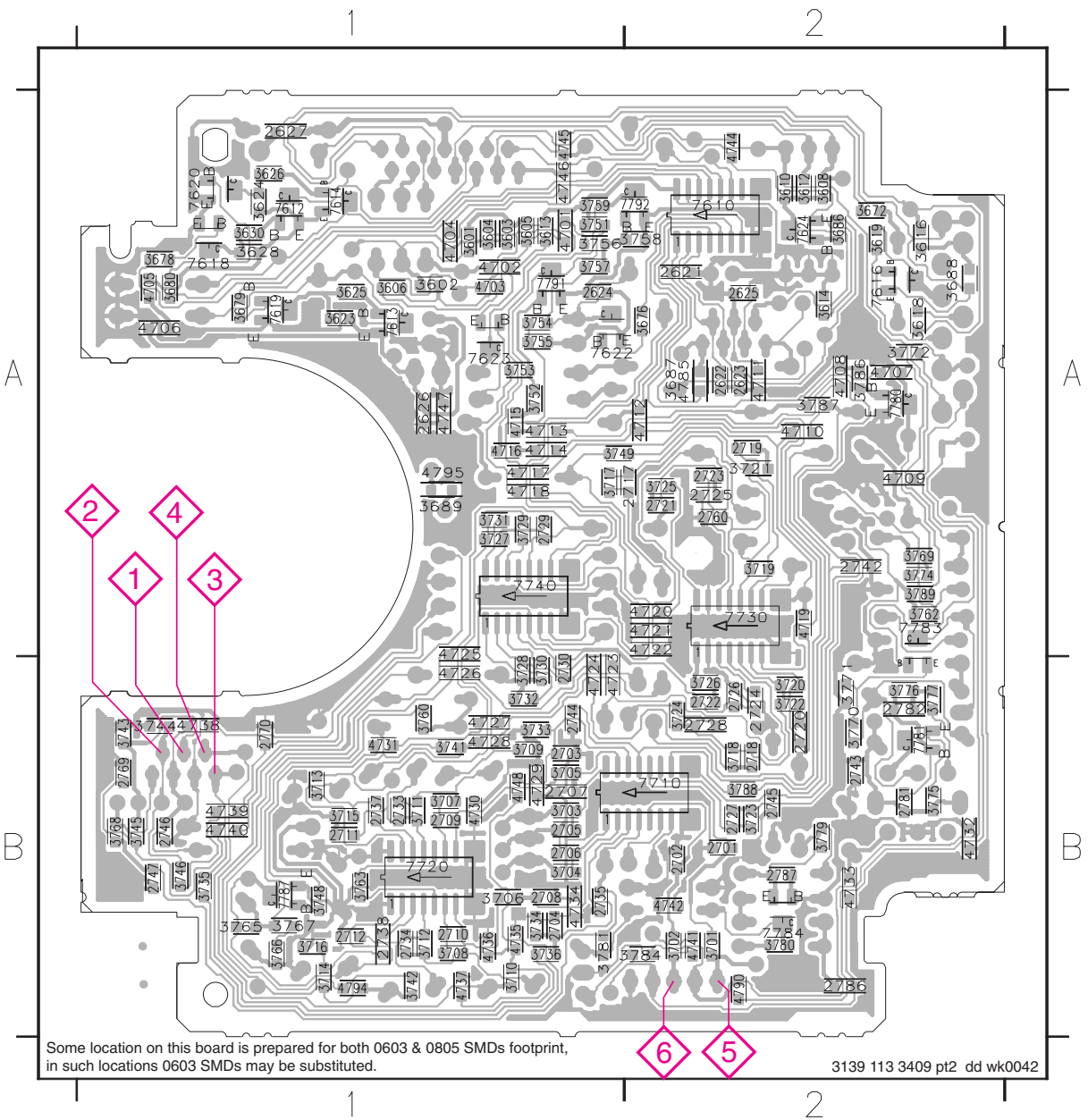
COMPONENT LAYOUT

1701	B2	2714	B2	2784	B1	3761	A1	6770	A1	6782	A2	9706	A1	9715	A1	9724	B2
1702	A2	2715	B2	2785	B1	3764	B2	6771	A1	6785	B2	9707	A2	9716	A2	9725	A2
1703	A2	2716	B2	3607	A1	3773	A1	6772	B1	6786	B2	9708	A2	9717	A2	9726	A2
1706	A1	2741	B1	3609	A1	3778	B1	6773	B1	7782	B1	9709	A2	9718	B2	9727	A2
1710	B1	2761	B2	3611	A1	5701	B1	6774	B1	7786	B2	9710	A1	9719	B1	9728	A2
1730	B2	2762	B2	3620	A1	5703	B1	6775	A1	9702	A1	9711	A1	9720	B1	9729	B1
1760	A2	2763	B2	3622	A1	6611	A2	6776	A1	9703	A1	9712	A1	9721	B1	9791	A2
1770	A2	2765	B2	3674	A2	6612	A2	6777	A1	9704	A2	9713	A1	9722	B1	9792	A2
2713	B2	2780	A1	3685	A1	6614	A1	6778	A1	9705	A2	9714	A1	9723	B2	9793	A1



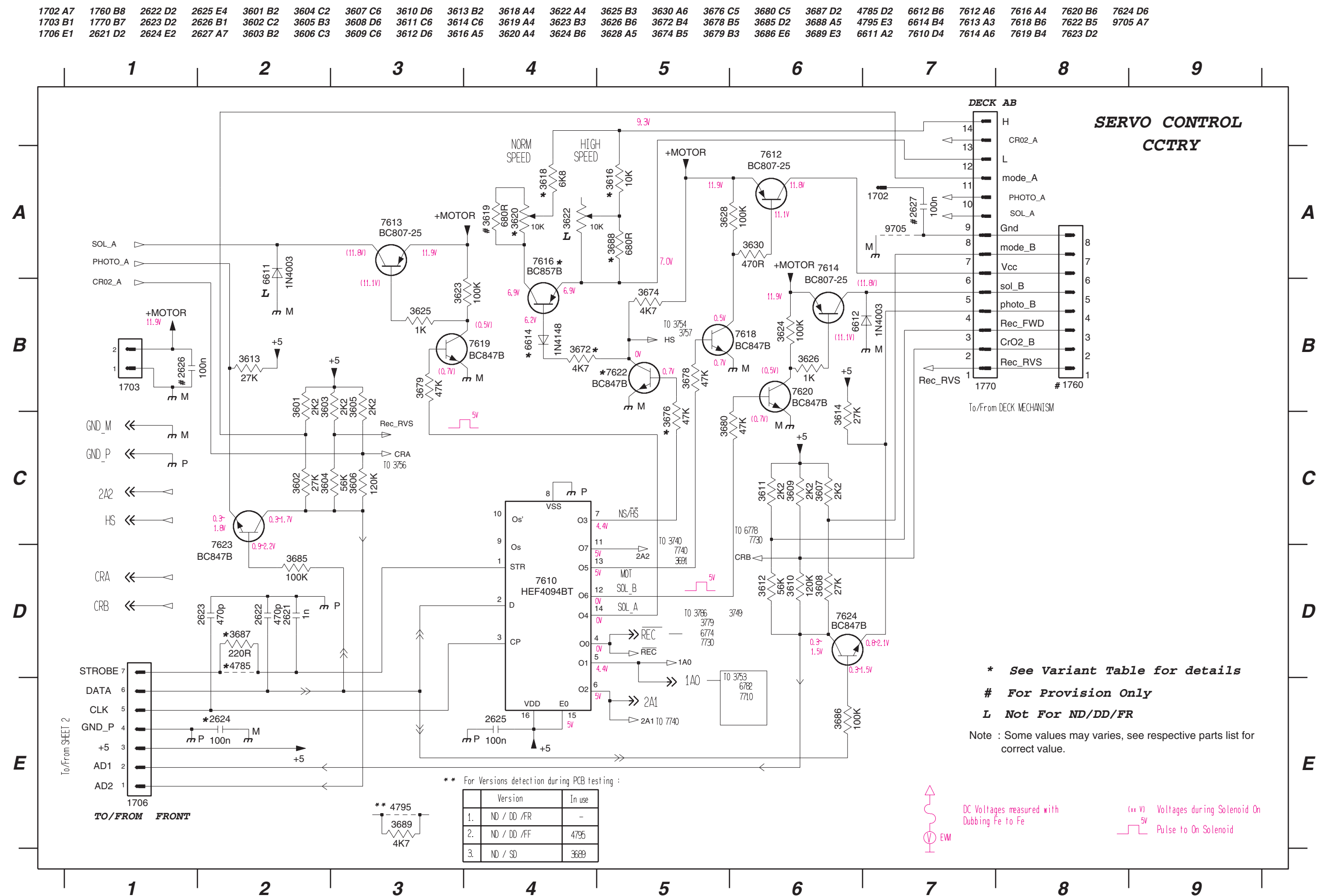
CHIP LAYOUT

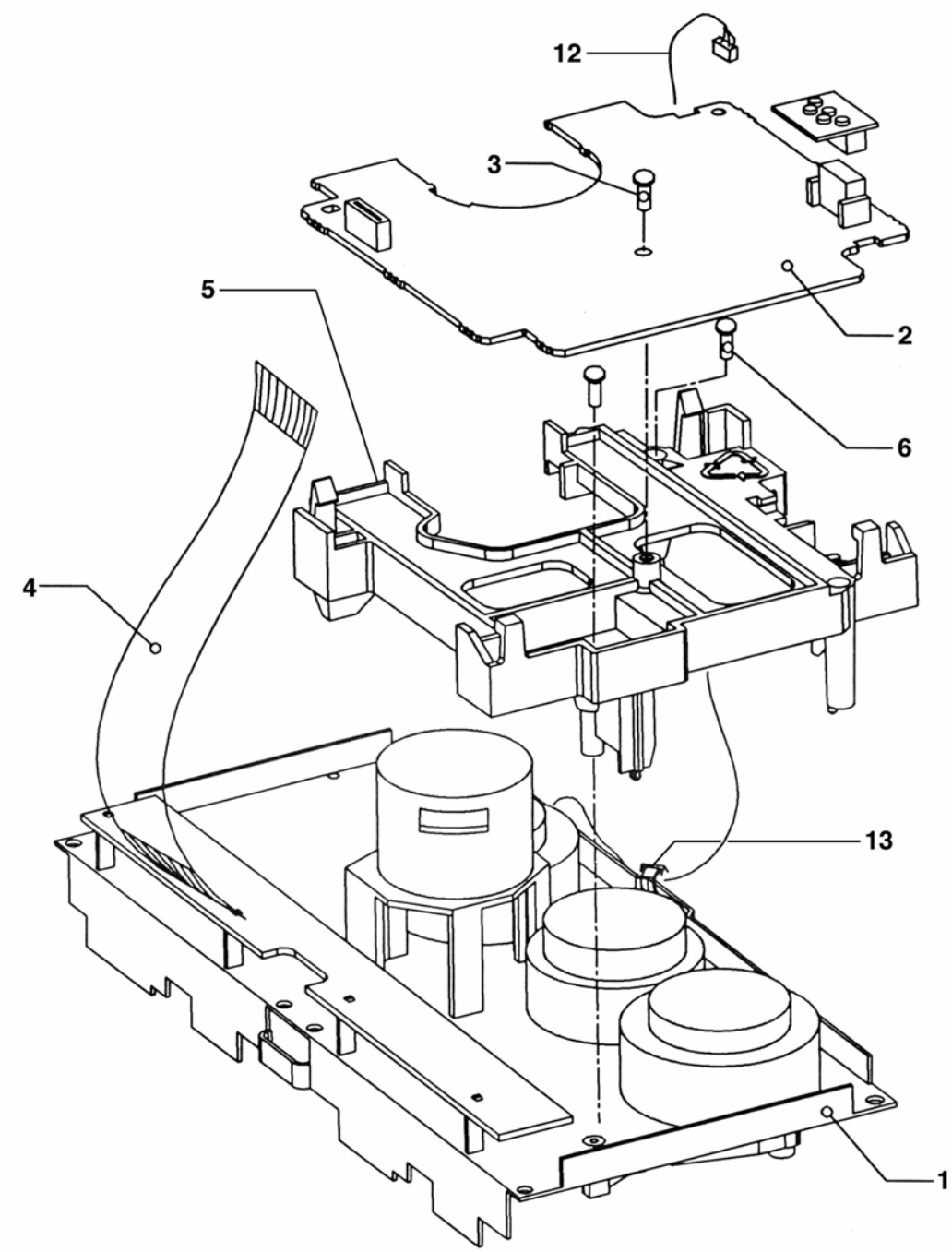
2621	A2	2724	B2	3602	A1	3688	A2	3725	A2	3757	A1	4701	A1	4727	B1	7612	A1
2622	A2	2725	A2	3603	A1	3689	A1	3726	B2	3758	A2	4702	A1	4728	B1	7613	A1
2623	A2	2726	B2	3604	A1	3701	B2	3727	A1	3759	A1	4703	A1	4729	B1	7614	A1
2624	A1	2727	B2	3605	A1	3702	B2	3728	B1	3760	B1	4704	A1	4730	B1	7616	A2
2625	A2	2728	B2	3606	A1	3703	B1	3729	A1	3762	A2	4705	A1	4731	B1	7618	A1
2626	A1	2729	A1	3608	A2	3704	B1	3730	B1	3763	B1	4706	A1	4732	B2	7619	A1
2627	A1	2730	B1	3610	A2	3705	B1	3731	A1	3765	B1	4707	A2	4733	B2	7620	A1
2701	B2	2733	B1	3612	A2	3706	B1	3732	B1	3766	B1	4708	A2	4734	B1	7622	A1
2702	B2	2734	B1	3613	A1	3707	B1	3733	B1	3767	B1	4709	A2	4735	B1	7623	A1
2703	B1	2735	B1	3614	A2	3708	B1	3734	B1	3768	B1	4710	A2	4736	B1	7624	A2
2704	B1	2737	B1	3616	A2	3709	B1	3735	B1	3769	A2	4711	A2	4737	B1	7710	B2
2705	B1	2738	B1	3618	A2	3710	B1	3736	B1	3770	B2	4712	A2	4738	B1	7720	B1
2706	B1	2742	A2	3619	A2	3711	B1	3741	B1	3771	B2	4713	A1	4739	B1	7730	A2
2707	B1	2743	B2	3623	A1	3712	B1	3742	B1	3772	A2	4714	A1	4740	B1	7740	A1
2708	B1	2744	B1	3624	A1	3713	B1	3743	B1	3774	A2	4715	A1	4741	B2	7780	A2
2709	B1	2745	B2	3625	A1	3714	B1	3744	B1	3775	B2	4716	A1	4742	B2	7781	B2
2710	B1	2746	B1	3626	A1	3715	B1	3745	B1	3776	B2	4717	A1	4744	A2	7783	A2
2711	B1	2747	B1	3628	A1	3716	B1	3746	B1	3777	B2	4718	A1	4745	A1	7784	B2
2712	B1	2760	A2	3630	A1	3717	A1	3748	A1	3779	B2	4719	A2	4746	A1	7787	B1
2717	A2	2769	B1	3672	A2	3718	B2	3749	A1	3780	B2	4720	A2	4747	A1	7791	A1
2718	B2	2770	B1	3676	A2	3719	A2	3751	A1	3781	B1	4721	A2	4748	A1	7792	A2
2719	A2	2781	B2	3678	A1	3720	B2	3752	A1	3784	B2	4722	A2	4785	A2		
2720	B2	2782	B2	3679	A1	3721	A2	3753	A1	3786	A2	4723	B1	4790	B2		
2721	A2	2786	B2	3680	A1	3722	B2	3754	A1	3787	A2	4724	B1	4794	A1		
2722	B2	2787	B2	3686	A2	3723	B2	3755	A1	3788	B2	4725	A1	4795	B1		
2723	A2	3601	A1	3687	A2	3724	B2	3756	A1	3789	A2	4726	B1	7610	A2		



Some location on this board is prepared for both 0603 & 0805 SMDs footprint, in such locations 0603 SMDs may be substituted.

**SERVO CONTROL
CCTRY**



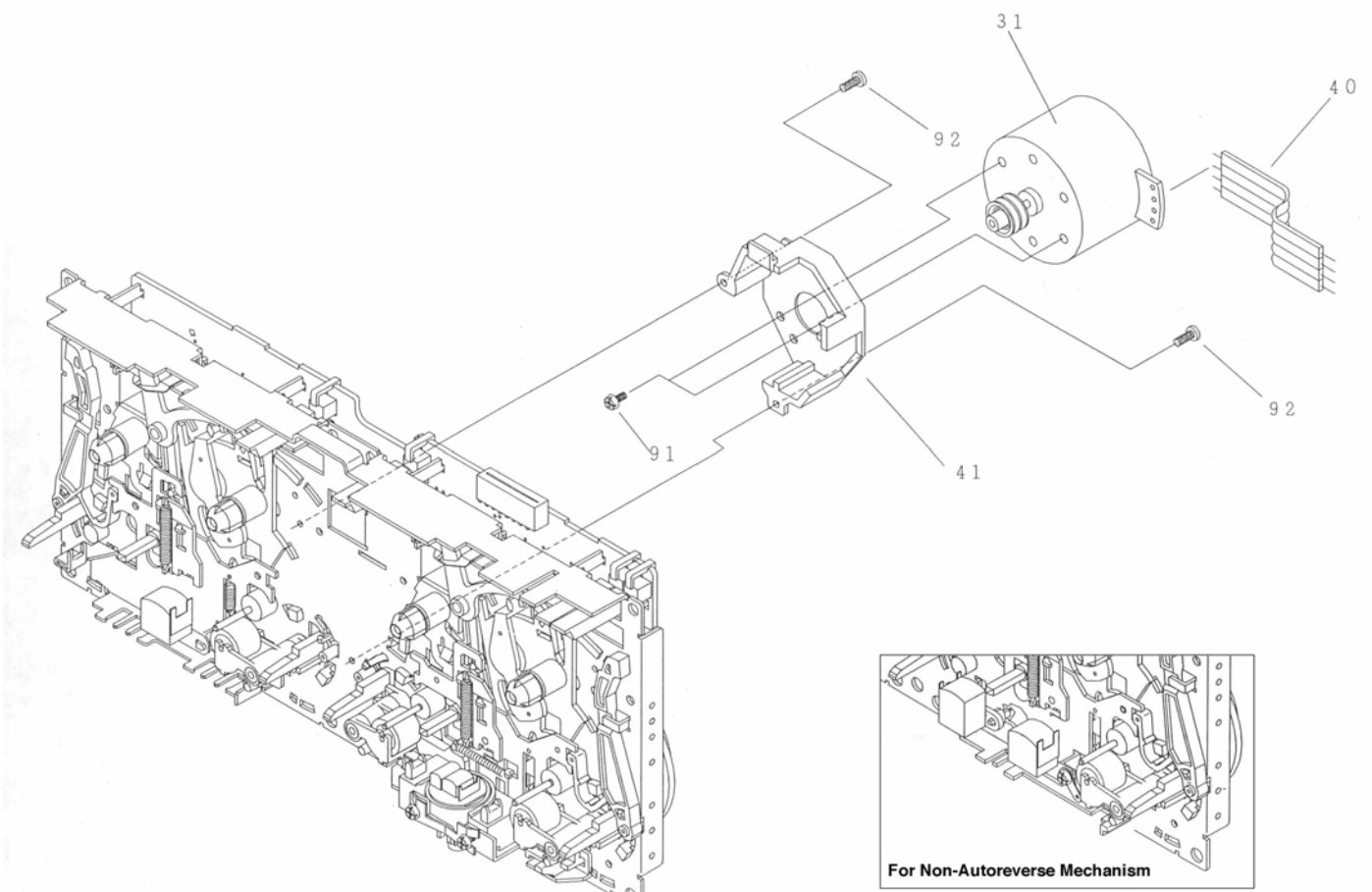


3139 118 77070 (Incl. ...77080) dd wk926

TAPE MODULE EXPLODED VIEW

- | | | |
|---|----------------|--|
| 1 | 3139 118 77130 | Autoreverse Mech. CWE44FR01 |
| 1 | 3139 118 77140 | Non-Autoreverse Mech. CWE44FF02 Chrome/Ferro |
| 1 | 3139 118 77950 | Non-Autoreverse Mech. CWE44FF05 Ferro |
| 3 | - | Screw D3 x 10 |
| 6 | - | Screw M2 x 16 |
| 7 | 3139 110 34080 | Flex Cable 14 pin 7,5 cm |

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



TAPE MECHANISM - MOTOR EXPLODED VIEW

- | | | |
|----|----------------|----------------|
| 31 | 4822 361 11055 | Motor Assembly |
| 91 | - | Screw M2,6 x 5 |
| 92 | - | Screw M2 x 5 |

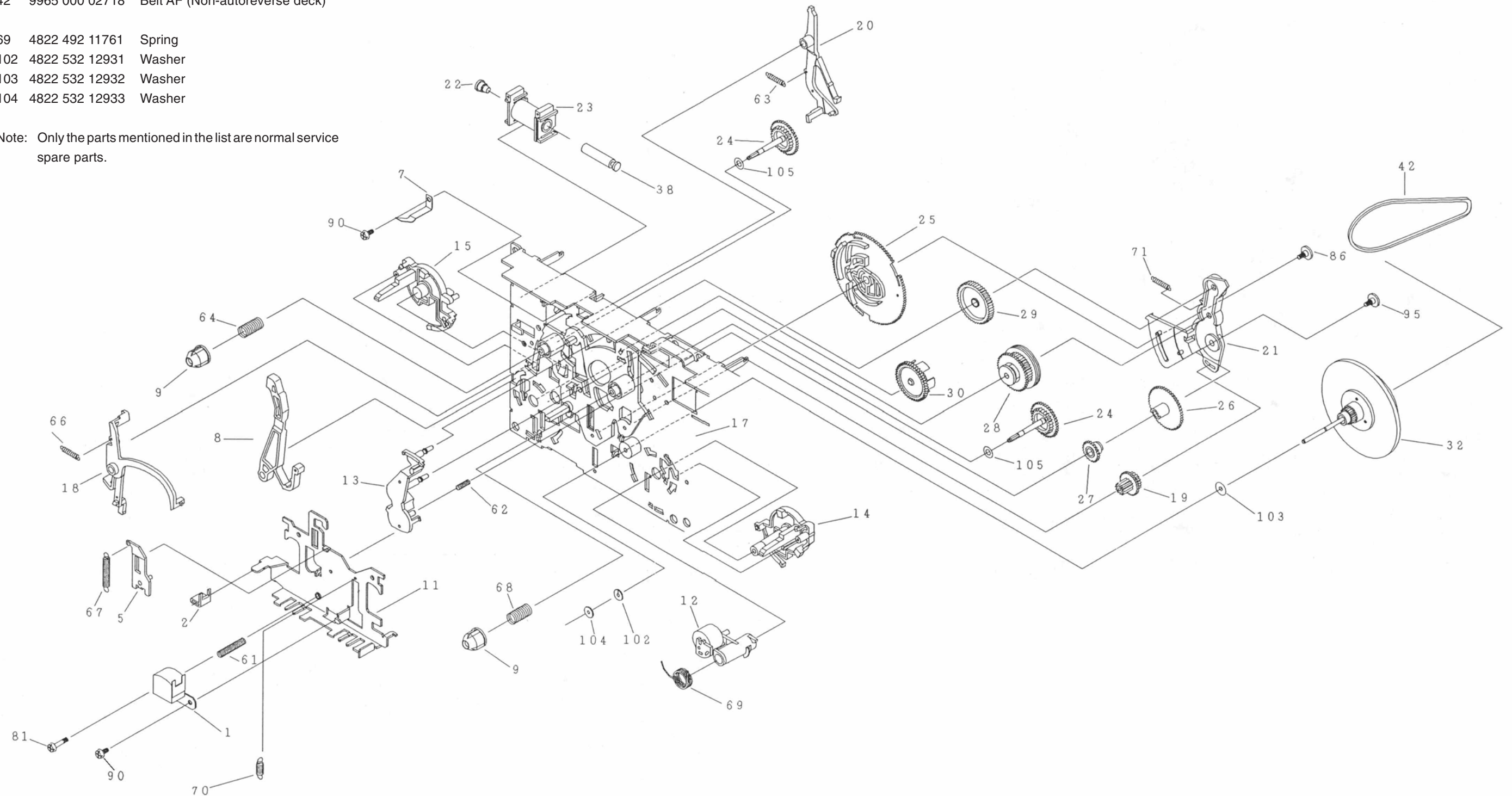
Note: Only the parts mentioned in this list are normal service spare parts.

TAPE MECHANISM A - PLAY

MECHANICAL PARTS - PLAY MECHANISM

1	9965 000 02313	Play Head (Non-Autoreverse deck)
1	9965 000 02321	Play Head (Autoreverse deck)
12	4822 402 10972	Pinch Arm Assembly R
23	9965 000 02314	Coil Assembly
25	9965 000 06443	Cam Gear
32	4822 528 11209	Flywheel Assembly RV
42	9965 000 02315	Belt AF (Autoreverse deck)
42	9965 000 02718	Belt AF (Non-autoreverse deck)
69	4822 492 11761	Spring
102	4822 532 12931	Washer
103	4822 532 12932	Washer
104	4822 532 12933	Washer

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

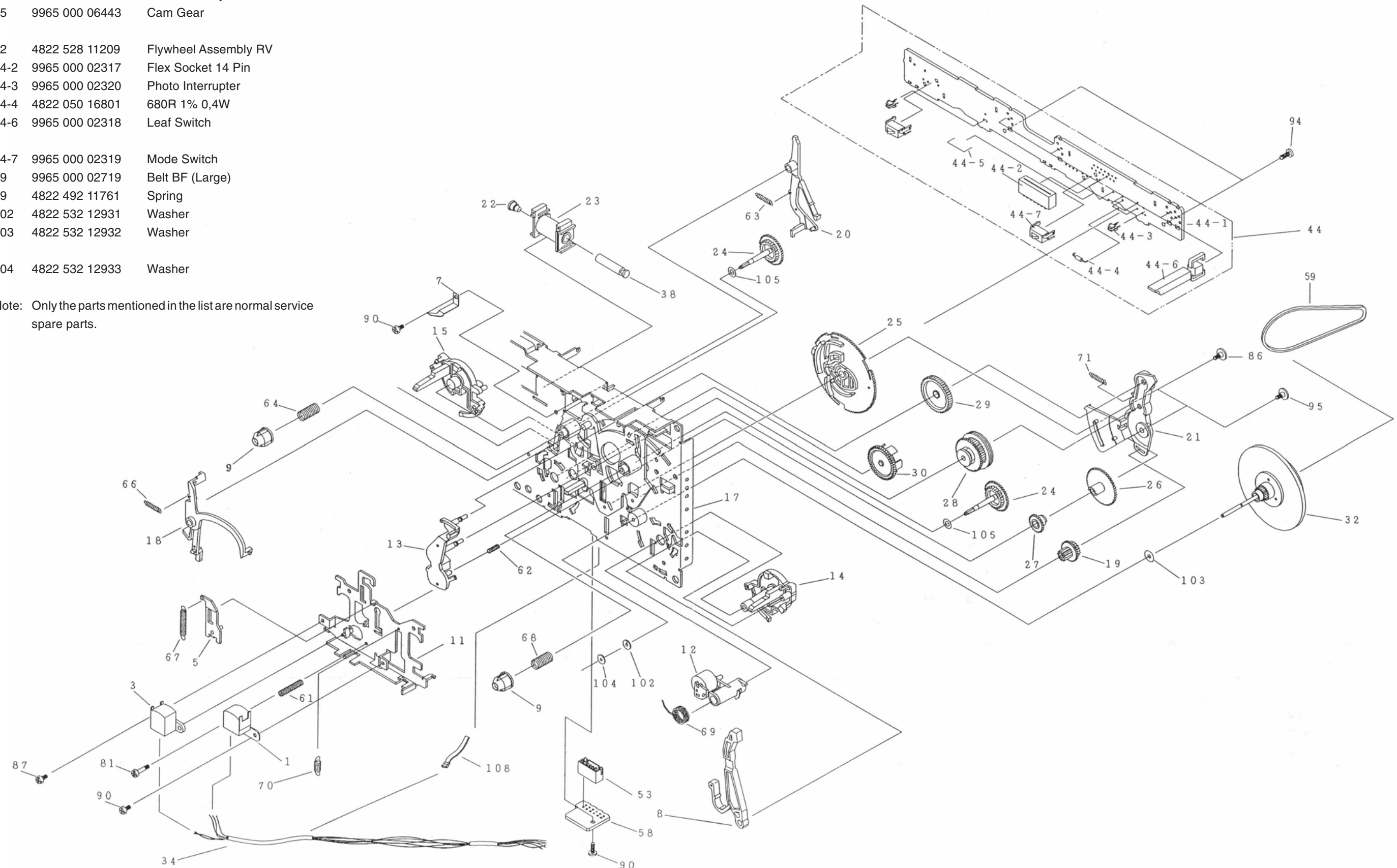


TAPE MECHANISM B - RECORD/PLAYBACK (Non-Autoreverse version)

MECHANICAL PARTS - REC/PB MECHANISM

1	9965 000 02313	Play Head
3	9965 000 02600	Head, Erase
12	4822 402 10972	Pinch Arm Assembly R
23	9965 000 02314	Coil Assembly
25	9965 000 06443	Cam Gear
32	4822 528 11209	Flywheel Assembly RV
44-2	9965 000 02317	Flex Socket 14 Pin
44-3	9965 000 02320	Photo Interrupter
44-4	4822 050 16801	680R 1% 0,4W
44-6	9965 000 02318	Leaf Switch
44-7	9965 000 02319	Mode Switch
59	9965 000 02719	Belt BF (Large)
69	4822 492 11761	Spring
102	4822 532 12931	Washer
103	4822 532 12932	Washer
104	4822 532 12933	Washer

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



TAPE MECHANISM B - RECORD/PLAYBACK (Autoreverse version)

MECHANICAL PARTS - REC/PB MECHANISM

12	4822 402 10972	Pinch Arm Assembly R
23	9965 000 02314	Coil Assembly
25	9965 000 06443	Cam Gear
32	4822 528 11209	Flywheel Assembly RV
39	9965 000 02322	Belt AF

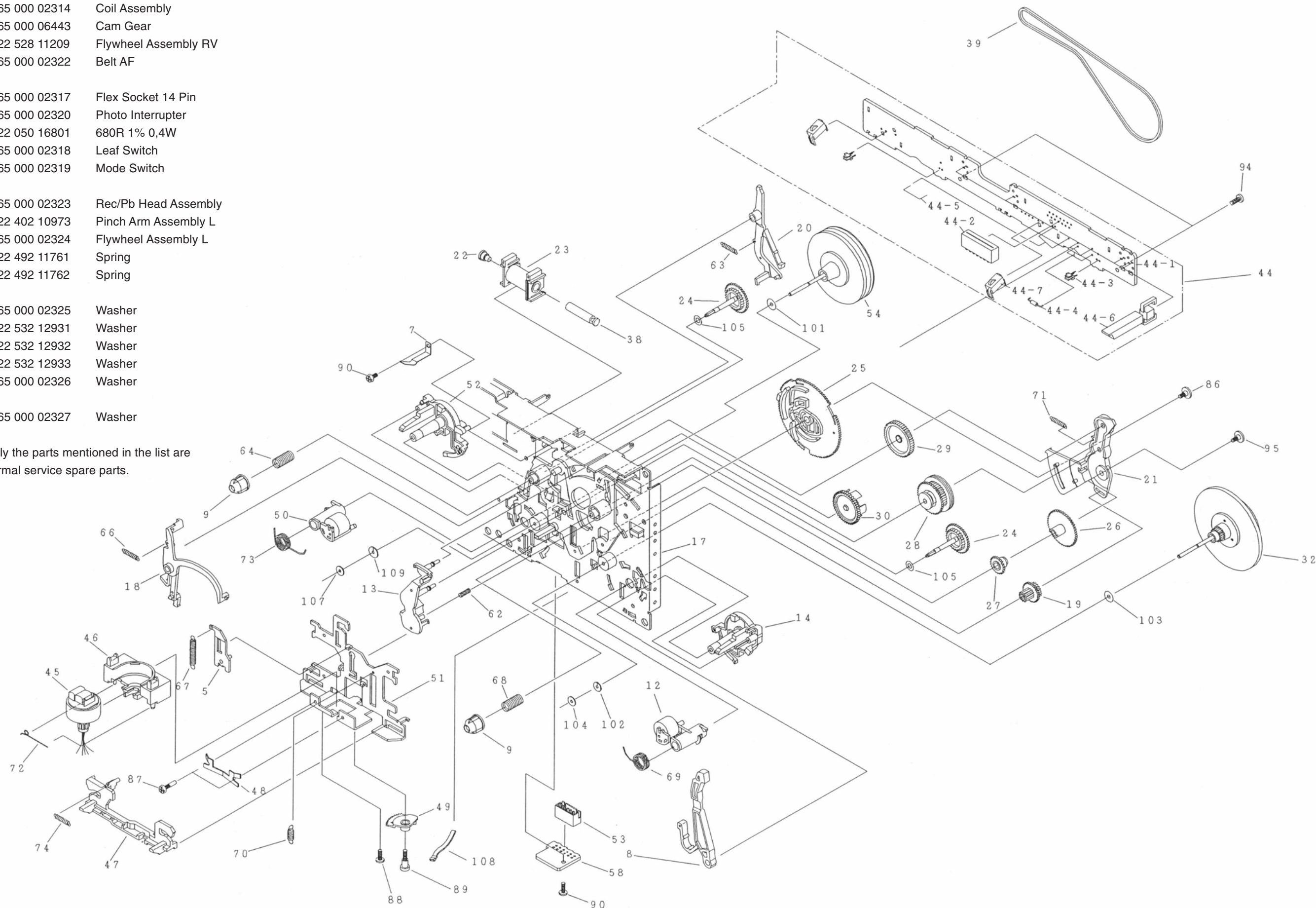
44-2	9965 000 02317	Flex Socket 14 Pin
44-3	9965 000 02320	Photo Interrupter
44-4	4822 050 16801	680R 1% 0,4W
44-6	9965 000 02318	Leaf Switch
44-7	9965 000 02319	Mode Switch

45	9965 000 02323	Rec/Pb Head Assembly
50	4822 402 10973	Pinch Arm Assembly L
54	9965 000 02324	Flywheel Assembly L
69	4822 492 11761	Spring
73	4822 492 11762	Spring

101	9965 000 02325	Washer
102	4822 532 12931	Washer
103	4822 532 12932	Washer
104	4822 532 12933	Washer
107	9965 000 02326	Washer

109	9965 000 02327	Washer
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Note: Only the parts mentioned in the list are normal service spare parts.



ELECTRICAL PARTS LIST - ETF7 NON-DOLBY BOARD

MISCELLANEOUS

1701	482226710953	Flex Socket 7pin Vert.
1706	482226710953	Flex Socket 7pin Vert.
1770	482226751255	Flex Socket 14pin Vert.

CAPACITORS

2621	532212231647	1nF 10% 63V
2622	532212234099	470pF 10% 63V
2623	532212234099	470pF 10% 63V
2624	482212614585	100nF 10% 50V only for Ferro
2625	482212614585	100nF 10% 50V
2701	532212233538	150pF 2% 63V Autoreverse
2701	482212233216	270pF 5% 63V Non-autoreverse
2702	532212233538	150pF 2% 63V Autoreverse
2702	482212233216	270pF 5% 63V Non-autoreverse
2703	532212232531	100pF 5% 50V Autoreverse
2703	482212233575	220pF 5% 63V Non-autoreverse
2704	532212232531	100pF 5% 50V Autoreverse
2704	482212233575	220pF 5% 63V Non-autoreverse
2705	482212233575	220pF 5% 63V
2706	482212233575	220pF 5% 63V
2707	532212234099	470pF 10% 63V
2708	532212234099	470pF 10% 63V
2709	532212231863	330pF 5% 63V
2710	532212231863	330pF 5% 63V
2711	532212232531	100pF 5% 50V
2712	532212232531	100pF 5% 50V
2713	482212440248	10µF 20% 63V
2714	482212440248	10µF 20% 63V
2715	482212480195	470µF 20% 10V
2716	482212480195	470µF 20% 10V
2717	482212233177	10nF 20% 50V Autoreverse
2717	482212613188	15nF 5% 63V Non-autoreverse
2718	482212233177	10nF 20% 50V Autoreverse
2718	482212613188	15nF 5% 63V Non-autoreverse
2719	482212612105	33nF 5% 50V
2720	482212612105	33nF 5% 50V
2721	532212231866	6,8nF 10% 63V not for Ferro
2722	532212231866	6,8nF 10% 63V not for Ferro
2723	482212613188	15nF 5% 63V
2724	482212613188	15nF 5% 63V
2725	532212610223	4,7nF 10% 63V
2726	532212610223	4,7nF 10% 63V
2727	532212234099	470pF 10% 63V Autoreverse
2727	532212231647	1nF 10% 63V Non-autoreverse
2728	532212234099	470pF 10% 63V Autoreverse
2728	532212231647	1nF 10% 63V Non-autoreverse
2729	532212232654	22nF 10% 63V
2730	532212232654	22nF 10% 63V
2733	532212234099	470pF 10% 63V
2734	532212234099	470pF 10% 63V
2735	482212614585	100nF 10% 50V
2737	482212614585	100nF 10% 50V

2738	482212614585	100nF 10% 50V
2741	482212611585	22nF +80/-20% 25V
2742	532212232654	22nF 10% 63V
2743	532212232654	22nF 10% 63V
2744	482212614585	100nF 10% 50V
2760	482212614585	100nF 10% 50V
2761	482212480144	220µF 20% 25V
2762	482212440769	4,7µF 20% 100V
2763	482212440433	47µF 20% 25V
2765	482212440433	47µF 20% 25V
2769	532212234099	470pF 10% 63V
2770	532212234099	470pF 10% 63V
2780	482212481151	22µF 20% 50V
2781	482212233177	10nF 20% 50V
2782	532212610223	4,7nF 10% 63V
2784	482212151305	15nF 10% 50V
2785	482212421913	1µF 20% 63V
2786	532212232531	100pF 5% 50V
2787	482212612105	33nF 5% 50V

RESISTORS

3601	482211711449	2k2 1% 0,1W
3602	482205120273	27k 5% 0,1W
3603	482211711449	2k2 1% 0,1W
3604	482211711148	56k 1% 0,1W
3605	482211711449	2k2 1% 0,1W
3606	482205120124	120k 5% 0,1W
3607	482211652256	2k2 5% 0,5W
3608	482205120273	27k 5% 0,1W
3609	482211652256	2k2 5% 0,5W
3610	482205120124	120k 5% 0,1W
3611	482211652256	2k2 5% 0,5W
3612	482211711148	56k 1% 0,1W
3613	482205120273	27k 5% 0,1W
3614	482205120273	27k 5% 0,1W
3616	482211710833	10k 1% 0,1W Autoreverse
3616	482205110102	1k 2% 0,25W Non-autoreverse
3618	482211711507	6k8 1% 0,1W Autoreverse
3620	482210011141	Trim. 10k 30% Autoreverse
3622	482210011141	Trim. 10k 30% Non-autoreverse
3623	482211710837	100k 1% 0,1W
3624	482211710837	100k 1% 0,1W
3625	482205110102	1k 2% 0,25W
3626	482205110102	1k 2% 0,25W
3628	482211710837	100k 1% 0,1W
3630	482205120471	470R 5% 0,1W
3672	482205120472	4k7 5% 0,1W Autoreverse
3674	482211652283	4k7 5% 0,5W
3676	482211710834	47k 1% 0,1W Autoreverse
3678	482211710834	47k 1% 0,1W
3679	482211710834	47k 1% 0,1W
3680	482211710834	47k 1% 0,1W

ELECTRICAL PARTS LIST - ETF7 NON-DOLBY BOARD

3685	482211652234	100k 5% 0,5W
3686	482211710837	100k 1% 0,1W
3687	482211711503	220R 1% 0,1W not for Ferro
3688	482211710361	680R 1% 0,1W Autoreverse
3701	482211711503	220R 1% 0,1W
3702	482211711503	220R 1% 0,1W
3703	482211711503	220R 1% 0,1W
3704	482211711503	220R 1% 0,1W
3705	482211711503	220R 1% 0,1W
3706	482211711503	220R 1% 0,1W
3707	482205120101	100R 5% 0,1W
3708	482205120101	100R 5% 0,1W
3709	482205120109	10R 5% 0,1W
3710	482205120109	10R 5% 0,1W
3711	482205120154	150k 5% 0,1W
3712	482205120154	150k 5% 0,1W
3713	482205120109	10R 5% 0,1W
3714	482205120109	10R 5% 0,1W
3715	482205120182	1k8 5% 0,1W
3716	482205120182	1k8 5% 0,1W
3717	482211711449	2k2 1% 0,1W
3718	482211711449	2k2 1% 0,1W
3719	482211711383	12k 1% 0,1W
3720	482211711383	12k 1% 0,1W
3721	482205120392	3k9 5% 0,1W
3722	482205120392	3k9 5% 0,1W
3723	482211683933	15k 1% 0,1W Autoreverse
3723	482211710965	18k 1% 0,1W Non-autoreverse
3724	482211683933	15k 1% 0,1W Autoreverse
3724	482211710965	18k 1% 0,1W Non-autoreverse
3725	482205120109	10R 5% 0,1W not for Ferro
3726	482205120109	10R 5% 0,1W not for Ferro
3727	482205120562	5k6 5% 0,1W Autoreverse
3727	482211711507	6k8 1% 0,1W Non-autoreverse
3728	482205120562	5k6 5% 0,1W Autoreverse
3728	482211711507	6k8 1% 0,1W Non-autoreverse
3729	482205120332	3k3 5% 0,1W Autoreverse
3729	482205120472	4k7 5% 0,1W Non-autoreverse
3730	482205120332	3k3 5% 0,1W Autoreverse
3730	482205120472	4k7 5% 0,1W Non-autoreverse
3731	482205120822	8k2 5% 0,1W
3732	482205120822	8k2 5% 0,1W
3733	482205120122	1k2 5% 0,1W
3734	482205120122	1k2 5% 0,1W
3735	482205120223	22k 5% 0,1W
3736	482205120223	22k 5% 0,1W
3741	482211711449	2k2 1% 0,1W
3742	482211711449	2k2 1% 0,1W
3743	482211711139	1k5 1% 0,1W Autoreverse
3743	482211711449	2k2 1% 0,1W Non-autoreverse
3744	482211711139	1k5 1% 0,1W Autoreverse
3744	482211711449	2k2 1% 0,1W Non-autoreverse

3745	482205120332	3k3 5% 0,1W Autoreverse
3745	482205120562	5k6 5% 0,1W Non-autoreverse
3746	482205120332	3k3 5% 0,1W Autoreverse
3746	482205120562	5k6 5% 0,1W Non-autoreverse
3748	482211711449	2k2 1% 0,1W
3749	482211710834	47k 1% 0,1W
3751	482211710833	10k 1% 0,1W
3752	482211710837	100k 1% 0,1W
3753	482211710837	100k 1% 0,1W
3754	482205120105	1M 5% 0,1W Autoreverse
3754	482205120479	47R 5% 0,1W Non-autoreverse
3755	482205120105	1M 5% 0,1W Autoreverse
3755	482205120479	47R 5% 0,1W Non-autoreverse
3756	482211713579	220k 1% 0,1W
3757	482211713579	220k 1% 0,1W
3758	482211710833	10k 1% 0,1W
3759	482211710833	10k 1% 0,1W
3760	482205120121	120R 5% 0,1W
3761	482205021003	10k 1% 0,6W
3762	482211711454	820R 1% 0,1W
3763	482205120154	150k 5% 0,1W
3764	482211683872	220R 5% 0,5W
3765	482205120393	39k 5% 0,1W
3766	482205120475	4M7 5% 0,1W
3767	482205120475	4M7 5% 0,1W
3768	482211710833	10k 1% 0,1W
3769	482211711383	12k 1% 0,1W Autoreverse
3769	482205120822	8k2 5% 0,1W Non-autoreverse
3770	482211711139	1k5 1% 0,1W
3771	482205120122	1k2 5% 0,1W
3772	482211711507	6k8 1% 0,1W Autoreverse
3772	482205120562	5k6 5% 0,1W Non-autoreverse
3773	482210012227	Trimmer 4k7 30% 0,1W
3774	482211683933	15k 1% 0,1W Autoreverse
3774	482205120822	8k2 5% 0,1W Non-autoreverse
3775	482205120478	4R7 5% 0,1W
3776	482211711507	6k8 1% 0,1W
3777	482211710353	150R 1% 0,1W
3778	482205210688	△ 6R8 5% 0,33W
3779	482205120334	330k 5% 0,1W
3780	482205120105	1M 5% 0,1W
3781	482205120475	4M7 5% 0,1W
3784	482205110102	1k 2% 0,25W
3786	482205120223	22k 5% 0,1W
3787	482205120105	1M 5% 0,1W
3788	482205120105	1M 5% 0,1W
3789	482211710834	47k 1% 0,1W
4701	482205120008	0R Jumper 0805
4702	482205120008	0R Jumper 0805
4703	482205120008	0R Jumper 0805
4704	482205120008	0R Jumper 0805
4705	482205120008	0R Jumper 0805

ELECTRICAL PARTS LIST - ETF7 NON-DOLBY BOARD**RESISTORS**

4706	482205120008	OR Jumper 0805	6612	482213031878	1N4003G	
4707	482205120008	OR Jumper 0805	6614	482213030621	1N4148	Autoreverse
4708	482205120008	OR Jumper 0805	6770	482213030621	1N4148	
4709	482205120008	OR Jumper 0805	6771	482213030621	1N4148	
4710	482205120008	OR Jumper 0805	6772	482213030621	1N4148	
4711	482205120008	OR Jumper 0805	6773	482213030621	1N4148	
4712	482205120008	OR Jumper 0805	6774	482213030621	1N4148	
4713	482205120008	OR Jumper 0805	6775	482213030621	1N4148	
4714	482205120008	OR Jumper 0805	6776	482213030621	1N4148	
4715	482205120008	OR Jumper 0805	6777	482213034382	BZX79-F8V2	
4716	482205120008	OR Jumper 0805	6778	482213030621	1N4148	
4717	482205120008	OR Jumper 0805	6782	482213030621	1N4148	
4718	482205120008	OR Jumper 0805	6785	482213030621	1N4148	
4719	482205120008	OR Jumper 0805	6786	482213030621	1N4148	
4720	482205120008	OR Jumper 0805				
4721	482205120008	OR Jumper 0805				
4722	482205120008	OR Jumper 0805				
4723	482205120008	OR Jumper 0805				
4724	482205120008	OR Jumper 0805				
4725	482205120008	OR Jumper 0805				
4726	482205120008	OR Jumper 0805				
4727	482205120008	OR Jumper 0805				
4728	482205120008	OR Jumper 0805				
4729	482205120008	OR Jumper 0805				
4730	482205120008	OR Jumper 0805				
4731	482205120008	OR Jumper 0805				
4732	482205120008	OR Jumper 0805				
4733	482205120008	OR Jumper 0805				
4734	482205120008	OR Jumper 0805				
4735	482205120008	OR Jumper 0805				
4736	482205120008	OR Jumper 0805				
4737	482205120008	OR Jumper 0805				
4738	482205120008	OR Jumper 0805				
4739	482205120008	OR Jumper 0805				
4740	482205120008	OR Jumper 0805				
4741	482205120008	OR Jumper 0805				
4742	482205120008	OR Jumper 0805				
4744	482205120008	OR Jumper 0805				
4745	482205120008	OR Jumper 0805				
4746	482205120008	OR Jumper 0805				
4748	482205120008	OR Jumper 0805				
4785	482205120008	OR Jumper 0805 only for Ferro				
4790	482205120008	OR Jumper 0805				
4794	482205120008	OR Jumper 0805				
4795	482205120008	OR Jumper 0805				

TRANSISTORS & INTEGRATED CIRCUITS

7610	532220911306	HEF4094BT	
7612	532213060845	BC807-25	
7613	532213060845	BC807-25	
7614	532213060845	BC807-25	
7616	482213060373	BC857B	Autoreverse
7618	482213060511	BC847B	
7619	482213060511	BC847B	
7620	482213060511	BC847B	
7622	482213060511	BC847B	Autoreverse
7623	482213060511	BC847B	
7624	482213060511	BC847B	
7710	482220932919	HEF4952BT	
7720	932214000668	AN7323S	
7730	482220932919	HEF4952BT	
7740	482220932919	HEF4952BT	
7780	482213060511	BC847B	
7781	482213042804	BC817-25	
7782	482213044568	BC557B	
7783	482213060511	BC847B	
7784	482213060373	BC857B	
7786	482213063494	J111	
7787	482213060511	BC847B	
7791	482213060511	BC847B	
7792	482213060511	BC847B	

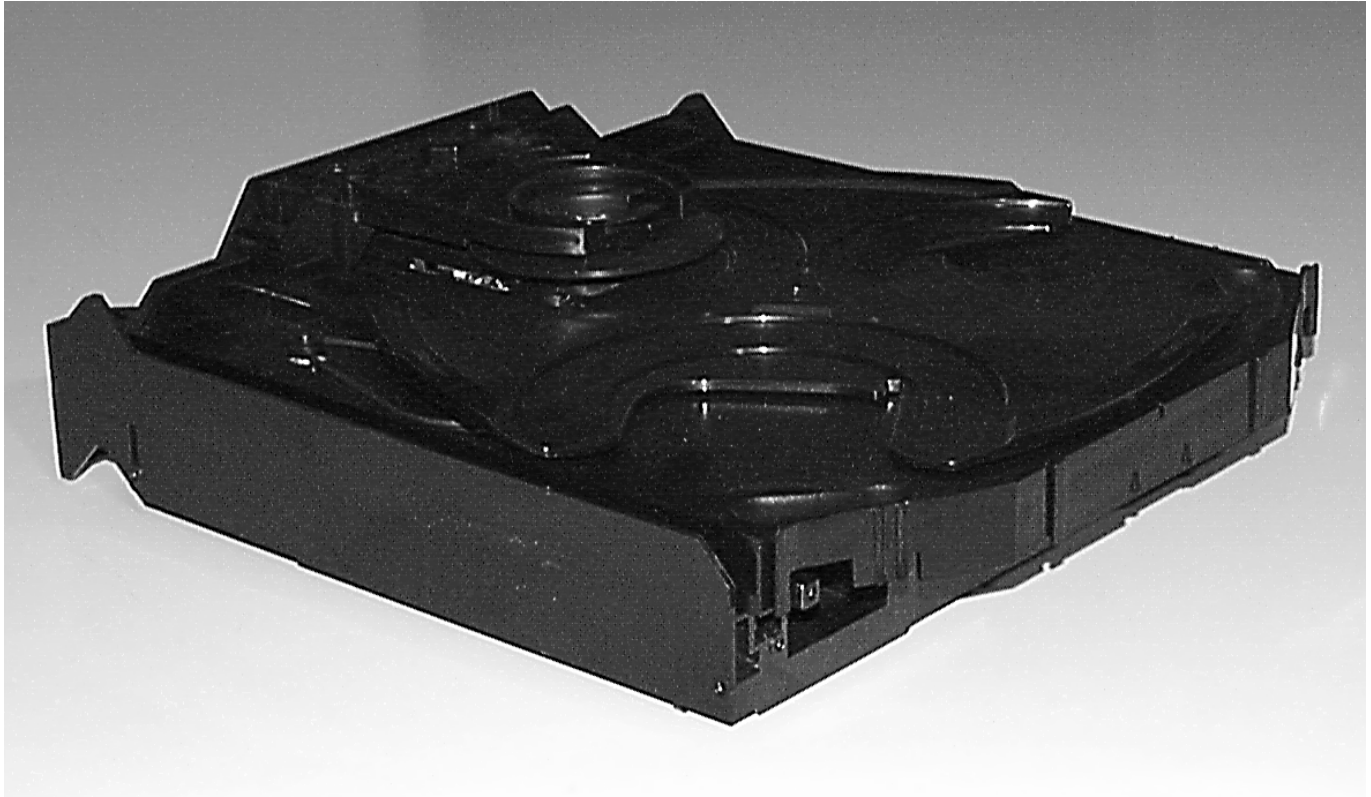
Note: Only the parts mentioned in this list are normal service spare parts.

COILS & FILTERS

5701	482215711477	Coil 2,2μH 5%
5703	482215620946	Osc Coil 100kHz

DIODES

6611	482213031878	1N4003G
------	--------------	---------



3CDC-LC-MB Module

(3 Disc Carousel Changer)

Layout stage .2

TABLE OF CONTENTS

Servicing Hints	10A-2
Wiring	10A-4
Blockdiagram	10A-5
Component Layout Main Board	10A-6
Circuit Diagram part1	10A-7
Component Layout Main Board	10A-8
Circuit Diagram part2	10A-9
Exploded View	10A-10
Partslist	10A-12



WARNING

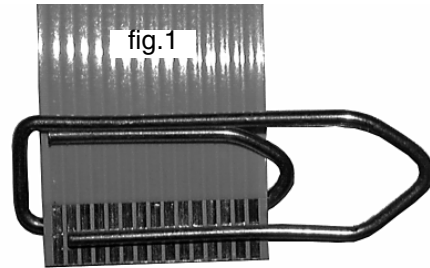
CHARGED CAPACITORS ON THE SERVO BOARD MAY DAMAGE THE CD DRIVE ELECTRONICS WHEN CONNECTING A NEW CDM MECHANISM. THAT'S WHY, BESIDES THE SAFETY MEASURES LIKE

- **SWITCH OFF POWER SUPPLY**
- **ESD PROTECTION**

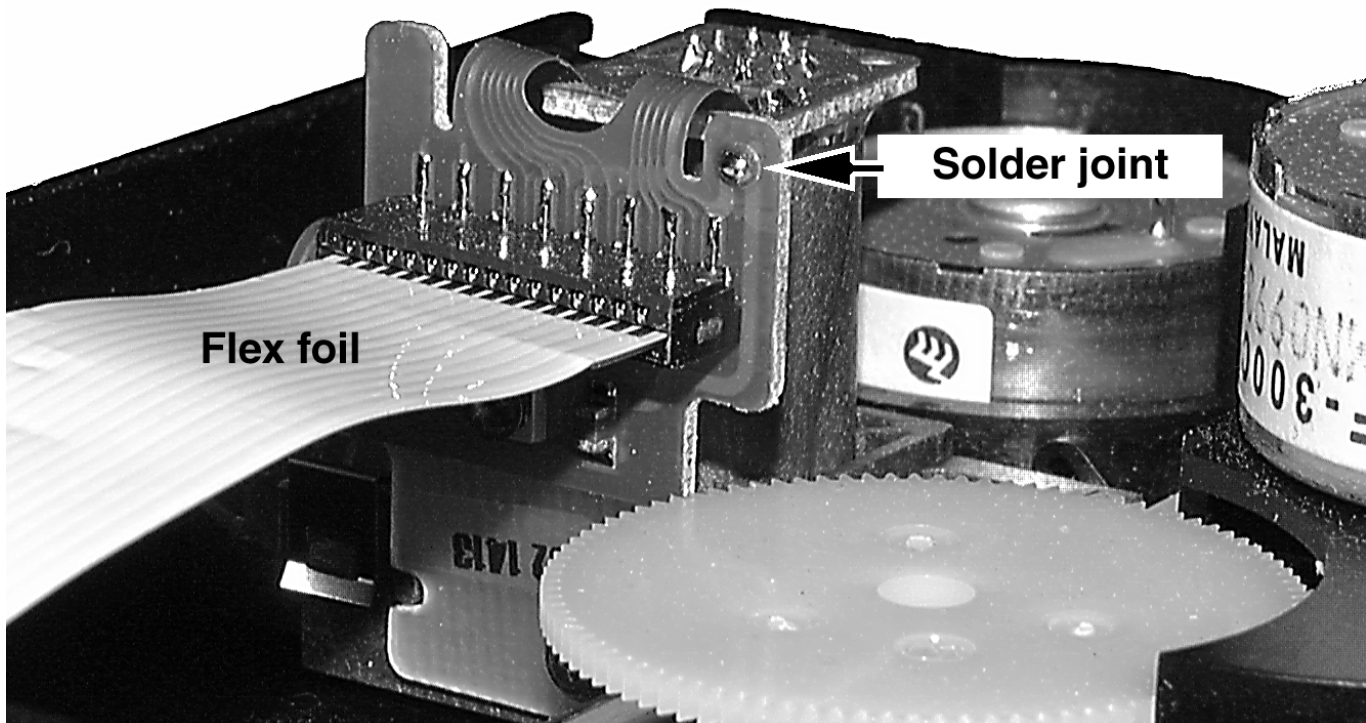
ADDITIONAL ACTIONS MUST BE TAKEN BY THE REPAIR TECHNICIAN.

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

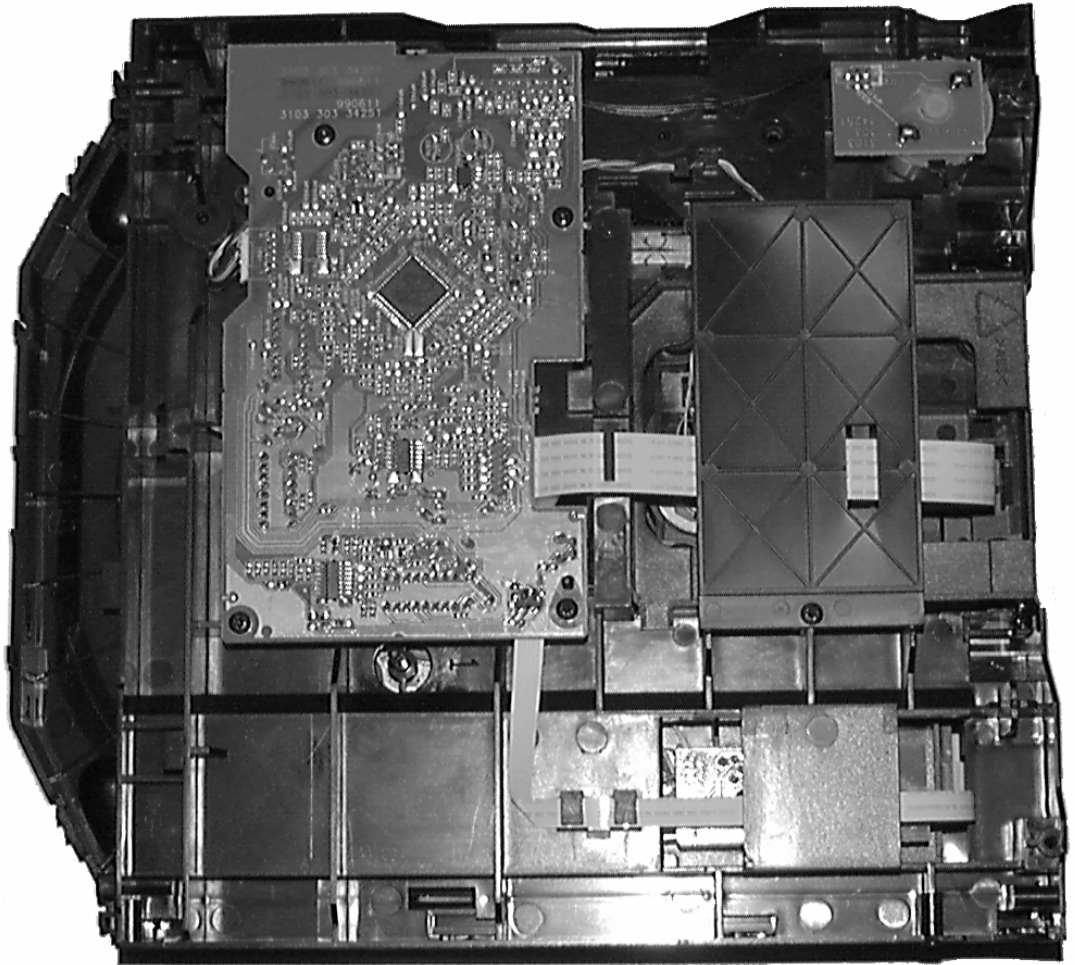
1. Disconnect CD drive flexfoil from old CD drive
2. Connect paperclip to CD drive flexfoil to short-circuit flexfoil (fig.1)
3. Remove old CD drive
4. Remove short-circuit from flexfoil of CD drive
5. Connect flexfoil to new CD drive
6. Position new CD drive in its studs
7. Remove short-circuit from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

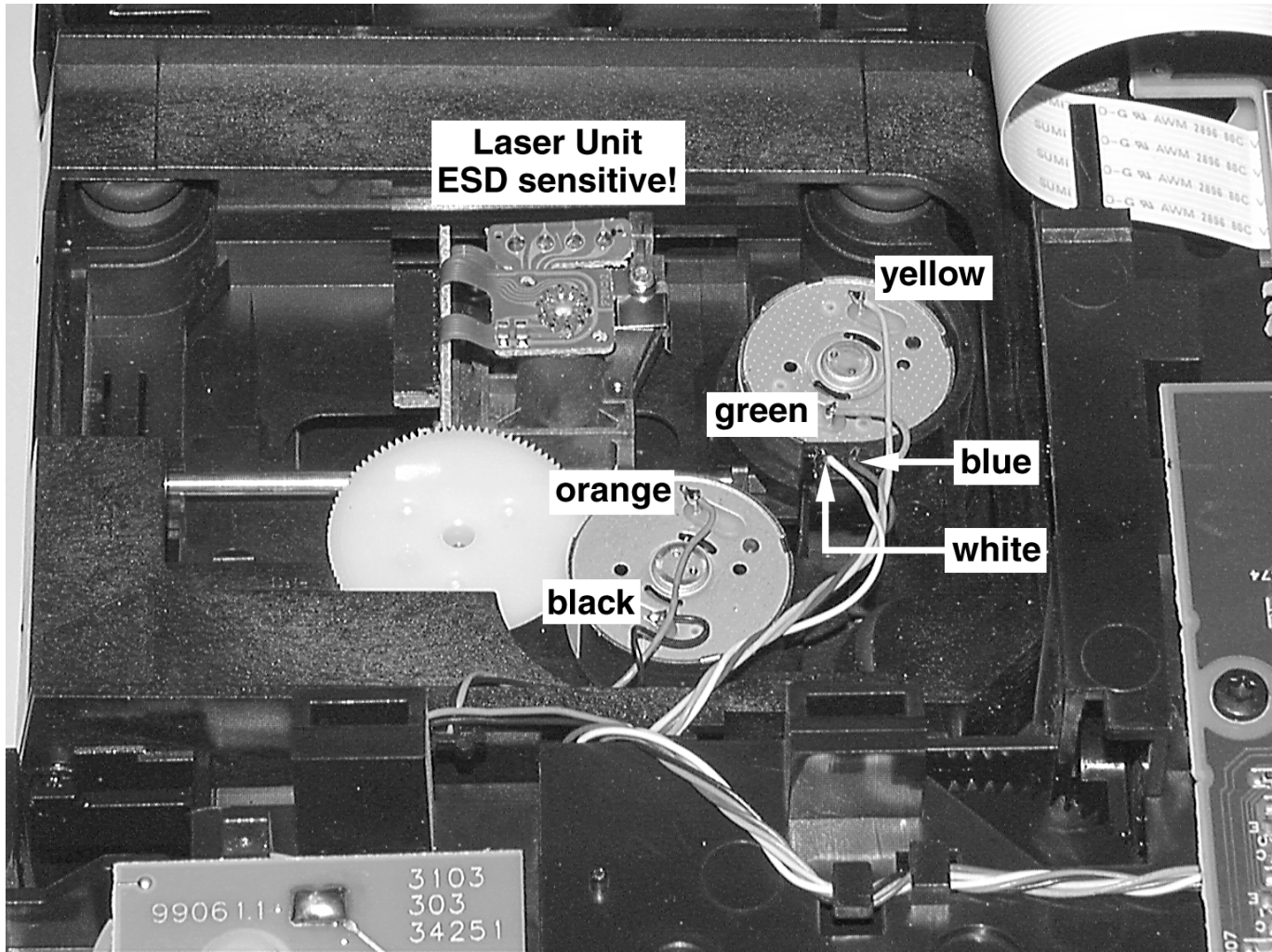


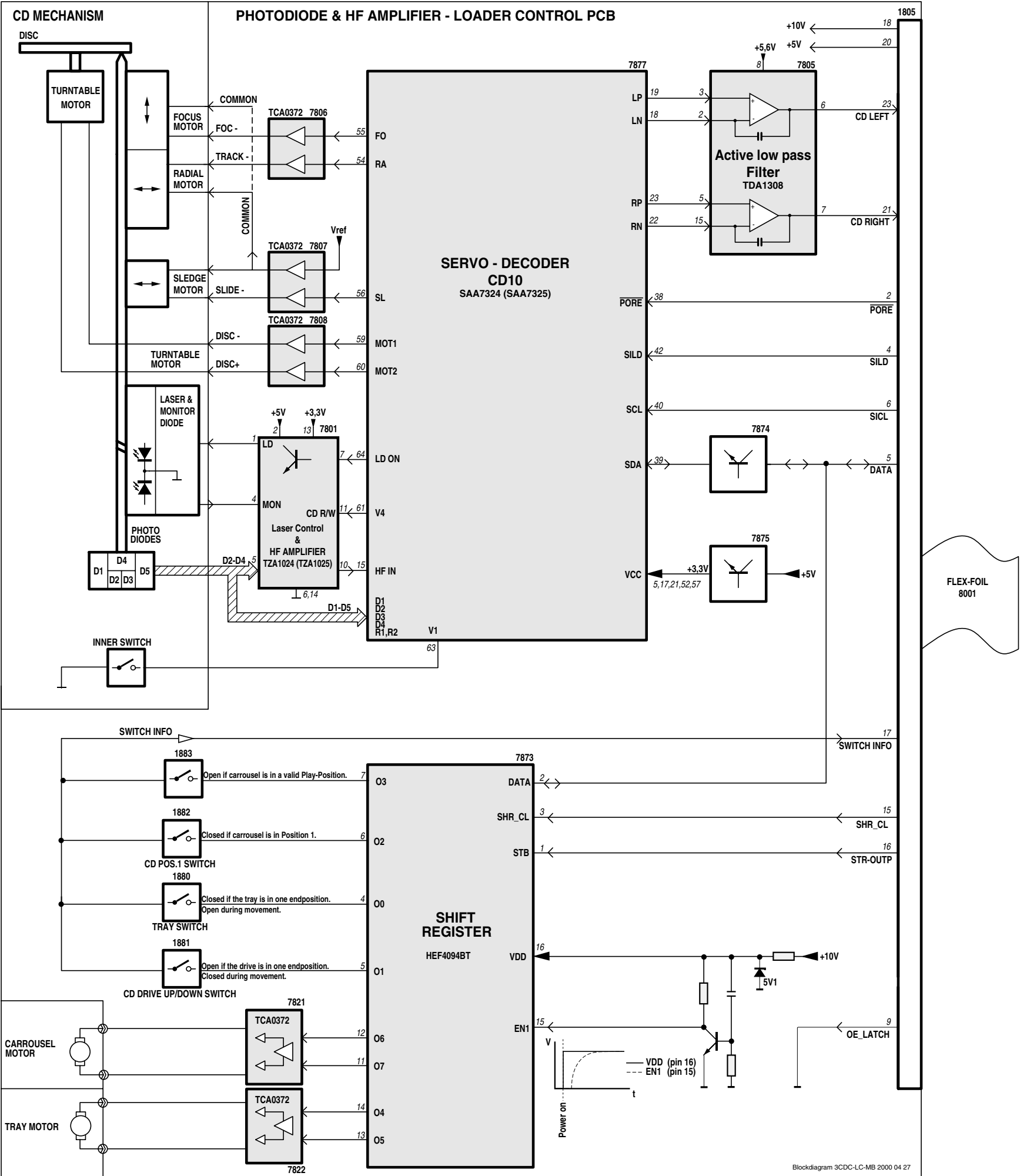
Attention: The laser diode of this CD drive is protected against ESD by a solder joint which shortcircuits the laserdiode to ground.
For proper functionality of the CD drive this solder joint must be removed **after** connection the drive to the set.



Service Position

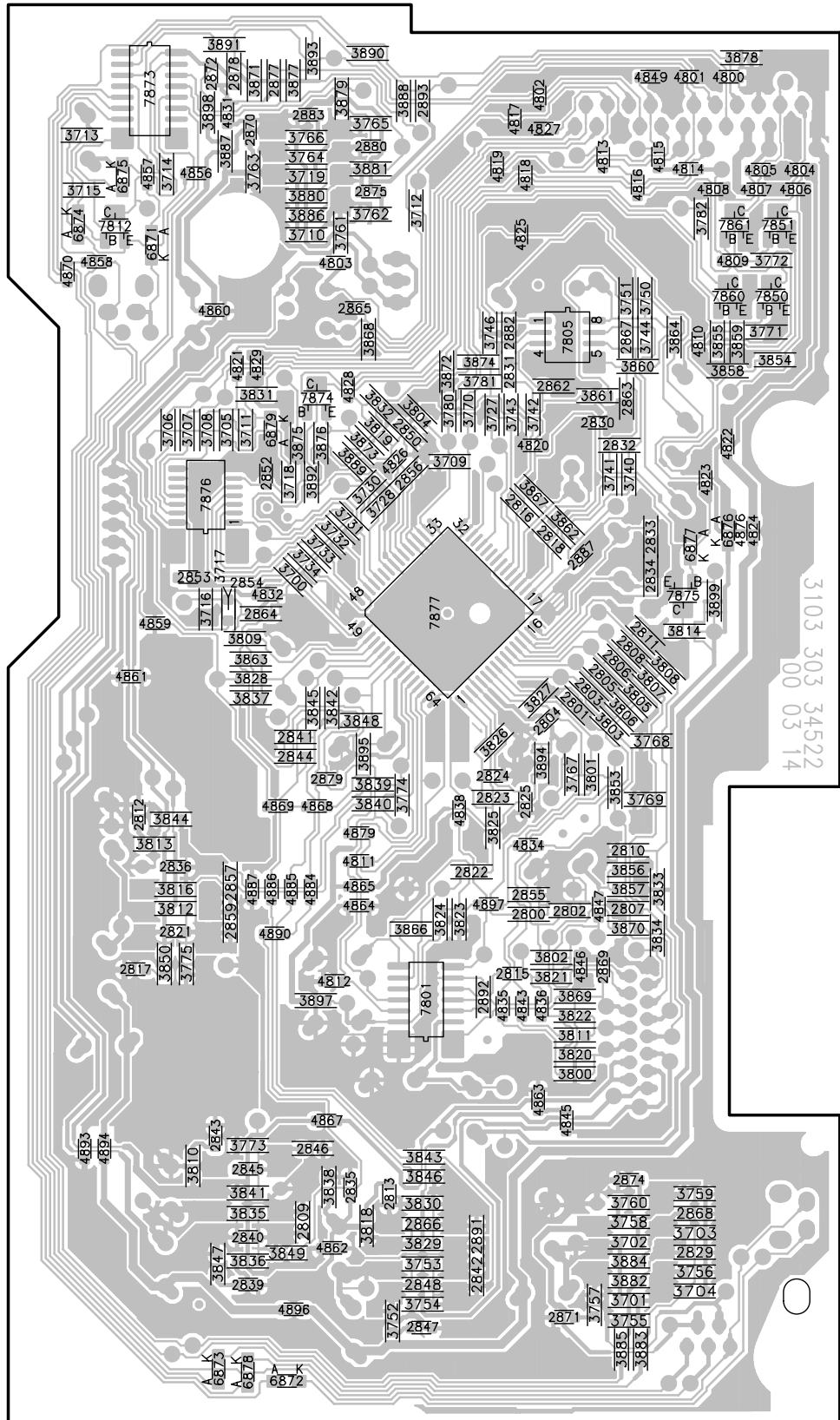


Wiring



Mapping

3CDC-LC-MB Copperside view

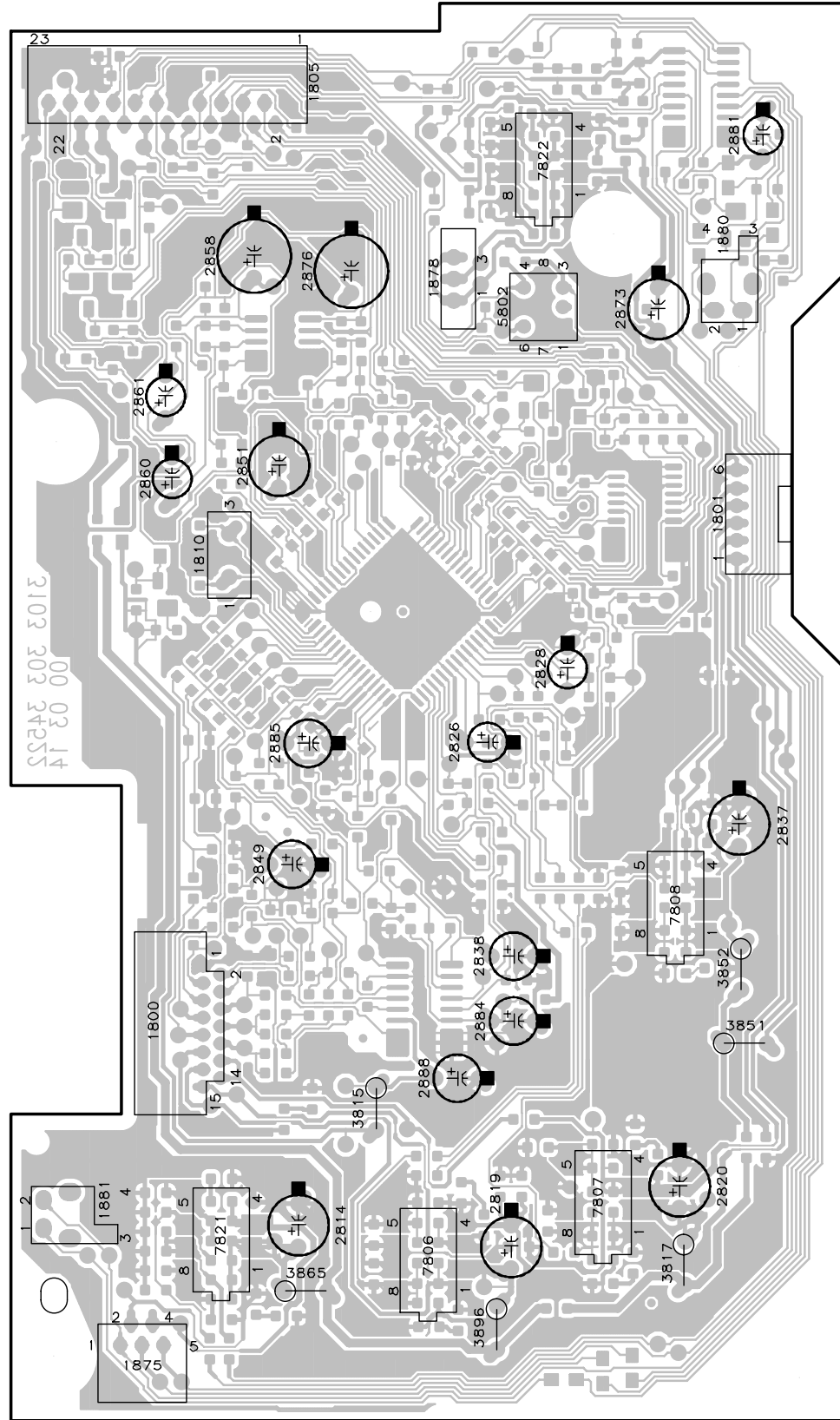


This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram respectively partslist.

3CDC-LC-MB Layout stage 2 2000-05-02

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

3CDC-LC-MB Componentside view

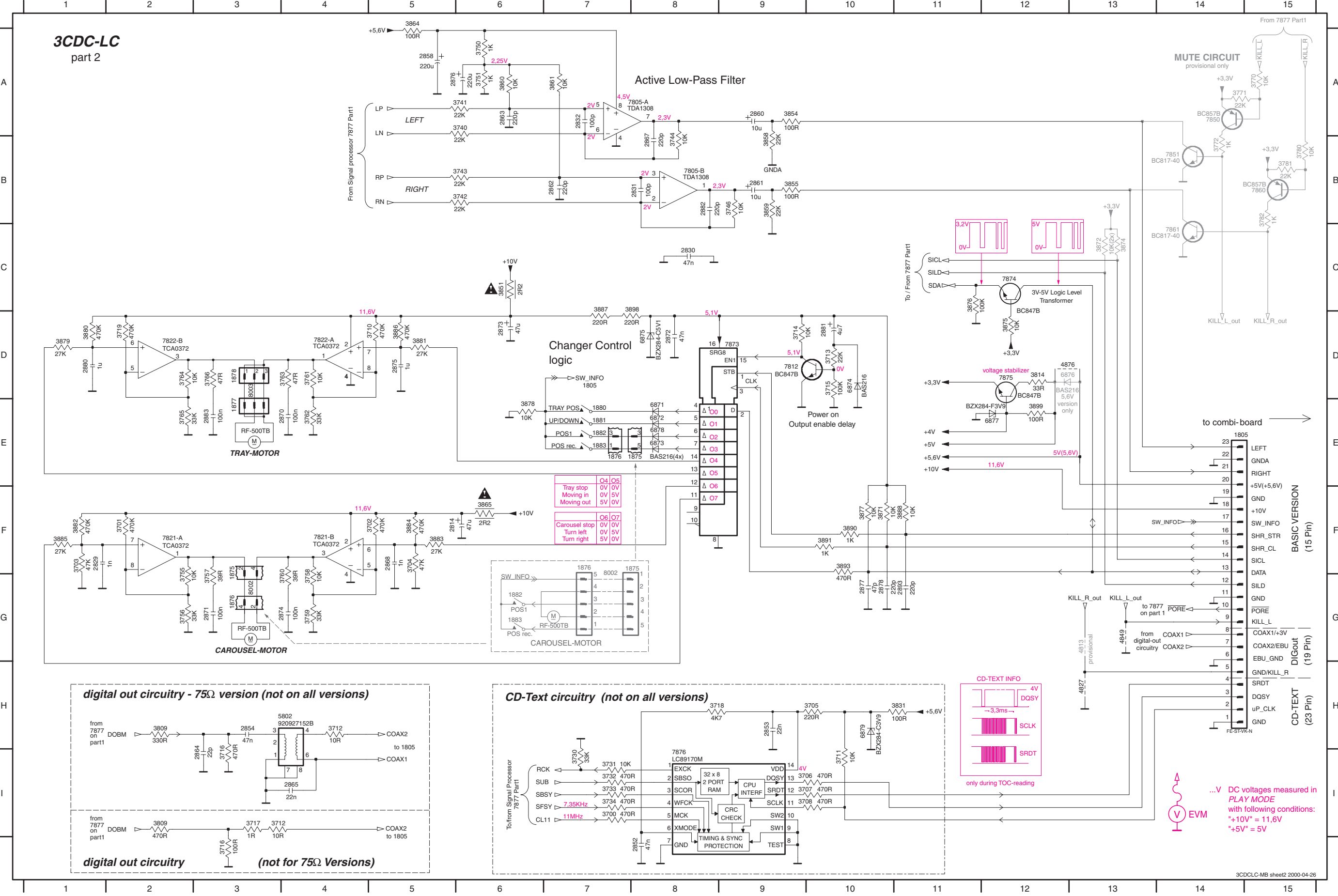


This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram respectively partslist.

3CDC-LC-MB Layout stage 2 2000-05-02



1805	E14	1880	E7	2831	B8	2861	B9	2870	E4	2877	G10	3372	C13	3705	H10	3713	D10	3730	I7	3743	B6	3757	G3	3764	D2	3781	B15	3855	B9	3871	F10	3881	D5	3888	F11	4827	H13	6874	D10	7805-B	B8	7851	B14
1850	G3	1881	E7	2832	A7	2862	B7	2871	G3	2878	G10	3374	C13	3706	I10	3714	D9	3732	I7	3744	B8	3758	G4	3765	E2	3782	B15	3858	B9	3875	D12	3882	F1	3890	F10	4849	G13	6875	D8	7812	D9	7860	B15
1875	E8	1882	E7	2852	I8	2863	A6	2872	D8	2880	D10	3700	I7	3707	I10	3715	D10	3733	I7	3746	B9	3759	G4	3766	D3	3809	H2	3859	B9	3876	C11	3883	F5	3891	F10	4876	D12	6876	D12	7821-A	F2	7861	C14
1876	E7	1883	E7	2853	H9	2864	I3	2873	D6	2881	D10	3701	F2	3708	I10	3716	I3	3734	I7	3750	A6	3760	G4	3770	A15	3814	D12	3860	A6	3877	F10	3884	F5	3893	F10	5802	H4	6877	E12	7821-B	F4	7873	D9
1877	E3	2814	F6	2854	H3	2865	I4	2874	G4	2882	B8	3702	F5	3710	D5	3718	H8	3740	A6	3751	A6	3761	D4	3771	A14	3831	H11	3861	A7	3878	E6	3885	F1	3898	D7	6871	E8	6878	E8	7822-A	D4	7874	C12
1878	D3	2829	F2	2858	A5	2867	B8	2875	D5	2883	E3	3703	F1	3711	I10	3719	D2	3741	A6	3755	G2	3762	E4	3772	B14	3851	C6	3864	A5	3879	D1	3886	D5	3899	E12	6872	E8	6879	H10	7822-B	D2	7875	D12
1878	G3	2830	C8	2860	A9	2868	F5	2876	A6	2893	G11	3704	F5	3712	H4	3730	I7	3742	B6	3756	G2	3763	D4	3780	B15	3854	A9	3865	F6	3880	D1	3887	D7	4813	G13	6873	E8	7805-A	A7	7850	A14	7876	I8



EXPLODED VIEW (3CDC-LC MODULE)

MECHANICAL PARTS *Loader* → *this page*

- 20

3103 304 66500

DRAWER BLACK
- 21

3140 117 58650

CLAMPER ASSY-VAM
- 30

3103 304 66560

SUPPORT
- 31

4822 529 10431

DAMPER - RUBBER (25DEG)
- 32

4822 529 10431

DAMPER - RUBBER (25DEG)
- 33

3103 304 06970

WASHER
- 35

4822 691 10772

VAM2201/01 CD Drive
- 41

3103 304 66480

FRAME
- 42

3103 304 66540

BRACKET-GUIDING
- 43

3103 301 06460

SPRING-GUIDING
- 44

3103 304 06890

GEAR-3
- 45

3103 304 06980

NAIL FIXATION
- 46

3103 304 06880

GEAR-2
- 47

3103 304 66530

BRACKET-LOAD
- 48

3103 304 06910

CAM
- 49

3103 304 66510

GUIDING
- 51

3103 304 06900

GEAR-4
- 52

3103 304 06870

GEAR-1
- 53

3103 304 06960

PULLEY-FRAME
- 54

3103 304 66910

DRIVING-BELT-DRAWER
- 55

4822 361 10753

TRAY MOTOR
- 56

4822 502 12548

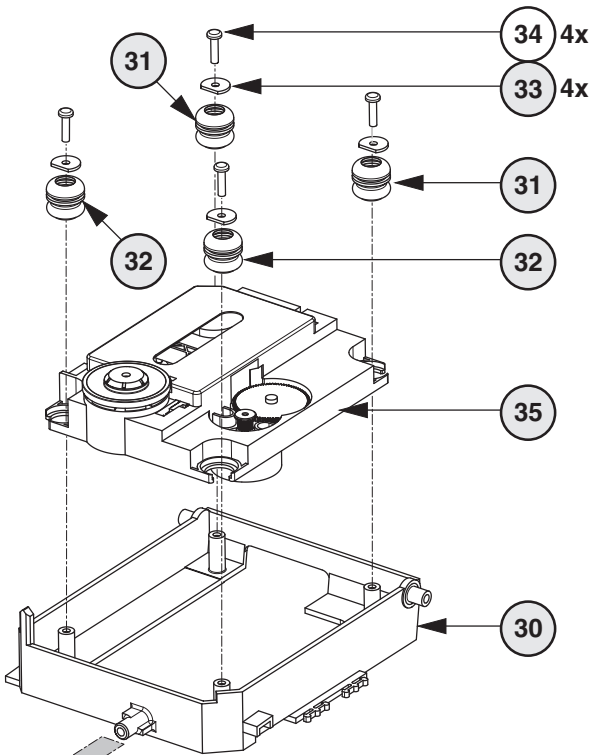
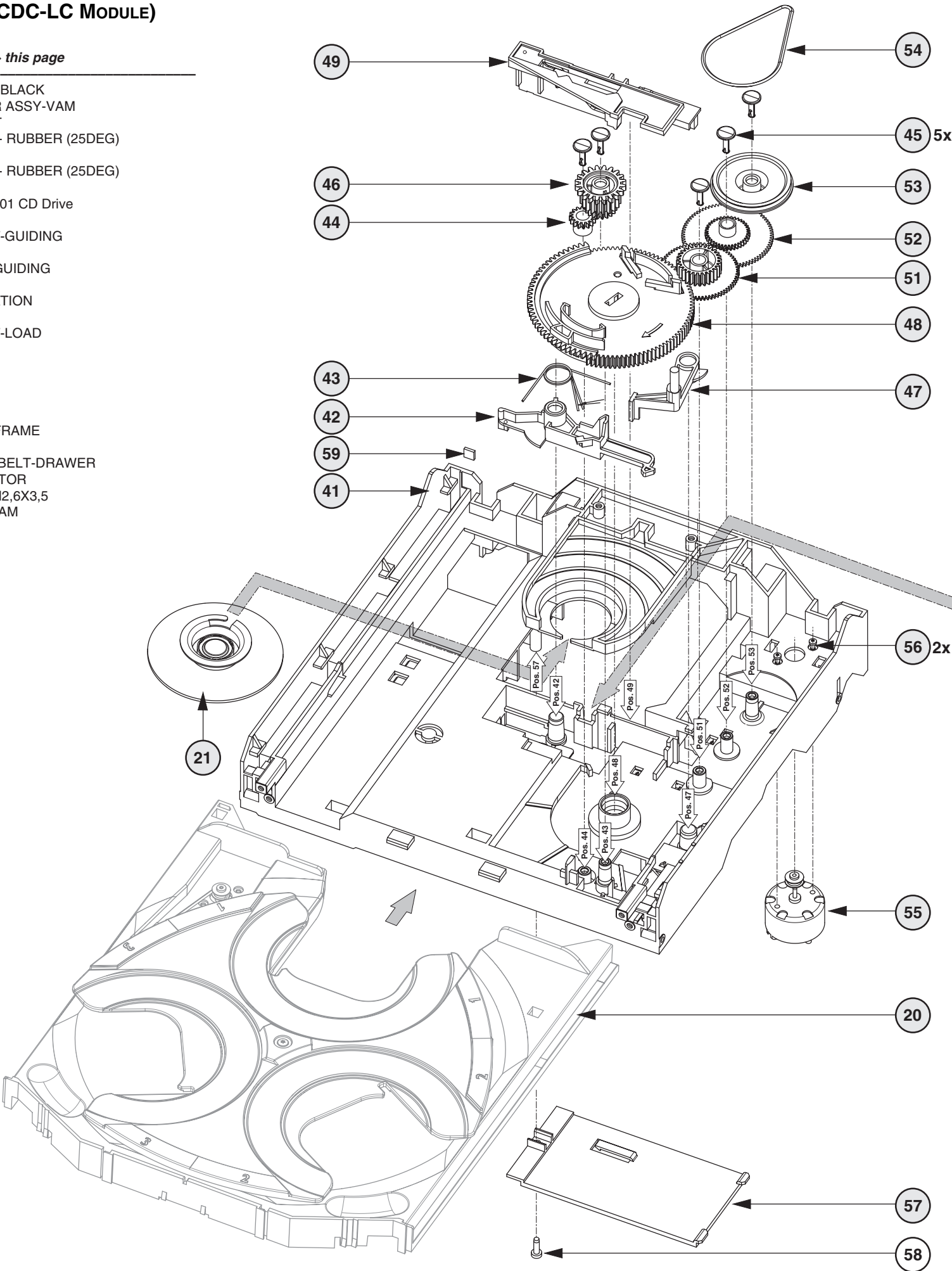
SCREW M2,6X3,5
- 57

3103 304 68890

COVER-VAM
- 59

4822 466 12146

RUBBER



MECHANICAL PARTS *Drawer* → *Chapter 10A-11*

- 20

3103 304 66500

DRAWER BLACK
- 21

3103 304 66490

CAROUSEL BLACK
- 22

3103 304 06860

PULLEY-DRAWER
- 23

3103 304 06850

ECCENTRIC GEAR WHEEL
- 24

3103 304 06980

NAIL FIXATION
- 25

3103 304 66850

DRIVING BELT CAROUSEL
- 27

3103 304 07100

BUSH DRAWER (height=8,5mm,d=16mm)
- 27

4822 532 12365

BUSH DRAWER (height=5,5mm,d=9,4mm)
- 29

3103 304 66550

BRACKET-DISC
- 30

3103 304 66520

TUMBLER
- 31

3103 301 06470

SPRING-DISC
- 32

3103 304 06920

CONTROL-DISC
- 34

3103 304 06870

GEAR-1
- 37

4822 361 10753

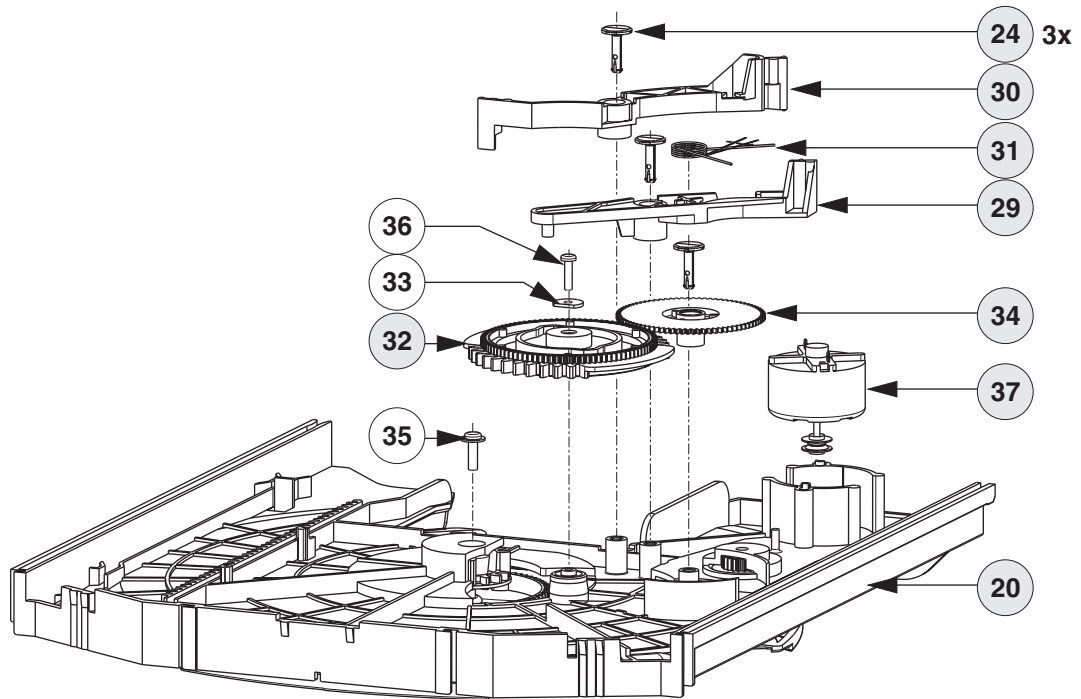
CAROUSEL MOTOR

- X

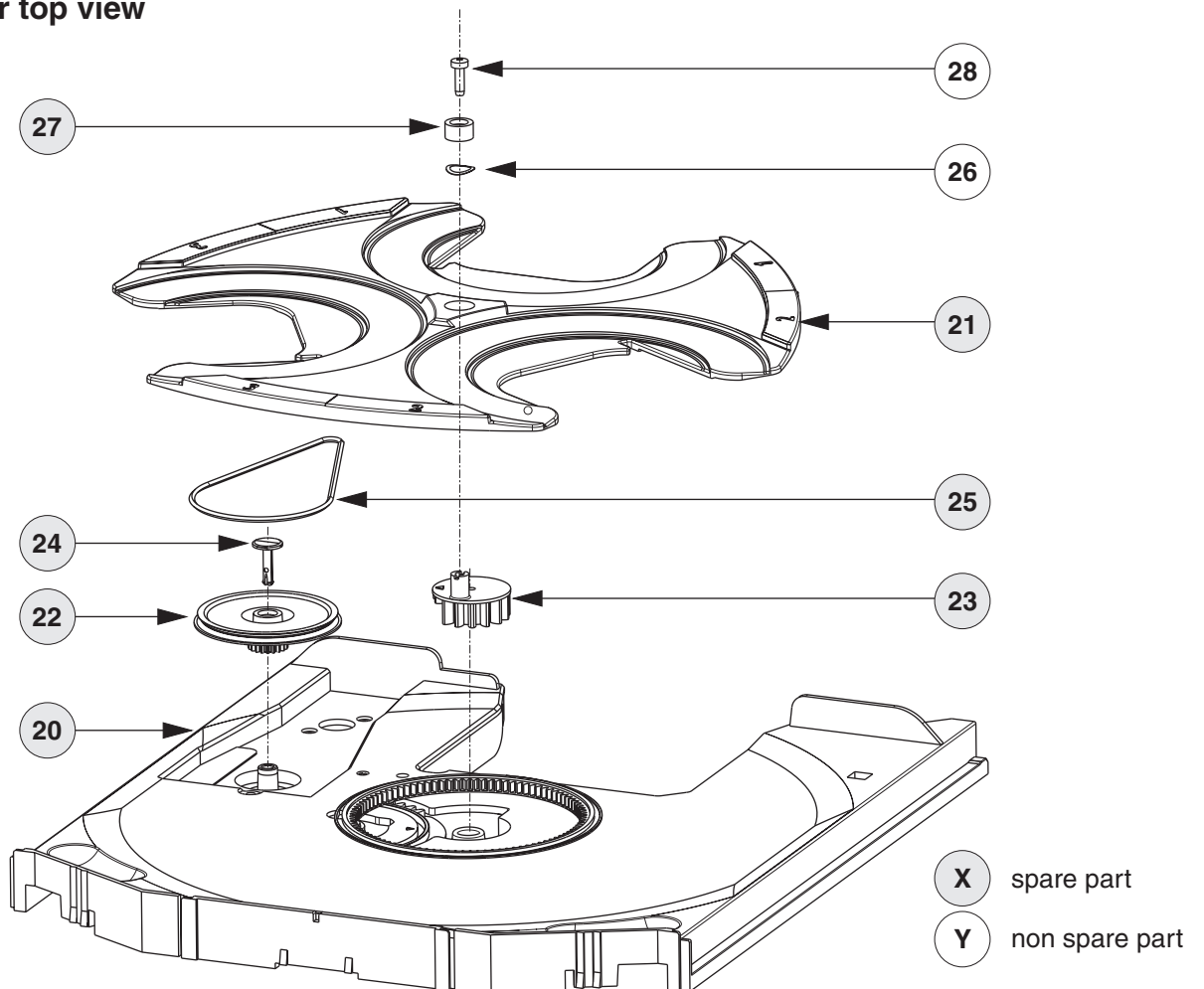
spare part
- Y

non spare part

Drawer bottom view



Drawer top view



ELECTRICAL PARTSLIST 3CDC-LC-MB MODULE**MISCELLANEOUS**

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

CAPACITORS

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

CAPACITORS

2851	4822 124 42383	220µF	20%	4V
2852©	4822 126 13751	47nF	10%	50V
2853©	5322 122 32654	22nF	10%	63V
2854©	4822 126 13751	47nF	10%	50V
2855©	5322 122 34099	470pF	10%	63V
2856©	4822 126 13691	27pF	1%	63V
2857©	4822 122 33575	220pF	5%	50V
2858	4822 124 12245	220µF	20%	16V
2859©	4822 122 33575	220pF	5%	50V
2860	4822 124 11947	10µF	20%	16V
2861	4822 124 11947	10µF	20%	16V
2862©	4822 122 33575	220pF	5%	50V
2863©	4822 122 33575	220pF	5%	50V
2864©	5322 122 32658	22pF	5%	50V
2865©	5322 122 32654	22nF	10%	63V
2866©	5322 122 33538	150pF	5%	63V
2867©	4822 122 33575	220pF	5%	50V
2868©	5322 122 31647	1nF	10%	63V
2869©	4822 126 13751	47nF	10%	50V
2870©	4822 126 14585	100nF	10%	50V
2871©	4822 126 14585	100nF	10%	50V
2872©	4822 126 13751	47nF	10%	50V
2873	4822 124 40433	47µF	20%	25V
2874©	4822 126 14585	100nF	10%	50V
2875©	4822 126 14043	1µF	20%	16V
2876	4822 124 12245	220µF	20%	16V
2877©	4822 126 13692	47pF	1%	63V
2878©	4822 122 33575	220pF	5%	50V
2879©	4822 126 14585	100nF	10%	50V
2880©	4822 126 14043	1µF	20%	16V
2881	4822 124 40769	4,7µF	20%	100V
2882©	4822 122 33575	220pF	5%	50V
2883©	4822 126 14585	100nF	10%	50V
2884	4822 124 40769	4,7µF	20%	100V
2885	4822 124 40769	4,7µF	20%	100V
2887©	4822 126 14585	100nF	10%	50V
2888	4822 124 40769	4,7µF	20%	100V
2891©	4822 122 33575	220pF	5%	50V
2892©	5322 126 10223	4,7nF	10%	63V
2893©	4822 122 33575	220pF	5%	50V

RESISTORS

3700©	4822 051 20471	470Ω	5%	0,1W
3701©	4822 051 20474	470kΩ	5%	0,1W
3702©	4822 051 20474	470kΩ	5%	0,1W
3703©	4822 117 10834	47kΩ	1%	0,1W
3704©	4822 117 10834	47kΩ	1%	0,1W
3705©	4822 117 11503	220Ω	5%	0,1W
3706©	4822 051 20471	470Ω	5%	0,1W
3707©	4822 051 20471	470Ω	5%	0,1W
3708©	4822 051 20471	470Ω	5%	0,1W
3709©	4822 051 20108	1Ω	5%	0,1W
3710©	4822 051 20474	470kΩ	5%	0,1W
3711©	4822 117 10833	10kΩ	1%	0,1W
3712©	4822 051 20109	10Ω	5%	0,1W
3713©	4822 051 20223	22kΩ	5%	0,1W
3714©	4822 117 10833	10kΩ	1%	0,1W
3715©	4822 117 10837	100kΩ	1%	0,1W
3716©	4822 051 20471	470Ω	5%	0,1W
3718©	4822 051 20472	4,7kΩ	5%	0,1W
3719©	4822 051 20474	470kΩ	5%	0,1W
3727©	4822 051 20472	4,7kΩ	5%	0,1W
3728©	4822 051 20472	4,7kΩ	5%	0,1W
3730©	4822 051 20333	33kΩ	5%	0,1W
3731©	4822 117 10833	10kΩ	1%	0,1W
3732©	4822 051 20471	470Ω	5%	0,1W
3733©	4822 051 20471	470Ω	5%	0,1W

ELECTRICAL PARTSLIST 3CDC-LC-MB MODULE**RESISTORS**

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

RESISTORS

3839	4822 051 20273	27kΩ	5%	0,1W
3840	4822 051 20273	27kΩ	5%	0,1W
3841	4822 117 10834	47kΩ	1%	0,1W
3842	4822 117 10833	10kΩ	1%	0,1W
3843	4822 117 12955	2,7kΩ	1%	0,1W
3844	4822 117 12024	27kΩ	1%	0,1W
3845	4822 117 10833	10kΩ	1%	0,1W
3846	4822 117 12955	2,7kΩ	1%	0,1W
3847	4822 051 20399	39Ω	5%	0,1W
3848	4822 117 10965	18kΩ	2%	0,1W
3849	4822 117 10965	18kΩ	2%	0,1W
3850	4822 051 20399	39Ω	5%	0,1W
3851	4822 052 10228	2,2Ω	5%	0,33W
3852	4822 052 10228	2,2Ω	5%	0,33W
3853	4822 051 20471	470Ω	5%	0,1W
3854	4822 051 20101	100Ω	5%	0,1W
3855	4822 051 20101	100Ω	5%	0,1W
3856	4822 117 12521	68Ω	1%	0,1W
3857	4822 117 12521	68Ω	1%	0,1W
3858	4822 051 20223	22kΩ	5%	0,1W
3859	4822 051 20223	22kΩ	5%	0,1W
3860	4822 117 10833	10kΩ	1%	0,1W
3861	4822 117 10833	10kΩ	1%	0,1W
3862	4822 051 20121	120Ω	5%	0,1W
3863	4822 051 20101	100Ω	5%	0,1W
3863	4822 051 20339	33Ω	5%	0,1W
3864	4822 051 20101	100Ω	5%	0,1W
3865	4822 052 10228	2,2Ω	5%	0,33W
3866	4822 117 10833	10kΩ	1%	0,1W
3867	4822 051 20121	120Ω	5%	0,1W
3869	4822 051 20478	4,7Ω	5%	0,1W
3870	4822 051 20101	100Ω	5%	0,1W
3871	4822 117 10833	10kΩ	1%	0,1W
3873	4822 051 20471	470Ω	5%	0,1W
3875	4822 117 10833	10kΩ	1%	0,1W
3876	4822 117 10837	100kΩ	1%	0,1W
3877	4822 117 10833	10kΩ	1%	0,1W
3878	4822 117 10833	10kΩ	1%	0,1W
3879	4822 051 20273	27kΩ	5%	0,1W
3880	4822 051 20474	470kΩ	5%	0,1W
3881	4822 051 20273	27kΩ	5%	0,1W
3882	4822 051 20474	470kΩ	5%	0,1W
3883	4822 051 20273	27kΩ	5%	0,1W
3884	4822 051 20474	470kΩ	5%	0,1W
3885	4822 051 20273	27kΩ	5%	0,1W
3886	4822 051 20474	470kΩ	5%	0,1W
3887	4822 117 11503	220Ω	5%	0,1W
3888	4822 117 10833	10kΩ	1%	0,1W
3889	4822 051 20471	470Ω	5%	0,1W
3890	4822 051 10102	1kΩ	2%	0,25W
3891	4822 051 10102	1kΩ	2%	0,25W
3892	4822 051 20471	470Ω	5%	0,1W
3893	4822 051 20471	470Ω	5%	0,1W
3894	4822 051 20101	100Ω	5%	0,1W
3895	4822 051 20159	15Ω	5%	0,1W
3896	4822 052 10228	2,2Ω	5%	0,33W
3897	4822 051 20101	100Ω	5%	0,1W
3898	4822 117 11503	220Ω	5%	0,1W
3899	4822 051 20101	100Ω	5%	0,1W
4800	4822 051 20008	CHIP JUMPER 0805		
4801	4822 051 20008	CHIP JUMPER 0805		
4802	4822 051 20008	CHIP JUMPER 0805		
4804	4822 051 20008	CHIP JUMPER 0805		
4805	4822 051 20008	CHIP JUMPER 0805		
4806	4822 051 20008	CHIP JUMPER 0805		

ELECTRICAL PARTSLIST 3CDC-LC-MB MODULE**RESISTORS**

4807© 4822 051 20008 CHIP JUMPER 0805
 4808© 4822 051 20008 CHIP JUMPER 0805
 4809© 4822 051 20008 CHIP JUMPER 0805
 4810© 4822 051 20008 CHIP JUMPER 0805
 4812© 4822 051 20008 CHIP JUMPER 0805

4814© 4822 051 20008 CHIP JUMPER 0805
 4815© 4822 051 20008 CHIP JUMPER 0805
 4816© 4822 051 20008 CHIP JUMPER 0805
 4817© 4822 051 20008 CHIP JUMPER 0805
 4818© 4822 051 20008 CHIP JUMPER 0805

4819© 4822 051 20008 CHIP JUMPER 0805
 4820© 4822 051 20008 CHIP JUMPER 0805
 4821© 4822 051 20008 CHIP JUMPER 0805
 4822© 4822 051 20008 CHIP JUMPER 0805
 4823© 4822 051 20008 CHIP JUMPER 0805

4824© 4822 051 20008 CHIP JUMPER 0805
 4825© 4822 051 20008 CHIP JUMPER 0805
 4826© 4822 051 20008 CHIP JUMPER 0805
 4827© 4822 051 20008 CHIP JUMPER 0805
 4828© 4822 051 20008 CHIP JUMPER 0805

4831© 4822 051 20008 CHIP JUMPER 0805
 4832© 4822 051 20008 CHIP JUMPER 0805
 4834© 4822 051 20008 CHIP JUMPER 0805
 4835© 4822 051 20008 CHIP JUMPER 0805
 4836© 4822 051 20008 CHIP JUMPER 0805

4838© 4822 051 20008 CHIP JUMPER 0805
 4843© 4822 051 20008 CHIP JUMPER 0805
 4845© 4822 051 20008 CHIP JUMPER 0805
 4846© 4822 051 20008 CHIP JUMPER 0805
 4847© 4822 051 20008 CHIP JUMPER 0805

4849© 4822 051 20008 CHIP JUMPER 0805
 4856© 4822 051 20008 CHIP JUMPER 0805
 4857© 4822 051 20008 CHIP JUMPER 0805
 4858© 4822 051 20008 CHIP JUMPER 0805
 4859© 4822 051 20008 CHIP JUMPER 0805

4860© 4822 051 20008 CHIP JUMPER 0805
 4861© 4822 051 20008 CHIP JUMPER 0805
 4862© 4822 051 20008 CHIP JUMPER 0805
 4863© 4822 051 20008 CHIP JUMPER 0805
 4864© 4822 051 20008 CHIP JUMPER 0805

4865© 4822 051 20008 CHIP JUMPER 0805
 4867© 4822 051 20008 CHIP JUMPER 0805
 4868© 4822 051 20008 CHIP JUMPER 0805
 4869© 4822 051 20008 CHIP JUMPER 0805
 4870© 4822 051 20008 CHIP JUMPER 0805

4876© 4822 051 20008 CHIP JUMPER 0805
 4879© 4822 051 20008 CHIP JUMPER 0805
 4884© 4822 051 20008 CHIP JUMPER 0805
 4885© 4822 051 20008 CHIP JUMPER 0805
 4886© 4822 051 20008 CHIP JUMPER 0805

4887© 4822 051 20008 CHIP JUMPER 0805
 4890© 4822 051 20008 CHIP JUMPER 0805
 4893© 4822 051 20008 CHIP JUMPER 0805
 4894© 4822 051 20008 CHIP JUMPER 0805
 4896© 4822 051 20008 CHIP JUMPER 0805

4897© 4822 051 20008 CHIP JUMPER 0805

COILS

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

DIODES

6871© 4822 130 11397 BAS316
 6872© 4822 130 11397 BAS316
 6873© 4822 130 11397 BAS316
 6874© 4822 130 11397 BAS316
 6875© 9340 548 52115 BZX284-C5V1

6877© 9322 129 34685 BZX284-C3V9
 6878© 4822 130 11397 BAS316
 6879© 9322 129 34685 BZX284-C3V9

TRANSISTORS

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

INTEGRATED CIRCUITS

7801© 9352 622 36118 TZA1025T/V2, HF-Amplifier
 7805© 4822 209 33165 TDA1308T/N1, OPAMP
 7806 4822 209 62059 TCA0372DP1, Motor driver
 7807 4822 209 62059 TCA0372DP1, Motor driver
 7808 4822 209 62059 TCA0372DP1, Motor driver

 7821 4822 209 62059 TCA0372DP1, Motor driver
 7822 4822 209 62059 TCA0372DP1, Motor driver
 7873 5322 209 11306 HEF4094BT, Shift register
 7876 4822 209 16143 LC89170M, CD TEXT IC
 7877© 9352 642 17557 SAA7325H/M2B Signal processor CD10

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, -32V, 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 μ P 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 μ P on the Front board.

b) SOURCE SELECTION

One of the 4 sources, namely AUX, TAPE, TUNER, CD, can be selected via A0 & A1 lines which control the IC 7501 (HEF4052BT). Karaoke mic. mixing is connected to the selected source before the signal is amplified with a buffer amplifier (Tr 7503 & 7504). The source signal is then split into recording path (for recording on tape) and main signal path (to the PWM volume control).

c) PWM VOLUME CONTROL

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

d) SOUND FEATURES

Sound Features include the DBB, IS and 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

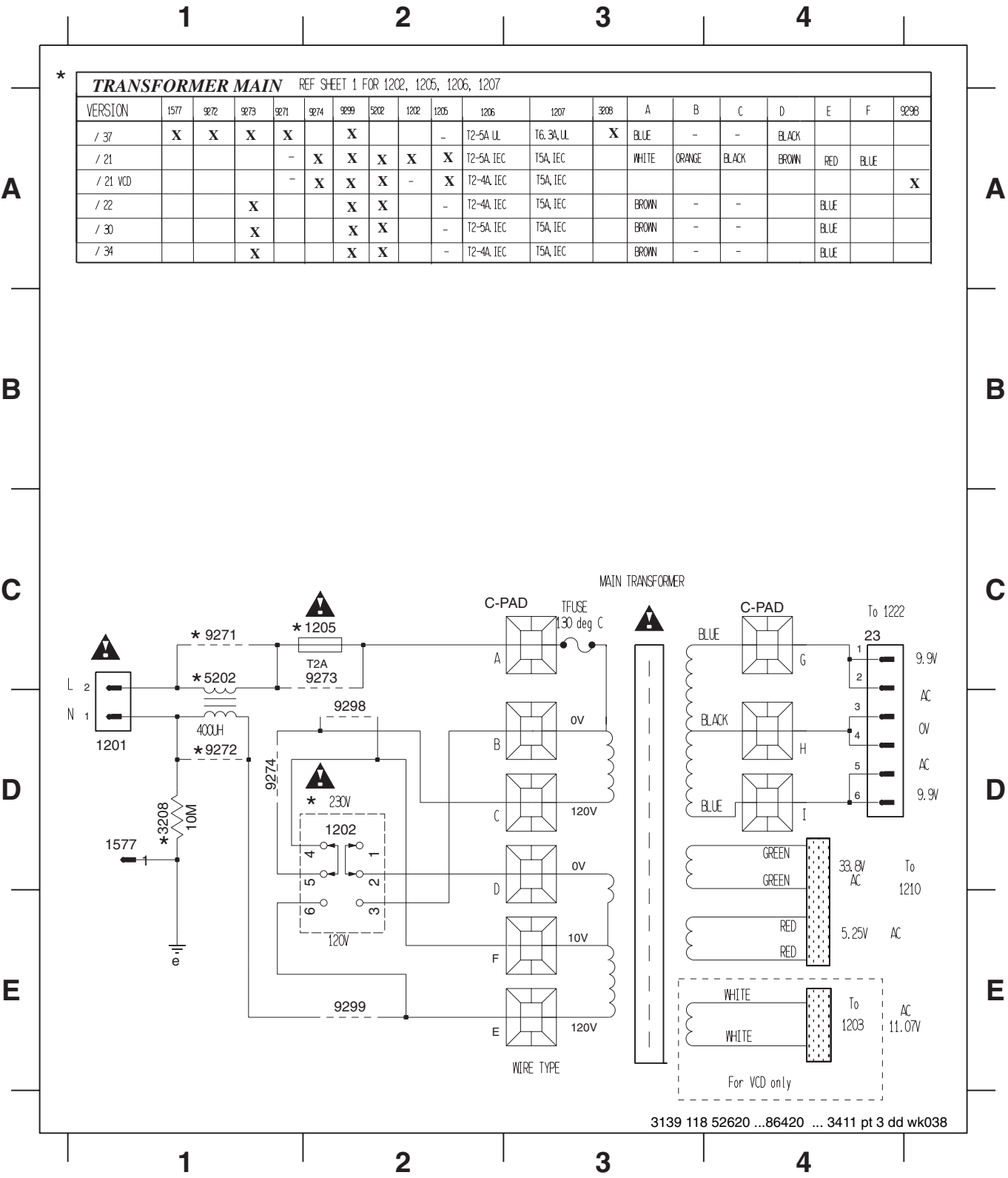
A54050	FW-C200/21/21M, FW-C220/21K
A54060	FW-C220/22/34
A54090	FW-C250/37
A54100	FW-C250/21
A54110	FW-C280/22/34
A54120	FW-C290/21
A54330	FW-C200/30
A54350	FW-C200/33
A54440	FW-C150/37

NOTES:

Features/Configuration:	A54050	A54060	A54090	A54100	A54110	A54120	A54330	A54350	A54440		
Aux-In	x	x	x	x	x	x	x	x	x		
Sub-woofer Out	-	-	-	-	-	-	-	-	-		
Digital Out	-	-	-	-	-	-	-	-	-		
I.S.	-	-	-	-	x	x	-	-	-		
Voltage Selector	x	-	-	x	-	x	-	-	-		
Karaoke	x	-	-	x	-	x	-	x	-		
DBB	x	x	x	x	x	x	x	x	x		
DSC	x	x	x	x	x	x	x	x	x		
Matrix Surroud	-	-	-	-	-	-	-	-	-		
1-band Spectrum Analyser	x	x	x	x	x	x	x	x	x		
3-band Spectrum Analyser	-	-	-	-	-	-	-	-	-		
12W	-	-	-	-	-	-	-	-	x		
18W	x	x	-	-	-	-	x	x	-		
25W	-	-	x	x	x	x	-	-	-		
VCD	-	-	-	-	-	-	-	-	-		
NTC	-	-	-	x	-	x	-	-	-		
ECO-MTF	-	-	x	x	-	-	-	-	x		
ETF7	x	x	-	-	x	x	x	x	-		

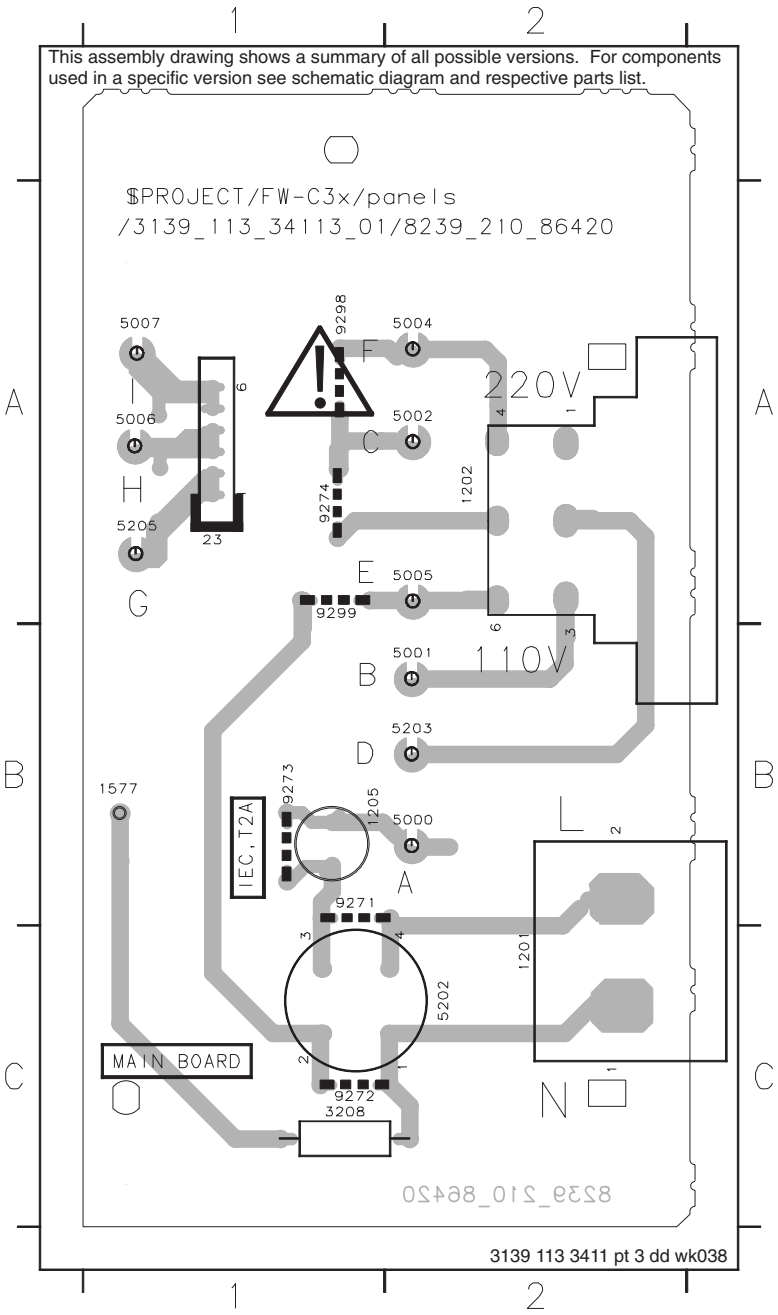
CIRCUIT DIAGRAM - TRANSFORMER PRIMARY PART

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



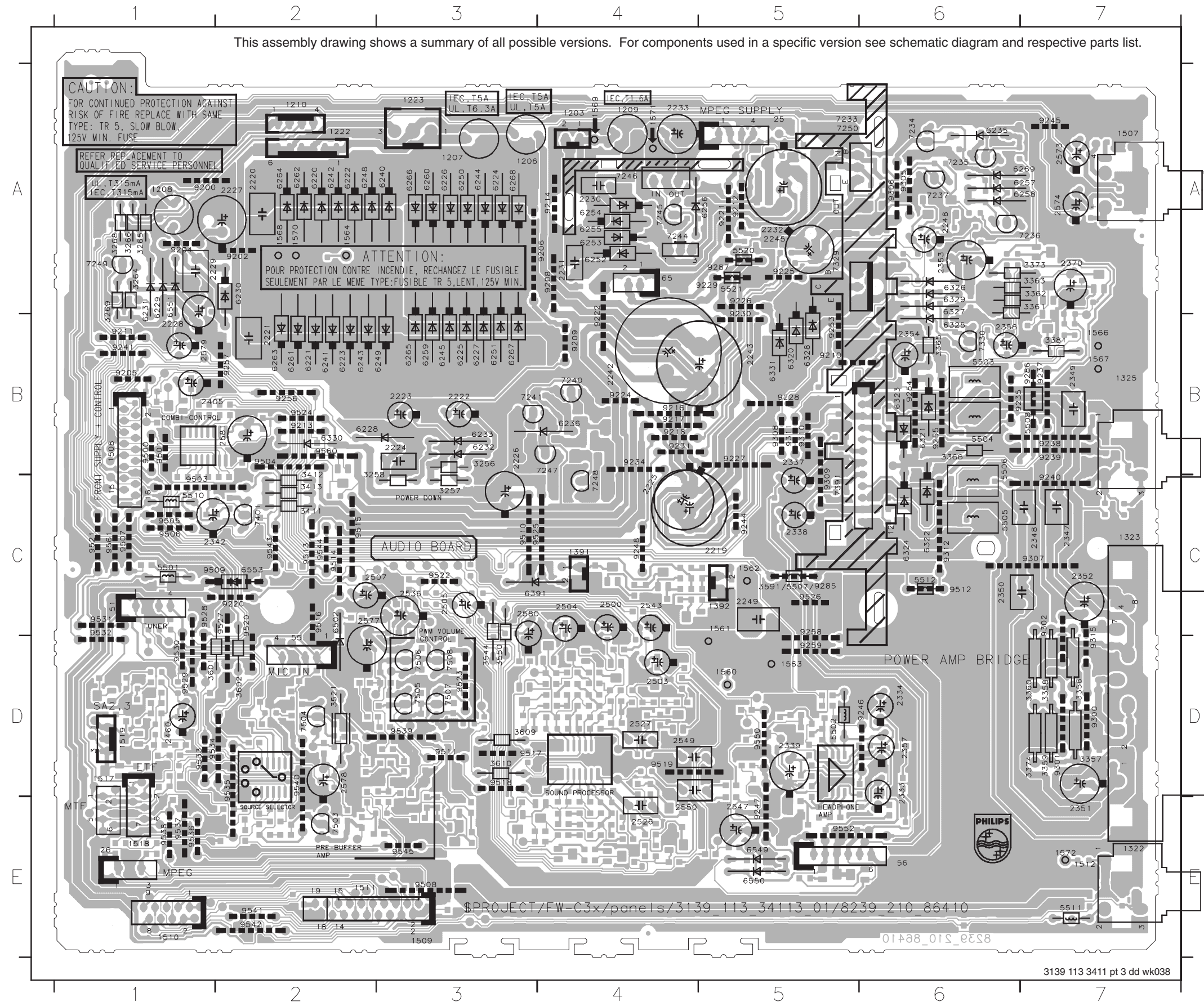
COMPONENT LAYOUT - TRANSFORMER PRIMARY

23 A1 1577 B1 5002 A2 5007 A1 9271 B1 9298 A1
1201 C2 1205 C2 5004 A2 5005 A1 9272 C2 9299 A1
1205 B1 5001 B2 5006 A1 5203 B2 9273 D1 9274 A1



[illegible]

COMPONENT LAYOUT - MAIN PART

[illegible]

^ For /37 only
 & Fro /22 digital version only
 # Provision on Layout
 @ For VCD version only
 Refer to parts list for usage

% VALUE FOR FW-V28 only			
ITEM	3279	3280	3281
VALUE	1K	1K	1K

3139 118 52620 ...86410 ... 3411 pt 3 dd wk038

25 E7	3261 D8	6258 D7
1203 E1	3263 C9	6259 C5
1206 A1	3264 C3	6260 B5
1207 B1	3265 D4	6261 C3
1208 C2	3266 D4	6262 B3
1209 E1	3268 D4	6263 C3
1210 C1	3269 D3	6264 B3
1222 B1	3270 E8	6265 C4
1223 B1	3271 D8	6266 B4
1391 A9	3272 D7	6267 C5
1392 A7	3273 D7	6268 B5
1560 E9	3274 D6	6269 C7
1561 E9	3275 C6	6391 A9
1563 E9	3276 D8	7233 B7
1564 E9	3277 C8	7234 B8
1566 F9	3278 C7	7235 C8
1567 F9	3279 C7	7236 C7
1568 F9	3280 C7	7237 D7
1569 D1	3281 C6	7238 D8
1570 F9	3282 C6	7239 E8
1571 F5	3283 B6	7240 A5
2219 A2	3286 A3	7241 A5
2220 B1	3287 A3	7243 F3
2221 C1	3288 A4	7244 E3
2222 C5	3289 A4	7245 E4
2223 C5	3391 A9	7246 E5
2224 D5	3392 B9	7247 A4
2225 A1	3393 A9	7248 A3
2226 A6	3394 B8	7249 C3
2227 C3	3395 A8	7250 B7
2228 D3	3396 A8	7395 A9
2229 D2	3397 A7	7396 A8
2230 E2	3398 A7	7397 A8
2231 E2	3399 A7	
2232 E3	4215 F7	
2233 F5	4216 F8	
2234 D9	4217 C6	
2235 E9	4218 B6	
2236 E9	4221 C7	
2242 B6	4222 C7	
2243 B5	4224 B7	
2245 C8	4226 B9	
2246 D7	4502 D1	
2247 C8	4503 D1	
2248 C6	6220 B2	
2391 B8	6221 C2	
2392 B7	6222 B3	
2393 B7	6223 C3	
3209 A3	6224 B4	
3210 A4	6225 C4	
3212 A6	6226 B4	
3213 A6	6227 C4	
3214 A3	6228 D5	
3215 A3	6229 D3	
3216 E5	6230 C2	
3217 F4	6231 C4	
3218 F4	6232 C5	
3219 E3	6233 D5	
3220 E3	6235 C9	
3221 E4	6236 A6	
3222 E4	6240 B2	
3223 E3	6241 C2	
3242 A4	6242 B3	
3243 A4	6243 C2	
3246 A4	6244 B4	
3247 A3	6245 C4	
3248 B3	6248 B2	
3249 A4	6249 C2	
3252 A5	6250 B4	
3253 A6	6251 C4	
3254 A6	6252 E2	
3256 C5	6253 E2	
3257 D5	6254 E2	
3258 D5	6255 E2	
3259 C8	6256 E5	
3260 D8	6257 C7	

Legend:

- # Provision on layout
- △ For set with Karaoke
- & For set without Karaoke
- ▲ For set with Digital Out
- ^ For VCD version only
- Refer to parts list for usage

	Incl	Incl	Jazz	Bass	Pre	DAB
Jazz	X	X	L	H	L	L
Techno	X	X	L	H	L	H
Optima	X	X	H	L	H	L / H
[S] vol (-24)	L	H	X	X	X	X
[S] vol (+24)	L	H	X	X	X	X

% VALUE FOR ONE BAND SPECTRUM ANALYZER				
ITEM #	3345	3346	3349	2469
VALUE	150K	56K	220K	100nF

* VALUE FOR 12W & 18W VERSIONS

ITEM	3345	3346	6325	6326	6327
12W 6K8	BZX79-F15	BZX79-C18	BZX79-B3V3		
18W 10K	BZX79-F15	BZX79-C18	BZX79-B3V3		

Remark : +A AND +C SUPPLY SWITCH AT VOL 32

3139 118 52620 ...86410 ... 3411 pt 3 dd wk038

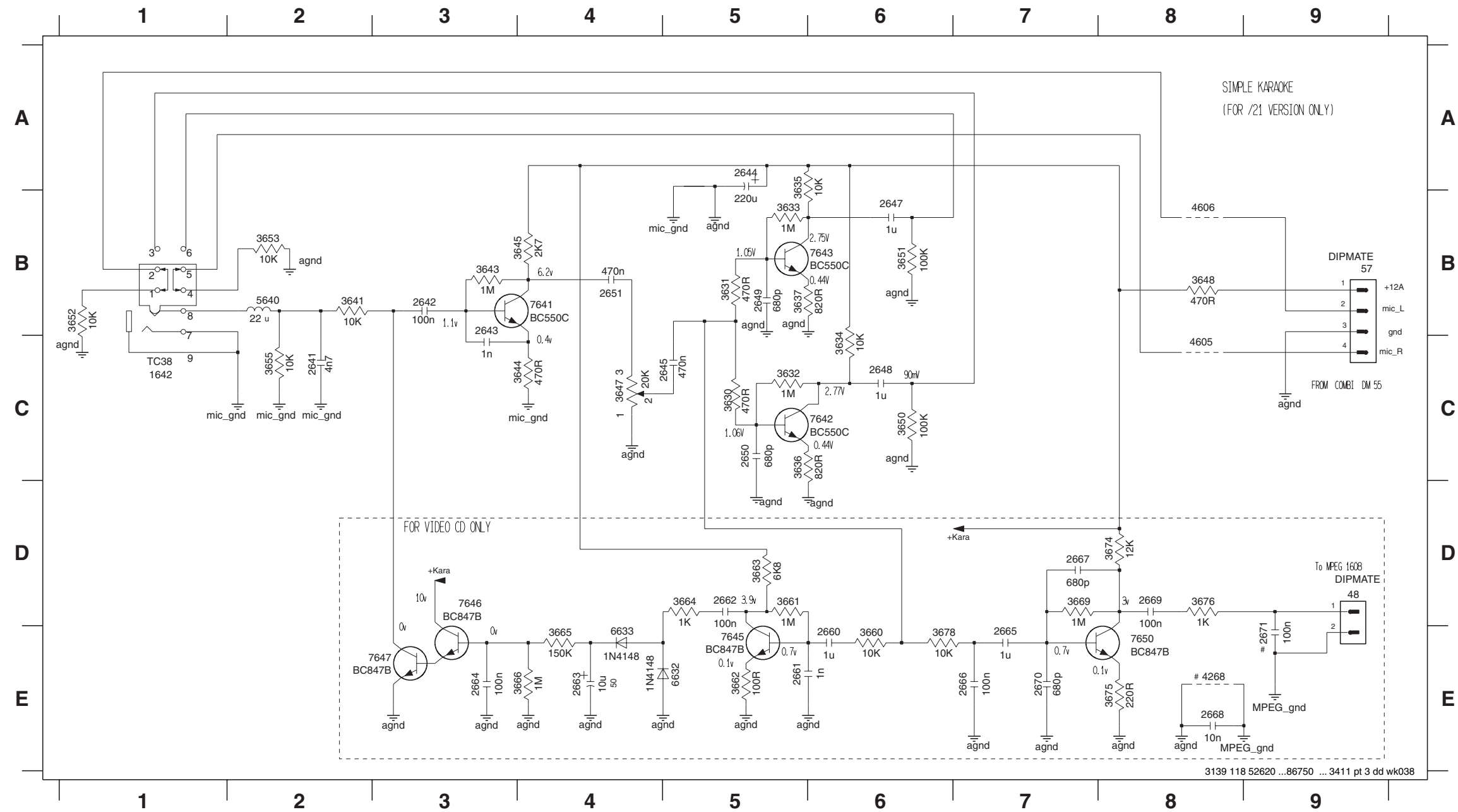
Remark : +A AND +C SUPPLY SWITCH AT VOL 32

* VALUE FOR 12W & 18W VERSIONS

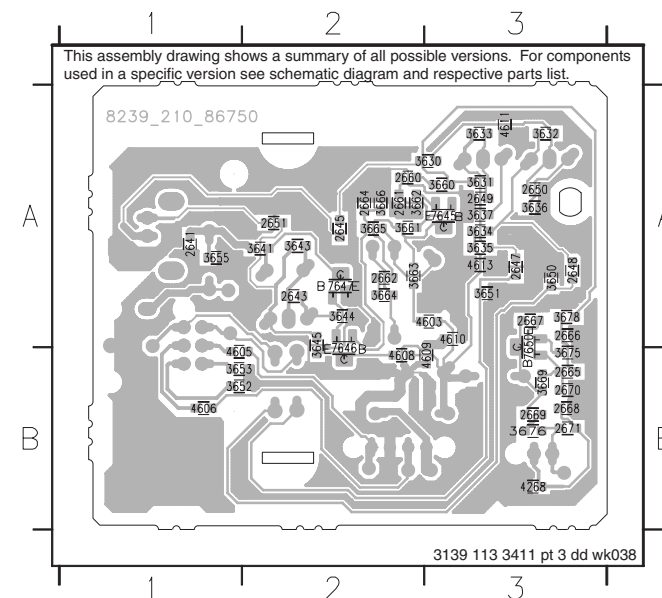
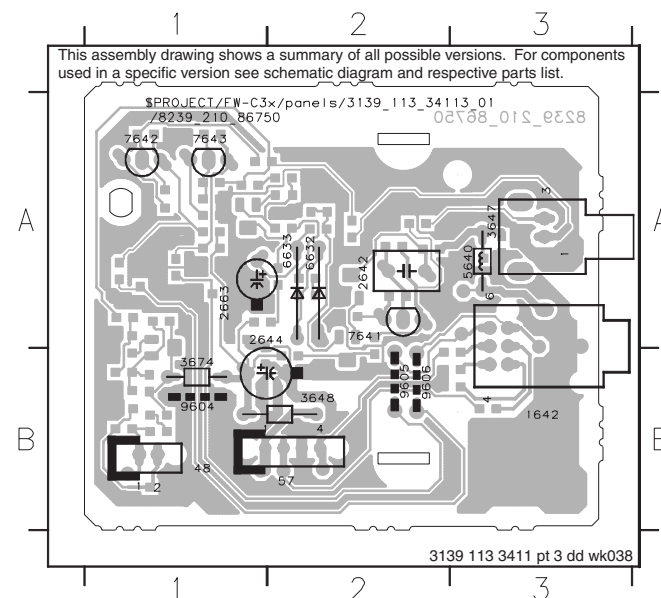
ITEM	3345	3346	6325	6326	6327
12W	6K8	6K8	BZX79-F15	BZX79-C18	BZX79-B3V3
18W	10K	10K	BZX79-F15	BZX79-C18	BZX79-B3V3

3139 118 52620 ...86410 ... 3411 pt 3 dd wk038

KARAOKE PART - CIRCUIT & COMPONENT LAYOUT

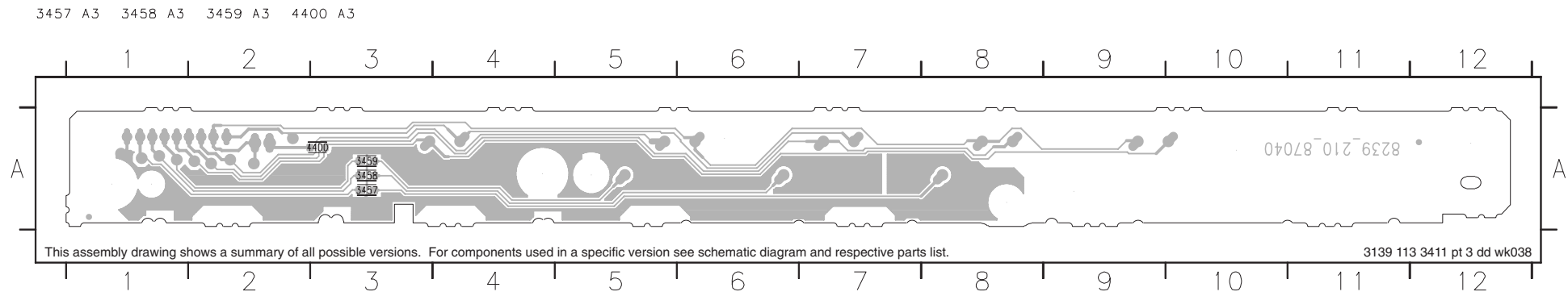
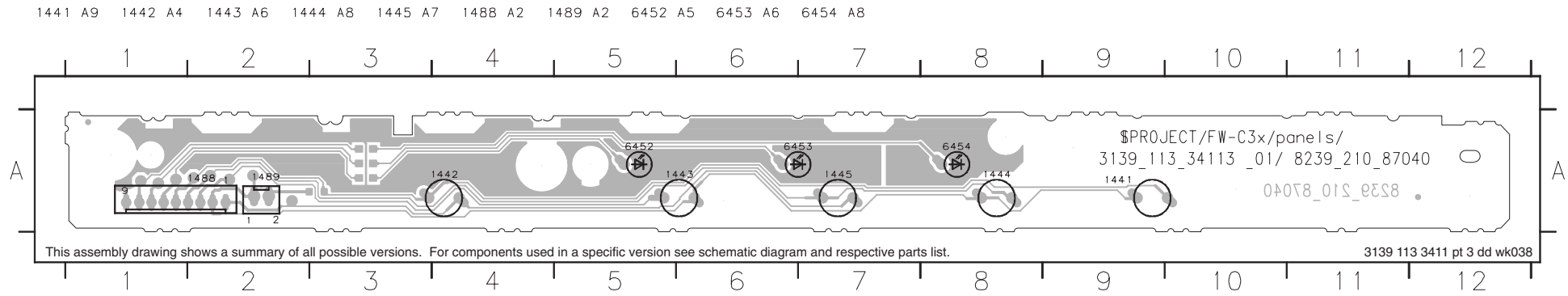
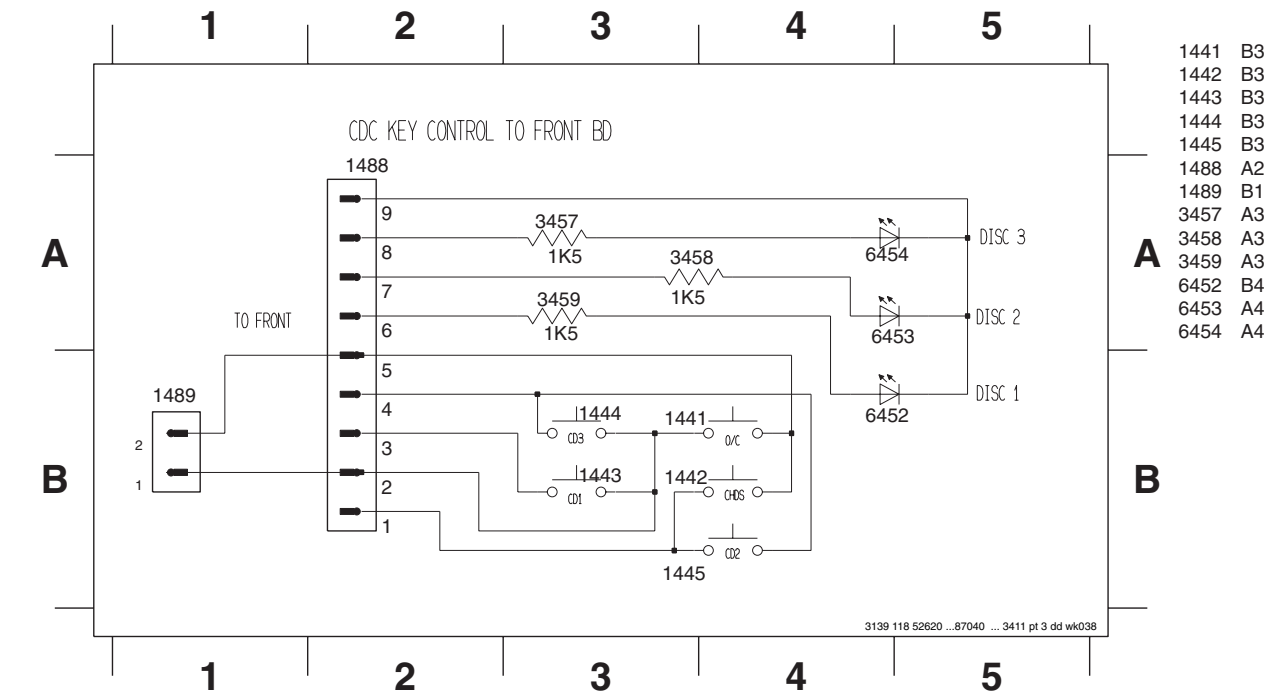


48 D9	7641 B4
57 B9	7642 C6
1642 C1	7643 B6
2641 C2	7645 E5
2642 B3	7646 D3
2643 B3	7647 E3
2644 A5	7650 E8
2645 C5	
2647 B6	
2648 C6	
2649 B5	
2650 C5	
2651 B4	
2660 E6	
2661 E5	
2662 D5	
2663 E4	
2664 E3	
2665 E7	
2666 E7	
2667 D7	
2668 E8	
2669 D8	
2670 E7	
2671 E9	
3630 C5	
3631 B5	
3632 C5	
3633 B5	
3634 C6	
3635 A5	
3636 C5	
3637 B5	
3641 B2	
3643 B3	
3644 C4	
3645 B4	
3647 C4	
3648 B8	
3650 C6	
3651 B6	
3652 B1	
3653 B2	
3655 C2	
3660 E6	
3661 D5	
3662 E5	
3663 D5	
3664 D5	
3665 E4	
3666 E4	
3669 D7	
3674 D8	
3675 E8	
3676 D8	
3678 E6	
4268 E8	
4605 C8	
4606 B8	
5640 B2	
6632 E5	
6633 E4	

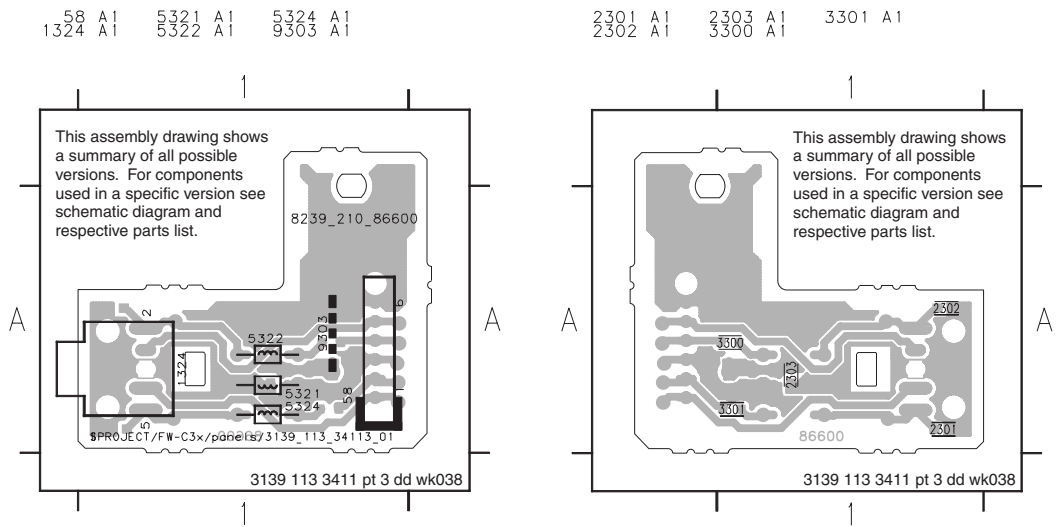


2641	A	3666	A
2642	A	3669	A
2643	A	3670	A
2644	A	3675	A
2645	A	3676	A
2646	A	3678	A
2647	A	3679	A
2648	A	3680	A
2649	A	3681	A
2650	A	3683	A
2651	A	3685	A
2652	A	3686	A
2653	A	3687	A
2654	A	3688	A
2655	A	3689	A
2656	A	3690	A
2657	A	3691	A
2658	A	3692	A
2659	A	3693	A
2660	A	3694	A
2661	A	3695	A
2662	A	3696	A
2663	A	3697	A
2664	A	3698	A
2665	A	3699	A
2666	A	3700	A
2667	A	3701	A
2668	A	3702	A
2669	A	3703	A
2670	A	3704	A
2671	A	3705	A
2672	A	3706	A
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2674	A	3708	A
2675	A	3709	A
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2677	A	3711	A
2678	A	3712	A
2679	A	3713	A
2680	A	3714	A
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2682	A	3716	A
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2725	A	3759	A
2726	A	3760	A
2727	A	3761	A
2728	A	3762	A
2729	A	3763	A
2730	A	3764	A
2731	A	3765	A
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2733	A	3767	A
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2735	A	3769	A
2736	A	3770	A
2737	A	3771	A
2738	A	3772	A
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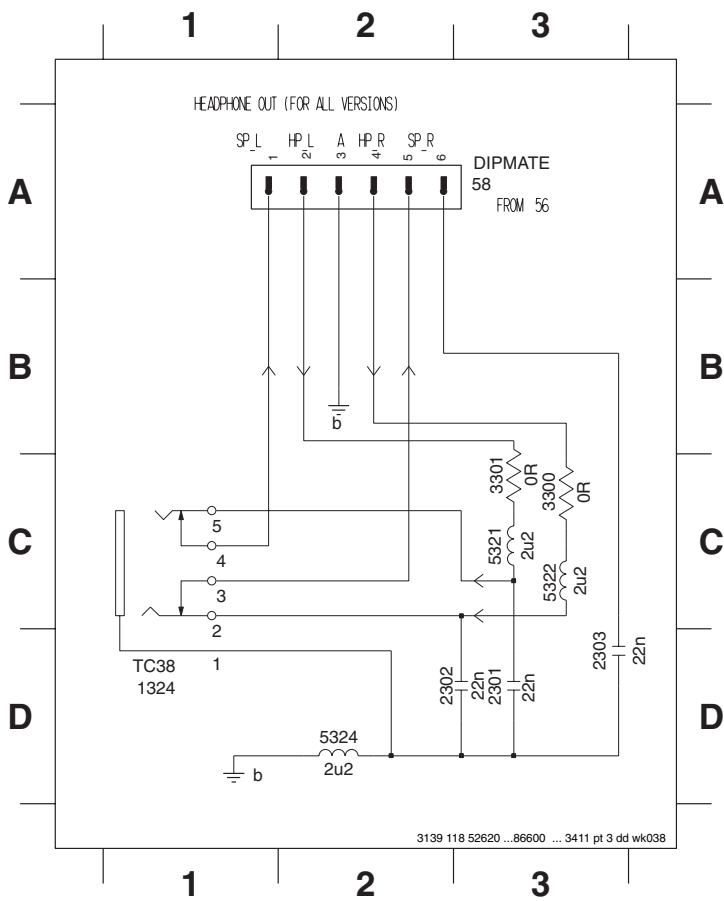
CDC KEY PART - CIRCUIT & COMPONENT LAYOUT



HEADPHONE PART - CIRCUIT & COMPONENT LAYOUT



58 A3 1324 D1 2301 D3 2302 D2 2303 D3 3300 C3 3301 C3 5321 C3 5322 C3 5324 D2



ELECTRICAL PARTS LIST - COMBI BOARD

MISCELLANEOUS

1201	4822 265 31015	△	Mains Socket
1202	4822 272 10269	△	Voltage Selector
1205	4822 071 52002	△	Fuse T2A 250V
1206	4822 071 55002	△	Fuse T5A 250V
1207	4822 071 55002	△	Fuse T5A 250V
1208	4822 071 53151	△	Fuse T315mA 250V
1322	4822 267 31176		Loudspeaker Socket L/R
1324	4822 265 11547		Headphone Socket
1441	4822 276 13775		Tact Switch
1442	4822 276 13775		Tact Switch
1443	4822 276 13775		Tact Switch
1444	4822 276 13775		Tact Switch
1445	4822 276 13775		Tact Switch
1507	4822 265 20553		Aux-in Socket
1508	2422 025 14526		Flex Socket 16pin Vert.
1509	4822 265 10981		Flex Socket 15pin Vert.
1510	2422 025 14518		Flex Socket 9pin Vert.
1518	4822 267 10953		Flex Socket 7pin Vert.
1642	4822 265 11529		Headphone Socket

CAPACITORS

2219	4822 124 42367		3300µF 20% 35V
2220	5322 121 42386		100nF 5% 63V
2221	5322 121 42386		100nF 5% 63V
2222	4822 124 21913		1µF 20% 63V
2223	4822 124 21913		1µF 20% 63V
2224	4822 121 43526		47nF 5% 250V
2226	4822 124 80144		220µF 20% 25V
2227	4822 124 40255		100µF 20% 63V
2228	4822 124 41751		47µF 20% 50V
2229	5322 121 42386		100nF 5% 63V
2235	5322 122 32654		22nF 10% 63V
2242	4822 124 80415		4700µF 20% 50V
2245	4822 124 81144		1000µF 20% 16V
2246	5322 122 31647		1nF 10% 63V
2247	5322 122 31647		1nF 10% 63V
2248	4822 124 40433		47µF 20% 25V
2249	4822 121 43526		47nF 5% 250V
2301	5322 122 32654		22nF 10% 63V
2302	5322 122 32654		22nF 10% 63V
2303	5322 122 32654		22nF 10% 63V
2321	5322 122 32531		100pF 5% 50V
2322	5322 122 32531		100pF 5% 50V
2323	4822 126 14043		1µF +80/-20% 16V
2324	4822 126 14043		1µF +80/-20% 16V
2327	5322 122 34099		470pF 10% 63V
2328	5322 122 34099		470pF 10% 63V
2331	4822 122 33575		220pF 5% 63V
2332	4822 122 33575		220pF 5% 63V
2333	4822 124 40433		47µF 20% 25V
2334	4822 124 40433		47µF 20% 25V
2335	4822 122 32535		680pF 10% 63V

2336	4822 122 32535		680pF 10% 63V
2337	4822 124 40769		4,7µF 20% 100V
2338	4822 124 40769		4,7µF 20% 100V
2339	4822 124 80144		220µF 20% 25V
2340	5322 126 10223		4,7nF 10% 63V
2341	4822 122 32535		680pF 10% 63V
2342	4822 124 40207		100µF 20% 25V
2343	5322 122 32658		22pF 5% 50V
2344	5322 122 32658		22pF 5% 50V
2345	4822 126 14585		100nF 10% 50V
2346	4822 126 14585		100nF 10% 50V
2347	4822 121 42408		220nF 5% 63V
2348	4822 121 42408		220nF 5% 63V
2349	4822 121 42408		220nF 5% 63V
2350	4822 121 42408		220nF 5% 63V
2353	4822 124 80144		220µF 20% 25V
2354	4822 124 40769		4,7µF 20% 100V
2355	4822 122 33127		2,2nF 10% 63V
2356	4822 124 21913		1µF 20% 63V
2357	4822 124 40433		47µF 20% 25V
2358	4822 122 33177		10nF 20% 50V
2359	4822 122 33177		10nF 20% 50V
2360	5322 122 32654		22nF 10% 63V
2361	5322 122 32654		22nF 10% 63V
2362	4822 122 32535		680pF 10% 63V
2363	4822 126 13692		47pF 1% 63V
2364	4822 122 32535		680pF 10% 63V
2365	4822 122 32535		680pF 10% 63V
2370	4822 124 81151		22µF 20% 50V
2391	4822 122 33177		10nF 20% 50V
2392	4822 122 33177		10nF 20% 50V
2393	4822 122 33177		10nF 20% 50V
2400	5322 122 32448		10pF 5% 63V
2401	5322 122 32448		10pF 5% 63V
2402	5322 116 80853		560pF 5% 63V
2405	4822 124 40433		47µF 20% 25V
2407	4822 126 13751		47nF 10% 63V
2460	4822 124 40207		100µF 20% 25V
2469	4822 126 14585		100nF 10% 50V
2500	4822 124 80195		470µF 20% 10V
2501	5322 122 32268		470pF 10% 50V
2502	5322 122 32268		470pF 10% 50V
2503	4822 124 40433		47µF 20% 25V
2504	4822 124 40433		47µF 20% 25V
2505	4822 124 40433		47µF 20% 25V
2506	4822 122 33891		3,3nF 10% 63V
2507	4822 124 81151		22µF 20% 50V
2508	4822 126 14043		1µF +80/-20% 16V
2509	4822 126 14043		1µF +80/-20% 16V
2510	5322 122 34099		470pF 10% 63V
2511	5322 122 34099		470pF 10% 63V
2512	5322 122 34099		470pF 10% 63V

ELECTRICAL PARTS LIST - COMBI BOARD

2513	5322 122 34099		470pF 10% 63V
2514	4822 126 13561		220nF 10% 16V
2515	4822 126 13561		220nF 10% 16V
2517	5322 122 32658		22pF 5% 50V
2518	5322 122 34099		470pF 10% 63V
2519	5322 122 34099		470pF 10% 63V
2520	5322 122 31647		1nF 10% 63V
2521	5322 122 31647		1nF 10% 63V
2522	5322 122 31866		6,8nF 10% 63V
2523	5322 122 31866		6,8nF 10% 63V
2524	5322 122 32659		33pF 5% 50V
2525	5322 122 32659		33pF 5% 50V
2526	4822 121 41856		22nF 5% 250V
2527	4822 121 41856		22nF 5% 250V
2528	4822 126 13751		47nF 10% 63V
2529	4822 126 13751		47nF 10% 63V
2530	4822 126 13691		27pF 1% 63V
2531	4822 126 13691		27pF 1% 63V
2532	4822 126 10326		180pF 5% 63V
2533	4822 126 10326		180pF 5% 63V
2534	5322 122 31865		1,5nF 10% 63V
2535	5322 122 31865		1,5nF 10% 63V
2536	4822 124 80195		470µF 20% 10V
2537	4822 126 13838		100nF +80/-20% 50V
2538	4822 126 13838		100nF +80/-20% 50V
2539	4822 126 14043		1µF +80/-20% 16V
2540	4822 126 14043		1µF +80/-20% 16V
2541	4822 126 14585		100nF 10% 50V
2542	4822 126 14585		100nF 10% 50V
2543	4822 124 40207		100µF 20% 25V
2545	4822 126 13838		100nF +80/-20% 50V
2546	4822 126 13838		100nF +80/-20% 50V
2547	4822 124 40207		100µF 20% 25V
2549	4822 121 41854		150nF 5% 63V
2550	4822 121 41854		150nF 5% 63V
2551	4822 126 14043		1µF +80/-20% 16V
2552	4822 126 14043		1µF +80/-20% 16V
2553	5322 122 31863		330pF 5% 63V
2554	5322 122 31863		330pF 5% 63V
2557	5322 122 31863		330pF 5% 63V
2558	5322 122 31863		330pF 5% 63V
2559	4822 126 14043		1µF +80/-20% 16V
2560	4822 126 14043		1µF +80/-20% 16V
2561	4822 126 14585		100nF 10% 50V
2563	5322 122 32654		22nF 10% 63V
2564	5322 122 31863		330pF 5% 63V
2565	5322 122 31863		330pF 5% 63V
2566	4822 126 13838		100nF +80/-20% 50V
2567	5322 122 32654		22nF 10% 63V
2568	4822 126 13694		68pF 1% 63V
2569	4822 122 33127		2,2nF 10% 63V
2570	4822 122 32535		680pF 10% 63V

2571	4822 122 32535		680pF 10% 63V
2572	4822 126 13838		100nF +80/-20% 50V
2573	4822 124 40769		4,7µF 20% 100V
2574	4822 124 40769		4,7µF 20% 100V
2575	4822 126 13689		18pF 1% 63V
2576	4822 126 13689		18pF 1% 63V
2577	4822 124 80195		470µF 20% 10V
2578	4822 124 40207		100µF 20% 25V
2579	4822 124 40433		47µF 20% 25V
2580	4822 124 40433		47µF 20% 25V
2581	4822 124 80791		470µF 20% 16V
2582	4822 126 13561		220nF 10% 16V
2583	4822 126 13561		220nF 10% 16V
2584	4822 126 13692		47pF 1% 63V
2585	4822 126 13692		47pF 1% 63V
2588	4822 122 32535		680pF 10% 63V
2591	4822 122 32535		680pF 10% 63V
2592	4822 122 32535		680pF 10% 63V
2593	4822 126 13692		47pF 1% 63V
2594	4822 126 13692		47pF 1% 63V
2599	5322 122 32654		22nF 10% 63V
2641	5322 126 10223		4,7nF 10% 63V
2642	5322 121 42386		100nF 5% 63V
2643	5322 122 31647		1nF 10% 63V
2644	4822 124 80144		220µF 20% 25V
2645	4822 126 13482		470nF 80/20% 16V
2647	4822 126 14043		1µF +80/-20% 16V
2648	4822 126 14043		1µF +80/-20% 16V
2649	4822 122 32535		680pF 10% 63V
2650	4822 122 32535		680pF 10% 63V
2651	4822 126 13482		470nF 80/20% 16V

RESISTORS

3209	4822 051 20478		4R7 5% 0,1W
3210	4822 051 20478		4R7 5% 0,1W
3212	4822 051 20109		10R 5% 0,1W
3213	4822 051 20122		1k2 5% 0,1W
3214	4822 051 20478		4R7 5% 0,1W
3215	4822 051 20478		4R7 5% 0,1W
3242	4822 051 20478		4R7 5% 0,1W
3243	4822 051 20478		4R7 5% 0,1W
3246	4822 117 13577		330R 1% 0,1W
3247	4822 117 12521		68R 1% 0,1W
3248	4822 117 13577		330R 1% 0,1W
3249	4822 117 12521		68R 1% 0,1W
3251	4822 117 10833		10k 1% 0,1W
3252	4822 051 10102		1k 2% 0,25W
3253	4822 051 20109		10R 5% 0,1W
3254	4822 051 20109		10R 5% 0,1W
3256	4822 050 21003		10k 1% 0,6W
3257	4822 050 21003		10k 1% 0,6W
3258	4822 116 52283		4k7 5% 0,5W

ELECTRICAL PARTS LIST - COMBI BOARD**RESISTORS**

3264	4822 116 52289	5k6 5% 0,5W	3352	4822 051 20228	2R2 5% 0,1W
3265	4822 116 52257	22k 5% 0,5W	3353	4822 051 20228	2R2 5% 0,1W
3266	4822 116 83872	220R 5% 0,5W	3354	4822 051 20228	2R2 5% 0,1W
3268	4822 116 83872	220R 5% 0,5W	3361	4822 116 52249	1k8 5% 0,5W
3269	4822 116 52256	2k2 5% 0,5W	3362	4822 116 52249	1k8 5% 0,5W
3270	4822 117 10833	10k 1% 0,1W	3363	4822 116 52249	1k8 5% 0,5W
3271	4822 117 10833	10k 1% 0,1W	3364	4822 051 20471	470R 5% 0,1W
3272	4822 051 20472	4k7 5% 0,1W	3365	4822 116 83872	220R 5% 0,5W
3273	4822 117 11449	2k2 5% 0,1W	3366	4822 116 52283	4k7 5% 0,5W
3274	4822 051 20472	4k7 5% 0,1W	3372	4822 051 20109	10R 5% 0,1W
3275	4822 051 20472	4k7 5% 0,1W	3373	4822 116 52219	330R 5% 0,5W
3276	4822 051 20393	39k 5% 0,1W	3379	4822 051 20472	4k7 5% 0,1W
3277	4822 117 10834	47k 1% 0,1W	3380	4822 051 20392	3k9 5% 0,1W
3278	4822 117 10361	680R 1% 0,1W	3381	4822 116 52175	100R 5% 0,5W
3279	4822 117 11139	1k5 1% 0,1W	3382	4822 116 83933	15k 1% 0,1W
3280	4822 117 11139	1k5 1% 0,1W	3383	4822 051 20223	22k 5% 0,1W
3281	4822 117 11139	1k5 1% 0,1W	3384	4822 051 20223	22k 5% 0,1W
3282	4822 117 10833	10k 1% 0,1W	3385	4822 117 10834	47k 1% 0,1W
3283	4822 051 20121	120R 5% 0,1W	3386	4822 117 10834	47k 1% 0,1W
3286	4822 117 13577	330R 1% 0,1W	3387	4822 117 11149	82k 1% 0,1W
3287	4822 117 13577	330R 1% 0,1W	3388	4822 051 20334	330k 5% 0,1W
3288	4822 117 13577	330R 1% 0,1W	3390	4822 051 20154	150k 5% 0,1W
3289	4822 117 13577	330R 1% 0,1W	3391	4822 051 20101	100R 5% 0,1W
3300	4822 051 20008	0R Jumper 0805	3392	4822 117 11449	2k2 5% 0,1W
3301	4822 051 20008	0R Jumper 0805	3393	4822 117 10833	10k 1% 0,1W
3321	4822 051 20392	3k9 5% 0,1W	3394	4822 051 20472	4k7 5% 0,1W
3322	4822 051 20392	3k9 5% 0,1W	3395	4822 117 10833	10k 1% 0,1W
3325	4822 117 10837	100k 1% 0,1W	3396	4822 051 20471	470R 5% 0,1W
3326	4822 117 10837	100k 1% 0,1W	3397	4822 117 10833	10k 1% 0,1W
3329	4822 051 20472	4k7 5% 0,1W	3398	4822 117 13577	330R 1% 0,1W
3330	4822 051 20472	4k7 5% 0,1W	3399	4822 051 20472	4k7 5% 0,1W
3331	4822 117 11383	12k 1% 0,1W	3400	4822 117 11449	2k2 5% 0,1W
3332	4822 117 11383	12k 1% 0,1W	3401	4822 117 11449	2k2 5% 0,1W
3333	4822 117 11449	2k2 5% 0,1W	3402	4822 117 11449	2k2 5% 0,1W
3334	4822 117 11449	2k2 5% 0,1W	3403	4822 117 11449	2k2 5% 0,1W
3335	4822 051 20273	27k 5% 0,1W	3404	4822 117 11449	2k2 5% 0,1W
3336	4822 051 20273	27k 5% 0,1W	3406	4822 117 11449	2k2 5% 0,1W
3337	4822 051 20479	47R 5% 0,1W	3407	4822 117 11449	2k2 5% 0,1W
3338	4822 051 20479	47R 5% 0,1W	3409	4822 051 20562	5k6 5% 0,1W
3339	4822 051 20479	47R 5% 0,1W	3410	4822 051 20562	5k6 5% 0,1W
3340	4822 051 20479	47R 5% 0,1W	3411	4822 116 52175	100R 5% 0,5W
3341	4822 051 10102	1k 2% 0,25W	3412	4822 116 52175	100R 5% 0,5W
3342	4822 051 10102	1k 2% 0,25W	3413	4822 116 52175	100R 5% 0,5W
3343	4822 051 20154	150k 5% 0,1W	3414	4822 117 11507	6k8 1% 0,1W
3344	4822 051 20154	150k 5% 0,1W	3415	4822 117 11507	6k8 1% 0,1W
3345	4822 117 11383	12k 1% 0,1W	3457	4822 117 11139	1k5 1% 0,1W
3346	4822 117 11383	12k 1% 0,1W	3458	4822 117 11139	1k5 1% 0,1W
3347	4822 117 10833	10k 1% 0,1W	3459	4822 117 11139	1k5 1% 0,1W
3348	4822 117 10833	10k 1% 0,1W	3496	4822 117 11139	1k5 1% 0,1W
3349	4822 117 10833	10k 1% 0,1W	3497	4822 051 20684	680k 5% 0,1W
3350	4822 117 10833	10k 1% 0,1W	3498	4822 117 11149	82k 1% 0,1W
3351	4822 051 20228	2R2 5% 0,1W	3499	4822 051 20474	470k 5% 0,1W

ELECTRICAL PARTS LIST - COMBI BOARD

3501	4822 051 20683	68k 5% 0,1W	3559	4822 051 20184	180k 5% 0,1W
3502	4822 051 20683	68k 5% 0,1W	3560	4822 051 20471	470R 5% 0,1W
3503	4822 117 10837	100k 1% 0,1W	3561	4822 051 20471	470R 5% 0,1W
3504	4822 117 10837	100k 1% 0,1W	3562	4822 051 20822	8k2 5% 0,1W
3507	4822 117 10834	47k 1% 0,1W	3563	4822 051 20822	8k2 5% 0,1W
3508	4822 117 10834	47k 1% 0,1W	3564	4822 117 11448	180R 1% 0,1W
3509	4822 117 11149	82k 1% 0,1W	3565	4822 117 11448	180R 1% 0,1W
3510	4822 117 11149	82k 1% 0,1W	3566	4822 117 10833	10k 1% 0,1W
3511	4822 051 20184	180k 5% 0,1W	3567	4822 117 10833	10k 1% 0,1W
3512	4822 051 20184	180k 5% 0,1W	3570	4822 117 10833	10k 1% 0,1W
3517	4822 117 10833	10k 1% 0,1W	3571	4822 117 10833	10k 1% 0,1W
3518	4822 051 20333	33k 5% 0,1W	3574	4822 051 20223	22k 5% 0,1W
3519	4822 051 20333	33k 5% 0,1W	3575	4822 051 20223	22k 5% 0,1W
3520	4822 116 83933	15k 1% 0,1W	3576	4822 117 11507	6k8 1% 0,1W
3521	4822 052 10339 Δ	33R 5% 0,33W	3577	4822 117 11507	6k8 1% 0,1W
3522	4822 051 20105	1M 5% 0,1W	3579	4822 051 20154	150k 5% 0,1W
3523	4822 051 20105	1M 5% 0,1W	3580	4822 051 20223	22k 5% 0,1W
3524	4822 051 20683	68k 5% 0,1W	3581	4822 051 20223	22k 5% 0,1W
3525	4822 051 20683	68k 5% 0,1W	3582	4822 051 20122	1k2 5% 0,1W
3526	4822 051 20273	27k 5% 0,1W	3583	4822 051 20122	1k2 5% 0,1W
3527	4822 051 20273	27k 5% 0,1W	3584	4822 117 10361	680R 1% 0,1W
3528	4822 117 10833	10k 1% 0,1W	3585	4822 051 20228	2R2 5% 0,1W
3529	4822 117 10833	10k 1% 0,1W	3586	4822 117 11449	2k2 5% 0,1W
3530	4822 051 20333	33k 5% 0,1W	3587	4822 117 11507	6k8 1% 0,1W
3531	4822 051 20333	33k 5% 0,1W	3588	4822 051 20471	470R 5% 0,1W
3532	4822 051 20393	39k 5% 0,1W	3589	4822 051 20391	390R 5% 0,1W
3533	4822 051 20393	39k 5% 0,1W	3590	4822 117 11449	2k2 5% 0,1W
3534	4822 117 10837	100k 1% 0,1W	3591	4822 116 83872	220R 5% 0,5W
3535	4822 117 10837	100k 1% 0,1W	3592	4822 051 20333	33k 5% 0,1W
3536	4822 051 20332	3k3 5% 0,1W	3593	4822 051 10102	1k 2% 0,25W
3537	4822 051 20332	3k3 5% 0,1W	3594	4822 051 10102	1k 2% 0,25W
3538	4822 117 11149	82k 1% 0,1W	3596	4822 051 20683	68k 5% 0,1W
3539	4822 117 11149	82k 1% 0,1W	3597	4822 051 20683	68k 5% 0,1W
3540	4822 051 20472	4k7 5% 0,1W	3598	4822 117 10837	100k 1% 0,1W
3541	4822 051 20472	4k7 5% 0,1W	3599	4822 117 10837	100k 1% 0,1W
3542	4822 051 20109	10R 5% 0,1W	3601	4822 116 83884	47k 5% 0,5W
3543	4822 051 20683	68k 5% 0,1W	3602	4822 116 83884	47k 5% 0,5W
3544	4822 116 52297	68k 5% 0,5W	3603	4822 051 20105	1M 5% 0,1W
3545	4822 117 10834	47k 1% 0,1W	3604	4822 051 20105	1M 5% 0,1W
3546	4822 117 10834	47k 1% 0,1W	3605	4822 117 10834	47k 1% 0,1W
3547	4822 051 20471	470R 5% 0,1W	3606	4822 117 10834	47k 1% 0,1W
3548	4822 051 20471	470R 5% 0,1W	3609	4822 116 83883	470R 5% 0,5W
3549	4822 051 20472	4k7 5% 0,1W	3610	4822 116 83883	470R 5% 0,5W
3550	4822 116 52304	82k 5% 0,5W	3611	4822 051 20333	33k 5% 0,1W
3551	4822 051 20228	2R2 5% 0,1W	3616	4822 117 10837	100k 1% 0,1W
3552	4822 051 20228	2R2 5% 0,1W	3617	4822 051 20182	1k8 5% 0,1W
3553	4822 051 20393	39k 5% 0,1W	3618	4822 051 20182	1k8 5% 0,1W
3554	4822 051 20393	39k 5% 0,1W	3630	4822 051 20471	470R 5% 0,1W
3555	4822 117 11149	82k 1% 0,1W	3631	4822 051 20471	470R 5% 0,1W
3556	4822 051 20332	3k3 5% 0,1W	3632	4822 051 20105	1M 5% 0,1W
3557	4822 051 20332	3k3 5% 0,1W	3633	4822 051 20105	1M 5% 0,1W
3558	4822 051 20184	180k 5% 0,1W	3634	4822 117 10833	10k 1% 0,1W

ELECTRICAL PARTS LIST - COMBI BOARD**RESISTORS**

3635	4822 117 10833	10k 1% 0,1W
3636	4822 117 11454	820R 1% 0,1W
3637	4822 117 11454	820R 1% 0,1W
3638	4822 117 12955	2k7 1% 0,1W
3639	4822 117 12955	2k7 1% 0,1W
3640	4822 117 10833	10k 1% 0,1W
3641	4822 117 10833	10k 1% 0,1W
3643	4822 051 20105	1M 5% 0,1W
3644	4822 051 20471	470R 5% 0,1W
3645	4822 117 12955	2k7 1% 0,1W
3647	4822 101 21204	Rotary Potm 20KA
3648	4822 116 83883	470R 5% 0,5W
3650	4822 117 10837	100k 1% 0.1W
3651	4822 117 10837	100k 1% 0.1W
3652	4822 117 10833	10k 1% 0,1W
3653	4822 117 10833	10k 1% 0,1W
3655	4822 117 10833	10k 1% 0,1W
4214	4822 051 20008	0R Jumper 0805
4215	4822 051 20008	0R Jumper 0805
4217	4822 051 20008	0R Jumper 0805
4221	4822 051 20008	0R Jumper 0805
4226	4822 051 20008	0R Jumper 0805
4229	4822 051 20008	0R Jumper 0805
4244	4822 051 20008	0R Jumper 0805
4269	4822 051 20008	0R Jumper 0805
4270	4822 051 20008	0R Jumper 0805
4271	4822 051 20008	0R Jumper 0805
4272	4822 051 20008	0R Jumper 0805
4273	4822 051 20008	0R Jumper 0805
4275	4822 051 20008	0R Jumper 0805
4276	4822 051 20008	0R Jumper 0805
4278	4822 051 20008	0R Jumper 0805
4279	4822 051 20008	0R Jumper 0805
4280	4822 051 20008	0R Jumper 0805
4288	4822 051 20008	0R Jumper 0805
4400	4822 051 20008	0R Jumper 0805
4502	4822 051 20008	0R Jumper 0805
4503	4822 051 20008	0R Jumper 0805
4504	4822 051 20008	0R Jumper 0805
4505	4822 051 20008	0R Jumper 0805
4506	4822 051 20008	0R Jumper 0805
4508	4822 051 20008	0R Jumper 0805
4509	4822 051 20008	0R Jumper 0805
4510	4822 051 20008	0R Jumper 0805
4511	4822 051 20008	0R Jumper 0805
4512	4822 051 20008	0R Jumper 0805
4513	4822 051 20008	0R Jumper 0805
4514	4822 051 20008	0R Jumper 0805
4515	4822 051 20008	0R Jumper 0805
4516	4822 051 20008	0R Jumper 0805
4517	4822 051 20008	0R Jumper 0805
4518	4822 051 20008	0R Jumper 0805

4519	4822 051 20008	0R Jumper 0805
4520	4822 051 20008	0R Jumper 0805
4521	4822 051 20008	0R Jumper 0805
4522	4822 051 20008	0R Jumper 0805
4523	4822 051 20008	0R Jumper 0805
4524	4822 051 20008	0R Jumper 0805
4525	4822 051 20008	0R Jumper 0805
4526	4822 051 20008	0R Jumper 0805
4527	4822 051 20008	0R Jumper 0805
4529	4822 051 20008	0R Jumper 0805
4530	4822 051 20008	0R Jumper 0805
4531	4822 051 20008	0R Jumper 0805
4532	4822 051 20008	0R Jumper 0805
4533	4822 051 20008	0R Jumper 0805
4534	4822 051 20008	0R Jumper 0805
4535	4822 051 20008	0R Jumper 0805
4536	4822 051 20008	0R Jumper 0805
4537	4822 051 20008	0R Jumper 0805
4538	4822 051 20008	0R Jumper 0805
4539	4822 051 20008	0R Jumper 0805
4540	4822 051 20008	0R Jumper 0805
4541	4822 051 20008	0R Jumper 0805
4542	4822 051 20008	0R Jumper 0805
4543	4822 051 20008	0R Jumper 0805
4544	4822 051 20008	0R Jumper 0805
4545	4822 051 20008	0R Jumper 0805
4546	4822 051 20008	0R Jumper 0805
4548	4822 051 20008	0R Jumper 0805
4550	4822 051 20008	0R Jumper 0805
4551	4822 051 20008	0R Jumper 0805
4552	4822 051 20008	0R Jumper 0805
4553	4822 051 20008	0R Jumper 0805
4554	4822 051 20008	0R Jumper 0805
4555	4822 051 20008	0R Jumper 0805
4556	4822 051 20008	0R Jumper 0805
4558	4822 051 20008	0R Jumper 0805
4559	4822 051 20008	0R Jumper 0805
4560	4822 051 20008	0R Jumper 0805
4561	4822 051 20008	0R Jumper 0805
4562	4822 051 20008	0R Jumper 0805
4563	4822 051 20008	0R Jumper 0805
4564	4822 051 20008	0R Jumper 0805
4565	4822 051 20008	0R Jumper 0805
4566	4822 051 20008	0R Jumper 0805
4567	4822 051 20008	0R Jumper 0805
4568	4822 051 20008	0R Jumper 0805
4569	4822 051 20008	0R Jumper 0805
4570	4822 051 20008	0R Jumper 0805
4571	4822 051 20008	0R Jumper 0805
4573	4822 051 20008	0R Jumper 0805
4574	4822 051 20008	0R Jumper 0805
4575	4822 051 20008	0R Jumper 0805

ELECTRICAL PARTS LIST - COMBI BOARD

4576	4822 051 20008	0R Jumper 0805
4577	4822 051 20008	0R Jumper 0805
4578	4822 051 20008	0R Jumper 0805
4579	4822 051 20008	0R Jumper 0805
4580	4822 051 20008	0R Jumper 0805
4581	4822 051 20008	0R Jumper 0805
4582	4822 051 20008	0R Jumper 0805
4583	4822 051 20008	0R Jumper 0805
4584	4822 051 20008	0R Jumper 0805
4585	4822 051 20008	0R Jumper 0805
4586	4822 051 20008	0R Jumper 0805
4587	4822 051 20008	0R Jumper 0805
4589	4822 051 20008	0R Jumper 0805
4590	4822 051 20008	0R Jumper 0805
4592	4822 051 20008	0R Jumper 0805
4593	4822 051 20008	0R Jumper 0805
4594	4822 051 20008	0R Jumper 0805
4595	4822 051 20008	0R Jumper 0805
4596	4822 051 20008	0R Jumper 0805
4597	4822 051 20008	0R Jumper 0805
4598	4822 051 20008	0R Jumper 0805
4599	4822 051 20008	0R Jumper 0805
4603	4822 051 20008	0R Jumper 0805
4605	4822 051 20008	0R Jumper 0805
4606	4822 051 20008	0R Jumper 0805
4608	4822 051 20008	0R Jumper 0805
4609	4822 051 20008	0R Jumper 0805
4610	4822 051 20008	0R Jumper 0805
4611	4822 051 20008	0R Jumper 0805
4613	4822 051 20008	0R Jumper 0805
4677	4822 051 20008	0R Jumper 0805

COILS & FILTERS

5202	4822 157 11832	Mains Filter 400µH 3A
5321	4822 157 62552	Coil 2,2µH 5%
5322	4822 157 62552	Coil 2,2µH 5%
5324	4822 157 62552	Coil 2,2µH 5%
5501	4822 157 62552	Coil 2,2µH 5%
5502	4822 157 62552	Coil 2,2µH 5%
5503	4822 157 62255	Coil 1µH 18,5 Turns
5504	4822 157 62255	Coil 1µH 18,5 Turns
5505	4822 157 62255	Coil 1µH 18,5 Turns
5506	4822 157 62255	Coil 1µH 18,5 Turns
5508	4822 526 10704	FE Bead 100MHz
5510	4822 157 62552	Coil 2,2µH 5%
5512	4822 157 62552	Coil 2,2µH 5%
5521	4822 157 62552	Coil 2,2µH 5%
5640	4822 157 11235	Coil 22µH 5%

DIODES

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

6223	4822 130 31878	1N4003G
6224	4822 130 31878	1N4003G
6225	4822 130 31878	1N4003G
6226	4822 130 31878	1N4003G
6227	4822 130 31878	1N4003G
6228	4822 130 34173	BZX79-B5V6
6229	4822 130 34142	BZX79-B33
6230	4822 130 31878	1N4003G
6231	4822 130 34174	BZX79-B4V7
6232	4822 130 30621	1N4148
6233	4822 130 30621	1N4148
6236	4822 130 34174	BZX79-B4V7
6240	4822 130 31878	1N4003G
6241	4822 130 31878	1N4003G
6242	4822 130 31878	1N4003G
6243	4822 130 31878	1N4003G
6244	4822 130 31878	1N4003G
6245	4822 130 31878	1N4003G
6248	4822 130 31878	1N4003G
6249	4822 130 31878	1N4003G
6250	4822 130 31878	1N4003G
6251	4822 130 31878	1N4003G
6257	4822 130 30621	1N4148
6258	4822 130 34173	BZX79-B5V6
6259	4822 130 31878	1N4003G
6260	4822 130 31878	1N4003G
6261	4822 130 31878	1N4003G
6262	4822 130 31878	1N4003G
6263	4822 130 31878	1N4003G
6264	4822 130 31878	1N4003G
6265	4822 130 31878	1N4003G
6266	4822 130 31878	1N4003G
6267	4822 130 31878	1N4003G
6268	4822 130 31878	1N4003G
6269	4822 130 30621	1N4148
6320	4822 130 31878	1N4003G
6321	4822 130 31878	1N4003G
6322	4822 130 31878	1N4003G
6323	4822 130 31878	1N4003G
6324	4822 130 31878	1N4003G
6325	4822 130 31024	BZX79-B18
6326	4822 130 34441	BZX79-B22
6327	4822 130 34174	BZX79-B4V7
6328	4822 130 31878	1N4003G
6329	4822 130 30621	1N4148
6330	4822 130 30621	1N4148
6331	4822 130 31878	1N4003G
6391	4822 130 30621	1N4148
6452	4822 130 11589	LTL-1CHAE
6453	4822 130 11589	LTL-1CHAE
6454	4822 130 11589	LTL-1CHAE
6502	4822 130 34173	BZX79-B5V6
6549	4822 130 30621	1N4148

ELECTRICAL PARTS LIST - COMBI BOARD**DIODES**

6550	4822 130 30621	1N4148
6551	4822 130 30862	BZX79-B9V1
6553	4822 130 31878	1N4003G

TRANSISTORS & INTEGRATED CIRCUITS

7233	9322 139 22687	BD242BFP
7236	4822 130 41246	BC327-25
7237	4822 130 40981	BC337-25
7238	5322 130 60159	BC847B
7239	4822 130 42804	BC817-25
7240	4822 130 40981	BC337-25
7241	4822 130 40981	BC337-25
7247	4822 130 40981	BC337-25
7248	4822 130 40981	BC337-25
7249	4822 130 41246	BC327-25
7320	4822 130 42804	BC817-25
7321	4822 130 42804	BC817-25
7322	4822 130 42804	BC817-25
7323	4822 130 42804	BC817-25
7324	4822 130 60373	BC857B
7329	4822 130 10847	BDW94C
7330	4822 130 40981	BC337-25
7331	4822 130 60373	BC857B
7332	4822 130 60373	BC857B
7333	4822 130 42804	BC817-25
7391	4822 209 16224	AN7125
7395	4822 130 60373	BC857B
7396	4822 130 60373	BC857B
7397	5322 130 60159	BC847B
7400	4822 130 60373	BC857B
7401	4822 130 40981	BC337-25
7402	5322 209 11306	HEF4094BT
7405	4822 130 60373	BC857B
7501	5322 209 11102	HEF4052BT
7503	4822 130 41096	BC550C
7504	4822 130 41096	BC550C
7505	4822 130 44568	ON4986
7506	4822 130 44568	ON4986
7507	4822 130 44568	ON4986
7508	4822 130 44568	ON4986
7509	5322 130 60159	BC847B
7510	4822 130 60373	BC857B
7530	5322 209 14482	HEF4069UBT
7537	5322 130 60159	BC847B
7538	5322 130 60159	BC847B
7539	5322 130 60159	BC847B
7540	5322 130 60159	BC847B
7543	5322 130 60159	BC847B
7544	5322 130 60159	BC847B
7545	5322 130 60159	BC847B
7546	5322 130 60159	BC847B
7547	5322 130 60159	BC847B

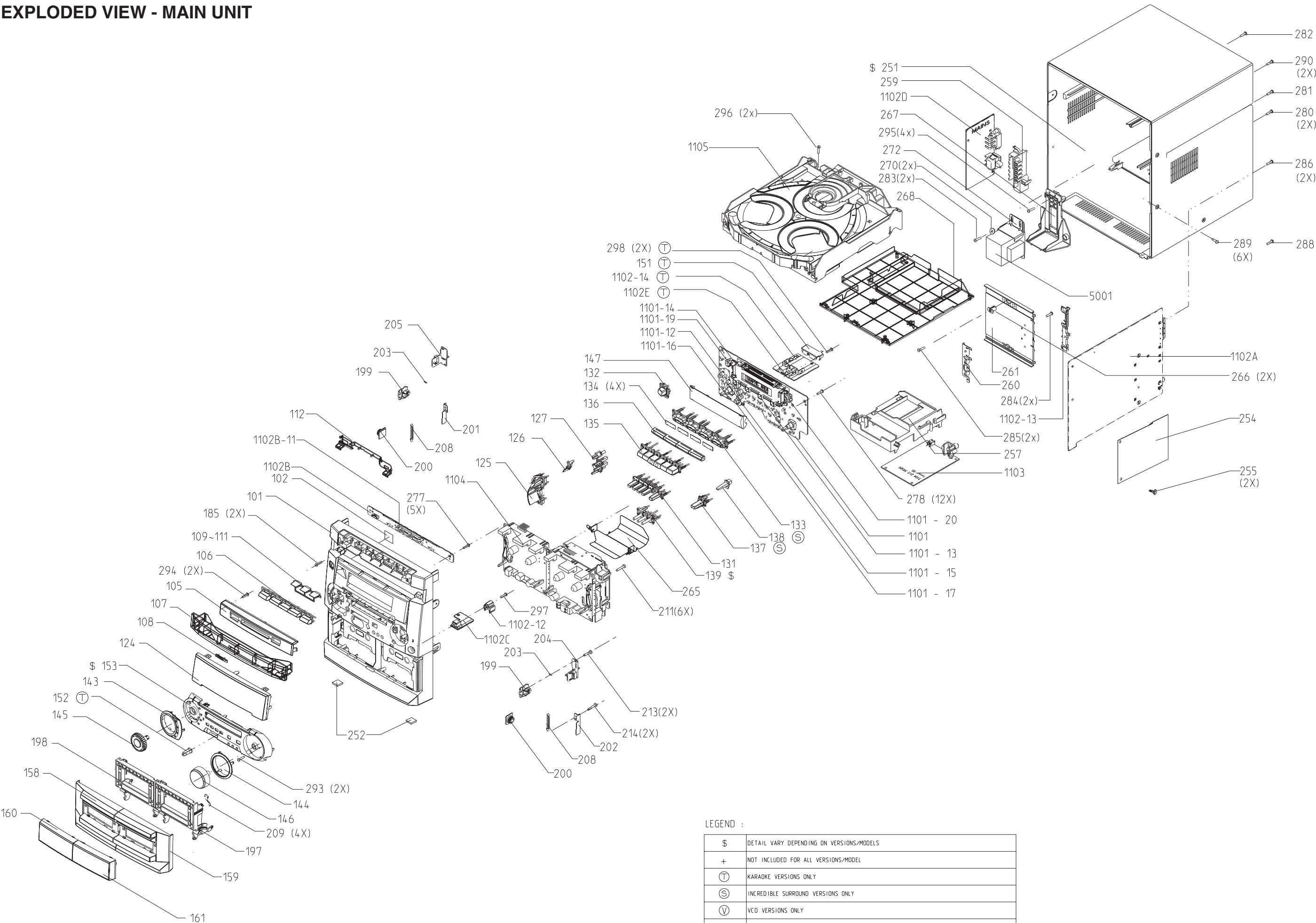
7548	5322 130 60159	BC847B
7549	5322 130 60159	BC847B
7550	5322 130 60159	BC847B
7554	4822 209 31378	NJM4556MB
7556	3198 010 44010	PDTA114ET
7641	4822 130 41096	BC550C
7642	4822 130 41096	BC550C
7643	4822 130 41096	BC550C

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

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EXPLODED VIEW - MAIN UNIT



LEGEND :

\$	DETAIL VARY DEPENDING ON VERSIONS/MODELS
+	NOT INCLUDED FOR ALL VERSIONS/MODEL
(T)	KARAOKE VERSIONS ONLY
(S)	INCREDIBLE SURROUND VERSIONS ONLY
(V)	VCD VERSIONS ONLY
*	BREAKAWAY FROM SERVO PCB

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

0101	3139 118 13630	Cabinet Front	0387	3139 115 20520	Instruction For Use	185	D3 x 25
0105	3139 118 13700	Window CDC Control	1450	3139 110 34770	Flex Cable 15pin 22cm BD	211	D3 x 12
0106	3139 118 13710	Button Set CDC Select	1451	4822 320 12604	Flex Cable 9pin 22cm AD	213	D3 x 12
0107	3139 118 13210	Cover Tray CDC-LC	1455	4822 320 12752	Flex Cable 7pin 18cm AD	214	D3 x 12
0108	4822 454 13408	Badge Philips	1456	3139 110 34180	Flex Cable 16pin 22cm AD	277	D3 x 12
0124	3139 118 13970	Window Display	1557	4822 320 12663	Flex Cable 7pin 34cm BD	278	D3 x 12
0125	3139 118 13980	Button Set DBB/VEC/DSC	5001	3139 118 32260	△ Mains Transfo.OVS NTC	280	D3 x 12
0127	3139 114 68340	Lightguide DSC				281	D3 x 12
0131	3139 118 13460	Button Set Program	Note:	Only the parts mentioned in this list are normal service spare parts.		282	D3 x 12
0132	3139 118 13550	Button Power On/Off				283	D3 x 16
0133	3139 114 69720	Button Set S. Select Blue				284	M3 x 15
0135	3139 118 13560	Button Set Controls				285	D3 x 16
0136	3139 118 10310	Lightcap Source Select Blue				286	D3 x 12
0137	3139 118 13990	Button Incredible Sound				288	D3 x 12
0139	3139 114 71860	Button Clock/Timer				289	D3 x 12
0143	3139 118 10620	Cover Ring Jog				290	D3 x 12
0144	3139 118 10330	Cover Ring Volume				293	D3 x 12
0145	3139 118 14000	Knob Jog Rotary				294	D2 x 8
0146	3139 118 13760	Knob Volume Rotary				295	D3 x 16
0152	3139 114 72010	Knob Karaoke				296	D3 x 20
0153	3139 118 14010	Cover Control				297	D3 x 12
0158	3139 118 13500	Cover Cassette Left				298	D3 x 12
0159	3139 118 13510	Cover Cassette Right					
0160	3139 114 71840	Lens Cassette Left					
0161	3139 114 71850	Lens Cassette Right					
0197	4822 443 10488	Door Cassette Right					
0198	4822 443 10487	Door Cassette Left					
0199	4822 402 10621	Push-Catch					
0200	4822 529 10322	Damper Assembly					
0203	4822 492 11344	Spring Compression					
0204	4822 402 11246	Bracket Right					
0205	4822 402 11245	Bracket Left					
0208	4822 492 11345	Spring Tension					
0209	4822 492 42787	Spring Cassette					
0251	3139 114 73000	Cabinet Rear					
0252	4822 462 40683	Foot Rubber SQ					
0255	4822 466 93148	Spacer 5mm					
0260	4822 492 11734	Spring IC					
0266	3139 114 68040	Spacer Heatsink					
0350	3139 118 78210	LS Box FWB-C290/01					
0351	4822 303 50063	FM Aerial 75R					
0356	3139 228 83620	Rem. Control RC282426/01					
0384	4822 303 50082	AM Frame Aerial					
0385	4822 321 10249	△ Mains Cord					
0386	4822 263 21092	△ Adapter Plug					