

Service  
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# Service Manual

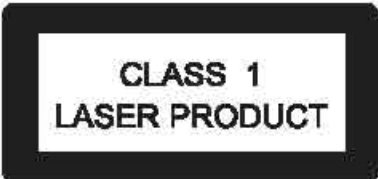
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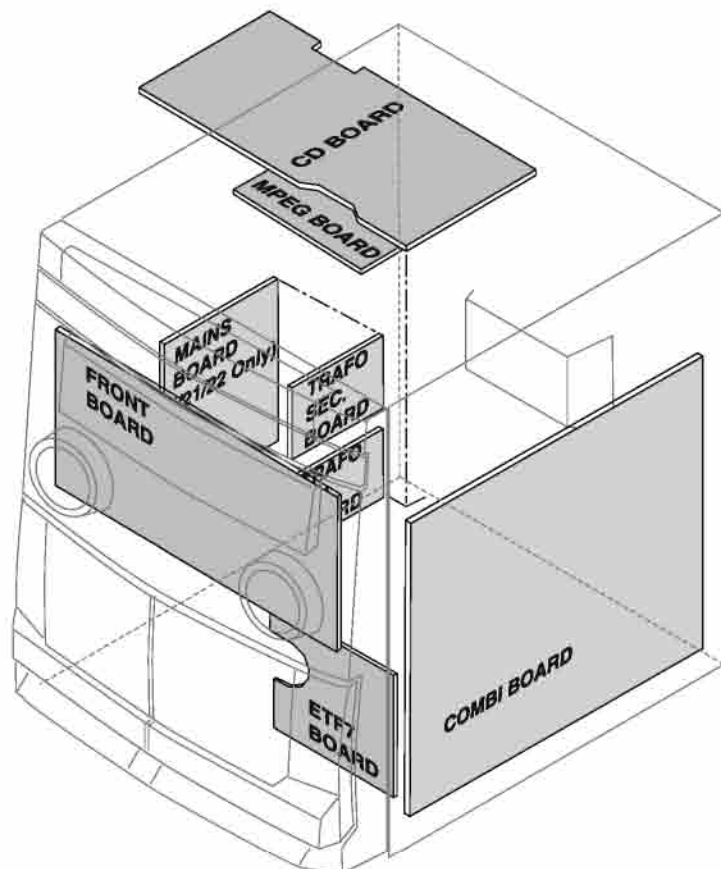
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Version 1.0



# PHILIPS

## LOCATION OF PC BOARDS



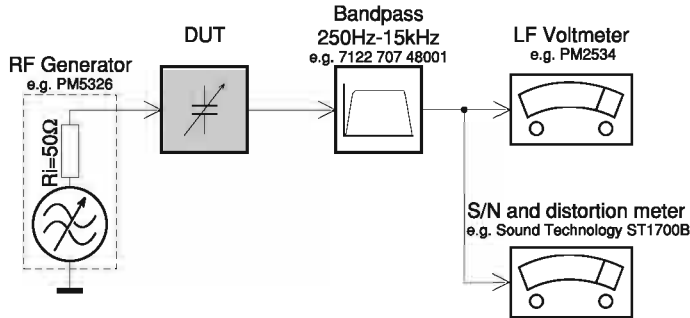
### VERSION VARIATIONS:

Type /Versions:	FWV357							
	/55	/98						
Features & Board in used:								
Karaoke	x	x						
News								
RDS								
Incredible Surround								
Rotary Encoder (volume control)	x	x						
Jog Shuttle	x	x						
Voltage Selector	x	x						
Aux / CDR Input	x	x						
Video Output	x	x						
Headphone Socket	x	x						
Line Output								
Subwoofer Output								
Surround Output								
Matrix Surround Loudspeakers								
Standby - FTD Clock Display	x	x						
ECO Standby - Dark								
Combi - Non-Cenelec Tuner	x	x						
Combi - Cenelec Tuner								
Mains Board (Chapter 5)	x	x						
MP3-CD Play	x	x						
Video CD Play	x	x						



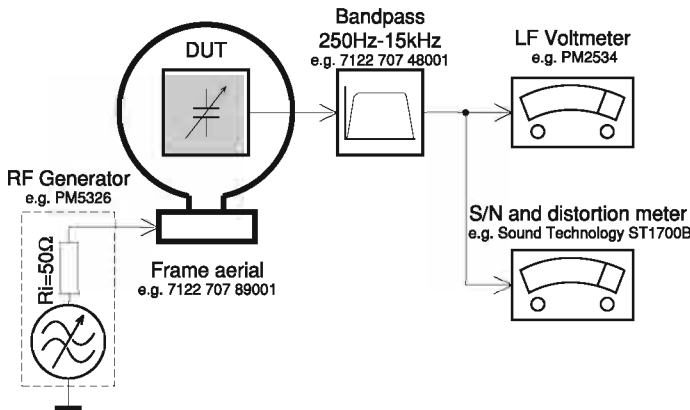
## MEASUREMENT SETUP

### Tuner FM



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

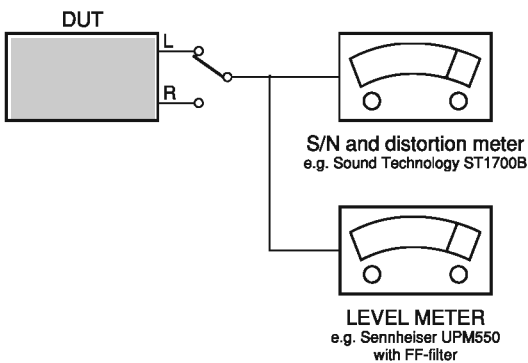
### Tuner AM (MW,LW)



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).

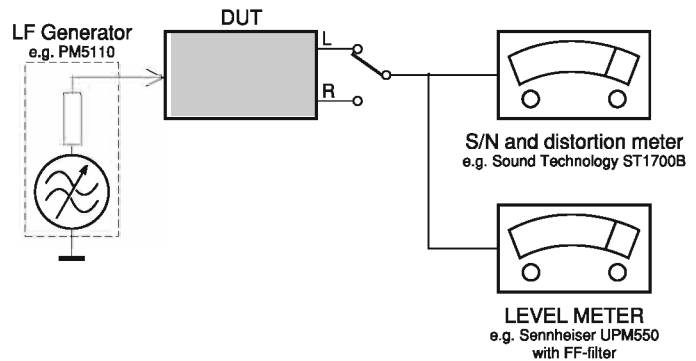
### CD

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

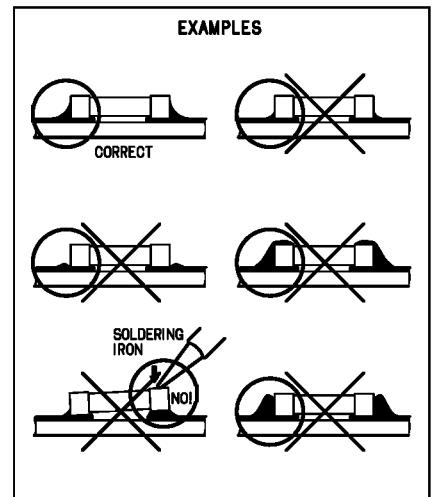
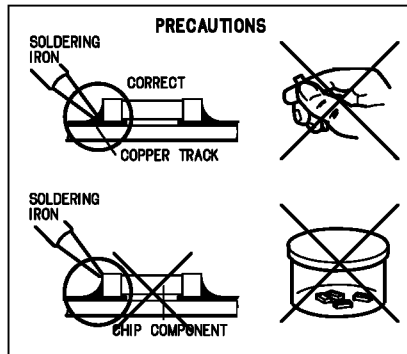
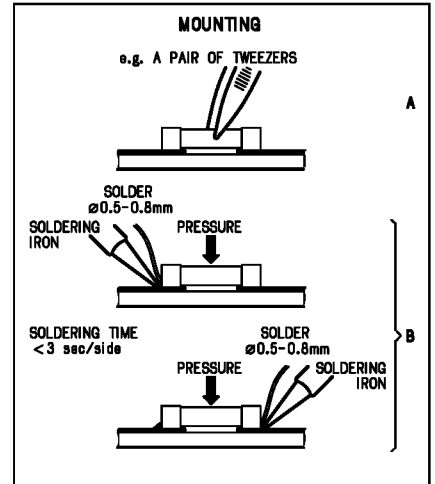
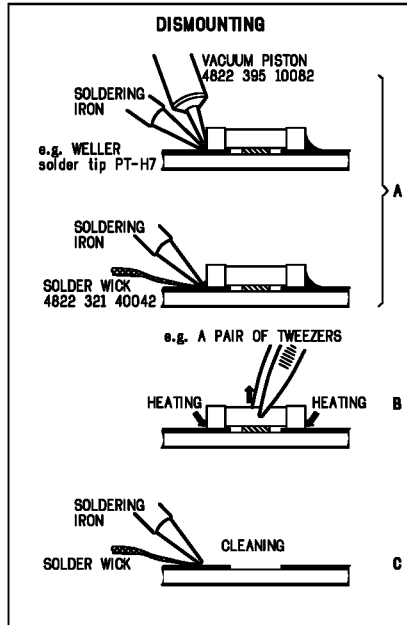
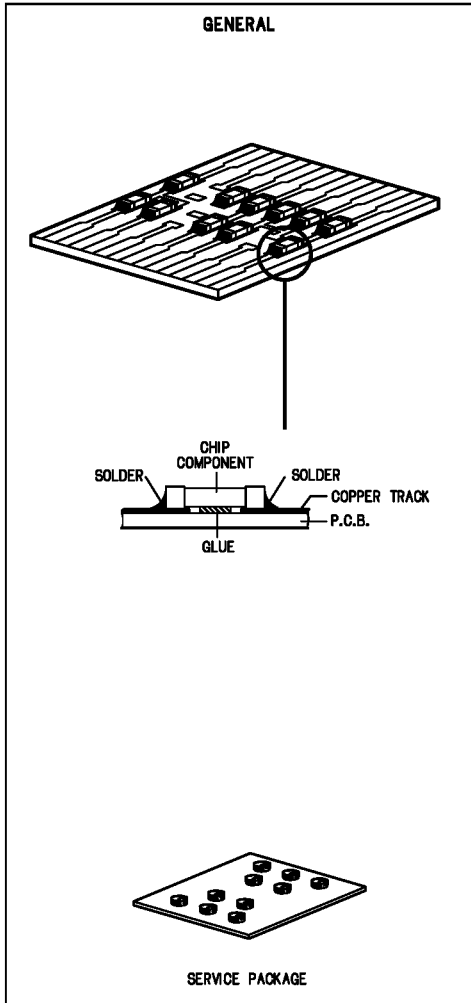
### Compact Disc:

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

## HANDLING CHIP COMPONENTS



**(GB) WARNING**

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

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

Keep components and tools also at this potential.

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

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

Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen.

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

Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

**(F) ATTENTION**

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

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

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

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

**(D) WARNUNG**

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

Unvorsichtige Behandlung im Reparaturfall kann die Lebensdauer drastisch reduzieren.

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

Bauteile und Hilfsmittel auch auf dieses gleiche Potential halten.

**(I) AVVERTIMENTO**

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

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

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

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

**(GB)**

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

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

**(NL)**

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

**(F)**

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

**(GB) Warning !**

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

**(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.

**(S) Varning !**

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

**(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.

**(SF) Varoitus !**

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

**(DK) Advarse !**

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

"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."

## INFORMATION ABOUT LEAD-FREE SOLDERING

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

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



### Example S/N:



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

So from **0601** onwards = from 1 Jan 2005 onwards

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

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

- Use only lead-free solder alloy Philips SAC305 with order code 0622 149 00106. If lead-free solder-paste is required, please contact the manufacturer of your solder-equipment. In general use of solder-paste within workshops should be avoided because paste is not easy to store and to handle.
- Use only adequate solder tools applicable for lead-free solder alloy. The solder tool must be able
  - To reach at least a solder-temperature of 400°C,
  - To stabilize the adjusted temperature at the solder-tip
  - To exchange solder-tips for different applications.
- Adjust your solder tool so that a temperature around 360°C – 380°C is reached and stabilized at the solder joint. Heating-time of the solder-joint should not exceed ~ 4 sec. Avoid temperatures above 400°C otherwise wear-out of tips will rise drastically and flux-fluid will be destroyed. To avoid wear-out of tips switch off un-used equipment, or reduce heat.
- Mix of lead-free solder alloy / parts with leaded solder alloy / parts is possible but PHILIPS recommends strongly to avoid mixed solder alloy types (leaded and lead-free).  
 If one cannot avoid or does not know whether product is lead-free, clean carefully the solder-joint from old solder alloy and re-solder with new solder alloy (SAC305).
- Use only original spare-parts listed in the Service-Manuals. Not listed standard-material (commodities) has to be purchased at external companies.
- **Special information for BGA-ICs:**
  - always use the 12no-recognizable soldering temperature profile of the specific BGA (for de-soldering always use the lead-free temperature profile, in case of doubt)
  - lead free BGA-ICs will be delivered in so-called 'dry-packaging' (sealed pack including a silica gel pack) to protect the IC against moisture. After opening, dependent of MSL-level seen on indicator-label in the bag, the BGA-IC possibly still has to be baked dry. (MSL=Moisture Sensitivity Level). This will be communicated via AYS-website. Do not re-use BGAs at all.
- For sets produced before 1.1.2005 (except products of 2004), containing leaded solder-alloy and components, all needed spare-parts will be available till the end of the service-period. For repair of such sets nothing changes.
- On our website [www.atyourservice.es.Philips.com](http://www.atyourservice.es.Philips.com) you find more information to:
  - BGA-de-/soldering (+ baking instructions)
  - Heating-profiles of BGAs and other ICs used in Philips-sets

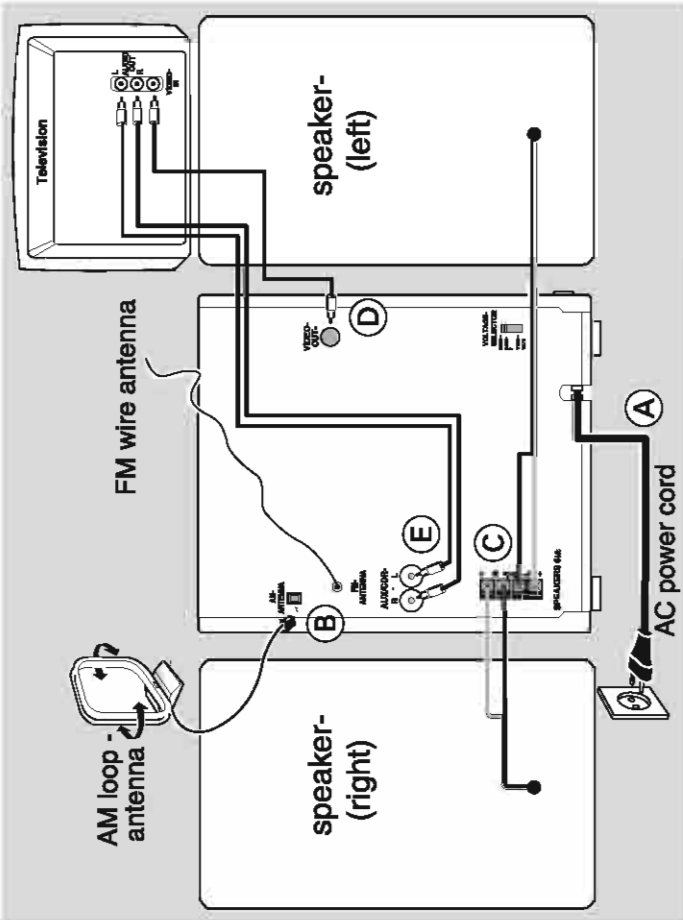
You will find this and more technical information within the "magazine", chapter "workshop news".

For additional questions please contact your local repair-helpdesk.

## SERVICE INSTRUCTION

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

- Route the wire trees correctly and fix them with the mounted cable clamps.
- Check the insulation of the AC Power lead for external damage.
- Check the strain relief of the AC Power cord for proper function.
- Check the electrical DC resistance between the AC Power Plug and the secondary side (only for sets which have a AC Power Isolated power supply):
  1. Unplug the AC Power cord and connect a wire between the two pins of the AC Power plug.
  2. Set the AC Power switch to the "on" position (keep the AC Power cord unplugged!).
  3. Measure the resistance value between the pins of the AC Power plug and the metal shielding of the tuner or the aerial connection on the set. The reading should be larger than 4.6 Mohm (For U.S. it should be between 4.2 Mohm and 12 Mohm).
  4. Switch "off" the set, and remove the wire between the two pins of the AC Power plug.
- Check the cabinet for defects, to avoid touching of any inner parts by the customer.



### Rear connections

The type plate is located at the rear of the system.

#### (A) Power

- Before connecting the AC power cord to the wall outlet, ensure that the following are done;
  - If your system is equipped with a Voltage Selector, set the VOLTAGE SELECTOR to the local power line voltage.
  - All other connections have been made.

#### WARNING!

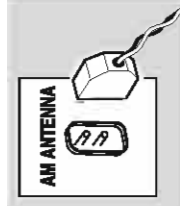
- For optimal performance, use only the original power cable.
- Never make or change any connections with the power switched on.

### (B) Antennas Connection

#### AM Antenna

Connect the supplied AM loop antenna to the "AM ANTENNA" terminal.

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



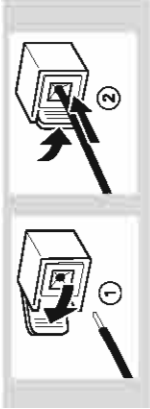
#### FM Antenna

It is unnecessary to connect the FM pigtail antenna since it is fixed to the main unit. Adjust the FM antenna for optimal FM stereo reception.

### (C) Speakers Connection

#### Front Speakers

Connect the speaker wires to the SPEAKERS terminals, right speaker to "R" and left speaker to "L", coloured (marked) wire to "+" and black (unmarked) wire to "-".



Fully insert the stripped portion of the speaker wire into the terminal as shown.

#### Notes:

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

### (E) Connecting other equipment to your system

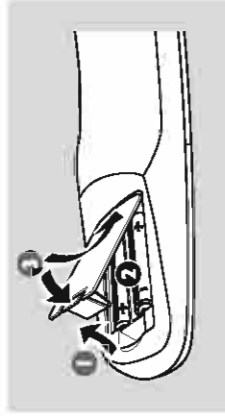
Use a cinch cable to connect AUX/CDR IN to the analogue audio out terminals of an external equipment (TV, VCR, Laser Disc player, DVD player or CD Recorder).

#### Note:

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

### Inserting batteries into the remote control

Insert two batteries type R06 or AA into the remote control with the correct polarity as indicated by the "+" and "-" symbols inside the battery compartment.



#### CAUTION!

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

### (D) Video Out Connection

Connect the VIDEO OUT terminal at the rear of the system to the TV or VCR VIDEO IN for viewing or recording.

#### Note:

- To avoid magnetic interference with the picture on your TV, do not position the front speakers too close to the TV.



# PREPARATIONS AND CONTROLS

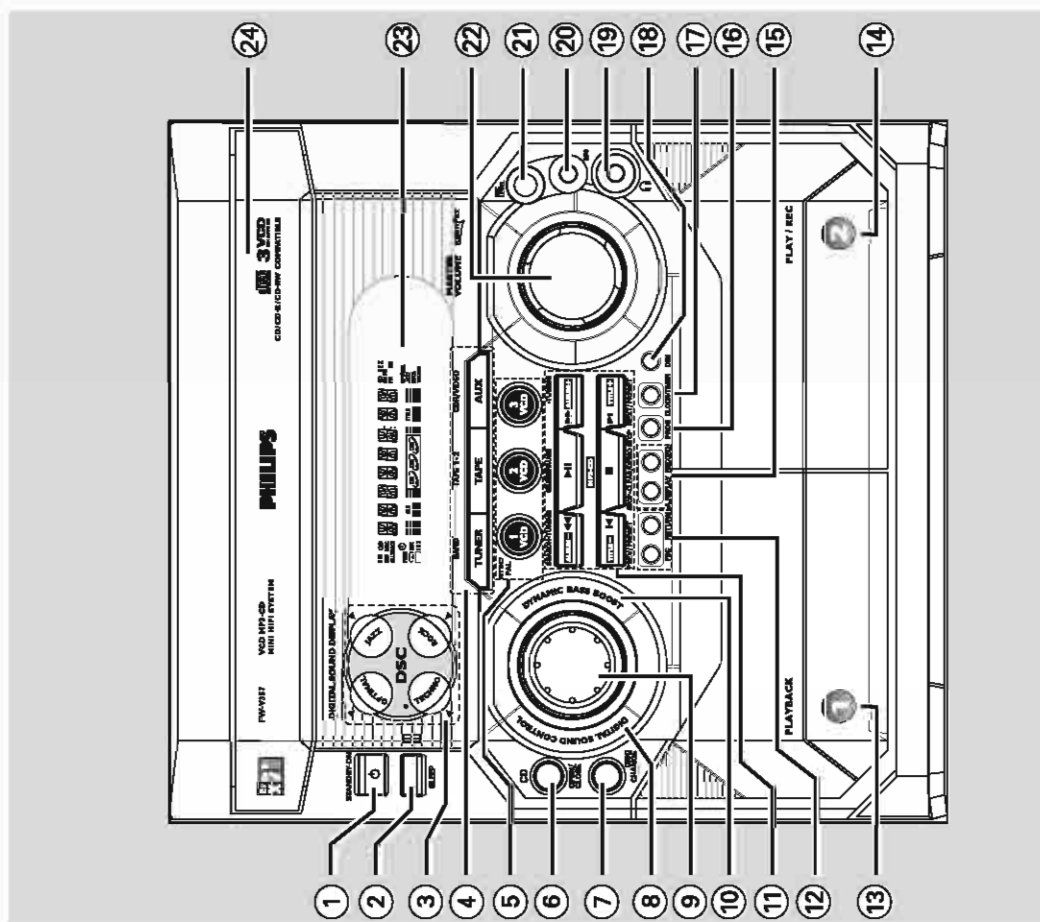
## Controls

### Controls on the system and remote control

- ① **STANDBY ON**  $\odot$ 
  - to switch the system on or to standby mode.
- ② **SLEEP**
  - to activate/deactivate or set the sleep timer.
- ③ **DIGITAL SOUND DISPLAY**
  - the active DSC will be lighted.
- ④ **TUNER (BAND)**
  - to select waveband : FM or MW.
- TAPE (TAPE 1•2)**
  - to select tape deck 1 or 2.
- AUX (CDR/VIDEO)**
  - to select the input for an additional appliance.
- ⑤ **VCD 1 / 2 / 3 (VCD.CD 1/2/3 - MP3-CD 1/2/3)**
  - to select disc tray 1, 2 or 3.
- VCD 1 (NTSC/PAL)**
  - (on the system only) to select corresponding video output for NTSC or PAL system of your TV set (except Multi-system TV).
- ⑥ **OPEN/CLOSE**
  - to open or close the disc tray.
- ⑦ **DISC CHANGE**
  - to change disc(s).
- ⑧ **DIGITAL SOUND CONTROL (DSC)**
  - to activate the jog control for DSC selection.
- ⑨ **Jog control**
  - to select the desired sound effect for the selected sound feature.
- DSC** ..... JAZZ, ROCK, TECHNO or OPTIMAL
- DBB** ..... DBB 1, DBB 2, DBB 3 or DBB OFF.
- ⑩ **DYNAMIC BASS BOOST (DBB)**
  - to activate the jog control for DBB selection.

### ⑪ Mode Selection

- PLAY•PAUSE  $\blacktriangleright$  II**
  - for CD/VCD/MP3-CD ... to start or interrupt playback.
  - for Tape ..... to start playback
  - for Plug & Play... (on the system only) to initiate and start plug & play mode.
- SEARCH•TUNING  $\blacktriangleleft$ (ALBUM -)**
  - for MP3-CD ..... to select previous/next album.
  - for VCD ..... to move the zoomed picture to the left or right.
- SEARCH•TUNING  $\blacktriangleright$ (ALBUM +)**
  - for CD/VCD ... to search backward/forward.
  - for Tuner ..... to tune to a lower or higher radio frequency.
  - for Tape ..... to rewind or fast forward.
  - for Clock ..... (on the system only) to set the hour.
- STOP-CLEAR / DEMO STOP ■**
  - for CD/VCD/MP3-CD ... to stop playback or to clear a programme.
  - for Tuner ..... (on the system only) to stop programming or to erase a selected preset.
  - for Tape ..... to stop playback or recording.
  - for Demo ..... (on the system only) to activate/deactivate the demonstration.
  - for Clock ..... (on the system only) to exit clock setting or cancel timer.
  - for Plug & Play... (on the system only) to exit plug & play mode.
- PREV  $\blacktriangleleft$  / PRESET  $\blacktriangledown$  (TITLE -)**
  - NEXT  $\blacktriangleright$  / PRESET  $\blacktriangle$  (TITLE +)**
    - for MP3-CD ... to select previous/next title.
    - for VCD ..... to move the zoomed picture down or up.
    - ..... to select next or previous menu or track during playback (for VCD with PBC switched on).
  - for CD/VCD ... to skip to the beginning of the current, previous, or next track.
  - for Tuner ..... to select a preset radio station.
  - for Clock ..... (on the system only) to set the minute.



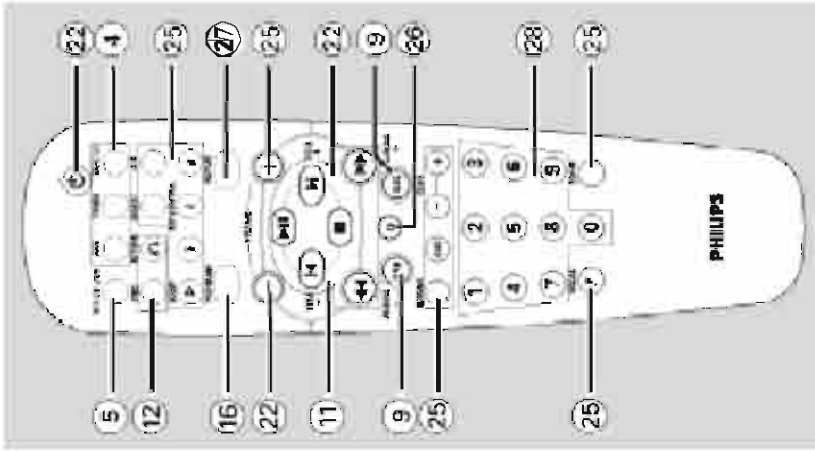
## PREPARATIONS AND CONTROLS

## Controls

- 12 VCD operations** (for VCD version 2.0 only)
- PBC**
- to switch on or off the playback control mode.
- RETURN** ↶
- to return to the previous menu level during playback (for VCD with PBC switched on).
- 13 Tape deck 1**
- 14 Tape deck 2**
- 15 Tape deck operations**
- A. REPLAY**
- to select continuous playback in either AUTO REPLAY or ONCE mode only.
- RECORD**
- to start recording on tape deck 2.
- 16 PROG**
- for CDVCD/MP3-CD... to programme disc tracks.
  - for Tuner ..... to programme preset radio stations.
  - for Clock ..... to select 12- or 24-hour clock mode.
- 17 CLOCK-TIMER**
- to view the clock, set the clock or set the timer.
- 18 DIM**
- to select different brightness for the display screen : DIM 1, DIM 2, DIM 3 or DIM OFF.
- 19** ↶
- to connect headphones.
- 20 MIC**
- to connect microphone jack.
- 21 MIC LEVEL**
- to adjust the mixing level for karaoke or microphone recording.
- 22 MASTER VOLUME (VOLUME +/-)**
- to increase or decrease the volume.
- 23 Display screen**
- to view the current status of the system.
- S Disc tray**
- ∞ VCD operations** (on remote control only)
- OSD**
- to switch on or off the On Screen Display on the TV.
- ZOOM**
- to enlarge a still picture of the VCD on the TV screen.
- RESUME**
- to continue playback again from where you have stopped (for VCD with PBC switched off).
- VOCAL /**
- to fade out the original vocal from a Karaoke VCD or to switch between mono or stereo mode during audio disc playback.
- KEY CONTROL (b h #)**
- to change the VCD key tone level to suit your vocal range.
  - b** ..... to decrease the key tone level.
  - h** ..... to restore the key tone level to original setting.
  - #** ..... to increase the key tone level.
- ECHO -/+**
- to adjust the VCD echo level for karaoke after inserted the microphone.
- SLOW Σ**
- to watch the VCD at a slower speed.
- A - B**
- to playback a certain scene or passage of a CD/ VCD repeatedly.
- DIGEST**
- to scan through a VCD or a specific track.
- 26 IS** (not functional for this model)

## Controls

- 27 REPEAT**
- to playback track/disc/programme repeatedly.
- 28 Numeric keys (0 - 9)**
- (numbers consisting more than two figures must be keyed in within 2 seconds.)
  - to direct key in a track number for CDVCD/MP3-CD.
- 29** ⏻
- to switch the system to standby mode.



- Notes for remote control:**
- First select the source you wish to control by pressing one of the source select keys on the remote control (for example TAPE 1/2, TUNER).
  - Then select the desired function (for example  $\blacktriangle$ ,  $\blacktriangleleft$ ,  $\blacktriangleright$ ).

## Troubleshooting

### WARNING

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

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

### Problem

### Solution

#### CD OPERATION

"UNRECOVERABLE DISC" is displayed.

- Check if the disc is inserted upside down.
- Wait until the moisture condensation at the lens has cleared.
- Replace or clean the disc, see "Maintenance".
- Use a finalised CD-RW or a correct MP3-CD format disc.

"NO DISC" is displayed.

- Insert a disc.

No picture on TV screen.

- Connect the cable between the system and TV.

No colour on TV screen.

- Change the system to the respective PAL or NTSC setting.

Cannot adjust the TV system to PAL or NTSC.

- Remove the MP-3 CD from disc tray 1 or press DISC CHANGE to select a non MP3 disc tray

#### RADIO RECEPTION

Radio reception is poor.

- If the signal is too weak, adjust the antenna or connect an external antenna for better reception.
- Increase the distance between the Mini HiFi System and your TV or VCR.

#### TAPE OPERATION/RECORDING

Recording or playback cannot be made.

- Clean deck parts, see "Maintenance".
- Use only NORMAL (IEC I) tape.
- Apply a piece of adhesive tape over the missing tab space.

The tape deck door cannot open.

- Remove and reconnect the AC power plug and switch on the system again.

## Troubleshooting

### GENERAL

The system does not react when buttons are pressed.

- Remove and reconnect the AC power plug and switch on the system again.

Sound cannot be heard or is of poor quality.

- Adjust the volume.
- Disconnect the headphones.
- Check that the speakers are connected correctly.
- Check if the stripped speaker wire is clamped.
- Make sure the MP3 disc was recorded within 32-256 kbps bit rate with sampling frequencies at 48 kHz, 44.1 kHz or 32 kHz.

The left and right sound outputs are reversed.

- Check the speaker connections and location.

The remote control does not function properly.

- Select the source (VCD 1/2/3 or TUNER, for example) before pressing the function button (▶◀◂◃◄◅).
- Reduce the distance between the remote control and the system.
- Insert the batteries with their polarities (+/- signs) aligned as indicated.
- Replace the batteries.
- Point the remote control directly towards the IR sensor.

The timer is not working.

- Set the clock correctly.
- Press and hold CLOCK•TIMER to switch on the timer.
- If recording or tape dubbing is in progress, stop recording.

The Clock/Timer setting is erased.

- Power has been interrupted or the power cord has been disconnected. Reset the clock/timer.

The system displays features automatically.

- Press and hold ■ on the system to switch off the demonstration.

## DISMANTLING INSTRUCTIONS

### Dismantling the SCDC Module

- 1) Loosen the 4 screws, slide Cover top (pos 256) towards the rear and remove it upwards.
- 2) Loosen 3 screws slide the Panel right (pos 254) towards the rear and remove it outwards. Do likewise for the Panel left (pos 253).
- 3) Push the gear slowly towards the front as shown in figure 2 until the CDC tray starts to move out of the Front Cabinet (pos 101). The CDC tray is now disengage and can be pulled out completely.

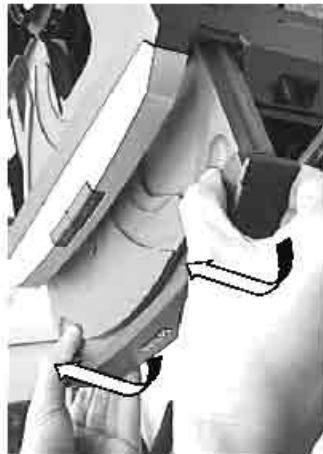


Figure 1

- 4) Remove the Cover Tray (pos 106) as shown in figure 1.
- 5) Loosen 4 screws A to remove the SCDC-LC-VCD Module (pos 1104) as shown in figure 2.

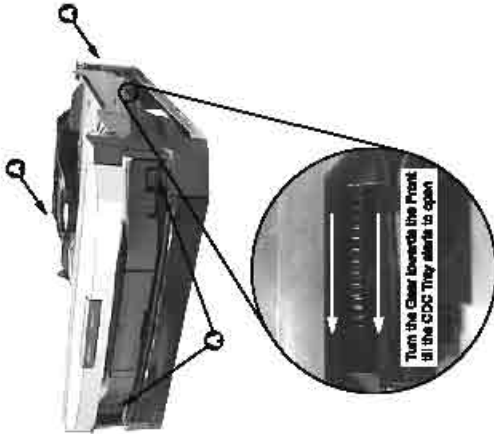


Figure 2

### Dismantling of the Volume & Jog Rotary Knob

- 1) Cut a piece of packaging tape approximately 5cm width by 12cm length and tape its narrow side on to the top and bottom side of the Volume knob (pos 136) as shown in figure 3.



Figure 3

- 2) Place a small screw driver in between the tape & knob (see figure 3) to give more leverage in pulling out the knob as shown in figure 4.
- 3) Do likewise for the Jog Rotary knob (pos 138). You may have to rotate the knob to provide the most exposed area during application of the packaging tape.



Figure 4

### Dismantling of the Front Panel assembly

- 1) Loosen 2 screws below the Front Panel (pos 101) mounting it to the Bottom plate (pos 265).
- 2) Release the 2 catches on the sides of the Front Panel to separate it from the Bottom plate.
- 3) Remove the Volume and Jog Rotary knob if the Front board needs to be dismantled. For Karaoke variations, the Karaoke knob (pos 133) also need to be removed.

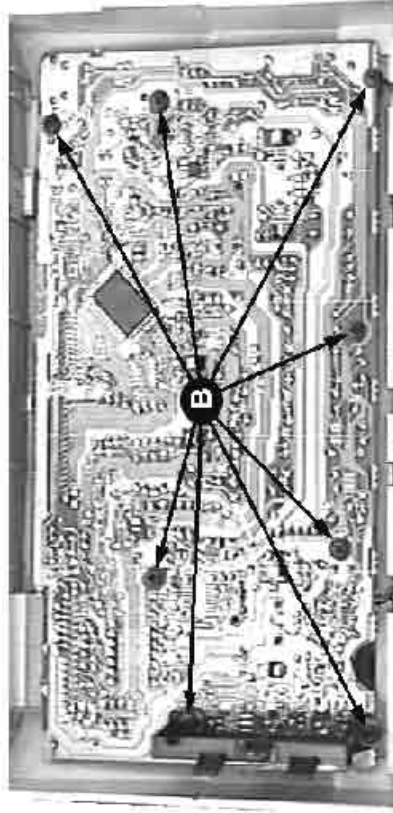


Figure 5

- 4) Loosen 6 screws B to remove the Front board as shown in Figure 5.
- 5) Loosen 6 screws C and eject both cassette doors to remove the Tape mechanism (pos 1103) as shown in figure 6.

**Note:** The Cassette door can be removed only after the removal of the Tape mechanism and buttons.

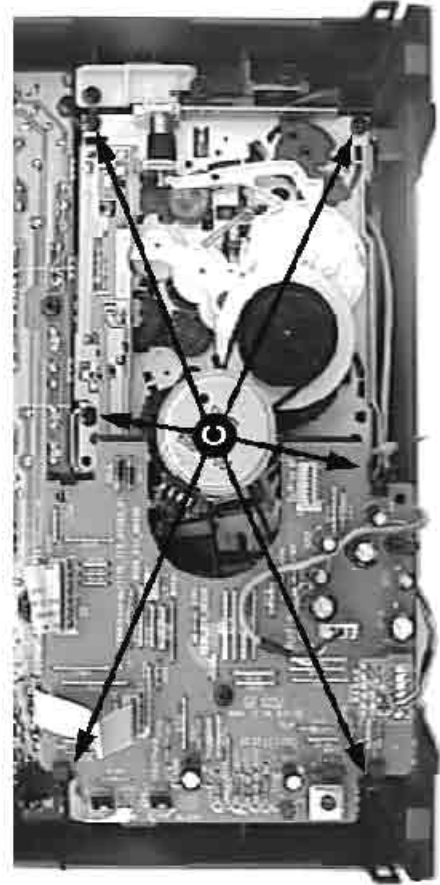


Figure 6

**Disassembling of the Bottom & Rear Panel assembly**

- 1) Loosen 6 screws D mounting the Combi board to the Rear Panel (see 206) as shown in figure 7.
- 2) Loosen 3 screws E and release the 2 catches on the sides of the Rear Panel to separate it from the Bottom plate (see 205).
- 3) Loosen 4 screws G to remove the Mains Transformer as shown in figure 8.
- 4) Loosen 2 screws F to remove the Combi Board.

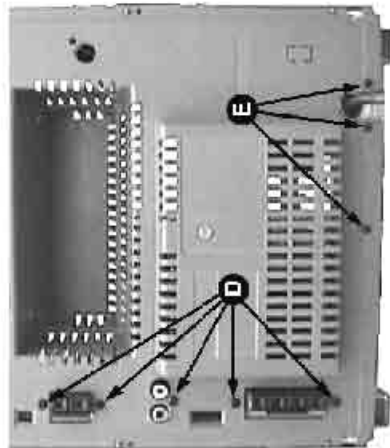


Figure 7

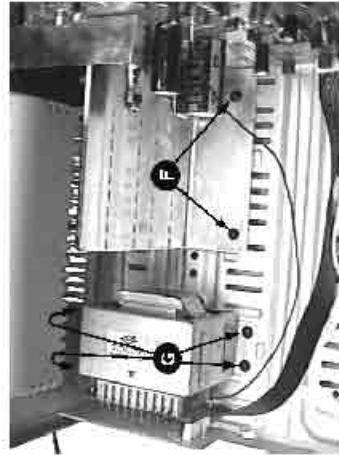


Figure 8

**Separating the MPEG and SCDC-LC-VCD Module**

- 1) Loosen 4 screws P to remove the MPEG shield & MPEG Board as shown in figure 9.
- 2) Loosen 2 screws M and release catch C3 with a flat screwdriver in the direction as shown to loosen the Plate Insulator.

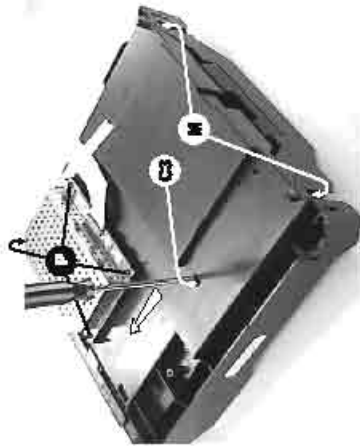


Figure 9

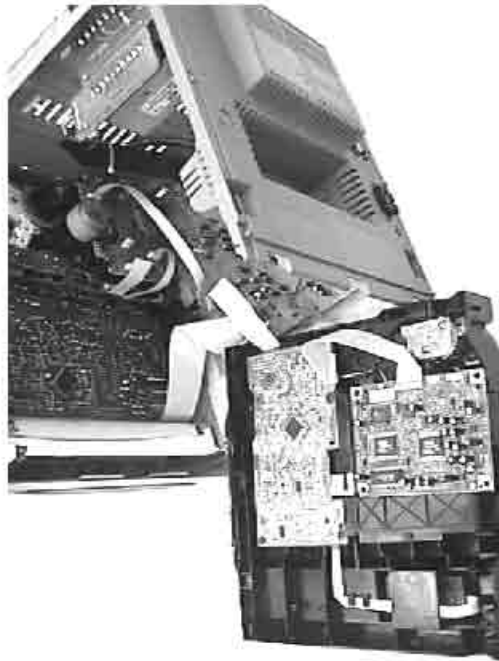
Service pos B



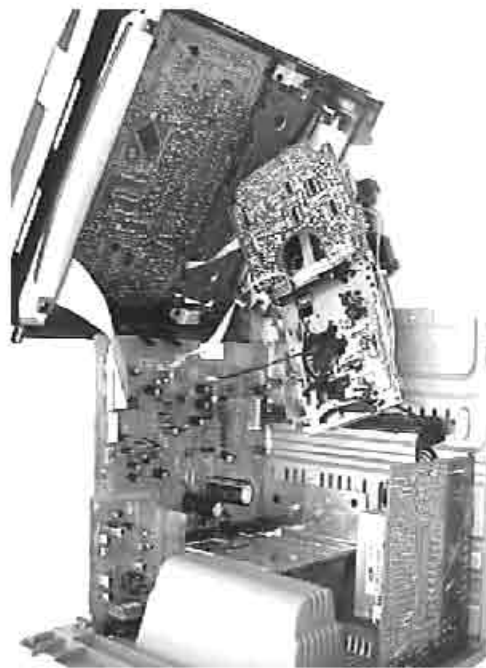
**Note:** After re-assembly, it is very important to ensure all wires are routed properly to ensure that they do not touch/bump any moving parts.

The SCDC-LC-VCD Module can be completely debushed while repairing the other portion of the set.

Service pos A



Service pos C

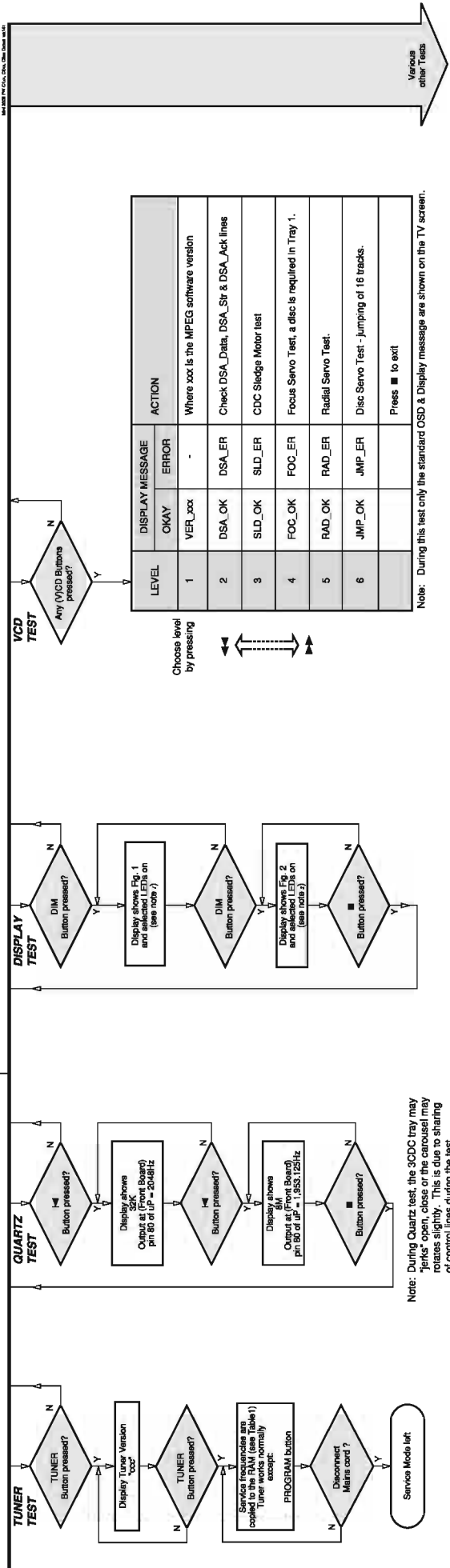


**SERVICE TEST PROGRAM**

To start service test program hold **▶** & **TAPE** depressed while plugging in the mains cord

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

S refers to Service Mode.  
V refers to Version.  
yy refers to Software version number of Processor.  
(Scrolling up from 01 to 89)



PRESET	EUROPE "EUR"	East Eur. Extended-band "EAS"	East Eur. "EAS"	USA "USA"	Oversea "OSE"
1	87.5MHz	65.81MHz	87.5MHz	87.5MHz	87.5MHz
2	108MHz	108MHz	108MHz	108MHz	108MHz
3	531kHz	74MHz	531kHz	530kHz	530531kHz*
4	1629kHz	87.5MHz	1629kHz	1700kHz	1700/1629kHz*
5	558kHz	531kHz	558kHz	558kHz	560/558kHz*
6	1494kHz	1602kHz	1494kHz	1500kHz	1500/1494kHz*
7	87.5MHz	558kHz	87.5MHz	98MHz	98/7.5MHz*
8	87.5MHz	1494kHz	87.5MHz	87.5MHz	87.5MHz
9	87.5MHz	98MHz	87.5MHz	87.5MHz	87.5MHz
10	87.5MHz	70.01MHz	87.5MHz	87.5MHz	87.5MHz
11	98MHz	65.81MHz	98MHz	87.5MHz	87.5/98MHz*

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. (24) version.



note: JAZZ & TECHNICO are on while OPTIMAL is off, other LEDs status are not important (applicable only for sets with LEDs)

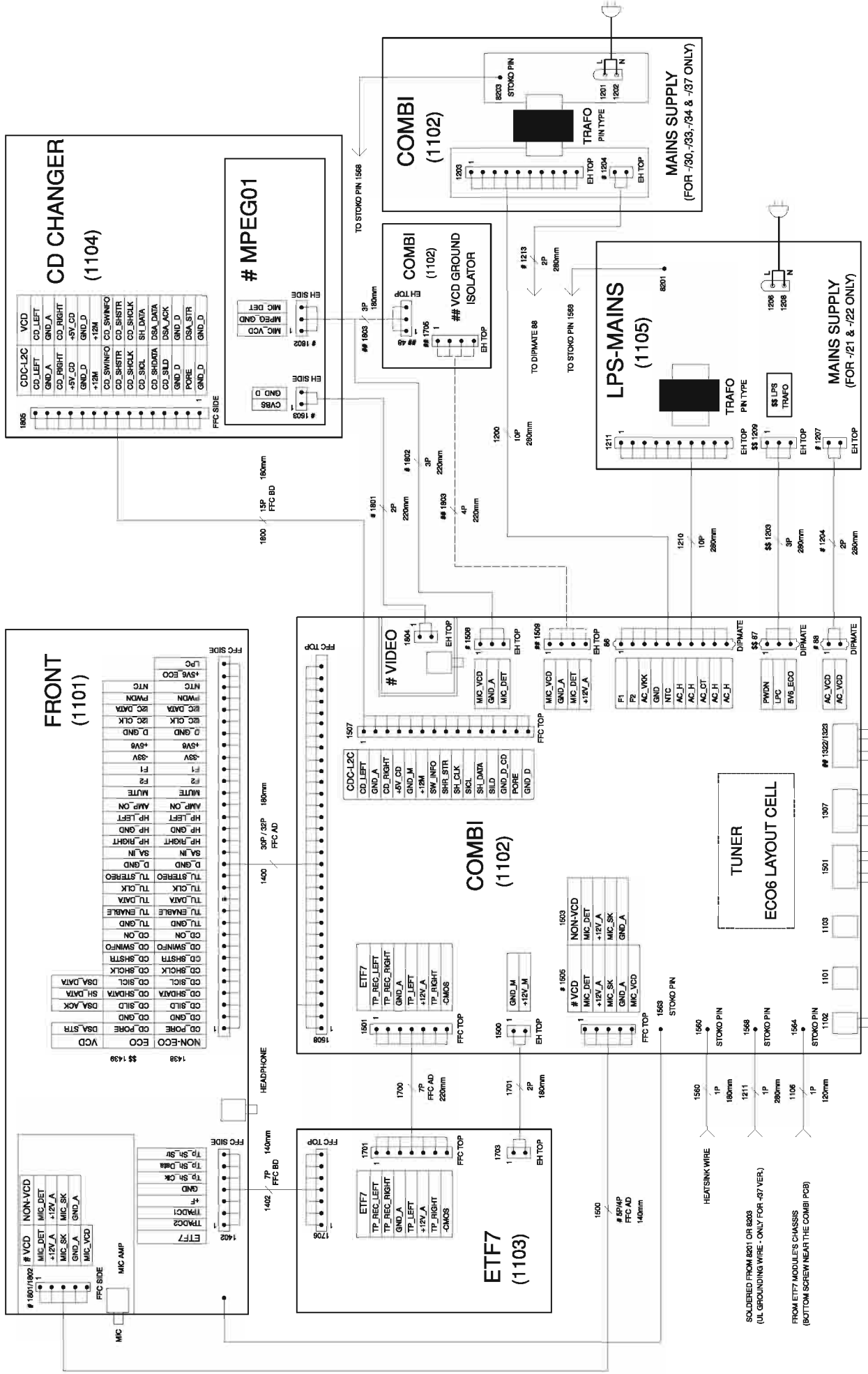


note: OPTIMAL is on while JAZZ & TECHNICO are off, other LEDs status are not important (applicable only for sets with LEDs)

TEST	Activated with	ACTION
EEPROM TEST	<b>▶</b> <b>■</b> to Exit	A test pattern will be sent to the EEPROM. "PASS" is displayed if the uProcessor read back the test pattern correctly, otherwise "FAIL" will be displayed.
EEPROM FORMAT	<b>◀</b>	Load default data. Display shows "NEW" for 1 second. <b>Caution!</b> All presets from the customer will be lost!!
ROTARY ENCODER TEST	Volume Knob Jog Shuttle knob	Display shows value for 2 seconds. Value increases or decreases in steps of 1 until 0 (min.) or 40 (max.) is reached.
DEMO	DBB	DEMO will toggle on or off. The message: "DEMO ON" or "DEMO OFF" will scroll across the display to show the new status of the set.
LEAVE SERVICE TEST PROGRAM	Disconnect mains cord	



**SET WIRING DIAGRAM**



NOTE :

- # - PROVISION FOR SETS WITH VCD/MP3 FEATURE.
- # - PROVISION FOR SETS WITH MATRIX SURROUND & VCD GROUND ISOLATOR.
- \$\$ - PROVISION FOR SETS WITH ECO FEATURE (ONLY FOR -/22 VER.).

FW-C355 Wiring diagram ... 3433 wk145





# MAINS CIRCUIT

- 1201 A3
- 1204 C3
- 1205 C3
- 1206 C1
- 1207 C5
- 1208 D1
- 1209 C6
- 1210 E2
- 1211 E6
- 1212 E5
- 1213 E5
- 1214 E8
- 2201 A6
- 2202 A4
- 2203 A8
- 2204 A9
- 2205 A6
- 2206 A4
- 2215 B9
- 2216 B9
- 2217 B10
- 2218 B3
- 2219 A8
- 2220 A6
- 2221 A3
- 2222 A10
- 2223 B2
- 2224 B6
- 2225 B8
- 2226 A2
- 2227 D1
- 2228 A2
- 2229 B2
- 2230 A2
- 2231 B1
- 2232 A10
- 2233 B3
- 2234 B5
- 2235 B7
- 2236 B1
- 2237 B2
- 2238 A5
- 2239 A5
- 2240 A7
- 2241 B8
- 2242 A6
- 2243 B6
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- 2246 A2
- 2247 B8
- 2248 A7
- 2249 A8
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- 2252 A6
- 2253 B3
- 2254 A7
- 2255 A8
- 2256 A4
- 2257 B9
- 2258 A3
- 2259 A6
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- 2262 A4
- 2263 A8
- 2264 A9
- 2265 A6
- 2266 A4
- 2267 B9
- 2268 A3
- 2269 A6
- 2270 A6
- 2271 B3
- 2272 B6
- 2273 B8
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- 2281 B1
- 2282 A10
- 2283 B3
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- 2306 A4
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- 2965 B7
- 2966 B1
- 2967 B2
- 2968 A5
- 2969 A5
- 2970 A7
- 2971 B8
- 2972 A6
- 2973 B8
- 2974 A7
- 2975 A8
- 2976 A4
- 2977 B9
- 2978 A3
- 2979 A6
- 2980 A6
- 2981 A8
- 2982 A4
- 2983 B9
- 2984 A3
- 2985 A6
- 2986 A4
- 2987 B9
- 2988 A3
- 2989 A6
- 2990 A6
- 2991 B3
- 2992 B6
- 2993 B8
- 2994 A2
- 2995 B8
- 2996 A2
- 2997 D1
- 2998 A2
- 2999 B2
- 3000 A2
- 3001 B1
- 3002 A10
- 3003 B3
- 3004 B5
- 3005 B7
- 3006 B1
- 3007 B2
- 3008 A5
- 3009 A5
- 3010 A7
- 3011 B8
- 3012 A6
- 3013 B8
- 3014 A7
- 3015 A8
- 3016 A4
- 3017 B9
- 3018 A3
- 3019 A6
- 3020 A6
- 3021 A8
- 3022 A4
- 3023 B9
- 3024 A3
- 3025 A6
- 3026 A4
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- 3033 B8
- 3034 A2
- 3035 B8
- 3036 A2
- 3037 D1
- 3038 A2
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- 3042 A10
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- 3056 A4
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- 3059 A6
- 3060 A6
- 3061 A8
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- 3063 B9
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- 3065 A6
- 3066 A4
- 3067 B9
- 3068 A3
- 3069 A6
- 3070 A6
- 3071 B3
- 3072 B6
- 3073 B8
- 3074 A2
- 3075 B8
- 3076 A2
- 3077 D1
- 3078 A2
- 3079 B2
- 3080 A2
- 3081 B1
- 3082 A10
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- 3096 A4
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- 3098 A3
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- 3101 A8
- 3102 A4
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- 3106 A4
- 3107 B9
- 3108 A3
- 3109 A6
- 3110 A6
- 3111 B3
- 3112 B6
- 3113 B8
- 3114 A2
- 3115 B8
- 3116 A2
- 3117 D1
- 3118 A2
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- 3157 D1
- 3158 A2
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- 3165 B7
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- 3186 A4
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- 3205 B7
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- 3219 A6
- 3220 A6
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- 3236 A2
- 3237 D1
- 3238 A2
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- 3287 B2
- 3288 A5
- 3289 A5
- 3290 A7
- 3291 B8
- 3292 A6
- 3293 B8
- 3294 A7
- 3295 A8
- 3296 A4
- 3297 B9
- 3298 A3
- 3299 A6
- 3300 A6
- 3301 A8
- 3302 A4
- 3303 B9

***ELECTRICAL PARTS LIST - MAINS BOARD***

1205 ▲ 994000001885 FUSE RAD T 2A 250V  
1210 ▲ 994000001043 POWER VOLTAGE SW  
1212 ▲ 994000002955 FUSE RAD LT 5A 250V  
5206 ▲ 994000002975 FIL MAINS 400μH

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



Front Board application

A55470	FW-C355/21/33
A55480	FW-C355/22
A55490	FW-V355/21M, FWV357/08
A55500	FW-C355/04
A55520	FW-M355/22
A55530	FW-M355/04
A55540	FW-M355/37

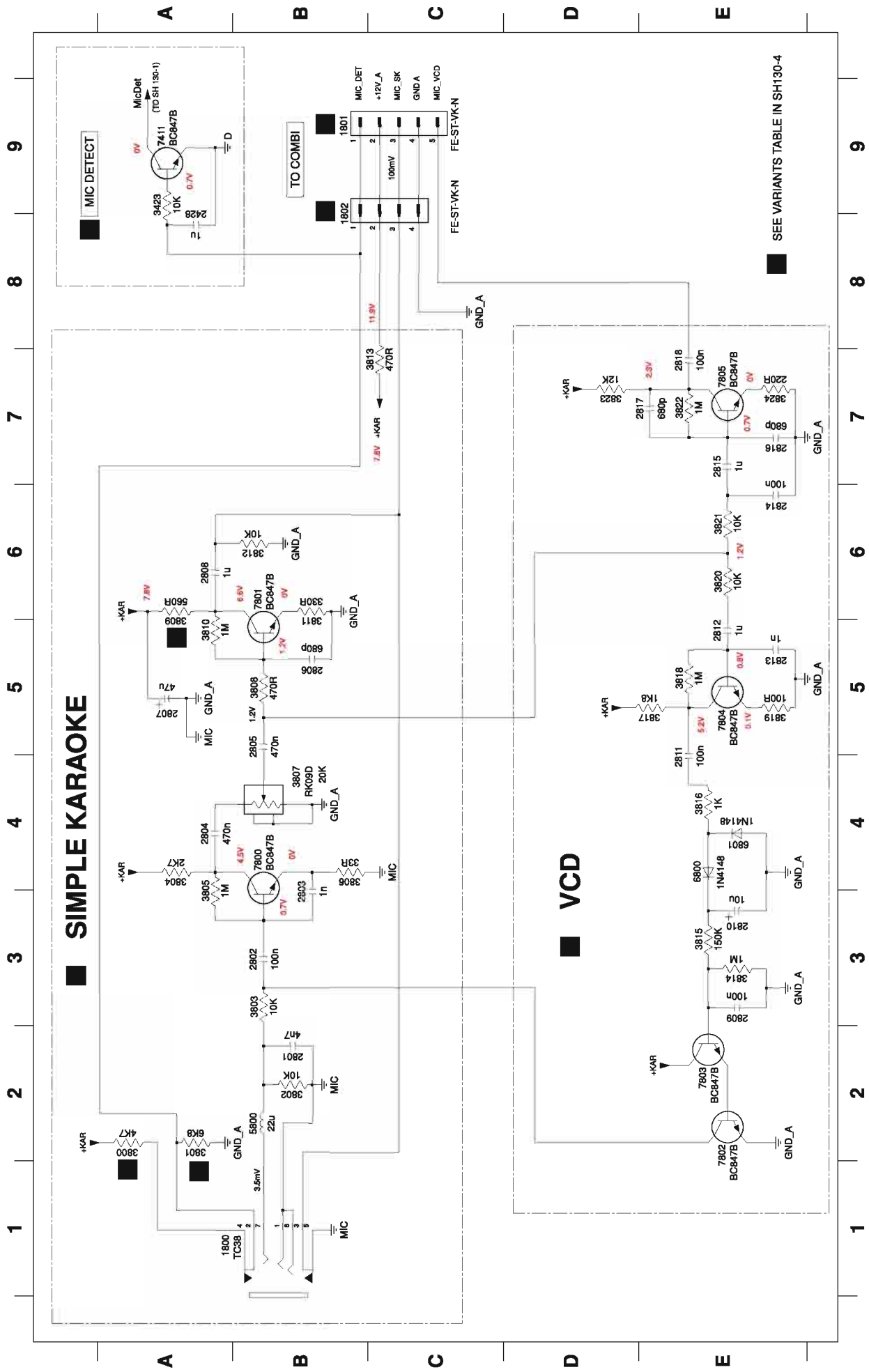
FEATURES:	A55470	A55480	A55490	A55500	A55520	A55530	A55540
Karaoke / Mic Detect	x	-	x	-	-	-	-
VCD	-	-	x	-	-	-	-
RDS	-	x	-	x	x	x	-
ECO Power LED	-	x	-	-	x	-	-

ITEM NO.	A55470	A55480	A55490	A55500	A55520	A55530	A55540	Functions
1427	-	x	x	x	x	x	-	REC
1428	REC	AUTO	AUTO	AUTO	AUTO	AUTO	REC	
1432	AUTO	RDS	PBC	RDS	RDS	RDS	AUTO	
1433	-	NEWS	RETURN	NEWS	NEWS	NEWS	-	
1438	-	x	-	-	x	-	-	with LPC
1439	x	-	x	x	-	x	x	without LPC
1801	-	-	x	-	-	-	-	VCD & KARAOKE
1802	x	-	-	-	-	-	-	KARAOKE
3529	-	330R	330R	330R	330R	330R	-	P01
3546	10k	-	10k	-	-	-	10k	RDSCLK
3548	10k	-	10k	-	-	-	10k	RDSDAT
3549	10k	-	10k	10k	-	10k	10k	RESET
3565	4R7	2R2	4R7	2R2	2R2	2R2	2R2	FTD Filament
3566	-	2R2	-	2R2	2R2	2R2	2R2	FTD Filament
3567	4R7	2R2	4R7	2R2	2R2	2R2	2R2	FTD Filament
3568	-	2R2	-	2R2	2R2	2R2	2R2	FTD Filament
3569	10k	-	10k	10k	-	10k	10k	LPC
3570	-	100k	-	-	100k	-	-	RESET
3800	4k7	-	1k	-	-	-	-	KARAOKE
3801	6k8	-	1k2	-	-	-	-	KARAOKE
3809	560R	-	680R	-	-	-	-	KARAOKE
4408	x	x	-	x	-	-	-	CDS/CL
4409	x	-	x	x	-	x	x	+5V6
4410	-	-	x	-	x	x	x	SH_DATA
4411	-	x	-	x	x	x	x	HP_GND
4414	x	-	x	x	-	x	x	DLPC
4416	x	-	-	-	-	-	x	# AUTO
4417	-	x	x	x	x	x	-	AUTO
4419	x	-	x	x	-	x	x	RESET
4459	-	x	-	-	x	-	-	+5V6_ECO
4490	x	-	x	x	-	x	x	+5V6
4491	x	-	-	-	-	-	x	# REC
6401	-	x	-	-	x	-	-	+5V6_ECO
6417	-	x	x	x	x	-	-	P01
6429	x	-	x	-	-	-	-	KARAOKE
6430	-	x	-	-	x	-	-	ECO Power
9401	x	-	x	-	-	-	-	FTD Filament
9402	x	-	x	-	-	-	-	FTD Filament
9410	-	-	x	-	x	x	x	DSA_DATA
9411	-	x	-	-	x	-	-	+LPS
9416	x	x	-	x	-	-	-	CDS/DATA
9488	-	x	-	-	x	-	-	LPC
9506	-	x	-	-	x	-	-	+5V6_ECO
9514	-	x	-	-	x	-	-	+5V6_ECO

x = Item in use.

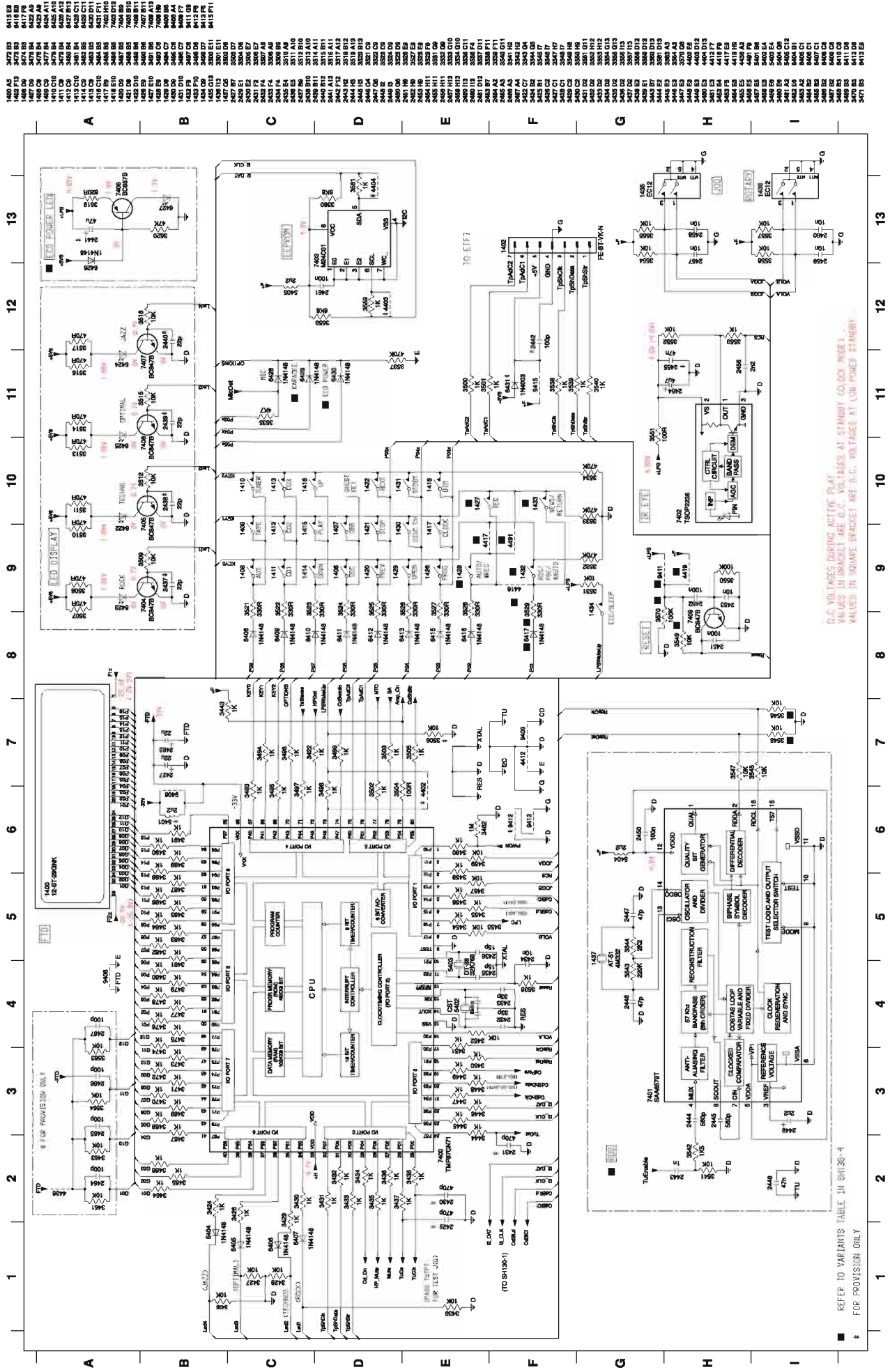
CIRCUIT DIAGRAM - KARAOKE PART

- 1800 A1 2428 A8 2803 B3 2806 B5 2812 E5 2815 E7 2818 E7 3901 A2 3904 A4 3907 B4 3810 A5 3813 C7 3816 E4 3819 E5 3822 E7 5800 B2 7411 A9 7802 E2 7805 E7
- 1801 B9 2801 B2 2804 A4 2807 A5 2810 E3 2813 E5 2816 E7 3423 A9 3902 B2 3905 A3 3908 B5 3811 B6 3814 E3 3817 E5 3920 E6 3923 D7 6800 E4 7800 B4 7803 E2
- 1802 B8 2802 B3 2805 B5 2808 A6 2811 E4 2814 E6 2817 E7 3900 A2 3903 B3 3906 B4 3909 A6 3812 B8 3815 E3 3818 E5 3921 E6 3924 E7 6801 E4 7801 B6 7804 E5



SEE VARIANTS TABLE IN SH130-4

# CIRCUIT DIAGRAM - MICROPROCESSOR PART



REFER TO VARIANTS TABLE IN 56136-4 FOR PROVISION ONLY

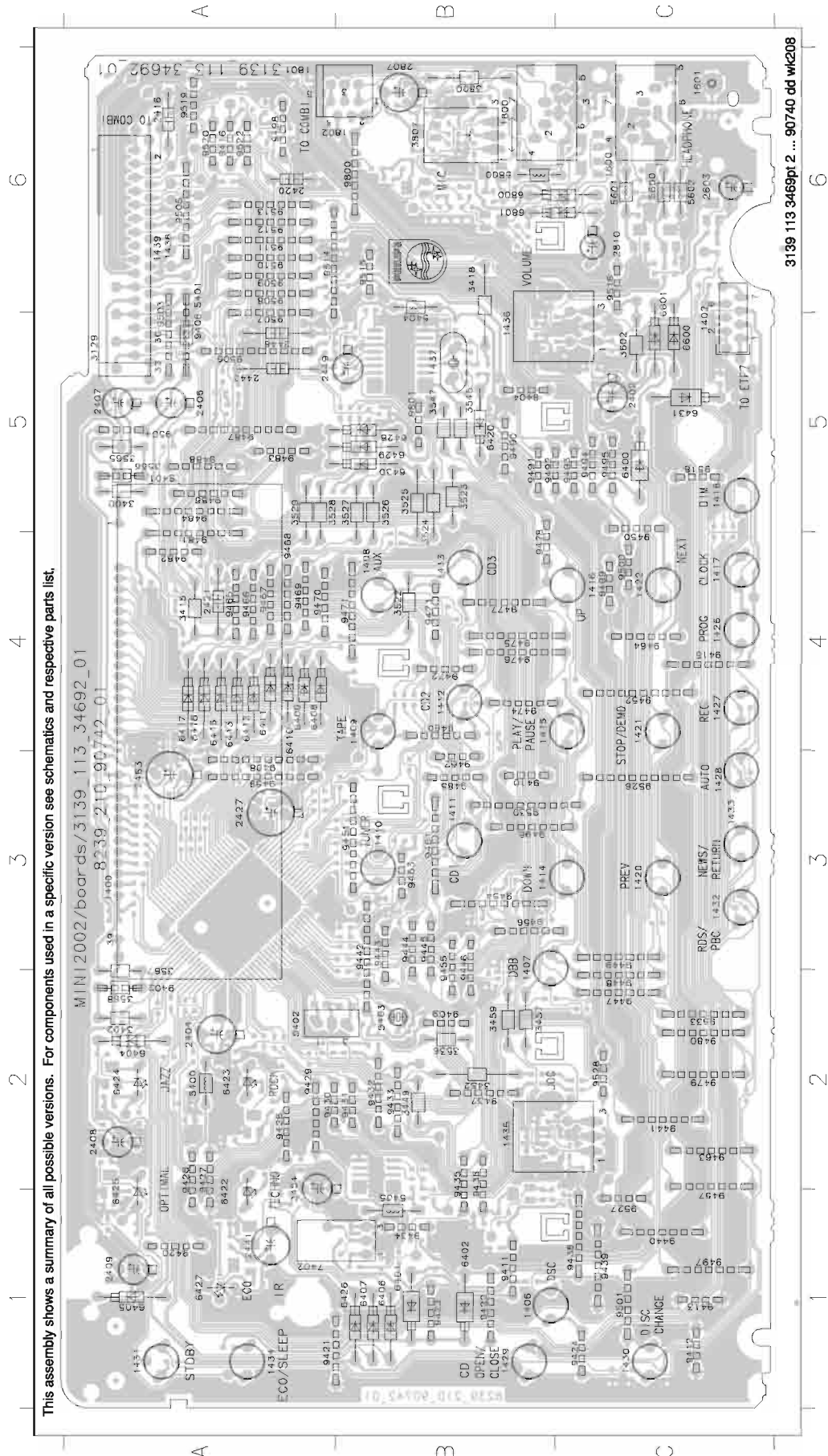






COMPONENT LAYOUT

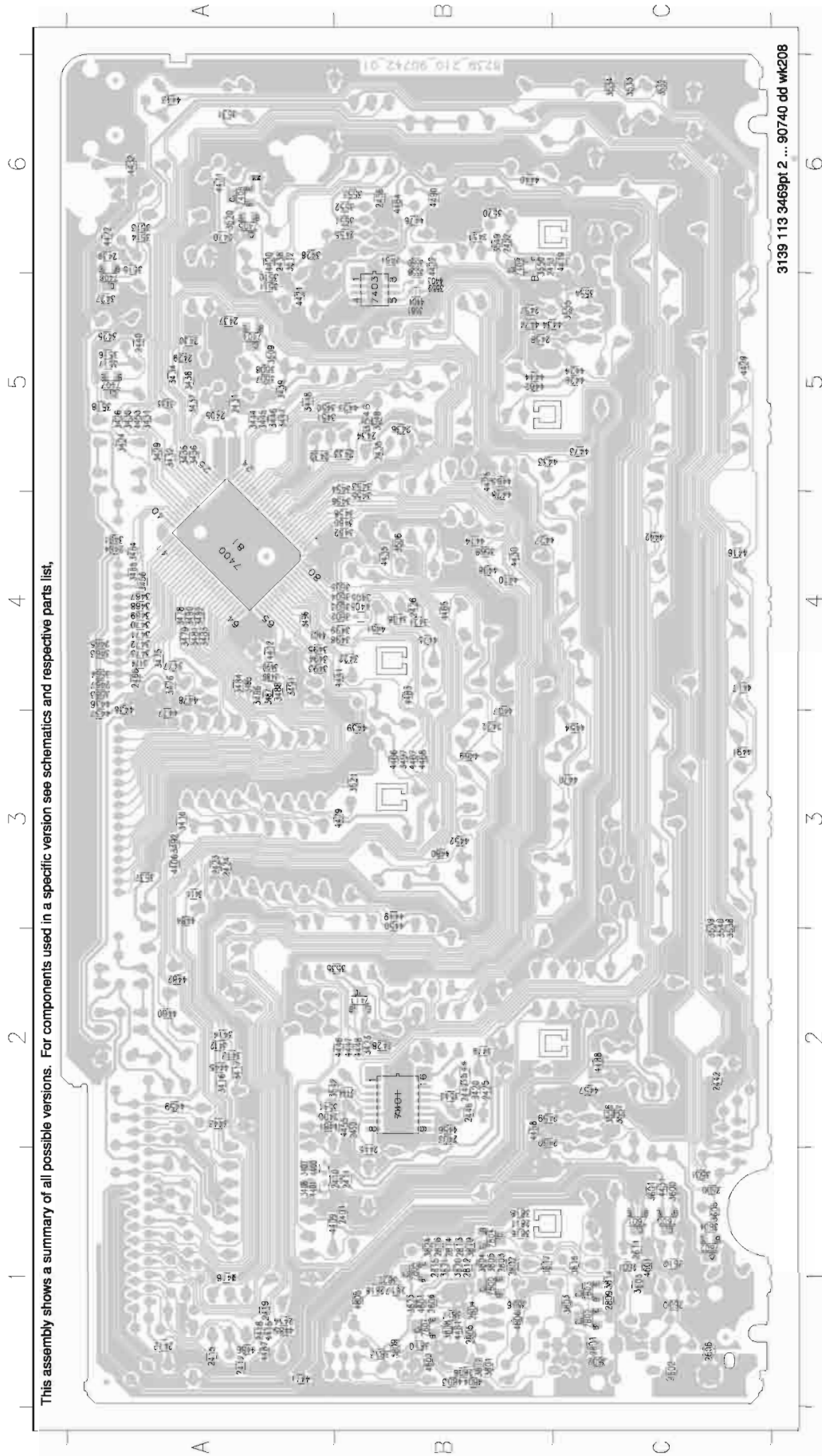
Placeholder text for component descriptions, consisting of multiple lines of repeating characters and symbols.



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

# CHIP LAYOUT

1. This assembly shows a summary of all possible versions. For components used in a specific version see schematics and respective parts list.  
 2. The chip layout is divided into sections A, B, and C.  
 3. The layout includes various components such as resistors, capacitors, and integrated circuits.  
 4. The layout is designed to be compatible with a specific package type.  
 5. The layout is subject to change without notice.  
 6. The layout is provided for informational purposes only.  
 7. The layout is not to be used for manufacturing without explicit permission.

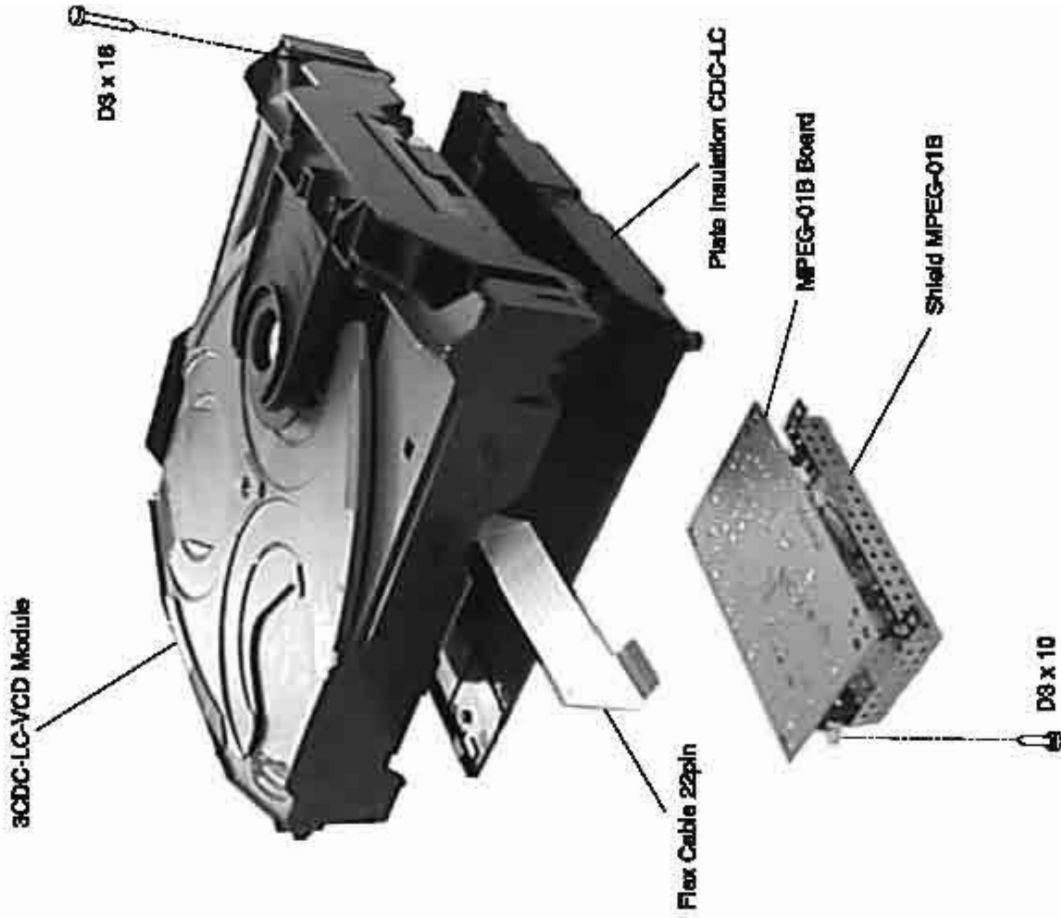


**ELECTRICAL PARTS LIST - FRONT BOARD**

1400	996500013637	FTD 12ST046GNK
1406	482227613775	TACT SW
1407	482227613775	TACT SW
1408	482227613775	TACT SW
1409	482227613775	TACT SW
1410	482227613775	TACT SW
1435	994000002961	ROT ENCODER EC12E2460803
1436	994000001854	ROT ENCODER EC12E2460802
1800	994000002962	HEADPHONE D3.5
3807	996500014725	POTM CAR LIN 20K
5400	482215711477	FIXED IND 2.2μH TP=52MM
5402	996500011372	XTAL 8MHZ
5403	996500011373	XTAL 32.768KHZ
5405	482215711477	FIXED IND 2.2μH TP=52MM
5600	482215711477	FIXED IND 2.2μH TP=52MM
5601	482215711477	FIXED IND 2.2μH TP=52MM
5602	482215711477	FIXED IND 2.2μH TP=52MM
5800	994000002976	FIXED 22μH TP26mm
6422	994000002306	LED L174A2SET XEL
6423	994000002306	LED L174A2SET XEL
6424	994000002306	LED L174A2SET XEL
6425	994000002306	LED L174A2SET XEL
7400	994000002977	IC TMP87CS71F-3NN8
7402	932215522667	IR RECEIVER TSOP2236ZC1
7403	932213104668	IC M24C01-WMIN6TP

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

## EXPLODED VIEW OF MODULE



## MPEG-01B MODULE

*This chapter shows the MPEG-01B Board, for 3CDC-LC-VCD mechanism & electronics please refer to Chapter 10*

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

In case of defects please replace the entire board.

The module can be ordered with codenumber "9940 000 02916".

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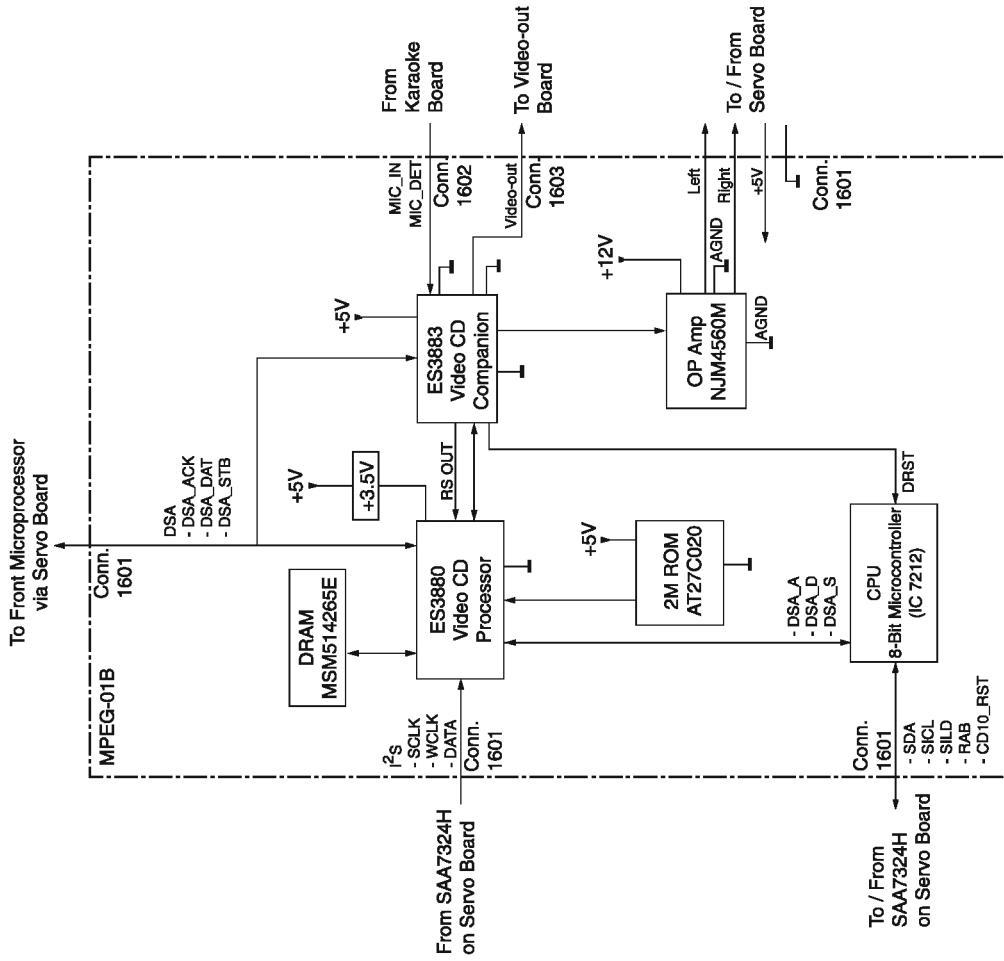
Exploded View of Module .....	6-1
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## NOTES:

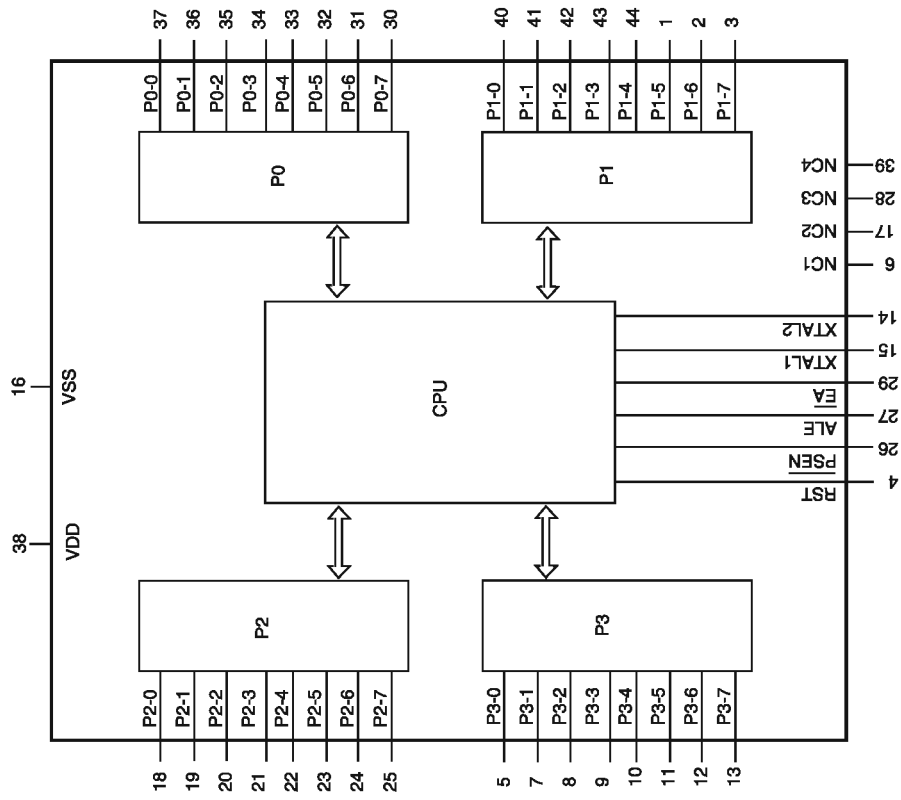
### Brief Introduction on the MPEG

1. When VCD source is selected the MPEG\_RESET line will go positive triggering the following:
  - DRST pulse to reset 8-bit microcontroller IC 7212
  - RSTOUT# pulse to reset IC 7201 ES3880
  - IC7212 sends CD10\_RST to reset Signal Processor IC 7802 on the CD Board.
2. Communication will establish as follows:
  - DSA\_ACK, DSA\_STB and DSA\_DAT between µProcessor IC 7401 on the Front Board and IC 7201 ES3880.
  - DSA\_STB to IC7204 ES3883 to select between NTSC (Lo) or PALS (Hi)
  - DSA\_A, DSA\_D and DSA\_S between IC 7201 ES3880 and microcontroller IC7212
  - SILD, SICL, RAB and SDA between microcontroller IC7212 and Signal Processor IC7802 on the CD Board.
3. Other activities between IC7201 ES3880 and Eprom IC7202, Dram IC7203 and IC7204 ES3883 will follow resulting in the OSD display on the TV set connected to the Video out socket.
4. When play button is activated the FS signal (IIS\_SCLK, IIS\_WCLK and IIS\_DATA) from the CD Board will enter IC7201 ES3880 which will work closely with the Eprom IC7202 and Dram IC7203. Inverter IC7205 74HC04D serves to reconstruct the Digital signal & level required by IC7201 ES3880.
5. Digital Audio information (AUDIOCLK, AUDATA and BCLK) will be sent to DAC (Digital to Analog Converter) of IC7204 ES3883.
6. Analog output (AOL+, AOL-, AOR+ and AOR-) is amplified by the differential Op. Amplifier IC7207 NJM4560M.
7. Digital Video information YUV(0.....7) will be sent to the Video processing part of IC7204 ES3883 and out to the Video out socket.
8. The HSYNC & VSYNC from IC7204 ES3883 to IC7201 ES3880 are to synchronize the Digital Video Information.
9. Mic Echo Input into IC7204 ES3883 is converted to digital signal (ARCLK, AIN and ARFS) for IC7201 ES3880 to combine into the Digital Audio Information.

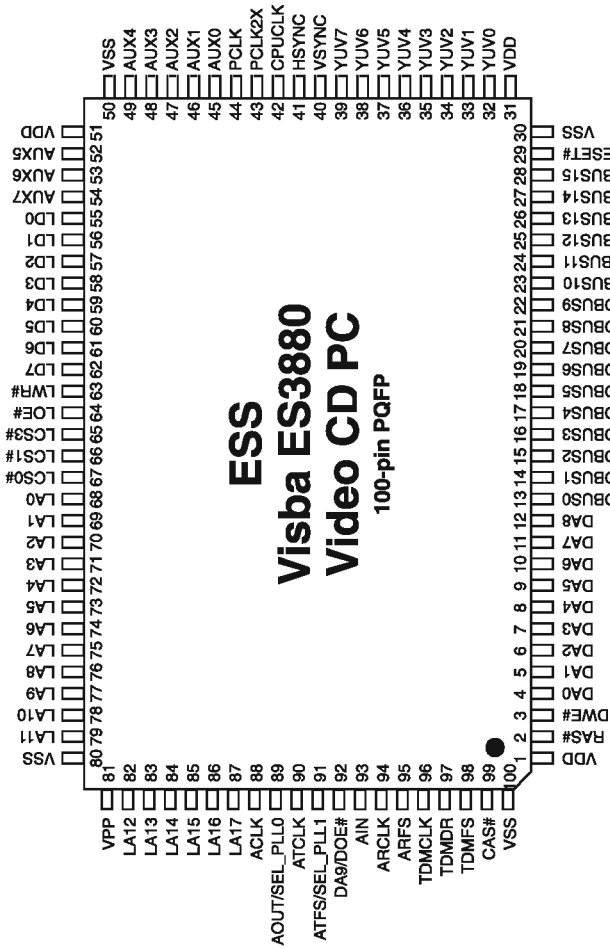
**MPEG-01B BLOCK DIAGRAM**



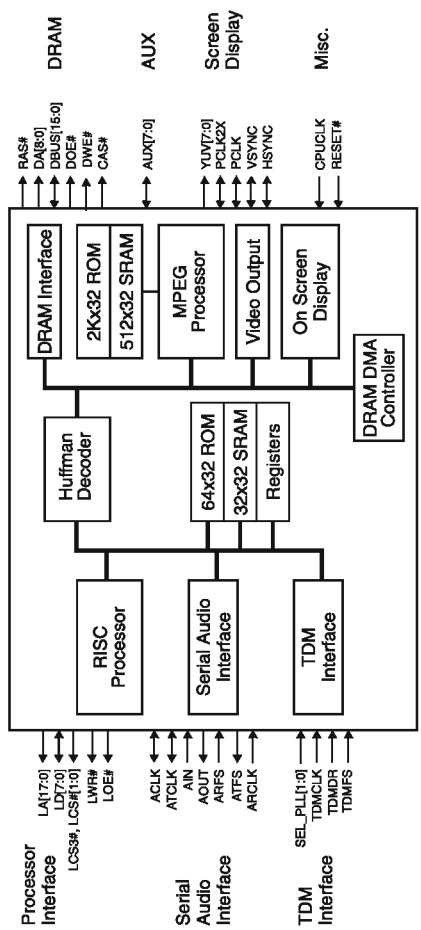
**8-BIT MICROCONTROLLER (IC 7212) INTERNAL BLOCK**



ES3880 VIDEO CD PROCESSOR CHIP



ESS  
Visba ES3880  
Video CD PC  
100-pin PQFP

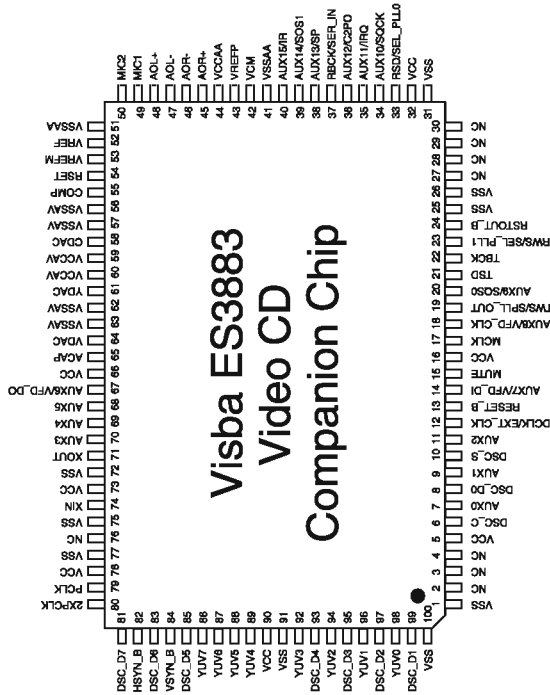


Visba Video CD PC Block Diagram

VISBA VIDEO PC PROCESSOR CHIP PIN DESCRIPTION

Name	Number	I/O	Definition
VDD	1, 31, 51	I	Voltage supply for 3.3 V.
RAS#	2	O	DRAM row address strobe (active low).
DWE#	3	O	DRAM write enable (active low).
DA[8:0]	12-4	O	DRAM multiplexed row and column address bus.
DBUS[15:0]	28-13	I/O	DRAM data bus.
RESET#	29	I	System reset (active low).
VSS	30, 50, 80, 100	I	Ground.
YUV[7:0]	39-32	O	Y is luminance, UV are chrominance data bus for screen video interface. YUV[7:0] for 8-bit YUV mode.
VSYNC	40	I/O	Vertical sync for screen video interface, programmable for rising or falling edge.
HSYNC	41	I/O	Horizontal sync for screen video interface, programmable for rising or falling edge.
CPUCCLK	42	I	RISC and system clock input. CPUCCLK is used only if SEL_PLL[1:0] = 00.
PCLK2X	43	I/O	Pixel clock; two times the actual pixel clock for screen video interface.
PCLK	44	I/O	Pixel clock qualifier in for screen video interface.
AUX[7:0]	54, 52, 53, 49-45	I/O	Auxiliary control pins (AUX0 and AUX1 are open collectors).
LD[7:0]	62-55	I/O	RISC interface data bus.
LWR#	63	O	RISC interface write enable (active low).
LOE#	64	O	RISC interface output enable (active low).
LCS[3,1:0]#	65,66,67	O	RISC interface chip select (active low).
LA[17:0]	87-82, 79-68	O	RISC interface address bus.
VPP	81	I	Digital supply voltage for 5 V.
ACLK	88	I/O	Master clock for external audio DAC (8.192 MHz, 11.2896 MHz, 12.288 MHz, 16.9344 MHz, and 18.432 MHz).
AOUT/ SEL_PLL0	89	O	Dual-purpose pin. AOUT is the audio interface serial data output for the Visba. Pins SEL_PLL[1:0] select phase-lock loop (PLL) clock frequency CPUCCLK for the Visba: 00 = bypass PLL. 01 = 54 MHz PLL. 10 = 67.5 MHz PLL. 11 = 81 MHz PLL.
ATCLK	90	I/O	Audio transmit bit clock.
ATFS/ SEL_PLL1	91	O	Dual-purpose pin. ATFS is the audio interface transmit frame sync. Pins SEL_PLL[1:0] select phase-lock loop (PLL) clock frequency CPUCCLK for the Visba. See the SEL_PLL0 pin above for the settings.
DA9/DOE#	92	O	Dual purpose pin: DRAM output enable (active low)/DRAM multiplexed row and column address bus.
AIN	93	I	Audio interface serial data input.
ARCLK	94	I	Audio receive bit clock.
ARFS	95	I	Audio interface receive frame sync.
TDMCLK	96	I	TDM interface serial clock.
TDMDR	97	I	TDM interface serial data receive.
TDMFS	98	I	TDM interface frame sync.
CAS#	99	O	DRAM column address strobe bank 0 (active low).

ES3883 VIDEO CD COMPANION CHIP



Visba ES3883  
Video CD  
Companion Chip

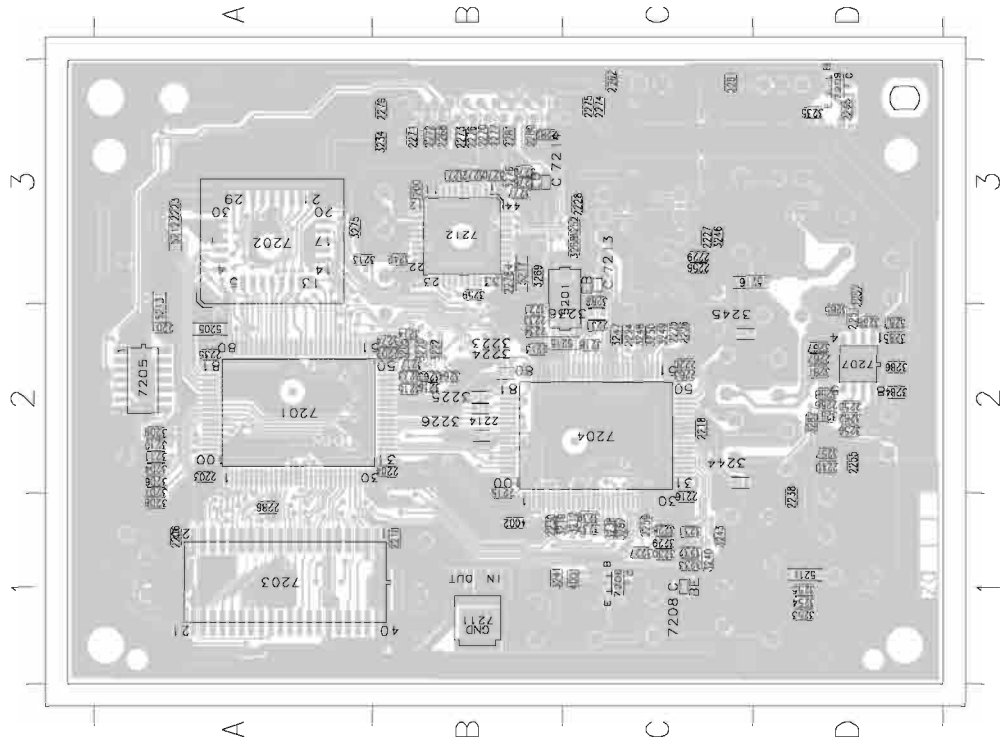
PIN DESCRIPTION

Name	Number	I/O	Definition
VSS	1,25,26,31,72,75,77,91,100	I	Ground.
VCC	5,16,32,66,73,78,90	I	Voltage supply, 5 V.
DSC_C	6	I	Clock for programming to access internal registers.
AUX0	7	I/O	Servo Forward or Control Pin.
AUX1	9	I/O	Servo Reverse or Control Pin.
AUX2	11	I/O	Servo LDON or Control Pin.
AUX3	70	I/O	Servo CW/Limit or Control Pin.
AUX4	69	I/O	Servo CCW/Close or Control Pin.
AUX5	68	I/O	Servo Data or Control Pin.
AUX6	67	I/O	Servo XLAT or Control Pin/VFD_DO.
AUX7	14	I/O	Servo BRKM/Sense or Control Pin/VFD_DI.
AUX8	18	I/O	Servo Mute/Open or Control Pin/VFD_CLK.
AUX9	20	I/O	Servo SOS0 or Control Pin.
AUX10	34	I/O	Servo SOCK or Control Pin.
AUX11	35	I/O	3880 IRG or Interrupt Output or Control Pin.
AUX12	36	I/O	CD CPPO or Interrupt Input or Control Pin.
AUX13	38	I/O	Serial Interrupt/OD-Mute or Control Pin.
AUX14	39	I/O	Servo SCOR (SOS1) or Interrupt Input or Control Pin.
AUX15	40	I/O	Interrupt Input or Control Pin.
DSC_D7[0]	81,83,85,86,89,97,99,8	I/O	Data for programming to access internal registers.
DSC_S	10	I	Strobe for programming to access internal registers.
DCLK	12	O	Dual-purpose pin DCLK is the MPEG decoder clock.
EXT_CLK	13	I	EXT_CLK is the external clock EXT_CLK is an input during bypass PLL mode.
RESET_B	15	O	Video reset (active-low).
MUTE	15	O	Audio mute.
MCLK	17	I	Audio master clock.
TWS	19	I	Dual-purpose pin TWS is the transmit audio frame sync.
SPLL_OUT	19	O	SPLL_OUT is the select PLL output.

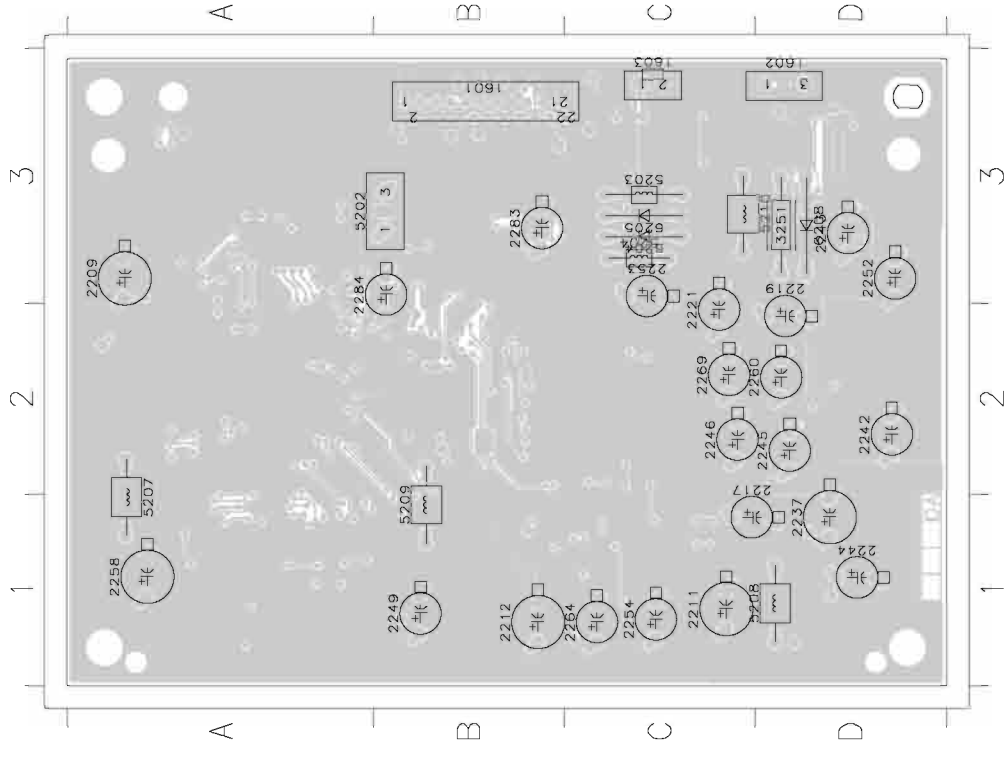
Name	Number	I/O	Definition
TSD	21	I	Transmit audio data input.
RBCK	22	I	Transmit audio bit clock.
RWS		O	Dual-purpose pin RWS is the receive audio frame sync.
SEL_PLL1		I	Pin SEL_PLL[1:0] select the PLL clock frequency for the DCLK output.
	23		SEL_PLL1 SEL_PLL0 DCLK 0 0 Bypass PLL (Input mode) 0 1 27 MHz (output mode) 1 0 32.4 MHz (output mode) 1 1 40.5 MHz (output mode)
RSTOUT_B	24	O	Reset output (active-low).
NC	24,27,30,76		No connect. Do not connect to these pins.
RSD		O	Dual-purpose pin. RSD is the receive audio data input.
SEL_PLL0	33	I	SEL_PLL0 along with SEL_PLL1 select the PLL clock frequency for the DCLK output. See the table for pin number 23.
RBCK		O	Dual-purpose pin. RBCK is the receive audio bit clock.
SER_IN	37	I	SER_IN is the serial input DSC mode. 0 - Parallel DSC mode. 1 - Serial DSC mode.
VSSAA	41,51	I	Audio Analog Ground.
VGM	42	I	ADC Common Mode Reference (CMR) buffer output. CMR is approximately 2.25 V. Bypass to analog ground with 47 nF electrolytic in parallel with 0.1 nF.
VREFP	43	I	DAC and ADC maximum reference. Bypass to VCMR with 10 nF in parallel with 0.1 nF.
VCCAA	44	I	Analog VCC, 5 V.
AOR+, AOR-	45,46	O	Right channel output.
AOL+, AOL-	47,48	O	Left channel output.
MIC1	49	I	Microphone input 1.
MIC2	50	I	Microphone input 2.
VREF	52	I	Internal resistor divider generates Common Mode Reference (CMR) voltage. Bypass to analog ground with 0.1 nF.
VREFM	53	I	DAC and ADC minimum reference. Bypass to VCMR with 10 nF in parallel with 0.1 nF.
RSET	54	I	Full scale DAC current adjustment.
COMP	55	I	Compensation pin.
VSSAV	56,57,62,63	I	Video Analog Ground
CDAC	58	O	Modulated chrominance output.
VCCAV	59,60	I	Video VCC, 5 V
YDAC	61	O	Y luminance data bus for screen video port.
VDAC	64	O	Composite video output.
AGAP	65	I	Audio CAP
XOUT	71	O	Crystal output.
XIN	74	I	27 MHz crystal input.
PCLK	79	I/O	13.5 MHz pixel clock.
2XPCLK	80	I/O	27 MHz (2 times pixel clock).
HSYN_B	82	O	Horizontal sync (active-low).
VSYN_B	84	O	Vertical sync (active-low).
YUV7[0]	86,88,92,94,96,98	I	YUV data bus for screen video port.



**MPEG-01B BOARD LAYOUT**



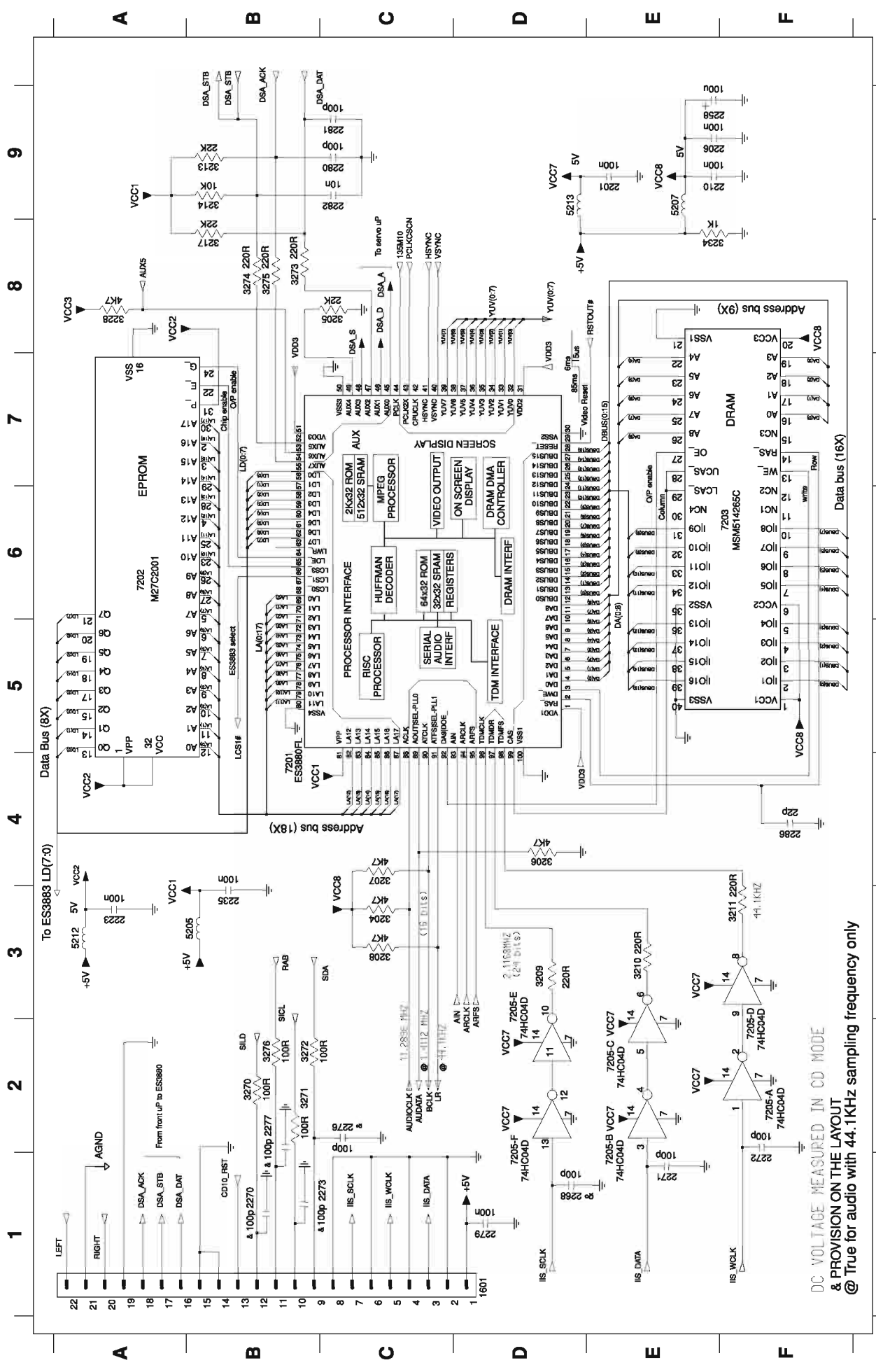
2201	A2
2202	A2
2203	A2
2204	A2
2205	A1
2206	B2
2207	B2
2208	B2
2209	B2
2210	B2
2211	B2
2212	B2
2213	B2
2214	B2
2215	B2
2216	B2
2217	B2
2218	B2
2219	B2
2220	B2
2221	B2
2222	B2
2223	B2
2224	B2
2225	B2
2226	B2
2227	B2
2228	B2
2229	B2
2230	B2
2231	B2
2232	B2
2233	B2
2234	B2
2235	B2
2236	B2
2237	B2
2238	B2
2239	B2
2240	B2
2241	B2
2242	B2
2243	B2
2244	B2
2245	B2
2246	B2
2247	B2
2248	B2
2249	B2
2250	B2
2251	B2
2252	B2
2253	B2
2254	B2
2255	B2
2256	B2
2257	B2
2258	B2
2259	B2
2260	B2
2261	B2
2262	B2
2263	B2
2264	B2
2265	B2
2266	B2
2267	B2
2268	B2
2269	B2
2270	B2



1601	B3
1602	C3
1603	A3
2211	C1
2212	C2
2213	C2
2214	C2
2215	D2
2216	D2
2217	D2
2218	D2
2219	D2
2220	D2
2221	D2
2222	D2
2223	D2
2224	D2
2225	D2
2226	D2
2227	D2
2228	D2
2229	D2
2230	D2
2231	D2
2232	D2
2233	D2
2234	D2
2235	D2
2236	D2
2237	D2
2238	D2
2239	D2
2240	D2
2241	D2
2242	D2
2243	D2
2244	D2
2245	D2
2246	D2
2247	D2
2248	D2
2249	D2
2250	D2
2251	D2
2252	D2
2253	D2
2254	D2
2255	D2
2256	D2
2257	D2
2258	D2
2259	D2
2260	D2
2261	D2
2262	D2
2263	D2
2264	D2
2265	D2
2266	D2
2267	D2
2268	D2
2269	D2
2270	D2

# ES3880 CIRCUIT

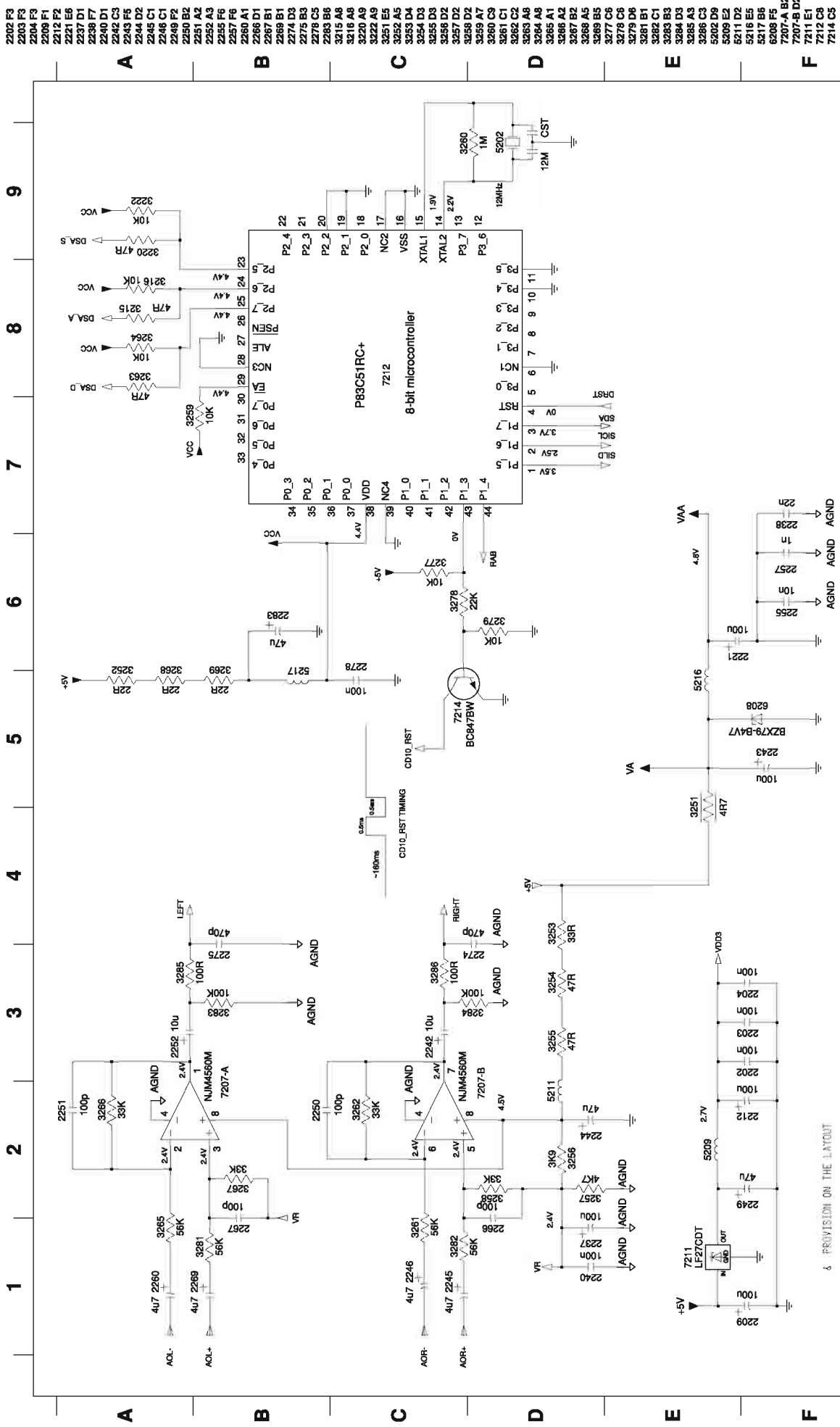
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|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 1601 D1 | 2210 E9 | 2258 E9 | 2271 E1 | 2276 C2 | 2280 C9 | 3205 D4 | 3209 D3 | 3213 B9 | 3214 B9 | 3217 B2 | 3218 B8 | 3219 B8 | 3220 B2 | 3221 F3 | 3222 C4 | 3223 C8 | 3224 C9 | 3225 C9 | 3226 F4 | 3227 C3 | 3228 C3 | 3229 C8 | 3230 C4 | 3231 C8 | 3232 C9 | 3233 E3 | 3234 E8 | 3235 E8 | 3236 E8 | 3237 B2 | 3238 B2 | 3239 B8 | 3240 B2 | 3241 B8 | 3242 B8 | 3243 B8 | 3244 B8 | 3245 B8 | 3246 B8 | 3247 B8 | 3248 B8 | 3249 B8 | 3250 B8 | 3251 B8 | 3252 B8 | 3253 B8 | 3254 B8 | 3255 B8 | 3256 B8 | 3257 B8 | 3258 B8 | 3259 B8 | 3260 B8 | 3261 B8 | 3262 B8 | 3263 B8 | 3264 B8 | 3265 B8 | 3266 B8 | 3267 B8 | 3268 B8 | 3269 B8 | 3270 B8 | 3271 B8 | 3272 B2 | 3273 B8 | 3274 B8 | 3275 B8 | 3276 B2 | 3277 B2 | 3278 B2 | 3279 B2 | 3280 B2 | 3281 B2 | 3282 B2 | 3283 B2 | 3284 B2 | 3285 B2 | 3286 B2 | 3287 B2 | 3288 B2 | 3289 B2 | 3290 B2 | 3291 B2 | 3292 B2 | 3293 B2 | 3294 B2 | 3295 B2 | 3296 B2 | 3297 B2 | 3298 B2 | 3299 B2 | 3300 B2 | 3301 B2 | 3302 B2 | 3303 B2 | 3304 B2 | 3305 B2 | 3306 B2 | 3307 B2 | 3308 B2 | 3309 B2 | 3310 B2 | 3311 B2 | 3312 B2 | 3313 B2 | 3314 B2 | 3315 B2 | 3316 B2 | 3317 B2 | 3318 B2 | 3319 B2 | 3320 B2 | 3321 B2 | 3322 B2 | 3323 B2 | 3324 B2 | 3325 B2 | 3326 B2 | 3327 B2 | 3328 B2 | 3329 B2 | 3330 B2 | 3331 B2 | 3332 B2 | 3333 B2 | 3334 B2 | 3335 B2 | 3336 B2 | 3337 B2 | 3338 B2 | 3339 B2 | 3340 B2 | 3341 B2 | 3342 B2 | 3343 B2 | 3344 B2 | 3345 B2 | 3346 B2 | 3347 B2 | 3348 B2 | 3349 B2 | 3350 B2 | 3351 B2 | 3352 B2 | 3353 B2 | 3354 B2 | 3355 B2 | 3356 B2 | 3357 B2 | 3358 B2 | 3359 B2 | 3360 B2 | 3361 B2 | 3362 B2 | 3363 B2 | 3364 B2 | 3365 B2 | 3366 B2 | 3367 B2 | 3368 B2 | 3369 B2 | 3370 B2 | 3371 B2 | 3372 B2 | 3373 B2 | 3374 B2 | 3375 B2 | 3376 B2 | 3377 B2 | 3378 B2 | 3379 B2 | 3380 B2 | 3381 B2 | 3382 B2 | 3383 B2 | 3384 B2 | 3385 B2 | 3386 B2 | 3387 B2 | 3388 B2 | 3389 B2 | 3390 B2 | 3391 B2 | 3392 B2 | 3393 B2 | 3394 B2 | 3395 B2 | 3396 B2 | 3397 B2 | 3398 B2 | 3399 B2 | 3400 B2 |
|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|



DC VOLTAGE MEASURED IN CD MODE  
& PROVISION ON THE LAYOUT  
@ True for audio with 44.1KHz sampling frequency only



# AUDIO CIRCUIT



PROVISION ON THE LAYOUT

ALL DC VOLTAGES ARE MEASURED UNDER 5V SUPPLY CONDITION

**ELECTRICAL PARTS LIST - MPEG-01B BOARD**

**MISCELLANEOUS**

1601 2422 025 16837 Flex Socket 22pin, Hort.

**CAPACITORS**

2201	4822 126 14305	100nF 10% 16V	2266	2020 522 94427	100pF 50V
2202	4822 126 14305	100nF 10% 16V	2287	2020 522 94427	100pF 50V
2203	4822 126 14305	100nF 10% 16V	2289	4822 124 40769	4.7uF 20% 100V
2204	4822 126 14305	100nF 10% 16V	2271	4822 122 31765	100pF 2% 63V
2205	4822 126 14305	100nF 10% 16V	2272	4822 122 31765	100pF 2% 63V
2206	4822 126 14305	100nF 10% 16V	2274	4822 126 13881	470nF 5% 50V
2207	4822 126 14305	100nF 10% 16V	2275	4822 126 13881	470nF 5% 50V
2208	4822 126 14305	100nF 10% 16V	2278	4822 126 14305	100nF 10% 16V
2209	4822 124 40207	100uF 20% 25V	2279	4822 126 14305	100nF 10% 16V
2210	4822 126 14305	100nF 10% 16V	2280	4822 122 31765	100pF 2% 63V
2211	4822 124 40207	100uF 20% 25V	2281	4822 122 31765	100pF 2% 63V
2212	4822 124 40207	100uF 20% 25V	2282	5322 126 11583	10nF 10% 50V
2213	4822 126 14305	100nF 10% 16V	2283	4822 124 40433	47uF 20% 25V
2214	4822 126 14305	100nF 10% 16V	2286	4822 122 33761	22pF 50V NPO 060
2215	4822 126 14305	100nF 10% 16V	<b>RESISTORS</b>		
2216	4822 126 14305	100nF 10% 16V	3204	4822 051 30472	4k7 5% 0.062W
2217	4822 124 40433	47uF 20% 25V	3205	4822 051 30223	22k 5% 0.062W
2218	4822 126 14305	100nF 10% 16V	3206	4822 051 30472	4k7 5% 0.062W
2219	4822 124 40433	47uF 20% 25V	3207	4822 051 30472	4k7 5% 0.062W
2220	4822 126 14305	100nF 10% 16V	3208	4822 051 30472	4k7 5% 0.062W
2221	4822 124 41584	100uF 20% 10V	3209	4822 051 30221	220R 5% 0.062W
2222	4822 126 14305	100nF 10% 16V	3210	4822 051 30221	220R 5% 0.062W
2223	4822 126 14305	100nF 10% 16V	3211	4822 051 30221	220R 5% 0.062W
2224	4822 126 14305	100nF 10% 16V	3212	4822 051 30101	100R 5% 0.062W
2225	4822 126 14305	100nF 10% 16V	3213	4822 051 30223	22k 5% 0.062W
2226	4822 126 14305	100nF 10% 16V	3214	4822 051 30103	10k 5% 0.062W
2227	4822 126 14315	390pF 5% 50V	3215	4822 051 30479	47R 5% 0.062W
2228	4822 126 14315	390pF 5% 50V	3216	4822 051 30103	10k 5% 0.062W
2229	4822 126 14305	100nF 10% 16V	3217	4822 051 30223	22k 5% 0.062W
2230	4822 126 14305	100nF 10% 16V	3218	4822 051 30472	4k7 5% 0.062W
2231	4822 126 14305	100nF 10% 16V	3220	4822 051 30479	47R 5% 0.062W
2232	4822 126 14494	22nF 10% 25V	3221	4822 117 13632	100k 1% 0.062W
2233	4822 122 33741	10pF 10% 50V	3222	4822 051 30103	10k 5% 0.062W
2234	4822 122 33741	10pF 10% 50V	3223	4822 051 30221	220R 5% 0.062W
2235	4822 126 14305	100nF 10% 16V	3224	4822 051 30221	220R 5% 0.062W
2236	4822 124 40207	100uF 20% 25V	3225	4822 051 30101	100R 5% 0.062W
2237	4822 126 14494	22nF 10% 25V	3226	4822 051 30101	100R 5% 0.062W
2238	4822 126 14305	100nF 10% 16V	3228	4822 051 30101	100R 5% 0.062W
2239	4822 124 40433	47uF 20% 25V	3229	4822 051 30101	100R 5% 0.062W
2240	4822 126 14305	100nF 10% 16V	3230	4822 051 30101	100R 5% 0.062W
2241	4822 124 40248	10uF 20% 63V	3231	4822 051 30472	4k7 5% 0.062W
2242	4822 124 40248	10uF 20% 63V	3232	4822 051 30472	4k7 5% 0.062W
2243	4822 124 41584	100uF 20% 10V	3233	4822 051 30101	100R 5% 0.062W
2244	4822 124 40433	47uF 20% 25V	3234	4822 051 30102	1k 5% 0.062W
2245	4822 124 40769	4.7uF 20% 100V	3235	4822 051 30103	10k 5% 0.062W
2246	4822 124 40769	4.7uF 20% 100V	3236	4822 051 30101	100R 5% 0.062W
2247	4822 124 40433	47uF 20% 25V	3237	4822 051 30472	4k7 5% 0.062W
2248	4822 124 40433	47uF 20% 25V	3238	4822 051 30101	100R 5% 0.062W
2249	4822 124 40433	47uF 20% 25V	3239	4822 051 30103	10k 5% 0.062W
2250	2020 522 94427	100pF 50V	3240	4822 051 30472	4k7 5% 0.062W
2251	2020 522 94427	100pF 50V	3242	4822 051 30103	10k 5% 0.062W
2252	4822 124 40248	10uF 20% 63V	<b>COILS &amp; FILTERS</b>		
2253	4822 124 41584	100uF 20% 10V	5201	2422 543 01137	X'tal Resonator 27MHz
2254	5322 126 11583	10nF 10% 50V	5202	5322 242 73686	Ceram Resonator 12MHz
2255	4822 126 14305	100nF 10% 16V	5203	4822 157 11868	Coil 2.7 H 5%
2256	3198 016 31020	1nF 5% 25V	5204	4822 157 11868	Coil 2.7 H 5%
2257	4822 124 40207	100uF 20% 25V	5205	4822 157 11506	Chip Ind. 120R 100MHz
2258	4822 124 40207	100uF 20% 25V			
2259	5322 126 11583	10nF 10% 50V			
2260	4822 124 40769	4.7uF 20% 100V			
2261	3198 016 31020	1nF 5% 25V			
2264	4822 124 40248	10uF 20% 63V			

**ELECTRICAL PARTS LIST - MPEG-01B BOARD**

5207	4822 526 10704	FE Bead 100MHz	3243	4822 051 30472	4k7 5% 0.062W
5208	4822 526 10704	FE Bead 100MHz	3244	4822 051 30472	4k7 5% 0.062W
5209	4822 526 10704	FE Bead 100MHz	3245	4822 051 30102	1k 5% 0.062W
5210	4822 526 10704	FE Bead 100MHz	3246	4822 051 30759	75R 5% 0.062W
5211	4822 157 11506	Chip Ind. 120R 100MHz	3247	4822 051 30759	75R 5% 0.062W
5212	4822 157 11506	Chip Ind. 120R 100MHz	3248	4822 051 30759	75R 5% 0.062W
5213	4822 157 11506	Chip Ind. 120R 100MHz	3249	4822 051 30221	220R 5% 0.062W
5214	4822 157 11506	Chip Ind. 120R 100MHz	3250	4822 117 12139	22R 5% 0.062W
5215	4822 157 11506	Chip Ind. 120R 100MHz	3251	4822 052 10478	4R7 5% 0.33W
5216	4822 157 11506	Chip Ind. 120R 100MHz	3252	4822 117 12139	22R 5% 0.062W
5217	4822 157 11506	Chip Ind. 120R 100MHz	3253	4822 051 30339	33R 5% 0.062W
<b>DIODES</b>					
6204	4822 130 31983	BAT85	3254	4822 051 30479	47R 5% 0.062W
6205	4822 130 31983	BAT85	3255	4822 051 30479	47R 5% 0.062W
6208	4822 130 34174	BZX79-BAV7	3256	4822 051 30392	3k9 5% 0.062W
<b>TRANSISTORS &amp; INTEGRATED CIRCUITS</b>					
7201	9322 178 33671	ES360FL	3257	4822 051 30472	4k7 5% 0.062W
7202	9965 000 09683	AT27C020-70JC	3259	4822 051 30333	33k 5% 0.1W
7203	9322 164 19668	MSM514266E-60JS	3259	4822 051 30103	10k 5% 0.062W
7204	9322 138 97671	ES3883	3260	4822 051 30103	10k 5% 0.062W
7205	9337 142 60653	74HC04D	3261	4822 051 30563	56k 5% 0.1W
7207	4822 209 83357	NJM4560M	3262	4822 051 30333	33k 5% 0.1W
7208	5322 130 42758	BC857BW	3263	4822 051 30479	47R 5% 0.062W
7209	3198 010 42310	BC847BW	3264	4822 051 30103	10k 5% 0.062W
7211	9322 178 32888	LF27C0T	3265	4822 051 30563	56k 5% 0.1W
7212	9352 701 41518	CV8210B-83C51RC+	3266	4822 051 30333	33k 5% 0.1W
7214	3198 010 42310	BC847BW	3267	4822 051 30333	33k 5% 0.1W
<b>Note:</b> Completed MPEG-01 module available on service stock. Code numbers are published for orientation only.					

**COILS & FILTERS**

5201	2422 543 01137	X'tal Resonator 27MHz
5202	5322 242 73686	Ceram Resonator 12MHz
5203	4822 157 11868	Coil 2.7 H 5%
5204	4822 157 11868	Coil 2.7 H 5%
5205	4822 157 11506	Chip Ind. 120R 100MHz

# ETF7 TAPE MODULE

## (Non-Dolby Version)

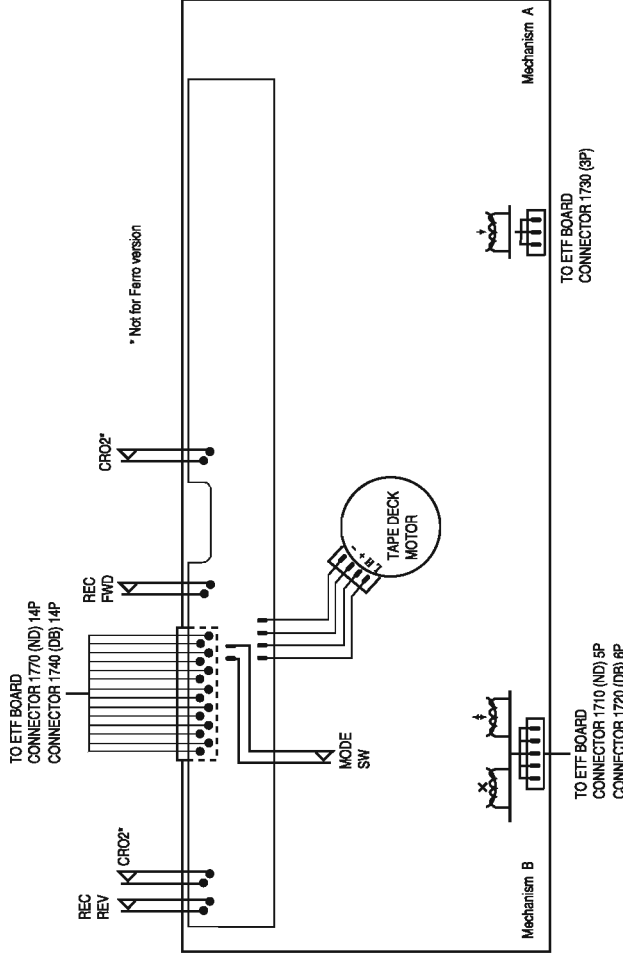
This module is not intended to be repaired on component level. Circuit Diagram and Printed Circuit Board drawings are published for orientation only. In case of defects please replace the entire board and mechanism.

The Tape Board can be ordered with codenumber "9940 000 02967".  
The Tape Deck can be ordered with codenumber "9940 000 02927".

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### Tapedeck wiring (Double deck)

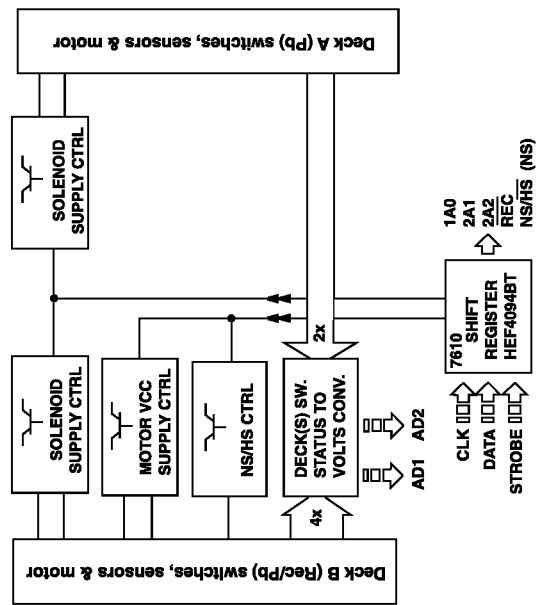
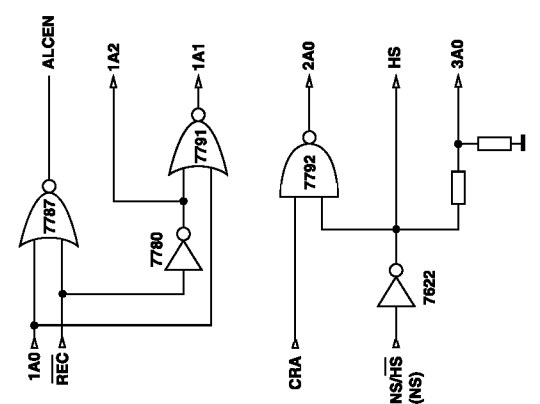
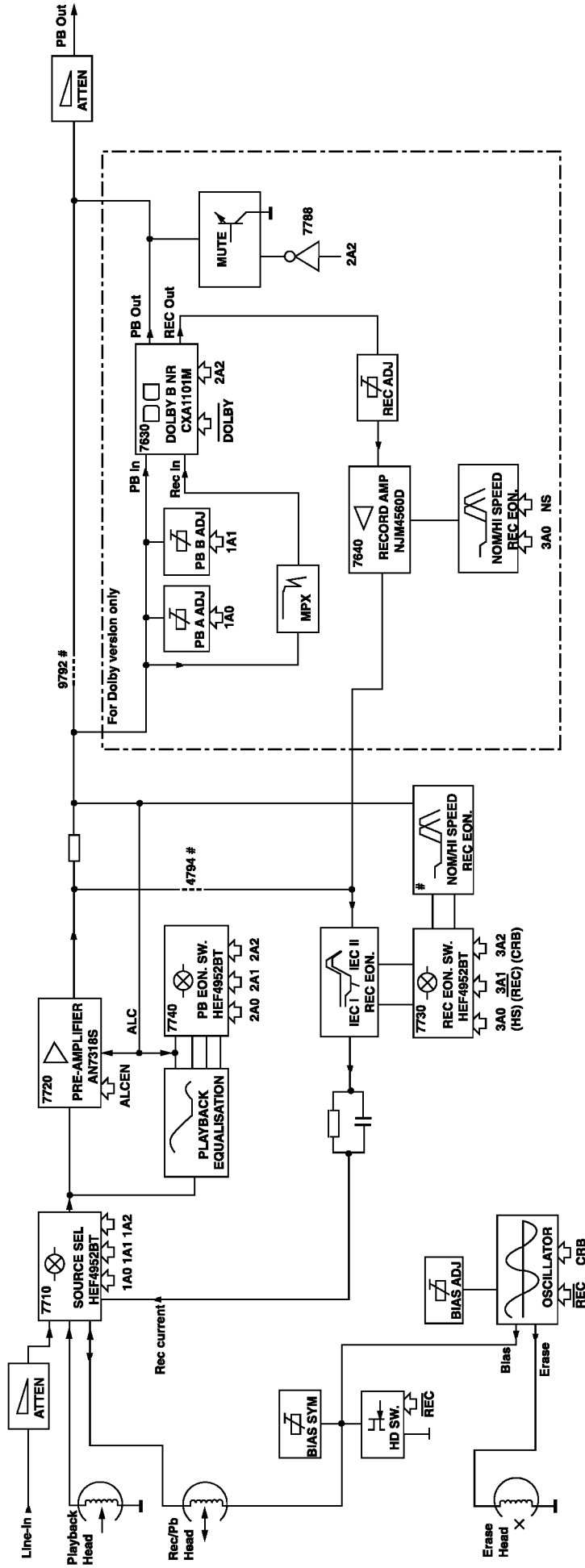


### Variations table for Analog Circuit

	Autoreverse ND/DD/FR		Non-autoreverse ND/DD/FF	
	Chrome/Ferro	Ferro	Chrome/Ferro	Ferro
2624	-	100nF	-	100nF
2701 , 2702	150pF	270pF	270pF	270pF
2703 , 2704	100pF	220pF	220pF	220pF
2717 , 2718	10nF	15nF	15nF	15nF
2721 , 2722	6.8nF	-	6.8nF	-
2727 , 2728	470pF	1nF	1nF	1nF
3616	10k	1k	1k	1k
3618	6k8	-	-	-
3620	10k trimmer	-	10k trimmer	10k trimmer
3672	4k7	-	-	-
3676	47k	-	-	-
3687	220R	-	220R	-
3688	680R	-	-	-
3723 , 3724	15k	18k	18k	18k
3725 , 3726	10R	10R	10R	-
3727 , 3728	5k6	6k8	6k8	6k8
3729 , 3730	3k3	4k7	4k7	4k7
3743 , 3744	1k5	2k2	2k2	2k2
3745 , 3746	3k3	5k6	5k6	5k6
3754 , 3755	1M	47R	47R	47R

	Autoreverse ND/DD/FR		Non-autoreverse ND/DD/FF	
	Chrome/Ferro	Ferro	Chrome/Ferro	Ferro
3769	12k	8k2	8k2	8k2
3772	6k8	5k6	5k6	5k6
4785	-	-	-	0R Jumper
3774	15k	8k2	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

- 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.
- 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.
- 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.
- 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.
- Amplifier PB/REC**  
Amplifier IC7720 (AN7323S) is for the purpose of amplifying the Playback and Recording signal from the Mode Selector.
- 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.
- 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.
- 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.
- 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).
- Bias Level**  
Bias Level making use of the Variable resistor (3773) for adjusting the optimal level of the bias current for Ferro or Chrome.
- 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.
- 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 ER 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 amos 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 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	Not 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 (For Non-Dolby version only)**

○ 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 (For Dolby B NR version only)**

○ 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 (For Double Deck versions only)**

○ 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

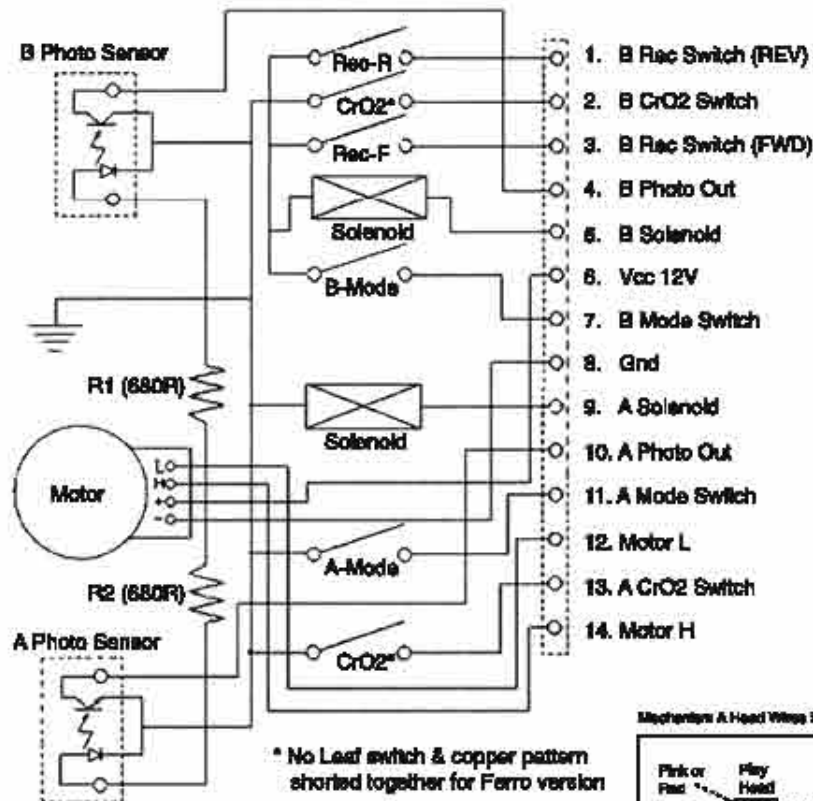
**CONNECTOR 1740****DECK A & B CONTROL INTERFACE (For Dolby B NR version only)**

○ 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	

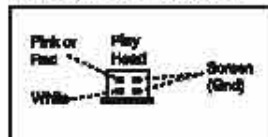
**CONNECTOR 1770****DECK A & B CONTROL INTERFACE (For Non-Dolby version only)**

○ 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

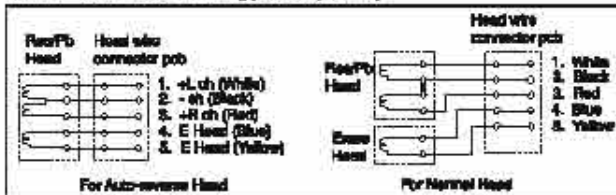


Mechanism A Head Wires Soldering

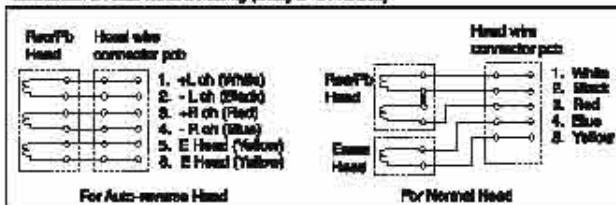


\* No Leaf switch & copper pattern shorted together for Ferro version

Mechanism B Head Wires Soldering (Non-Dolby version)



Mechanism B Head Wires Soldering (Dolby B NR version)

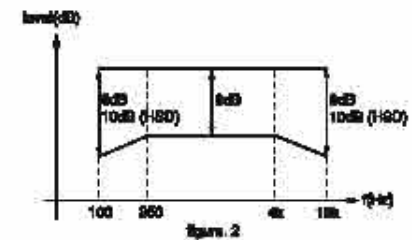
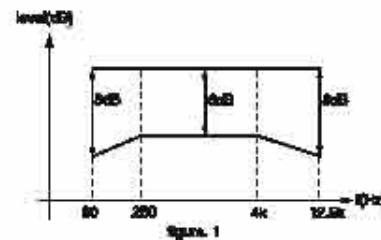


TAPE ADJUSTMENT & CHECK TABLE

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST	
					with	to
<b>ADJUST MOTOR SPEED</b>						
NORMAL SPEED	SBC420 2150Hz	PLAY B	1 or 2 LEFT RIGHT	frequency counter	3220	3150Hz +/- 0.5%
		PLAY A			check	5150Hz -0.5/+1.0%
<b>CHECK WOW &amp; FLUTTER</b>						
DECK A & B	SBC420 2150Hz	PLAY	1 or 2 LEFT RIGHT	WSF-meter	check	<0.4 % DIN
<b>ADJUST AZIMUTH</b>						
DECK A & B	SBC420 100Hz	PLAY FWD	1 or 2 LEFT RIGHT	mV-meter	left hand screw	max. output level & left-right
		PLAY REV #			right hand screw	
<b>CHECK PLAYBACK FREQUENCY RESPONSE</b>						
DECK A & B	SBC420	PLAY	1 or 2 LEFT RIGHT	mV-meter	check	limits see fig. 1
<b>ADJUST BIAS CURRENT</b>						
DECK B	SBC418A*	RECORD	5 or 6 LEFT RIGHT	mV-meter	3773	985mV
	SBC420				check	750mV +/- 1.5dB
<b>CHECK OVERALL FREQUENCY RESPONSE AND DISTORTION</b>						
Inject 3mV signals 100Hz, 250Hz, 1kHz, 10kHz, 12.5kHz via 3 or 4	SBC418A* 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	SBC418A* or SBC420	RECORD B				
	RECORDED CASSETTE	PLAY B	1 or 2 LEFT RIGHT	THD-meter	check	<3%*

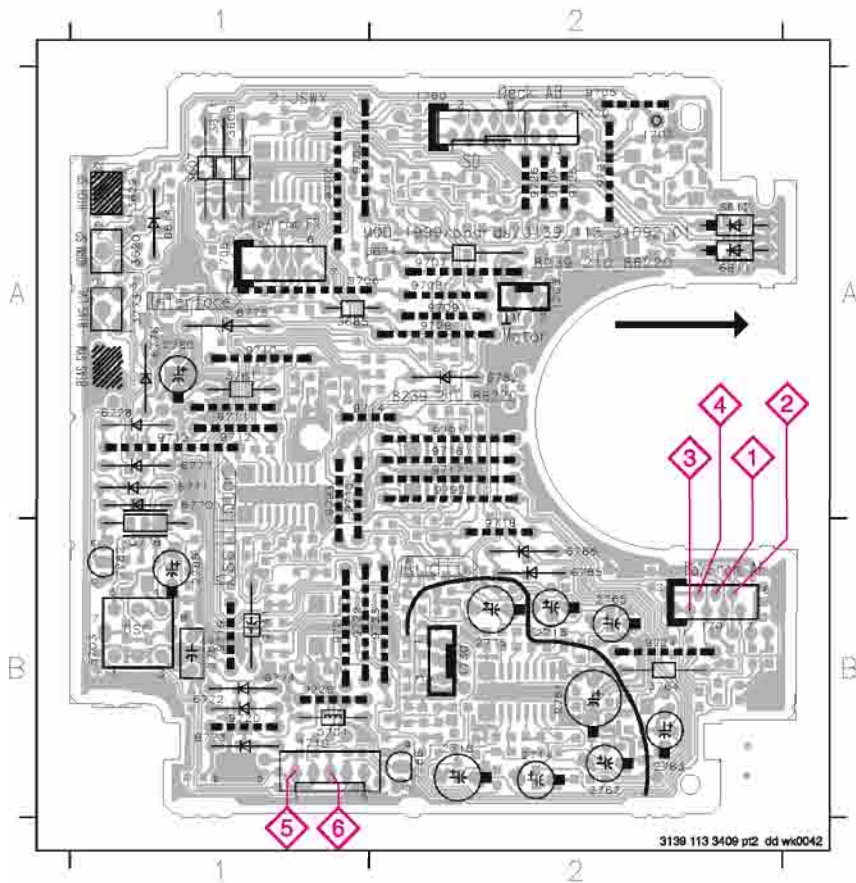
SBC418A\* : 4622 307 30089  
SBC420 : 4622 307 30071

\* 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

701	B2	2714	B2	2784	B1	3761	A1	6770	A1	8782	A2	9706	A1	9715	A1	9724	B2
702	A2	2715	B2	2785	B1	3762	A2	6771	A1	8783	A2	9707	A2	9716	A2	9725	A2
703	A1	2716	B2	2786	B1	3763	A1	6772	A1	8784	B2	9708	A2	9717	A2	9726	A2
706	A1	2717	B1	2787	A1	3764	A2	6773	A1	8785	B1	9709	A2	9718	A1	9727	A2
710	B1	2718	B2	2788	A1	3765	A1	6774	B1	8786	B2	9710	A1	9719	A1	9728	B2
730	B1	2719	B2	2789	A1	3766	A2	6775	A1	8787	A1	9711	A1	9720	B1	9729	B2
760	A2	2720	B2	2790	A1	3767	A1	6776	A1	8788	A1	9712	A1	9721	A1	9730	A2
770	A2	2721	B2	2791	A1	3768	A2	6777	A1	8789	A2	9713	A1	9722	B1	9731	A2
2713	B2	2780	A1	2792	A1	3769	A1	6778	A1	8790	A2	9714	A1	9723	B2	9732	A1



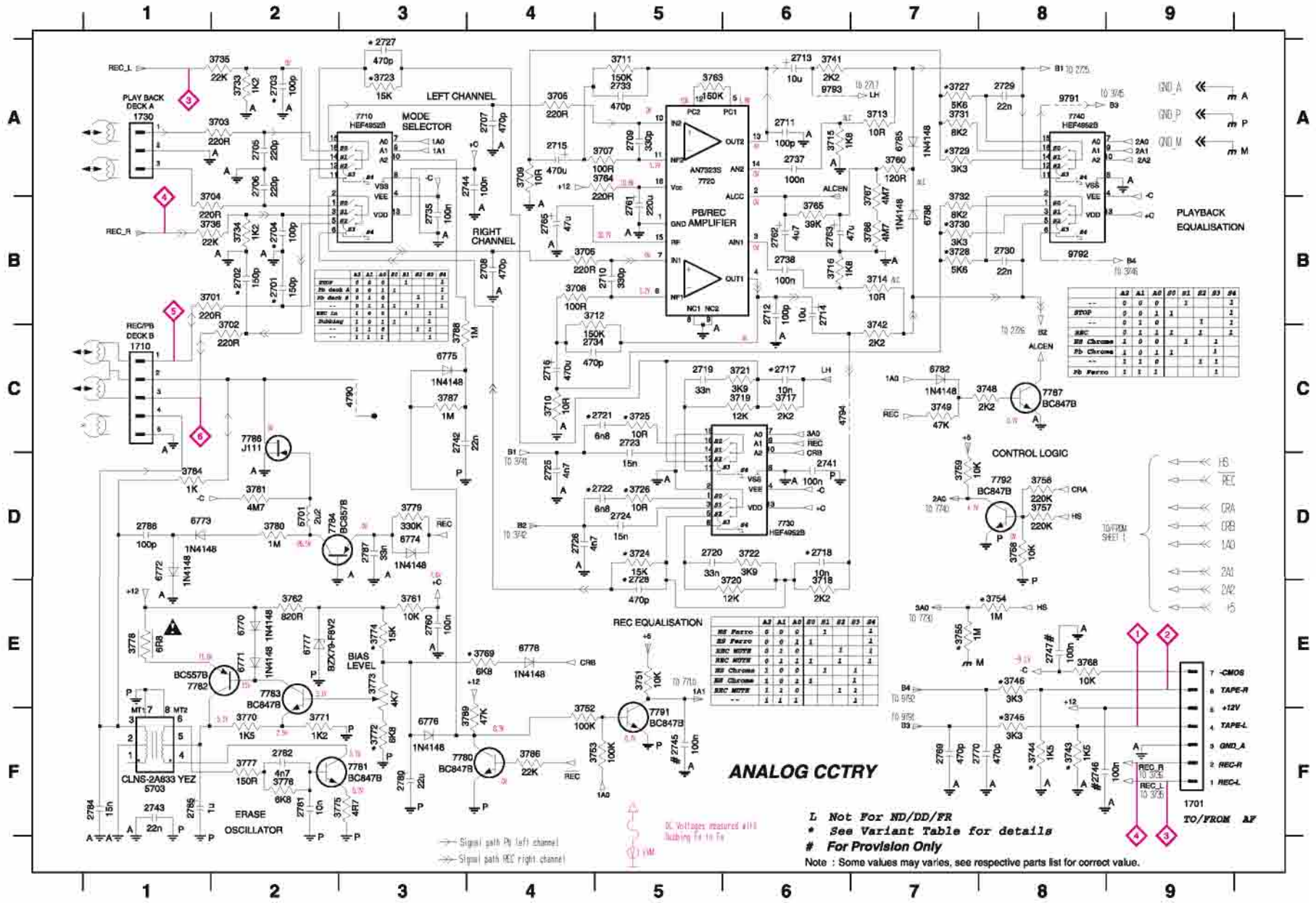
CHIP LAYOUT

2621	A2	2724	B2	3602	A1	3688	A2	3722	A2	4701	A1	4727	B1	7612	A1
2622	A2	2725	B2	3603	A1	3689	A1	3723	A2	4702	A1	4728	B1	7613	A1
2623	A1	2726	B2	3604	A1	3690	A1	3724	A2	4703	A1	4729	B1	7614	A1
2625	A2	2727	B2	3605	A1	3691	A1	3725	A2	4704	A1	4730	B1	7615	A1
2626	A1	2728	B2	3606	A1	3692	A1	3726	A2	4705	A1	4731	B1	7616	A1
2627	A1	2729	B2	3607	A1	3693	A1	3727	A2	4706	A1	4732	B1	7617	A1
2701	B1	2730	B2	3608	A2	3694	A2	3728	A2	4707	A1	4733	B2	7618	A1
2702	B2	2731	B1	3609	A2	3695	A2	3729	A2	4708	A2	4734	B2	7619	A1
2703	B1	2732	B1	3610	A2	3696	A2	3730	A2	4709	A2	4735	B2	7620	A1
2704	B1	2733	B1	3611	A2	3697	A2	3731	A2	4710	A1	4736	B2	7621	A1
2705	B1	2734	B1	3612	A2	3698	A2	3732	A2	4711	A1	4737	B2	7622	A1
2706	B1	2735	B1	3613	A2	3699	A2	3733	A2	4712	A2	4738	B2	7623	A1
2707	B1	2736	B1	3614	A2	3700	A2	3734	A2	4713	A1	4739	B2	7624	A1
2708	B1	2737	B1	3615	A2	3701	A2	3735	A2	4714	A1	4740	B2	7625	A1
2709	B1	2738	B1	3616	A2	3702	A2	3736	A2	4715	A1	4741	B2	7626	A1
2710	B1	2739	B1	3617	A2	3703	A2	3737	A2	4716	A1	4742	B2	7627	A1
2711	B1	2740	B1	3618	A2	3704	A2	3738	A2	4717	A1	4743	B2	7628	A1
2712	B1	2741	B1	3619	A2	3705	A2	3739	A2	4718	A1	4744	B2	7629	A1
2718	B2	2742	B2	3620	A2	3706	A2	3740	A2	4719	A2	4745	B2	7630	A1
2719	B2	2743	B2	3621	A2	3707	A2	3741	A2	4720	A2	4746	B2	7631	A1
2720	B2	2744	B2	3622	A2	3708	A2	3742	A2	4721	A2	4747	B2	7632	A1
2721	A2	2745	B2	3623	A2	3709	A2	3743	A2	4722	A2	4748	B2	7633	A1
2722	A2	2746	B2	3624	A2	3710	A2	3744	A2	4723	A2	4749	B2	7634	A1
2723	A2	2747	B2	3625	A2	3711	A2	3745	A2	4724	A2	4750	B2	7635	A1
		2748	B2	3626	A2	3712	A2	3746	A2	4725	A1	4751	B2	7636	A1
		2749	B2	3627	A2	3713	A2	3747	A2	4726	B1	4752	B2	7637	A1
		2750	B2	3628	A2	3714	A2	3748	A2	4727	B1	4753	B2	7638	A1
		2751	B2	3629	A2	3715	A2	3749	A2	4728	B1	4754	B2	7639	A1
		2752	B2	3630	A1	3716	A2	3750	A2	4729	B1	4755	B2	7640	A1
		2753	B2	3631	A1	3717	A1	3751	A2	4730	B1	4756	B2	7641	A1
		2754	B2	3632	A2	3718	B2	3752	A2	4731	B1	4757	B2	7642	A1
		2755	B2	3633	A2	3719	B2	3753	A2	4732	B1	4758	B2	7643	A1
		2756	B2	3634	A2	3720	B2	3754	A2	4733	B1	4759	B2	7644	A1
		2757	B2	3635	A2	3721	B2	3755	A2	4734	B1	4760	B2	7645	A1
		2758	B2	3636	A2	3722	B2	3756	A2	4735	B1	4761	B2	7646	A1
		2759	B2	3637	A2	3723	B2	3757	A2	4736	B1	4762	B2	7647	A1
		2760	B2	3638	A2	3724	B2	3758	A2	4737	B1	4763	B2	7648	A1
		2761	B2	3639	A2	3725	B2	3759	A2	4738	B1	4764	B2	7649	A1
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		2766	B2	3644	A2	3730	B2	3764	A2	4743	B1	4769	B2	7654	A1
		2767	B2	3645	A2	3731	B2	3765	A2	4744	B1	4770	B2	7655	A1
		2768	B2	3646	A2	3732	B2	3766	A2	4745	B1	4771	B2	7656	A1
		2769	B2	3647	A2	3733	B2	3767	A2	4746	B1	4772	B2	7657	A1
		2770	B2	3648	A2	3734	B2	3768	A2	4747	B1	4773	B2	7658	A1
		2771	B2	3649	A2	3735	B2	3769	A2	4748	B1	4774	B2	7659	A1
		2772	B2	3650	A2	3736	B2	3770	A2	4749	B1	4775	B2	7660	A1
		2773	B2	3651	A2	3737	B2	3771	A2	4750	B1	4776	B2	7661	A1
		2774	B2	3652	A2	3738	B2	3772	A2	4751	B1	4777	B2	7662	A1
		2775	B2	3653	A2	3739	B2	3773	A2	4752	B1	4778	B2	7663	A1
		2776	B2	3654	A2	3740	B2	3774	A2	4753	B1	4779	B2	7664	A1
		2777	B2	3655	A2	3741	B2	3775	A2	4754	B1	4780	B2	7665	A1
		2778	B2	3656	A2	3742	B2	3776	A2	4755	B1	4781	B2	7666	A1
		2779	B2	3657	A2	3743	B2	3777	A2	4756	B1	4782	B2	7667	A1
		2780	B2	3658	A2	3744	B2	3778	A2	4757	B1	4783	B2	7668	A1
		2781	B2	3659	A2	3745	B2	3779	A2	4758	B1	4784	B2	7669	A1
		2782	B2	3660	A2	3746	B2	3780	A2	4759	B1	4785	B2	7670	A1
		2783	B2	3661	A2	3747	B2	3781	A2	4760	B1	4786	B2	7671	A1
		2784	B2	3662	A2	3748	B2	3782	A2	4761	B1	4787	B2	7672	A1
		2785	B2	3663	A2	3749	B2	3783	A2	4762	B1	4788	B2	7673	A1
		2786	B2	3664	A2	3750	B2	3784	A2	4763	B1	4789	B2	7674	A1
		2787	B2	3665	A2	3751	B2	3785	A2	4764	B1	4790	B2	7675	A1
		2788	B2	3666	A2	3752	B2	3786	A2	4765	B1	4791	B2	7676	A1
		2789	B2	3667	A2	3753	B2	3787	A2	4766	B1	4792	B2	7677	A1
		2790	B2	3668	A2	3754	B2	3788	A2	4767	B1	4793	B2	7678	A1
		2791	B2	3669	A2	3755	B2	3789	A2	4768	B1	4794	B2	7679	A1
		2792	B2	3670	A2	3756	B2	3790	A2	4769	B1	4795	B2	7680	A1
		2793	B2	3671	A2	3757	B2	3791	A2	4770	B1	4796	B2	7681	A1
		2794	B2	3672	A2	3758	B2	3792	A2	4771	B1	4797	B2	7682	A1
		2795	B2	3673	A2	3759	B2	3793	A2	4772	B1	4798	B2	7683	A1
		2796	B2	3674	A2	3760	B2	3794	A2	4773	B1	4799	B2	7684	A1
		2797	B2	3675	A2	3761	B2	3795	A2	4774	B1	4800	B2	7685	A1
		2798	B2	3676	A2	3762	B2	3796	A2	4775	B1	4801	B2	7686	A1
		2799	B2	3677	A2	3763	B2	3797	A2	4776	B1	4802	B2	7687	A1
		2800	B2	3678	A2	3764	B2	3798	A2	4777	B1	4803	B2	7688	A1
		2801	B2	3679	A2	3765	B2	3799	A2	4778	B1	4804	B2	7689	A1
		2802	B2	3680	A1	3766	B2	3800	A2	4779	B1	4805	B2	7690	A1
		2803	B2	3681	A1	3767	B2	3801	A2	4780	B1	4806	B2	7691	A1
		2804	B2	3682	A2	3768	B2	3802	A2	4781	B1	4807	B2	7692	A1
		2805	B2	3683	A2	3769	B2	3803	A2	4782	B1	4808	B2	7693	A1
		2806	B2	3684	A2	3770	B2	3804	A2	4783	B1	4809	B2	7694	A1
		2807	B2	3685	A2	3771	B2	3805	A2	4784	B1	4810	B2	7695	A1
		2808	B2	3686	A2	3772	B2	3806	A2	4785	B1	4811	B2	7696	A1
		2809	B2	3687	A2	3773	B2	3807	A2	4786	B1	4812	B2	7697	A1
		2810	B2	3688	A2	3774	B2	3808	A2	4787	B1	4813	B2	7698	A1
		2811	B2	3689	A2	3775	B2	3809	A2	4788	B1	4814	B2	7699	A1
		2812	B2	3690	A2	3776	B2	3810	A2	4789	B1	4815	B2	7700	A1
		2813	B2	3691	A2	3777	B2	3811	A2	4790	B1	4816</			



ANALOG CIRCUIT

1701 P8	2705 A2	2712 B6	2719 C5	2726 D4	2735 B3	2746 F5	2765 B4	2785 F1	3705 A4	3712 B4	3719 C6	3726 D5	3733 A2	3744 F8	3753 F5	3760 A7	3767 A7	3774 E3	3781 D2	4784 C6	6774 D3	6785 E7	7782 E1	9791 A8
1710 C1	2706 A2	2713 B6	2720 D5	2727 A3	2737 A6	2748 F8	2769 F7	2786 D1	3706 B4	3713 A7	3720 E6	3727 A7	3734 B2	3745 F8	3754 E8	3761 E3	3768 E8	3775 F3	3784 D1	5701 D2	6775 C3	7710 A3	7783 E2	9792 B8
1730 A1	2707 A4	2714 B6	2721 C5	2728 E5	2738 B6	2747 E8	2770 F8	2787 D3	3707 A5	3714 B7	3721 C6	3728 B7	3735 A2	3746 E8	3755 E7	3762 E2	3769 E4	3776 F2	3786 F4	5703 F1	6776 F3	7720 A5	7784 D2	9793 A6
2701 B2	2708 B4	2715 A4	2722 D5	2729 A8	2741 D6	2760 E3	2780 F3	3701 B1	3708 B4	3715 A6	3722 D6	3729 A7	3736 B1	3748 C8	3758 D6	3763 A5	3770 F2	3777 F2	3787 C3	6770 E2	6777 E2	7730 D6	7786 C2	
2702 B2	2709 A5	2718 C4	2723 C5	2730 B8	2742 C3	2761 B5	2781 F2	3702 C2	3709 A4	3718 B6	3723 A3	3730 B7	3741 A8	3749 C7	3757 D8	3764 A5	3771 F2	3778 E1	3788 C3	6771 E2	6778 E4	7740 A8	7787 C8	
2703 A2	2710 B5	2717 C6	2724 D5	2733 A5	2743 F1	2762 B6	2782 F2	3703 A2	3710 C4	3717 C6	3724 D5	3731 A7	3742 C7	3751 E5	3758 D8	3765 B6	3772 F3	3779 D3	3789 F4	6772 D1	6782 C7	7750 F4	7791 F5	
2704 B2	2711 A6	2718 D6	2725 D4	2734 C4	2744 A4	2763 B6	2784 F1	3704 B1	3711 A5	3718 E6	3725 C5	3732 B7	3743 F8	3752 F4	3759 D7	3766 B7	3773 E3	3780 D2	4790 C3	6773 D1	6785 A7	7781 F3	7792 D6	

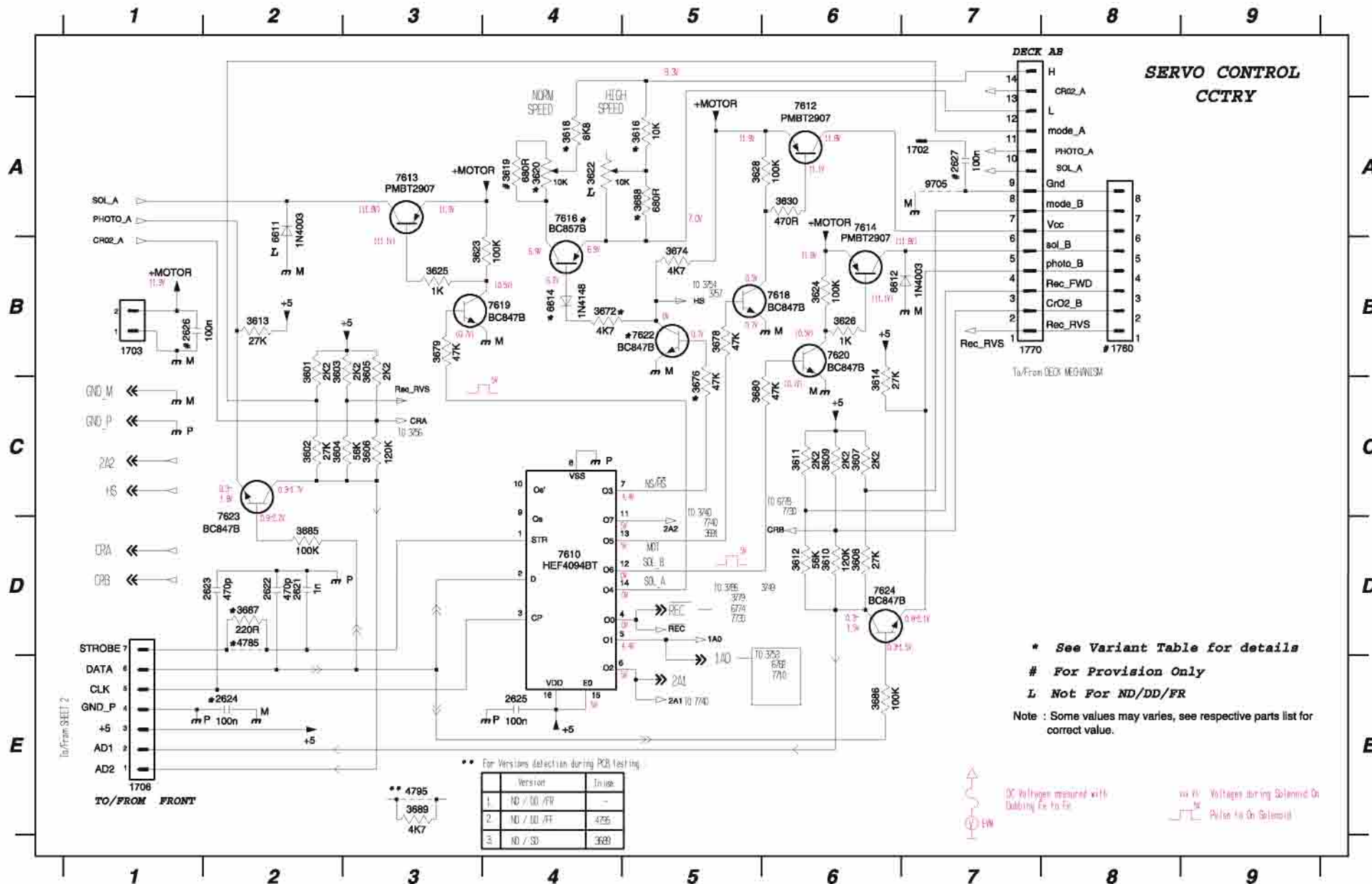


ANALOG CSTRY

L Not For ND/DD/FR  
 \* See Variant Table for details  
 # For Provision Only  
 Note : Some values may varies, see respective parts list for correct value.

SERVO CONTROL CIRCUIT

- 1702 A7 1760 B8 2622 D2 2625 E4 3601 B2 3604 C2 3607 C6 3610 D6 3613 B2 3618 A4 3622 A4 3625 B3 3630 A6 3676 C5 3680 C5 3687 D2 4785 D2 6612 B6 7612 A6 7616 A4 7620 B6 7624 D6
- 1703 B1 1770 B7 2623 D2 2626 B1 3602 C2 3605 B3 3608 D8 3611 C6 3614 C6 3619 A4 3623 B3 3626 B6 3672 B4 3678 B5 3685 D2 3688 A5 4795 E3 6614 B4 7613 A3 7618 B6 7622 B5 9705 A7
- 1706 E1 2621 D2 2624 E2 2627 A7 3603 B2 3606 C3 3609 C6 3612 D6 3616 A5 3620 A4 3624 B6 3628 A5 3674 B5 3679 B3 3686 E6 3689 E3 6611 A2 7610 D4 7614 A6 7619 B4 7623 D2

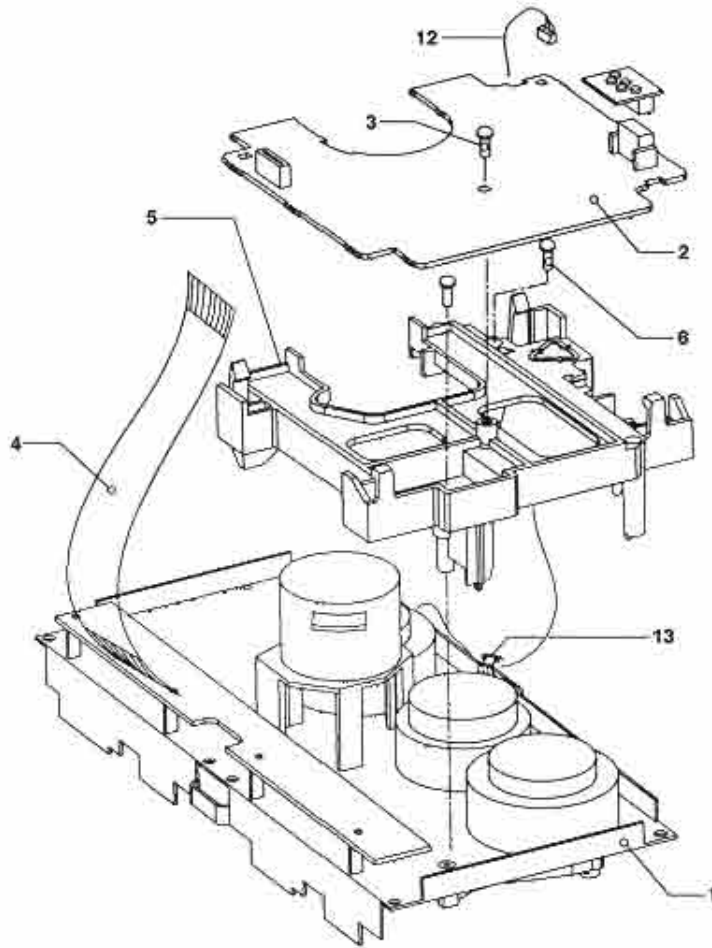


\*\* For Versions detection during PCB testing

Version	In Use
1. ND / DD / FR	-
2. ND / DD / FF	425
3. ND / DD	369

\* See Variant Table for details  
 # For Provision Only  
 L Not For ND/DD/FR  
 Note : Some values may varies, see respective parts list for correct value.



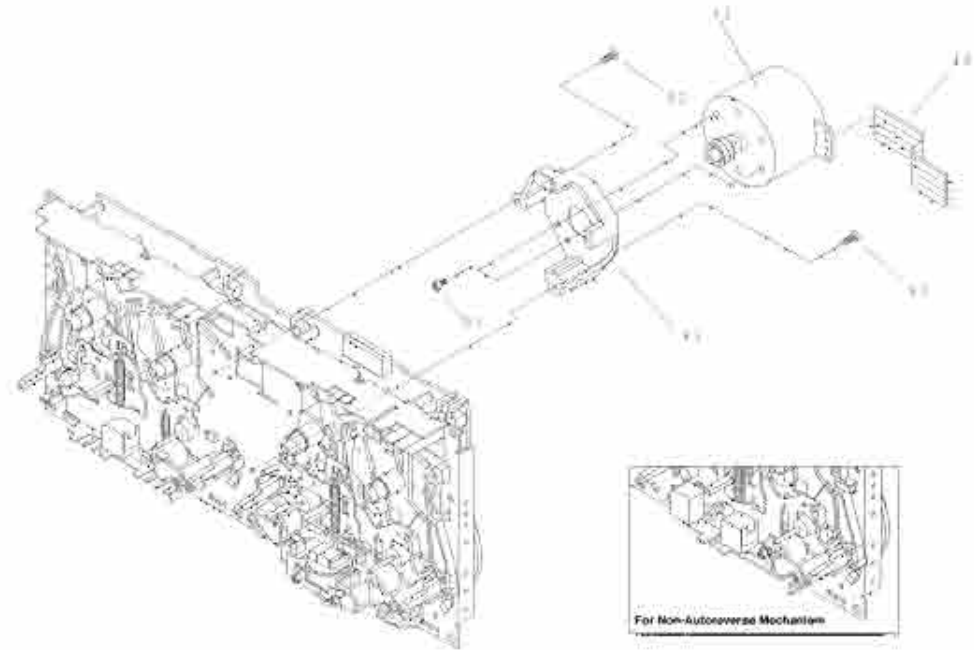


010 118 77000 (rev. ... 77000) de vna20

**TAPE MODULE EXPLODED VIEW**

- 1 3130 118 77130 Autoreverse Mech. CWE44FR01
- 1 3130 118 77140 Non-Autoreverse Mech. CWE44FR02 Chroma/Ferro
- 1 3130 118 77150 Non-Autoreverse Mech. CWE44FR05 Ferro
- 3 - Screw D3 x 10
- 6 - Screw M2 x 16
- 7 3130 110 34080 Flex Cable 14 pin 7,5 cm

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



For Non-Autoreverse Mechanism

**TAPE MECHANISM - MOTOR EXPLODED VIEW**

- 31 4822 381 11055 Motor Assembly
- 91 - Screw M2, 6 x 5
- 92 - Screw M2 x 5

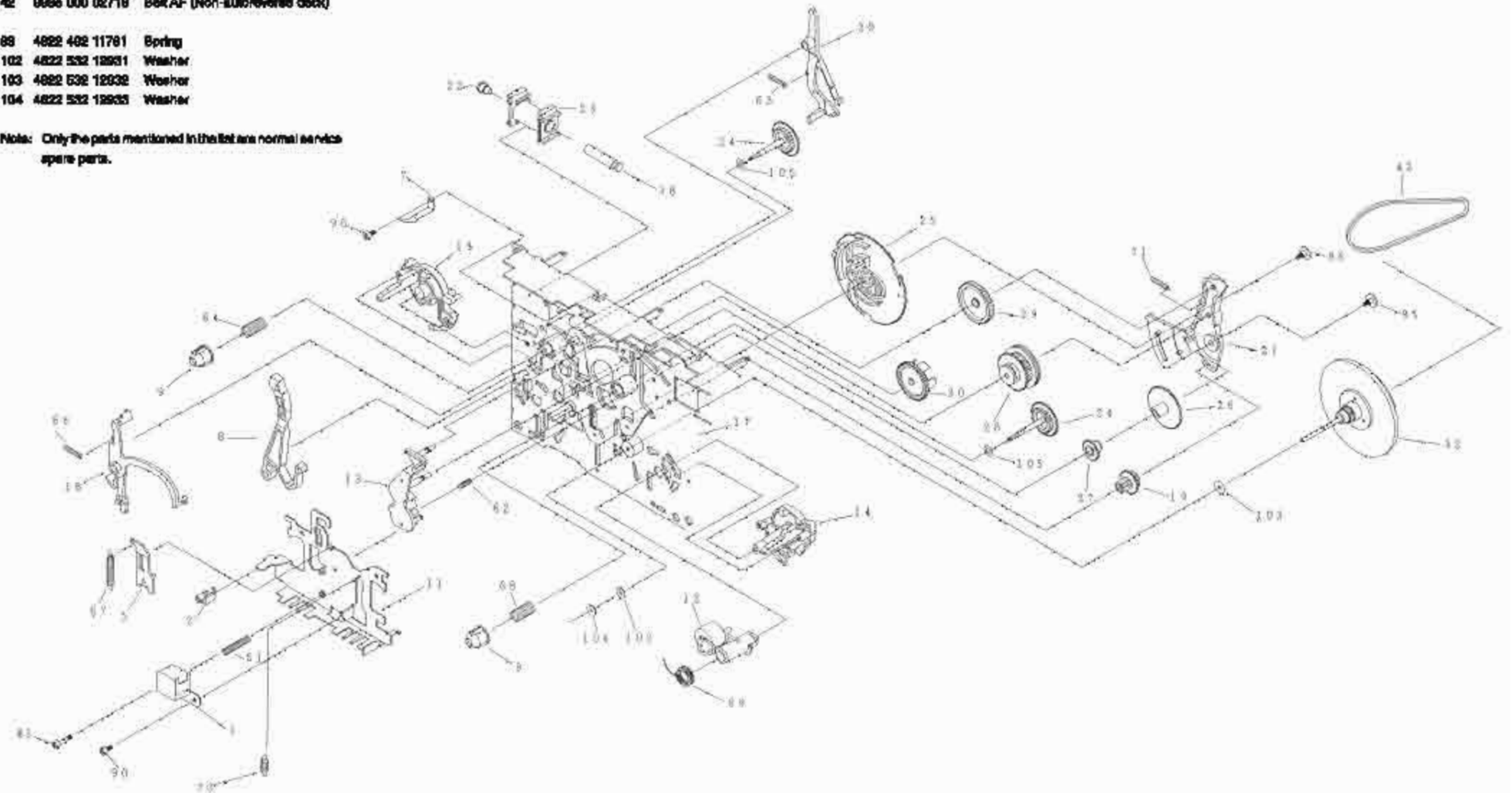
Note: Only the parts mentioned in this list are normal service spare parts.

## TAPE MECHANISM A - PLAY

**MECHANICAL PARTS - PLAY MECHANISM**

1	0005 000 02013	Play Head (Non-Autoreverse deck)
1	0005 000 02021	Play Head (Autoreverse deck)
12	4822 402 10972	Pinch Arm Assembly R
25	0005 000 02214	Coil Assembly
26	0005 000 06443	Cam Gear
32	4822 528 11208	Flywheel Assembly RV
42	0005 000 02216	Belt AF (Autoreverse deck)
42	0005 000 02718	Belt AF (Non-autoreverse deck)
88	4822 482 11781	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.

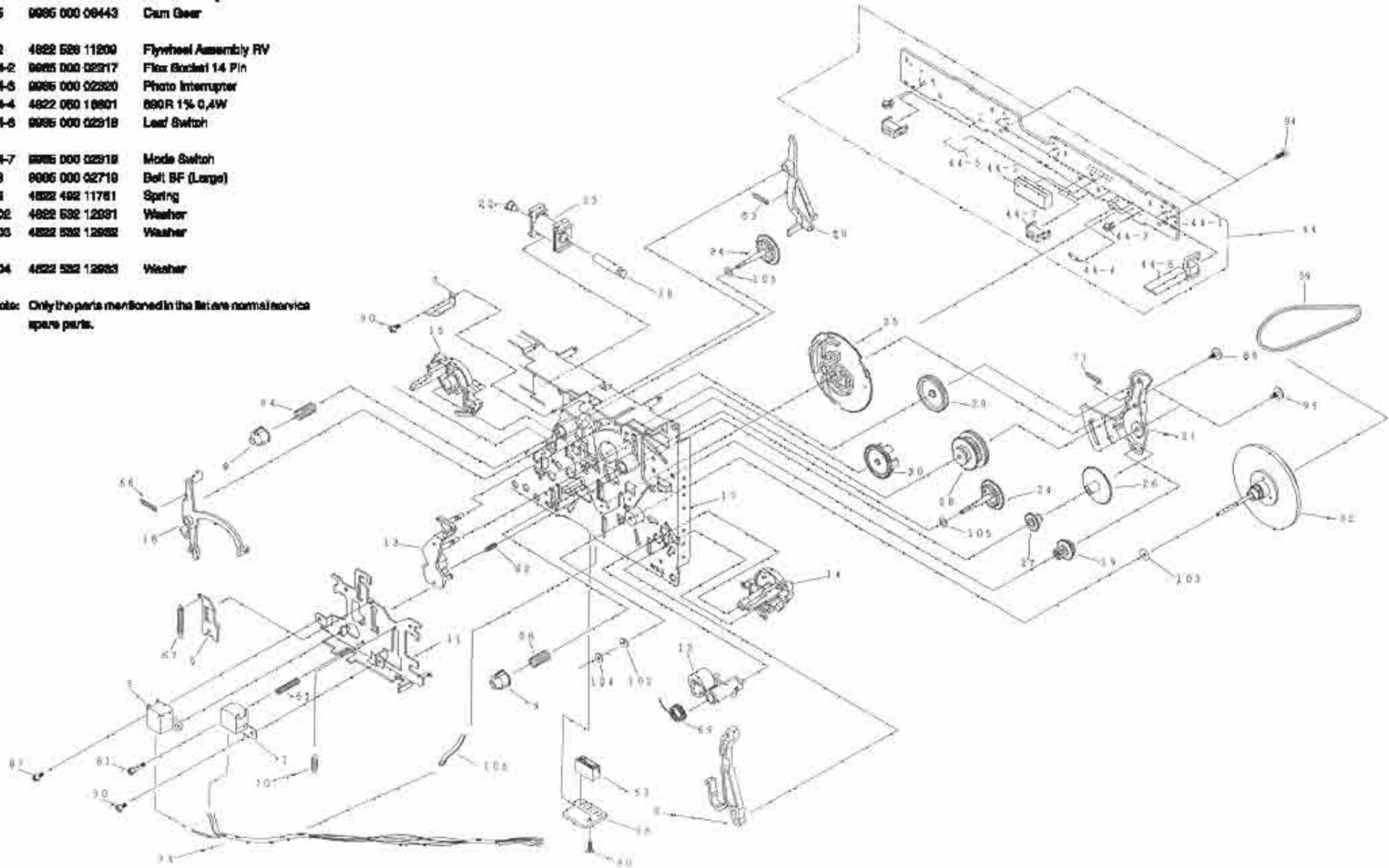




**TAPE MECHANISM B - RECORD/PLAYBACK (Not-At-Mainframe Variant)**
**MECHANICAL PARTS - RECORD MECHANISM**

1	9905 000 02913	Play Head
3	9905 000 02900	Head, Erase
12	4822 402 10672	Pinch Arm Assembly R
23	9925 000 02914	Coil Assembly
25	9905 000 06443	Cum Gear
32	4822 526 11200	Flywheel Assembly RV
44-2	9905 000 02917	Flux Shield 14 Pin
44-5	9905 000 02920	Photo Interrupter
44-4	4822 060 10601	890R 1% 0.4W
44-6	9905 000 02919	Leaf Switch
44-7	9905 000 02918	Mode Switch
58	9905 000 02719	Bolt BF (Large)
68	4822 492 11781	Spring
102	4822 532 12991	Washer
103	4822 532 12992	Washer
104	4822 532 12993	Washer

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

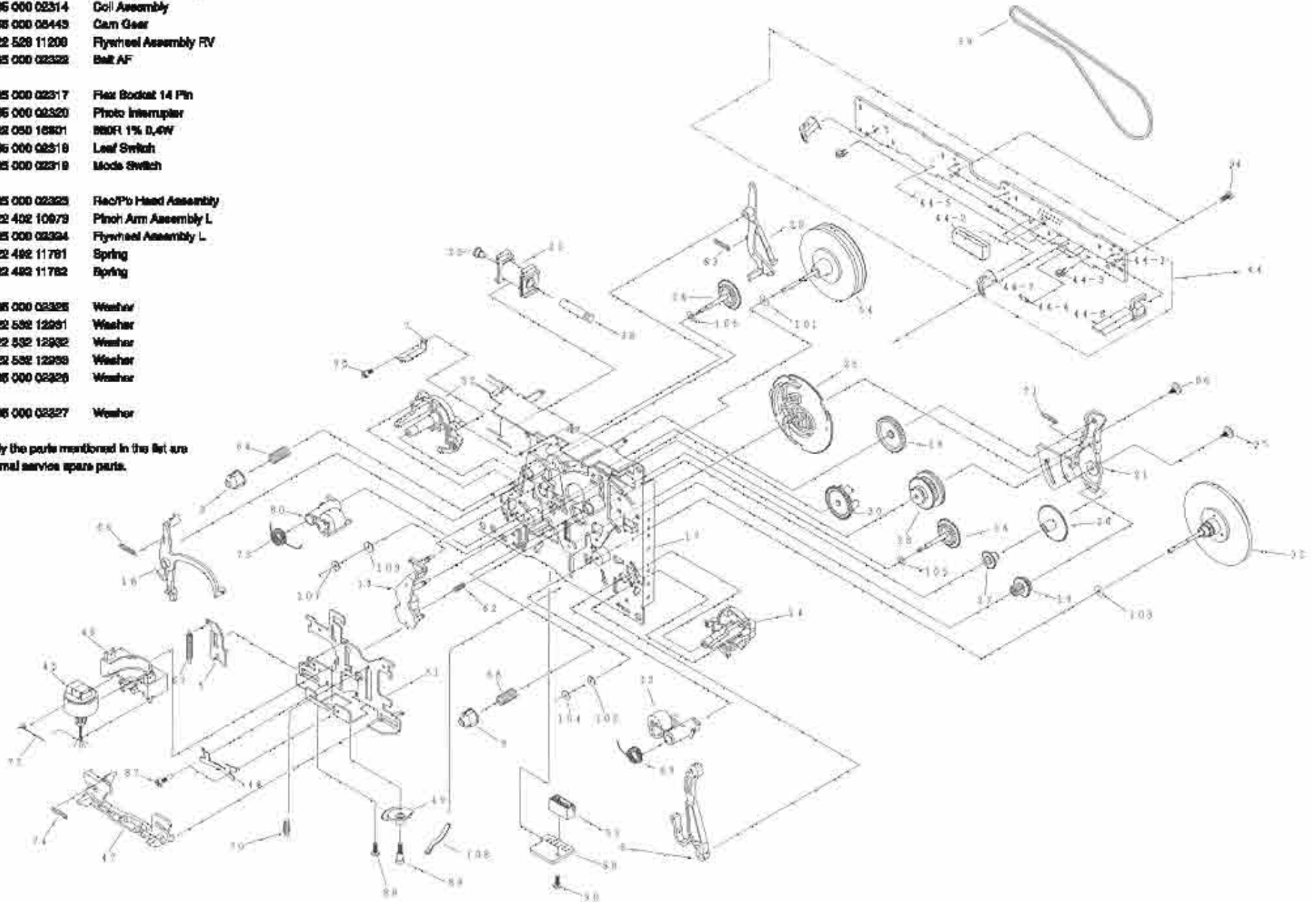




**TAPE MECHANISM B - RECORD/PLAYBACK (Autoreverse Version)**
**MECHANICAL PARTS - REC/PB MECHANISM**

12	4822 402 10972	Pinch Arm Assembly R
23	9985 000 02314	Coil Assembly
28	9985 000 05443	Cam Gear
32	4822 529 11200	Flywheel Assembly RV
39	9985 000 02322	Belt AF
44-2	9985 000 02317	Flex Bracket 14 Pin
44-3	9985 000 02320	Photo Interrupter
44-4	4822 050 16901	BBFR 1% D,4W
44-6	9985 000 02319	Leaf Switch
44-7	9985 000 02318	Mode Switch
45	9985 000 02323	Rec/Pb Head Assembly
60	4822 402 10973	Pinch Arm Assembly L
54	9985 000 02324	Flywheel Assembly L
69	4822 482 11781	Spring
73	4822 482 11782	Spring
101	9985 000 02325	Washer
102	4822 532 12931	Washer
103	4822 532 12932	Washer
104	4822 532 12939	Washer
107	9985 000 02326	Washer
109	9985 000 02327	Washer

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



## ELECTRICAL PARTS LIST - E7F7 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 - E7F7 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	6k 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	OR Jumper 0805
4702	482205120008	OR Jumper 0805
4703	482205120008	OR Jumper 0805
4704	482205120008	OR Jumper 0805
4705	482205120008	OR 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	482213011201	PMBT2907			
7613	482213011201	PMBT2907			
7614	482213011201	PMBT2907			
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			

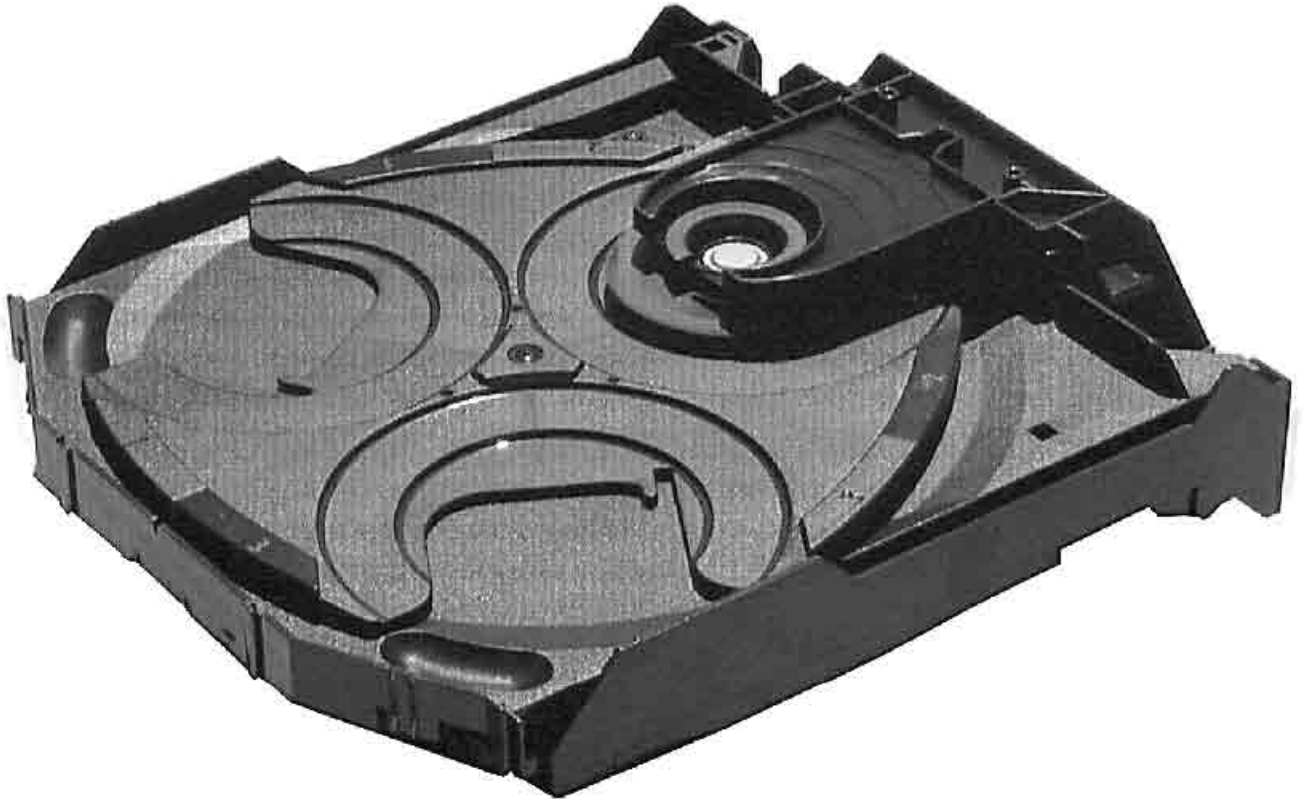
Note: Only the parts mentioned in this list are normal service spare parts.

**COILS & FILTERS**

5701	482215711477	Coil 2,2 $\mu$ H 5%
5703	482215620946	Osc Coil 100kHz

**DIODES**

6611	482213031878	1N4003G
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## **3CDC-LC-VCD**

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

Layout stage .2

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

**In case of defects please replace the entire board and  
mechanism.**

**The CD Board can be ordered with codenumber "9940 000 02968".**

**The CDC module can be ordered with codenumber "9940 000 02993".**

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## Service hints

### CAUTION

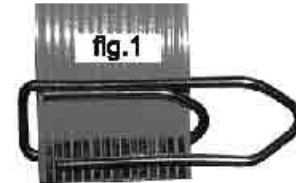
**CHARGED CAPACITORS ON THE SERVO BOARD MAY DAMAGE THE CD DRIVE ELECTRONICS WHEN CONNECTING A NEW CD MECHANISM. THAT'S WHY, BESIDES THE SAFETY MEASURES LIKE**

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

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

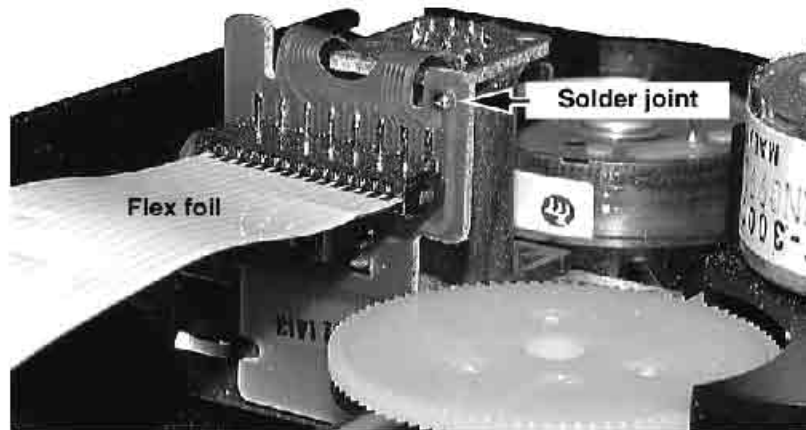
The following steps have to be done when replacing the CD mechanism:

1. Disconnect flexfoil cable from the old CD drive
2. Put a paperclip onto the flexfoil cable to short-circuit the contacts (fig.1)
3. Remove the old CD drive
4. Remove paperclip from the flexfoil cable and connect it to the new CD drive
5. Position the new CD drive on its studs
6. Remove solder joint from the Laser unit (see below)



**Attention:** The laser diode of this CD drive is protected against ESD by a solder joint which short-circuits the laserdiode to ground.

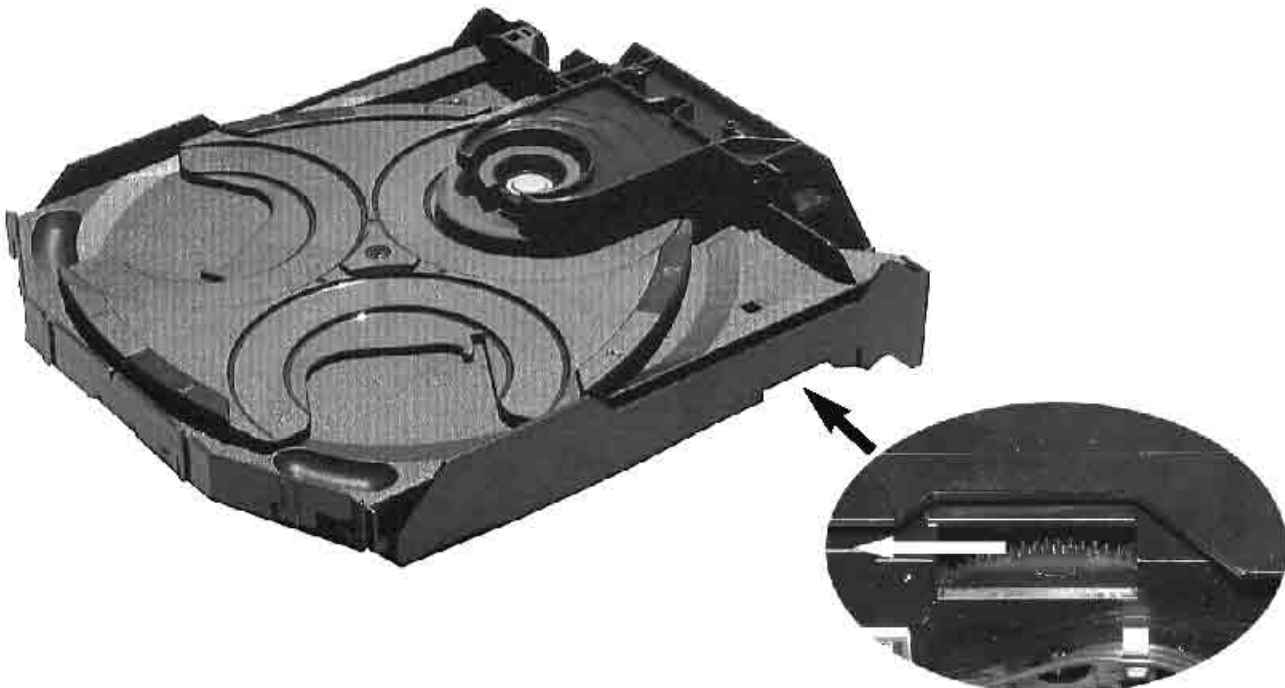
For proper functionality of the CD drive this solder joint must be removed **after** connecting the drive to the set.



### Emergency open

In case of a Supply fault, the tray can be opened manually.

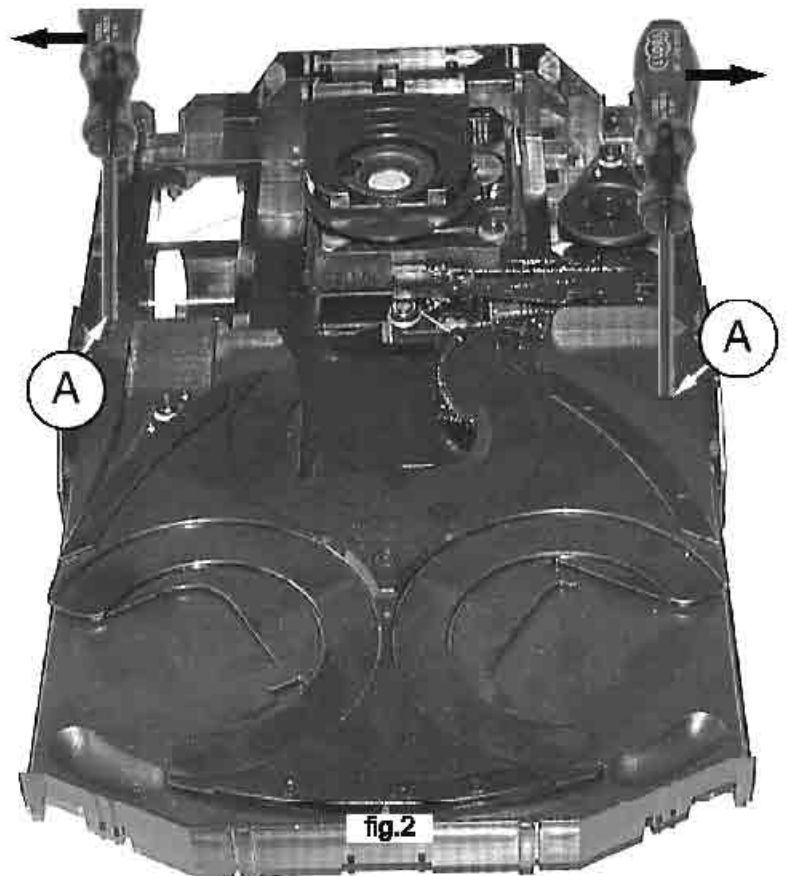
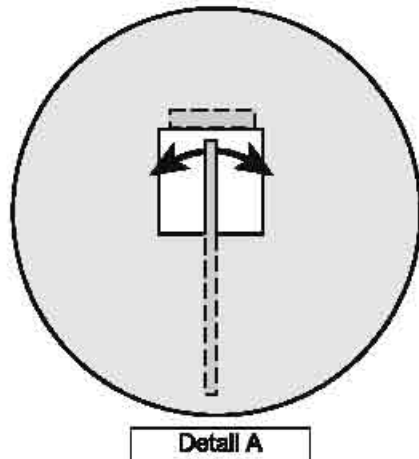
1. Remove the top cover of the set to get access to the Changer Module.
2. Turn gearwheel clockwise (as shown in picture below).



## Service hints

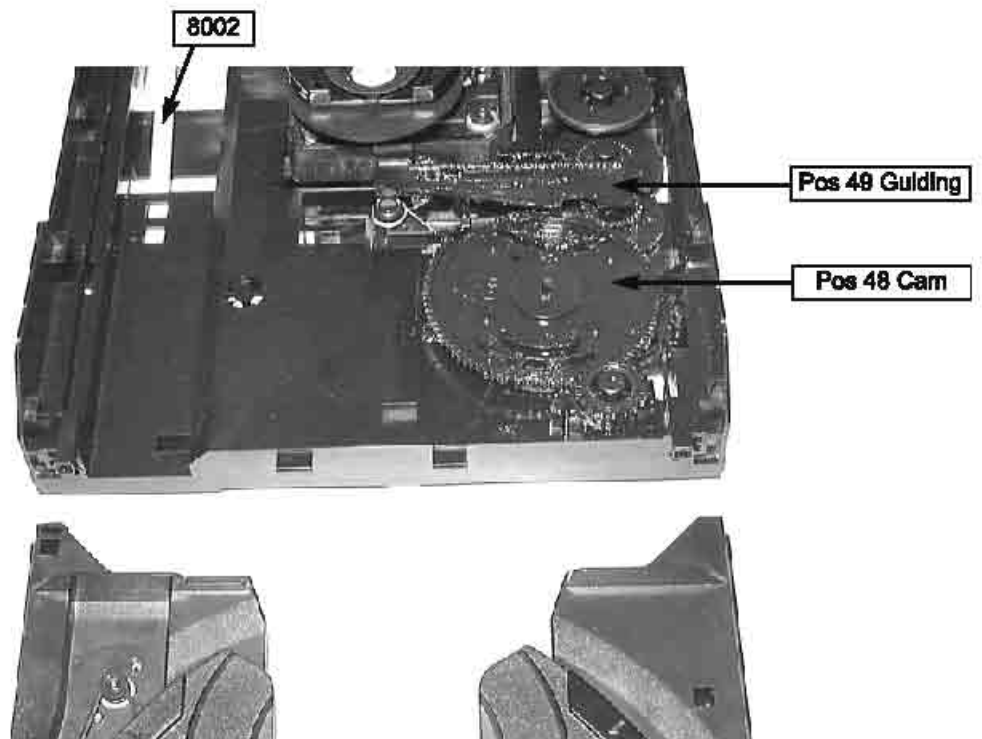
### Dismantling of Tray

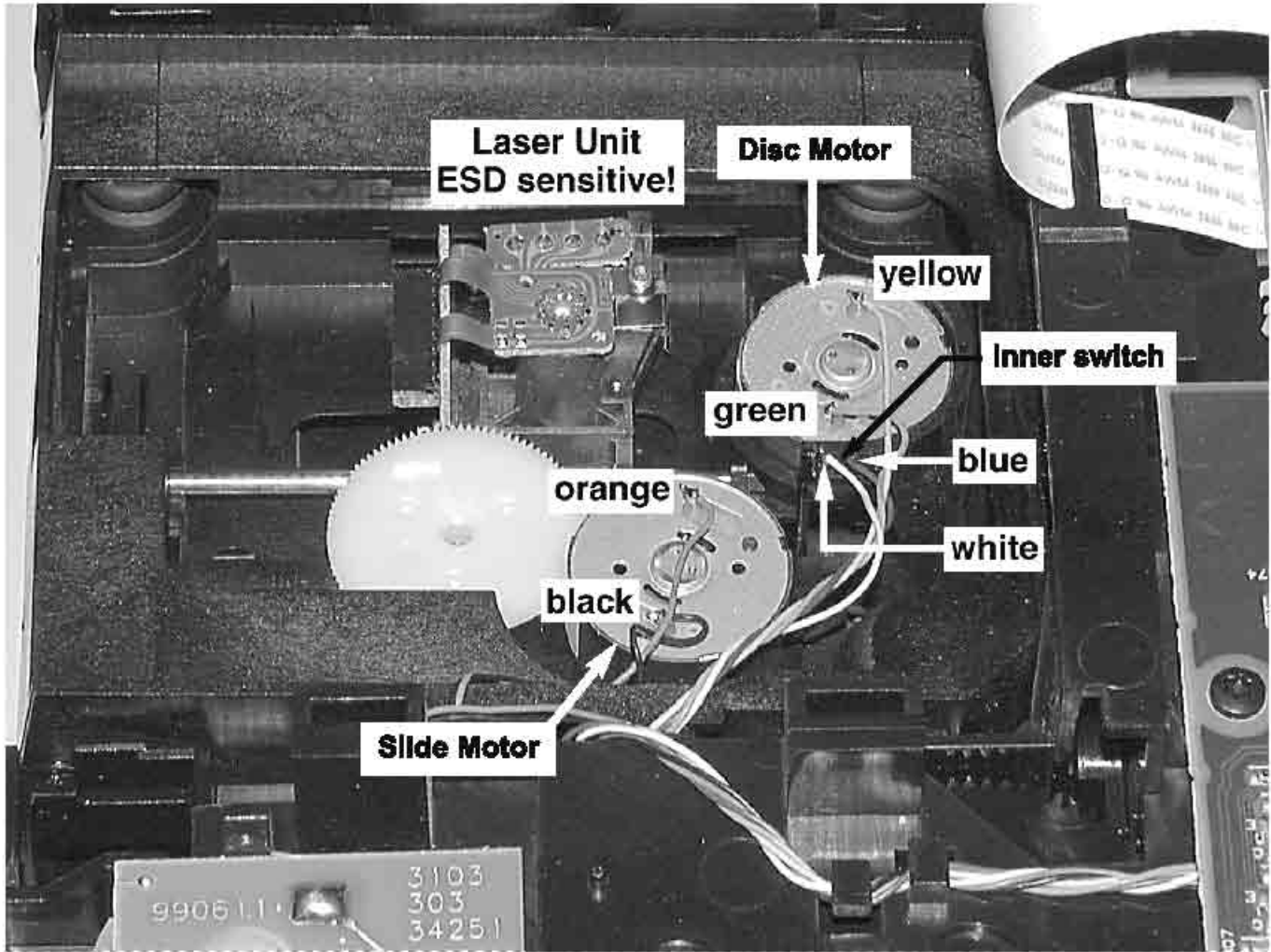
1. Open the tray.
2. Release 2x catch as shown in fig. 2 and Detail A
3. Pull tray out.



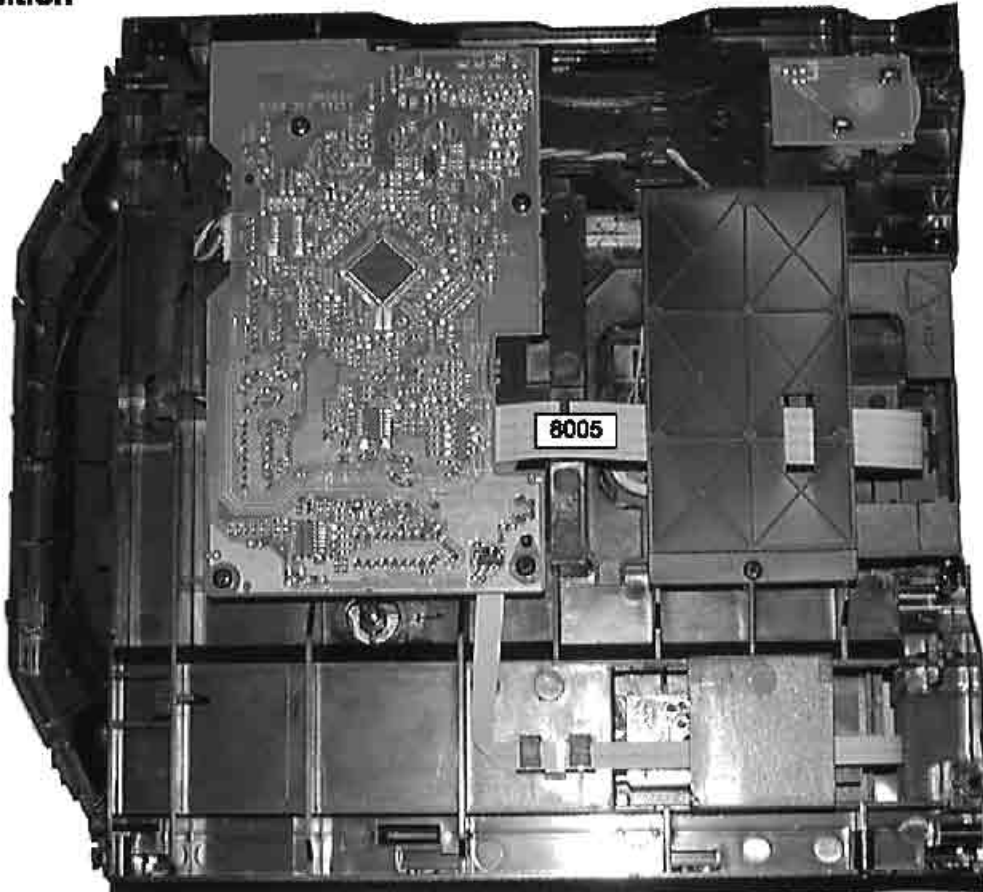
### Assembling of Tray

1. Turn Cam (pos. 48) clockwise to end position.
2. If necessary - move Guiding (pos. 49) to the right end position.
3. Insert the Tray.



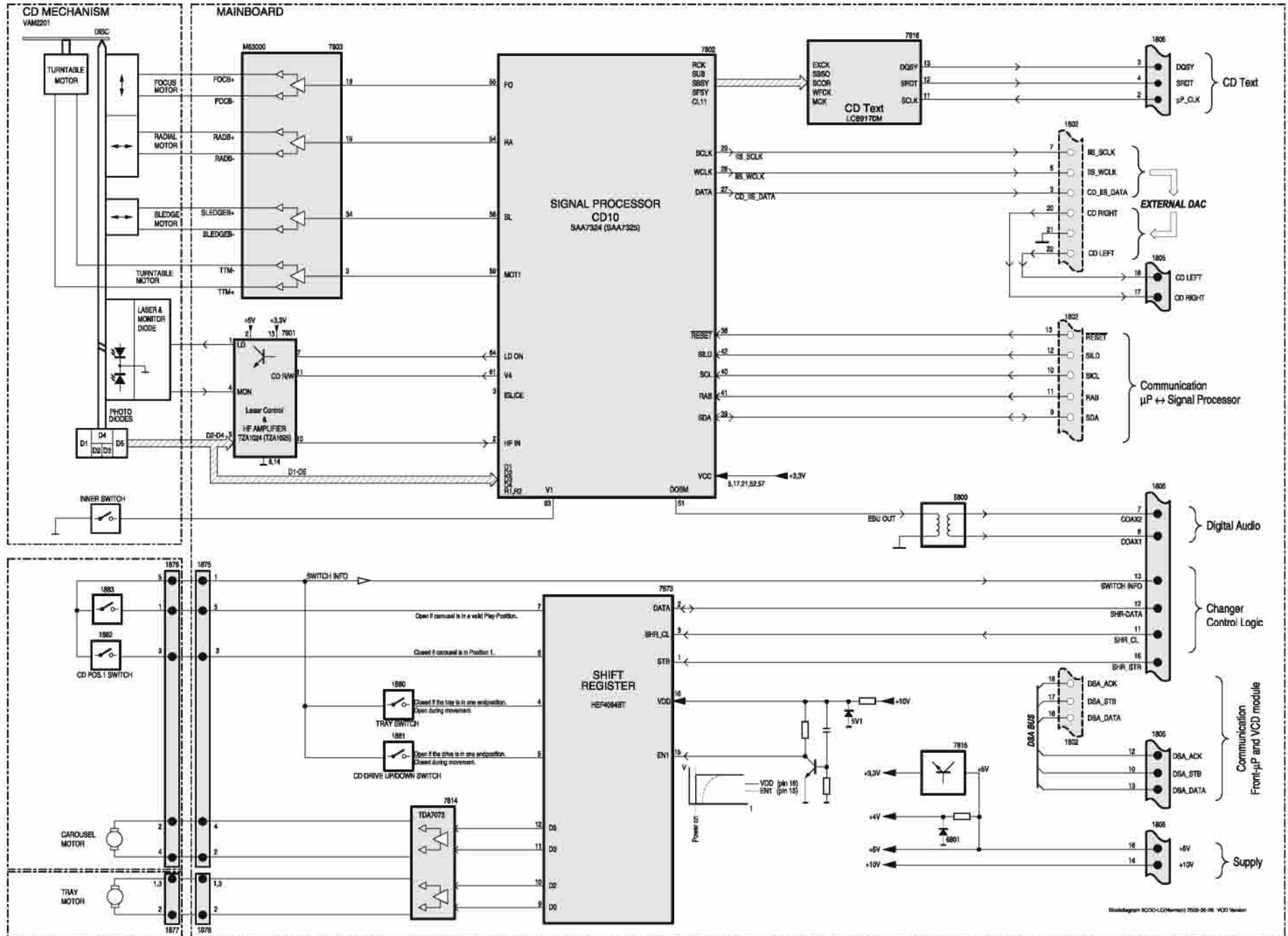


**Service Position**



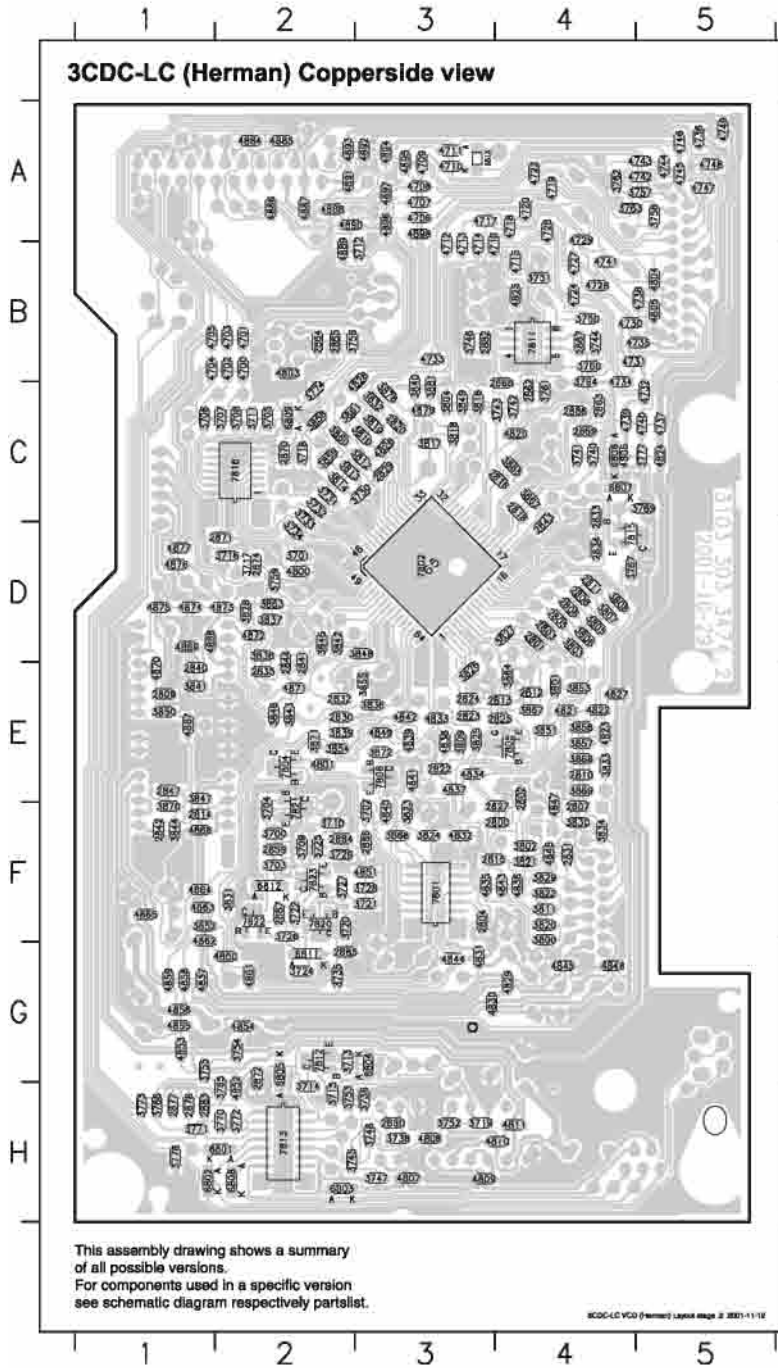


# BLOCK DIAGRAM 3CDC-LC VCD Version

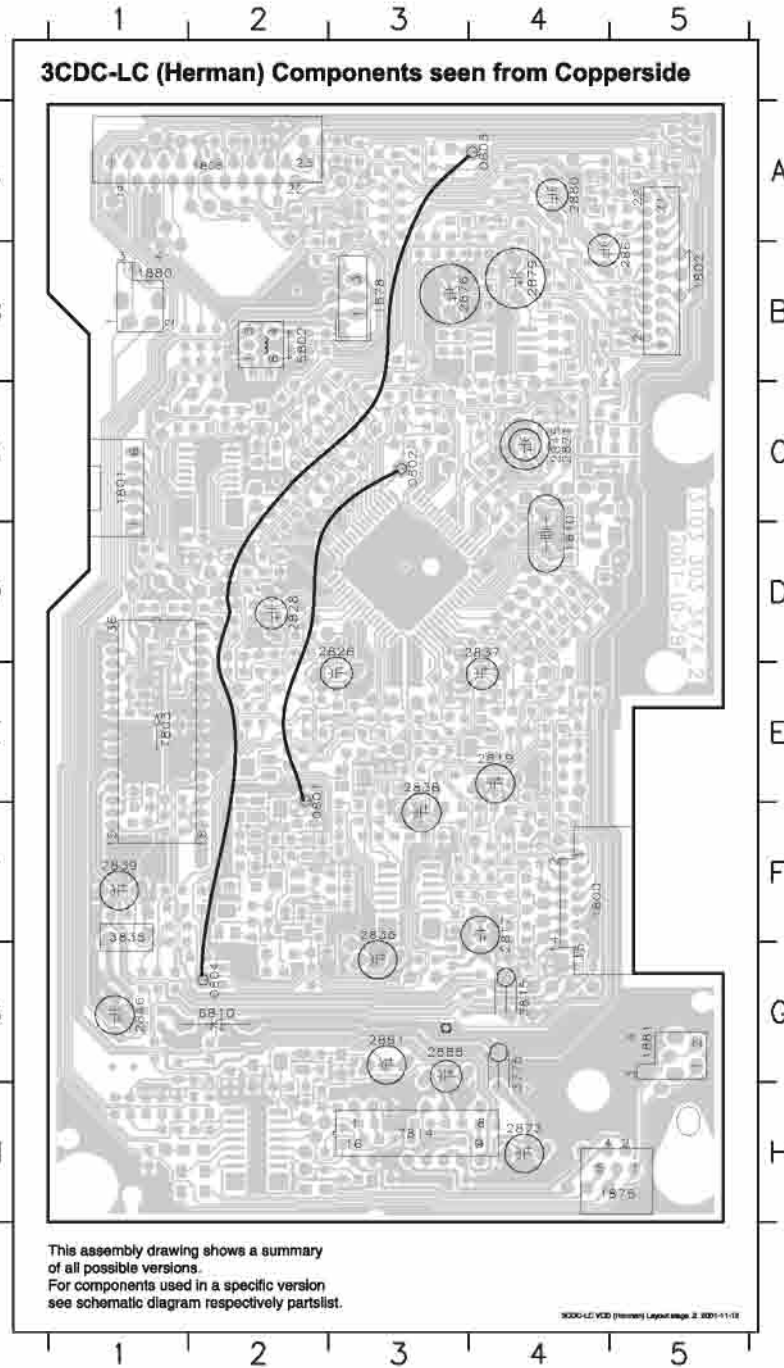




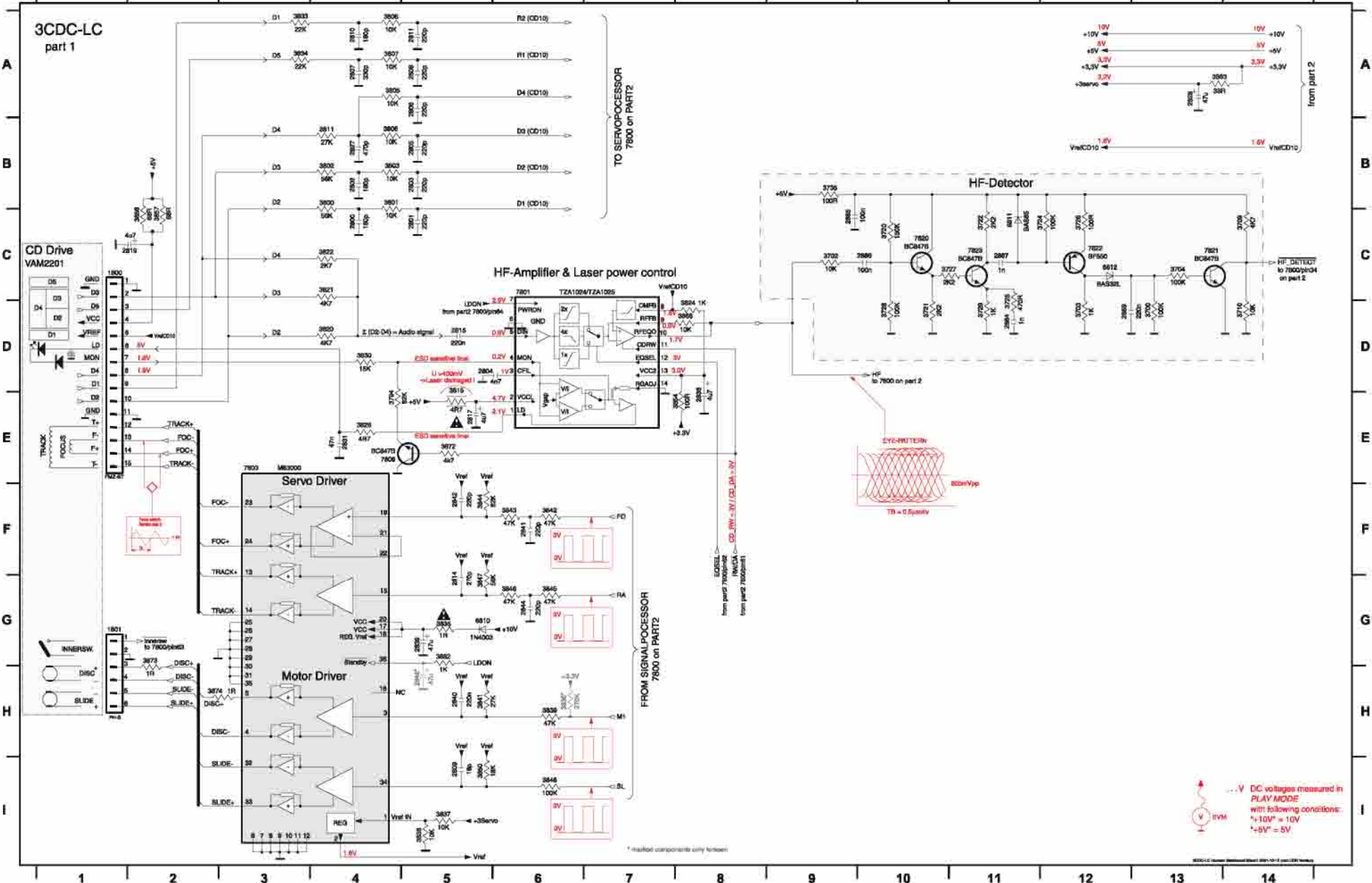
Mapping



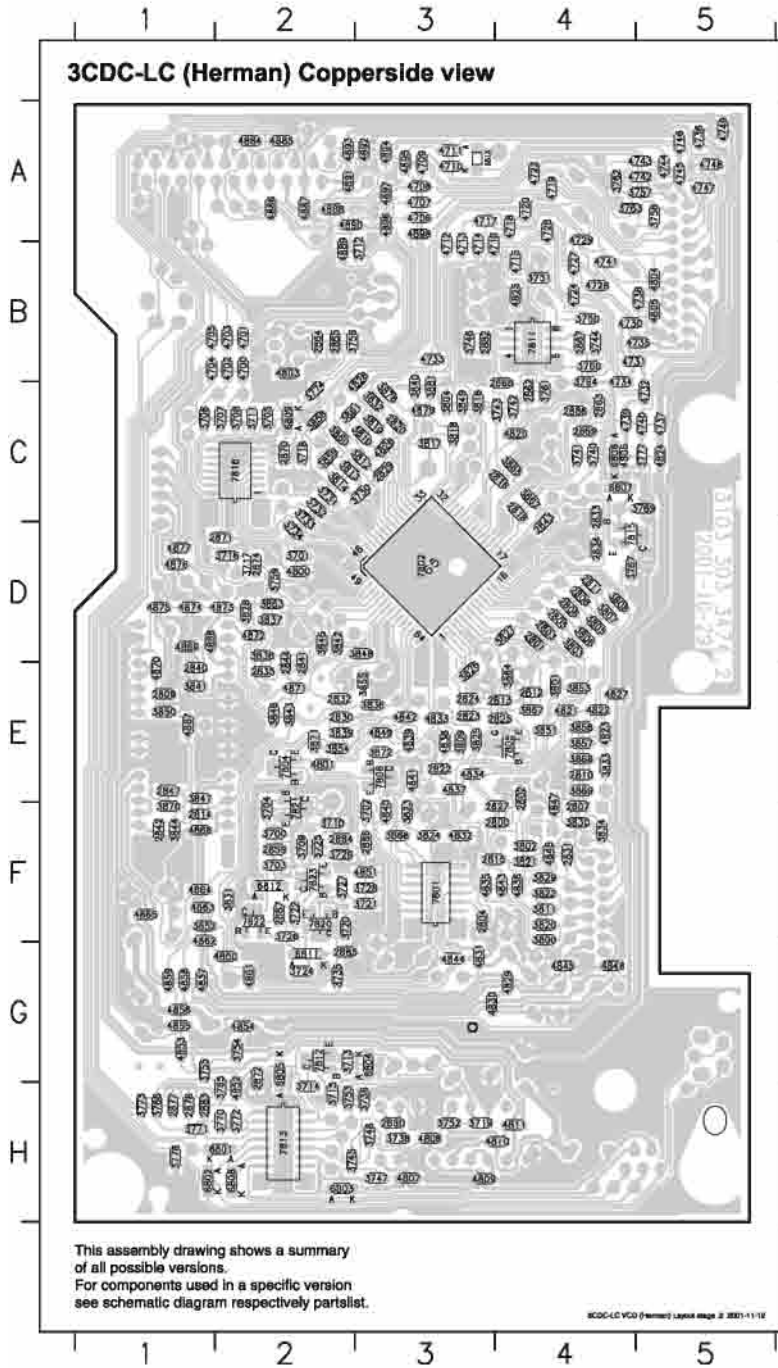
Copperside		Componentside	
2800 F4	3732 C2	3851 E4	4828 C3
2801 D4	3733 C2	3852 F1	4829 G4
2802 E4	3734 D2	3853 E4	4830 G3
2803 D4	3735 G2	3854 E2	4831 G3
2804 F3	3736 H3	3855 E3	4832 F3
2805 D4	3738 H3	3856 E4	4833 E3
2806 D4	3740 C4	3857 E4	4834 E3
2807 F4	3741 C4	3858 C2	4835 F3
2808 D4	3742 C4	3859 C2	4836 F4
2809 E1	3743 C4	3860 C2	4837 E3
2810 E4	3744 B4	3861 C2	4838 E3
2811 D4	3745 H2	3862 C4	4839 E3
2812 E4	3746 B3	3863 D2	4840 F3
2813 E4	3747 H3	3864 E4	4841 E3
2814 F1	3748 H3	3865 C4	4842 E3
2815 F3	3750 B4	3866 F3	4843 F4
2816 C4	3751 B4	3867 E4	4844 G3
2818 C4	3752 H3	3868 E4	4845 G4
2820 C3	3753 H2	3869 E4	4846 F4
2822 E3	3754 G2	3870 F1	4847 F4
2823 E3	3755 G1	3871 E2	4848 G4
2824 E3	3756 B2	3872 E3	4849 E3
2825 E4	3757 A5	3878 C3	4850 G2
2827 F4	3758 A5	3881 C3	4851 F3
2829 C3	3759 D2	4700 B2	4852 H2
2830 E2	3760 B4	4701 B2	4853 G1
2831 F4	3761 C4	4702 B2	4854 G2
2832 E2	3762 A4	4703 B2	4855 G1
2833 C4	3763 A4	4704 B1	4856 G1
2834 D4	3764 C4	4705 B1	4857 G1
2835 E2	3765 H2	4706 A3	4858 G1
2840 E1	3766 H1	4707 A3	4859 G1
2841 E2	3767 D4	4708 A3	4861 G2
2842 F1	3769 C5	4709 A3	4862 F1
2843 D4	3770 H2	4710 A3	4863 F1
2844 E2	3771 H1	4711 A3	4864 F1
2847 E1	3772 H2	4712 B3	4865 F1
2859 F2	3773 H1	4713 B3	4866 F1
2860 H3	3774 C2	4714 B3	4867 E1
2862 C4	3776 H1	4715 B4	4868 D1
2863 C4	3777 C5	4716 B3	4869 D1
2864 B2	3800 F4	4717 A3	4870 E1
2865 B2	3801 E4	4718 A4	4871 E2
2866 C4	3802 F4	4719 A4	4872 D2
2867 B4	3803 D4	4720 A4	4873 D2
2868 C4	3804 C3	4722 A4	4874 D1
2869 C4	3805 D4	4724 B4	4875 D1
2870 G2	3806 D4	4726 B4	4876 D1
2871 D2	3807 D4	4727 B4	4877 D1
2872 G2	3808 D4	4728 A4	4879 C3
2874 D2	3809 E2	4729 A4	4884 A2
2877 H1	3810 C3	4730 B4	4885 A2
2878 H1	3811 F4	4731 B4	4886 A2
2882 B3	3812 C3	4732 C5	4887 A2
2883 H1	3813 C2	4733 B3	4888 A2
2884 F2	3814 C2	4734 C4	4889 B2
2885 G2	3816 C3	4735 B5	4890 A2
2886 F3	3817 C3	4736 A5	4891 A2
2887 F2	3818 C3	4737 C5	4892 A3
3700 F2	3819 C3	4738 B5	4893 A2
3701 D2	3820 F4	4739 C4	4894 A3
3702 F3	3821 F4	4740 C5	4895 A3
3703 F2	3822 F4	4741 B4	4896 A3
3704 F2	3823 F3	4742 A5	4897 A3
3705 C2	3824 F3	4743 A5	4898 A3
3706 C1	3825 E3	4744 A5	8801 H2
3707 C2	3826 E3	4745 A5	8802 H1
3708 C2	3827 D4	4746 A5	8803 G3
3709 F2	3828 D2	4747 A5	8804 G3
3710 F2	3829 F4	4748 A5	8805 G2
3711 C2	3830 F4	4749 A5	8806 C4
3712 B3	3831 F2	4800 D2	8807 C4
3713 G2	3832 C3	4801 E2	8808 H2
3714 H2	3833 E4	4803 B2	8809 C2
3715 H2	3834 F4	4804 B5	8811 G2
3718 D2	3836 E3	4805 B5	8812 F2
3717 D2	3837 D2	4806 C4	8813 A3
3718 C2	3838 D2	4807 H3	7801 F3
3719 H3	3839 E2	4808 H3	7802 D3
3720 F2	3840 C3	4809 H3	7804 E2
3721 F3	3841 E1	4810 H4	7805 E4
3722 F2	3842 D2	4811 H4	7806 E3
3724 G2	3843 E2	4820 C4	7811 B4
3725 F2	3844 F1	4821 E4	7812 G2
3726 F2	3845 D2	4822 E4	7813 H2
3727 F2	3846 E2	4823 E4	7815 D4
3728 F3	3847 E1	4824 C3	7816 C2
3729 F2	3848 D3	4825 B4	7820 F2
3730 C3	3848 C3	4826 C3	7821 F2
3731 C2	3850 E1	4827 E4	7822 F2



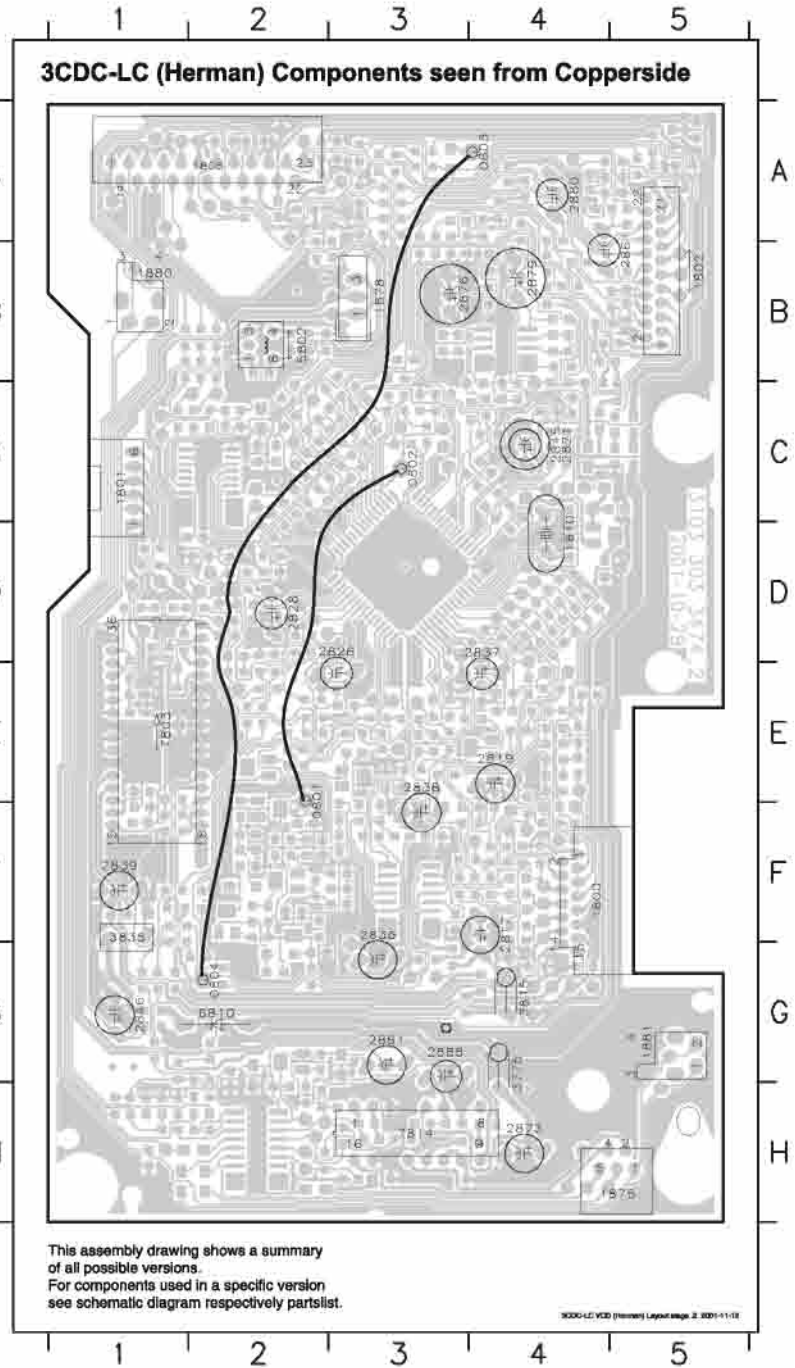
1800	C1	2803	B5	2808	A5	2815	D6	2830	H6	2839	G5	2848	H5	2886	C10	3704	C13	3722	C11	3728	D10	3802	B4	3808	A4	3822	C4	3834	A3	3839	H6	3845	G6	3852	H5	3866	D8	3874	H2	7801	D6	7822	C12		
1801	G1	2804	D6	2809	I5	2817	E5	2831	E4	2840	H5	2859	D13	2887	C11	3709	C14	3724	C12	3729	D11	3803	B4	3811	B4	3815	E5	3829	E4	3837	I5	3843	F8	3847	G5	3858	C2	3869	A4	3886	A10	7803	E3	7823	C13
2800	C4	2805	B5	2810	A4	2819	C2	2832	I8	2841	F6	2890	A9	3700	D13	3710	D14	3725	D11	3735	B9	3805	A4	3815	E5	3829	E4	3838	H6	3842	F8	3847	G5	3858	C2	3869	A4	4001	E8	7806	E5				
2801	C5	2806	A5	2811	A5	2827	B4	2835	I5	2842	F5	2884	D11	3702	C9	3720	C10	3726	C12	3800	B4	3806	B4	3820	D4	3830	D4	3837	I5	3843	F8	3847	G5	3857	C2	3872	E5	6811	C11	7820	C10				
2802	B4	2807	A4	2814	G6	2828	A13	2838	E8	2844	G6	2886	C8	3703	D12	3721	D10	3727	C11	3801	B4	3807	A4	3821	C4	3833	A3	3838	I5	3844	F8	3850	I8	3863	A13	3873	G2	6812	C12	7821	C13				



Mapping

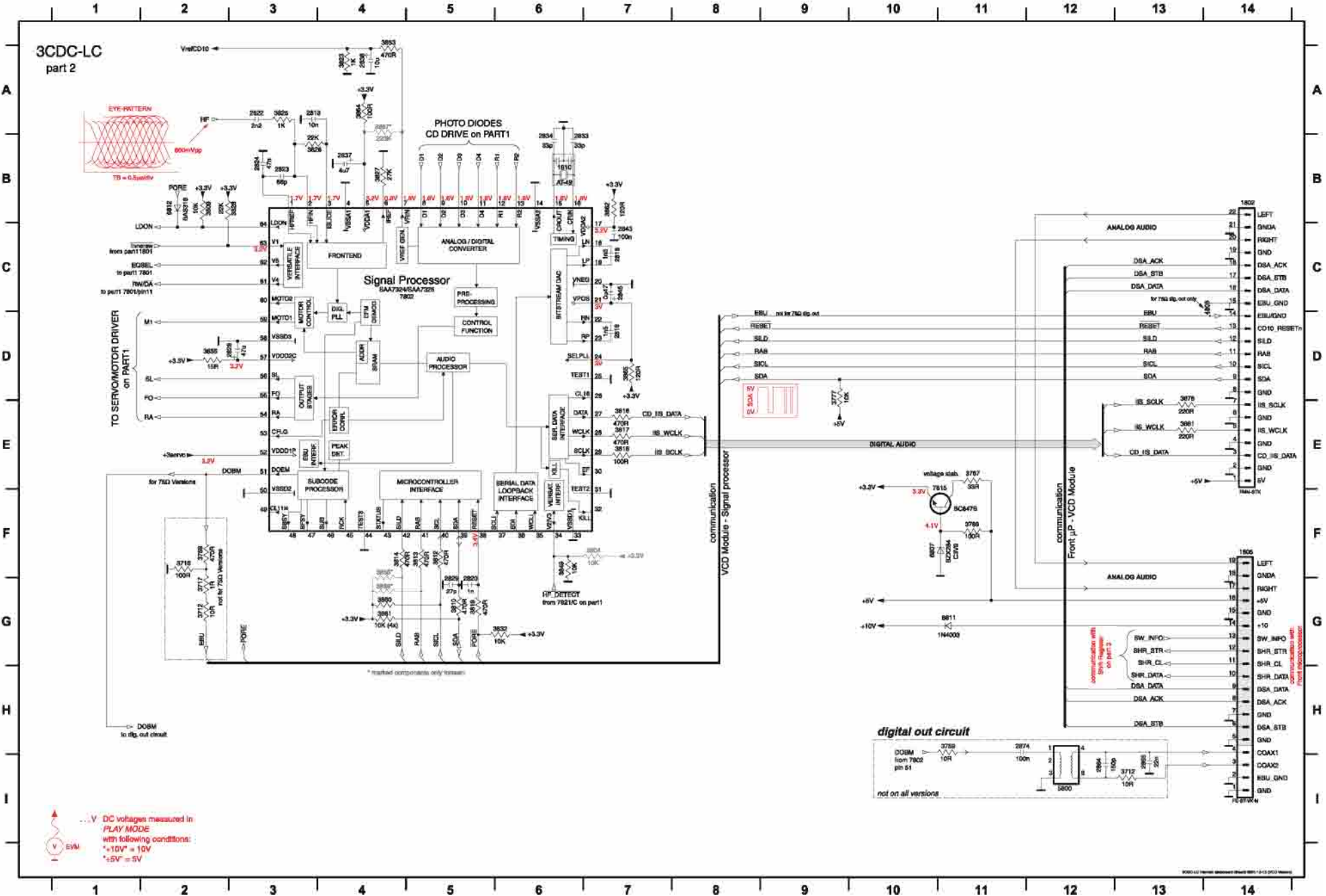


Copperside		Componentside	
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2801 D4	3733 C2	3852 F1	4829 G4
2802 E4	3734 D2	3853 E4	4830 G3
2803 D4	3735 G2	3854 E2	4831 G3
2804 F3	3736 H3	3855 E3	4832 F3
2805 D4	3738 H3	3856 E4	4833 E3
2806 D4	3740 C4	3857 E4	4834 E3
2807 F4	3741 C4	3858 C2	4835 F3
2808 D4	3742 C4	3859 C2	4836 F4
2809 E1	3743 C4	3860 C2	4837 E3
2810 E4	3744 B4	3861 C2	4838 E3
2811 D4	3745 H2	3862 C4	4839 E3
2812 E4	3746 B3	3863 D2	4840 F3
2813 E4	3747 H3	3864 E4	4841 E3
2814 F1	3748 H3	3865 C4	4842 E3
2815 F3	3750 B4	3866 F3	4843 F4
2816 C4	3751 B4	3867 E4	4844 G3
2818 C4	3752 H3	3868 E4	4845 G4
2820 C3	3753 H2	3869 E4	4846 F4
2822 E3	3754 G2	3870 F1	4847 F4
2823 E3	3755 G1	3871 E2	4848 G4
2824 E3	3756 B2	3872 E3	4849 E3
2825 E4	3757 A5	3878 C3	4850 G2
2827 F4	3758 A5	3881 C3	4851 F3
2829 C3	3759 D2	4700 B2	4852 H2
2830 E2	3760 B4	4701 B2	4853 G1
2831 F4	3761 C4	4702 B2	4854 G2
2832 E2	3762 A4	4703 B2	4855 G1
2833 C4	3763 A4	4704 B1	4856 G1
2834 D4	3764 C4	4705 B1	4857 G1
2835 E2	3765 H2	4706 A3	4858 G1
2841 E1	3766 H1	4707 A3	4859 G1
2841 E2	3767 D4	4708 A3	4861 G2
2842 F1	3769 C5	4709 A3	4862 F1
2843 D4	3770 H2	4710 A3	4863 F1
2844 E2	3771 H1	4711 A3	4864 F1
2847 E1	3772 H2	4712 B3	4865 F1
2859 F2	3773 H1	4713 B3	4866 F1
2860 H3	3774 C2	4714 B3	4867 E1
2862 C4	3776 H1	4715 B4	4868 D1
2863 C4	3777 C5	4716 B3	4869 D1
2864 B2	3800 F4	4717 A3	4870 E1
2865 B2	3801 E4	4718 A4	4871 E2
2866 C4	3802 F4	4719 A4	4872 D2
2867 B4	3803 D4	4720 A4	4873 D2
2868 C4	3804 C3	4722 A4	4874 D1
2869 C4	3805 D4	4724 B4	4875 D1
2870 G2	3806 D4	4726 B4	4876 D1
2871 D2	3807 D4	4727 B4	4877 D1
2872 G2	3808 D4	4728 A4	4879 C3
2874 D2	3809 E2	4729 A4	4884 A2
2877 H1	3810 C3	4730 B4	4885 A2
2878 H1	3811 F4	4731 B4	4886 A2
2882 B3	3812 C3	4732 C5	4887 A2
2883 H1	3813 C2	4733 B3	4888 A2
2884 F2	3814 C2	4734 C4	4889 B2
2885 G2	3816 C3	4735 B5	4890 A2
2886 F3	3817 C3	4736 A5	4891 A2
2887 F2	3818 C3	4737 C5	4892 A3
3700 F2	3819 C3	4738 B5	4893 A2
3701 D2	3820 F4	4739 C4	4894 A3
3702 F3	3821 F4	4740 C5	4895 A3
3703 F2	3822 F4	4741 B4	4896 A3
3704 F2	3823 F3	4742 A5	4897 A3
3705 C2	3824 F3	4743 A5	4898 A3
3706 C1	3825 E3	4744 A5	8801 H2
3707 C2	3826 E3	4745 A5	8802 H1
3708 C2	3827 D4	4746 A5	8803 H2
3709 F2	3828 D2	4747 A5	8804 G3
3710 F2	3829 F4	4748 A5	8805 G2
3711 C2	3830 F4	4749 A5	8806 C4
3712 B3	3831 F2	4800 D2	8807 C4
3713 G2	3832 C3	4801 E2	8808 H2
3714 H2	3833 E4	4803 B2	8809 C2
3715 H2	3834 F4	4804 B5	8811 G2
3718 D2	3836 E3	4805 B5	8812 F2
3717 D2	3837 D2	4806 C4	8813 A3
3718 C2	3838 D2	4807 H3	7801 F3
3719 H3	3839 E2	4808 H3	7802 D3
3720 F2	3840 C3	4809 H3	7804 E2
3721 F3	3841 E1	4810 H4	7805 E4
3722 F2	3842 D2	4811 H4	7806 E3
3724 G2	3843 E2	4820 C4	7811 B4
3725 F2	3844 F1	4821 E4	7812 G2
3726 F2	3845 D2	4822 E4	7813 H2
3727 F2	3846 E2	4823 E4	7815 D4
3728 F3	3847 E1	4824 C3	7816 C2
3729 F2	3848 D3	4825 B4	7820 F2
3730 C3	3848 C3	4826 C3	7821 F2
3731 C2	3850 E1	4827 E4	7822 F2

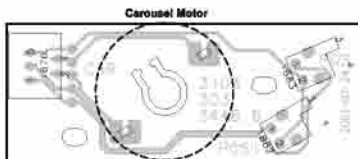
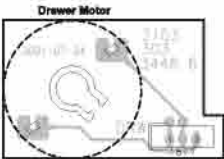
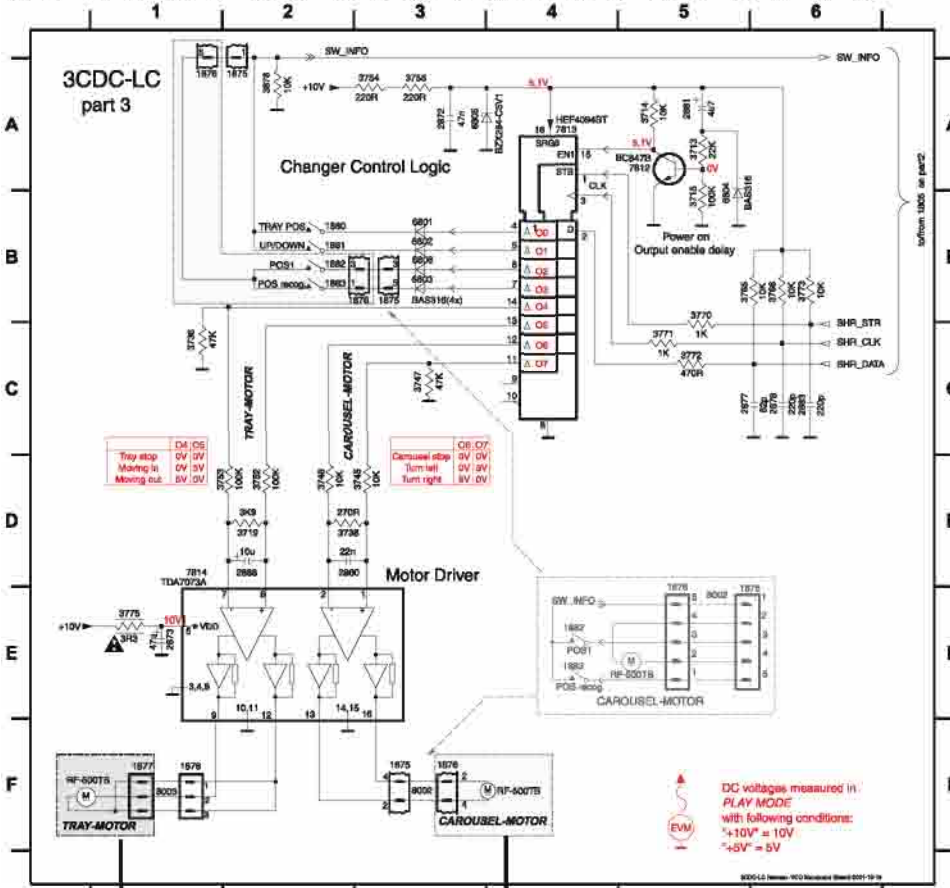




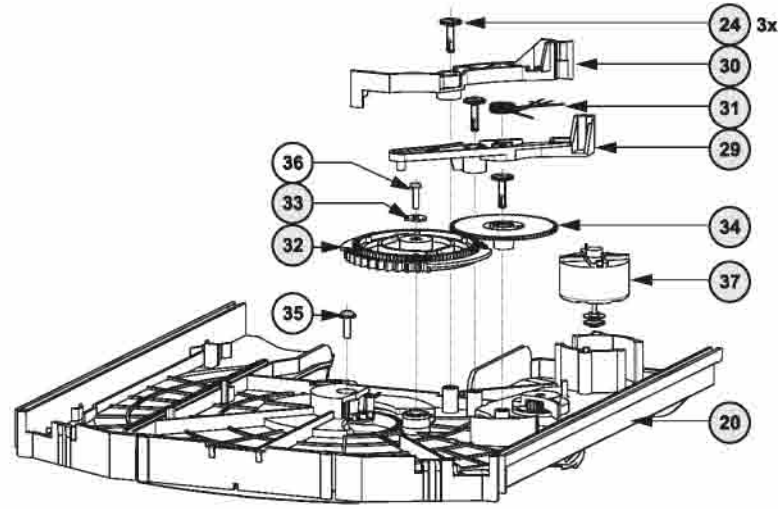
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1805	F14	2818	C7	2824	B3	2834	B6	2845	C7	2871	H6	3706	I7	3712	I13	3730	I4	3734	I5	3769	F11	3809	I7	3813	F5	3818	E7	3826	B3	3849	F6	3859	G4	3864	A4	3881	E13	6809	H7	7815	F11
1810	B6	2820	G5	2826	D3	2837	B4	2854	I12	2874	H11	3707	I7	3716	F2	3731	I5	3759	F2	3774	H8	3808	B2	3814	F4	3819	G5	3827	B4	3853	A4	3860	G4	3865	D7	4808	C14	6811	G11	7816	I5
2813	A3	2822	A3	2829	G5	2836	A4	2865	I13	3701	I5	3711	I7	3717	G2	3732	I5	3759	H10	3777	D9	3810	G5	3816	E7	3823	A4	3828	B3	3855	D2	3861	G4	3867	A4	6800	I12	6812	B2		



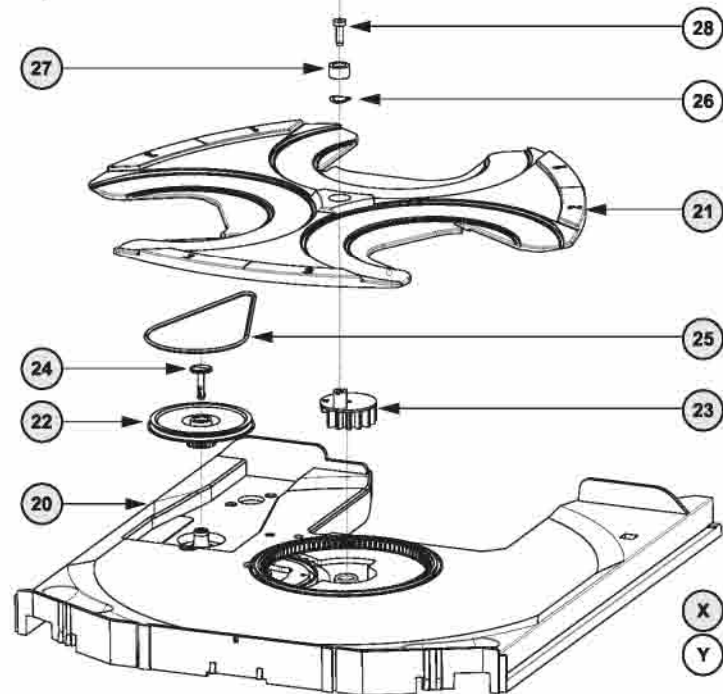
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1876	E5	1878	F3	1881	B2	2890	D2	2881	A5	3716	B5	3747	C3	3755	A3	3772	C5	6802	B3	7812	A5		
1876	B3	1876	E5	1882	B2	2872	A3	2883	C8	3718	D2	3748	D2	3765	B6	3773	B6	6803	B3	7813	A4		
1875	A2	1877	F1	1882	E4	2873	D2	3738	C1	3752	D2	3756	B6	3775	E1	6804	B5	7814	E1				
1876	A1	1878	F1	1883	B2	2877	C6	3713	A5	3738	D2	3753	D2	3770	C5	3678	A2	6805	A4	8002	E5		



Drawer bottom view



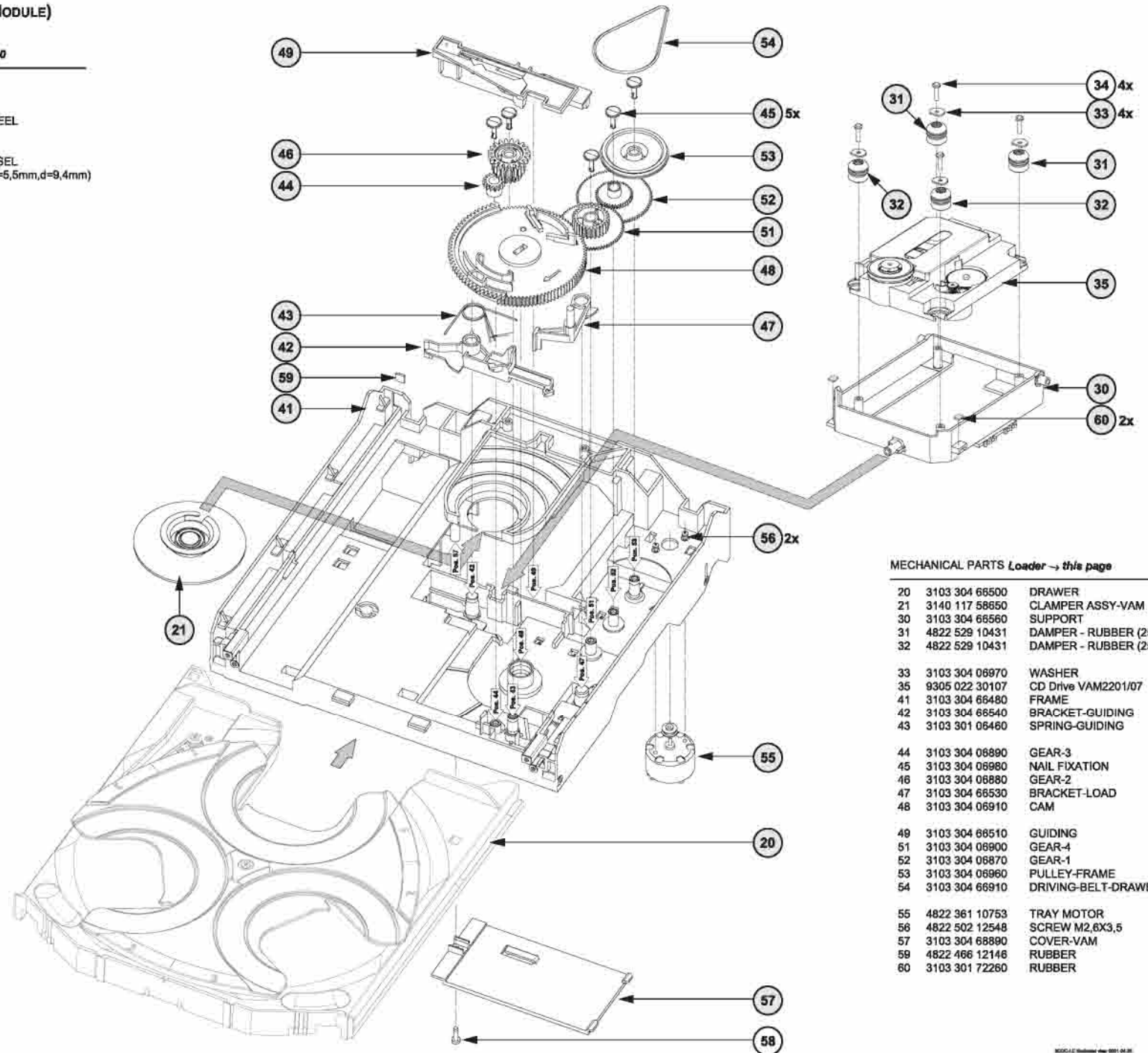
Drawer top view



## EXPLODED VIEW (3CDC-LC MODULE)

## MECHANICAL PARTS Drawer → Chapter 10-10

20	3103 304 66500	DRAWER
21	3103 304 66490	CAROUSEL
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	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
33	3103 304 06970	WASHER
34	3103 304 06870	GEAR-1
37	4822 361 10753	CAROUSEL MOTOR



- X spare part  
Y non spare part

## MECHANICAL PARTS Loader → this page

20	3103 304 66500	DRAWER
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	9305 022 30107	CD Drive VAM2201/07
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
60	3103 301 72260	RUBBER



## ELECTRICAL PARTSLIST 3CDC-LC-VCD MODULE

## MISCELLANEOUS

35	9305 022 30107	CD Drive VAM2201/07
37	4822 361 10753	CAROUSEL MOTOR
55	4822 361 10753	TRAY MOTOR
1800	4822 265 10925	FLEX FOIL CONNECTOR 15P
1802	2422 025 16837	FLEX FOIL CONNECTOR 22P
1805	4822 265 10979	FLEX FOIL CONNECTOR 15P
1805	4822 265 11545	FLEX FOIL CONNECTOR 19P <i>for digital out</i>
1875	4822 267 10958	FLEX FOIL CONNECTOR 5P
1876	2422 025 08332	FLEX FOIL CONNECTOR 5P
1880	4822 276 13503	SWITCH, Tray position

1881	4822 276 13503	SWITCH, Drive up/down
1882	4822 276 13503	SWITCH, Position 1 recognized
1883	4822 276 13503	SWITCH, valid position recognized
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%	50V
2801	4822 126 13883	220pF	5%	50V
2802	4822 126 14508	180pF	5%	50V
2803	4822 126 13883	220pF	5%	50V
2804	4822 126 13193	4,7nF	10%	83V

2805	4822 126 13883	220pF	5%	50V
2806	4822 126 13883	220pF	5%	50V
2807	5322 122 31863	330pF	5%	50V
2808	4822 126 13883	220pF	5%	50V
2809	4822 126 13879	220nF	20%	16V

2810	4822 126 10326	180pF	5%	50V
2811	4822 126 13883	220pF	5%	50V
2812	3198 017 34730	47nF	10%	16V
2813	4822 122 33177	10nF	20%	50V
2814	4822 122 33216	270pF	5%	50V

2815	4822 126 14076	220nF	20%	25V
2816	4822 126 13344	1,5nF	5%	83V
2817	4822 124 40769	4,7uF	20%	100V
2818	4822 126 13344	1,5nF	5%	83V
2819	4822 124 40769	4,7uF	20%	100V

2820	5322 126 11578	1nF	10%	63V
2822	2238 786 11554	2,2nF	5%	16V
2823	4822 126 13956	68pF	5%	63V
2824	4822 126 13751	47nF	10%	50V
2826	4822 124 12362	47uF	20%	4V

2827	5322 122 34099	470pF	10%	63V
2828	4822 124 12362	47uF	20%	4V
2829	4822 126 11669	27pF	10%	50V
2831	4822 126 13751	47nF	10%	50V
2833	4822 126 11671	33pF	5%	50V

2834	4822 126 11671	33pF	5%	50V
2835	3198 017 34730	47nF	10%	16V
2836	4822 124 40769	4,7uF	20%	100V
2837	4822 124 22726	4,7uF	20%	35V
2839	4822 124 40433	47uF	20%	25V

2840	4822 126 13751	47nF	10%	50V
2841	4822 122 33575	220pF	5%	50V
2842	4822 126 13883	220pF	5%	50V
2843	4822 126 14585	100nF	10%	50V
2844	5322 126 10794	220pF	10%	50V

2845	5322 124 41948	0,47uF	20%	50V
2846	5322 124 41948	0,47uF	20%	50V
2850	4822 126 14076	220nF	20%	25V
2860	4822 126 14494	22nF	10%	25V
2864	5322 122 33538	150pF	5%	63V

2865	5322 122 32654	22nF	10%	83V
2866	4822 126 13751	47nF	10%	50V
2872	3198 017 34730	47nF	10%	16V
2873	4822 124 80231	47uF	20%	16V
2874	4822 126 14305	100nF	10%	16V

## CAPACITORS

2877	4822 126 14226	82pF	5%	50V
2878	4822 126 13883	220pF	5%	50V
2881	4822 124 40769	4,7uF	20%	100V
2883	4822 126 13883	220pF	5%	50V
2884	5322 126 11578	1nF	10%	63V

2885	4822 126 14585	100nF	10%	50V
2886	4822 126 14585	100nF	10%	50V
2887	5322 126 11578	1nF	10%	63V
2888	4822 124 11947	10uF	20%	16V

## RESISTORS

3700	4822 117 10837	100kΩ	1%	0,1W
3702	4822 117 10833	10kΩ	1%	0,1W
3703	4822 051 10102	1kΩ	2%	0,25W
3704	4822 117 10837	100kΩ	1%	0,1W
3709	4822 051 20472	4,7kΩ	5%	0,1W

3710	4822 117 10833	10kΩ	1%	0,1W
3712	4822 051 30109	10Ω	5%	0,06W
3713	4822 051 30223	22kΩ	5%	0,06W
3714	4822 051 30103	10kΩ	5%	0,06W
3715	4822 117 13632	100kΩ	1%	0,06W

3716	4822 051 30101	100Ω	5%	0,06W
3717	4822 117 12917	1Ω	5%	0,06W
3719	4822 051 30392	3,9kΩ	5%	0,06W
3720	4822 051 20154	150kΩ	5%	0,1W
3721	4822 117 11449	2,2kΩ	1%	0,1W

3722	4822 117 11449	2,2kΩ	1%	0,1W
3724	4822 117 10837	220kΩ	1%	0,1W
3725	4822 051 20471	470Ω	5%	0,1W
3726	4822 117 11373	100Ω	1%	0,1W
3727	4822 117 11449	2,2kΩ	1%	0,1W

3728	4822 117 10837	100kΩ	1%	0,1W
3729	4822 051 20471	470Ω	5%	0,1W
3730	4822 051 20333	33kΩ	5%	0,1W
3735	4822 117 11373	100Ω	1%	0,1W
3736	4822 117 12925	47kΩ	1%	0,06W

3738	4822 051 30271	270Ω	5%	0,06W
3745	4822 117 10833	10kΩ	1%	0,1W
3747	4822 117 12925	47kΩ	1%	0,06W
3748	4822 051 30103	10kΩ	5%	0,06W
3752	4822 117 13632	100kΩ	1%	0,06W

3753	4822 117 13632	100kΩ	1%	0,06W
3754	4822 117 11503	220Ω	5%	0,1W
3755	4822 117 11503	220Ω	5%	0,1W
3759	4822 051 20109	10Ω	5%	0,1W
3765	4822 051 30103	10kΩ	5%	0,06W

3766	4822 117 10833	10kΩ	1%	0,1W
3767	4822 051 30339	33Ω	5%	0,06W
3769	4822 051 30101	100Ω	5%	0,06W
3770	4822 051 30102	1kΩ	5%	0,06W
3771	4822 051 30102	1kΩ	5%	0,06W

3772	4822 051 30471	470Ω	5%	0,06W
3773	4822 117 10833	10kΩ	1%	0,1W
3775	4822 052 10338	3,3Ω	5%	NFR25
3776	4822 051 30103	10kΩ	5%	0,06W
3777	4822 051 30103	10kΩ	5%	0,06W

3800	4822 051 30583	58kΩ	5%	0,06W
3801	4822 051 30103	10kΩ	5%	0,06W
3802	4822 117 11148	56kΩ	1%	0,1W
3803	4822 117 10833	10kΩ	1%	0,1W
3804	4822 051 30103	10kΩ	5%	0,06W

3805	4822 051 30103	10kΩ	5%	0,06W
3806	4822 051 30103	10kΩ	5%	0,06W
3807	4822 051 30103	10kΩ	5%	0,06W
3808	4822 051 30103	10kΩ	5%	0,06W
3809	4822 051 30103	10kΩ	5%	0,06W

## ELECTRICAL PARTSLIST 3CDC-LC-VCD MODULE

## RESISTORS

3810	4822 051 30471	470Ω	5%	0,06W
3811	4822 051 20273	27kΩ	5%	0,1W
3812	4822 051 20471	470Ω	5%	0,1W
3813	4822 051 20471	470Ω	5%	0,1W
3814	4822 051 20471	470Ω	5%	0,1W

3815	4822 052 10478	4,7Ω	5%	NFR25
3816	4822 051 20471	470Ω	5%	0,1W
3817	4822 051 30471	470Ω	5%	0,06W
3818	4822 051 30101	100Ω	5%	0,06W
3818	4822 051 30471	470Ω	5%	0,06W

3819	4822 051 20471	470Ω	5%	0,1W
3820	4822 051 30472	4,7kΩ	5%	0,06W
3821	4822 051 20472	4,7kΩ	5%	0,1W
3822	4822 051 30272	2,7kΩ	5%	0,06W
3823	4822 051 30102	1kΩ	5%	0,06W

3824	4822 051 30102	1kΩ	5%	0,06W
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 30223	22kΩ	5%	0,06W

3829	4822 117 13608	4,7Ω	5%	0,06W
3830	4822 116 83933	15kΩ	1%	0,1W
3832	4822 117 10833	10kΩ	1%	0,1W
3833	4822 051 30223	22kΩ	5%	0,06W
3834	4822 051 20223	22kΩ	5%	0,1W

3835	4822 052 10108	1Ω	5%	0,33W
3837	4822 117 10833	10kΩ	1%	0,1W
3838	4822 051 30103	10kΩ	5%	0,06W
3839	4822 051 20273	27kΩ	5%	0,1W
3841	4822 051 20273	27kΩ	5%	0,1W

3842	4822 117 10834	47kΩ	1%	0,1W
3843	4822 117 10834	47kΩ	1%	0,1W
3844	4822 117 12864	82kΩ	5%	0,6W
3845	4822 117 10834	47kΩ	1%	0,1W
3846	4822 117 10834	47kΩ	1%	0,1W

3847	4822 117 11148	56kΩ	1%	0,1W
3848	4822 117 10837	100kΩ	1%	0,1W
3850	4822 051 30183	18kΩ	5%	0,06W
3852	4822 051 10102	1kΩ	2%	0,25W
3853	4822 051 20471	470Ω	5%	0,1W

3854	4822 051 30101	100Ω	5%	0,06W
3855	4822 117 12971	15Ω	5%	0,06W
3856	4822 117 12521	68Ω	1%	0,1W
3857	4822 117 12521	68Ω	1%	0,1W
3860	4822 117 10833	10kΩ	1%	0,1W

3862	4822 051 20121	120Ω	5%	0,1W
3863	4822 051 30339	33Ω	5%	0,06W
3864	4822 051 30101	100Ω	5%	0,06W
3865	4822 051 30121	120Ω	5%	0,06W
3866	4822 051 30103	10kΩ	5%	0,06W

3871	4822 117 11149	82kΩ	1%	0,1W
3872	4822 051 20472	4,7kΩ	5%	0,1W
3878	4822 117 11503	220Ω	5%	0,1W
3881	4822 117 11503	220Ω	5%	0,1W
4707	4822 051 20008			CHIP JUMPER 0805

4708	4822 051 20008			CHIP JUMPER 0805
4709	4822 051 20008			CHIP JUMPER 0805
4710	4822 051 20008			CHIP JUMPER 0805
4711	4822 051 20008			

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

4868 ©	4822 051 20008	CHIP JUMPER 0805
4869 ©	4822 051 20008	CHIP JUMPER 0805
4870 ©	4822 051 20008	CHIP JUMPER 0805
4871 ©	4822 051 20008	CHIP JUMPER 0805
4872 ©	4822 051 20008	CHIP JUMPER 0805

4873 ©	4822 051 20008	CHIP JUMPER 0805
4874 ©	4822 051 20008	CHIP JUMPER 0805
4875 ©	4822 051 20008	CHIP JUMPER 0805
4876 ©	4822 051 20008	CHIP JUMPER 0805
4877 ©	4822 051 30008	CHIP JUMPER 0603

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 30008	CHIP JUMPER 0603

4888 ©	4822 051 20008	CHIP JUMPER 0805
4889 ©	4822 051 20008	CHIP JUMPER 0805
4890 ©	4822 051 20008	CHIP JUMPER 0805
4891 ©	4822 051 30008	CHIP JUMPER 0603
4892 ©	4822 051 20008	CHIP JUMPER 0805

4893 ©	4822 051 20008	CHIP JUMPER 0805
4894 ©	4822 051 20008	CHIP JUMPER 0805
4895 ©	4822 051 20008	CHIP JUMPER 0805
4896 ©	4822 051 20008	CHIP JUMPER 0805
4897 ©	4822 051 20008	CHIP JUMPER 0805

4898 ©	4822 051 20008	CHIP JUMPER 0805
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**COILS**

1810	4822 242 10849	CRYSTAL 8,46MHz
5802	2422 536 00019	TRANSFORMER, DIGITAL OUT

**DIODES**

6801 ©	4822 130 11397	BAS316
6802 ©	4822 130 11397	BAS316
6803 ©	4822 130 11397	BAS316
6804 ©	4822 130 11397	BAS316
6805 ©	4822 130 11383	BZX284-C5V1

6807 ©	4822 130 11366	BZX284-C3V9
6808 ©	4822 130 11397	BAS316
6810	4822 130 31878	1N4003G
6811 ©	4822 130 82334	BAS85
6812 ©	4822 130 80446	BAS32L

6813 ©	4822 130 11397	BAS316
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**TRANSISTORS**

7806 ©	4822 130 60511	BC847B
7812 ©	4822 130 60511	BC847B
7815 ©	4822 130 60511	BC847B
7820 ©	4822 130 60511	BC847B
7821 ©	4822 130 60511	BC847B

7822	4822 130 42131	BF550
7823 ©	4822 130 60511	BC847B

**INTEGRATED CIRCUITS**

7801 ©	9352 622 36118	TZA1025T/V2 HF-Amplifier
7802 ©	9352 641 81557	SAA7327M2B Signal processor
7803 ©	9322 158 56682	M63000SP, MOTOR DRIVER
7813 ©	5322 209 11306	HEF4094BT, SHIFT REGISTER
7814	4822 209 32852	TDA7073A/N2



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# COMBI BOARD

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## Brief introduction of the Combi Board

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### A. TRANSFORMER PRIMARY PART

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

### B. POWER SUPPLY PART

Power Supply Circuit consists of rectifiers, capacitive filters and voltage regulators. Regulated voltage include +5V6, +LED, +12A, +12M, -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  $\mu$ 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  $\mu$ P on the Front board.

#### b) SOURCE SELECTION

One of the 4 sources, namely AUX, TAPE, TUNER, CD, can be selected via A0 & A1 lines which control the IC 7501 (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  $\mu$ P. For good performance transistors for the left and right channels should be paired for gain characteristics.

#### d) SOUND FEATURES

Sound Features include the DBB, IS and 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.

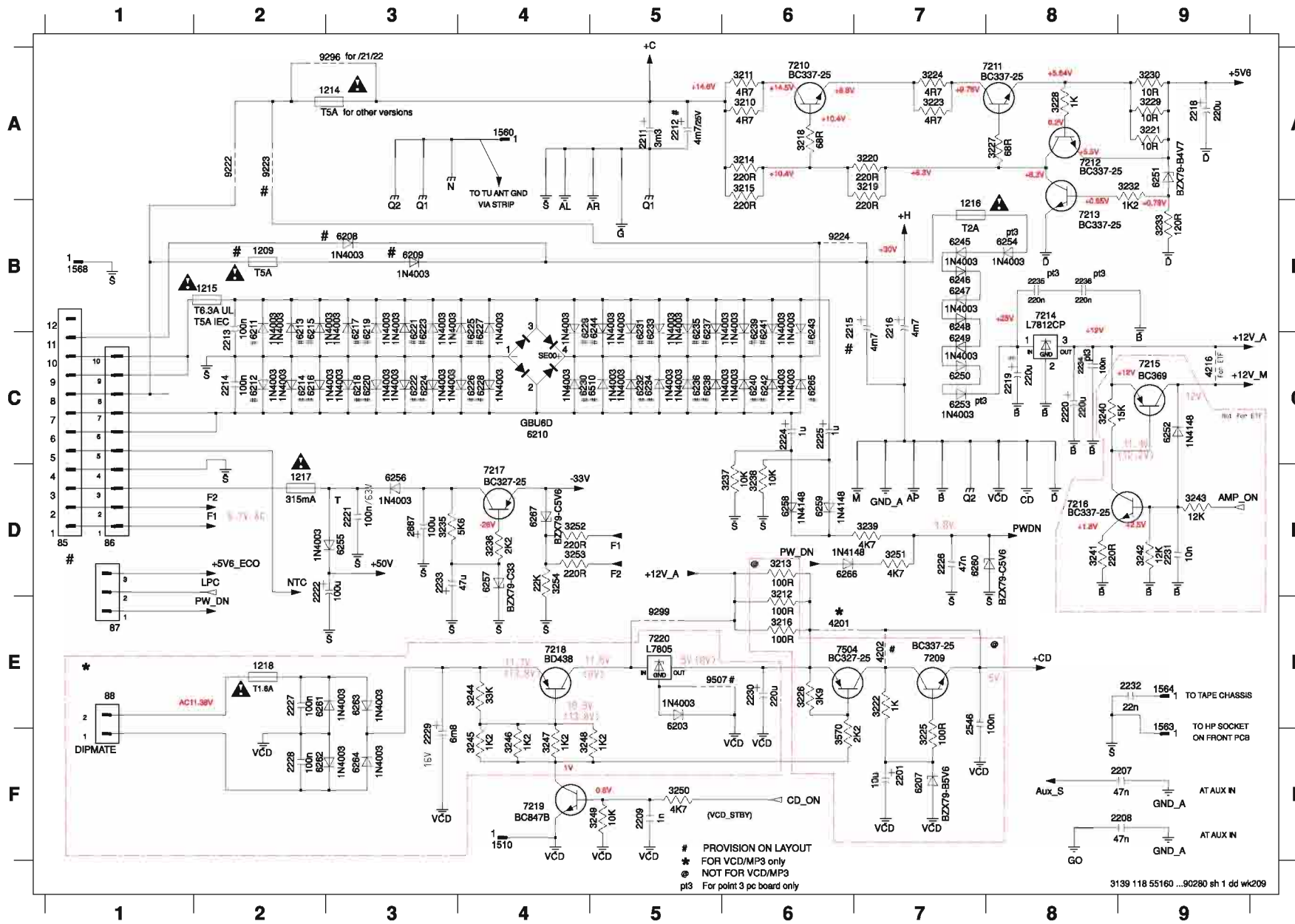








# POWER SUPPLY CIRCUIT



85 D1	3250 F5	7219 F4
86 D1	3251 D7	7220 E5
87 E1	3252 D4	7504 E8
88 E1	3253 D4	8222 A2
1208 B2	3254 D4	9223 A2
1214 A3	3570 F6	9224 B6
1215 B2	4201 E6	9296 A3
1216 B7	4202 E7	9298 E5
1217 D2	4216 C9	9507 E5
1218 E2	6203 E5	
1510 F4	6207 F7	
1560 A4	6208 B3	
1563 F9	6209 B3	
1564 E9	6210 C4	
1568 B1	6211 B2	
2201 F7	6212 C2	
2207 F9	6213 B2	
2208 F9	6214 C2	
2209 F5	6215 B2	
2211 A5	6216 C2	
2212 A5	6217 B3	
2213 B2	6218 C3	
2214 C2	6219 B3	
2215 B6	6220 C3	
2216 B7	6221 B3	
2218 A9	6222 C3	
2219 C8	6223 B3	
2220 C8	6224 C3	
2221 D3	6225 B4	
2222 D2	6226 C4	
2223 F2	6227 E2	
2224 C9	6228 C4	
2225 C6	6229 B4	
2226 D7	6230 C4	
2227 E2	6231 B5	
2228 F3	6232 C5	
2229 E6	6233 B5	
2230 E9	6234 C5	
2231 D9	6235 B5	
2232 E9	6236 C5	
2233 D3	6237 B5	
2234 C8	6238 C5	
2235 B8	6239 B5	
2236 B6	6240 C5	
2546 E3	6241 B6	
2657 D3	6242 C6	
3210 A6	6243 B8	
3211 A6	6244 B5	
3212 E6	6245 B7	
3213 D8	6246 B7	
3214 A6	6247 B7	
3215 A6	6248 B7	
3216 E6	6249 C7	
3218 A6	6250 C7	
3219 A7	6251 A9	
3220 A7	6252 C9	
3221 A9	6253 C7	
3222 E7	6254 B6	
3223 A7	6255 D3	
3224 A7	6256 D3	
3225 F7	6257 D4	
3226 E6	6258 D6	
3227 A8	6259 D6	
3228 A8	6260 D7	
3229 A9	6261 E2	
3230 A9	6262 F2	
3232 A9	6263 E3	
3233 B9	6264 F3	
3235 D3	6265 C6	
3236 D4	6266 D6	
3237 D6	6267 D4	
3238 D6	6268 D7	
3239 B7	6510 C5	
3240 C9	7209 E7	
3241 D8	7210 A6	
3242 D9	7211 A7	
3243 D9	7212 A8	
3244 E4	7213 B8	
3245 F4	7214 B8	
3246 F4	7215 C9	
3247 F4	7216 D8	
3248 F4	7217 D4	
3249 F5	7218 E4	

# PROVISION ON LAYOUT  
 \* FOR VCD/MP3 only  
 @ NOT FOR VCD/MP3  
 p3 For point 3 pc board only

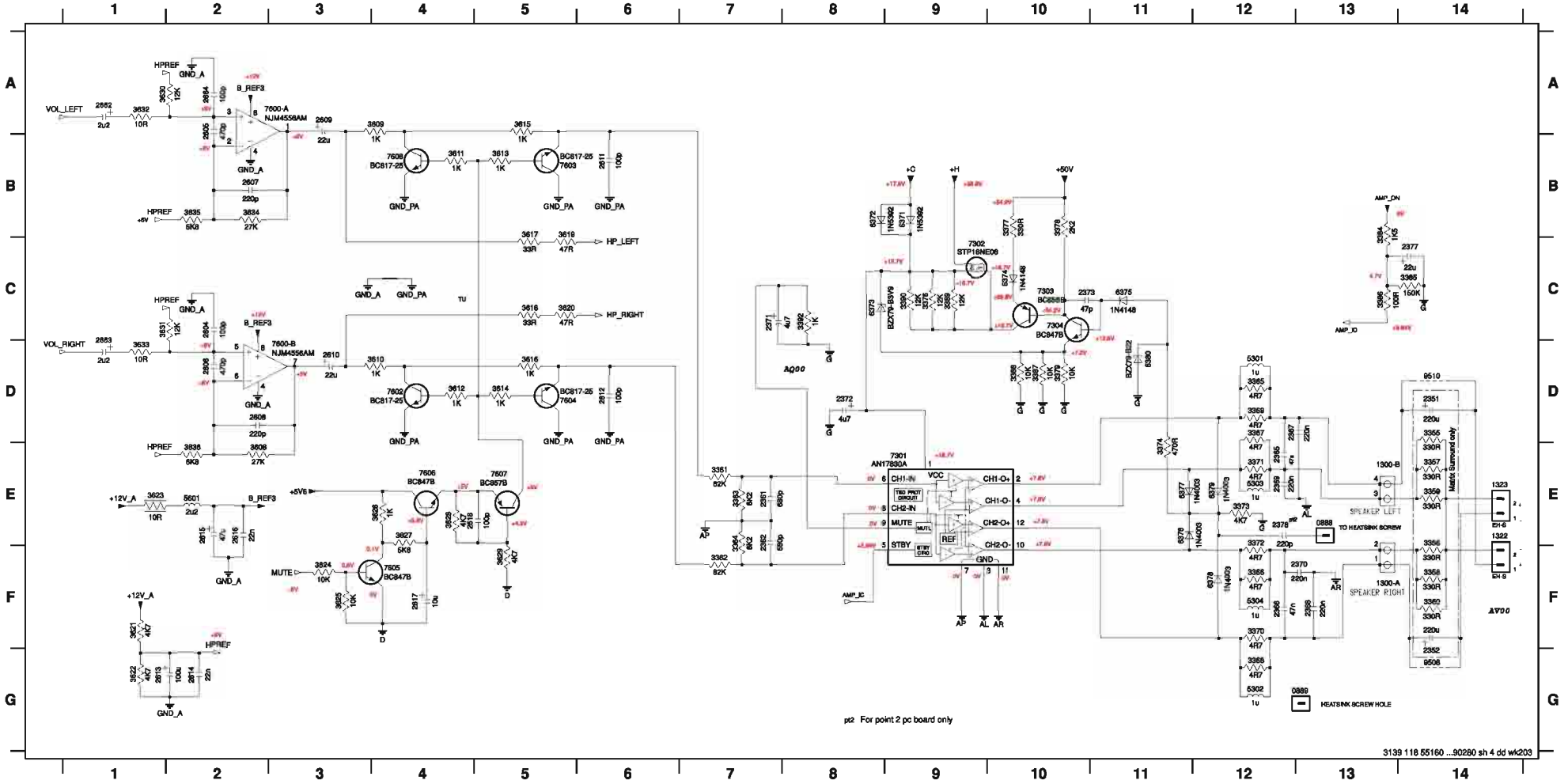
3139 118 55160 ...90280 sh 1 dd wk209





# PRE- & POWER AMPLIFIER CIRCUIT

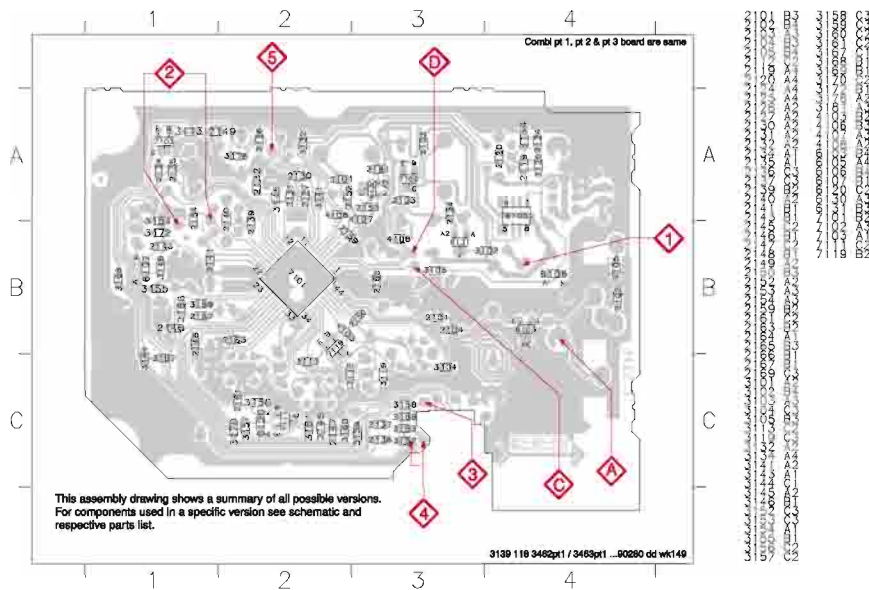
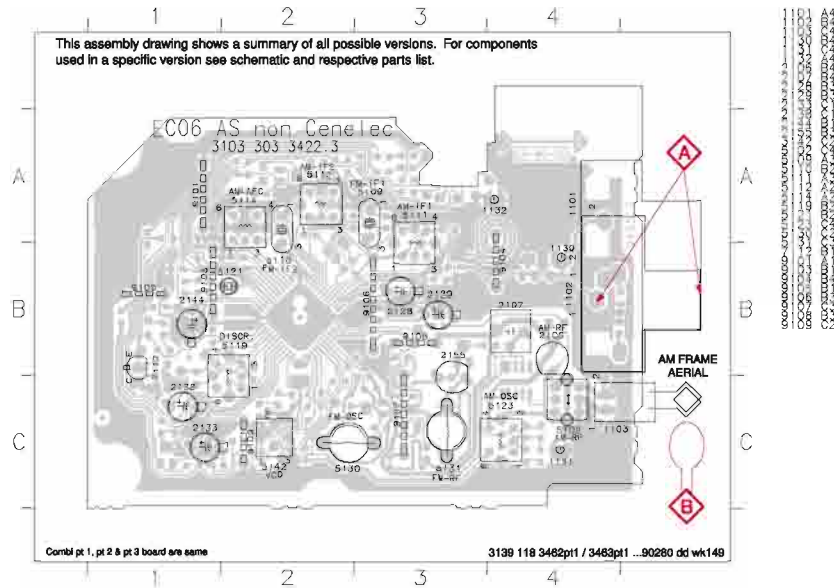
0885 E13	1323 E14	2260 E12	2370 F13	2378 E12	2608 D2	2613 G1	2618 E4	3365 E14	3361 E7	3366 F12	3371 E12	3377 B10	3386 C13	3382 C8	3612 D4	3617 B5	3622 G1	3627 E4	3632 A1	6301 D12	6371 B9	6376 E11	7301 E9	7600-B D3	7606 E4
0886 E13	2261 D14	2266 F12	2371 C7	2384 C2	2609 A3	2614 G2	2622 A1	3367 E14	3362 F7	3367 D12	3372 E12	3378 B10	3387 D13	3383 E2	3613 D5	3618 C5	3623 E1	3628 E4	3633 D1	6302 G12	6372 B8	6377 E11	7302 C9	7602 D4	7607 E5
1300-A F13	2362 F14	2367 D12	2372 D9	2602 A2	2610 D3	2615 E2	2623 D1	3354 F14	3363 E7	3368 G12	3373 E12	3379 D10	3382 D10	3608 A4	3614 D5	3619 B5	3624 F9	3629 F5	3634 B2	6303 E12	6373 C8	6378 F12	7303 C10	7603 B5	7608 D4
1300-B E13	2361 E7	2366 F13	2373 C10	2608 D2	2611 B5	2616 E2	2624 A2	3359 E14	3364 E7	3369 D12	3374 E11	3384 B13	3386 C9	3610 D4	3615 A5	3620 C5	3625 F9	3630 A1	3635 B2	6304 F12	6374 C10	6379 E12	7304 C10	7604 D5	8008 G14
1322 E14	2362 E7	2368 E12	2377 C14	2607 B2	2612 D6	2617 F4	3355 D14	3360 F14	3365 D12	3370 F12	3376 C8	3385 C14	3390 C8	3611 B4	3616 D5	3621 F1	3626 E4	3631 C1	3638 E2	6601 E2	6376 C11	6380 D11	7600-A A2	7605 F4	8510 D14





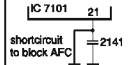
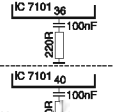
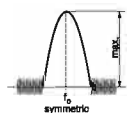
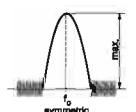


### NON-CENELEC TUNER PORTION - COMPONENT & CHIP LAYOUTS



Note: This layout drawings are applicable for both pt 1 and pt 2 pc board.

### TUNER ADJUSTMENT TABLE ( EC06 FM/MW- and FM/MW/LW - versions with AM-frame aerial )

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
<b>VARICAP ALIGNMENT</b>						
<b>FM</b> 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)			108MHz	5130	1	8V ±0.2V
			87.5MHz (65.81MHz)	check		4.3V ±0.5V (1.2V ±0.5V)
<b>MW</b> FM/AM-version, 10kHz grid 530 - 1700kHz			1700kHz	5123	1	8V ±0.2V
			530kHz	check		1.1V ±0.4V
<b>FM/MW</b> -version, 9kHz grid 531 - 1602kHz			1602kHz	5123	1	6.9V ±0.2V
			531kHz	check		1.1V ±0.4V
<b>LW</b> 153 - 279kHz			279kHz	5122	1	8V ±0.2V
			153kHz	check		1.1V ±0.4V
<b>MW</b> FM/MW/LW- version, 9kHz grid 531 - 1602kHz			1602kHz	5123	1	8V ±0.2V
			531kHz	check		1.1V ±0.4V
<b>FM IF</b>						
<b>FM</b>	10.7MHz, 45mV continuous wave	D		5119	2	0 ± 3 mV DC
<b>FM RF</b>						
<b>FM</b> 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)	108MHz	A	108MHz	2155	4	MAX
	87.5MHz (65.81MHz)	mod=1kHz Δf=±22.5kHz	87.5MHz (65.81MHz)	5131		
<b>VCO</b>						
<b>FM</b>	98MHz, 1mV continuous wave	A	98MHz	3142	3	152kHz ±1kHz <sup>1)</sup>
<b>AM IF</b>						
<b>MW</b>	450kHz connect pin 6 of IC 7101 (AM Osc.) with 3.3kΩ to Vcc	C		5111	5	
		C	see remark 2)	5112		
<b>AM AFC</b>		C		5114	2	0 ± 2 mV DC
<b>AM RF<sup>3)</sup></b>						
<b>MW<sup>4)</sup></b> FM/MW/LW- and FM/MW-version (9kHz grid) 531 - 1602kHz	1494kHz	B	1494kHz	2106	5	
	558kHz		558kHz	5102		
<b>LW</b>	198kHz		198kHz	5103		
<b>MW</b> FM/AM-version, 10kHz grid 530 - 1700kHz	1500kHz		1500kHz	2106		
	560kHz	Δf = ±30kHz V <sub>RF</sub> as low as possible	560kHz	5102		

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

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

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

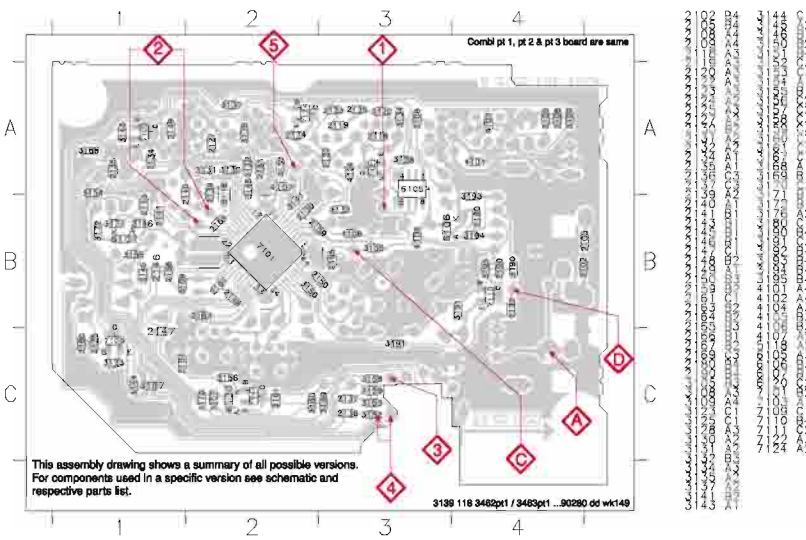
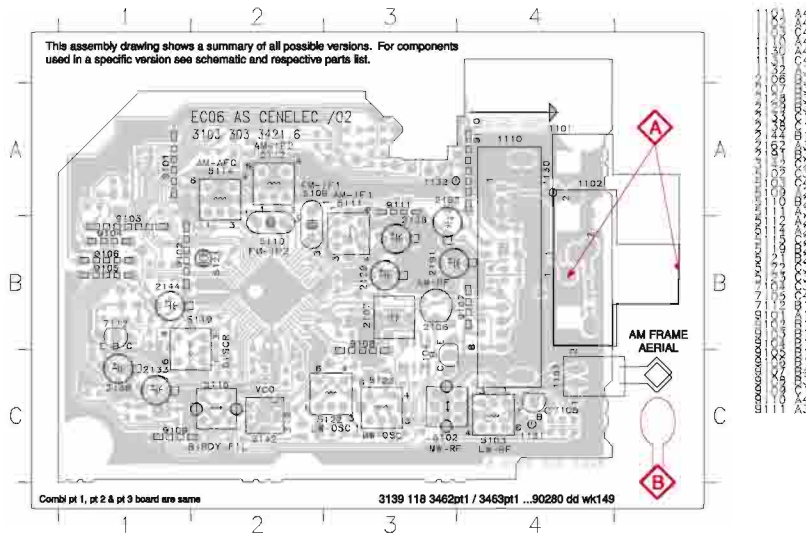
<sup>3)</sup> For AM RF adjustments the original frame antenna has to be used!

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

↑ Repeat



**CENELEC TUNER PORTION - COMPONENT & CHIP LAYOUTS**



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

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
<b>VARICAP ALIGNMENT</b>						
<b>FM</b> 87.5 - 108MHz (50kHz grid)			108MHz	check	◇ 1	8V ±1.2V
			87.5MHz	check		1.6V ±0.5V
<b>MW</b> 531 - 1602kHz (9kHz grid)			1602kHz	5123	◇ 1	8V ±0.2V 3-band 6.9V ±0.2V 2-band
			531kHz	check		1.1V ±0.4V
<b>LW</b> 153 - 279kHz (3kHz grid)			279kHz	5122	◇ 1	8V ±0.2V
			153kHz	check		1.1V ±0.4V
<b>FM - IF</b>						
<b>FM</b>	10.7MHz, 45mV continuous wave	◇ D	IC 7101 21 shortcircuit to block AFC	5119	◇ 2	0mV ±3mV
<b>FM - VCO</b>						
<b>FM</b>	98MHz, 1mV continuous wave	◇ A	98MHz	3142	◇ 3	152kHz ±1kHz 1)
<b>FM RF (channel separation)</b> Note: The FM-frontend unit has already been adjusted by the factory and needs therefore no further adjustments for service purposes.						
<b>FM</b>	98MHz, 1mV 90% Left + 9% pilot mod=1kHz	◇ A	98MHz	IF coil inside FM frontend 1110	◇ 4	right channel min.
<b>AM IF</b>						
<b>MW</b>	450kHz  connect pin 6 of IC 7101 (AM Osc.) with 3.3kΩ to Vcc	◇ C	IC 7101 38 200pF 100nF	5111	◇ 5	 symmetric
			IC 7101 40 200pF 100nF see remark 2)	5112		
<b>AM AFC</b> <b>MW</b>		◇ C	continuous wave V <sub>RF</sub> = 2mV	5114	◇ 2	0mV ±2mV
<b>AM RF 3)</b>						
<b>MW</b>	1494kHz	◇ B	1494kHz	2106	◇ 5	 symmetric
	558kHz		558kHz	5102		
<b>LW</b>	198kHz	◇ B	198kHz	5103	◇ 5	 symmetric

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

- 1) If sensitivity of frequency counter is too low adjust to max. channel separation (input signal: stereo left 90% + 9%, adjust output on right channel to minimum)
- 2) RC network serves for damping the IF-filter while adjusting the other one.
- 3) For AM RF adjustments the original frame antenna has to be used!  
MW has to be aligned before LW.

↑ Repeat

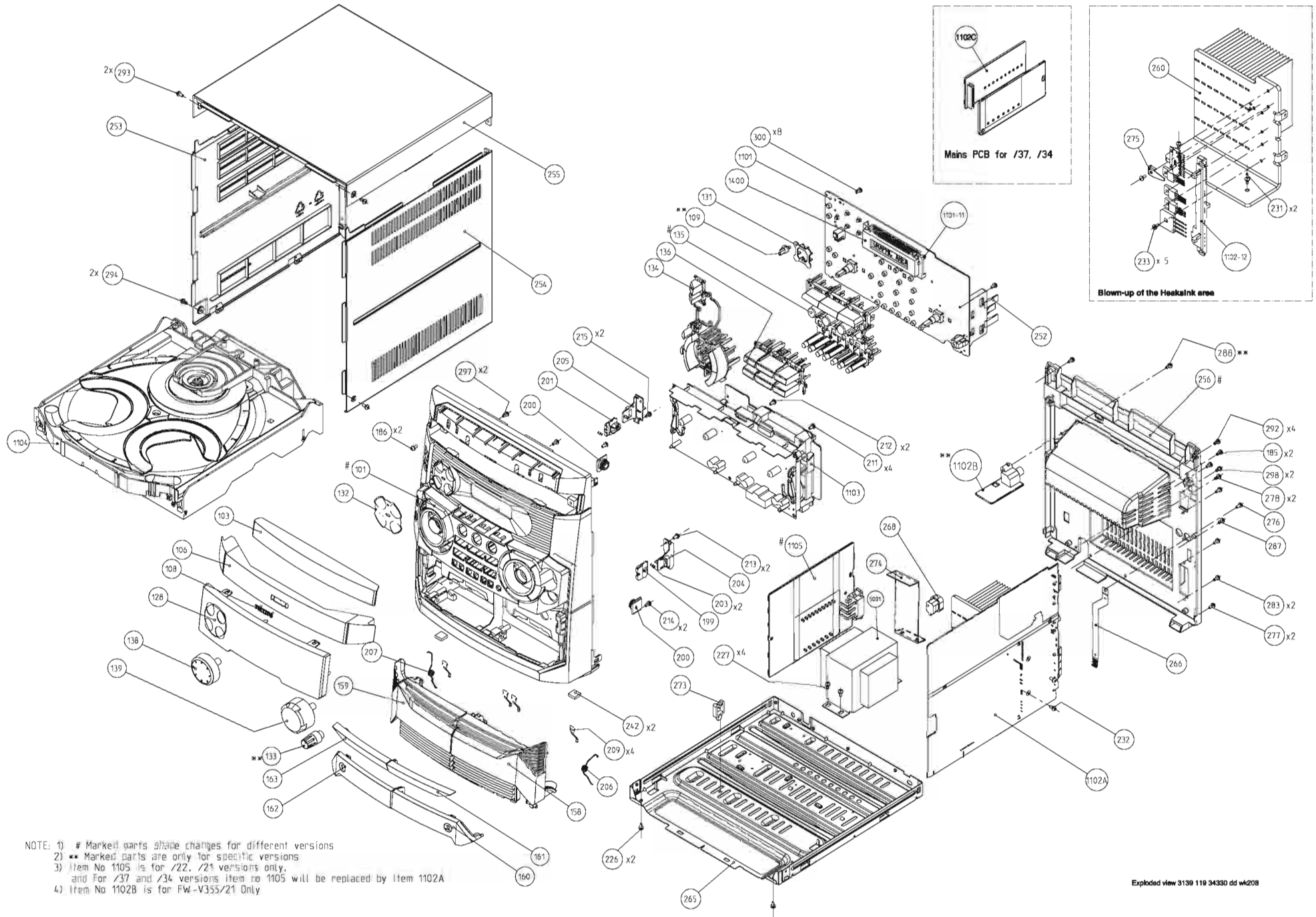




**ELECTRICAL PARTS LIST - COMBI BOARD**

1215	△	994000002955	FUSE RAD LT 5A 250V IEC	
1216	△	994000001885	FUSE RAD T 2A IEC250V	
1217	△	994000002957	FUSE RAD LT 315MA 250V	
1218	△	994000002958	FUSE 1.6 250V VDE	<b>Note: Only these parts mentioned in the list are normal service parts.</b>
1300		996500016263	SPEAKER TERMINAL 4P	
1504		996500014506	SOC CINCH 2P	
1563		996500014709	TERMINAL PIN D1	
1564		996500014709	TERMINAL PIN D1	
1568		996500014709	TERMINAL PIN D1	
1803		994000001852	SOC CINCH HIP	
2106		482212560101	CER TRIMMER 3P-11P 100V N450	
2155		482212560101	CER TRIMMER 3P-11P 100V N450	
2211	△	994000002953	E-CAP, 3300μF/35V	
2216	△	994000002952	E-CAP, 4700μF/50V	
2229		994000002954	ELEC CAP 6800μF/16V	
3142		482210012159	RTRM CAR LIN 100KH	
3623	△	996500018242	FUSE RES NFR 25A 10Ω	
5102		482215771634	MW RF COIL	
5109		996500018257	CERAMIC FILTER SFE10.7MS3AZ	
5110		996500018257	CERAMIC FILTER SFE10.7MS3AZ	
5111		242254944023	IND VER 7mm 7PY 450KHZ	
5112		482215770302	IND VAR 7mm 7P 450KHZ	
5114		482215770302	IND VAR 7mm 7P 450KHZ	
5119		482215711443	OSC COIL	
5121		482224210261	X'TAL 75KHz	
5123		242254944108	IND VAR 7mm 7PY 796KHz	
5130		482215711843	RF COIL 1.5 TURNS	
5131		482215711843	RF COIL 1.5 TURNS	
5301		994000002947	TURNS COIL	
5302		994000002947	TURNS COIL	
5303		994000002947	TURNS COIL	
5304		994000002947	TURNS COIL	
5305		996500019720	FIXED IND 2.2μH TP=52MM	
5501		996500019720	FIXED IND 2.2μH TP=52MM	
5601		996500019720	FIXED IND 2.2μH TP=52MM	
6105		482213083075	DIODE VARICAP HN1V02H-B	
6130		482213082833	DIODE 1SV228	
6131		482213082833	DIODE 1SV228	
6210		994000002949	DIODE GBU602	
7101		935174080557	IC TEA5757H/VI	
7214		996500016574	IC KIA7812API	
7220		994000002948	IC KIA7805API	
7301		932217432682	IC AN17830A	
7302		994000002951	FET POW STP16NE06FP	
7501		932215074668	IC TDA7468D	
7600		532220915853	IC NJM4556AM	

**EXPLODED VIEW - MAIN UNIT**



NOTE: 1) # Marked parts shape changes for different versions  
 2) \*\* Marked parts are only for specific versions  
 3) Item No 1105 is for /22, /21 versions only, and for /37 and /34 versions item no 1105 will be replaced by item 1102A  
 4) Item No 1102B is for FW-V335/21 Only

**MECHANICAL & ACCESSORIES PARTS LIST ELECTRICAL PARTS LIST - MISCELLANEOUS**

101	994000002935	FRONT CAB PRE-ASS'Y	1004	994000002928	FFC 14P 075MM 1.25
106	994000002936	CDC TRAY PRE-ASS'Y	1400	994000002933	FFC 30P 180MM 1.25
128	994000002937	WINDOW DISPLAY	1402	994000002932	FFC 07P 140MM 1.25
133	994000002938	KNOB KARAOKE	1500	994000002934	FFC 05P 140MM 1.25
134	994000002939	BUTTON SET PWR	1700	994000002929	FFC 07P 220MM 1.25
135	994000002941	BUTTON SET SRCE	1800	994000002931	FFC 15P 180MM 1.25
136	994000002942	BUTTON SET CTRL	5001	Δ 994000002915	TFM POWER 76-40 OVS VCD
138	994000002944	KNOB JOG ROTARY	8001	994000002969	FFC 22P/163/22P 1.0MM
139	994000002943	KNOB VOL ROTARY	8002	994000002972	FFC 5P 200MM 1.25
253	996500022382	PANEL LEFT		994000002916	MPEG-01B PCB ASS'Y
254	996500022383	PANEL RIGHT		994000002967	TAPE PCB ASS'Y
255	996500022384	COVER-TOP		994000002968	CD PCB ASS'Y
256	994000002945	PANEL REAR PRE-ASSY		994000002993	CDC MODULE
268	996500018352	BUSHING CORD			
385	Δ 996500014712	MAINS CORD			
1103	994000002927	TAPE DECK CWE FF FERRD			
	242254945067	AM FRAME AERIAL ANT			
	994000002924	REMOTE CONTROL V357			
	994000002925	BOX SPK ASS'Y FW-V357/21M			
	994000002926	FM ANTENNA WIRE			
	994000002971	CD DRIVE VAM2201/16			

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

**SCREW LISTS - MAIN UNIT**

185	D3 x 12
186	D3 x 12
211	D3 x 12
212	D3 x 12
219	D3 x 12
214	D3 x 12
215	D3 x 12
226	M3 x 6
227	M3 x 6
231	M3 x 10
232	M3 x 10
233	M3 x 10
276	M3 x 6
277	M3 x 10
278	M3 x 6
283	D3 x 12
287	D3 x 12
288	D3 x 12
292	D3 x 12
293	D3 x 12
294	D3 x 10
297	D3 x 12
298	D3 x 12
300	D3 x 12

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