

Service  
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**Service**



# Service Manual

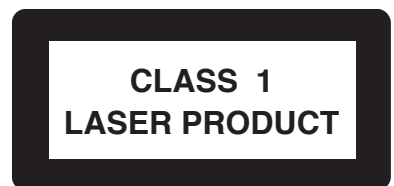


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# PHILIPS



## **SPECIFICATIONS**

### **GENERAL:**

Mains voltage : 230V  $\pm$  10% for /22  
 120V  $\pm$  10% for /07

Mains frequency : 50Hz

Power consumption : < 1W at ECO Power Standby  
 : 25W at Standby  
 : 110W at Active

Clock accuracy : < 4 seconds per day

Dimension centre unit : 265W x 322H x 390Dmm

Game Sound : Speed /Punch /Blast /Off

Input sensitivity  
 Aux in : 640mV  $\pm$  2dB at 1kHz  
 CDR in : 1V  $\pm$  3dB at 1kHz  
 Game Port (at 1kHz) : 310mV  $\pm$  2d

Output sensitivity  
 Line out (Left/Right) : 550mV  $\pm$  2dB at 22k $\Omega$   
 Headphone output at 32!& : 700mV  $\pm$  2dB (Max. vol.)

### **TUNER:**

#### **FM**

Tuning range : 87.5-108MHz

Grid : 50kHz

Grid : 100kHz for /37

IF frequency : 10.7MHz  $\pm$  25kHz

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

Sensitivity at 26dB S/N : < 22  $\mu$ V

Selectivity at 300kHz bandwidth : > 25dB

Image rejection : > 25dB [>75dB]

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

-3dB Limiting point : < 23.5 $\mu$ V

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

#### **MW**

Tuning range : 531-1602kHz  
 530-1700kHz for /07

Grid : 9kHz  
 10kHz for /07

IF frequency : 450kHz  $\pm$  1kHz

Aerial input : Frame aerial

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

Selectivity at 300kHz bandwidth : > 18dB

IF rejection : > 45dB

Image rejection : > 28dB

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

### **AMPLIFIER:**

Output power (4 $\Omega$ , 1kHz, 10% THD)  
 L & R : 2 x 110W RMS /22  
 : 2 x 88W FTC /07

Frequency response within -3dB : 50Hz-20kHz

Incredible Surround : ON/OFF

WOOX : Level 1, 2, 3 & OFF

Digital Sound Control (DSC) : Digital, Rock, Pop,  
 Newage, Classic, Electric

Virtual Ambience Control (VAC) : Hall, Concert, Cinema,  
 Disco, Arcade, Cyber

### **CASSETTE RECORDER:**

Number of track : 2 x 2 stereo

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

Wow and flutter : < 0.4% DIN

Fast-wind/Rewind time C60 : 130 sec

Bias system : 78kHz  $\pm$  10kHz

Rec/Pb frequency response  
 within 10dB : 125Hz - 8kHz

Signal to Noise Ratio (Type I) : > 48dBA

### **COMPACT DISC:**

Measurement done at output conn. of the CDC module.

Frequency response : <  $\pm$ 3dB for 20Hz-20kHz

Output Voltage (in Vrms) : 0.65Vrms  $\pm$  1dB unloaded

Signal to Noise Ratio (A-weighted) : > 80dBA

Distortion at 1kHz : < 0.003%

Channel Unbalance : <  $\pm$ 1dB

Channel Separation (1kHz) : >60dB

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

MPEG 1 Layer 3 (MP3-CD) : MPEG AUDIO

MP3-CD Bit Rate : 56-256 kbps

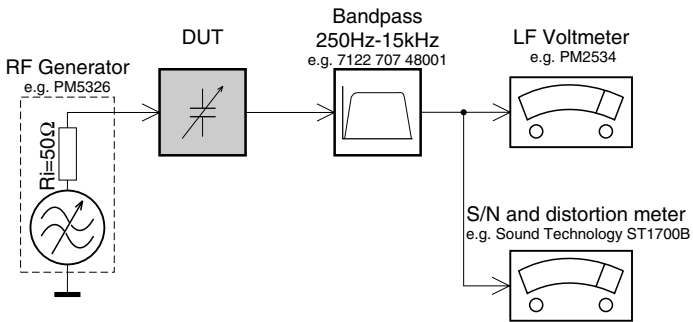
MP3-CD Sampling Frequencies : 32 kHz, 44.1 kHz,  
 48kHz

Recording Format : ISO 9660  
 UDF format not  
 supported

[...] Values indicated are for "ECO6 Cenelec Board" only.

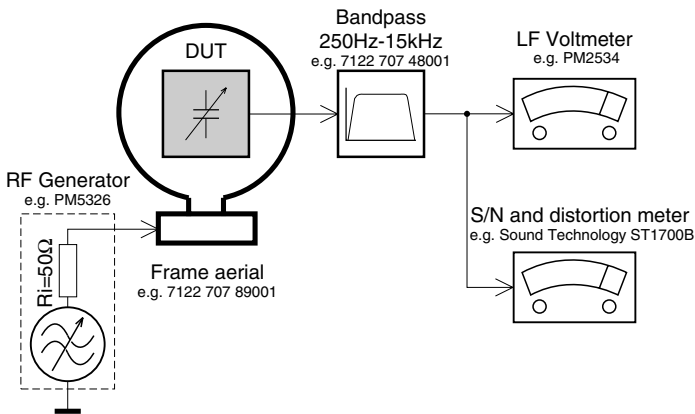
## MEASUREMENT SETUP

### Tuner FM



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

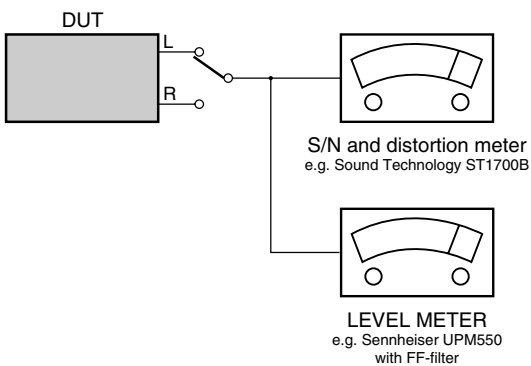
### Tuner AM (MW,LW)



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).

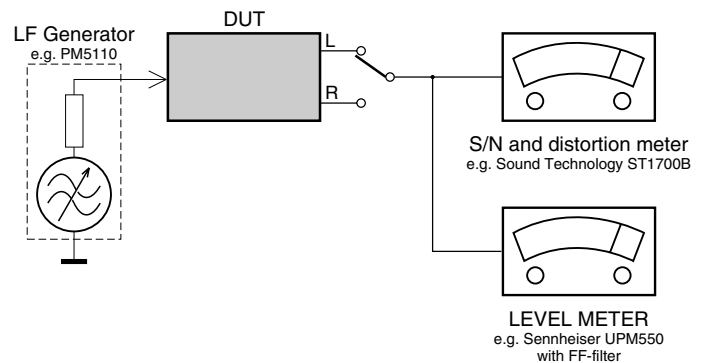
### CD

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

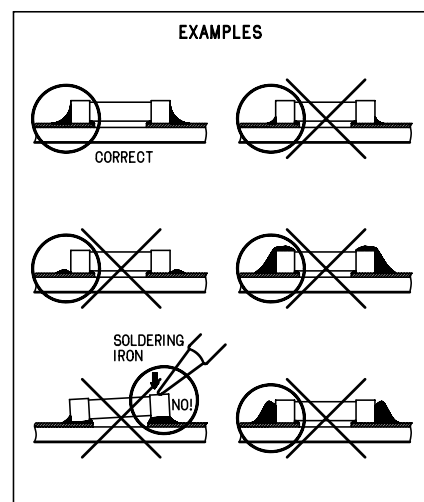
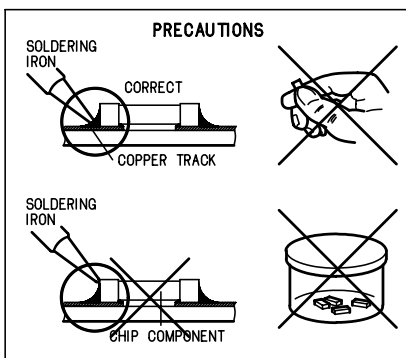
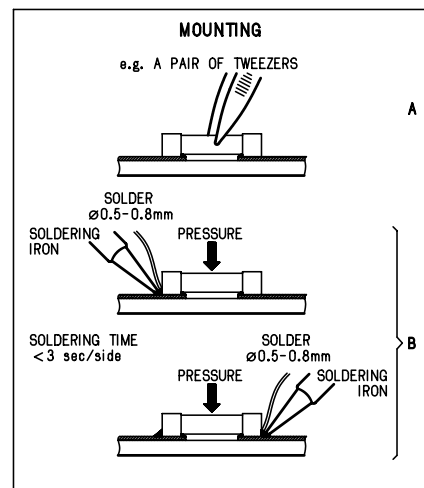
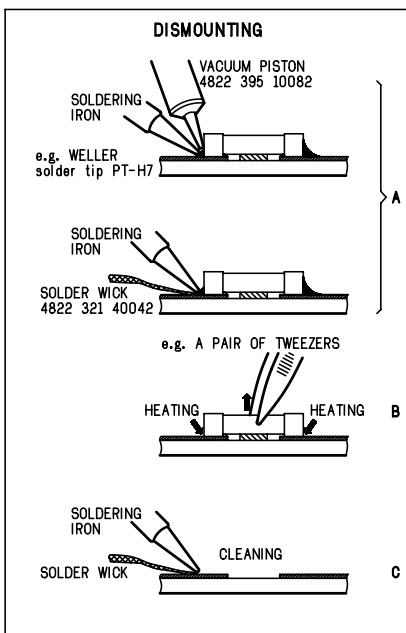
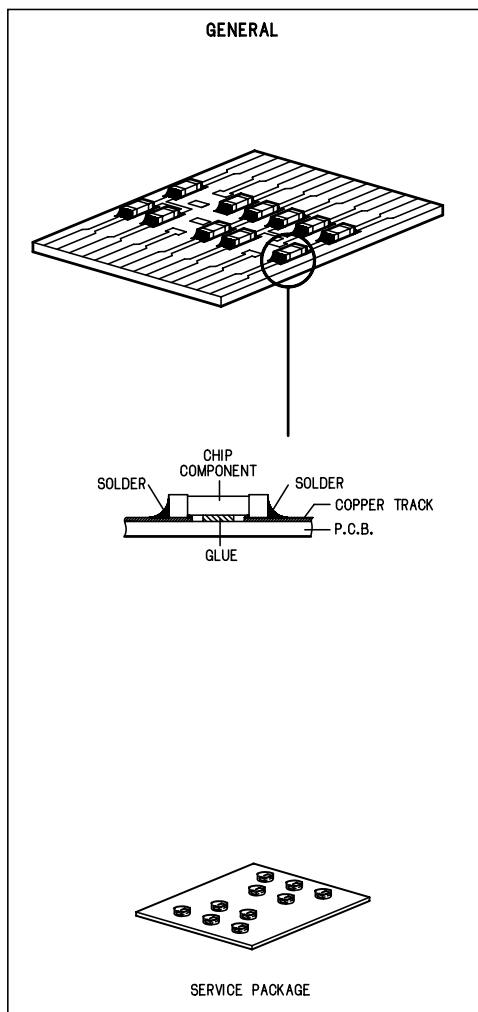
### Compact Disc:

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 ridatta in caso di non osservazione della più grande cauzione alla loro manipolazione.

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

Safety components are marked by the symbol  $\triangle$ .

**NL**

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

De Veiligheidsonderdelen zijn aangeduid met het symbool  $\triangle$

**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.

Les composants de sécurité sont marqués  $\triangle$

**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.

Sicherheitsbauteile sind durch das Symbol  $\triangle$  markiert.

**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.

Componenti di sicurezza sono marcati con  $\triangle$

**GB**

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

**GB Warning !**

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

**S Varning !**

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

**SF Varoitus !**

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

**DK Advarse !**

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

**F**

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

## INFORMATION ABOUT LEAD-FREE SOLDERING

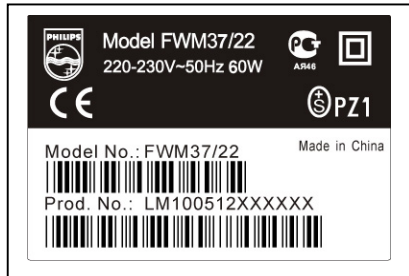
Philips CE is producing lead-free sets from 1.1.2005 onwards.

### IDENTIFICATION:

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



### Example S/N:



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

So from 0501 onwards = from 1 Jan 2005 onwards

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

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

- Use only lead-free solder alloy Philips SAC305 with order code 0622 149 00106. If lead-free solder-paste is required, please contact the manufacturer of your solder-equipment. In general use of solder-paste within workshops should be avoided because paste is not easy to store and to handle.
- Use only adequate solder tools applicable for lead-free solder alloy. The solder tool must be able
  - To reach at least a solder-temperature of 400°C,
  - To stabilize the adjusted temperature at the solder-tip
  - To exchange solder-tips for different applications.
- Adjust your solder tool so that a temperature around 360°C – 380°C is reached and stabilized at the solder joint. Heating-time of the solder-joint should not exceed ~ 4 sec. Avoid temperatures above 400°C otherwise wear-out of tips will rise drastically and flux-fluid will be destroyed. To avoid wear-out of tips switch off un-used equipment, or reduce heat.
- Mix of lead-free solder alloy / parts with leaded solder alloy / parts is possible but PHILIPS recommends strongly to avoid mixed solder alloy types (leaded and lead-free).  
If one cannot avoid or does not know whether product is lead-free, clean carefully the solder-joint from old solder alloy and re-solder with new solder alloy (SAC305).
- Use only original spare-parts listed in the Service-Manuals. Not listed standard-material (commodities) has to be purchased at external companies.
- Special information for BGA-ICs:
  - always use the 12nc-recognizable soldering temperature profile of the specific BGA (for de-soldering always use the lead-free temperature profile, in case of doubt)
  - lead free BGA-ICs will be delivered in so-called 'dry-packaging' (sealed pack including a silica gel pack) to protect the IC against moisture. After opening, dependent of MSL-level seen on indicator-label in the bag, the BGA-IC possibly still has to be baked dry. (MSL=Moisture Sensitivity Level). This will be communicated via AYS-website. Do not re-use BGAs at all.
- For sets produced before 1.1.2005 (except products of 2004), containing leaded solder-alloy and components, all needed spare-parts will be available till the end of the service-period. For repair of such sets nothing changes.
- On our website [www.atyourservice.ce.Philips.com](http://www.atyourservice.ce.Philips.com) you find more information to:
  - \* BGA-de-/soldering (+ baking instructions)
  - \* Heating-profiles of BGAs and other ICs used in Philips-sets

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

For additional questions please contact your local repair-helpdesk.

## SERVICE INSTRUCTION

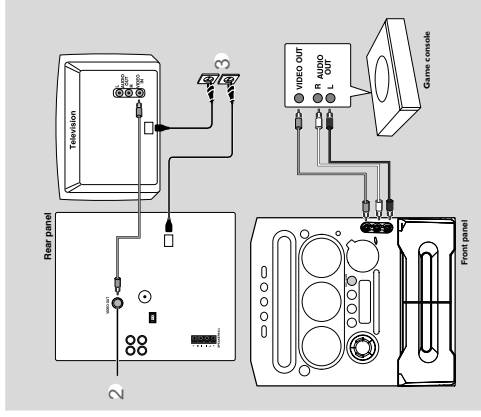
Safety regulations require that after a repair, the set must be returned in its original condition. Pay in particular attention to the following points:

- Route the wire trees correctly and fix them with the mounted cable clamps.
- Check the insulation of the AC Power lead for external damage.
- Check the strain relief of the AC Power cord for proper function.
- Check the electrical DC resistance between the AC Power Plug and the secondary side (only for sets which have a AC Power isolated power supply):
  1. Unplug the AC Power cord and connect a wire between the two pins of the AC Power plug.
  2. Set the AC Power switch to the "on" position (keep the AC Power cord unplugged!).
  3. Measure the resistance value between the pins of the AC Power plug and the metal shielding of the tuner or the aerial connection on the set. The reading should be larger than 4.5 Mohm (For U.S. it should be between 4.2 Mohm and 12 Mohm).
  4. Switch "off" the set, and remove the wire between the two pins of the AC Power plug.
- Check the cabinet for defects, to avoid touching of any inner parts by the customer.

## About Gameport

Gameport allows you to connect your game console to this audio system which enables you to enjoy a total game immersion experience through powerful sound output.

## Preparation before use



- 1 Connect your game console's video and audio output to the GAMEPORT video and audio inputs respectively (refer to "Connections - Connecting to game console").
- 2 Connect your TV's video input to the **VIDEO OUT (CVBS)** on the rear panel.
- 3 Connect all the AC power cord to the power outlet.

## Starting operation

- 4 Turn on the TV and set to the correct video-in channel.  
The TV's video input channel may be called AUX(iliary) IN, AUDIO/VIDEO (AV) IN, EXT 1, etc. These channels are often near channel 00 on your TV. Or, your TV remote control may have a button or switch that chooses different video modes. See your TV manual for details.

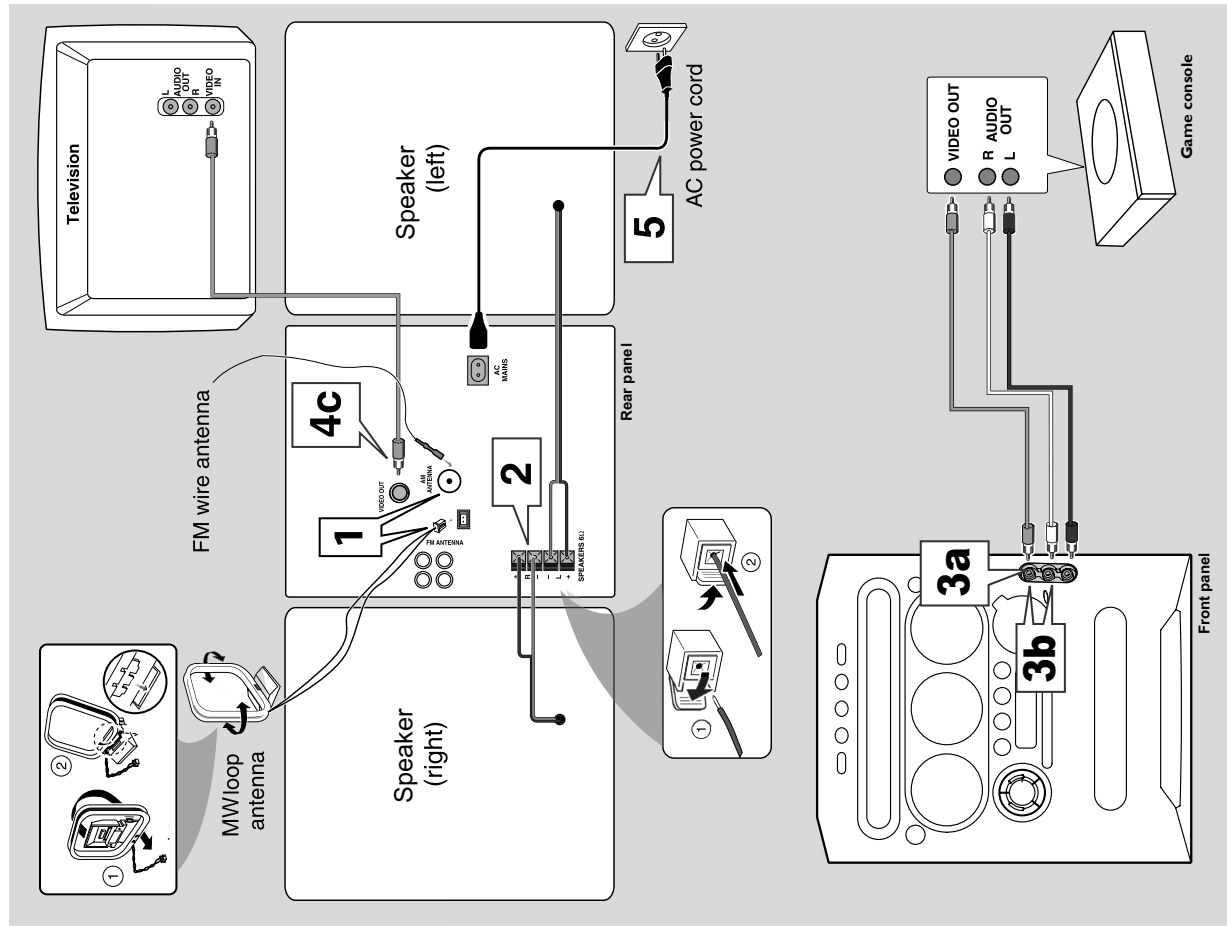
## WARNING

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

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

Problem	Solution
<b>Radio reception is poor.</b>	<p>If the signal is too weak, adjust the antenna or connect an external antenna for better reception. Increase the distance between the system and your TV or VCR.</p> <p>Insert a disc. Load in the disc with the labeled side facing up. Replace or clean the disc, see "Care and safety information". Use a finalised CD-R(W) or a correct format disc.</p> <p>Remove and reconnect the AC power cord and switch on the system again.</p> <p>Adjust the volume. Disconnect the headphones. Check that the speakers are connected correctly. Check that the AC power cord is connected properly.</p> <p>Select the source (CD or TUNER, for example) before pressing the function button (▶◀, ◀▶, ▶▶▶▶). Reduce the distance between the remote control and the system. Replace the battery. Point the remote control directly toward the IR sensor.</p> <p>Set the clock correctly. Press <b>TIMER ON/OFF</b> to switch on the timer.</p> <p>Press and hold <b>DEMO STOP</b> on the main unit to switch off the demonstration mode.</p>
<b>"NO DISC" is displayed or the disc cannot be played.</b>	
<b>The system does not react when buttons are pressed.</b>	
<b>Sound cannot be heard or is of poor quality.</b>	
<b>The remote control does not function properly.</b>	
<b>The timer is not working.</b>	
<b>The system displays features automatically and buttons start flashing.</b>	

Refer to the FAQ (Frequently Asked Questions) on the supplied CD-ROM or visit our website "[www.audio.philips.com](http://www.audio.philips.com)" for latest update on FAQ.



**Warning!**

- Use only the supplied speakers. The combination of the main unit and speakers provides the best sound. Using other speakers can damage the unit and sound quality will be negatively affected.
- Never make or change connections with the power switched on.
- Connect the AC power cord to the power outlet only after you have finished hooking up everything.
- To avoid overheating of the system, a safety circuit has been built in. Therefore, your system may switch to Standby mode automatically under extreme conditions. If this happens, let the system cool down before reusing it (not available for all versions).

**Step 1: Connecting FM/MW antennas**

- Place the MW loop antenna on a shelf or attach it to a stand or wall.
- Extend the FM antenna and fix its ends to the wall.
- Adjust the position of the antennas for optimal reception.
- Position the antennas as far as possible from a TV, VCR or other radiation source to prevent unwanted noise.
- For better FM stereo reception, connect the external FM antenna.

**Step 2: Connecting the 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 on page 10.

**Notes:**

- Ensure that the speaker cables are correctly connected. Improper connections may damage the system due to short-circuit.
- Do not connect more than one speaker to any one pair of +/- speaker terminals.

**Step 3: Connecting to the game console**

**IMPORTANT!**

Gameport inputs are for the game console only.

- Use the game console's video cable (not supplied) to connect its video output to the GAMEPORT-VIDEO terminal.
- Use the game console's audio cables (not supplied) to connect its audio outputs to the GAMEPORT-AUDIO L./AUDIO R. terminals.
- Use the video cable (yellow) to connect the VIDEO OUT terminal to the video input on the TV for viewing.

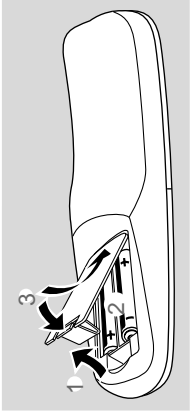
**Notes:**

- On the TV, the Video Input jack is usually yellow and might be labeled A/V In, CVBS, Composite or Baseband.
- To avoid magnetic interference, do not position the front speakers too close to your TV.

**Step 4: Connecting the AC power cord**

"AUTO INST TALL - PRESS PLAY" may appear on the display panel when the AC power cord is plugged into the power outlet for the first time. Press ► on the main unit to store all available radio stations (page 3 - P3) or press ► to exit (refer to "Tuner Operations").

## Step 5: Inserting batteries into the remote control



- 1 Open the battery compartment cover.
- 2 Insert two batteries type R06 or AA, following the indications ( + / - ) inside the compartment.
- 3 Close the cover:

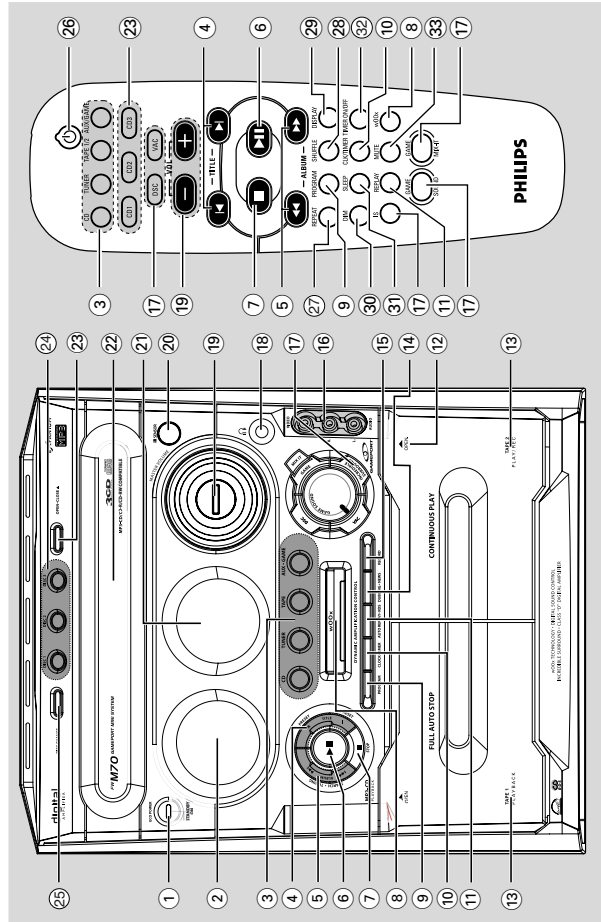
### Using the remote control to operate the system

- 1 Aim the remote control directly at the remote sensor (IR) on the main unit.
- 2 Select the source you wish to control by pressing one of the source select keys on the remote control (for example CD,TUNER).
- 3 Then select the desired function (for example ► II, ◀, ▶).

### CAUTION!

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

# Functional Overview



## Main unit and remote control

- 1 **STANDBY ON / ECO POWER**
  - Switches to the Eco Power standby mode or turns on the system.
  - \*Switches to the standby mode.
- 2 **Display screen**
- 3 **CD / TUNER / TAPE (TAPE1/2) / AUX-GAME**
  - Selects the relevant active mode.
  - CD: toggles between DISC 1-3.
  - TUNER: toggles between FM and MW band.
  - AUX-GAME: toggles between AUX and GAMEPORT mode.
  - TAPE: toggles between Tape Deck 1 and Tape Deck 2.
- 4 **PRESET (-) (◀) PRESET (+) (▶)**
  - CD: selects a track or selects a title from MP3 disc.
  - TUNER: selects a preset radio station.
  - CLOCK: sets the minutes.
- 5 **SEARCH-TUNING-ALBUM** (◀◀ / ▶▶) (◀◀ / ▶▶)
  - CD: \*searches backward/forward.
  - MP3-CD: select an album
  - TUNER: tunes the radio frequency up/down.
  - CLOCK: sets the hours.
  - TAPE: searches backward/forward.
- 6 **PLAY-PAUSE ▶ II**
  - CD: starts/pauses playback.
  - TAPE: starts playback.
- 7 **STOP ■**
  - Exits an operation.
  - CD: stops playback or clears a programme.
  - TUNER: \*erases a preset radio station.
- 8 **WOOX**
  - \*Turns on/off the demonstration mode.
  - Selects the enhanced or normal wOOx sound effect.
- 9 **PROGRAM**
  - CD: starts or confirms tracks programming.
  - TUNER: starts \*automatic/manual preset

\* = Press and hold the button for more than two seconds.

# Functional Overview

- 10 **CLOCK-TIMER (CLK/TIMER)**
  - \*Enters clock or timer setting mode.
- 11 **AUTO REPLAY-RDS**
  - Selects continuous playback in either AUTO PLAY or ONCE mode only.
  - Selects RDS information in the TUNER mode.
- 12 **OPEN ▲**
  - Opens the tape deck
- 13 **TAPE1 / TAPE2**
  - Tape deck 1 and tape deck 2.
- 14 **DUBBING-NEWS**
  - Dubs a tape
  - \*Turns on/off news.
- 15 **RECORD**
  - Starts recording on tape deck 2
- 16 **VIDEO**
  - Use a video cable to connect to your game console's video output.
- 17 **AUDIO L. / AUDIO R.**
  - Use an audio cable to connect to your game console's left/right audio output.
- 18 **INCREDIBLE SURROUND**
  - Creates a super-enhanced stereo effect.
- 19 **DSC**
  - Selects different type of preset sound equaliser settings (NEW AGE, ELECTRIC, DIGITAL, POP, CLASSIC or ROCK).
- 20 **VAC**
  - Selects different type of ambience-based equaliser settings (CINEMA, ARCADE, CONCERT, DISCO, CYBER or HALL).
- 21 **MIX IT (GAME MIX IT)**
  - Mixes the game sound with your favourite music from one of these music sources (CD, TUNER or AUX).
- 22 **GAME SOUND**
  - Adjusts the game's output volume level.
  - Selects different type of equaliser setting for Gameport (SPEED, PUNCH or BLAST).
- 23 **Plugs in the headphones jack. The speakers output will be cancelled.**
- 24 **MASTER VOLUME (VOL + -)**
  - Adjusts the volume level.
- 25 **IR SENSOR**
  - Points the remote control towards this sensor.
- 26 **VU meters**
  - Indicates signal strength of left/right channel.
- 27 **DISC TRAY**
- 28 **OPEN-CLOSE ▲ (DISC 1-3)**
  - Opens/closes the respective disc tray.
- 29 **DISC 1, 2 and 3**
  - Selects a disc tray to playback
- 30 **DISC CHANGE**
  - Changes discs
- 31 **Control buttons available on the remote control only**
- 32 **Power**
  - Switches to the Eco Power standby mode.
  - \*Switches to the standby mode.
- 33 **REPEAT**
  - Repeats a track/disc/all programmed tracks.
- 34 **SHUFFLE**
  - Turns on/off the random play mode.
- 35 **DISPLAY**
  - Displays the album and title name for MP3 disc.
- 36 **DIM**
  - Turns on/off the dim mode.
- 37 **SLEEP**
  - Sets the sleep timer function.
- 38 **TIMER ON/OFF**
  - Turns on/off the timer function.
- 39 **MUTE**
  - Mutes or restores the volume

\* = Press and hold the button for more than two seconds.



### DISMANTLING INSTRUCTIONS

#### Dismantling of the Cassette Cover

Lift up and out



Figure 1

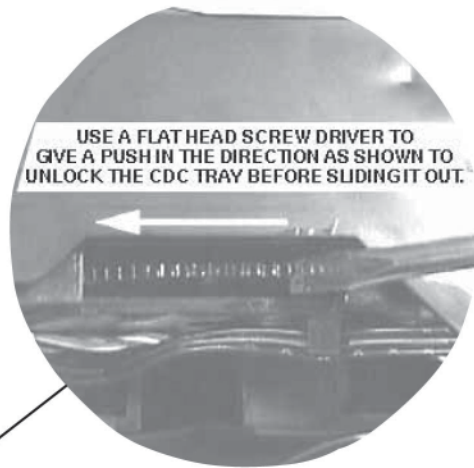
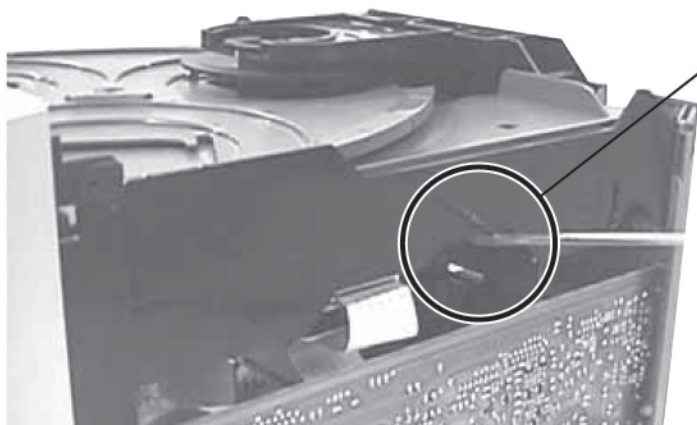
Remove Cassette Cover

Cassette Cover

#### Dismantling of the CDC Module and Front Panel

- 1) Loosen 4 screws to remove the Cover Top (pos 255) of the set.
- 2) Loosen 2 screws to remove the Panel Left (pos 253) and 2 screws to remove the Panel Right (pos 254) of the set.
- 3) Slide out the CDC Tray as shown in the diagram below with the help of a flat head screw driver.

Figure 2



Sliding out the CDC Tray

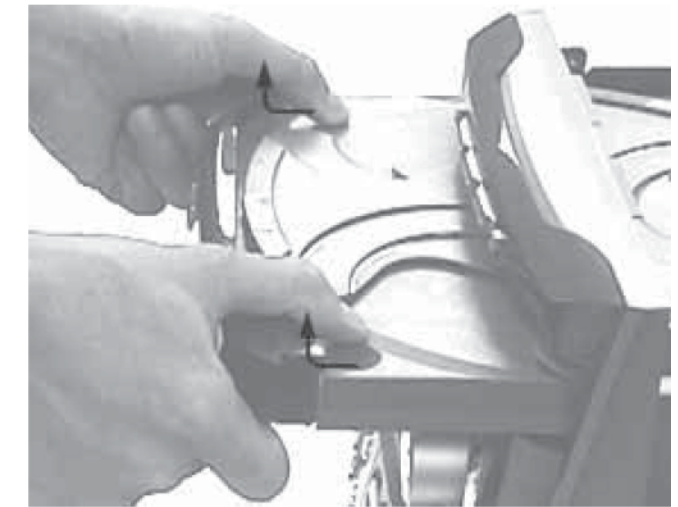
Figure 3

USE A FLAT HEAD SCREW DRIVER TO GIVE A PUSH IN THE DIRECTION AS SHOWN TO UNLOCK THE CDC TRAY BEFORE SLIDING IT OUT.

#### Dismantling of the CDC Module and Front Panel

- 4) Remove the Cover Tray CDC as indicated.

Figure 4



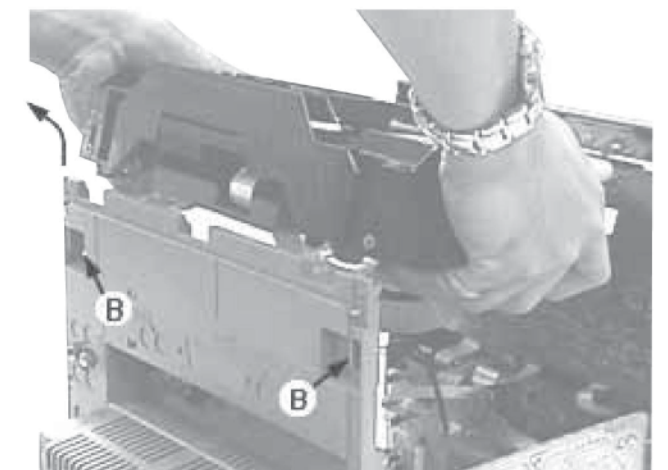
Remove Cover Tray CDC

- 5) Loosen 2 screws A and 2 screws B to remove the CDC Module as indicated.
- 6) Remove 2 screws at the bottom to separate the Front Panel Assembly from the Plate Bottom.



Front View CDC

Figure 5



Remove CDC Module

Figure 6



## DISMANTLING INSTRUCTIONS

### Detaching the Front Panel assembly from the Bottom/Rear assembly

- 1) Remove 2 screws B as shown in Figure 8 from the bottom of the Cabinet Front .
- 2) Release the fixation of the AF Board to Bracket CDC Right by releasing the 2 catches C1 (see Figure 9) and pulling the AF Board outwards as shown in Figure 8.
- 3) Uncatch 2 catches C2 (see Figure 9) on the left & right sides of the Cabinet Front and slides the Front Panel assembly out towards the front.

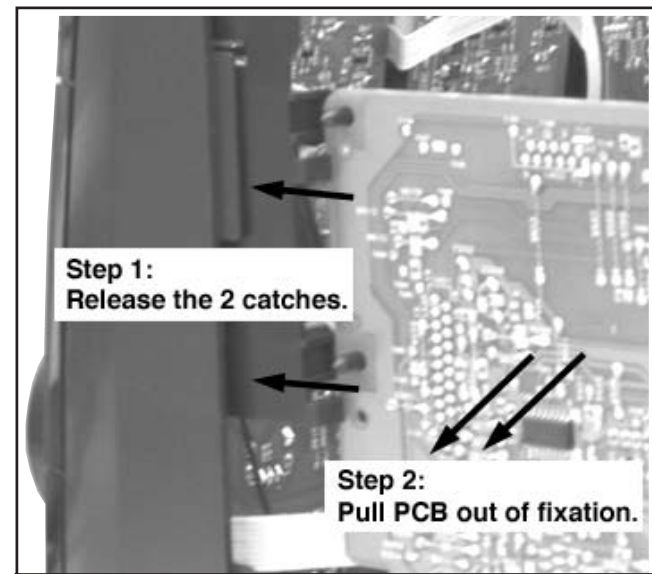


Figure 8

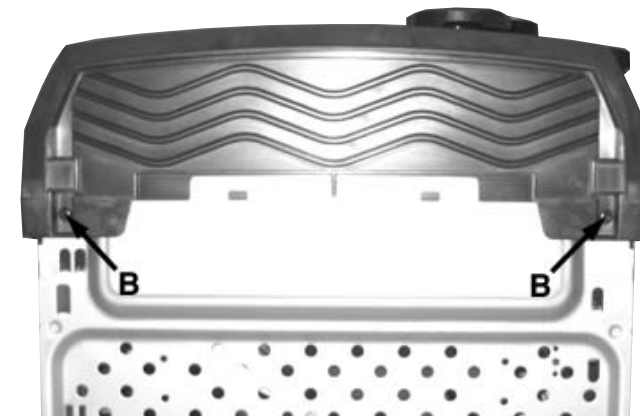


Figure 7

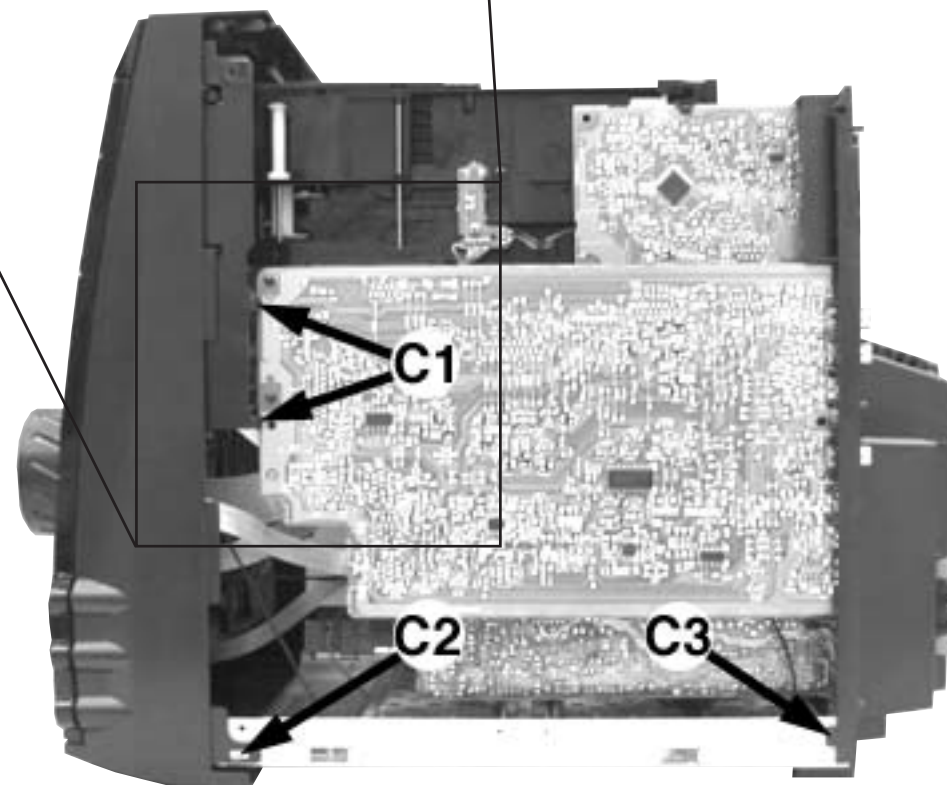


Figure 9

### Dismantling of the Front Control Board and Front Display Board

- 1) The Knob Volume Rotary can be remove by pulling it out in the direction as shown in Figure 10.
- 2) The Knob Jog Rotary can be remove by inserting a strong string into the slot and pull it in the direction as shown in Figure 11.
- 3) Loosen 2 nuts (see Figure 12) to remove the Front Display Board.
- 4) Loosen 8 screws D (see Figure 13) to remove the Front Display Board.
- 5) Loosen 4 screws E (see Figure 13) to remove the CDC Key Board.

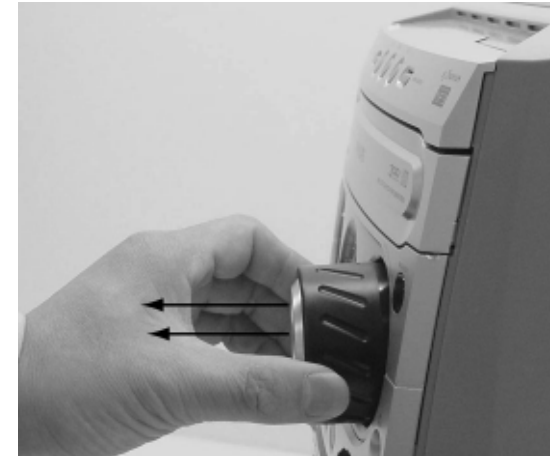


Figure 10



Figure 11

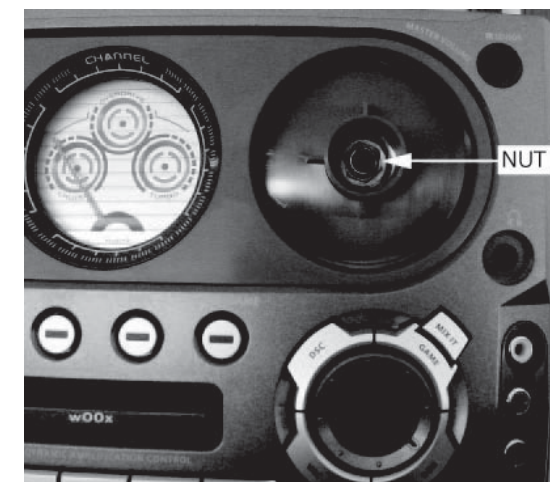


Figure 12

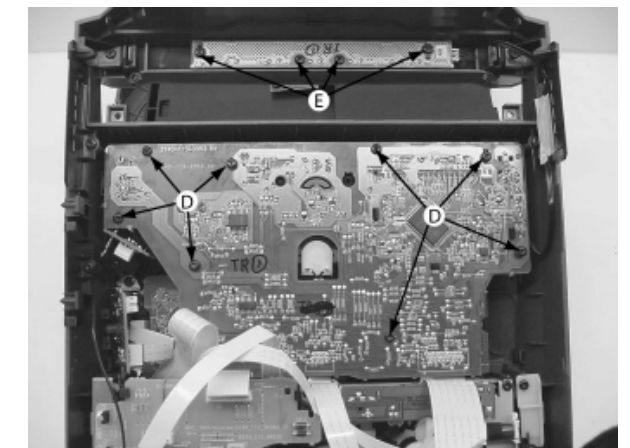


Figure 13

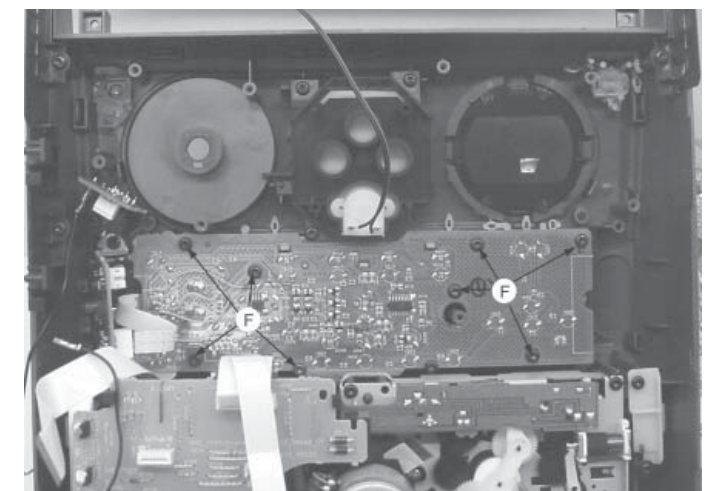


Figure 14

- 6) Loosen 8 screws F (see Figure 14) to remove the Front Control Board .
- 7) Loosen 3 screws G (see Figure 15) to remove the Headphone Board and Game Port Board.

## DISMANTLING INSTRUCTIONS

### Dismantling of the Game Port Board and Headphone Board

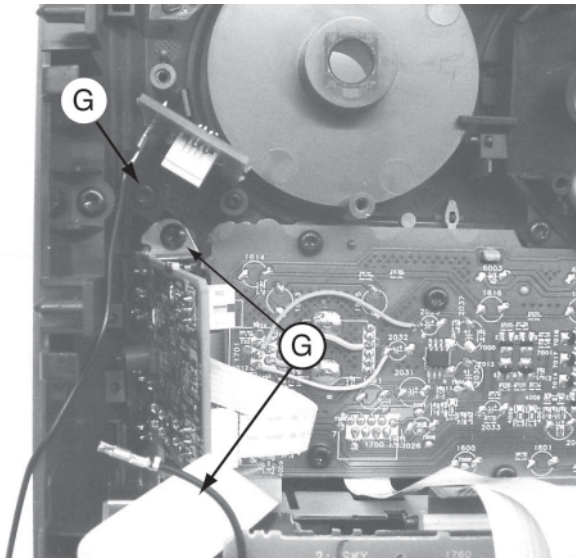


Figure 15

### Dismantling of the ETF Tape Module

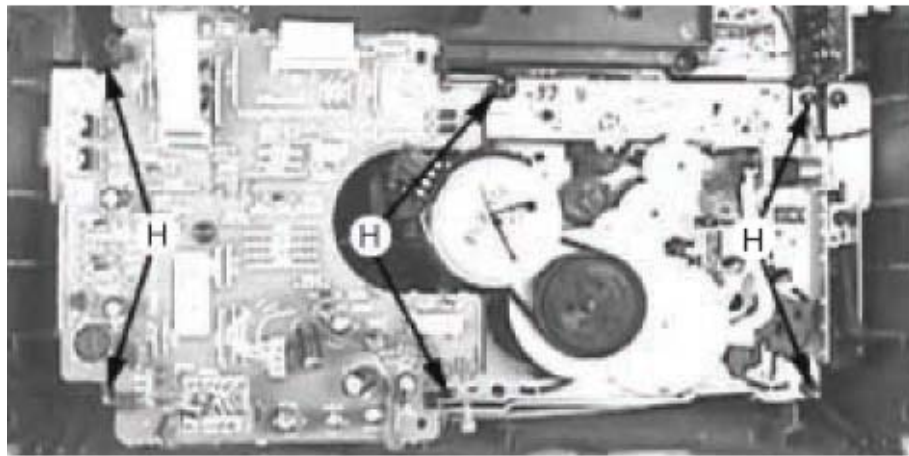


Figure 16

- 1) Loosen 6 screws H (see Figure 16) to remove the ETF Tape Module.

### Dismantling of Rear Portion

- 1) Remove 2 screws I (see Figure 17) to loose the AF12 Board.
- 2) Loosen 3 screws J and uncatch N (see Figure 17) to remove the Tuner Board.
- 3) Loosen 1 screws K (see Figure 17) to remove the Video Board.
- 4) Loosen 4 screws L (see Figure 17) and uncatch C5 (see Figure 18) to remove the Fan.
- 5) Loosen 3 screws M (see Figure 17) and uncatch C3 (see Figure 9) to remove the Panel Rear by sliding it out towards the rear.



Figure 18

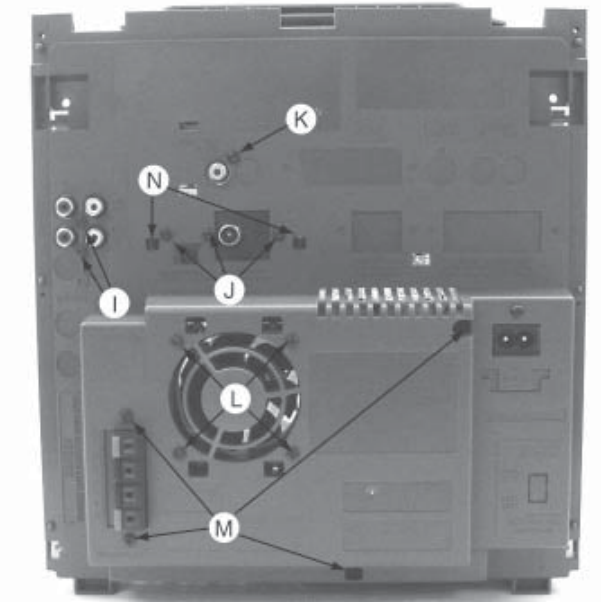


Figure 17

### Repair Hint

- 1) During repair it is possible to disconnect the Tuner Board and CDC Module completely unless the fault is suspected to be in that area. This will not affect the performance of the rest of the set.
- 2) Due to the short flex cable wires in the ETF Module, the PCB should be disconnected and reconnected on the reverse side of the tape mechanism to keep it electrically connected during repair. see Figure 19.

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

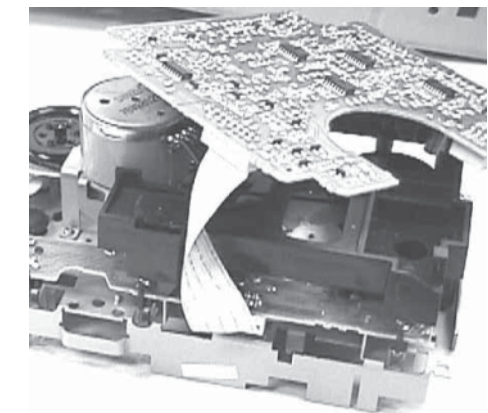
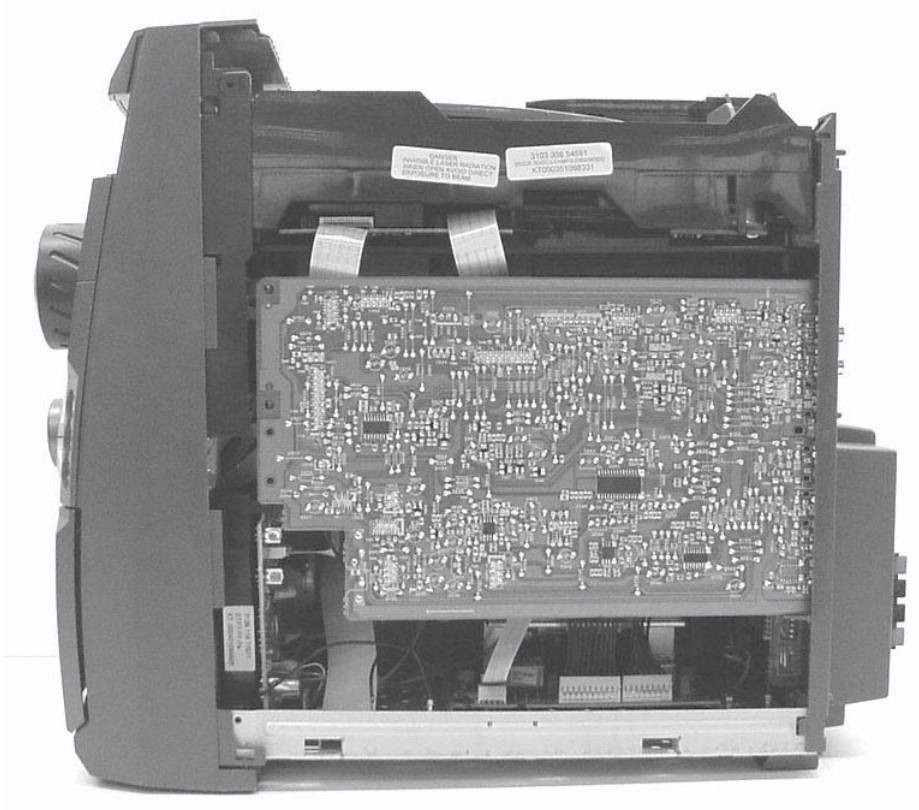


Figure 19

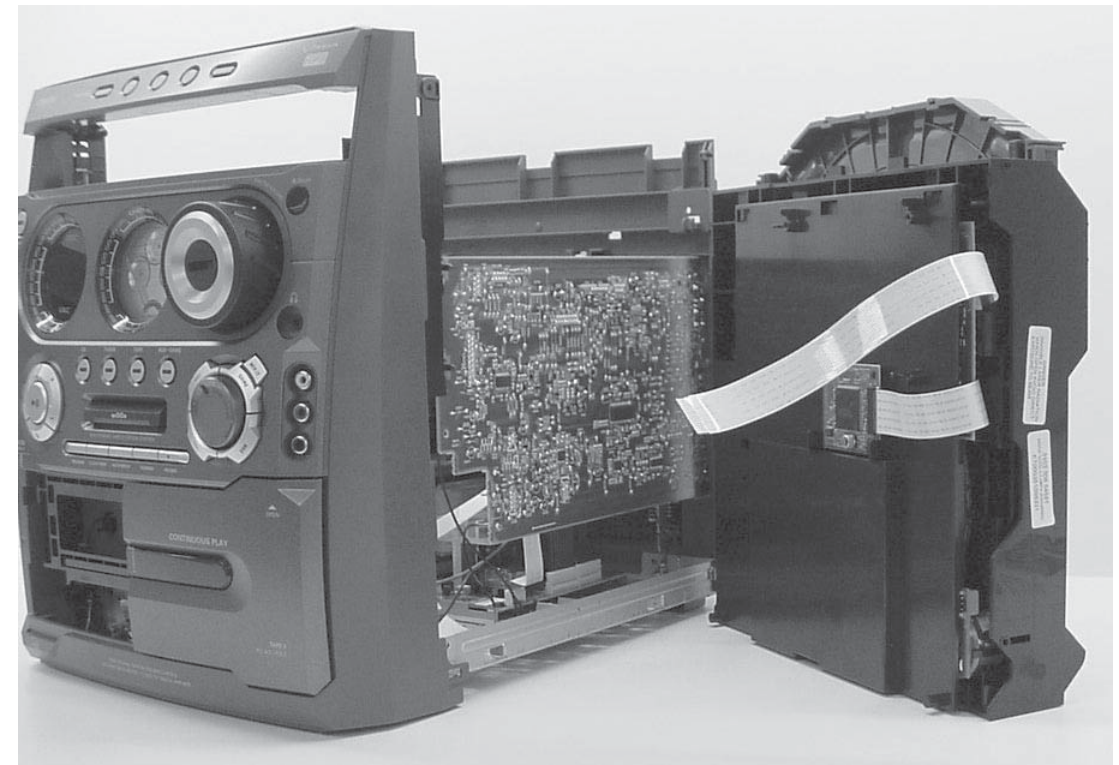


# DISMANTLING INSTRUCTIONS

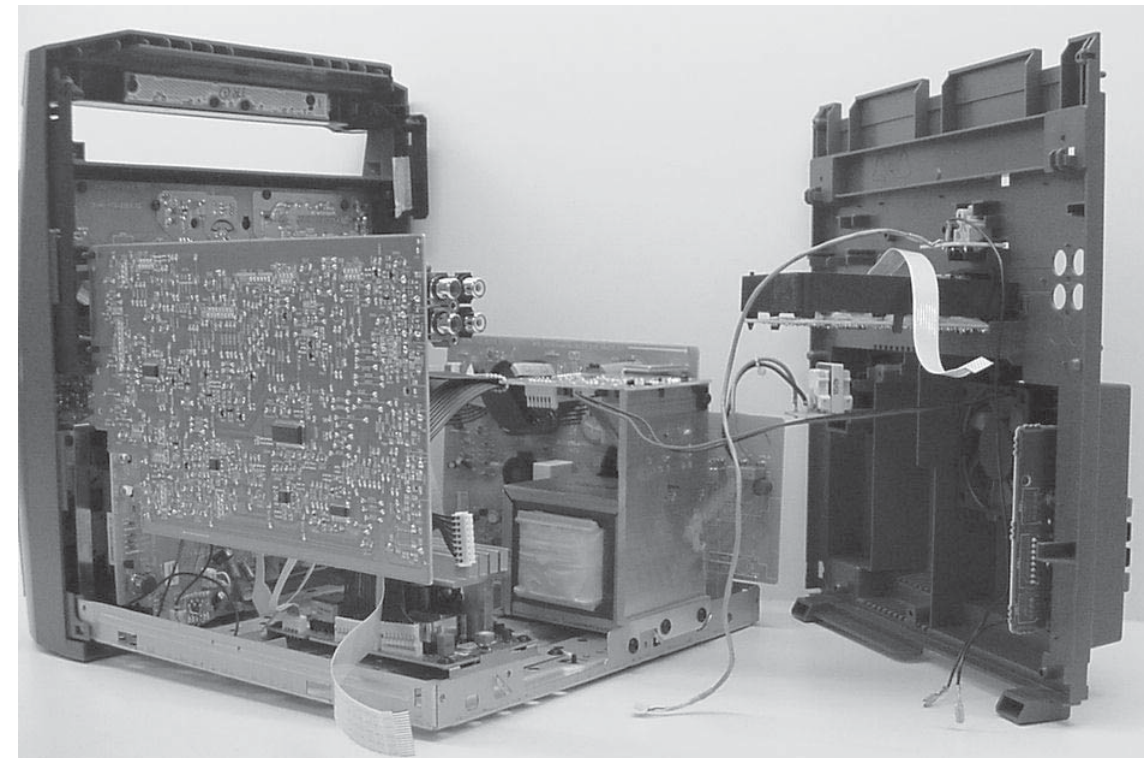
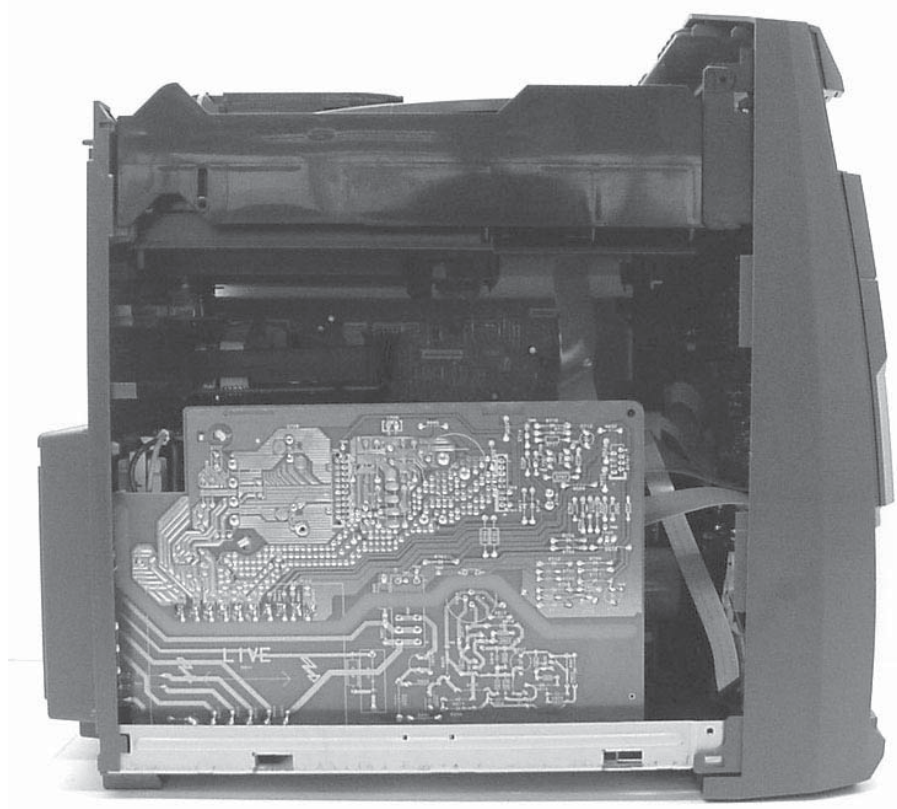
Service position A



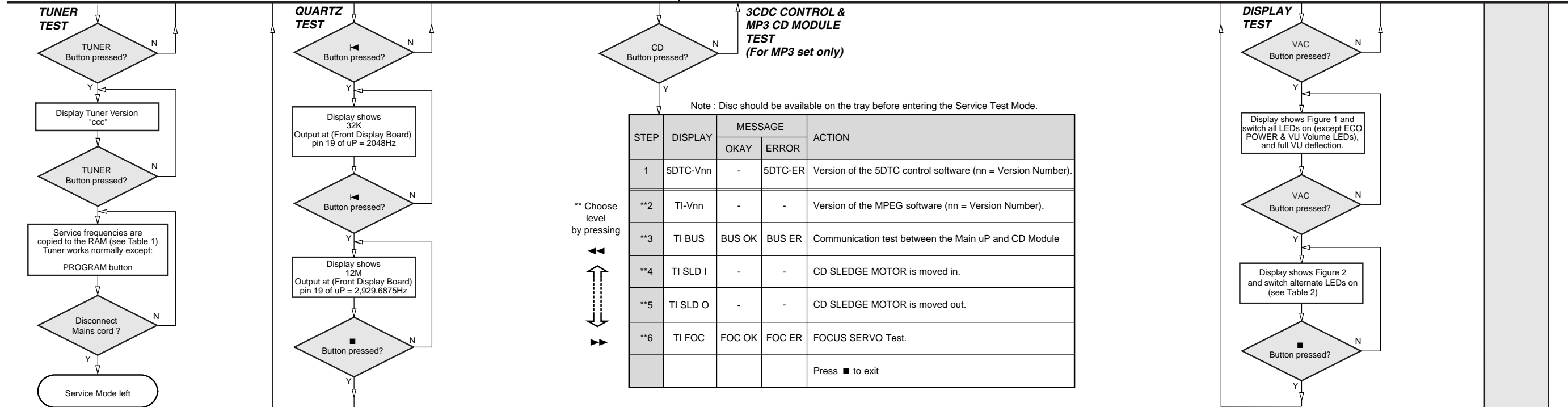
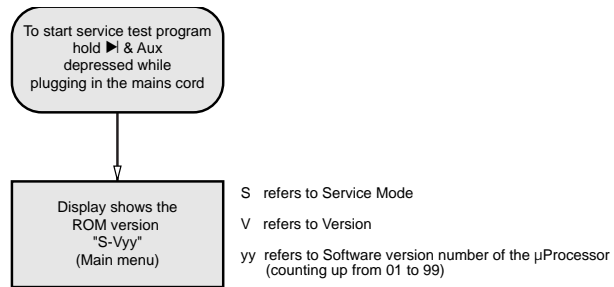
Service position B



Service position C



# SERVICE TEST PROGRAM



PRESET	Europe "EUR"	East Eur. "EAS"	East Eur. Extended-band "EAS"	USA "USA"	Oversea "OSE"
1	87.5MHz	87.5MHz	65.81MHz	87.5MHz	87.5MHz
2	108MHz	108MHz	108MHz	108MHz	108MHz
3	531kHz	531kHz	74MHz	530kHz	531/530kHz*
4	1602kHz	1602kHz	87.5MHz	1700kHz	1602/1700kHz*
5	558kHz	558kHz	531kHz	560kHz	558/560kHz*
6	1494kHz	1494kHz	1602kHz	1500kHz	1494/1500kHz*
7	153kHz	87.5MHz	558kHz	98MHz	87.5MHz
8	279kHz	87.5MHz	1494kHz	87.5MHz	87.5MHz
9	198kHz	87.5MHz	98MHz	87.5MHz	87.5MHz
10	98MHz	87.5MHz	70.01MHz	87.5MHz	87.5MHz
11	87.5MHz	98MHz	65.81MHz	87.5MHz	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. (/34) version.

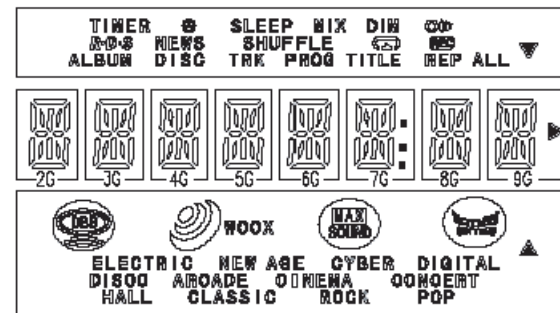


Figure 1

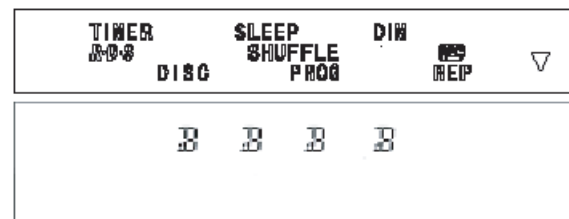


Figure 2

LEDs	FWM730	FWM570	
CD	ON	-	
TUNER	OFF	-	
TAPE	ON	-	
AUX / GAME	OFF	-	
^^ MAX (WOOX)	OFF	OFF	

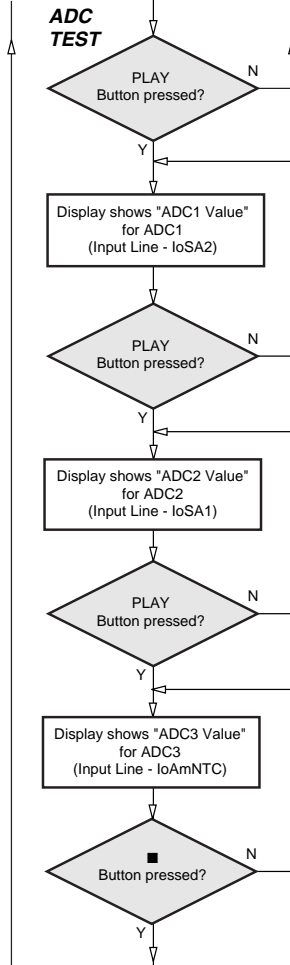
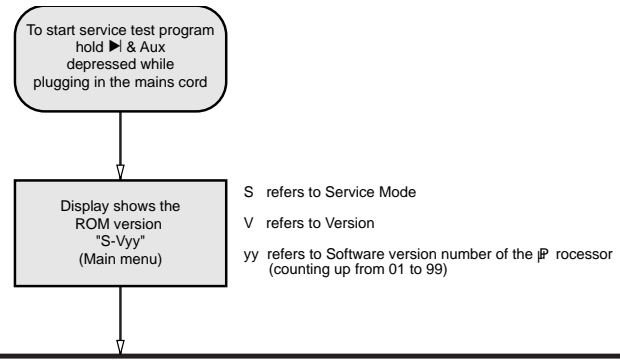
To test Standby LED, put the set into ECO mode.  
Table 2

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 "ERROR" will be displayed.
EEPROM FORMAT TEST	<b>◀◀</b>	Load default data. Display shows "NEW" for 1 second. <b>Caution!</b> <b>All presets from the customer will be lost!!</b>
ROTARY ENCODER TEST	Rotary Volume Knob	Display shows value for 2 seconds. Values increases or decreases in steps of 1 until 0 (Min.) or 40 (Max.) is reached.
DEMO	^^ MAX/WOOX 2	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 TESTPROGRAM	Disconnect mains cord	

^^ MAX - FWM570, WOOX - FWM730

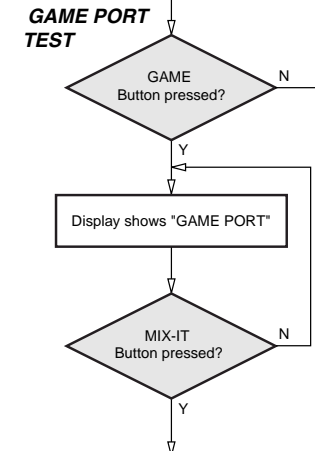


SERVICE TEST PROGRAM



ADC Test is used for checking the ADC inputs to the microprocessor.

The display shows an ADC value between 0 and 255 for an input signal between 0 and 5V.

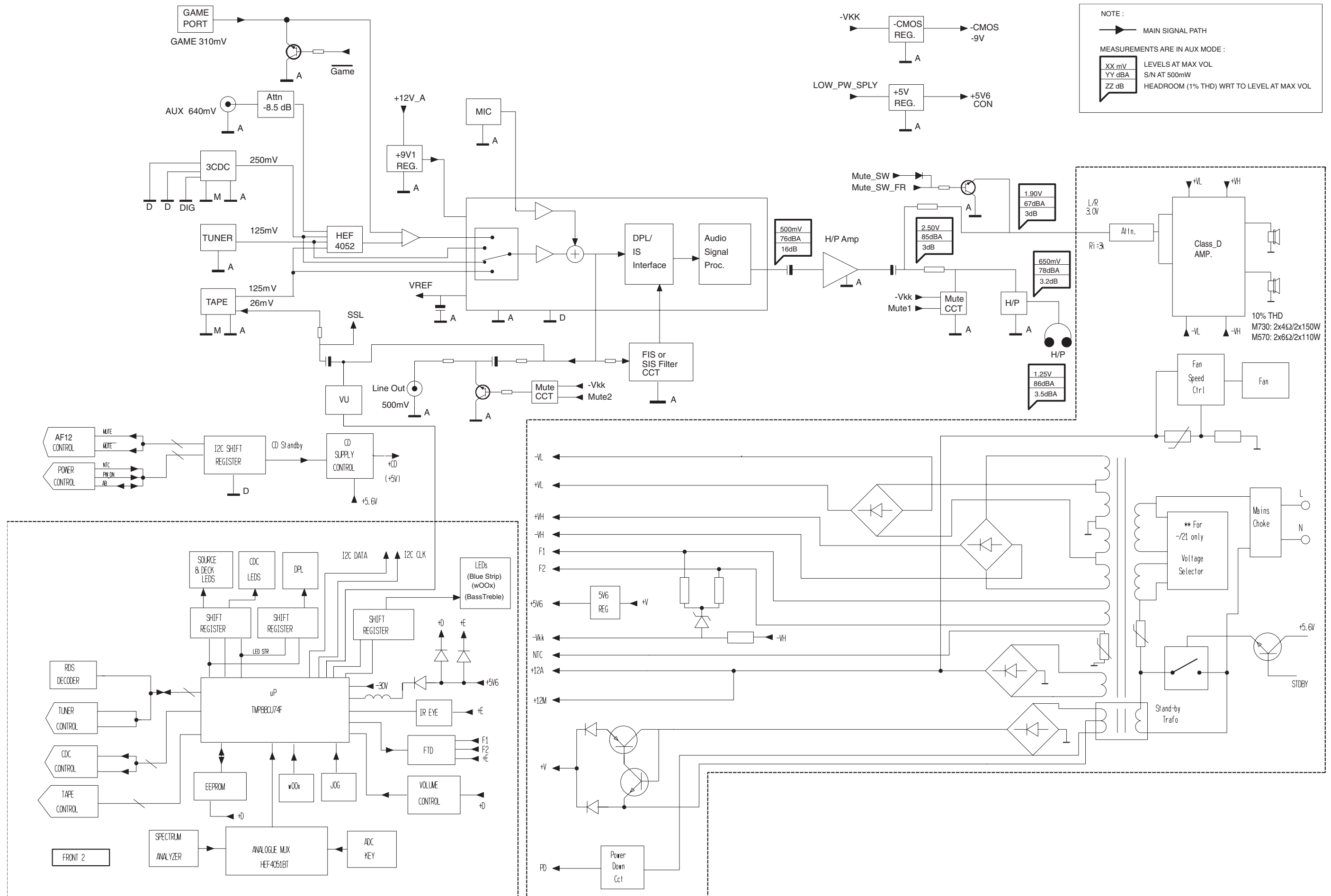


Choose desired background source by pressing button



STEP	DISPLAY (SCROLL ONCE)	ACTION
1	MIX-CD	Select CD as background sound source. Press PLAY to play the track.
2	MIX-TU	Select TUNER as background sound source.
3	MIX-TA1	Select TA1 as background sound source. Press PLAY to play the Tape1.
4	MIX-TA2	Select TA1 as background sound source. Press PLAY to play the Tape 2.
5	MIX-AUX	Select AUX as background sound source.
6	MIX-OFF	No mixing.
		Disconnect mains cord to exit

# SERVICE BLOCK DIAGRAM



# SERVICE WIRING DIAGRAM

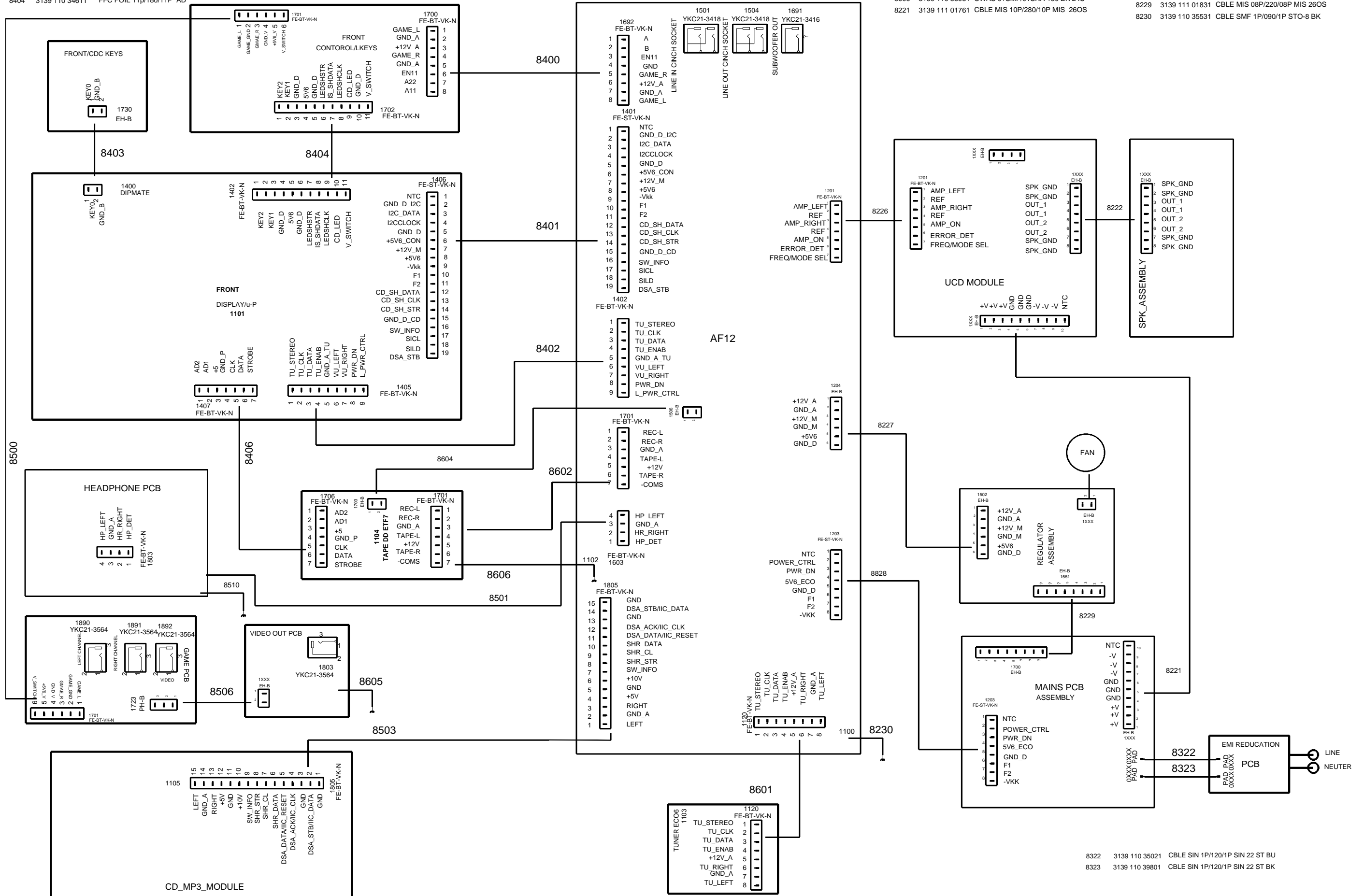
8400	3139 110 34921	FFC FOIL 08P/280/08P BD
8401	3139 111 02491	FFC FOIL 19P/280/19P AD
8402	3140 110 22471	FFC FOIL 09P/280/09P AD
8403	3139 110 37171	CBLE HR 02P/220/02P OE 26OS BK
8404	3139 110 34611	FFC FOIL 11P/180/11P AD

8406	3140 110 22481	FFC FOIL 07P/280/07P BD
8500	3139 110 35211	FFC FOIL 06P/80/06P AD
8501	3139 110 33941	FFC FOIL 04P/180/04P BD
8503	3139 110 35881	FFC FOIL 15P/180/15P BD

8506	3140 110 22451	CBLE PH 3P/340/3P OE SCR WIRE
8510	3139 111 02641	CWAS SMF 1P/220/1P STO-8 BK

8601	3139 110 35050	FFC FOIL 08P/220/08P AD
8602	3139 110 34131	FFC FOIL 07P/180/07P AD
8604	3139 110 38381	CBLE HR 02P/180/02P HR 26 OS BK
8605	3139 111 02621	CWAS SMF 1P/280/1P STO-8 BK
8606	3139 110 33931	CWAS 01SMF/01SRA 180 BK 24S
8221	3139 111 01761	CBLE MIS 10P/280/10P MIS 26OS

8222	3139 111 02131	CBLE MIS 08P/120/08P MIS 26OS
8226	3139 110 35901	FFC FOIL 07P/220/07P AD
8227	3139 111 03201	CBLE MIS 06P/220/06P MIS 26OS
8228	3140 110 22501	FFC FOIL 08P/280/08P AD
8229	3139 111 01831	CBLE MIS 08P/220/08P MIS 26OS
8230	3139 110 35531	CBLE SMF 1P/090/1P STO-8 BK



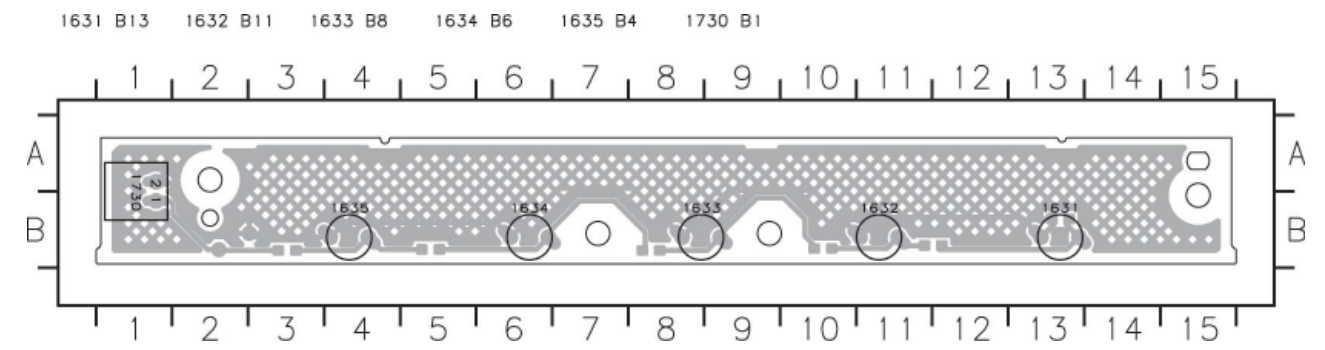
8322	3139 110 35021	CBLE SIN 1P/120/1P SIN 22 ST BU
8323	3139 110 39801	CBLE SIN 1P/120/1P SIN 22 ST BK

# FRONT CONTROL BOARD

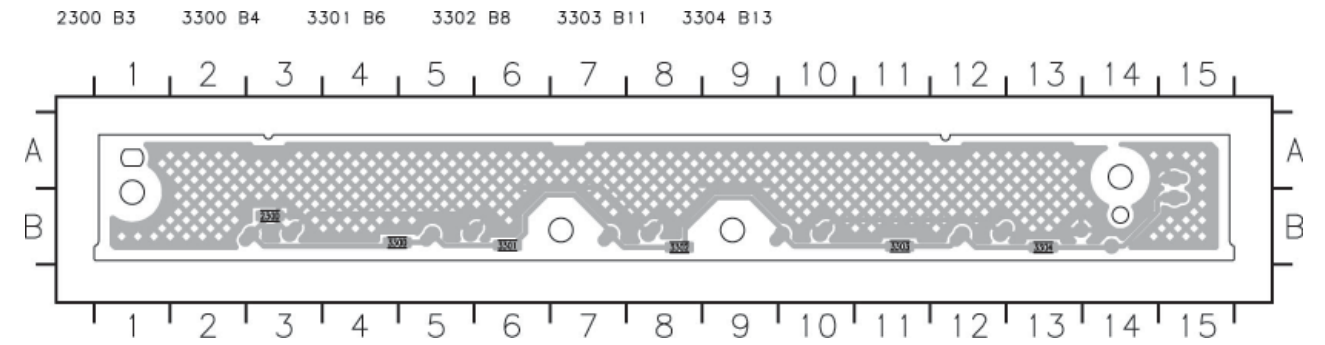
TABLE OF CONTENTS

- CDC Key part - Layout & Circuit diagram ..... 5-1
- Control part - Component Layout ..... 5-2
- Control part - Chip Layout ..... 5-3
- Control part - Circuit diagram ..... 5-4
- Game Port part - Layout & Circuit diagram ..... 5-5
- Electrical parts list..... 5-6

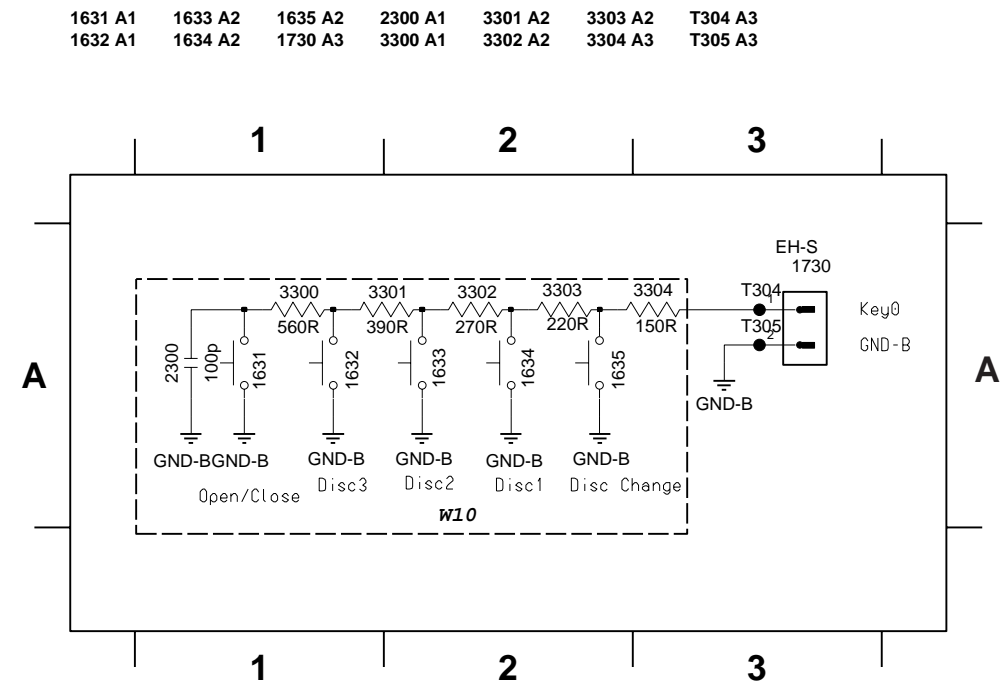
## CDC KEY BOARD - COMPONENT LAYOUT



## CDC KEY BOARD - CHIP LAYOUT



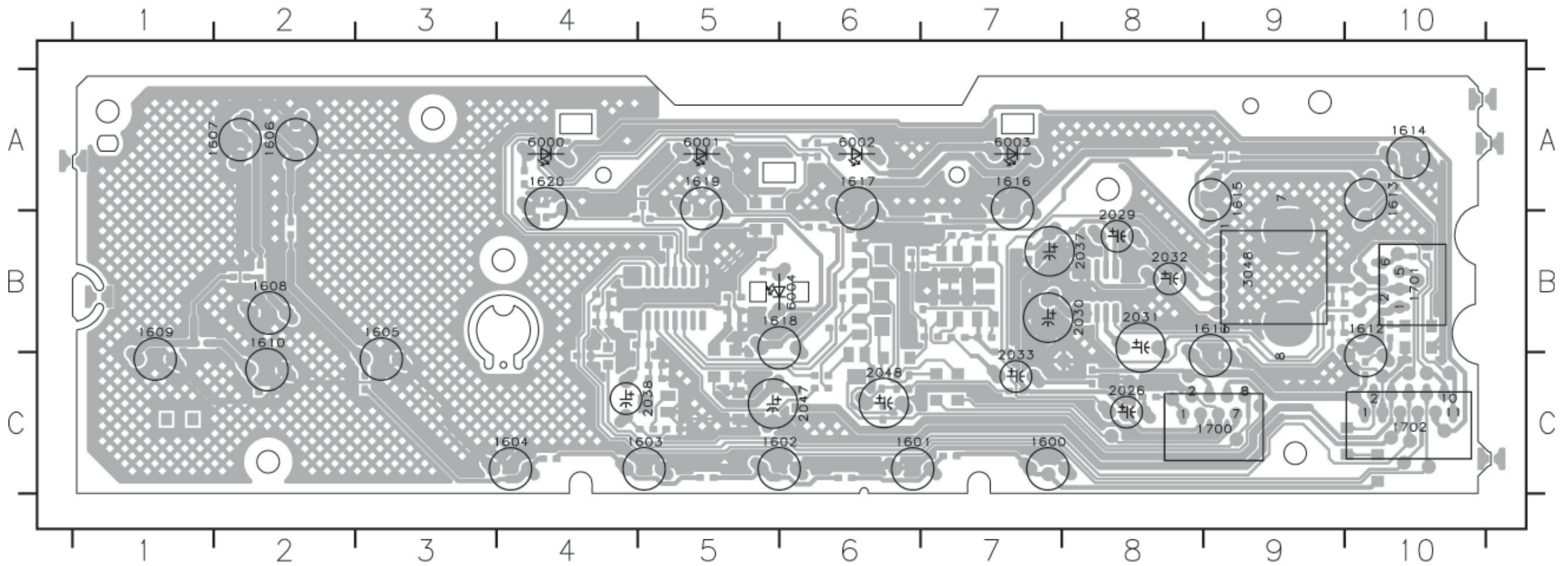
## CDC KEY BOARD - CIRCUIT DIAGRAM





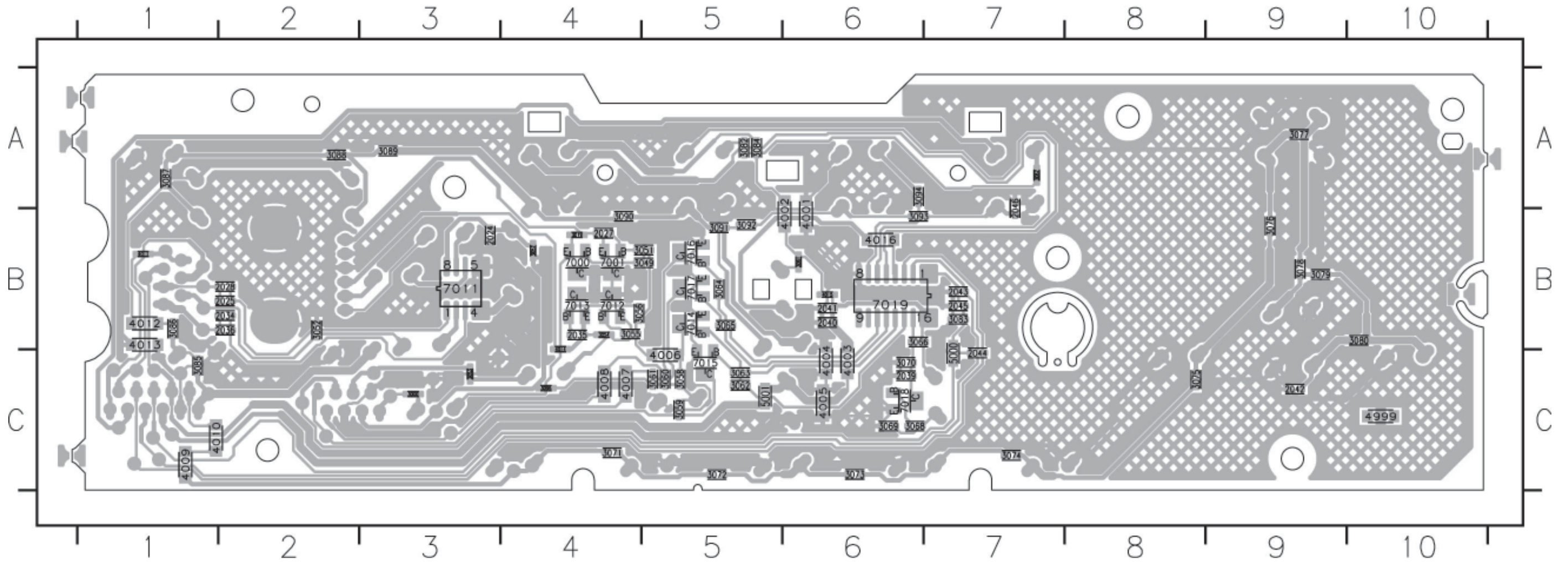
CONTROL BOARD - COMPONENT LAYOUT

1600 C8	1603 C5	1606 A2	1609 B1	1612 B10	1615 A8	1618 B6	1700 C9	2026 C8	2031 B8	2037 B8	2048 C6	6001 A5	6004 B6
1601 C6	1604 C4	1607 A1	1610 C2	1613 A10	1616 A7	1619 A5	1701 B10	2029 B8	2032 B8	2038 C5	3048 B10	6002 A6	
1602 C6	1605 C3	1608 B2	1611 C9	1614 A10	1617 A6	1620 A4	1702 C10	2030 B8	2033 C7	2047 C6	6000 A4	6003 A7	



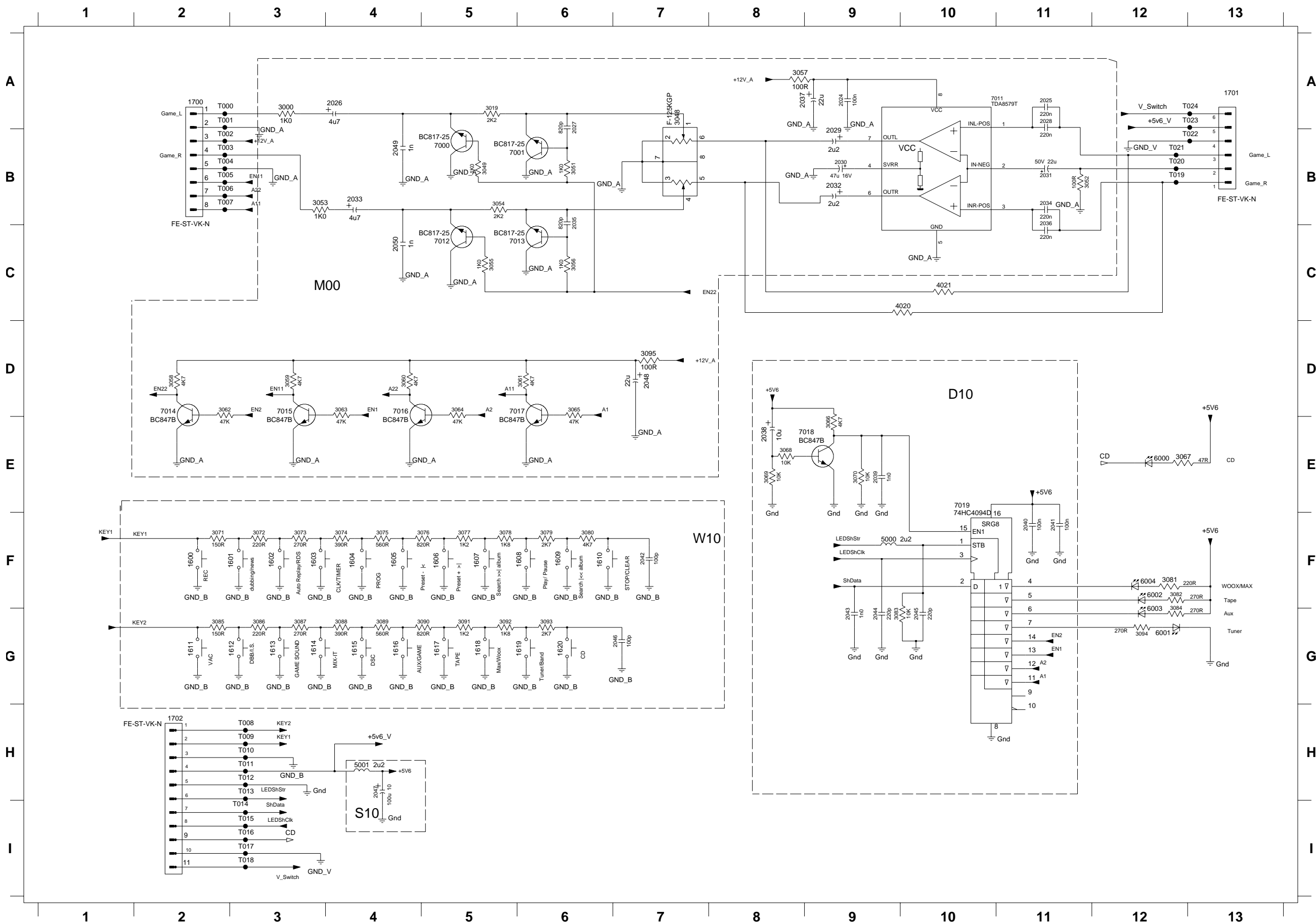
CONTROL BOARD - CHIP LAYOUT

2024	B3	2039	C6	2046	B7	3005	B4	3006	C1	3007	C6	3075	C8	3008	A5	3009	A3	4001	B6	4008	C4	4015	B6	7011	B3	7018	C6
2027	B4	2040	B6	3000	C3	3005	B4	3006	C1	3077	A8	3078	A5	3008	A5	3009	A4	4002	B6	4009	C2	4016	B6	7012	B3	7019	B7
2028	B2	2041	B6	3019	C4	3005	B4	3006	C1	3077	A8	3078	A5	3008	A5	3009	A4	4003	C6	4010	C2	4999	C10	7013	B4		
2034	B2	2042	C7	3049	C5	3005	B4	3006	C1	3077	A8	3078	A5	3008	A5	3009	A4	4004	C6	4011	B1	5000	C7	7014	C5		
2035	B4	2043	C7	3051	C2	3005	B4	3006	C1	3077	A8	3078	A5	3008	A5	3009	A4	4005	C6	4012	B1	5001	C5	7015	B5		
2036	B2	2044	C7	3052	C2	3005	B4	3006	C1	3077	A8	3078	A5	3008	A5	3009	A4	4006	C4	4013	B1	7000	B4	7016	B5		
		2045	B7	3053	C3	3005	B4	3006	C1	3077	A8	3078	A5	3008	A5	3009	A4	4007	C4	4014	B4	7001	B5	7017	B5		



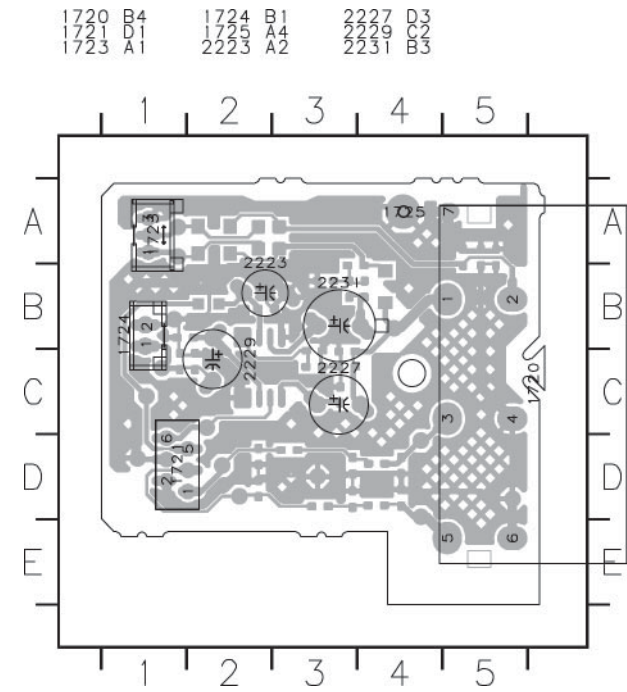


CONTROL BOARD - CIRCUIT DIAGRAM

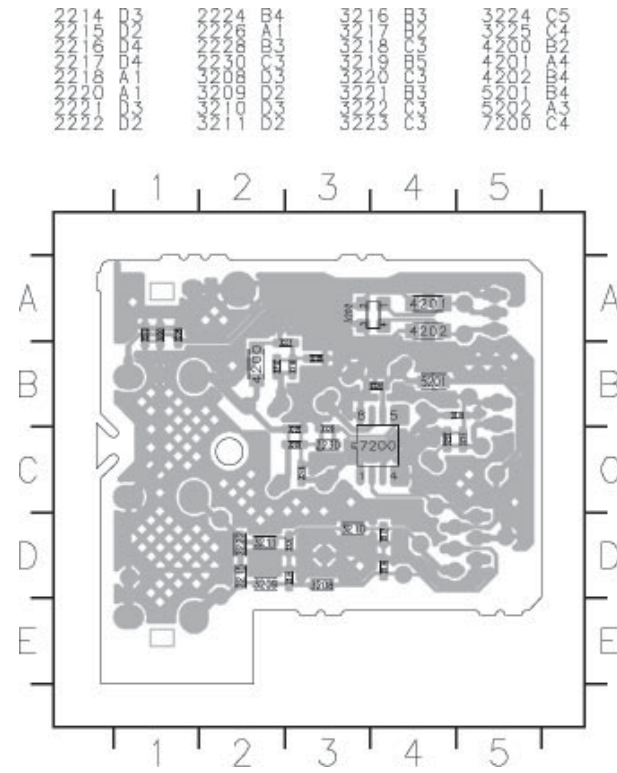


- 1600 F2
- 1601 F2
- 1602 F3
- 1603 F3
- 1604 F4
- 1605 F4
- 1606 F5
- 1607 F5
- 1608 F5
- 1609 F6
- 1610 F6
- 1611 G2
- 1612 G2
- 1613 G3
- 1614 G3
- 1615 G4
- 1616 G4
- 1617 G5
- 1618 G5
- 1619 G5
- 1620 G6
- 1700 A2
- 1701 A13
- 1702 H2
- 2024 A9
- 2025 A11
- 2026 A4
- 2027 A6
- 2028 A11
- 2029 B9
- 2030 B9
- 2031 B11
- 2032 B9
- 2033 B4
- 2034 B11
- 2035 B6
- 2036 C11
- 2037 A9
- 2038 E8
- 2039 E9
- 2040 F11
- 2041 F11
- 2042 F7
- 2043 G9
- 2044 G9
- 2045 G10
- 2046 G7
- 2047 H4
- 2048 D7
- 2049 B4
- 2050 C4
- 3000 A3
- 3019 A5
- 3048 A7
- 3049 B5
- 3051 B6
- 3052 B11
- 3053 B5
- 3054 B5
- 3055 C5
- 3056 C6
- 3057 A8
- 3058 D2
- 3059 D3
- 3060 D4
- 3061 D6
- 3062 D2
- 3063 D4
- 3064 D5
- 3065 D6
- 3066 E9
- 3067 E12
- 3068 E8
- 3069 E8
- 3070 E9
- 3071 F2
- 3072 F3
- 3073 F3
- 3074 F4
- 3075 F4
- 3076 F5
- 3077 F5
- 3078 F5
- 3079 F6
- 3080 F6
- 3081 F12
- 3082 F12
- 3083 G9
- 3084 G12
- 3085 G2
- 3086 G3
- 3087 G3
- 3088 G4
- 3089 G4
- 3090 G5
- 3091 G5
- 3092 G5
- 3093 G6
- 3094 G12
- 3095 D7
- 3096 B4
- 3097 C4
- 4020 C10
- 4021 C10
- 5000 F9
- 5001 H4
- 6000 E12
- 6001 G12
- 6002 F12
- 6003 G12
- 6004 F12
- 7000 B5
- 7001 B6
- 7011 A10
- 7012 C5
- 7013 C6
- 7014 D2
- 7015 D3
- 7016 D4
- 7017 D6
- 7018 E8
- 7019 E10
- T000 A2
- T001 A2
- T002 B2
- T003 B2
- T004 B2
- T005 B2
- T006 B2
- T007 B2
- T008 B2
- T009 H3
- T010 H3
- T011 H3
- T012 H3
- T013 H3
- T014 I3
- T015 I3
- T016 I3
- T017 I3
- T018 I3
- T019 B12
- T020 B12
- T021 B12
- T022 B13
- T023 A13
- T024 A13

GAME PORT BOARD - COMPONENT LAYOUT

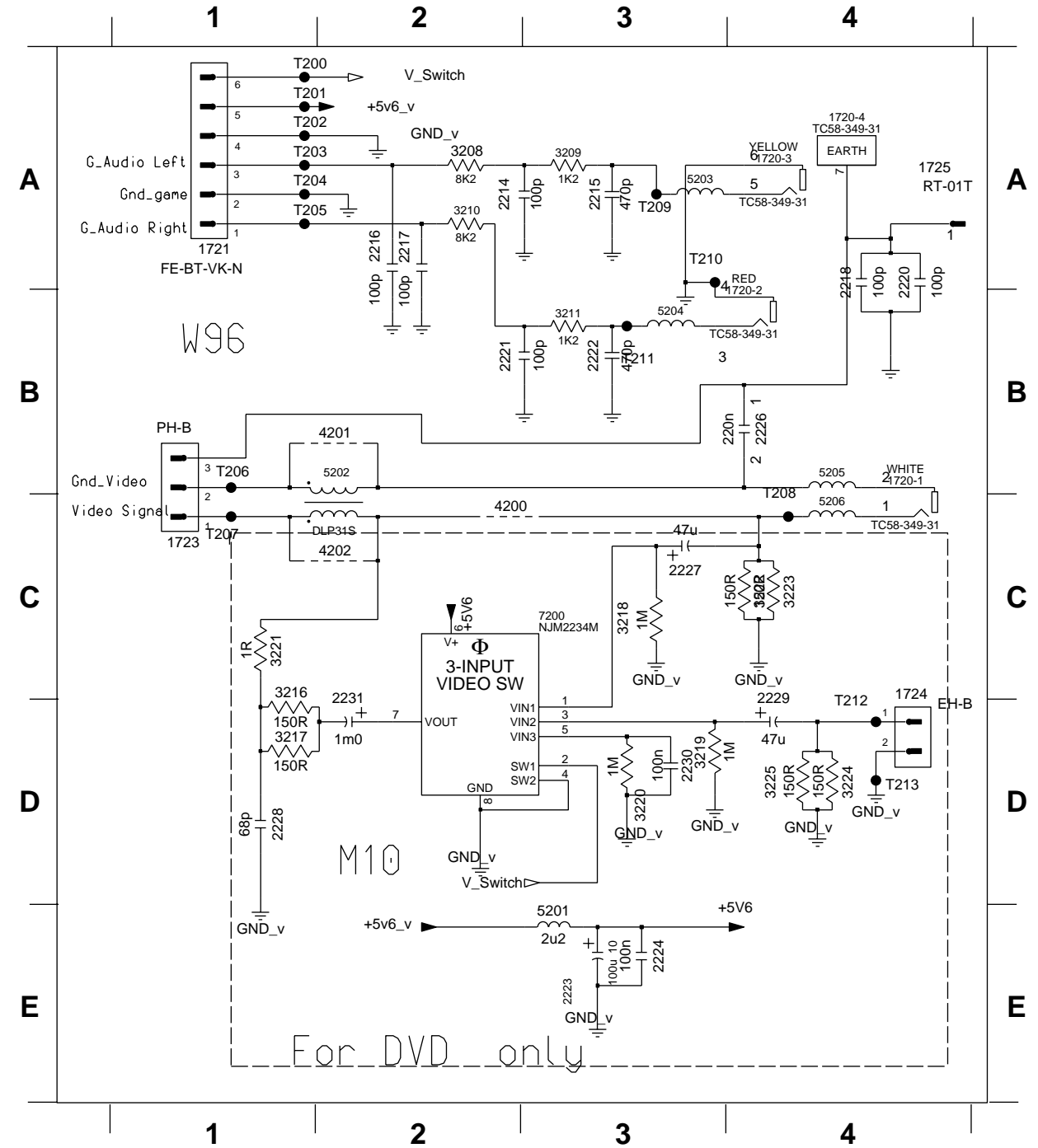


GAME PORT BOARD - CHIP LAYOUT



GAME PORT BOARD - CIRCUIT DIAGRAM

1720-1 B4	1725 A4	2221 B2	2229 D4	3216 C1	3223 C4	5202 B2	T201 A1	T208 C4
1720-2 B4	2214 A2	2222 B3	2230 D3	3217 D1	3224 D4	5203 A3	T202 A1	T209 A3
1720-3 A4	2215 A3	2223 E3	2231 D2	3218 C3	3225 D4	5204 B3	T203 A1	T210 A3
1720-4 A4	2216 A2	2224 E3	3208 A2	3219 D3	4200 C2	5205 B4	T204 A1	T211 B3
1721 A1	2217 A2	2226 B4	3209 A3	3220 D3	4201 B2	5206 C4	T205 A1	T212 D4
1723 C1	2218 A4	2227 C3	3210 A2	3221 C1	4202 C2	7200 C3	T206 B1	T213 D4
1724 C4	2220 A4	2228 D1	3211 B3	3222 C4	5201 E3	T200 A1	T207 C1	



**ELECTRICAL PARTS - FRONT CONTROL BOARD**

1600	482227613775	TACT SW
1601	482227613775	TACT SW
1602	482227613775	TACT SW
1603	482227613775	TACT SW
1604	482227613775	TACT SW
1605	482227613775	TACT SW
1606	482227613775	TACT SW
1607	482227613775	TACT SW
1608	482227613775	TACT SW
1609	482227613775	TACT SW
1610	482227613775	TACT SW
1611	482227613775	TACT SW
1612	482227613775	TACT SW
1613	482227613775	TACT SW
1614	482227613775	TACT SW
1615	482227613775	TACT SW
1616	482227613775	TACT SW
1617	482227613775	TACT SW
1618	482227613775	TACT SW
1619	482227613775	TACT SW
1620	482227613775	TACT SW
1631	482227613775	TACT SW
1632	482227613775	TACT SW
1633	482227613775	TACT SW
1634	482227613775	TACT SW
1635	482227613775	TACT SW
1720	994000001862	SOC CINCH H 3P
3048	994000001861	POTM CAR LIN
6000	994000001863	LED BT-436N-31-F3.5-T20
6001	994000001863	LED BT-436N-31-F3.5-T20
6002	994000001863	LED BT-436N-31-F3.5-T20
6003	994000001863	LED BT-436N-31-F3.5-T20
6004	994000001864	LED BT-502BXK-31-470E-B6-F3.5
7019	482220915449	IC 74HC4094D

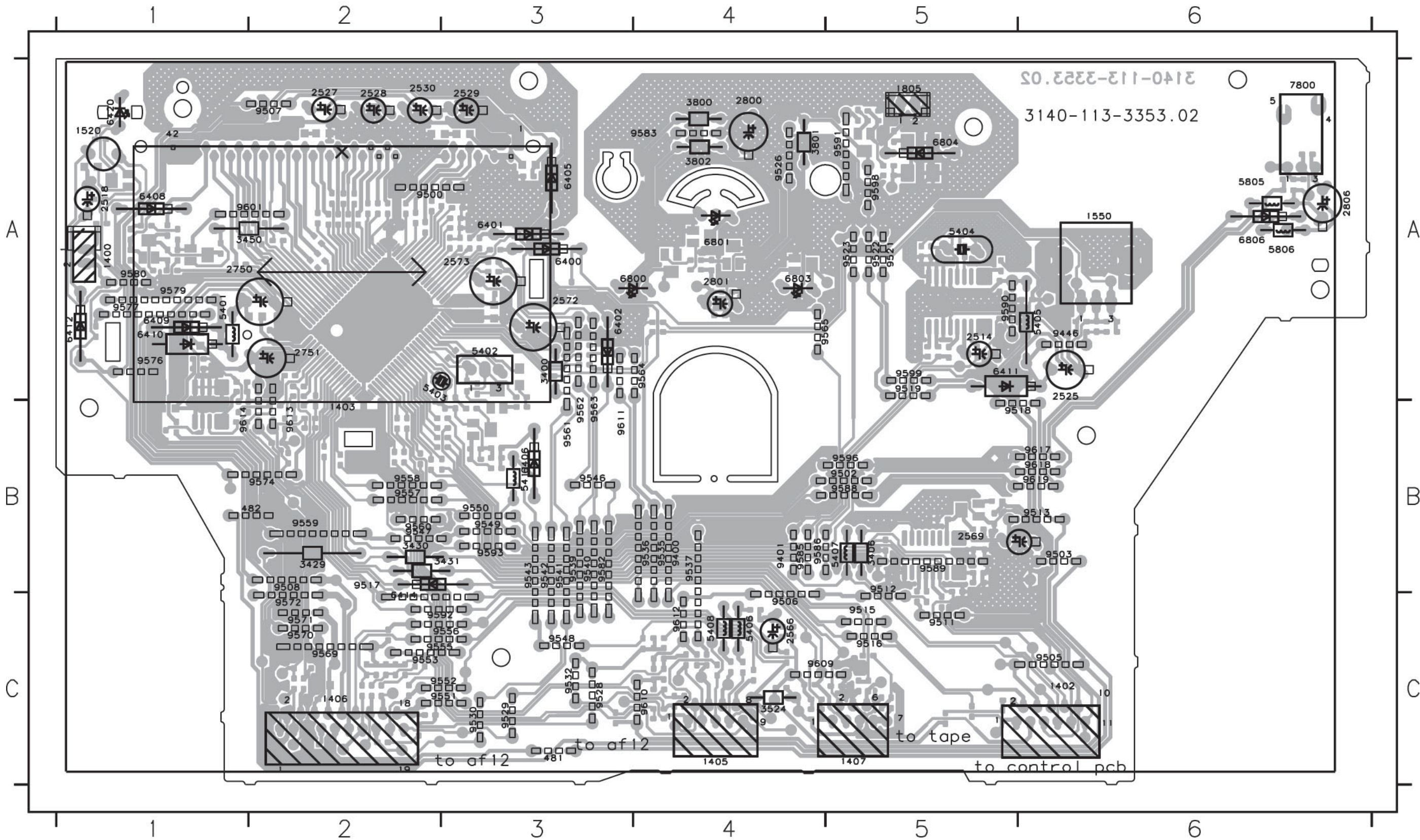
**Note:** Only these parts mentioned in the list are normal service parts.





DISPLAY BOARD - COMPONENT LAYOUT

1400	A1	2514	A5	2572	A3	3429	B2	5402	A3	6400	A3	6412	A1	9500	A3	9501	B4	9502	B4	9503	B4	9504	B4	9505	B4	9506	B4	9507	B4	9508	B4	9509	B4	9510	B4	9511	B4	9512	B4	9513	B4	9514	B4	9515	B4	9516	B4	9517	B4	9518	B4	9519	B4	9520	B4	9521	B4	9522	B4	9523	B4	9524	B4	9525	B4	9526	B4	9527	B4	9528	B4	9529	B4	9530	B4	9531	B4	9532	B4	9533	B4	9534	B4	9535	B4	9536	B4	9537	B4	9538	B4	9539	B4	9540	B4	9541	B4	9542	B4	9543	B4	9544	B4	9545	B4	9546	B4	9547	B4	9548	B4	9549	B4	9550	B4	9551	B4	9552	B4	9553	B4	9554	B4	9555	B4	9556	B4	9557	B4	9558	B4	9559	B4	9560	B4	9561	B4	9562	B4	9563	B4	9564	B4	9565	B4	9566	B4	9567	B4	9568	B4	9569	B4	9570	B4	9571	B4	9572	B4	9573	B4	9574	B4	9575	B4	9576	B4	9577	B4	9578	B4	9579	B4	9580	B4	9581	B4	9582	B4	9583	B4	9584	B4	9585	B4	9586	B4	9587	B4	9588	B4	9589	B4	9590	B4	9591	B4	9592	B4	9593	B4	9594	B4	9595	B4	9596	B4	9597	B4	9598	B4	9599	B4	9600	B4	9601	B4	9602	B4	9603	B4	9604	B4	9605	B4	9606	B4	9607	B4	9608	B4	9609	B4	9610	B4	9611	B4	9612	B4	9613	B4	9614	B4	9615	B4	9616	B4	9617	B4	9618	B4	9619	B4	9620	B4	9621	B4	9622	B4	9623	B4	9624	B4	9625	B4	9626	B4	9627	B4	9628	B4	9629	B4	9630	B4	9631	B4	9632	B4	9633	B4	9634	B4	9635	B4	9636	B4	9637	B4	9638	B4	9639	B4	9640	B4	9641	B4	9642	B4	9643	B4	9644	B4	9645	B4	9646	B4	9647	B4	9648	B4	9649	B4	9650	B4	9651	B4	9652	B4	9653	B4	9654	B4	9655	B4	9656	B4	9657	B4	9658	B4	9659	B4	9660	B4	9661	B4	9662	B4	9663	B4	9664	B4	9665	B4	9666	B4	9667	B4	9668	B4	9669	B4	9670	B4	9671	B4	9672	B4	9673	B4	9674	B4	9675	B4	9676	B4	9677	B4	9678	B4	9679	B4	9680	B4	9681	B4	9682	B4	9683	B4	9684	B4	9685	B4	9686	B4	9687	B4	9688	B4	9689	B4	9690	B4	9691	B4	9692	B4	9693	B4	9694	B4	9695	B4	9696	B4	9697	B4	9698	B4	9699	B4	9700	B4	9701	B4	9702	B4	9703	B4	9704	B4	9705	B4	9706	B4	9707	B4	9708	B4	9709	B4	9710	B4	9711	B4	9712	B4	9713	B4	9714	B4	9715	B4	9716	B4	9717	B4	9718	B4	9719	B4	9720	B4	9721	B4	9722	B4	9723	B4	9724	B4	9725	B4	9726	B4	9727	B4	9728	B4	9729	B4	9730	B4	9731	B4	9732	B4	9733	B4	9734	B4	9735	B4	9736	B4	9737	B4	9738	B4	9739	B4	9740	B4	9741	B4	9742	B4	9743	B4	9744	B4	9745	B4	9746	B4	9747	B4	9748	B4	9749	B4	9750	B4	9751	B4	9752	B4	9753	B4	9754	B4	9755	B4	9756	B4	9757	B4	9758	B4	9759	B4	9760	B4	9761	B4	9762	B4	9763	B4	9764	B4	9765	B4	9766	B4	9767	B4	9768	B4	9769	B4	9770	B4	9771	B4	9772	B4	9773	B4	9774	B4	9775	B4	9776	B4	9777	B4	9778	B4	9779	B4	9780	B4	9781	B4	9782	B4	9783	B4	9784	B4	9785	B4	9786	B4	9787	B4	9788	B4	9789	B4	9790	B4	9791	B4	9792	B4	9793	B4	9794	B4	9795	B4	9796	B4	9797	B4	9798	B4	9799	B4	9800	B4	9801	B4	9802	B4	9803	B4	9804	B4	9805	B4	9806	B4	9807	B4	9808	B4	9809	B4	9810	B4	9811	B4	9812	B4	9813	B4	9814	B4	9815	B4	9816	B4	9817	B4	9818	B4	9819	B4	9820	B4	9821	B4	9822	B4	9823	B4	9824	B4	9825	B4	9826	B4	9827	B4	9828	B4	9829	B4	9830	B4	9831	B4	9832	B4	9833	B4	9834	B4	9835	B4	9836	B4	9837	B4	9838	B4	9839	B4	9840	B4	9841	B4	9842	B4	9843	B4	9844	B4	9845	B4	9846	B4	9847	B4	9848	B4	9849	B4	9850	B4	9851	B4	9852	B4	9853	B4	9854	B4	9855	B4	9856	B4	9857	B4	9858	B4	9859	B4	9860	B4	9861	B4	9862	B4	9863	B4	9864	B4	9865	B4	9866	B4	9867	B4	9868	B4	9869	B4	9870	B4	9871	B4	9872	B4	9873	B4	9874	B4	9875	B4	9876	B4	9877	B4	9878	B4	9879	B4	9880	B4	9881	B4	9882	B4	9883	B4	9884	B4	9885	B4	9886	B4	9887	B4	9888	B4	9889	B4	9890	B4	9891	B4	9892	B4	9893	B4	9894	B4	9895	B4	9896	B4	9897	B4	9898	B4	9899	B4	9900	B4	9901	B4	9902	B4	9903	B4	9904	B4	9905	B4	9906	B4	9907	B4	9908	B4	9909	B4	9910	B4	9911	B4	9912	B4	9913	B4	9914	B4	9915	B4	9916	B4	9917	B4	9918	B4	9919	B4	9920	B4	9921	B4	9922	B4	9923	B4	9924	B4	9925	B4	9926	B4	9927	B4	9928	B4	9929	B4	9930	B4	9931	B4	9932	B4	9933	B4	9934	B4	9935	B4	9936	B4	9937	B4	9938	B4	9939	B4	9940	B4	9941	B4	9942	B4	9943	B4	9944	B4	9945	B4	9946	B4	9947	B4	9948	B4	9949	B4	9950	B4	9951	B4	9952	B4	9953	B4	9954	B4	9955	B4	9956	B4	9957	B4	9958	B4	9959	B4	9960	B4	9961	B4	9962	B4	9963	B4	9964	B4	9965	B4	9966	B4	9967	B4	9968	B4	9969	B4	9970	B4	9971	B4	9972	B4	9973	B4	9974	B4	9975	B4	9976	B4	9977	B4	9978	B4	9979	B4	9980	B4	9981	B4	9982	B4	9983	B4	9984	B4	9985	B4	9986	B4	9987	B4	9988	B4	9989	B4	9990	B4	9991	B4	9992	B4	9993	B4	9994	B4	9995	B4	9996	B4	9997	B4	9998	B4	9999	B4	10000	B4
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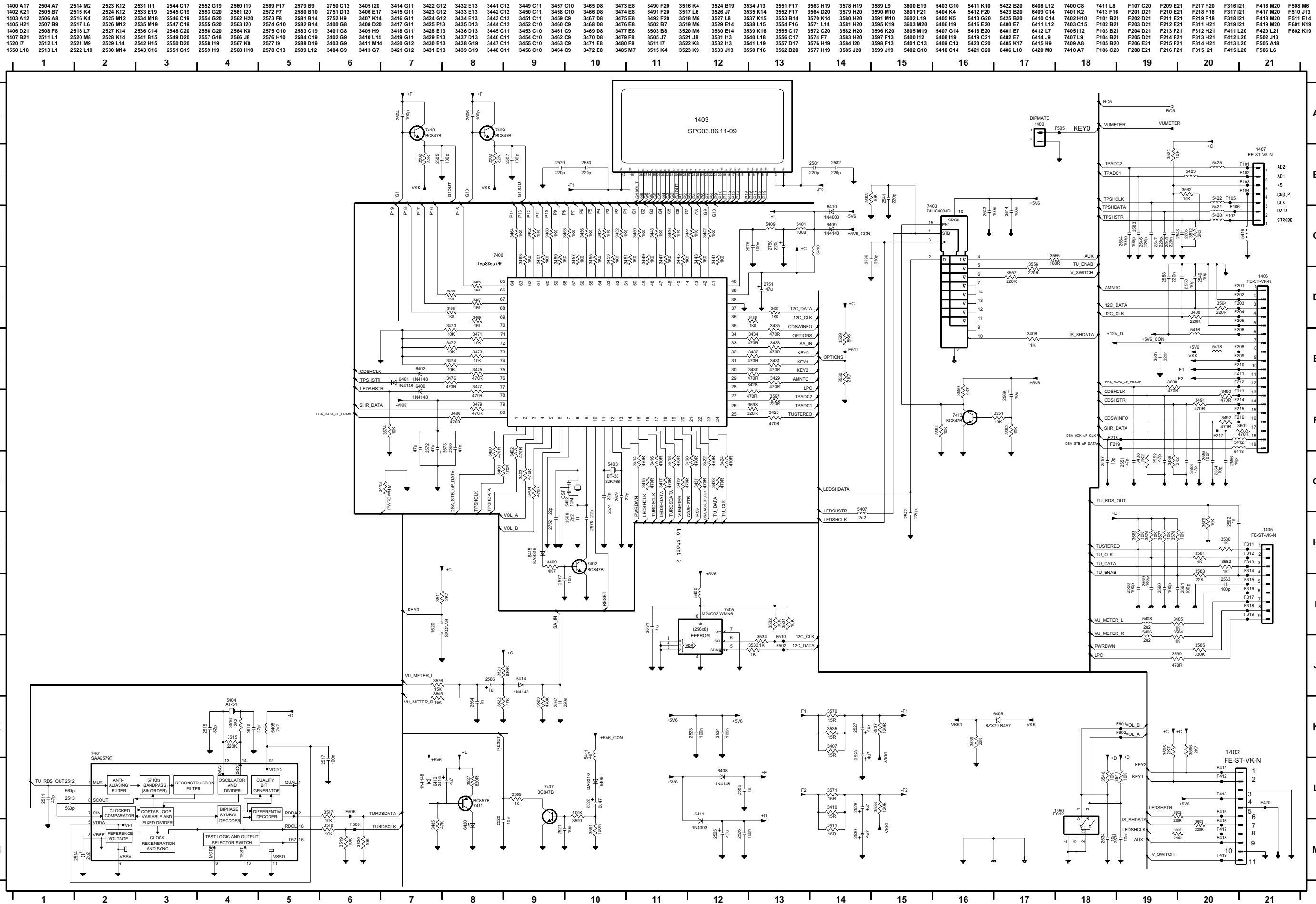






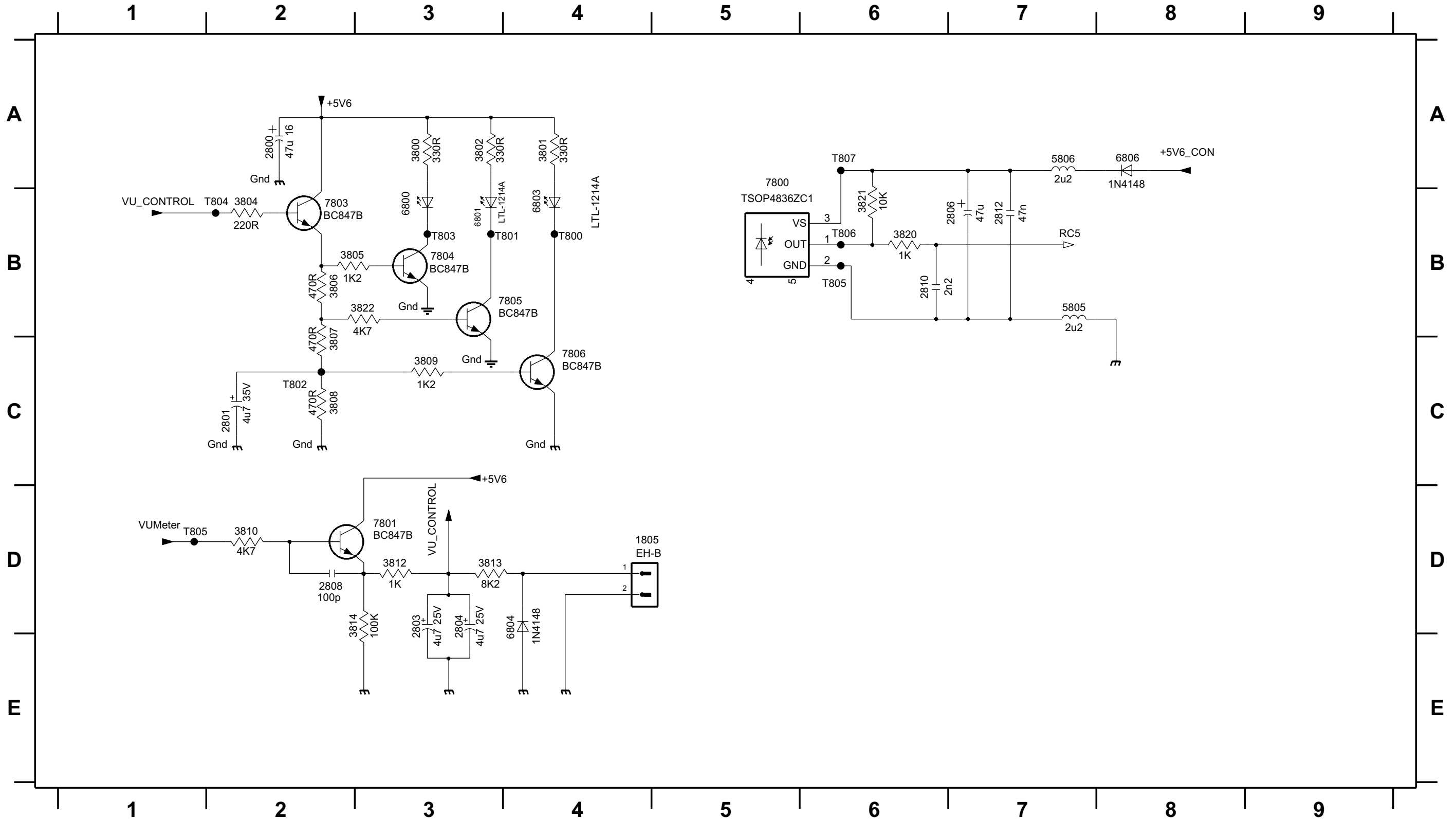


DISPLAY BOARD - CIRCUIT DIAGRAM 1



DISPLAY BOARD - CIRCUIT DIAGRAM 2

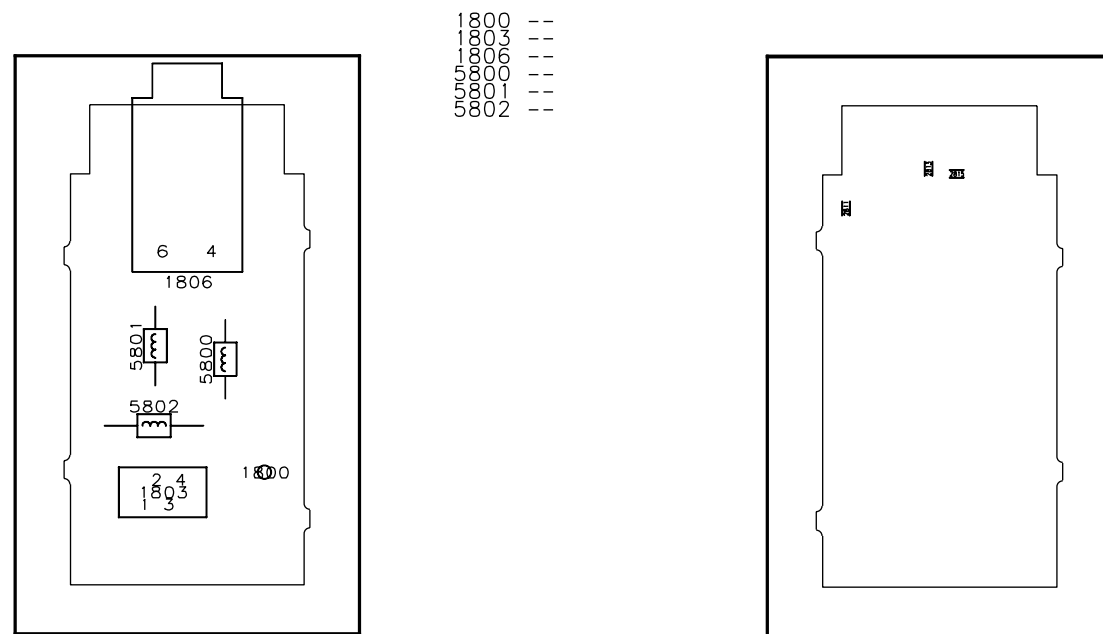
1805 D4	2803 D3	2808 D2	3800 A3	3804 B2	3807 C2	3810 D2	3814 D3	3822 B3	6800 B3	6804 D4	7801 D3	7805 B3	T801 B4	T804 B2	T806 B6
2800 A2	2804 D3	2810 B6	3801 A4	3805 B2	3808 C2	3812 D3	3820 B6	5805 B7	6801 B3	6806 A8	7803 B2	7806 C4	T802 C2	T805 D1	T807 A6
2801 C2	2806 B7	2812 B7	3802 A3	3806 B2	3809 C3	3813 D3	3821 B6	5806 A7	6803 B4	7800 A5	7804 B3	T800 B4	T803 B3	T805 B6	



**HEADPHONE BOARD - COMPONENT LAYOUT**

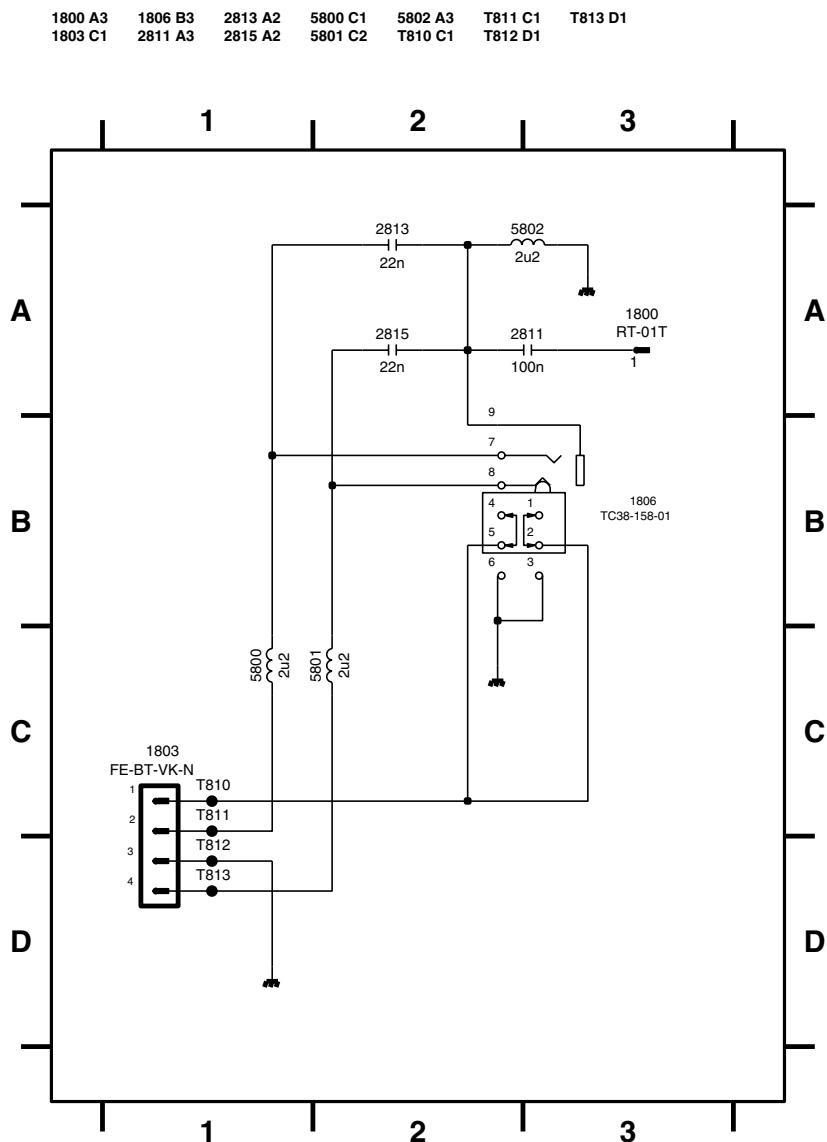
**HEADPHONE BOARD - CHIP LAYOUT**

**ELECTRICAL PARTS - FRONT DISPLAY BOARD**

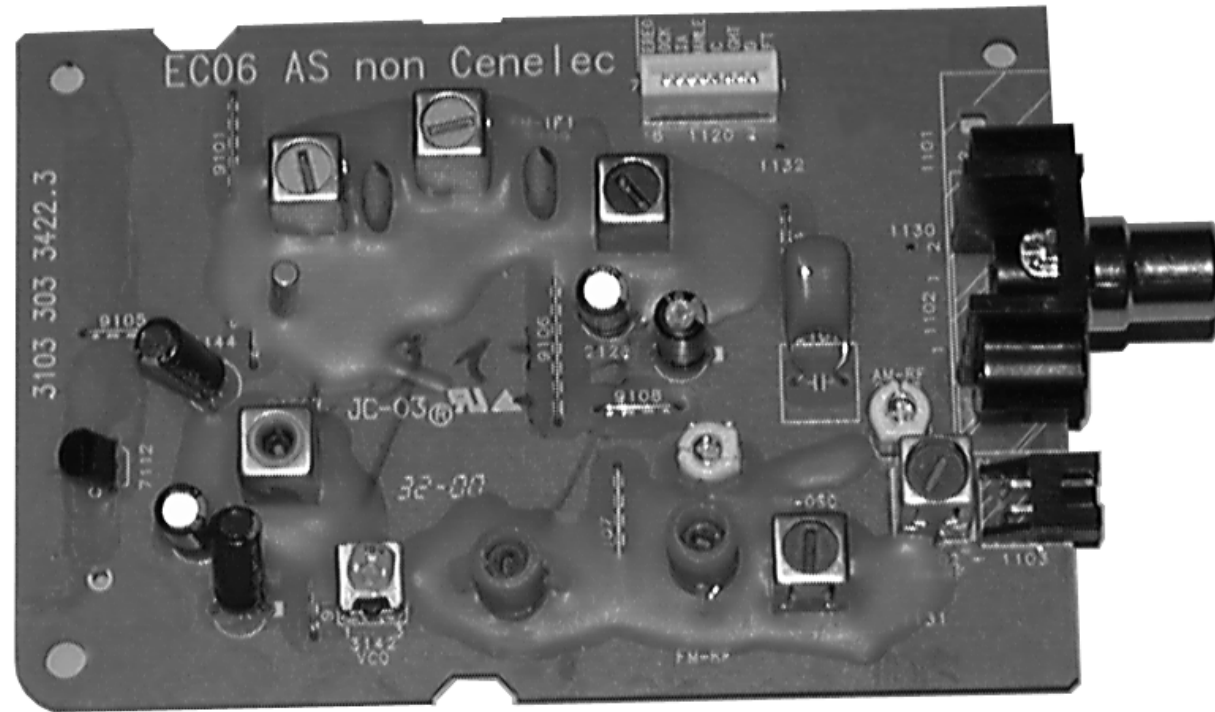


1403	994000001853	FTD (MINI 404)
1520	482227613775	TACT SW
1550	994000001854	ROT ENCODER 24P
1806	994000001855	SOC PHONE 1P F3.5
6420	994000001859	LED BT-H202D-31-F3.5-T20
6800	994000001857	LED BT-436YOEK-31-605E-B6
6801	994000001857	LED BT-436YOEK-31-605E-B6
6803	994000001856	LED BT-H202D-30
7400	994000001858	IC TMP88CU7YF-5J06(G)
7401	935268605118	IC SAA6581T
7403	482220915449	IC 74HC4094D
7405	482281650048	IC EEPROM M24C02-WMN6TP
7800	932218597667	IR REC TSOP4836ZC1

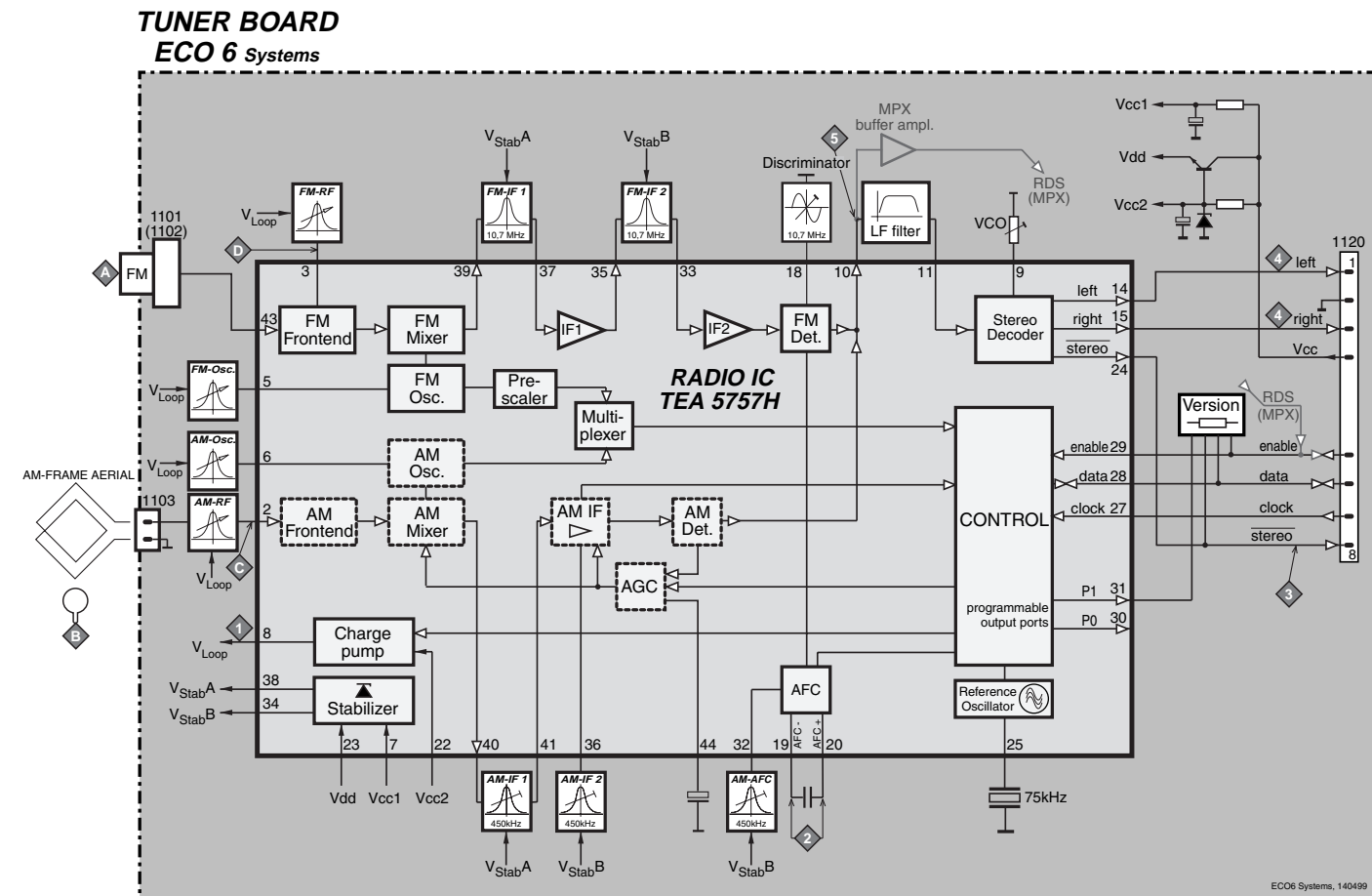
**HEADPHONE BOARD - CIRCUIT DIAGRAM**



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



BLOCK DIAGRAM



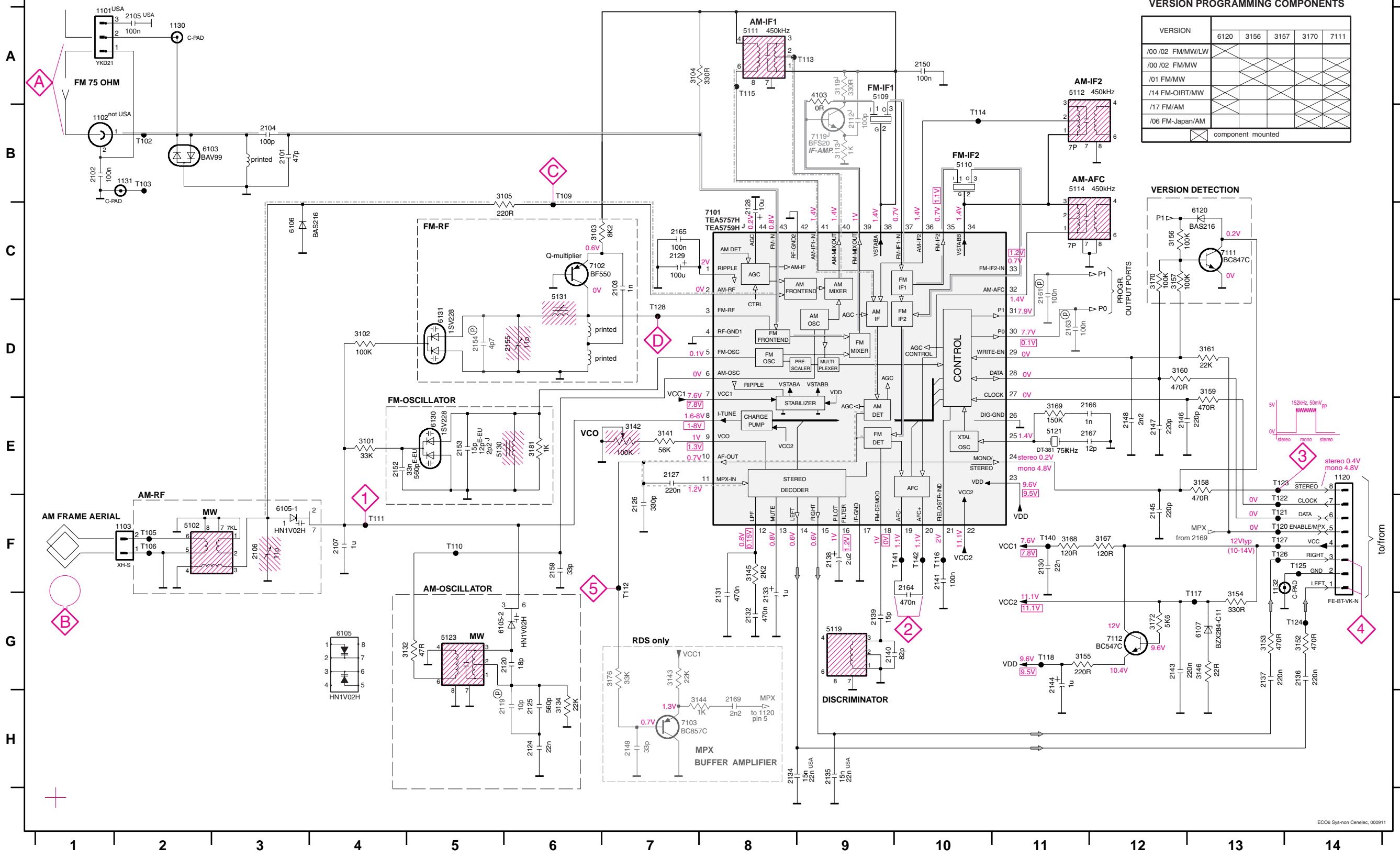
# ECO6 Tuner Board

version: **SYSTEMS non-CENELEC**

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 Schematic Diagram .....7A-2  
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 Adjustment table .....7A-3  
 Electrical Partslist.....7A-4

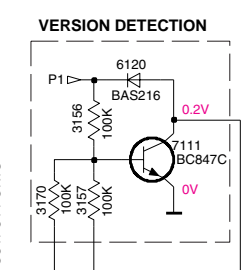
### TUNER BOARD ECO6 / SYSTEMS NON CENELEC



#### VERSION PROGRAMMING COMPONENTS

VERSION	6120	3156	3157	3170	7111
/00 /02 FM/MW/LW					
/00 /02 FM/MW					
/01 FM/MW					
/14 FM-OIRT/MW					
/17 FM/AM					
/06 FM-Japan/AM					

component mounted



#### LEGEND

Ⓟ...for provision only  
 USA ... for USA version only  
 E-EU ... for East European version only  
 J ... for Japanese version only

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

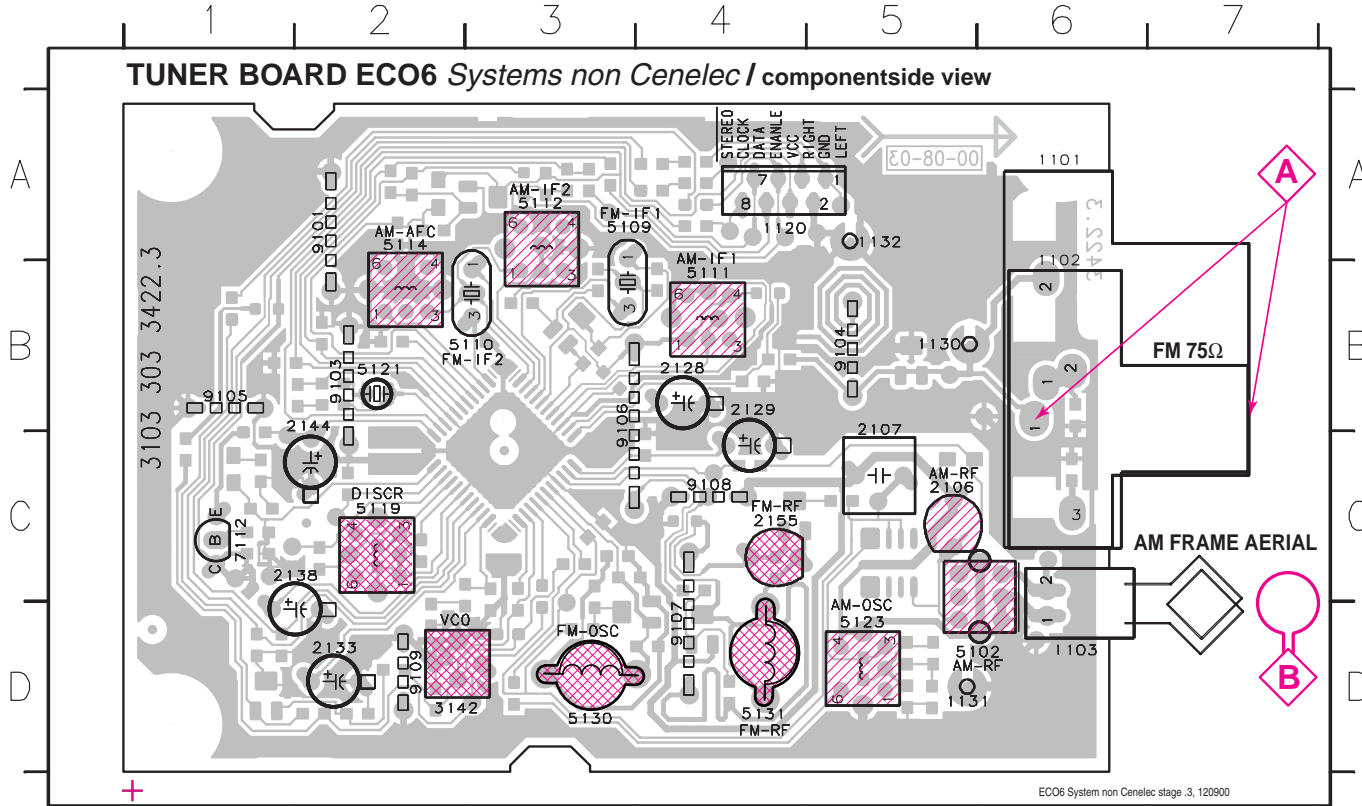
#### Signal path

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

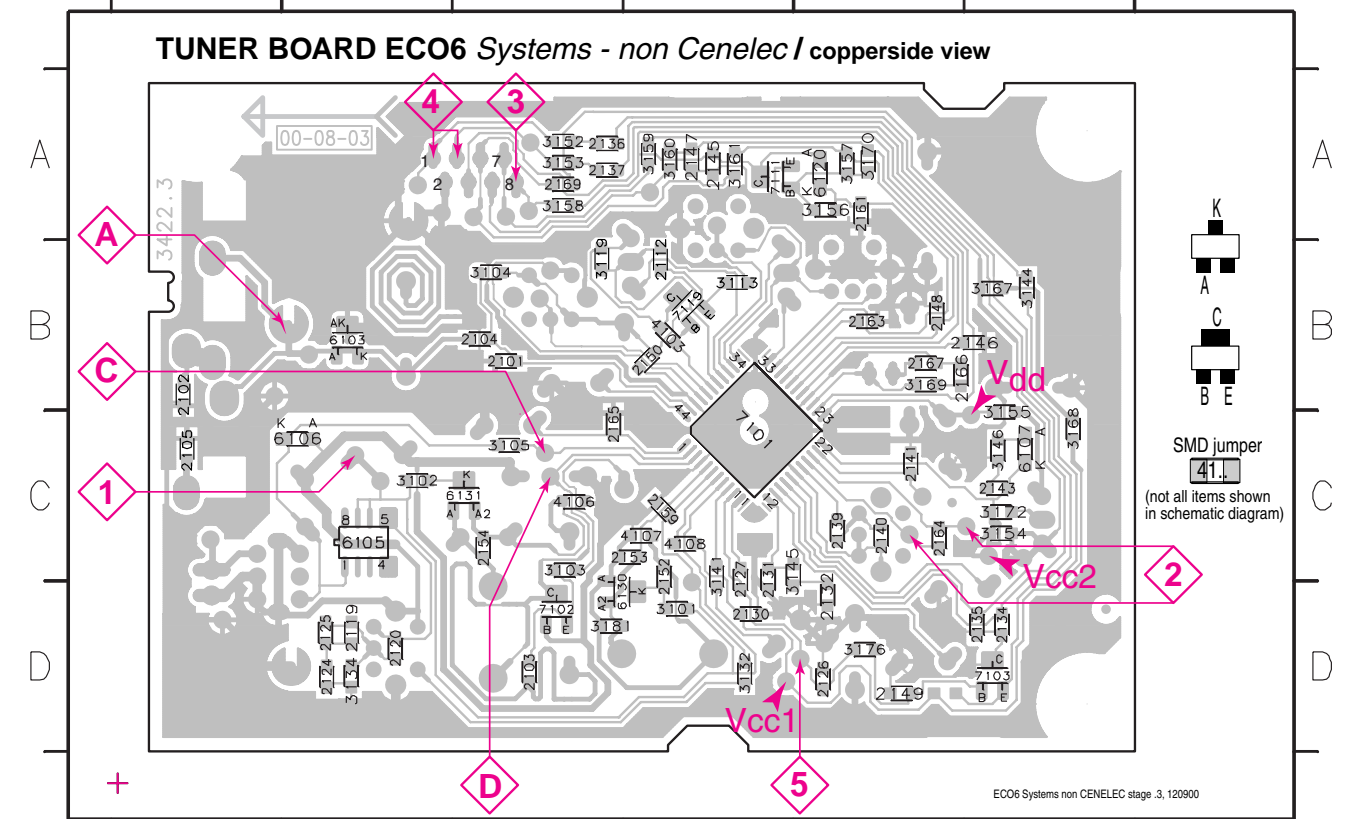
1101 A1  
1102 B1  
1103 F2  
1120 E14  
1130 A2  
1131 B2  
1132 G13  
2101 B3  
2102 F1  
2103 C7  
2104 B3  
2105 A2  
2106 F3  
2107 F4  
2119 H6  
2120 G6  
2124 H6  
2125 H6  
2126 F7  
2127 E7  
2128 C8  
2129 C7  
2130 F11  
2131 G8  
2132 G13  
2133 G8  
2134 H8  
2135 H9  
2136 G14  
2137 G13  
2138 F9  
2139 G9  
2140 G9  
2141 F10  
2143 G12  
2144 G11  
2145 F12  
2146 E12  
2147 E12  
2148 E12  
2149 H7  
2150 A10  
2152 E4  
2153 E5  
2154 D5  
2155 D5  
2159 F6  
2161 C11  
2163 D11  
2164 F10  
2165 C7  
2166 E11  
2167 E11  
2169 H8  
3101 E4  
3102 D4  
3103 C6  
3104 A7  
3105 B6  
3132 G5  
3134 H6  
3141 E7  
3142 E7  
3143 G7  
3144 H7  
3145 F8  
3146 G13  
3152 G14  
3153 G13  
3154 G13  
3155 G11  
3156 C12  
3157 C12  
3158 E13  
3159 D13  
3160 D12  
3161 D13  
3167 F12  
3168 F11  
3169 E11  
3170 C12  
3172 G12  
3176 G7  
3181 E6  
5102 F2  
5105 B6  
5110 B10  
5111 A8  
5112 A11  
5114 B11  
5119 G9  
5121 E11  
5123 G5  
5130 E5  
5131 C6  
6103 B6  
6105-1 F3  
6105-2 G5  
6106 C3  
6107 G13  
6120 C13  
6130 E5  
6131 D5  
7101 C8  
7102 C6  
7103 H7  
7111 C13  
7112 F13  
T102 B2  
T103 B2  
T105 F2  
T106 F2  
T109 B6  
T110 F5  
T111 F4  
T112 F7  
T113 A8  
T114 B8  
T115 A8  
T122 F13  
T123 F13  
T124 D7  
T125 F14  
T126 F13  
T127 F13  
T128 D7  
T140 F11  
T141 F10  
T142 F10  
T143 F10  
T144 F10  
T145 F10  
T146 F10  
T147 F10  
T148 F10  
T149 F10  
T150 F10  
T151 F10  
T152 F10  
T153 F10  
T154 F10  
T155 F10  
T156 F10  
T157 F10  
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T159 F10  
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T162 F10  
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T166 F10  
T167 F10  
T168 F10  
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T173 F10  
T174 F10  
T175 F10  
T176 F10  
T177 F10  
T178 F10  
T179 F10  
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T181 F10  
T182 F10  
T183 F10  
T184 F10  
T185 F10  
T186 F10  
T187 F10  
T188 F10  
T189 F10  
T190 F10  
T191 F10  
T192 F10  
T193 F10  
T194 F10  
T195 F10  
T196 F10  
T197 F10  
T198 F10  
T199 F10  
T200 F10



1101 A6 1120 A4 1132 A5 2128 C4 2138 C2 3142 D2 5110 B3 5114 A2 5123 D5 7112 C1 9104 B5 9107 D4  
 1102 B6 1130 B5 2106 C5 2129 B4 2144 B2 5102 D6 5111 B4 5119 C2 5130 D3 9101 A2 9105 B1 9108 C4  
 1103 D6 1131 D5 2107 B5 2133 D2 2155 C4 5109 A3 5112 A3 5121 B2 5131 D4 9103 B2 9106 B3 9109 D2



2101 B4 2119 D3 2130 D5 2137 A4 2146 B7 2153 C5 2165 C4 3103 C4 3134 D3 3152 A4 3158 A4 3169 B6 4106 C4 6107 C7 7103 D7  
 2102 B1 2120 D3 2131 C5 2139 C6 2147 A5 2154 C4 2166 B6 3104 B4 3141 C5 3153 A4 3159 A5 3170 A6 4107 C5 6120 A6 7111 A5  
 2103 D4 2124 D3 2132 D6 2140 C6 2148 B6 2159 C5 2167 B6 3105 C4 3143 D6 3154 C7 3160 A5 3172 C7 4108 C5 6130 D4 7119 B5  
 2104 B4 2125 D3 2134 D7 2141 C6 2149 D6 2161 A6 2169 A4 3113 B5 3144 B7 3155 C7 3161 A5 3176 D6 6103 B3 6131 C4  
 2105 C1 2126 D6 2135 D7 2143 C7 2150 B5 2163 B6 3101 D5 3119 B5 3145 C5 3156 A6 3167 B7 3181 D4 6105 C3 7101 C5  
 2112 B5 2127 C5 2136 A4 2145 A5 2152 C5 3102 C3 3132 D5 3146 C7 3157 A6 3168 C7 4103 B5 6106 C3 7102 D4



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

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

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
<b>VARICAP ALIGNMENT</b>						
<b>FM</b> 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)			108MHz	5130		8V ±0.2V
			87.5MHz (65.81MHz)	check		4.3V ±0.5V (1.2V ±0.5V)
<b>MW</b> FM/AM-version, 10kHz grid 530 - 1700kHz			1700kHz	5123		8V ±0.2V
			530kHz	check		1.1V ±0.4V
FM/MW-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		8V ±0.2V
			153kHz	check		1.1V ±0.4V
<b>MW</b> FM/MW/LW- version, 9kHz grid 531 - 1602kHz			1602kHz	5123		8V ±0.2V
			531kHz	check		1.1V ±0.4V
<b>FM IF</b>						
<b>FM</b>	10.7MHz, 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		5112		
<b>AM AFC</b> <b>MW</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)	1494kHz	B	1494kHz	2106	5	
	531 - 1602kHz		558kHz	5102		
<b>LW</b>	198kHz		198kHz	5103		
<b>MW</b> FM/AM-version, 10kHz grid 530 - 1700kHz	1500kHz	B	1500kHz	2106	5	
	560kHz		560kHz	5102		

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

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

↑ Repeat

MISCELLANEOUS

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

CAPACITORS

2101	4822 126 13692	47pF	1%	63V	
2102	4822 126 13838	100nF	10%	50V	not USA
2103	5322 122 31647	1nF	10%	63V	
2104	5322 122 32531	100pF	5%	50V	
2105	4822 126 13838	100nF	10%	50V	USA only

2106	2020 800 00191	3-11pF TRIMCAP.,N450		
2107	4822 121 51319	1μF	20%	50V
2120	4822 126 13689	18pF	1%	63V
2124	5322 122 32654	22nF	10%	63V
2125	2020 552 96199	560pF	1%	50V

2126	5322 122 31863	330pF	5%	50V
2127	4822 126 14076	220nF	20%	25V
2128	4822 124 40248	10μF	20%	63V
2129	4822 124 41584	100μF	20%	10V
2130	5322 122 32654	22nF	10%	63V

2131	4822 126 13482	470nF	20%	16V	
2132	4822 126 13482	470nF	20%	16V	
2133	4822 124 21913	1μF	20%	63V	
2134	4822 126 13188	15nF	5%	63V	not USA
2134	5322 122 32654	22nF	10%	63V	USA only

2135	4822 126 13188	15nF	5%	63V	not USA
2135	5322 122 32654	22nF	10%	63V	USA only
2136	4822 126 14076	220nF	20%	25V	
2137	4822 126 14076	220nF	20%	25V	
2138	4822 124 22652	2,2μF	20%	50V	

2139	4822 126 14236	15pF	5%	50V
2140	4822 126 13695	82pF	1%	63V
2141	4822 126 13838	100nF	10%	50V
2143	4822 126 14076	220nF	20%	25V
2144	4822 124 21913	1μF	20%	63V

2145	4822 122 33575	220pF	5%	50V	
2146	4822 122 33575	220pF	5%	50V	
2147	4822 122 33575	220pF	5%	50V	
2148	4822 122 33127	2,2nF	10%	63V	
2149	5322 122 32659	33pF	5%	50V	RDS only

2150	4822 126 13838	100nF	10%	50V	
2152	4822 126 12105	33nF	5%	63V	not for East Europe
2152	5322 116 80853	560pF	5%	63V	for East Europe only
2153	4822 126 13486	15pF	2%	63V	not for East Europe
2153	4822 122 33926	12pF	2%	50V	for East Europe only

2155	2020 800 00191	3-11pF TRIMCAP.,N450		
2159	5322 122 32659	33pF	5%	50V
2164	4822 126 13482	470nF	20%	16V
2165	4822 126 13838	100nF	10%	50V
2166	5322 122 31647	1nF	10%	63V

2167	4822 122 33926	12pF	5%	50V	
2169	4822 122 33127	2,2nF	10%	63V	RDS only

RESISTORS

3101	4822 051 20333	33kΩ	5%	0,1W
3102	4822 117 10837	100kΩ	1%	0,1W
3103	4822 051 20822	8,2kΩ	5%	0,1W
3104	4822 117 13577	330Ω	1%	0,1W
3105	4822 117 11503	220Ω	5%	0,1W

3132	4822 051 20479	47Ω	5%	0,1W
3134	4822 051 20223	22kΩ	5%	0,1W
3141	4822 117 11148	56kΩ	1%	0,1W
3142	4822 100 12159	TRIMPOT. 100kΩ		

RESISTORS

3143	4822 051 20223	22kΩ	5%	0,1W	RDS only
3144	4822 051 10102	1kΩ	2%	0,25W	RDS only
3145	4822 117 11449	2,2kΩ	1%	0,1W	
3146	4822 051 20229	22Ω	5%	0,1W	
3152	4822 051 20471	470Ω	5%	0,1W	

3153	4822 051 20471	470Ω	5%	0,1W
3154	4822 117 13577	330Ω	1%	0,1W
3155	4822 117 11503	220Ω	5%	0,1W
3156	4822 117 10837	100kΩ	1%	0,1W
3157	4822 117 10837	100kΩ	1%	0,1W

3158	4822 051 20471	470Ω	5%	0,1W
3159	4822 051 20471	470Ω	5%	0,1W
3160	4822 051 20471	470Ω	5%	0,1W
3161	4822 051 20223	22kΩ	5%	0,1W
3167	4822 051 20121	120Ω	5%	0,1W

3168	4822 051 20121	120Ω	5%	0,1W	
3169	4822 051 20154	150kΩ	5%	0,1W	
3170	4822 117 10837	100kΩ	1%	0,1W	
3172	4822 051 20562	5,6kΩ	5%	0,1W	
3176	4822 051 20333	33kΩ	5%	0,1W	RDS only

3181	4822 051 10102	1kΩ	2%	0,25W
4103	4822 051 20008	CHIP JUMPER 0805		
4106	4822 051 20008	CHIP JUMPER 0805		
4107	4822 051 20008	CHIP JUMPER 0805		
4108	4822 051 20008	CHIP JUMPER 0805		

COILS

5102	4822 157 71634	RF-COIL MW
5109	4822 242 70665	FM-IF FILTER 10,7MHz
5110	4822 242 70665	FM-IF FILTER 10,7MHz
5111	2422 549 44023	AM-IF FILTER 450kHz
5112	4822 157 70302	AM-IF FILTER 450kHz

5114	4822 157 70302	AM-IF FILTER 450kHz
5119	4822 157 11443	DISCRIMINATOR COIL
5121	4822 242 10261	QUARTZ 75kHz
5123	2422 549 44108	RF-COIL, AM-OSCILLATOR
5130	4822 157 11843	RF COIL 1,5 TURNS

5131	4822 157 11843	RF COIL 1,5 TURNS
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DIODES

6103	5322 130 34337	BAV99
6105	4822 130 83075	HN1V02H
6106	4822 130 83757	BAS216
6107	9340 386 90115	BZX284-C11
6120	4822 130 83757	BAS216

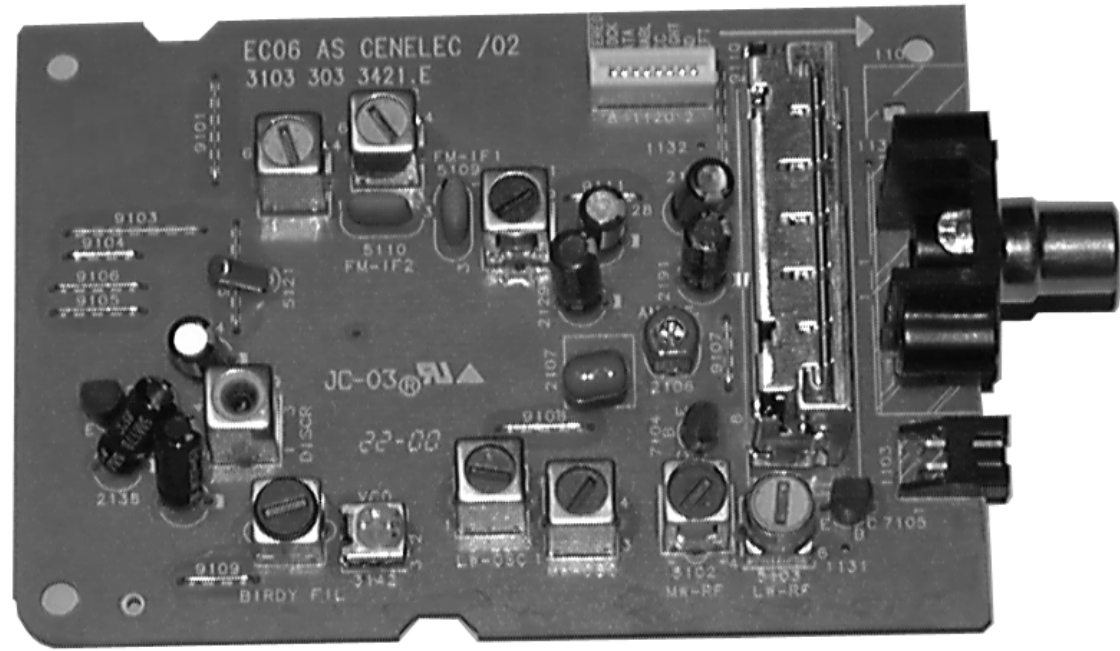
6130	4822 130 82833	1SV228
6131	4822 130 82833	1SV228

TRANSISTORS

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

INTEGRATED CIRCUITS

7101	9351 740 80557	TEA5757H/V1, RADIO IC
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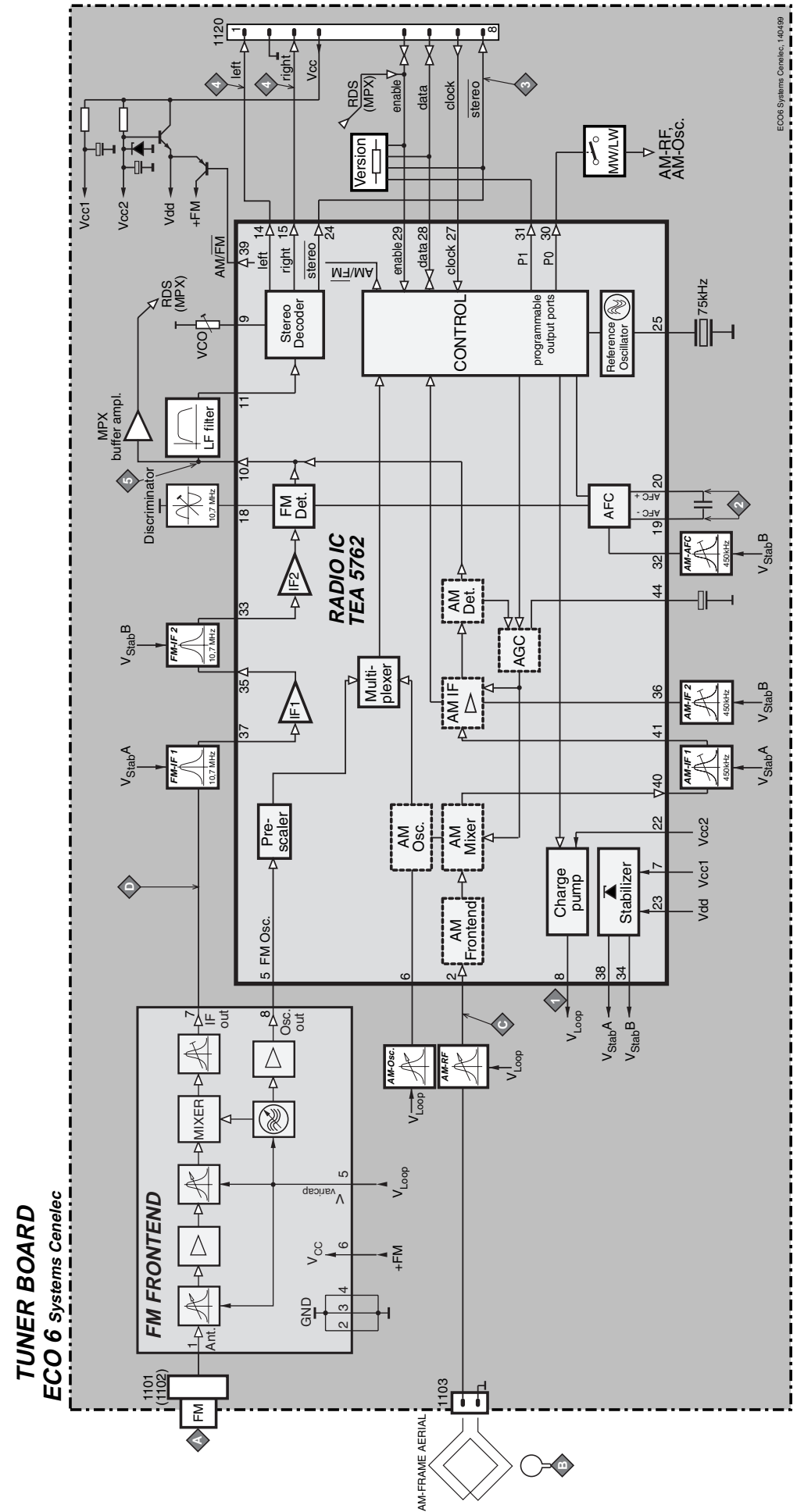
# ECO6 Tuner Board

version: **SYSTEMS CENELEC**

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- Schematic Diagram .....7B-2
- Component Layout .....7B-3
- Adjustment table .....7B-3
- Electrical Partslist .....7B-4

## BLOCK DIAGRAM





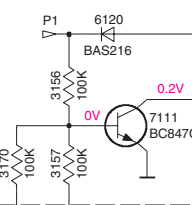
# TUNER BOARD ECO6 / SYSTEMS-CENELEC

## VERSION PROGRAMMING COMPONENTS

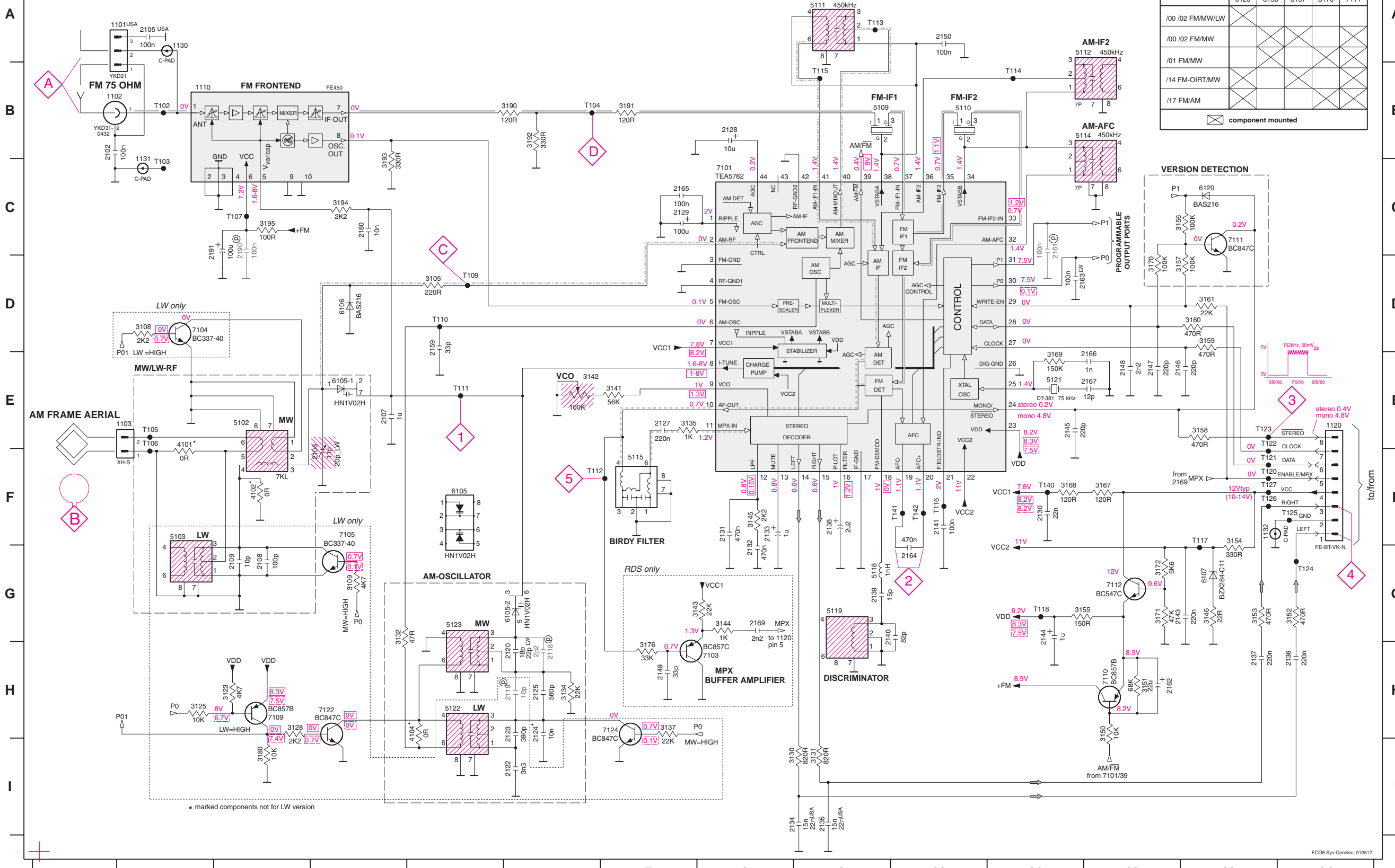
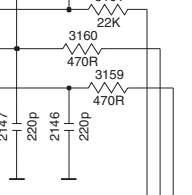
VERSION	6120	3156	3157	3170	7111
/00 /02 FM/MW/LW					
/00 /02 FM/MW					
/01 FM/MW					
/14 FM-OIRT/MW					
/17 FM/AM					

⊠ component mounted

## VERSION DETECTION



## PROGRAMMABLE OUTPUT PORTS



- 1101 A2
- 1102 B1
- 1103 E2
- 1110 B2
- 1120 E4
- 1130 A2
- 1131 C2
- 1132 F3
- 2102 B1
- 2105 A2
- 2106 E3
- 2107 E4
- 2108 G3
- 2109 C3
- 2118 H6
- 2119 H6
- 2120 H6
- 2122 I6
- 2123 H6
- 2124 H6
- 2125 H6
- 2128 B8
- 2129 C7
- 2130 F11
- 2131 F8
- 2132 F8
- 2133 F8
- 2134 B
- 2135 I9
- 2136 H4
- 2137 H3
- 2138 F9
- 2139 G9
- 2140 G9
- 2141 F10
- 2143 G12
- 2144 G11
- 2145 E11
- 2146 E12
- 2147 E12
- 2148 E12
- 2149 H7
- 2150 A10
- 2159 D5
- 2161 C11
- 2162 H12
- 2163 D11
- 2164 G10
- 2165 C7
- 2166 E11
- 2167 E11
- 2169 G8
- 2180 C4
- 2190 C3
- 2191 C3
- 3105 D5
- 3108 D2
- 3109 S4
- 3123 H3
- 3128 H3
- 3130 I9
- 3131 I9
- 3132 G4
- 3134 H6
- 3135 E7
- 3141 E7
- 3142 E6
- 3143 G7
- 3144 G8
- 3145 F9
- 3150 H12
- 3151 H12
- 3152 G4
- 3153 G13
- 3154 F13
- 3155 G12
- 3156 C12
- 3157 D12
- 3158 E13
- 3159 D13
- 3160 D13
- 3161 D13
- 3167 F12
- 3168 F11
- 3169 E11
- 3170 D12
- 3171 G12
- 3172 G12
- 3176 H7
- 3180 I3
- 3191 B7
- 3192 B6
- 3193 B4
- 3194 C4
- 3195 C3
- 4101 E2
- 4102 F3
- 4104 H5
- 5102 E3
- 5103 F9
- 5109 B9
- 5110 B10
- 5111 A9
- 5112 A11
- 5114 B11
- 5115 E7
- 5118 G9
- 5119 G9
- 5121 E11
- 5122 H5
- 5123 G5
- 6105-1 E4
- 6105-2 G6
- 6106 D4
- 6107 G13
- 6120 C13
- 7101 C8
- 7103 H8
- 7104 D2
- 7105 F4
- 7109 H3
- 7110 H12
- 7111 C13
- 7112 G12
- 7122 H4
- 7124 H7
- 7125 H2
- 7126 B2
- 7127 H2
- 7104 B6
- 7105 E2
- 7106 E2
- 7107 C3
- 7109 D5
- 7110 D5
- 7111 E5
- 7112 F7
- 7113 A9
- 7114 B11
- 7116 F10
- 7117 F13
- 7118 G11
- 7120 F13
- 7121 F13
- 7122 E13
- 7123 E13
- 7124 G14
- 7125 F14
- 7126 F13
- 7127 F13
- 7140 F11
- 7141 F10
- 7142 F10
- 7149 H7
- 7150 A10

**LEGEND**  
 \* ... only assembled in FM/AM-version  
 ⊕ ... for provision only  
 USA ... for USA version only  
 LW ... for LW version only

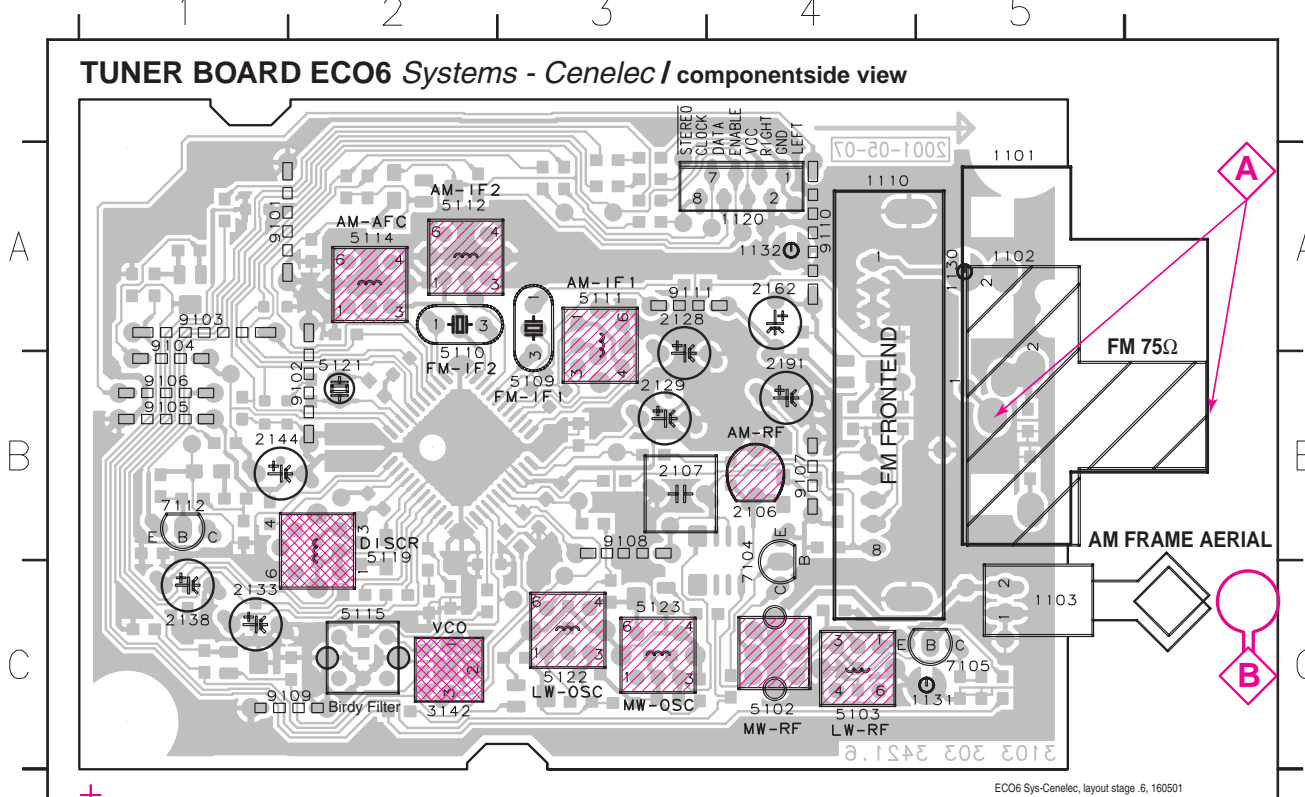
**SMD jumper**  
 41xx  
 OR

**EVM**

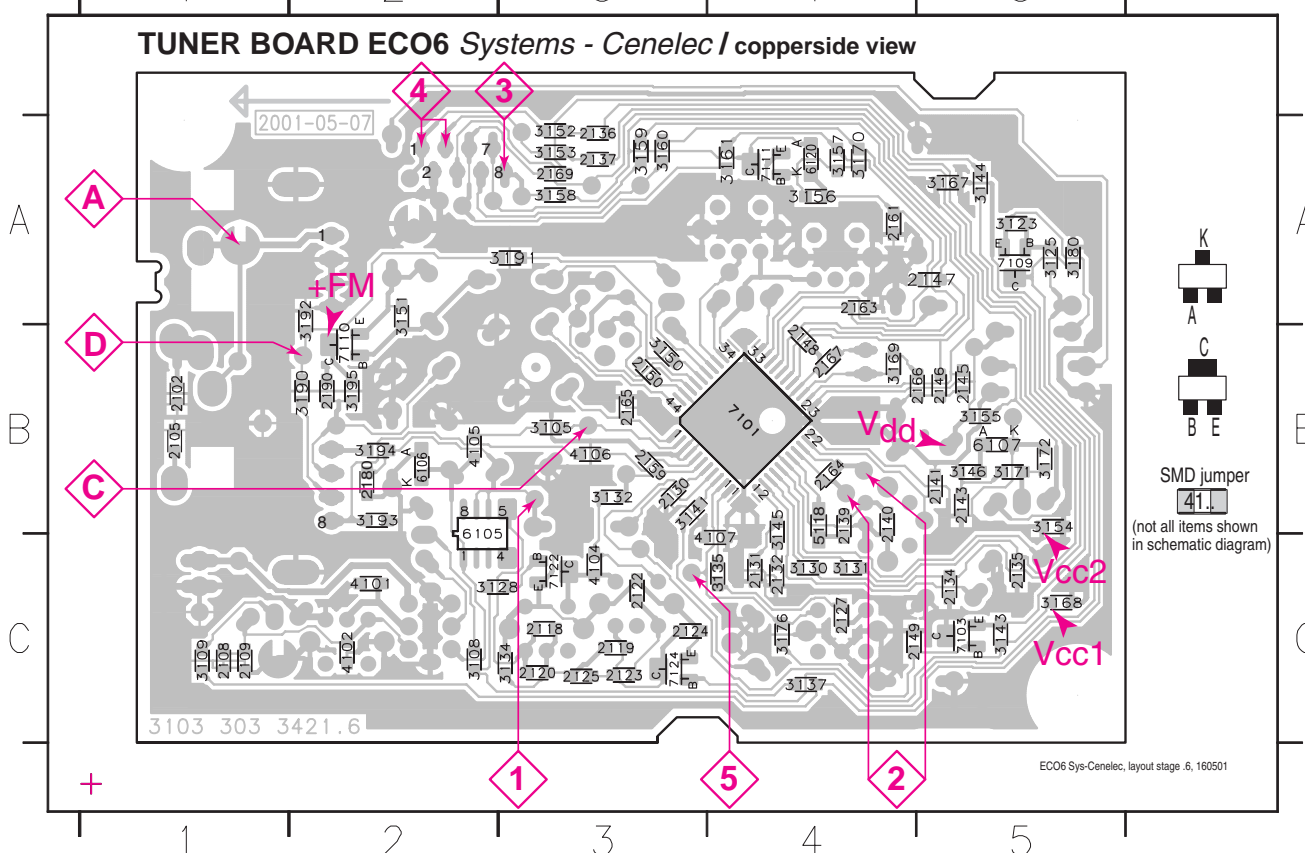
...V FM mode stereo  
 ...V MW mode  
 ...V LW mode  
 voltages measured while set is tuned to a strong transmitter

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

1101 B5 1110 B4 1131 C5 2107 B3 2133 C1 2162 A4 5102 C4 5110 A2 5114 A2 5121 B2 7104 C4 9101 A2 9104 B1 9107 B4 9110 A4  
 1102 B5 1120 A4 1132 A4 2128 A3 2138 B1 2191 B4 5103 C4 5111 A3 5115 C2 5122 C3 7105 C5 9102 B2 9105 B1 9108 B3 9111 A3  
 1103 C5 1130 A5 2106 B4 2129 B3 2144 B1 3142 C2 5109 B3 5112 A2 5119 B2 5123 C3 7112 B1 9103 A1 9106 B1 9109 C2

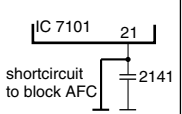
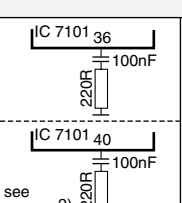
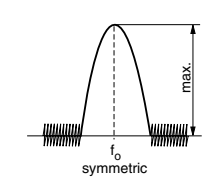

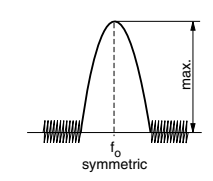


2102 B1 2120 C3 2130 B3 2137 A3 2146 B5 2161 A4 2169 A3 3123 A5 3134 C3 3145 C4 3154 B5 3160 A3 3171 B5 3192 A2 4104 C3 6106 B2 7110 B2  
 2105 B1 2122 C3 2131 C4 2139 B4 2147 A5 2163 A4 2180 B2 3125 A5 3135 C4 3146 B5 3155 B5 3161 A4 3172 B5 3193 B2 4105 B2 6107 B5 7111 A4  
 2108 C1 2123 C3 2132 C4 2140 B4 2148 B4 2164 B4 2190 B2 3128 C2 3137 C4 3150 B3 3156 A4 3167 A5 3176 C4 3194 B2 4106 B3 6120 A4 7122 C3  
 2109 C1 2124 C3 2134 C5 2141 B5 2149 C4 2165 B3 3105 B3 3130 C4 3141 B3 3151 A2 3157 A4 3168 C5 3180 A5 3195 B2 4107 C4 7101 B4 7124 C3  
 2118 C3 2125 C3 2135 C5 2143 B5 2150 B3 2166 B5 3108 C2 3131 C4 3143 C5 3152 A3 3158 A3 3169 B4 3190 B2 4101 C2 5118 C4 7103 C5  
 2119 C3 2127 C4 2136 A3 2145 B5 2159 B3 2167 B4 3109 C1 3132 B3 3144 A5 3153 A3 3159 A3 3170 A4 3191 A3 4102 C2 6105 B2 7109 A5



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

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

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
<i>VARICAP ALIGNMENT</i>						
<b>FM</b> 87.5 - 108MHz (50kHz grid)			108MHz	check		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		8V ±0.2V
			153kHz	check		1.1V ±0.4V
<i>FM - IF</i>						
<b>FM</b>	10.7MHz, 45mV continuous wave	D		5119	2	0mV ±3mV
<i>FM - VCO</i>						
<b>FM</b>	98MHz, 1mV continuous wave	A	98MHz	3142	3	152kHz ±1kHz <sup>1)</sup>
<i>FM RF (channel separation)</i> <span style="float:right">Note: The FM-frontend unit has already been adjusted by the factory and needs therefore no further adjustments for service purposes.</span>						
<b>FM</b>	98MHz, 1mV 90% Left + 9% pilot mod=1kHz	A	98MHz	IF coil inside FM frontend 1110	4	right channel min.
<i>AM IF</i>						
<b>MW</b>	450kHz  connect pin 6 of IC 7101 (AM Osc.) with 3.3kΩ to Vcc	C  $\Delta f = \pm 10\text{kHz}$ $V_{RF} = 0.5\text{mV}$ (as low as possible)		5111	5	
			see remark 2)	5112		
<b>AM AFC</b> <b>MW</b>		C  continuous wave $V_{RF} = 2\text{mV}$		5114	2	0mV ±2mV
<i>AM RF<sup>3)</sup></i>						
<b>MW</b>	1494kHz	B  	1494kHz	2106	5	
	558kHz		5102			
<b>LW</b>	198kHz	$\Delta f = \pm 30\text{kHz}$ $V_{RF}$ as low as possible	198kHz	5103		

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

MISCELLANEOUS

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

CAPACITORS

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

RESISTORS

3105	4822 117 11503	220Ω 5% 0,1W	
3108	4822 117 11449	2,2kΩ 1% 0,1W	LW only
3109	4822 051 20472	4,7kΩ 5% 0,1W	LW only
3123	4822 051 20472	4,7kΩ 5% 0,1W	LW only
3125	4822 117 10833	10kΩ 1% 0,1W	LW only

RESISTORS

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

COILS

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

DIODES

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

TRANSISTORS

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

INTEGRATED CIRCUITS

7101	4822 209 90315	TEA5762H/V1, RADIO IC	
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# PWR303 MODULE UCD 100-150W

Mains pt5 / Reg pt3 / Amp pt2 / Spk pt5 - 17 Nov 03

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Regulator UCD Board

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Amplifier UCD Board (SE)

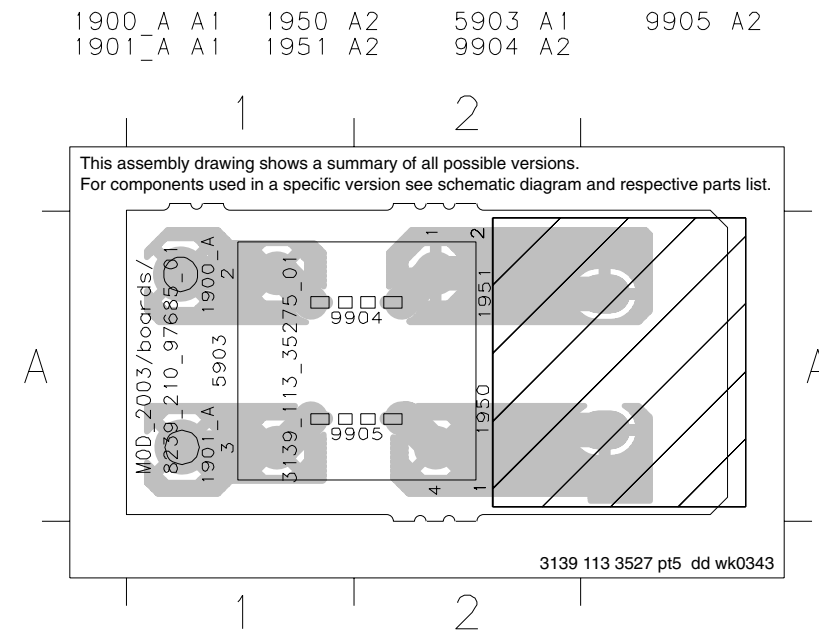
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Speaker UCD Board

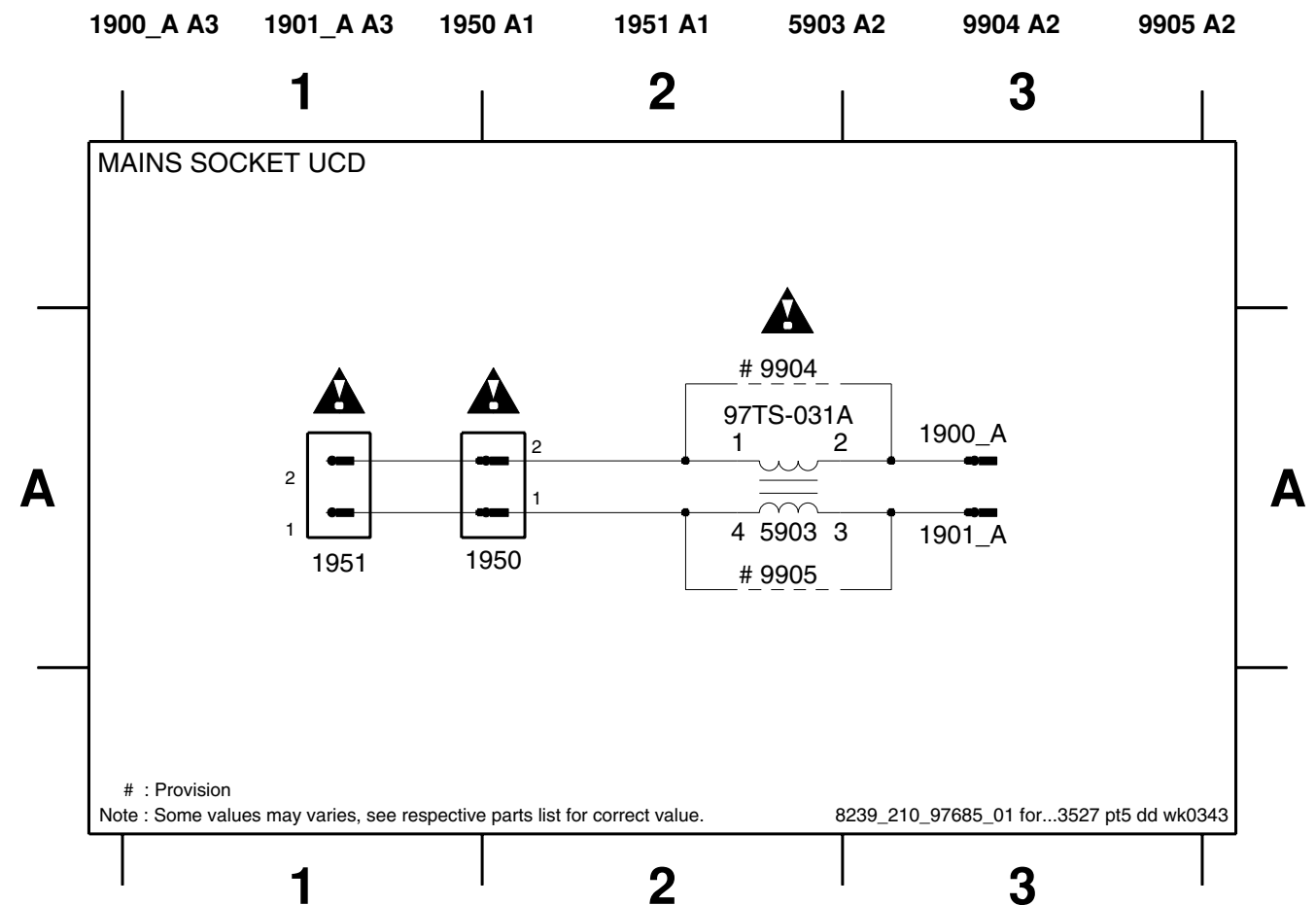
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## MAINS SOCKET UCD BOARD - COMPONENT LAYOUT



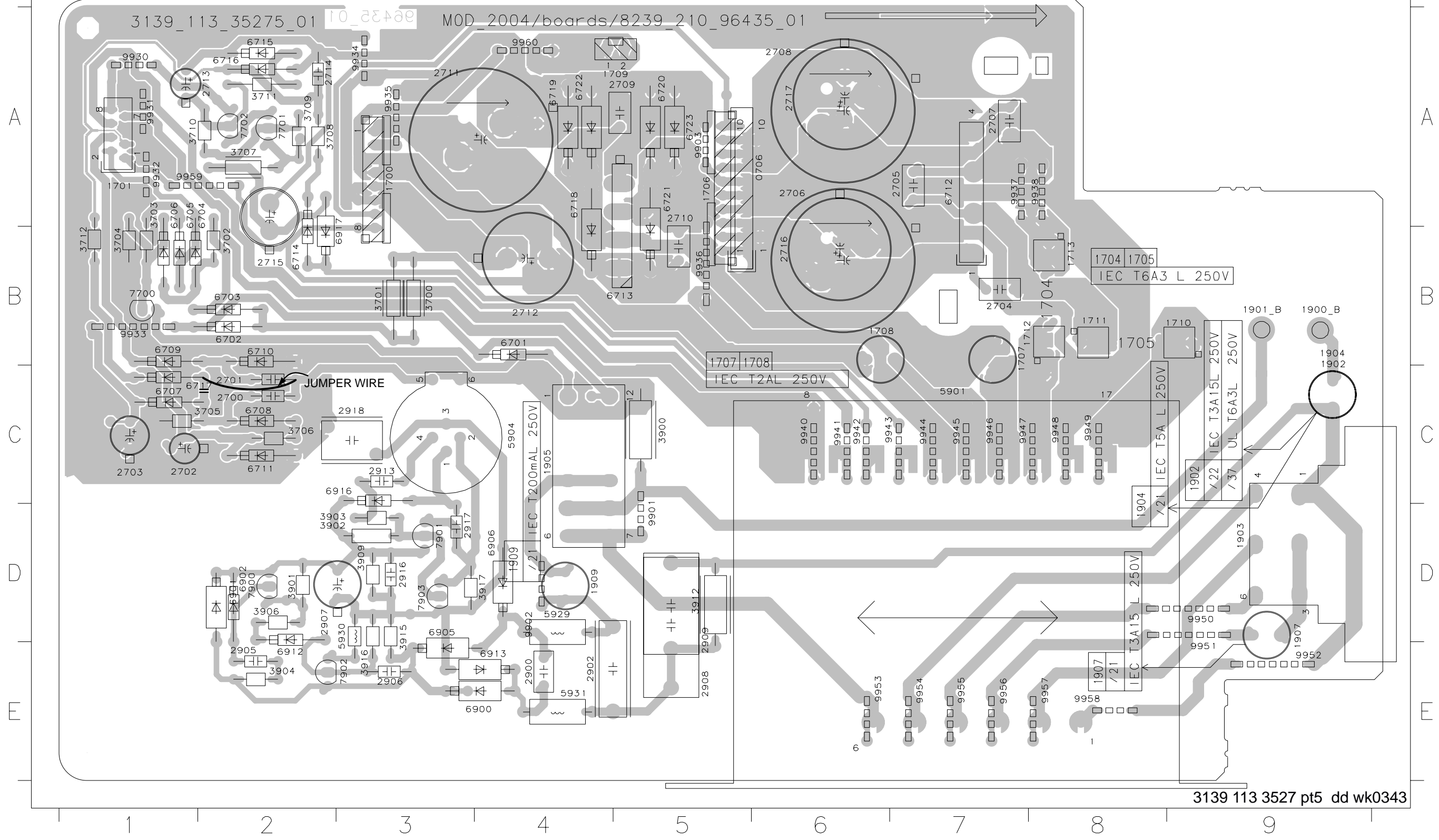
## MAINS SOCKET UCD BOARD - CIRCUIT DIAGRAM



### MAINS UCD BOARD - COMPONENT LAYOUT

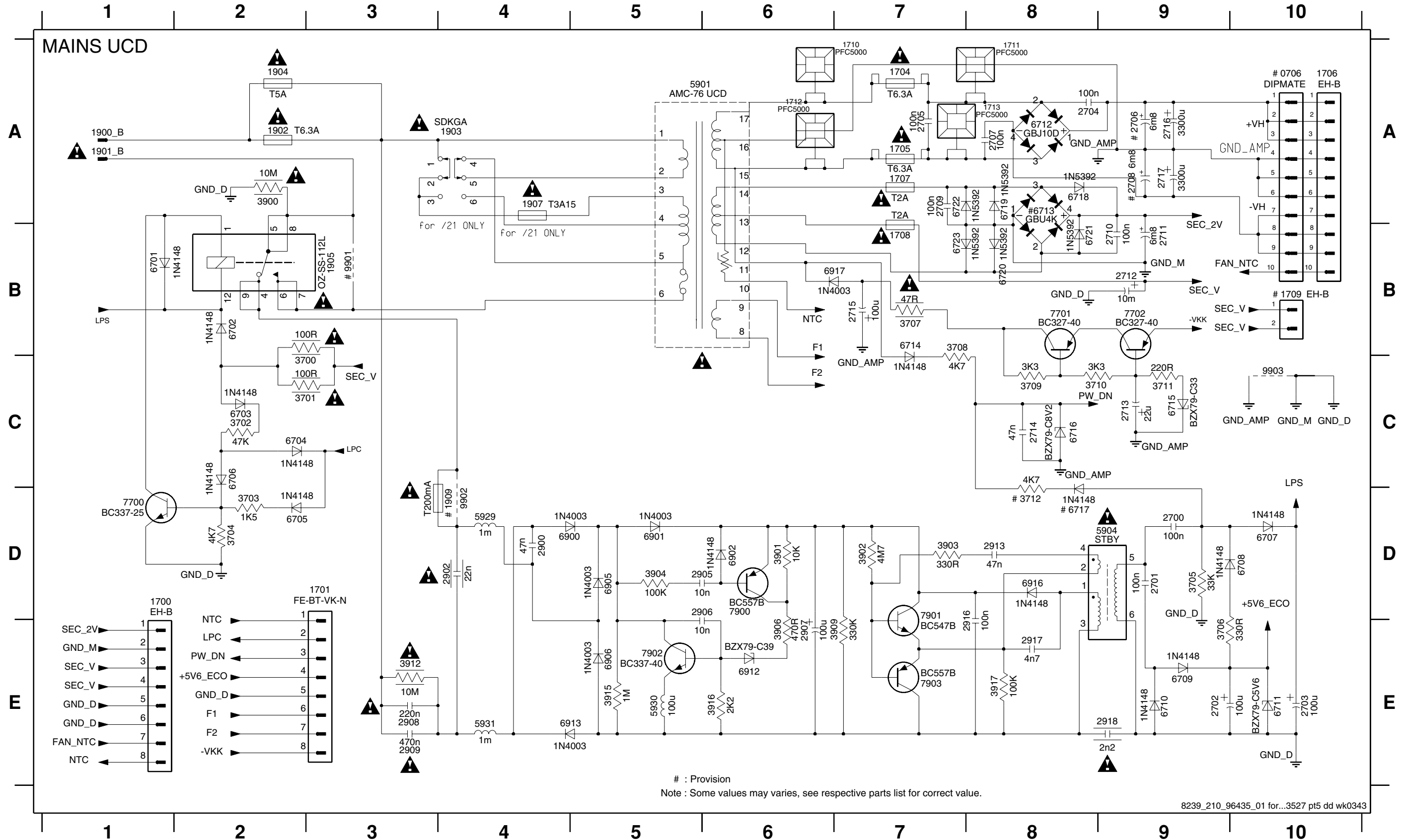
0706 A6	1713 B8	2701 C2	2711 A3	2906 E3	3702 B2	3712 B1	3916 E3	6704 A2	6714 B2	6900 E4	7701 A2	9931 A1	9942 C6	9952 E9
1700 A3	1900_B B9	2702 C1	2712 B4	2907 D2	3703 A1	3900 C5	3917 D4	6705 A1	6715 A2	6901 D2	7702 A2	9932 A1	9943 C6	9953 E6
1701 A1	1901_B B9	2703 C1	2713 A2	2908 E5	3704 B1	3901 D2	5901 C7	6706 A1	6716 A2	6902 D2	7900 D2	9933 B1	9944 C7	9954 E7
1706 A5	1902_B B9	2704 B7	2714 A2	2909 D5	3705 C2	3902 D2	5904 C4	6707 C1	6717 C2	6905 D3	7901 D3	9934 A3	9945 C7	9955 E7
1707 B7	1903 D9	2705 A7	2715 B2	2913 C3	3706 C2	3903 D2	5929 D4	6708 C2	6718 A4	6906 D4	7902 E3	9935 A3	9946 C7	9956 E7
1708 B6	1904 B9	2706 A6	2716 B6	2916 D3	3707 A2	3904 E2	5930 D3	6709 B1	6719 A4	6912 E2	7903 D3	9936 B5	9947 C7	9957 E8
1709 A5	1905 C4	2707 A7	2717 A6	2917 D3	3708 A2	3906 D2	5931 E4	6710 B2	6720 A5	6913 E4	9901 D5	9937 A7	9948 C8	9958 E8
1710 B9	1907 D9	2708 A6	2900 E4	2918 C3	3709 A2	3909 D3	6701 B4	6711 C2	6721 A5	6916 C3	9902 D4	9938 A8	9949 C8	9959 A1
1711 B8	1909 D4	2709 A5	2902 E4	3700 B3	3710 A1	3912 D5	6702 B2	6712 A7	6722 A4	6917 B3	9903 A5	9939 C6	9940 C6	9950 D9
1712 B7	2700 C2	2710 A5	2905 E2	3701 B3	3711 A2	3915 D3	6703 B2	6713 B5	6723 A5	7700 B1	9930 A1	9941 C6	9951 E9	9960 A4

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



# MAINS UCD BOARD - CIRCUIT DIAGRAM

0706 A10	1708 B7	1901_B A1	2700 D9	2707 A8	2714 C8	2906 D5	2918 E9	3706 E9	3900 A2	3912 E3	5930 E5	6706 C2	6713 A8	6720 B8	6905 D5	7701 B8	9902 D4
1700 D1	1709 B10	1902 A2	2701 D9	2708 A9	2715 B7	2907 E6	3700 C2	3707 B7	3901 D6	3915 E5	5931 E4	6707 D10	6714 B7	6721 B8	6906 E5	7702 B9	9903 C10
1701 D3	1710 A7	1903 A4	2702 E9	2709 A7	2716 A9	2908 E3	3701 C2	3708 B7	3902 D7	3916 E6	6701 B1	6708 D10	6715 C9	6722 A8	6912 E6	7900 D6	
1704 A7	1711 A8	1904 A2	2703 E10	2710 B9	2717 A9	2909 E3	3702 C2	3709 C8	3903 D7	3917 E8	6702 B2	6709 E9	6716 C8	6723 B7	6913 E5	7901 D7	
1705 A7	1712 A6	1905 B3	2704 A8	2711 B9	2718 A9	2900 D4	3703 D2	3710 C8	3904 D5	5901 A6	6703 C2	6710 E9	6717 D8	6900 D4	6916 D8	7902 E5	
1706 A10	1713 A7	1907 A4	2705 A7	2712 B9	2902 D4	2916 E8	3704 D2	3711 C9	3906 E6	5904 D8	6704 C2	6711 E10	6718 A8	6901 D5	6917 B7	7903 E7	
1707 A7	1900_B A1	1909 D4	2706 A9	2713 C9	2905 D5	2917 E8	3705 D9	3712 D8	3909 E7	5929 D4	6705 D2	6712 A8	6719 A8	6902 D6	7700 D1	9901 B3	

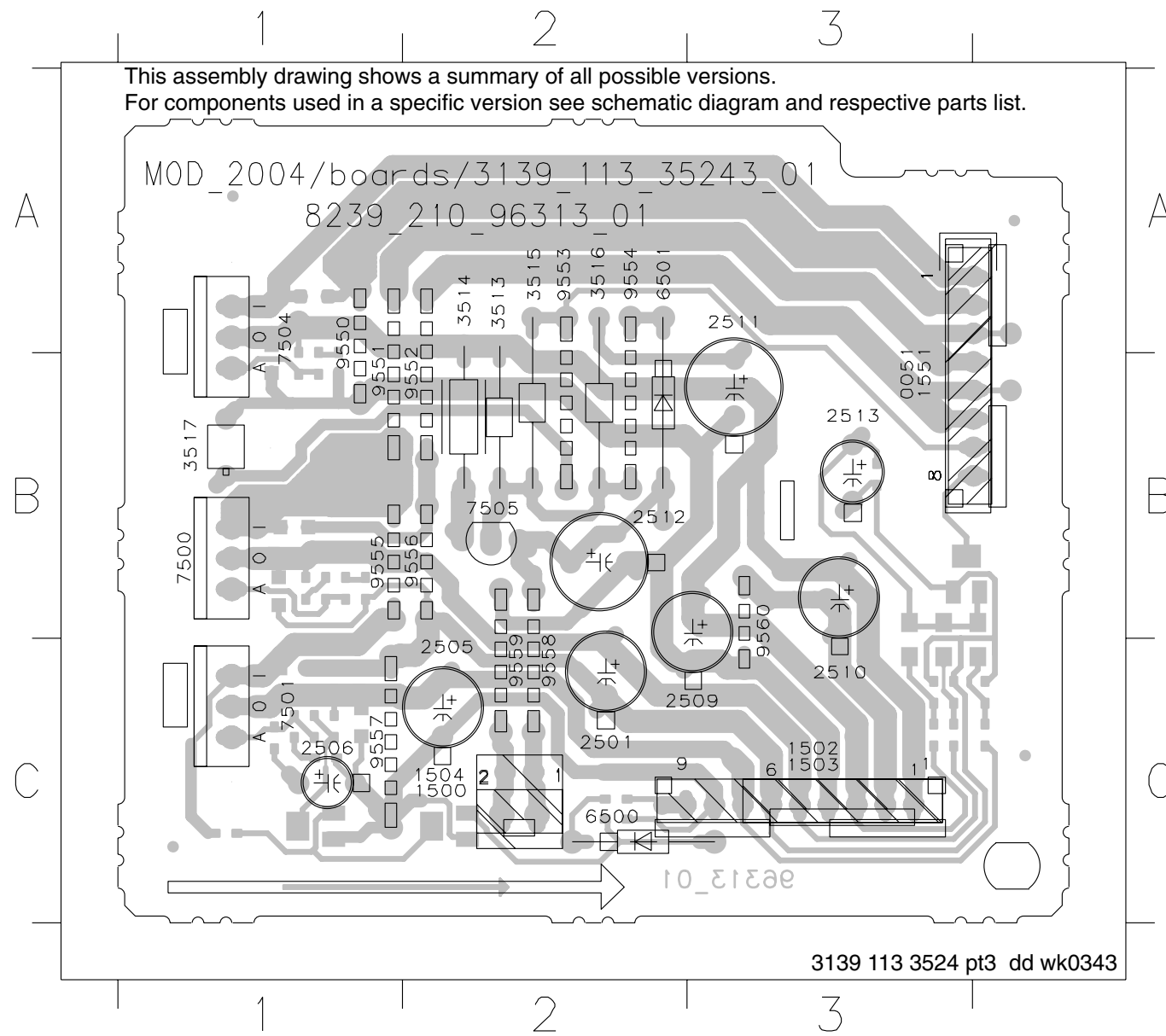


# : Provision  
 Note : Some values may varies, see respective parts list for correct value.



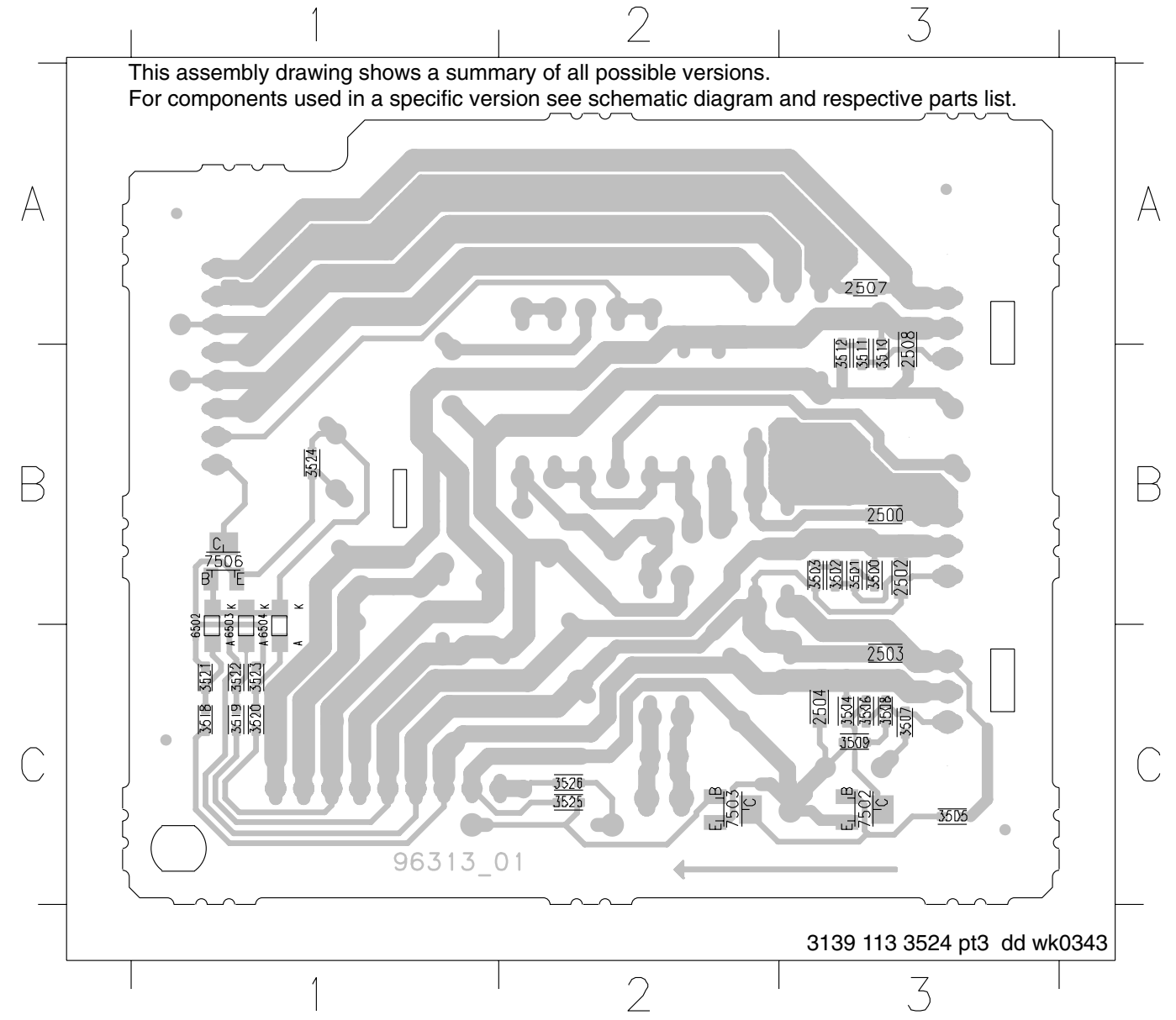
**REGULATOR UCD BOARD - COMPONENT LAYOUT**

0051 B3	2501 C2	2512 B2	3517 B1	7505 B2	9555 B1
1500 C2	2505 C2	2513 B3	6500 C2	9550 A1	9556 B2
1502 C3	2506 C1	3513 A2	6501 A2	9551 B1	9557 C1
1503 C3	2509 C3	3514 A2	7500 B1	9552 B2	9558 C2
1504 C2	2510 C3	3515 A2	7501 C1	9553 A2	9559 C2
1551 B3	2511 A3	3516 A2	7504 A1	9554 A2	9560 B3



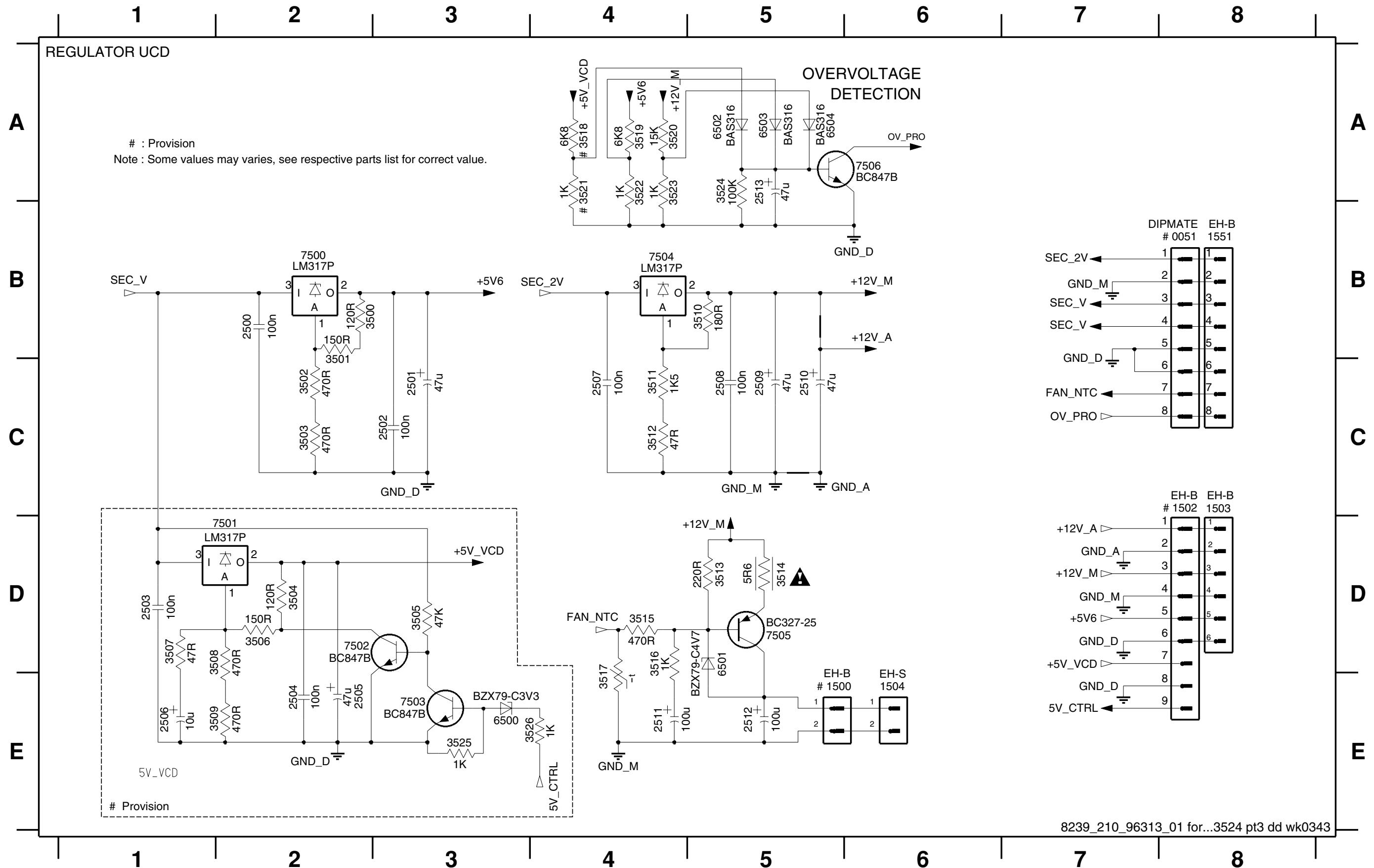
**REGULATOR UCD BOARD - CHIP LAYOUT**

2500 B3	2508 B3	3504 C3	3509 C3	3519 C1	3524 B1	6504 C1
2502 B3	3500 B3	3505 C3	3510 B3	3520 C1	3525 C2	7502 C3
2503 C3	3501 B3	3506 C3	3511 B3	3521 C1	3526 C2	7503 C2
2504 C3	3502 B3	3507 C3	3512 B3	3522 C1	6502 C1	7506 B1
2507 A3	3503 B3	3508 C3	3518 C1	3523 C1	6503 C1	



REGULATOR UCD BOARD - CIRCUIT DIAGRAM

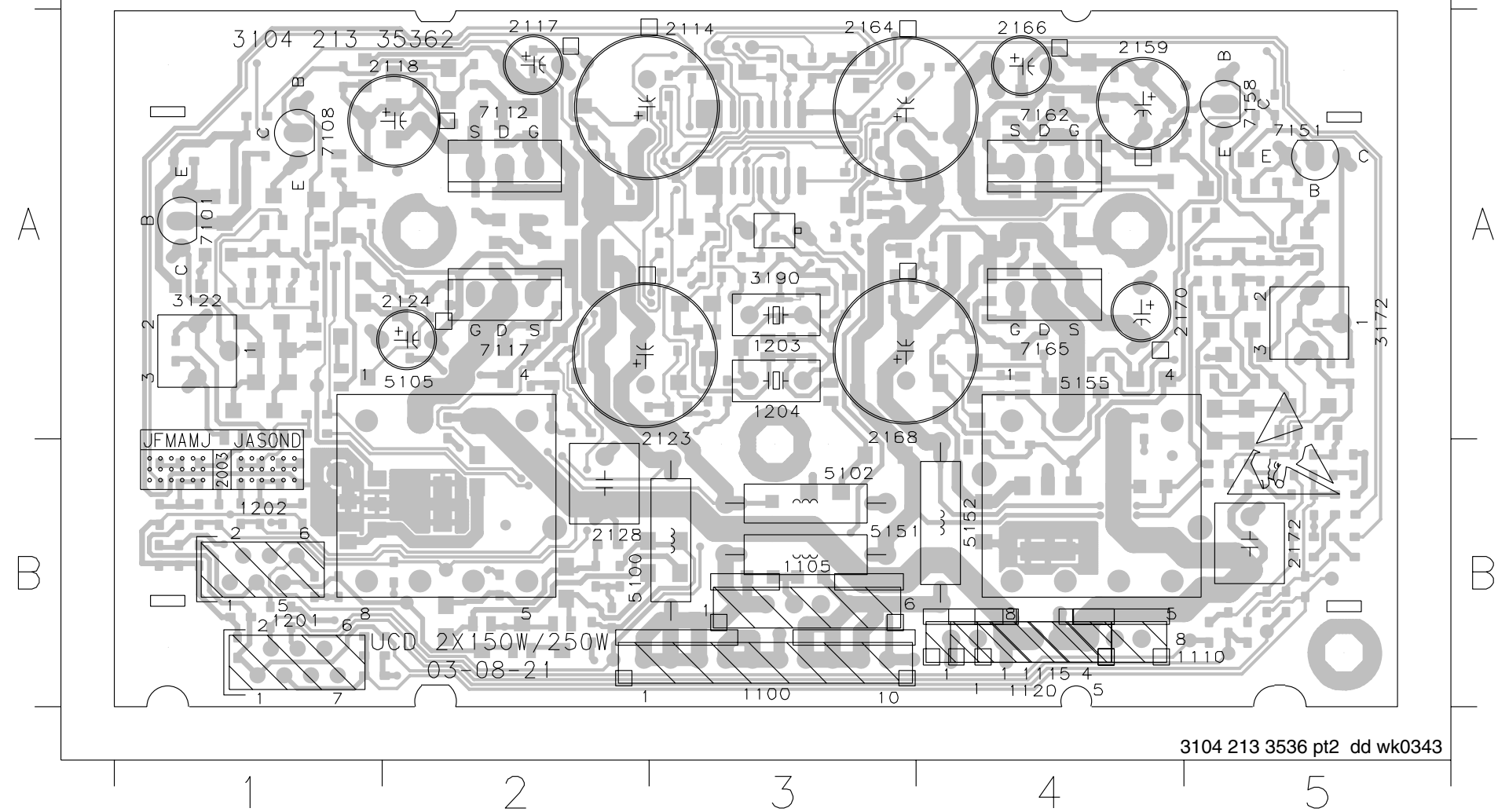
0051 B8	1503 C8	2500 B2	2503 D1	2506 E1	2509 C5	2512 E5	3501 B2	3504 D2	3507 D1	3510 B5	3513 D5	3516 D4	3519 A4	3522 A4	3525 E3	6501 D5	6504 A5	7502 D2	7505 D5
1500 E5	1504 E6	2501 C3	2504 E2	2507 C4	2510 C5	2513 A5	3502 C2	3505 D3	3508 D2	3511 C4	3514 D5	3517 E4	3520 A4	3523 A4	3526 E4	6502 A5	7500 B2	7503 E3	7506 A6
1502 C8	1551 B8	2502 C3	2505 E2	2508 C5	2511 E4	3500 B2	3503 C2	3506 D2	3509 E2	3512 C4	3515 D4	3518 A4	3521 A4	3524 A5	6500 E3	6503 A5	7501 D1	7504 B4	



**AMPLIFIER UCD BOARD (SE) - COMPONENT LAYOUT**

1100 B3	1201 B1	2117 A2	2159 A4	2172 B5	5102 B3	7101 A1	7158 A5
1105 B3	1202 B1	2118 A2	2164 A3	3122 A1	5105 B2	7108 A1	7162 A4
1110 B4	1203 A3	2123 A2	2166 A4	3172 A5	5151 B3	7112 A2	7165 A4
1115 B4	1204 A3	2124 A2	2168 A3	3190 A3	5152 B4	7117 A2	
1120 B4	2114 A2	2128 B2	2170 A4	5100 B3	5155 B4	7151 A5	

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

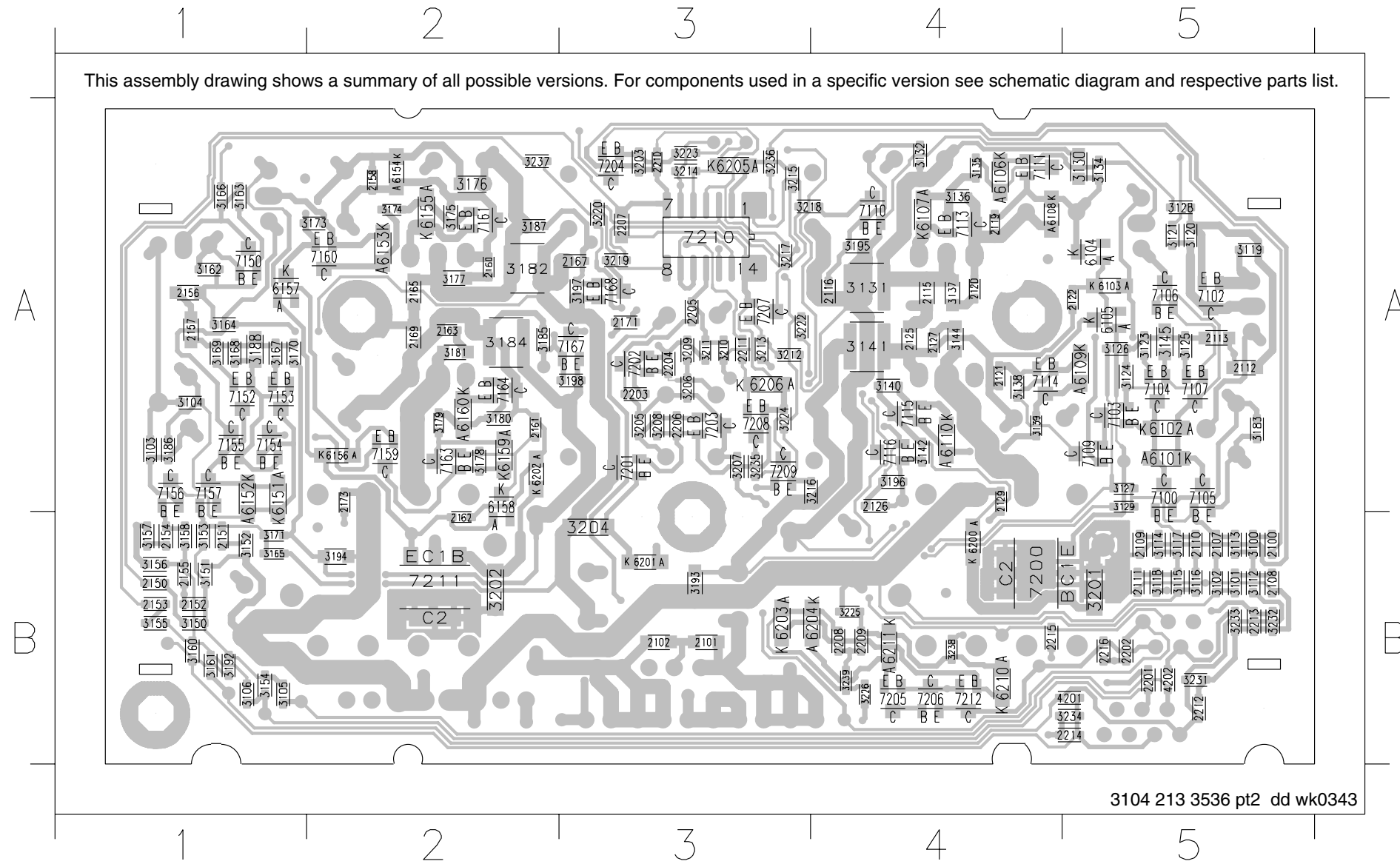




AMPLIFIER UCD BOARD (SE) - CHIP LAYOUT

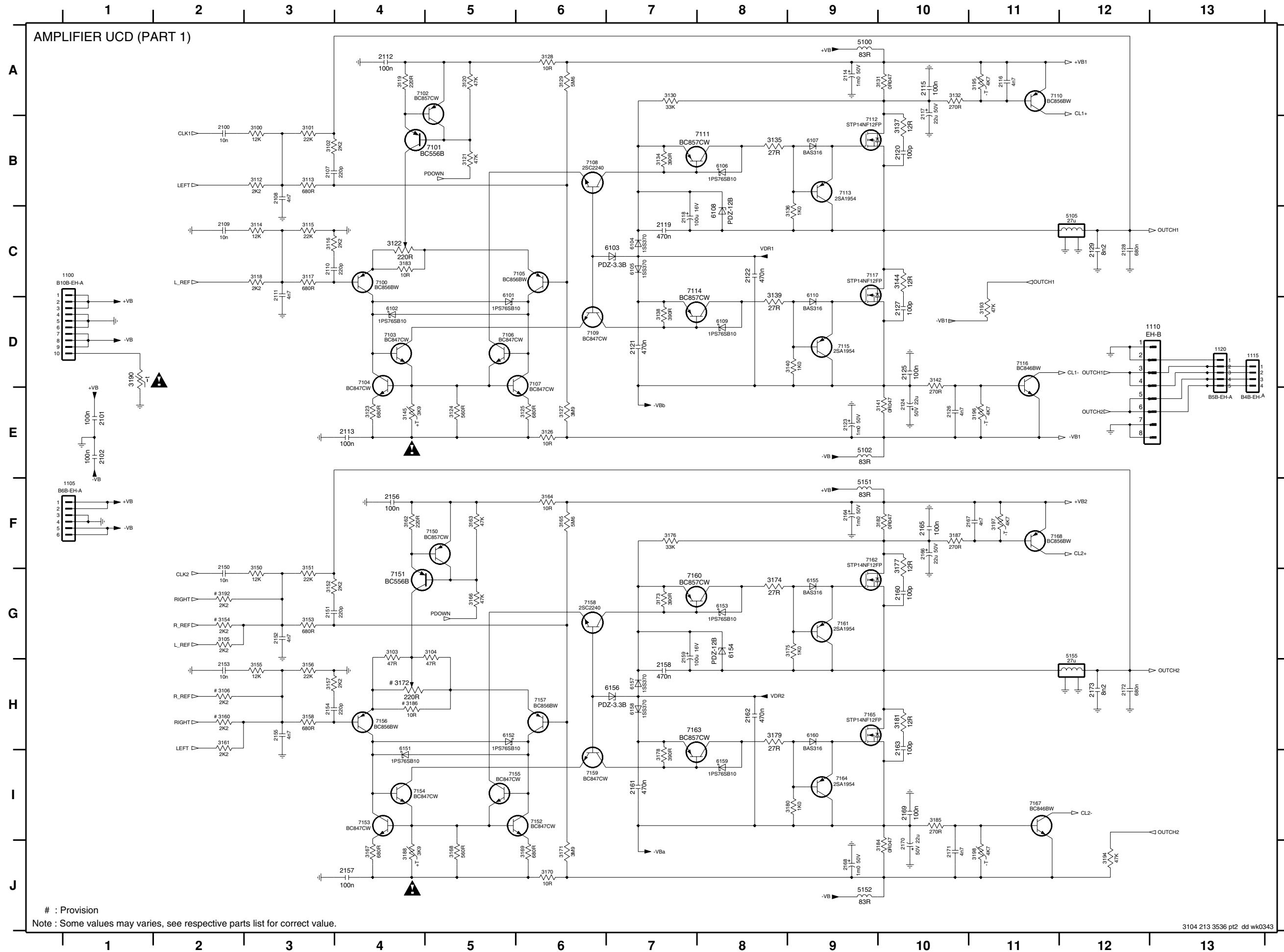
2100	B5	2122	A5	2161	A2	2208	B4	3106	B1	3127	A5	3144	A4	3164	A1	3180	A2
2101	B3	2125	A4	2162	B2	2209	B4	3112	B5	3128	A5	3145	A5	3165	B1	3181	A2
2102	B3	2126	A4	2163	A2	2210	A3	3113	B5	3129	A5	3150	B1	3166	A1	3182	A2
2107	B5	2127	A4	2165	A2	2211	A3	3114	B5	3130	A5	3151	B1	3167	A1	3183	A5
2108	B5	2129	A4	2167	A3	2212	B5	3115	B5	3131	A4	3152	B1	3168	A1	3184	A2
2109	B5	2150	B1	2169	A2	2213	B5	3116	B5	3132	A4	3153	B1	3169	A1	3185	A2
2110	B5	2151	B1	2171	A3	2214	B5	3117	B5	3134	A5	3154	B1	3170	A1	3186	A1
2111	B5	2152	B1	2173	A2	2215	B4	3118	B5	3135	A4	3155	B1	3171	B1	3187	A2
2112	A5	2153	B1	2201	B5	2216	B5	3119	A5	3136	A4	3156	B1	3173	A2	3188	A1
2113	A5	2154	B1	2202	B5	3100	B5	3120	A5	3137	A4	3157	B1	3174	A2	3192	B1
2115	A4	2155	B1	2203	A3	3101	B5	3121	A5	3138	A4	3158	B1	3175	A2	3193	B3
2116	A4	2156	A1	2204	A3	3102	B5	3123	A5	3139	A4	3160	B1	3176	A2	3194	B2
2119	A4	2157	A1	2205	A3	3103	A1	3124	A5	3140	A4	3161	B1	3177	A2	3195	A4
2120	A4	2158	A2	2206	A3	3104	A1	3125	A5	3141	A4	3162	A1	3178	A2	3196	A4
2121	A4	2160	A2	2207	A3	3105	B1	3126	A5	3142	A4	3163	A1	3179	A2	3197	A3

3198	A3	6158	A2	F101	B3
3201	B5	6159	A2	F102	B3
3202	B2	6160	A2	F103	B2
3203	A3	6200	B4	F104	B2
3204	B3	6201	B3	F105	B2
3205	A3	6202	A2	F106	B3
3206	A3	6203	B3	F107	A4
3207	A3	6204	B4	F108	A4
3208	A3	6205	A3	F109	A2
3209	A3	6206	A3	F110	A3
3210	A3	6210	B4	F111	A5
3211	A3	6211	B4	F112	B2
3212	A3	7100	A5	F113	A3
3213	A3	7102	A5	F114	B1
3214	A3	7103	A5	F115	B1
3215	A3	7104	A5	F116	B1
3216	A4	7105	A5	F117	B1
3217	A3	7106	A5	F118	B4
3218	A3	7107	A5	F119	B4
3219	A3	7109	A5	F120	B4
3220	A3	7110	A4	F121	A3
3222	A3	7111	A4	F122	A3
3223	A3	7113	A4		
3224	A3	7114	A4		
3225	B4	7115	A4		
3226	B4	7116	A4		
3231	B5	7150	A1		
3232	B5	7152	A1		
3233	B5	7153	A1		
3234	B5	7154	A1		
3235	A3	7155	A1		
3236	A3	7156	A1		
3237	A2	7157	A1		
3238	B4	7159	A2		
3239	B4	7160	A2		
4201	B5	7161	A2		
4202	B5	7163	A2		
6101	A5	7164	A2		
6102	A5	7167	A3		
6103	A5	7168	A3		
6104	A5	7200	B4		
6105	A5	7201	A3		
6106	A4	7202	A3		
6107	A4	7203	A3		
6108	A4	7204	A3		
6109	A5	7205	B4		
6110	A4	7206	B4		
6151	A1	7207	A3		
6152	A1	7208	A3		
6153	A2	7209	A3		
6154	A2	7210	A3		
6155	A2	7211	B2		
6156	A2	7212	B4		
6157	A1	F100	B3		



3198	A3	6158	A2	F101	B3
3201	B5	6159	A2	F102	B3
3202	B2	6160	A2	F103	B2
3203	A3	6200	B4	F104	B2
3204	B3	6201	B3	F105	B2
3205	A3	6202	A2	F106	B3
3206	A3	6203	B3	F107	A4
3207	A3	6204	B4	F108	A4
3208	A3	6205	A3	F109	A2
3209	A3	6206	A3	F110	A3
3210	A3	6210	B4	F111	A5
3211	A3	6211	B4	F112	B2
3212	A3	7100	A5	F113	A3
3213	A3	7102	A5	F114	B1
3214	A3	7103	A5	F115	B1
3215	A3	7104	A5	F116	B1
3216	A4	7105	A5	F117	B1
3217	A3	7106	A5	F118	B4
3218	A3	7107	A5	F119	B4
3219	A3	7109	A5	F120	B4
3220	A3	7110	A4	F121	A3
3222	A3	7111	A4	F122	A3
3223	A3	7113	A4		
3224	A3	7114	A4		
3225	B4	7115	A4		
3226	B4	7116	A4		
3231	B5	7150	A1		
3232	B5	7152	A1		
3233	B5	7153	A1		
3234	B5	7154	A1		
3235	A3	7155	A1		
3236	A3	7156	A1		
3237	A2	7157	A1		
3238	B4	7159	A2		
3239	B4	7160	A2		
4201	B5	7161	A2		
4202	B5	7163	A2		
6101	A5	7164	A2		
6102	A5	7167	A3		
6103	A5	7168	A3		
6104	A5	7200	B4		
6105	A5	7201	A3		
6106	A4	7202	A3		
6107	A4	7203	A3		
6108	A4	7204	A3		
6109	A5	7205	B4		
6110	A4	7206	B4		
6151	A1	7207	A3		
6152	A1	7208	A3		
6153	A2	7209	A3		
6154	A2	7210	A3		
6155	A2	7211	B2		
6156	A2	7212	B4		
6157	A1	F100	B3		

# AMPLIFIER UCD BOARD (SE) - CIRCUIT DIAGRAM PART 1

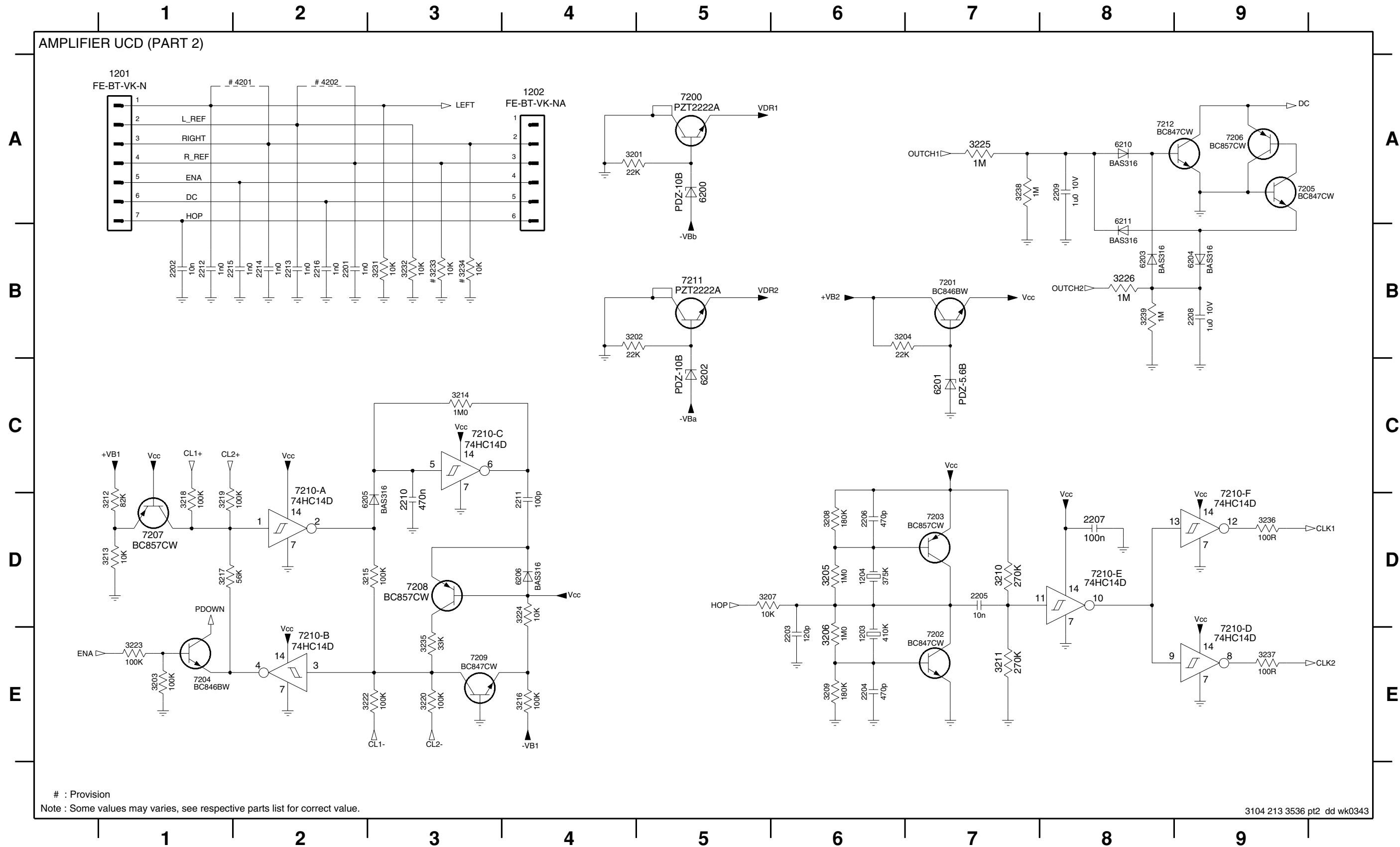


1100 C1	3187 F10
1105 F1	3188 J4
1110 D12	3190 D1
1115 D13	3192 G2
1120 D13	3193 D11
2100 B2	3194 J12
2101 E1	3195 A11
2102 E1	3196 E11
2107 B3	3197 F11
2108 B3	3198 J11
2109 C2	5100 A9
2110 C3	5102 E9
2111 C3	5105 C12
2112 A4	5151 F9
2113 E4	5152 J9
2114 A9	5155 G12
2115 A10	6101 D5
2116 A11	6102 D4
2117 A10	6103 C7
2118 C7	6104 C7
2119 C7	6105 C7
2120 B10	6106 B8
2121 D7	6107 B9
2122 C8	6108 C8
2123 E9	6109 D8
2124 E10	6110 D9
2125 D10	6151 I4
2126 E10	6152 H5
2127 D10	6153 G8
2128 C12	6154 G8
2129 C12	6155 G9
2150 G2	6156 H7
2151 G3	6157 H7
2152 G3	6158 H7
2153 H2	6159 I8
2154 H3	6160 H9
2155 H3	7100 C4
2156 F4	7101 B5
2157 J4	7102 A4
2158 H7	7103 D4
2159 G7	7104 D4
2160 G10	7105 C6
2161 I7	7106 D5
2162 H8	7107 D6
2163 H10	7108 B6
2164 F9	7109 D6
2165 F10	7110 A11
2166 F10	7111 B8
2167 F11	7112 B9
2168 J9	7113 B9
2169 I10	7114 C8
2170 J10	7115 D9
2171 J10	7116 D11
2172 H12	7117 C9
2173 H12	7150 F5
3100 B3	7151 F4
3101 B3	7152 I6
3102 B3	7153 I4
3103 G4	7154 I4
3104 G5	7155 I6
3105 G2	7156 H4
3106 H2	7157 H6
3112 B3	7158 G6
3113 B3	7159 I6
3114 C3	7160 G8
3115 C3	7161 G9
3116 C3	7162 F9
3117 C3	7163 H8
3118 C3	7164 I9
3119 A4	7165 H9
3120 A5	7167 I11
3121 B5	7168 F11
3122 C4	
3123 C4	
3124 E5	
3125 E6	
3126 E6	
3127 E6	
3128 A6	
3129 A6	
3130 A7	
3131 A10	
3132 A10	
3134 B7	
3135 B8	
3136 C9	
3137 B10	
3138 D7	
3139 D8	
3140 D9	
3141 E10	
3142 D10	
3144 C10	
3145 E4	
3150 G3	
3151 G3	
3152 G3	
3153 G3	
3154 G2	
3155 H3	
3156 H3	
3157 H3	
3158 H3	
3160 H2	
3161 H2	
3162 F4	
3163 F5	
3164 F6	
3165 F6	
3166 G5	
3167 J4	
3168 J5	
3169 J6	
3170 J6	
3171 J6	
3172 H4	
3173 G7	
3174 G8	
3175 G9	
3176 F7	
3177 F10	
3178 I7	
3179 H8	
3180 I9	
3181 H10	
3182 F10	
3183 C4	
3184 J10	
3185 I10	
3186 H4	

# : Provision  
 Note : Some values may varies, see respective parts list for correct value.

### AMPLIFIER UCD BOARD (SE) - CIRCUIT DIAGRAM PART 2

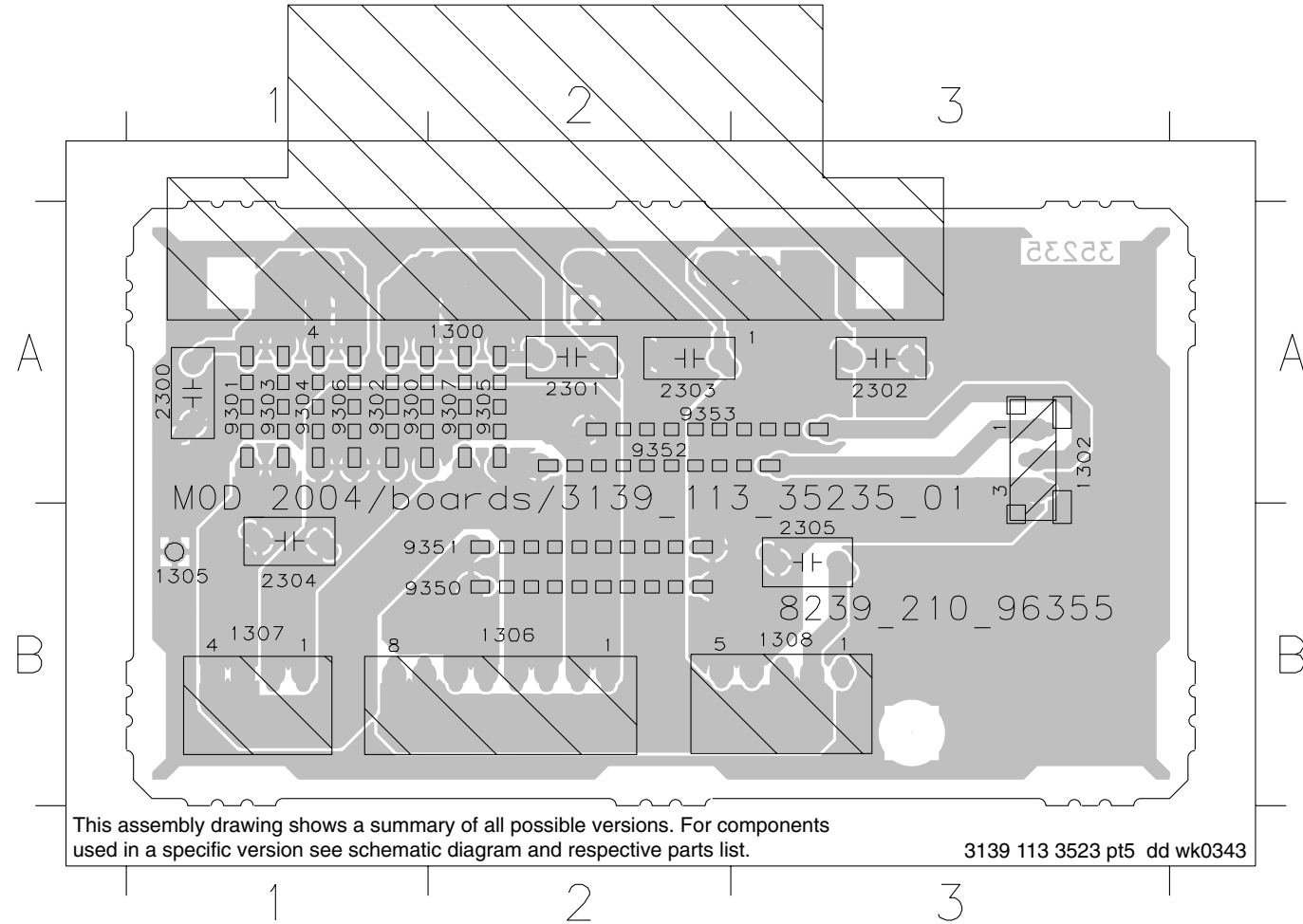
1201 A1	2201 B2	2205 D7	2209 A8	2213 B2	3201 A4	3205 D6	3209 E6	3213 D1	3217 D1	3222 E3	3226 B8	3234 B3	3238 A7	6200 A5	6204 B9	6211 B8	7203 D7	7207 D1	7210-B E2	7210-F D9
1202 A4	2202 B1	2206 D6	2210 D3	2214 B2	3202 B4	3206 E6	3210 D7	3214 C3	3218 D1	3223 E1	3231 B3	3235 E3	3239 B8	6201 C7	6205 D2	7200 A5	7204 E1	7208 D3	7210-C C3	7211 B5
1203 E6	2203 E6	2207 D8	2211 D4	2215 B1	3203 E1	3207 D5	3211 E7	3215 D3	3219 D1	3224 D4	3232 B3	3236 D9	4201 A2	6202 C5	6206 D4	7201 B7	7205 A9	7209 E3	7210-D E9	7212 A8
1204 D6	2204 E6	2208 B9	2212 B1	2216 B2	3204 B6	3208 D6	3212 D1	3216 E4	3220 E3	3225 A7	3233 B3	3237 E9	4202 A2	6203 B8	6210 A8	7202 E7	7206 A9	7210-A D2	7210-E D8	



# : Provision  
 Note : Some values may varies, see respective parts list for correct value.

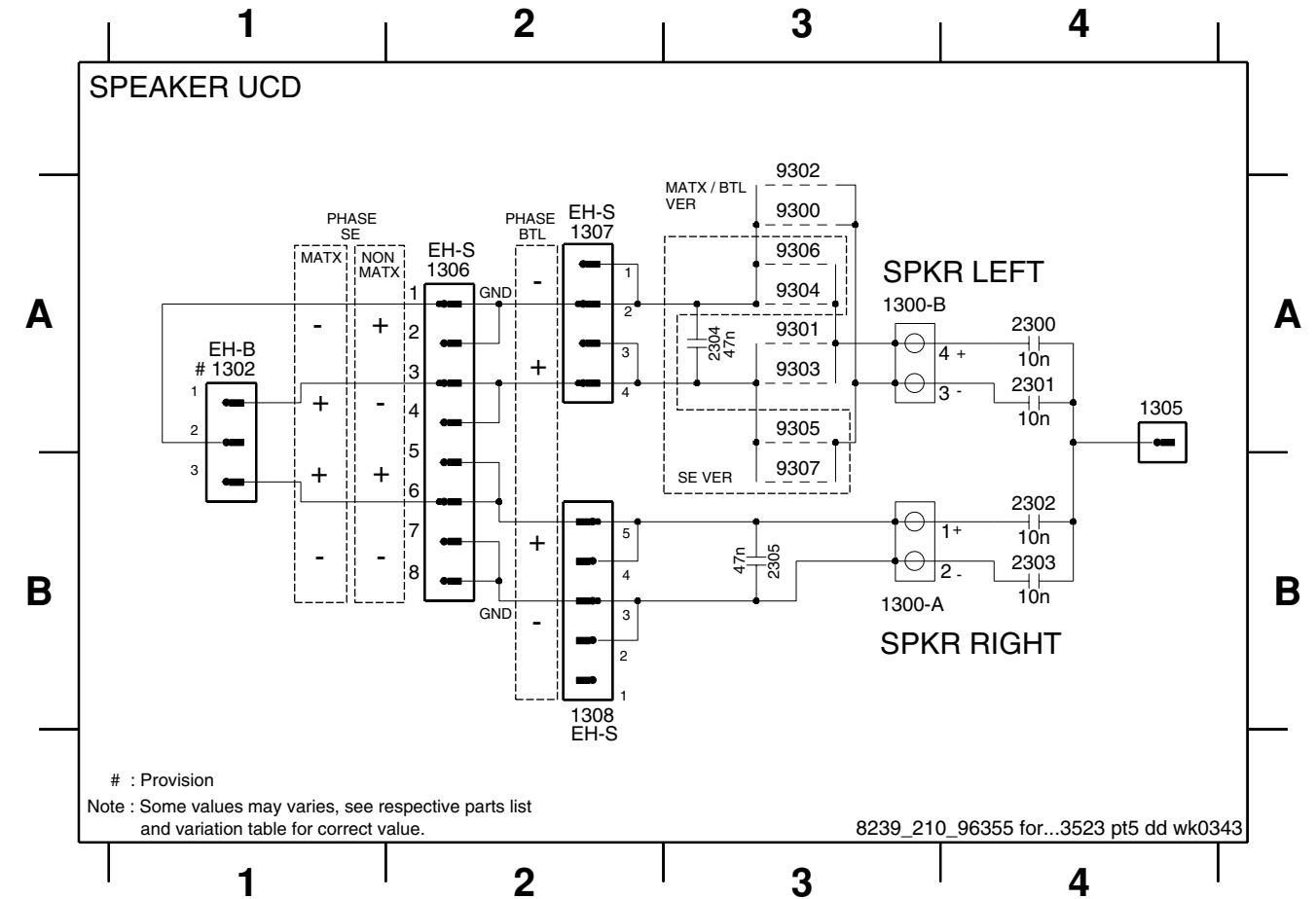
**SPEAKER UCD BOARD - COMPONENT LAYOUT**

1300 A2	1307 B1	2302 A3	9300 A1	9304 A1	9350 B2
1302 A3	1308 B3	2303 A2	9301 A1	9305 A2	9351 B2
1305 B1	2300 A1	2304 B1	9302 A1	9306 A1	9352 A2
1306 B2	2301 A2	2305 B3	9303 A1	9307 A2	9353 A2



**SPEAKER UCD BOARD - CIRCUIT DIAGRAM**

1300-A B3	1302 A1	1306 A2	1308 B2	2301 A4	2303 B4	2305 B3	9301 A3	9303 A3	9305 A3	9307 B3
1300-B A3	1305 A4	1307 A2	2300 A4	2302 B4	2304 A3	9300 A3	9302 A3	9304 A3	9306 A3	



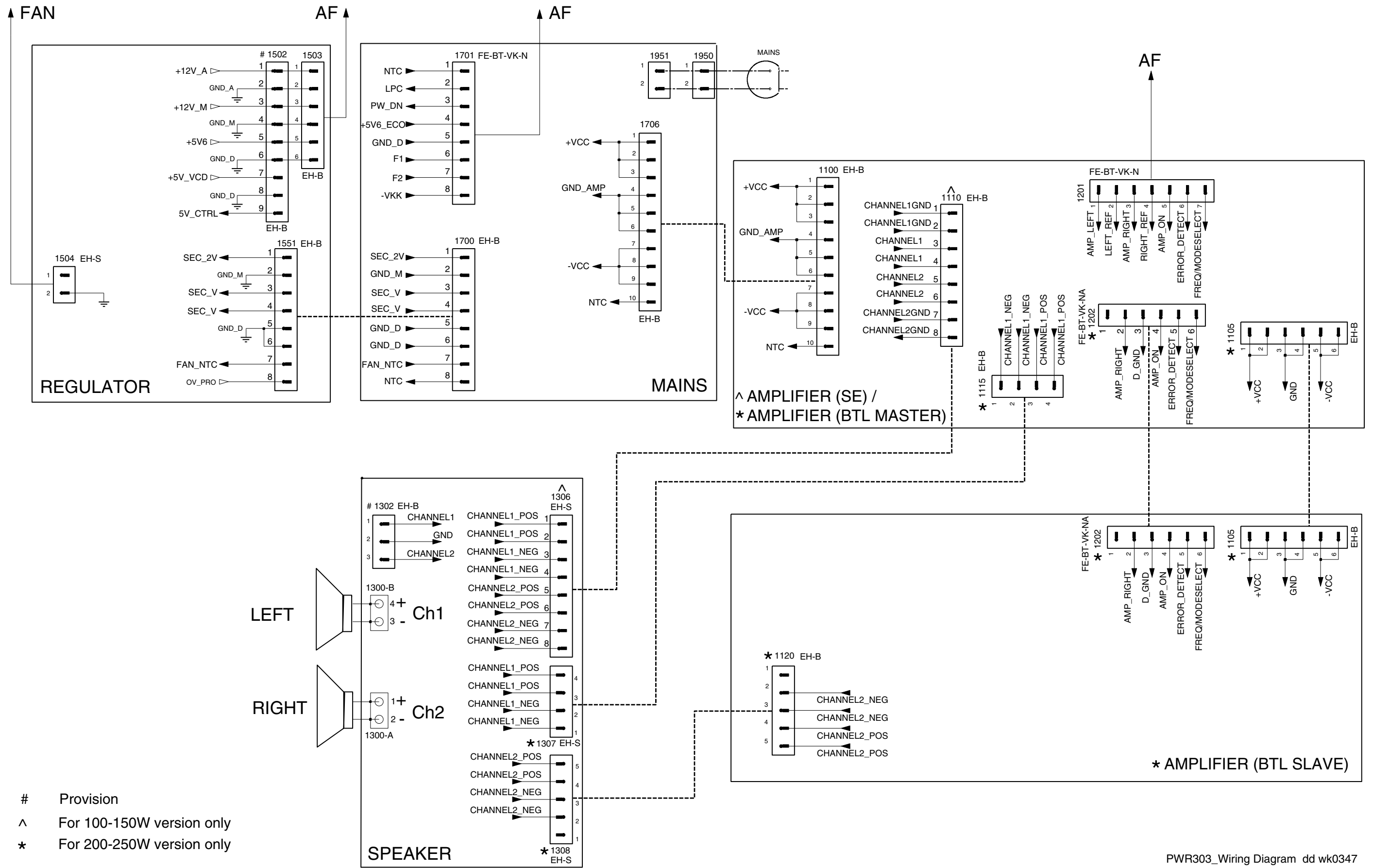
**SPEAKER UCD BOARD - VARIATION TABLE**

Item No.	SPEAKER UCD BOARD	
	100-150W (Non Matrix Version)	200-250W
1302	-	-
1306	X	-
1307 , 1308	-	X
2304 , 2305	-	X
9300 , 9301	-	X
9302 , 9303	-	X
9304 , 9305	X	-
9306 , 9307	X	-

X - item in use.

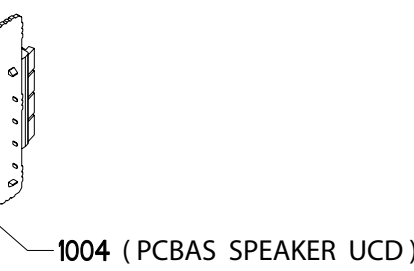
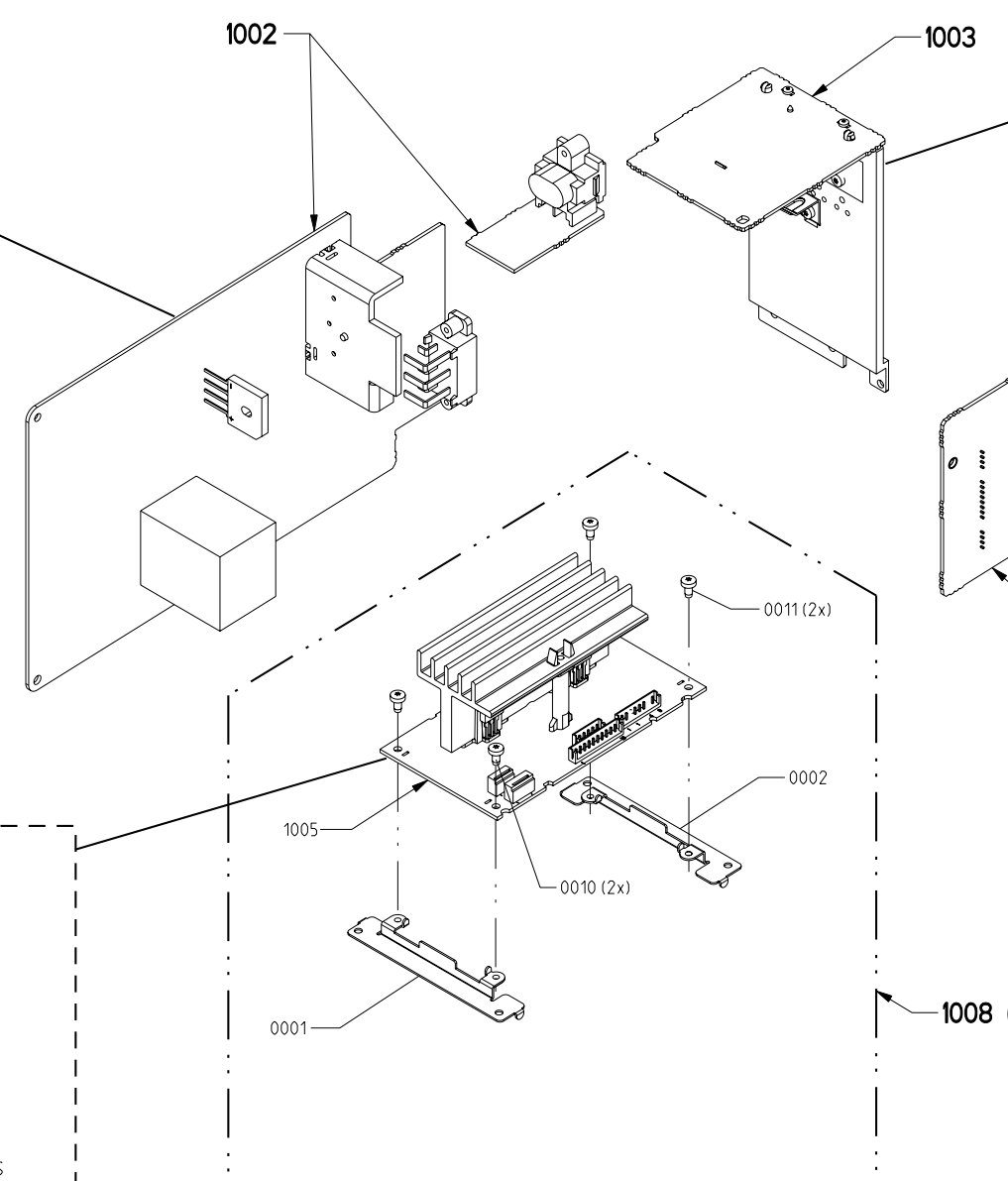
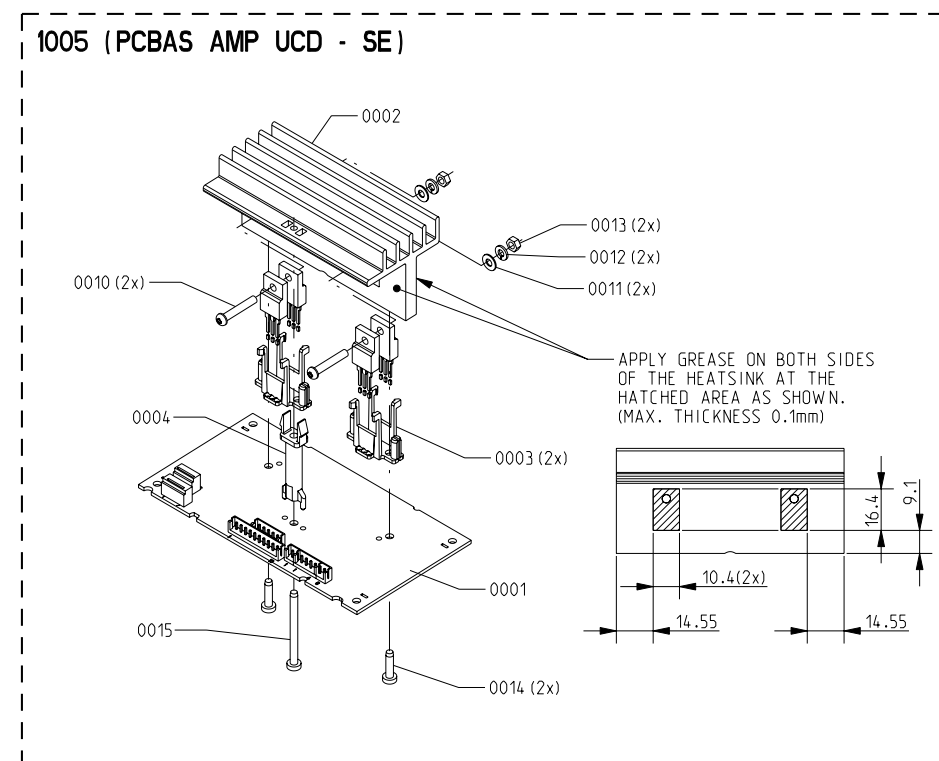
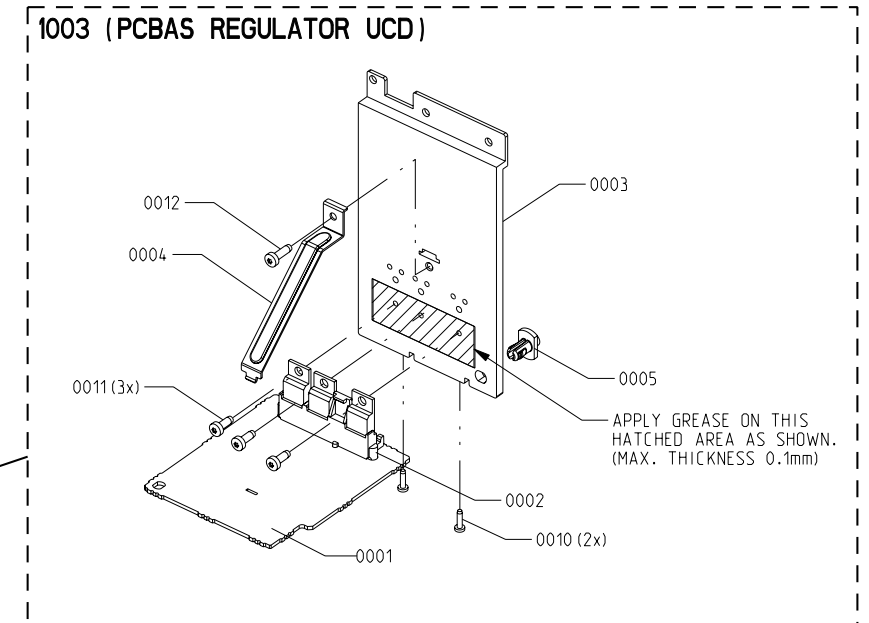
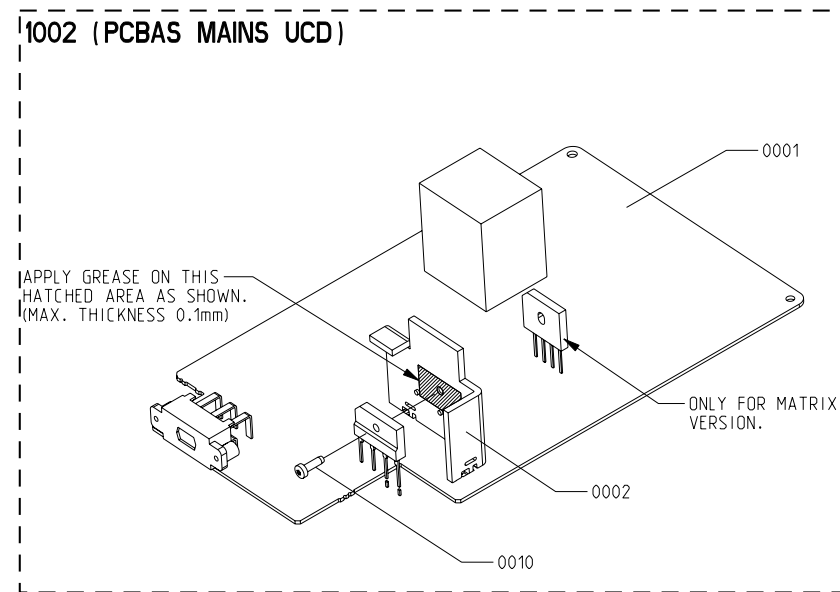


# WIRING DIAGRAM



- # Provision
- ^ For 100-150W version only
- \* For 200-250W version only

EXPLODED VIEW



1008 (ASSY UCD SE)

SCREW LISTS

ASSY UCD SE

0010	M3 x 6
0011	M3 x 6

PCBAS MAINS UCD

0010	D3 x 10
------	---------

PCBAS REGULATOR UCD

0010	D2 x 8
0011	D2.5 x 8
0012	D3 x 10

PCBAS AMP UCD - SE

0010	M3 x 18
0014	D3 x 12
0015	D3 x 35

**ELECTRICAL PARTS - MAINS UCD BOARD**

1704	△	994000001873	FUSE T6.3A 250V
1705	△	994000001873	FUSE T6.3A 250V
1707	△	994000001885	FUSE RAD T 2A IEC250V
1708	△	994000001885	FUSE RAD T 2A IEC250V
1902	△	994000001886	FUSE RAD LT 3A15 250V
1905		994000001032	RELAY 1P 12V 16A
1950	△	994000001879	MAINS SOCKET 2P 2A5 250V /22
1950	△	994000002251	CON MAINS 2P 7A 125V /07
2711		994000001881	ELCAP 35V 6800uF PM20
2712		994000002253	ELCAP YK 16V S 10000U /07
2716		994000002254	ELCAP REA 50V S 3300U /07
2717		994000002254	ELCAP REA 50V S 3300U /37
2902		994000001876	CAP MPP 275V 22N PM20
2908		994000001877	CAP MPP 275V 220N PM20 /22
2908		994000002252	CAP MPP 275V S 470N PM20 /07
2918		482212614088	CERSAF NSA 250V 2N2
2920		994000001878	CAP MKP 275V 100N PM20
3700	△	994000001887	RST FUSE NFR25 100R PM5
3701	△	994000001887	RST FUSE NFR25 100R PM5
3707	△	994000001888	RST FUSE NFR25 47R PM5
3902		994000001889	RST MFLM MBB0207 4M7 PM1
3912		994000001882	ST MGL 10M
5903		994000001874	FILTER TR-23-11-14 /22
5903		994000002249	FIL MAINS 650UH 6A 97TS /07
5904	△	996500016272	ST.BY TRANSFORMER
6712		994000001875	BRIDGE GBJ10D
		994000001883	NTC AC 300V DC 385V 0.8W

**ELECTRICAL PARTS - REGULATOR  
UCD BOARD**

3514	△	994000001893	RST FUSE NFR25 5R6 PM5
3517		994000001868	NTC DC 0W5 10K PM5
7500		482220981351	IC VOITAGE REGULATOR
7504		482220981351	IC VOITAGE REGULATOR
		994000001891	STOPPER HEATSINK

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

**ELECTRICAL PARTS - AMPLIFIER UCD BOARD**

3122		994000001867	RTRM CAR LIN 220Ω H
3145	△	994000001871	PTC TFJPT0805L3901KZ
3172		994000001867	RTRM CAR LIN 220Ω H
3188		994000001871	PTC TFJPT0805L3901KZ
3190	△	994000001868	NTC 0W5 10K PM5
3195		994000001869	NTC 0W1 4K7 PM5
3196		994000001869	NTC 0W1 4K7 PM5
3197		994000001869	NTC 0W1 4K7 PM5
3198		994000001869	NTC 0W1 4K7 PM5
5105		994000001866	IND FXD SC4684-145 PM1
5155		994000001866	IND FXD SC4684-145 PM1
7112		994000001865	FET POW STP14NF12FP
7117		994000001865	FET POW STP14NF12FP
7162		994000001865	FET POW STP14NF12FP
7165		994000001865	FET POW STP14NF12FP
7210		532220911548	IC 74HC14D

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

**ELECTRICAL PARTS - SPEAKER  
UCD BOARD**

1300		9965 000 16263	SPEAKER TERMINAL 4P
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**Note:** Only these parts mentioned in the list are normal service parts.

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

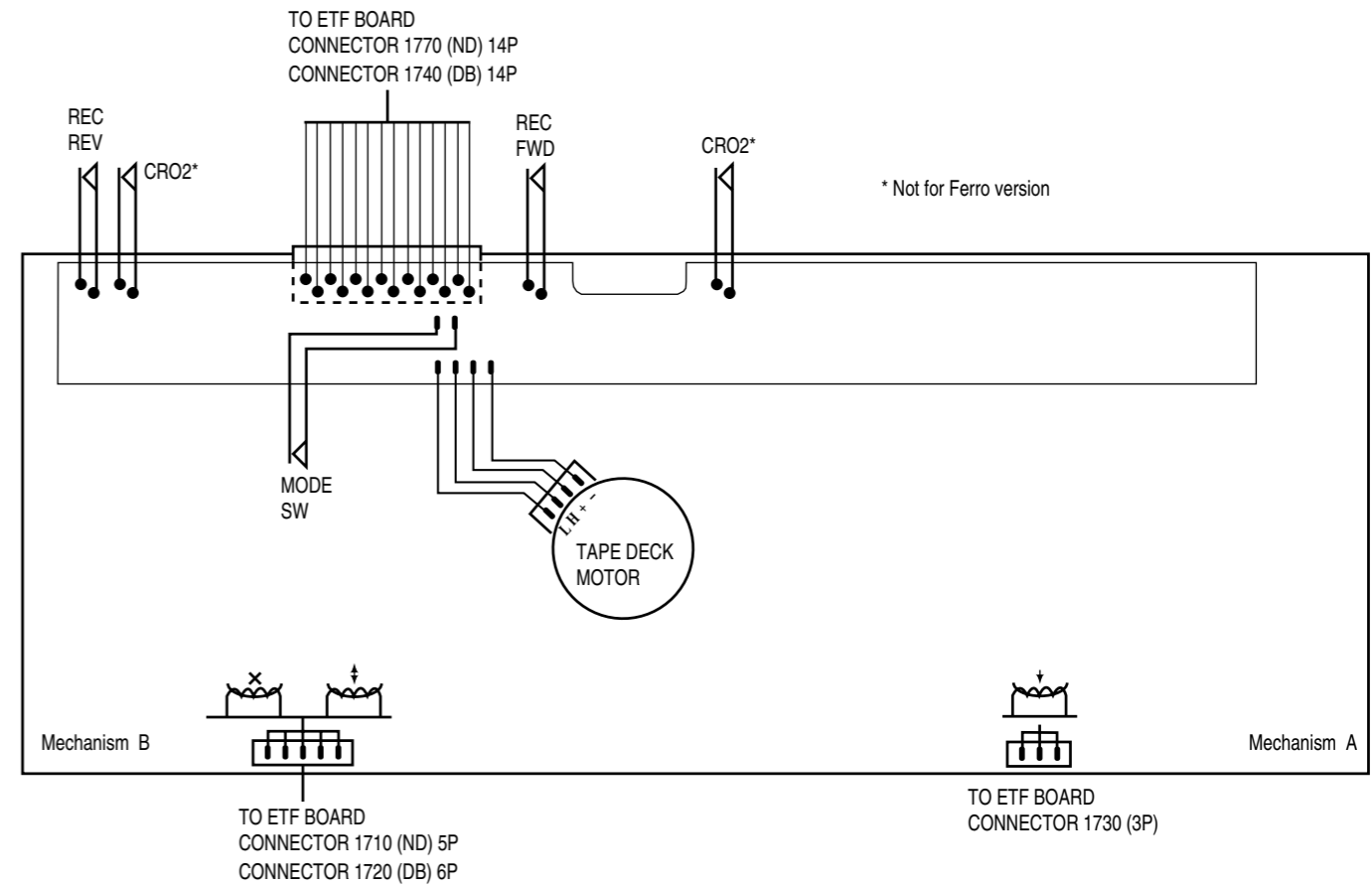
# ETF7 TAPE MODULE

## (Non-Dolby Version)

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 ETF7 Non-Dolby board layouts ..... 9-6  
 Analog Circuit diagram ..... 9-7  
 Servo Circuit diagram ..... 9-8  
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 Electrical parts list ..... 9-13

**Tapedeck wiring (Double deck)**



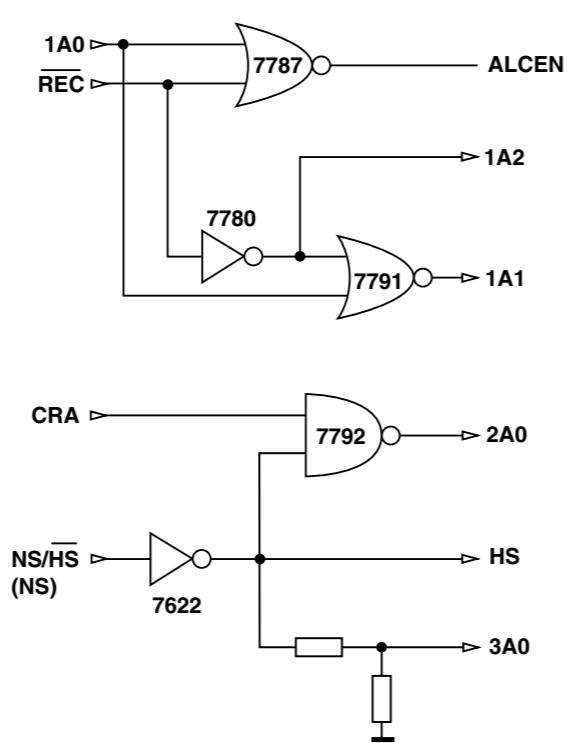
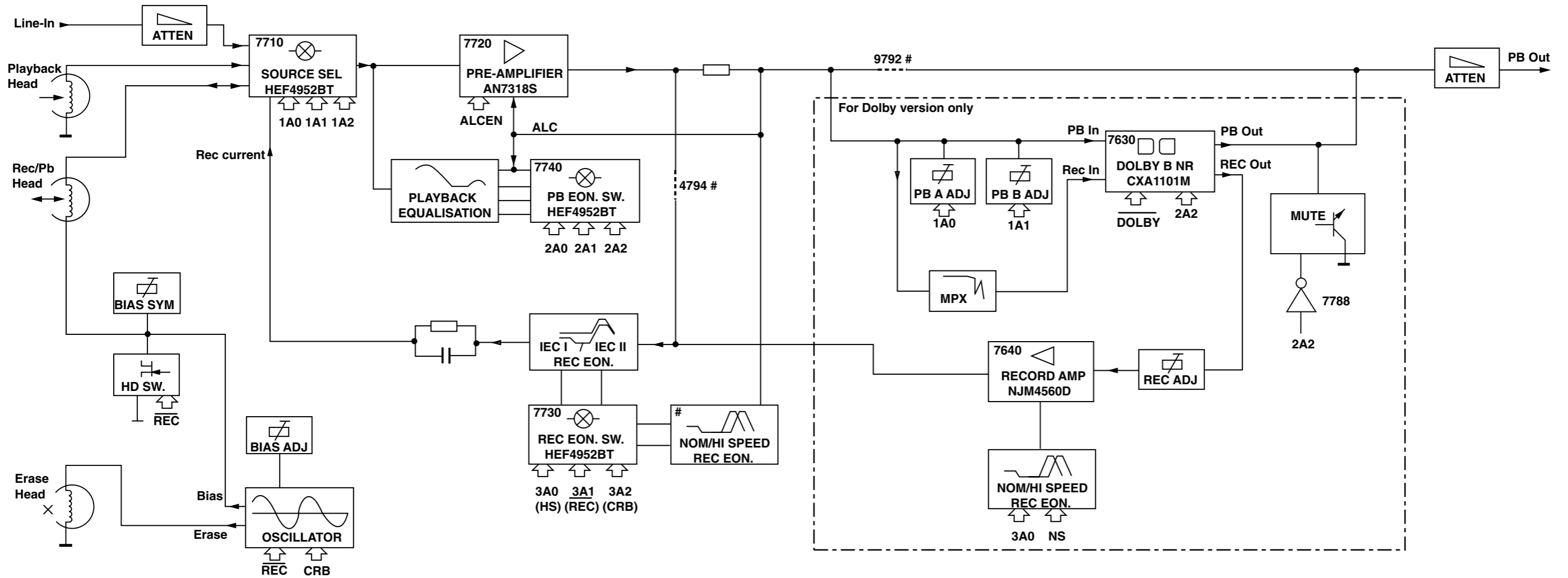
**Variations table for Analog Circuit**

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

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

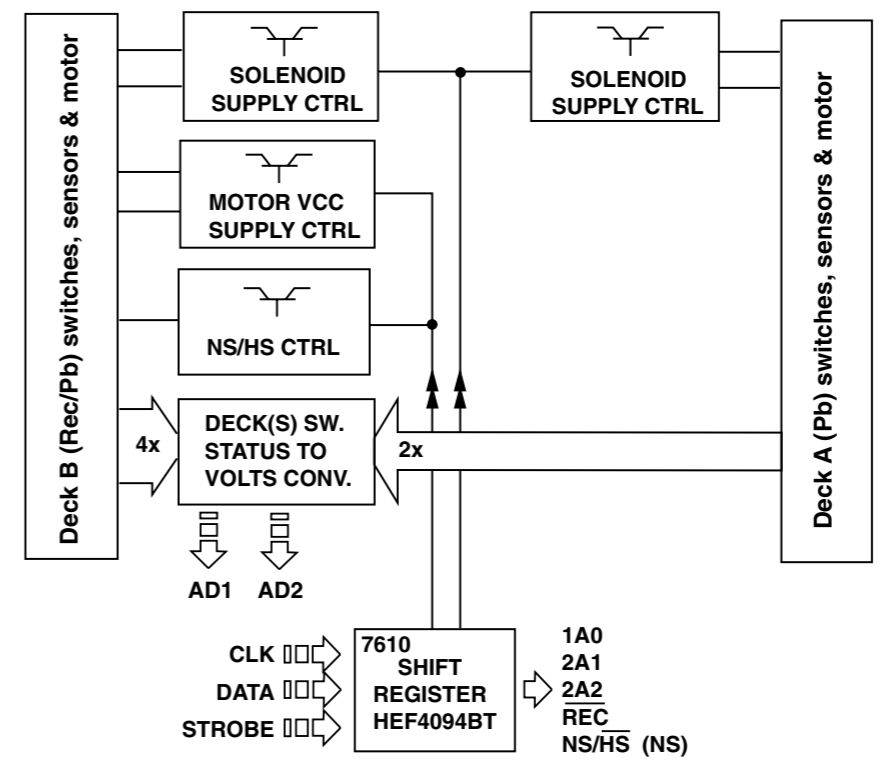


**BLOCK DIAGRAM**



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

MicroProcessor Control / Communication lines  
Direct / Indirect Control lines from Shift Registers



## Brief introduction

### General

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

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

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

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

### NOTATIONS & ABBREVIATIONS USED IN THIS DOCUMENT

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

**CONNECTORS ASSIGNMENTS:**CONNECTOR 1701INTERCONNECTION 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 1703INTERCONNECTION TO AF BOARD

○ 1	GND M	Motor Ground
○ 2	+MOTOR	D.C. supply (+12V) for tape deck motor & solenoid

CONNECTOR 1706INTERCONNECTION 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 1710DECK 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 1720DECK 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 1730DECK 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

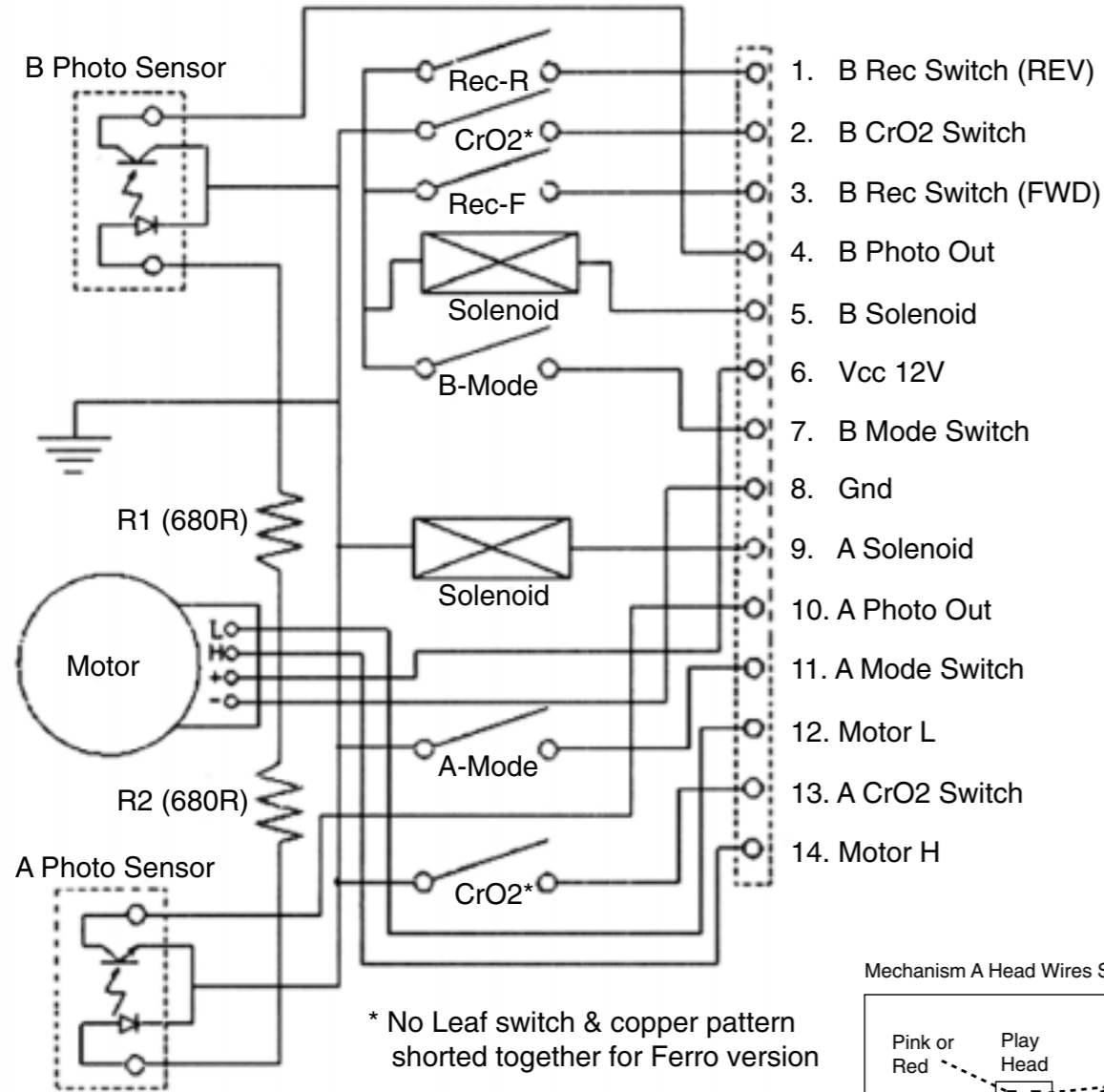
CONNECTOR 1740DECK A & B CONTROL INTERFACE (For Dolby B NR version only)

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

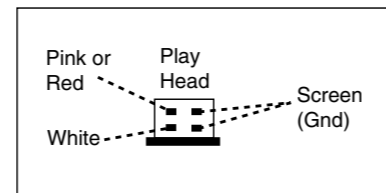
○ 1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
○ 2	CrO2 B	Chrome tape detection switch deck B	[open=Cr: close=Fe]
○ 3	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
○ 4	PHOTO B	Photo sensor output (tape movement indication)	
○ 5	SOL B	Solenoid 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

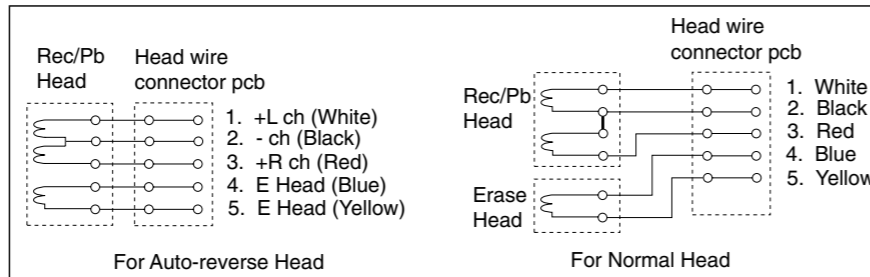


\* No Leaf switch & copper pattern shorted together for Ferro version

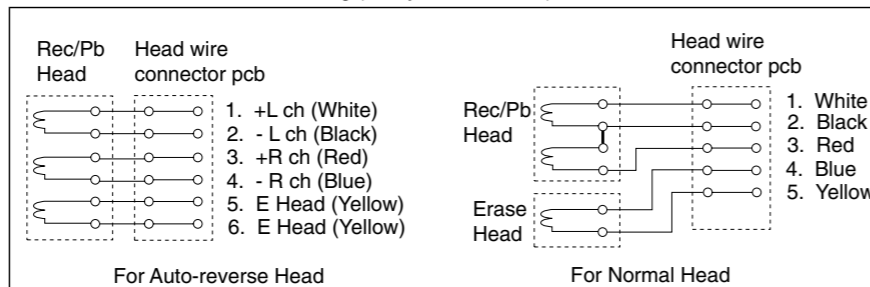
Mechanism A Head Wires Soldering



Mechanism B Head Wires Soldering (Non-Dolby version)



Mechanism B Head Wires Soldering (Dolby B NR version)

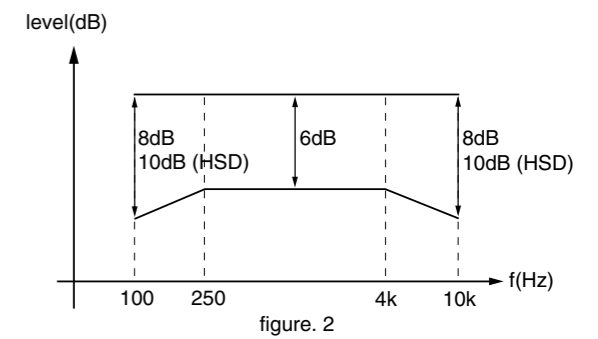
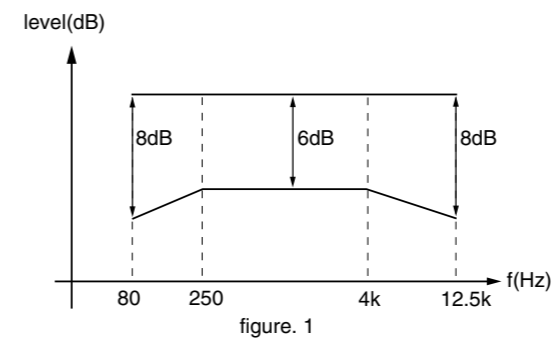


TAPE ADJUSTMENT & CHECK TABLE

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

SBC419A^ : 4822 397 30069  
 SBC420 : 4822 397 30071

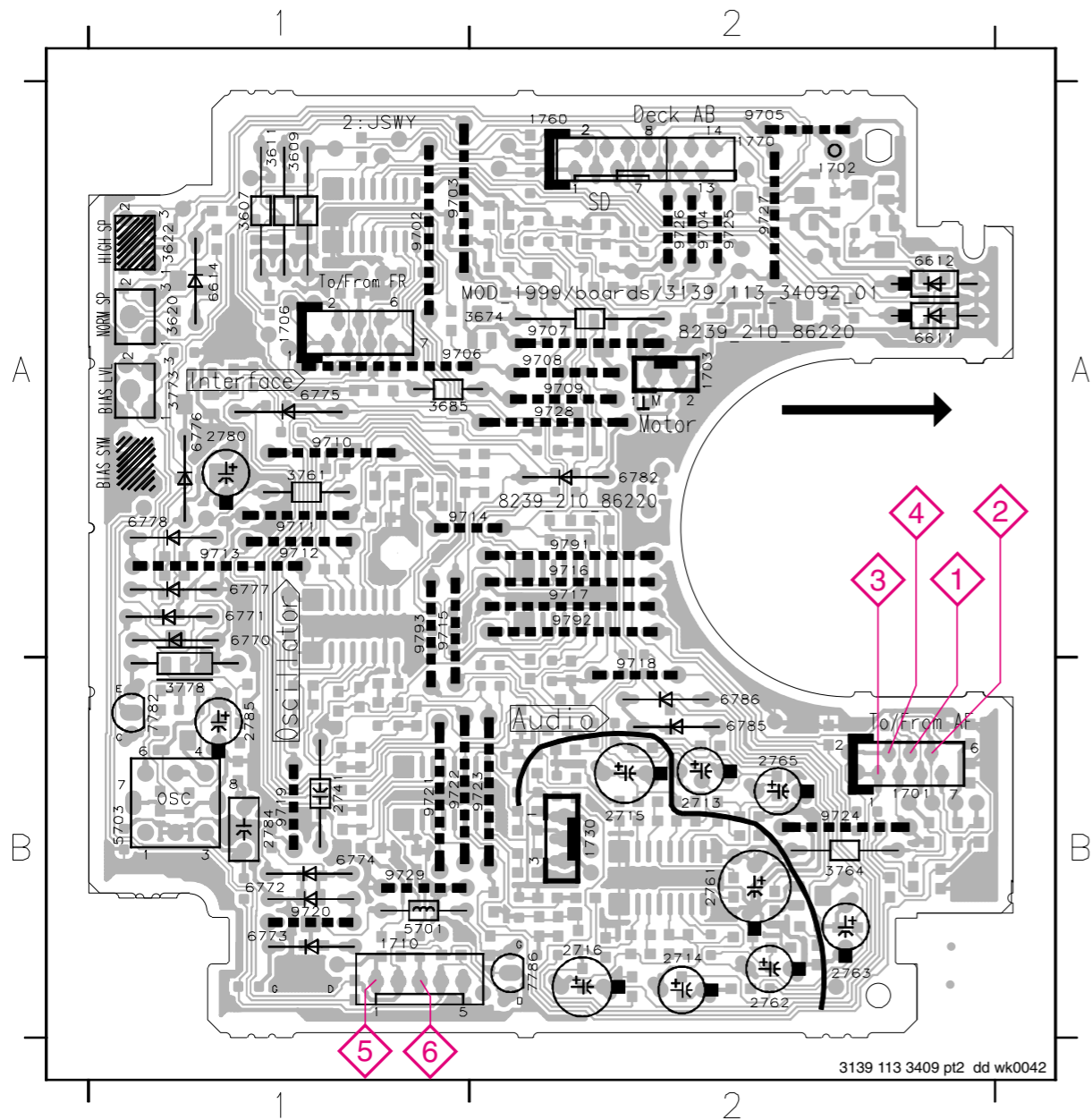
# For Auto-reverse version only  
 \* If high frequencies are not within limits, decrease bias and re-measure.  
 If distortion is too high, increase bias and re-measure  
 ^ Not applicable for Ferro version





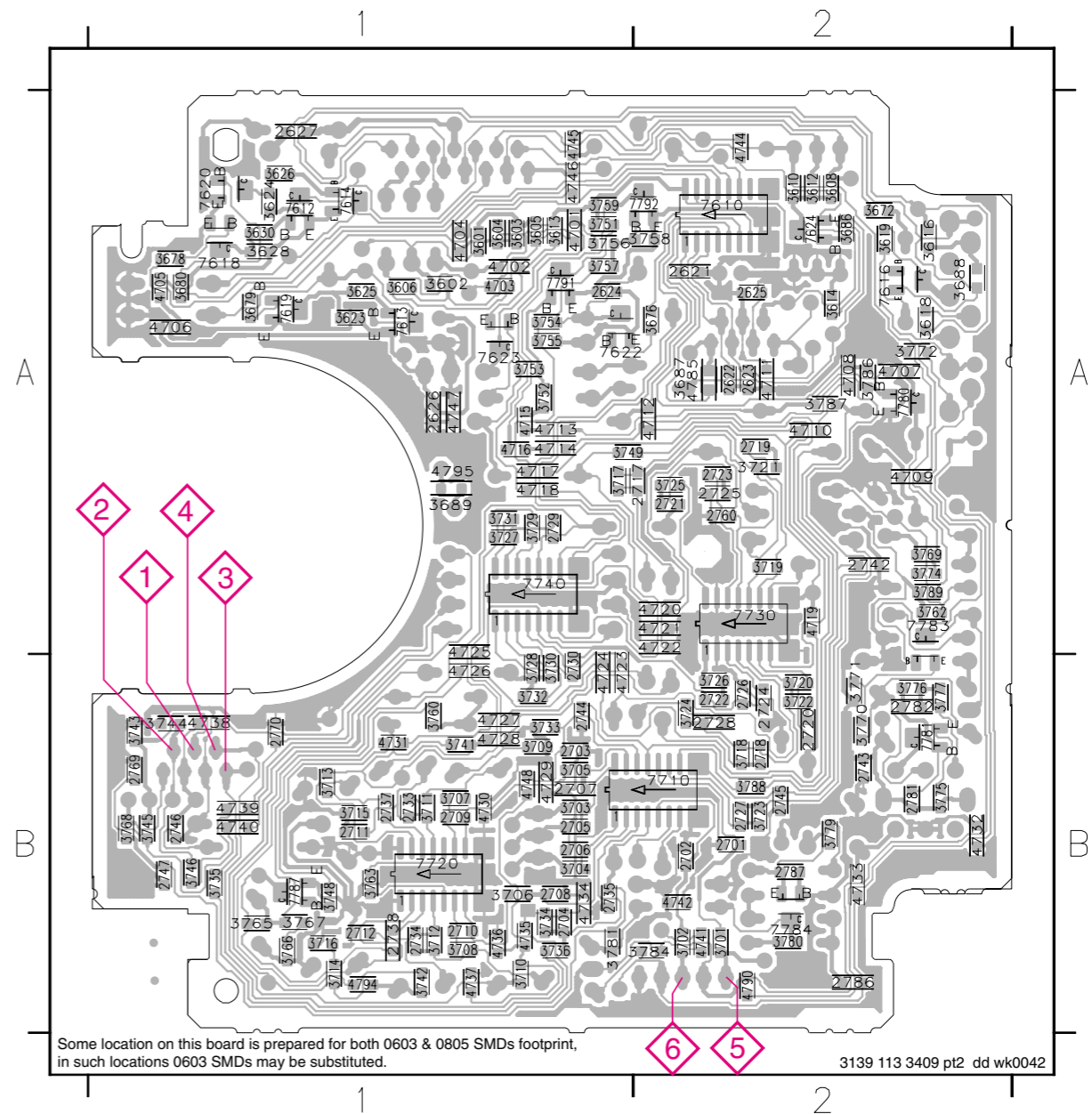
# COMPONENT LAYOUT

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



# CHIP LAYOUT

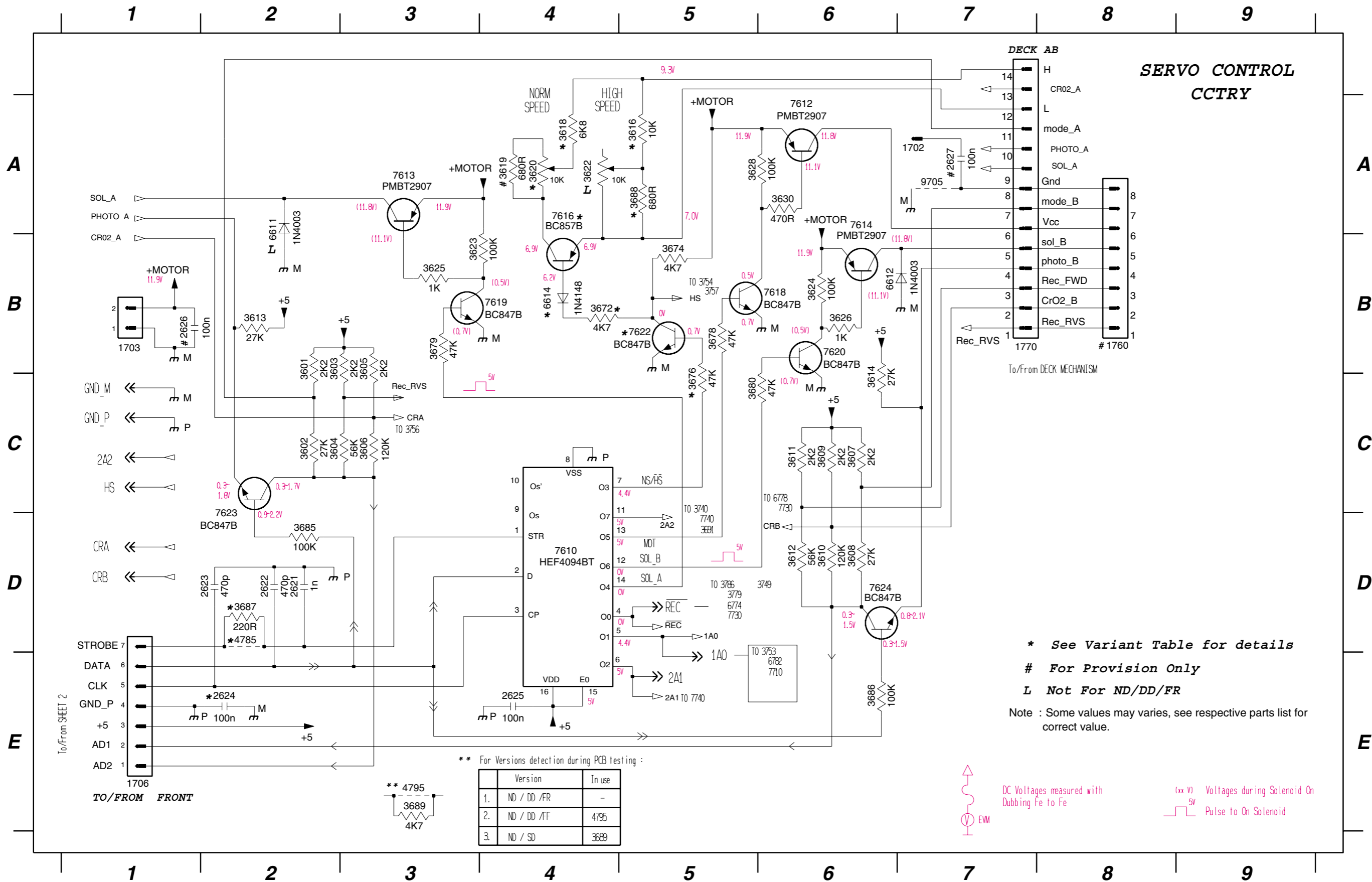
2621 A2	2724 B2	3602 A1	3688 A2	3725 A2	3757 A1	4701 A1	4727 B1	7612 A1
2622 A2	2725 A2	3603 A1	3689 A1	3726 B2	3758 A2	4702 A1	4728 B1	7613 A1
2623 A2	2726 B2	3604 A1	3701 B2	3727 B1	3759 A1	4703 A1	4729 B1	7614 A1
2624 A1	2727 B2	3605 A1	3702 B2	3728 B1	3760 B1	4704 A1	4730 B1	7616 A2
2625 A2	2728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





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 D6	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	



\* 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.

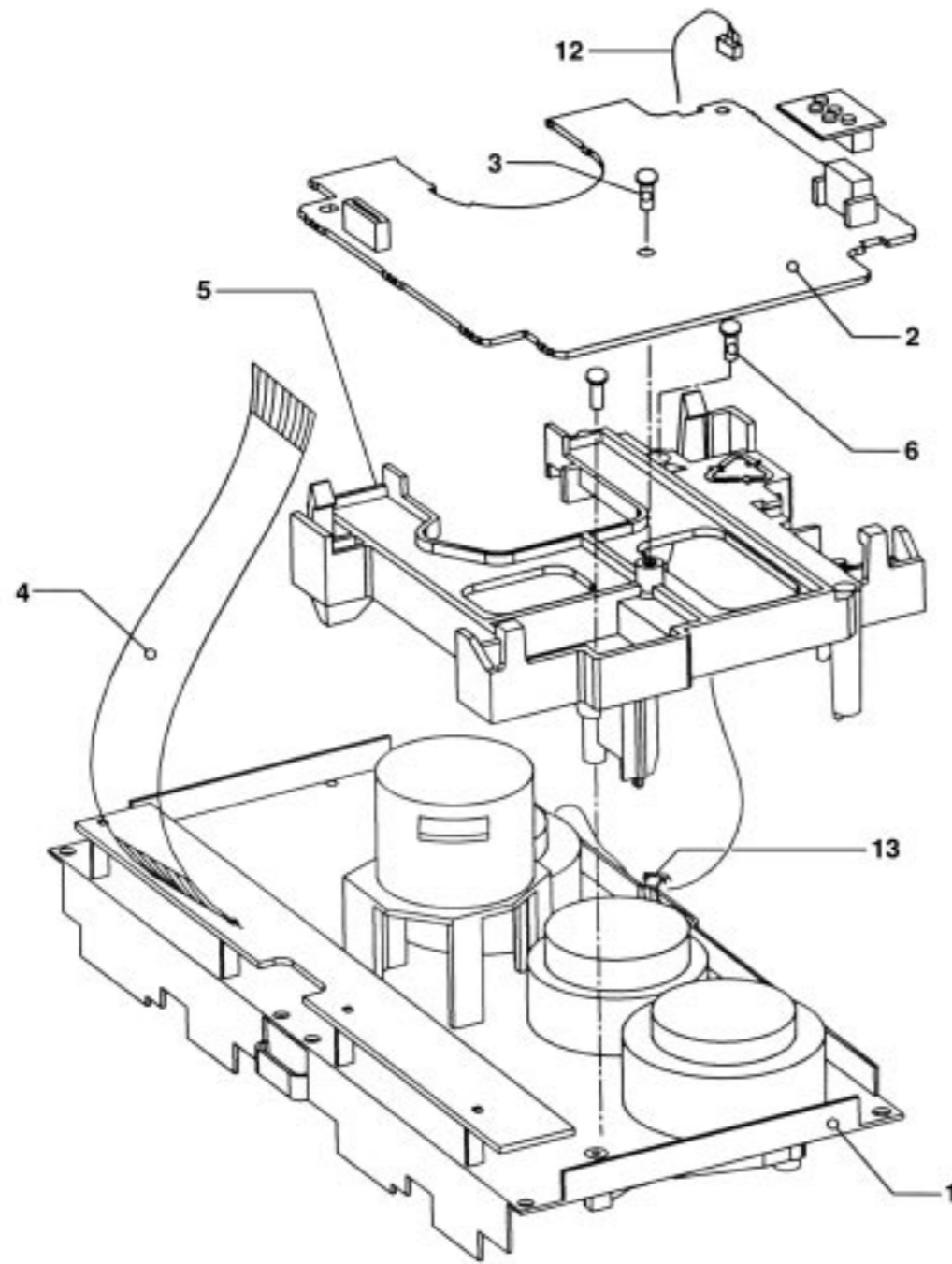
\*\* For Versions detection during PCB testing :

Version	In use
1. ND / DD /FR	-
2. ND / DD /FF	4795
3. ND / SD	3689



DC Voltages measured with Dubbing Fe to Fe

(\*\* V) Voltages during Solenoid On  
 5V Pulse to On Solenoid

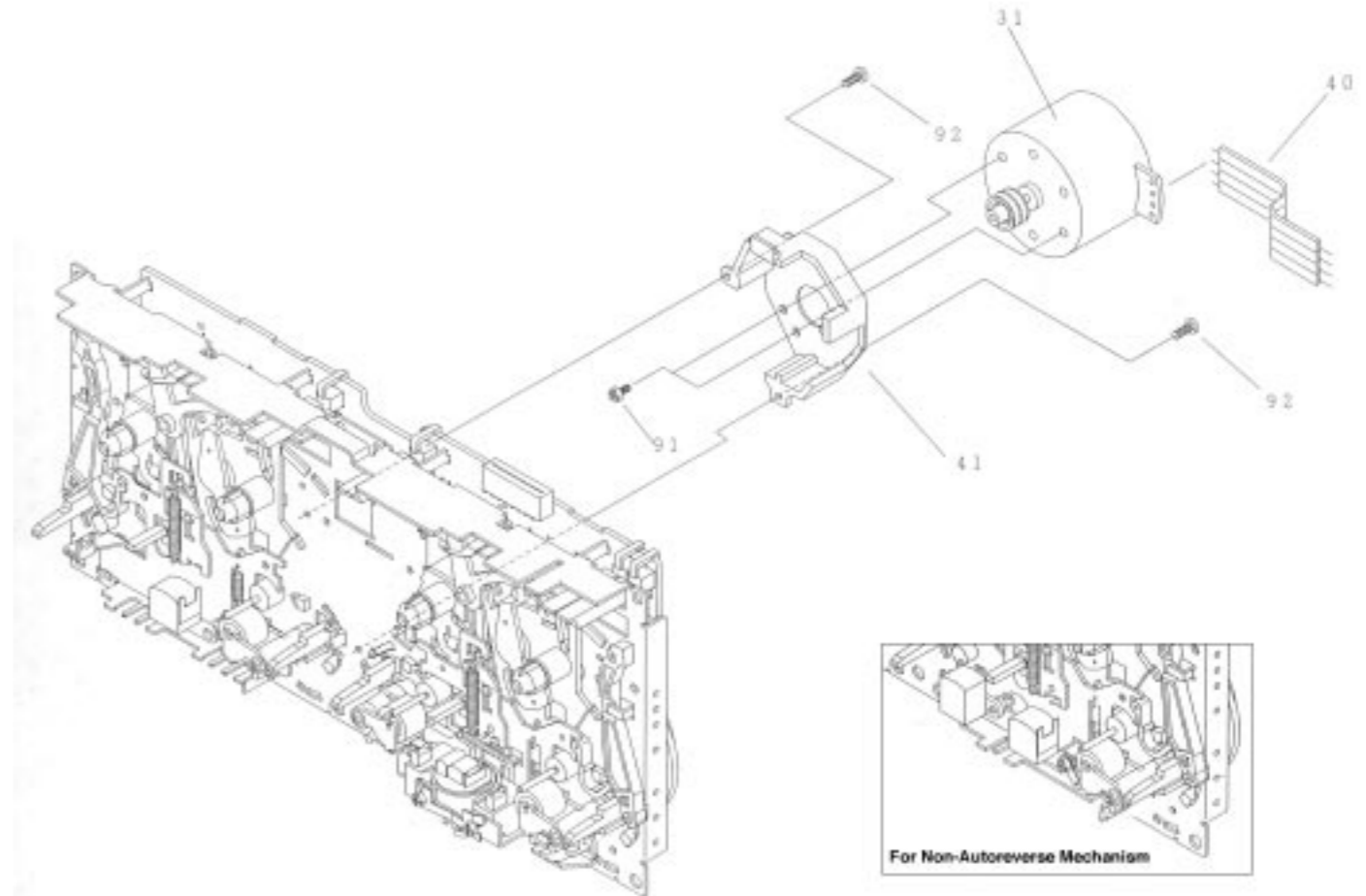


3139 118 77070 (incl. ...77080) dd wk926

**TAPE MODULE EXPLODED VIEW**

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

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



**TAPE MECHANISM - MOTOR EXPLODED VIEW**

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

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

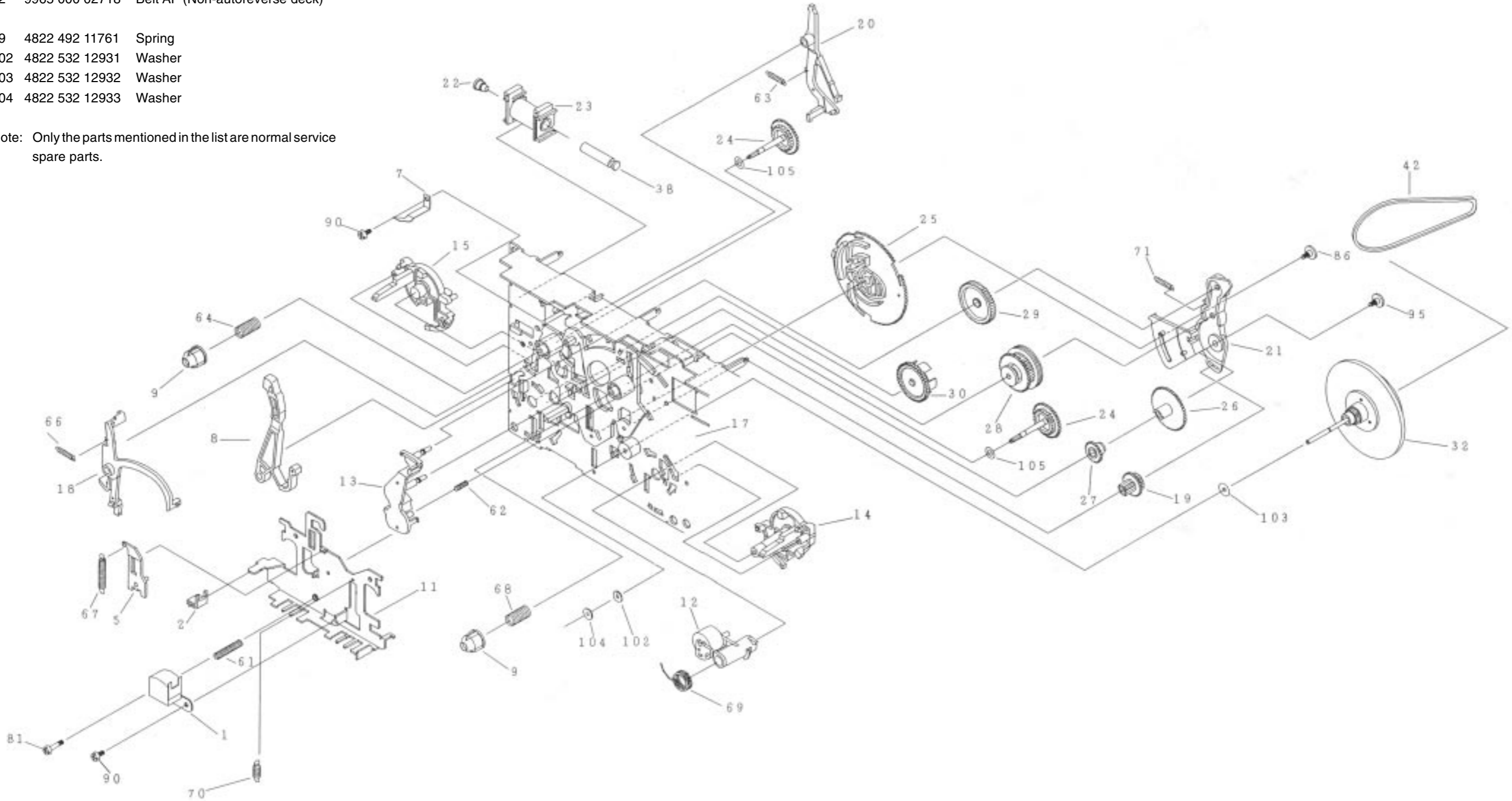


**TAPE MECHANISM A - PLAY**

***MECHANICAL PARTS - PLAY MECHANISM***

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

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

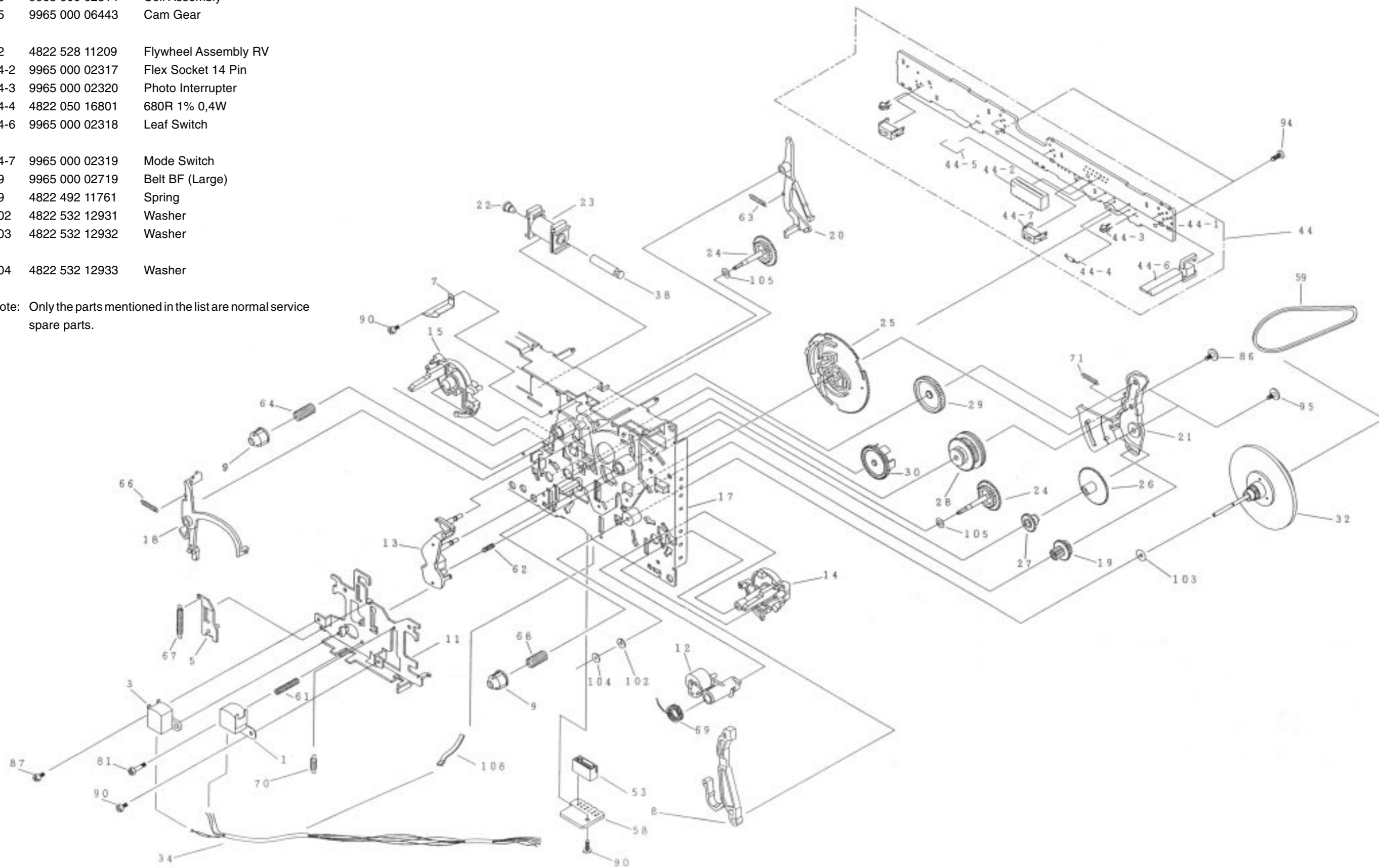


**TAPE MECHANISM B - RECORD/PLAYBACK (Non-Autoreverse version)**

**MECHANICAL PARTS - REC/PB MECHANISM**

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

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

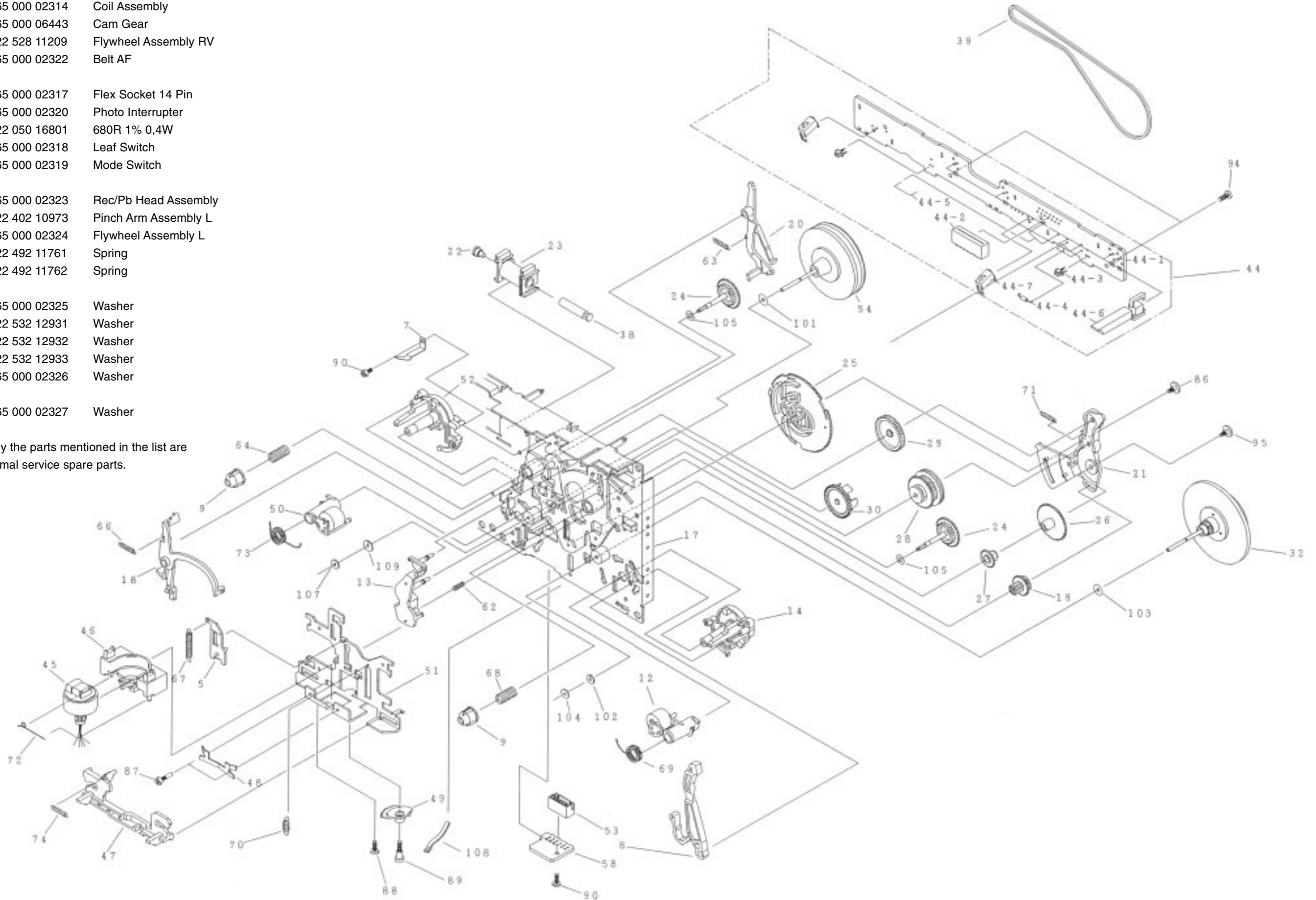


**TAPE MECHANISM B - RECORD/PLAYBACK (Autoreverse version)**

**MECHANICAL PARTS - REC/PB MECHANISM**

12	4822 402 10972	Pinch Arm Assembly R
23	9965 000 02314	Coil Assembly
25	9965 000 06443	Cam Gear
32	4822 528 11209	Flywheel Assembly RV
39	9965 000 02322	Belt AF
44-2	9965 000 02317	Flex Socket 14 Pin
44-3	9965 000 02320	Photo Interrupter
44-4	4822 050 16801	680R 1% 0,4W
44-6	9965 000 02318	Leaf Switch
44-7	9965 000 02319	Mode Switch
45	9965 000 02323	Rec/Pb Head Assembly
50	4822 402 10973	Pinch Arm Assembly L
54	9965 000 02324	Flywheel Assembly L
69	4822 492 11761	Spring
73	4822 492 11762	Spring
101	9965 000 02325	Washer
102	4822 532 12931	Washer
103	4822 532 12932	Washer
104	4822 532 12933	Washer
107	9965 000 02326	Washer
109	9965 000 02327	Washer

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







**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 2,2μH 5%
5703	482215620946	Osc Coil 100kHz

**DIODES**

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



# **3CDC-LC-MP3CD2002**

**(3 Disc Carousel Changer+MP3 Board)** Layout stage .2

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### MP3 PART

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## Service hints

### CAUTION

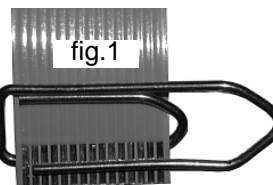
**CHARGED CAPACITORS ON THE SERVO BOARD MAY DAMAGE THE CD DRIVE ELECTRONICS WHEN CONNECTING A NEW CD MECHANISM. THAT'S WHY, BESIDES THE SAFETY MEASURES LIKE**

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

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

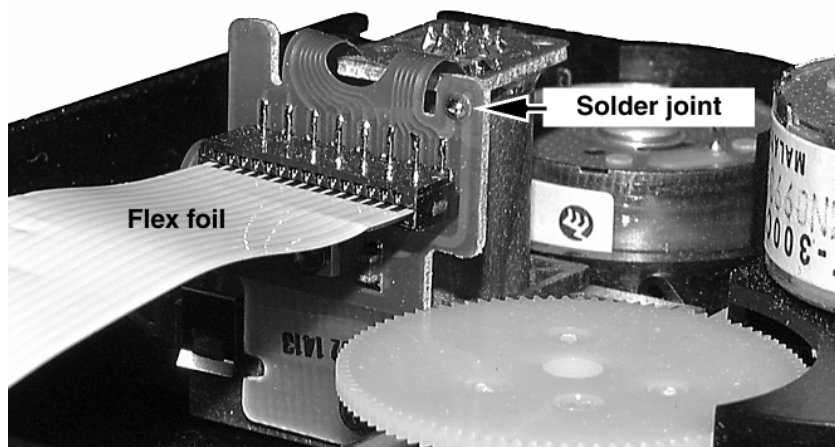
The following steps have to be done when replacing the CD mechanism:

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



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

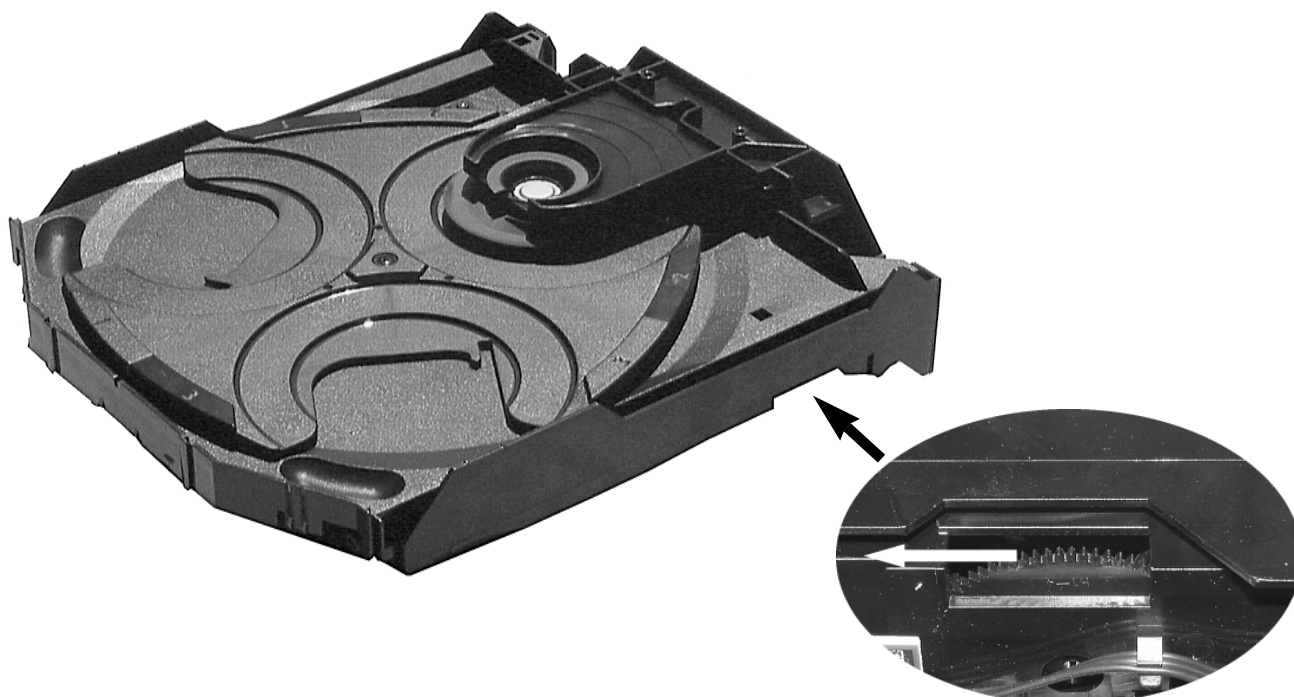
For proper functionality of the CD drive this solder joint must be removed **after** connection the drive to the set.



### Emergency open

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

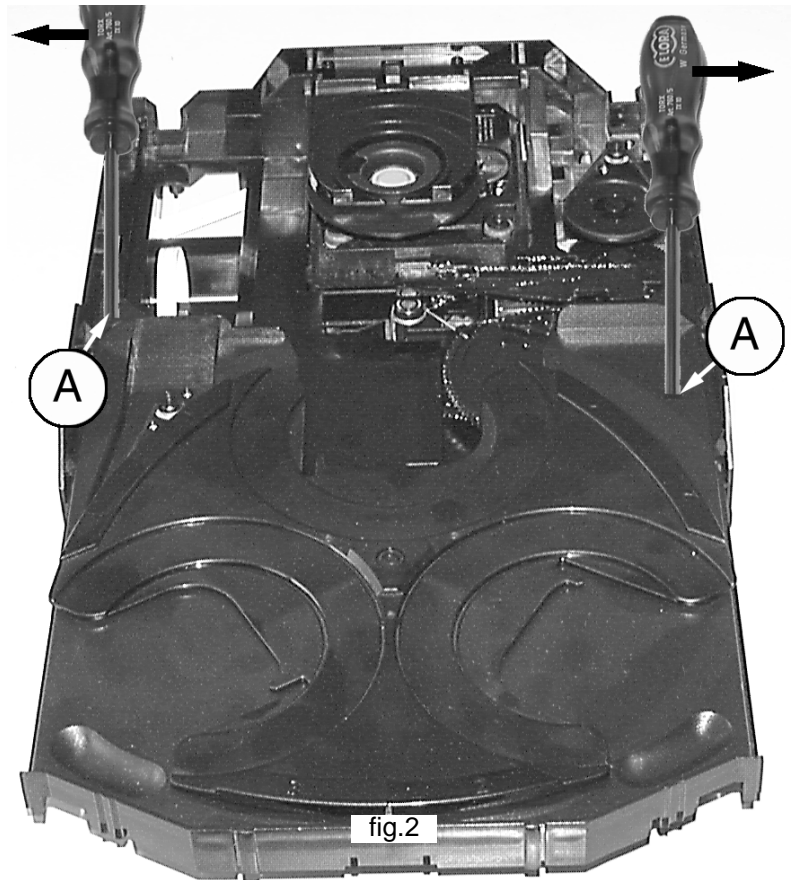
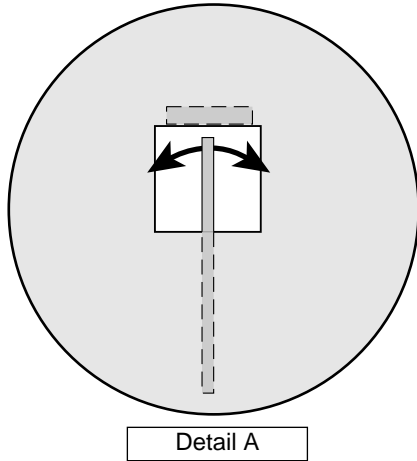
1. Remove the top cover of the set to get access to the Changer Module.
2. Turn gearwheel clockwise (as shown in picture below).



## Service hints

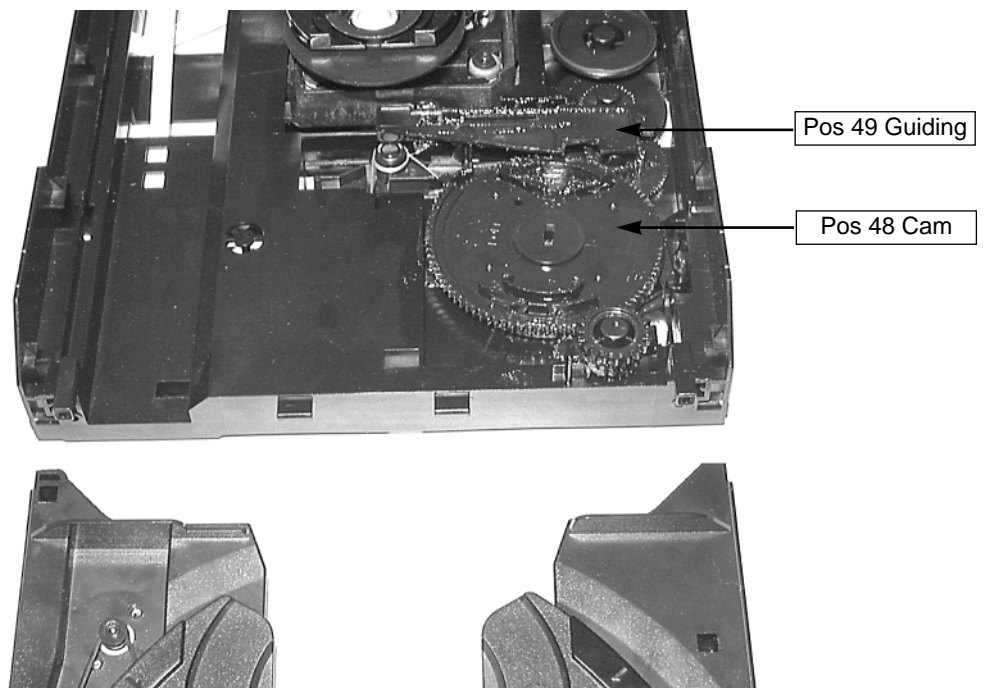
### Dismantling of Tray

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

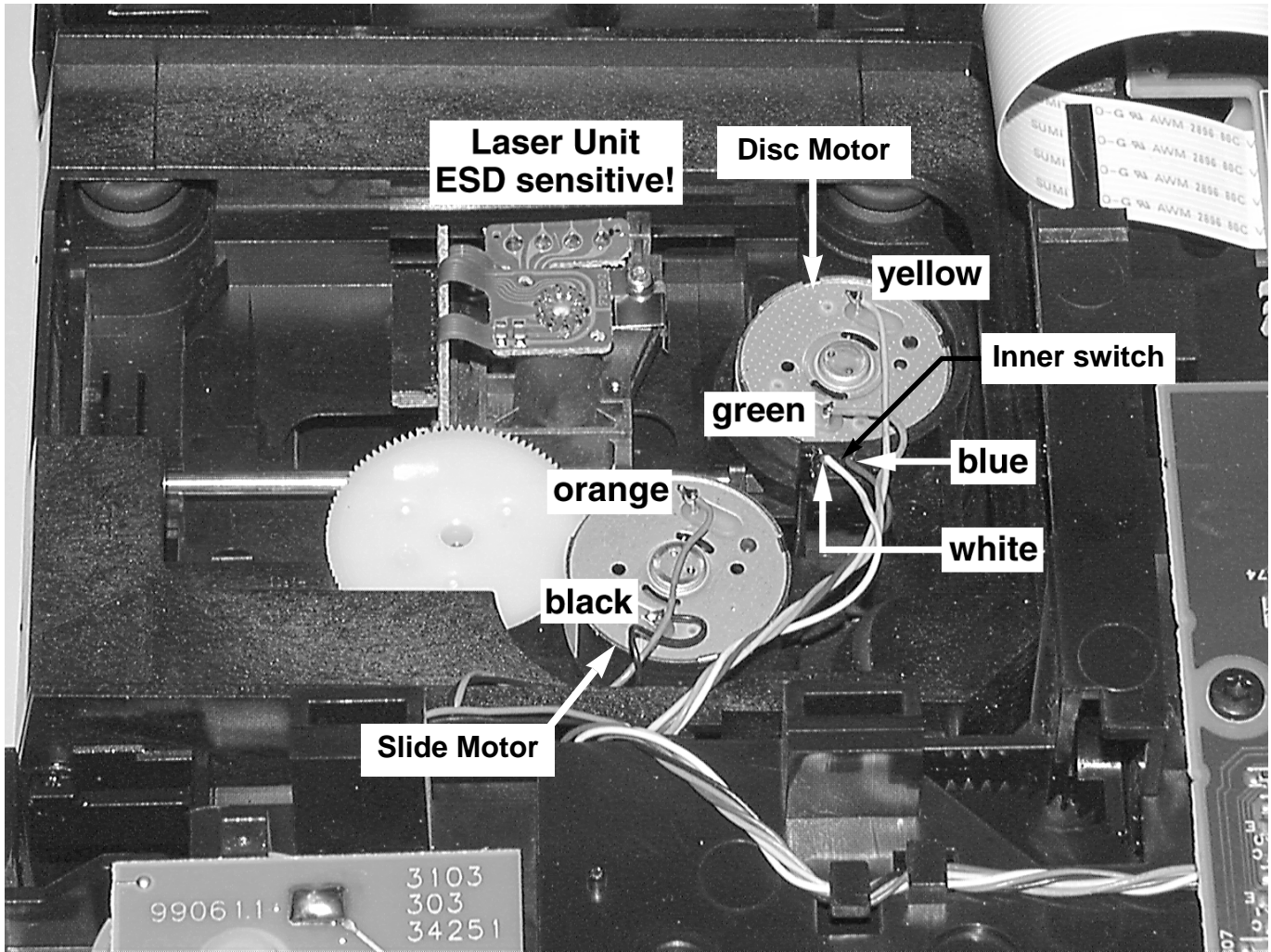


### Assembling of Tray

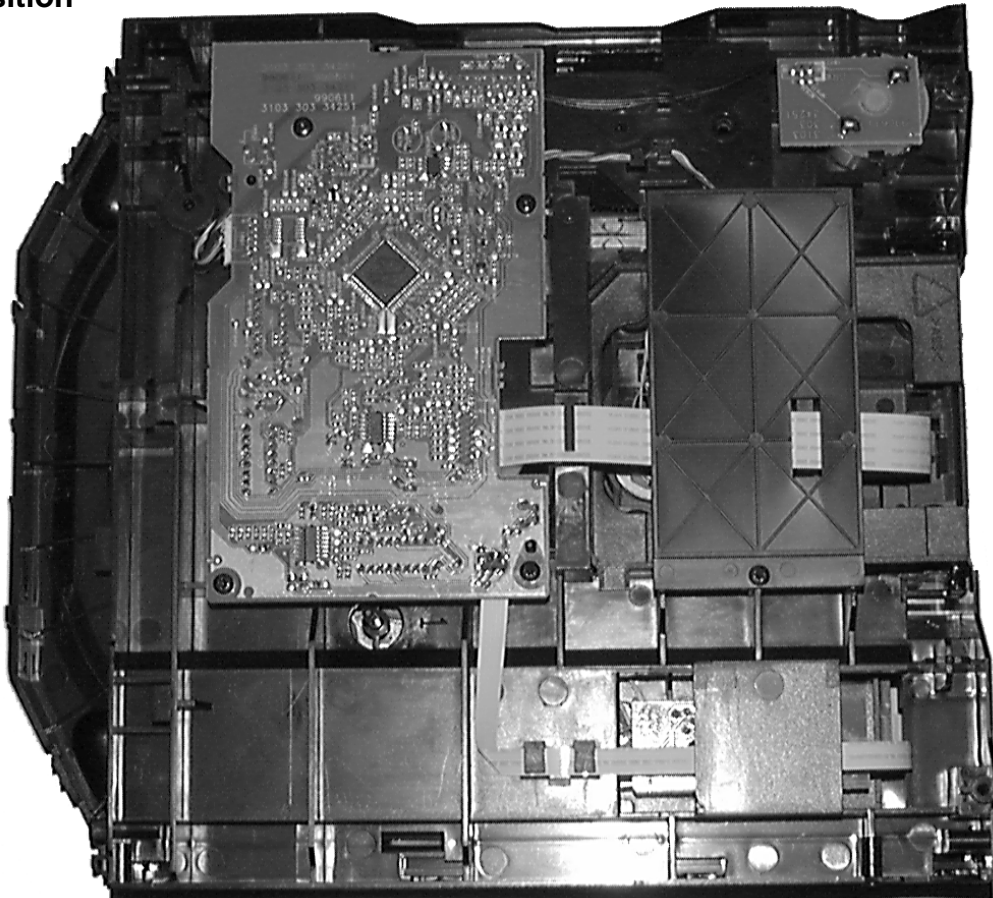
1. Turn Cam (pos. 48) clockwise to end position.
2. If necessary - move Guiding (pos. 49) to the right end position.
3. Insert the Tray.



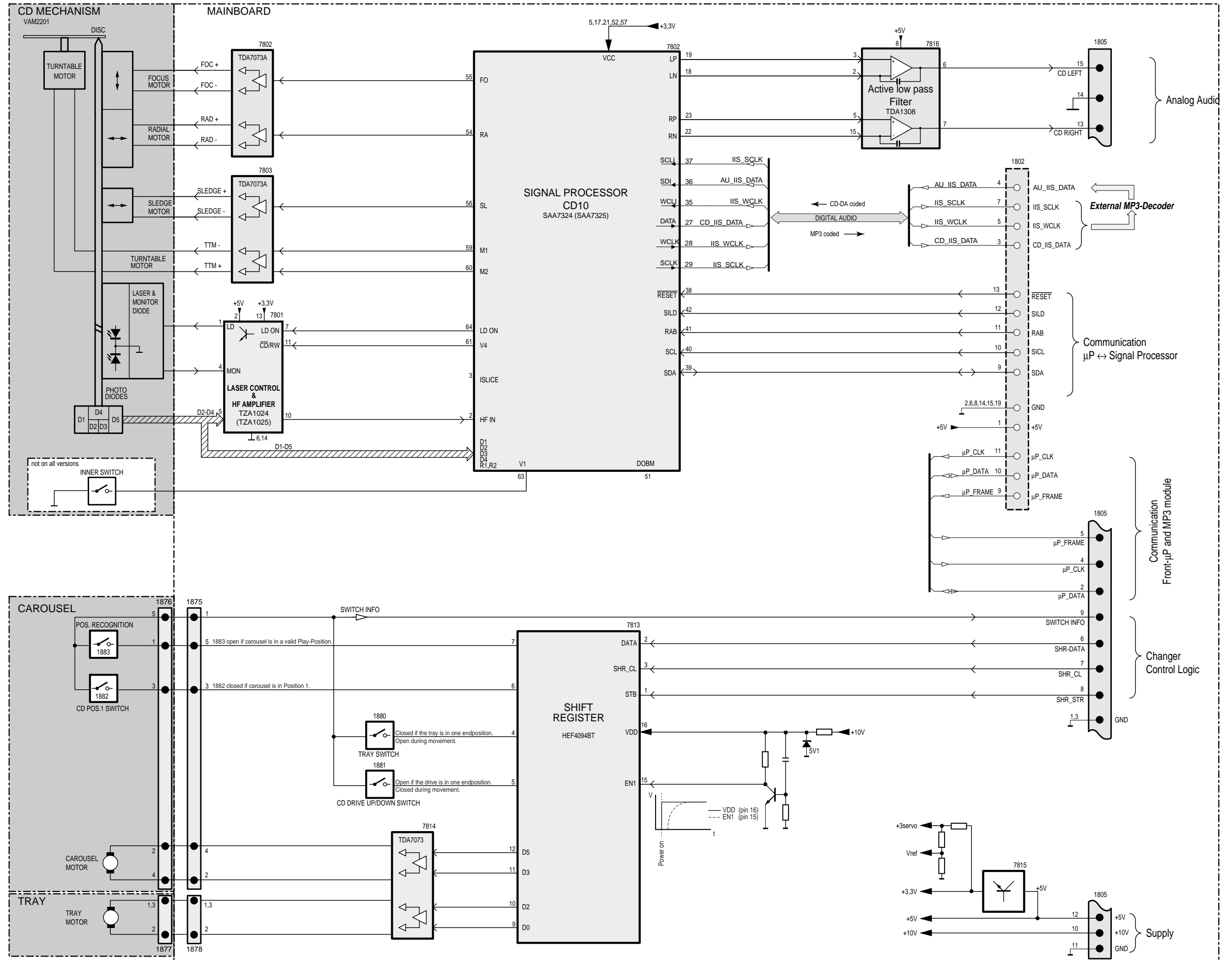




Service Position



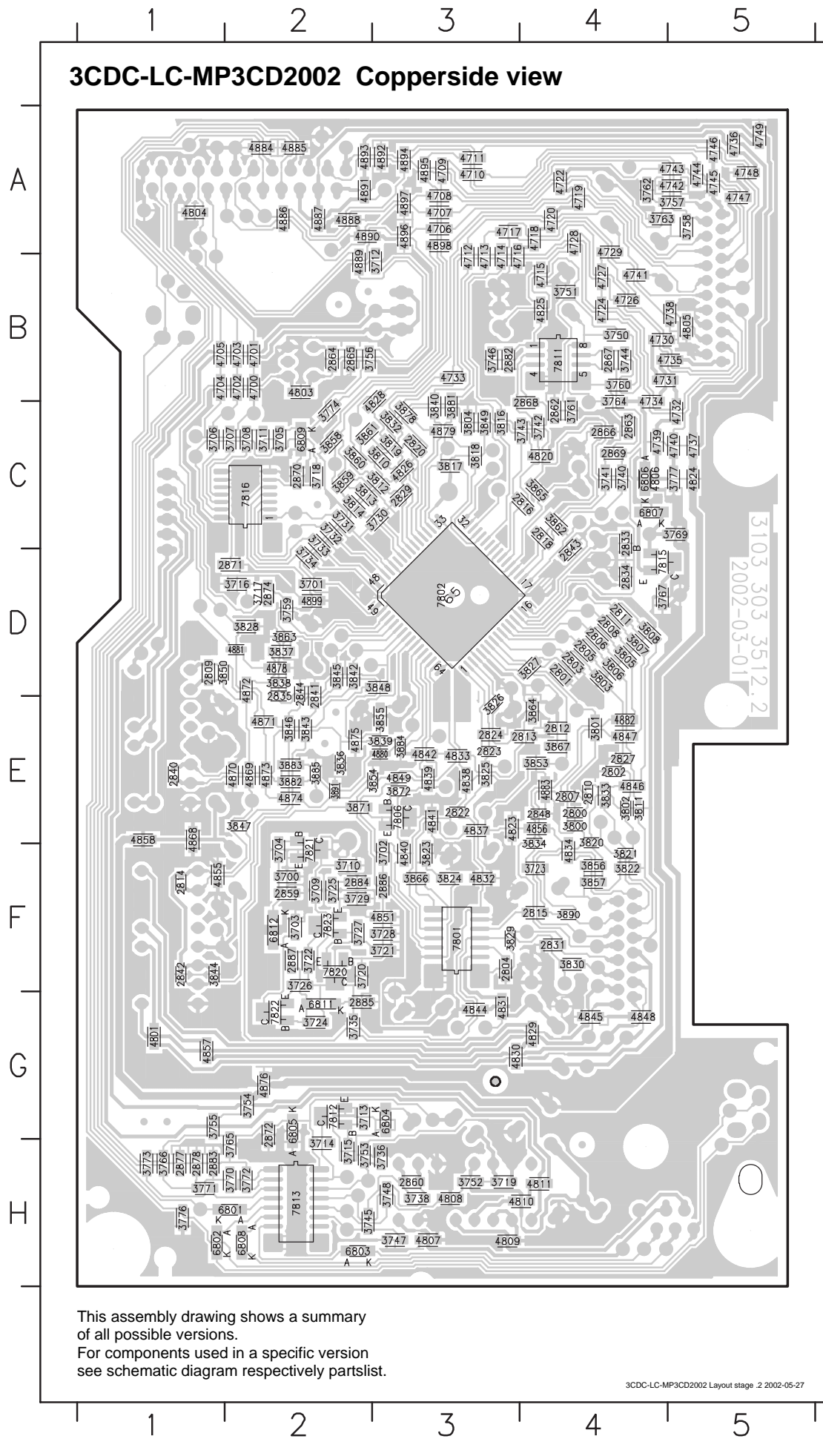
BLOCK DIAGRAM 3CDC-LC MP3 Version



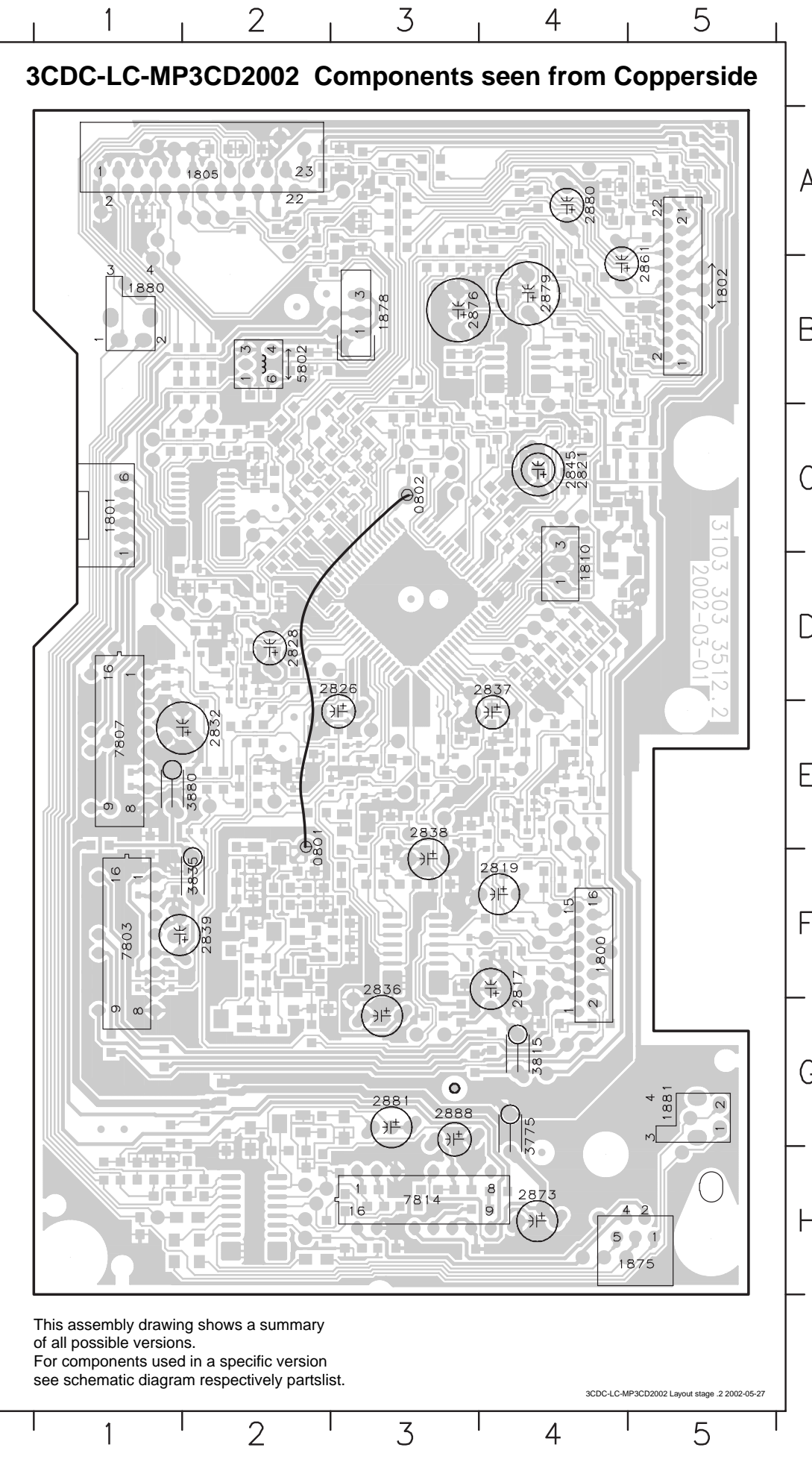
Mapping

3CDC-LC-MP3CD2002 Copperside view

3CDC-LC-MP3CD2002 Components seen from Copperside

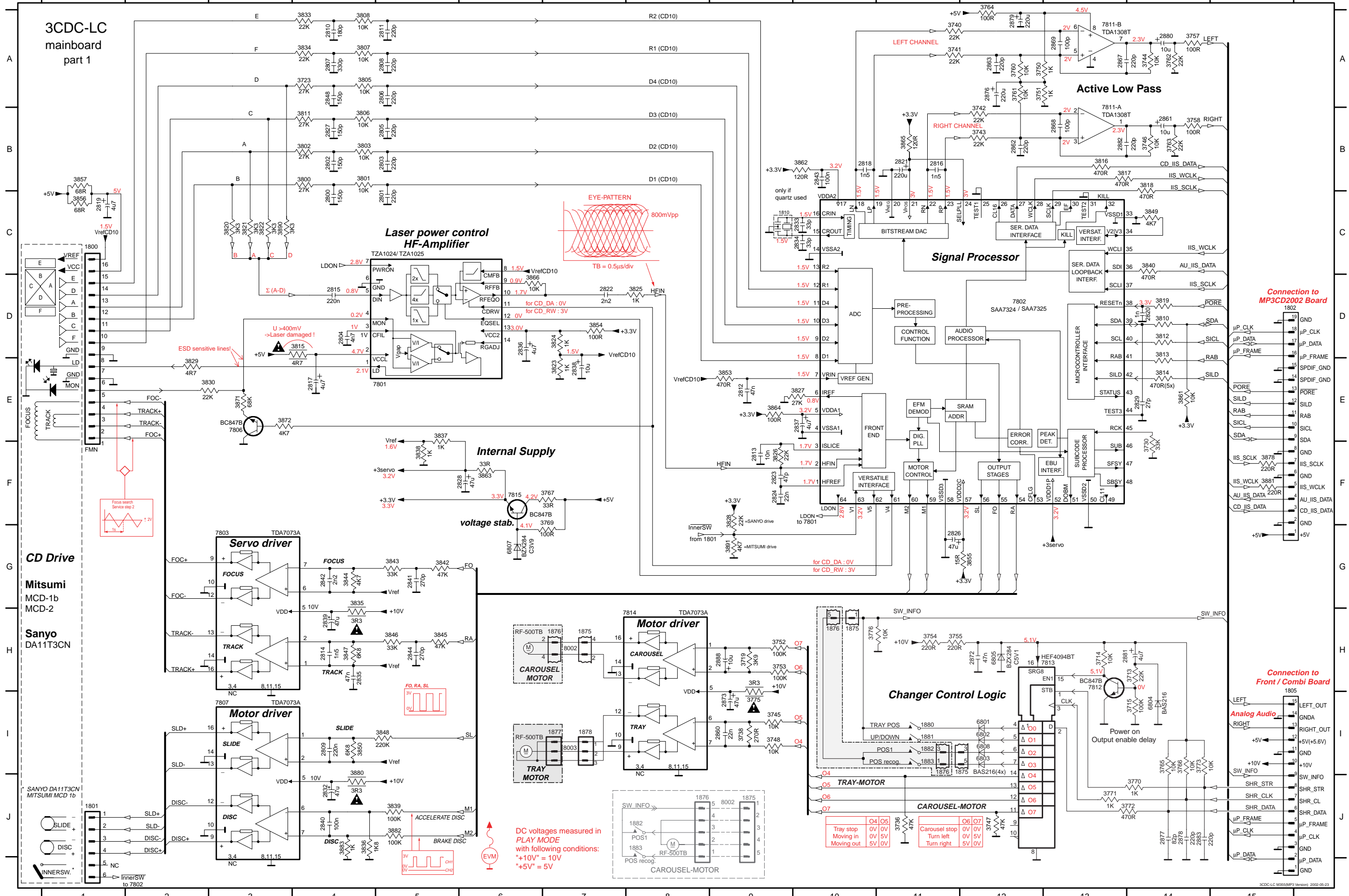


	Copperside	Componentside
2800 E4	3730 C3	3848 D3
2801 D4	3731 C2	3849 C3
2802 E4	3732 C2	3850 D1
2803 D4	3733 C2	3853 E4
2804 F3	3734 D2	3854 E3
2805 D4	3735 G2	3855 E3
2806 D4	3736 H3	3856 F4
2807 E4	3738 H3	3857 F4
2808 D4	3740 C4	3858 C2
2809 D1	3741 C4	3859 C2
2810 E4	3742 C4	3860 C2
2811 D4	3743 C4	3861 C2
2812 E4	3744 B4	3862 C4
2813 E4	3745 H2	3863 D2
2814 F1	3746 B3	3864 E4
2815 F4	3747 H3	3865 C4
2816 C4	3748 H3	3866 F3
2818 C4	3750 B4	3867 E4
2820 C3	3751 B4	3871 E2
2822 E3	3752 H3	3872 E3
2823 E3	3753 H2	3878 C3
2824 E3	3754 G2	3881 C3
2827 E4	3755 G1	3882 E2
2829 C3	3756 B2	3883 E2
2831 F4	3757 A5	3884 E3
2833 C4	3758 A5	3885 E2
2834 D4	3759 D2	3890 F4
2835 D2	3760 B4	3891 E2
2840 E1	3761 C4	4700 B2
2841 D2	3762 A4	4701 B2
2842 F1	3763 A4	4702 B2
2843 D4	3764 C4	4703 B2
2844 D2	3765 H2	4704 B1
2848 E4	3766 H1	4705 B1
2859 F2	3767 D4	4706 A3
2860 H3	3769 C5	4707 A3
2862 C4	3770 H2	4708 A3
2863 C4	3771 H1	4709 A3
2864 B2	3772 H2	4710 A3
2865 B2	3773 H1	4711 A3
2866 C4	3774 C2	4712 B3
2867 B4	3776 H1	4713 B3
2868 C4	3777 C5	4714 B3
2869 C4	3800 E4	4715 B4
2870 C2	3801 E4	4716 B3
2871 D2	3802 E4	4717 A3
2872 G2	3803 D4	4718 A4
2874 D2	3804 C3	4719 A4
2877 H1	3805 D4	4720 A4
2878 H1	3806 D4	4722 A4
2882 B3	3807 D4	4724 B4
2883 H1	3808 D4	4726 B4
2884 F2	3810 C3	4727 B4
2885 G2	3811 E4	4728 A4
2886 F3	3812 C3	4729 A4
2887 F2	3813 C2	4730 B4
3700 F2	3814 C2	4731 B4
3701 D2	3816 C3	4732 C5
3702 F3	3817 C3	4733 B3
3703 F2	3818 C3	4734 C4
3704 F2	3819 C3	4735 B5
3705 C2	3820 E4	4736 A5
3706 C1	3821 F4	4737 C5
3707 C2	3822 F4	4738 B5
3708 C2	3823 F3	4739 C4
3709 F2	3824 F3	4740 C5
3710 F2	3825 E3	4741 B4
3711 C2	3826 E3	4742 A5
3712 B3	3827 D4	4743 A5
3713 G2	3828 D2	4744 A5
3714 H2	3829 F3	4745 A5
3715 H2	3830 F4	4746 A5
3716 D2	3832 C3	4747 A5
3717 D2	3833 E4	4748 A5
3718 C2	3834 E4	4749 A5
3719 H3	3836 E2	4801 G1
3720 F2	3837 D2	4803 B2
3721 F3	3838 D2	4804 A1
3722 F2	3839 E3	4805 B5
3723 F4	3840 C3	4806 C4
3724 G2	3842 D2	4807 H3
3725 F2	3843 E2	4808 H3
3726 F2	3844 F1	4809 H3
3727 F2	3845 D2	4810 H4
3728 F3	3846 E2	4811 H4
3729 F2	3847 E2	4820 C4





1800	C1	1876	H10	1883	I11	2807	A4	2815	D4	2823	F9	2834	C10	2842	G4	2867	A13	2879	A12	3715	I14	3742	B12	3751	A12	3761	A12	3770	J14	3802	B4	3812	D14	3820	C3	3828	F9	3837	E5	3846	H5	3856	C1	3871	E3	3891	G9	7801	D5	7813	H13
1801	J1	1876	H7	1880	C4	2808	A5	2816	B11	2824	F9	2835	H4	2843	B10	2868	B13	2880	A14	3719	H9	3743	B12	3752	H9	3762	A14	3771	J13	3803	B4	3813	E14	3821	C3	3829	E2	3838	F5	3847	H4	3857	B1	3872	E3	3891	I12	7802	D12	7814	H8
1802	D15	1876	H11	1881	C5	2809	I4	2817	E4	2826	G11	2836	D6	2844	H5	2869	A13	2881	H14	3723	A4	3744	A14	3753	B14	3763	B14	3772	J14	3805	A4	3814	E14	3822	C3	3830	E2	3839	I5	3848	I5	3858	F15	3873	F15	3892	G3	7803	G3	7815	F8
1805	I15	1877	I7	1882	B4	2810	A4	2818	B10	2827	B4	2837	E10	2848	A4	2872	H12	2882	B13	3730	F14	3745	I9	3754	H11	3764	A12	3773	I14	3806	B4	3815	D4	3823	E7	3832	E14	3840	C14	3849	C14	3859	C14	3868	B10	3880	J4	6803	I12	7806	E3
1810	C9	1878	I7	1883	B5	2811	A5	2819	C1	2828	F6	2838	E7	2850	I9	2873	I9	2883	J14	3736	J11	3746	B14	3755	H11	3765	I14	3775	I9	3807	A4	3816	B13	3824	D7	3833	A4	3842	G5	3850	I4	3863	F6	3881	F15	6804	I14	7807	I3		
1875	H10	1880	I11	1882	D4	2812	E9	2820	D14	2829	F14	2839	H4	2846	B14	2876	I12	2888	H5	3747	J12	3747	J12	3757	A14	3766	I14	3776	H11	3808	A4	3817	B13	3825	D8	3834	A4	3843	G5	3853	E9	3864	F9	3885	H12	6805	H12	7811	A13		
1875	H12	1881	I11	1882	A5	2813	F9	2821	B11	2830	F9	2840	J4	2849	A12	2877	J14	2887	H14	3740	A11	3748	I9	3757	F7	3767	F7	3776	G7	3809	B4	3818	B14	3827	E10	3836	J4	3845	H5	3855	G12	3866	D6	3889	C3	6806	I12	7812	H13		



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

Tray stop	O4	O5
Moving in	OV	OV
Moving out	OV	OV
Carousel stop	O6	O7
Turn left	OV	OV
Turn right	OV	OV

Connection to MP3CD2002 Board

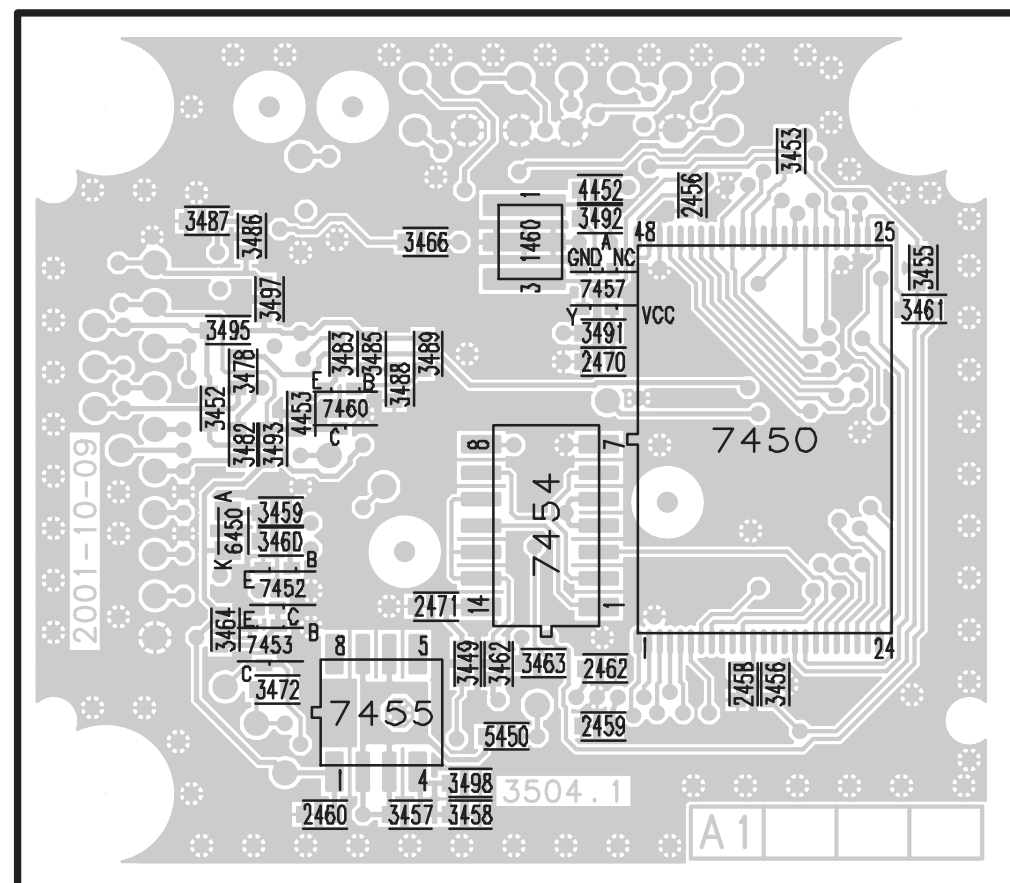
Connection to Front / Combi Board



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

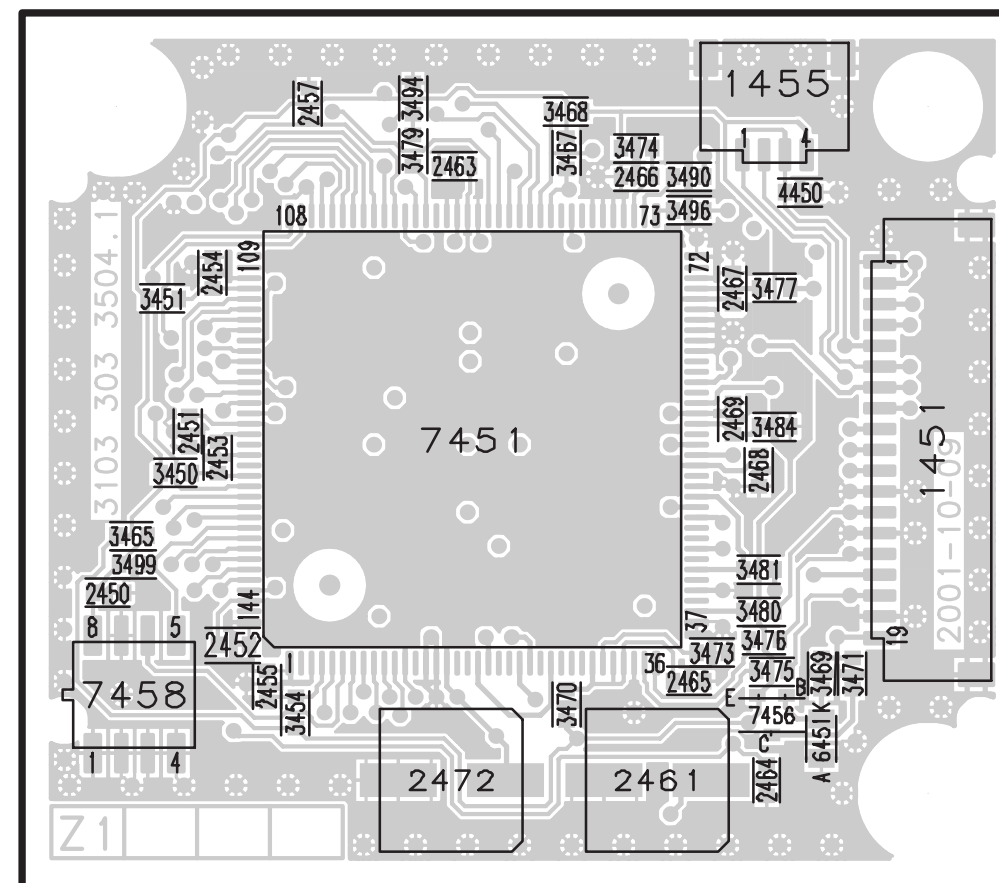
1451 B5	2457 A2	2469 B4	3469 C4	3479 A2	4450 A4
1455 A4	2461 D4	2472 D3	3470 D3	3480 C4	6451 D4
2450 C1	2463 A3	3450 C1	3471 C4	3481 C4	7451 B3
2451 B1	2464 D4	3451 B1	3473 C4	3484 B4	7456 D4
2452 C2	2465 D4	3454 D2	3474 A3	3490 A4	7458 D1
2453 B1	2466 A3	3465 C1	3475 C4	3494 A2	
2454 B1	2467 B4	3467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

## Side A

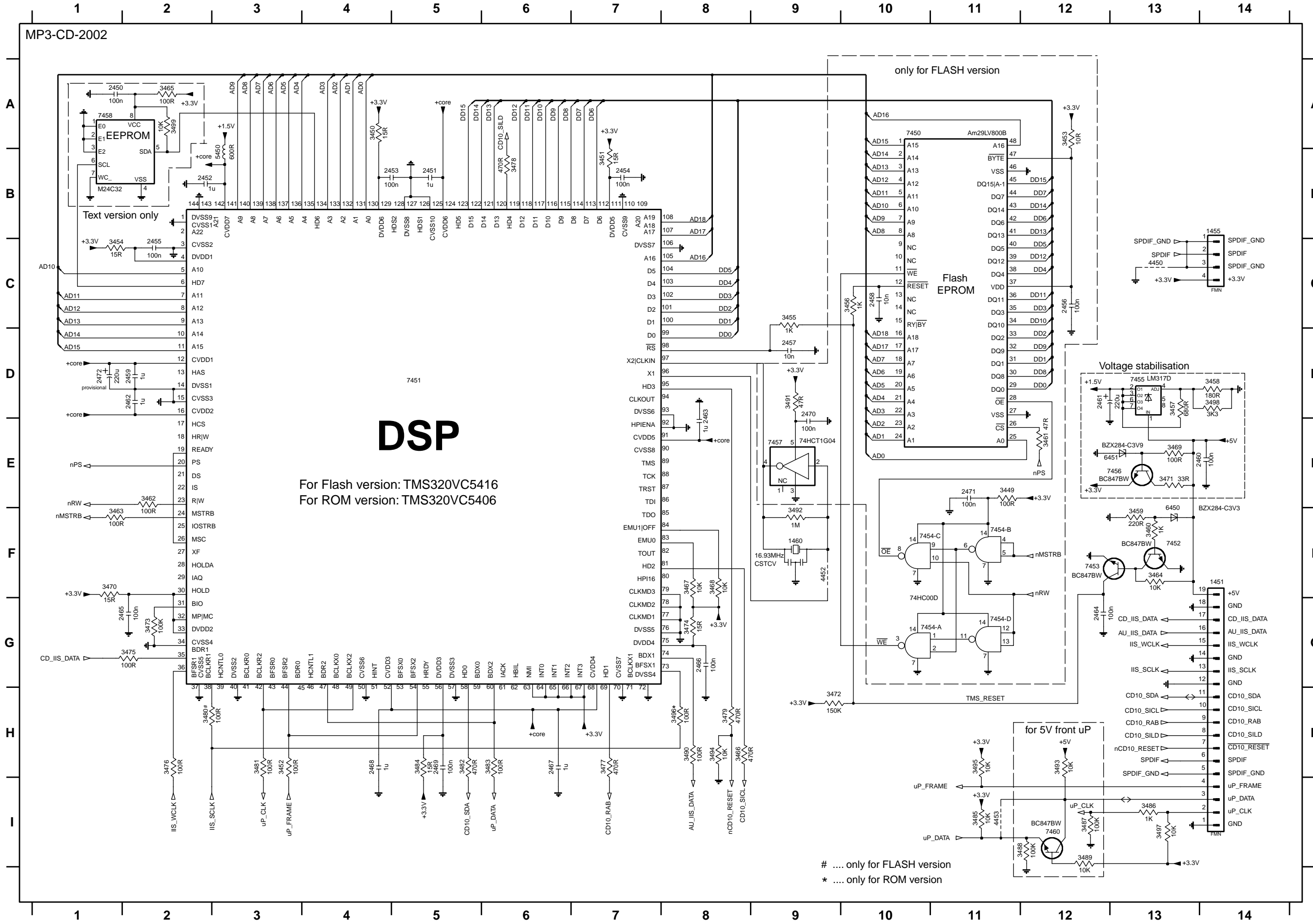


This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram respectively partslist.

## Side B



MP3-CD-2002



# DSP

For Flash version: TMS320VC5416  
 For ROM version: TMS320VC5406

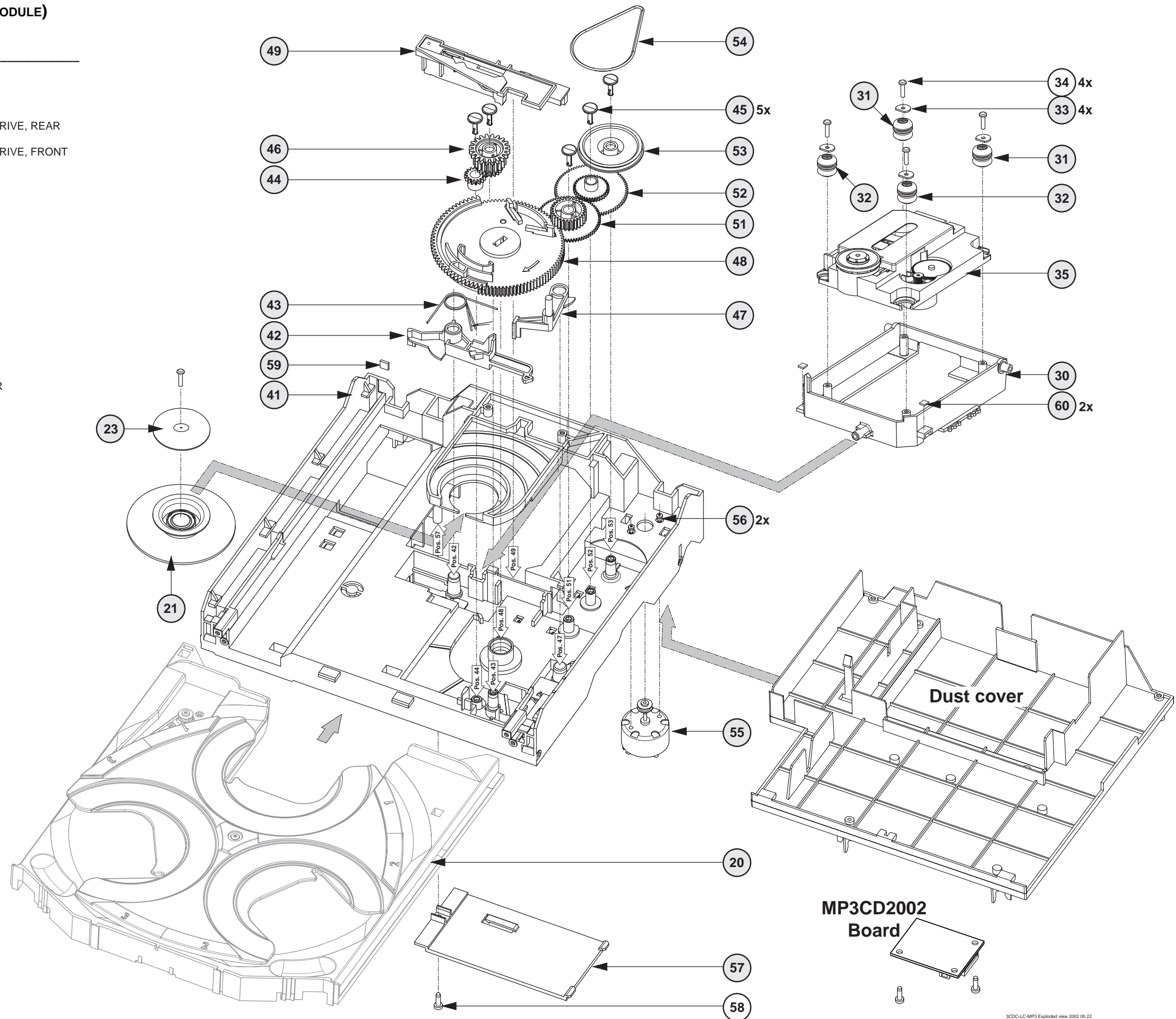
# .... only for FLASH version  
 \* .... only for ROM version

- 2451 B5
- 2452 B2
- 2453 B4
- 2454 B7
- 2455 C2
- 2456 C12
- 2457 D9
- 2458 C10
- 2459 D2
- 2460 E13
- 2461 D12
- 2462 D2
- 2463 D8
- 2464 G12
- 2465 G2
- 2466 G8
- 2467 H6
- 2468 H4
- 2469 H5
- 2470 D9
- 2471 E11
- 2472 D1
- 3449 E11
- 3450 A4
- 3451 B7
- 3452 H3
- 3453 A12
- 3454 C1
- 3455 C9
- 3456 C10
- 3457 D13
- 3458 D14
- 3459 F13
- 3460 F12
- 3461 E12
- 3462 E2
- 3463 F1
- 3464 F13
- 3465 A2
- 3466 H8
- 3467 F8
- 3468 F8
- 3469 E13
- 3470 F1
- 3471 E13
- 3472 H9
- 3473 G2
- 3474 G8
- 3475 G2
- 3476 H2
- 3477 H1
- 3478 B6
- 3479 H8
- 3480 H2
- 3481 H3
- 3482 H5
- 3483 H6
- 3484 H5
- 3485 H1
- 3486 H3
- 3487 I2
- 3488 I2
- 3489 I2
- 3490 H8
- 3491 D9
- 3492 F9
- 3493 H12
- 3494 H8
- 3495 H11
- 3496 H8
- 3497 I3
- 3498 D14
- 3499 A2
- 4450 C13
- 4452 F9
- 4453 I1
- 5450 B3
- 6450 E13
- 6451 E13
- 7450 A10
- 7451 D5
- 7452 F13
- 7453 F12
- 7454-A G11
- 7454-B F11
- 7454-C F11
- 7454-D G11
- 7455 D13
- 7457 E9
- 7458 A1
- 7460 I2

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

MECHANICAL PARTS *Loader*

20	3103 304 66500	DRAWER BLACK
21	3140 114 29070	PRESSURE RING-DA11
23	3140 111 21270	METAL RING-DA11
30	3103 304 66560	SUPPORT
31	4822 529 10386	RUBBER DAMPER CD DRIVE, REAR
32	4822 529 10387	RUBBER DAMPER CD DRIVE, FRONT
33	3103 304 06970	WASHER
35	3103 309 05350	CD DRIVE MCD1B
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 69880	COVER-DA11
59	4822 466 12146	RUBBER

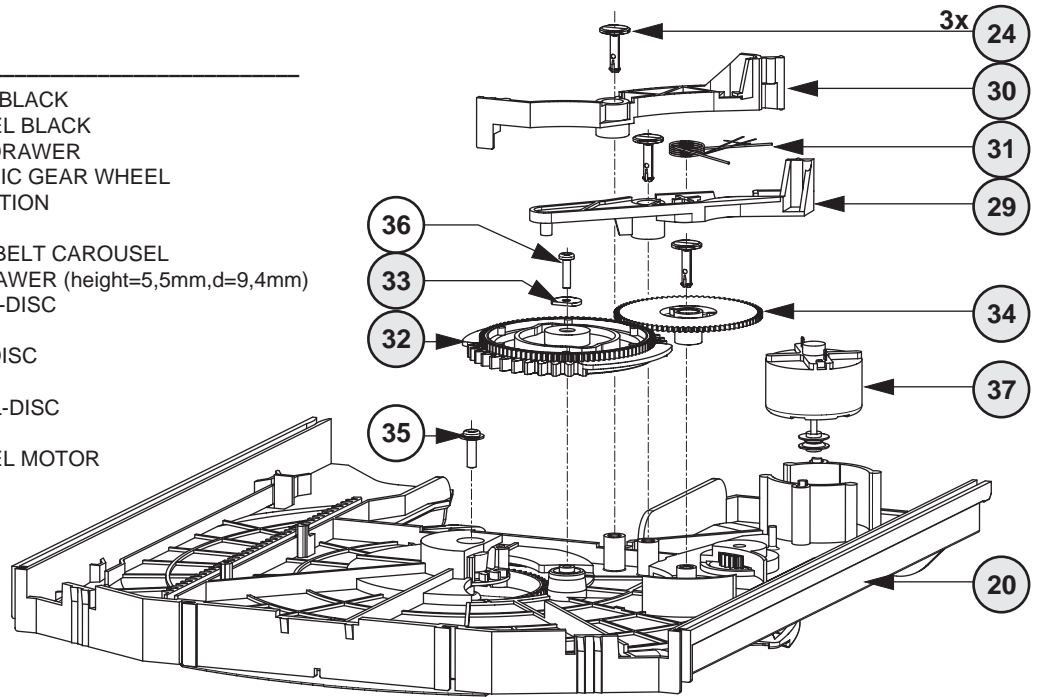


- X** spare part
- Y** non spare part

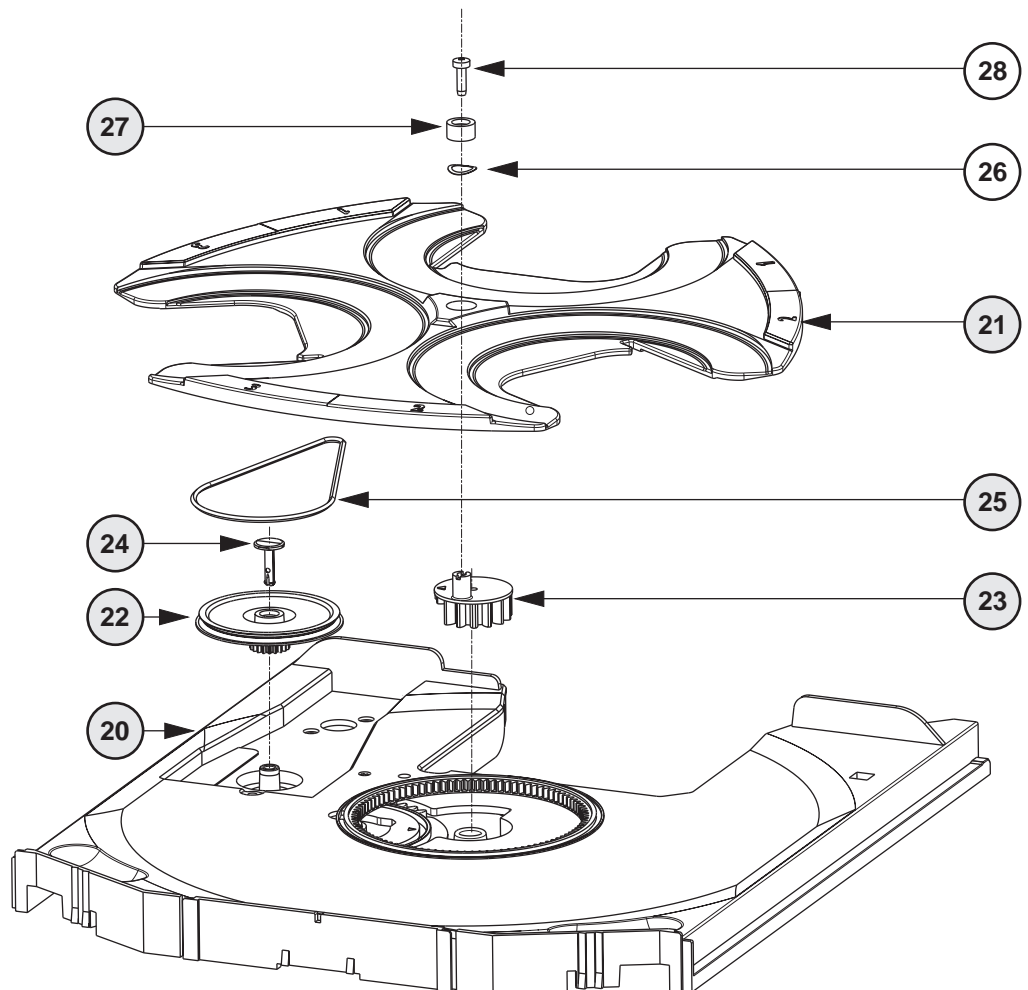
### Drawer bottom view

MECHANICAL PARTS *Drawer*

20	3103 304 66500	DRAWER BLACK
21	3103 304 66490	CAROUSEL BLACK
22	3103 304 06860	PULLEY-DRAWER
23	3103 304 06850	ECCENTRIC GEAR WHEEL
24	3103 304 06980	NAIL FIXATION
25	3103 304 66850	DRIVING BELT CAROUSEL
27	4822 532 12365	BUSH DRAWER (height=5,5mm,d=9,4mm)
29	3103 304 66550	BRACKET-DISC
30	3103 304 66520	TUMBLER
31	3103 301 06470	SPRING-DISC
32	3103 304 06920	CONTROL-DISC
34	3103 304 06870	GEAR-1
37	4822 361 10753	CAROUSEL MOTOR



### Drawer top view



- X** spare part
- Y** non spare part



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

37	4822 361 10753	CAROUSEL MOTOR
55	4822 361 10753	TRAY MOTOR
1800	2422 025 17389	FFC-CONNECTOR 16Pin
1805	4822 265 10979	FFC-CONNECTOR 15Pin
1875	4822 267 10958	FFC-CONNECTOR 5Pin
1876	2422 025 08332	FFC-CONNECTOR 5Pin
1880	4822 276 13503	SWITCH
1881	4822 276 13503	SWITCH
1882	4822 276 13503	SWITCH
1883	4822 276 13503	SWITCH
8001	3103 308 93070	FLEX FOIL CABLE 19P, 170mm BD
8002	3103 308 91990	FLEXFOIL CABLE, 5P, 200mm AD
8005	3103 308 92930	FLEX FOIL CABLE 16P 170mm 1:n

**CAPACITORS**

2800©	4822 122 33753	150pF	5%	50V
2801©	4822 126 13883	220pF	5%	50V
2802©	4822 122 33753	150pF	5%	50V
2803©	4822 126 13883	220pF	5%	50V
2804©	4822 126 13193	4,7nF	10%	63V
2805©	4822 126 13883	220pF	5%	50V
2806©	4822 126 13883	220pF	5%	50V
2807©	4822 126 14241	330pF		50V
2808©	4822 126 13883	220pF	5%	50V
2809©	4822 126 13879	220nF	20%	16V
2810©	4822 126 14508	180pF	5%	50V
2811©	4822 126 13883	220pF	5%	50V
2812©	3198 024 44730	47nF	5%	50V
2813©	4822 122 33177	10nF	20%	50V
2814©	4822 126 14247	1,5nF	10%	50V
2815©	4822 126 14076	220nF	20%	25V
2816©	4822 126 13344	1,5nF	5%	63V
2817	4822 124 40769	4,7µF	20%	100V
2818©	4822 126 13344	1,5nF	5%	63V
2819	4822 124 40769	4,7µF	20%	100V
2820©	5322 126 11578	1nF	10%	63V
2821	4822 124 42383	220µF	20%	4V
2822©	4822 126 14238	2,2nF	10%	50V
2823©	4822 126 11785	47pF	5%	50V
2824©	5322 122 32654	22nF	10%	63V
2826	4822 124 12362	47µF	20%	4V
2827©	4822 122 33753	150pF	5%	50V
2828	4822 124 12362	47µF	20%	4V
2829©	4822 126 11669	27pF	10%	50V
2832	4822 124 40433	47µF	20%	25V
2833©	2222 867 15339	33pF	5%	50V
2835©	3198 024 44730	47nF	5%	50V
2836	4822 124 40769	4,7µF	20%	100V
2837	4822 124 22726	4,7µF	20%	35V
2838	4822 124 40248	10µF	20%	63V
2839	4822 124 40433	47µF	20%	25V
2840©	4822 126 14585	100nF	10%	50V
2841©	4822 122 33216	270pF	5%	50V
2842©	4822 126 14238	2,2nF	10%	50V
2843©	4822 126 14585	100nF	10%	50V
2844©	4822 122 33216	270pF	5%	50V
2848©	4822 122 33753	150pF	5%	50V
2860©	4822 126 14494	22nF	10%	25V
2861	4822 124 11947	10µF	20%	16V
2862©	4822 126 13883	220pF	5%	50V
2863©	4822 126 13883	220pF	5%	50V
2865©	5322 122 32654	22nF	10%	63V
2866©	4822 126 13751	47nF	10%	50V

**CAPACITORS**

2867©	4822 126 13883	220pF	5%	50V
2868©	2020 552 94427	100pF	5%	50V
2869©	2020 552 94427	100pF	5%	50V
2872©	3198 024 44730	47nF	5%	50V
2873	4822 124 80231	47µF	20%	16V
2876	4822 124 12245	220µF	20%	16V
2877©	4822 126 14226	82pF		50V
2878©	4822 126 13883	220pF	5%	50V
2879	4822 124 12245	220µF	20%	16V
2880	4822 124 11947	10µF	20%	16V
2881	4822 124 40769	4,7µF	20%	100V
2882©	4822 126 13883	220pF	5%	50V
2888	4822 124 11947	10µF	20%	16V

**RESISTORS**

3713©	4822 051 30223	22kΩ	5%	0,06W
3714©	4822 051 30103	10kΩ	5%	0,06W
3715©	4822 117 13632	100kΩ	1%	0,06W
3719©	4822 051 30392	3,9kΩ	5%	0,06W
3723©	4822 051 20273	27kΩ	5%	0,1W
3730©	4822 051 20333	33kΩ	5%	0,1W
3736©	4822 117 12925	47kΩ	1%	0,06W
3738©	4822 051 30271	270Ω	5%	0,06W
3740©	4822 051 20223	22kΩ	5%	0,1W
3741©	4822 051 20223	22kΩ	5%	0,1W
3742©	4822 051 20223	22kΩ	5%	0,1W
3743©	4822 051 20223	22kΩ	5%	0,1W
3744©	4822 051 30103	10kΩ	5%	0,06W
3745©	4822 117 10833	10kΩ	1%	0,1W
3746©	4822 051 30103	10kΩ	5%	0,06W
3747©	4822 117 12925	47kΩ	1%	0,06W
3748©	4822 051 30103	10kΩ	5%	0,06W
3750©	4822 051 30102	1kΩ	5%	0,06W
3751©	4822 051 30102	1kΩ	5%	0,06W
3752©	4822 117 13632	100kΩ	1%	0,06W
3753©	4822 117 13632	100kΩ	1%	0,06W
3754©	4822 051 30221	220Ω	5%	0,06W
3755©	4822 117 11503	220Ω	5%	0,1W
3757©	4822 117 11373	100Ω	1%	0,1W
3758©	4822 051 30101	100Ω	5%	0,06W
3760©	4822 117 10833	10kΩ	1%	0,1W
3761©	4822 051 30103	10kΩ	5%	0,06W
3762©	4822 051 30223	22kΩ	5%	0,06W
3763©	4822 051 30223	22kΩ	5%	0,06W
3764©	4822 117 11373	100Ω	1%	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
3774©	4822 117 11373	100Ω	1%	0,1W
3775▲	4822 052 10338	3,3Ω	5%	NFR25
3776©	4822 051 30103	10kΩ	5%	0,06W
3800©	4822 051 30273	27kΩ	5%	0,06W
3801©	4822 117 10833	10kΩ	1%	0,1W
3802©	4822 051 30273	27kΩ	5%	0,06W
3803©	4822 117 10833	10kΩ	1%	0,1W
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



**ELECTRICAL PARTSLIST 3CDC-LC MODULE**

## RESISTORS

3810	©	4822 051 30471	470Ω	5%	0,06W
3811	©	4822 051 30273	27kΩ	5%	0,06W
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 30471	470Ω	5%	0,06W
3819	©	4822 051 20471	470Ω	5%	0,1W
3820	©	4822 051 30332	3,3kΩ	5%	0,06W
3821	©	4822 051 30332	3,3kΩ	5%	0,06W
3822	©	4822 051 20332	3,3kΩ	5%	0,1W
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 30223	22kΩ	5%	0,06W
3827	©	4822 051 20273	27kΩ	5%	0,1W
3829	©	4822 117 13608	4,7Ω	5%	0,06W
3830	©	4822 051 20223	22kΩ	5%	0,1W
3833	©	4822 051 30223	22kΩ	5%	0,06W
3834	©	4822 051 30223	22kΩ	5%	0,06W
3835	▲	4822 052 10338	3,3Ω	5%	NFR25
3836	©	4822 117 12903	1,8kΩ	1%	0,06W
3837	©	4822 051 10102	1kΩ	2%	0,25W
3838	©	4822 051 30102	1kΩ	5%	0,06W
3839	©	4822 117 13632	100kΩ	1%	0,06W
3840	©	4822 051 20471	470Ω	5%	0,1W
3842	©	4822 117 10834	47kΩ	1%	0,1W
3843	©	4822 051 20333	33kΩ	5%	0,1W
3844	©	4822 051 30472	4,7kΩ	5%	0,06W
3845	©	4822 117 10834	47kΩ	1%	0,1W
3846	©	4822 051 20333	33kΩ	5%	0,1W
3847	©	4822 051 30682	6,8kΩ	5%	0,06W
3848	©	3198 021 52240	220kΩ	5%	0,1W
3849	©	4822 051 30472	4,7kΩ	5%	0,06W
3850	©	4822 051 30682	6,8kΩ	5%	0,06W
3853	©	4822 051 20471	470Ω	5%	0,1W
3854	©	4822 117 11373	100Ω	1%	0,1W
3855	©	4822 117 12971	15Ω	5%	0,06W
3856	©	4822 117 12521	68Ω	1%	0,1W
3857	©	4822 117 12521	68Ω	1%	0,1W
3861	©	4822 051 30103	10kΩ	5%	0,06W
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 051 20683	68kΩ	5%	0,1W
3872	©	4822 051 30472	4,7kΩ	5%	0,06W
3878	©	4822 117 11503	220Ω	5%	0,1W
3880	▲	4822 052 10338	3,3Ω	5%	NFR25
3881	©	4822 117 11503	220Ω	5%	0,1W
3882	©	4822 117 10837	100kΩ	1%	0,1W
3883	©	4822 051 10102	1kΩ	2%	0,25W
3890	©	4822 051 30332	3,3kΩ	5%	0,06W
3891	©	4822 051 30472	4,7kΩ	5%	0,06W
4700	©	4822 051 20008	CHIP JUMPER		0805
4701	©	4822 051 20008	CHIP JUMPER		0805
4702	©	4822 051 20008	CHIP JUMPER		0805
4703	©	4822 051 20008	CHIP JUMPER		0805
4704	©	4822 051 20008	CHIP JUMPER		0805
4705	©	4822 051 20008	CHIP JUMPER		0805
4706	©	4822 051 20008	CHIP JUMPER		0805

## RESISTORS

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	CHIP JUMPER		0805
4712	©	4822 051 20008	CHIP JUMPER		0805
4713	©	4822 051 20008	CHIP JUMPER		0805
4714	©	4822 051 20008	CHIP JUMPER		0805
4715	©	4822 051 20008	CHIP JUMPER		0805
4716	©	4822 051 20008	CHIP JUMPER		0805
4717	©	4822 051 30008	CHIP JUMPER		0603
4718	©	4822 051 20008	CHIP JUMPER		0805
4719	©	4822 051 20008	CHIP JUMPER		0805
4720	©	4822 051 20008	CHIP JUMPER		0805
4722	©	4822 051 20008	CHIP JUMPER		0805
4724	©	4822 051 20008	CHIP JUMPER		0805
4726	©	4822 051 20008	CHIP JUMPER		0805
4727	©	4822 051 20008	CHIP JUMPER		0805
4728	©	4822 051 20008	CHIP JUMPER		0805
4729	©	4822 051 20008	CHIP JUMPER		0805
4730	©	4822 051 20008	CHIP JUMPER		0805
4731	©	4822 051 30008	CHIP JUMPER		0603
4732	©	4822 051 20008	CHIP JUMPER		0805
4733	©	4822 051 30008	CHIP JUMPER		0603
4734	©	4822 051 20008	CHIP JUMPER		0805
4735	©	4822 051 20008	CHIP JUMPER		0805
4736	©	4822 051 30008	CHIP JUMPER		0603
4737	©	4822 051 30008	CHIP JUMPER		0603
4738	©	4822 051 30008	CHIP JUMPER		0603
4739	©	4822 051 30008	CHIP JUMPER		0603
4740	©	4822 051 30008	CHIP JUMPER		0603
4741	©	4822 051 20008	CHIP JUMPER		0805
4742	©	4822 051 20008	CHIP JUMPER		0805
4743	©	4822 051 20008	CHIP JUMPER		0805
4744	©	4822 051 30008	CHIP JUMPER		0603
4745	©	4822 051 20008	CHIP JUMPER		0805
4746	©	4822 051 20008	CHIP JUMPER		0805
4747	©	4822 051 20008	CHIP JUMPER		0805
4748	©	4822 051 20008	CHIP JUMPER		0805
4749	©	4822 051 30008	CHIP JUMPER		0603
4801	©	4822 051 20008	CHIP JUMPER		0805
4804	©	4822 051 20008	CHIP JUMPER		0805
4806	©	4822 051 20008	CHIP JUMPER		0805
4807	©	4822 051 20008	CHIP JUMPER		0805
4808	©	4822 051 20008	CHIP JUMPER		0805
4809	©	4822 051 20008	CHIP JUMPER		0805
4810	©	4822 051 20008	CHIP JUMPER		0805
4811	©	4822 051 20008	CHIP JUMPER		0805
4820	©	4822 051 20008	CHIP JUMPER		0805
4823	©	4822 051 30008	CHIP JUMPER		0603
4824	©	4822 051 30008	CHIP JUMPER		0603
4825	©	4822 051 20008	CHIP JUMPER		0805
4826	©	4822 051 20008	CHIP JUMPER		0805
4828	©	4822 051 30008	CHIP JUMPER		0603
4829	©	4822 051 20008	CHIP JUMPER		0805
4830	©	4822 051 20008	CHIP JUMPER		0805
4831	©	4822 051 20008	CHIP JUMPER		0805
4832	©	4822 051 30008	CHIP JUMPER		0603
4833	©	4822 051 20008	CHIP JUMPER		0805
4834	©	4822 051 20008	CHIP JUMPER		0805
4837	©	4822 051 20008	CHIP JUMPER		0805
4838	©	4822 051 30008	CHIP JUMPER		0603
4839	©	4822 051 20008	CHIP JUMPER		0805
4840	©	4822 051 20008	CHIP JUMPER		0805

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

4841 ©	4822 051 20008	CHIP JUMPER 0805
4842 ©	4822 051 20008	CHIP JUMPER 0805
4844 ©	4822 051 20008	CHIP JUMPER 0805
4845 ©	4822 051 20008	CHIP JUMPER 0805
4846 ©	4822 051 20008	CHIP JUMPER 0805
4847 ©	4822 051 20008	CHIP JUMPER 0805
4848 ©	4822 051 20008	CHIP JUMPER 0805
4849 ©	4822 051 30008	CHIP JUMPER 0603
4851 ©	4822 051 30008	CHIP JUMPER 0603
4855 ©	4822 051 20008	CHIP JUMPER 0805
4856 ©	4822 051 20008	CHIP JUMPER 0805
4857 ©	4822 051 20008	CHIP JUMPER 0805
4858 ©	4822 051 20008	CHIP JUMPER 0805
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
4878 ©	4822 051 20008	CHIP JUMPER 0805
4879 ©	4822 051 20008	CHIP JUMPER 0805
4880 ©	4822 051 20008	CHIP JUMPER 0805
4882 ©	4822 051 20008	CHIP JUMPER 0805
4883 ©	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

**RESISTORS**

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
4899 ©	4822 051 20008	CHIP JUMPER 0805

**COILS**

1810	2422 540 98519	RESONATOR 8,467MHz
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**DIODES**

6801 ©	4822 130 11397	BAS316
6802 ©	4822 130 11397	BAS316
6803 ©	4822 130 11397	BAS316
6804 ©	4822 130 11397	BAS316
6805 ©	9340 548 52115	BZX284-C5V1
6807 ©	9322 129 34685	BZX284-C3V9
6808 ©	4822 130 11397	BAS316
6809 ©	9322 129 34685	BZX284-C3V9

**TRANSISTORS**

7806 ©	5322 130 60159	BC846B
7812 ©	5322 130 60159	BC846B
7815 ©	5322 130 60159	BC846B

**INTEGRATED CIRCUITS**

7801 ©	9352 622 36118	TZA1025T/V2 HF-Amplifier
7802 ©	9352 641 80557	SAA7324H/M2B, "CD10" SIGN.PROC.
7803	4822 209 32852	TDA7073A/N2
7807	4822 209 32852	TDA7073A/N2
7811 ©	4822 209 33165	TDA1308T/N1
7813 ©	5322 209 11306	HEF4094BT, SHIFT REGISTER
7814	4822 209 32852	TDA7073A/N2

**ELECTRICAL PARTSLIST MP3CD2002 MODULE****MISCELLANEOUS**

3103 308 67020 complete MP3CD2002 Module  
 1451 2422 025 17303 FLEX FOIL CONNECTOR 19P

**CAPACITORS**

2450	2238 586 59812	100nF	10%	50V
2451	3198 017 41050	1µF	20%	10V
2452	3198 017 41050	1µF	20%	10V
2453	2238 586 59812	100nF	10%	50V
2454	2238 586 59812	100nF	10%	50V
2455	2238 586 59812	100nF	10%	50V
2456	2238 586 59812	100nF	10%	50V
2457	5322 126 11583	10nF	10%	63V
2458	5322 126 11583	10nF	10%	63V
2459	3198 017 41050	1µF	20%	10V
2460	2238 586 59812	100nF	10%	50V
2461	4822 124 81059	220µF	20%	4V
2462	3198 017 41050	1µF	20%	10V
2463	3198 017 41050	1µF	20%	10V
2464	2238 586 59812	100nF	10%	50V
2465	2238 586 59812	100nF	10%	50V
2466	2238 586 59812	100nF	10%	50V
2467	3198 017 41050	1µF	20%	10V
2468	3198 017 41050	1µF	20%	10V
2469	2238 586 59812	100nF	10%	50V
2470	2238 586 59812	100nF	10%	50V
2471	2238 586 59812	100nF	10%	50V

**RESISTORS**

3449	4822 051 30101	100Ω	5%	0,06W
3450	4822 117 12971	15Ω	5%	0,06W
3451	4822 117 12971	15Ω	5%	0,06W
3452	4822 051 30101	100Ω	5%	0,06W
3453	4822 051 30109	10Ω	5%	0,06W
3454	4822 117 12971	15Ω	5%	0,06W
3455	4822 051 30102	1kΩ	5%	0,06W
3456	4822 051 30102	1kΩ	5%	0,06W
3457	5322 117 13051	680Ω	1%	0,063W
3458	5322 117 13061	180Ω	1%	0,063W
3459	4822 051 30221	220Ω	5%	0,06W
3460	4822 051 30102	1kΩ	5%	0,06W
3461	4822 051 30479	47Ω	5%	0,06W
3462	4822 051 30101	100Ω	5%	0,06W
3463	4822 051 30101	100Ω	5%	0,06W
3464	4822 051 30103	10kΩ	5%	0,06W
3465	4822 051 30101	100Ω	5%	0,06W
3466	4822 051 30471	470Ω	5%	0,06W
3467	4822 051 30103	10kΩ	5%	0,06W
3468	4822 051 30103	10kΩ	5%	0,06W
3469	4822 051 30101	100Ω	5%	0,06W
3470	4822 117 12971	15Ω	5%	0,06W
3471	4822 051 30339	33Ω	5%	0,06W
3472	4822 051 30154	150kΩ	5%	0,06W
3473	4822 117 13632	100kΩ	1%	0,06W

**RESISTORS**

3474	4822 117 12971	15Ω	5%	0,06W
3475	4822 051 30101	100Ω	5%	0,06W
3476	4822 051 30101	100Ω	5%	0,06W
3477	4822 051 30471	470Ω	5%	0,06W
3478	4822 051 30471	470Ω	5%	0,06W
3479	4822 051 30471	470Ω	5%	0,06W
3480	4822 051 30101	100Ω	5%	0,06W
3481	4822 051 30101	100Ω	5%	0,06W
3482	4822 051 30471	470Ω	5%	0,06W
3483	4822 051 30101	100Ω	5%	0,06W
3484	4822 117 12971	15Ω	5%	0,06W
3486	4822 051 30101	100Ω	5%	0,06W
3488	4822 117 13632	100kΩ	1%	0,06W
3489	4822 051 30103	10kΩ	5%	0,06W
3490	4822 051 30101	100Ω	5%	0,06W
3491	4822 051 30479	47Ω	5%	0,06W
3492	4822 051 30105	1MΩ	5%	0,06W
3493	4822 051 30103	10kΩ	5%	0,06W
3494	4822 051 30103	10kΩ	5%	0,06W
3495	4822 051 30103	10kΩ	5%	0,06W
3497	4822 051 30103	10kΩ	5%	0,06W
3498	4822 051 30332	3,3kΩ	5%	0,06W
3499	4822 051 30103	10kΩ	5%	0,06W
4450	4822 051 30008			CHIP JUMPER 0603

**COILS**

1460	4822 242 10989	CER.RES. 16,9MHz
5450	4822 157 11074	100µH

**DIODES**

6450	4822 130 11411	BZX284-C3V3
6451	4822 130 11366	BZX284-C3V9
7454	4822 130 34174	BZX79-B4V7

**TRANSISTORS**

7452	3198 010 42310	BC847BW
7453	3198 010 42310	BC847BW
7456	3198 010 42310	BC847BW
7460	3198 010 42310	BC847BW

**INTEGRATED CIRCUITS**

7450	not available	please order complete MP3 module
7451	not available	please order complete MP3 module
7455	4822 209 17108	LM317LD Voltage Regulator
7457	9352 456 50115	HC1G04, Inverter
7458	9322 130 41668	M24C64, EEPROM

**3103 308 67020 complete MP3CD2002 Module**

**BRIEF INTRODUCTION OF THE AF12 BOARD**


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# AF12 BOARD

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The AF12 Board consists of the following features :

a. TDA7468D IC

TDA7468D IC (7501) which includes functions such as source selection, loudness control, dynamic bass control, treble control, volume control and muting function. Sound features such as ALC, DBB, DSC and IS are controllable via I<sup>2</sup>C Bus from the microprocessor.

The TDA7468D IC caters for 4 input sources namely TUNER, PC LINK, CD and AUX. It also has a Mic mix input. In our application, software will switch the input source to previous source MUTE during STANDBY mode and some other occasions where noise from other input sources is undesirable.

Note that the input to the TDA7468D IC must be ac coupled to prevent 'pop' noise. Input networks are included to provide appropriate attenuation for various sources.

b. SIMPLE MIC MIXING

The AF12 Board has provisions which can be configured to cater for one of the following:

MM : which caters for Mic mixing with additional Mic amplifier board.  
 NM : non Mic mixing.

c. LINE OUT

Line out cinch socket for connection to external amplifier.

d. SUB-WOOFER OUT

Sub-woofer out cinch socket for connection to active sub-woofer speaker.

e. INCREDIBLE SURROUND

Incredible surround effect using transistor circuit to create phase shifting and spatial effect.

f. HEADPHONE AMPLIFIER

Headphone amplifier to drive 32 ohm to 1kohm headphone.

g. CD STANDBY CONTROL

CD Standby Control circuit which switches on the supply to CD servo control IC, digital out buffer IC, HF circuit and the laser light pen in CD mode only.

h. ATTENUATION NETWORK

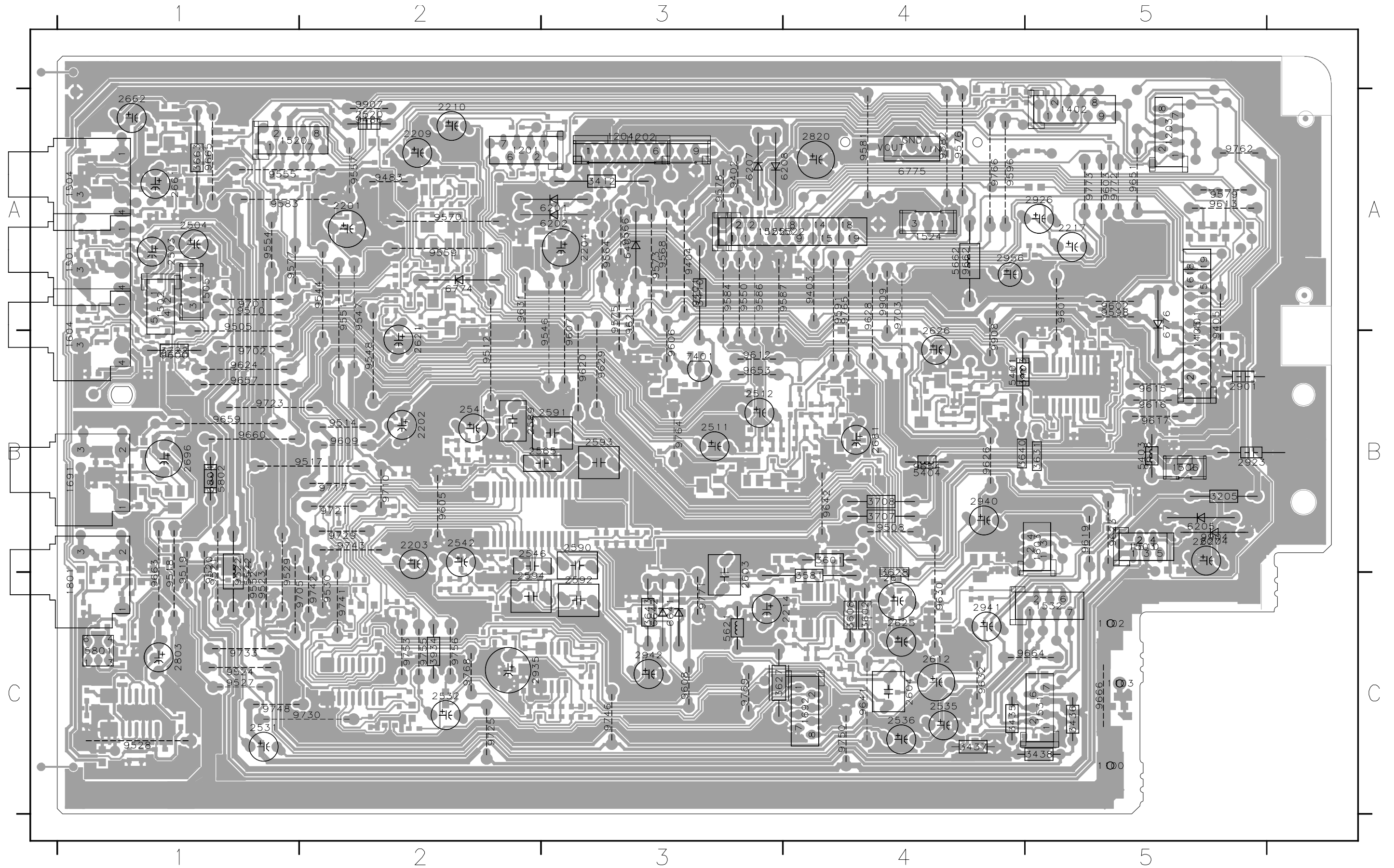
Attenuation network is provided at the output of the AF12 Board for interfacing with power board of different output power.

i. CD DIGITAL OUT

CD Digital out cinch socket for connection to external digital audio decoders.



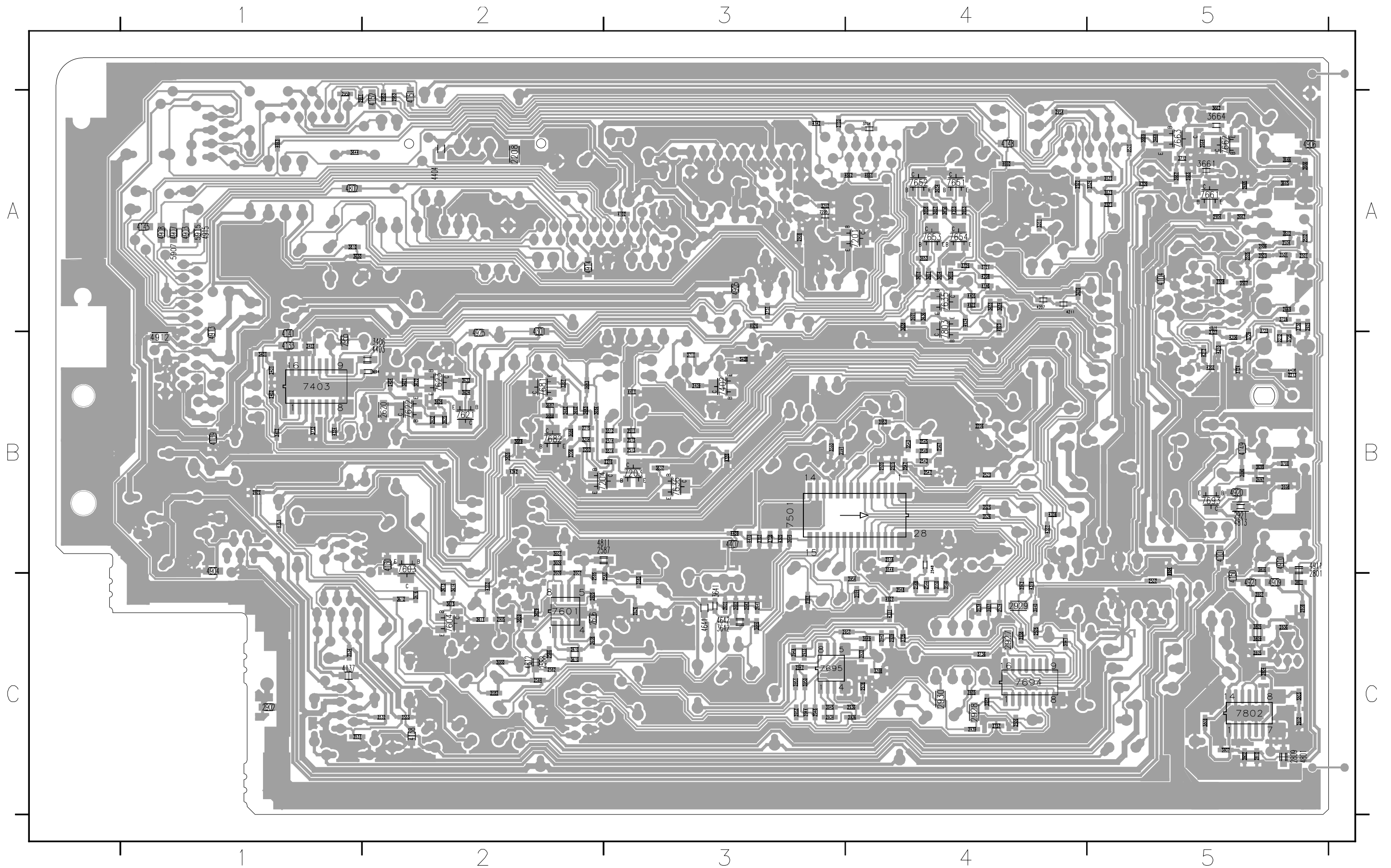
# AF12 BOARD - COMPONENT LAYOUT



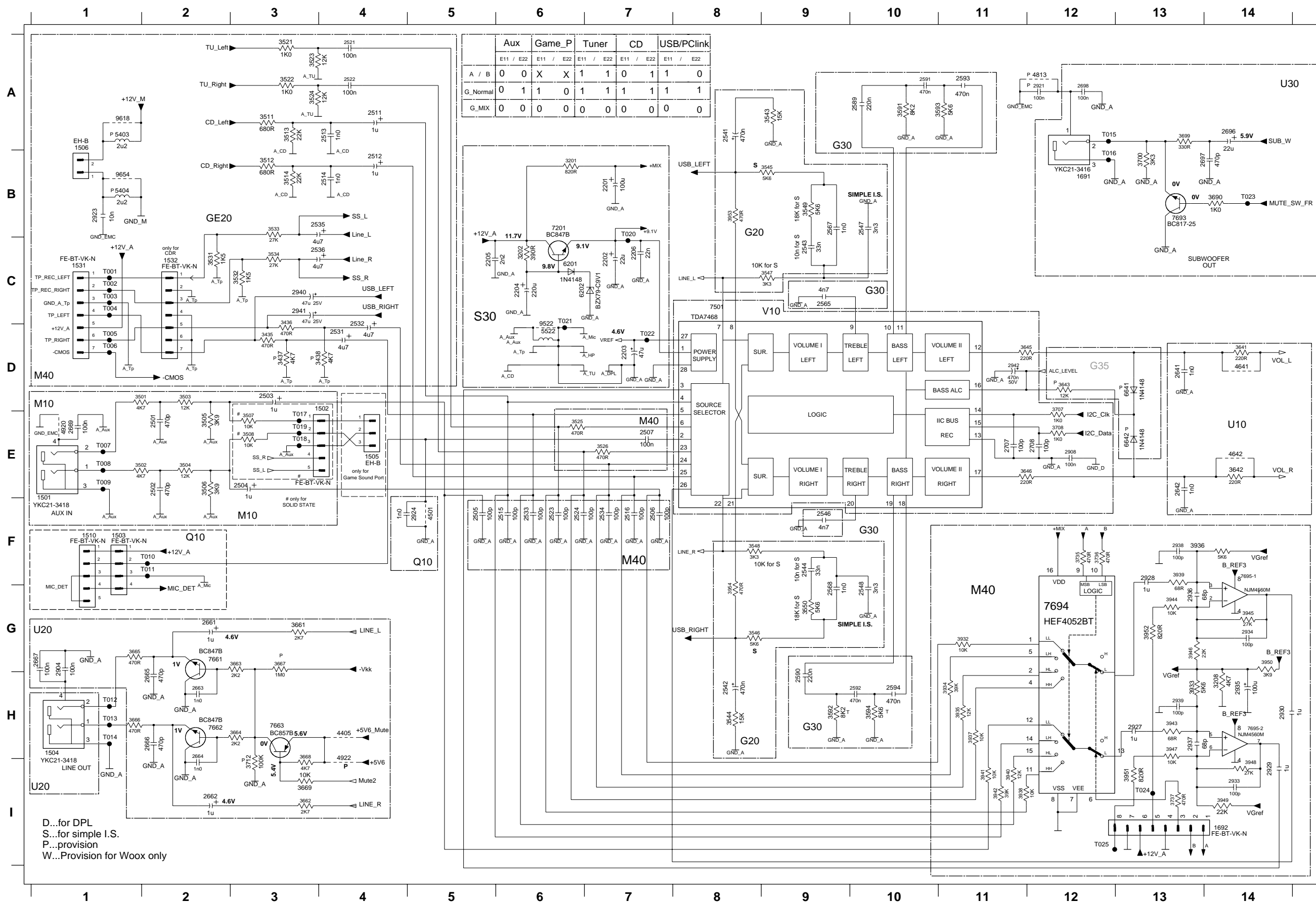




# AF12 BOARD - CHIP LAYOUT

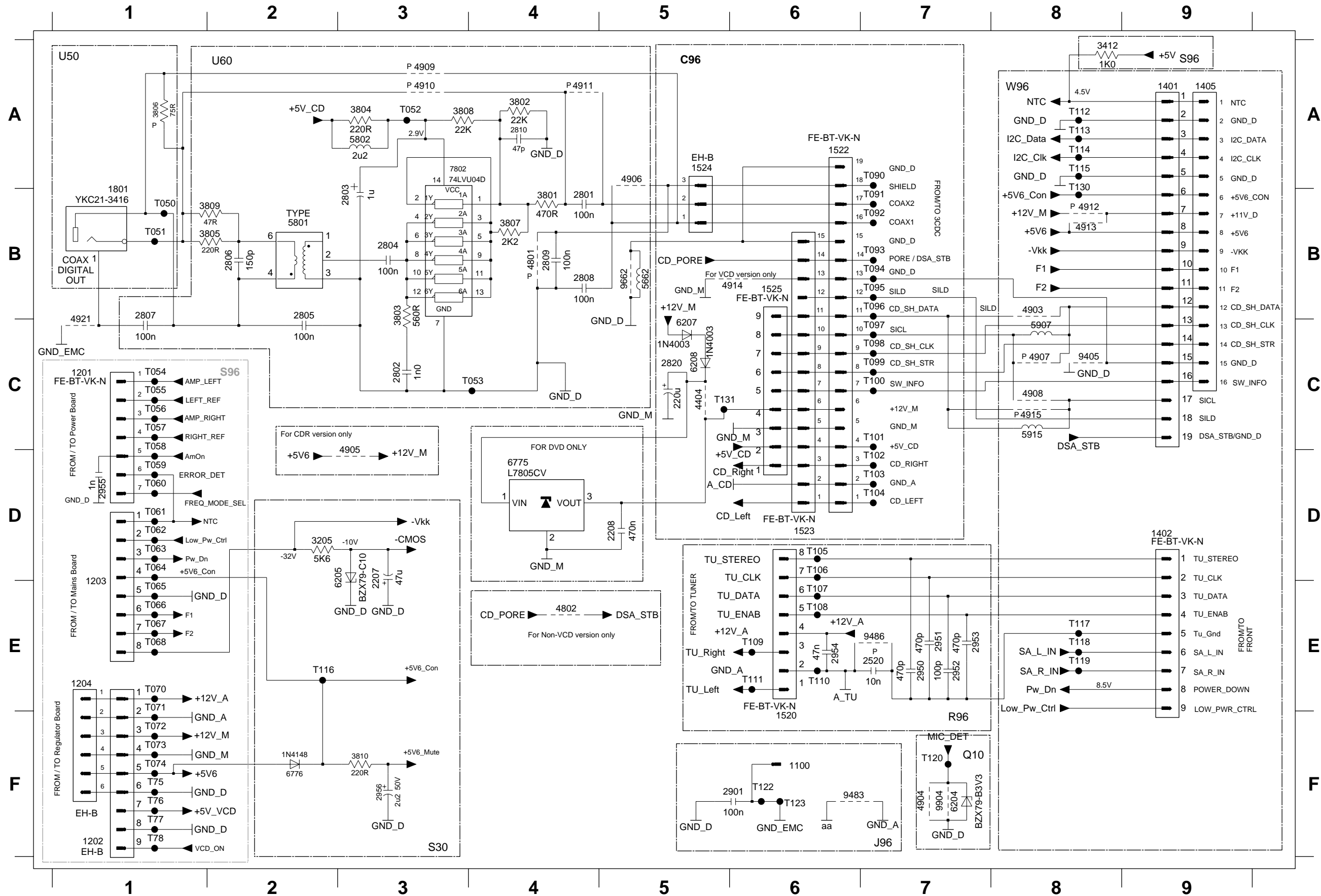


# AF12 BOARD - CIRCUIT DIAGRAM (PART 1)



- 1501 E1
- 1502 D3
- 1503 F1
- 1504 H1
- 1505 E4
- 1506 A1
- 1510 F1
- 1531 C1
- 1532 C2
- 1691 B12
- 1692 H4
- 2201 B7
- 2202 C7
- 2203 D7
- 2204 C6
- 2205 C5
- 2206 C7
- 2501 E2
- 2502 E2
- 2503 D3
- 2504 E3
- 2505 F5
- 2506 F7
- 2507 E7
- 2511 A4
- 2512 B4
- 2513 A4
- 2514 B4
- 2515 F6
- 2516 F7
- 2521 A4
- 2522 A4
- 2523 F6
- 2524 F6
- 2531 D4
- 2532 D4
- 2533 F6
- 2534 F7
- 2535 B3
- 2536 C3
- 2541 A8
- 2542 H8
- 2543 C9
- 2544 F9
- 2545 F9
- 2546 F9
- 2547 B10
- 2548 G10
- 2565 C9
- 2566 G9
- 2568 G9
- 2569 A10
- 2590 H9
- 2591 A10
- 2592 H10
- 2593 A11
- 2594 H10
- 2641 D13
- 2642 E13
- 2661 G2
- 2662 I2
- 2663 H2
- 2664 H2
- 2665 H2
- 2666 H2
- 4267 E1
- 4268 E1
- 4925 H4
- 4926 A14
- 2698 A12
- 2707 E11
- 2708 E12
- 2904 G1
- 2908 C12
- 2921 A12
- 2923 B1
- 2924 F5
- 2927 H13
- 2928 F13
- 2929 H4
- 2930 H14
- 2933 H14
- 2934 F14
- 2935 H14
- 2936 G13
- 2937 H13
- 2938 F13
- 2939 H13
- 2940 C3
- 2941 C3
- 2942 D11
- 3201 B6
- 3202 C6
- 3208 H14
- 3435 D3
- 3436 C3
- 3437 D3
- 3438 D4
- 3501 E1
- 3502 E1
- 3503 D2
- 3504 E2
- 3505 E2
- 3506 E2
- 3507 E3
- 3508 E3
- 3511 A3
- 3512 B3
- 3513 A3
- 3514 B3
- 3521 A3
- 3522 A3
- 3523 A3
- 3524 A3
- 3525 E6
- 3526 E7
- 3531 C2
- 3532 C3
- 3533 B3
- 3534 C3
- 3543 A9
- 3544 H8
- 3545 B9
- 3546 G8
- 3547 C9
- 3548 F8
- 3549 B9
- 3550 G9
- 3591 A10
- 3592 H9
- 3593 A11
- 3594 H10
- 3641 D14
- 3642 E14
- 3643 D12
- 3645 D11
- 3646 E11
- 3661 G3
- 3662 I3
- 3663 G3
- 3664 H3
- 3665 G1
- 3666 H1
- 3667 G3
- 3668 H3
- 3669 I3
- 3690 B14
- 3699 A13
- 3700 B13
- 3707 D12
- 3708 E12
- 3712 I3
- 3735 F12
- 3736 D12
- 3737 H3
- 3932 G11
- 3933 H13
- 3934 H11
- 3935 H11
- 3942 H11
- 3943 H13
- 3944 G13
- 3945 G13
- 3939 F13
- 3940 H11
- 3941 H11
- 3942 H11
- 3943 H13
- 3944 G13
- 3945 G13
- 3946 G13
- 3947 H13
- 3948 H14
- 3949 H14
- 3950 G14
- 3951 H3
- 3952 H3
- 3953 B8
- 3954 G8
- 4501 F5
- 4641 D14
- 4642 E14
- 4813 A12
- 4925 H4
- 5403 A1
- 5404 B1
- 5522 D6
- 6201 C6
- 6202 C6
- 6541 D13
- 6642 E13
- 7201 B6
- 7501 C8
- 7661 G2
- 7662 H2
- 7663 H3
- 7693 B13
- 7694 D12
- 7695-1 F14
- 7695-2 H14
- 9522 D6
- 9618 A1
- 9654 B1
- 1001 C1
- 1002 C1
- 1003 C1
- 1004 C1
- 1005 D1
- 1006 D1
- 1007 E1
- 1008 E1
- 1009 E1
- 1010 F2
- 1011 F2
- 1012 H1
- 1013 H1
- 1014 H1
- 1015 A12
- 1016 B12
- 1017 E3
- 1018 E3
- 1019 E3
- 1020 B7
- 1021 C6
- 1022 D7
- 1023 B14
- 1024 H3
- 1025 H12

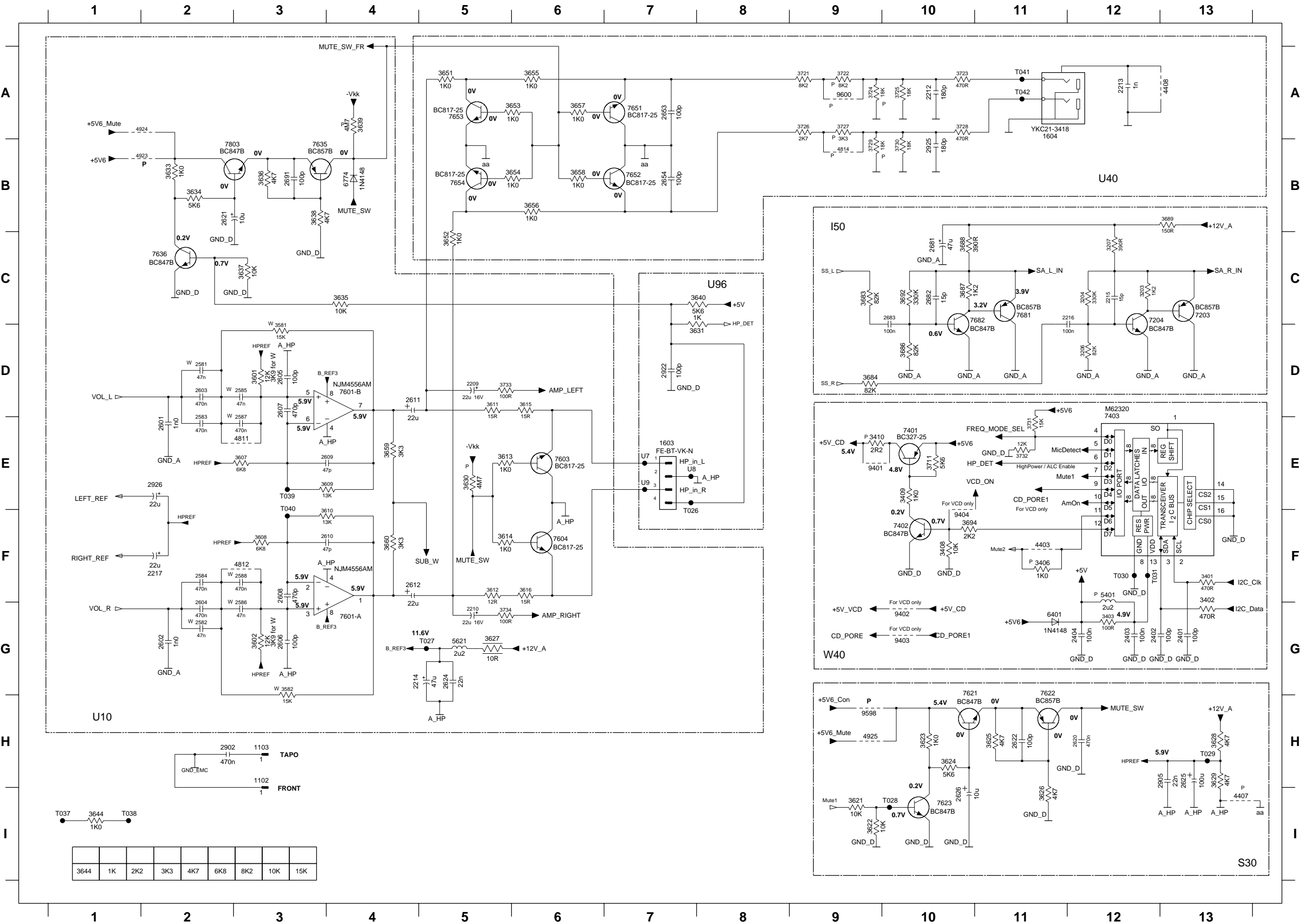
AF12 BOARD - CIRCUIT DIAGRAM (PART 2)



- T75 F1
- T76 F1
- T77 F1
- T78 F1
- 1100 F6
- 1201 C1
- 1202 F1
- 1203 E1
- 1204 E1
- 1401 A9
- 1402 D9
- 1401 A9
- 1405 A9
- 1520 F6
- 1522 A6
- 1523 D6
- 1524 A5
- 1525 B6
- 1801 B1
- 2207 D3
- 2208 D5
- 2520 E7
- 2802 C3
- 2803 B3
- 2804 B3
- 2805 B2
- 2806 B2
- 2807 B1
- 2808 B4
- 2809 B4
- 2810 A4
- 2820 C5
- 2901 F6
- 2950 E7
- 2951 E7
- 2952 E7
- 2953 E7
- 2954 E6
- 2955 D1
- 2956 F3
- 3205 D2
- 3412 A8
- 3801 B4
- 3802 A4
- 3803 B3
- 3804 A3
- 3805 B2
- 3806 A1
- 3807 B4
- 3808 A3
- 3809 B2
- 3810 F3
- 4404 C5
- 4801 B4
- 4802 E4
- 4903 B8
- 4904 F7
- 4905 D3
- 4906 A5
- 4907 C8
- 4908 C8
- 4909 A3
- 4910 A3
- 4911 A4
- 4912 B8
- 4913 B8
- 4914 B6
- 4915 C8
- 4921 C1
- 5662 B5
- 5801 E2
- 5802 A3
- 5907 C8
- 5915 C8
- 6204 F7
- 6205 D3
- 6207 B5
- 6208 C5
- 6775 D4
- 6776 F2
- 7802 A3
- 9405 C8
- 9483 F6
- 9486 E7
- 9662 B5
- 9904 F7
- T050 B1
- T051 B1
- T052 A3
- T053 C4
- T054 C1
- T055 C1
- T057 C1
- T058 C1
- T059 D1
- T060 D1
- T061 B1
- T062 D1
- T063 B1
- T064 B1
- T065 B1
- T066 B1
- T067 B1
- T068 B1
- T070 B1
- T071 B1
- T072 B1
- T073 B1
- T074 B1
- T075 B1
- T076 B1
- T077 B1
- T078 B1
- T090 B1
- T091 B1
- T092 B1
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- T101 B1
- T102 B1
- T103 B1
- T104 B1
- T105 B1
- T106 B1
- T107 B1
- T108 B1
- T109 B1
- T110 B1
- T111 B1
- T112 B1
- T113 B1
- T114 B1
- T115 B1
- T130 B1
- T131 B1
- T122 B1
- T123 B1
- T124 B1
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- T127 B1
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- T129 B1
- T130 B1
- T131 B1

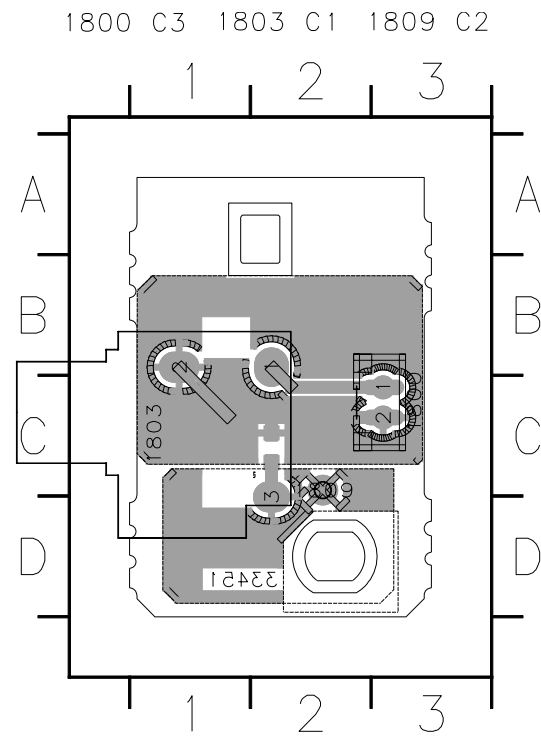


# AF12 BOARD - CIRCUIT DIAGRAM (PART 3)

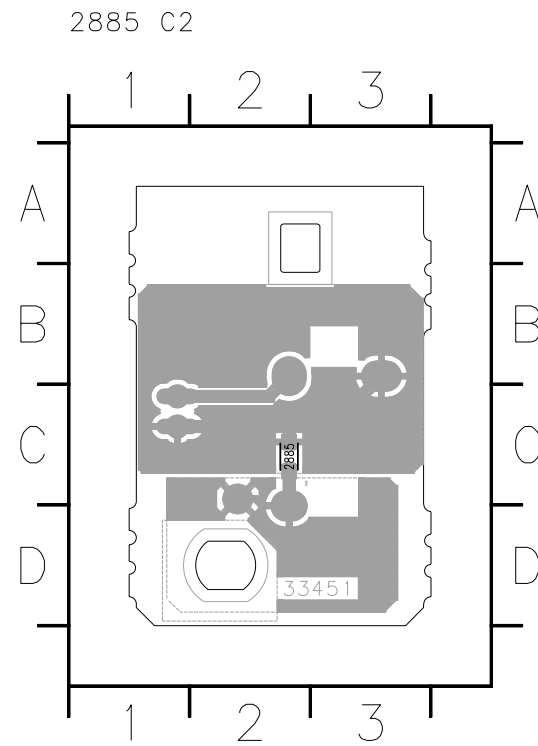


- U7 E7 3686 D10
- U8 E7 3687 C10
- U9 E7 3688 C10
- 1102 H3 3689 B13
- 1103 H3 3692 C10
- 1603 E7 3694 F10
- 1604 A11 3711 E10
- 2209 D5 3721 A9
- 2210 G5 3722 A9
- 2212 A10 3723 A10
- 2213 A12 3724 A9
- 2214 G4 3725 A10
- 2215 C12 3726 A9
- 2216 C12 3727 A9
- 2217 F2 3728 A10
- 2401 G13 3729 B9
- 2402 G12 3730 B10
- 2403 G12 3731 E11
- 2404 G12 3732 E11
- 2581 D2 3733 D5
- 2582 G2 3734 G5
- 2583 E2 4403 F11
- 2584 F2 4407 H13
- 2585 D3 4408 A13
- 2586 G3 4811 E3
- 2587 E3 4812 F3
- 2588 F3 4814 B9
- 2601 E2 4923 B2
- 2602 G2 4924 A2
- 2603 D2 4925 H9
- 2604 G2 5401 F12
- 2605 D3 5621 G5
- 2606 G3 6401 G11
- 2607 D3 6774 B4
- 2608 F3 7203 C13
- 2609 E4 7204 C12
- 2610 F4 7401 E10
- 2611 D4 7402 F10
- 2612 F4 7403 D12
- 2620 H12 7601-A G4
- 2621 B2 7601-B D4
- 2622 H11 7603 E5
- 2624 G5 7604 F6
- 2625 H13 7621 H10
- 2626 H10 7622 G11
- 2653 A7 7623 H10
- 2654 B7 7635 B3
- 2681 C10 7636 C2
- 2682 C10 7651 A7
- 2683 C10 7652 B7
- 2691 B3 7653 A5
- 2902 H2 7654 B5
- 2905 H13 7681 C11
- 2922 D7 7682 C10
- 2925 B10 7803 B3
- 2926 E2 9401 E9
- 3203 C12 9402 G10
- 3204 C12 9403 G10
- 3206 D12 9404 F10
- 3207 C12 9598 H9
- 3401 F13 9600 A9
- 3402 F13 T026 F7
- 3403 G12 T027 G5
- 3406 F11 T028 H10
- 3408 F10 T029 H13
- 3409 E10 T030 F12
- 3410 E9 T031 F12
- 3581 D3 T037 H1
- 3582 G3 T038 I1
- 3601 D3 T039 E3
- 3602 G3 T040 F3
- 3607 E3 T041 A11
- 3608 F3 T042 A11
- 3609 E4 3624 H10
- 3610 F4 3625 H11
- 3611 D5 3626 H11
- 3612 F5 3627 G5
- 3613 E5 3628 H13
- 3614 F5 3629 H13
- 3615 D6 3630 E5
- 3616 F6 3631 D8
- 3621 I9 3632 B2
- 3622 I9 3633 B2
- 3623 H10 3634 B2
- 3624 H10 3635 C4
- 3625 H11 3636 B3
- 3626 H11 3637 C3
- 3627 G5 3638 B3
- 3628 H13 3639 A4
- 3629 H13 3640 C8
- 3630 E5 3644 I1
- 3631 D8 3651 A5
- 3632 B2 3652 C5
- 3633 B2 3653 A6
- 3634 B2 3654 B6
- 3635 C4 3655 A6
- 3636 B3 3656 B6
- 3637 C3 3657 A6
- 3638 B3 3658 B6
- 3639 A4 3659 E4
- 3640 C8 3660 F4
- 3644 I1 3663 C9
- 3651 A5 3664 D9
- 3652 C5 3684 D9
- 3653 A6 3685 C9
- 3654 B6 3686 D10
- 3655 A6 3687 C10
- 3656 B6 3688 C10
- 3657 A6 3689 B13
- 3658 B6 3692 C10
- 3659 E4 3694 F10
- 3660 F4 3711 E10
- 3663 C9 3721 A9
- 3684 D9 3722 A9
- 3685 C9 3723 A10
- 3686 D10 3724 A9
- 3687 C10 3725 A10
- 3688 C10 3726 A9
- 3689 B13 3727 A9
- 3692 C10 3728 A10
- 3694 F10 3729 B9
- 3711 E10 3730 B10
- 3721 A9 3731 E11
- 3722 A9 3732 E11
- 3723 A10 3733 D5
- 3724 A9 3734 G5
- 3725 A10 4403 F11
- 3726 A9 4407 H13
- 3727 A9 4408 A13
- 3728 A10 4811 E3
- 3729 B9 4812 F3
- 3730 B10 4814 B9
- 3731 E11 4923 B2
- 3732 E11 4924 A2
- 3733 D5 4925 H9
- 3734 G5 5401 F12
- 3735 A10 5621 G5
- 3736 A9 6401 G11
- 3737 A9 6774 B4
- 3738 A10 7203 C13
- 3739 B9 7204 C12
- 3740 A10 7401 E10
- 3741 E10 7402 F10
- 3742 A9 7403 D12
- 3743 A10 7601-A G4
- 3744 A9 7601-B D4
- 3745 A9 7603 E5
- 3746 A9 7604 F6
- 3747 A9 7621 H10
- 3748 A9 7622 G11
- 3749 A9 7623 H10
- 3750 A9 7635 B3
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- 3752 A9 7651 A7
- 3753 A9 7652 B7
- 3754 A9 7653 A5
- 3755 A9 7654 B5
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- 3758 A9 7803 B3
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- 3760 A9 9402 G10
- 3761 A9 9403 G10
- 3762 A9 9404 F10
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- 3768 A9 T029 H13
- 3769 A9 T030 F12
- 3770 A9 T031 F12
- 3771 A9 T037 H1
- 3772 A9 T038 I1
- 3773 A9 T039 E3
- 3774 A9 T040 F3
- 3775 A9 T041 A11
- 3776 A9 T042 A11

**VIDEO OUT CINCH BOARD - COMPONENT LAYOUT**



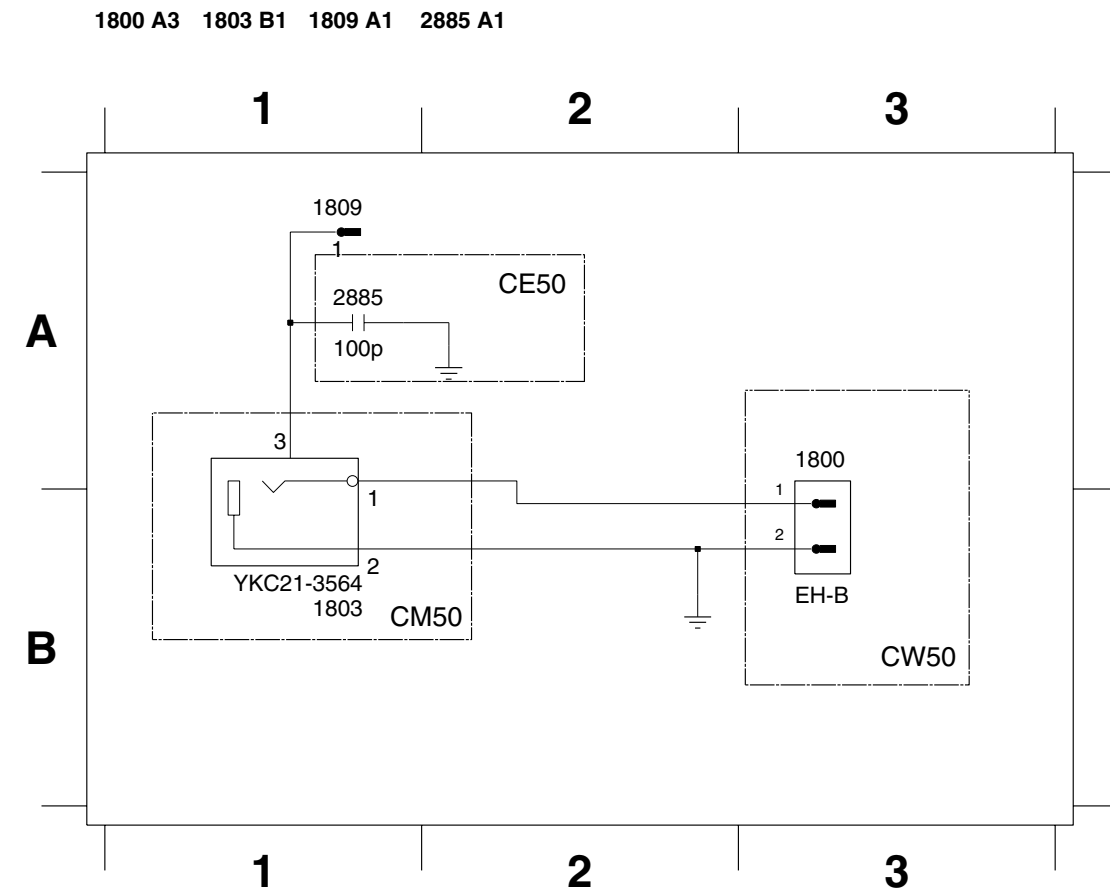
**VIDEO OUT CINCH BOARD - CHIP LAYOUT**



**ELECTRICAL PARTS - AF12 BOARD**

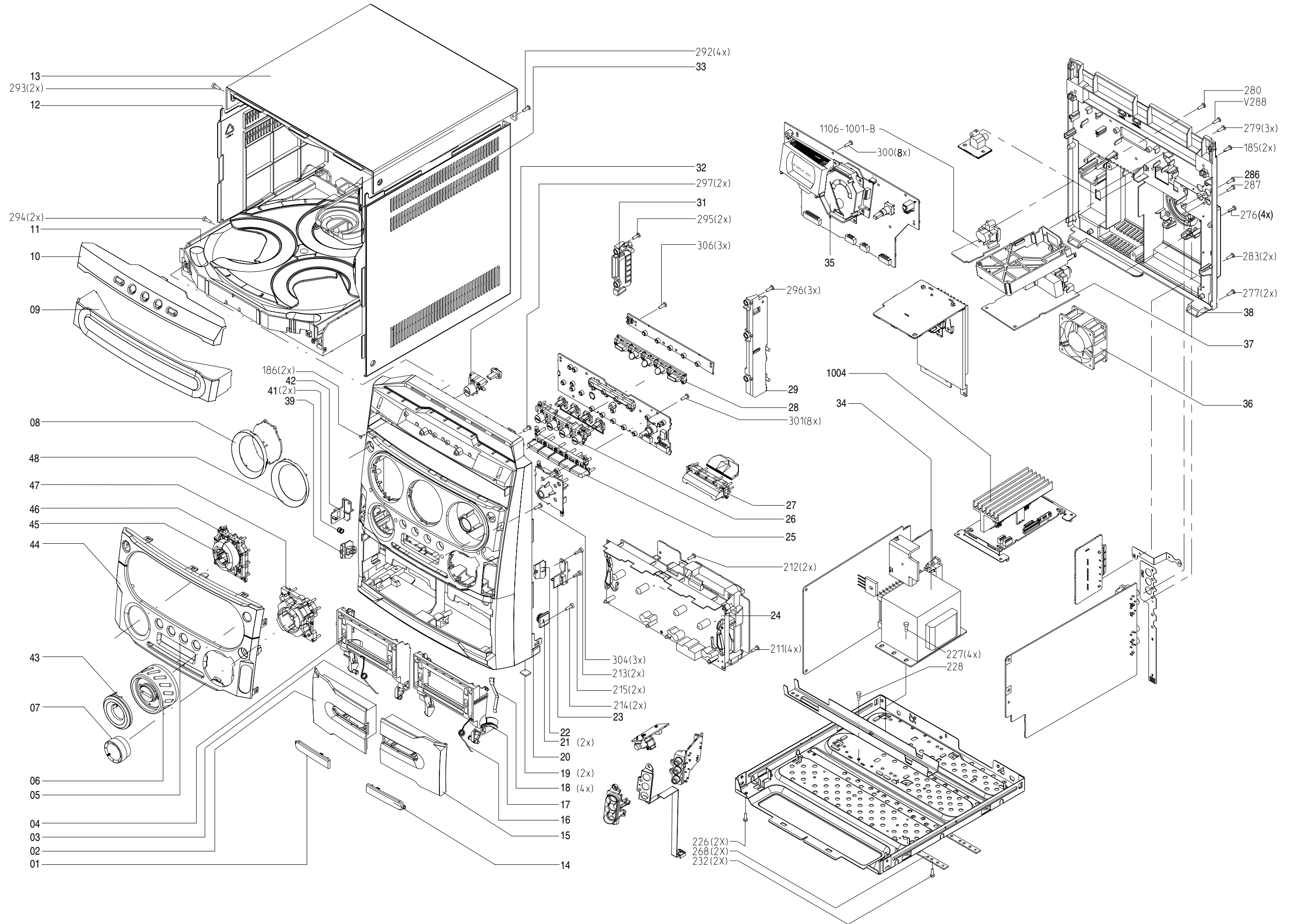
1501	996500014506	SOC CINCH H 2P
1504	996500014506	SOC CINCH H 2P
1803	994000001852	SOC CINCH H 1P
3627	△ 996500018242	FUSE RES NFR 25A 10R
7403	482220917345	IC M62320FP
7501	932215074668	IC TDA7468D
7601	532220915853	IC NJM4556AM-TE1
7694	532220911102	IC HEF4052BT
7695	482220983357	IC NJM4560M

**VIDEO OUT CINCH BOARD - CIRCUIT DIAGRAM**



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

# SET MECHANICAL EXPLODED VIEW



**MECHANICAL & ACCESSORIES**

1	994000001825	LENS CASSETTE LEFT	994000001811	L/R BOX SPK ASSY /22
2	994000001823	COVER CASS LEFT	994000002827	L/R BOX SPK ASS'Y /07
3	994000001849	SPRING TORSION LEFT	994000001786	FM AERIAL /22
4	994000001821	CASS DOOR LEFT	994000002828	FM ANT 300R CABLE 2.6M /07
6	994000001827	KNOB VOL MASTER	994000001787	ANT AM LOOP LAN-006 /22
7	994000001832	KNOB RTY (GAME SOUND)	994000001192	AM LOOP ANT LAN-031 /07
8	994000001839	COVER RING FTD	994000001788	REMOTE CONTROL /22
9	994000001815	COVER TRAY CDC	994000002826	REMOTE CONTROL /07
10	994000001814	PANEL COVER CDC DISC	△ 994000001789	AC CORD /22
10	994000001814	PANEL COVER CDC DISC /22	△ 994000001688	AC CORD SET 6FT /07
11	994000002248	PANEL COVER CDC DISC /07	994000001025	CD DA12T3 ASSY
12	994000001818	PANEL LEFT	994000001315	RCA PLUG CORD 1P 1M5 /07
13	994000001817	COVER TOP	994000001791	CBLE CINCH/1M7/CINCH /22
14	994000001826	LENS CASSETTE RIGHT		
15	994000001824	COVER CASS RIGHT		
16	994000001851	SPRING TORSION RIGHT		
17	994000001822	CASS DOOR RIGHT		
18	482249242787	SPRING CASSETTE		
19	994000001848	FOOT RUBBER 4mm		
20	994000001812	FRONT CAB.		
21	994000001843	DAMPER ASSY MODULE 0.8		
22	994000001846	PUSH-CATCH RIGHT		
23	994000001844	BRACKET-RIGHT		
25	994000001838	BUTTON CASSETTE		
26	994000001837	BUTTON SOURCE (WOOX)		
27	994000001836	BUTTON MAX-WOOX		
28	994000001831	BUTTON SET CDC SELECT		
29	313911470980	BRACKET CDC RIGHT		
31	313911470970	BRACKET CDC LEFT		
32	994000001829	BUTTON POWER STANDBY		
33	994000001819	PANEL RIGHT		
34	△ 994000001794	TRAFO MAINS UCD 240W/22		
34	△ 994000002246	TRAFO MAINS UCD 110W/07		
35	994000001796	METER VU FOR MINI404		
36	994000001795	FAN 12V DC 0.8W		
38	994000001816	BACK PANEL		
39	994000001847	PUSH CATCH LEFT		
41	482249242787	SPRING COMPRESSION		
42	994000001845	BRACKET-LEFT		
43	994000001828	CAP KNOB VOL PNT		
44	994000001813	PANEL FRONT DISPLAY /22		
44	994000002247	PANEL FRONT DISPLAY /07		
45	994000001835	BUTTON CONTROL PLAY(1)		
46	994000001834	BUTTON CONTROL (2)		
47	994000001833	BUTTON DSC/DBB/VAC		
48	994000001842	COVER RING VU METER		

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

**ELECTRICAL PARTS - MISCELLANEOUS**

994000001797	FFC FOIL 04P/180/04P
994000001798	FFC FOIL 06P/080/06P
994000001799	FFC FOIL 07P/180/07P
994000001801	FFC FOIL 07P/180/07P
994000001802	FFC FOIL 07P/220/07P
994000001803	FFC FOIL 08P/180/08P
994000001804	FFC FOIL 08P/280/08P
994000001805	FFC FOIL 08P/280/08P
994000001806	FFC FOIL 09P/280/09P
994000001807	FFC FOIL 11P/180/11P
994000001808	FFC FOIL 15P/180/15P
994000001809	FFC FOIL 19P/280/19P
994000001922	TUNER BOARD ASS'Y /22
994000002245	TUNER BOARD ASS'Y /07
994000001915	MAIN BOARD ASS'Y
994000001916	FRONT BOARD ASS'Y /22
994000002243	FRONT BOARD ASS'Y /07
994000001917	KEY BOARD ASS'Y
994000001918	AMP BOARD ASS'Y
994000001919	MAINS UCD BOARD ASS'Y /22
994000002244	MAINS UCD BOARD ASS'Y /07
994000001921	REGULATOR BOARD ASS'Y
994000001923	SPEAKER BOARD ASS'Y

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



## REVISION LIST

### **Version 1.0 (3141 785 30180)**

\* Initial Release FWM70/22

### **Version 1.1 (3141 785 30181)**

\* Add FWM70/07 information,

- 1) Page 1-2 Version Variations add /07 version
- 2) Page 1-3 Specifications add /07 version.
- 3) Page 8-13 and page 12-2 partslist adapted.
- 4) Chapter 7A - ECO6 Non Genelec have been added.