

Service  
Service  
**Service**

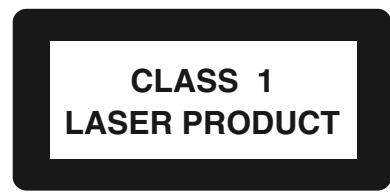


# Service Manual



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3140 785 32360

Version 1.0



**PHILIPS**



## SPECIFICATIONS

### GENERAL:

Mains voltage : 110-127V/220-240V Switchable for /21/21M  
 230V for /22/30/33/34  
 Mains frequency : 50/60Hz  
 Power consumption : < 1W at ECO Standby (FTD off)  
 < 25W Standby (Demo off)  
 < 175W 1/8 Prated  
 Clock accuracy : < 4 seconds per day  
 Dimension centre unit : 265 x 310 x 381mm

### TUNER:

#### FM

Tuning range : 87.5-108MHz  
 65.81-74MHz for /34 <sup>1)</sup>  
 Grid : 50kHz (& 30kHz for /34)  
 IF frequency : 10.7MHz ± 20kHz  
 Aerial input : 75Ω coaxial  
 Sensitivity at 26dB S/N : < 7μV  
 Selectivity at 600kHz bandwidth : > 25dB  
 IF rejection : > 60dB [> 75dB]  
 Image rejection : > 25dB  
 Distortion at RF=1mV, dev. 75kHz : < 3%  
 -3dB Limiting point : < 8μV  
 Crosstalk at RF=1mV, dev. 40kHz : > 18dB

#### MW

Tuning range : 531-1602kHz  
 530-1700kHz for /21/21M  
 Grid : 9kHz  
 10kHz for /21/21M  
 IF frequency : 450kHz ± 1kHz  
 Aerial input : Frame aerial  
 Sensitivity at 26dB S/N : < 4.0mV/M  
 Selectivity at 18kHz bandwidth : > 18dB  
 IF rejection : > 45dB  
 Image rejection : > 28dB  
 Distortion at RF=50mV, m=80% : < 5%

#### LW

Tuning range : 153-279kHz for /22  
 Grid : 3kHz  
 IF frequency : 450kHz ± 1kHz  
 Aerial input : Frame aerial  
 Sensitivity at 26dB S/N : < 7.0mV/M  
 Selectivity at 18kHz bandwidth : > 24dB  
 IF rejection : > 30dB  
 Image rejection : > 30dB  
 Distortion at RF=50mV, m=80% : < 5%

### AMPLIFIER:

Output power (6Ω, 1 kHz, 10% THD) : 2 x 60W  
 Frequency response within -3dB : 60Hz-16kHz  
 Dynamic Bass Boost : DBB OFF, DBB 1, DBB 2, DBB 3 <sup>2)</sup>  
 Digital Sound Control : Jazz, Rock, Techno, Optimal <sup>2)</sup>  
 VEC Control : Cinema, Hall, Concert <sup>2)</sup>  
 Incredible Surround : IS ON, IS OFF <sup>2)</sup>  
 Max Sound : Max Sound, Max off <sup>2)</sup>  
 Headphone output at 32Ω : 15mW ± 2dB  
 5mW ± 2dB (CD mode)

### Input sensitivity

Aux / CDR : 500mV /1.0V at 600Ω  
 Mic : {3.5mV ± 3dB} at 600Ω

### CASSETTE RECORDER:

Number of track : 2 x 2 stereo  
 Tape speed : 4.76 cm/sec ± 2%  
 Wow and flutter : < 0.4% DIN  
 Fast-wind/rewind time C60 : 130 sec  
 Bias system : 75kHz ± 10kHz  
 Rec/Pb frequency response within 8dB : 80Hz - 12.5kHz  
 Signal to noise ratio Ferro : > 48dBA

### COMPACT DISC:

Measurement done at output conn. of the CDC module.  
 Frequency response within ± 1.5dB : 20Hz - 20kHz  
 Output level (in Vrms) : 550mV ± 1dB, Z<sub>out</sub> = 100Ω  
 Signal/Noise ratio (A-weighted) : > 80dBA  
 Distortion at 1kHz : < 0.003%  
 Channel unbalance at 1kHz : ± 1dB  
 Channel separation at 1kHz : > 60dB  
 De-emphasis : 0 or 15/50 mS (Switched by subcode  
 on the disc)

[...] Values indicated are strictly for "Cenelec version" only

{...} Values for Karaoke version only

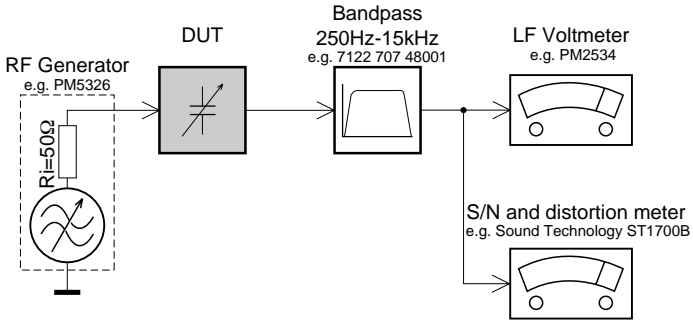
<sup>1)</sup> Default setting is OFF, to switch on please refer page 3-1.

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

<sup>3)</sup> 6Ω, 60Hz - 12,5 kHz, 10% THD for /37 only.

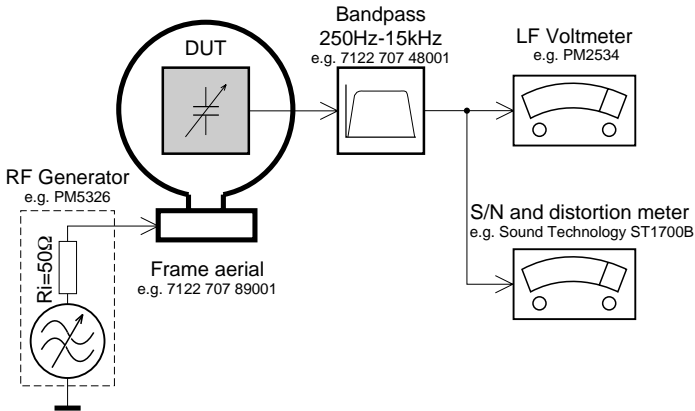
# MEASUREMENT SETUP

## Tuner FM



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

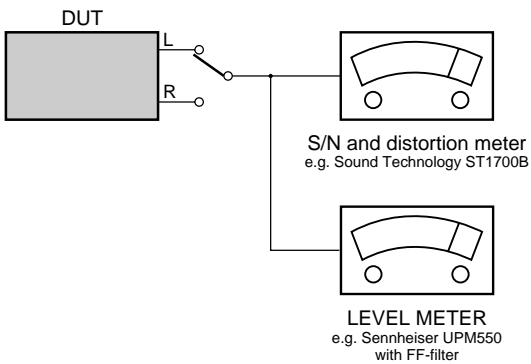
## Tuner AM (MW,LW)



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).

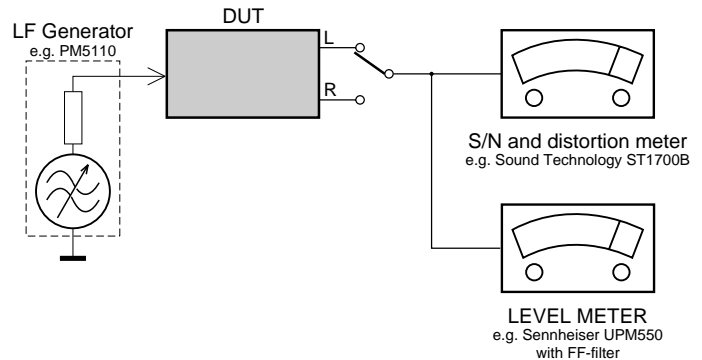
## CD

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

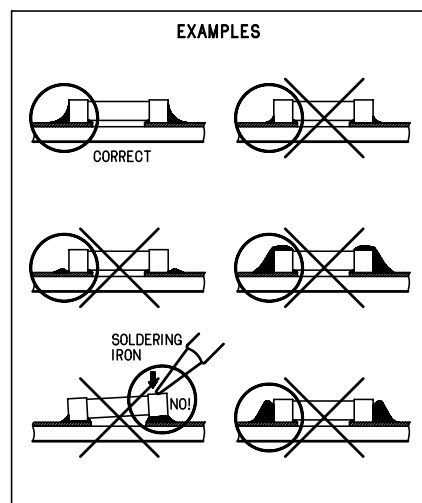
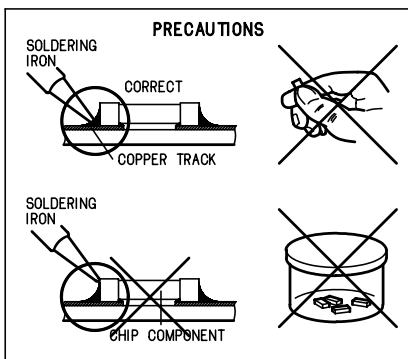
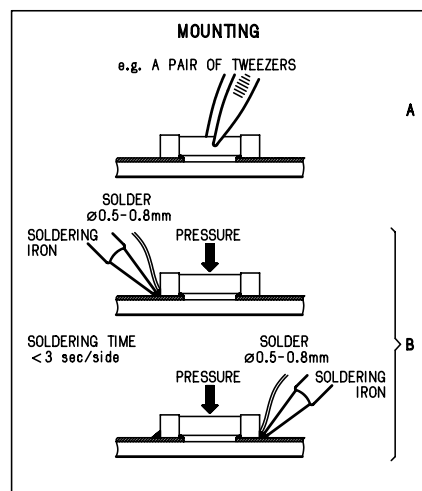
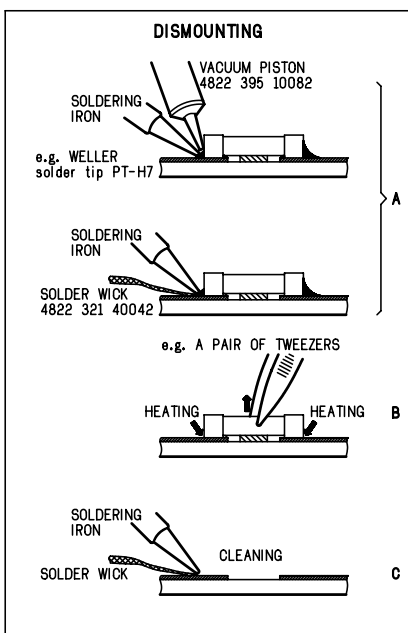
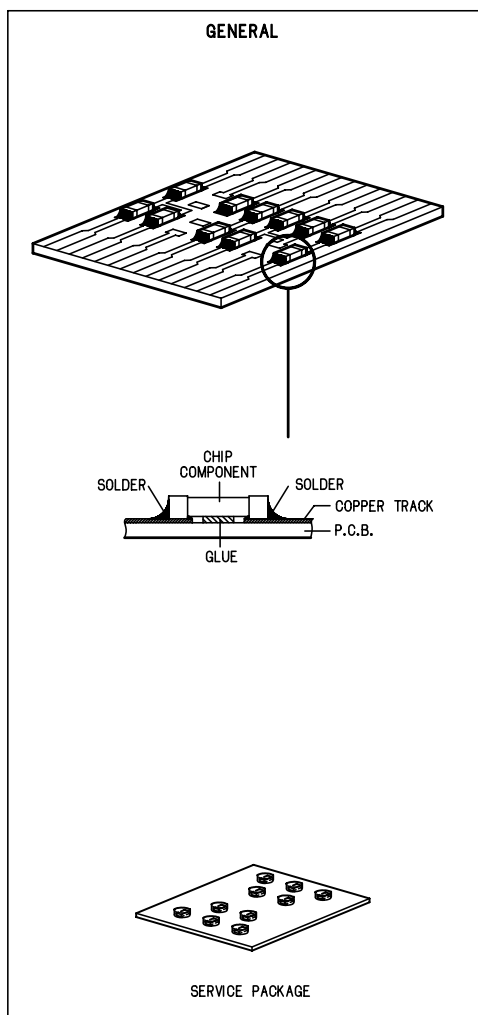
## Compact Disc:

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 hetzelfde potentiaal.

**(F) ATTENTION**

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

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

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

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

**(D) WARNUNG**

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

Unvorsichtige Behandlung im Reparaturfall kann die Lebensdauer drastisch reduzieren.

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

Bauteile und Hilfsmittel auch auf dieses gleiche Potential halten.

**(I) AVVERTIMENTO**

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

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

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

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

**(GB)**

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

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

**(NL)**

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

**(F)**

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

**(D)**

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

**(I)**

Le norme di sicurezza esigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati i pezzi di ricambio identici a quelli specificati.

"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.

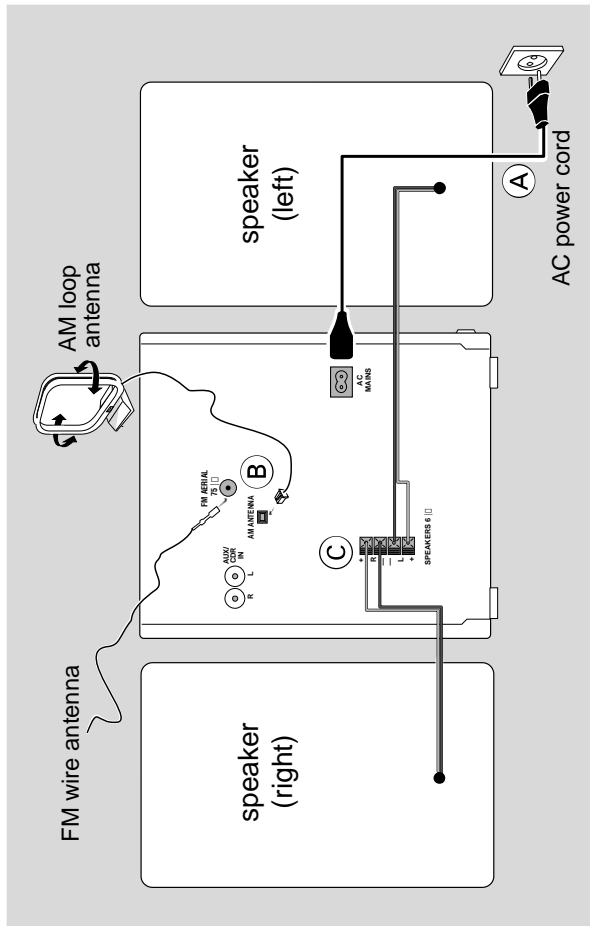
**(SF) Varoitus !**

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

**(DK) Advarse !**

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

# Preparations



# Preparations

**Optional connection**  
The optional equipment and connecting cords are not supplied. Refer to the operating instructions of the connected equipment for details.

**Connecting other equipment to your system**

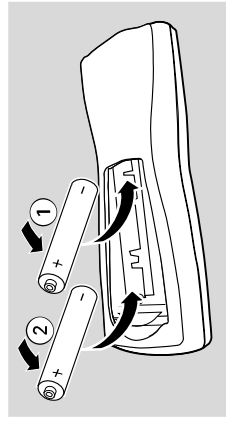
Use a cinch cable to connect **AUX/CDR IN** to the analogue audio out terminals of an external equipment (TV, VCR, Laser Disc player, DVD player or CD Recorder).

**Note:**

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

**Inserting batteries into the remote control**

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



**CAUTION!**

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

**FM Antenna**

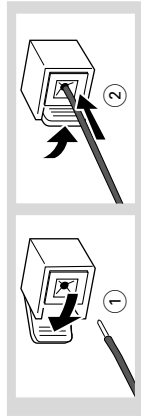


For better FM stereo reception, connect an outdoor FM antenna to the **FM ANTENNA** terminal.

**Speakers Connection**

**Front Speakers**

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



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

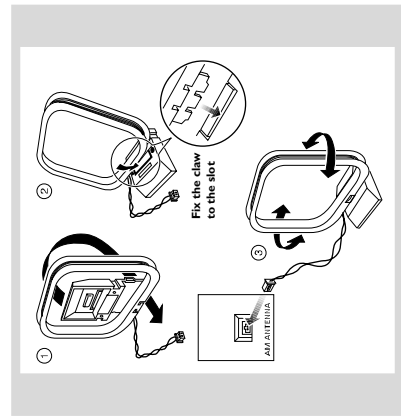
**Notes:**

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

**Antennas Connection**

Connect the supplied AM loop antenna and FM antenna to the respective terminals. Adjust the position of the antenna for optimal reception.

**AM Antenna**



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

**Rear connections**

The type plate is located at the rear of the system.  
For users in the U.K.: please follow the instructions on page 1-9.

**Power**

Before connecting the AC power cord to the wall outlet, ensure that all other connections have been made.

**WARNING!**

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

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).

# Controls

## Controls on the system and remote control

- 1 **STANDBY ON**
  - to switch the system on or to standby mode.
- 2 **ECO POWER**
  - to switch the system on or to Eco Power standby mode.
- 3 **DISC 1/2/3 (CD DIRECT 1/2/3)**
  - to select a disc tray for playback.
- 4 **Source selection** – to select the following:
  - CD** (CD 1•2•3)
  - to select disc tray 1, 2 or 3.
  - TUNER** (BAND)
    - to select waveband : FM, MW or LW.
  - TAPE** (TAPE 1•2)
    - to select tape deck 1 or 2.
  - AUX** (VIDEO/CDR)
    - to select the input for an additional appliance : AUX or CDR.

### 5 Mode Selection

- 4 **SEARCH•TUNING**
  - for CD ..... to search backward/forward.
  - for Tuner ..... to tune to a lower or higher radio frequency.
  - for Tape ..... to rewind or fast forward.
  - for Clock ..... (on the system only) to set the hour.

### ■ STOP•CLEAR (DEMO STOP)

- for CD ..... to stop playback or to clear a programme.
- for Tuner ..... (on the system only) to stop programming.
- for Tape ..... to stop playback or recording.
- for Demo ..... (on the system only) to activate/deactivate the demonstration.
- for Clock ..... (on the system only) to exit clock setting or cancel timer.
- for Plug & Play... (on the system only) to exit plug & play mode.

### ▶ II PLAY•PAUSE

- for CD ..... to start or interrupt playback.
- for Tape ..... to start playback.
- for Plug & Play... (on the system only) to initiate and start plug & play mode.

### ◀ PREV / ▶ NEXT (▼ PRESET ▲)

- for CD ..... to skip to the beginning of the current, previous, or next track.
- for Tuner ..... to select a preset radio station.
- for Clock ..... (on the system only) to set the minute.

### 6 SOUND NAVIGATION

- to select and activate the JOG control for the desired sound feature : DBB, DSC or VEC.

### 7 JOG

- to select the desired sound effect for the selected sound feature.
- DBB** ..... DBB 1, DBB 2 or DBB 3.
- DSC** ..... OPTIMAL, JAZZ, ROCK or TECHNO.
- VEC** ..... CINEMA, HALL or CONCERT.

### 8 INCREDIBLE SURROUND (INC. SURR.)

- to activate or deactivate the surround sound effect.

### 9 CLOCK•TIMER

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

### 10 Tape Deck Operation

- RECORD**
  - to start recording on tape deck 2.

### DUBBING

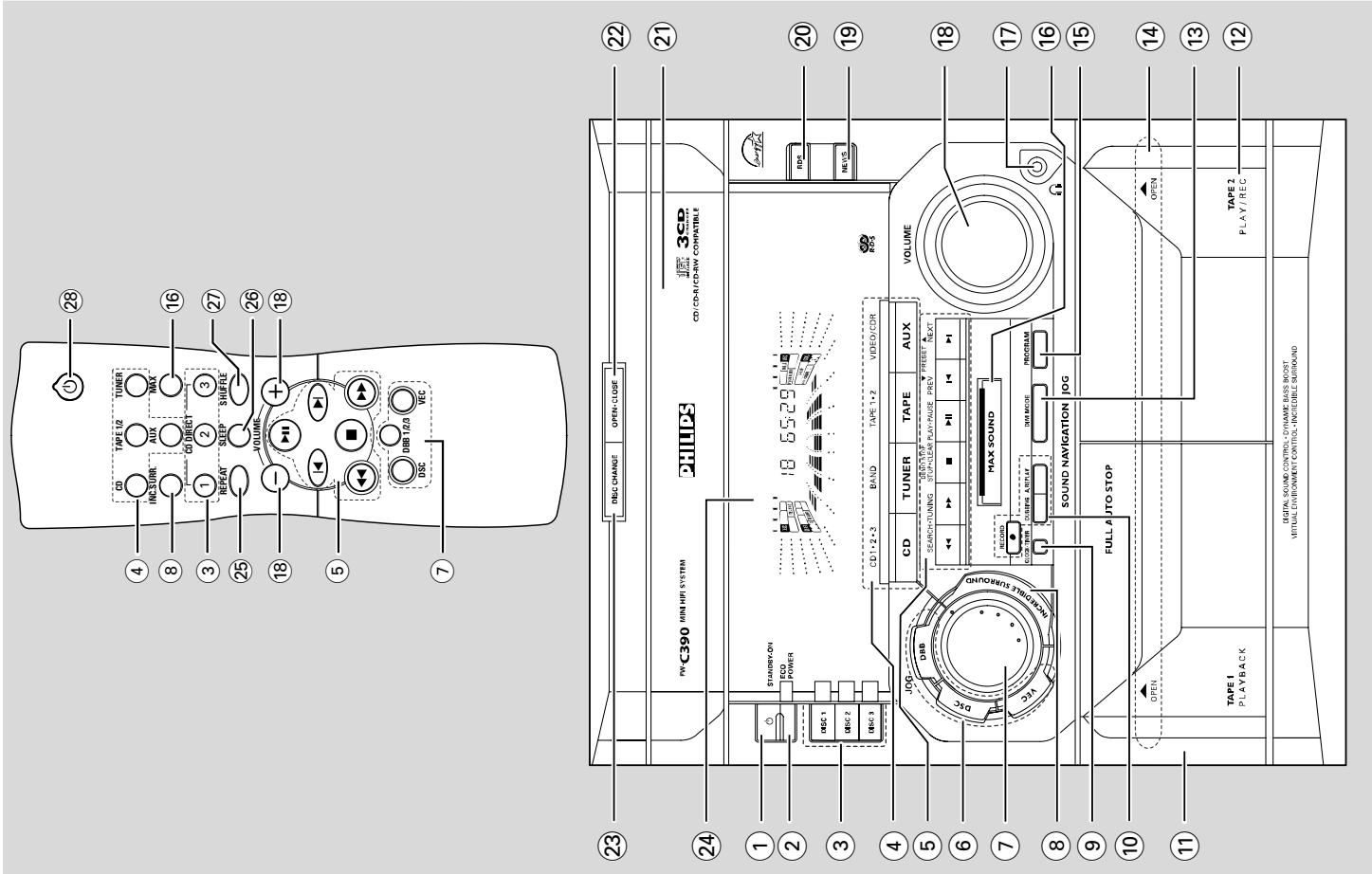
- to dub a tape.

### A. REPLAY

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







### 11 Tape deck 1

### 12 Tape deck 2





## Controls

- 13 DIM MODE**  
to select different brightness for the display screen : DIM 1, DIM 2, DIM 3 or DIM OFF.
- 14 ▲ OPEN**  
to open the tape deck door.
- 15 PROGRAM**  
for CD ..... to programme disc tracks.  
for Tuner ..... to programme preset radio stations.  
for Clock ..... to select 12- or 24-hour clock mode.
- 16 MAX SOUND (MAX)**  
to activate or deactivate the optimal mix of various sound features.
- 17 **  
to connect headphones.
- 18 VOLUME (VOLUME +/-)**  
to increase or decrease the volume.
- 19 NEWS**  
to hear News automatically.
- 20 RDS**  
to select RDS information.
- 21 Disc tray**
- 22 OPEN•CLOSE**  
to open or close the disc tray.
- 23 DISC CHANGE**  
to change disc(s).
- 24 Display screen**  
to view the current status of the system.
- 25 REPEAT**  
to playback track(s)/disc(s)/programme repeatedly.
- 26 SLEEP**  
to activate/deactivate or set the sleep timer.
- 27 SHUFFLE**  
to playback all a available discs and their tracks/ programme in random order.
- 28 **  
to switch the system to standby mode.  
to switch the system to Eco Power standby mode.
- Notes for remote control:**  
– **First, select the source you wish to control by pressing one of the source select keys on the remote control (CD or TUNER, for example).**  
– **Then select the desired function (, , , , for example).**

## Important notes for users in the U.K.

### Mains plug

This apparatus is fitted with an approved 13 Amp plug. To change a fuse in this type of plug proceed as follows:

- 1** Remove fuse cover and fuse.
- 2** Fix new fuse which should be a BS1362 5 Amp, A.S.T.A. or BSI approved type.
- 3** Refit the fuse cover.

If the fitted plug is not suitable for your socket outlets, it should be cut off and an appropriate plug fitted in its place.

If the mains plug contains a fuse, this should have a value of 5 Amp. If a plug without a fuse is used, the fuse at the distribution board should not be greater than 5 Amp.

**Note:** These vered plug must be disposed of to avoid a possible shock hazard should it be inserted into a 13 Amp socket else where.

### How to connect a plug

The wires in the mains lead are coloured with the following code: blue = neutral (N), brown = live (L).

- As these colours may not correspond with the colour markings identifying the terminals in your plug, proceed as follows:
  - Connect the blue wire to the terminal marked N or coloured black.
  - Connect the brown wire to the terminal marked L or coloured red.
  - Do not connect either wire to the earth terminal in the plug, marked E (or  $\text{⏏}$ ) or coloured green (or green and yellow).

Before replacing the plug cover, make certain that the cord grip is clamped over the sheath of the lead - not simply over the two wires.

### Copyright in the U.K.

Recording and playback of material may require consent. See Copyright Act 1956 and The Performer's Protection Acts 1958 to 1972.

## Italia

### DICHIARAZIONE DI CONFORMITA'

Si dichiara che l'apparecchio FVW-C717 Philips risponde alle prescrizioni dell'art. 2 comma 1 del D.M. 28 Agosto 1995 n. 548.

Fatto a Eindhoven

Philips Consumer Electronics  
Philips, Glaslaan 2  
5616 JB Eindhoven, The Netherlands

## Norge

Typeskilt finnes på apparatens underside.

**Observed: Netthøyteren er sekundært innkoplet. Den innebygde nettdelen er derfor ikke frakoplet nettet så lenge apparatet er tilsluttet nettkontaktene.**

For å redusere faren for brann eller elektrisk støt, skal apparatet ikke utsettes for regn eller fuktighet.

## CAUTION

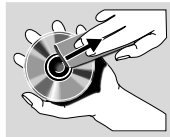
**Use of controls or adjustments or performance of procedures other than herein may result in hazardous radiation exposure or other unsafe operation.**

## Cleaning the Cabinet

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

## Cleaning Discs

When a disc becomes dirty, clean it with a cleaning cloth. Wipe the disc from the centre out.



Do not use solvents such as benzene, thinner, commercially available cleaners, or antistatic spray intended for analogue records.

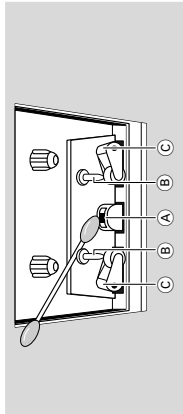
## Cleaning the disc lens

After prolonged use, dirt or dust may accumulate at the disc lens. To ensure good playback quality, clean the disc lens with Philips CD Lens Cleaner or any commercially available cleaner. Follow the instructions supplied with cleaner.

## Cleaning the Heads and the Tape Paths

To ensure good recording and playback quality, clean the heads (A), the capstan(s) (B), and pressure roller(s) (C) after every 50 hours of tape operation.

Use a cotton swab slightly moistened with cleaning fluid or alcohol. You can also clean the heads by playing a cleaning tape once.



## Demagnetising the heads

Use a demagnetising tape available at your dealer.

## RADIO RECEPTION

### Radio reception is poor

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

## TAPE OPERATION/RECORDING

### Recording or playback cannot be made.

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

### The tape deck door cannot open.

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

## GENERAL

### The system does not react when buttons are pressed.

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

### Sound cannot be heard or is of poor quality.

- Adjust the volume.
- Disconnect the headphones.
- Check that the speakers are connected correctly.
- Check if the stripped speaker wire is clamped.
- Check the speaker connections and location.

### The left and right sound outputs are reversed.

- Check the speaker connections and location.

### The remote control does not function properly.

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

### The timer is not working.

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

### Not all lighted buttons are showing light.

- Press DIM to select DIM OFF display mode.

### The Clock/Timer setting is erased.

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

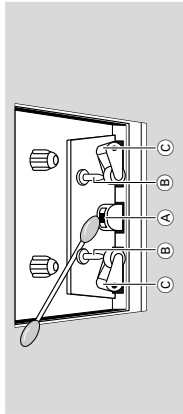
### The system displays features automatically

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

## WARNING

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

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



## Solution

Insert a disc.

Check if the disc is inserted upside down.

Wait until the moisture condensation at the lens has cleared.

Replace or clean the disc, see "Maintenance".

Use a finalised CD-RW or CD-R.

## WARNING

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

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

## Problem

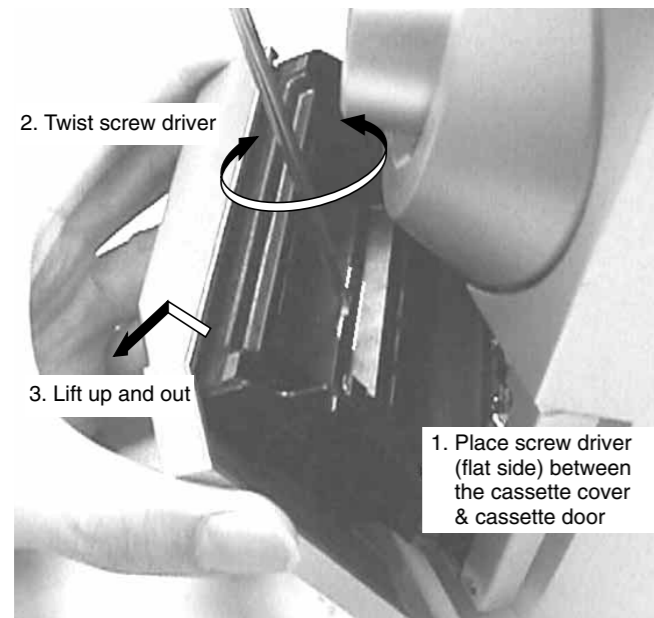
### CD OPERATION

#### "NO DISC" is displayed.

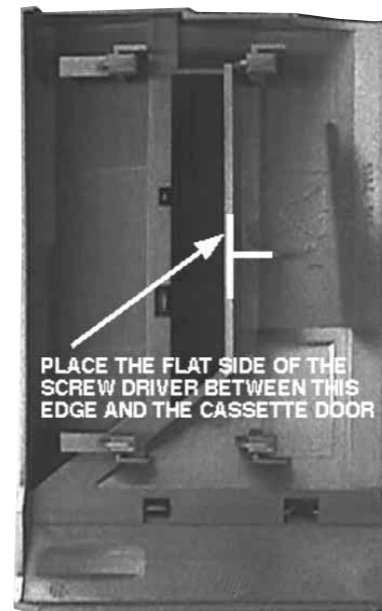
- Insert a disc.
- Check if the disc is inserted upside down.
- Wait until the moisture condensation at the lens has cleared.
- Replace or clean the disc, see "Maintenance".
- Use a finalised CD-RW or CD-R.

**DISMANTLING INSTRUCTIONS**

***Dismantling of the Cassette Cover***



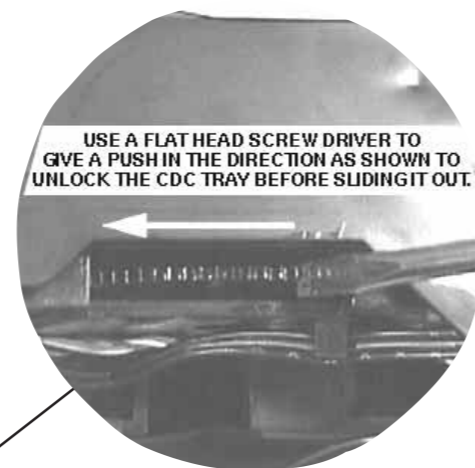
Remove Cassette Cover



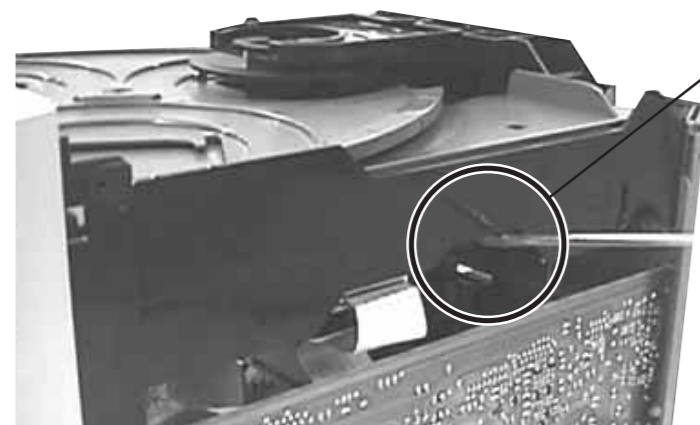
Cassette Cover

***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.

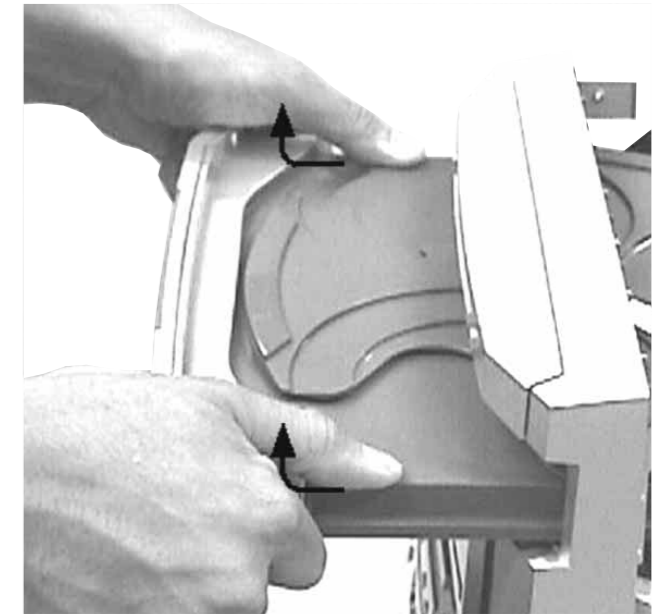


Sliding Out The CDC Tray



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

- 4) Remove the Cover Tray CDC (pos 106) as indicated.



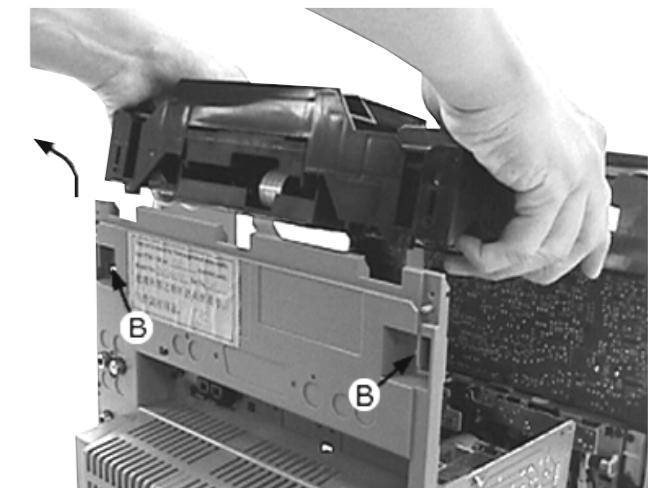
Remove Cover Tray CDC

- 5) Loosen 2 screws A and 2 screws B to remove the CDC Module (pos 1105) as indicated.

- 6) Remove 2 screws (pos 226) at the bottom to separate the Front Panel Assembly from the Plate Bottom (pos 265).



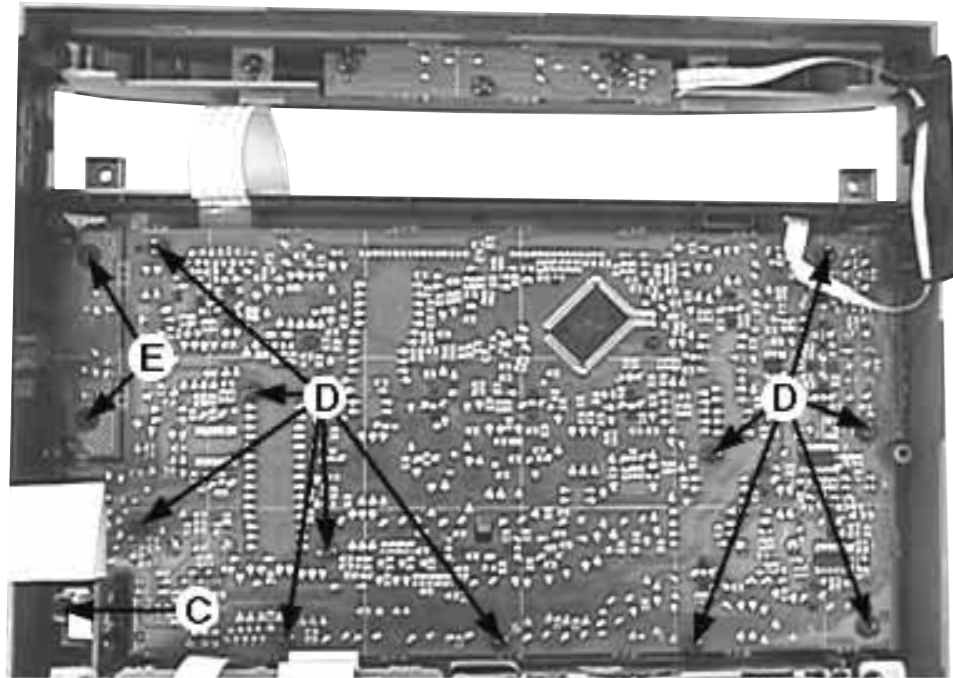
Front View CDC



Remove CDC Module

**Dismantling of the Front Board**

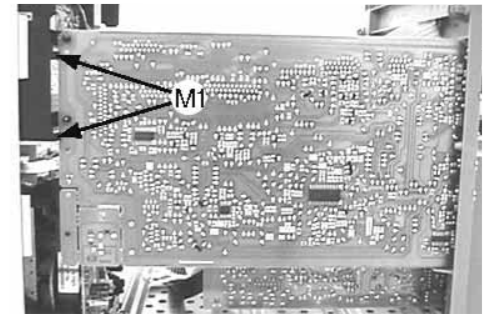
- 1) Remove 1 screw C as indicated to loosen the Headphone Board (pos 1101-C).
- 2) For set without Karaoke :  
Remove 11 screws D and 2 screws E as indicated to loosen the Front Board (pos 1101-A).  
For set with Karaoke :  
Remove 11 screws D as indicated to loosen the Front Board (pos 1101-A) and 2 screws E as indicated to loosen the Karaoke Board (pos 1101-D).

**Dismantling of the ETF Tape Module**

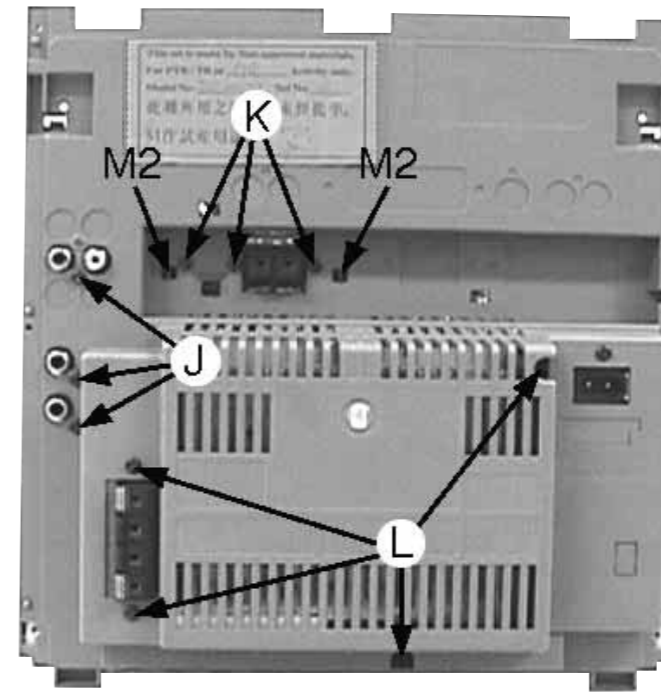
- 1) Remove 6 screws G as indicated to loosen the ETF Tape Module (pos 1104).

**Dismantling of Rear Portion**

- 1) Remove 3 screws J and uncatch M1 as indicated to loosen the AF Board (pos 1102).
- 2) Remove 3 screws K and uncatch M2 as indicated to loosen the Tuner Board (pos 1103).
- 3) Remove 4 screws L as indicated to loosen the Panel Rear (pos 256).

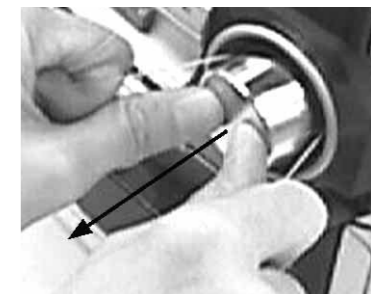


Remove AF Board

**Repair Hints**

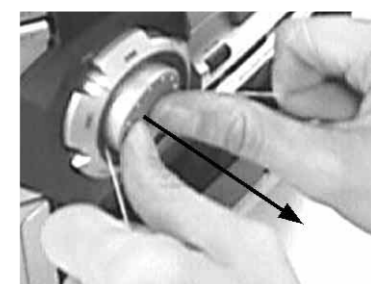
- 1) The Knob Volume (pos 139) can be removed by inserting a strong string into the slot and pulling it out in the direction as indicated. See picture 1.

Picture 1



- 2) The Knob Rotary (pos 138) can be removed by inserting a strong string into the slot and pulling it out in the direction as indicated. See picture 2.

Picture 2

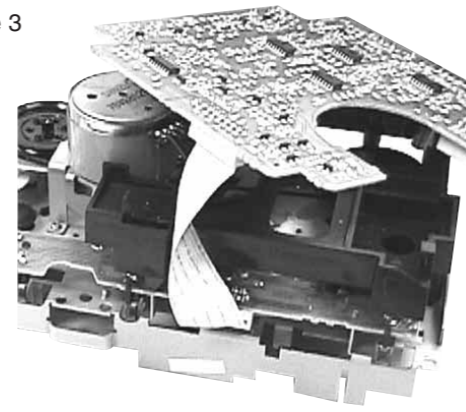


**Repair Hints**

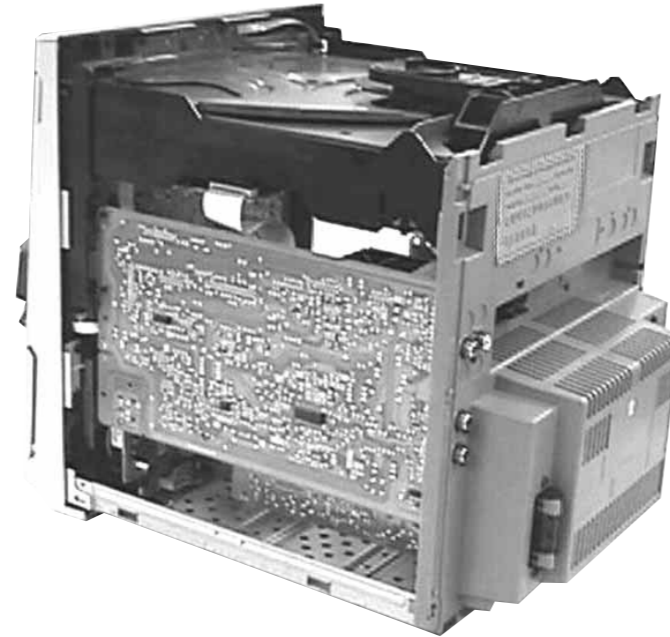
- 3) During repair it is possible to disconnect the Tuner board and CDC Module completely unless the fault is suspected to be in that area. This will not affect the performance of the rest of the set.
- 4) Due to the short flex cable wires in the ETF Module, the pc board should be disconnected and reconnected on the reverse side of the tape mechanism to keep it electrically connected during repair. See picture 3.

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.

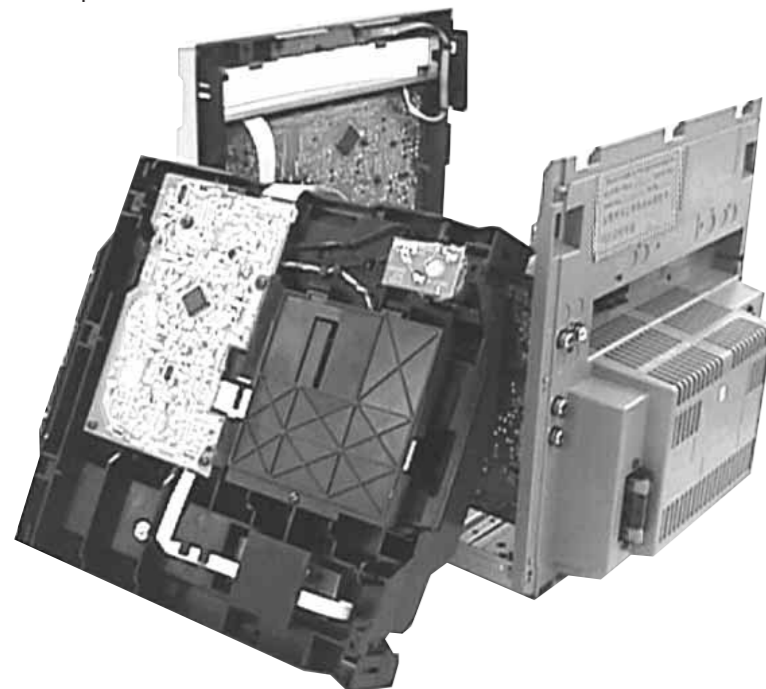
Picture 3



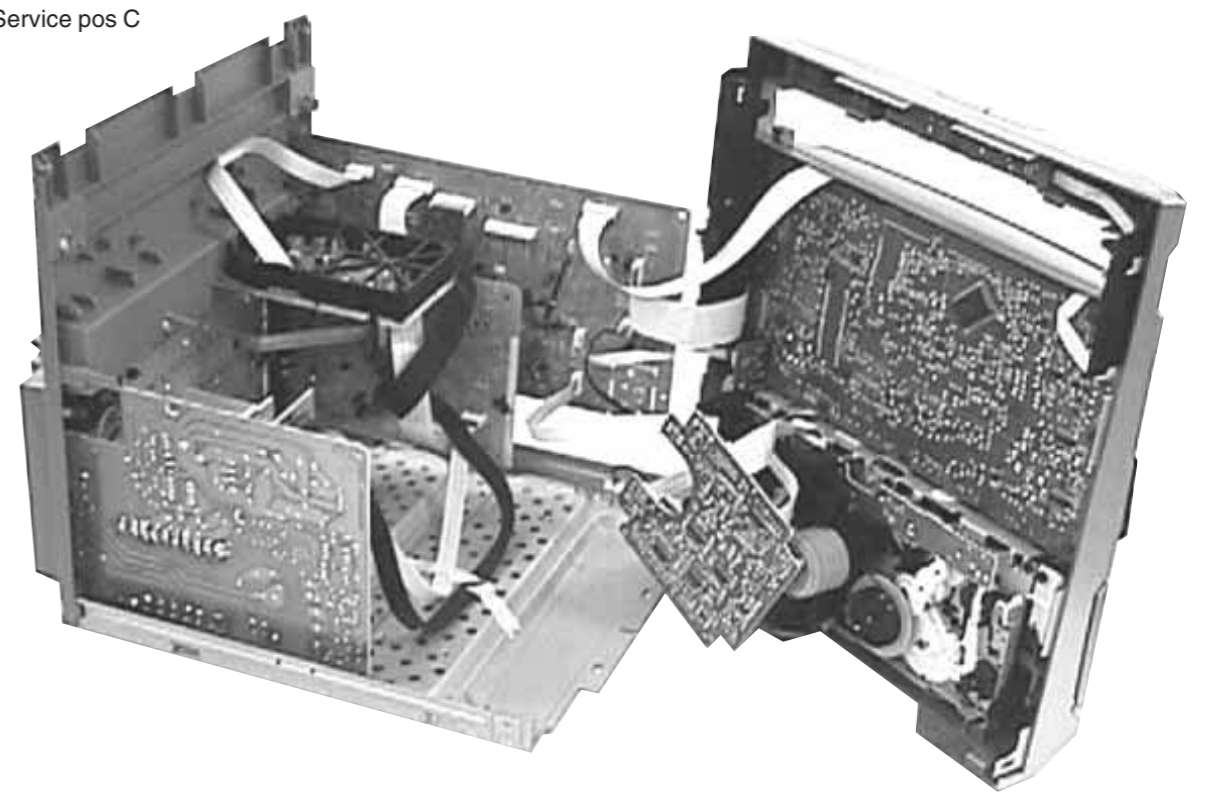
Service pos A



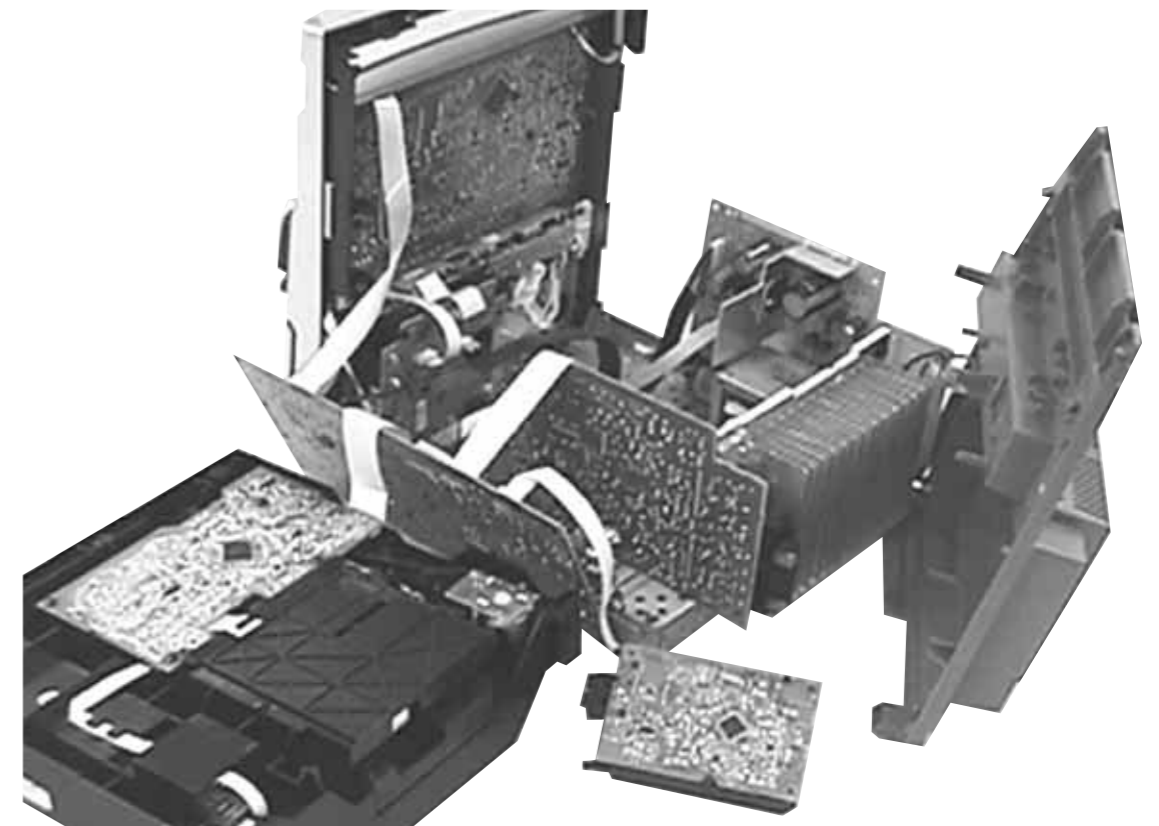
Service pos B



Service pos C



Service pos D

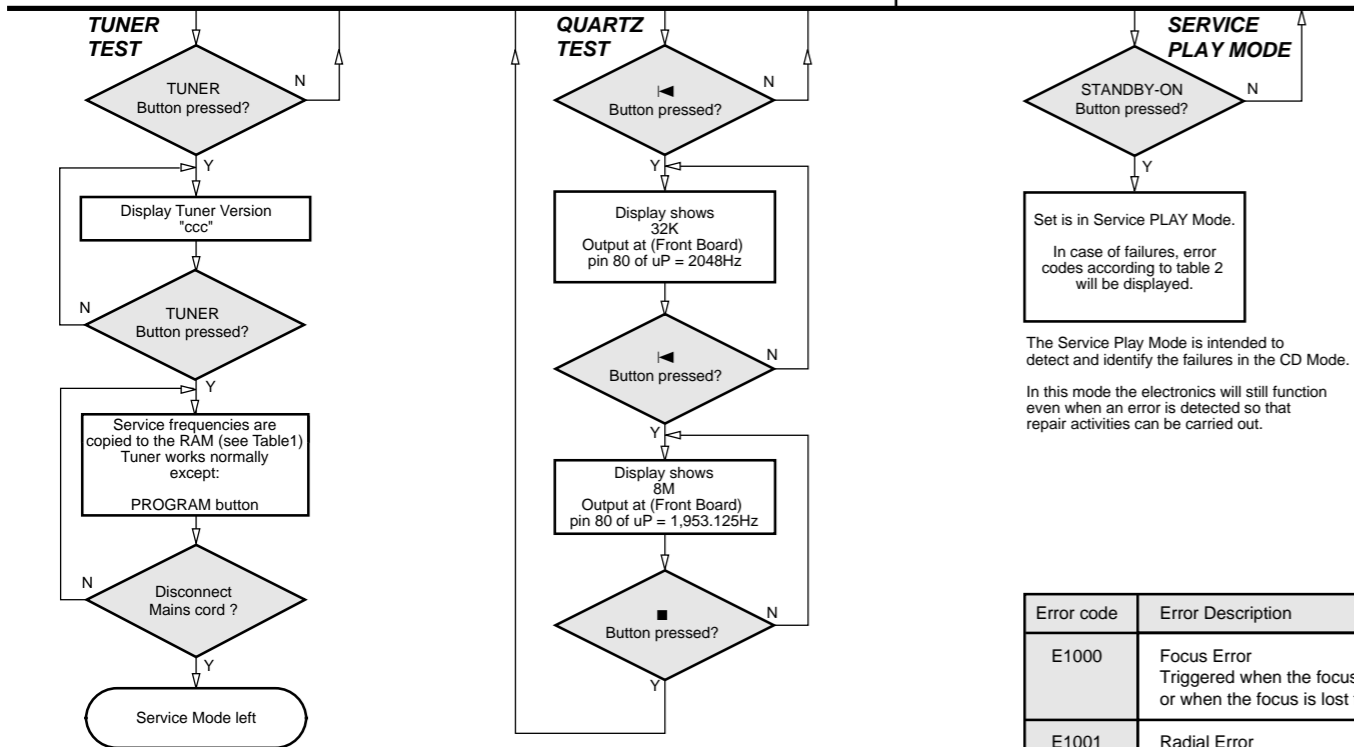


# SERVICE TEST PROGRAM

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

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

S refers to Service Mode.  
V refers to Version.  
yy refers to Software version number of Processor. (Counting up from 01 to 99)



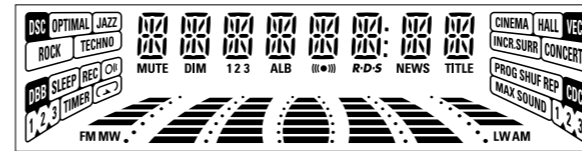
PRESET	Europe "EUR"	East Eur. Extended-band "EAS"	East Eur. "EAS"	USA "USA"	Oversea "OSE"
1	87.5MHz	65.81MHz	87.5MHz	87.5MHz	87.5MHz
2	108MHz	108MHz	108MHz	108MHz	108MHz
3	531kHz	74MHz	531kHz	530kHz	530/531kHz*
4	1602kHz	87.5MHz	1602kHz	1700kHz	1700/1602kHz*
5	558kHz	531kHz	558kHz	560kHz	560/558kHz*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

Table 1

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

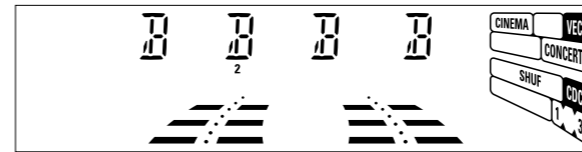
# DEMO Mode

	ACTION
To Switch off	Hold the <b>■</b> button down for 5 seconds during the DEMO display, the set will confirm with "DEMO OFF" and switch to Standby.
To Switch on	Hold the <b>■</b> button down for 5 seconds during Standby, DEMO will begin.



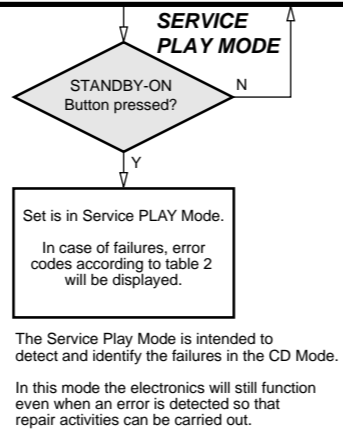
note 1: All LEDs are on except ECO POWER.

Figure 1



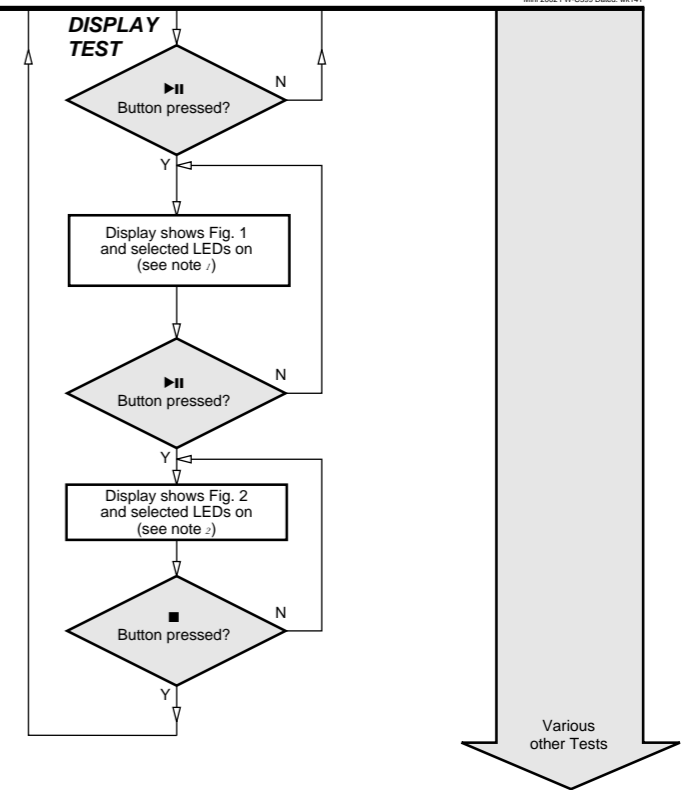
note 2: Only DISC 2, TUNER, AUX, DSC, VEC & MAX SOUND are on.

Figure 2



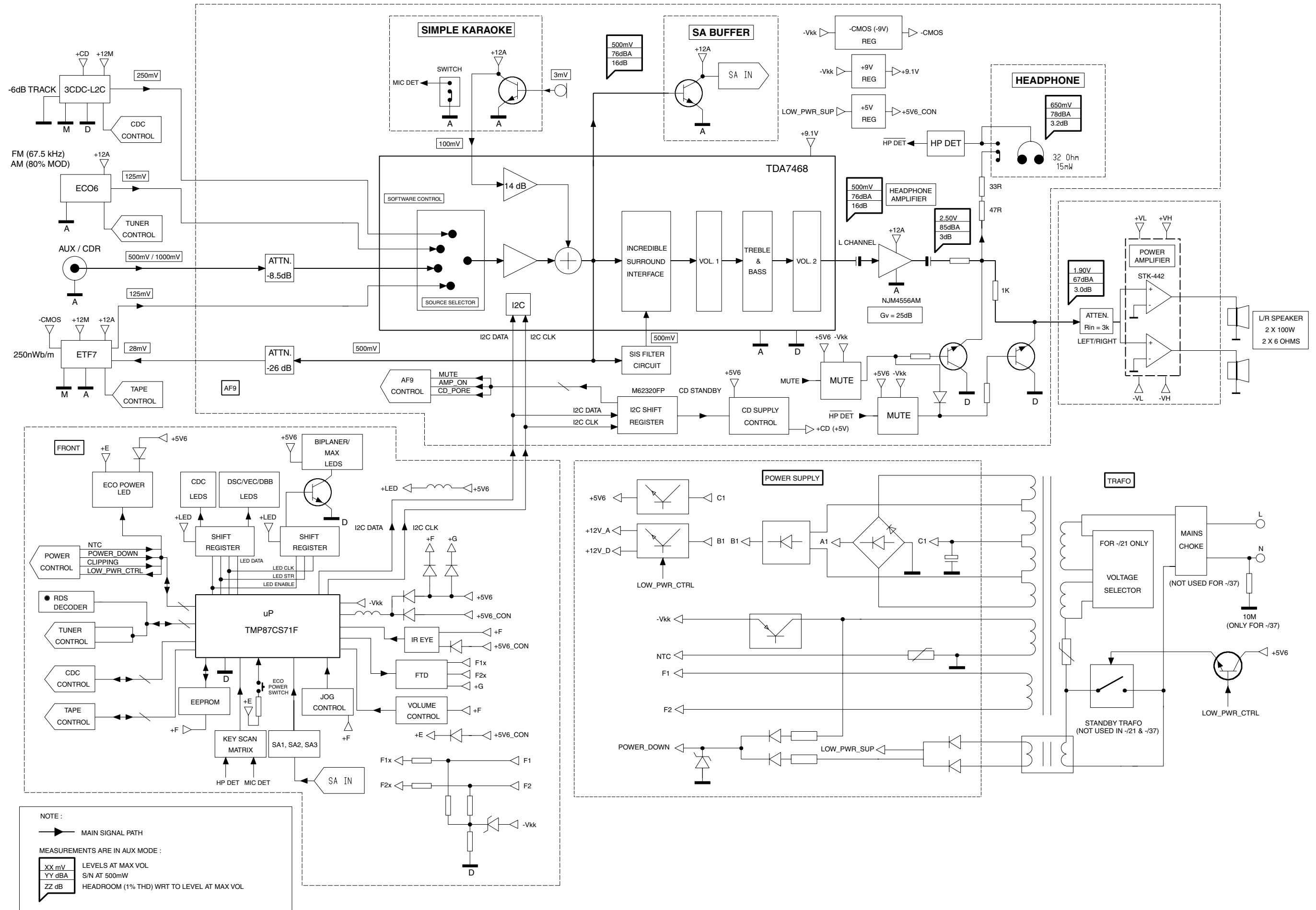
Error code	Error Description
E1000	Focus Error Triggered when the focus could not be found within a certain time when starting up the CD or when the focus is lost for a certain time during play.
E1001	Radial Error Triggered when the radial servo is off-track for a certain time during play.
E1002	Sledge In Error The sledge did not reach its inner position (inner-switch is still close) before approximately 6 Sec. have passed by. Inner-switch or sledge motor problem.
E1003	Sledge Out Error The sledge did not come out of its inner position (inner-switch is still open) before approximately 250 mSec. have passed by. Inner-switch or sledge motor problem.
E1005	Jump-offtrack error Triggered in normal play when the jump destination could not be found within a certain time. When this error occurred, software will try to recover by initiating the jump command again. If it is recoverable, the disc will continue to play.
E1006	Subcode Error Triggered when a new subcode was missing for a certain time during play.
E1007	PLL Error The Phase Lock Loop could not lock within a certain time.
E1008	Turntable Motor Error Generated when the CD could not reached 75% of speed during startup within a certain time. Discmotor problem.
E1020	Focus Search Error The focus point has not been found within a certain time.
E1070	This happens when the carousel switch is defective and closed all the time, or when the carousel is blocked when it is located exactly at a disc position.
E1071	This happens when the carousel switch is defective and does not closed electrically, or when the carousel is blocked in between two disc positions. The time-out is approximately 5 Sec.
E1079	The drawer could not open or enter the inside position and is opening again. This happen when the drawer is blocked and cannot go fully inside or when the drawer switch is defective and does not close.

Table 2

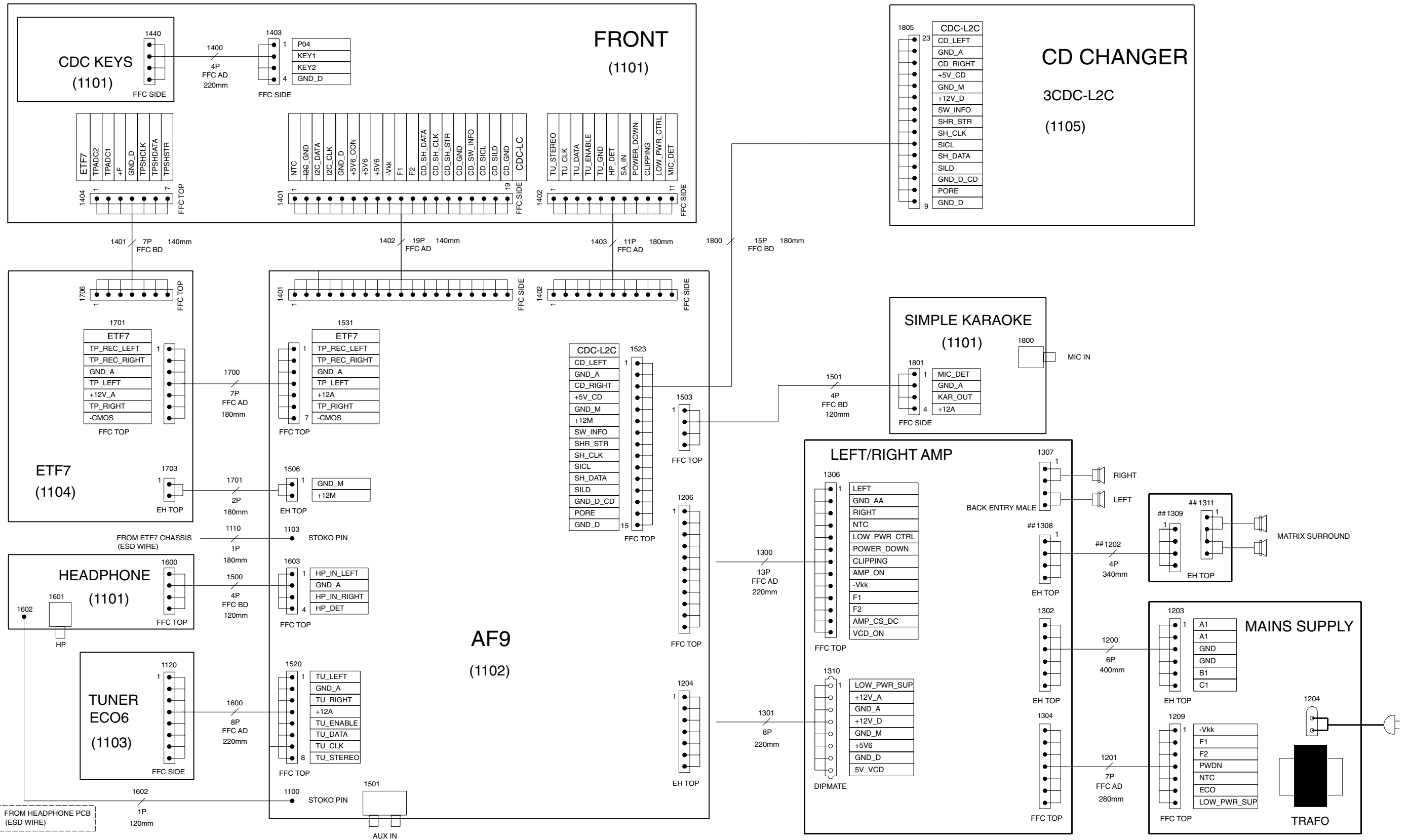


TEST	Activated with	ACTION
EEPROM TEST	<b>▶▶</b> <b>■</b> to Exit	A test pattern will be sent to the EEPROM. "PASS" is displayed if the uProcessor read back the test pattern correctly, otherwise "FAIL" will be displayed.
EEPROM FORMAT	<b>◀◀</b>	Load default data. Display shows "NEW" for 1 second. <b>Caution!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

# SET BLOCK DIAGRAM



# SET WIRING DIAGRAM



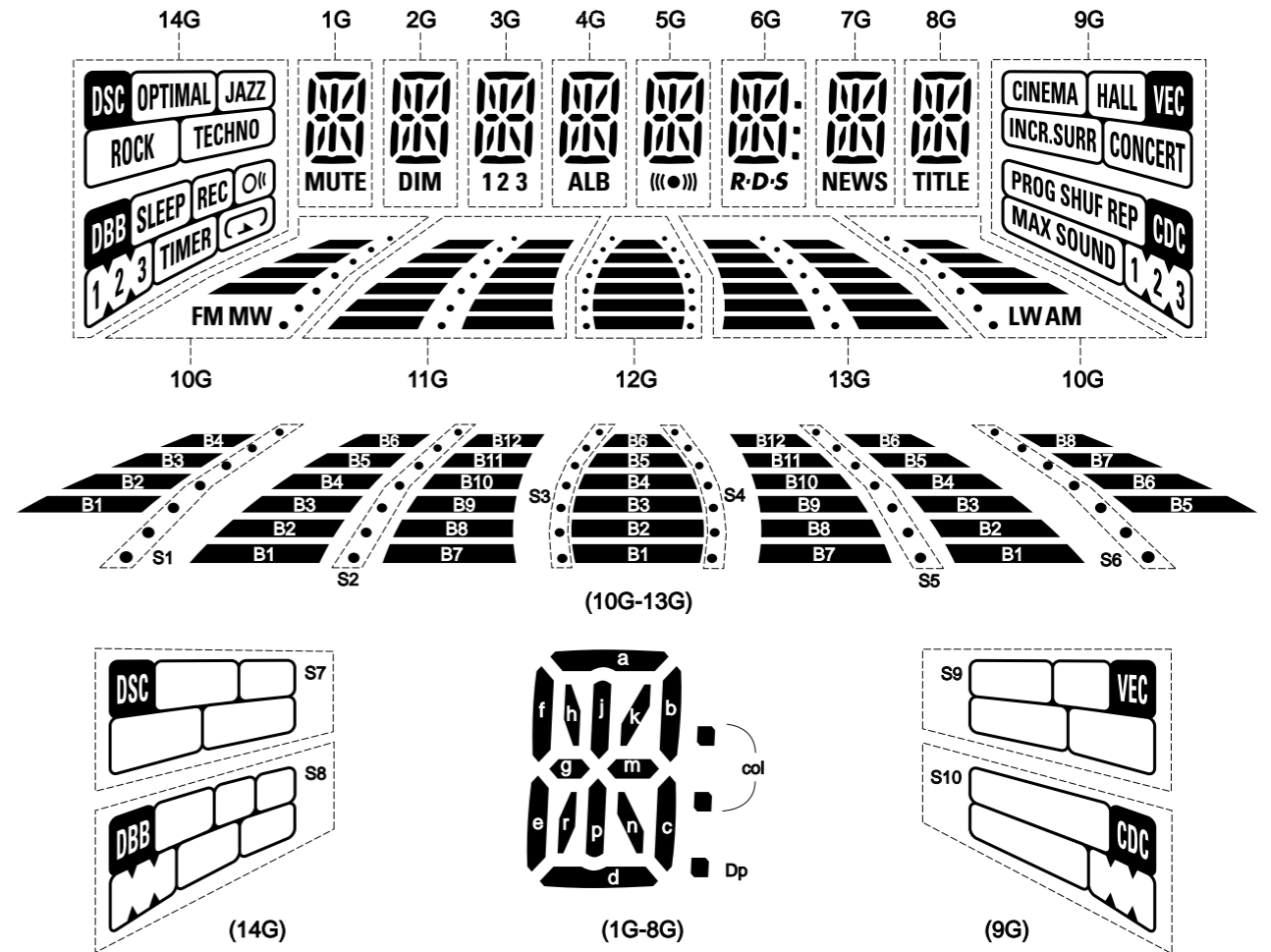


# FRONT BOARD

## TABLE OF CONTENTS

- FTD pin connection ..... 6-1
- Variation Table ..... 6-2
- Key-CDC part - Layout & Circuit diagram ..... 6-2
- Front part - Circuit diagram ..... 6-3
- Front part - Component layout ..... 6-4
- Front part - Chip layout ..... 6-5
- Headphone part - Layout & Circuit diagram ..... 6-6
- Karaoke part - Component & Chip layout ..... 6-6
- Karaoke part - Circuit diagram ..... 6-7
- Electrical parts list ..... 6-8

## FTD DISPLAY PIN CONNECTIONS



	1G	2G	3G	4G	5G	6G	7G	8G	9G	10G	11G	12G	13G	14G
P1	a	a	a	a	a	a	a	a	CINEMA	B1	B1	B1	B1	S7
P2	h	h	h	h	h	h	h	h	HALL	B2	B2	B2	B2	OPTIMAL
P3	j . p	j . p	j . p	j . p	j . p	j . p	j . p	j . p	S9	B3	B3	B3	B3	JAZZ
P4	k	k	k	k	k	k	k	k	INCR.SURR	B4	B4	B4	B4	ROCK
P5	b	b	b	b	b	b	b	b	CONCERT	S1	B5	B5	B5	TECHNO
P6	f	f	f	f	f	f	f	f	PROG	-	B6	B6	B6	S8
P7	m	m	m	m	m	m	m	m	SHUF	FM	S2	-	S5	SLEEP
P8	g	g	g	g	g	g	g	g	REP	MW	-	-	-	REC
P9	c	c	c	c	c	c	c	c	S10	B5	B7	-	B7	OK
P10	e	e	e	e	e	e	e	e	MAX SOUND	B6	B8	-	B8	1
P11	r	r	r	r	r	r	r	r	1	B7	B9	S3	B9	2
P12	n	n	n	n	n	n	n	n	2	B8	B10	S4	B10	3
P13	d	d	d	d	d	d	d	d	3	S6	B11	-	B11	TIMER
P14	MUTE	DIM	1	ALB	((●))	R-D-S	NEWS	TITLE	-	-	B12	-	B12	↶
P15	-	-	2	-	-	col	-	-	-	LW	-	-	-	▶
P16	-	-	3	-	-	Dp	-	-	-	AM	-	-	-	-

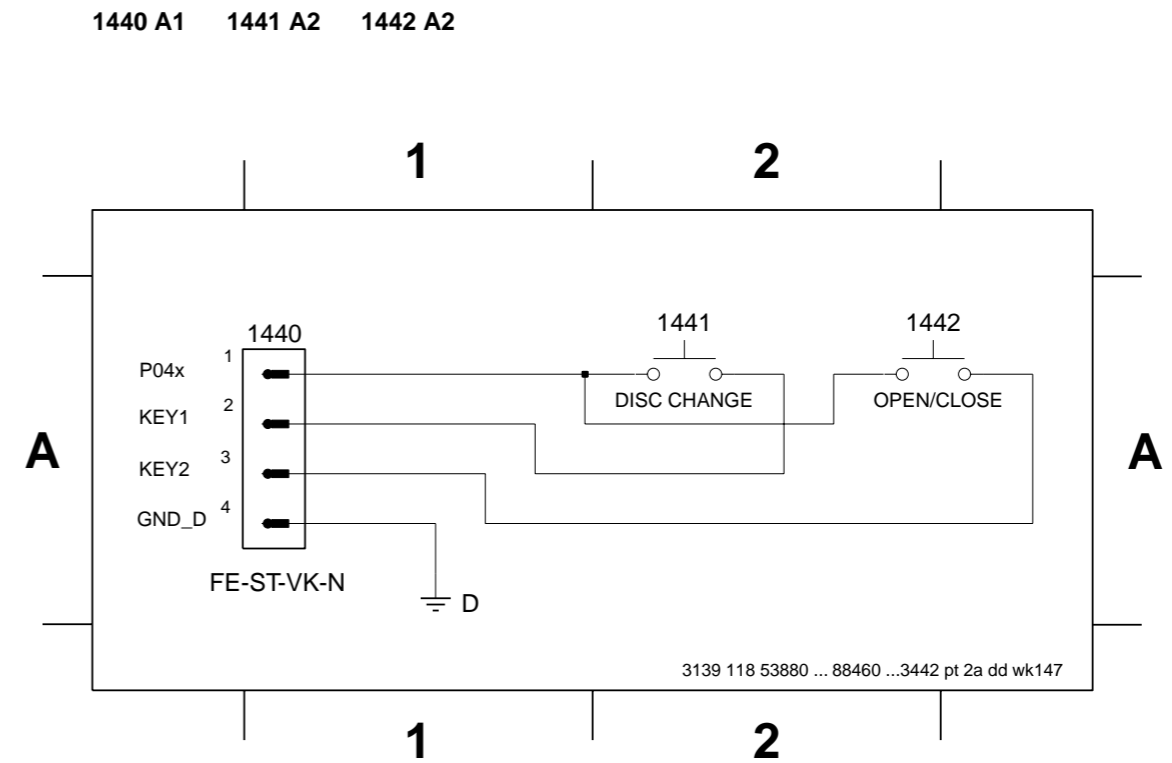
FTD DISPLAY PIN NO.	4	4	4	4	4	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	9	8	7	6	5	4	3	2	1			
FUNCTION	F	F	-	-	1	2	3	4	5	6	7	8	9	10	11	12	13	14	-	-	-	-	-	-	-	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	-	-	F	F	1
	2	2			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16			1	1	

**VARIATION TABLE**

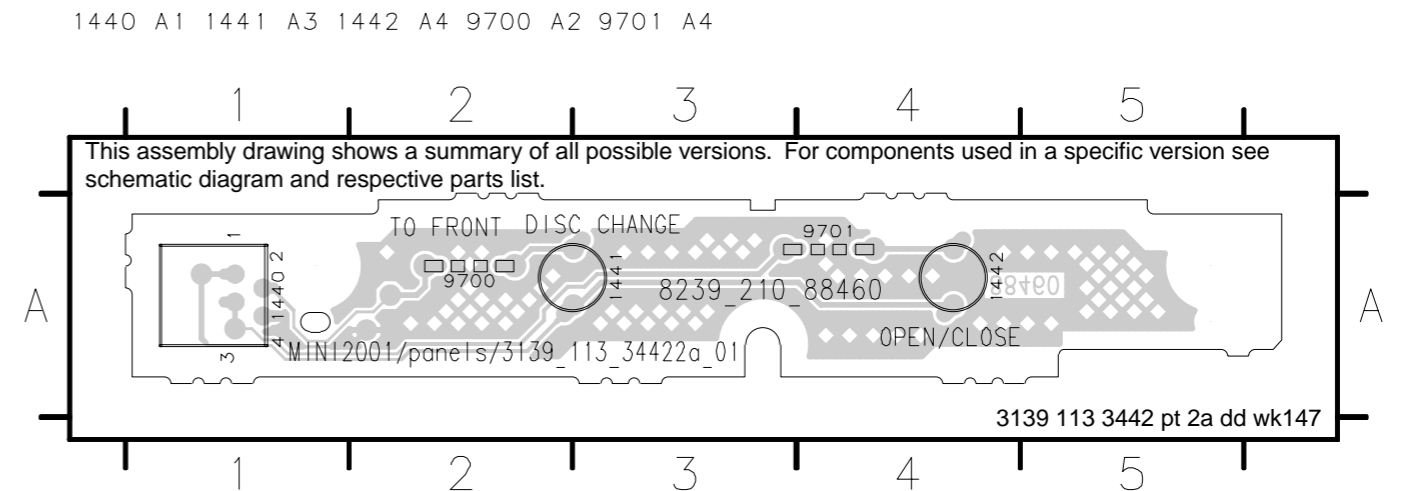
Item No / Features	FW-C390/30/37	FW-C390/21/21M/33	FW-C390/22/34
RDS / News	-	-	x
Simple Karaoke	-	x	-
Mic Detect	-	x	-
1409	x	x	x
1424	-	-	-
1425	-	-	x
1427	-	-	x
1437	-	-	-
3486	1k	1k	1k
3511	10k	10k	-
3530	-	-	330R
3531	10k	10k	10k
3581	10k	10k	-
3595	-	-	-
3808	-	-	820R
4402	-	-	-
4404	-	-	-
6400	x	x	x
6403	x	x	x
6426	-	-	x
6440	-	x	-
6441	x	x	x
6447	x	x	x
6448	x	x	x
9402	-	-	x
9404	-	-	x
9405	-	-	x
9406	-	-	x
9407	-	-	-
9408	x	x	x
9409	-	-	-
9410	x	x	x
9411	-	-	-
9462	-	-	-
9488	x	x	x
9505	-	-	-
9508	-	-	x
9509	-	-	x

x - item in use

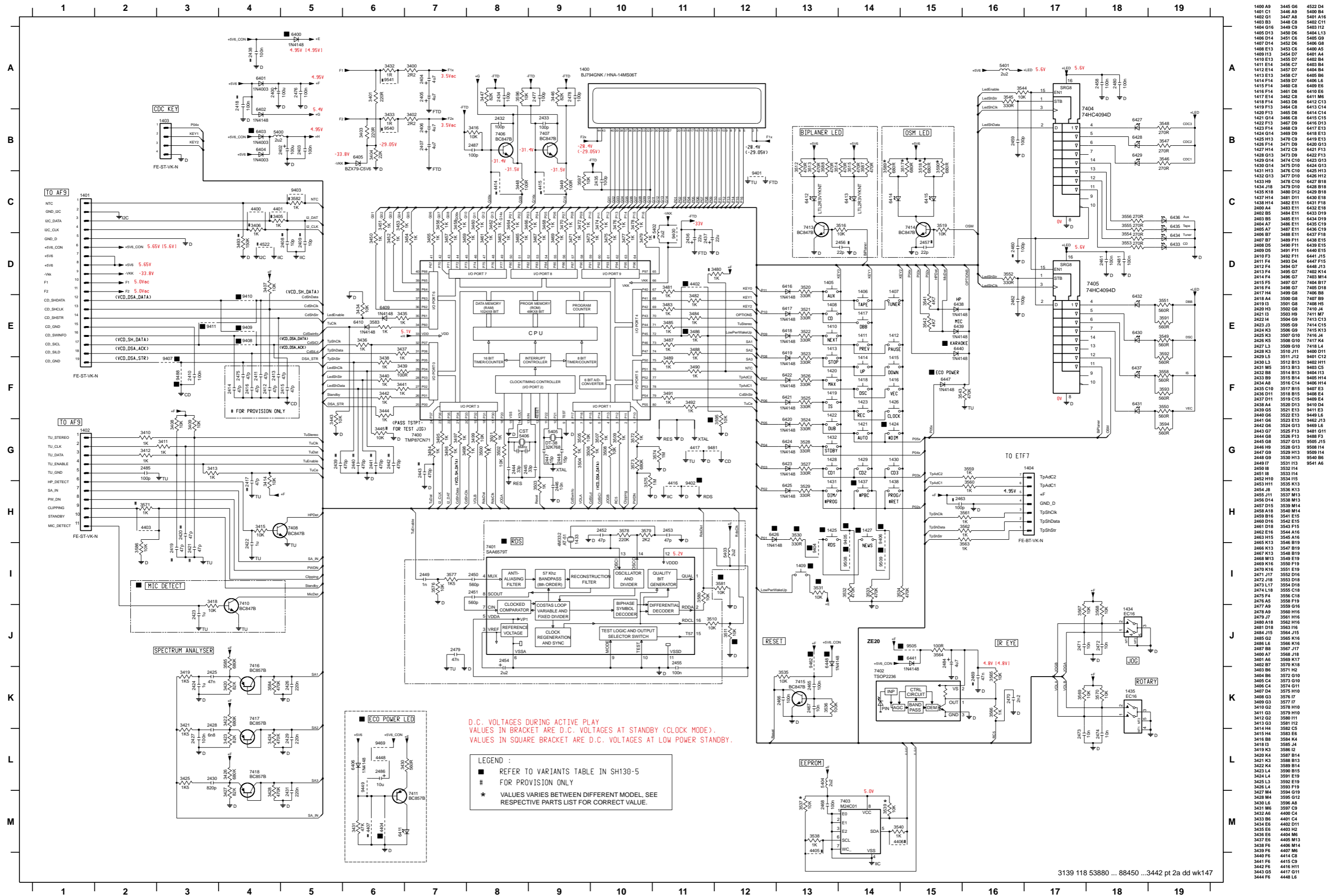
**KEY-CDC PART - CIRCUIT DIAGRAM**



**KEY-CDC PART - COMPONENT LAYOUT**



# FRONT PART - CIRCUIT DIAGRAM

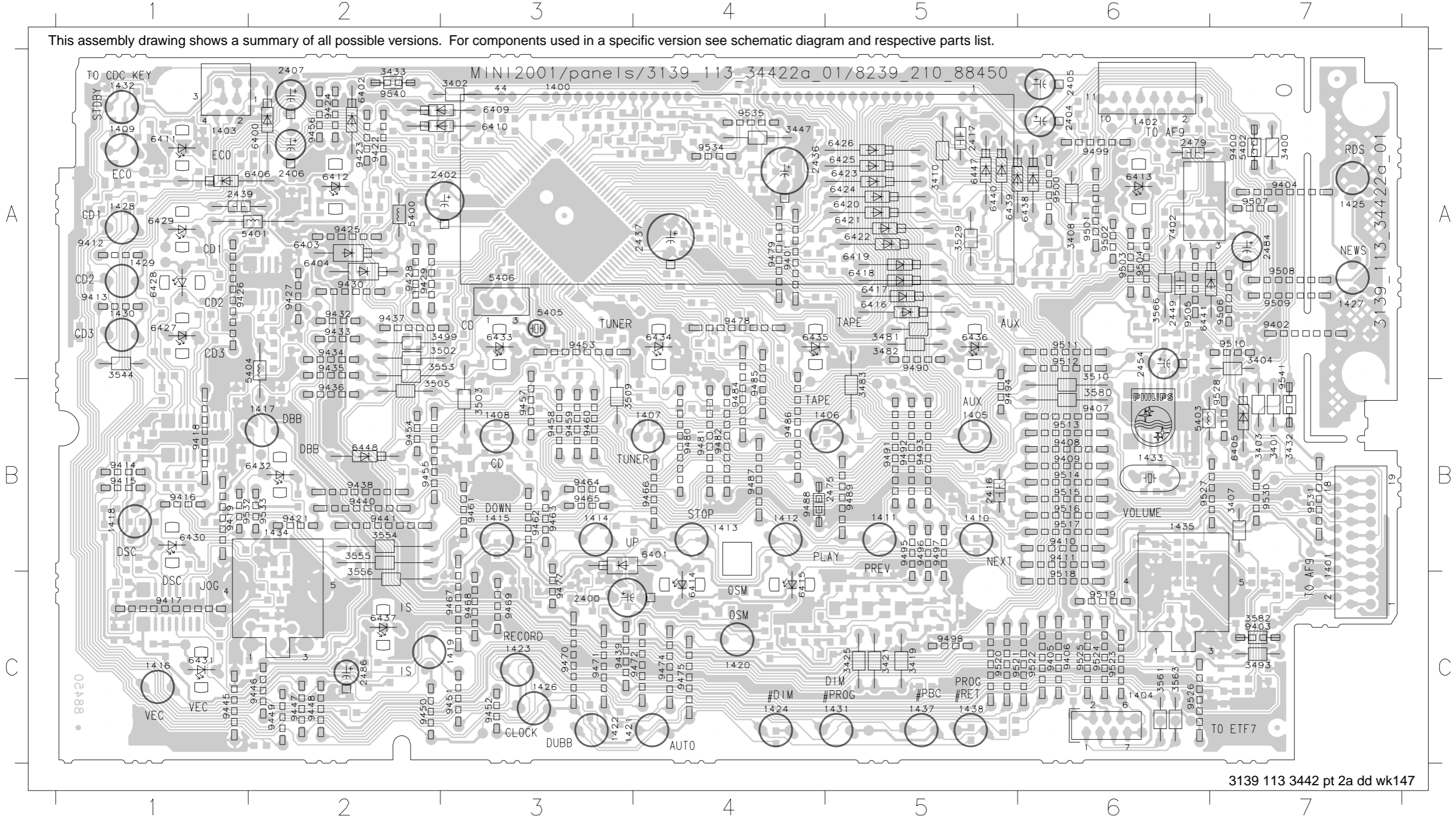


D.C. VOLTAGES DURING ACTIVE PLAY  
 VALUES IN BRACKET ARE D.C. VOLTAGES AT STANDBY (CLOCK MODE).  
 VALUES IN SQUARE BRACKET ARE D.C. VOLTAGES AT LOW POWER STANDBY.

LEGEND :  
 ■ REFER TO VARIANTS TABLE IN SH130-5  
 # FOR PROVISION ONLY  
 \* VALUES VARIES BETWEEN DIFFERENT MODEL, SEE RESPECTIVE PARTS LIST FOR CORRECT VALUE.

# FRONT PART - COMPONENT LAYOUT

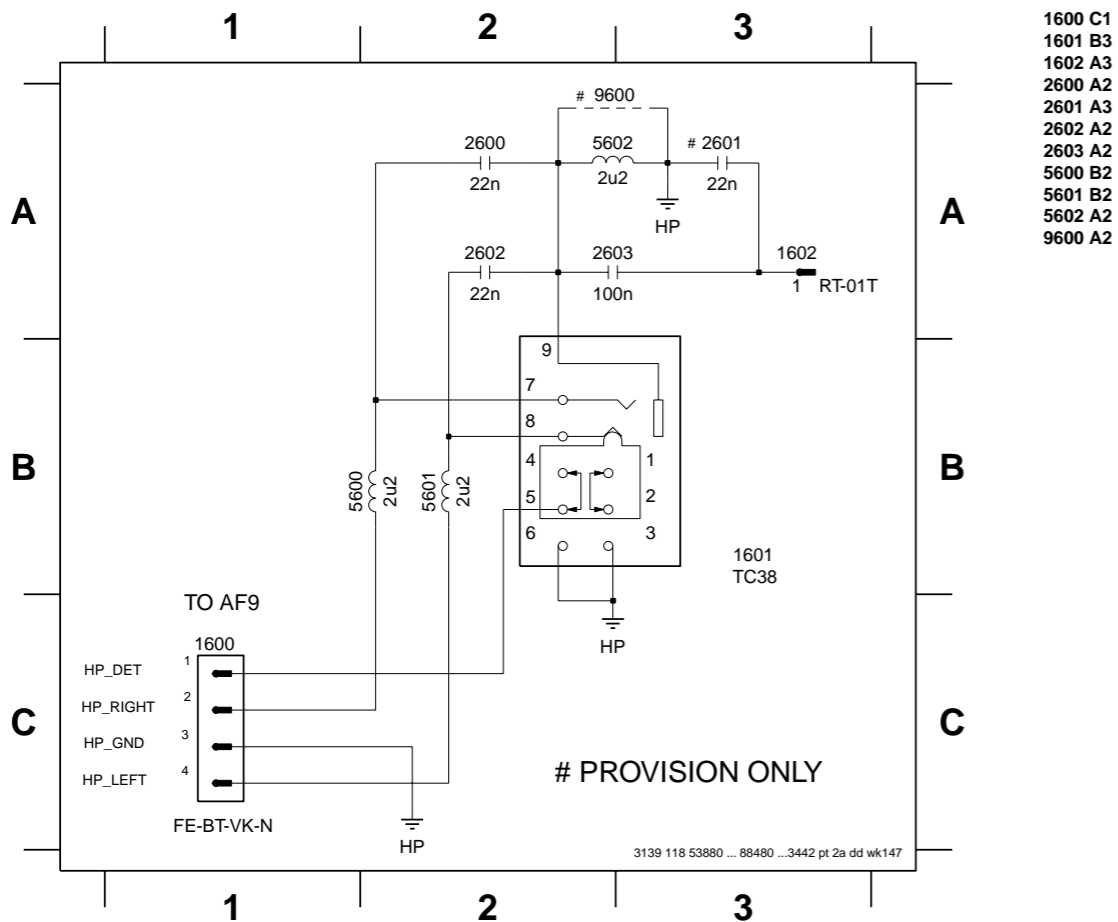
14000 A3  
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 14000-3 14  
 14000-4 14  
 14000-5 14  
 14000-6 14  
 14000-7 14  
 14000-8 14  
 14000-9 14  
 14000-10 14  
 14000-11 14  
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 14000-99 14  
 14000-100 14



3139 113 3442 pt 2a dd wk147

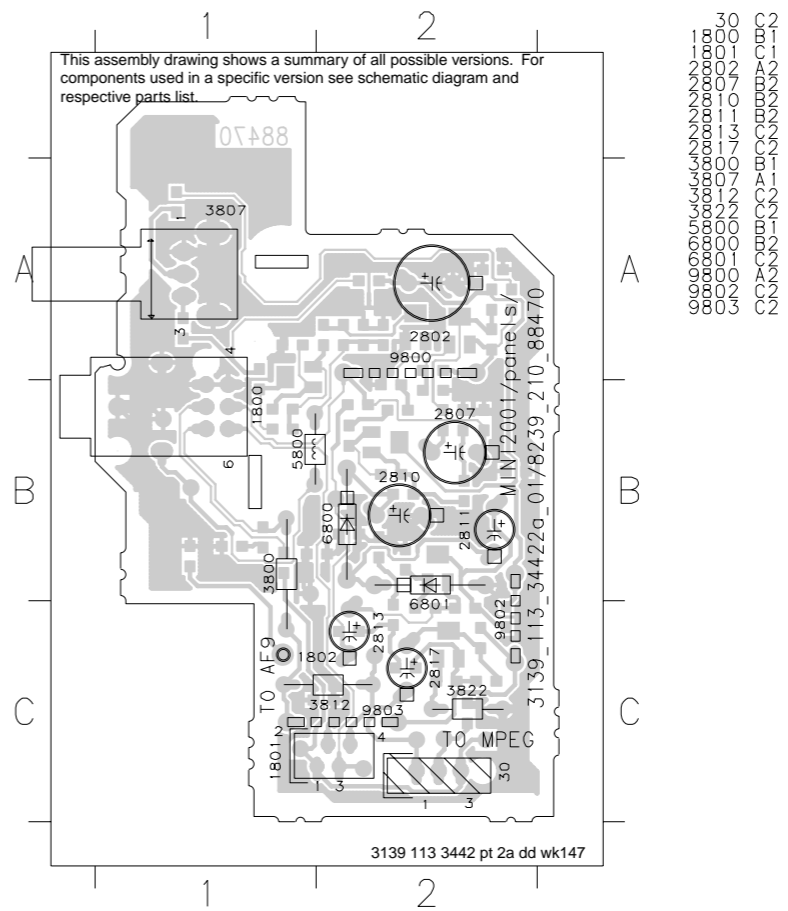


### HEADPHONE PART - CIRCUIT DIAGRAM



- 1600 C1
- 1601 B3
- 1602 A3
- 2600 A2
- 2601 A3
- 2602 A2
- 2603 A2
- 5600 B2
- 5601 B2
- 5602 A2
- 9600 A2

### KARAOKE PART - COMPONENT & CHIP LAYOUTS

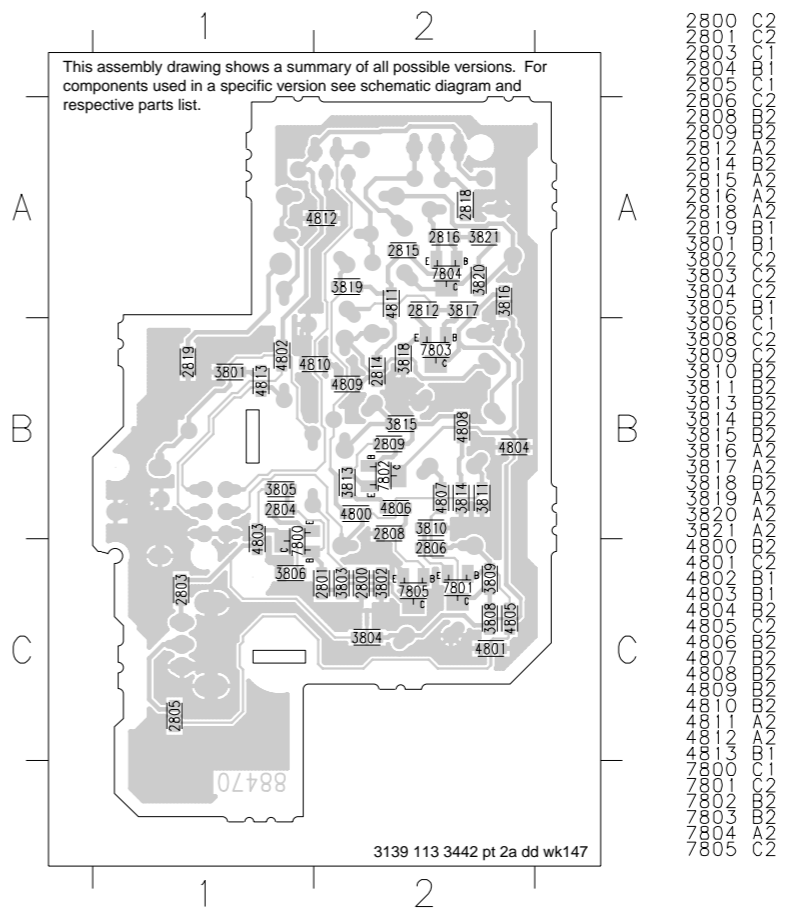
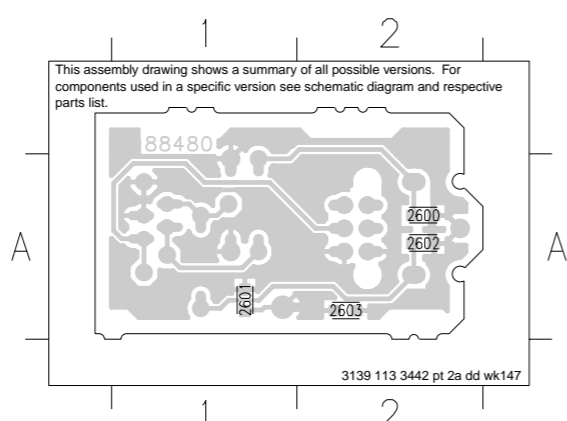
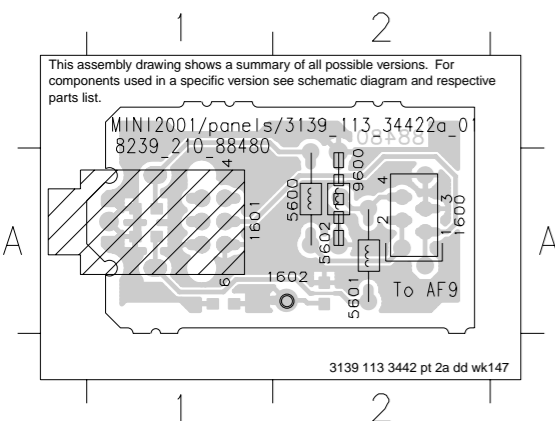


- 1600 C1
- 1601 B3
- 1602 A3
- 2600 A2
- 2601 A3
- 2602 A2
- 2603 A2
- 5600 B2
- 5601 B2
- 5602 A2
- 9600 A2

### HEADPHONE PART - COMPONENT & CHIP LAYOUTS

- 1600 A2
- 1602 A2
- 5601 A2
- 9600 A2
- 1601 A1
- 5600 A2
- 5602 A2

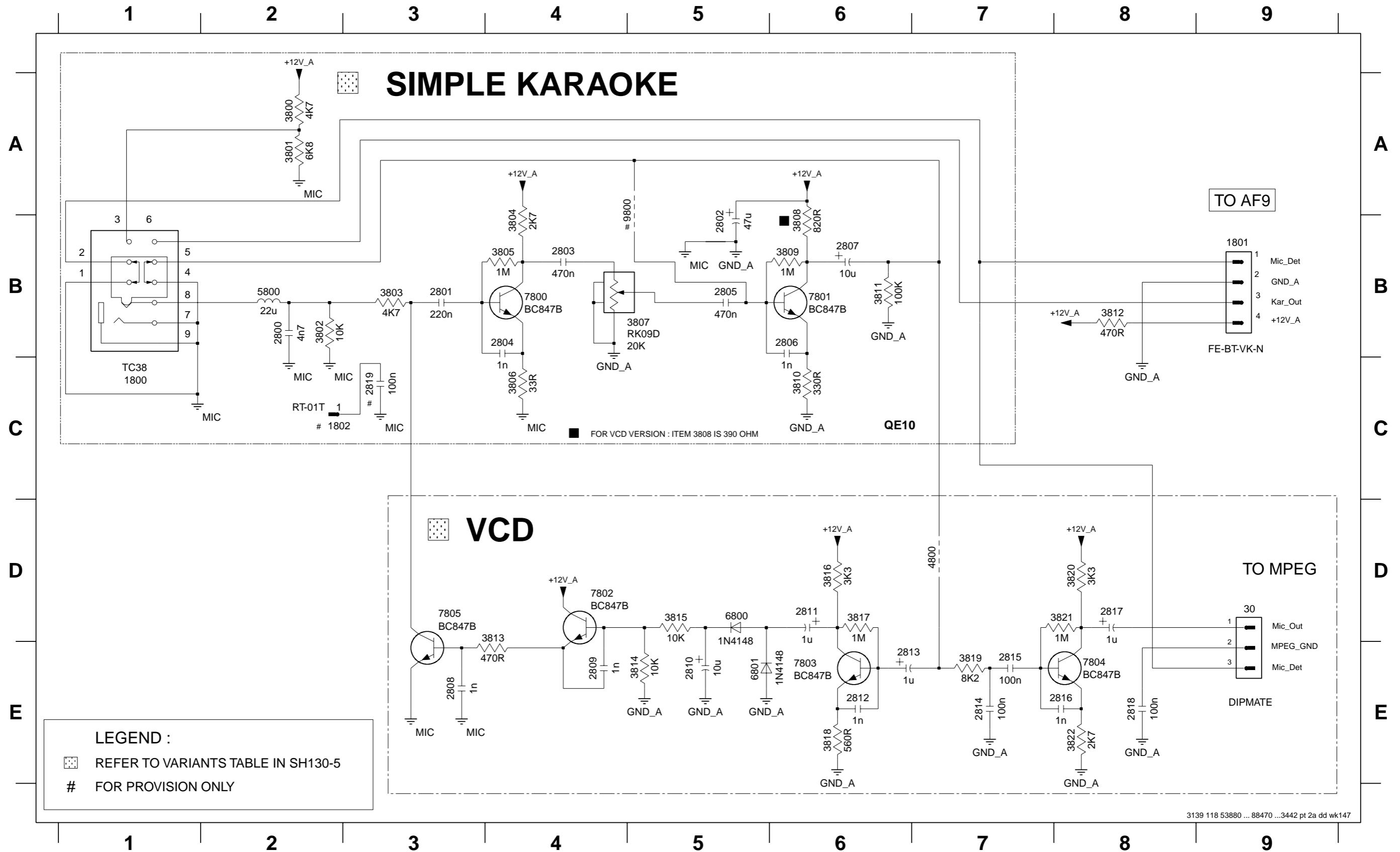
- 2600 A2
- 2601 A1
- 2602 A2
- 2603 A2



- 1600 C1
- 1601 B3
- 1602 A3
- 2600 A2
- 2601 A3
- 2602 A2
- 2603 A2
- 5600 B2
- 5601 B2
- 5602 A2
- 9600 A2

# KARAOKE PART - CIRCUIT DIAGRAM

30 D9	1802 C2	2802 B5	2805 B5	2808 E3	2811 D6	2814 E7	2817 D8	3800 A2	3803 B3	3806 C4	3809 B6	3812 B8	3815 D5	3818 E6	3821 D8	5800 B2	7800 B4	7803 E6	9800 A5
1800 C1	2800 B2	2803 B4	2806 B6	2809 E4	2812 E6	2815 E7	2818 E8	3801 A2	3804 B4	3807 B4	3810 C6	3813 D4	3816 D6	3819 E7	3822 E8	6800 D5	7801 B6	7804 E8	
1801 B9	2801 B3	2804 B4	2807 B6	2810 E5	2813 E6	2816 E8	2819 C3	3802 B2	3805 B4	3808 B6	3811 B6	3814 E5	3817 D6	3820 D8	4800 D7	6801 E5	7802 D4	7805 D3	









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

4518	4822 051 30008	OR Jumper 0603
4519	4822 051 30008	OR Jumper 0603
4520	4822 051 30008	OR Jumper 0603
4521	4822 051 30008	OR Jumper 0603
4523	4822 051 30008	OR Jumper 0603
4524	4822 051 30008	OR Jumper 0603
4525	4822 051 30008	OR Jumper 0603
4526	4822 051 30008	OR Jumper 0603
4527	4822 051 30008	OR Jumper 0603
4528	4822 051 30008	OR Jumper 0603
4529	4822 051 30008	OR Jumper 0603
4530	4822 051 30008	OR Jumper 0603
4531	4822 051 30008	OR Jumper 0603
4532	4822 051 30008	OR Jumper 0603
4533	4822 051 30008	OR Jumper 0603
4534	4822 051 30008	OR Jumper 0603
4535	4822 051 30008	OR Jumper 0603
4536	4822 051 30008	OR Jumper 0603
4537	4822 051 30008	OR Jumper 0603
4538	4822 051 30008	OR Jumper 0603
4539	4822 051 30008	OR Jumper 0603
4540	4822 051 30008	OR Jumper 0603
4541	4822 051 30008	OR Jumper 0603
4542	4822 051 30008	OR Jumper 0603
4801	4822 051 30008	OR Jumper 0603
4802	4822 051 30008	OR Jumper 0603
4803	4822 051 30008	OR Jumper 0603
4804	4822 051 30008	OR Jumper 0603
4805	4822 051 30008	OR Jumper 0603
4806	4822 051 30008	OR Jumper 0603
4807	4822 051 30008	OR Jumper 0603
4808	4822 051 30008	OR Jumper 0603
4809	4822 051 30008	OR Jumper 0603
4810	4822 051 30008	OR Jumper 0603
4811	4822 051 30008	OR Jumper 0603
4812	4822 051 30008	OR Jumper 0603
4813	4822 051 30008	OR Jumper 0603

**COILS & FILTERS**

5400	4822 157 62552	Coil 2,2μH 5%
5401	4822 157 62552	Coil 2,2μH 5%
5403	4822 157 62552	Coil 2,2μH 5%
5404	4822 157 62552	Coil 2,2μH 5%
5405	2422 543 01069	X'tal Resonator 32,768kHz
5406	4822 242 72066	Ceram Resonator 8MHz
5600	4822 157 62552	Coil 2,2μH 5%
5601	4822 157 62552	Coil 2,2μH 5%
5602	4822 157 62552	Coil 2,2μH 5%
5800	4822 157 11235	Coil 22μH 5%

**DIODES**

6400	4822 130 30621	1N4148
------	----------------	--------

6401	4822 130 31878	1N4003G
6402	4822 130 30621	1N4148
6403	4822 130 31878	1N4003G
6404	4822 130 31878	1N4003G
6405	4822 130 34173	BZX79-B5V6
6406	4822 130 30621	1N4148
6409	4822 130 30621	1N4148
6410	4822 130 30621	1N4148
6411	9322 167 73676	LTL-4221NLC-KA
6412	9322 161 99676	LTL-2R3VYKNT
6413	9322 161 99676	LTL-2R3VYKNT
6414	9322 172 75676	LTL-1CHKFK
6415	9322 172 75676	LTL-1CHKFK
6416	4822 130 30621	1N4148
6417	4822 130 30621	1N4148
6418	4822 130 30621	1N4148
6419	4822 130 30621	1N4148
6420	4822 130 30621	1N4148
6421	4822 130 30621	1N4148
6422	4822 130 30621	1N4148
6423	4822 130 30621	1N4148
6424	4822 130 30621	1N4148
6425	4822 130 30621	1N4148
6426	4822 130 30621	1N4148
6427	4822 130 11589	LTL-1CHAE
6428	4822 130 11589	LTL-1CHAE
6429	4822 130 11589	LTL-1CHAE
6430	4822 130 11589	LTL-1CHAE
6431	4822 130 11589	LTL-1CHAE
6432	4822 130 11589	LTL-1CHAE
6433	4822 130 10791	LTL-1CHGE
6434	4822 130 10791	LTL-1CHGE
6435	4822 130 10791	LTL-1CHGE
6436	4822 130 10791	LTL-1CHGE
6437	4822 130 10791	LTL-1CHGE
6438	4822 130 30621	1N4148
6439	4822 130 30621	1N4148
6440	4822 130 30621	1N4148
6441	4822 130 30621	1N4148
6448	4822 130 30621	1N4148

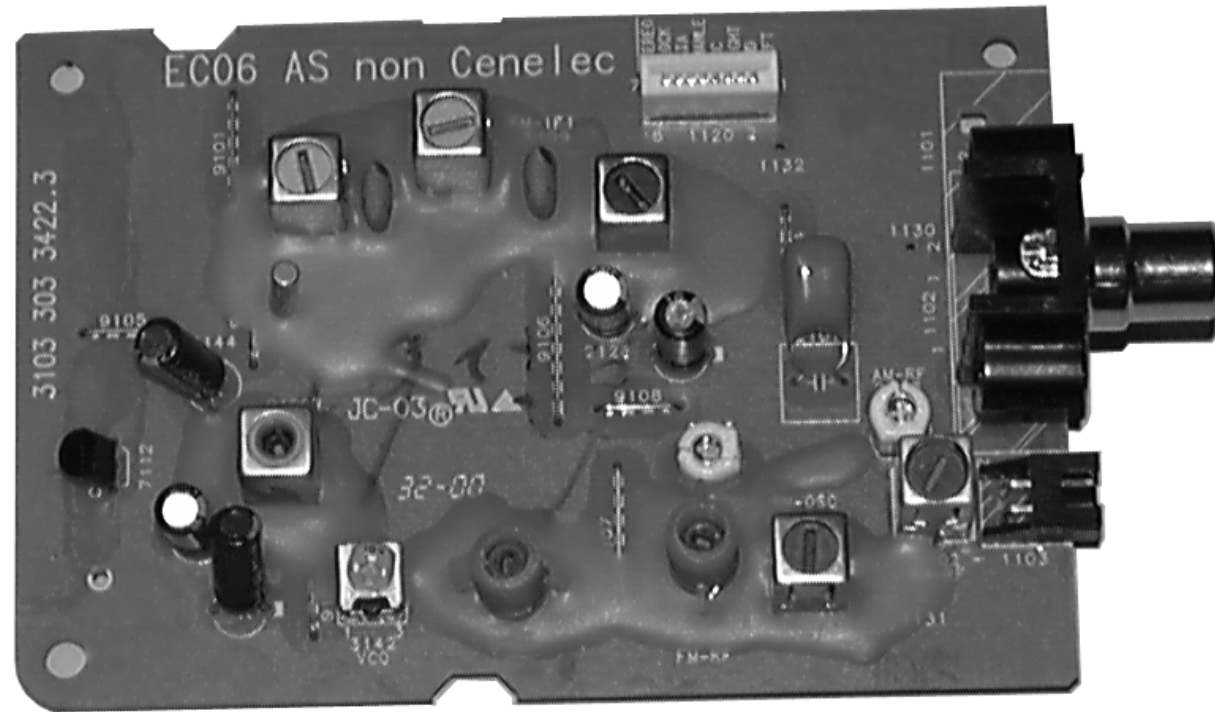
**TRANSISTORS & INTEGRATED CIRCUITS**

7401	9352 679 67118	SAA6579T/V1/M4
7400	3139 110 52970	TMP87CS71F "C399S52971"
7402	9322 155 22667	IR Receiver TSOP2236ZC1
7403	9965 000 04931	M24C01-WMN6
7404	4822 209 15449	74HC4094D
7405	4822 209 15449	74HC4094D
7406	4822 130 60511	BC847B
7407	4822 130 60511	BC847B
7408	4822 130 60511	BC847B

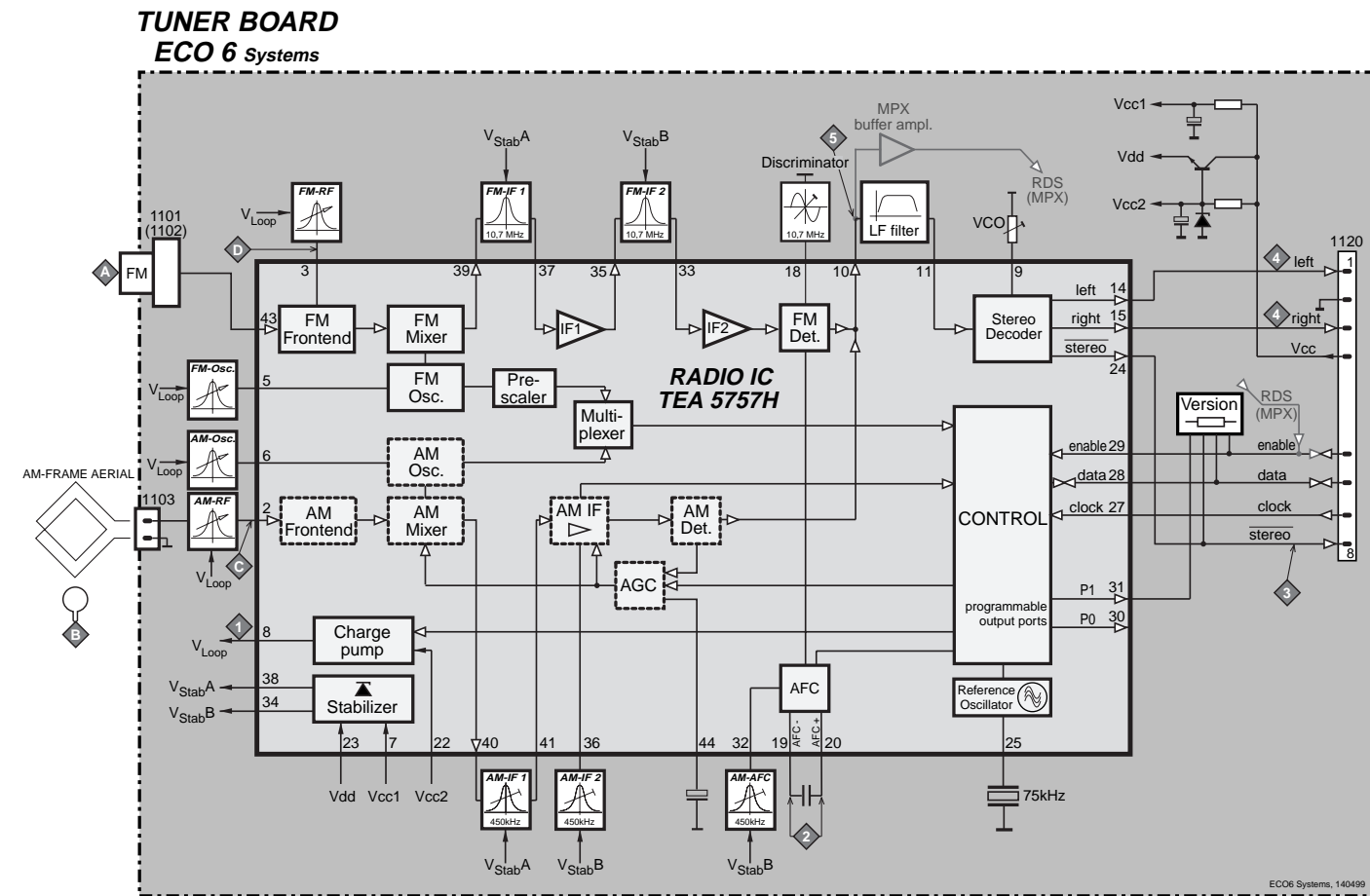
**ELECTRICAL PARTS LIST - FRONT BOARD**

7410	4822 130 60511	BC847B
7411	4822 130 60373	BC857B
7413	4822 130 60511	BC847B
7414	4822 130 60511	BC847B
7415	4822 130 60511	BC847B
7416	4822 130 60373	BC857B
7417	4822 130 60373	BC857B
7418	4822 130 60373	BC857B
7800	4822 130 60511	BC847B
7801	4822 130 60511	BC847B

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



**BLOCK DIAGRAM**

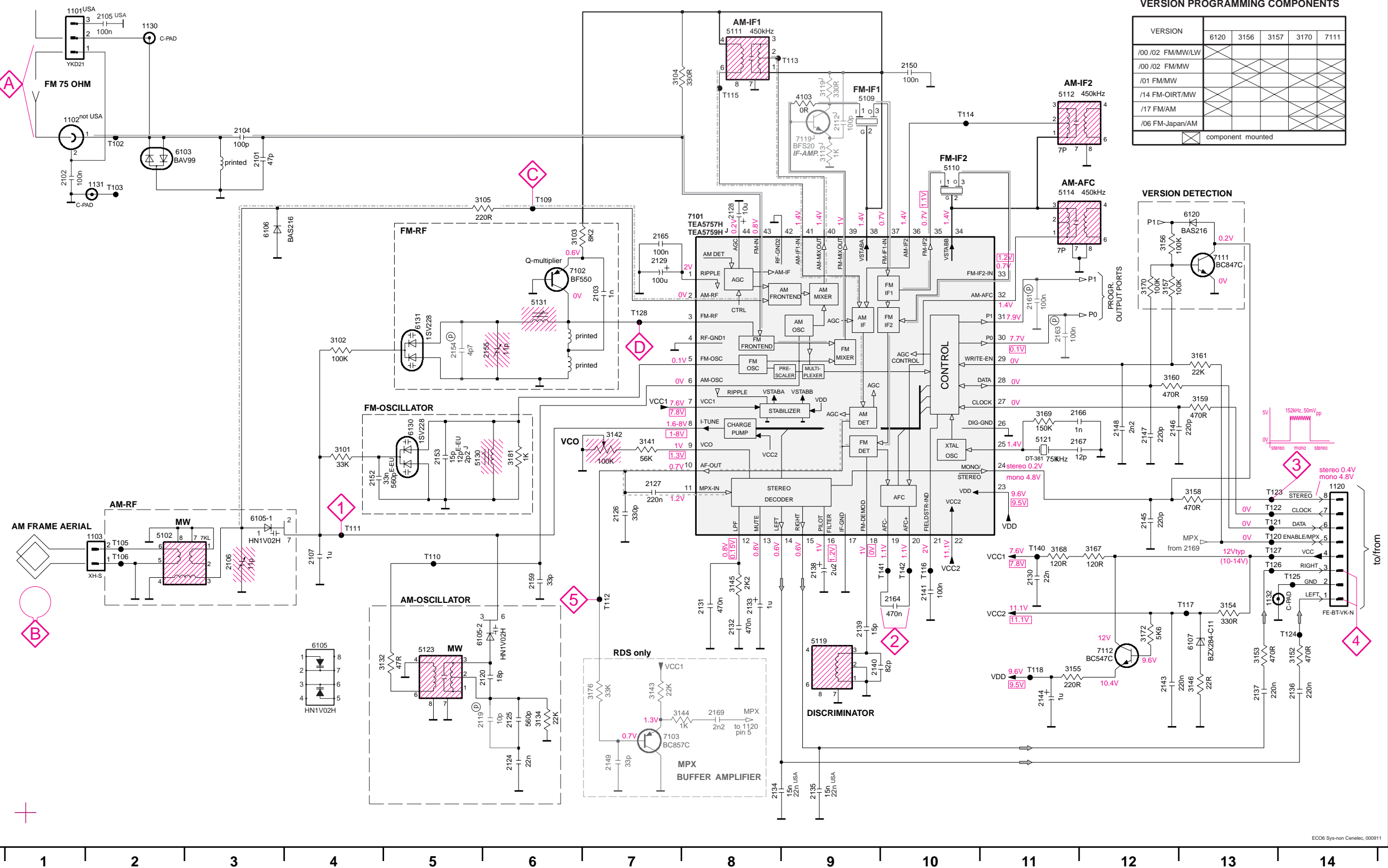


**ECO6 Tuner Board**  
version: **SYSTEMS non-CENELEC**

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 Component Layout.....7A-3  
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 Electrical Partslist.....7A-4

# TUNER BOARD ECO6 / SYSTEMS NON CENELEC

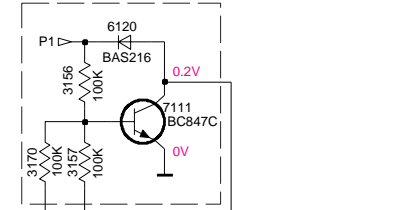


### VERSION PROGRAMMING COMPONENTS

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

### VERSION DETECTION



### LEGEND

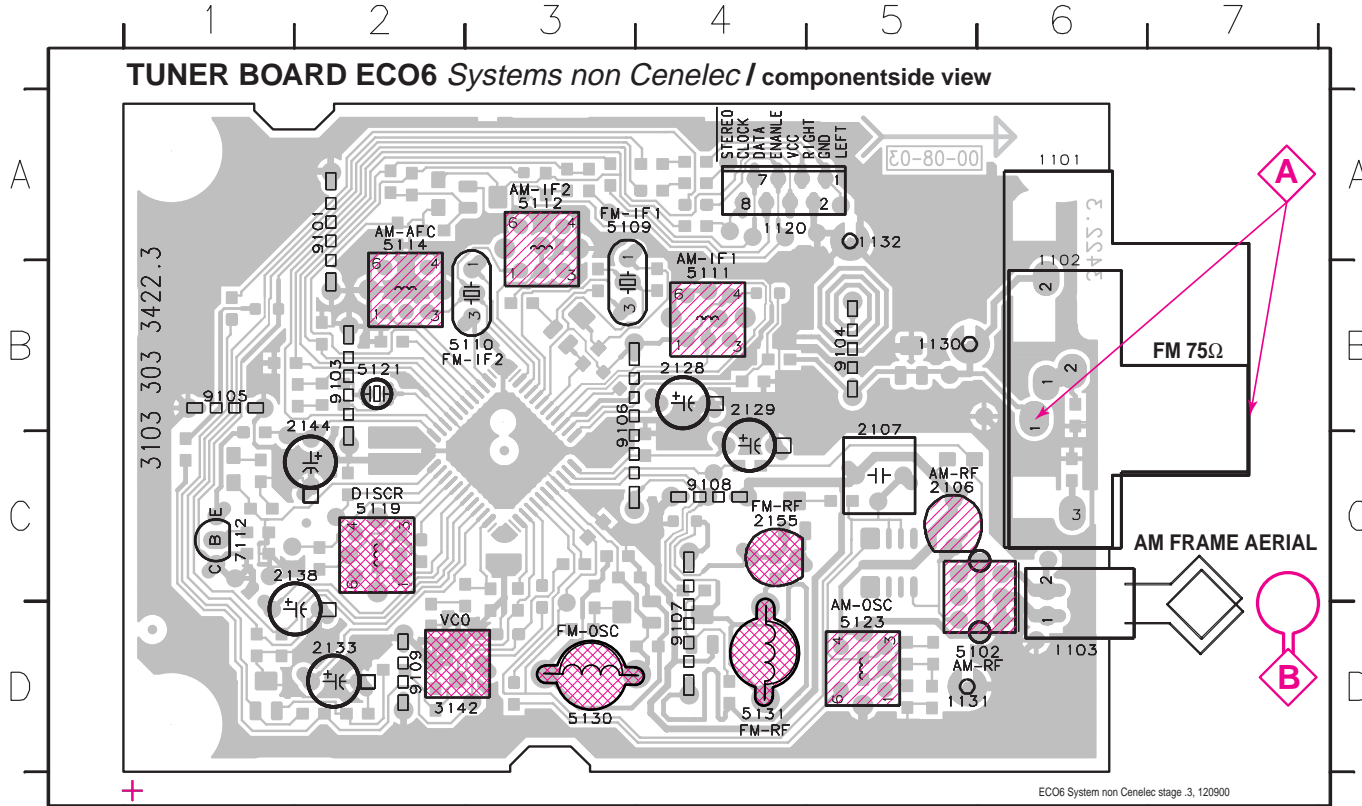
- (P)...for provision only
- USA ... for USA version only
- E-EU ... for East European version only
- J ... for Japanese version only

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

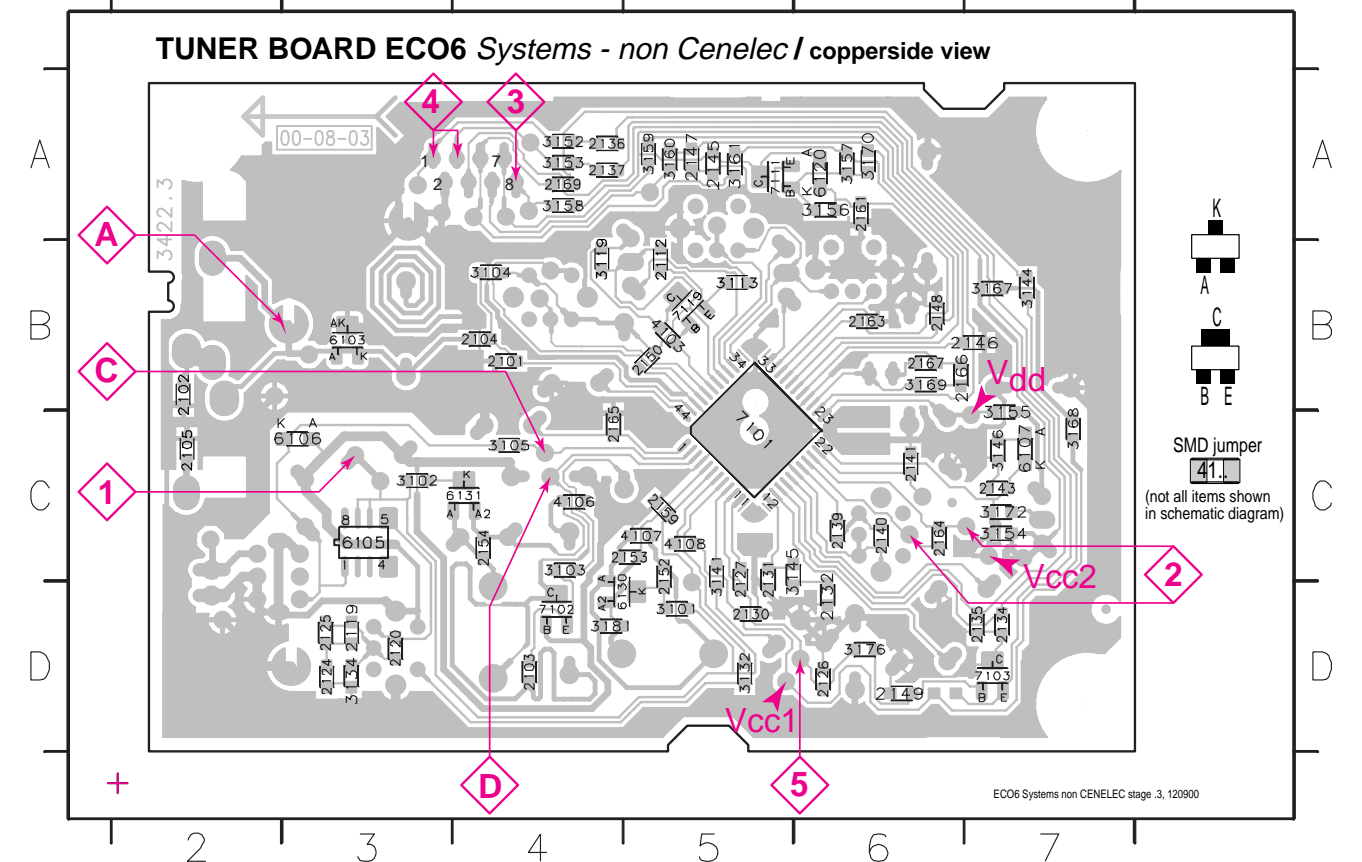
- Signal path
- FM
- - - AM
- · - · MPX (Audio Frequency)
- ⇒ AF - left/right

- 1101 A1
- 1102 B1
- 1103 F2
- 1120 E14
- 1130 A2
- 1131 B2
- 1132 G13
- 2101 B3
- 2102 B1
- 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 G8
- 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
- 5109 B9
- 5110 B10
- 5111 A8
- 5112 A11
- 5114 B11
- 5119 G9
- 5121 E11
- 5123 G5
- 5130 E5
- 5131 C6
- 5132 E2
- 6105 F3
- 6105-2 G5
- 6106 C3
- 6107 G13
- 6120 G13
- 6130 E5
- 6131 D5
- 7101 C8
- 7102 C6
- 7103 H7
- 7111 C13
- 7112 G12
- T102 B2
- T103 B2
- T105 F2
- T106 F2
- T109 B6
- T110 F5
- T111 F4
- T112 F7
- T113 A8
- T114 B10
- T115 A8
- T116 F10
- T117 G13
- T118 G11
- T120 F13
- T121 F13
- T122 F13
- T123 E13
- T124 G14
- T125 F14
- T126 F13
- T127 F13
- T128 D7
- T140 F11
- T141 F10
- T142 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		108MHz	5130		8V ±0.2V
	87.5MHz (65.81MHz)		87.5MHz (65.81MHz)	check		4.3V ±0.5V (1.2V ±0.5V)
<b>MW</b> FM/AM-version, 10kHz grid 530 - 1700kHz	1700kHz		1700kHz	5123		8V ±0.2V
	530kHz		530kHz	check		1.1V ±0.4V
FM/MW-version, 9kHz grid 531 - 1602kHz	1602kHz		1602kHz	5123	1	6.9V ±0.2V
	531kHz		531kHz	check		1.1V ±0.4V
<b>LW</b> 153 - 279kHz	279kHz		279kHz	5122		8V ±0.2V
	153kHz		153kHz	check		1.1V ±0.4V
<b>MW</b> FM/MW/LW- version, 9kHz grid 531 - 1602kHz	1602kHz		1602kHz	5123		8V ±0.2V
	531kHz		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	continuous wave V <sub>RF</sub> = 2mV	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			

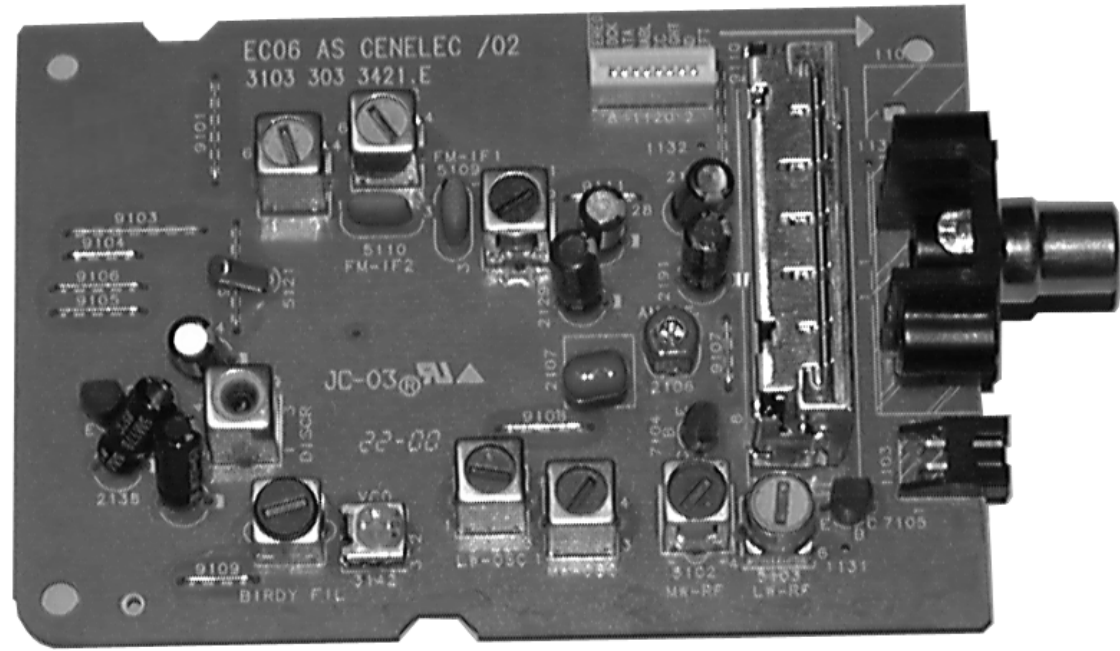
6130©	4822 130 82833	1SV228			
6131©	4822 130 82833	1SV228			

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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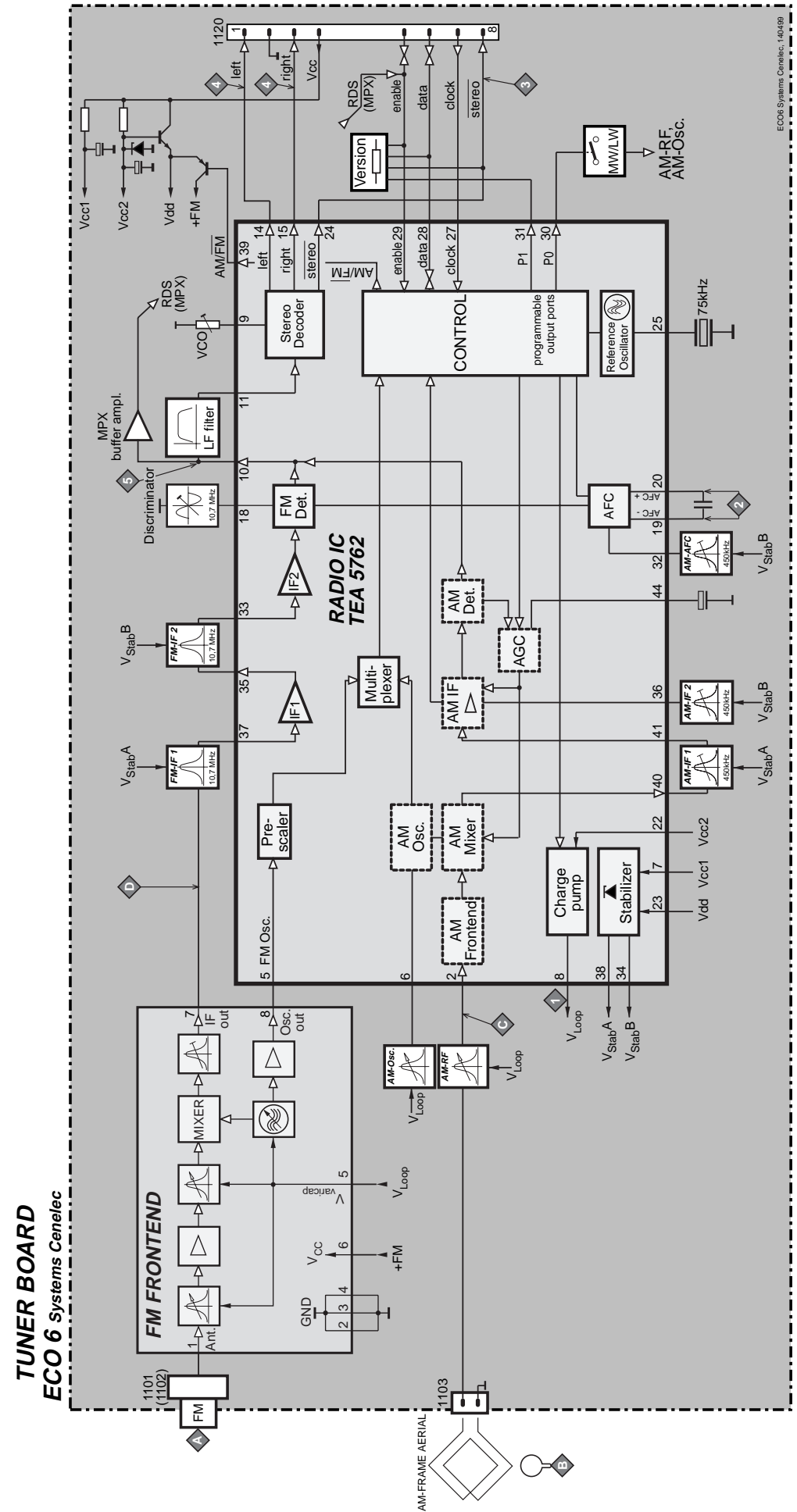
# ECO6 Tuner Board

version: **SYSTEMS CENELEC**

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## BLOCK DIAGRAM



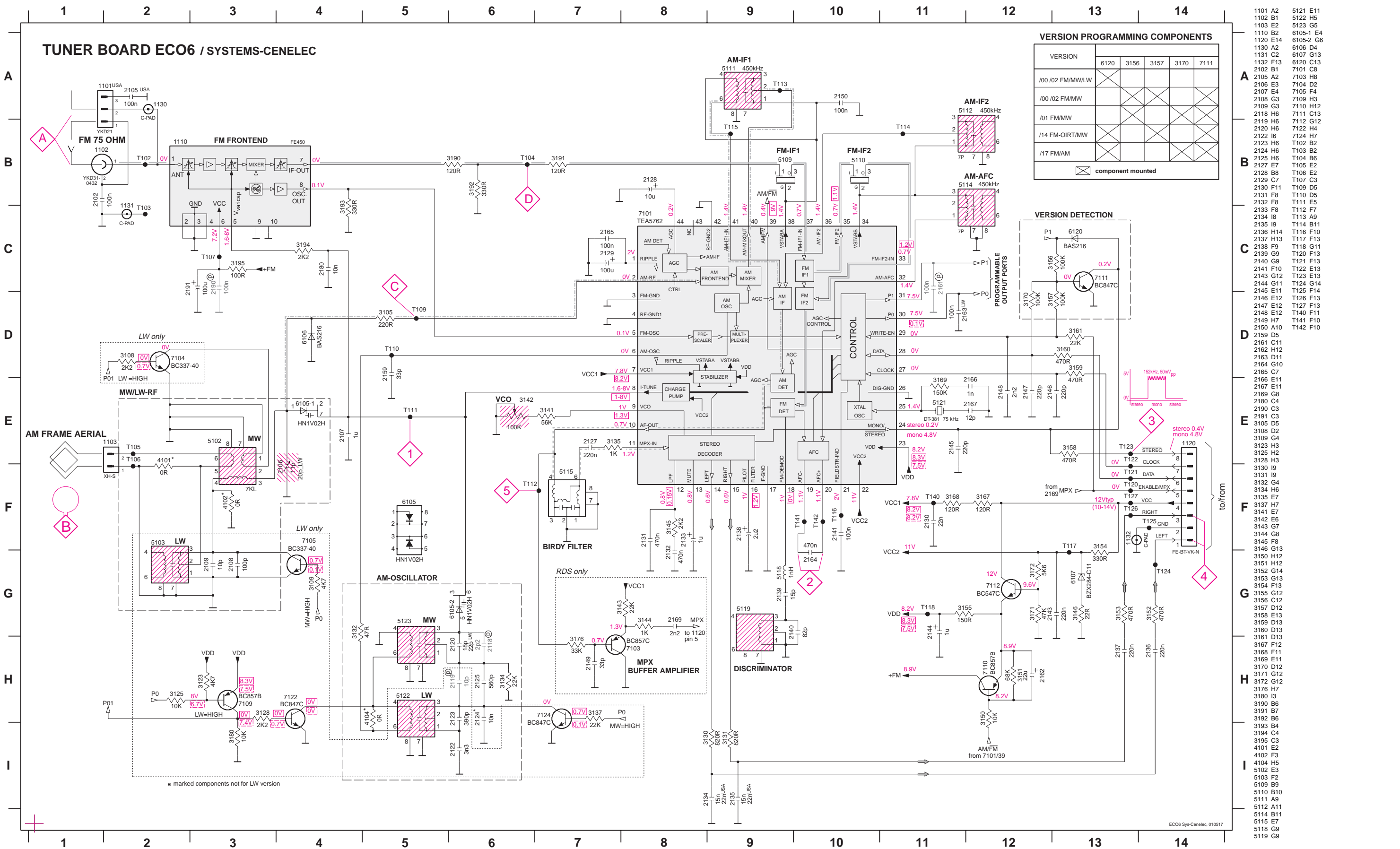
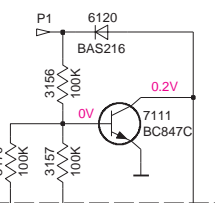
### TUNER BOARD ECO6 / SYSTEMS-CENELEC

### 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



- 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 G3
- 2118 H6
- 2119 H6
- 2120 H6
- 2122 I6
- 2123 H6
- 2124 H6
- 2125 H6
- 2127 E7
- 2128 B8
- 2129 C7
- 2130 F11
- 2131 F8
- 2132 F8
- 2133 F8
- 2134 I8
- 2135 I9
- 2136 H14
- 2137 H13
- 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 E6
- 3135 E7
- 3137 H7
- 3141 E7
- 3142 E6
- 3143 G7
- 3144 G8
- 3145 F8
- 3146 G13
- 3150 H12
- 3151 H12
- 3152 G14
- 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
- 3190 B6
- 3191 B7
- 3192 B6
- 3193 B4
- 3194 C4
- 3195 C3
- 4101 E2
- 4102 F3
- 4104 H5
- 5102 E3
- 5103 F2
- 5109 B9
- 5110 B10
- 5111 A9
- 5112 A11
- 5114 B11
- 5115 E7
- 5118 G9
- 5119 G9
- 5121 E11
- 5122 H5
- 5123 G5
- 5125-1 E4
- 5125-2 G6
- 6106 D4
- 6107 G13
- 6120 C13
- 7101 C8
- 7104 H8
- 7105 D2
- 7105 F4
- 7109 H3
- 7110 H2
- 7111 C13
- 7112 G12
- 7122 H4
- 7124 H7
- 7125 B2
- 7125 H4
- 7126 B2
- 7126 H4
- 7127 E7
- 7127 F3
- 7128 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

### LEGEND

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



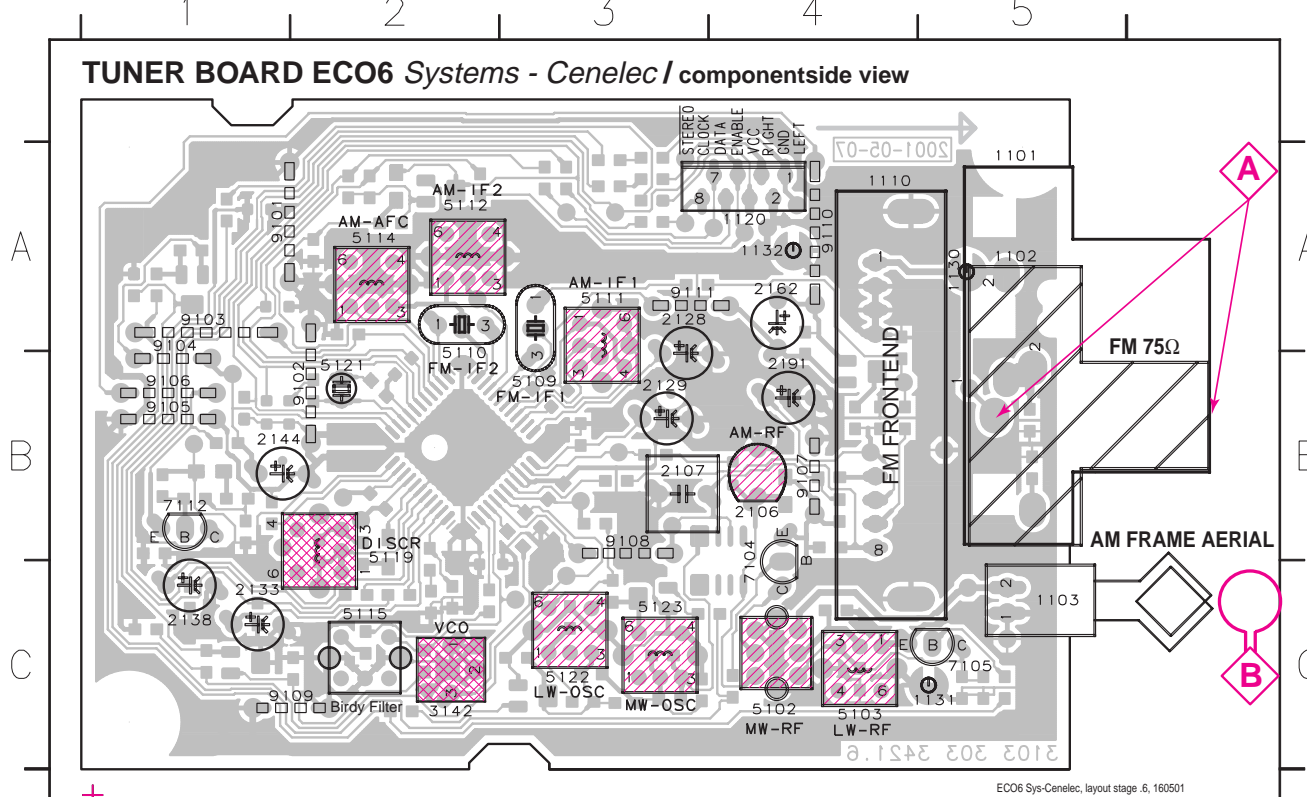
- ...V FM mode stereo
- ...V MW mode
- ...V LW mode
- voltages measured while set is tuned to a strong transmitter

### Signal path

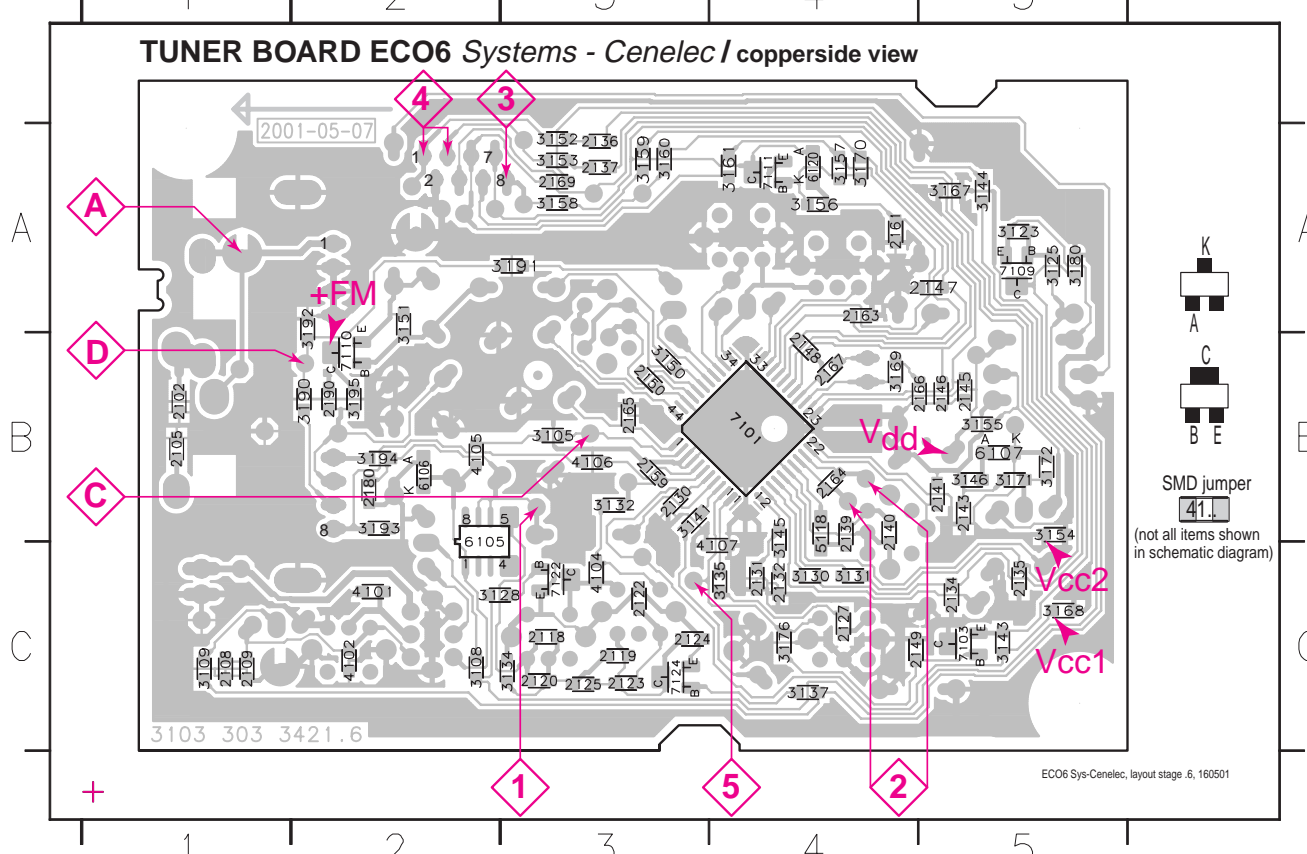
- FM
- - - AM
- · - · - MPX (Audio Frequency)
- ⇒ AF - left/right



1101 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

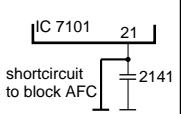
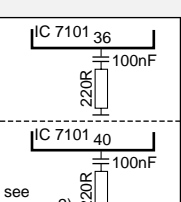
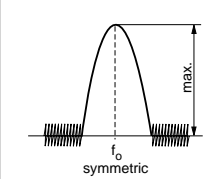

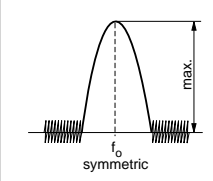


2102 B1 2120 C3 2130 B3 2137 A3 2146 B5 2161 A4 2169 A3 3123 A5 3134 C3 3145 C4 3154 B5 3160 A3 3171 B5 3192 A2 4104 C3 6106 B2 7110 B2  
 2105 B1 2122 C3 2131 C4 2139 B4 2147 A5 2163 A4 2180 B2 3125 A5 3135 C4 3146 B5 3155 B5 3161 A4 3172 B5 3193 B2 4105 B2 6107 B5 7111 A4  
 2108 C1 2123 C3 2132 C4 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	
				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		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

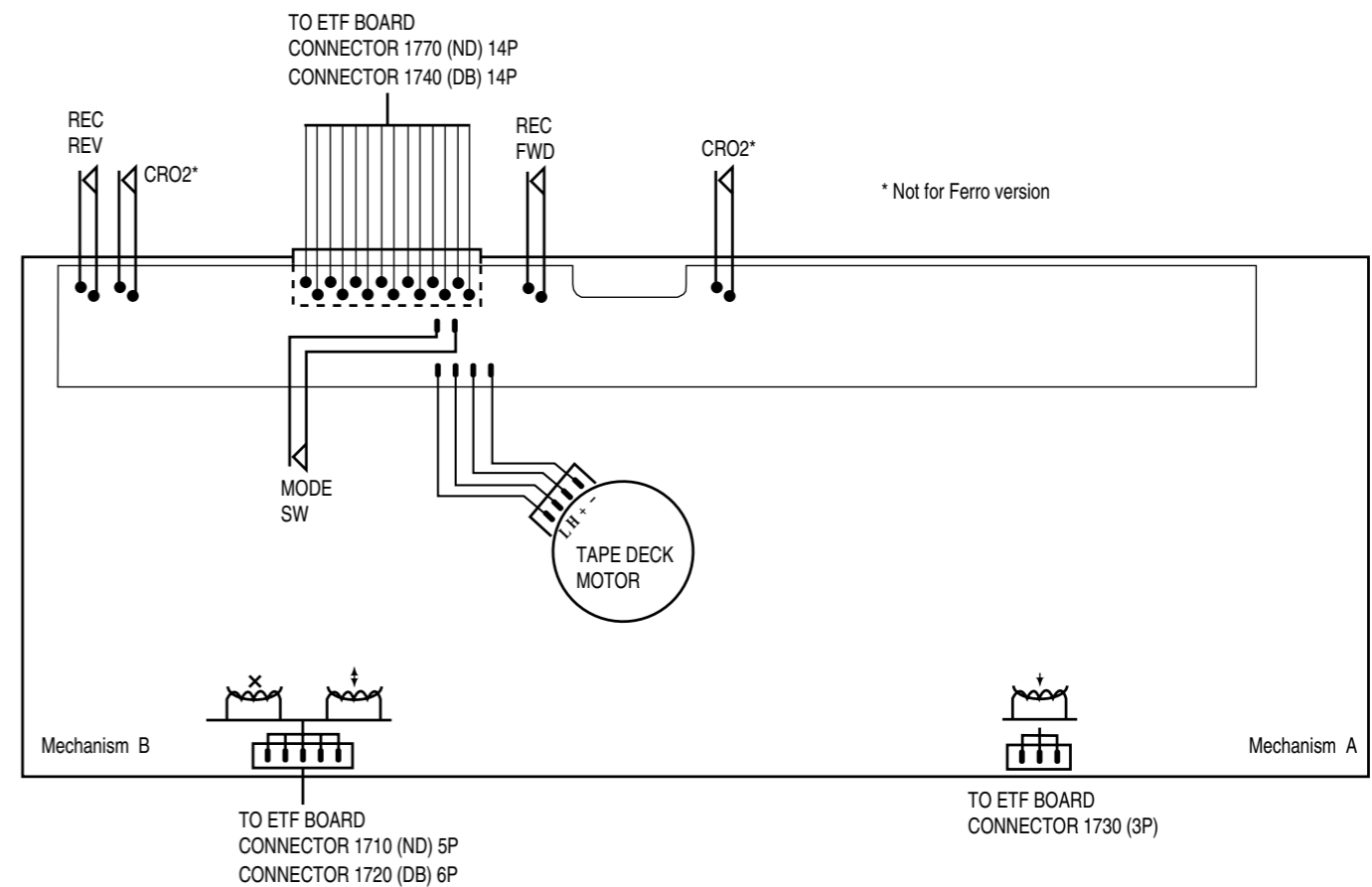
INTEGRATED CIRCUITS

7101	4822 209 90315	TEA5762H/V1, RADIO IC	
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# ETF7 TAPE MODULE

## (Non-Dolby Version)

### Tapedeck wiring (Double deck)



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Servo Circuit diagram ..... 9-8

Exploded views & parts list ..... 9-9

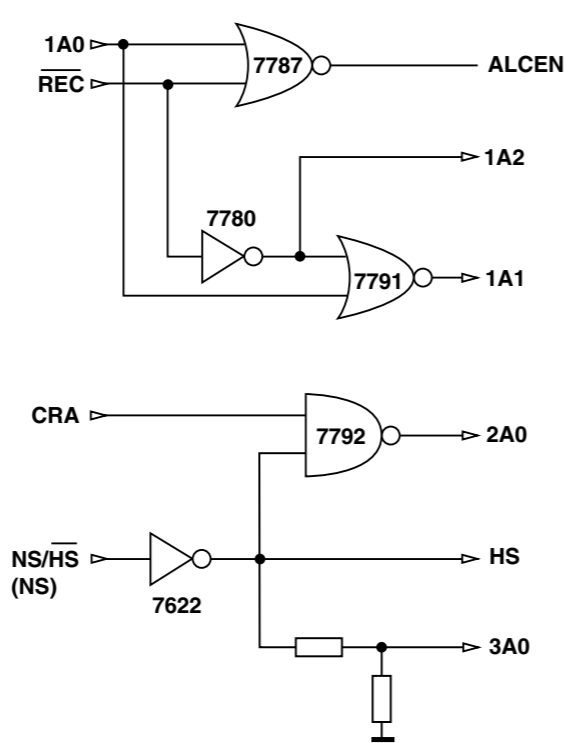
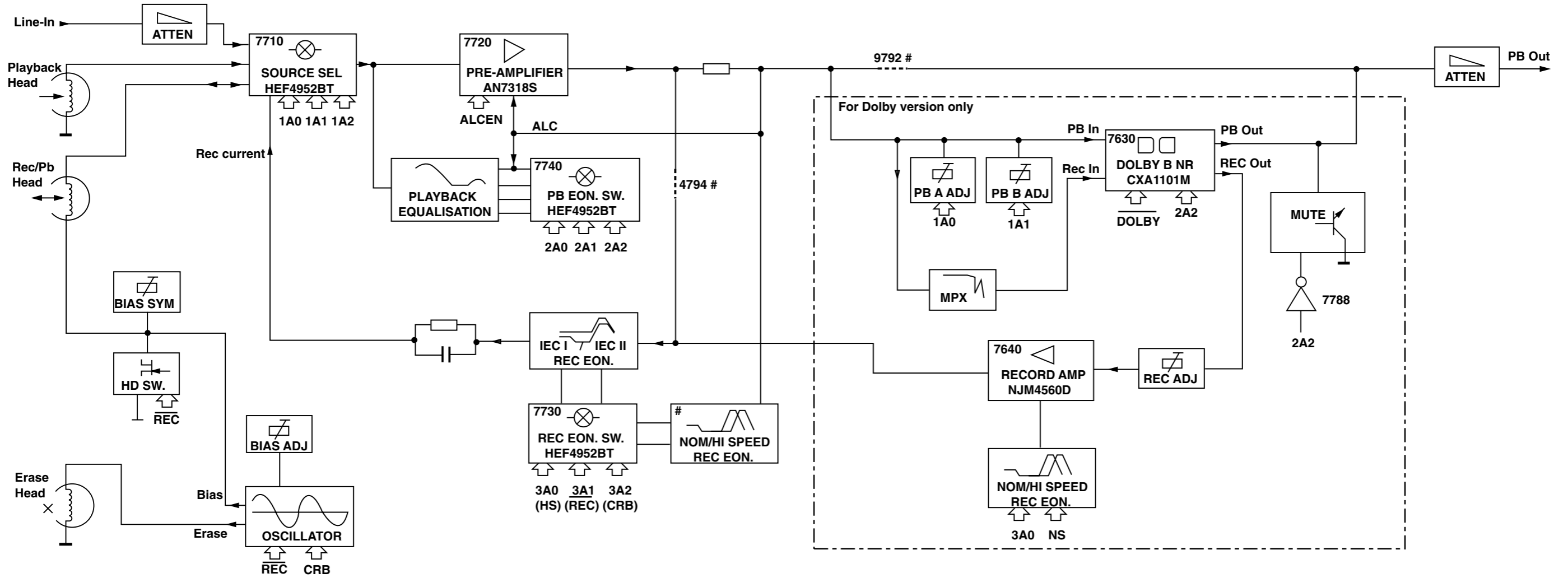
Electrical parts list ..... 9-13

#### 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	-	-

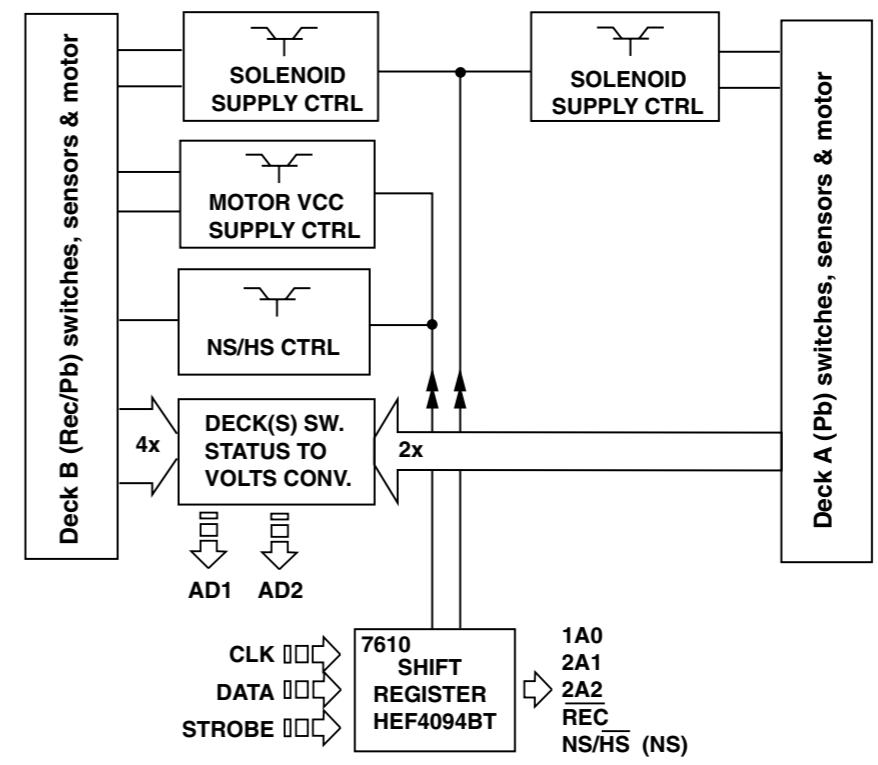
### BLOCK DIAGRAM



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

### NOTATIONS & ABBREVIATIONS USED IN THIS DOCUMENT

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

**CONNECTORS ASSIGNMENTS:**CONNECTOR 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

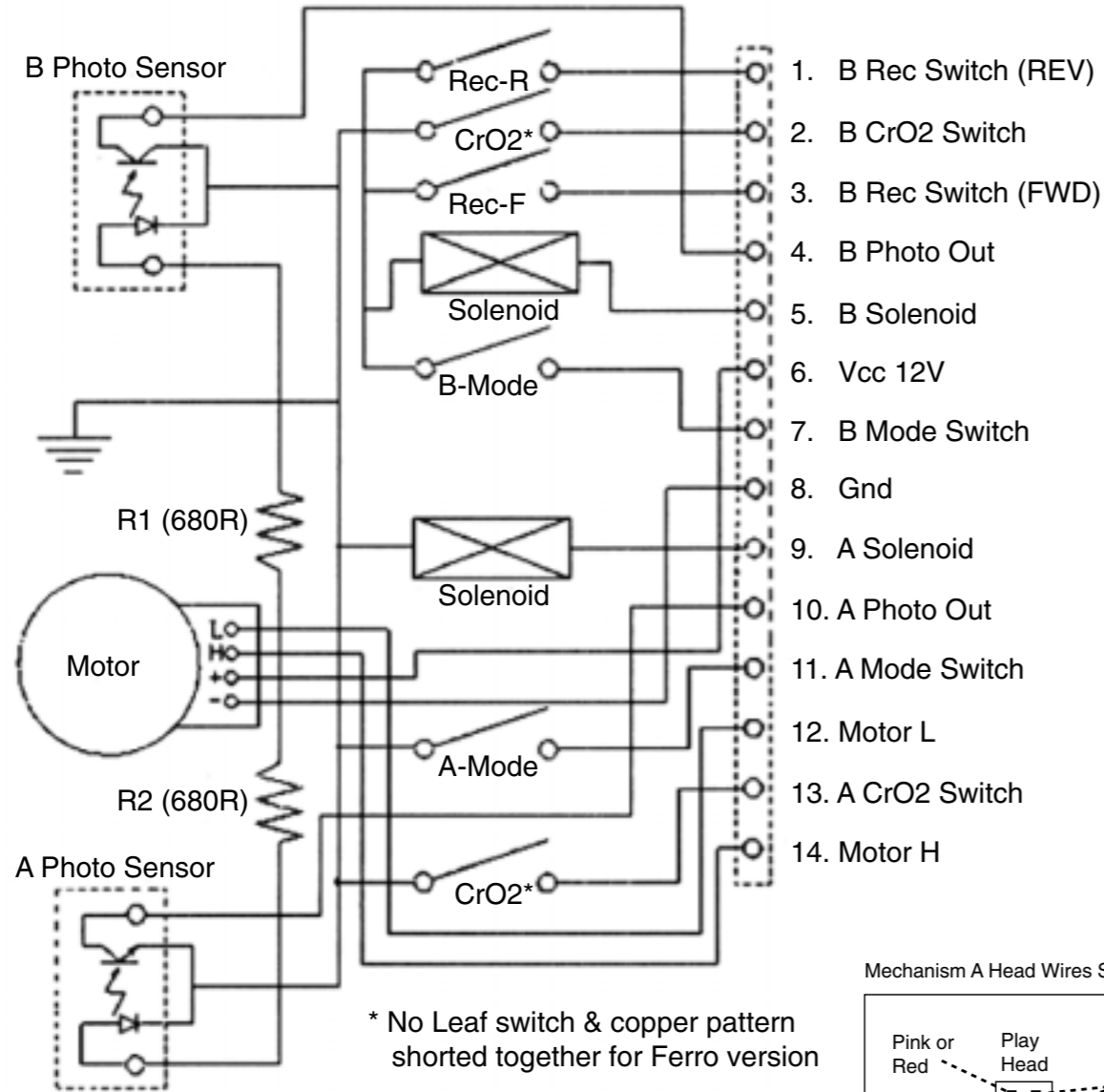
CONNECTOR 1740DECK A & B CONTROL INTERFACE (For Dolby B NR version only)

○ 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)

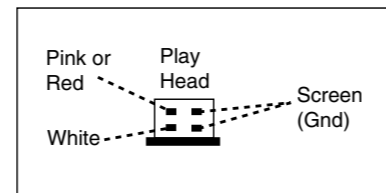
○ 1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
○ 2	CrO2 B	Chrome tape detection switch deck B	[open=Cr: close=Fe]
○ 3	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
○ 4	PHOTO B	Photo sensor output (tape movement indication)	
○ 5	SOL B	Solenoid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

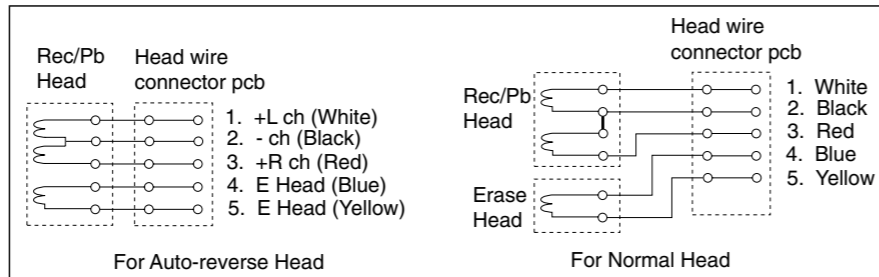


\* No Leaf switch & copper pattern shorted together for Ferro version

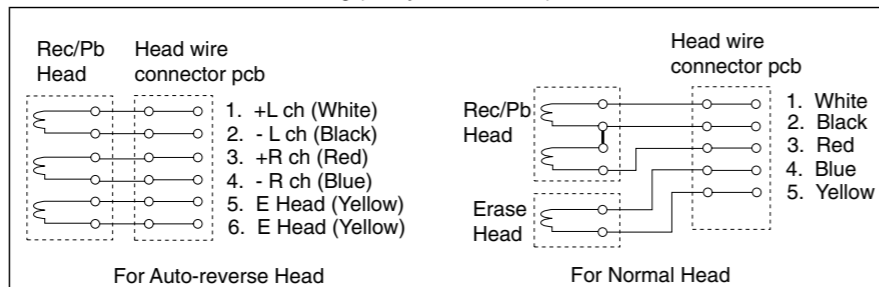
Mechanism A Head Wires Soldering



Mechanism B Head Wires Soldering (Non-Dolby version)



Mechanism B Head Wires Soldering (Dolby B NR version)

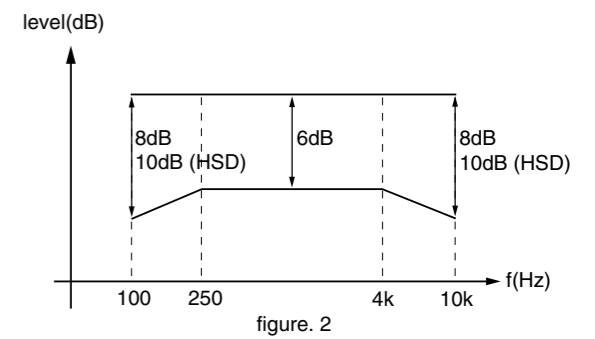
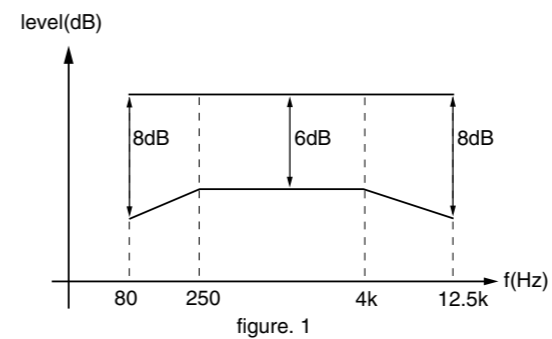


TAPE ADJUSTMENT & CHECK TABLE

	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% *

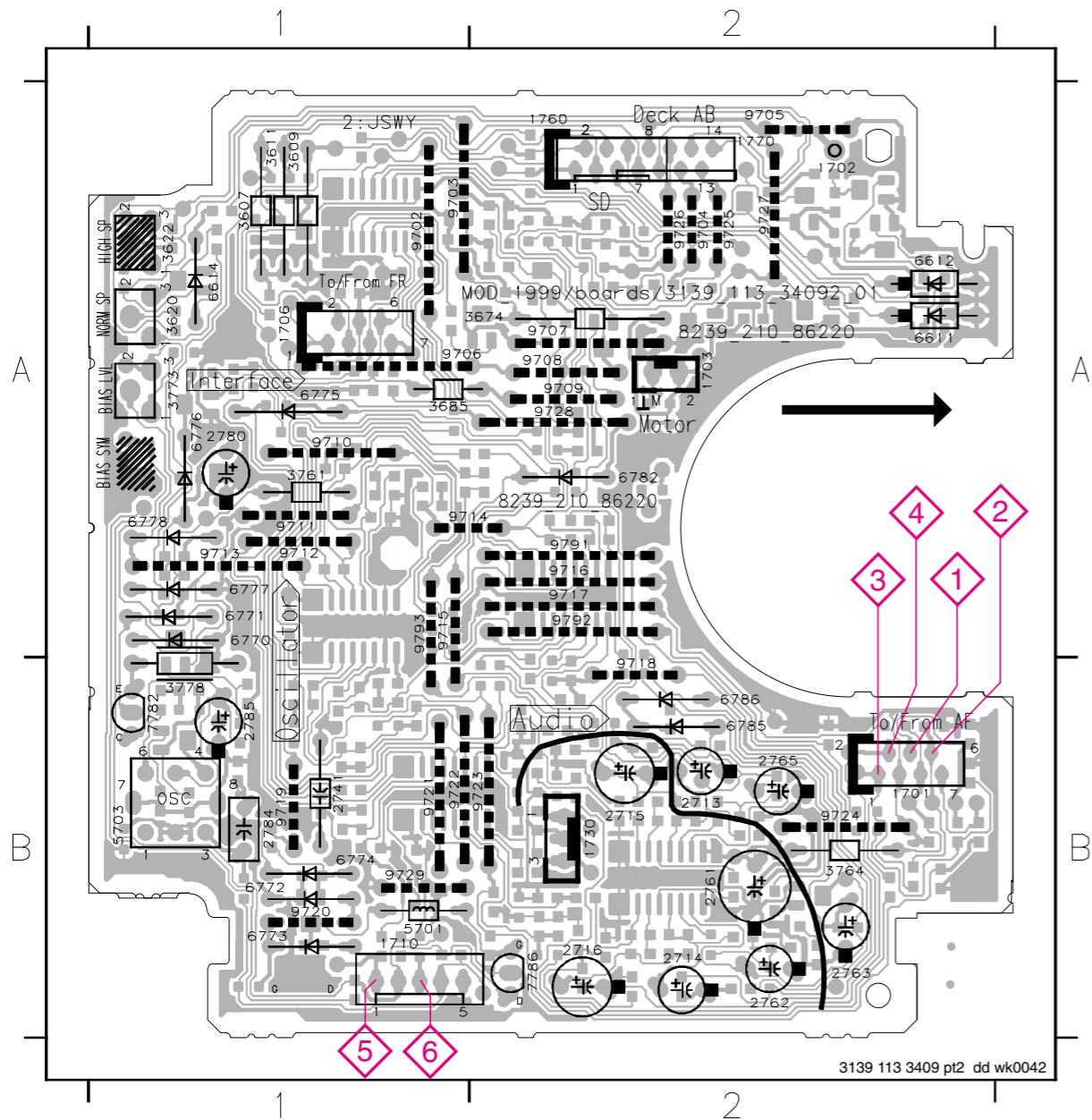
SBC419A^ : 4822 397 30069  
 SBC420 : 4822 397 30071

# 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

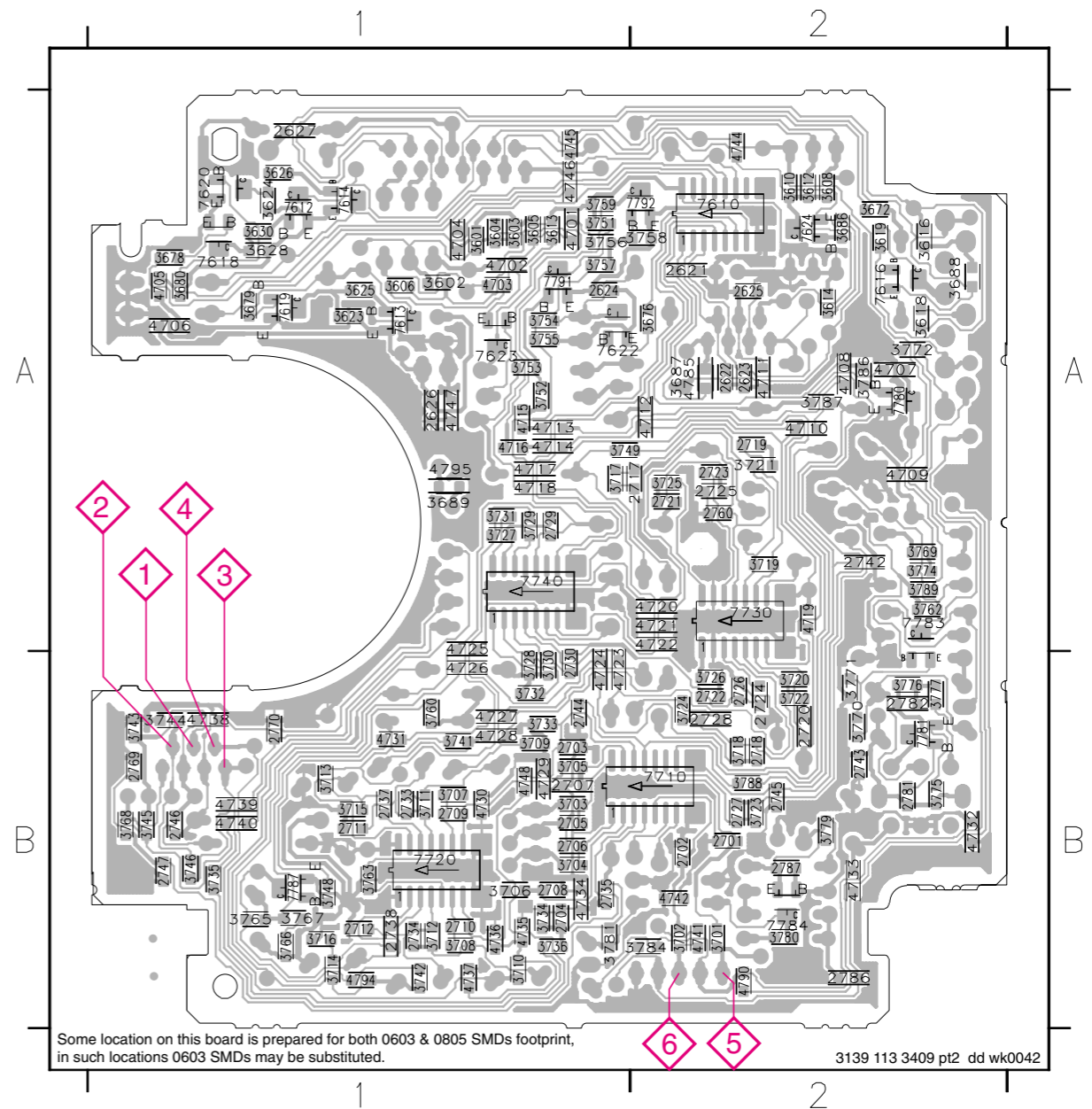
1701 B2	2714 B2	2784 B1	3761 A1	6770 A1	6782 A2	9706 A1	9715 A1	9724 B2
1702 A2	2715 B2	2785 B1	3764 B2	6771 A1	6785 B2	9707 A2	9716 A2	9725 A2
1703 A2	2716 B2	3607 A1	3773 A1	6772 B1	6786 B2	9708 A2	9717 A2	9726 A2
1706 A1	2741 B1	3609 A1	3778 B1	6773 B1	7782 B1	9709 A2	9718 B2	9727 A2
1710 B1	2761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



3139 113 3409 pt2 dd wk0042

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	



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

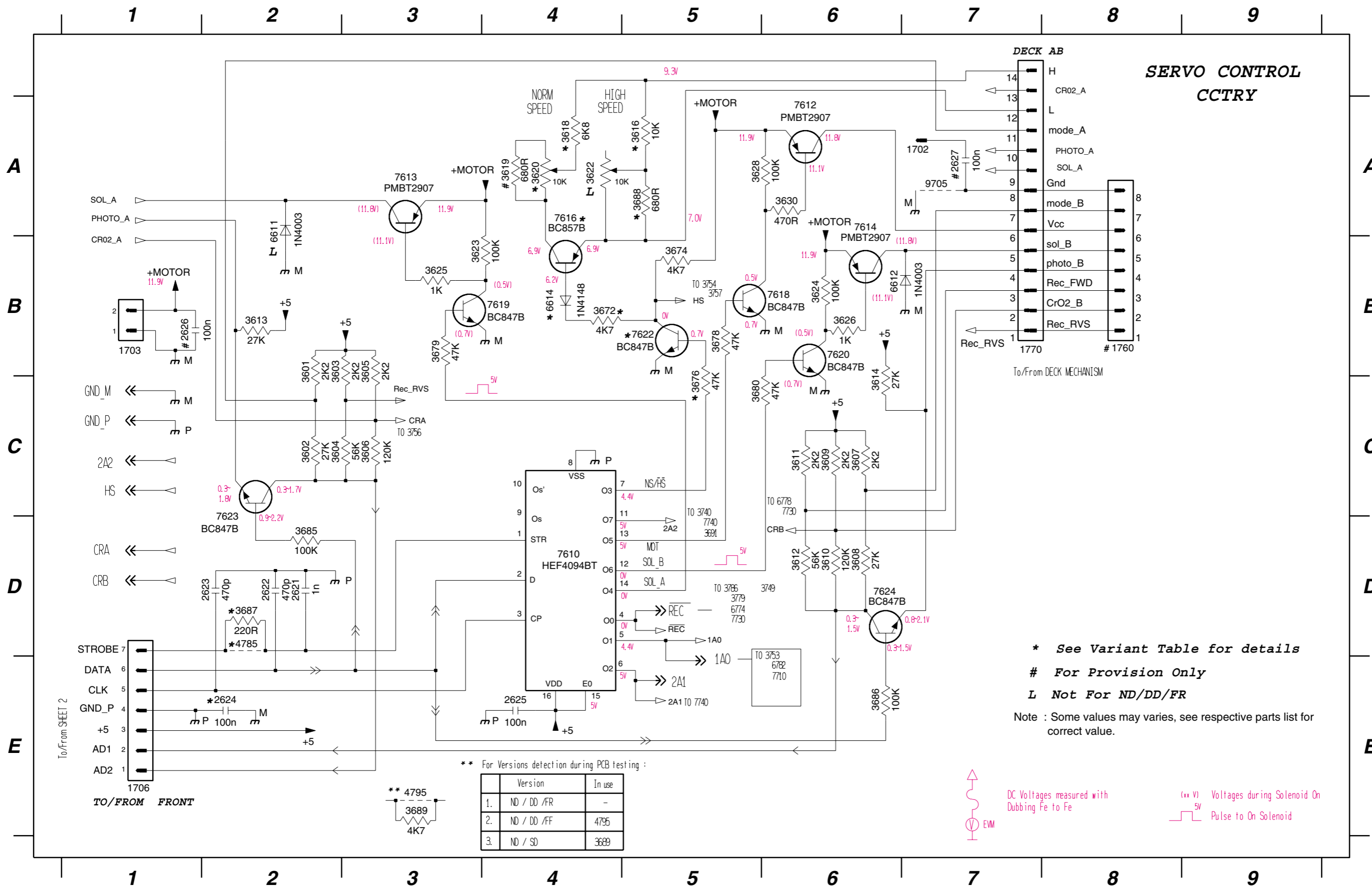
3139 113 3409 pt2 dd wk0042

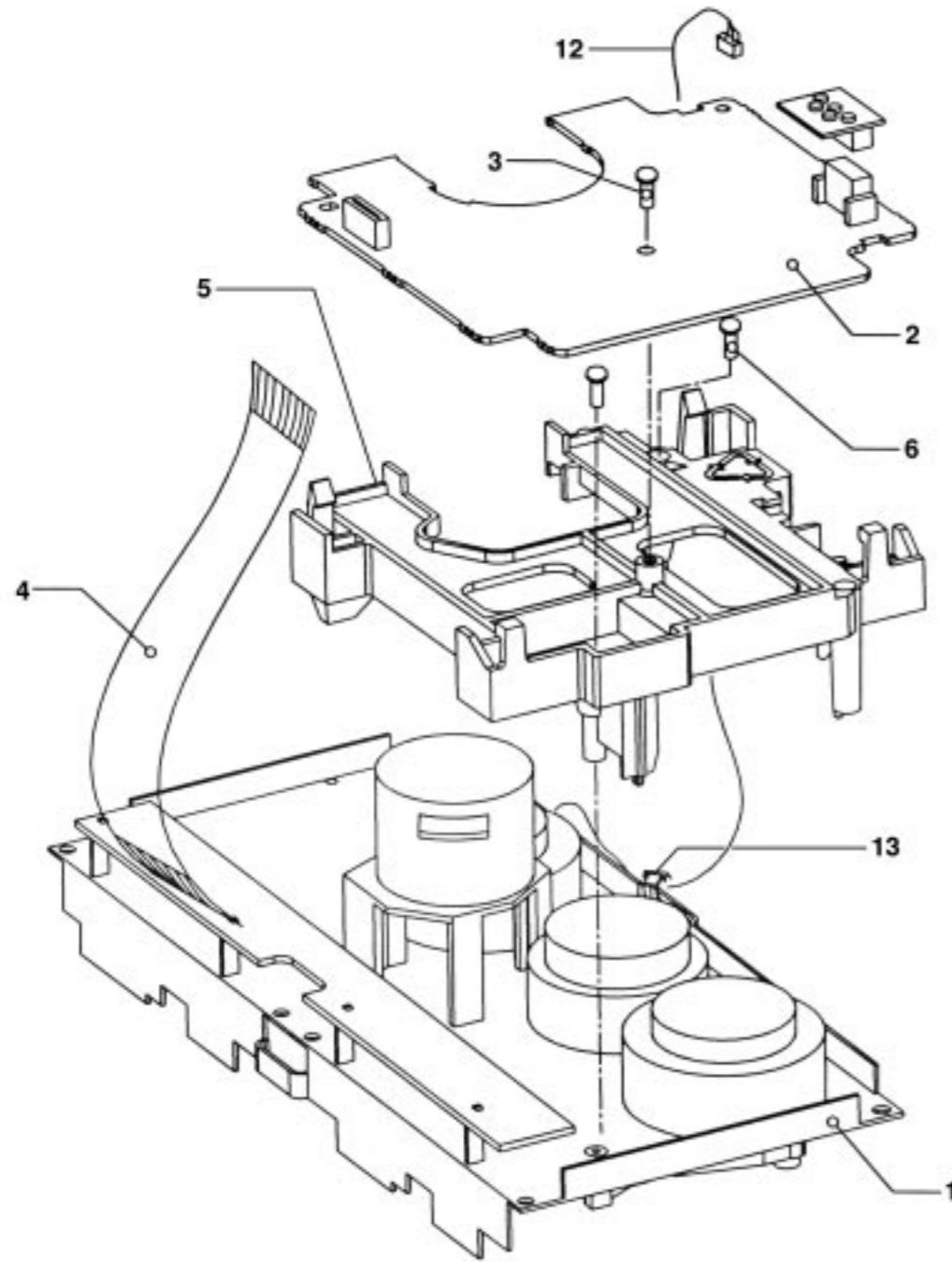




SERVO CONTROL CIRCUIT

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 B6	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	



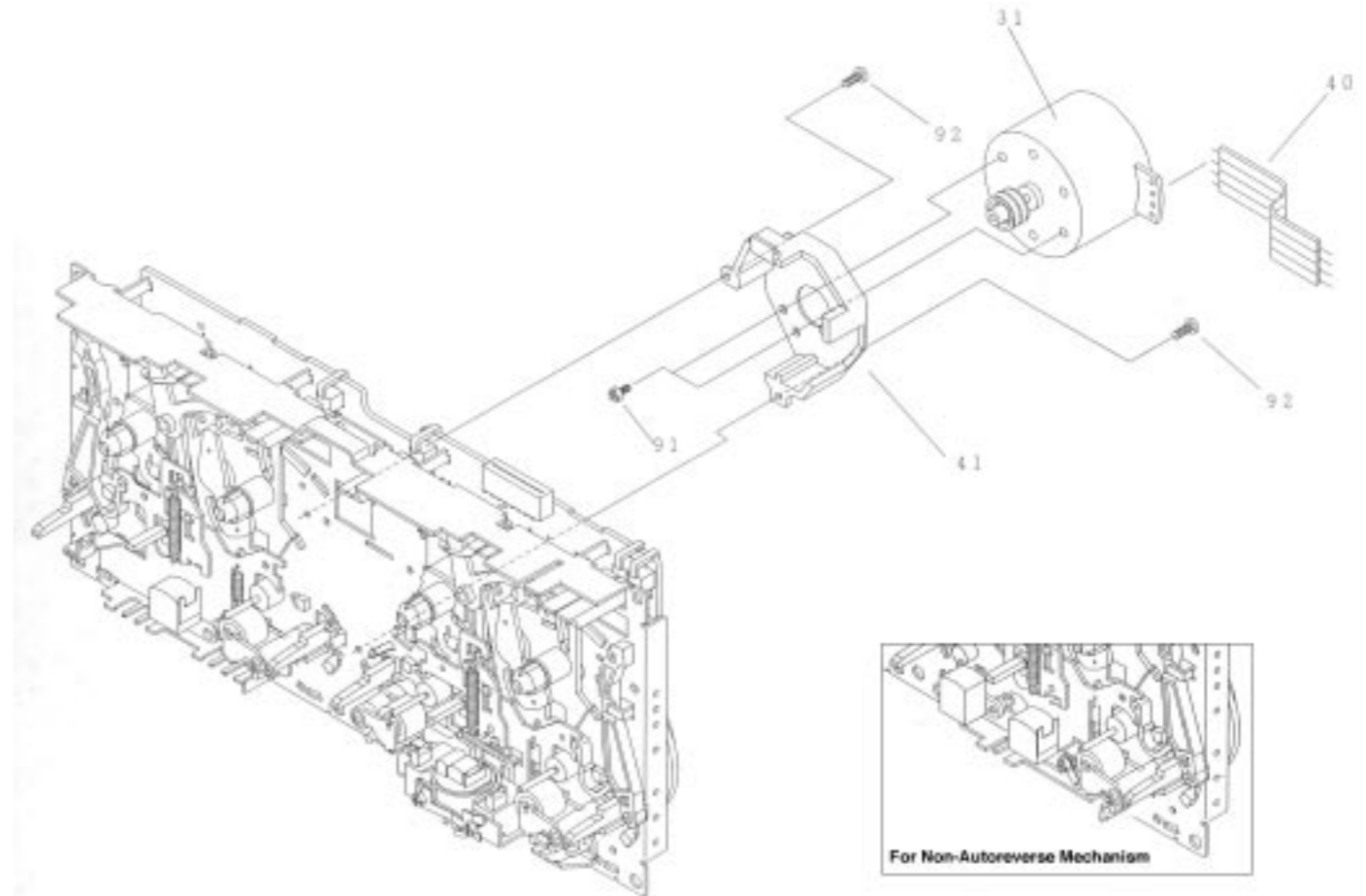


3139 118 77070 (incl. ...77080) dd wk926

**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

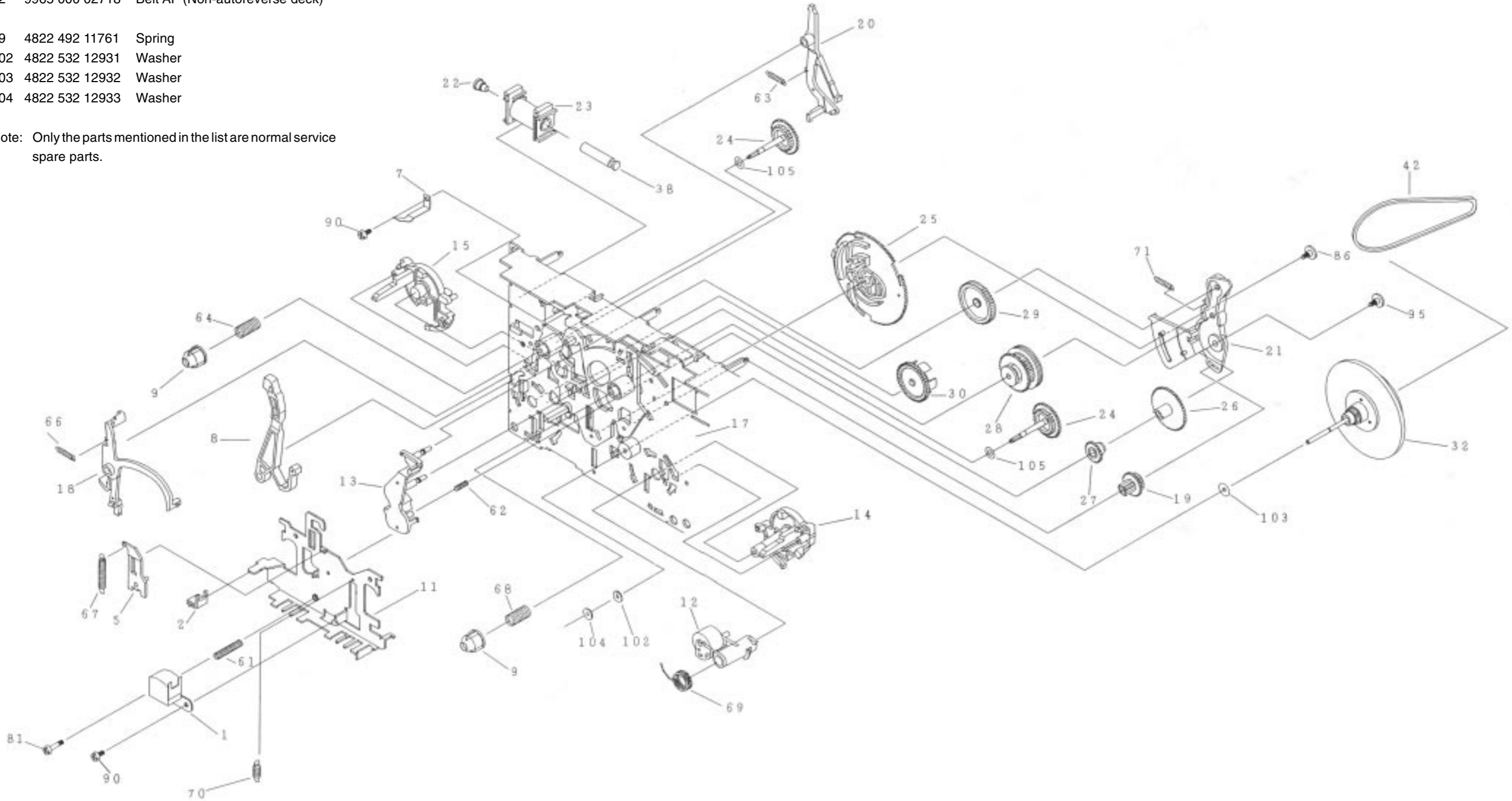
Note: Only the parts mentioned in this list are normal service spare parts.

**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.

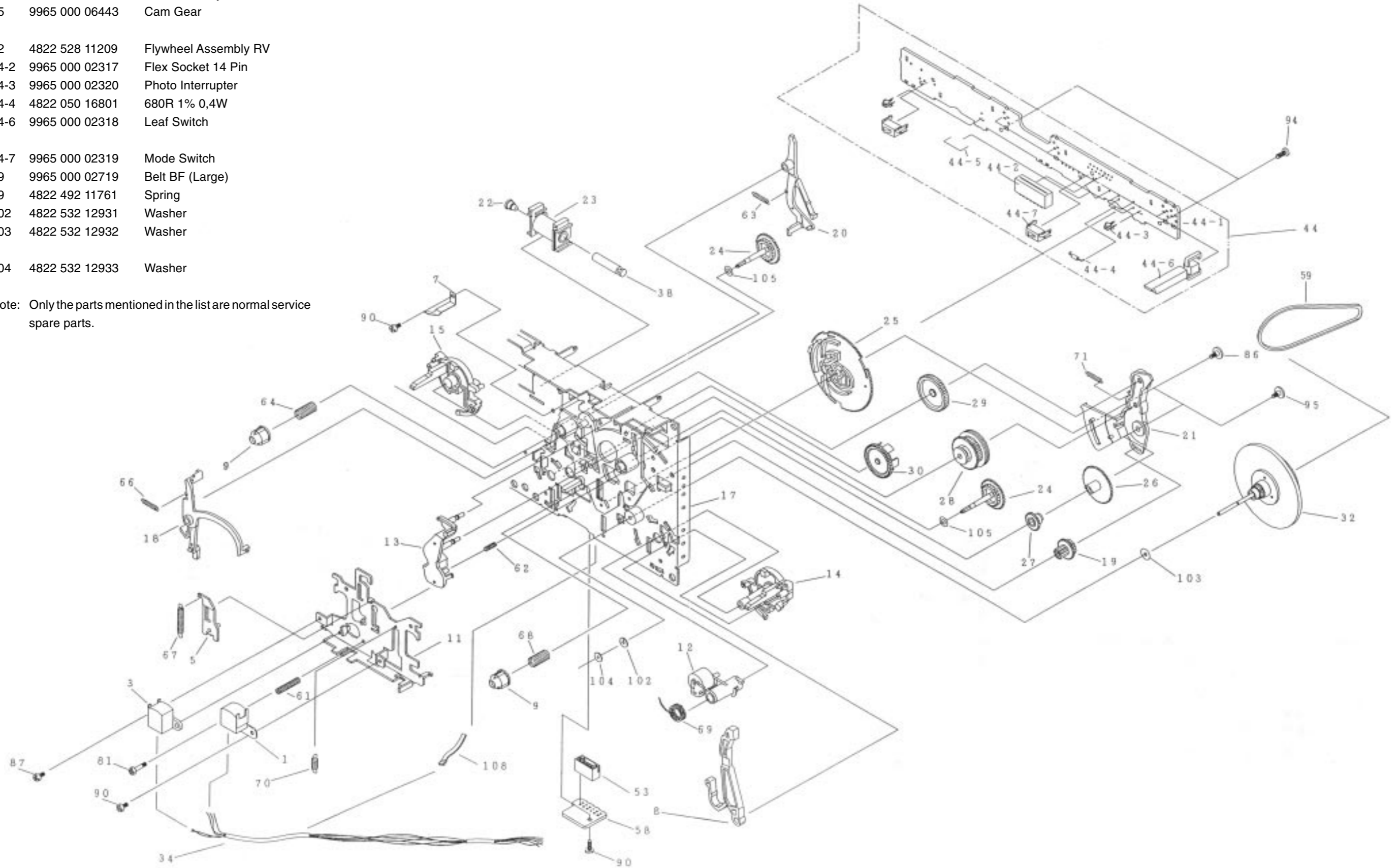


**TAPE MECHANISM B - RECORD/PLAYBACK (Non-Autoreverse version)**

**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.

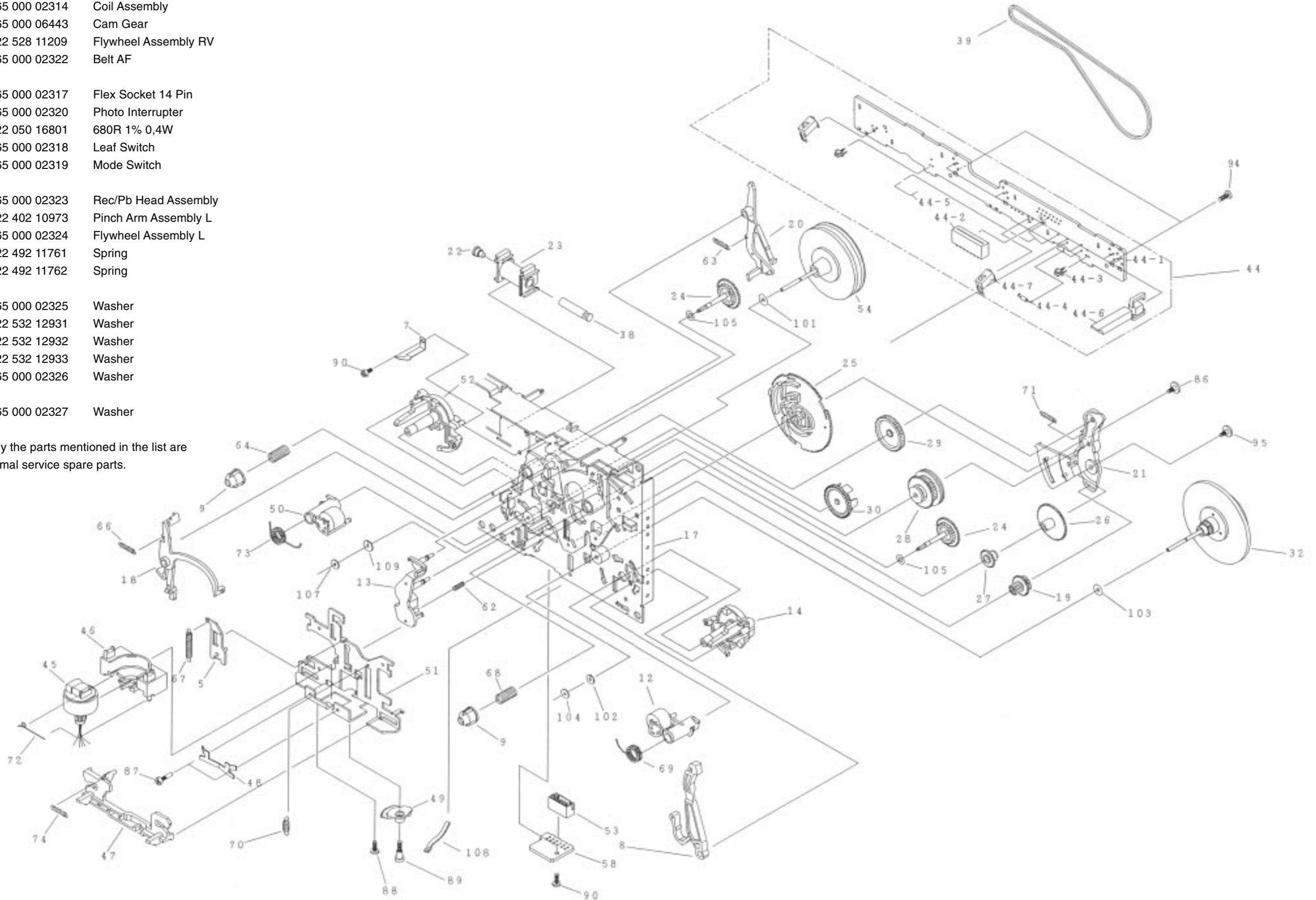


**TAPE MECHANISM B - RECORD/PLAYBACK (Autoreverse version)**

**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
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# **3CDC-LLC-MCD1**

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

Layout stage .3

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## Service hints

### CAUTION

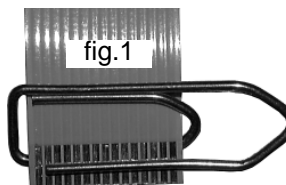
**CHARGED CAPACITORS ON THE SERVO BOARD MAY DAMAGE THE CD DRIVE ELECTRONICS WHEN CONNECTING A NEW CD MECHANISM. THAT'S WHY, BESIDES THE SAFETY MEASURES LIKE**

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

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

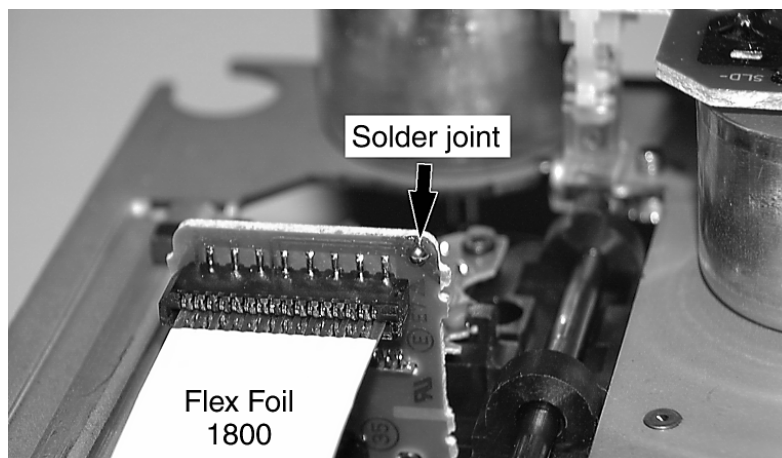
The following steps have to be done when replacing the CD mechanism:

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.

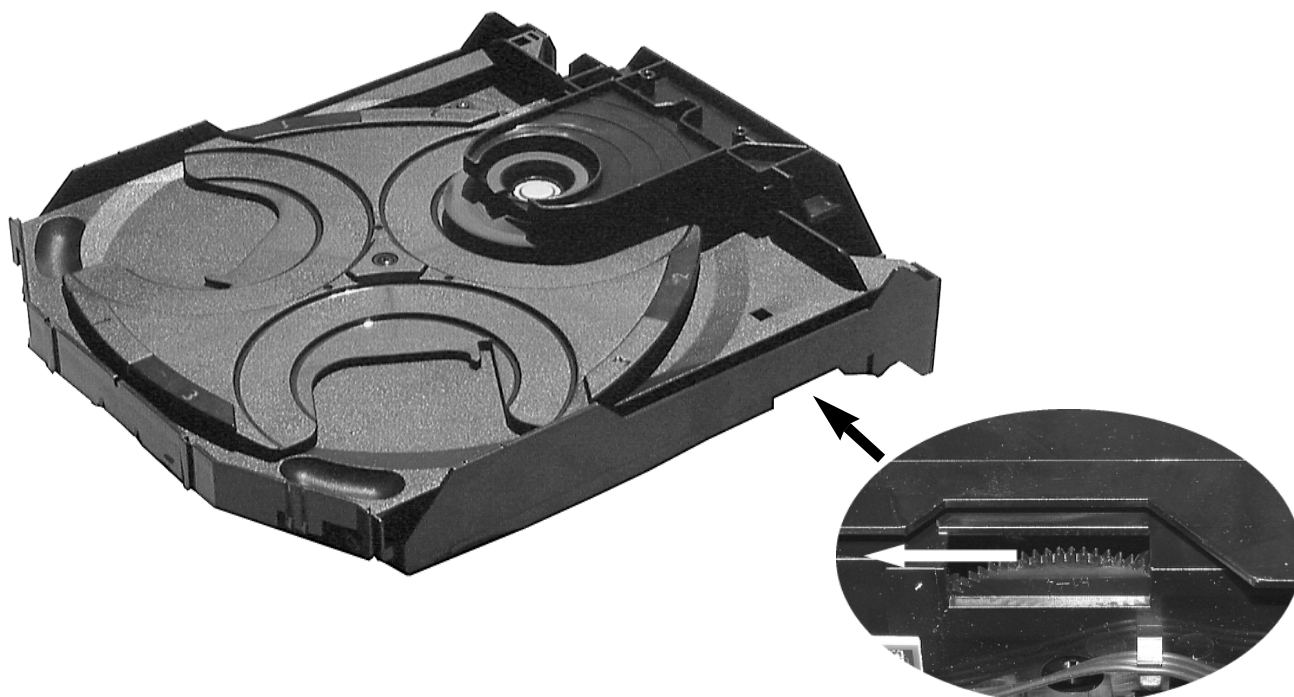
For proper functionality of the CD drive this solder joint must be removed **after** connection the drive to the set.



### Emergency open

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

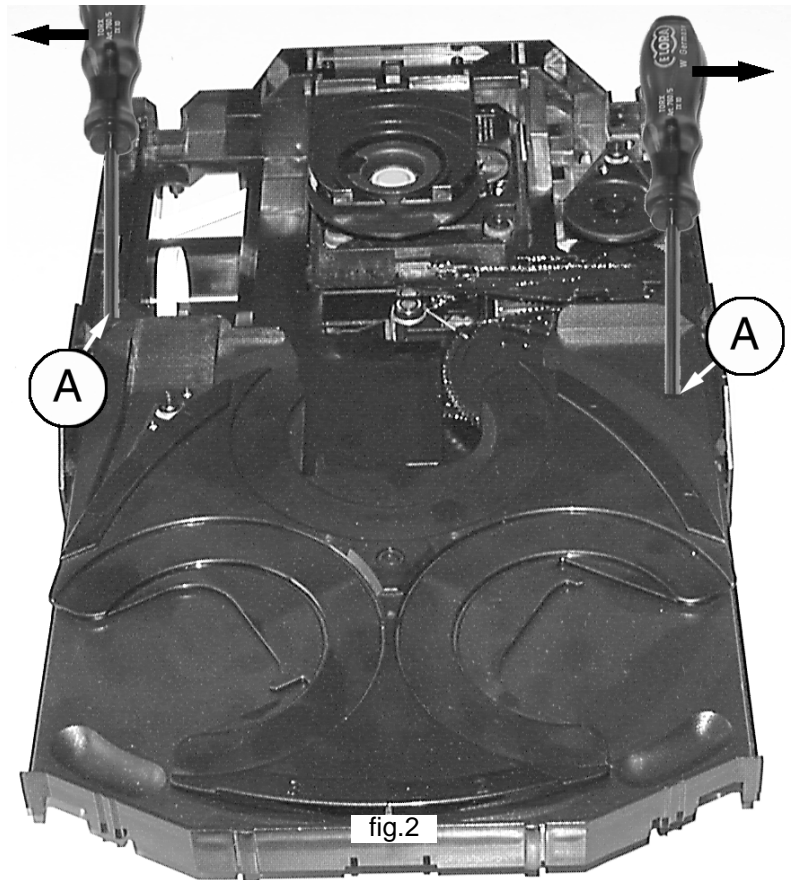
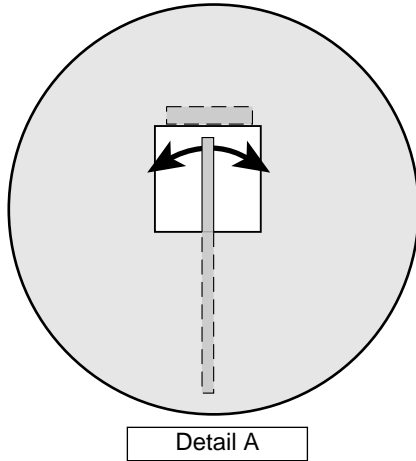
1. Remove the top cover of the set to get access to the Changer Module.
2. Turn gearwheel clockwise (as shown in picture below).



## Service hints

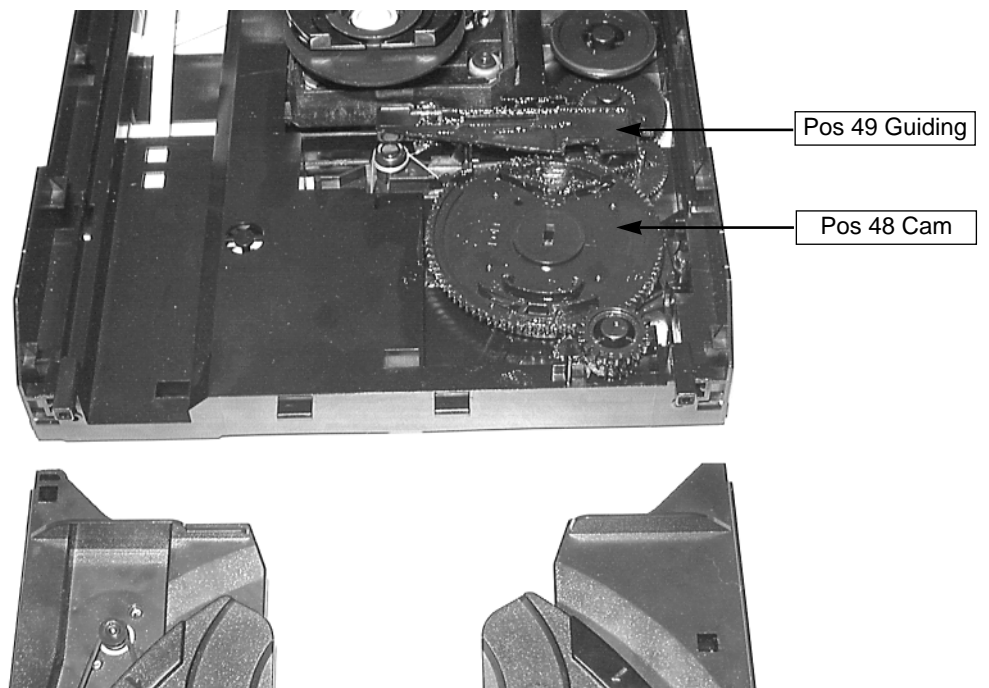
### Dismantling of Tray

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

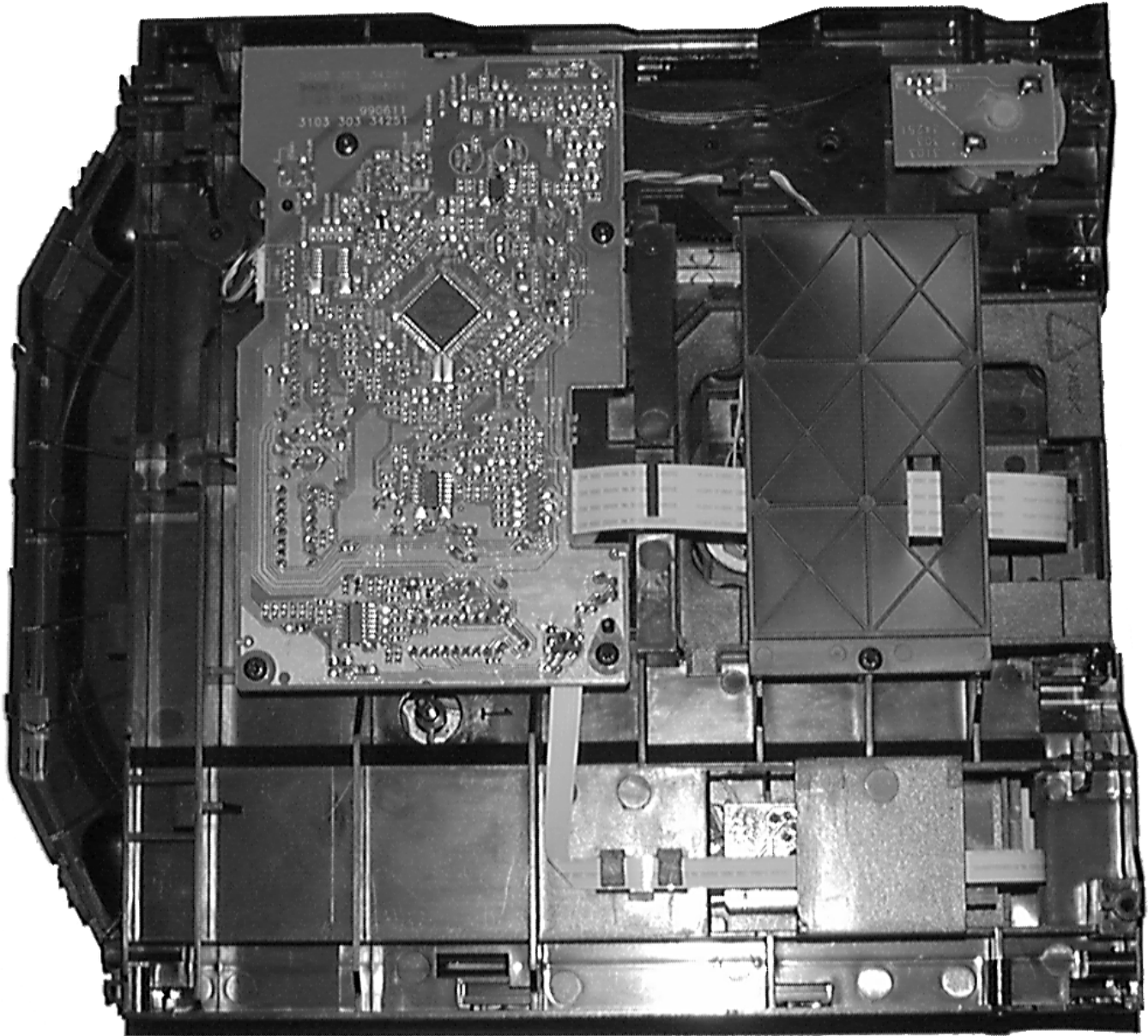


### Assembling of Tray

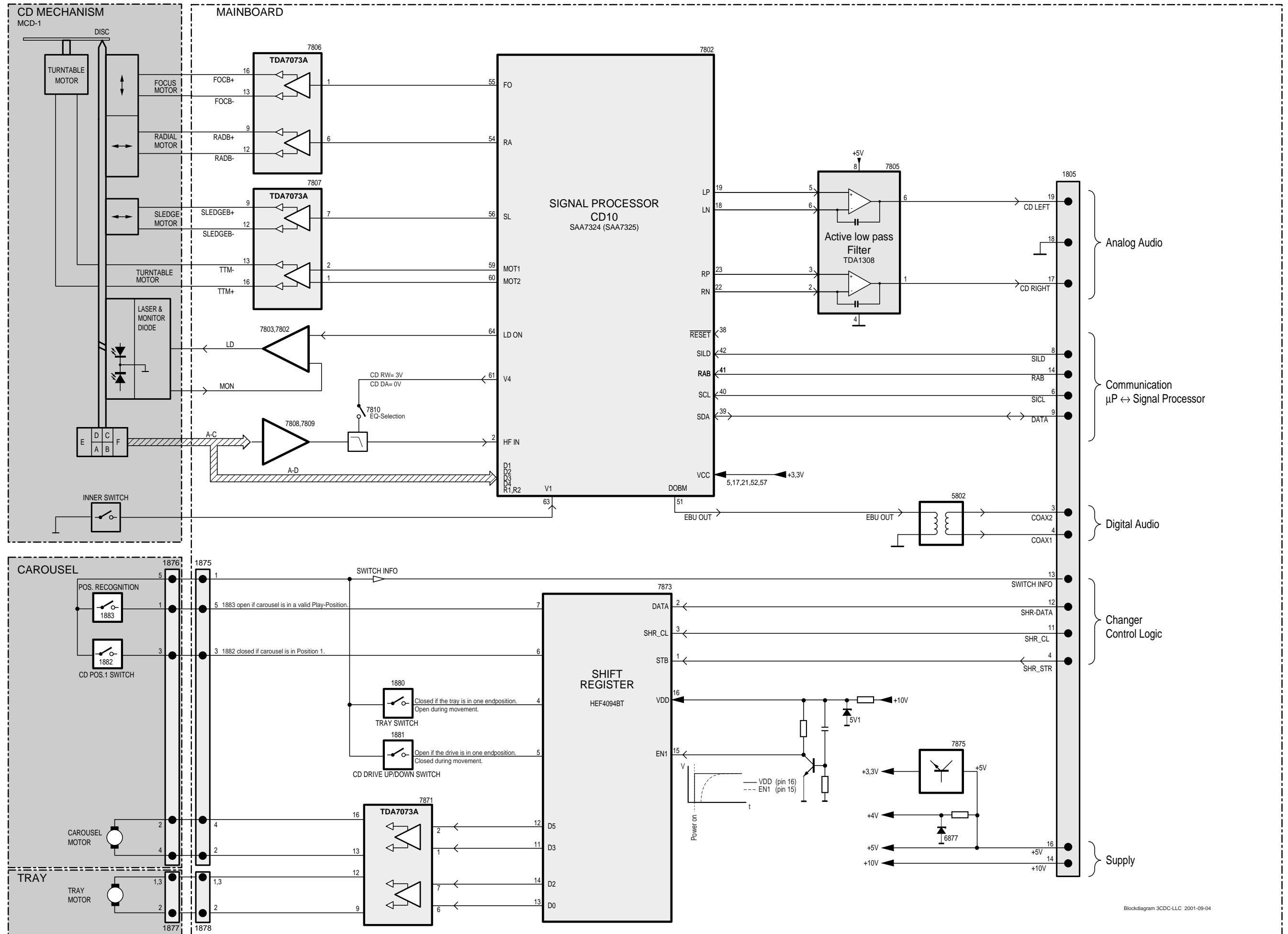
1. Turn Cam (pos. 48) clockwise to end position.
2. If necessary - move Guiding (pos. 49) to the right end position.
3. Insert the Tray.

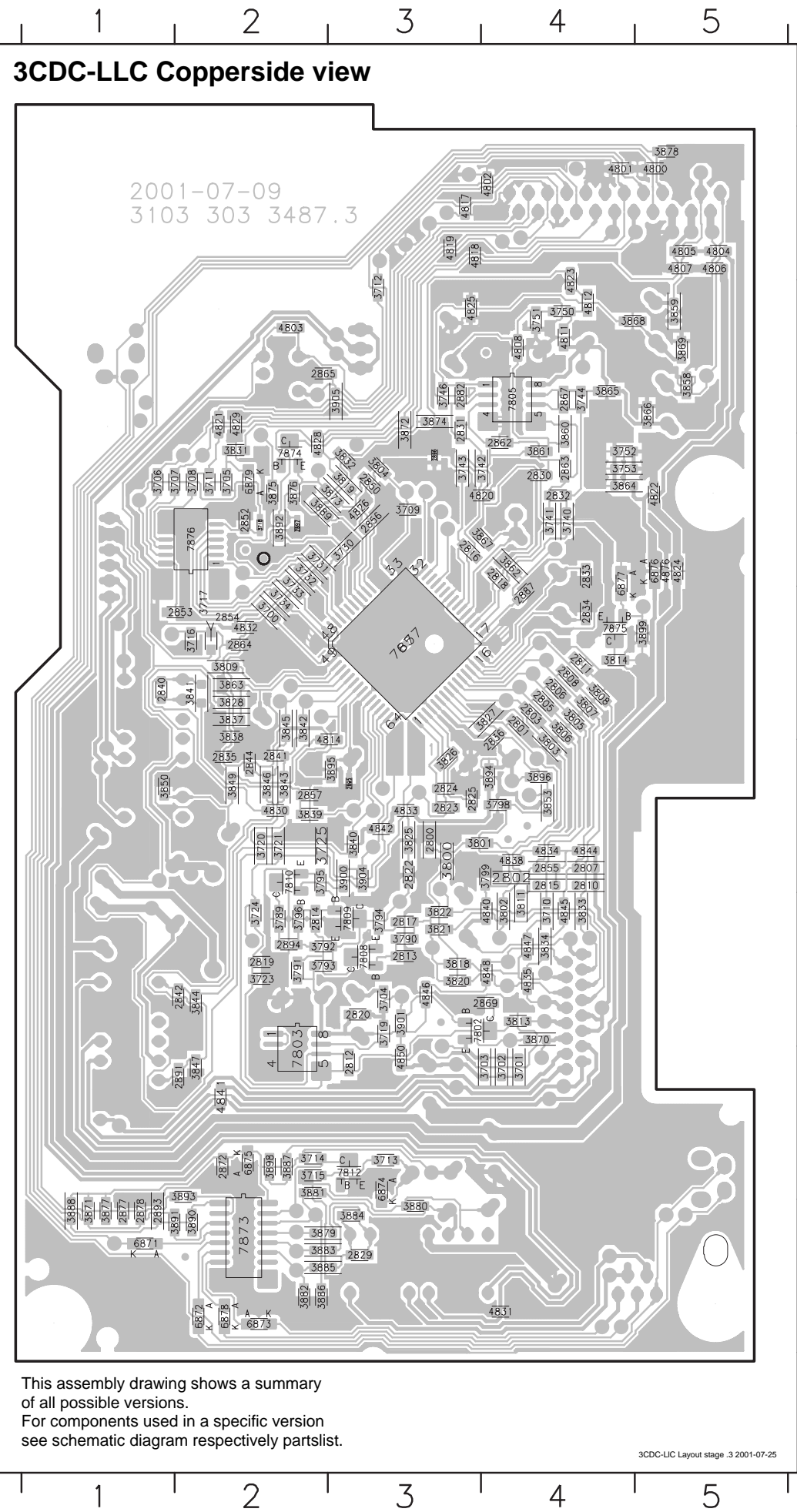


**Service Position**



# BLOCK DIAGRAM 3CDC-LLC-MCD1

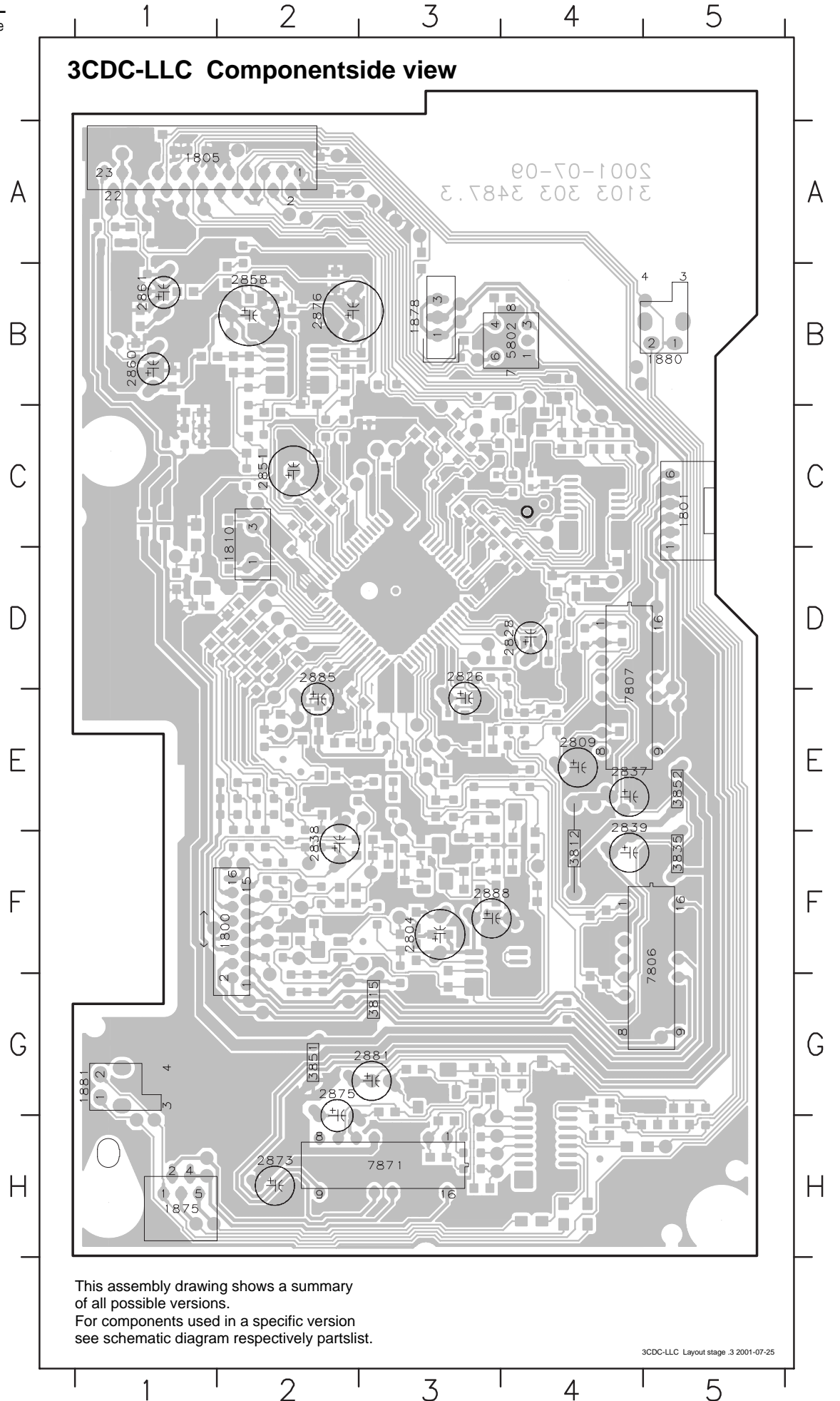




This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram respectively partlist.

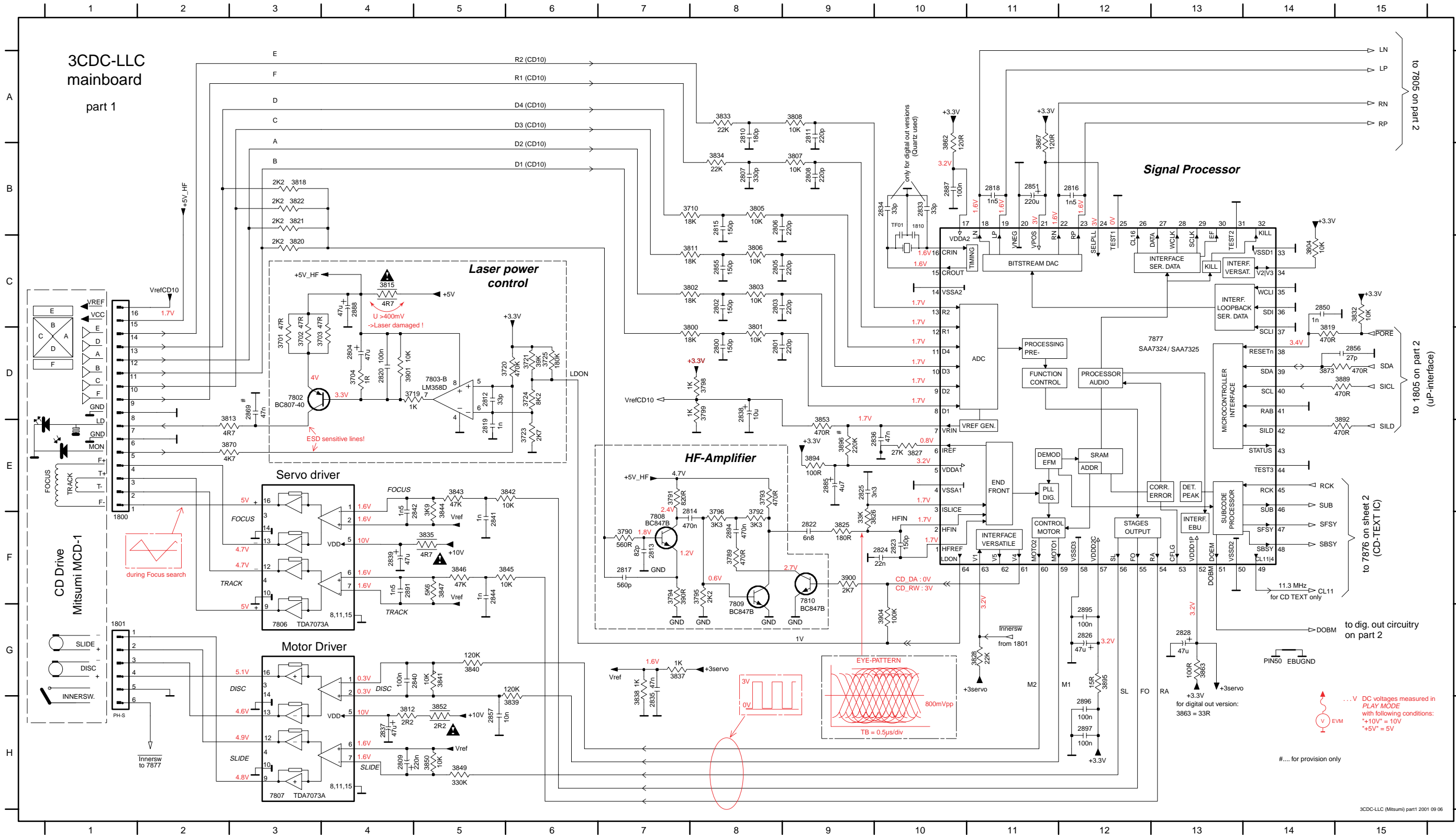
### Mapping

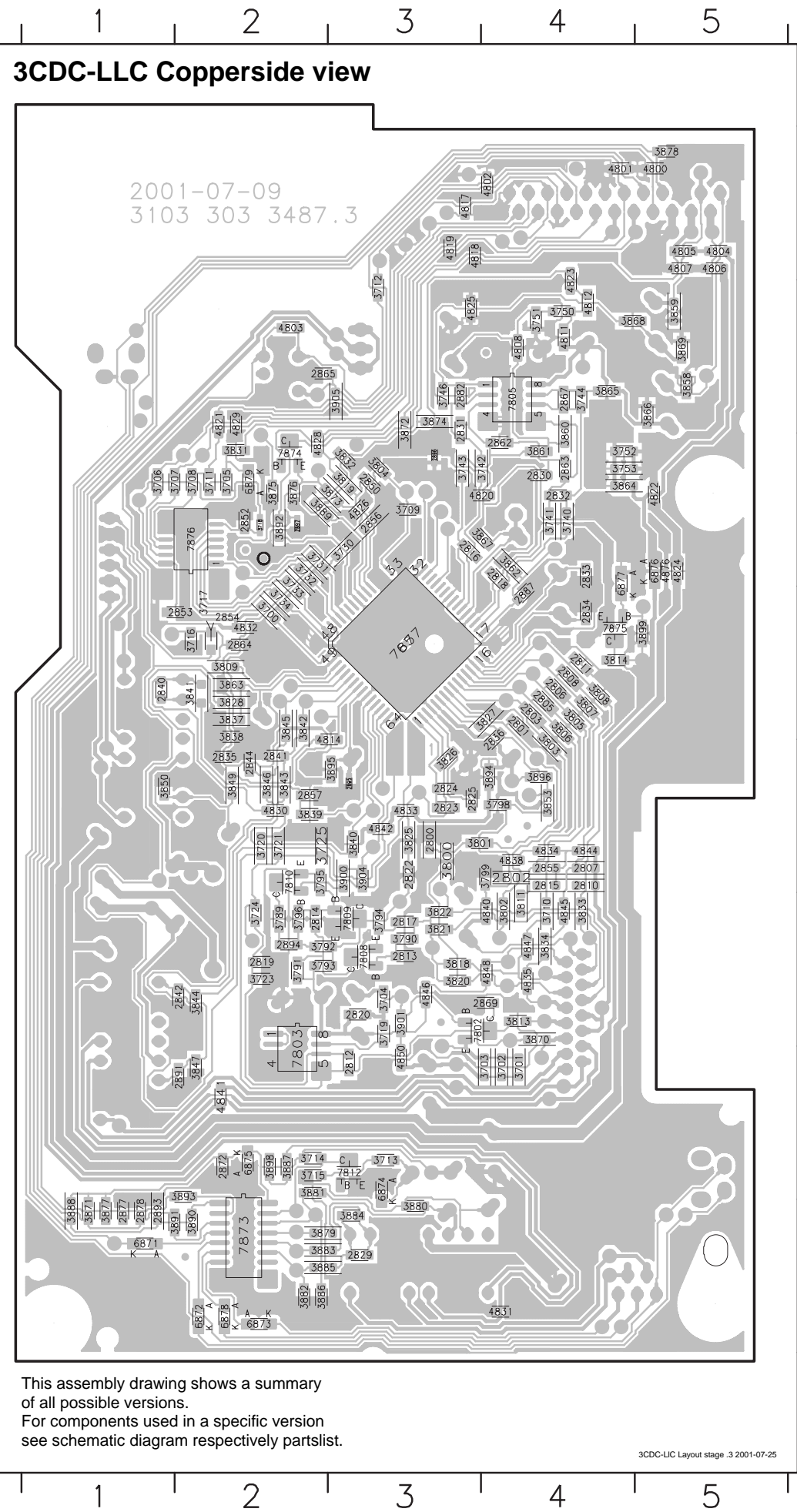
Copperside		Componentside	
2800 E3	3741 C4	3889 C2	1800 F2
2801 D4	3742 C4	3890 H2	1801 C5
2802 E4	3743 C3	3891 H2	1805 A2
2803 D4	3744 B4	3892 C2	1810 C2
2805 D4	3746 B3	3893 G2	1875 H1
2806 D4	3750 B4	3894 E4	1878 B3
2807 E4	3751 B4	3895 E3	1880 B5
2808 D4	3752 C4	3896 E4	1881 G1
2810 E4	3753 C4	3898 G2	2804 F3
2811 D4	3789 F2	3899 D5	2809 E4
2812 G3	3790 F3	3900 E3	2826 D3
2813 F3	3791 F2	3901 F3	2828 D4
2814 F2	3792 F3	3904 E3	2837 E5
2815 E4	3793 F3	3905 B3	2838 F2
2816 C3	3794 F3	4800 A5	2839 E5
2817 F3	3795 E2	4801 A4	2851 C2
2818 C4	3796 F2	4802 A4	2858 B2
2819 F2	3798 E4	4803 B2	2860 B1
2820 F3	3799 E4	4804 A5	2861 B1
2822 E3	3800 E3	4805 A5	2873 H2
2823 E3	3801 E4	4806 A5	2875 G3
2824 E3	3802 F4	4807 A5	2876 B2
2825 E3	3803 D4	4808 B4	2881 G3
2829 H3	3804 C3	4811 B4	2885 D2
2830 C4	3805 D4	4812 B4	2888 F4
2831 B3	3806 D4	4814 D3	3812 F4
2832 C4	3807 D4	4817 A3	3815 G3
2833 C4	3808 D4	4818 A3	3835 F5
2834 D4	3809 D2	4819 A3	3851 G2
2835 E2	3811 F4	4820 C4	3852 E5
2836 D4	3813 F4	4821 B2	5802 B4
2840 D1	3814 D4	4822 C5	7806 F5
2841 E2	3818 F3	4823 A4	7807 D5
2842 F2	3819 C3	4824 C5	7871 H3
2844 E2	3820 F3	4825 B3	
2850 C3	3821 F3	4826 C3	
2852 C2	3822 F3	4828 C2	
2853 D2	3825 E3	4829 B2	
2854 D2	3826 E3	4830 E2	
2855 E4	3827 D4	4831 H4	
2856 C3	3828 D2	4832 D2	
2857 E2	3831 C2	4833 E3	
2862 C4	3832 C3	4834 E4	
2863 C4	3833 F4	4835 F4	
2864 D2	3834 F4	4838 E4	
2865 B3	3837 D2	4840 F4	
2867 B4	3838 D2	4841 G2	
2869 F4	3839 E2	4842 E3	
2872 G2	3840 E3	4844 E4	
2877 H1	3841 D2	4845 F4	
2878 H1	3842 D2	4846 F3	
2882 B3	3843 E2	4847 F4	
2887 C4	3844 F2	4848 F4	
2891 G2	3845 D2	4850 G3	
2893 H1	3846 E2	4876 C5	
2894 F2	3847 G2	6871 H1	
2895 E3	3849 E2	6872 H2	
2896 C3	3850 E1	6873 H2	
2897 C2	3853 E4	6874 G3	
3700 D2	3858 B5	6875 G2	
3701 G4	3859 B5	6876 C5	
3702 G4	3860 B4	6877 C4	
3703 G4	3861 C4	6878 H2	
3704 F3	3862 C4	6879 C2	
3705 C2	3863 D2	7802 F4	
3706 C1	3864 C4	7803 F2	
3707 C2	3865 B4	7805 B4	
3708 C2	3866 B5	7808 F3	
3709 C3	3867 C4	7809 F3	
3710 F4	3868 B5	7810 E2	
3711 C2	3869 B5	7812 G3	
3712 A3	3870 F4	7873 H2	
3713 G3	3871 H1	7874 C2	
3714 G2	3872 B3	7875 D4	
3715 G2	3873 C3	7876 C2	
3716 D2	3874 B3	7877 D3	
3717 D2	3875 C2		
3718 C2	3876 C2		
3719 F3	3877 H1		
3720 E2	3878 A5		
3721 E2	3879 H3		
3723 F2	3880 G3		
3724 F2	3881 G2		
3725 E2	3882 H2		
3730 C3	3883 H3		
3731 C2	3884 H3		
3732 C2	3885 H3		
3733 C2	3886 H2		
3734 D2	3887 G2		
3740 C4	3888 H1		



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

1800 F1	2804 D4	2811 A9	2818 B11	2826 G12	2838 D8	2851 B11	2888 C4	3702 D3	3721 D6	3792 F8	3800 D8	3807 B9	3819 D14	3828 G11	3839 H6	3846 F5	3863 G13	3895 G12	7803-B D5	MP713 C9	MP743 D2	MP813 B3	MP820 F8	MP837 D4	MP844 E9	MP851 E2	MP873 H4	MP884 C5
1801 G1	2805 C8	2812 D5	2819 E5	2828 G13	2839 F4	2855 C8	2891 F4	3703 D3	3723 E6	3793 E8	3801 D8	3808 A9	3820 C3	3832 C15	3840 G5	3847 F5	3867 A11	3896 E9	7806 G3	MP715 D9	MP744 C2	MP814 G2	MP821 C15	MP838 G6	MP845 F4	MP852 G2	MP875 F13	MP893 F10
1810 B10	2806 B8	2813 F7	2820 D4	2833 B10	2840 G4	2856 D15	2894 F8	3704 D4	3724 D6	3794 F7	3802 C8	3811 C8	3821 B3	3833 A8	3841 G5	3849 H5	3870 E2	3900 F9	7807 H3	MP716 B9	MP745 E2	MP815 B3	MP827 B10	MP839 G6	MP846 H2	MP853 G2	MP876 E2	
2800 D8	2807 B8	2814 F7	2822 F9	2834 B10	2841 F5	2857 H5	2895 G12	3709 C14	3725 D6	3795 F8	3803 C8	3812 H4	3822 B3	3834 B8	3842 E6	3850 H5	3873 D14	3901 D4	7808 F7	MP717 A9	MP800 E2	MP816 A3	MP828 G11	MP840 E6	MP847 H2	MP858 G8	MP877 E3	
2801 D8	2808 B9	2815 B8	2823 F10	2835 H7	2842 E5	2869 D3	2896 H12	3710 B8	3789 F8	3796 F8	3804 C14	3813 E2	3825 F9	3835 F5	3843 E5	3852 H5	3889 D15	3904 G10	7809 G8	MP729 B9	MP802 B15	MP817 A3	MP829 A3	MP841 F6	MP848 E2	MP859 E10	MP878 B13	
2802 C8	2809 H4	2816 B12	2824 F10	2836 E10	2844 F5	2885 E9	2897 H12	3719 D4	3790 F7	3798 D8	3805 B8	3815 C4	3826 F9	3837 G7	3844 E5	3853 E9	3892 E15	7802 D3	7810 F9	MP730 C9	MP809 D10	MP818 C4	MP831 A4	MP842 H6	MP849 E2	MP860 C2	MP879 B11	
2803 C8	2810 A8	2817 F7	2825 E9	2837 H4	2850 C14	2887 B10	3701 D3	3720 D5	3791 E7	3799 D8	3806 C8	3818 B3	3827 E10	3838 H7	3845 F6	3862 A10	3894 E9	7803-A B5	7877 D12	MP731 B13	MP812 G2	MP819 F10	MP836 D3	MP843 G7	MP850 E2	MP872 C15	MP883 C4	

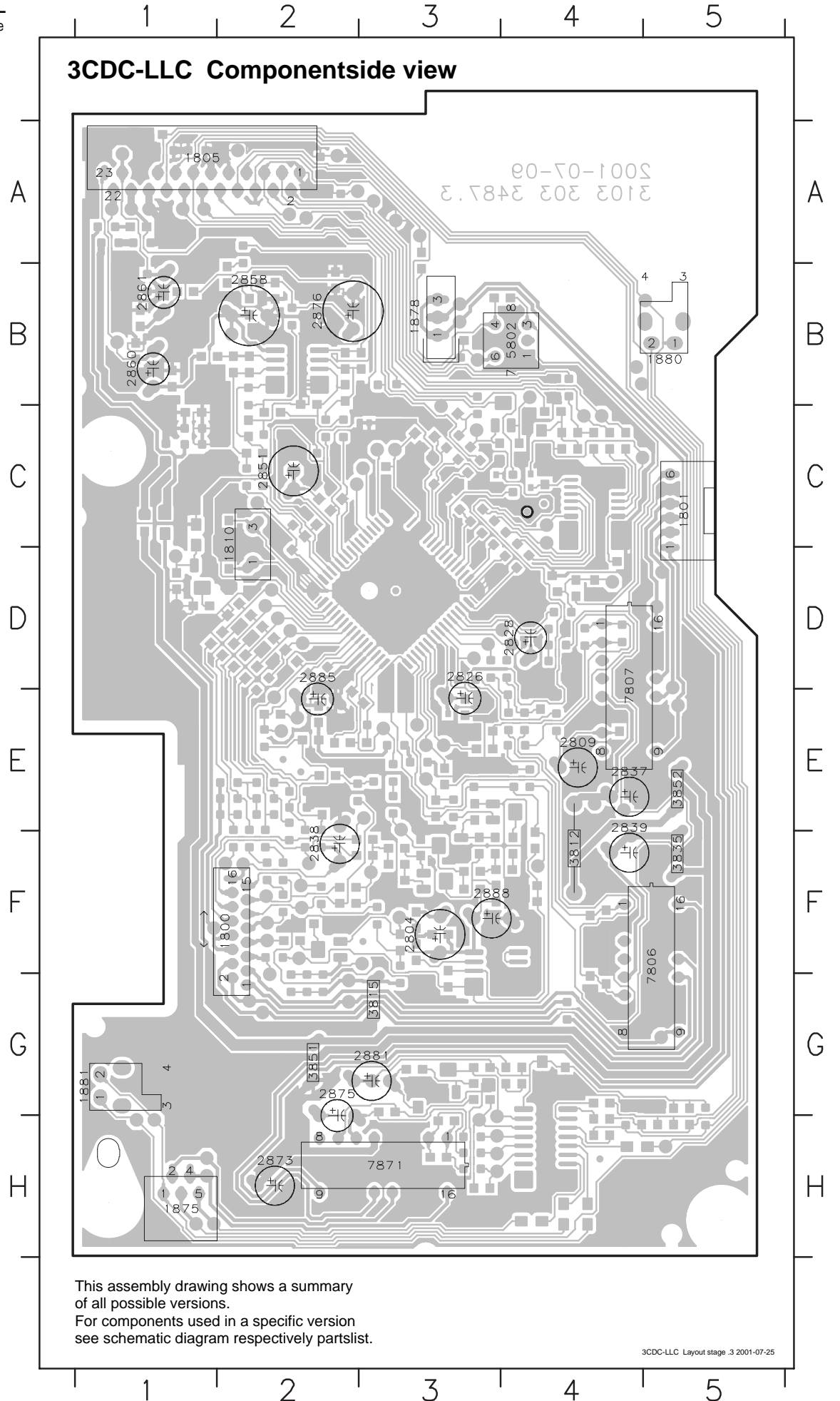




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### Mapping

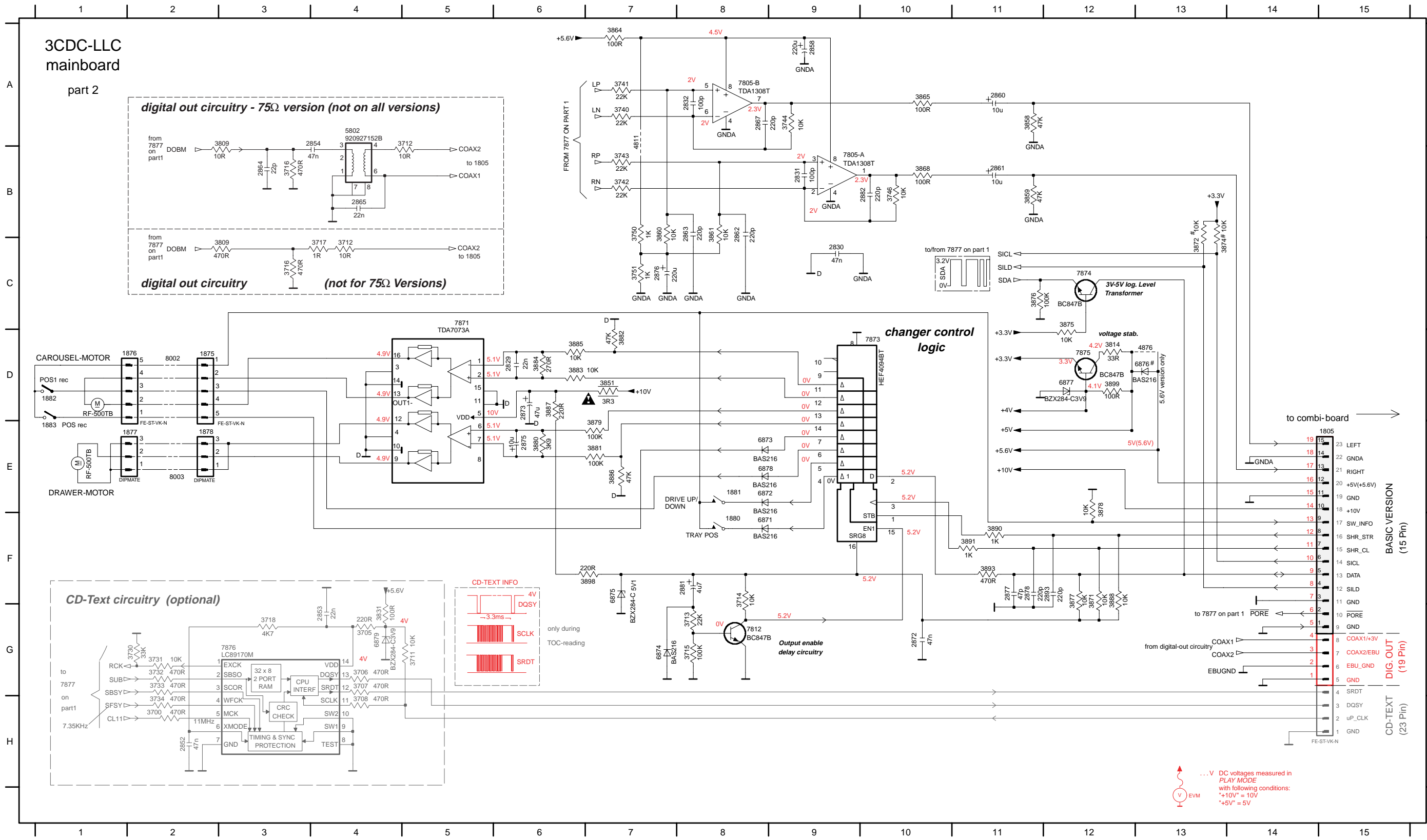
Copperside		Componentside	
2800 E3	3741 C4	3889 C2	1800 F2
2801 D4	3742 C4	3890 H2	1801 C5
2802 E4	3743 C3	3891 H2	1805 A2
2803 D4	3744 B4	3892 C2	1810 C2
2805 D4	3746 B3	3893 G2	1875 H1
2806 D4	3750 B4	3894 E4	1878 B3
2807 E4	3751 B4	3895 E3	1880 B5
2808 D4	3752 C4	3896 E4	1881 G1
2810 E4	3753 C4	3898 G2	2804 F3
2811 D4	3789 F2	3899 D5	2809 E4
2812 G3	3790 F3	3900 E3	2826 D3
2813 F3	3791 F2	3901 F3	2828 D4
2814 F2	3792 F3	3904 E3	2837 E5
2815 E4	3793 F3	3905 B3	2838 F2
2816 C3	3794 F3	4800 A5	2839 E5
2817 F3	3795 E2	4801 A4	2851 C2
2818 C4	3796 F2	4802 A4	2858 B2
2819 F2	3798 E4	4803 B2	2860 B1
2820 F3	3799 E4	4804 A5	2861 B1
2822 E3	3800 E3	4805 A5	2873 H2
2823 E3	3801 E4	4806 A5	2875 G3
2824 E3	3802 F4	4807 A5	2876 B2
2825 E3	3803 D4	4808 B4	2881 G3
2829 H3	3804 C3	4811 B4	2885 D2
2830 C4	3805 D4	4812 B4	2888 F4
2831 B3	3806 D4	4814 D3	3812 F4
2832 C4	3807 D4	4817 A3	3815 G3
2833 C4	3808 D4	4818 A3	3835 F5
2834 D4	3809 D2	4819 A3	3851 G2
2835 E2	3811 F4	4820 C4	3852 E5
2836 D4	3813 F4	4821 B2	5802 B4
2840 D1	3814 D4	4822 C5	7806 F5
2841 E2	3818 F3	4823 A4	7807 D5
2842 F2	3819 C3	4824 C5	7871 H3
2844 E2	3820 F3	4825 B3	
2850 C3	3821 F3	4826 C3	
2852 C2	3822 F3	4828 C2	
2853 D2	3825 E3	4829 B2	
2854 D2	3826 E3	4830 E2	
2855 E4	3827 D4	4831 H4	
2856 C3	3828 D2	4832 D2	
2857 E2	3831 C2	4833 E3	
2862 C4	3832 C3	4834 E4	
2863 C4	3833 F4	4835 F4	
2864 D2	3834 F4	4838 E4	
2865 B3	3837 D2	4840 F4	
2867 B4	3838 D2	4841 G2	
2869 F4	3839 E2	4842 E3	
2872 G2	3840 E3	4844 E4	
2877 H1	3841 D2	4845 F4	
2878 H1	3842 D2	4846 F3	
2882 B3	3843 E2	4847 F4	
2887 C4	3844 F2	4848 F4	
2891 G2	3845 D2	4850 G3	
2893 H1	3846 E2	4876 C5	
2894 F2	3847 G2	6871 H1	
2895 E3	3849 E2	6872 H2	
2896 C3	3850 E1	6873 H2	
2897 C2	3853 E4	6874 G3	
3700 D2	3858 B5	6875 G2	
3701 G4	3859 B5	6876 C5	
3702 G4	3860 B4	6877 C4	
3703 G4	3861 C4	6878 H2	
3704 F3	3862 C4	6879 C2	
3705 C2	3863 D2	7802 F4	
3706 C1	3864 C4	7803 F2	
3707 C2	3865 B4	7805 B4	
3708 C2	3866 B5	7808 F3	
3709 C3	3867 C4	7809 F3	
3710 F4	3868 B5	7810 E2	
3711 C2	3869 B5	7812 G3	
3712 A3	3870 F4	7873 H2	
3713 G3	3871 H1	7874 C2	
3714 G2	3872 B3	7875 D4	
3715 G2	3873 C3	7876 C2	
3716 D2	3874 B3	7877 D3	
3717 D2	3875 C2		
3718 C2	3876 C2		
3719 F3	3877 H1		
3720 E2	3878 A5		
3721 E2	3879 H3		
3723 F2	3880 G3		
3724 F2	3881 G2		
3725 E2	3882 H2		
3730 C3	3883 H3		
3731 C2	3884 H3		
3732 C2	3885 H3		
3733 C2	3886 H2		
3734 D2	3887 G2		
3740 C4	3888 H1		



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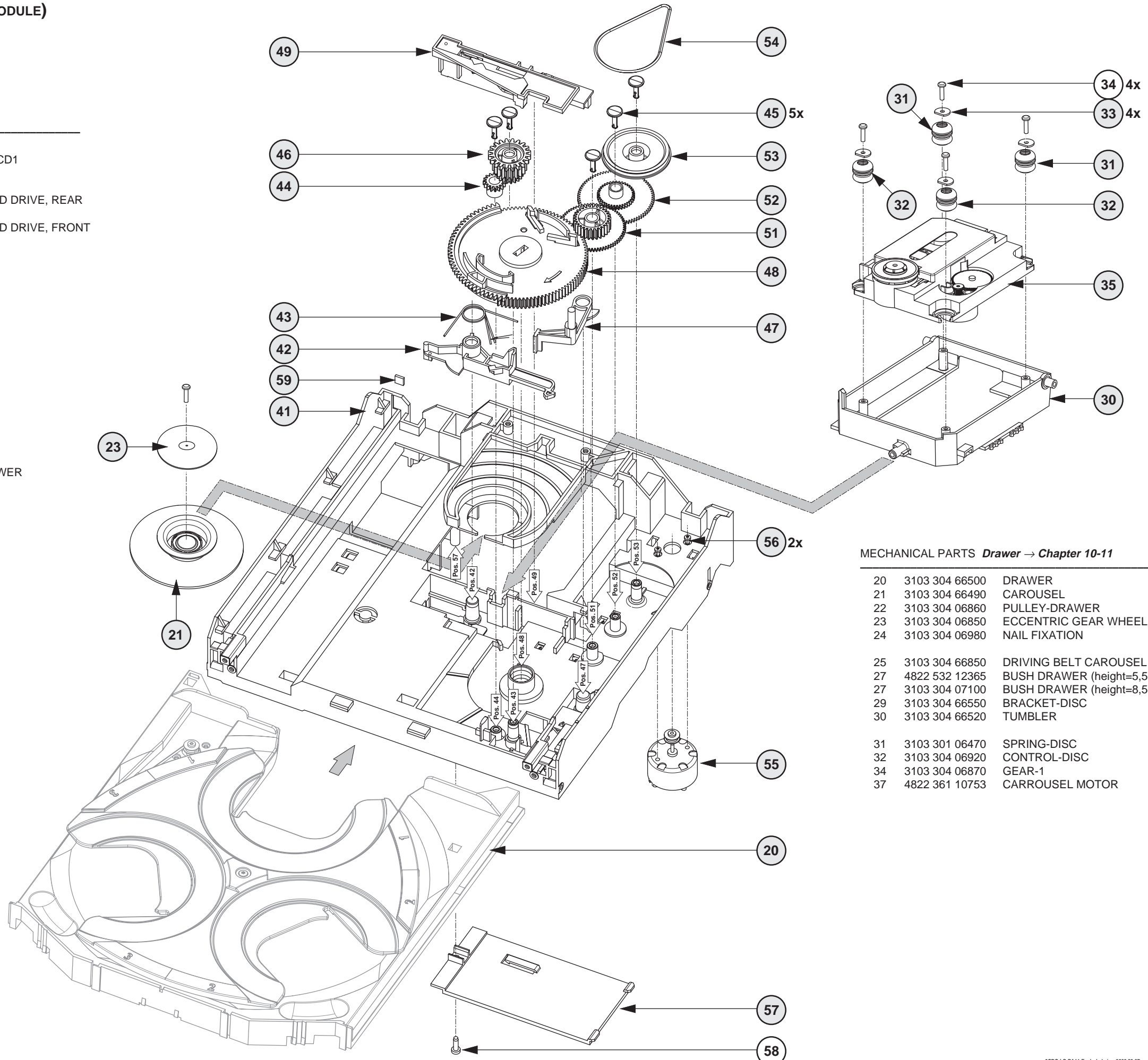
1805 E15	2830 C9	2858 A9	2865 C4	2877 F11	3705 G4	3713 G8	3730 G2	3741 A7	3751 C7	3851 D7	3865 A10	3874 C13	3880 E6	3886 E7	3898 F7	4876 D13	6875 F7	7805-B A8	7876 G3	MP726 D8	MP804 G14	MP811 F14	MP832 G9	MP863 C11	MP871 D6	MP888 G5	MP898 E13
1875 D2	2831 B9	2860 A11	2867 A8	2878 F11	3706 G4	3714 F8	3731 G2	3742 B7	3752 A6	3858 A11	3866 A10	3875 C12	3881 E7	3887 D6	3899 D12	5802 B4	6876 D13	7812 G8	7812 G8	MP721 C8	MP740 H14	MP805 F13	MP822 E3	MP865 D11	MP874 D12	MP889 G5	MP899 E14
1878 E2	2832 A8	2861 B11	2872 G10	2881 F8	3707 G4	3715 G8	3732 G2	3743 B7	3753 A6	3859 B11	3868 B10	3876 C11	3882 D7	3888 F12	3905 C5	6871 F8	6877 D12	7871 C5	7871 C5	MP722 E8	MP742 G14	MP806 F13	MP823 E3	MP835 F14	MP866 E8	MP881 G2	MP890 B3
1880 F8	2852 H2	2862 B8	2873 D6	2882 B10	3708 H4	3716 B3	3733 G2	3744 A9	3809 B2	3860 B7	3869 B10	3877 F12	3883 D6	3890 F11	4803 B4	6872 E8	6878 E8	7873 D10	7873 D10	MP723 D8	MP742 G14	MP807 F14	MP824 D4	MP854 A13	MP867 E8	MP882 G2	MP891 B5
1881 E8	2853 G4	2863 B8	2875 E6	2883 F12	3711 G5	3717 B3	3734 H2	3746 B10	3814 D12	3861 B8	3871 F12	3878 E12	3884 D6	3891 F11	4811 A7	6873 E8	6879 G4	7874 C12	7874 C12	MP724 D8	MP801 E12	MP808 F13	MP825 D4	MP856 E14	MP868 F8	MP886 G3	MP892 B5
2829 D6	2854 B3	2864 B3	2876 C7	3700 H2	3712 B4	3718 G3	3740 A7	3750 B7	3831 G4	3864 A7	3872 C13	3879 D7	3885 D6	3893 F11	4812 B7	6874 G7	7805-A B9	7875 D12	7875 D12	MP725 D8	MP803 F10	MP810 F13	MP830 A7	MP857 B13	MP869 C12	MP887 H5	MP897 E13



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

**MECHANICAL PARTS Loader → this page**

20	3103 304 66500	DRAWER
21	3140 114 29070	PRESSURE RING-MCD1
23	3140 111 21270	METAL RING-MCD1
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-MCD1
59	4822 466 12146	RUBBER

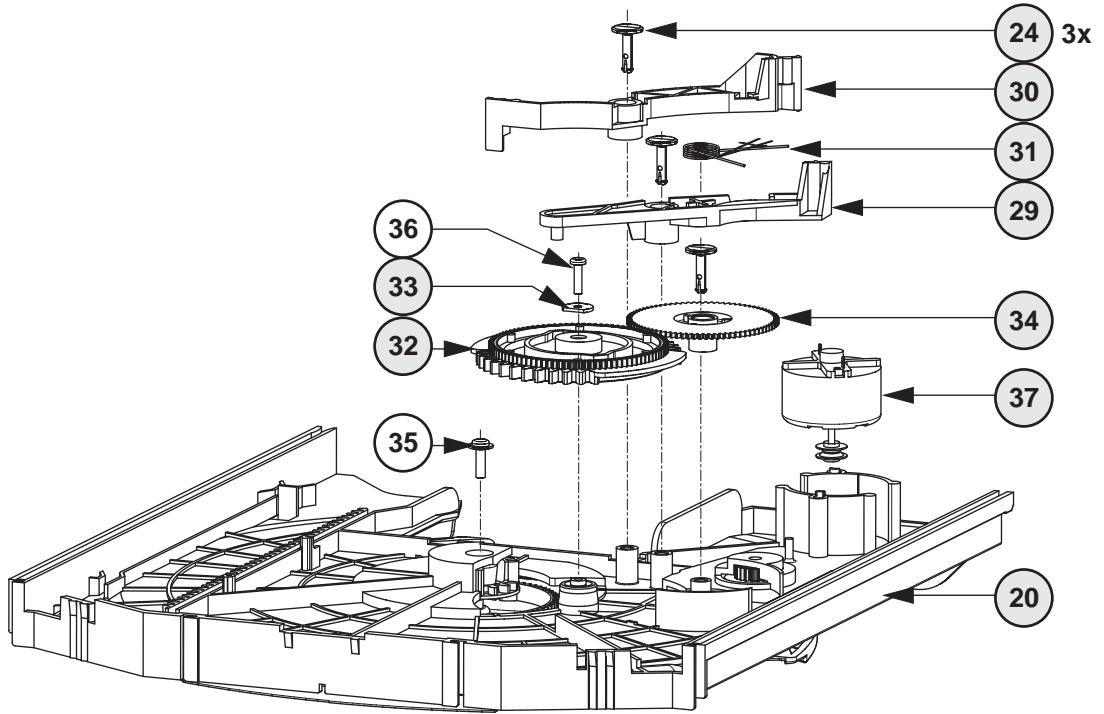


**MECHANICAL PARTS Drawer → Chapter 10-11**

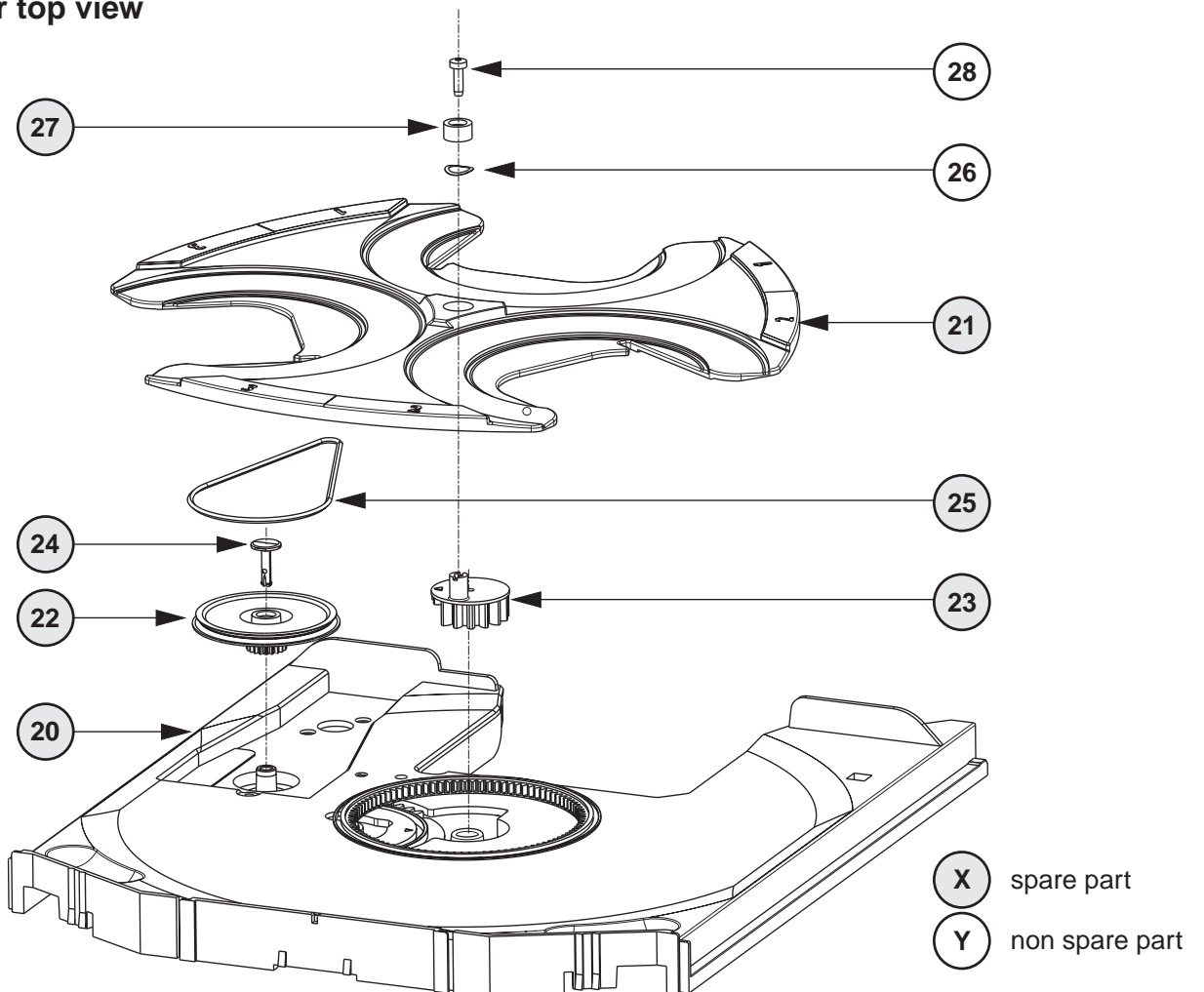
20	3103 304 66500	DRAWER
21	3103 304 66490	CAROUSEL
22	3103 304 06860	PULLEY-DRAWER
23	3103 304 06850	ECCENTRIC GEAR WHEEL
24	3103 304 06980	NAIL FIXATION
25	3103 304 66850	DRIVING BELT CAROUSEL
27	4822 532 12365	BUSH DRAWER (height=5,5mm,d=9,4mm)
27	3103 304 07100	BUSH DRAWER (height=8,5mm,d=16mm)
29	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	CARROUSEL MOTOR

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

**Drawer bottom view**



**Drawer top view**



**ELECTRICAL PARTSLIST 3CDC-LLC-MCD1 MODULE****MISCELLANEOUS**

35	3103 309 05350	CD DRIVE MCD1B
37	4822 361 10753	CAROUSEL MOTOR
55	4822 361 10753	TRAY MOTOR
1800	2422 025 17389	FLEX FOIL CONNECTOR 16Pin
1805	4822 265 10979	FLEX FOIL CONNECTOR 15Pin
1805	4822 265 11545	FLEX FOIL CONNECTOR 19Pin
1875	4822 267 10958	FLEX FOIL CONNECTOR 5Pin
1876	2422 025 08332	FLEX FOIL CONNECTOR 5Pin
1880	4822 276 13503	SWITCH, Tray switch
1881	4822 276 13503	SWITCH, Drive UP/DOWN
1882	4822 276 13503	SWITCH, CD Pos.1 recognized
1883	4822 276 13503	SWITCH, valid CD Play position
8002	3103 308 91990	FLEX FOIL CABLE 5P, 200mm 1:n
8005	3103 308 92930	FLEX FOIL CABLE 16P 170mm 1:n

**CAPACITORS**

2800	4822 122 33172	390pF	5%	50V
2801	4822 126 13883	220pF	5%	50V
2802	4822 122 33172	390pF	5%	50V
2803	4822 126 13883	220pF	5%	50V
2804	4822 124 41751	47μF	20%	16V
2805	4822 126 13883	220pF	5%	50V
2806	4822 126 13883	220pF	5%	50V
2807	5322 122 31863	330pF	5%	50V
2808	4822 126 13883	220pF	5%	50V
2809	4822 124 40746	0,22μF	20%	63V
2810	4822 126 10326	180pF	5%	
2811	4822 126 13883	220pF	5%	50V
2812	2222 867 15339	33pF	5%	50V
2813	4822 126 14226	82pF		50V
2814	2238 246 59858	450nF	20%	10V
2815	4822 122 33172	390pF	5%	50V
2816	4822 126 14247	1,5nF	10%	50V
2817	4822 126 14249	560pF	10%	50V
2818	4822 126 13344	1,5nF	5%	63V
2819	5322 126 11578	1nF	10%	63V
2820	4822 126 14305	100nF	10%	16V
2822	5322 122 31866	6,8nF	10%	63V
2823	3198 016 31510	150pF	10%	50V
2824	5322 122 32654	22nF	10%	63V
2825	4822 122 33891	3,3nF	10%	63V
2826	4822 124 12362	47μF	20%	4V
2828	4822 124 12362	47μF	20%	4V
2829	3198 017 42230	22nF	10%	50V
2830	4822 126 13751	47nF	10%	50V
2831	4822 122 31765	100pF	5%	50V
2832	4822 122 31765	100pF	5%	50V
2835	3198 024 44730	47nF	5%	50V
2836	3198 024 44730	47nF	5%	50V
2837	4822 124 40433	47μF	20%	25V
2838	4822 124 40248	10μF	20%	63V
2839	4822 124 40433	47μF	20%	25V
2840	4822 126 14585	100nF	10%	50V
2841	5322 126 10511	1nF	5%	50V
2842	4822 126 14247	1,5nF	10%	50V
2844	3198 016 31020	1nF	5%	25V
2850	5322 126 11578	1nF	10%	63V
2851	4822 124 42383	220μF	20%	4V
2855	4822 122 33172	390pF	5%	50V
2856	4822 126 13691	27pF	1%	63V
2857	5322 126 11583	10nF	10%	63V
2858	4822 124 12245	220μF	20%	16V

**CAPACITORS**

2860	4822 124 11947	10μF	20%	16V
2861	4822 124 11947	10μF	20%	16V
2862	4822 126 13883	220pF	5%	50V
2863	4822 126 13883	220pF	5%	50V
2865	4822 126 14494	22nF	10%	25V
2867	4822 126 13883	220pF	5%	50V
2872	3198 024 44730	47nF	5%	50V
2873	4822 124 80231	47μF	20%	16V
2875	4822 124 11947	10μF	20%	16V
2876	4822 124 12245	220μF	20%	16V
2877	4822 122 33777	47pF	5%	63V
2878	4822 126 13883	220pF	5%	50V
2881	4822 124 40769	4,7μF	20%	100V
2882	4822 126 13883	220pF	5%	50V
2885	4822 124 40769	4,7μF	20%	100V
2887	4822 126 14585	100nF	10%	50V
2888	4822 124 80231	47μF	20%	16V
2891	4822 126 14247	1,5nF	10%	50V
2893	4822 122 33575	220pF	5%	50V
2894	3198 017 44740	470nF	20%	10V
2895	4822 126 14305	100nF	10%	16V
2896	4822 126 14305	100nF	10%	16V
2897	4822 126 14305	100nF	10%	16V

**RESISTORS**

3701	4822 051 20479	47Ω	5%	0,1W
3702	4822 051 20479	47Ω	5%	0,1W
3703	4822 051 20479	47Ω	5%	0,1W
3704	4822 117 12917	1Ω	5%	0,06W
3710	4822 051 51831	18kΩ	5%	0,1W
3712	4822 051 30109	10Ω	5%	0,06W
3713	4822 051 30223	22kΩ	5%	0,06W
3714	4822 051 30103	10kΩ	5%	0,06W
3715	4822 117 13632	100kΩ	1%	0,06W
3716	4822 051 30471	470Ω	5%	0,06W
3717	4822 117 12917	1Ω	5%	0,06W
3719	4822 051 30102	1kΩ	5%	0,06W
3720	4822 051 20474	470kΩ	5%	0,1W
3721	4822 051 20393	39kΩ	5%	0,1W
3723	4822 051 30272	2,7kΩ	5%	0,06W
3724	4822 117 12902	8,2kΩ	1%	0,06W
3725	4822 051 30184	180kΩ	5%	0,06W
3730	4822 051 20333	33kΩ	5%	0,1W
3740	4822 051 20223	22kΩ	5%	0,1W
3741	4822 051 20223	22kΩ	5%	0,1W
3742	4822 051 20223	22kΩ	5%	0,1W
3743	4822 051 20223	22kΩ	5%	0,1W
3744	4822 051 30103	10kΩ	5%	0,06W
3746	4822 051 30103	10kΩ	5%	0,06W
3750	4822 051 30102	1kΩ	5%	0,06W
3751	4822 051 30102	1kΩ	5%	0,06W
3789	4822 051 30471	470Ω	5%	0,06W
3790	4822 051 30561	560Ω	5%	0,06W
3791	4822 117 12968	820Ω	5%	0,06W
3792	4822 051 30332	3,3kΩ	5%	0,06W
3793	4822 051 20471	470Ω	5%	0,1W
3794	4822 051 30391	390Ω	5%	0,06W
3795	4822 051 30222	2,2kΩ	5%	0,06W
3796	4822 051 30332	3,3kΩ	5%	0,06W
3798	4822 051 30102	1kΩ	5%	0,06W
3799	4822 051 30102	1kΩ	5%	0,06W
3800	4822 051 51831	18kΩ	5%	0,1W

**ELECTRICAL PARTSLIST 3CDC-LLC-MCD1 MODULE**

## RESISTORS

3801	© 4822 051 30103	10kΩ	5%	0,06W
3802	© 4822 051 51831	18kΩ	5%	0,1W
3803	© 4822 117 10833	10kΩ	1%	0,1W
3804	© 4822 051 30103	10kΩ	5%	0,06W
3805	© 4822 051 30103	10kΩ	5%	0,06W
3806	© 4822 051 30103	10kΩ	5%	0,06W
3807	© 4822 051 30103	10kΩ	5%	0,06W
3808	© 4822 051 30103	10kΩ	5%	0,06W
3809	© 4822 051 20471	470Ω	5%	0,1W
3811	© 4822 051 51831	18kΩ	5%	0,1W
3812	4822 053 10228	2,2Ω	5%	1W
3813	© 4822 117 13608	4,7Ω	5%	0,06W
3814	© 4822 051 30339	33Ω	5%	0,06W
3815	4822 052 10478	4,7Ω	5%	NFR
3818	© 4822 051 30222	2,2kΩ	5%	0,06W
3819	© 4822 051 20471	470Ω	5%	0,1W
3820	© 4822 051 30222	2,2kΩ	5%	0,06W
3821	© 4822 051 30222	2,2kΩ	5%	0,06W
3822	© 4822 051 30222	2,2kΩ	5%	0,06W
3825	© 4822 051 20181	180Ω	5%	0,1W
3826	© 4822 051 30333	33kΩ	5%	0,06W
3827	© 4822 051 20273	27kΩ	5%	0,1W
3828	© 4822 051 20223	22kΩ	5%	0,1W
3831	© 4822 051 30101	100Ω	5%	0,06W
3832	© 4822 051 30103	10kΩ	5%	0,06W
3833	© 4822 051 30223	22kΩ	5%	0,06W
3834	© 4822 051 20223	22kΩ	5%	0,1W
3835	4822 052 10478	4,7Ω	5%	NFR
3837	© 4822 051 10102	1kΩ	2%	0,25W
3838	© 4822 051 30102	1kΩ	5%	0,06W
3839	© 4822 051 20124	120kΩ	5%	0,1W
3840	© 4822 051 30124	120kΩ	5%	0,06W
3841	© 4822 117 10833	10kΩ	1%	0,1W
3842	© 4822 117 10833	10kΩ	1%	0,1W
3843	© 4822 117 10834	47kΩ	1%	0,1W
3844	© 4822 051 20392	3,9kΩ	5%	0,1W
3845	© 4822 117 10833	10kΩ	1%	0,1W
3846	© 4822 117 10834	47kΩ	1%	0,1W
3847	© 4822 051 20562	5,6kΩ	5%	0,1W
3849	© 4822 051 20334	330kΩ	5%	0,1W
3850	© 4822 051 30103	10kΩ	5%	0,06W
3851	4822 052 10338	3,3Ω		NFR25
3852	4822 052 10228	2,2Ω	5%	0,33W
3853	© 4822 051 20471	470Ω	5%	0,1W
3858	© 4822 117 12925	47kΩ	1%	0,06W
3859	© 4822 117 10834	47kΩ	1%	0,1W
3860	© 4822 117 10833	10kΩ	1%	0,1W
3861	© 4822 051 30103	10kΩ	5%	0,06W
3862	© 4822 051 20121	120Ω	5%	0,1W
3863	© 4822 117 11373	100Ω	1%	0,1W
3864	© 4822 117 11373	100Ω	1%	0,1W
3865	© 4822 051 30101	100Ω	5%	0,06W
3867	© 4822 051 30121	120Ω	5%	0,06W
3868	© 4822 051 30101	100Ω	5%	0,06W
3870	© 4822 051 20472	4,7kΩ	5%	0,1W
3871	© 4822 051 30103	10kΩ	5%	0,06W
3873	© 4822 051 20471	470Ω	5%	0,1W
3875	© 4822 051 30103	10kΩ	5%	0,06W
3876	© 4822 117 13632	100kΩ	1%	0,06W
3877	© 4822 051 30103	10kΩ	5%	0,06W
3878	© 4822 051 30103	10kΩ	5%	0,06W
3879	© 4822 117 10837	100kΩ	1%	0,1W

## RESISTORS

3880	© 4822 051 30392	3,9kΩ	5%	0,06W
3881	© 4822 117 13632	100kΩ	1%	0,06W
3882	© 4822 117 12925	47kΩ	1%	0,06W
3883	© 4822 117 10833	10kΩ	1%	0,1W
3884	© 4822 051 30271	270Ω	5%	0,06W
3885	© 4822 117 10833	10kΩ	1%	0,1W
3886	© 4822 117 12925	47kΩ	1%	0,06W
3887	© 4822 051 30221	220Ω	5%	0,06W
3888	© 4822 117 10833	10kΩ	1%	0,1W
3889	© 4822 051 20471	470Ω	5%	0,1W
3890	© 4822 051 30102	1kΩ	5%	0,06W
3891	© 4822 051 30102	1kΩ	5%	0,06W
3892	© 4822 051 20471	470Ω	5%	0,1W
3893	© 4822 051 30471	470Ω	5%	0,06W
3894	© 4822 051 30101	100Ω	5%	0,06W
3895	© 4822 117 12971	15Ω	5%	0,06W
3898	© 4822 051 30221	220Ω	5%	0,06W
3899	© 4822 051 30101	100Ω	5%	0,06W
3900	© 4822 117 12955	2,7kΩ	1%	0,1W
3901	© 4822 117 10833	10kΩ	1%	0,1W
3904	© 4822 117 13632	100kΩ	1%	0,06W
4800	© 4822 051 20008			CHIP JUMPER 0805
4801	© 4822 051 20008			CHIP JUMPER 0805
4802	© 4822 051 20008			CHIP JUMPER 0805
4803	© 4822 051 30008			CHIP JUMPER 0603
4804	© 4822 051 20008			CHIP JUMPER 0805
4805	© 4822 051 30008			CHIP JUMPER 0603
4806	© 4822 051 20008			CHIP JUMPER 0805
4807	© 4822 051 20008			CHIP JUMPER 0805
4808	© 4822 051 20008			CHIP JUMPER 0805
4811	© 4822 051 20008			CHIP JUMPER 0805
4814	© 4822 051 20008			CHIP JUMPER 0805
4817	© 4822 051 20008			CHIP JUMPER 0805
4818	© 4822 051 20008			CHIP JUMPER 0805
4819	© 4822 051 20008			CHIP JUMPER 0805
4820	© 4822 051 20008			CHIP JUMPER 0805
4821	© 4822 051 20008			CHIP JUMPER 0805
4822	© 4822 051 20008			CHIP JUMPER 0805
4823	© 4822 051 20008			CHIP JUMPER 0805
4824	© 4822 051 30008			CHIP JUMPER 0603
4825	© 4822 051 30008			CHIP JUMPER 0603
4826	© 4822 051 20008			CHIP JUMPER 0805
4828	© 4822 051 20008			CHIP JUMPER 0805
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
4835	© 4822 051 20008			CHIP JUMPER 0805
4838	© 4822 051 30008			CHIP JUMPER 0603
4840	© 4822 051 20008			CHIP JUMPER 0805
4841	© 4822 051 30008			CHIP JUMPER 0603
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
4850	© 4822 051 20008			CHIP JUMPER 0805
4876	© 4822 051 20008			CHIP JUMPER 0805

***ELECTRICAL PARTSLIST 3CDC-LLC-MCD1 MODULE*****COILS**


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 1810 4822 242 73557 CERAMIC RES. 8,46MHz
 

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**DIODES**


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

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


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 7802 © 5322 130 60123 BC807-40  
 7808 © 4822 130 60511 BC847B  
 7809 © 4822 130 60511 BC847B  
 7810 © 4822 130 60511 BC847B  
 7812 © 4822 130 60511 BC847B
 

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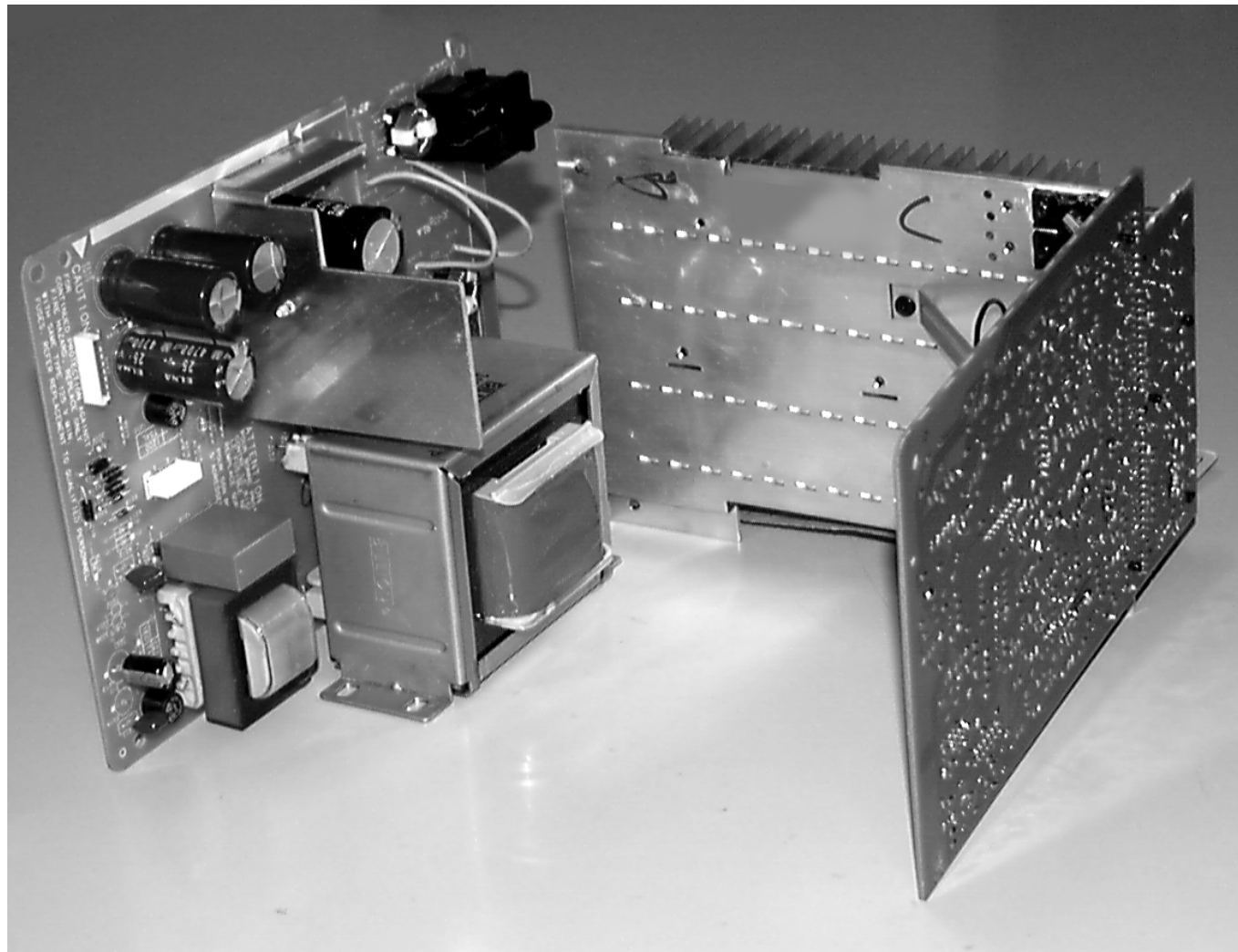
 7874 © 4822 130 60511 BC847B  
 7875 © 4822 130 60511 BC847B
**INTEGRATED CIRCUITS**


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 7803 © 5322 209 82941 LM358D, Dual Opamp  
 7805 © 4822 209 33165 TDA1308T/N1  
 7806 4822 209 32852 TDA7073A/N2  
 7807 4822 209 32852 TDA7073A/N2  
 7871 4822 209 32852 TDA7073A/N2
 

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 7873 © 5322 209 11306 HEF4094BT, SHIFT REGISTER  
 7877 © 9352 641 80557 SAA7324H/M2B,"CD10" SIGN.PROC.



# POWER 2001 Module

(30 - 70W Version)

stage .9

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Partslst .....	11-8

### Circuit details:

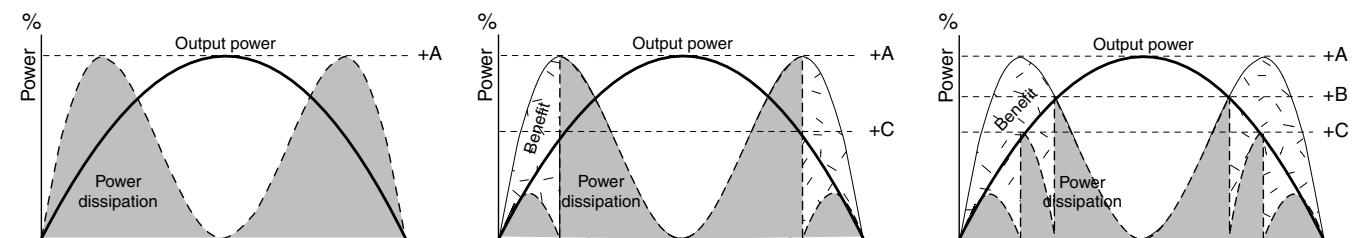
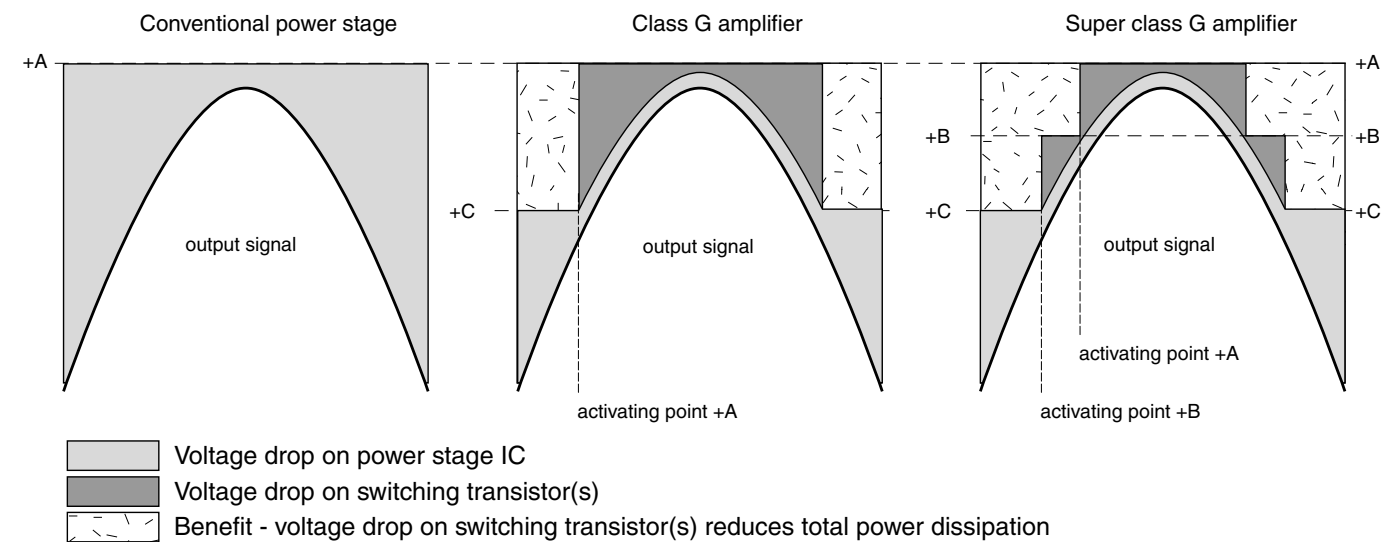
#### Amplifier:

Attention: In the POWER 2001 module the power amplifier IC AN7591 is used as a bridge-amplifier.  
Any connection from output to ground will destroy the output stages!

- Via the AMP\_ON control line, connected to pins 6 (Stby), the power amplifiers are switched on/off by the  $\mu$ P.  
High level (approx. 4,5V): power amplifiers switched on  
Low level (approx. 0V): power amplifiers switched off
- Super class G - operation

The power amplifiers operate as so-called super class G - amplifiers:  
The supply pins 12 (Vcc) are not just connected to one fixed DC-supply as in conventional amplifiers.  
Dependent on the output power there are three different DC-voltages supplied to the power amplifiers:  
⇒ +C1 (+20V) for low output power  
⇒ +B1 (+29V) for medium output power  
⇒ +A1 (+41V for high output power

### Principle / benefit of Super Class G



**Circuit details continued:**

• **Low power standby feature**

An additional small standby transformer, reduces power consumption in standby-mode. In case power is switched on, the control line ECO is low → relay 1210 is activated → contacts 1 and 2 are closed → transformer 5001 is connected to mains. When the set is switched off (standby) the control line ECO is high → relay 1210 is not activated → mainstransformer is disconnected. Via standby transformer and rectifiers 6210-6214 the supply voltage LOW\_PWR\_SUP is substituted. This voltage is always available and so the microprocessor is kept running.

• **DC voltages +A1, +B1, +C1**

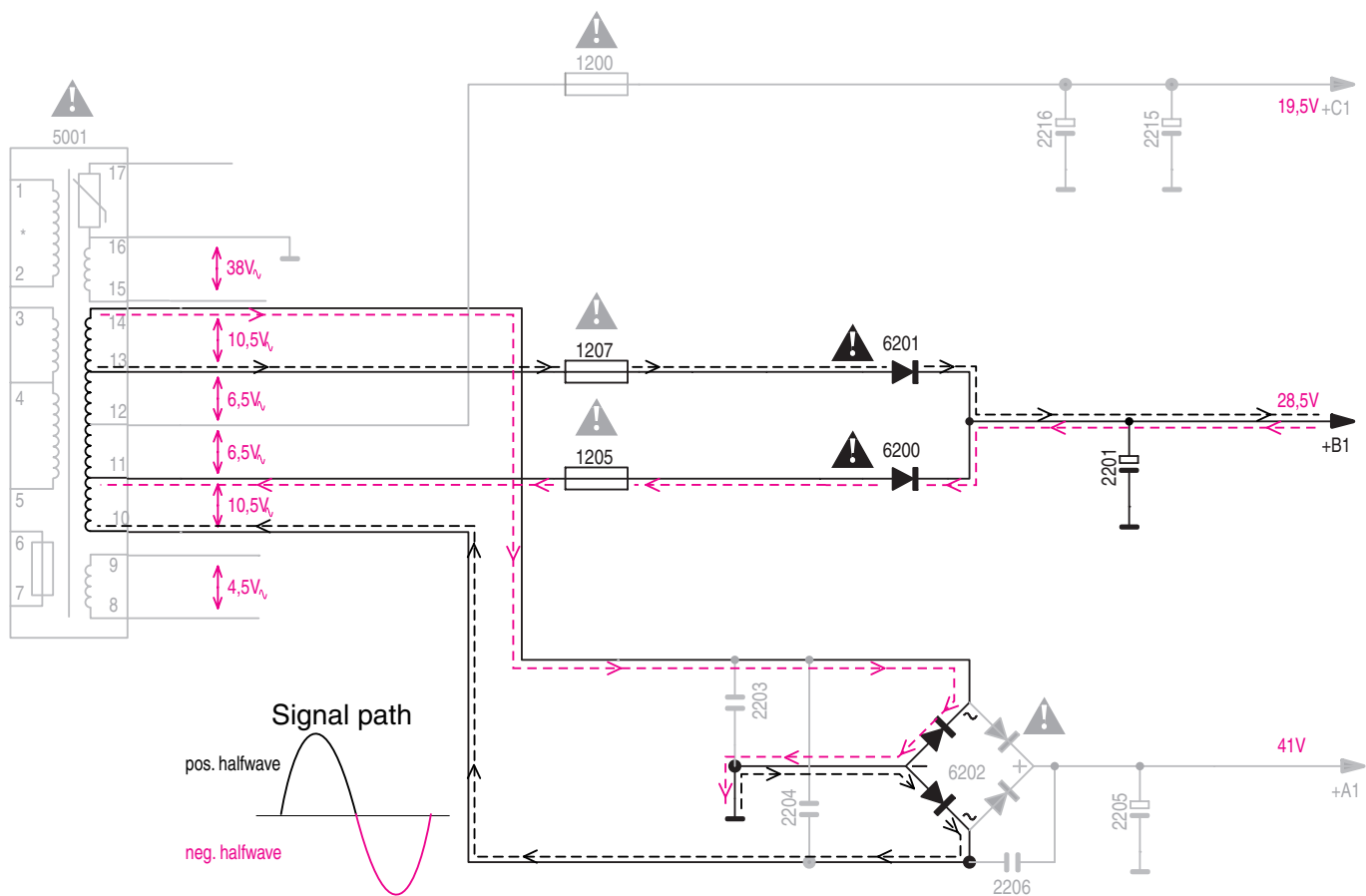
These voltages supply the Super Class G amplifier, described on previous page. The whole power supply is optimized for the special characteristic of this type of amplifier. For that reason several “tricky” details have been applied to ensure optimal efficiency and symmetrical load to the mains transformer.

**Generation of +A1**

Common full wave rectifying with bridge rectifier 6202, using 100% secondary winding of mains transformer (pin 10-14).

**Generation of +B1**

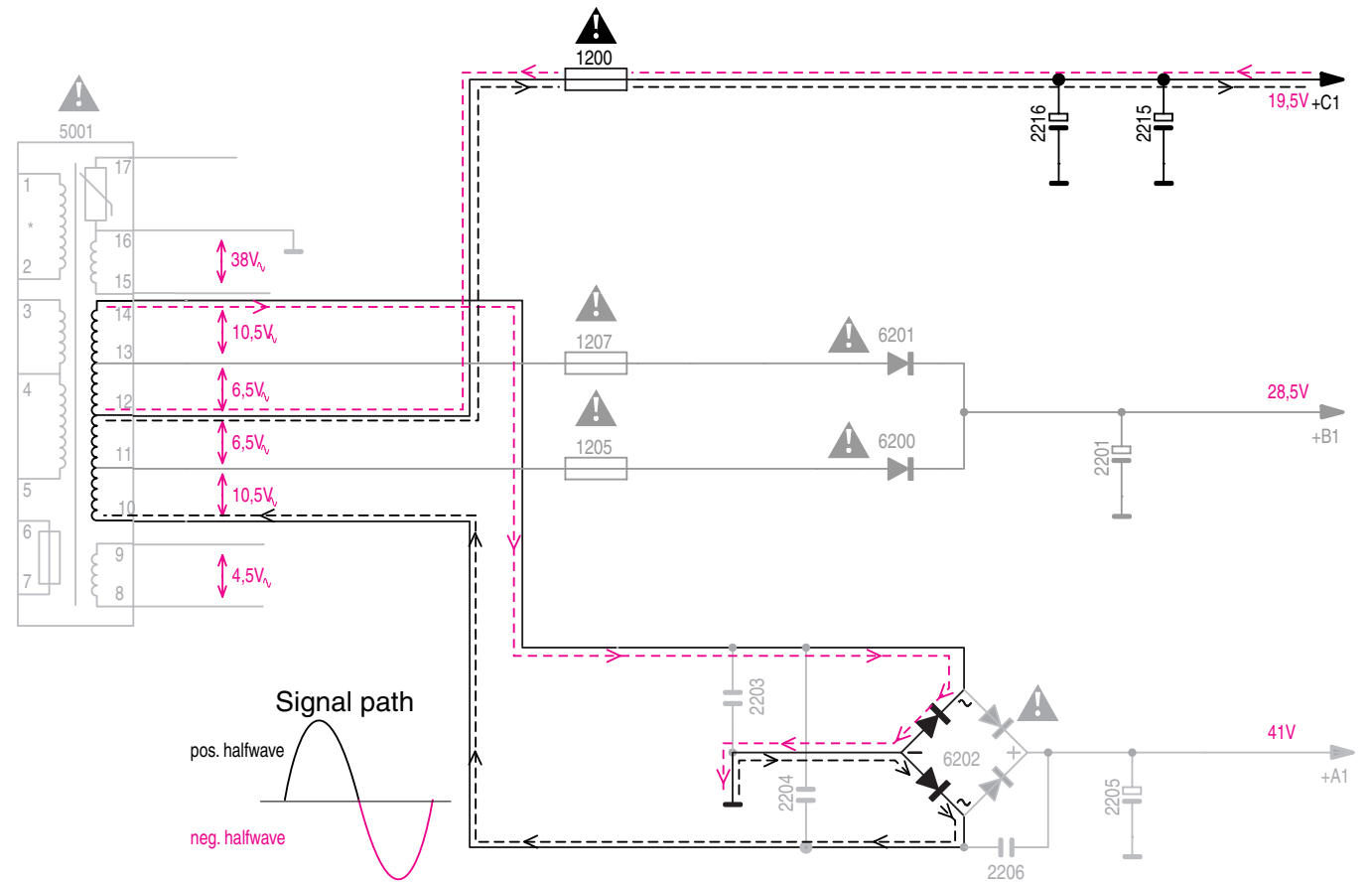
The supply for +B1 consists of one full wave rectifier:  
 – 2 diodes of bridge rectifier 6202, with 6200(6220 in parallel) 6201(6221 in parallel) for generation of +B1 using approx. 70% secondary winding of mains transformer (pin 10-13 respectively pin 11-14).  
 As example for generation of +B1 see picture 1.



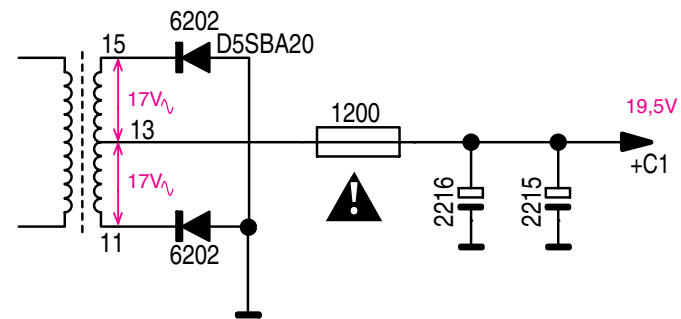
picture 1

**Generation of +C1**

Full wave rectifying with 2 diodes of bridge rectifier 6202, using 50% secondary winding of mains transformer (pin 13-15/13-11). See picture 2 below.



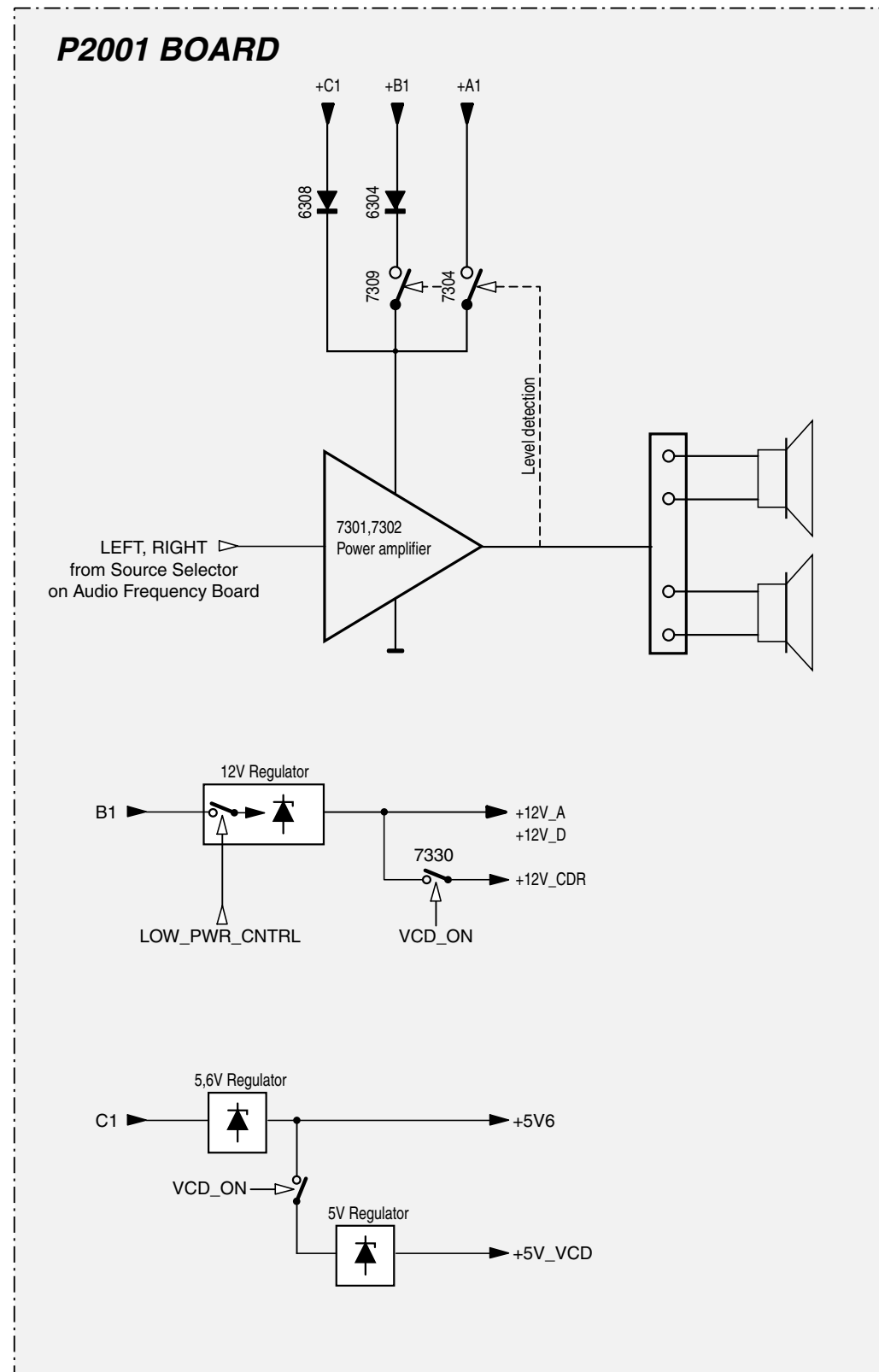
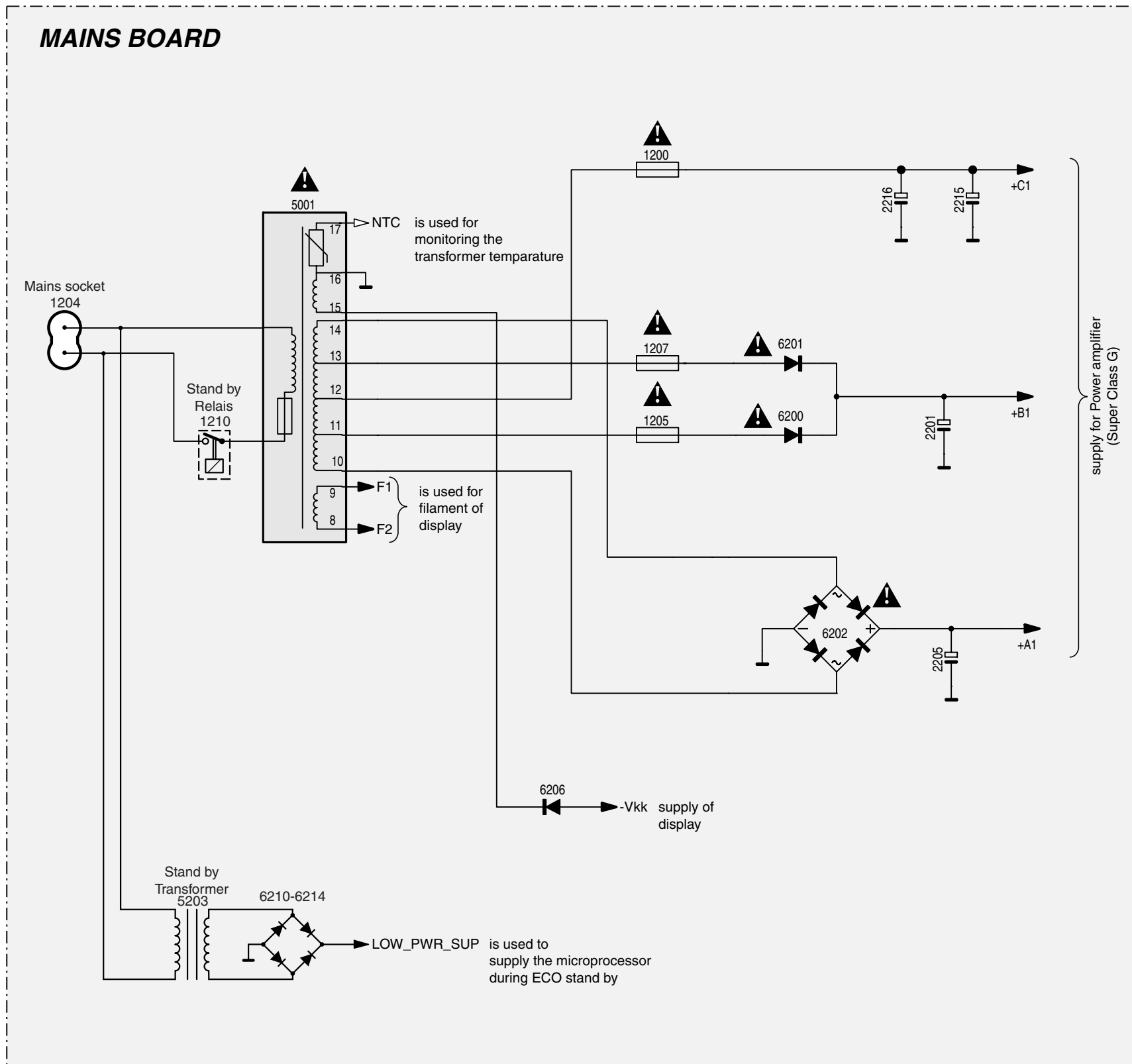
**simplified:**



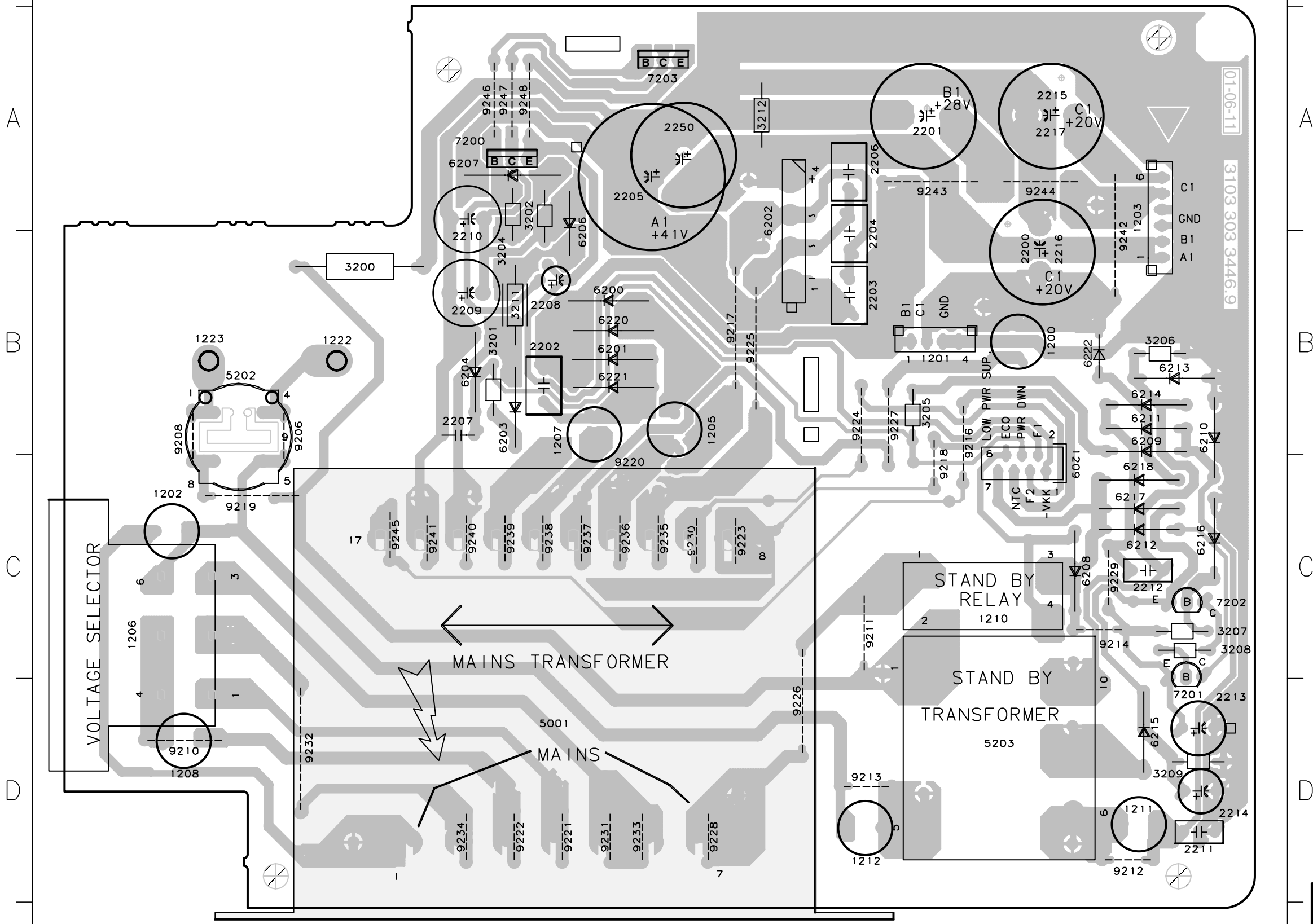
picture 2



Block Diagram

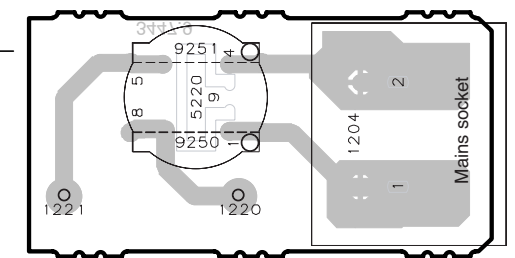


# Mains Board Copperside view



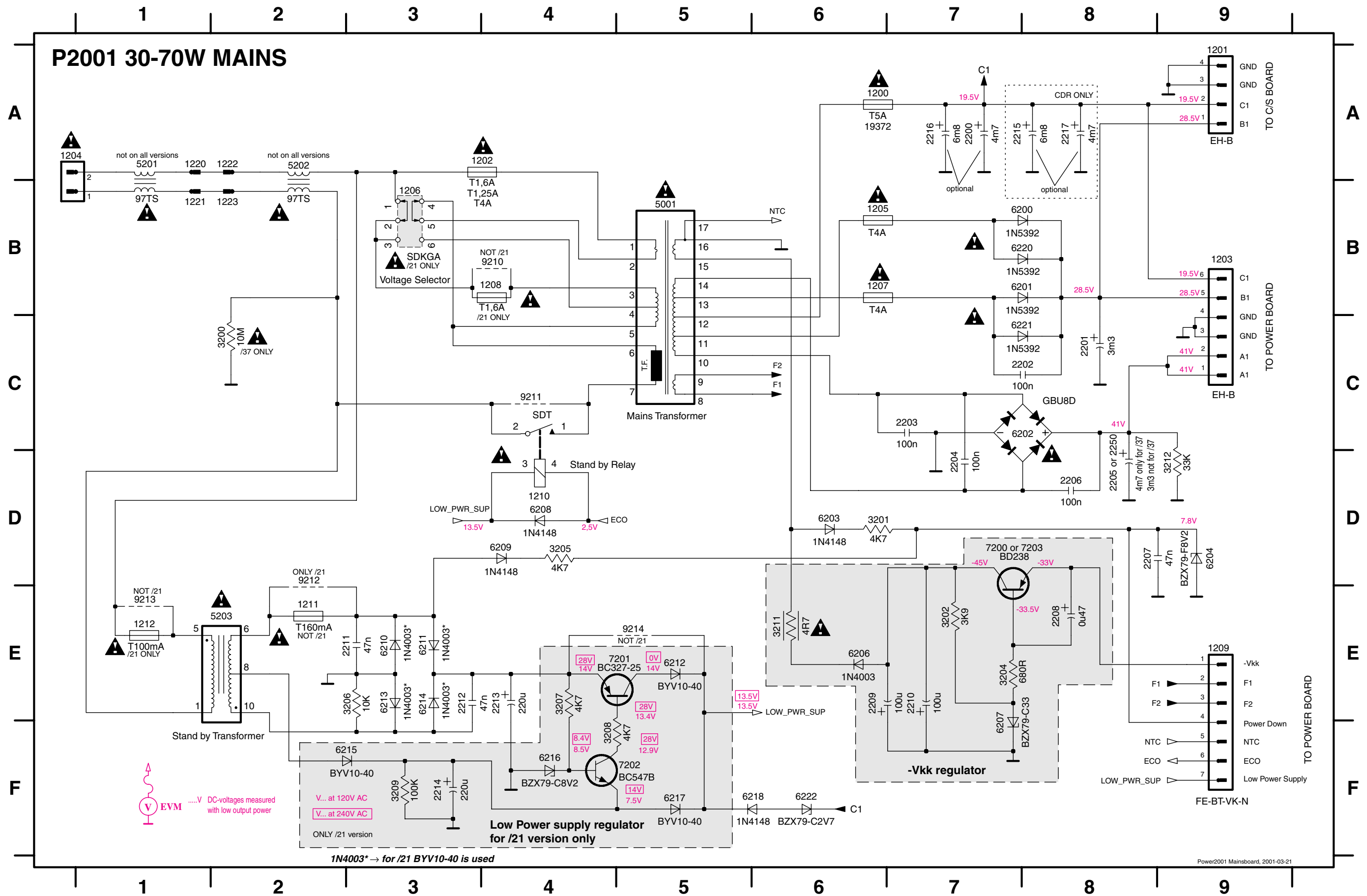
- 1200 B5
- 1201 B4
- 1202 C1
- 1203 A5
- 1205 B3
- 1206 C1
- 1207 C3
- 1208 D1
- 1209 C5
- 1210 C5
- 1211 D5
- 1212 D4
- 1222 B2
- 1223 B1
- 2200 B5
- 2201 A4
- 2202 B3
- 2203 B4
- 2204 B4
- 2205 B3
- 2206 A4
- 2207 B2
- 2208 B3
- 2209 B2
- 2210 B2
- 2211 D5
- 2212 C5
- 2213 D5
- 2214 D5
- 2215 A5
- 2216 B5
- 2217 A5
- 2250 A3
- 3200 B2
- 3201 B2
- 3202 B3
- 3204 A3
- 3205 B4
- 3206 B5
- 3207 C5
- 3208 C5
- 3209 D5
- 3211 B3
- 3212 A4
- 5001 C2
- 5202 B1
- 5203 D5
- 6200 B3
- 6201 B3
- 6202 B4
- 6203 B2
- 6204 B2
- 6206 B3
- 6207 A2
- 6208 C5
- 6209 C5
- 6210 C5
- 6211 B5
- 6212 C5
- 6213 B5
- 6214 B5
- 6215 D5
- 6216 C5
- 6217 C5
- 6218 C5
- 6220 B3
- 6221 B3
- 6222 B5
- 7200 A2
- 7201 D5
- 7202 C5
- 7203 A3
- 9206 B2
- 9208 B1
- 9210 D1
- 9211 D4
- 9212 D5
- 9213 D4
- 9214 C5
- 9216 B4
- 9217 B3
- 9218 C4
- 9219 C1
- 9220 C3
- 9221 D3
- 9222 D3
- 9223 C4
- 9224 B4
- 9225 B4
- 9226 D4
- 9227 B4
- 9228 D3
- 9229 C5
- 9230 C3
- 9231 D3
- 9232 D2
- 9233 D3
- 9234 D2
- 9235 C3
- 9236 C3
- 9237 C3
- 9238 C3
- 9239 C3
- 9240 C2
- 9241 C2
- 9242 B5
- 9243 A4
- 9244 A5
- 9245 C2
- 9246 A2
- 9247 A2
- 9248 A3

### Mains Socket



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

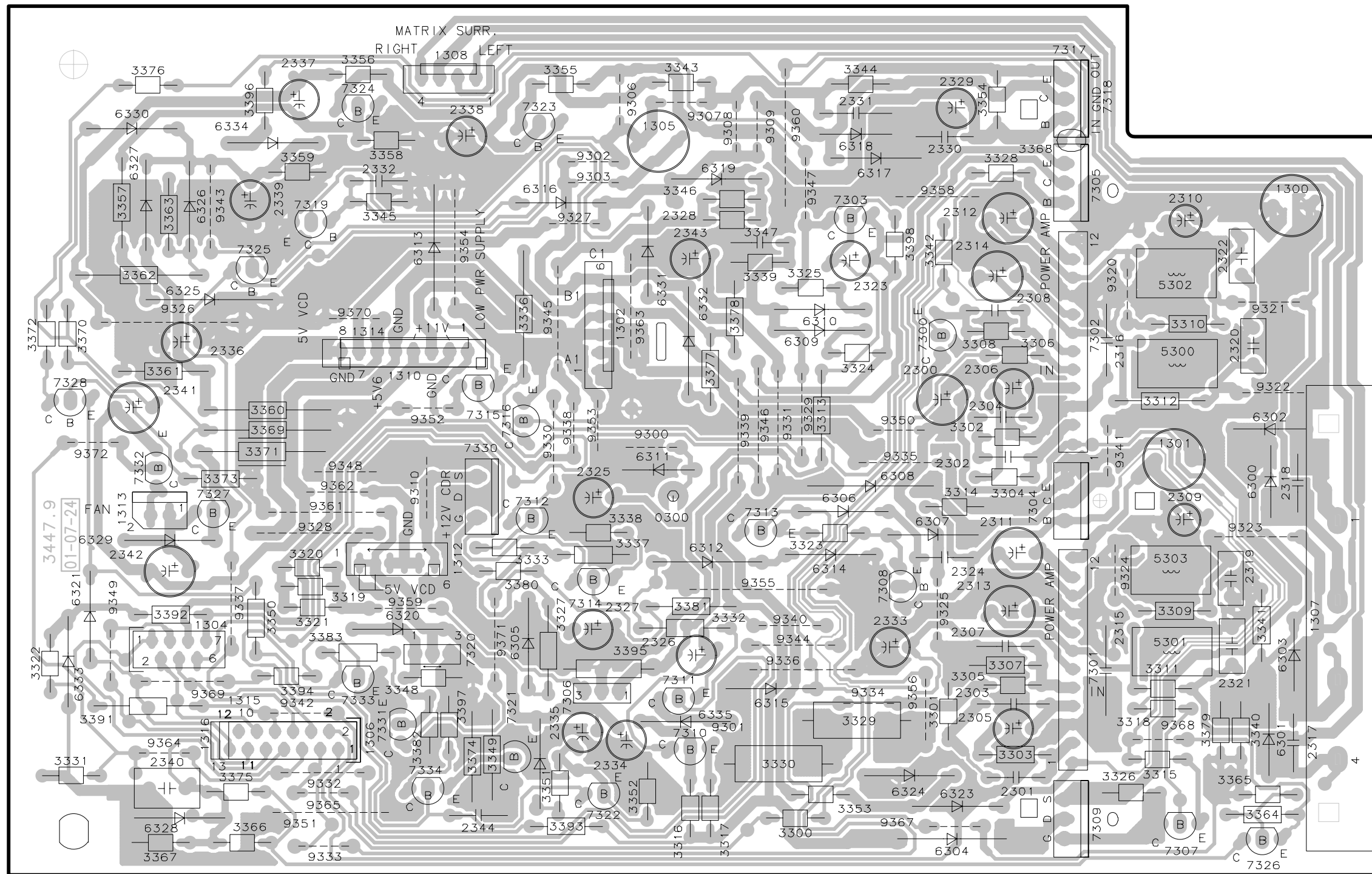
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1201 A9	1208 B4	1223 B2	2205 D8	2211 E3	2217 A8	3205 E4	3212 D9	6202 C8	6209 E4	6215 F3	7200 D7	9210 B4	
1202 A4	1209 E9	2200 A7	2206 D8	2212 E3	2250 D8	3206 E3	5001 C5	6203 D6	6210 E3	6216 F4	7201 E4	9211 C4	
1203 B9	1210 D4	2201 C8	2207 D8	2213 E4	3200 C2	3207 E4	5202 A2	6204 D9	6211 E3	6217 F5	7202 F5	9212 D2	
1205 B6	1211 E2	2202 C8	2208 E8	2214 F3	3201 D6	3208 F4	5203 E1	6206 E6	6212 E5	6218 F6	7203 D7	9213 E1	
1206 B3	1212 E1	2203 C7	2209 E6	2215 A7	3202 E7	3209 F3	6200 B8	6207 F7	6213 E3	6220 B8	9206 A2	9214 E5	



0300 B3	1307 B5	1316 C1	2306 A4	2313 B4	2320 A5	2327 B3	2334 C3	2341 B1	3303 C4	3310 A5	3317 C3	3324 A3	3331 C1	3340 C5	3347 A3	3354 A4	3361 A1	3368 A4	3375 C1	3382 C2	7301 C4
1300 A5	1308 A2	2300 B4	2307 C4	2314 A4	2321 C5	2328 A3	2335 C2	2342 B1	3304 B4	3311 C5	3318 C5	3325 A3	3332 B3	3341 B5	3348 C2	3355 A2	3362 A1	3369 B1	3376 A1	3383 C1	7302 A4
1301 B5	1310 A2	2301 C4	2308 A4	2315 C4	2322 A5	2329 A4	2336 A1	2343 A3	3305 C4	3312 B5	3319 B1	3326 C5	3333 B2	3342 A4	3349 C2	3356 A1	3363 A1	3370 A1	3377 B3	3391 C1	7303 A3
1302 A3	1312 B2	2302 B4	2309 B5	2316 A4	2323 A3	2330 A4	2337 A1	2344 C2	3306 A4	3313 B3	3320 B1	3327 B2	3336 A2	3343 A3	3350 B1	3357 A1	3364 C5	3371 B1	3378 A3	3392 B1	7304 B4
1304 C1	1313 B1	2303 C4	2310 A5	2317 C5	2324 B4	2331 A3	2338 A2	3300 C3	3307 C4	3314 B4	3321 B1	3328 A4	3337 B3	3344 A3	3351 C2	3358 A2	3365 C5	3372 A1	3379 C5	3393 C2	7305 A4
1305 A3	1314 A2	2304 B4	2311 B4	2318 B5	2325 B2	2332 A2	2339 A1	3301 C4	3308 A4	3315 C5	3322 C1	3329 C3	3338 B3	3345 A2	3352 C3	3359 A1	3366 C1	3373 B1	3380 B2	3394 C1	7306 C2
1306 C2	1315 C1	2305 C4	2312 A4	2319 B5	2326 C3	2333 B4	2340 C1	3302 B4	3309 B5	3316 C3	3323 B3	3330 C3	3339 A3	3346 A3	3353 C3	3360 B1	3367 C1	3374 C2	3381 B3	3395 C2	7307 C5

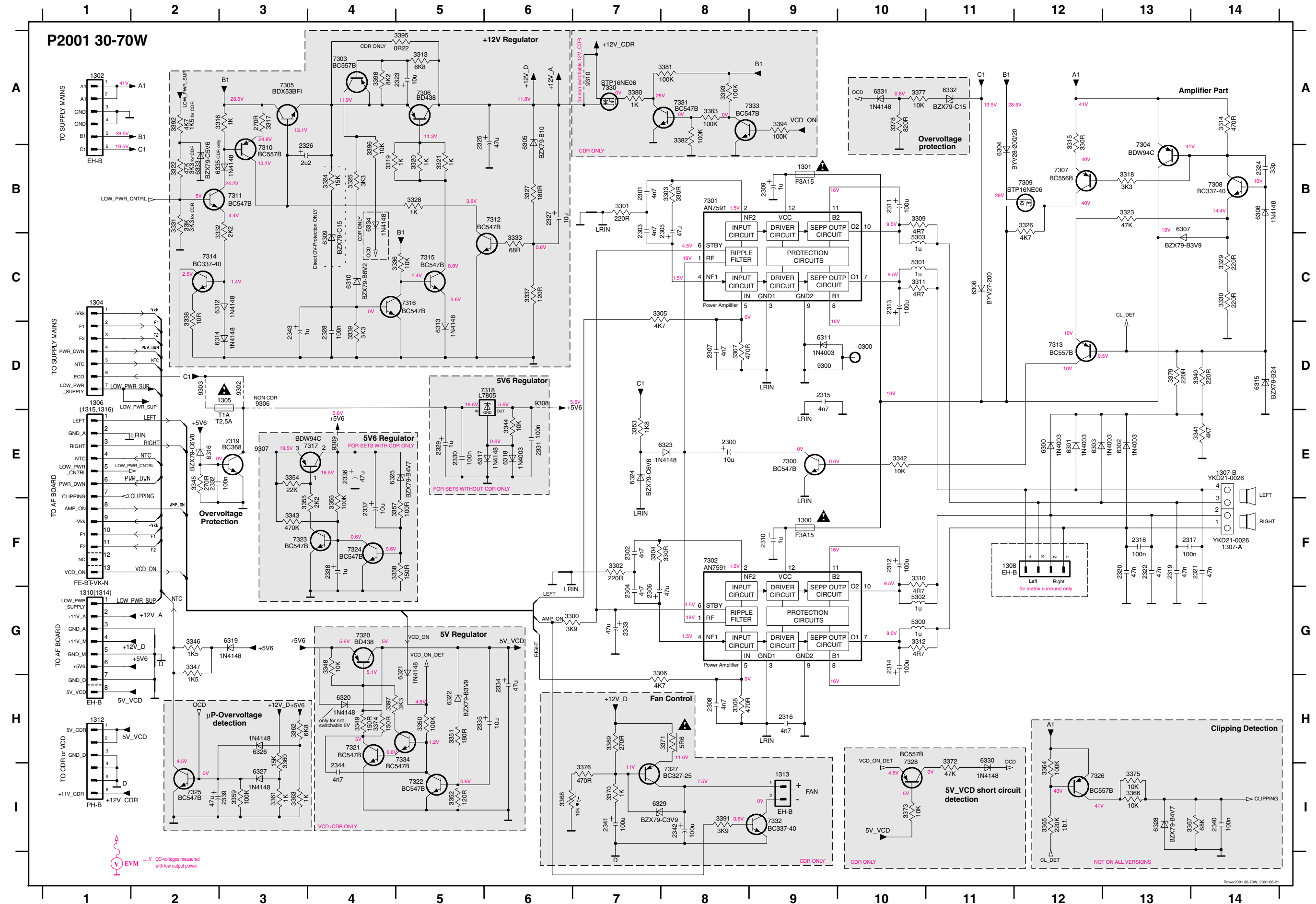
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### Power Board Copperside view



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

0300	D10	1307-a	F14	1315	D1	2305	B8	2312	F10	2319	F13	2326	B3	2333	G7	2340	I14	3303	B8	3310	F10	3317	A3	3324	B4	3331	B2	3340	D14	3347	G2	3354	E3	3361	I3	3368	I6	3375	I13	3382	A8	6300	E12	6307	B13	6314	D2	6321	H5	6328	I13	7302	F8	7309	B12	7316	C5	7323	F3	7331	A8	9306	D4
1300	F9	1307-b	E14	1316	D1	2306	G7	2313	C10	2320	F13	2327	B6	2334	H6	2341	I7	3304	F7	3311	C10	3318	B13	3325	B4	3332	B3	3341	E10	3348	G4	3355	F3	3362	I3	3369	H7	3376	I7	3383	A8	6301	E12	6308	C11	6315	D14	6322	H5	6329	I7	7303	A4	7310	B3	7317	E3	7324	F4	7332	F4	9307	D4
1301	B9	1308	F12	2300	E8	2307	D8	2314	G10	2321	F13	2328	D4	2335	H5	2342	I8	3305	C7	3312	G10	3319	B4	3326	B12	3333	C6	3342	E10	3349	H4	3356	F4	3363	I3	3370	I7	3377	A10	3384	A8	6302	E13	6309	C4	6316	F5	6323	E8	6330	H11	7304	A3	7311	B3	7318	D6	7325	I2	9300	D9	9310	A5
1302	A1	1310	G1	2301	B7	2308	H8	2315	D9	2322	F13	2329	E5	2336	E4	2343	D3	3306	H7	3313	A5	3320	B6	3327	B6	3334	C5	3343	F3	3350	H7	3357	F3	3364	I12	3371	H8	3378	A10	3385	G10	6303	E12	6310	C4	6317	E6	6324	E7	6331	A10	7305	A8	7312	B6	7319	F6	7326	I12	9302	D3		
1304	C1	1312	H1	2302	F7	2309	B9	2316	H9	2323	A4	2330	E5	2337	F4	2344	B4	3307	D8	3314	A14	3321	B5	3328	B3	3335	C6	3344	E5	3351	H5	3358	F5	3365	I12	3372	I11	3379	D13	3386	C10	6304	B11	6311	D9	6318	E6	6325	E5	6332	A11	7306	A5	7313	D12	7320	G4	7327	H4	9303	D2		
1305	D3	1313	I9	2303	B7	2310	F9	2317	F13	2324	A4	2331	E6	2338	F4	2345	B2	3308	H8	3315	A12	3322	B2	3329	C14	3336	C2	3345	F5	3352	I5	3359	I3	3366	I13	3373	I10	3380	A7	3387	G10	6305	A6	6312	C2	6319	G3	6326	H2	6333	E9	7307	B12	7314	C2	7321	H4	7328	H10	9304	D3		
1306	E1	1314	G1	2304	G7	2311	B10	2318	F13	2325	A5	2332	F5	2339	I2	2346	F7	3309	B10	3316	A3	3323	B13	3330	C14	3337	D4	3346	G2	3353	E7	3360	H3	3367	I14	3374	H4	3381	A8	5303	C10	6306	B14	6313	D5	6320	H4	6327	H3	7301	B8	7308	B14	7315	C5	7322	I5	7330	A7	9305	E3		



**EVM** — V DC-voltages measured with low output power



# AF9 BOARD

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## BRIEF INTRODUCTION OF THE AF9 BOARD

The AF9 Board consists of the following features :

- a. TDA7468D  
 TDA7468D (7501) provides the basic sound processing - loudness, bass, treble, volume & mute controls and source selection - TUNER, TAPE, CD & AUX including Mic mixing for the set.  
 Sound features such as ALC, DBB, DSC and IS are controlled by the microprocessor IC on the Front Board via I<sup>2</sup>C Bus.  
 Undesirable noise during source switching are muted off by via the software of the microprocessor IC on the Front Board.
- b. MIC MIXING  
 Simple Mic mixing is provided by pin 2 of TDA7468D. During Mic mixed a 1nF capacitor is connected across this pin to ground instead of a chip connector(0R).
- c. DOLBY PRO LOGIC (DPL) INTERFACE  
 The AF9 Board has provisions to cater for DPL. External DPL Board would be required.
- d. LINE OUT  
 Line out cinch socket (1504) is catered including transistors muting circuitry.
- e. SUB-WOOFER OUT  
 Sub-woofer out cinch socket (691) for connection to active sub-woofer speaker is catered.
- f. INCREDIBLE SURROUND (IS)  
 The AF9 provides 2 possible IS namely:
  - a) Simple IS using TDA7468D with addition of passive network.
  - b) Full IS using transistor circuitry to create phase shifting and spatial effect.
- g. HEADPHONE AMPLIFIER  
 Headphone amplifier NJM4556AM (7601) is provided after the Sound processor (7501) to drive 32 ohm to 1kohm headphone.
- h. M62320FP  
 The M62320FP (7403) I<sup>2</sup>C Expander provides additional controls required.
- i. CD STANDBY CONTROL  
 Transistors 7401 & 7402 ensures the +5V\_CD supply is switched only during CD mode.
- j. CD DIGITAL OUT  
 CD Digital out cinch socket (1801) for connection to external digital audio decoders.

## VARIATION TABLE:

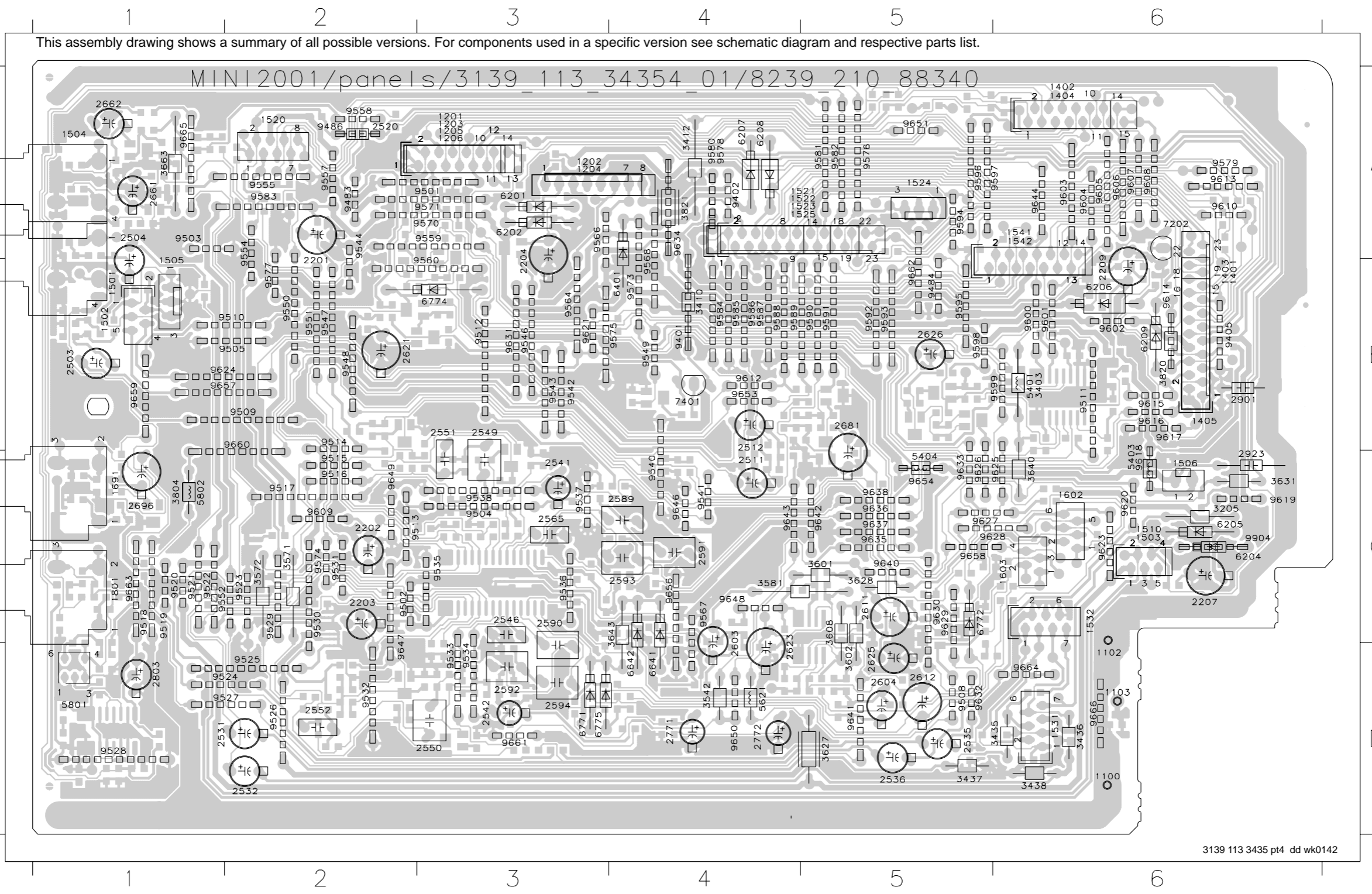
Type /Versions:	FW-C390						
	/21	/21M	/22	/30	/33	/34	/37
Features:							
Line In	x	x	x	x	x	x	x
Line Out	-	-	-	-	-	-	-
Sub-woofer Out	-	-	-	-	-	-	-
Digital Out	-	-	-	-	-	-	-
Video Out	-	-	-	-	-	-	-
Mic mix / Mic Detect	x	x	-	-	x	-	-
Simple IS	x	x	x	x	x	x	x
Full IS	-	-	-	-	-	-	-
Dolby ProLogic (DPL)	-	-	-	-	-	-	-
Voice Control (VC)	-	-	-	-	-	-	-



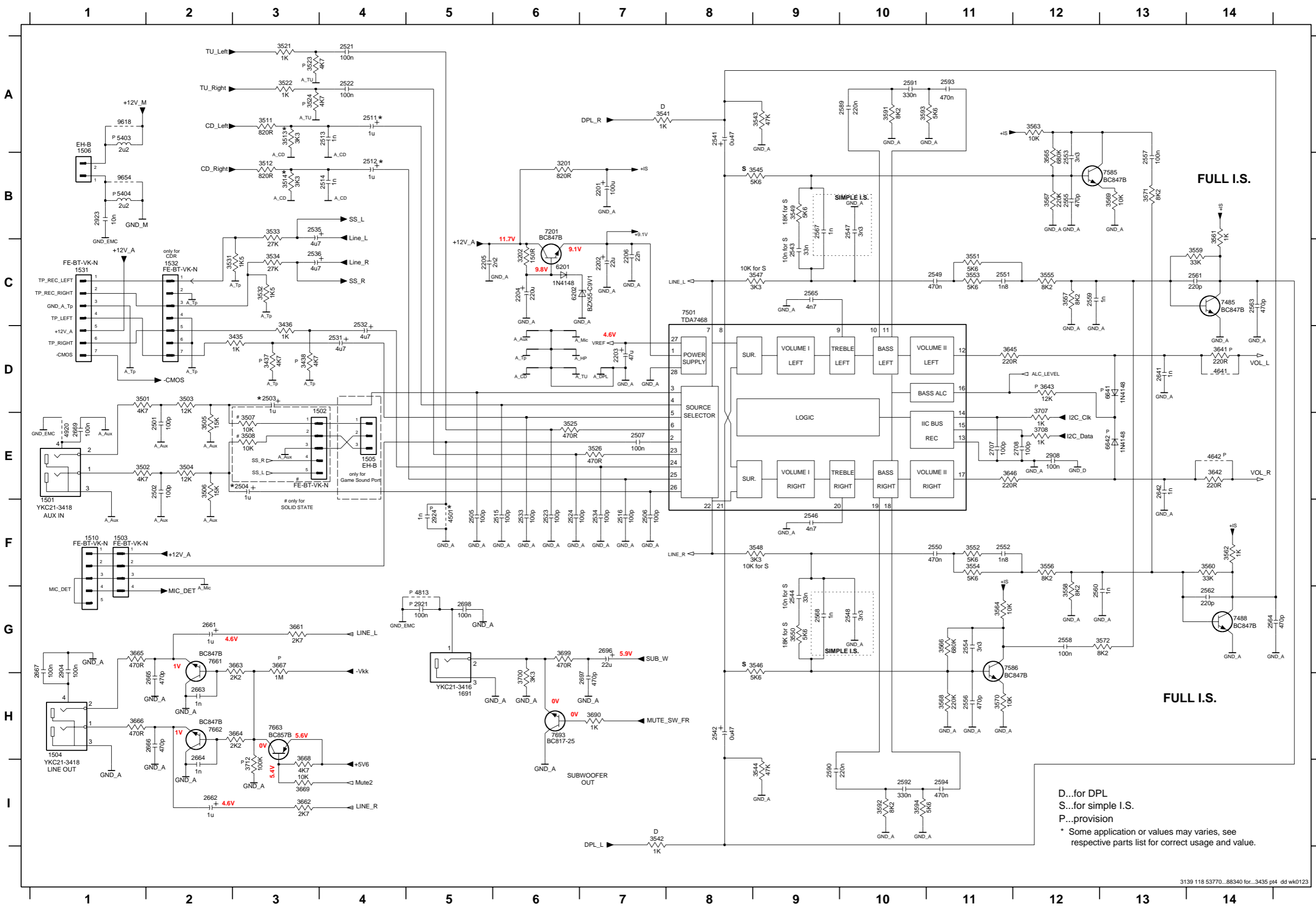


COMPONENT LAYOUT

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1101	D	11
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1103	D	11
1104	D	11
1105	D	11
1106	D	11
1107	D	11
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1109	D	11
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1111	D	11
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1115	D	11
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1299	D	11
1300	D	11



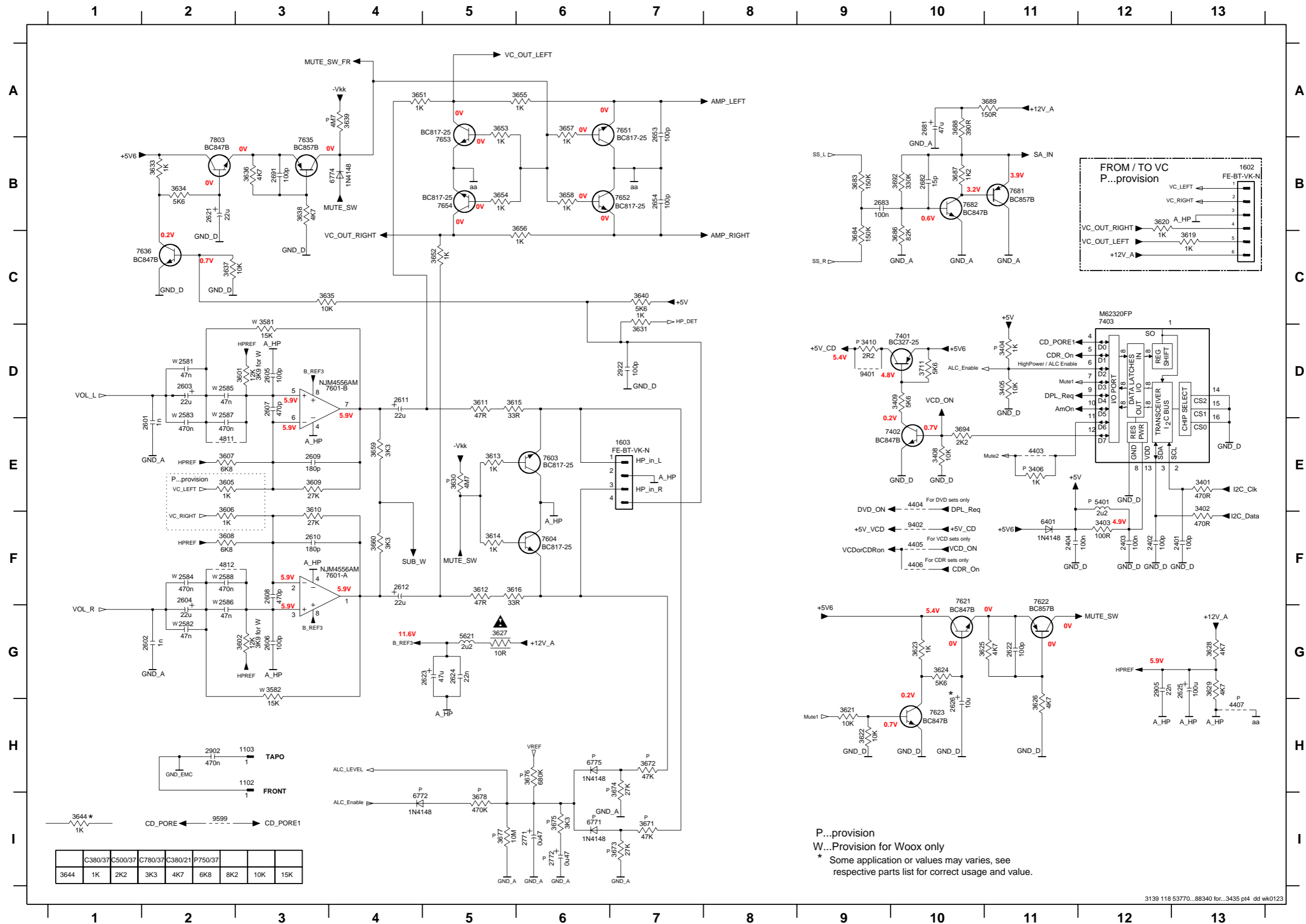
# SOURCE SELECTION & SOUND PROCESSING CIRCUIT



1501 E1	3511 A3
1502 E3	3512 B3
1503 F1	3513 A3
1504 H1	3514 B3
1505 E4	3521 A3
1506 A1	3522 A3
1510 F1	3523 A3
1531 C1	3524 A3
1532 C2	3525 E6
1691 H5	3526 E7
2201 B7	3531 C2
2202 C7	3532 C3
2203 D7	3533 B3
2204 C6	3534 C3
2205 C5	3541 A7
2206 C7	3542 I7
2501 E2	3543 A9
2502 E2	3544 I9
2503 D3	3545 B9
2504 E3	3546 G9
2505 F5	3547 C9
2506 F7	3548 F9
2507 E7	3549 B9
2511 A4	3550 G9
2512 B4	3551 C11
2513 A4	3552 F11
2514 B4	3553 C11
2515 F6	3554 F11
2516 F7	3555 C12
2521 A4	3556 F12
2522 A4	3557 C12
2523 F6	3558 G12
2524 F6	3559 C14
2531 D4	3560 F14
2532 C4	3561 B14
2533 F6	3562 F14
2534 F7	3563 A12
2535 B3	3564 G11
2536 C3	3565 B12
2541 A8	3566 G11
2542 H8	3567 B12
2543 C9	3568 H11
2544 G9	3569 B13
2546 F9	3570 H11
2547 B10	3571 B13
2548 G10	3572 G13
2549 C11	3591 A10
2550 F11	3592 I10
2551 C11	3593 A10
2552 F12	3594 I10
2553 B12	3641 D14
2554 G11	3642 E14
2555 B12	3643 D12
2556 H11	3645 D11
2557 B13	3646 E11
2558 G12	3661 G3
2559 C12	3662 I3
2560 G12	3663 G3
2561 C14	3664 H3
2562 G14	3665 G1
2563 C14	3666 H1
2564 G14	3667 G3
2565 C9	3668 I3
2567 B9	3669 I3
2568 G9	3690 H7
2569 A10	3699 G6
2590 I9	3700 H6
2591 A10	3707 E12
2592 I10	3708 E12
2593 A11	3712 I3
2594 I11	4501 F5
2641 D13	4641 D14
2642 E13	4642 E14
2661 G2	4813 G5
2662 I2	4920 E1
2663 H2	5403 A1
2664 I2	5404 B1
2665 H2	6201 C6
2666 H2	6202 C6
2667 G1	6641 D13
2669 E1	6642 E13
2696 G7	7201 B6
2697 H7	7485 C14
2698 G5	7488 G14
2707 E11	7501 C8
2708 E12	7585 B13
2904 G1	7586 G11
2908 E12	7661 G2
2921 G5	7662 H2
2923 B1	7663 H3
2924 F5	7693 H6
3201 B6	9618 A1
3202 C6	9654 B1
3435 D3	
3436 D3	
3437 D3	
3438 D3	
3501 D1	
3502 E1	
3503 D2	
3504 E2	
3505 E2	
3506 E2	
3507 E3	
3508 E3	

D...for DPL  
 S...for simple I.S.  
 P...provision  
 \* Some application or values may varies, see respective parts list for correct usage and value.

# HEADPHONE AMPLIFIER & I<sup>2</sup>C EXPANDER CIRCUIT



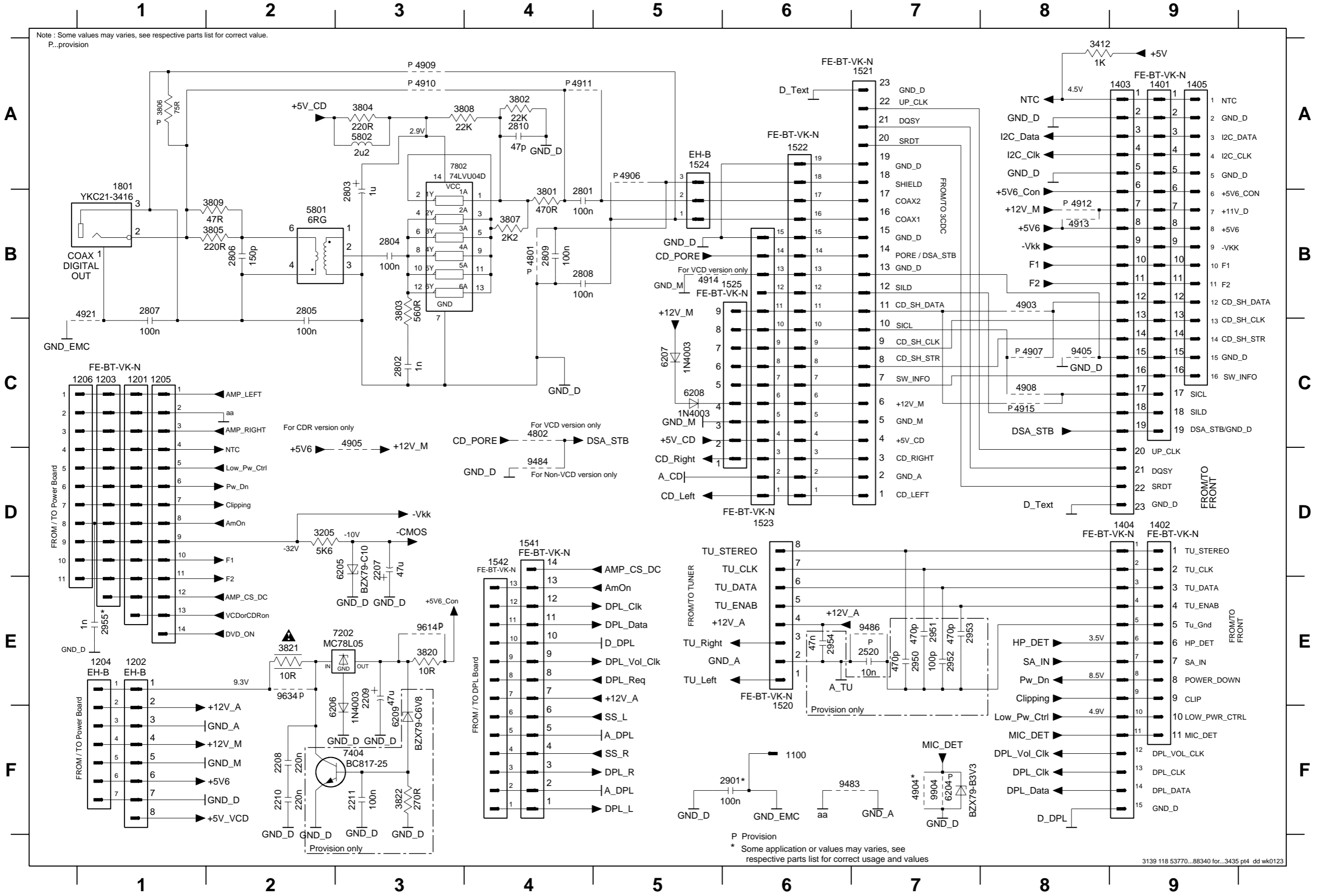
	C380/37	C500/37	C780/37	C380/21	P750/37		
3644	1K	2K2	3K3	4K7	6K8	8K2	10K

P...provision  
W...Provision for Woox only  
\* Some application or values may varies, see respective parts list for correct usage and value.

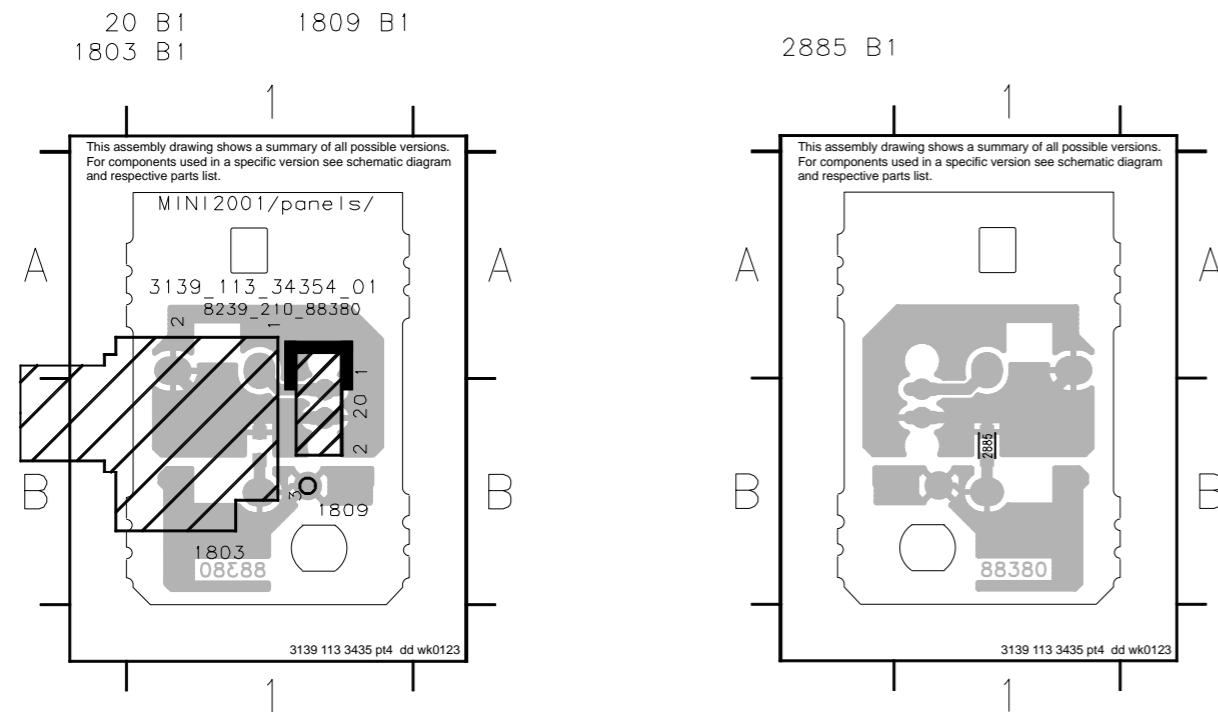
- 1102 H3
- 1103 H3
- 1602 B13
- 1603 E7
- 2401 F13
- 2402 F12
- 2403 F12
- 2404 F11
- 2581 D2
- 2582 G2
- 2583 D2
- 2584 F2
- 2585 D2
- 2586 F2
- 2587 D2
- 2588 F2
- 2601 E2
- 2602 G2
- 2603 D2
- 2604 F2
- 2605 D3
- 2606 G3
- 2607 D3
- 2608 F3
- 2609 E3
- 2610 F3
- 2611 D4
- 2612 F4
- 2621 B2
- 2622 G11
- 2623 G5
- 2624 G5
- 2625 G13
- 2626 H10
- 2653 A7
- 2654 B7
- 2681 A10
- 2682 B10
- 2683 B9
- 2691 B3
- 2771 I6
- 2772 I6
- 2902 H2
- 2905 G12
- 2922 D7
- 3401 E13
- 3402 E13
- 3403 F12
- 3404 D11
- 3405 D11
- 3406 E11
- 3408 E10
- 3409 D10
- 3410 D9
- 3581 D3
- 3582 G3
- 3601 D3
- 3602 G3
- 3605 E2
- 3606 F2
- 3607 E2
- 3608 F2
- 3609 E3
- 3610 F3
- 3611 D5
- 3612 F5
- 3613 E5
- 3614 F5
- 3615 F5
- 3616 F5
- 3619 C13
- 3620 B12
- 3621 H9
- 3622 H9
- 3623 G10
- 3624 G10
- 3625 G10
- 3626 H11
- 3627 G5
- 3628 G13
- 3629 G13
- 3630 E5
- 3631 D7
- 3633 B2
- 3634 B2
- 3635 C3
- 3636 B3
- 3637 C2
- 3638 B3
- 3639 A4
- 3640 C7
- 3644 I1
- 3651 A4
- 3652 C5
- 3653 A5
- 3654 B5
- 3655 A6
- 3656 C6
- 3657 A6
- 1102 H3
- 1103 H3
- 1602 B13
- 1603 E7
- 2401 F13
- 2402 F12
- 2403 F12
- 2404 F11
- 2581 D2
- 2582 G2
- 2583 D2
- 2584 F2
- 2585 D2
- 2586 F2
- 2587 D2
- 2588 F2
- 2601 E2
- 2602 G2
- 2603 D2
- 2604 F2
- 2605 D3
- 2606 G3
- 2607 D3
- 2608 F3
- 2609 E3
- 2610 F3
- 2611 D4
- 2612 F4
- 2621 B2
- 2622 G11
- 2623 G5
- 2624 G5
- 2625 G13
- 2626 H10
- 2653 A7
- 2654 B7
- 2681 A10
- 2682 B10
- 2683 B9
- 2691 B3
- 2771 I6
- 2772 I6
- 2902 H2
- 2905 G12
- 2922 D7
- 3401 E13
- 3402 E13
- 3403 F12
- 3404 D11
- 3405 D11
- 3406 E11
- 3408 E10
- 3409 D10
- 3410 D9
- 3581 D3
- 3582 G3
- 3601 D3
- 3602 G3
- 3605 E2
- 3606 F2
- 3607 E2
- 3608 F2
- 3609 E3
- 3610 F3
- 3611 D5
- 3612 F5
- 3613 E5
- 3614 F5
- 3615 F5
- 3616 F5
- 3619 C13
- 3620 B12
- 3621 H9
- 3622 H9
- 3623 G10
- 3624 G10
- 3625 G10
- 3626 H11
- 3627 G5
- 3628 G13
- 3629 G13
- 3630 E5
- 3631 D7
- 3633 B2
- 3634 B2
- 3635 C3
- 3636 B3
- 3637 C2
- 3638 B3
- 3639 A4
- 3640 C7
- 3644 I1
- 3651 A4
- 3652 C5
- 3653 A5
- 3654 B5
- 3655 A6
- 3656 C6
- 3657 A6

# DIGITAL OUT & INTERCONNECTION CIRCUIT

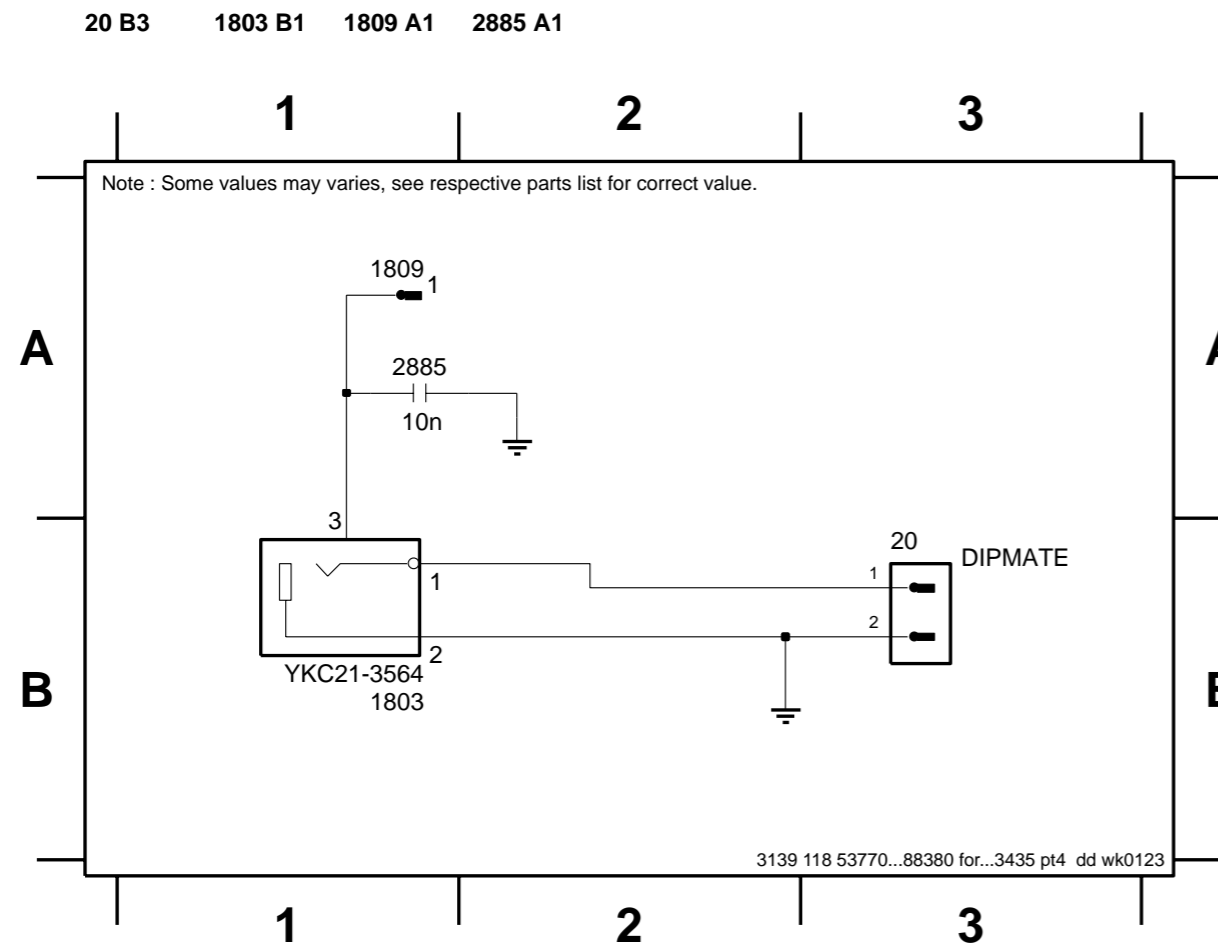
1100 F6	1203 C1	1206 C1	1403 A9	1520 E6	1523 D6	1541 D4	2207 D3	2210 F2	2801 B4	2804 B3	2807 B1	2810 A4	2951 E7	2954 E6	3412 A8	3803 B3	3806 A1	3809 B2	3822 F3	4903 B8	4906 A5	4909 A3	4912 B8	4915 C8	5802 A3	6206 F3	6209 F3	7802 A3	9484 D4	9634 E2
1201 C1	1204 E1	1401 A9	1404 D9	1521 A7	1524 A5	1542 D4	2208 F2	2211 F3	2802 C3	2805 B2	2808 B4	2901 F6	2952 E7	2955 E1	3801 B4	3804 A3	3807 B4	3820 E3	4801 B4	4904 F7	4907 C8	4910 A3	4913 B8	4921 B1	6204 F7	6207 C5	7202 E3	9405 C8	9486 E7	9904 F7
1202 E1	1205 C1	1402 D9	1405 A9	1522 A6	1525 B5	1801 A1	2209 E3	2520 E7	2803 B3	2806 B2	2809 B4	2950 E7	2953 E7	3205 D2	3802 A4	3805 B2	3808 A3	3821 E2	4802 C4	4905 C3	4908 C8	4911 A4	4914 B5	5801 B2	6205 D3	6208 C5	7404 F3	9483 F6	9614 E3	



**VIDEO OUT PART - COMPONENT & CHIP LAYOUTS**



**CIRCUIT DIAGRAM - VIDEO OUT PART**



**ELECTRICAL PARTS LIST - AF9 BOARD**

MISCELLANEOUS		
1206	4822 267 11039	Flex Socket 11 Pin Vert.
1401	4822 265 11553	Flex Socket 19 Pin Vert.
1402	4822 267 11039	Flex Socket 11 Pin Vert.
1501	4822 265 20553	FFC Foil 4P/120/4P BD /21/21M
1503	4822 267 10733	CON BM V 4P F1.25 FFC 0.3B /21/21M
1520	4822 265 11515	Flex Socket 8 Pin Vert.
1523	4822 265 10981	Flex Socket 15 Pin Vert.
1531	4822 267 10953	Flex Socket 7 Pin Vert.
1603	4822 267 10733	Flex Socket 4 Pin Vert.
2546	4822 121 43856	4,7nF 5% 250V
2547	5322 126 11579	3,3nF 10% 63V
2548	5322 126 11579	3,3nF 10% 63V
2565	4822 121 43856	4,7nF 5% 250V
2567	3198 016 31020	1nF 25V
2568	3198 016 31020	1nF 25V
2589	4822 121 42408	220nF 5% 63V
2590	4822 121 42408	220nF 5% 63V
2591	5322 121 42661	330nF 5% 63V
2592	5322 121 42661	330nF 5% 63V
2593	4822 121 51252	470nF 5% 63V
2594	4822 121 51252	470nF 5% 63V
2601	3198 016 31020	1nF 25V
2602	3198 016 31020	1nF 25V
2603	4822 124 81151	22µF 50V
2604	4822 124 81151	22µF 50V
2605	4822 122 31765	100pF 2% 63V
2606	4822 122 31765	100pF 2% 63V
2607	4822 126 13881	470pF 5% 50V
2608	4822 126 13881	470pF 5% 50V
2609	4822 126 14508	180pF 5% 50V
2610	4822 126 14508	180pF 5% 50V
2611	4822 124 81151	22µF 50V
2612	4822 124 81151	22µF 50V
2621	4822 124 81151	22µF 50V
2622	4822 122 31765	100pF 2% 63V
2623	4822 124 40433	47µF 20% 25V
2624	3198 017 42230	22nF 50V
2625	4822 124 40207	100µF 20% 25V
2626	4822 124 40769	4,7µF 20% 100V
2641	3198 016 31020	1nF 25V
2642	3198 016 31020	1nF 25V
2653	4822 122 31765	100pF 2% 63V
2654	4822 122 31765	100pF 2% 63V
2669	4822 126 14305	100nF 10% 16V
2681	4822 124 40433	47µF 20% 25V
2682	4822 122 33752	15pF 5% 50V
2683	4822 126 14305	100nF 10% 16V
2691	4822 122 31765	100pF 2% 63V
2707	4822 122 31765	100pF 2% 63V
2708	4822 122 31765	100pF 2% 63V
2771	4822 124 41407	0,47µF 20% 63V
2902	3198 017 44740	470nF 10V
2905	3198 017 42230	22nF 50V
2908	4822 126 14305	100nF 10% 16V
2922	4822 122 31765	100pF 2% 63V
2923	4822 121 51387	10nF 20% 16V
CAPACITORS		
2201	4822 124 40207	100µF 20% 25V
2202	4822 124 81151	22µF 50V
2203	4822 124 40433	47µF 20% 25V
2204	4822 124 40196	220µF 20% 16V
2205	4822 126 14238	2,2nF 50V
2206	4822 126 14494	22nF 10% 25V
2207	4822 124 40433	47µF 20% 25V
2208	4822 126 13879	220nF +80/-20% 16V
2209	4822 124 41751	47µF 20% 50V
2210	4822 126 13879	220nF +80/-20% 16V
2401	4822 122 31765	100pF 2% 63V
2402	4822 122 31765	100pF 2% 63V
2403	4822 126 14305	100nF 10% 16V
2404	4822 126 14305	100nF 10% 16V
2501	4822 122 31765	100pF 2% 63V
2502	4822 122 31765	100pF 2% 63V
2503	4822 121 51252	470nF 5% 63V
2504	4822 121 51252	470nF 5% 63V
2505	4822 122 31765	100pF 2% 63V
2506	4822 122 31765	100pF 2% 63V
2507	4822 126 14305	100nF 10% 16V
2511	4822 121 51252	470nF 5% 63V
2512	4822 121 51252	470nF 5% 63V
2513	3198 016 31020	1nF 25V
2514	3198 016 31020	1nF 25V
2515	4822 122 31765	100pF 2% 63V
2516	4822 122 31765	100pF 2% 63V
2521	4822 126 14305	100nF 10% 16V
2522	4822 126 14305	100nF 10% 16V
2523	4822 122 31765	100pF 2% 63V
2524	4822 122 31765	100pF 2% 63V
2531	4822 124 40769	4,7µF 20% 100V
2532	4822 124 40769	4,7µF 20% 100V
2533	4822 122 31765	100pF 2% 63V
2534	4822 122 31765	100pF 2% 63V
2535	4822 124 40769	4,7µF 20% 100V
2536	4822 124 40769	4,7µF 20% 100V
2541	4822 124 41407	0,47µF 20% 63V
2542	4822 124 41407	0,47µF 20% 63V
2543	5322 126 11583	10nF 10% 50V
2544	5322 126 11583	10nF 10% 50V
RESISTORS		
3201	4822 117 12968	820R 5% 0,62W
3202	4822 051 30151	150R 5% 0,062W
3205	4822 116 52289	5k6 5% 0,5W

ELECTRICAL PARTS LIST - AF9 BOARD

RESISTORS

3401	4822 051 30471	470R 5% 0,062W	3622	4822 051 30103	10k 5% 0,062W
3402	4822 051 30471	470R 5% 0,062W	3623	4822 051 30102	1k 5% 0,062W
3403	4822 116 52175	100R 5% 0,5W	3624	4822 051 30562	5k6 5% 0,063W
3405	4822 051 30103	10k 5% 0,062W	3625	4822 051 30472	4k7 5% 0,062W
3408	4822 051 30103	10k 5% 0,062W	3626	4822 051 30472	4k7 5% 0,062W
3409	4822 051 30562	5k6 5% 0,063W	3627	4822 052 10109 $\Delta$	10R 5% 0,33W
3412	4822 050 11002	1k 1% 0,4W	3628	4822 116 52283	4k7 5% 0,5W
3435	4822 050 11002	1k 1% 0,4W	3629	4822 051 30472	4k7 5% 0,062W
3436	4822 050 11002	1k 1% 0,4W	3631	4822 050 11002	1k 1% 0,4W
3501	4822 051 30472	4k7 5% 0,062W	3633	4822 051 30102	1k 5% 0,062W
3502	4822 051 30472	4k7 5% 0,062W	3634	4822 051 30562	5k6 5% 0,063W
3503	4822 051 30123	12k 5% 0,062W	3635	4822 051 30103	10k 5% 0,062W
3504	4822 051 30123	12k 5% 0,062W	3636	4822 051 30472	4k7 5% 0,062W
3505	4822 051 30153	15k 5% 0,062W	3637	4822 051 30103	10k 5% 0,062W
3506	4822 051 30153	15k 5% 0,062W	3638	4822 051 30472	4k7 5% 0,062W
3511	4822 117 12968	820R 5% 0,62W	3640	4822 116 52289	5k6 5% 0,5W
3512	4822 117 12968	820R 5% 0,62W	3644	4822 051 30102	1k 5% 0,062W
3513	4822 117 12903	1k8 1% 0,063W	3645	4822 051 30221	220R 5% 0,062W
3514	4822 117 12903	1k8 1% 0,063W	3646	4822 051 30221	220R 5% 0,062W
3521	4822 051 30102	1k 5% 0,062W	3651	4822 051 30102	1k 5% 0,062W
3522	4822 051 30102	1k 5% 0,062W	3652	4822 051 30102	1k 5% 0,062W
3525	4822 051 30471	470R 5% 0,062W	3653	4822 051 30102	1k 5% 0,062W
3526	4822 051 30471	470R 5% 0,062W	3654	4822 051 30102	1k 5% 0,062W
3531	4822 051 30152	1k5 5% 0,062W	3655	4822 051 30102	1k 5% 0,062W
3532	4822 051 30152	1k5 5% 0,062W	3656	4822 051 30102	1k 5% 0,062W
3533	4822 051 30273	27k 5% 0,062W	3657	4822 051 30102	1k 5% 0,062W
3534	4822 051 30273	27k 5% 0,062W	3658	4822 051 30102	1k 5% 0,062W
3543	4822 117 12925	47k 1% 0,063W	3683	4822 051 30154	150k 5% 0,062W
3544	4822 117 12925	47k 1% 0,063W	3684	4822 051 30154	150k 5% 0,062W
3545	4822 051 30562	5k6 5% 0,063W	3686	4822 117 12864	82k 5% 0,6W
3546	4822 051 30562	5k6 5% 0,063W	3687	4822 117 11817	1k2 1% 1/16W
3547	4822 051 30103	10k 5% 0,062W	3688	4822 051 30391	390R 5% 0,062W
3548	4822 051 30103	10k 5% 0,062W	3689	4822 051 30151	150R 5% 0,062W
3549	4822 051 30183	18k 5% 0,062W	3692	4822 051 30334	330k 5% 0,062W
3550	4822 051 30183	18k 5% 0,062W	3694	4822 051 30222	2k2 5% 0,062W
3591	4822 117 12902	8k2 1% 0,063W	3707	4822 051 30102	1k 5% 0,062W
3592	4822 117 12902	8k2 1% 0,063W	3708	4822 051 30102	1k 5% 0,062W
3593	4822 051 30562	5k6 5% 0,063W	3711	4822 051 30562	5k6 5% 0,063W
3594	4822 051 30562	5k6 5% 0,063W	3820	4822 116 52176	10R 5% 0,5W
3601	4822 116 52238	12k 5% 0,5W	3821	4822 052 10109 $\Delta$	10R 5% 0,33W
3602	4822 116 52238	12k 5% 0,5W	4100	4822 051 30008	OR Jumper 0603
3607	4822 051 30682	6k8 5% 0,062W	4101	4822 051 30008	OR Jumper 0603
3608	4822 116 83961	6k8 5%	4104	4822 051 30008	OR Jumper 0603
3609	4822 051 30273	27k 5% 0,062W	4108	4822 051 30008	OR Jumper 0603
3610	4822 051 30273	27k 5% 0,062W	4110	4822 051 30008	OR Jumper 0603
3611	4822 051 30479	47R 5% 0,062W	4111	4822 051 30008	OR Jumper 0603
3612	4822 051 30479	47R 5% 0,062W	4112	4822 051 30008	OR Jumper 0603
3613	4822 051 30102	1k 5% 0,062W	4113	4822 051 30008	OR Jumper 0603
3614	4822 051 30102	1k 5% 0,062W	4114	4822 051 30008	OR Jumper 0603
3615	4822 051 30339	33R 5% 0,062W	4115	4822 051 30008	OR Jumper 0603
3616	4822 051 30339	33R 5% 0,062W	4116	4822 051 30008	OR Jumper 0603
3621	4822 051 30103	10k 5% 0,062W	4119	4822 051 30008	OR Jumper 0603

ELECTRICAL PARTS LIST - AF9 BOARD

4122	4822 051 30008	OR Jumper 0603	7401	4822 130 41246	BC327-25
4124	4822 051 30008	OR Jumper 0603	7402	4822 130 60511	BC847B
4125	4822 051 30008	OR Jumper 0603	7403	4822 209 17345	M62320FP
4126	4822 051 30008	OR Jumper 0603	7501	9322 150 74668	TDA7468D
4127	4822 051 30008	OR Jumper 0603	7601	4822 209 31378	NJM4556MB
4128	4822 051 30008	OR Jumper 0603	7603	4822 130 42804	BC817-25
4130	4822 051 30008	OR Jumper 0603	7604	4822 130 42804	BC817-25
4132	4822 051 30008	OR Jumper 0603	7621	4822 130 60511	BC847B
4133	4822 051 30008	OR Jumper 0603	7622	4822 130 60373	BC857B
4134	4822 051 30008	OR Jumper 0603	7623	4822 130 60511	BC847B
4135	4822 051 30008	OR Jumper 0603	7635	4822 130 60373	BC857B
4137	4822 051 30008	OR Jumper 0603	7636	4822 130 60511	BC847B
4138	4822 051 30008	OR Jumper 0603	7651	4822 130 42804	BC817-25
4139	4822 051 30008	OR Jumper 0603	7652	4822 130 42804	BC817-25
4141	4822 051 30008	OR Jumper 0603	7653	4822 130 42804	BC817-25
4142	4822 051 30008	OR Jumper 0603	7654	4822 130 42804	BC817-25
4143	4822 051 30008	OR Jumper 0603	7681	4822 130 60373	BC857B
4144	4822 051 30008	OR Jumper 0603	7682	4822 130 60511	BC847B
4145	4822 051 30008	OR Jumper 0603	7803	4822 130 60511	BC847B
4146	4822 051 30008	OR Jumper 0603			
4147	4822 051 30008	OR Jumper 0603			
4148	4822 051 30008	OR Jumper 0603			
4151	4822 051 30008	OR Jumper 0603			
4152	4822 051 30008	OR Jumper 0603			
4153	4822 051 30008	OR Jumper 0603			
4501	4822 051 30008	OR Jumper 0603 /22/30/34/37			
4641	4822 051 30008	OR Jumper 0603			
4642	4822 051 30008	OR Jumper 0603			
4811	4822 051 30008	OR Jumper 0603			
4812	4822 051 30008	OR Jumper 0603			
4903	4822 051 30008	OR Jumper 0603			
4904	4822 051 30008	OR Jumper 0603 /22/30/34/37			
4908	4822 051 30008	OR Jumper 0603			
4913	4822 051 30008	OR Jumper 0603			
4920	4822 051 30008	OR Jumper 0603			

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

COILS & FILTERS

5621	4822 157 62552	Coil 2,2 $\mu$ H 5%
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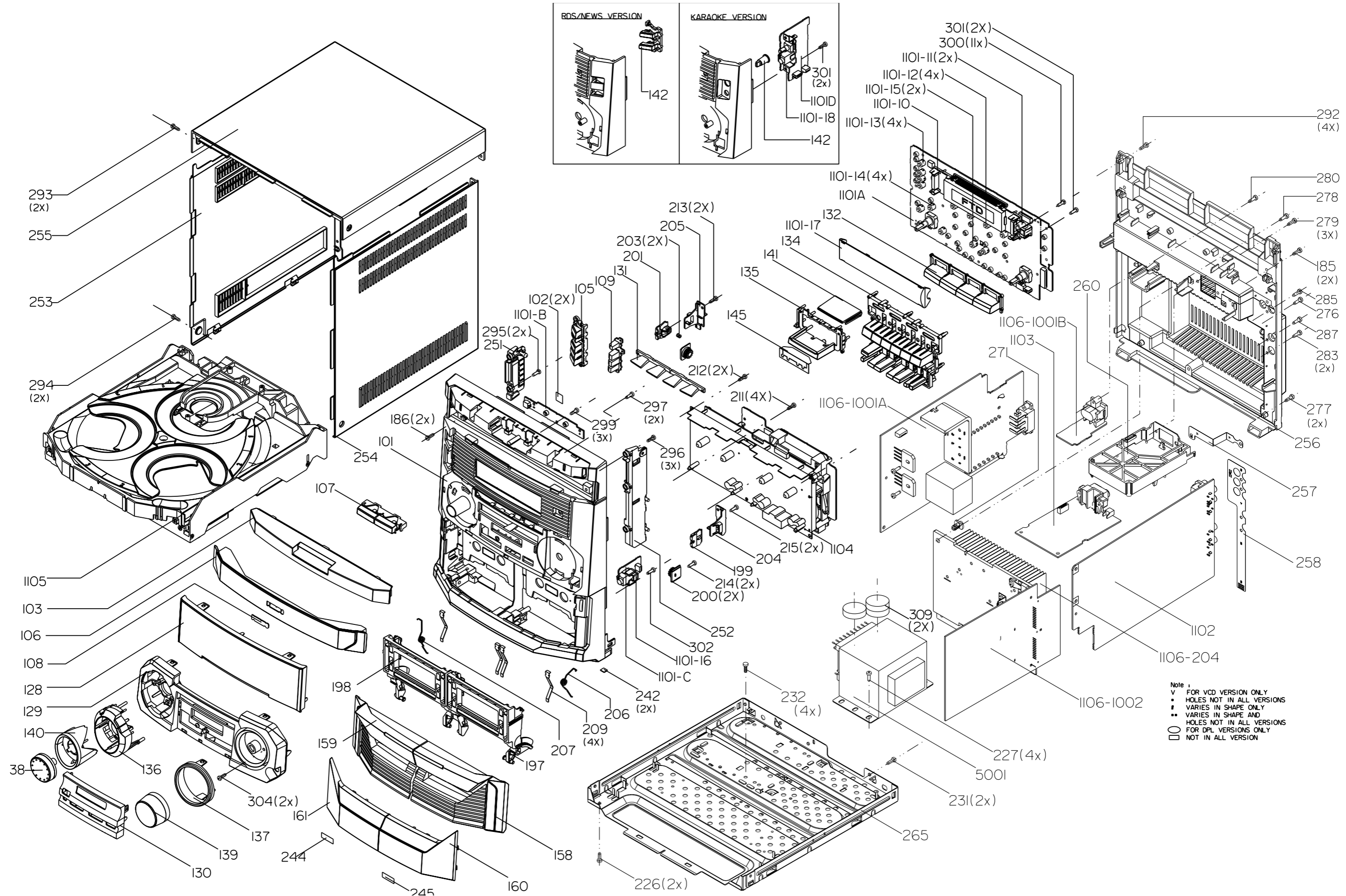
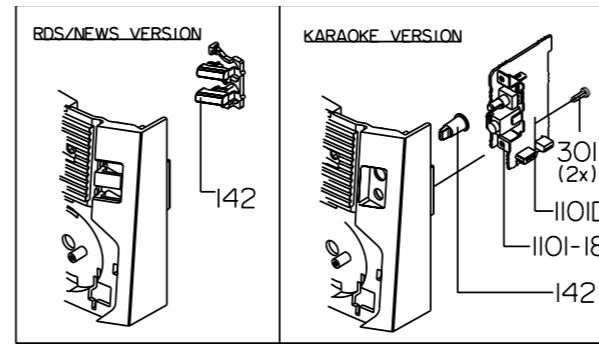
DIODES

6201	4822 130 30621	1N4148
6202	4822 130 30862	BZX79-B9V1
6205	4822 130 61219	BZX79-B10
6206	4822 130 31878	1N4003G
6207	4822 130 31878	1N4003G
6208	4822 130 31878	1N4003G
6401	4822 130 30621	1N4148
6774	4822 130 30621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

7201	4822 130 60511	BC847B
7202	4822 209 72042	L78L05ACZ

EXPLODED VIEW - MAIN UNIT



Note:

- V FOR VCD VERSION ONLY
- HOLES NOT IN ALL VERSIONS
- VARIES IN SHAPE ONLY
- VARIES IN SHAPE AND
- HOLES NOT IN ALL VERSIONS
- FOR DPL VERSIONS ONLY
- NOT IN ALL VERSION

**MECHANICAL PARTSLIST****ACCESSORIES****SCREW LISTS - MAIN UNIT**

101	3140 117 64520	CAB FRONT /21/21M	350	3140 118 51270	BOX SPK ASSY FWB-390/01	185	D3 x 12
101	3140 117 64740	CAB FRONT /22/34	351	4822 303 50063	FM ANTENNA	186	D3 x 12
101	3140 117 64760	CAB FRONT /30	356	3139 228 89680	REMOTE CONTROL	211	D3 x 12
103	3140 117 64530	COVER FRONT CDC	384	2422 549 45067	ANT AM LOOP LAN-006 B	212	D3 x 12
105	3140 117 64710	BTN SET C/CDC SEL /21/21M	385	△ 2422 070 98151	MAINSKORD /21/21M/22/34	213	D3 x 12
105	3140 117 64540	BTN SET CDC LPS C390 /22/34	385	△ 2422 070 98148	MAINSKORD /30	214	D3 x 12
106	3140 117 64550	COVER TRAY CDC	386	△ 4822 263 21092	ADAPTER PLUG /21/21M	215	D3 x 12
107	3140 117 64560	BUTTON SET OPEN/CLOSE	387	3140 115 29900	IFU FW-C390 /21/21M/30	226	M3 x 6
108	4822 454 13408	BADGE PHILIPS	387	3140 115 29910	IFU FW-C390 /22/34	227	M3 x 10
128	3140 117 64570	WINDOW DISPLAY /21/21M	387	3140 115 29930	IFU FW-C390 /34	229	M3 x 10
128	3139 118 16490	WINDOW DISPLAY /22/34	1201	3139 110 34600	FFC FOIL /21/21M/22/30	230	D3 x 10
128	3140 117 64770	WINDOW DISPLAY /30	1300	3139 110 35350	FFC FOIL 11P/220/11P AD	231	M3 x 10
129	3140 117 64580	COVER FRONT DISPLAY	1400	3139 110 35110	FFC FOIL 04P/220/04P AD	232	M3 x 6
130	3140 117 64590	COVER FRONT ORNA.	1401	4822 320 12703	7P - 140MM	276	M3 x 6
131	3139 114 71350	LIGHTGUIDE SOURCE SELECT	1402	3139 110 35100	FFC FOIL 19P/140/19P AD	277	M3 x 10
132	3140 117 64600	BUTTON SET SOURCE	1403	3139 110 34610	FFC FOIL 11P/180/11P AD	278	D3 x 16
134	3140 117 64610	BTN SET C/PROG N VCD	1500	3139 110 33960	FFC FOIL 04P/120/04P BD	279	D3 x 12
135	3140 117 64620	BUTTON MAX	1501	3139 110 33960	FFC FOIL 04P/120/04P BD /21/2'	280	D3 x 12
136	3140 117 64630	BUTTON DSC/DBB/VEC/IS	1600	3139 110 35050	FFC FOIL 08P/220/08P AD	283	D3 x 12
137	3140 117 64640	RING VOLUME	1700	4822 320 12752	7P - 180MM	287	D3 x 12
138	3140 117 64650	KNOB ROTARY	1800	3139 110 35880	FFC FOIL 15P/180/15P BD	292	D3 x 12
139	3140 117 64660	KNOB VOLUME CHROME	5001	△ 3103 308 30640	TRANSF. MAINS /21/21M	293	D3 x 12
140	3139 114 71330	LIGHTGUIDE DSC/DBB/VEC/IS	5001	△ 3103 308 30630	TRANSF. MAINS /22/34	294	M3 x 10
142	3140 117 65570	KNOB KARAOKE /21/21M				295	D3 x 12
142	3140 117 64750	BUT SET RDS/NEWS /22/34				296	D3 x 12
158	3140 117 64670	COVER CASS RIGHT				297	D3 x 12
159	3140 117 64680	COVER CASS LEFT				299	D3 x 12
160	3139 118 13900	LENS CASS RIGHT				300	D3 x 12
161	3139 118 13890	LENS CASS LEFT				301	D3 x 12
197	3139 114 68630	DOOR CASSETTE RIGHT ETF				302	D3 x 12
198	3139 114 68620	DOOR CASSETTE LEFT ETF				304	D3 x 12
199	4822 402 10621	PUSH-CATCH					
200	4822 529 10322	DAMPER ASSY					
201	3139 114 68640	PUSH CATCH LEFT					
203	4822 492 11344	SPRING COMPRESSION					
204	4822 402 11246	BRACKET RIGHT					
205	4822 402 11245	BRACKET LEFT					
206	3139 111 01380	SPRING TORSION RIGHT					
207	3139 111 01390	SPRING TORSION LEFT					
209	4822 492 42787	SPRING CASSETTE					
242	4822 462 40683	RUBBER FOOT					
251	3139 114 70970	BRACKET CDC LEFT					
252	3139 114 70980	BRACKET CDC RIGHT					
253	3139 114 73570	PANEL LEFT					
254	3139 114 73580	PANEL RIGHT					
255	3139 114 73590	COVER TOP					
256	3139 114 73140	PANEL REAR /21					
256	3139 114 73880	PANEL REAR /21M/22/34					
271	3139 114 71010	STOPPER HEATSINK					
309	3104 217 72032	RUBBER FOOT					
310	3104 217 72032	RUBBER FOOT					

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